GDCM

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Chapter 1

GDCM Documentation

This is the developpers documentation.

A PDF version of this doxygen documentation can be found here:

```
http://gdcm.sourceforge.net/3.0/gdcm-3.0.10.pdf
```

A tarball version of this HTML doxygen documentation can be found here:

```
http://gdcm.sourceforge.net/3.0/gdcm-3.0.10-doc.tar.gz
```

Author

Mathieu Malaterre

Chapter 2

Todo List

Class gdcm::CSAHeader

MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

Class gdcm::network::ApplicationContext

Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009)

Class gdcm::Overlay

Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

Class gdcm::SequenceOfFragments

I do not enforce that Sequence of Fragments ends with a SQ end del

Class gdcm::TransferSyntax

: The implementation is completely retarded -> see gdcm::UIDs for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

Member gdcm::UIDGenerator::IsValid (const char *uid)

: Move that in DataStructureAndEncoding (see FileMetaInformation::CheckFileMetaInformation)

Chapter 3

Deprecated List

Member gdcm::CompositeNetworkFunctions::ConstructQuery (ERootType inRootType, EQueryLevel in↩ QueryLevel, const KeyValuePairArrayType &keys, EQueryType queryType=eFind)

Member gdcm::FileSet::AddFile (File const &)

. Does nothing

Member gdcm::TransferSyntax::GetSwapCode () const

Return the SwapCode associated with the Transfer Syntax. Be careful with the special GE private syntax the DataSet is written in little endian but the Pixel Data is in Big Endian.

Chapter 4

Bug List

Class gdcm::DICOMDIRGenerator

: There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the Scanner does not allow us See PS 3.11 / Table D.3-2 STD-GEN Additional DICOMDIR Keys

Member gdcm::FileStreamer::StartGroupDataElement (const PrivateTag &pt, size_t maxsizede=0, uint8_t startoffset=0)

maxsizede should be a value lower than the actual total size of the buffer to be copied

Class gdcm::IPPSorter

There are currently a couple of bugs in this implementation:

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5.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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Chapter 9

Namespace Documentation

9.1 gdcm Namespace Reference

Namespaces

- network
- SegmentHelper
- terminal

  Class for Terminal.

Classes

- class AbortEvent
- class AnonymizeEvent

  AnonymizeEvent.
- class Anonymizer

  Anonymizer.
- class AnyEvent
- class ApplicationEntity

  ApplicationEntity.
- class ASN1

  Class for ASN1.
- class Attribute

  Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.
- class Attribute< Group, Element, TVR, VM::VM1 >
- class Attribute< Group, Element, TVR, VM::VM1_3 >
- class Attribute< Group, Element, TVR, VM::VM1_8 >
- class Attribute< Group, Element, TVR, VM::VM1_n >
- class Attribute< Group, Element, TVR, VM::VM2_2n >
- class Attribute< Group, Element, TVR, VM::VM2_n >
- class Attribute< Group, Element, TVR, VM::VM3_3n >

- class Attribute< Group, Element, TVR, VM::VM3_n >
- class AudioCodec

  AudioCodec.
- class Base64

  Class for Base64.
- class BaseQuery

  BaseQuery.
- class BaseRootQuery

  BaseRootQuery.
- class BasicOffsetTable

  Class to represent a BasicOffsetTable.
- class Bitmap

  Bitmap class.
- class BitmapToBitmapFilter

  BitmapToBitmapFilter class.
- class BoxRegion

  Class for manipulation box region.
- class ByteBuffer

  ByteBuffer.
- class ByteSwap

  ByteSwap.
- class ByteSwapFilter

  ByteSwapFilter.
- class ByteValue

  Class to represent binary value (array of bytes)
- class CAPICryptoFactory
- class CAPICryptographicMessageSyntax
- class Codec

  Codec class.
- class Coder

  Coder.
- class CodeString

  CodeString.
- class Command

  Command superclass for callback/observer methods.
- class CommandDataSet

  Class to represent a Command DataSet.
- class CompositeNetworkFunctions

  Composite Network Functions.
- class ConstCharWrapper

  Do not use me.
- class CP246ExplicitDataElement

  Class to read/write a DataElement as CP246Explicit Data Element.
- class CryptoFactory

  Class to do handle the crypto factory.
- class CryptographicMessageSyntax
- class CSAElement

Class to represent a CSA Element.

- class CSAHeader

  Class for CSAHeader.
- class CSAHeaderDict

  Class to represent a map of CSAHeaderDictEntry.
- class CSAHeaderDictEntry

  Class to represent an Entry in the Dict.
- class CSAHeaderDictException
- class Curve

  Curve class to handle element 50xx,3000 Curve Data.
- class DataElement

  Class to represent a Data Element either Implicit or Explicit.
- class DataElementException
- class DataEvent

  DataEvent.
- class DataSet

  Class to represent a Data Set (which contains Data Elements)
- class DataSetEvent

  DataSetEvent.
- class DataSetHelper

  DataSetHelper (internal class, not intended for user level)
- class Decoder

  Decoder.
- class DefinedTerms

  Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data Element with Defined Terms that does not contain a Value equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation Type ID (4008,0210) is an example of a Data Element having Defined Terms. It is defined to have a Value that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data Element has Defined Terms other Interpretation Type IDs may be defined by the implementor.
- class Defs

  FIXME I do not like the name 'Defs'.
- class DeltaEncodingCodec

  DeltaEncodingCodec compression used by some private vendor.
- class DICOMDIR

  DICOMDIR class.
- class DICOMDIRGenerator

  DICOMDIRGenerator class.
- class Dict

  Class to represent a map of DictEntry.
- class DictConverter

  Class to convert a .dic file into something else:
- class DictEntry

  Class to represent an Entry in the Dict.
- class DictPrinter

  DictPrinter class.
- class Dicts

Class to manipulate the sum of knowledge (all the dict user load)

- class DirectionCosines

  class to handle DirectionCosines

- class Directory

  Class for manipulation directories.

- class DirectoryHelper

  DirectoryHelper.

- class DummyValueGenerator

  Class for generating dummy value.

- class Dumper

  Codec class.

- class Element

  Element class.

- class Element< TVR, VM::VM1_2 >
- class Element< TVR, VM::VM1_n >
- class Element< TVR, VM::VM2_2n >
- class Element< TVR, VM::VM2_n >
- class Element< TVR, VM::VM3_3n >
- class Element< TVR, VM::VM3_4 >
- class Element< TVR, VM::VM3_n >
- class Element< VR::AS, VM::VM5 >
- class Element< VR::OB, VM::VM1 >
- class Element< VR::OW, VM::VM1 >
- class ElementDisableCombinations

  A class which is used to produce compile errors for an invalid combination of template parameters.

- class ElementDisableCombinations< VR::OB, VM::VM1_n >
- class ElementDisableCombinations< VR::OW, VM::VM1_n >
- class EmptyMaskGenerator

  EmptyMaskGenerator Main class to generate a Empty Mask Series from an input Series. This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM Series within the same input directory.

- class EncapsulatedDocument

  EncapsulatedDocument.

- class EncodingImplementation

  EncodingImplementation.

- class EncodingImplementation< VR::VRASCII >
- class EncodingImplementation< VR::VRBINARY >
- class EndEvent
- class EnumeratedValues

  Element. A Data Element with Enumerated Values that does not have a Value equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

- class EquipmentManufacturer
- class Event

  superclass for callback/observer methods

- class Exception

  Exception.

- class ExitEvent
- class ExplicitDataElement

  Class to read/write a DataElement as Explicit Data Element.

- class ExplicitImplicitDataElement

  Class to read/write a DataElement as ExplicitImplicit Data Element.
- class Fiducials

  Fiducials.
- class File

  a DICOM File
- class FileAnonymizer

  FileAnonymizer.
- class FileChangeTransferSyntax

  FileChangeTransferSyntax.
- class FileDecompressLookupTable

  FileDecompressLookupTable class.
- class FileDerivation

  FileDerivation class.
- class FileExplicitFilter

  FileExplicitFilter class.
- class FileMetaInformation

  Class to represent a File Meta Information.
- class Filename

  Class to manipulate file name's.
- class FileNameEvent

  FileNameEvent.
- class FilenameGenerator

  FilenameGenerator.
- class FileSet
- class FileStreamer

  FileStreamer.
- class FileWithName

  FileWithName.
- class FindPatientRootQuery

  PatientRootQuery.
- class FindStudyRootQuery

  FindStudyRootQuery.
- class Fragment

  Class to represent a Fragment.
- class Global

  Global.
- class GroupDict

  Class to represent the mapping from group number to its abbreviation and name.
- class IconImageFilter

  IconImageFilter.
- class IconImageGenerator

  IconImageGenerator.
- struct ignore_char
- class Image

  Image.
- class ImageApplyLookupTable

ImageApplyLookupTable class.

- class ImageChangePhotometricInterpretation

  ImageChangePhotometricInterpretation class.
- class ImageChangePlanarConfiguration

  ImageChangePlanarConfiguration class.
- class ImageChangeTransferSyntax

  ImageChangeTransferSyntax class.
- class ImageCodec

  ImageCodec.
- class ImageConverter

  Image Converter.
- class ImageFragmentSplitter

  ImageFragmentSplitter class.
- class ImageHelper

  ImageHelper (internal class, not intended for user level)
- class ImageReader

  ImageReader.
- class ImageRegionReader

  ImageRegionReader.
- class ImageToImageFilter

  ImageToImageFilter class.
- class ImageWriter

  ImageWriter.
- class ImplicitDataElement

  Class to represent an Implicit *VR* Data *Element*.
- class InitializeEvent
- class IOD

  Class for representing a *IOD*.
- class IODEntry

  Class for representing a *IODEntry*.
- class IODs

  Class for representing a *IODs*.
- class IPPSorter

  IPPSorter.
- class Item

  Class to represent an *Item*.
- class IterationEvent
- class JPEG12Codec

  Class to do JPEG 12bits (lossy & lossless)
- class JPEG16Codec

  Class to do JPEG 16bits (lossless)
- class JPEG2000Codec

  Class to do JPEG 2000.
- class JPEG8Codec

  Class to do JPEG 8bits (lossy & lossless)
- class JPEGCodec

  JPEG codec.

- class JPEGLSCodec

  JPEG-LS.
- class JSON
- class KAKADUCodec

  KAKADUCodec.
- class LO

  LO.
- class LookupTable

  LookupTable class.
- class Macro

  Class for representing a Macro.
- class Macros

  Class for representing a Modules.
- class MD5

  Class for MD5.
- class MediaStorage

  MediaStorage.
- class MemberCommand

  Command subclass that calls a pointer to a member function.
- class MeshPrimitive

  This class defines surface mesh primitives.
- class ModalityPerformedProcedureStepCreateQuery

  ModalityPerformedProcedureStepCreateQuery.
- class ModalityPerformedProcedureStepSetQuery

  ModalityPerformedProcedureStepSetQuery.
- class ModifiedEvent
- class Module

  Class for representing a Module.
- class ModuleEntry

  Class for representing a ModuleEntry.
- class Modules

  Class for representing a Modules.
- class MovePatientRootQuery

  MovePatientRootQuery.
- class MoveStudyRootQuery

  MoveStudyRootQuery.
- class MrProtocol

  Class for MrProtocol.
- class NestedModuleEntries

  Class for representing a NestedModuleEntries.
- class NoEvent
- class NormalizedNetworkFunctions

  Normalized Network Functions.
- class Object

  Object.
- class OpenSSLCryptoFactory
- class OpenSSLCryptographicMessageSyntax

- class OpenSSLP7CryptoFactory
- class OpenSSLP7CryptographicMessageSyntax
- class Orientation

  class to handle Orientation
- class Overlay

  Overlay class.
- class ParseException

  ParseException Standard exception handling object.
- class Parser

  Parser ala XML_Parser from expat (SAX)
- class Patient

  See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.
- class PDBElement

  Class to represent a PDB Element.
- class PDBHeader

  Class for PDBHeader.
- class PDFCodec

  PDFCodec class.
- class PersonName

  PersonName class.
- class PGXCodec

  Class to do PGX.
- class PhotometricInterpretation

  Class to represent an PhotometricInterpretation.
- class PixelFormat

  PixelFormat.
- class Pixmap

  Pixmap class.
- class PixmapReader

  PixmapReader.
- class PixmapToPixmapFilter

  PixmapToPixmapFilter class.
- class PixmapWriter

  PixmapWriter.
- class PNMCodec

  Class to do PNM.
- class Preamble

  DICOM Preamble (Part 10)
- class PresentationContext

  PresentationContext.
- class PresentationContextGenerator

  PresentationContextGenerator.
- class Printer

  Printer class.
- class PrivateDict

  Private Dict.
- class PrivateTag

Class to represent a Private DICOM Data Element (Attribute) Tag (Group, Element, Owner)

- class ProgressEvent

  ProgressEvent.
- class PVRGCodec

  PVRGCodec.
- class PythonFilter

  PythonFilter PythonFilter is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a DataElement into a string, typically this is a nice feature to have for wrapped language.
- class QueryBase

  QueryBase.
- class QueryFactory

  QueryFactory.h.
- class QueryImage

  QueryImage.
- class QueryPatient

  QueryPatient.
- class QuerySeries

  QuerySeries.
- class QueryStudy

  QueryStudy.h.
- class RAWCodec

  RAWCodec class.
- class Reader

  Reader ala DOM (Document Object Model)
- struct RealWorldValueMappingContent
- class Region

  Class for manipulation region.
- class Rescaler

  Rescale class.
- class RLECodec

  Class to do RLE.
- class Scanner

  Scanner.
- class Segment

  This class defines a segment.
- class SegmentedPaletteColorLookupTable

  SegmentedPaletteColorLookupTable class.
- class SegmentReader

  This class defines a segment reader.
- class SegmentWriter

  This class defines a segment writer.
- class SequenceOfFragments

  Class to represent a Sequence Of Fragments.
- class SequenceOfItems

  Class to represent a Sequence Of Items.
- class SerieHelper

  SerieHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

- class Series

  Series.
- class ServiceClassUser

  ServiceClassUser.
- class SHA1

  Class for SHA1.
- class SimpleMemberCommand

  Command subclass that calls a pointer to a member function.
- class SimpleSubjectWatcher

  SimpleSubjectWatcher.
- class SmartPointer

  Class for Smart Pointer.
- class SOPClassUIDToIOD

  Class convert a class SOP Class UID into IOD.
- class Sorter

  Sorter.
- class Spacing

  Class for Spacing.
- class Spectroscopy

  Spectroscopy class.
- class SplitMosaicFilter

  SplitMosaicFilter class.
- class StartEvent
- struct static_assert_test
- struct STATIC_ASSERTION_FAILURE
- struct STATIC_ASSERTION_FAILURE< true >
- class StreamImageReader

  StreamImageReader.
- class StreamImageWriter

  StreamImageReader.
- class StrictScanner

  StrictScanner.
- class String

  String.
- class StringFilter

  StringFilter.
- class Study

  Study.
- class Subject

  Subject.
- class Surface

  This class defines a SURFACE IE.
- class SurfaceHelper

  SurfaceHelper.
- class SurfaceReader

  This class defines a SURFACE IE reader.
- class SurfaceWriter

This class defines a SURFACE IE writer.

- class SwapCode

  SwapCode representation.
- class SwapperDoOp
- class SwapperNoOp
- class System

  Class to do system operation.
- class Table

  Table.
- class TableEntry

  TableEntry.
- class TableReader

  Class for representing a TableReader.
- class Tag

  Class to represent a DICOM Data Element (Attribute) Tag (Group, Element).
- class TagPath

  class to handle a path of tag.
- class Testing

  class for testing
- class Trace

  Trace.
- class TransferSyntax

  Class to manipulate Transfer Syntax.
- class Type

  Type.
- struct UI
- class UIDGenerator

  Class for generating unique UID.
- class UIDs

  all known uids
- class UNExplicitDataElement

  Class to read/write a DataElement as UNExplicit Data Element.
- class UNExplicitImplicitDataElement

  Class to read/write a DataElement as ExplicitImplicit Data Element.
- class Unpacker12Bits

  Pack/Unpack 12 bits pixel into 16bits.
- class Usage

  Usage.
- class UserEvent
- class UUIDGenerator

  Class for generating unique UUID.
- class Validate

  Validate class.
- class Value

  Class to represent the value of a Data Element.
- class ValueIO

  Class to dispatch template calls.

- class Version

  major/minor and build version
- class VL

  Value Length.
- class VM

  Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.
- struct VMToLength
- class VR

  VR class.
- class VR16ExplicitDataElement

  Class to read/write a DataElement as Explicit Data Element.
- struct VRToEncoding
- struct VRToType
- class VRVLSize
- class VRVLSize< 0 >
- class VRVLSize< 1 >
- class Waveform

  Waveform class.
- class WLMFindQuery

  PatientRootQuery.
- class Writer

  Writer ala DOM (Document Object Model)
- class XMLDictReader

  Class for representing a XMLDictReader.
- class XMLPrinter
- class XMLPrivateDictReader

  Class for representing a XMLPrivateDictReader.

Typedefs

- typedef String<'\\', 16 > AEComp
- typedef String<'\\', 64 > ASComp
- typedef bool(* BOOL_FUNCTION_PFILE_PFILE_POINTER) (File *, File *)
- typedef String<'\\', 16 > CSComp
- typedef String<'\\', 64 > DAComp
- typedef String<'\\', 64 > DTComp
- typedef std::vector< SmartPointer< FileWithName > > FileList
- typedef Bitmap IconImage
- typedef String<'\\', 64 > LOComp
- typedef String<'\\', 64 > LTComp
- typedef ModuleEntry MacroEntry
- typedef NestedModuleEntries NestedMacroEntries
- typedef String<'\\', 64 > PNComp
- typedef String<'\\', 64 > SHComp
- typedef String<'\\', 64 > STComp
- typedef String<'\\', 16 > TMComp
- typedef String<'\\', 4294967294 > UCComp
- typedef String<'\\', 64, 0 > UIComp
- typedef String<'\\', 4294967294 > URComp
- typedef String<'\\', 64 > UTComp

Enumerations

- enum CompOperators {
  GDCM_EQUAL = 0 ,
  GDCM_DIFFERENT ,
  GDCM_GREATER ,
  GDCM_GREATEROREQUAL ,
  GDCM_LESS ,
  GDCM_LESSOREQUAL }
- enum ECharSet {
  eLatin1 = 0 ,
  eLatin2 ,
  eLatin3 ,
  eLatin4 ,
  eCyrillic ,
  eArabic ,
  eGreek ,
  eHebrew ,
  eLatin5 ,
  eJapanese ,
  eThai ,
  eJapaneseKanjiMultibyte ,
  eJapaneseSupplementaryKanjiMultibyte ,
  eKoreanHangulHanjaMultibyte ,
  eUTF8 ,
  eGB18030 }
- enum ENQueryType {
  eCreateMMPS = 0 ,
  eSetMMPS }
- enum EQueryLevel {
  ePatient = 0 ,
  eStudy = 1 ,
  eSeries = 2 ,
  eImage = 3 }
- enum EQueryType {
  eFind = 0 ,
  eMove ,
  eWLMFind }
- enum ERootType {
  ePatientRootType ,
  eStudyRootType }
- enum LodModeType {
  LD_ALL = 0x00000000 ,
  LD_NOSEQ = 0x00000001 ,
  LD_NOSHADOW = 0x00000002 ,
  LD_NOSHADOWSEQ = 0x00000004 }

Functions

- static int add1 (char *buf, int n)
- ignore_char const backslash ('\\')
- template<typename T >
  static T Clamp (int v)

- static void clean (char *mant)
- static int doround (char *buf, unsigned int n)
- VR::VRType GetVRFromTag (Tag const &tag)
- bool operator!= (const CodeString &ref, const CodeString &cs)
- bool operator!= (const DataElement &lhs, const DataElement &rhs)
- std::ostream & operator<< (std::ostream &_os, const GroupDict &_val)
- std::ostream & operator<< (std::ostream &_os, const IOD &_val)
- std::ostream & operator<< (std::ostream &_os, const IODEntry &_val)
- std::ostream & operator<< (std::ostream &_os, const IODs &_val)
- std::ostream & operator<< (std::ostream &_os, const Macro &_val)
- std::ostream & operator<< (std::ostream &_os, const Macros &_val)
- std::ostream & operator<< (std::ostream &_os, const MediaStorage &ms)
- std::ostream & operator<< (std::ostream &_os, const Module &_val)
- std::ostream & operator<< (std::ostream &_os, const ModuleEntry &_val)
- std::ostream & operator<< (std::ostream &_os, const Modules &_val)
- std::ostream & operator<< (std::ostream &_os, const NestedModuleEntries &_val)
- std::ostream & operator<< (std::ostream &_os, const Tag &_val)
- std::ostream & operator<< (std::ostream &_os, const TransferSyntax &ts)
- std::ostream & operator<< (std::ostream &_os, const Type &val)
- std::ostream & operator<< (std::ostream &_os, const UI &_val)
- std::ostream & operator<< (std::ostream &_os, const UIDs &uid)
- std::ostream & operator<< (std::ostream &_os, const Usage &val)
- std::ostream & operator<< (std::ostream &_os, const VM &_val)
- std::ostream & operator<< (std::ostream &_os, const VR &val)
- std::ostream & operator<< (std::ostream &os, const BasicOffsetTable &val)
- std::ostream & operator<< (std::ostream &os, const CodeString &str)
- std::ostream & operator<< (std::ostream &os, const CommandDataSet &val)
- std::ostream & operator<< (std::ostream &os, const CSAElement &val)
- std::ostream & operator<< (std::ostream &os, const CSAHeader &d)
- std::ostream & operator<< (std::ostream &os, const CSAHeaderDict &val)
- std::ostream & operator<< (std::ostream &os, const CSAHeaderDictEntry &val)
- std::ostream & operator<< (std::ostream &os, const DataElement &val)
- std::ostream & operator<< (std::ostream &os, const DataSet &val)
- std::ostream & operator<< (std::ostream &os, const Dict &val)
- std::ostream & operator<< (std::ostream &os, const DictEntry &val)
- std::ostream & operator<< (std::ostream &os, const Dicts &d)
- std::ostream & operator<< (std::ostream &os, const Directory &d)
- std::ostream & operator<< (std::ostream &os, const File &val)
- std::ostream & operator<< (std::ostream &os, const FileMetaInformation &val)
- std::ostream & operator<< (std::ostream &os, const FileSet &f)
- std::ostream & operator<< (std::ostream &os, const Fragment &val)
- std::ostream & operator<< (std::ostream &os, const Global &g)
- std::ostream & operator<< (std::ostream &os, const Item &val)
- std::ostream & operator<< (std::ostream &os, const MrProtocol &d)
- std::ostream & operator<< (std::ostream &os, const Object &obj)
- std::ostream & operator<< (std::ostream &os, const Orientation &o)
- std::ostream & operator<< (std::ostream &os, const PDBElement &val)
- std::ostream & operator<< (std::ostream &os, const PDBHeader &d)
- std::ostream & operator<< (std::ostream &os, const PhotometricInterpretation &val)
- std::ostream & operator<< (std::ostream &os, const PixelFormat &pf)
- std::ostream & operator<< (std::ostream &os, const Preamble &val)

- std::ostream & operator<< (std::ostream &os, const PrivateDict &val)
- std::ostream & operator<< (std::ostream &os, const PrivateTag &val)
- std::ostream & operator<< (std::ostream &os, const Region &r)
- std::ostream & operator<< (std::ostream &os, const Scanner &s)
- std::ostream & operator<< (std::ostream &os, const Sorter &s)
- std::ostream & operator<< (std::ostream &os, const StrictScanner &s)
- std::ostream & operator<< (std::ostream &os, const SwapCode &sc)
- std::ostream & operator<< (std::ostream &os, const Version &v)
- std::ostream & operator<< (std::ostream &os, const VL &val)
- std::ostream & operator<< (std::ostream &os, Event &e)

  Generic inserter operator for Event and its subclasses.
- bool operator== (const CodeString &ref, const CodeString &cs)
- std::istream & operator>> (std::istream &_is, Tag &_val)
- std::istream & operator>> (std::istream &in, ignore_char const &ic)
- template<char TDelimiter, unsigned int TMaxLength, char TPadChar>
  std::istream & operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)
- template<typename T >
  static int Round (T x)
- static int roundat (char *buf, unsigned int i, int iexp)
- TYPETOENCODING (SQ, VRBINARY, unsigned char) TYPETOENCODING(UN
- template<typename Float >
  static void x16printf (char *buf, int size, Float f)

Variables

- static Global GlobalInstance
- VRBINARY

9.1.1 Detailed Description

This header defines the classes for the AA Actions, Association Abort Related Actions (Table 9-9 of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AE Actions, Association Establishment Related Actions (Table 9-6 of ps 3.↩ 8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AR Actions, Association Release Related Actions (Table 9-8 of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the DT Actions, Data Transfer Related Actions (Table 9-8 of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

9.1.2 Typedef Documentation

9.1.2.1 AEComp

```
typedef String<'\\',16> gdcm::AEComp
```

9.1.2.2 ASComp

```
typedef String<'\\',64> gdcm::ASComp
```

9.1.2.3 BOOL_FUNCTION_PFILE_PFILE_POINTER

```
typedef bool(* gdcm::BOOL_FUNCTION_PFILE_PFILE_POINTER) (File *, File *)
```

9.1.2.4 CSComp

```
typedef String<'\\',16> gdcm::CSComp
```

9.1.2.5 DAComp

```
typedef String<'\\',64> gdcm::DAComp
```

9.1.2.6 DTComp

```
typedef String<'\\',64> gdcm::DTComp
```

9.1.2.7 FileList

```
typedef std::vector< SmartPointer<FileWithName> > gdcm::FileList
```

9.1.2.8 IconImage

```
typedef Bitmap gdcm::IconImage
```

9.1.2.9 LOComp

```
typedef String<'\\',64> gdcm::LOComp
```

9.1.2.10 LTComp

```
typedef String<'\\',64> gdcm::LTComp
```

9.1.2.11 MacroEntry

```
typedef ModuleEntry gdcm::MacroEntry
```

9.1.2.12 NestedMacroEntries

```
typedef NestedModuleEntries gdcm::NestedMacroEntries
```

9.1.2.13 PNComp

```
typedef String<'\\',64> gdcm::PNComp
```

9.1.2.14 SHComp

```
typedef String<'\\',64> gdcm::SHComp
```

9.1.2.15 STComp

```
typedef String<'\\',64> gdcm::STComp
```

9.1.2.16 TMComp

```
typedef String<'\\',16> gdcm::TMComp
```

9.1.2.17 UCComp

```
typedef String<'\\',4294967294> gdcm::UCComp
```

9.1.2.18 UIComp

```
typedef String<'\\',64,0> gdcm::UIComp
```

9.1.2.19 URComp

```
typedef String<'\\',4294967294> gdcm::URComp
```

9.1.2.20 UTComp

```
typedef String<'\\',64> gdcm::UTComp
```

9.1.3 Enumeration Type Documentation

9.1.3.1 CompOperators

```
enum gdcm::CompOperators
```

Enumerator

GDCM_EQUAL	
GDCM_DIFFERENT	
GDCM_GREATER	
GDCM_GREATEROREQUAL	
GDCM_LESS	
GDCM_LESSOREQUAL	

9.1.3.2 ECharSet

`enum gdcm::ECharSet`

The character sets enumerated in PS 3.3 2009 Annex C, section C.12.1.1.2 The resulting character set is stored in 0008,0005 The conversion to the data element is performed by the QueryFactory itself

Enumerator

eLatin1	
eLatin2	
eLatin3	
eLatin4	
eCyrillic	
eArabic	
eGreek	
eHebrew	
eLatin5	
eJapanese	
eThai	
eJapaneseKanjiMultibyte	
eJapaneseSupplementaryKanjiMultibyte	
eKoreanHangulHanjaMultibyte	
eUTF8	
eGB18030	

9.1.3.3 ENQueryType

`enum gdcm::ENQueryType`

Enumerator

eCreateMMPS	
eSetMMPS	

9.1.3.4 EQueryLevel

`enum gdcm::EQueryLevel`

Enumerator

ePatient	
eStudy	
eSeries	
eImage	

9.1.3.5 EQueryType

`enum gdcm::EQueryType`

Enumerator

eFind	
eMove	
eWLMFind	

9.1.3.6 ERootType

`enum gdcm::ERootType`

Enumerator

ePatientRootType	
eStudyRootType	

9.1.3.7 LodModeType

```
enum gdcm::LodModeType
```

Enumerator

LD_ALL	
LD_NOSEQ	
LD_NOSHADOW	
LD_NOSHADOWSEQ	

9.1.4 Function Documentation

9.1.4.1 add1()

```
static int gdcm::add1 (
            char * buf,
            int n )  [static]
```

Referenced by doround().

9.1.4.2 backslash()

```
ignore_char const gdcm::backslash (
            '\\'  )
```

Referenced by gdcm::EncodingImplementation< VR::VRASCII >::ReadComputeLength().

9.1.4.3 Clamp()

```
template<typename T >
static T gdcm::Clamp (
            int v )  [inline], [static]
```

9.1.4.4 clean()

```
static void gdcm::clean (
            char * mant )  [inline], [static]
```

Referenced by x16printf().

9.1.4.5 doround()

```
static int gdcm::doround (
            char * buf,
            unsigned int n )  [static]
```

References add1().

Referenced by roundat().

9.1.4.6 GetVRFromTag()

```
VR::VRType gdcm::GetVRFromTag (
            Tag const & tag )
```

9.1.4.7 operator"!=() [1/2]

```
bool gdcm::operator!= (
            const CodeString & ref,
            const CodeString & cs )  [inline]
```

9.1.4.8 operator"!=() [2/2]

```
bool gdcm::operator!= (
            const DataElement & lhs,
            const DataElement & rhs )  [inline]
```

9.1.4.9 operator<<() [1/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const GroupDict & _val )  [inline]
```

9.1.4.10 operator<<() [2/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const IOD & _val )  [inline]
```

9.1.4.11 operator<<() [3/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const IODEntry & _val )  [inline]
```

9.1.4.12 operator<<() [4/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const IODs & _val )  [inline]
```

9.1.4.13 operator<<() [5/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Macro & _val )  [inline]
```

9.1.4.14 operator<<() [6/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Macros & _val )  [inline]
```

9.1.4.15 operator<<() [7/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const MediaStorage & ms )  [inline]
```

9.1.4.16 operator<<() [8/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Module & _val )  [inline]
```

9.1.4.17 operator<<() [9/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const ModuleEntry & _val )  [inline]
```

9.1.4.18 operator<<() [10/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Modules & _val )  [inline]
```

9.1.4.19 operator<<() [11/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const NestedModuleEntries & _val )  [inline]
```

9.1.4.20 operator<<() [12/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Tag & _val )  [inline]
```

9.1.4.21 operator<<() [13/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const TransferSyntax & ts )  [inline]
```

9.1.4.22 operator<<() [14/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Type & val )  [inline]
```

9.1.4.23 operator<<() [15/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const UI & _val )  [inline]
```

9.1.4.24 operator<<() [16/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const UIDs & uid )  [inline]
```

References gdcm::UIDs::GetName(), and gdcm::UIDs::GetString().

9.1.4.25 operator<<() [17/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const Usage & val )  [inline]
```

9.1.4.26 operator<<() [18/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const VM & _val )  [inline]
```

9.1.4.27 operator<<() [19/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & _os,
            const VR & val )  [inline]
```

9.1.4.28 operator<<() [20/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const BasicOffsetTable & val )  [inline]
```

9.1.4.29 operator<<() [21/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CodeString & str )  [inline]
```

9.1.4.30 operator<<() [22/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CommandDataSet & val )  [inline]
```

9.1.4.31 operator<<() [23/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CSAElement & val )  [inline]
```

9.1.4.32 operator<<() [24/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CSAHeader & d )  [inline]
```

9.1.4.33 operator<<() [25/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CSAHeaderDict & val )  [inline]
```

9.1.4.34 operator<<() [26/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const CSAHeaderDictEntry & val )  [inline]
```

9.1.4.35 operator<<() [27/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const DataElement & val )  [inline]
```

9.1.4.36 operator<<() [28/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const DataSet & val )  [inline]
```

9.1.4.37 operator<<() [29/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Dict & val )  [inline]
```

9.1.4.38 operator<<() [30/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const DictEntry & val )  [inline]
```

9.1.4.39 operator<<() [31/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Dicts & d )  [inline]
```

9.1.4.40 operator<<() [32/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Directory & d )  [inline]
```

9.1.4.41 operator<<() [33/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const File & val )  [inline]
```

9.1.4.42 operator<<() [34/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const FileMetaInformation & val )  [inline]
```

9.1.4.43 operator<<() [35/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const FileSet & f )  [inline]
```

9.1.4.44 operator<<() [36/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Fragment & val )  [inline]
```

9.1.4.45 operator<<() [37/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Global & g )  [inline]
```

9.1.4.46 operator<<() [38/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Item & val )  [inline]
```

9.1.4.47 operator<<() [39/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const MrProtocol & d )  [inline]
```

9.1.4.48 operator<<() [40/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Object & obj )  [inline]
```

9.1.4.49 operator<<() [41/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Orientation & o )  [inline]
```

9.1.4.50 operator<<() [42/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PDBElement & val )  [inline]
```

9.1.4.51 operator<<() [43/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PDBHeader & d )  [inline]
```

9.1.4.52 operator<<() [44/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PhotometricInterpretation & val )  [inline]
```

9.1.4.53 operator<<() [45/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PixelFormat & pf )  [inline]
```

9.1.4.54 operator<<() [46/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Preamble & val )  [inline]
```

9.1.4.55 operator<<() [47/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PrivateDict & val )  [inline]
```

9.1.4.56 operator<<() [48/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const PrivateTag & val )  [inline]
```

9.1.4.57 operator<<() [49/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Region & r )  [inline]
```

References gdcm::Region::Print().

9.1.4.58 operator<<() [50/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Scanner & s )  [inline]
```

9.1.4.59 operator<<() [51/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Sorter & s )  [inline]
```

9.1.4.60 operator<<() [52/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const StrictScanner & s )  [inline]
```

9.1.4.61 operator<<() [53/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const SwapCode & sc )  [inline]
```

9.1.4.62 operator<<() [54/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const Version & v )  [inline]
```

9.1.4.63 operator<<() [55/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            const VL & val )  [inline]
```

9.1.4.64 operator<<() [56/56]

```
std::ostream& gdcm::operator<< (
            std::ostream & os,
            Event & e )  [inline]
```

Generic inserter operator for Event and its subclasses.

References gdcm::Event::Print().

9.1.4.65 operator==()

```
bool gdcm::operator== (
            const CodeString & ref,
            const CodeString & cs )  [inline]
```

Examples

DumpPhilipsECHO.cxx.

9.1.4.66 operator>>() [1/3]

```
std::istream& gdcm::operator>> (
            std::istream & _is,
            Tag & _val )  [inline]
```

9.1.4.67 operator>>() [2/3]

```
std::istream& gdcm::operator>> (
            std::istream & in,
            ignore_char const & ic )  [inline]
```

References gdcm::ignore_char::m_char.

9.1.4.68 operator>>() [3/3]

```
template<char TDelimiter, unsigned int TMaxLength, char TPadChar>
std::istream& gdcm::operator>> (
            std::istream & is,
            String< TDelimiter, TMaxLength, TPadChar > & ms )  [inline]
```

9.1.4.69 Round()

```
template<typename T >
static int gdcm::Round (
            T x )  [inline], [static]
```

Referenced by gdcm::ImageChangePhotometricInterpretation::RGB2YBR(), and gdcm::ImageChangePhotometric↩ Interpretation::YBR2RGB().

9.1.4.70 roundat()

```
static int gdcm::roundat (
            char * buf,
            unsigned int i,
            int iexp )  [static]
```

References doround().

Referenced by x16printf().

9.1.4.71 TYPETOENCODING()

```
gdcm::TYPETOENCODING (
            SQ ,
            VRBINARY ,
            unsigned char  )
```

9.1.4.72 x16printf()

```
template<typename Float >
static void gdcm::x16printf (
            char * buf,
            int size,
            Float f )  [static]
```

References clean(), and roundat().

Referenced by gdcm::EncodingImplementation< VR::VRASCII >::Write().

9.1.5 Variable Documentation

9.1.5.1 GlobalInstance

```
Global gdcm::GlobalInstance  [static]
```

9.1.5.2 VRBINARY

```
gdcm::VRBINARY
```

Referenced by gdcm::Element< TVR, VM::VM1_n >::Set(), and gdcm::Element< TVR, VM::VM1_n >::SetNoSwap().

9.2 gdcm::network Namespace Reference

Classes

- class AAbortPDU

  AAbortPDU.
- class AAssociateACPDU

  AAssociateACPDU.
- class AAssociateRJPDU

  AAssociateRJPDU.
- class AAssociateRQPDU

  AAssociateRQPDU.
- class AbstractSyntax

  AbstractSyntax.
- class ApplicationContext

  ApplicationContext.
- class AReleaseRPPDU

  AReleaseRPPDU.
- class AReleaseRQPDU

  AReleaseRQPDU.
- class ARTIMTimer

  ARTIMTimer.
- class AsynchronousOperationsWindowSub

  AsynchronousOperationsWindowSub.
- class BaseCompositeMessage

  BaseCompositeMessage.
- class BaseNormalizedMessage

  BaseNormalizedMessage.
- class BasePDU

  BasePDU.
- class CEchoRQ

  CEchoRQ.
- class CEchoRSP

  CEchoRSP this file defines the messages for the cecho action.
- class CFind
- class CFindCancelRQ

  CFindCancelRQ this file defines the messages for the cfind action.
- class CFindRQ

  CFindRQ.
- class CFindRSP

  CFindRSP this file defines the messages for the cfind action.
- class CMoveCancelRq
- class CMoveRQ

  CMoveRQ.
- class CMoveRSP

  CMoveRSP this file defines the messages for the cmove action.
- class CompositeMessageFactory

CompositeMessageFactory.

- class CStoreRQ

  CStoreRQ.
- class CStoreRSP

  CStoreRSP this file defines the messages for the cecho action.
- class DIMSE

  DIMSE.
- class ImplementationClassUIDSub

  ImplementationClassUIDSub.
- class ImplementationUIDSub

  ImplementationUIDSub.
- class ImplementationVersionNameSub

  ImplementationVersionNameSub.
- class MaximumLengthSub

  MaximumLengthSub.
- class NActionRQ

  NActionRQ.
- class NActionRSP

  NActionRSP this file defines the messages for the NAction action.
- class NCreateRQ

  NCreateRQ.
- class NCreateRSP

  NCreateRSP this file defines the messages for the ncreate action.
- class NDeleteRQ

  NDeleteRQ.
- class NDeleteRSP

  NDeleteRSP this file defines the messages for the ndelete action.
- class NEventReportRQ

  NEventReportRQ.
- class NEventReportRSP

  NEventReportRSP this file defines the messages for the neventreport action.
- class NGetRQ

  NGetRQ.
- class NGetRSP

  NGetRSP this file defines the messages for the nget action.
- class NormalizedMessageFactory
- class NSetRQ

  NSetRQ.
- class NSetRSP

  NSetRSP this file defines the messages for the nset action.
- class PDataTFPDU

  PDataTFPDU.
- class PDUFactory

  PDUFactory basically, given an initial byte, construct the.
- class PresentationContextAC

  PresentationContextAC.
- class PresentationContextRQ

PresentationContextRQ.

- class PresentationDataValue

  PresentationDataValue.
- class RoleSelectionSub

  RoleSelectionSub.
- class ServiceClassApplicationInformation
- class SOPClassExtendedNegociationSub

  SOPClassExtendedNegociationSub.
- class TableRow
- class TransferSyntaxSub

  TransferSyntaxSub.
- struct Transition
- class ULAction

  ULAction.
- class ULActionAA1
- class ULActionAA2
- class ULActionAA3
- class ULActionAA4
- class ULActionAA5
- class ULActionAA6
- class ULActionAA7
- class ULActionAA8
- class ULActionAE1
- class ULActionAE2
- class ULActionAE3
- class ULActionAE4
- class ULActionAE5
- class ULActionAE6
- class ULActionAE7
- class ULActionAE8
- class ULActionAR1
- class ULActionAR10
- class ULActionAR2
- class ULActionAR3
- class ULActionAR4
- class ULActionAR5
- class ULActionAR6
- class ULActionAR7
- class ULActionAR8
- class ULActionAR9
- class ULActionDT1
- class ULActionDT2
- class ULBasicCallback

  ULBasicCallback.
- class ULConnection

  ULConnection.
- class ULConnectionCallback
- class ULConnectionInfo

  ULConnectionInfo.

- class ULConnectionManager

  ULConnectionManager.
- class ULEvent

  ULEvent.
- class ULTransitionTable

  ULTransitionTable The transition table of all the ULEvents, new ULActions, and ULStates.
- class ULWritingCallback
- class UserInformation

  UserInformation.

Enumerations

- enum EEventID {
  eAASSOCIATERequestLocalUser = 0 ,
  eTransportConnConfirmLocal ,
  eASSOCIATE_ACPDUreceived ,
  eASSOCIATE_RJPDUreceived ,
  eTransportConnIndicLocal ,
  eAASSOCIATE_RQPDUreceived ,
  eAASSOCIATEresponseAccept ,
  eAASSOCIATEresponseReject ,
  ePDATArequest ,
  ePDATATFPDU ,
  eARELEASERequest ,
  eARELEASE_RQPDUReceivedOpen ,
  eARELEASE_RPPDUReceived ,
  eARELEASEResponse ,
  eAABORTRequest ,
  eAABORTPDUReceivedOpen ,
  eTransportConnectionClosed ,
  eARTIMTimerExpired ,
  eUnrecognizedPDUReceived ,
  eEventDoesNotExist }
- enum EStateID {
  eStaDoesNotExist = 0 ,
  eSta1Idle = 1 ,
  eSta2Open = 2 ,
  eSta3WaitLocalAssoc = 4 ,
  eSta4LocalAssocDone = 8 ,
  eSta5WaitRemoteAssoc = 16 ,
  eSta6TransferReady = 32 ,
  eSta7WaitRelease = 64 ,
  eSta8WaitLocalRelease = 128 ,
  eSta9ReleaseCollisionRqLocal = 256 ,
  eSta10ReleaseCollisionAc = 512 ,
  eSta11ReleaseCollisionRq = 1024 ,
  eSta12ReleaseCollisionAcLocal = 2048 ,
  eSta13AwaitingClose = 4096 }

Functions

- int GetStateIndex (EStateID inState)

Variables

- const int cMaxEventID = eEventDoesNotExist
- const int cMaxStateID = 13

9.2.1 Enumeration Type Documentation

9.2.1.1 EEventID

enum gdcm::network::EEventID

Enumerator

eAASSOCIATERequestLocalUser	
eTransportConnConfirmLocal	
eASSOCIATE_ACPDUreceived	
eASSOCIATE_RJPDUreceived	
eTransportConnIndicLocal	
eAASSOCIATE_RQPDUreceived	
eAASSOCIATEresponseAccept	
eAASSOCIATEresponseReject	
ePDATArequest	
ePDATATFPDU	
eARELEASERequest	
eARELEASE_RQPDUReceivedOpen	
eARELEASE_RPPDUReceived	
eARELEASEResponse	
eAABORTRequest	
eAABORTPDUReceivedOpen	
eTransportConnectionClosed	
eARTIMTimerExpired	
eUnrecognizedPDUReceived	
eEventDoesNotExist	

9.2.1.2 EStateID

enum gdcm::network::EStateID

Each network connection will be in a particular state at any given time. Those states have IDs as described in the standard ps3.8-2009, roughly 1-13. This enumeration lists those states. The actual ULState class will contain more information about transitions to other states.

name and date: 16 sept 2010 mmr

Enumerator

eStaDoesNotExist	
eSta1Idle	
eSta2Open	
eSta3WaitLocalAssoc	
eSta4LocalAssocDone	
eSta5WaitRemoteAssoc	
eSta6TransferReady	
eSta7WaitRelease	
eSta8WaitLocalRelease	
eSta9ReleaseCollisionRqLocal	
eSta10ReleaseCollisionAc	
eSta11ReleaseCollisionRq	
eSta12ReleaseCollisionAcLocal	
eSta13AwaitingClose	

9.2.2 Function Documentation

9.2.2.1 GetStateIndex()

```
int gdcm::network::GetStateIndex (
            EStateID inState ) [inline]
```

References eSta10ReleaseCollisionAc, eSta11ReleaseCollisionRq, eSta12ReleaseCollisionAcLocal, eSta13AwaitingClose, eSta1Idle, eSta2Open, eSta3WaitLocalAssoc, eSta4LocalAssocDone, eSta5WaitRemoteAssoc, eSta6TransferReady, eSta7WaitRelease, eSta8WaitLocalRelease, eSta9ReleaseCollisionRqLocal, and eStaDoesNotExist.

9.2.3 Variable Documentation

9.2.3.1 cMaxEventID

```
const int gdcm::network::cMaxEventID = eEventDoesNotExist
```

9.2.3.2 cMaxStateID

```
const int gdcm::network::cMaxStateID = 13
```

Referenced by gdcm::network::TableRow::TableRow(), and gdcm::network::TableRow::~TableRow().

9.3 gdcm::SegmentHelper Namespace Reference

Classes

- struct BasicCodedEntry

  This structure defines a basic coded entry with all of its attributes.

9.4 gdcm::terminal Namespace Reference

Class for Terminal.

Enumerations

- enum Attribute {
  reset = 0 ,
  bright = 1 ,
  dim = 2 ,
  underline = 3 ,
  blink = 5 ,
  reverse = 7 ,
  hidden = 8 }
- enum Color {
  black = 0 ,
  red ,
  green ,
  yellow ,
  blue ,
  magenta ,
  cyan ,
  white }
- enum Mode {
  CONSOLE = 0 ,
  VT100 }

Functions

- GDCM_EXPORT std::string setattribute (Attribute att)
- GDCM_EXPORT std::string setbgcolor (Color c)
- GDCM_EXPORT std::string setfgcolor (Color c)
- GDCM_EXPORT void setmode (Mode m)

9.4.1 Detailed Description

Class for Terminal.

Allow one to print in color in a shell

- support VT100 compatible shell
- win32 console

9.4.2 Enumeration Type Documentation

9.4.2.1 Attribute

enum gdcm::terminal::Attribute

Enumerator

reset	
bright	
dim	
underline	
blink	
reverse	
hidden	

9.4.2.2 Color

enum gdcm::terminal::Color

Enumerator

black	
red	
green	
yellow	
blue	
magenta	
cyan	
white	

9.4.2.3 Mode

```
enum gdcm::terminal::Mode
```

Enumerator

CONSOLE	
VT100	

9.4.3 Function Documentation

9.4.3.1 setattribute()

```
GDCM_EXPORT std::string gdcm::terminal::setattribute (
            Attribute att )
```

9.4.3.2 setbgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setbgcolor (
            Color c )
```

9.4.3.3 setfgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setfgcolor (
            Color c )
```

9.4.3.4 setmode()

```
GDCM_EXPORT void gdcm::terminal::setmode (
            Mode m )
```

Chapter 10

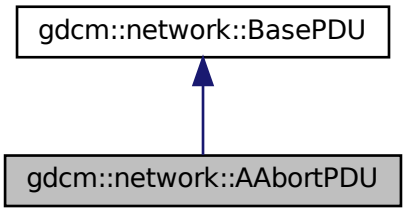
Class Documentation

10.1 gdcm::network::AAbortPDU Class Reference

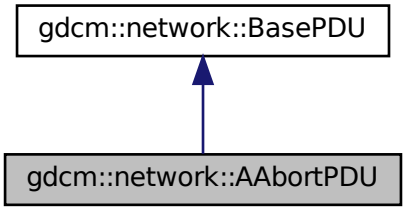
AAbortPDU.

`#include <gdcmAAbortPDU.h>`

Inheritance diagram for gdcm::network::AAbortPDU:



Collaboration diagram for gdcm::network::AAbortPDU:



Public Member Functions

- AAbortPDU ()
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- void SetReason (const uint8_t r)
- void SetSource (const uint8_t s)
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

10.1.1 Detailed Description

AAbortPDU.

Table 9-26 A-ABORT PDU FIELDS

10.1.2 Constructor & Destructor Documentation

10.1.2.1 AAbortPDU()

```
gdcm::network::AAbortPDU::AAbortPDU ( )
```

10.1.3 Member Function Documentation

10.1.3.1 IsLastFragment()

```
bool gdcm::network::AAbortPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.1.3.2 Print()

```
void gdcm::network::AAbortPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.1.3.3 Read()

```
std::istream& gdcm::network::AAbortPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.1.3.4 SetReason()

```
void gdcm::network::AAbortPDU::SetReason (
            const uint8_t r )
```

10.1.3.5 SetSource()

```
void gdcm::network::AAbortPDU::SetSource (
            const uint8_t s )
```

10.1.3.6 Size()

```
size_t gdcm::network::AAbortPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.1.3.7 Write()

```
const std::ostream& gdcm::network::AAbortPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

The documentation for this class was generated from the following file:

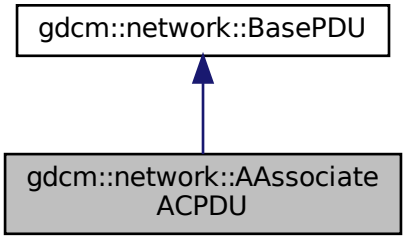
- gdcmAAbortPDU.h

10.2 gdcm::network::AAssociateACPDU Class Reference

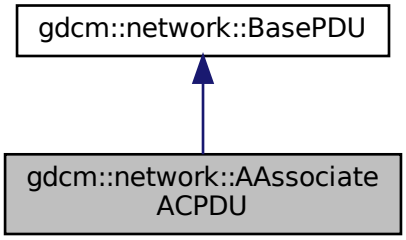
AAssociateACPDU.

`#include <gdcmAAssociateACPDU.h>`

Inheritance diagram for gdcm::network::AAssociateACPDU:



Collaboration diagram for gdcm::network::AAssociateACPDU:



Public Types

- typedef std::vector< PresentationContextAC >::size_type SizeType

Public Member Functions

- AAssociateACPDU ()
- void AddPresentationContextAC (PresentationContextAC const &pcac)
- SizeType GetNumberOfPresentationContextAC () const
- const PresentationContextAC & GetPresentationContextAC (SizeType i)
- const UserInformation & GetUserInformation () const
- void InitFromRQ (AAssociateRQPDU const &rqpdu)
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- SizeType Size () const override
- const std::ostream & Write (std::ostream &os) const override

Protected Member Functions

- void SetCalledAETitle (const char calledaetitle[16])
- void SetCallingAETitle (const char callingaetitle[16])

Friends

- class AAssociateRQPDU

10.2.1 Detailed Description

AAssociateACPDU.

Table 9-17 ASSOCIATE-AC PDU fields

10.2.2 Member Typedef Documentation

10.2.2.1 SizeType

```
typedef std::vector<PresentationContextAC>::size_type gdcm::network::AAssociateACPDU::SizeType
```

10.2.3 Constructor & Destructor Documentation

10.2.3.1 AAssociateACPDU()

```
gdcm::network::AAssociateACPDU::AAssociateACPDU ( )
```

10.2.4 Member Function Documentation

10.2.4.1 AddPresentationContextAC()

```
void gdcm::network::AAssociateACPDU::AddPresentationContextAC (
            PresentationContextAC const & pcac )
```

10.2.4.2 GetNumberOfPresentationContextAC()

```
SizeType gdcm::network::AAssociateACPDU::GetNumberOfPresentationContextAC ( ) const  [inline]
```

10.2.4.3 GetPresentationContextAC()

```
const PresentationContextAC& gdcm::network::AAssociateACPDU::GetPresentationContextAC (
            SizeType i )  [inline]
```

10.2.4.4 GetUserInformation()

```
const UserInformation& gdcm::network::AAssociateACPDU::GetUserInformation ( ) const  [inline]
```

10.2.4.5 InitFromRQ()

```
void gdcm::network::AAssociateACPDU::InitFromRQ (
            AAssociateRQPDU const & rqpdu )
```

10.2.4.6 IsLastFragment()

```
bool gdcm::network::AAssociateACPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.2.4.7 Print()

```
void gdcm::network::AAssociateACPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.2.4.8 Read()

```
std::istream& gdcm::network::AAssociateACPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.2.4.9 SetCalledAETitle()

```
void gdcm::network::AAssociateACPDU::SetCalledAETitle (
            const char calledaetitle[16] )  [protected]
```

10.2.4.10 SetCallingAETitle()

```
void gdcm::network::AAssociateACPDU::SetCallingAETitle (
            const char callingaetitle[16] )  [protected]
```

10.2.4.11 Size()

```
SizeType gdcm::network::AAssociateACPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.2.4.12 Write()

```
const std::ostream& gdcm::network::AAssociateACPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.2.5 Friends And Related Function Documentation

10.2.5.1 AAssociateRQPDU

```
friend class AAssociateRQPDU  [friend]
```

The documentation for this class was generated from the following file:

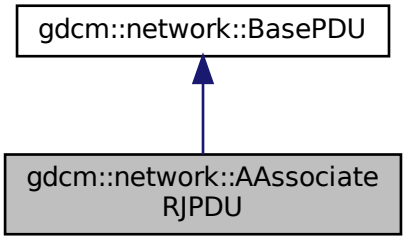
- gdcmAAssociateACPDU.h

10.3 gdcm::network::AAssociateRJPDU Class Reference

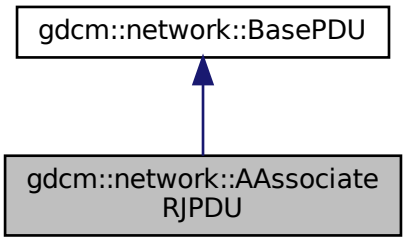
AAssociateRJPDU.

```
#include <gdcmAAssociateRJPDU.h>
```

Inheritance diagram for gdcm::network::AAssociateRJPDU:



Collaboration diagram for gdcm::network::AAssociateRJPDU:



Public Member Functions

- AAssociateRJPDU ()
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

10.3.1 Detailed Description

AAssociateRJPDU.

Table 9-21 ASSOCIATE-RJ PDU FIELDS

10.3.2 Constructor & Destructor Documentation

10.3.2.1 AAssociateRJPDU()

```
gdcm::network::AAssociateRJPDU::AAssociateRJPDU ( )
```

10.3.3 Member Function Documentation

10.3.3.1 IsLastFragment()

```
bool gdcm::network::AAssociateRJPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.3.3.2 Print()

```
void gdcm::network::AAssociateRJPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.3.3.3 Read()

```
std::istream& gdcm::network::AAssociateRJPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.3.3.4 Size()

```
size_t gdcm::network::AAssociateRJPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.3.3.5 Write()

```
const std::ostream& gdcm::network::AAssociateRJPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

The documentation for this class was generated from the following file:

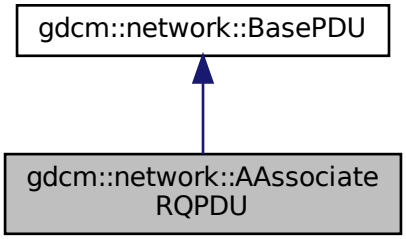
- gdcmAAssociateRJPDU.h

10.4 gdcm::network::AAssociateRQPDU Class Reference

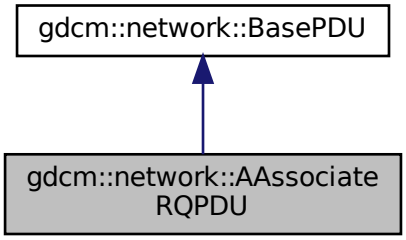
AAssociateRQPDU.

`#include <gdcmAAssociateRQPDU.h>`

Inheritance diagram for gdcm::network::AAssociateRQPDU:



Collaboration diagram for gdcm::network::AAssociateRQPDU:



Public Types

- typedef std::vector< PresentationContextRQ > PresentationContextArrayType
- typedef std::vector< PresentationContextRQ >::size_type SizeType

Public Member Functions

- AAssociateRQPDU ()
- AAssociateRQPDU (const AAssociateRQPDU &pdu)
- void AddPresentationContext (PresentationContextRQ const &pc)
- std::string GetCalledAETitle () const
- std::string GetCallingAETitle () const
- SizeType GetNumberOfPresentationContext () const
- PresentationContextRQ const & GetPresentationContext (SizeType i) const
- const PresentationContextRQ * GetPresentationContextByAbstractSyntax (AbstractSyntax const &absyn) const
- const PresentationContextRQ * GetPresentationContextByID (uint8_t i) const
- PresentationContextArrayType const & GetPresentationContexts ()
- const UserInformation & GetUserInformation () const
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- void SetCalledAETitle (const char calledaetitle[16])

  Set the Called AE Title.
- void SetCallingAETitle (const char callingaetitle[16])

  Set the Calling AE Title.
- void SetUserInformation (UserInformation const &ui)
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

Static Public Member Functions

- static bool IsAETitleValid (const char title[16])

  Check whether or not the.

Protected Member Functions

- std::string GetReserved43_74 () const

Friends

- class AAssociateACPDU

10.4.1 Detailed Description

AAssociateRQPDU.

Table 9-11 ASSOCIATE-RQ PDU fields

10.4.2 Member Typedef Documentation

10.4.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContextRQ> gdcm::network::AAssociateRQPDU::PresentationContextArrayType
```

10.4.2.2 SizeType

```
typedef std::vector<PresentationContextRQ>::size_type gdcm::network::AAssociateRQPDU::SizeType
```

10.4.3 Constructor & Destructor Documentation

10.4.3.1 AAssociateRQPDU() [1/2]

```
gdcm::network::AAssociateRQPDU::AAssociateRQPDU ( )
```

10.4.3.2 AAssociateRQPDU() [2/2]

```
gdcm::network::AAssociateRQPDU::AAssociateRQPDU (
            const AAssociateRQPDU & pdu )  [inline]
```

10.4.4 Member Function Documentation

10.4.4.1 AddPresentationContext()

```
void gdcm::network::AAssociateRQPDU::AddPresentationContext (
            PresentationContextRQ const & pc )
```

10.4.4.2 GetCalledAETitle()

```
std::string gdcm::network::AAssociateRQPDU::GetCalledAETitle ( ) const  [inline]
```

10.4.4.3 GetCallingAETitle()

```
std::string gdcm::network::AAssociateRQPDU::GetCallingAETitle ( ) const  [inline]
```

10.4.4.4 GetNumberOfPresentationContext()

```
SizeType gdcm::network::AAssociateRQPDU::GetNumberOfPresentationContext ( ) const  [inline]
```

10.4.4.5 GetPresentationContext()

```
PresentationContextRQ const& gdcm::network::AAssociateRQPDU::GetPresentationContext (
            SizeType i ) const  [inline]
```

10.4.4.6 GetPresentationContextByAbstractSyntax()

```
const PresentationContextRQ* gdcm::network::AAssociateRQPDU::GetPresentationContextByAbstract↩
Syntax (
            AbstractSyntax const & absyn ) const
```

10.4.4.7 GetPresentationContextByID()

```
const PresentationContextRQ* gdcm::network::AAssociateRQPDU::GetPresentationContextByID (
            uint8_t i ) const
```

10.4.4.8 GetPresentationContexts()

```
PresentationContextArrayType const& gdcm::network::AAssociateRQPDU::GetPresentationContexts ( )
[inline]
```

10.4.4.9 GetReserved43_74()

```
std::string gdcm::network::AAssociateRQPDU::GetReserved43_74 ( ) const  [protected]
```

10.4.4.10 GetUserInformation()

```
const UserInformation& gdcm::network::AAssociateRQPDU::GetUserInformation ( ) const  [inline]
```

10.4.4.11 IsAETitleValid()

```
static bool gdcm::network::AAssociateRQPDU::IsAETitleValid (
            const char title[16] )  [static]
```

Check whether or not the.

Parameters

title	is a valid AE title

10.4.4.12 IsLastFragment()

```
bool gdcm::network::AAssociateRQPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.4.4.13 Print()

```
void gdcm::network::AAssociateRQPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

This function will initialize an AAssociateACPDU from the fields in the AAssociateRQPDU structure

Implements gdcm::network::BasePDU.

10.4.4.14 Read()

```
std::istream& gdcm::network::AAssociateRQPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.4.4.15 SetCalledAETitle()

```
void gdcm::network::AAssociateRQPDU::SetCalledAETitle (
            const char calledaetitle[16] )
```

Set the Called AE Title.

10.4.4.16 SetCallingAETitle()

```
void gdcm::network::AAssociateRQPDU::SetCallingAETitle (
            const char callingaetitle[16] )
```

Set the Calling AE Title.

10.4.4.17 SetUserInformation()

```
void gdcm::network::AAssociateRQPDU::SetUserInformation (
            UserInformation const & ui )
```

10.4.4.18 Size()

```
size_t gdcm::network::AAssociateRQPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.4.4.19 Write()

```
const std::ostream& gdcm::network::AAssociateRQPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.4.5 Friends And Related Function Documentation

10.4.5.1 AAssociateACPDU

```
friend class AAssociateACPDU  [friend]
```

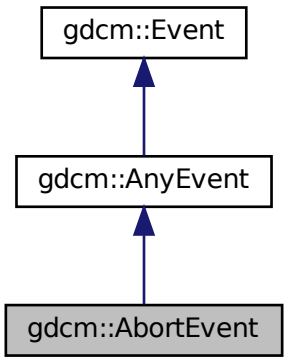
The documentation for this class was generated from the following file:

- gdcmAAssociateRQPDU.h

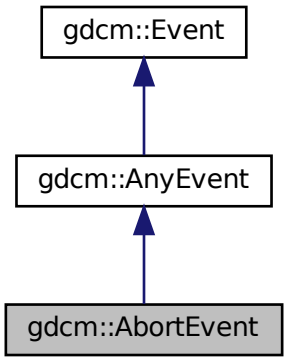
10.5 gdcm::AbortEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::AbortEvent:



Collaboration diagram for gdcm::AbortEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.6 gdcm::network::AbstractSyntax Class Reference

AbstractSyntax.

`#include <gdcmAbstractSyntax.h>`

Public Member Functions

- AbstractSyntax ()
- DataElement GetAsDataElement () const
- const char * GetName () const
- bool operator== (const AbstractSyntax &as) const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetName (const char *name)
- void SetNameFromUID (UIDs::TSName tsname)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.6.1 Detailed Description

AbstractSyntax.

Table 9-14 ABSTRACT SYNTAX SUB-ITEM FIELDS

10.6.2 Constructor & Destructor Documentation

10.6.2.1 AbstractSyntax()

```
gdcm::network::AbstractSyntax::AbstractSyntax ( )
```

10.6.3 Member Function Documentation

10.6.3.1 GetAsDataElement()

```
DataElement gdcm::network::AbstractSyntax::GetAsDataElement ( ) const
```

10.6.3.2 GetName()

```
const char* gdcm::network::AbstractSyntax::GetName ( ) const  [inline]
```

10.6.3.3 operator==()

```
bool gdcm::network::AbstractSyntax::operator== (
            const AbstractSyntax & as ) const  [inline]
```

10.6.3.4 Print()

```
void gdcm::network::AbstractSyntax::Print (
            std::ostream & os ) const
```

10.6.3.5 Read()

```
std::istream& gdcm::network::AbstractSyntax::Read (
            std::istream & is )
```

10.6.3.6 SetName()

```
void gdcm::network::AbstractSyntax::SetName (
            const char * name )  [inline]
```

10.6.3.7 SetNameFromUID()

```
void gdcm::network::AbstractSyntax::SetNameFromUID (
            UIDs::TSName tsname )
```

10.6.3.8 Size()

```
size_t gdcm::network::AbstractSyntax::Size ( ) const
```

10.6.3.9 Write()

```
const std::ostream& gdcm::network::AbstractSyntax::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

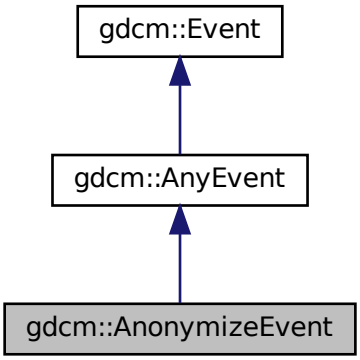
- gdcmAbstractSyntax.h

10.7 gdcm::AnonymizeEvent Class Reference

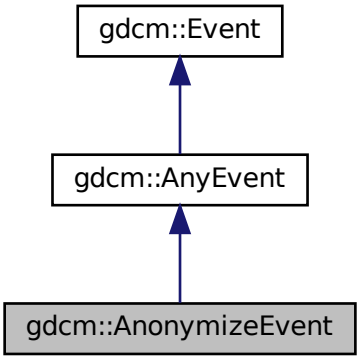
AnonymizeEvent.

`#include <gdcmAnonymizeEvent.h>`

Inheritance diagram for gdcm::AnonymizeEvent:



Collaboration diagram for gdcm::AnonymizeEvent:



Public Types

- typedef AnonymizeEvent Self
- typedef AnyEvent Superclass

Public Member Functions

- AnonymizeEvent (const Self &s)
- AnonymizeEvent (Tag const &tag=0)
- ~AnonymizeEvent () override=default
- bool CheckEvent (const ::gdcm::Event *e) const override
- const char * GetEventName () const override
- Tag const & GetTag () const
- ::gdcm::Event * MakeObject () const override
- void operator= (const Self &)=delete
- void SetTag (const Tag &t)

10.7.1 Detailed Description

AnonymizeEvent.

Special type of event triggered during the Anonymization process

See also

Anonymizer

10.7.2 Member Typedef Documentation

10.7.2.1 Self

```
typedef AnonymizeEvent gdcm::AnonymizeEvent::Self
```

10.7.2.2 Superclass

```
typedef AnyEvent gdcm::AnonymizeEvent::Superclass
```

10.7.3 Constructor & Destructor Documentation

10.7.3.1 AnonymizeEvent() [1/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
            Tag const & tag = 0 )  [inline]
```

10.7.3.2 ~AnonymizeEvent()

```
gdcm::AnonymizeEvent::~AnonymizeEvent ( )  [override], [default]
```

10.7.3.3 AnonymizeEvent() [2/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
            const Self & s )  [inline]
```

10.7.4 Member Function Documentation

10.7.4.1 CheckEvent()

```
bool gdcm::AnonymizeEvent::CheckEvent (
            const ::gdcm::Event * e ) const  [inline], [override]
```

10.7.4.2 GetEventName()

```
const char* gdcm::AnonymizeEvent::GetEventName ( ) const  [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements gdcm::Event.

10.7.4.3 GetTag()

```
Tag const& gdcm::AnonymizeEvent::GetTag ( ) const  [inline]
```

10.7.4.4 MakeObject()

```
::gdcm::Event* gdcm::AnonymizeEvent::MakeObject ( ) const  [inline], [override], [virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implements gdcm::Event.

10.7.4.5 operator=()

```
void gdcm::AnonymizeEvent::operator= (
             const Self &  )  [delete]
```

10.7.4.6 SetTag()

```
void gdcm::AnonymizeEvent::SetTag (
             const Tag & t )  [inline]
```

The documentation for this class was generated from the following file:

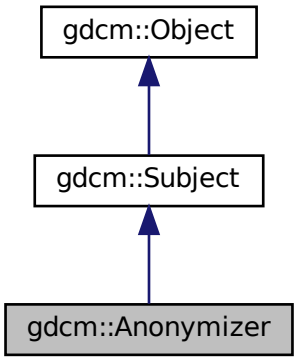
- gdcmAnonymizeEvent.h

10.8 gdcm::Anonymizer Class Reference

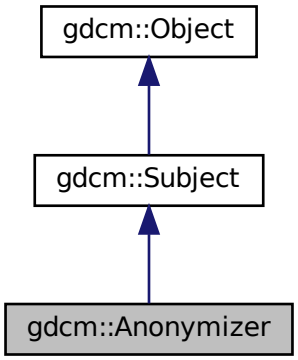
Anonymizer.

```
#include <gdcmAnonymizer.h>
```

Inheritance diagram for gdcm::Anonymizer:



Collaboration diagram for gdcm::Anonymizer:



Public Member Functions

- Anonymizer ()
- ~Anonymizer () override
- bool BasicApplicationLevelConfidentialityProfile (bool deidentify=true)
- bool Empty (Tag const &t)
- const CryptographicMessageSyntax * GetCryptographicMessageSyntax () const
- File & GetFile ()
- bool Remove (Tag const &t)
- bool RemoveGroupLength ()

  Main function that loop over all elements and remove group length.
- bool RemovePrivateTags ()

  Main function that loop over all elements and remove private tags.
- bool RemoveRetired ()

  Main function that loop over all elements and remove retired element.
- bool Replace (Tag const &t, const char *value)
- bool Replace (Tag const &t, const char *value, VL const &vl)
- void SetCryptographicMessageSyntax (CryptographicMessageSyntax *cms)

  Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.
- void SetFile (const File &f)

  Set/Get File.

Static Public Member Functions

- static void ClearInternalUIDs ()
- static std::vector< Tag > GetBasicApplicationLevelConfidentialityProfileAttributes ()

  Return the list of Tag that will be considered when anonymizing a DICOM file.
- static SmartPointer< Anonymizer > New ()

  for wrapped language: instantiate a reference counted object

Protected Member Functions

- bool BALCPProtect (DataSet &ds, Tag const &tag, const IOD &iod)
- bool CanEmptyTag (Tag const &tag, const IOD &iod) const
- void RecurseDataSet (DataSet &ds)

10.8.1 Detailed Description

Anonymizer.

This class is a multi purpose anonymizer. It can work in 2 mode:

- Full (irreversible) anonymizer (aka dumb mode)
- reversible de-identifier/re-identifier (aka smart mode). This implements the Basic Application Level Confidentiality Profile, DICOM PS 3.15-2009

1. dumb mode This is a dumb anonymizer implementation. All it allows user is simple operation such as:

Tag based functions:

- complete removal of DICOM attribute (Remove)
- make a tag empty, ie make it's length 0 (Empty)
- replace with another string-based value (Replace)

DataSet based functions:

- Remove all group length attribute from a DICOM dataset (Group Length element are deprecated, DICOM 2008)
- Remove all private attributes
- Remove all retired attributes

All function calls actually execute the user specified request. Previous implementation were calling a general Anonymize function but traversing a std::set is O(n) operation, while a simple user specified request is O(log(n)) operation. So 'm' user interaction is O(m∗log(n)) which is $<$ O(n) complexity.

1. smart mode this mode implements the Basic Application Level Confidentiality Profile (DICOM PS 3.15-2008) In this case, it is extremely important to use the same Anonymizer class when anonymizing a FileSet. Once the Anonymizer is destroyed its memory of known (already processed) UIDs will be lost. which will make the anonymizer behaves incorrectly for attributes such as Series UID Study UID where user want some consistency. When attribute is Type 1 / Type 1C, a dummy generator will take in the existing value and produce a dummy value (a sha1 representation). sha1 algorithm is considered to be cryptographically strong (compared to md5sum) so that we meet the following two conditions:
   - Produce the same dummy value for the same input value
   - do not provide an easy way to retrieve the original value from the sha1 generated value

This class implement the Subject/Observer pattern trigger the following event:

- AnonymizeEvent
- IterationEvent
- StartEvent
- EndEvent

See also

CryptographicMessageSyntax

Examples

ClinicalTrialAnnotate.cxx, CreateJPIPDataSet.cxx, and EncapsulateFileInRawData.cxx.

10.8.2 Constructor & Destructor Documentation

10.8.2.1 Anonymizer()

```
gdcm::Anonymizer::Anonymizer ( )  [inline]
```

10.8.2.2 ~Anonymizer()

```
gdcm::Anonymizer::~Anonymizer ( )  [override]
```

10.8.3 Member Function Documentation

10.8.3.1 BALCPProtect()

```
bool gdcm::Anonymizer::BALCPProtect (
            DataSet & ds,
            Tag const & tag,
            const IOD & iod )  [protected]
```

10.8.3.2 BasicApplicationLevelConfidentialityProfile()

```
bool gdcm::Anonymizer::BasicApplicationLevelConfidentialityProfile (
            bool deidentify = true )
```

PS 3.15 / E.1.1 De-Identifier An Application may claim conformance to the Basic Application Level Confidentiality Profile as a deidentifier if it protects all Attributes that might be used by unauthorized entities to identify the patient. NOT THREAD SAFE

10.8.3.3 CanEmptyTag()

```
bool gdcm::Anonymizer::CanEmptyTag (
            Tag const & tag,
            const IOD & iod ) const  [protected]
```

10.8.3.4 ClearInternalUIDs()

```
static void gdcm::Anonymizer::ClearInternalUIDs ( )  [static]
```

Clear the internal mapping of real UIDs to generated UIDs

Warning

the mapping is definitely lost

10.8.3.5 Empty()

```
bool gdcm::Anonymizer::Empty (
            Tag const & t )
```

Make Tag t empty (if not found tag will be created) Warning: does not handle SQ element

Examples

CreateJPIPDataSet.cxx.

10.8.3.6 GetBasicApplicationLevelConfidentialityProfileAttributes()

```
static std::vector<Tag> gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes
( )  [static]
```

Return the list of Tag that will be considered when anonymizing a DICOM file.

Examples

GenFakeIdentifyFile.cxx, and TraverseModules.cxx.

10.8.3.7 GetCryptographicMessageSyntax()

```
const CryptographicMessageSyntax* gdcm::Anonymizer::GetCryptographicMessageSyntax ( ) const
```

10.8.3.8 GetFile()

```
File& gdcm::Anonymizer::GetFile ( )  [inline]
```

10.8.3.9 New()

```
static SmartPointer<Anonymizer> gdcm::Anonymizer::New ( )  [inline], [static]
```

for wrapped language: instantiate a reference counted object

10.8.3.10 RecurseDataSet()

```
void gdcm::Anonymizer::RecurseDataSet (
            DataSet & ds )  [protected]
```

10.8.3.11 Remove()

```
bool gdcm::Anonymizer::Remove (
            Tag const & t )
```

remove a tag (even a SQ can be removed) Return code is false when tag t cannot be found

10.8.3.12 RemoveGroupLength()

```
bool gdcm::Anonymizer::RemoveGroupLength ( )
```

Main function that loop over all elements and remove group length.

Examples

ClinicalTrialAnnotate.cxx.

10.8.3.13 RemovePrivateTags()

```
bool gdcm::Anonymizer::RemovePrivateTags ( )
```

Main function that loop over all elements and remove private tags.

Examples

ClinicalTrialAnnotate.cxx.

10.8.3.14 RemoveRetired()

```
bool gdcm::Anonymizer::RemoveRetired ( )
```

Main function that loop over all elements and remove retired element.

10.8.3.15 Replace() [1/2]

```
bool gdcm::Anonymizer::Replace (
            Tag const & t,
            const char * value )
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCII

Examples

ClinicalTrialAnnotate.cxx, CreateJPIPDataSet.cxx, and EncapsulateFileInRawData.cxx.

10.8.3.16 Replace() [2/2]

```
bool gdcm::Anonymizer::Replace (
            Tag const & t,
            const char * value,
            VL const & vl )
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

10.8.3.17 SetCryptographicMessageSyntax()

```
void gdcm::Anonymizer::SetCryptographicMessageSyntax (
            CryptographicMessageSyntax * cms )
```

Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.

10.8.3.18 SetFile()

```
void gdcm::Anonymizer::SetFile (
            const File & f )  [inline]
```

Set/Get File.

Examples

ClinicalTrialAnnotate.cxx, CreateJPIPDataSet.cxx, and EncapsulateFileInRawData.cxx.

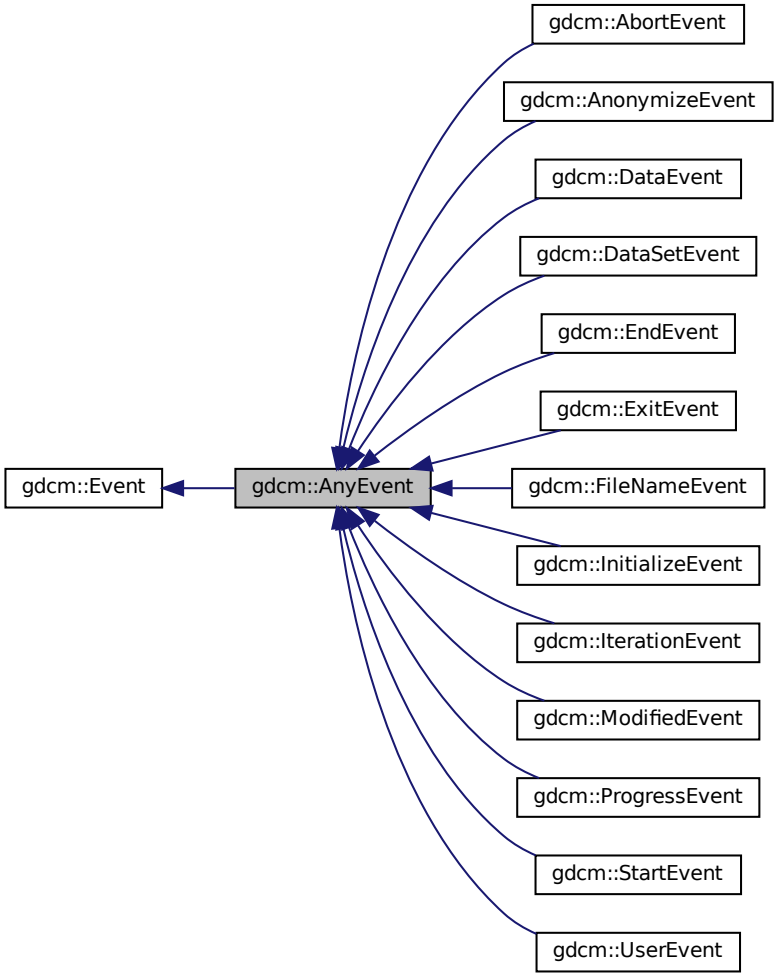
The documentation for this class was generated from the following file:

- gdcmAnonymizer.h

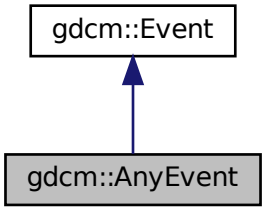
10.9 gdcm::AnyEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::AnyEvent:



Collaboration diagram for gdcm::AnyEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.10 gdcm::network::ApplicationContext Class Reference

ApplicationContext.

`#include <gdcmApplicationContext.h>`

Public Member Functions

- ApplicationContext ()
- const char * GetName () const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetName (const char *name)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.10.1 Detailed Description

ApplicationContext.

Table 9-12 APPLICATION CONTEXT ITEM FIELDS

Todo Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009)

10.10.2 Constructor & Destructor Documentation

10.10.2.1 ApplicationContext()

```
gdcm::network::ApplicationContext::ApplicationContext ( )
```

10.10.3 Member Function Documentation

10.10.3.1 GetName()

```
const char* gdcm::network::ApplicationContext::GetName ( ) const  [inline]
```

10.10.3.2 Print()

```
void gdcm::network::ApplicationContext::Print (
            std::ostream & os ) const
```

10.10.3.3 Read()

```
std::istream& gdcm::network::ApplicationContext::Read (
            std::istream & is )
```

10.10.3.4 SetName()

```
void gdcm::network::ApplicationContext::SetName (
            const char * name )  [inline]
```

10.10.3.5 Size()

```
size_t gdcm::network::ApplicationContext::Size ( ) const
```

10.10.3.6 Write()

```
const std::ostream& gdcm::network::ApplicationContext::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

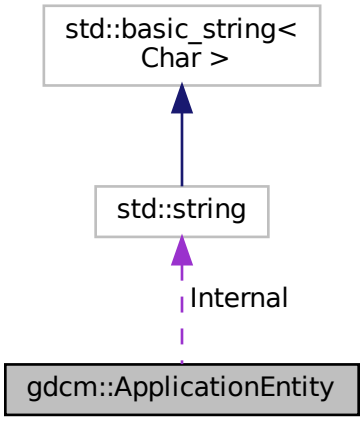
- gdcmApplicationContext.h

10.11 gdcm::ApplicationEntity Class Reference

ApplicationEntity.

```
#include <gdcmApplicationEntity.h>
```

Collaboration diagram for gdcm::ApplicationEntity:



Public Member Functions

- bool IsValid () const
- void Print (std::ostream &os) const
- void SetBlob (const std::vector< char > &v)
- void Squeeze ()

Public Attributes

- std::string Internal

Static Public Attributes

- static const unsigned int MaxLength = 16
- static const unsigned int MaxNumberOfComponents = 1
- static const char Padding = ' '
- static const char Separator = ' '

10.11.1 Detailed Description

ApplicationEntity.

- AE Application Entity
- A string of characters that identifies an Application Entity with leading and trailing spaces (20H) being non-significant. A value consisting solely of spaces shall not be used.
- Default Character Repertoire excluding character code 5CH (the BACKSLASH \ in ISO-IR 6), and control characters LF, FF, CR and ESC.
- 16 bytes maximum

10.11.2 Member Function Documentation

10.11.2.1 IsValid()

```
bool gdcm::ApplicationEntity::IsValid ( ) const  [inline]
```

10.11.2.2 Print()

```
void gdcm::ApplicationEntity::Print (
            std::ostream & os ) const  [inline]
```

10.11.2.3 SetBlob()

```
void gdcm::ApplicationEntity::SetBlob (
            const std::vector< char > & v )  [inline]
```

10.11.2.4 Squeeze()

```
void gdcm::ApplicationEntity::Squeeze ( )  [inline]
```

10.11.3 Member Data Documentation

10.11.3.1 Internal

```
std::string gdcm::ApplicationEntity::Internal
```

10.11.3.2 MaxLength

```
const unsigned int gdcm::ApplicationEntity::MaxLength = 16  [static]
```

10.11.3.3 MaxNumberOfComponents

```
const unsigned int gdcm::ApplicationEntity::MaxNumberOfComponents = 1  [static]
```

10.11.3.4 Padding

```
const char gdcm::ApplicationEntity::Padding = ' '  [static]
```

10.11.3.5 Separator

```
const char gdcm::ApplicationEntity::Separator = ' '  [static]
```

The documentation for this class was generated from the following file:

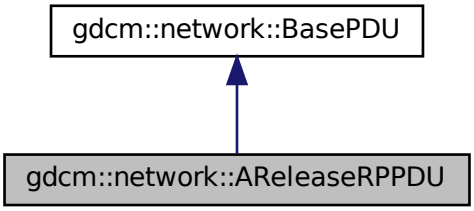
- gdcmApplicationEntity.h

10.12 gdcm::network::AReleaseRPPDU Class Reference

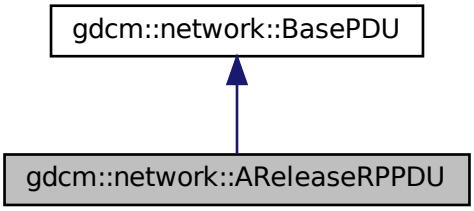
AReleaseRPPDU.

```
#include <gdcmAReleaseRPPDU.h>
```

Inheritance diagram for gdcm::network::AReleaseRPPDU:



Collaboration diagram for gdcm::network::AReleaseRPPDU:



Public Member Functions

- AReleaseRPPDU ()
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

10.12.1 Detailed Description

AReleaseRPPDU.

Table 9-25 A-RELEASE-RP PDU fields

10.12.2 Constructor & Destructor Documentation

10.12.2.1 AReleaseRPPDU()

```
gdcm::network::AReleaseRPPDU::AReleaseRPPDU ( )
```

10.12.3 Member Function Documentation

10.12.3.1 IsLastFragment()

```
bool gdcm::network::AReleaseRPPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.12.3.2 Print()

```
void gdcm::network::AReleaseRPPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.12.3.3 Read()

```
std::istream& gdcm::network::AReleaseRPPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.12.3.4 Size()

```
size_t gdcm::network::AReleaseRPPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.12.3.5 Write()

```
const std::ostream& gdcm::network::AReleaseRPPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

The documentation for this class was generated from the following file:

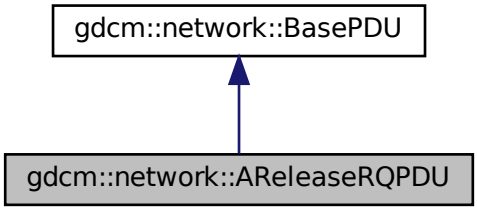
- gdcmAReleaseRPPDU.h

10.13 gdcm::network::AReleaseRQPDU Class Reference

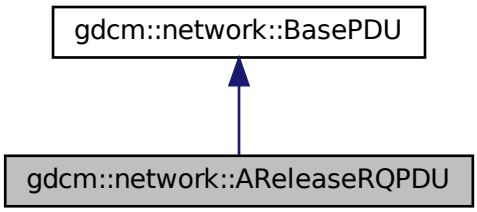
AReleaseRQPDU.

```
#include <gdcmAReleaseRQPDU.h>
```

Inheritance diagram for gdcm::network::AReleaseRQPDU:



Collaboration diagram for gdcm::network::AReleaseRQPDU:



Public Member Functions

- AReleaseRQPDU ()
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

10.13.1 Detailed Description

AReleaseRQPDU.

Table 9-24 A-RELEASE-RQ PDU FIELDS

10.13.2 Constructor & Destructor Documentation

10.13.2.1 AReleaseRQPDU()

```
gdcm::network::AReleaseRQPDU::AReleaseRQPDU ( )
```

10.13.3 Member Function Documentation

10.13.3.1 IsLastFragment()

```
bool gdcm::network::AReleaseRQPDU::IsLastFragment ( ) const  [inline], [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.13.3.2 Print()

```
void gdcm::network::AReleaseRQPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.13.3.3 Read()

```
std::istream& gdcm::network::AReleaseRQPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.13.3.4 Size()

```
size_t gdcm::network::AReleaseRQPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.13.3.5 Write()

```
const std::ostream& gdcm::network::AReleaseRQPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

The documentation for this class was generated from the following file:

- gdcmAReleaseRQPDU.h

10.14 gdcm::network::ARTIMTimer Class Reference

ARTIMTimer.

```
#include <gdcmARTIMTimer.h>
```

Public Member Functions

- ARTIMTimer ()
- double GetElapsedTime () const
- bool GetHasExpired () const
- double GetTimeout () const
- void SetTimeout (double inTimeout)
- void Start ()
- void Stop ()

10.14.1 Detailed Description

ARTIMTimer.

This file contains the code for the ARTIM timer.

Basically, the ARTIM timer will just get the wall time when it's started, and then can be queried for the current time, and then can be stopped (ie, the start time reset).

Because we're trying to do this without threading, we should be able to 'start' the ARTIM timer by this mechanism, and then when waiting for a particular response, tight loop that with sleep calls and determinations of when the ARTIM timer has reached its peak. As such, this isn't a strict 'timer' in the traditional sense of the word, but more of a time keeper.

There can be only one ARTIM timer per connection.

10.14.2 Constructor & Destructor Documentation

10.14.2.1 ARTIMTimer()

```
gdcm::network::ARTIMTimer::ARTIMTimer ( )
```

10.14.3 Member Function Documentation

10.14.3.1 GetElapsedTime()

```
double gdcm::network::ARTIMTimer::GetElapsedTime ( ) const
```

10.14.3.2 GetHasExpired()

```
bool gdcm::network::ARTIMTimer::GetHasExpired ( ) const
```

10.14.3.3 GetTimeout()

```
double gdcm::network::ARTIMTimer::GetTimeout ( ) const
```

10.14.3.4 SetTimeout()

```
void gdcm::network::ARTIMTimer::SetTimeout (
            double inTimeout )
```

10.14.3.5 Start()

```
void gdcm::network::ARTIMTimer::Start ( )
```

10.14.3.6 Stop()

```
void gdcm::network::ARTIMTimer::Stop ( )
```

The documentation for this class was generated from the following file:

- gdcmARTIMTimer.h

10.15 gdcm::ASN1 Class Reference

Class for ASN1.

```
#include <gdcmASN1.h>
```

Public Member Functions

- ASN1 ()
- ASN1 (const ASN1 &)=delete
- ~ASN1 ()
- void operator= (const ASN1 &)=delete

Static Public Member Functions

- static bool ParseDump (const char *array, size_t length)
- static bool ParseDumpFile (const char *filename)

Protected Member Functions

- int TestPBKDF2 ()

10.15.1 Detailed Description

Class for ASN1.

10.15.2 Constructor & Destructor Documentation

10.15.2.1 ASN1() [1/2]

```
gdcm::ASN1::ASN1 ( )
```

10.15.2.2 ~ASN1()

```
gdcm::ASN1::~ASN1 ( )
```

10.15.2.3 ASN1() [2/2]

```
gdcm::ASN1::ASN1 (
            const ASN1 &  )  [delete]
```

10.15.3 Member Function Documentation

10.15.3.1 operator=()

```
void gdcm::ASN1::operator= (
            const ASN1 &  )  [delete]
```

10.15.3.2 ParseDump()

```
static bool gdcm::ASN1::ParseDump (
            const char * array,
            size_t length )  [static]
```

10.15.3.3 ParseDumpFile()

```
static bool gdcm::ASN1::ParseDumpFile (
            const char * filename )  [static]
```

10.15.3.4 TestPBKDF2()

```
int gdcm::ASN1::TestPBKDF2 ( )  [protected]
```

The documentation for this class was generated from the following file:

- gdcmASN1.h

10.16 gdcm::network::AsynchronousOperationsWindowSub Class Reference

AsynchronousOperationsWindowSub.

```
#include <gdcmAsynchronousOperationsWindowSub.h>
```

Public Member Functions

- AsynchronousOperationsWindowSub ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.16.1 Detailed Description

AsynchronousOperationsWindowSub.

PS 3.7 Table D.3-7 ASYNCHRONOUS OPERATIONS WINDOW SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

10.16.2 Constructor & Destructor Documentation

10.16.2.1 AsynchronousOperationsWindowSub()

```
gdcm::network::AsynchronousOperationsWindowSub::AsynchronousOperationsWindowSub ( )
```

10.16.3 Member Function Documentation

10.16.3.1 Print()

```
void gdcm::network::AsynchronousOperationsWindowSub::Print (
            std::ostream & os ) const
```

10.16.3.2 Read()

```
std::istream& gdcm::network::AsynchronousOperationsWindowSub::Read (
            std::istream & is )
```

10.16.3.3 Size()

```
size_t gdcm::network::AsynchronousOperationsWindowSub::Size ( ) const
```

10.16.3.4 Write()

```
const std::ostream& gdcm::network::AsynchronousOperationsWindowSub::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

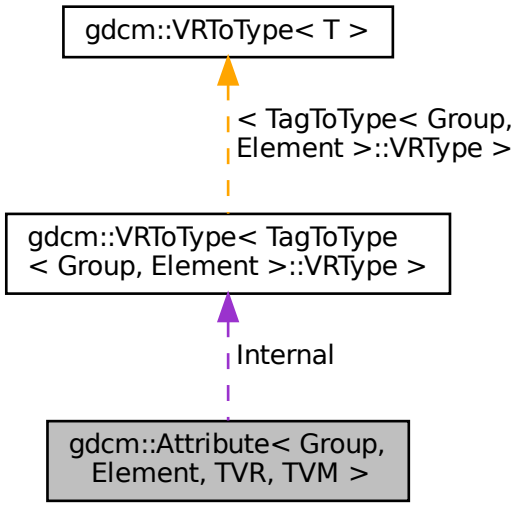
- gdcmAsynchronousOperationsWindowSub.h

10.17 gdcm::Attribute< Group, Element, TVR, TVM > Class Template Reference

Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

```
#include <gdcmAttribute.h>
```

Collaboration diagram for gdcm::Attribute< Group, Element, TVR, TVM >:



Public Types

- enum { VMType = VMToLength<TVM>::Length }
- typedef VRToType< TVR >::Type ArrayType

Public Member Functions

- GDCM_STATIC_ASSERT (((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) TVM==VM::VM1))||!((VR::VRType) TVR &VR::VR_VM1)))
- GDCM_STATIC_ASSERT (((VM::VMType) TVM &(VM::VMType)(TagToType< Group, Element >::VMType)))
- GDCM_STATIC_ASSERT (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- DataElement GetAsDataElement () const
- unsigned int GetNumberOfValues () const
- ArrayType & GetValue (unsigned int idx=0)
- ArrayType const & GetValue (unsigned int idx=0) const
- const ArrayType * GetValues () const
- bool operator!= (const Attribute &att) const
- bool operator< (const Attribute &att) const
- bool operator== (const Attribute &att) const
- ArrayType & operator[ ] (unsigned int idx)
- ArrayType const & operator[ ] (unsigned int idx) const
- void Print (std::ostream &os) const
- void Set (DataSet const &ds)
- void SetFromDataElement (DataElement const &de)
- void SetFromDataSet (DataSet const &ds)
- void SetValue (ArrayType v, unsigned int idx=0)
- void SetValues (const ArrayType *array, unsigned int numel=VMType)

Static Public Member Functions

- static VM GetDictVM ()
- static VR GetDictVR ()
- static Tag GetTag ()
- static VM GetVM ()
- static VR GetVR ()

Public Attributes

- ArrayType Internal [VMToLength< TVM >::Length]

Protected Member Functions

- void SetByteValue (const ByteValue *bv)
- void SetByteValueNoSwap (const ByteValue *bv)

10.17.1 Detailed Description

template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int TVM = TagToType<Group, Element>::VMType>
class gdcm::Attribute< Group, Element, TVR, TVM >

Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

Typical example that compile is: Attribute<0x0008,0x9007> a = {"ORIGINAL","PRIMARY","T1","NONE"};

Examples that will NOT compile are:

Attribute<0x0018,0x1182, VR::IS, VM::VM1> fd1 = {}; // not enough parameters Attribute<0x0018,0x1182, VR::IS, VM::VM2> fd2 = {0,1,2}; // too many initializers Attribute<0x0018,0x1182, VR::IS, VM::VM3> fd3 = {0,1,2}; // VM3 is not valid Attribute<0x0018,0x1182, VR::UL, VM::VM2> fd3 = {0,1}; // UL is not valid VR

Examples

CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_In FixOrientation.cxx, GenFakeIdentifyFile.cxx, GetSequenceUltrasound.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, PatchFile.cxx, ReadAndDumpDICOMDIR2.cxx, SortImage.cxx, StreamImageReaderTest.cxx, VolumeSorter.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.17.2 Member Typedef Documentation

10.17.2.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
typedef VRToType<TVR>::Type gdcm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

Examples

ReadAndPrintAttributes.cxx.

10.17.3 Member Enumeration Documentation

10.17.3.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
anonymous enum
```

Enumerator

VMType	

10.17.4 Member Function Documentation

10.17.4.1 GDCM_STATIC_ASSERT() [1/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
             ((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) TVM==VM::VM1))||!((VR::VRType) TVR
&VR::VR_VM1))  )
```

10.17.4.2 GDCM_STATIC_ASSERT() [2/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
             ((VM::VMType) TVM &(VM::VMType)(TagToType< Group, Element >::VMType))  )
```

10.17.4.3 GDCM_STATIC_ASSERT() [3/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
             ((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType))  )
```

10.17.4.4 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement ( ) const  [inline]
```

Examples

CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixOrientation.cxx, GenFakeIdentifyFile.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, PatchFile.cxx, and StreamImageReaderTest.cxx.

References gdcm::DataElement::GetVR(), gdcm::DataElement::SetByteValue(), and gdcm::DataElement::SetVR().

10.17.4.5 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM ( )  [inline], [static]
```

10.17.4.6 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR ( )  [inline], [static]
```

10.17.4.7 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues ( ) const  [inline]
```

Examples

LargeVRDSExplicit.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::operator<(), and gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator<().

10.17.4.8 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag ( )  [inline], [static]
```

Examples

PatchFile.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.17.4.9 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType& gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
            unsigned int idx = 0 )  [inline]
```

Examples

DeriveSeries.cxx, FixOrientation.cxx, GetSequenceUltrasound.cxx, PatchFile.cxx, ReadAndDumpDICOMDIR2.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.17.4.10 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const& gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
            unsigned int idx = 0 ) const  [inline]
```

10.17.4.11 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
const ArrayType* gdcm::Attribute< Group, Element, TVR, TVM >::GetValues ( ) const  [inline]
```

Examples

FixOrientation.cxx, LargeVRDSExplicit.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::operator!=(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!=(), gdcm::Attribute< Group, Element, TVR, TVM >::operator<(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator<(), gdcm::Attribute< Group, Element, TVR, TVM >::operator==(), and gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator==().

10.17.4.12 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VM gdcm::Attribute< Group, Element, TVR, TVM >::GetVM ( )  [inline], [static]
```

10.17.4.13 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VR gdcm::Attribute< Group, Element, TVR, TVM >::GetVR ( )  [inline], [static]
```

10.17.4.14 operator"!=()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator!= (
            const Attribute< Group, Element, TVR, TVM > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.17.4.15 operator<()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator< (
            const Attribute< Group, Element, TVR, TVM > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues(), and gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.17.4.16 operator==()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator== (
            const Attribute< Group, Element, TVR, TVM > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.17.4.17 operator[]() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType& gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
            unsigned int idx )  [inline]
```

10.17.4.18 operator[]() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const& gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
            unsigned int idx ) const  [inline]
```

10.17.4.19 Print()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::Print (
            std::ostream & os ) const  [inline]
```

10.17.4.20 Set()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::Set (
            DataSet const & ds )  [inline]
```

Examples

LargeVRDSExplicit.cxx, SortImage.cxx, and VolumeSorter.cxx.

References gdcm::DataSet::GetDataElement().

10.17.4.21 SetByteValue()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
            const ByteValue * bv )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.17.4.22 SetByteValueNoSwap()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
            const ByteValue * bv )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.17.4.23 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
            DataElement const & de )  [inline]
```

Examples

GetSequenceUltrasound.cxx, LargeVRDSExplicit.cxx, PatchFile.cxx, ReadAndDumpDICOMDIR2.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

References gdcm::DataElement::GetByteValue(), gdcm::DataElement::GetTag(), gdcm::DataElement::GetVR(), and gdcm::DataElement::IsEmpty().

10.17.4.24 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
            DataSet const & ds )  [inline]
```

Examples

DeriveSeries.cxx, FixOrientation.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

References gdcm::DataSet::FindDataElement(), and gdcm::DataSet::GetDataElement().

10.17.4.25 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValue (
            ArrayType v,
            unsigned int idx = 0 )  [inline]
```

Examples

CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, FixOrientation.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, and PatchFile.cxx.

10.17.4.26 SetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValues (
            const ArrayType * array,
            unsigned int numel = VMType )  [inline]
```

Examples

FixOrientation.cxx, and LargeVRDSExplicit.cxx.

10.17.5 Member Data Documentation

10.17.5.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType gdcm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

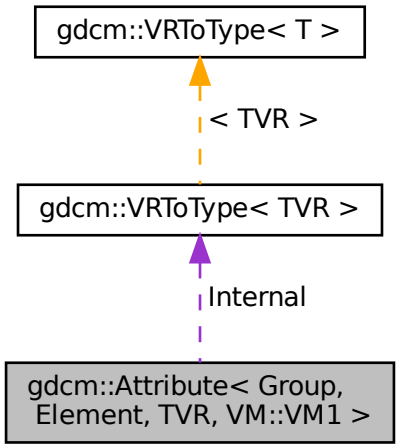
The documentation for this class was generated from the following file:

- gdcmAttribute.h

10.18 gdcm::Attribute< Group, Element, TVR, VM::VM1 > Class Template Reference

`#include <gdcmAttribute.h>`

Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1 >:



Public Types

- enum { VMType = VMToLength<VM::VM1>::Length }
- typedef VRToType< TVR >::Type ArrayType

Public Member Functions

- GDCM_STATIC_ASSERT (((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) VM::VM1==VM::VM1))||!((VR::VRType) TVR &VR::VR_VM1)))
- GDCM_STATIC_ASSERT (((VM::VMType) VM::VM1 &(VM::VMType)(TagToType< Group, Element >::VMType)))
- GDCM_STATIC_ASSERT (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- GDCM_STATIC_ASSERT (VMToLength< VM::VM1 >::Length==1)
- DataElement GetAsDataElement () const
- unsigned int GetNumberOfValues () const
- ArrayType & GetValue ()
- ArrayType const & GetValue () const
- const ArrayType * GetValues () const
- bool operator!= (const Attribute &att) const
- bool operator< (const Attribute &att) const
- bool operator== (const Attribute &att) const

- void Print (std::ostream &os) const
- void Set (DataSet const &ds)
- void SetFromDataElement (DataElement const &de)
- void SetFromDataSet (DataSet const &ds)
- void SetValue (ArrayType v)

Static Public Member Functions

- static VM GetDictVM ()
- static VR GetDictVR ()
- static Tag GetTag ()
- static VM GetVM ()
- static VR GetVR ()

Public Attributes

- ArrayType Internal

Protected Member Functions

- void SetByteValue (const ByteValue *bv)
- void SetByteValueNoSwap (const ByteValue *bv)

10.18.1 Member Typedef Documentation

10.18.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdcm::Attribute< Group, Element, TVR, VM::VM1 >::ArrayType
```

10.18.2 Member Enumeration Documentation

10.18.2.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR>
anonymous enum
```

Enumerator

VMType	

10.18.3 Member Function Documentation

10.18.3.1 GDCM_STATIC_ASSERT() [1/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
             ((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) VM::VM1==VM::VM1))||!((VR::VRType)
TVR &VR::VR_VM1))  )
```

10.18.3.2 GDCM_STATIC_ASSERT() [2/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
             ((VM::VMType) VM::VM1 &(VM::VMType)(TagToType< Group, Element >::VMType))  )
```

10.18.3.3 GDCM_STATIC_ASSERT() [3/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
             ((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType))  )
```

10.18.3.4 GDCM_STATIC_ASSERT() [4/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
             VMToLength< VM::VM1 >::Length  = =1 )
```

10.18.3.5 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement ( ) const  [inline]
```

References gdcm::DataElement::GetVR(), gdcm::DataElement::SetByteValue(), and gdcm::DataElement::SetVR().

10.18.3.6 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVM ( )  [inline], [static]
```

10.18.3.7 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVR ( )  [inline], [static]
```

10.18.3.8 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetNumberOfValues ( ) const  [inline]
```

10.18.3.9 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static Tag gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetTag ( )  [inline], [static]
```

10.18.3.10 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType& gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValue ( )  [inline]
```

10.18.3.11 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const& gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValue ( ) const  [inline]
```

10.18.3.12 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType* gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValues ( ) const  [inline]
```

10.18.3.13 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVM ( )  [inline], [static]
```

10.18.3.14 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVR ( )  [inline], [static]
```

10.18.3.15 operator"!=()

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!= (
            const Attribute< Group, Element, TVR, VM::VM1 > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.18.3.16 operator<()

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator< (
            const Attribute< Group, Element, TVR, VM::VM1 > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues(), and gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.18.3.17 operator==()

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator== (
            const Attribute< Group, Element, TVR, VM::VM1 > & att ) const  [inline]
```

References gdcm::Attribute< Group, Element, TVR, TVM >::GetValues().

10.18.3.18 Print()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Print (
            std::ostream & os ) const  [inline]
```

10.18.3.19 Set()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Set (
            DataSet const & ds )  [inline]
```

References gdcm::DataSet::GetDataElement().

10.18.3.20 SetByteValue()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue (
            const ByteValue * bv )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.18.3.21 SetByteValueNoSwap()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap (
            const ByteValue * bv )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.18.3.22 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement (
            DataElement const & de )  [inline]
```

References gdcm::DataElement::GetByteValue(), gdcm::DataElement::GetTag(), gdcm::DataElement::GetVR(), and gdcm::DataElement::IsEmpty().

10.18.3.23 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet (
            DataSet const & ds )  [inline]
```

References gdcm::DataSet::FindDataElement(), and gdcm::DataSet::GetDataElement().

10.18.3.24 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetValue (
            ArrayType v )  [inline]
```

10.18.4 Member Data Documentation

10.18.4.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Internal
```

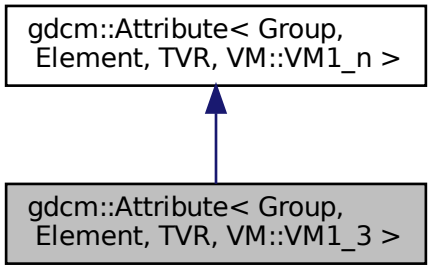
The documentation for this class was generated from the following file:

- gdcmAttribute.h

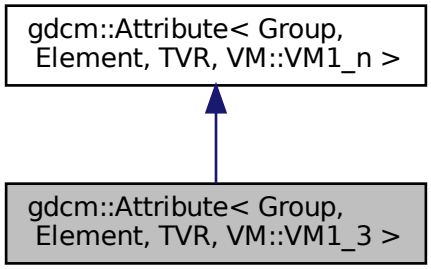
10.19 gdcm::Attribute< Group, Element, TVR, VM::VM1_3 > Class Template Reference

`#include <gdcmAttribute.h>`

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >:



Public Member Functions

- VM GetVM () const

Additional Inherited Members

10.19.1 Member Function Documentation

10.19.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >::GetVM ( ) const  [inline]
```

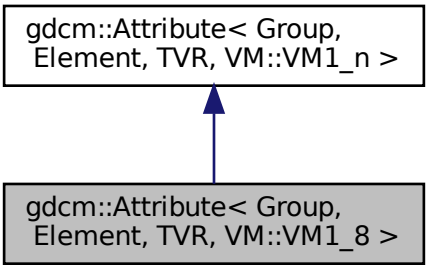
The documentation for this class was generated from the following file:

- gdcmAttribute.h

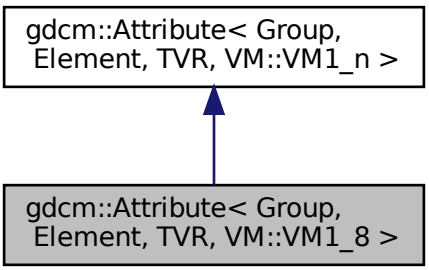
10.20 gdcm::Attribute< Group, Element, TVR, VM::VM1_8 > Class Template Reference

`#include <gdcmAttribute.h>`

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >:



Public Member Functions

- VM GetVM () const

Additional Inherited Members

10.20.1 Member Function Documentation

10.20.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >::GetVM ( ) const  [inline]
```

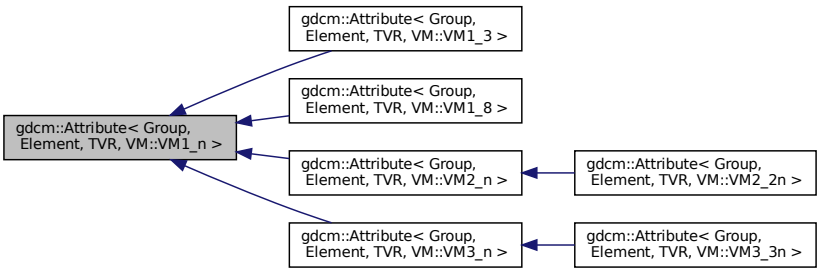
The documentation for this class was generated from the following file:

- gdcmAttribute.h

10.21 gdcm::Attribute< Group, Element, TVR, VM::VM1_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1_n >:



Public Types

- typedef VRToType< TVR >::Type ArrayType

Public Member Functions

- Attribute ()
- ~Attribute ()
- GDCM_STATIC_ASSERT (((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR_VM1)))
- GDCM_STATIC_ASSERT (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- GDCM_STATIC_ASSERT ((VM::VM1_n &(VM::VMType)(TagToType< Group, Element >::VMType)))
- DataElement GetAsDataElement () const
- unsigned int GetNumberOfValues () const
- ArrayType & GetValue (unsigned int idx=0)
- ArrayType const & GetValue (unsigned int idx=0) const
- const ArrayType * GetValues () const
- ArrayType & operator[ ] (unsigned int idx)
- ArrayType const & operator[ ] (unsigned int idx) const
- void Print (std::ostream &os) const
- void Set (DataSet const &ds)
- void SetFromDataElement (DataElement const &de)
- void SetFromDataSet (DataSet const &ds)
- void SetNumberOfValues (unsigned int numel)
- void SetValue (ArrayType v)
- void SetValue (unsigned int idx, ArrayType v)
- void SetValues (const ArrayType *array, unsigned int numel, bool own=false)

Static Public Member Functions

- static VM GetDictVM ()
- static VR GetDictVR ()
- static Tag GetTag ()
- static VM GetVM ()
- static VR GetVR ()

Protected Member Functions

- void SetByteValue (const ByteValue *bv)

10.21.1 Member Typedef Documentation

10.21.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::ArrayType
```

10.21.2 Constructor & Destructor Documentation

10.21.2.1 Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Attribute ( )  [inline], [explicit]
```

10.21.2.2 ~Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::~Attribute ( )  [inline]
```

10.21.3 Member Function Documentation

10.21.3.1 GDCM_STATIC_ASSERT() [1/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
             ((((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1))||!((V
TVR &VR::VR_VM1))  )
```

10.21.3.2 GDCM_STATIC_ASSERT() [2/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
             ((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType))  )
```

10.21.3.3 GDCM_STATIC_ASSERT() [3/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
             (VM::VM1_n &(VM::VMType)(TagToType< Group, Element >::VMType))  )
```

10.21.3.4 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsDataElement ( ) const  [inline]
```

References gdcm::DataElement::GetVR(), gdcm::DataElement::SetByteValue(), and gdcm::DataElement::SetVR().

10.21.3.5 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVM ( )  [inline], [static]
```

10.21.3.6 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVR ( )  [inline], [static]
```

10.21.3.7 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetNumberOfValues ( ) const  [inline]
```

10.21.3.8 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static Tag gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetTag ( )  [inline], [static]
```

10.21.3.9 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType& gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
            unsigned int idx = 0 )  [inline]
```

10.21.3.10 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const& gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
            unsigned int idx = 0 ) const  [inline]
```

10.21.3.11 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType* gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetValues ( ) const  [inline]
```

10.21.3.12 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetVM ( )  [inline], [static]
```

10.21.3.13 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetVR ( )  [inline], [static]
```

10.21.3.14 operator[]() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType& gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::operator[] (
            unsigned int idx )  [inline]
```

10.21.3.15 operator[]() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const& gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::operator[] (
            unsigned int idx ) const  [inline]
```

10.21.3.16 Print()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Print (
            std::ostream & os ) const  [inline]
```

10.21.3.17 Set()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Set (
            DataSet const & ds )  [inline]
```

References gdcm::DataSet::GetDataElement().

10.21.3.18 SetByteValue()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetByteValue (
            const ByteValue * bv )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.21.3.19 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataElement (
            DataElement const & de )  [inline]
```

References gdcm::DataElement::GetByteValue(), gdcm::DataElement::GetTag(), gdcm::DataElement::GetVR(), and gdcm::DataElement::IsEmpty().

10.21.3.20 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataSet (
            DataSet const & ds )  [inline]
```

References gdcm::DataSet::FindDataElement(), and gdcm::DataSet::GetDataElement().

10.21.3.21 SetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetNumberOfValues (
            unsigned int numel )  [inline]
```

10.21.3.22 SetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
            ArrayType v )  [inline]
```

References SetValue().

Referenced by SetValue().

10.21.3.23 SetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
            unsigned int idx,
            ArrayType v )  [inline]
```

10.21.3.24 SetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetValues (
            const ArrayType * array,
            unsigned int numel,
            bool own = false )  [inline]
```

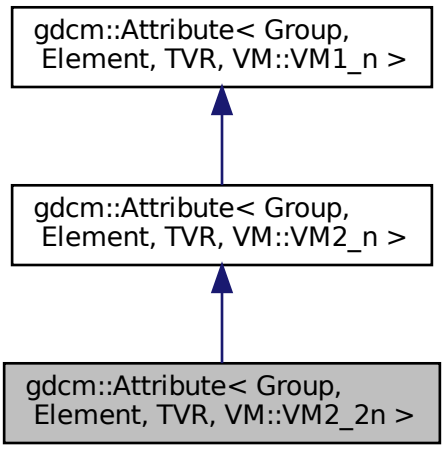
The documentation for this class was generated from the following file:

- gdcmAttribute.h

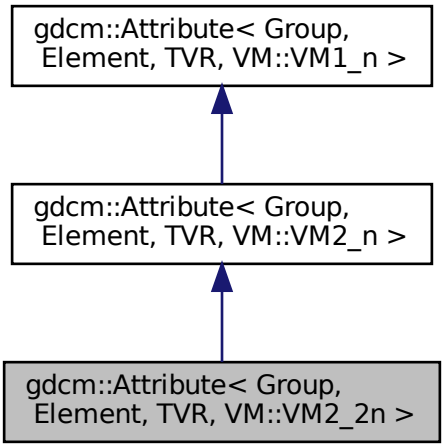
10.22 gdcm::Attribute< Group, Element, TVR, VM::VM2_2n > Class Template Reference

`#include <gdcmAttribute.h>`

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2_2n >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2_2n >:



Static Public Member Functions

- static VM GetVM ()

Additional Inherited Members

10.22.1 Member Function Documentation

10.22.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM2_2n >::GetVM ( )  [inline], [static]
```

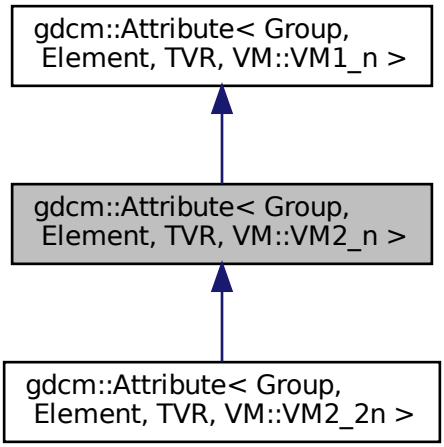
The documentation for this class was generated from the following file:

- gdcmAttribute.h

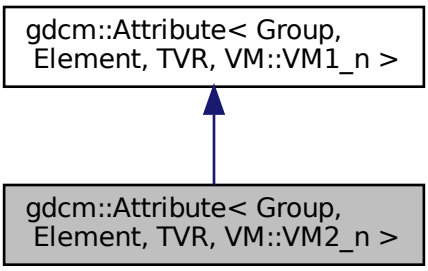
10.23 gdcm::Attribute< Group, Element, TVR, VM::VM2_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2_n >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2_n >:



Public Member Functions

- VM GetVM () const

Additional Inherited Members

10.23.1 Member Function Documentation

10.23.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM2_n >::GetVM ( ) const  [inline]
```

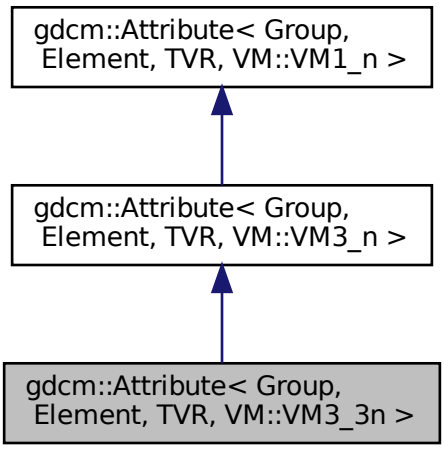
The documentation for this class was generated from the following file:

- gdcmAttribute.h

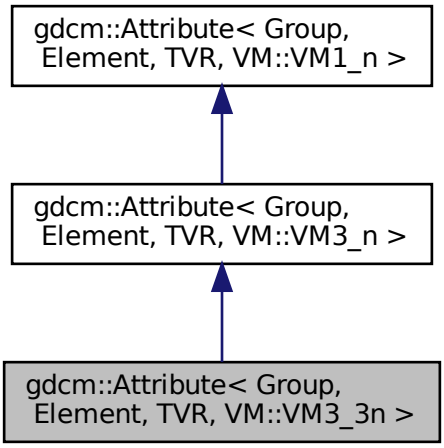
10.24 gdcm::Attribute< Group, Element, TVR, VM::VM3_3n > Class Template Reference

`#include <gdcmAttribute.h>`

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3_3n >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3_3n >:



Static Public Member Functions

- static VM GetVM ()

Additional Inherited Members

10.24.1 Member Function Documentation

10.24.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM3_3n >::GetVM ( )  [inline], [static]
```

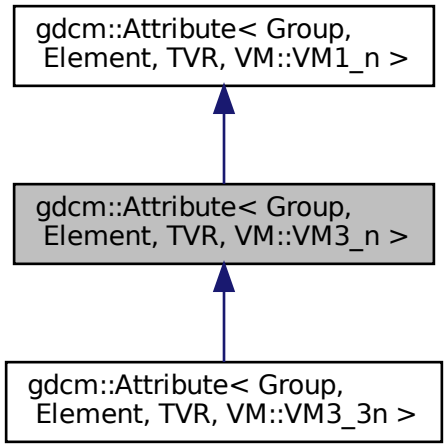
The documentation for this class was generated from the following file:

- gdcmAttribute.h

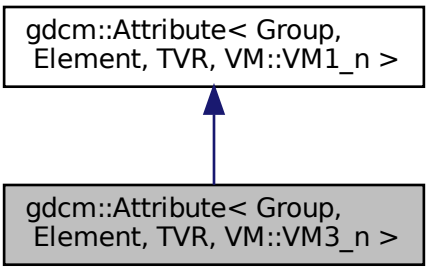
10.25 gdcm::Attribute< Group, Element, TVR, VM::VM3_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3_n >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3_n >:



Static Public Member Functions

- static VM GetVM ()

Additional Inherited Members

10.25.1 Member Function Documentation

10.25.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM3_n >::GetVM ( )  [inline], [static]
```

The documentation for this class was generated from the following file:

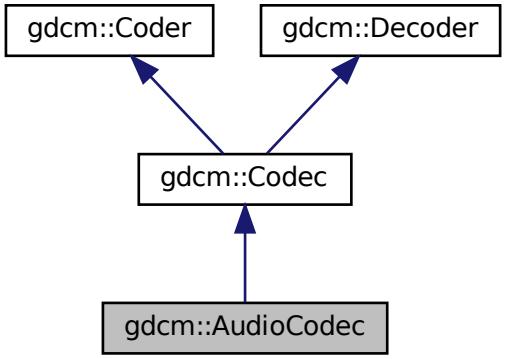
- gdcmAttribute.h

10.26 gdcm::AudioCodec Class Reference

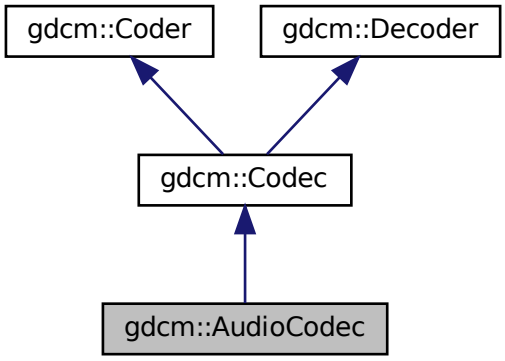
AudioCodec.

`#include <gdcmAudioCodec.h>`

Inheritance diagram for gdcm::AudioCodec:



Collaboration diagram for gdcm::AudioCodec:



Public Member Functions

- AudioCodec ()
- ~AudioCodec () override
- bool CanCode (TransferSyntax const &) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &) const override

  Return whether this decoder support this transfer syntax (can decode it)
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.

Additional Inherited Members

10.26.1 Detailed Description

AudioCodec.

10.26.2 Constructor & Destructor Documentation

10.26.2.1 AudioCodec()

```
gdcm::AudioCodec::AudioCodec ( )
```

10.26.2.2 ~AudioCodec()

```
gdcm::AudioCodec::~AudioCodec ( )  [override]
```

10.26.3 Member Function Documentation

10.26.3.1 CanCode()

```
bool gdcm::AudioCodec::CanCode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements gdcm::Coder.

10.26.3.2 CanDecode()

```
bool gdcm::AudioCodec::CanDecode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements gdcm::Decoder.

10.26.3.3 Decode()

```
bool gdcm::AudioCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::Decoder.

The documentation for this class was generated from the following file:

- gdcmAudioCodec.h

10.27 gdcm::Base64 Class Reference

Class for Base64.

```
#include <gdcmBase64.h>
```

Public Member Functions

- Base64 (const Base64 &)=delete
- void operator= (const Base64 &)=delete

Static Public Member Functions

- static size_t Decode (char *dst, size_t dlen, const char *src, size_t slen)

  Decode a base64-formatted buffer.
- static size_t Encode (char *dst, size_t dlen, const char *src, size_t slen)

  Encode a buffer into base64 format.
- static size_t GetDecodeLength (const char *src, size_t len)
- static size_t GetEncodeLength (const char *src, size_t srclen)

10.27.1 Detailed Description

Class for Base64.

10.27.2 Constructor & Destructor Documentation

10.27.2.1 Base64()

```
gdcm::Base64::Base64 (
            const Base64 &  )  [delete]
```

10.27.3 Member Function Documentation

10.27.3.1 Decode()

```
static size_t gdcm::Base64::Decode (
            char * dst,
            size_t dlen,
            const char * src,
            size_t slen )  [static]
```

Decode a base64-formatted buffer.

Parameters

dst	destination buffer
dlen	size of the buffer
src	source buffer
slen	amount of data to be decoded

Returns

0 if not successful, size of decoded otherwise

Examples

DumpExamCard.cxx, and DumpSiemensBase64.cxx.

10.27.3.2 Encode()

```
static size_t gdcm::Base64::Encode (
            char * dst,
            size_t dlen,
            const char * src,
            size_t slen )  [static]
```

Encode a buffer into base64 format.

Parameters

dst	destination buffer
dlen	size of the buffer
src	source buffer
slen	amount of data to be encoded

Returns

0 if not successful, size of encoded otherwise

10.27.3.3 GetDecodeLength()

```
static size_t gdcm::Base64::GetDecodeLength (
            const char * src,
            size_t len )  [static]
```

Call this function to obtain the required buffer size

Examples

DumpExamCard.cxx, and DumpSiemensBase64.cxx.

10.27.3.4 GetEncodeLength()

```
static size_t gdcm::Base64::GetEncodeLength (
            const char * src,
            size_t srclen )  [static]
```

Call this function to obtain the required buffer size

10.27.3.5 operator=()

```
void gdcm::Base64::operator= (
            const Base64 &  )  [delete]
```

The documentation for this class was generated from the following file:

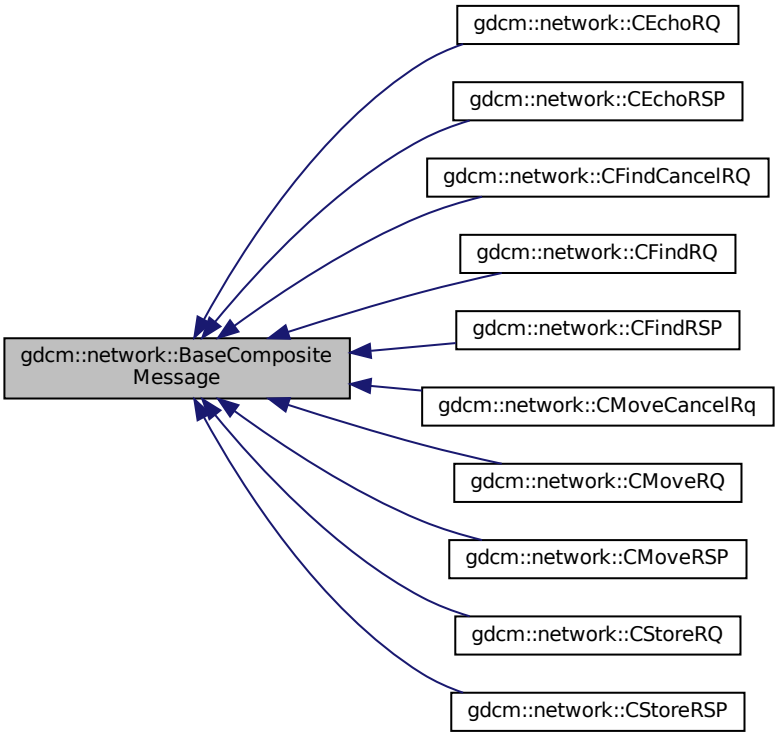
- gdcmBase64.h

10.28 gdcm::network::BaseCompositeMessage Class Reference

BaseCompositeMessage.

`#include <gdcmBaseCompositeMessage.h>`

Inheritance diagram for gdcm::network::BaseCompositeMessage:



Public Member Functions

- virtual ~BaseCompositeMessage ()=default
- virtual std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)=0

10.28.1 Detailed Description

BaseCompositeMessage.

The Composite events described in section 3.7-2009 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2009 of the standard, and then fill in appropriate values in their datasets.

So, for the five composites:

- C-ECHO
- C-FIND
- C-MOVE
- C-GET
- C-STORE there are a series of messages. However, all of these messages are obtained as part of a PDataPDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, gdcmComposite↩ PDUFactory.

This is an abstract class. It cannot be instantiated on its own.

10.28.2 Constructor & Destructor Documentation

10.28.2.1 ~BaseCompositeMessage()

```
virtual gdcm::network::BaseCompositeMessage::~BaseCompositeMessage ( )  [virtual], [default]
```

10.28.3 Member Function Documentation

10.28.3.1 ConstructPDV()

```
virtual std::vector<PresentationDataValue> gdcm::network::BaseCompositeMessage::ConstructPDV (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [pure virtual]
```

Implemented in gdcm::network::CMoveRQ, gdcm::network::CFindRQ, and gdcm::network::CEchoRQ.

The documentation for this class was generated from the following file:

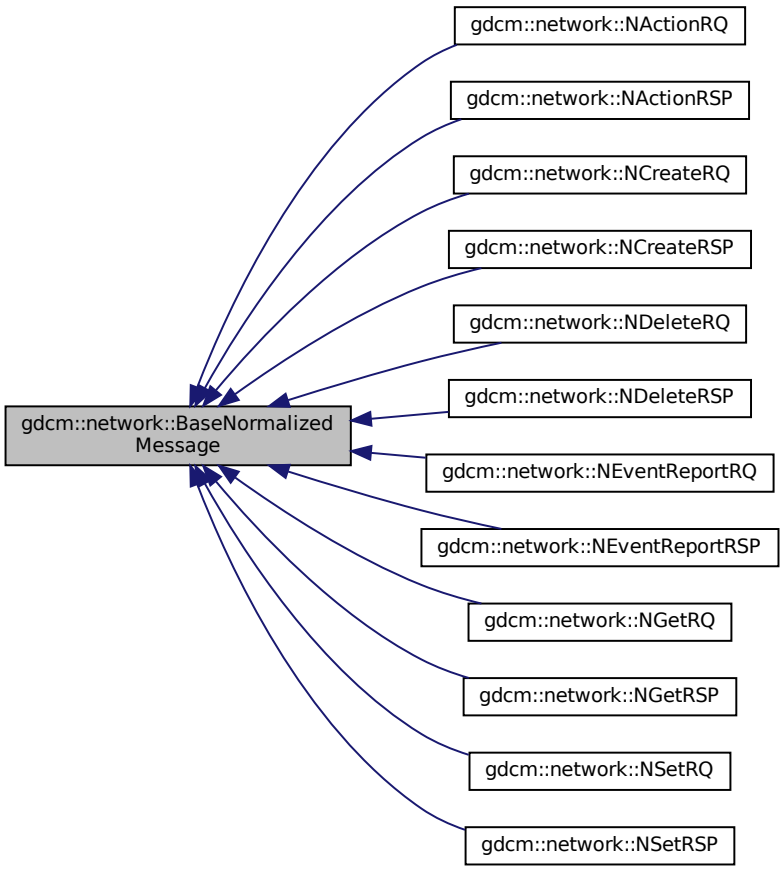
- gdcmBaseCompositeMessage.h

10.29 gdcm::network::BaseNormalizedMessage Class Reference

BaseNormalizedMessage.

`#include <gdcmBaseNormalizedMessage.h>`

Inheritance diagram for gdcm::network::BaseNormalizedMessage:



Public Member Functions

- virtual ~BaseNormalizedMessage ()=default
- virtual std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery)=0

10.29.1 Detailed Description

BaseNormalizedMessage.

The Normalized events described in section 3.7-2011 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2011 of the standard, and then fill in appropriate values in their datasets.

So, for the five normalized:

- N-ACTION
- N-CREATE
- N-DELETE
- N-EVENT
- N-GET
- N-SET there are a series of messages. However, all of these messages are obtained as part of a PData↩ PDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, gdcmNormalizedMessageFactory.h.

This is an abstract class. It cannot be instantiated on its own.

10.29.2 Constructor & Destructor Documentation

10.29.2.1 ~BaseNormalizedMessage()

```
virtual gdcm::network::BaseNormalizedMessage::~BaseNormalizedMessage ( )  [virtual], [default]
```

10.29.3 Member Function Documentation

10.29.3.1 ConstructPDV()

```
virtual std::vector<PresentationDataValue> gdcm::network::BaseNormalizedMessage::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [pure virtual]
```

Implemented in gdcm::network::NSetRQ, gdcm::network::NGetRQ, gdcm::network::NEventReportRQ, gdcm::network::NDeleteRQ, gdcm::network::NCreateRQ, and gdcm::network::NActionRQ.

The documentation for this class was generated from the following file:

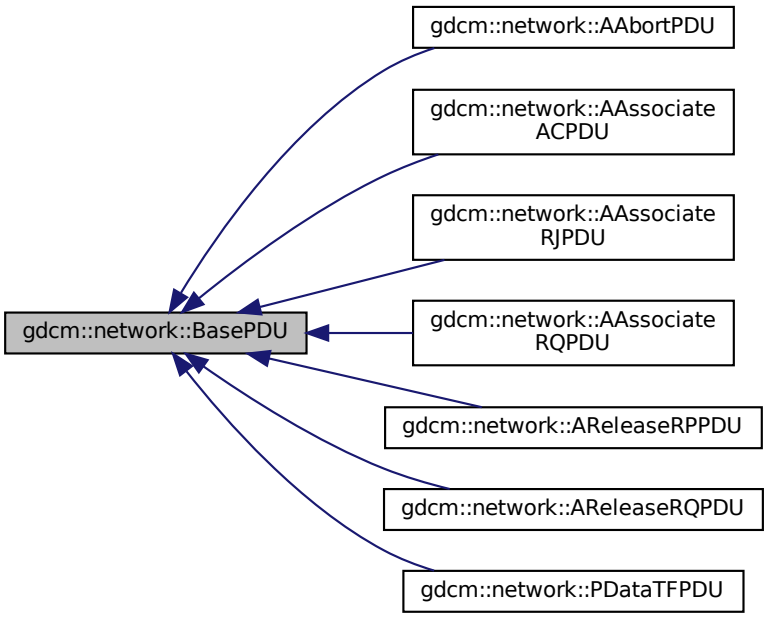
- gdcmBaseNormalizedMessage.h

10.30 gdcm::network::BasePDU Class Reference

BasePDU.

`#include <gdcmBasePDU.h>`

Inheritance diagram for gdcm::network::BasePDU:



Public Member Functions

- virtual ~BasePDU ()=default
- virtual bool IsLastFragment () const =0
- virtual void Print (std::ostream &os) const =0
- virtual std::istream & Read (std::istream &is)=0
- virtual size_t Size () const =0
- virtual const std::ostream & Write (std::ostream &os) const =0

10.30.1 Detailed Description

BasePDU.

base class for PDUs

all PDUs start with the first ten bytes as specified: 01 PDU type 02 reserved 3-6 PDU Length (unsigned) 7-10 variable

on some, 7-10 are split (7-8 as protocol version in Associate-RQ, for instance, while associate-rj splits those four bytes differently).

Also common to all the PDUs is their ability to read and write to a stream.

So, let's just get them all bunched together into one (abstract) class, shall we?

Why? 1) so that the ULEvent can have the PDU stored in it, since the event takes PDUs and not other class structures (other class structures get converted into PDUs) 2) to make reading PDUs in the event loop cleaner

10.30.2 Constructor & Destructor Documentation

10.30.2.1 ~BasePDU()

```
virtual gdcm::network::BasePDU::~BasePDU ( )  [virtual], [default]
```

10.30.3 Member Function Documentation

10.30.3.1 IsLastFragment()

```
virtual bool gdcm::network::BasePDU::IsLastFragment ( ) const  [pure virtual]
```

Implemented in gdcm::network::PDataTFPDU, gdcm::network::AReleaseRQPDU, gdcm::network::AReleaseRPPDU, gdcm::network::AAssociateRQPDU, gdcm::network::AAssociateRJPDU, gdcm::network::AAssociateACPDU, and gdcm::network::AAbortPDU.

10.30.3.2 Print()

```
virtual void gdcm::network::BasePDU::Print (
            std::ostream & os ) const  [pure virtual]
```

Implemented in gdcm::network::PDataTFPDU, gdcm::network::AReleaseRQPDU, gdcm::network::AReleaseRPPDU, gdcm::network::AAssociateRQPDU, gdcm::network::AAssociateRJPDU, gdcm::network::AAssociateACPDU, and gdcm::network::AAbortPDU.

10.30.3.3 Read()

```
virtual std::istream& gdcm::network::BasePDU::Read (
            std::istream & is )  [pure virtual]
```

Implemented in gdcm::network::PDataTFPDU, gdcm::network::AReleaseRQPDU, gdcm::network::AReleaseRPPDU, gdcm::network::AAssociateRQPDU, gdcm::network::AAssociateRJPDU, gdcm::network::AAssociateACPDU, and gdcm::network::AAbortPDU.

10.30.3.4 Size()

```
virtual size_t gdcm::network::BasePDU::Size ( ) const  [pure virtual]
```

Implemented in gdcm::network::PDataTFPDU, gdcm::network::AReleaseRQPDU, gdcm::network::AReleaseRPPDU, gdcm::network::AAssociateRQPDU, gdcm::network::AAssociateRJPDU, gdcm::network::AAssociateACPDU, and gdcm::network::AAbortPDU.

10.30.3.5 Write()

```
virtual const std::ostream& gdcm::network::BasePDU::Write (
            std::ostream & os ) const  [pure virtual]
```

Implemented in gdcm::network::PDataTFPDU, gdcm::network::AReleaseRQPDU, gdcm::network::AReleaseRPPDU, gdcm::network::AAssociateRQPDU, gdcm::network::AAssociateRJPDU, gdcm::network::AAssociateACPDU, and gdcm::network::AAbortPDU.

The documentation for this class was generated from the following file:

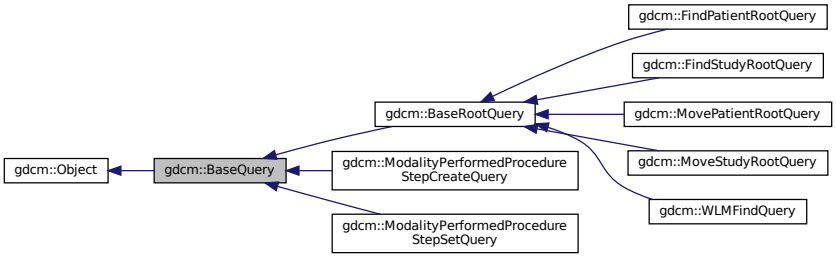
- gdcmBasePDU.h

10.31 gdcm::BaseQuery Class Reference

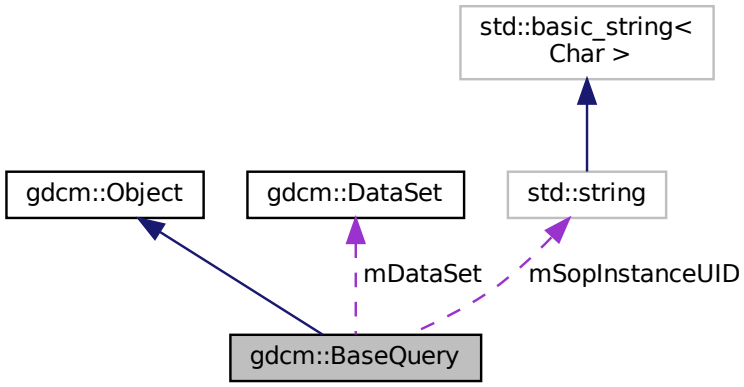
BaseQuery.

```
#include <gdcmBaseQuery.h>
```

Inheritance diagram for gdcm::BaseQuery:



Collaboration diagram for gdcm::BaseQuery:



Public Member Functions

- ~BaseQuery () override
- void AddQueryDataSet (const DataSet &ds)
- virtual UIDs::TSName GetAbstractSyntaxUID () const =0
- DataSet & GetQueryDataSet ()
- DataSet const & GetQueryDataSet () const

  Set/Get the internal representation of the query as a DataSet.
- std::string GetSOPInstanceUID () const
- void Print (std::ostream &os) const override
- void SetSearchParameter (const std::string &inKeyword, const std::string &inValue)
- void SetSearchParameter (const Tag &inTag, const std::string &inValue)
- void SetSOPInstanceUID (const std::string &iSopInstanceUID)
- virtual bool ValidateQuery (bool inStrict=true) const =0
- const std::ostream & WriteHelpFile (std::ostream &os)
- bool WriteQuery (const std::string &inFileName)

Protected Member Functions

- BaseQuery ()
- void SetSearchParameter (const Tag &inTag, const DictEntry &inDictEntry, const std::string &inValue)
- bool ValidDataSet (const DataSet &dataSetToValid, const DataSet &dataSetReference) const

Protected Attributes

- DataSet mDataSet
- std::string mSopInstanceUID

Friends

- class QueryFactory

10.31.1 Detailed Description

BaseQuery.

contains: a baseclass which will produce a dataset for all dimse messages

10.31.2 Constructor & Destructor Documentation

10.31.2.1 BaseQuery()

```
gdcm::BaseQuery::BaseQuery ( )  [protected]
```

10.31.2.2 ~BaseQuery()

```
gdcm::BaseQuery::~BaseQuery ( )  [override]
```

10.31.3 Member Function Documentation

10.31.3.1 AddQueryDataSet()

```
void gdcm::BaseQuery::AddQueryDataSet (
            const DataSet & ds )
```

10.31.3.2 GetAbstractSyntaxUID()

```
virtual UIDs::TSName gdcm::BaseQuery::GetAbstractSyntaxUID ( ) const  [pure virtual]
```

Implemented in gdcm::WLMFindQuery, gdcm::MoveStudyRootQuery, gdcm::MovePatientRootQuery, gdcm::ModalityPerformedProcedure
gdcm::ModalityPerformedProcedureStepCreateQuery, gdcm::FindStudyRootQuery, and gdcm::FindPatientRootQuery.

10.31.3.3 GetQueryDataSet() [1/2]

```
DataSet& gdcm::BaseQuery::GetQueryDataSet ( )
```

10.31.3.4 GetQueryDataSet() [2/2]

```
DataSet const& gdcm::BaseQuery::GetQueryDataSet ( ) const
```

Set/Get the internal representation of the query as a DataSet.

10.31.3.5 GetSOPInstanceUID()

```
std::string gdcm::BaseQuery::GetSOPInstanceUID ( ) const  [inline]
```

10.31.3.6 Print()

```
void gdcm::BaseQuery::Print (
            std::ostream & os ) const  [override], [virtual]
```

Reimplemented from gdcm::Object.

10.31.3.7 SetSearchParameter() [1/3]

```
void gdcm::BaseQuery::SetSearchParameter (
            const std::string & inKeyword,
            const std::string & inValue )
```

10.31.3.8 SetSearchParameter() [2/3]

```
void gdcm::BaseQuery::SetSearchParameter (
            const Tag & inTag,
            const DictEntry & inDictEntry,
            const std::string & inValue )  [protected]
```

10.31.3.9 SetSearchParameter() [3/3]

```
void gdcm::BaseQuery::SetSearchParameter (
            const Tag & inTag,
            const std::string & inValue )
```

10.31.3.10 SetSOPInstanceUID()

```
void gdcm::BaseQuery::SetSOPInstanceUID (
            const std::string & iSopInstanceUID )  [inline]
```

10.31.3.11 ValidateQuery()

```
virtual bool gdcm::BaseQuery::ValidateQuery (
            bool inStrict = true ) const  [pure virtual]
```

Implemented in gdcm::BaseRootQuery, gdcm::WLMFindQuery, gdcm::MoveStudyRootQuery, gdcm::MovePatientRootQuery, gdcm::ModalityPerformedProcedureStepSetQuery, gdcm::ModalityPerformedProcedureStepCreateQuery, gdcm::FindStudyRootQuery, and gdcm::FindPatientRootQuery.

10.31.3.12 ValidDataSet()

```
bool gdcm::BaseQuery::ValidDataSet (
            const DataSet & dataSetToValid,
            const DataSet & dataSetReference ) const  [protected]
```

10.31.3.13 WriteHelpFile()

```
const std::ostream& gdcm::BaseQuery::WriteHelpFile (
            std::ostream & os )
```

10.31.3.14 WriteQuery()

```
bool gdcm::BaseQuery::WriteQuery (
            const std::string & inFileName )
```

10.31.4 Friends And Related Function Documentation

10.31.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

10.31.5 Member Data Documentation

10.31.5.1 mDataSet

```
DataSet gdcm::BaseQuery::mDataSet  [protected]
```

10.31.5.2 mSopInstanceUID

```
std::string gdcm::BaseQuery::mSopInstanceUID  [protected]
```

The documentation for this class was generated from the following file:

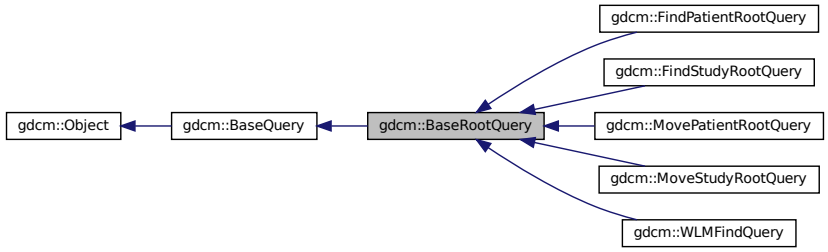
- gdcmBaseQuery.h

10.32 gdcm::BaseRootQuery Class Reference

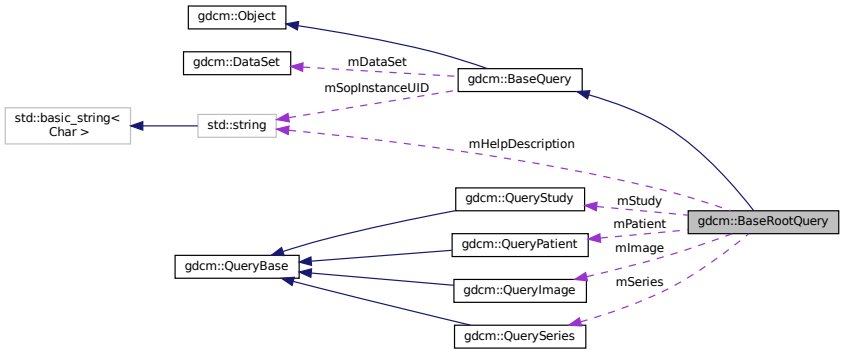
BaseRootQuery.

```
#include <gdcmBaseRootQuery.h>
```

Inheritance diagram for gdcm::BaseRootQuery:



Collaboration diagram for gdcm::BaseRootQuery:



Public Member Functions

- ~BaseRootQuery () override
- EQueryLevel GetQueryLevelFromQueryRoot (ERootType roottype)
- virtual std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel)=0
- virtual void InitializeDataSet (const EQueryLevel &inQueryLevel)=0
- bool ValidateQuery (bool inStrict=true) const override=0

Static Public Member Functions

- static QueryBase * Construct (ERootType inRootType, EQueryLevel qlevel)
- static int GetQueryLevelFromString (const char *str)
- static const char * GetQueryLevelString (EQueryLevel ql)

Protected Member Functions

- BaseRootQuery ()

Protected Attributes

- std::string mHelpDescription
- QueryImage mImage
- QueryPatient mPatient
- ERootType mRootType
- QuerySeries mSeries
- QueryStudy mStudy

Friends

- class QueryFactory

10.32.1 Detailed Description

BaseRootQuery.

contains: a baseclass which will produce a dataset for c-find and c-move with patient/study root

This class contains the functionality used in patient c-find and c-move queries. PatientRootQuery and StudyRootQuery derive from this class.

Namely: 1) list all tags associated with a particular query type 2) produce a query dataset via tag association

Eventually, it can be used to validate a particular dataset type.

The dataset held by this object (or, really, one of its derivates) should be passed to a c-find or c-move query.

10.32.2 Constructor & Destructor Documentation

10.32.2.1 BaseRootQuery()

```
gdcm::BaseRootQuery::BaseRootQuery ( )  [protected]
```

10.32.2.2 ~BaseRootQuery()

```
gdcm::BaseRootQuery::~BaseRootQuery ( )  [override]
```

10.32.3 Member Function Documentation

10.32.3.1 Construct()

```
static QueryBase* gdcm::BaseRootQuery::Construct (
            ERootType inRootType,
            EQueryLevel qlevel )  [static]
```

10.32.3.2 GetQueryLevelFromQueryRoot()

```
EQueryLevel gdcm::BaseRootQuery::GetQueryLevelFromQueryRoot (
            ERootType roottype )
```

10.32.3.3 GetQueryLevelFromString()

```
static int gdcm::BaseRootQuery::GetQueryLevelFromString (
            const char * str )  [static]
```

10.32.3.4 GetQueryLevelString()

```
static const char* gdcm::BaseRootQuery::GetQueryLevelString (
            EQueryLevel ql )  [static]
```

10.32.3.5 GetTagListByLevel()

```
virtual std::vector<Tag> gdcm::BaseRootQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [pure virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implemented in gdcm::WLMFindQuery, gdcm::MoveStudyRootQuery, gdcm::MovePatientRootQuery, gdcm::FindStudyRootQuery, and gdcm::FindPatientRootQuery.

10.32.3.6 InitializeDataSet()

```
virtual void gdcm::BaseRootQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [pure virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implemented in gdcm::WLMFindQuery, gdcm::MoveStudyRootQuery, gdcm::MovePatientRootQuery, gdcm::FindStudyRootQuery, and gdcm::FindPatientRootQuery.

10.32.3.7 ValidateQuery()

```
bool gdcm::BaseRootQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [pure virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements gdcm::BaseQuery.

Implemented in gdcm::WLMFindQuery, gdcm::MoveStudyRootQuery, gdcm::MovePatientRootQuery, gdcm::FindStudyRootQuery, and gdcm::FindPatientRootQuery.

10.32.4 Friends And Related Function Documentation

10.32.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

10.32.5 Member Data Documentation

10.32.5.1 mHelpDescription

```
std::string gdcm::BaseRootQuery::mHelpDescription  [protected]
```

10.32.5.2 mImage

```
QueryImage gdcm::BaseRootQuery::mImage  [protected]
```

10.32.5.3 mPatient

```
QueryPatient gdcm::BaseRootQuery::mPatient  [protected]
```

10.32.5.4 mRootType

```
ERootType gdcm::BaseRootQuery::mRootType  [protected]
```

10.32.5.5 mSeries

```
QuerySeries gdcm::BaseRootQuery::mSeries  [protected]
```

10.32.5.6 mStudy

```
QueryStudy gdcm::BaseRootQuery::mStudy  [protected]
```

The documentation for this class was generated from the following file:

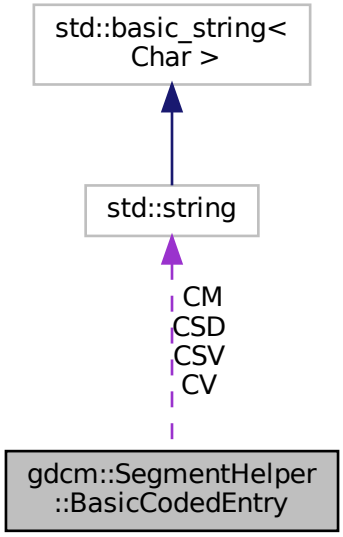
- gdcmBaseRootQuery.h

10.33 gdcm::SegmentHelper::BasicCodedEntry Struct Reference

This structure defines a basic coded entry with all of its attributes.

`#include <gdcmSegmentHelper.h>`

Collaboration diagram for gdcm::SegmentHelper::BasicCodedEntry:



Public Member Functions

- BasicCodedEntry ()
  Constructor.
- BasicCodedEntry (const char *a_CV, const char *a_CSD, const char *a_CM)
  constructor which defines type 1 attributes.
- BasicCodedEntry (const char *a_CV, const char *a_CSD, const char *a_CSV, const char *a_CM)
  constructor which defines attributes.
- bool IsEmpty (const bool checkOptionalAttributes=false) const
  Check if each attributes of the basic coded entry is defined.

Public Attributes

- std::string CM

  Coding Scheme Version attribute.
- std::string CSD

  Code Value attribute.
- std::string CSV

  Coding Scheme Designator attribute.
- std::string CV

10.33.1 Detailed Description

This structure defines a basic coded entry with all of its attributes.

See also

PS 3.3 section 8.8.

10.33.2 Constructor & Destructor Documentation

10.33.2.1 BasicCodedEntry() [1/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry ( )  [inline]
```

Constructor.

10.33.2.2 BasicCodedEntry() [2/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (
            const char * a_CV,
            const char * a_CSD,
            const char * a_CM )  [inline]
```

constructor which defines type 1 attributes.

10.33.2.3 BasicCodedEntry() [3/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (
            const char * a_CV,
            const char * a_CSD,
            const char * a_CSV,
            const char * a_CM )  [inline]
```

constructor which defines attributes.

10.33.3 Member Function Documentation

10.33.3.1 IsEmpty()

```
bool gdcm::SegmentHelper::BasicCodedEntry::IsEmpty (
            const bool checkOptionalAttributes = false ) const
```

Check if each attributes of the basic coded entry is defined.

Parameters

checkOptionalAttributes	Check also type 1C attributes.

10.33.4 Member Data Documentation

10.33.4.1 CM

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CM
```

Coding Scheme Version attribute.

10.33.4.2 CSD

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSD
```

Code Value attribute.

10.33.4.3 CSV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSV
```

Coding Scheme Designator attribute.

10.33.4.4 CV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CV
```

The documentation for this struct was generated from the following file:

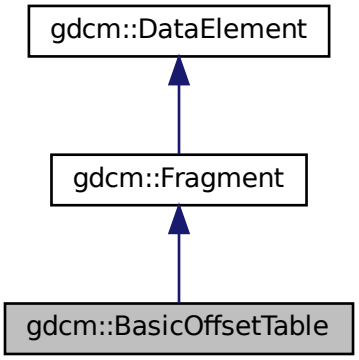
- gdcmSegmentHelper.h

10.34 gdcm::BasicOffsetTable Class Reference

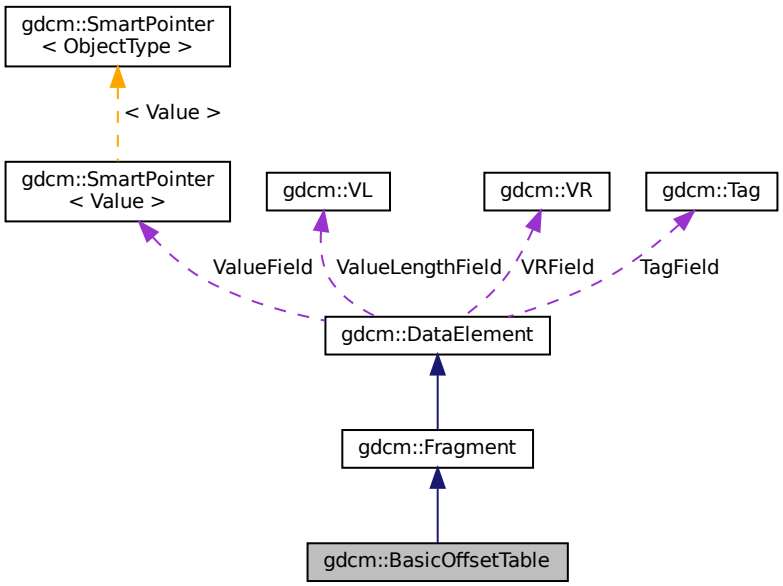
Class to represent a BasicOffsetTable.

```
#include <gdcmBasicOffsetTable.h>
```

Inheritance diagram for gdcm::BasicOffsetTable:



Collaboration diagram for gdcm::BasicOffsetTable:



Public Member Functions

- BasicOffsetTable ()
- template<typename TSwap >
  std::istream & Read (std::istream &is)

Friends

- std::ostream & operator<< (std::ostream &os, const BasicOffsetTable &val)

Additional Inherited Members

10.34.1 Detailed Description

Class to represent a BasicOffsetTable.

10.34.2 Constructor & Destructor Documentation

10.34.2.1 BasicOffsetTable()

```
gdcm::BasicOffsetTable::BasicOffsetTable ( )  [inline]
```

10.34.3 Member Function Documentation

10.34.3.1 Read()

```
template<typename TSwap >
std::istream& gdcm::BasicOffsetTable::Read (
            std::istream & is )  [inline]
```

References gdcmAssertAlwaysMacro, and gdcm::ParseException::SetLastElement().

10.34.4 Friends And Related Function Documentation

10.34.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const BasicOffsetTable & val )  [friend]
```

The documentation for this class was generated from the following file:

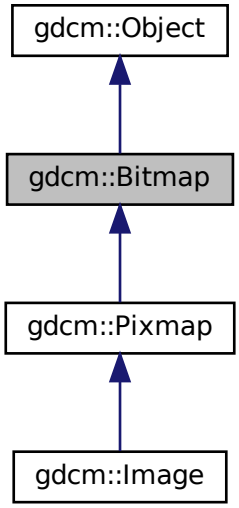
- gdcmBasicOffsetTable.h

10.35 gdcm::Bitmap Class Reference

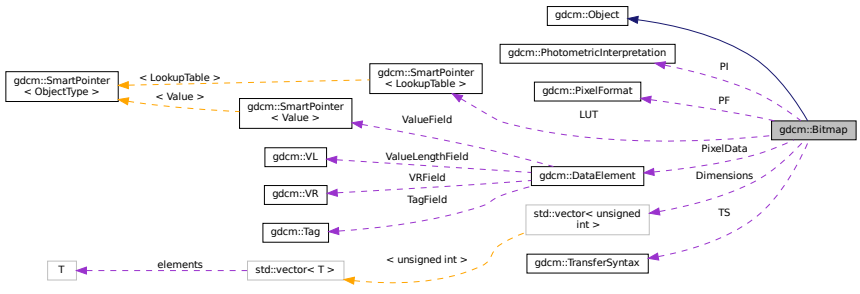
Bitmap class.

`#include <gdcmBitmap.h>`

Inheritance diagram for gdcm::Bitmap:



Collaboration diagram for gdcm::Bitmap:



Public Member Functions

- Bitmap ()

- ~Bitmap () override
- virtual bool AreOverlaysInPixelData () const
- void Clear ()
- bool GetBuffer (char *buffer) const

  Access the raw data.
- unsigned long GetBufferLength () const
- unsigned int GetColumns () const
- DataElement & GetDataElement ()
- const DataElement & GetDataElement () const
- unsigned int GetDimension (unsigned int idx) const
- const unsigned int * GetDimensions () const

  Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...
- LookupTable & GetLUT ()
- const LookupTable & GetLUT () const
- bool GetNeedByteSwap () const

  INTERNAL do not use.
- unsigned int GetNumberOfDimensions () const

  Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.
- const PhotometricInterpretation & GetPhotometricInterpretation () const

  return the photometric interpretation
- PixelFormat & GetPixelFormat ()
- const PixelFormat & GetPixelFormat () const

  Get/Set PixelFormat.
- unsigned int GetPlanarConfiguration () const

  return the planar configuration
- unsigned int GetRows () const
- const TransferSyntax & GetTransferSyntax () const
- bool IsEmpty () const
- bool IsLossy () const

  Return whether or not the image was compressed using a lossy compressor or not.
- bool IsTransferSyntaxCompatible (TransferSyntax const &ts) const
- void Print (std::ostream &) const override
- void SetColumns (unsigned int col)
- void SetDataElement (DataElement const &de)
- void SetDimension (unsigned int idx, unsigned int dim)
- void SetDimensions (const unsigned int dims[3])
- void SetLossyFlag (bool f)

  Specifically set that the image was compressed using a lossy compression mechanism.
- void SetLUT (LookupTable const &lut)

  Set/Get LUT.
- void SetNeedByteSwap (bool b)
- void SetNumberOfDimensions (unsigned int dim)
- void SetPhotometricInterpretation (PhotometricInterpretation const &pi)
- void SetPixelFormat (PixelFormat const &pf)
- void SetPlanarConfiguration (unsigned int pc)
- void SetRows (unsigned int rows)
- void SetTransferSyntax (TransferSyntax const &ts)

  Transfer syntax.
- virtual bool UnusedBitsPresentInPixelData () const

Protected Types

- typedef SmartPointer< LookupTable > LUTPtr

Protected Member Functions

- bool ComputeLossyFlag ()
- bool GetBuffer2 (std::ostream &os) const
- bool TryJPEG2000Codec (char *buffer, bool &lossyflag) const
- bool TryJPEG2000Codec2 (std::ostream &os) const
- bool TryJPEGCodec (char *buffer, bool &lossyflag) const
- bool TryJPEGCodec2 (std::ostream &os) const
- bool TryJPEGLSCodec (char *buffer, bool &lossyflag) const
- bool TryKAKADUCodec (char *buffer, bool &lossyflag) const
- bool TryPVRGCodec (char *buffer, bool &lossyflag) const
- bool TryRAWCodec (char *buffer, bool &lossyflag) const
- bool TryRLECodec (char *buffer, bool &lossyflag) const

Protected Attributes

- std::vector< unsigned int > Dimensions
- bool LossyFlag
- LUTPtr LUT
- bool NeedByteSwap
- unsigned int NumberOfDimensions
- PixelFormat PF
- PhotometricInterpretation PI
- DataElement PixelData
- unsigned int PlanarConfiguration
- TransferSyntax TS

Friends

- class ImageChangeTransferSyntax
- class PixmapReader

10.35.1 Detailed Description

Bitmap class.

A bitmap based image. Used as parent for both IconImage and the main Pixel Data Image It does not contains any World Space information (IPP, IOP)

Examples

ExtractIconFromFile.cxx.

10.35.2 Member Typedef Documentation

10.35.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcm::Bitmap::LUTPtr  [protected]
```

10.35.3 Constructor & Destructor Documentation

10.35.3.1 Bitmap()

```
gdcm::Bitmap::Bitmap ( )
```

10.35.3.2 ~Bitmap()

```
gdcm::Bitmap::~Bitmap ( )  [override]
```

10.35.4 Member Function Documentation

10.35.4.1 AreOverlaysInPixelData()

```
virtual bool gdcm::Bitmap::AreOverlaysInPixelData ( ) const  [inline], [virtual]
```

Reimplemented in gdcm::Pixmap.

10.35.4.2 Clear()

```
void gdcm::Bitmap::Clear ( )
```

10.35.4.3 ComputeLossyFlag()

```
bool gdcm::Bitmap::ComputeLossyFlag ( )  [protected]
```

10.35.4.4 GetBuffer()

```
bool gdcm::Bitmap::GetBuffer (
            char * buffer ) const
```

Access the raw data.

Examples

ConvertToQImage.cxx, ReadMultiTimesException.cxx, and threadgdcm.cxx.

10.35.4.5 GetBuffer2()

```
bool gdcm::Bitmap::GetBuffer2 (
            std::ostream & os ) const  [protected]
```

10.35.4.6 GetBufferLength()

```
unsigned long gdcm::Bitmap::GetBufferLength ( ) const
```

Return the length of the image after decompression WARNING for palette color: It will NOT take into account the Palette Color thus you need to multiply this length by 3 if computing the size of equivalent RGB image

Examples

ConvertToQImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, PatchFile.cxx, ReadMultiTimesException.cxx, and threadgdcm.cxx.

10.35.4.7 GetColumns()

```
unsigned int gdcm::Bitmap::GetColumns ( ) const  [inline]
```

10.35.4.8 GetDataElement() [1/2]

```
DataElement& gdcm::Bitmap::GetDataElement ( )  [inline]
```

10.35.4.9 GetDataElement() [2/2]

```
const DataElement& gdcm::Bitmap::GetDataElement ( ) const  [inline]
```

Examples

ExtractIconFromFile.cxx.

10.35.4.10 GetDimension()

```
unsigned int gdcm::Bitmap::GetDimension (
            unsigned int idx ) const
```

10.35.4.11 GetDimensions()

```
const unsigned int* gdcm::Bitmap::GetDimensions ( ) const
```

Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...

Examples

ConvertToQImage.cxx, ExtractIconFromFile.cxx, FixJAIBugJPEGLS.cxx, HelloVizWorld.cxx, and threadgdcm.cxx.

10.35.4.12 GetLUT() [1/2]

```
LookupTable& gdcm::Bitmap::GetLUT ( )  [inline]
```

10.35.4.13 GetLUT() [2/2]

```
const LookupTable& gdcm::Bitmap::GetLUT ( ) const  [inline]
```

Examples

ExtractIconFromFile.cxx, and PrintLUT.cxx.

10.35.4.14 GetNeedByteSwap()

```
bool gdcm::Bitmap::GetNeedByteSwap ( ) const  [inline]
```

INTERNAL do not use.

10.35.4.15 GetNumberOfDimensions()

```
unsigned int gdcm::Bitmap::GetNumberOfDimensions ( ) const
```

Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.

Examples

HelloVizWorld.cxx, and threadgdcm.cxx.

10.35.4.16 GetPhotometricInterpretation()

```
const PhotometricInterpretation& gdcm::Bitmap::GetPhotometricInterpretation ( ) const
```

return the photometric interpretation

Examples

ConvertToQImage.cxx, ExtractIconFromFile.cxx, and HelloVizWorld.cxx.

10.35.4.17 GetPixelFormat() [1/2]

```
PixelFormat& gdcm::Bitmap::GetPixelFormat ( )  [inline]
```

10.35.4.18 GetPixelFormat() [2/2]

```
const PixelFormat& gdcm::Bitmap::GetPixelFormat ( ) const  [inline]
```

Get/Set PixelFormat.

Examples

ConvertToQImage.cxx, ExtractIconFromFile.cxx, FixJAIBugJPEGLS.cxx, GenFakeImage.cxx, GetJPEGSamplePrecision.cxx, TemplateEmptyImage.cxx, and threadgdcm.cxx.

10.35.4.19 GetPlanarConfiguration()

```
unsigned int gdcm::Bitmap::GetPlanarConfiguration ( ) const
```

return the planar configuration

10.35.4.20 GetRows()

```
unsigned int gdcm::Bitmap::GetRows ( ) const  [inline]
```

10.35.4.21 GetTransferSyntax()

```
const TransferSyntax& gdcm::Bitmap::GetTransferSyntax ( ) const  [inline]
```

Examples

ExtractIconFromFile.cxx.

10.35.4.22 IsEmpty()

```
bool gdcm::Bitmap::IsEmpty ( ) const  [inline]
```

10.35.4.23 IsLossy()

```
bool gdcm::Bitmap::IsLossy ( ) const
```

Return whether or not the image was compressed using a lossy compressor or not.

10.35.4.24 IsTransferSyntaxCompatible()

```
bool gdcm::Bitmap::IsTransferSyntaxCompatible (
            TransferSyntax const & ts ) const
```

10.35.4.25 Print()

```
void gdcm::Bitmap::Print (
            std::ostream &  ) const  [override], [virtual]
```

Reimplemented from gdcm::Object.

Reimplemented in gdcm::Image, and gdcm::Pixmap.

Examples

ExtractIconFromFile.cxx.

10.35.4.26 SetColumns()

```
void gdcm::Bitmap::SetColumns (
            unsigned int col )  [inline]
```

10.35.4.27 SetDataElement()

```
void gdcm::Bitmap::SetDataElement (
            DataElement const & de )  [inline]
```

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.35.4.28 SetDimension()

```
void gdcm::Bitmap::SetDimension (
            unsigned int idx,
            unsigned int dim )
```

Examples

GenFakeImage.cxx, GetSubSequenceData.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.35.4.29 SetDimensions()

```
void gdcm::Bitmap::SetDimensions (
            const unsigned int dims[3] )
```

Examples

CreateARGBImage.cxx, and CreateCMYKImage.cxx.

10.35.4.30 SetLossyFlag()

```
void gdcm::Bitmap::SetLossyFlag (
            bool f )  [inline]
```

Specifically set that the image was compressed using a lossy compression mechanism.

10.35.4.31 SetLUT()

```
void gdcm::Bitmap::SetLUT (
            LookupTable const & lut )  [inline]
```

Set/Get LUT.

10.35.4.32 SetNeedByteSwap()

```
void gdcm::Bitmap::SetNeedByteSwap (
            bool b )  [inline]
```

10.35.4.33 SetNumberOfDimensions()

```
void gdcm::Bitmap::SetNumberOfDimensions (
            unsigned int dim )
```

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, FileChangeTS.cs, FileChangeTSLossy.cs, GenFakeImage.cxx, GetSubSequenceData.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.35.4.34 SetPhotometricInterpretation()

```
void gdcm::Bitmap::SetPhotometricInterpretation (
            PhotometricInterpretation const & pi )
```

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.35.4.35 SetPixelFormat()

```
void gdcm::Bitmap::SetPixelFormat (
            PixelFormat const & pf )  [inline]
```

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, csa2img.cxx, and iU22tomultisc.cxx.

References gdcm::PixelFormat::Validate().

10.35.4.36 SetPlanarConfiguration()

```
void gdcm::Bitmap::SetPlanarConfiguration (
            unsigned int pc )
```

Warning

you need to call SetPixelFormat first (before SetPlanarConfiguration) for consistency checking

10.35.4.37 SetRows()

```
void gdcm::Bitmap::SetRows (
            unsigned int rows )  [inline]
```

10.35.4.38 SetTransferSyntax()

```
void gdcm::Bitmap::SetTransferSyntax (
            TransferSyntax const & ts )  [inline]
```

Transfer syntax.

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, and MergeTwoFiles.cxx.

10.35.4.39 TryJPEG2000Codec()

```
bool gdcm::Bitmap::TryJPEG2000Codec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.40 TryJPEG2000Codec2()

```
bool gdcm::Bitmap::TryJPEG2000Codec2 (
            std::ostream & os ) const  [protected]
```

10.35.4.41 TryJPEGCodec()

```
bool gdcm::Bitmap::TryJPEGCodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.42 TryJPEGCodec2()

```
bool gdcm::Bitmap::TryJPEGCodec2 (
            std::ostream & os ) const  [protected]
```

10.35.4.43 TryJPEGLSCodec()

```
bool gdcm::Bitmap::TryJPEGLSCodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.44 TryKAKADUCodec()

```
bool gdcm::Bitmap::TryKAKADUCodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.45 TryPVRGCodec()

```
bool gdcm::Bitmap::TryPVRGCodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.46 TryRAWCodec()

```
bool gdcm::Bitmap::TryRAWCodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.47 TryRLECodec()

```
bool gdcm::Bitmap::TryRLECodec (
            char * buffer,
            bool & lossyflag ) const  [protected]
```

10.35.4.48 UnusedBitsPresentInPixelData()

```
virtual bool gdcm::Bitmap::UnusedBitsPresentInPixelData ( ) const  [inline], [virtual]
```

Reimplemented in gdcm::Pixmap.

10.35.5 Friends And Related Function Documentation

10.35.5.1 ImageChangeTransferSyntax

```
friend class ImageChangeTransferSyntax  [friend]
```

10.35.5.2 PixmapReader

```
friend class PixmapReader  [friend]
```

10.35.6 Member Data Documentation

10.35.6.1 Dimensions

```
std::vector<unsigned int> gdcm::Bitmap::Dimensions  [protected]
```

10.35.6.2 LossyFlag

```
bool gdcm::Bitmap::LossyFlag  [protected]
```

10.35.6.3 LUT

```
LUTPtr gdcm::Bitmap::LUT  [protected]
```

10.35.6.4 NeedByteSwap

```
bool gdcm::Bitmap::NeedByteSwap  [protected]
```

10.35.6.5 NumberOfDimensions

```
unsigned int gdcm::Bitmap::NumberOfDimensions  [protected]
```

10.35.6.6 PF

```
PixelFormat gdcm::Bitmap::PF  [protected]
```

10.35.6.7 PI

```
PhotometricInterpretation gdcm::Bitmap::PI  [protected]
```

10.35.6.8 PixelData

```
DataElement gdcm::Bitmap::PixelData  [protected]
```

10.35.6.9 PlanarConfiguration

```
unsigned int gdcm::Bitmap::PlanarConfiguration  [protected]
```

10.35.6.10 TS

```
TransferSyntax gdcm::Bitmap::TS  [protected]
```

The documentation for this class was generated from the following file:

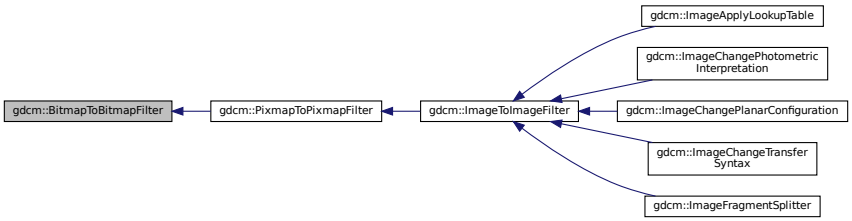
- gdcmBitmap.h

10.36 gdcm::BitmapToBitmapFilter Class Reference

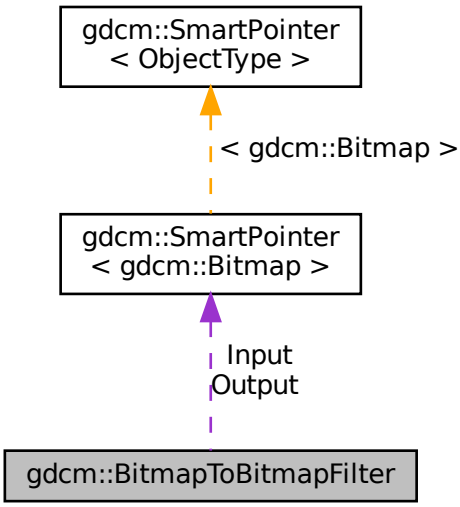
BitmapToBitmapFilter class.

```
#include <gdcmBitmapToBitmapFilter.h>
```

Inheritance diagram for gdcm::BitmapToBitmapFilter:



Collaboration diagram for gdcm::BitmapToBitmapFilter:



Public Member Functions

- BitmapToBitmapFilter ()
- ~BitmapToBitmapFilter ()=default
- const Bitmap & GetOutput () const

  Get Output image.
- const Bitmap & GetOutputAsBitmap () const
- void SetInput (const Bitmap &image)

  Set input image.

Protected Attributes

- SmartPointer< Bitmap > Input
- SmartPointer< Bitmap > Output

10.36.1 Detailed Description

BitmapToBitmapFilter class.

Super class for all filter taking an image and producing an output image

10.36.2 Constructor & Destructor Documentation

10.36.2.1 BitmapToBitmapFilter()

```
gdcm::BitmapToBitmapFilter::BitmapToBitmapFilter ( )
```

10.36.2.2 ~BitmapToBitmapFilter()

```
gdcm::BitmapToBitmapFilter::~BitmapToBitmapFilter ( )  [default]
```

10.36.3 Member Function Documentation

10.36.3.1 GetOutput()

```
const Bitmap& gdcm::BitmapToBitmapFilter::GetOutput ( ) const  [inline]
```

Get Output image.

10.36.3.2 GetOutputAsBitmap()

```
const Bitmap& gdcm::BitmapToBitmapFilter::GetOutputAsBitmap ( ) const
```

10.36.3.3 SetInput()

```
void gdcm::BitmapToBitmapFilter::SetInput (
            const Bitmap & image )
```

Set input image.

Examples

CompressImage.cxx.

10.36.4 Member Data Documentation

10.36.4.1 Input

```
SmartPointer<Bitmap> gdcm::BitmapToBitmapFilter::Input  [protected]
```

10.36.4.2 Output

```
SmartPointer<Bitmap> gdcm::BitmapToBitmapFilter::Output  [protected]
```

The documentation for this class was generated from the following file:

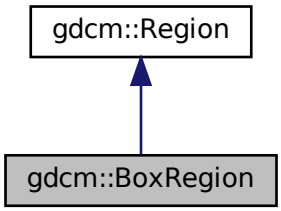
- gdcmBitmapToBitmapFilter.h

10.37 gdcm::BoxRegion Class Reference

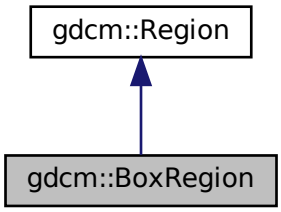
Class for manipulation box region.

```
#include <gdcmBoxRegion.h>
```

Inheritance diagram for gdcm::BoxRegion:



Collaboration diagram for gdcm::BoxRegion:



Public Member Functions

- BoxRegion ()
- BoxRegion (const BoxRegion &)

  copy/cstor and al.
- ~BoxRegion () override
- size_t Area () const override

  compute the area
- Region * Clone () const override
- BoxRegion ComputeBoundingBox () override

  Return the Axis-Aligned minimum bounding box for all regions.
- bool Empty () const override

  return whether this domain is empty:
- unsigned int GetXMax () const
- unsigned int GetXMin () const

  Get domain.
- unsigned int GetYMax () const
- unsigned int GetYMin () const
- unsigned int GetZMax () const
- unsigned int GetZMin () const
- bool IsValid () const override

  return whether this is valid domain
- void operator= (const BoxRegion &)
- void Print (std::ostream &os=std::cout) const override

  Print.
- void SetDomain (unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax)

  Set domain.

Static Public Member Functions

- static BoxRegion BoundingBox (BoxRegion const &b1, BoxRegion const &b2)

  Helper class to compute the bounding box of two BoxRegion.

10.37.1 Detailed Description

Class for manipulation box region.

This is a very simple implementation of the Region class. It only support 3D box type region. It assumes the 3D Box does not have a tilt Origin is as (0,0,0)

10.37.2 Constructor & Destructor Documentation

10.37.2.1 BoxRegion() [1/2]

```
gdcm::BoxRegion::BoxRegion ( )
```

10.37.2.2 ~BoxRegion()

```
gdcm::BoxRegion::~BoxRegion ( )  [override]
```

10.37.2.3 BoxRegion() [2/2]

```
gdcm::BoxRegion::BoxRegion (
            const BoxRegion &  )
```

copy/cstor and al.

10.37.3 Member Function Documentation

10.37.3.1 Area()

```
size_t gdcm::BoxRegion::Area ( ) const  [override], [virtual]
```

compute the area

Implements gdcm::Region.

10.37.3.2 BoundingBox()

```
static BoxRegion gdcm::BoxRegion::BoundingBox (
            BoxRegion const & b1,
            BoxRegion const & b2 )  [static]
```

Helper class to compute the bounding box of two BoxRegion.

10.37.3.3 Clone()

```
Region* gdcm::BoxRegion::Clone ( ) const  [override], [virtual]
```

Implements gdcm::Region.

10.37.3.4 ComputeBoundingBox()

```
BoxRegion gdcm::BoxRegion::ComputeBoundingBox ( )  [override], [virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implements gdcm::Region.

10.37.3.5 Empty()

```
bool gdcm::BoxRegion::Empty ( ) const  [override], [virtual]
```

return whether this domain is empty:

Implements gdcm::Region.

10.37.3.6 GetXMax()

```
unsigned int gdcm::BoxRegion::GetXMax ( ) const
```

10.37.3.7 GetXMin()

```
unsigned int gdcm::BoxRegion::GetXMin ( ) const
```

Get domain.

10.37.3.8 GetYMax()

```
unsigned int gdcm::BoxRegion::GetYMax ( ) const
```

10.37.3.9 GetYMin()

```
unsigned int gdcm::BoxRegion::GetYMin ( ) const
```

10.37.3.10 GetZMax()

```
unsigned int gdcm::BoxRegion::GetZMax ( ) const
```

10.37.3.11 GetZMin()

```
unsigned int gdcm::BoxRegion::GetZMin ( ) const
```

10.37.3.12 IsValid()

```
bool gdcm::BoxRegion::IsValid ( ) const  [override], [virtual]
```

return whether this is valid domain

Implements gdcm::Region.

10.37.3.13 operator=()

```
void gdcm::BoxRegion::operator= (
            const BoxRegion &  )
```

10.37.3.14 Print()

```
void gdcm::BoxRegion::Print (
            std::ostream & os = std::cout ) const  [override], [virtual]
```

Print.

Reimplemented from gdcm::Region.

10.37.3.15 SetDomain()

```
void gdcm::BoxRegion::SetDomain (
            unsigned int xmin,
            unsigned int xmax,
            unsigned int ymin,
            unsigned int ymax,
            unsigned int zmin,
            unsigned int zmax )
```

Set domain.

The documentation for this class was generated from the following file:

- gdcmBoxRegion.h

10.38 gdcm::ByteBuffer Class Reference

ByteBuffer.

```
#include <gdcmByteBuffer.h>
```

Public Member Functions

- ByteBuffer ()
- char * Get (int len)
- const char * GetStart () const
- void ShiftEnd (int len)
- void UpdatePosition ()

10.38.1 Detailed Description

ByteBuffer.

Detailed description here

Note

looks like a std::streambuf or std::filebuf class with the get and peek pointer

10.38.2 Constructor & Destructor Documentation

10.38.2.1 ByteBuffer()

```
gdcm::ByteBuffer::ByteBuffer ( )  [inline]
```

10.38.3 Member Function Documentation

10.38.3.1 Get()

```
char* gdcm::ByteBuffer::Get (
            int len )  [inline]
```

10.38.3.2 GetStart()

```
const char* gdcm::ByteBuffer::GetStart ( ) const  [inline]
```

10.38.3.3 ShiftEnd()

```
void gdcm::ByteBuffer::ShiftEnd (
            int len )  [inline]
```

10.38.3.4 UpdatePosition()

```
void gdcm::ByteBuffer::UpdatePosition ( )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmByteBuffer.h

10.39 gdcm::ByteSwap< T > Class Template Reference

ByteSwap.

```
#include <gdcmByteSwap.h>
```

Static Public Member Functions

- static void Swap (T &p)
- static void SwapFromSwapCodeIntoSystem (T &p, SwapCode const &sc)
- static void SwapRange (T *p, unsigned int num)
- static void SwapRangeFromSwapCodeIntoSystem (T *p, SwapCode const &sc, std::streamoff num)
- static bool SystemIsBigEndian ()
- static bool SystemIsLittleEndian ()

10.39.1 Detailed Description

template<class T>
class gdcm::ByteSwap< T >

ByteSwap.

Perform machine dependent byte swapping (Little Endian, Big Endian, Bad Little Endian, Bad Big Endian). TODO: bswap_32 / bswap_64 ...

Examples

TestByteSwap.cxx.

10.39.2 Member Function Documentation

10.39.2.1 Swap()

```
template<class T >
static void gdcm::ByteSwap< T >::Swap (
            T & p )  [static]
```

10.39.2.2 SwapFromSwapCodeIntoSystem()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapFromSwapCodeIntoSystem (
            T & p,
            SwapCode const & sc )  [static]
```

Examples

TestByteSwap.cxx.

10.39.2.3 SwapRange()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapRange (
            T * p,
            unsigned int num )  [static]
```

10.39.2.4 SwapRangeFromSwapCodeIntoSystem()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapRangeFromSwapCodeIntoSystem (
            T * p,
            SwapCode const & sc,
            std::streamoff num )  [static]
```

Examples

TestByteSwap.cxx.

10.39.2.5 SystemIsBigEndian()

```
template<class T >
static bool gdcm::ByteSwap< T >::SystemIsBigEndian ( )  [static]
```

Query the machine Endian-ness.

10.39.2.6 SystemIsLittleEndian()

```
template<class T >
static bool gdcm::ByteSwap< T >::SystemIsLittleEndian ( )  [static]
```

The documentation for this class was generated from the following file:

- gdcmByteSwap.h

10.40 gdcm::ByteSwapFilter Class Reference

ByteSwapFilter.

```
#include <gdcmByteSwapFilter.h>
```

Public Member Functions

- ByteSwapFilter (const ByteSwapFilter &)=delete
- ByteSwapFilter (DataSet &ds)
- ~ByteSwapFilter ()
- bool ByteSwap ()
- ByteSwapFilter & operator= (const ByteSwapFilter &)=delete
- void SetByteSwapTag (bool b)

10.40.1 Detailed Description

ByteSwapFilter.

In place byte-swapping of a dataset FIXME: FL status ??

10.40.2 Constructor & Destructor Documentation

10.40.2.1 ByteSwapFilter() [1/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (
            DataSet & ds )  [inline]
```

10.40.2.2 ~ByteSwapFilter()

```
gdcm::ByteSwapFilter::~ByteSwapFilter ( )
```

10.40.2.3 ByteSwapFilter() [2/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (
            const ByteSwapFilter &  )  [delete]
```

10.40.3 Member Function Documentation

10.40.3.1 ByteSwap()

```
bool gdcm::ByteSwapFilter::ByteSwap ( )
```

Referenced by gdcm::Item::Read().

10.40.3.2 operator=()

```
ByteSwapFilter& gdcm::ByteSwapFilter::operator= (
            const ByteSwapFilter &  )  [delete]
```

10.40.3.3 SetByteSwapTag()

```
void gdcm::ByteSwapFilter::SetByteSwapTag (
            bool b )  [inline]
```

Referenced by gdcm::Item::Read().

The documentation for this class was generated from the following file:

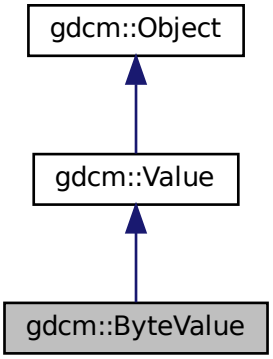
- gdcmByteSwapFilter.h

10.41 gdcm::ByteValue Class Reference

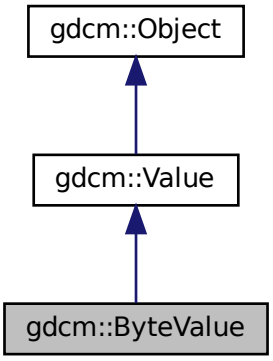
Class to represent binary value (array of bytes)

`#include <gdcmByteValue.h>`

Inheritance diagram for gdcm::ByteValue:



Collaboration diagram for gdcm::ByteValue:



Public Member Functions

- ByteValue (const char *array=nullptr, VL const &vl=0)
- ByteValue (std::vector< char > &v)
- ~ByteValue () override
- void Append (ByteValue const &bv)
- void Clear () override
- VL ComputeLength () const
- void Fill (char c)
- bool GetBuffer (char *buffer, unsigned long length) const
- VL GetLength () const override
- const char * GetPointer () const
- void * GetVoidPointer ()
- const void * GetVoidPointer () const
- bool IsEmpty () const
- bool IsPrintable (VL length) const

  Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) I don't think this function is working since it does not handle UNICODE or character set...
- operator const std::vector< char > & () const
- ByteValue & operator= (const ByteValue &val)
- bool operator== (const ByteValue &val) const
- bool operator== (const Value &val) const override
- void PrintASCII (std::ostream &os, VL maxlength) const
- void PrintASCIIXML (std::ostream &os) const
- void PrintGroupLength (std::ostream &os)
- void PrintHex (std::ostream &os, VL maxlength) const
- void PrintHexXML (std::ostream &os) const
- void PrintPNXML (std::ostream &os) const
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap , typename TType >
  std::istream & Read (std::istream &is, bool readvalues=true)
- void SetLength (VL vl) override
- template<typename TSwap , typename TType >
  std::ostream const & Write (std::ostream &os) const
- template<typename TSwap >
  std::ostream const & Write (std::ostream &os) const
- bool WriteBuffer (std::ostream &os) const

Protected Member Functions

- void Print (std::ostream &os) const override
- void SetLengthOnly (VL vl) override

10.41.1 Detailed Description

Class to represent binary value (array of bytes)

Note

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, MrProtocol.cxx, PatchFile.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.41.2 Constructor & Destructor Documentation

10.41.2.1 ByteValue() [1/2]

```
gdcm::ByteValue::ByteValue (
            const char * array = nullptr,
            VL const & vl = 0 )  [inline]
```

References gdcmDebugMacro.

10.41.2.2 ByteValue() [2/2]

```
gdcm::ByteValue::ByteValue (
            std::vector< char > & v )  [inline]
```

Warning

casting to uint32_t

10.41.2.3 ~ByteValue()

```
gdcm::ByteValue::~ByteValue ( )  [inline], [override]
```

10.41.3 Member Function Documentation

10.41.3.1 Append()

```
void gdcm::ByteValue::Append (
            ByteValue const & bv )
```

10.41.3.2 Clear()

```
void gdcm::ByteValue::Clear ( )  [inline], [override], [virtual]
```

Implements gdcm::Value.

10.41.3.3 ComputeLength()

```
VL gdcm::ByteValue::ComputeLength ( ) const  [inline]
```

Referenced by gdcm::Fragment::Write().

10.41.3.4 Fill()

```
void gdcm::ByteValue::Fill (
            char c )  [inline]
```

Examples

DuplicatePCDE.cxx.

10.41.3.5 GetBuffer()

```
bool gdcm::ByteValue::GetBuffer (
            char * buffer,
            unsigned long length ) const
```

Examples

FixJAIBugJPEGLS.cxx.

10.41.3.6 GetLength()

```
VL gdcm::ByteValue::GetLength ( ) const  [inline], [override], [virtual]
```

Implements gdcm::Value.

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, MrProtocol.cxx, PatchFile.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::SequenceOfFragments::ReadValue(), gdcm::Element< TVR, TVM >::Set(), gdcm::Element< TVR, VM::VM1_n >::Set(), gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap(), gdcm::Element< TVR, TVM >::SetNoSwap(), gdcm::Element< TVR, VM::VM1_n >::SetNoSwap(), and gdcm::Fragment::Write().

10.41.3.7 GetPointer()

```
const char* gdcm::ByteValue::GetPointer ( ) const  [inline]
```

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, MrProtocol.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::SequenceOfFragments::ReadValue(), gdcm::Element< TVR, TVM >::Set(), gdcm::Element< TVR, VM::VM1_n >::Set(), gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetByteValue(), gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap(), gdcm::Element< TVR, TVM >::SetNoSwap(), and gdcm::Element< TVR, VM::VM1_n >::SetNoSwap().

10.41.3.8 GetVoidPointer() [1/2]

```
void* gdcm::ByteValue::GetVoidPointer ( )  [inline]
```

10.41.3.9 GetVoidPointer() [2/2]

```
const void* gdcm::ByteValue::GetVoidPointer ( ) const  [inline]
```

Examples

FixBrokenJ2K.cxx.

Referenced by gdcm::Element< TVR, VM::VM1_n >::Set().

10.41.3.10 IsEmpty()

```
bool gdcm::ByteValue::IsEmpty ( ) const  [inline]
```

10.41.3.11 IsPrintable()

```
bool gdcm::ByteValue::IsPrintable (
            VL length ) const  [inline]
```

Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) I don't think this function is working since it does not handle UNICODE or character set...

10.41.3.12 operator const std::vector< char > &()

```
gdcm::ByteValue::operator const std::vector< char > & ( ) const  [inline]
```

10.41.3.13 operator=()

```
ByteValue& gdcm::ByteValue::operator= (
            const ByteValue & val )  [inline]
```

10.41.3.14 operator==() [1/2]

```
bool gdcm::ByteValue::operator== (
            const ByteValue & val ) const  [inline]
```

10.41.3.15 operator==() [2/2]

```
bool gdcm::ByteValue::operator== (
            const Value & val ) const  [inline], [override], [virtual]
```

Implements gdcm::Value.

10.41.3.16 Print()

```
void gdcm::ByteValue::Print (
            std::ostream & os ) const  [inline], [override], [protected], [virtual]
```

Reimplemented from gdcm::Object.

10.41.3.17 PrintASCII()

```
void gdcm::ByteValue::PrintASCII (
            std::ostream & os,
            VL maxlength ) const
```

10.41.3.18 PrintASCIIXML()

```
void gdcm::ByteValue::PrintASCIIXML (
            std::ostream & os ) const
```

10.41.3.19 PrintGroupLength()

```
void gdcm::ByteValue::PrintGroupLength (
            std::ostream & os )  [inline]
```

10.41.3.20 PrintHex()

```
void gdcm::ByteValue::PrintHex (
            std::ostream & os,
            VL maxlength ) const
```

10.41.3.21 PrintHexXML()

```
void gdcm::ByteValue::PrintHexXML (
            std::ostream & os ) const
```

10.41.3.22 PrintPNXML()

```
void gdcm::ByteValue::PrintPNXML (
            std::ostream & os ) const
```

To Print Values in Native DICOM format

10.41.3.23 Read() [1/2]

```
template<typename TSwap >
std::istream& gdcm::ByteValue::Read (
            std::istream & is )  [inline]
```

10.41.3.24 Read() [2/2]

```
template<typename TSwap , typename TType >
std::istream& gdcm::ByteValue::Read (
            std::istream & is,
            bool readvalues = true )  [inline]
```

10.41.3.25 SetLength()

```
void gdcm::ByteValue::SetLength (
            VL vl )  [override], [virtual]
```

Implements gdcm::Value.

Examples

ReadExplicitLengthSQIVR.cxx.

10.41.3.26 SetLengthOnly()

```
void gdcm::ByteValue::SetLengthOnly (
            VL vl )  [inline], [override], [protected], [virtual]
```

Reimplemented from gdcm::Value.

10.41.3.27 Write() [1/2]

```
template<typename TSwap , typename TType >
std::ostream const& gdcm::ByteValue::Write (
            std::ostream & os ) const  [inline]
```

Referenced by gdcm::Fragment::Write().

10.41.3.28 Write() [2/2]

```
template<typename TSwap >
std::ostream const& gdcm::ByteValue::Write (
            std::ostream & os ) const  [inline]
```

10.41.3.29 WriteBuffer()

```
bool gdcm::ByteValue::WriteBuffer (
            std::ostream & os ) const  [inline]
```

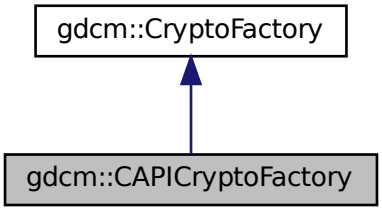
The documentation for this class was generated from the following file:

- gdcmByteValue.h

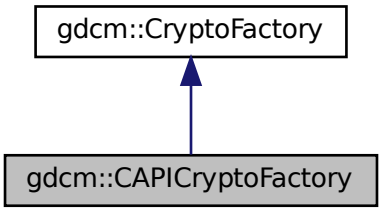
10.42 gdcm::CAPICryptoFactory Class Reference

`#include <gdcmCAPICryptoFactory.h>`

Inheritance diagram for gdcm::CAPICryptoFactory:



Collaboration diagram for gdcm::CAPICryptoFactory:



Public Member Functions

- CAPICryptoFactory (CryptoLib id)
- CryptographicMessageSyntax * CreateCMSProvider ()

Additional Inherited Members

10.42.1 Constructor & Destructor Documentation

10.42.1.1 CAPICryptoFactory()

```
gdcm::CAPICryptoFactory::CAPICryptoFactory (
            CryptoLib id )
```

10.42.2 Member Function Documentation

10.42.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax* gdcm::CAPICryptoFactory::CreateCMSProvider ( )  [virtual]
```

Implements gdcm::CryptoFactory.

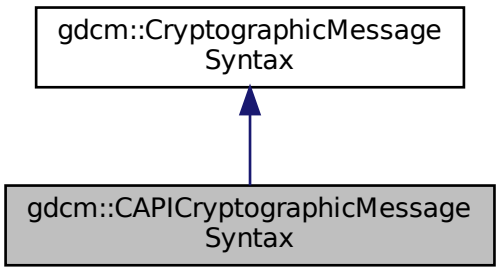
The documentation for this class was generated from the following file:

- gdcmCAPICryptoFactory.h

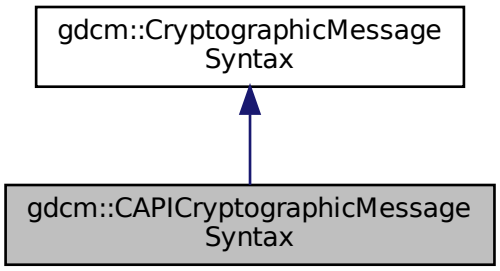
10.43 gdcm::CAPICryptographicMessageSyntax Class Reference

```
#include <gdcmCAPICryptographicMessageSyntax.h>
```

Inheritance diagram for gdcm::CAPICryptographicMessageSyntax:



Collaboration diagram for gdcm::CAPICryptographicMessageSyntax:



Public Member Functions

- CAPICryptographicMessageSyntax ()
- ~CAPICryptographicMessageSyntax ()
- bool Decrypt (char *output, size_t &outlen, const char *array, size_t len) const

  decrypt content from a CMS envelopedData structure
- bool Encrypt (char *output, size_t &outlen, const char *array, size_t len) const

  create a CMS envelopedData structure
- CipherTypes GetCipherType () const
- bool GetInitialized () const
- bool ParseCertificateFile (const char *filename)
- bool ParseKeyFile (const char *filename)
- void SetCipherType (CipherTypes type)
- bool SetPassword (const char *pass, size_t passLen)

Additional Inherited Members

10.43.1 Constructor & Destructor Documentation

10.43.1.1 CAPICryptographicMessageSyntax()

```
gdcm::CAPICryptographicMessageSyntax::CAPICryptographicMessageSyntax ( )
```

10.43.1.2 ~CAPICryptographicMessageSyntax()

```
gdcm::CAPICryptographicMessageSyntax::~CAPICryptographicMessageSyntax ( )
```

10.43.2 Member Function Documentation

10.43.2.1 Decrypt()

```
bool gdcm::CAPICryptographicMessageSyntax::Decrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

decrypt content from a CMS envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.43.2.2 Encrypt()

```
bool gdcm::CAPICryptographicMessageSyntax::Encrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

create a CMS envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.43.2.3 GetCipherType()

```
CipherTypes gdcm::CAPICryptographicMessageSyntax::GetCipherType ( ) const  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.43.2.4 GetInitialized()

```
bool gdcm::CAPICryptographicMessageSyntax::GetInitialized ( ) const  [inline]
```

10.43.2.5 ParseCertificateFile()

```
bool gdcm::CAPICryptographicMessageSyntax::ParseCertificateFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.43.2.6 ParseKeyFile()

```
bool gdcm::CAPICryptographicMessageSyntax::ParseKeyFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.43.2.7 SetCipherType()

```
void gdcm::CAPICryptographicMessageSyntax::SetCipherType (
            CipherTypes type )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.43.2.8 SetPassword()

```
bool gdcm::CAPICryptographicMessageSyntax::SetPassword (
            const char * pass,
            size_t passLen )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

The documentation for this class was generated from the following file:

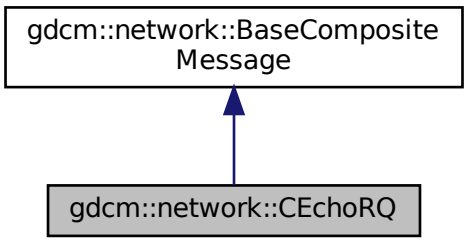
- gdcmCAPICryptographicMessageSyntax.h

10.44 gdcm::network::CEchoRQ Class Reference

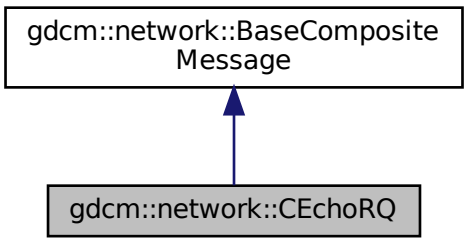
CEchoRQ.

`#include <gdcmCEchoMessages.h>`

Inheritance diagram for gdcm::network::CEchoRQ:



Collaboration diagram for gdcm::network::CEchoRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseRootQuery *inRootQuery) override

Public Attributes

- UIComp AffectedSOPClassUID
- uint16_t MessageID

10.44.1 Detailed Description

CEchoRQ.

this file defines the messages for the cecho action

10.44.2 Member Function Documentation

10.44.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::CEchoRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [override], [virtual]
```

Implements gdcm::network::BaseCompositeMessage.

10.44.3 Member Data Documentation

10.44.3.1 AffectedSOPClassUID

```
UIComp gdcm::network::CEchoRQ::AffectedSOPClassUID
```

10.44.3.2 MessageID

```
uint16_t gdcm::network::CEchoRQ::MessageID
```

The documentation for this class was generated from the following files:

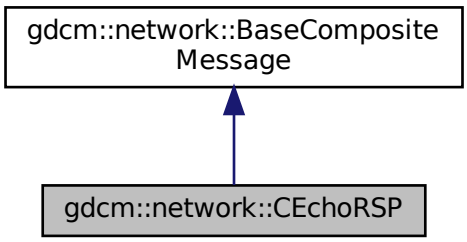
- gdcmCEchoMessages.h
- gdcmDIMSE.h

10.45 gdcm::network::CEchoRSP Class Reference

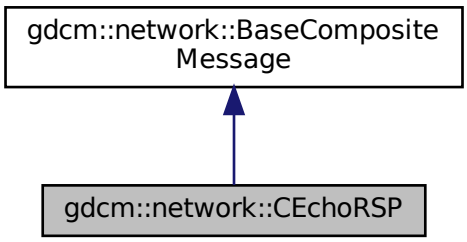
CEchoRSP this file defines the messages for the cecho action.

`#include <gdcmCEchoMessages.h>`

Inheritance diagram for gdcm::network::CEchoRSP:



Collaboration diagram for gdcm::network::CEchoRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.45.1 Detailed Description

CEchoRSP this file defines the messages for the cecho action.

10.45.2 Member Function Documentation

10.45.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::CEchoRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- gdcmCEchoMessages.h

10.46 gdcm::network::CFind Class Reference

```
#include <gdcmDIMSE.h>
```

10.46.1 Detailed Description

PS 3.4 - 2009 Table B.2-1 C-STORE STATUS

The documentation for this class was generated from the following file:

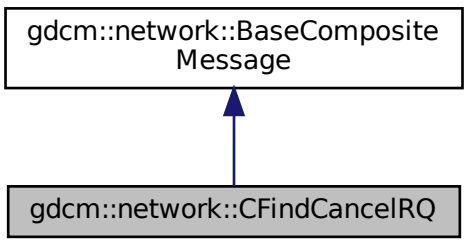
- gdcmDIMSE.h

10.47 gdcm::network::CFindCancelRQ Class Reference

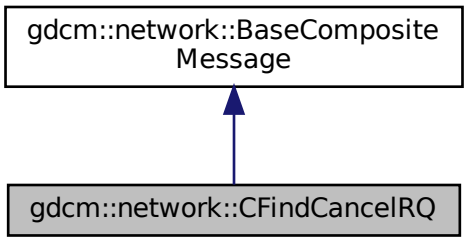
CFindCancelRQ this file defines the messages for the cfind action.

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for gdcm::network::CFindCancelRQ:



Collaboration diagram for gdcm::network::CFindCancelRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.47.1 Detailed Description

CFindCancelRQ this file defines the messages for the cfind action.

10.47.2 Member Function Documentation

10.47.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::CFindCancelRQ::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

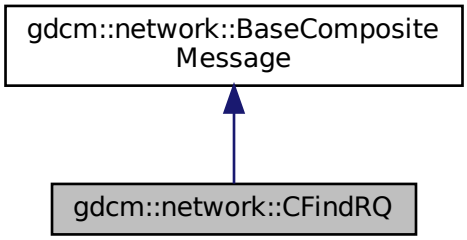
- gdcmCFindMessages.h

10.48 gdcm::network::CFindRQ Class Reference

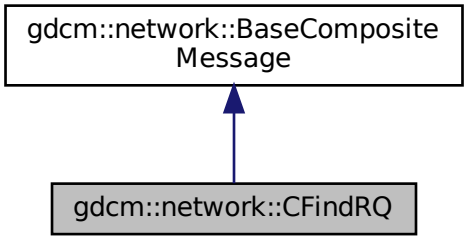
CFindRQ.

`#include <gdcmCFindMessages.h>`

Inheritance diagram for gdcm::network::CFindRQ:



Collaboration diagram for gdcm::network::CFindRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseRootQuery *inRootQuery) override

10.48.1 Detailed Description

CFindRQ.

this file defines the messages for the cfind action

10.48.2 Member Function Documentation

10.48.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::CFindRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [override], [virtual]
```

Implements gdcm::network::BaseCompositeMessage.

The documentation for this class was generated from the following file:

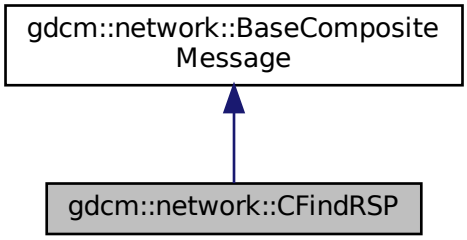
- gdcmCFindMessages.h

10.49 gdcm::network::CFindRSP Class Reference

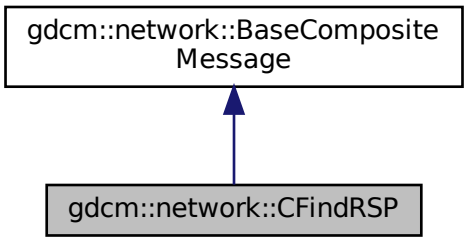
CFindRSP this file defines the messages for the cfind action.

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for gdcm::network::CFindRSP:



Collaboration diagram for gdcm::network::CFindRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.49.1 Detailed Description

CFindRSP this file defines the messages for the cfind action.

10.49.2 Member Function Documentation

10.49.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::CFindRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

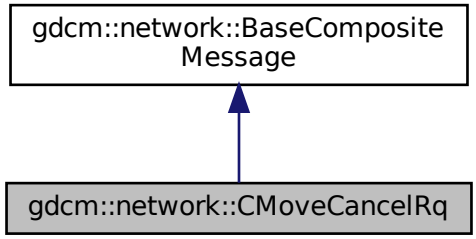
The documentation for this class was generated from the following file:

- gdcmCFindMessages.h

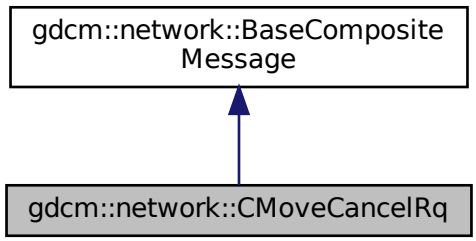
10.50 gdcm::network::CMoveCancelRq Class Reference

`#include <gdcmCMoveMessages.h>`

Inheritance diagram for gdcm::network::CMoveCancelRq:



Collaboration diagram for gdcm::network::CMoveCancelRq:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.50.1 Member Function Documentation

10.50.1.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::CMoveCancelRq::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

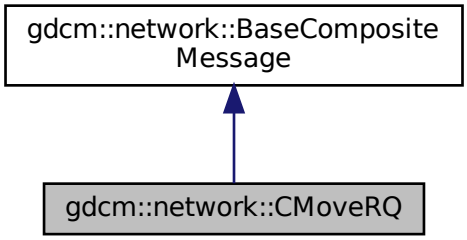
- gdcmCMoveMessages.h

10.51 gdcm::network::CMoveRQ Class Reference

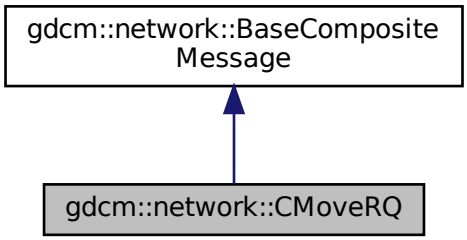
CMoveRQ.

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for gdcm::network::CMoveRQ:



Collaboration diagram for gdcm::network::CMoveRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseRootQuery *inRootQuery) override

10.51.1 Detailed Description

CMoveRQ.

this file defines the messages for the cmove action

10.51.2 Member Function Documentation

10.51.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::CMoveRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [override], [virtual]
```

Implements gdcm::network::BaseCompositeMessage.

The documentation for this class was generated from the following file:

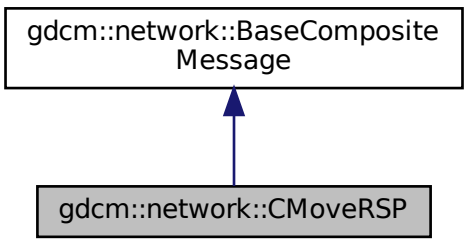
- gdcmCMoveMessages.h

10.52 gdcm::network::CMoveRSP Class Reference

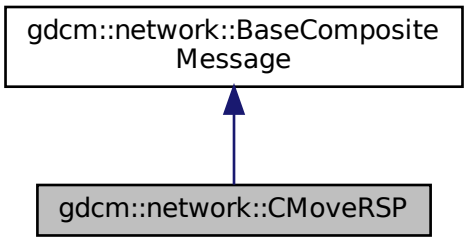
CMoveRSP this file defines the messages for the cmove action.

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for gdcm::network::CMoveRSP:



Collaboration diagram for gdcm::network::CMoveRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.52.1 Detailed Description

CMoveRSP this file defines the messages for the cmove action.

10.52.2 Member Function Documentation

10.52.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::CMoveRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

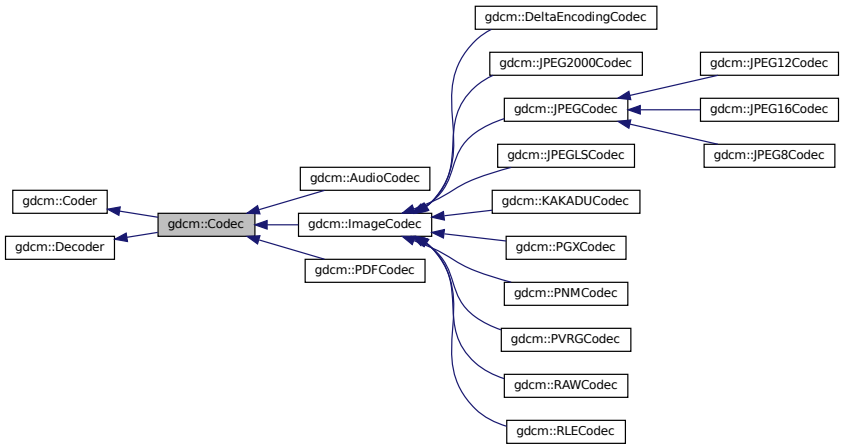
- gdcmCMoveMessages.h

10.53 gdcm::Codec Class Reference

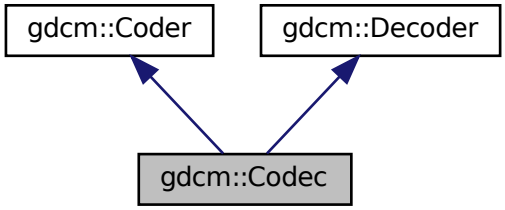
Codec class.

`#include <gdcmCodec.h>`

Inheritance diagram for gdcm::Codec:



Collaboration diagram for gdcm::Codec:



Additional Inherited Members

10.53.1 Detailed Description

Codec class.

The documentation for this class was generated from the following file:

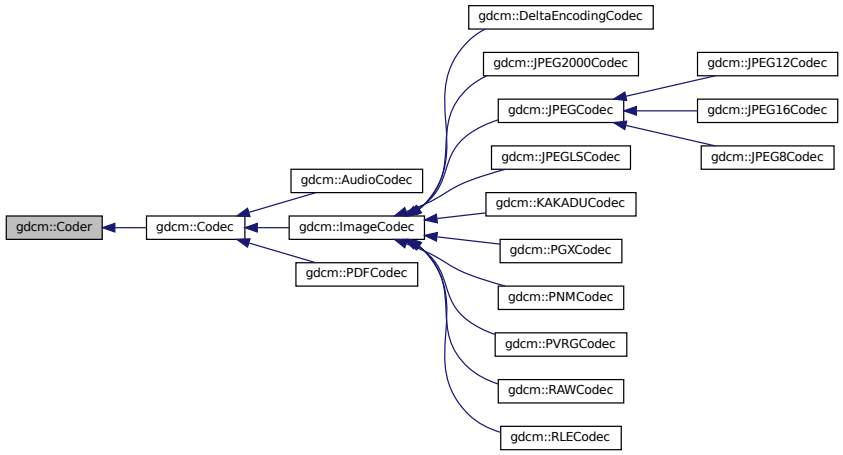
- gdcmCodec.h

10.54 gdcm::Coder Class Reference

Coder.

`#include <gdcmCoder.h>`

Inheritance diagram for gdcm::Coder:



Public Member Functions

- virtual ~Coder ()=default
- virtual bool CanCode (TransferSyntax const &) const =0

  Return whether this coder support this transfer syntax (can code it)
- virtual bool Code (DataElement const &in_, DataElement &out_)

  Code.

Protected Member Functions

- virtual bool InternalCode (const char *bv, unsigned long len, std::ostream &os)

10.54.1 Detailed Description

Coder.

10.54.2 Constructor & Destructor Documentation

10.54.2.1 ~Coder()

```
virtual gdcm::Coder::~Coder ( )  [virtual], [default]
```

10.54.3 Member Function Documentation

10.54.3.1 CanCode()

```
virtual bool gdcm::Coder::CanCode (
            TransferSyntax const &  ) const  [pure virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, gdcm::JPEG2000Codec, gdcm::PDFCodec, gdcm::ImageCodec, and gdcm::AudioCodec.

10.54.3.2 Code()

```
virtual bool gdcm::Coder::Code (
            DataElement const & in_,
            DataElement & out_ )  [inline], [virtual]
```

Code.

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.54.3.3 InternalCode()

```
virtual bool gdcm::Coder::InternalCode (
            const char * bv,
            unsigned long len,
            std::ostream & os )  [inline], [protected], [virtual]
```

Reimplemented in gdcm::JPEG8Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

The documentation for this class was generated from the following file:

- gdcmCoder.h

10.55 gdcm::CodeString Class Reference

CodeString.

`#include <gdcmCodeString.h>`

Public Types

- typedef InternalClass::const_iterator const_iterator
- typedef InternalClass::const_reference const_reference
- typedef InternalClass::const_reverse_iterator const_reverse_iterator
- typedef InternalClass::difference_type difference_type
- typedef InternalClass::iterator iterator
- typedef InternalClass::pointer pointer
- typedef InternalClass::reference reference
- typedef InternalClass::reverse_iterator reverse_iterator
- typedef InternalClass::size_type size_type
- typedef InternalClass::value_type value_type

Public Member Functions

- CodeString ()

  CodeString constructors.
- CodeString (const InternalClass &s, size_type pos=0, size_type n=InternalClass::npos)
- CodeString (const value_type *s)
- CodeString (const value_type *s, size_type n)
- std::string GetAsString () const

  Return the full code string as std::string.
- bool IsValid () const

  Check if CodeString obj is correct..
- size_type Size () const

  Return the size of the string.

Protected Member Functions

- std::string TrimInternal () const

Friends

- bool operator!= (const CodeString &ref, const CodeString &cs)
- std::ostream & operator<< (std::ostream &os, const CodeString &str)
- bool operator== (const CodeString &ref, const CodeString &cs)

10.55.1 Detailed Description

CodeString.

This is an implementation of DICOM VR: CS The cstor will properly Trim so that operator== is correct.

Note

the cstor of CodeString will Trim the string on the fly so as to remove the extra leading and ending spaces. However it will not perform validation on the fly (CodeString obj can contains invalid char such as lower cases). This design was chosen to be a little tolerant to broken DICOM implementation, and thus allow user to compare lower case CS from there input file without the need to first rewrite them to get rid of invalid character (validation is a different operation from searching, querying).

Warning

when writing out DICOM file it is highly recommended to perform the IsValid() call, at least to check that the length of the string match the definition in the standard.

10.55.2 Member Typedef Documentation

10.55.2.1 const_iterator

```
typedef InternalClass::const_iterator gdcm::CodeString::const_iterator
```

10.55.2.2 const_reference

```
typedef InternalClass::const_reference gdcm::CodeString::const_reference
```

10.55.2.3 const_reverse_iterator

```
typedef InternalClass::const_reverse_iterator gdcm::CodeString::const_reverse_iterator
```

10.55.2.4 difference_type

```
typedef InternalClass::difference_type gdcm::CodeString::difference_type
```

10.55.2.5 iterator

```
typedef InternalClass::iterator gdcm::CodeString::iterator
```

10.55.2.6 pointer

```
typedef InternalClass::pointer gdcm::CodeString::pointer
```

10.55.2.7 reference

```
typedef InternalClass::reference gdcm::CodeString::reference
```

10.55.2.8 reverse_iterator

```
typedef InternalClass::reverse_iterator gdcm::CodeString::reverse_iterator
```

10.55.2.9 size_type

```
typedef InternalClass::size_type gdcm::CodeString::size_type
```

10.55.2.10 value_type

```
typedef InternalClass::value_type gdcm::CodeString::value_type
```

10.55.3 Constructor & Destructor Documentation

10.55.3.1 CodeString() [1/4]

```
gdcm::CodeString::CodeString ( )  [inline]
```

CodeString constructors.

10.55.3.2 CodeString() [2/4]

```
gdcm::CodeString::CodeString (
            const value_type * s )  [inline]
```

10.55.3.3 CodeString() [3/4]

```
gdcm::CodeString::CodeString (
            const value_type * s,
            size_type n )  [inline]
```

10.55.3.4 CodeString() [4/4]

```
gdcm::CodeString::CodeString (
            const InternalClass & s,
            size_type pos = 0,
            size_type n = InternalClass::npos )  [inline]
```

10.55.4 Member Function Documentation

10.55.4.1 GetAsString()

```
std::string gdcm::CodeString::GetAsString ( ) const  [inline]
```

Return the full code string as std::string.

10.55.4.2 IsValid()

```
bool gdcm::CodeString::IsValid ( ) const
```

Check if CodeString obj is correct..

10.55.4.3 Size()

```
size_type gdcm::CodeString::Size ( ) const  [inline]
```

Return the size of the string.

10.55.4.4 TrimInternal()

```
std::string gdcm::CodeString::TrimInternal ( ) const  [inline], [protected]
```

10.55.5 Friends And Related Function Documentation

10.55.5.1 operator"!=

```
bool operator!= (
            const CodeString & ref,
            const CodeString & cs )  [friend]
```

10.55.5.2 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const CodeString & str )  [friend]
```

10.55.5.3 operator==

```
bool operator== (
             const CodeString & ref,
             const CodeString & cs )  [friend]
```

The documentation for this class was generated from the following file:

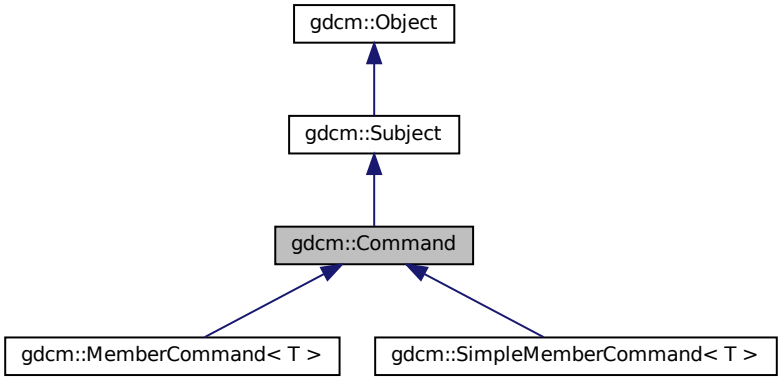
- gdcmCodeString.h

10.56 gdcm::Command Class Reference

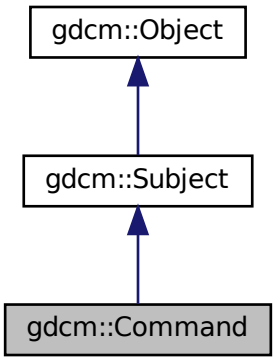
Command superclass for callback/observer methods.

```
#include <gdcmCommand.h>
```

Inheritance diagram for gdcm::Command:



Collaboration diagram for gdcm::Command:



Public Member Functions

- Command (const Command &)=delete
- virtual void Execute (const Subject *caller, const Event &event)=0
- virtual void Execute (Subject *caller, const Event &event)=0

  Abstract method that defines the action to be taken by the command.
- void operator= (const Command &)=delete

Protected Member Functions

- Command ()
- ~Command () override

10.56.1 Detailed Description

Command superclass for callback/observer methods.

See also

Subject

10.56.2 Constructor & Destructor Documentation

10.56.2.1 Command() [1/2]

```
gdcm::Command::Command (
            const Command &  )  [delete]
```

10.56.2.2 Command() [2/2]

```
gdcm::Command::Command ( )  [protected]
```

10.56.2.3 ~Command()

```
gdcm::Command::~Command ( )  [override], [protected]
```

10.56.3 Member Function Documentation

10.56.3.1 Execute() [1/2]

```
virtual void gdcm::Command::Execute (
            const Subject * caller,
            const Event & event )  [pure virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a const Object

Implemented in gdcm::MemberCommand< T >, and gdcm::SimpleMemberCommand< T >.

10.56.3.2 Execute() [2/2]

```
virtual void gdcm::Command::Execute (
            Subject * caller,
            const Event & event )  [pure virtual]
```

Abstract method that defines the action to be taken by the command.

Implemented in gdcm::MemberCommand< T >, and gdcm::SimpleMemberCommand< T >.

10.56.3.3 operator=()

```
void gdcm::Command::operator= (
            const Command &  )  [delete]
```

The documentation for this class was generated from the following file:

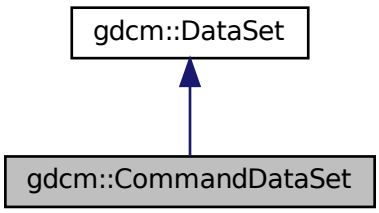
- gdcmCommand.h

10.57 gdcm::CommandDataSet Class Reference

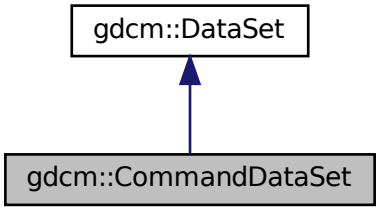
Class to represent a Command DataSet.

```
#include <gdcmCommandDataSet.h>
```

Inheritance diagram for gdcm::CommandDataSet:



Collaboration diagram for gdcm::CommandDataSet:



Public Member Functions

- CommandDataSet ()=default
- ~CommandDataSet ()=default
- void Insert (const DataElement &de)
- std::istream & Read (std::istream &is)

  Read.
- void Replace (const DataElement &de)
- std::ostream & Write (std::ostream &os) const

  Write.

Friends

- std::ostream & operator<< (std::ostream &_os, const CommandDataSet &_val)

Additional Inherited Members

10.57.1 Detailed Description

Class to represent a Command DataSet.

See also

DataSet

10.57.2 Constructor & Destructor Documentation

10.57.2.1 CommandDataSet()

```
gdcm::CommandDataSet::CommandDataSet ( )  [default]
```

10.57.2.2 ~CommandDataSet()

```
gdcm::CommandDataSet::~CommandDataSet ( )  [default]
```

10.57.3 Member Function Documentation

10.57.3.1 Insert()

```
void gdcm::CommandDataSet::Insert (
            const DataElement & de )  [inline]
```

References gdcmErrorMacro, gdcm::Tag::GetGroup(), and gdcm::DataElement::GetTag().

10.57.3.2 Read()

```
std::istream& gdcm::CommandDataSet::Read (
            std::istream & is )
```

Read.

10.57.3.3 Replace()

```
void gdcm::CommandDataSet::Replace (
            const DataElement & de )  [inline]
```

References gdcm::DataElement::GetTag().

10.57.3.4 Write()

```
std::ostream& gdcm::CommandDataSet::Write (
            std::ostream & os ) const
```

Write.

10.57.4 Friends And Related Function Documentation

10.57.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const CommandDataSet & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmCommandDataSet.h

10.58 gdcm::network::CompositeMessageFactory Class Reference

CompositeMessageFactory.

`#include <gdcmCompositeMessageFactory.h>`

Static Public Member Functions

- static std::vector< PresentationDataValue > ConstructCEchoRQ (const ULConnection &inConnection)
- static std::vector< PresentationDataValue > ConstructCFindRQ (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)
- static std::vector< PresentationDataValue > ConstructCMoveRQ (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)
- static std::vector< PresentationDataValue > ConstructCStoreRQ (const ULConnection &inConnection, const File &file, bool writeDataSet=true)
- static std::vector< PresentationDataValue > ConstructCStoreRSP (const DataSet *inDataSet, const BasePDU *inPC)

10.58.1 Detailed Description

CompositeMessageFactory.

This class constructs PDataPDUs, but that have been specifically constructed for the composite DICOM services (C-Echo, C-Find, C-Get, C-Move, and C-Store). It will also handle parsing the incoming data to determine which of the CompositePDUs the incoming data is, and so therefore allowing the scu to determine what to do with incoming data (if acting as a storescp server, for instance).

10.58.2 Member Function Documentation

10.58.2.1 ConstructCEchoRQ()

```
static std::vector<PresentationDataValue> gdcm::network::CompositeMessageFactory::ConstructCEchoRQ (
            const ULConnection & inConnection )  [static]
```

10.58.2.2 ConstructCFindRQ()

```
static std::vector<PresentationDataValue> gdcm::network::CompositeMessageFactory::ConstructCFindRQ (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [static]
```

10.58.2.3 ConstructCMoveRQ()

```
static std::vector<PresentationDataValue> gdcm::network::CompositeMessageFactory::Construct↩
CMoveRQ (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [static]
```

10.58.2.4 ConstructCStoreRQ()

```
static std::vector<PresentationDataValue> gdcm::network::CompositeMessageFactory::Construct↩
CStoreRQ (
            const ULConnection & inConnection,
            const File & file,
            bool writeDataSet = true )  [static]
```

10.58.2.5 ConstructCStoreRSP()

```
static std::vector<PresentationDataValue> gdcm::network::CompositeMessageFactory::Construct↩
CStoreRSP (
            const DataSet * inDataSet,
            const BasePDU * inPC )  [static]
```

The documentation for this class was generated from the following file:

- gdcmCompositeMessageFactory.h

10.59 gdcm::CompositeNetworkFunctions Class Reference

Composite Network Functions.

```
#include <gdcmCompositeNetworkFunctions.h>
```

Public Types

- typedef std::vector< KeyValuePairType > KeyValuePairArrayType
- typedef std::pair< Tag, std::string > KeyValuePairType

Static Public Member Functions

- static bool CEcho (const char *remote, uint16_t portno, const char *aetitle=nullptr, const char *call=nullptr)
- static bool CFind (const char *remote, uint16_t portno, const BaseRootQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle=nullptr, const char *call=nullptr)
- static bool CMove (const char *remote, uint16_t portno, const BaseRootQuery *query, uint16_t portscp, const char *aetitle=nullptr, const char *call=nullptr, const char *outputdir=nullptr)
- static BaseRootQuery * ConstructQuery (ERootType inRootType, EQueryLevel inQueryLevel, const DataSet &queryds, EQueryType queryType=eFind)
- static BaseRootQuery * ConstructQuery (ERootType inRootType, EQueryLevel inQueryLevel, const KeyValuePairArrayType &keys, EQueryType queryType=eFind)
- static bool CStore (const char *remote, uint16_t portno, const Directory::FilenamesType &filenames, const char *aetitle=nullptr, const char *call=nullptr)

10.59.1 Detailed Description

Composite Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- C-ECHO SCU
- C-FIND SCU
- C-STORE SCU
- C-MOVE SCU (+internal C-STORE SCP)

10.59.2 Member Typedef Documentation

10.59.2.1 KeyValuePairArrayType

```
typedef std::vector< KeyValuePairType > gdcm::CompositeNetworkFunctions::KeyValuePairArrayType
```

10.59.2.2 KeyValuePairType

```
typedef std::pair<Tag, std::string> gdcm::CompositeNetworkFunctions::KeyValuePairType
```

10.59.3 Member Function Documentation

10.59.3.1 CEcho()

```
static bool gdcm::CompositeNetworkFunctions::CEcho (
            const char * remote,
            uint16_t portno,
            const char * aetitle = nullptr,
            const char * call = nullptr )  [static]
```

The most basic network function. Use this function to ensure that the remote server is responding on the given IP and port number as expected.

Parameters

aetitle	when not set will default to 'GDCMSCU'
call	when not set will default to 'ANY-SCP'

Warning

This is an error to set remote to NULL or portno to 0

Returns

true if it worked.

10.59.3.2 CFind()

```
static bool gdcm::CompositeNetworkFunctions::CFind (
            const char * remote,
            uint16_t portno,
            const BaseRootQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle = nullptr,
            const char * call = nullptr )  [static]
```

This function will use the provided query to determine what files a remote server contains that match the query strings. The return is a vector of datasets that contain tags as reported by the server. If the dataset is empty, then it is possible that an error condition was encountered; in which case, the user should monitor the error and warning streams.

Parameters

aetitle	when not set will default to 'GDCMSCU'
call	when not set will default to 'ANY-SCP'

Warning

This is an error to set remote to NULL or portno to 0

Returns

true if it worked.

10.59.3.3 CMove()

```
static bool gdcm::CompositeNetworkFunctions::CMove (
            const char * remote,
            uint16_t portno,
            const BaseRootQuery * query,
            uint16_t portscp,
            const char * aetitle = nullptr,
            const char * call = nullptr,
            const char * outputdir = nullptr )  [static]
```

This function will use the provided query to get files from a remote server. NOTE that this functionality is essentially equivalent to C-GET in the DICOM standard; however, C-GET has been deprecated, so this function allows for the user to ask a remote server for files matching a query and return them to the local machine. Files will be written to the given output directory. If the operation succeeds, the function returns true. This function is a prime candidate for being overwritten by expert users; if the datasets should remain in memory, for instance, that behavior can be changed by creating a user-level version of this function.

Parameters

aetitle	when not set will default to 'GDCMSCU'
call	when not set will default to 'ANY-SCP' This is an error to set remote to NULL or portno to 0 when
outputdir	is not set default to current dir ('.')

Returns

true if it worked.

10.59.3.4 ConstructQuery() [1/2]

```
static BaseRootQuery* gdcm::CompositeNetworkFunctions::ConstructQuery (
            ERootType inRootType,
            EQueryLevel inQueryLevel,
            const DataSet & queryds,
            EQueryType queryType = eFind )  [static]
```

This function will take a list of strings and tags and fill in a query that can be used for either CFind or CMove (depending on the input boolean

Parameters

inMove).	Note that the caller is responsible for deleting the constructed query. This function is used to build both a move and a find query (true for inMove if it's move, false if it's find)

10.59.3.5 ConstructQuery() [2/2]

```
static BaseRootQuery* gdcm::CompositeNetworkFunctions::ConstructQuery (
            ERootType inRootType,
            EQueryLevel inQueryLevel,
            const KeyValuePairArrayType & keys,
            EQueryType queryType = eFind )  [static]
```

Deprecated

10.59.3.6 CStore()

```
static bool gdcm::CompositeNetworkFunctions::CStore (
            const char * remote,
            uint16_t portno,
            const Directory::FilenamesType & filenames,
            const char * aetitle = nullptr,
            const char * call = nullptr )  [static]
```

This function will place the provided files into the remote server. The function returns true if it worked for all files.

Warning

the server side can refuse an association on a given file

Parameters

aetitle	when not set will default to 'GDCMSCU'
call	when not set will default to 'ANY-SCP'

Warning

This is an error to set remote to NULL or portno to 0

Returns

true if it worked for all files

The documentation for this class was generated from the following file:

- gdcmCompositeNetworkFunctions.h

10.60 gdcm::ConstCharWrapper Class Reference

Do not use me.

`#include <gdcmConstCharWrapper.h>`

Public Member Functions

- ConstCharWrapper (const char *i=0)
- operator const char * () const

10.60.1 Detailed Description

Do not use me.

10.60.2 Constructor & Destructor Documentation

10.60.2.1 ConstCharWrapper()

```
gdcm::ConstCharWrapper::ConstCharWrapper (
            const char * i = 0 )  [inline]
```

10.60.3 Member Function Documentation

10.60.3.1 operator const char *()

```
gdcm::ConstCharWrapper::operator const char * ( ) const  [inline]
```

The documentation for this class was generated from the following file:

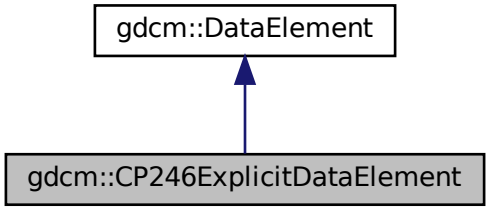
- gdcmConstCharWrapper.h

10.61 gdcm::CP246ExplicitDataElement Class Reference

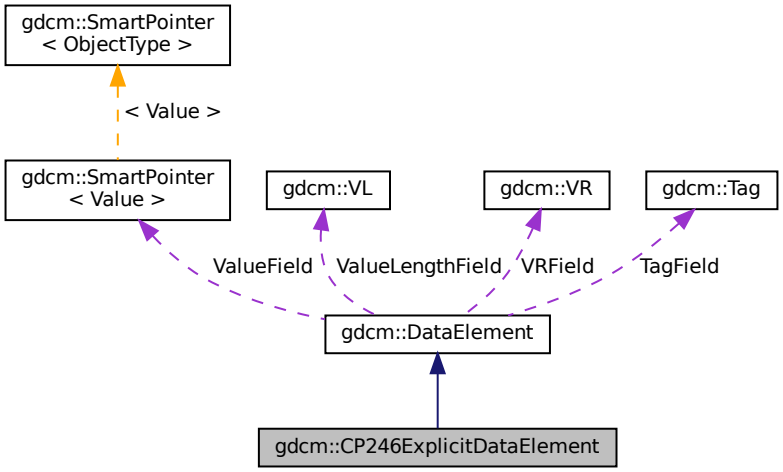
Class to read/write a DataElement as CP246Explicit Data Element.

`#include <gdcmCP246ExplicitDataElement.h>`

Inheritance diagram for gdcm::CP246ExplicitDataElement:



Collaboration diagram for gdcm::CP246ExplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)

- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)

Additional Inherited Members

10.61.1 Detailed Description

Class to read/write a DataElement as CP246Explicit Data Element.

Note

Some system are producing SQ, declare them as UN, but encode the SQ as 'Explicit' instead of Implicit

10.61.2 Member Function Documentation

10.61.2.1 GetLength()

```
VL gdcm::CP246ExplicitDataElement::GetLength ( ) const
```

10.61.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::CP246ExplicitDataElement::Read (
            std::istream & is )
```

10.61.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::CP246ExplicitDataElement::ReadPreValue (
            std::istream & is )
```

10.61.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::CP246ExplicitDataElement::ReadValue (
              std::istream & is,
              bool readvalues = true )
```

10.61.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::CP246ExplicitDataElement::ReadWithLength (
              std::istream & is,
              VL & length )
```

The documentation for this class was generated from the following file:

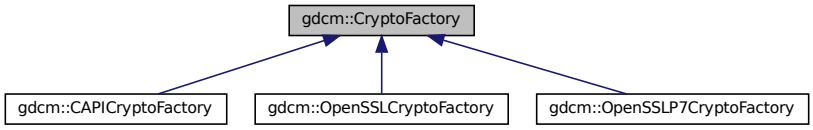
- gdcmCP246ExplicitDataElement.h

10.62 gdcm::CryptoFactory Class Reference

Class to do handle the crypto factory.

`#include <gdcmCryptoFactory.h>`

Inheritance diagram for gdcm::CryptoFactory:



Public Types

- enum CryptoLib {
  DEFAULT = 0 ,
  OPENSSL = 1 ,
  CAPI = 2 ,
  OPENSSLP7 = 3 }

Public Member Functions

- virtual CryptographicMessageSyntax * CreateCMSProvider ()=0

Static Public Member Functions

- static CryptoFactory * GetFactoryInstance (CryptoLib id=DEFAULT)

Protected Member Functions

- CryptoFactory ()=default
- CryptoFactory (CryptoLib id)
- ~CryptoFactory ()=default

10.62.1 Detailed Description

Class to do handle the crypto factory.

GDCM needs to access in a platform independent way the user specified crypto engine. It can be:

- CAPI (windows only)
- OPENSSL (portable)
- OPENSSLP7 (portable) By default the factory will try: CAPI if on windows OPENSSL if possible OPENSSLP7 when older OpenSSL is used.

10.62.2 Member Enumeration Documentation

10.62.2.1 CryptoLib

enum gdcm::CryptoFactory::CryptoLib

Enumerator

DEFAULT	
OPENSSL	
CAPI	
OPENSSLP7	

10.62.3 Constructor & Destructor Documentation

10.62.3.1 CryptoFactory() [1/2]

```
gdcm::CryptoFactory::CryptoFactory (
            CryptoLib id )  [inline], [protected]
```

10.62.3.2 CryptoFactory() [2/2]

```
gdcm::CryptoFactory::CryptoFactory ( )  [protected], [default]
```

10.62.3.3 ~CryptoFactory()

```
gdcm::CryptoFactory::~CryptoFactory ( )  [protected], [default]
```

10.62.4 Member Function Documentation

10.62.4.1 CreateCMSProvider()

```
virtual CryptographicMessageSyntax* gdcm::CryptoFactory::CreateCMSProvider ( )  [pure virtual]
```

Implemented in gdcm::OpenSSLP7CryptoFactory, gdcm::OpenSSLCryptoFactory, and gdcm::CAPICryptoFactory.

10.62.4.2 GetFactoryInstance()

```
static CryptoFactory* gdcm::CryptoFactory::GetFactoryInstance (
            CryptoLib id = DEFAULT )  [static]
```

Examples

BasicAnonymizer.cs, and ClinicalTrialIdentificationWorkflow.cs.

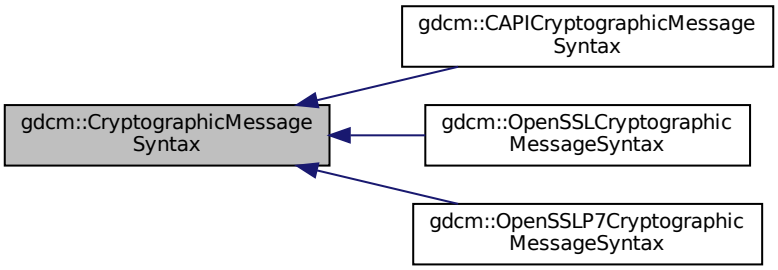
The documentation for this class was generated from the following file:

- gdcmCryptoFactory.h

10.63 gdcm::CryptographicMessageSyntax Class Reference

`#include <gdcmCryptographicMessageSyntax.h>`

Inheritance diagram for gdcm::CryptographicMessageSyntax:



Public Types

- enum CipherTypes {
  DES3_CIPHER ,
  AES128_CIPHER ,
  AES192_CIPHER ,
  AES256_CIPHER }

Public Member Functions

- CryptographicMessageSyntax ()=default
- CryptographicMessageSyntax (const CryptographicMessageSyntax &)=delete
- virtual ~CryptographicMessageSyntax ()=default
- virtual bool Decrypt (char *output, size_t &outlen, const char *array, size_t len) const =0
  decrypt content from a CMS envelopedData structure
- virtual bool Encrypt (char *output, size_t &outlen, const char *array, size_t len) const =0
  create a CMS envelopedData structure
- virtual CipherTypes GetCipherType () const =0
- void operator= (const CryptographicMessageSyntax &)=delete
- virtual bool ParseCertificateFile (const char *filename)=0
- virtual bool ParseKeyFile (const char *filename)=0
- virtual void SetCipherType (CipherTypes type)=0
- virtual bool SetPassword (const char *pass, size_t passLen)=0

10.63.1 Member Enumeration Documentation

10.63.1.1 CipherTypes

`enum gdcm::CryptographicMessageSyntax::CipherTypes`

Enumerator

DES3_CIPHER	
AES128_CIPHER	
AES192_CIPHER	
AES256_CIPHER	

10.63.2 Constructor & Destructor Documentation

10.63.2.1 CryptographicMessageSyntax() [1/2]

```
gdcm::CryptographicMessageSyntax::CryptographicMessageSyntax ( )  [default]
```

10.63.2.2 ~CryptographicMessageSyntax()

```
virtual gdcm::CryptographicMessageSyntax::~CryptographicMessageSyntax ( )  [virtual], [default]
```

10.63.2.3 CryptographicMessageSyntax() [2/2]

```
gdcm::CryptographicMessageSyntax::CryptographicMessageSyntax (
            const CryptographicMessageSyntax &  )  [delete]
```

10.63.3 Member Function Documentation

10.63.3.1 Decrypt()

```
virtual bool gdcm::CryptographicMessageSyntax::Decrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [pure virtual]
```

decrypt content from a CMS envelopedData structure

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.2 Encrypt()

```
virtual bool gdcm::CryptographicMessageSyntax::Encrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [pure virtual]
```

create a CMS envelopedData structure

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.3 GetCipherType()

```
virtual CipherTypes gdcm::CryptographicMessageSyntax::GetCipherType ( ) const  [pure virtual]
```

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.4 operator=()

```
void gdcm::CryptographicMessageSyntax::operator= (
            const CryptographicMessageSyntax &  )  [delete]
```

10.63.3.5 ParseCertificateFile()

```
virtual bool gdcm::CryptographicMessageSyntax::ParseCertificateFile (
            const char * filename )  [pure virtual]
```

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.6 ParseKeyFile()

```
virtual bool gdcm::CryptographicMessageSyntax::ParseKeyFile (
            const char * filename )  [pure virtual]
```

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.7 SetCipherType()

```
virtual void gdcm::CryptographicMessageSyntax::SetCipherType (
            CipherTypes type )  [pure virtual]
```

Implemented in gdcm::OpenSSLP7CryptographicMessageSyntax, gdcm::OpenSSLCryptographicMessageSyntax, and gdcm::CAPICryptographicMessageSyntax.

10.63.3.8 SetPassword()

```
virtual bool gdcm::CryptographicMessageSyntax::SetPassword (
            const char * pass,
            size_t passLen )  [pure virtual]
```

Implemented in gdcm::OpenSSLCryptographicMessageSyntax, gdcm::CAPICryptographicMessageSyntax, and gdcm::OpenSSLP7CryptographicMessageSyntax.

The documentation for this class was generated from the following file:

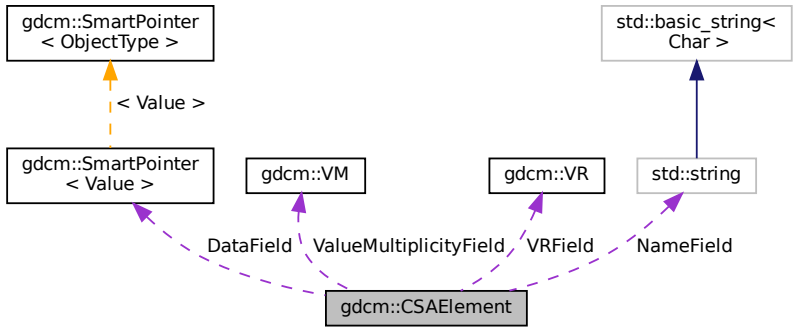
- gdcmCryptographicMessageSyntax.h

10.64 gdcm::CSAElement Class Reference

Class to represent a CSA Element.

```
#include <gdcmCSAElement.h>
```

Collaboration diagram for gdcm::CSAElement:



Public Member Functions

- CSAElement (const CSAElement &_val)
- CSAElement (unsigned int kf=0)
- const ByteValue * GetByteValue () const
- unsigned int GetKey () const

  Set/Get Key.
- const char * GetName () const

  Set/Get Name.
- unsigned int GetNoOfItems () const

  Set/Get NoOfItems.
- unsigned int GetSyngoDT () const

  Set/Get SyngoDT.
- Value & GetValue ()
- Value const & GetValue () const

  Set/Get Value (bytes array, SQ of items, SQ of fragments):
- const VM & GetVM () const

  Set/Get VM.
- VR const & GetVR () const

  Set/Get VR.
- bool IsEmpty () const

  Check if CSA Element is empty.
- bool operator< (const CSAElement &de) const
- CSAElement & operator= (const CSAElement &de)=default
- bool operator== (const CSAElement &de) const
- void SetByteValue (const char *array, VL length)

  Set.
- void SetKey (unsigned int key)
- void SetName (const char *name)
- void SetNoOfItems (unsigned int items)
- void SetSyngoDT (unsigned int syngodt)
- void SetValue (Value const &vl)
- void SetVM (const VM &vm)
- void SetVR (VR const &vr)

Protected Types

- typedef SmartPointer< Value > DataPtr

Protected Attributes

- DataPtr DataField
- unsigned int KeyField
- std::string NameField
- unsigned int NoOfItemsField
- unsigned int SyngoDTField
- VM ValueMultiplicityField
- VR VRField

Friends

- std::ostream & operator<< (std::ostream &os, const CSAElement &val)

10.64.1 Detailed Description

Class to represent a CSA Element.

See also

CSAHeader

Examples

DumpSiemensBase64.cxx, MrProtocol.cxx, and csa2img.cxx.

10.64.2 Member Typedef Documentation

10.64.2.1 DataPtr

```
typedef SmartPointer<Value> gdcm::CSAElement::DataPtr  [protected]
```

10.64.3 Constructor & Destructor Documentation

10.64.3.1 CSAElement() [1/2]

```
gdcm::CSAElement::CSAElement (
            unsigned int kf = 0 )  [inline]
```

10.64.3.2 CSAElement() [2/2]

```
gdcm::CSAElement::CSAElement (
            const CSAElement & _val )  [inline]
```

10.64.4 Member Function Documentation

10.64.4.1 GetByteValue()

```
const ByteValue* gdcm::CSAElement::GetByteValue ( ) const  [inline]
```

Return the Value of CSAElement as a ByteValue (if possible)

Warning

: You need to check for NULL return value

Examples

DumpSiemensBase64.cxx, and MrProtocol.cxx.

10.64.4.2 GetKey()

```
unsigned int gdcm::CSAElement::GetKey ( ) const  [inline]
```

Set/Get Key.

Referenced by operator<().

10.64.4.3 GetName()

```
const char* gdcm::CSAElement::GetName ( ) const  [inline]
```

Set/Get Name.

10.64.4.4 GetNoOfItems()

```
unsigned int gdcm::CSAElement::GetNoOfItems ( ) const  [inline]
```

Set/Get NoOfItems.

10.64.4.5 GetSyngoDT()

```
unsigned int gdcm::CSAElement::GetSyngoDT ( ) const  [inline]
```

Set/Get SyngoDT.

10.64.4.6 GetValue() [1/2]

```
Value& gdcm::CSAElement::GetValue ( )  [inline]
```

10.64.4.7 GetValue() [2/2]

```
Value const& gdcm::CSAElement::GetValue ( ) const  [inline]
```

Set/Get Value (bytes array, SQ of items, SQ of fragments):

Examples

csa2img.cxx.

10.64.4.8 GetVM()

```
const VM& gdcm::CSAElement::GetVM ( ) const  [inline]
```

Set/Get VM.

10.64.4.9 GetVR()

```
VR const& gdcm::CSAElement::GetVR ( ) const  [inline]
```

Set/Get VR.

10.64.4.10 IsEmpty()

```
bool gdcm::CSAElement::IsEmpty ( ) const  [inline]
```

Check if CSA Element is empty.

Examples

csa2img.cxx.

10.64.4.11 operator<()

```
bool gdcm::CSAElement::operator< (
            const CSAElement & de ) const  [inline]
```

References GetKey().

10.64.4.12 operator=()

```
CSAElement& gdcm::CSAElement::operator= (
            const CSAElement & de )  [default]
```

10.64.4.13 operator==()

```
bool gdcm::CSAElement::operator== (
            const CSAElement & de ) const  [inline]
```

References KeyField, NameField, SyngoDTField, ValueMultiplicityField, and VRField.

10.64.4.14 SetByteValue()

```
void gdcm::CSAElement::SetByteValue (
            const char * array,
            VL length )  [inline]
```

Set.

10.64.4.15 SetKey()

```
void gdcm::CSAElement::SetKey (
            unsigned int key )  [inline]
```

10.64.4.16 SetName()

```
void gdcm::CSAElement::SetName (
            const char * name )  [inline]
```

10.64.4.17 SetNoOfItems()

```
void gdcm::CSAElement::SetNoOfItems (
            unsigned int items )  [inline]
```

10.64.4.18 SetSyngoDT()

```
void gdcm::CSAElement::SetSyngoDT (
            unsigned int syngodt )  [inline]
```

10.64.4.19 SetValue()

```
void gdcm::CSAElement::SetValue (
            Value const & vl )  [inline]
```

10.64.4.20 SetVM()

```
void gdcm::CSAElement::SetVM (
            const VM & vm )  [inline]
```

10.64.4.21 SetVR()

```
void gdcm::CSAElement::SetVR (
            VR const & vr )  [inline]
```

10.64.5 Friends And Related Function Documentation

10.64.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const CSAElement & val )  [friend]
```

10.64.6 Member Data Documentation

10.64.6.1 DataField

```
DataPtr gdcm::CSAElement::DataField  [protected]
```

10.64.6.2 KeyField

```
unsigned int gdcm::CSAElement::KeyField  [protected]
```

Referenced by operator==().

10.64.6.3 NameField

```
std::string gdcm::CSAElement::NameField  [protected]
```

Referenced by operator==().

10.64.6.4 NoOfItemsField

```
unsigned int gdcm::CSAElement::NoOfItemsField  [protected]
```

10.64.6.5 SyngoDTField

```
unsigned int gdcm::CSAElement::SyngoDTField  [protected]
```

Referenced by operator==().

10.64.6.6 ValueMultiplicityField

```
VM gdcm::CSAElement::ValueMultiplicityField  [protected]
```

Referenced by operator==().

10.64.6.7 VRField

```
VR gdcm::CSAElement::VRField  [protected]
```

Referenced by operator==().

The documentation for this class was generated from the following file:

- gdcmCSAElement.h

10.65 gdcm::CSAHeader Class Reference

Class for CSAHeader.

```
#include <gdcmCSAHeader.h>
```

Public Types

- enum CSAHeaderType {
  UNKNOWN = 0 ,
  SV10 ,
  NOMAGIC ,
  DATASET_FORMAT ,
  INTERFILE ,
  ZEROED_OUT }

  Divers format of CSAHeader as found 'in the wild'.

Public Member Functions

- CSAHeader ()
- ~CSAHeader ()=default
- bool FindCSAElementByName (const char *name)
- const CSAElement & GetCSAElementByName (const char *name)
- const DataSet & GetDataSet () const

  Return the DataSet output (use only if Format == DATASET_FORMAT)
- CSAHeaderType GetFormat () const
- const char * GetInterfile () const

  Return the string output (use only if Format == Interfile)
- bool GetMrProtocol (const DataSet &ds, MrProtocol &mrProtocol)

  Retrieve the ASCII portion stored within the MrProtocol/MrPhoenixProtocol:
- bool LoadFromDataElement (DataElement const &de)

  Decode the CSAHeader from element 'de'.
- void Print (std::ostream &os) const

  Print the CSAHeader (use only if Format == SV10 or NOMAGIC)

Static Public Member Functions

- static const PrivateTag & GetCSADataInfo ()
- static const PrivateTag & GetCSAImageHeaderInfoTag ()
- static const PrivateTag & GetCSASeriesHeaderInfoTag ()

Protected Member Functions

- const CSAElement & GetCSAEEnd () const

Friends

- std::ostream & operator<< (std::ostream &_os, const CSAHeader &d)

10.65.1 Detailed Description

Class for CSAHeader.

SIEMENS store private information in tag (0x0029,0x10,"SIEMENS CSA HEADER") this class is meant for user wishing to access values stored within this private attribute. There are basically two main 'format' for this attribute : SV10/↩ NOMAGIC and DATASET_FORMAT SV10 and NOMAGIC are from a user prospective identical, see CSAHeader.xml for possible name / value stored in this format. DATASET_FORMAT is in fact simply just another DICOM dataset (implicit) with -currently unknown- value. This can be only be printed for now.

Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

the API of this class might change.

Todo MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

See also

PDBHeader

External references: 5.1.3.2.4.1 MEDCOM History Information and 5.1.4.3 CSA Non-Image Module in `http://tamsinfo.toshiba.com/docrequest/pdf/E.Soft_v2.0.pdf`

Examples

DumpSiemensBase64.cxx, MrProtocol.cxx, and csa2img.cxx.

10.65.2 Member Enumeration Documentation

10.65.2.1 CSAHeaderType

`enum gdcm::CSAHeader::CSAHeaderType`

Divers format of CSAHeader as found 'in the wild'.

Enumerator

UNKNOWN	
SV10	
NOMAGIC	
DATASET_FORMAT	
INTERFILE	
ZEROED_OUT	

10.65.3 Constructor & Destructor Documentation

10.65.3.1 CSAHeader()

```
gdcm::CSAHeader::CSAHeader ( )  [inline]
```

10.65.3.2 ~CSAHeader()

```
gdcm::CSAHeader::~CSAHeader ( )  [default]
```

10.65.4 Member Function Documentation

10.65.4.1 FindCSAElementByName()

```
bool gdcm::CSAHeader::FindCSAElementByName (
            const char * name )
```

Return true if the CSA element matching 'name' is found or not

Warning

Case Sensitive

Examples

DumpSiemensBase64.cxx, MrProtocol.cxx, and csa2img.cxx.

10.65.4.2 GetCSADataInfo()

```
static const PrivateTag& gdcm::CSAHeader::GetCSADataInfo ( )  [static]
```

Return the private tag used by SIEMENS to store the CSA Data Info This is: PrivateTag(0x0029,0x0010,"SIEMENS CSA NON-IMAGE");

10.65.4.3 GetCSAEEnd()

```
const CSAElement& gdcm::CSAHeader::GetCSAEEnd ( ) const  [protected]
```

10.65.4.4 GetCSAElementByName()

```
const CSAElement& gdcm::CSAHeader::GetCSAElementByName (
            const char * name )
```

Return the CSAElement corresponding to name 'name'

Warning

Case Sensitive

Examples

DumpSiemensBase64.cxx, MrProtocol.cxx, and csa2img.cxx.

10.65.4.5 GetCSAImageHeaderInfoTag()

```
static const PrivateTag& gdcm::CSAHeader::GetCSAImageHeaderInfoTag ( )  [static]
```

Return the private tag used by SIEMENS to store the CSA Image Header This is: PrivateTag(0x0029,0x0010,"SIEMENS CSA HEADER");

Examples

DumpSiemensBase64.cxx, PublicDict.cxx, and csa2img.cxx.

10.65.4.6 GetCSASeriesHeaderInfoTag()

```
static const PrivateTag& gdcm::CSAHeader::GetCSASeriesHeaderInfoTag ( )  [static]
```

Return the private tag used by SIEMENS to store the CSA Series Header This is: PrivateTag(0x0029,0x0020,"SIEMENS CSA HEADER");

Examples

MrProtocol.cxx.

10.65.4.7 GetDataSet()

```
const DataSet& gdcm::CSAHeader::GetDataSet ( ) const  [inline]
```

Return the DataSet output (use only if Format == DATASET_FORMAT)

10.65.4.8 GetFormat()

```
CSAHeaderType gdcm::CSAHeader::GetFormat ( ) const
```

return the format of the CSAHeader SV10 and NOMAGIC are equivalent.

10.65.4.9 GetInterfile()

```
const char* gdcm::CSAHeader::GetInterfile ( ) const  [inline]
```

Return the string output (use only if Format == Interfile)

10.65.4.10 GetMrProtocol()

```
bool gdcm::CSAHeader::GetMrProtocol (
            const DataSet & ds,
            MrProtocol & mrProtocol )
```

Retrieve the ASCII portion stored within the MrProtocol/MrPhoenixProtocol:

Examples

MrProtocol.cxx.

10.65.4.11 LoadFromDataElement()

```
bool gdcm::CSAHeader::LoadFromDataElement (
            DataElement const & de )
```

Decode the CSAHeader from element 'de'.

Examples

DumpSiemensBase64.cxx, MrProtocol.cxx, and csa2img.cxx.

10.65.4.12 Print()

```
void gdcm::CSAHeader::Print (
            std::ostream & os ) const
```

Print the CSAHeader (use only if Format == SV10 or NOMAGIC)

Examples

csa2img.cxx.

10.65.5 Friends And Related Function Documentation

10.65.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const CSAHeader & d )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmCSAHeader.h

10.66 gdcm::CSAHeaderDict Class Reference

Class to represent a map of CSAHeaderDictEntry.

`#include <gdcmCSAHeaderDict.h>`

Public Types

- typedef MapCSAHeaderDictEntry::const_iterator ConstIterator
- typedef MapCSAHeaderDictEntry::iterator Iterator
- typedef std::set< CSAHeaderDictEntry > MapCSAHeaderDictEntry

Public Member Functions

- CSAHeaderDict ()
- CSAHeaderDict (const CSAHeaderDict &_val)=delete
- void AddCSAHeaderDictEntry (const CSAHeaderDictEntry &de)
- ConstIterator Begin () const
- ConstIterator End () const
- const CSAHeaderDictEntry & GetCSAHeaderDictEntry (const char *name) const
- bool IsEmpty () const
- CSAHeaderDict & operator= (const CSAHeaderDict &_val)=delete

Protected Member Functions

- void LoadDefault ()

Friends

- class Dicts
- std::ostream & operator<< (std::ostream &_os, const CSAHeaderDict &_val)

10.66.1 Detailed Description

Class to represent a map of CSAHeaderDictEntry.

Examples

MrProtocol.cxx.

10.66.2 Member Typedef Documentation

10.66.2.1 ConstIterator

```
typedef MapCSAHeaderDictEntry::const_iterator gdcm::CSAHeaderDict::ConstIterator
```

10.66.2.2 Iterator

```
typedef MapCSAHeaderDictEntry::iterator gdcm::CSAHeaderDict::Iterator
```

10.66.2.3 MapCSAHeaderDictEntry

```
typedef std::set<CSAHeaderDictEntry> gdcm::CSAHeaderDict::MapCSAHeaderDictEntry
```

10.66.3 Constructor & Destructor Documentation

10.66.3.1 CSAHeaderDict() [1/2]

```
gdcm::CSAHeaderDict::CSAHeaderDict ( )  [inline]
```

10.66.3.2 CSAHeaderDict() [2/2]

```
gdcm::CSAHeaderDict::CSAHeaderDict (
            const CSAHeaderDict & _val )  [delete]
```

10.66.4 Member Function Documentation

10.66.4.1 AddCSAHeaderDictEntry()

```
void gdcm::CSAHeaderDict::AddCSAHeaderDictEntry (
            const CSAHeaderDictEntry & de )  [inline]
```

10.66.4.2 Begin()

```
ConstIterator gdcm::CSAHeaderDict::Begin ( ) const  [inline]
```

10.66.4.3 End()

```
ConstIterator gdcm::CSAHeaderDict::End ( ) const  [inline]
```

10.66.4.4 GetCSAHeaderDictEntry()

```
const CSAHeaderDictEntry& gdcm::CSAHeaderDict::GetCSAHeaderDictEntry (
            const char * name ) const  [inline]
```

Examples

MrProtocol.cxx.

10.66.4.5 IsEmpty()

```
bool gdcm::CSAHeaderDict::IsEmpty ( ) const  [inline]
```

10.66.4.6 LoadDefault()

```
void gdcm::CSAHeaderDict::LoadDefault ( )  [protected]
```

10.66.4.7 operator=()

```
CSAHeaderDict& gdcm::CSAHeaderDict::operator= (
            const CSAHeaderDict & _val )  [delete]
```

10.66.5 Friends And Related Function Documentation

10.66.5.1 Dicts

```
friend class Dicts  [friend]
```

10.66.5.2 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const CSAHeaderDict & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmCSAHeaderDict.h

10.67 gdcm::CSAHeaderDictEntry Class Reference

Class to represent an Entry in the Dict.

```
#include <gdcmCSAHeaderDictEntry.h>
```

Public Member Functions

- CSAHeaderDictEntry (const char *name="", VR const &vr=VR::INVALID, VM const &vm=VM::VM0, const char *desc="")
- const char * GetDescription () const

  Set/Get Description.
- const char * GetName () const

  Set/Get Name.
- const VM & GetVM () const

  Set/Get VM.
- const VR & GetVR () const

  Set/Get VR.
- bool operator< (const CSAHeaderDictEntry &entry) const
- void SetDescription (const char *desc)
- void SetName (const char *name)
- void SetVM (VM const &vm)
- void SetVR (const VR &vr)

Friends

- std::ostream & operator<< (std::ostream &_os, const CSAHeaderDictEntry &_val)

10.67.1 Detailed Description

Class to represent an Entry in the Dict.

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from gdcm::Tag to the needed information

Note

bla TODO FIXME: Need a PublicCSAHeaderDictEntry...indeed CSAHeaderDictEntry has a notion of retired which does not exist in PrivateCSAHeaderDictEntry...

See also

gdcm::Dict

Examples

MrProtocol.cxx.

10.67.2 Constructor & Destructor Documentation

10.67.2.1 CSAHeaderDictEntry()

```
gdcm::CSAHeaderDictEntry::CSAHeaderDictEntry (
            const char * name = "",
            VR const & vr = VR::INVALID,
            VM const & vm = VM::VM0,
            const char * desc = "" )  [inline]
```

10.67.3 Member Function Documentation

10.67.3.1 GetDescription()

```
const char* gdcm::CSAHeaderDictEntry::GetDescription ( ) const  [inline]
```

Set/Get Description.

10.67.3.2 GetName()

```
const char* gdcm::CSAHeaderDictEntry::GetName ( ) const  [inline]
```

Set/Get Name.

Referenced by operator<().

10.67.3.3 GetVM()

```
const VM& gdcm::CSAHeaderDictEntry::GetVM ( ) const  [inline]
```

Set/Get VM.

10.67.3.4 GetVR()

```
const VR& gdcm::CSAHeaderDictEntry::GetVR ( ) const  [inline]
```

Set/Get VR.

10.67.3.5 operator<()

```
bool gdcm::CSAHeaderDictEntry::operator< (
            const CSAHeaderDictEntry & entry ) const  [inline]
```

References GetName().

10.67.3.6 SetDescription()

```
void gdcm::CSAHeaderDictEntry::SetDescription (
            const char * desc )  [inline]
```

10.67.3.7 SetName()

```
void gdcm::CSAHeaderDictEntry::SetName (
            const char * name )  [inline]
```

10.67.3.8 SetVM()

```
void gdcm::CSAHeaderDictEntry::SetVM (
            VM const & vm )  [inline]
```

10.67.3.9 SetVR()

```
void gdcm::CSAHeaderDictEntry::SetVR (
            const VR & vr )  [inline]
```

10.67.4 Friends And Related Function Documentation

10.67.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const CSAHeaderDictEntry & _val )  [friend]
```

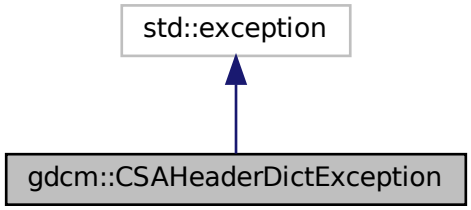
The documentation for this class was generated from the following file:

- gdcmCSAHeaderDictEntry.h

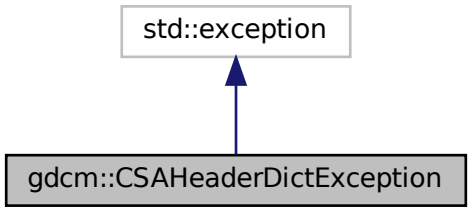
10.68 gdcm::CSAHeaderDictException Class Reference

`#include <gdcmCSAHeaderDict.h>`

Inheritance diagram for gdcm::CSAHeaderDictException:



Collaboration diagram for gdcm::CSAHeaderDictException:



The documentation for this class was generated from the following file:

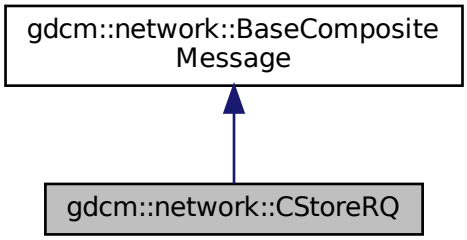
- gdcmCSAHeaderDict.h

10.69 gdcm::network::CStoreRQ Class Reference

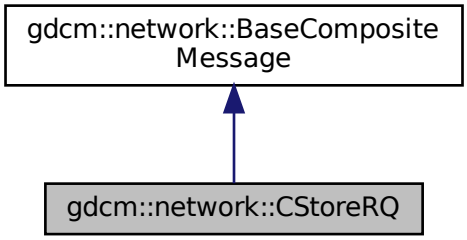
CStoreRQ.

`#include <gdcmCStoreMessages.h>`

Inheritance diagram for gdcm::network::CStoreRQ:



Collaboration diagram for gdcm::network::CStoreRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const File &file, bool writeDataSet=true)

10.69.1 Detailed Description

CStoreRQ.

this file defines the messages for the cecho action

10.69.2 Member Function Documentation

10.69.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::CStoreRQ::ConstructPDV (
            const ULConnection & inConnection,
            const File & file,
            bool writeDataSet = true )
```

The documentation for this class was generated from the following file:

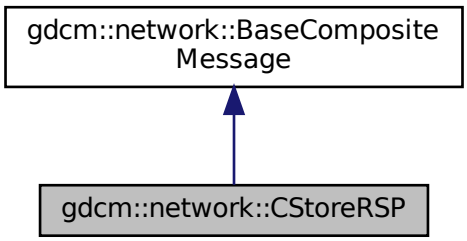
- gdcmCStoreMessages.h

10.70 gdcm::network::CStoreRSP Class Reference

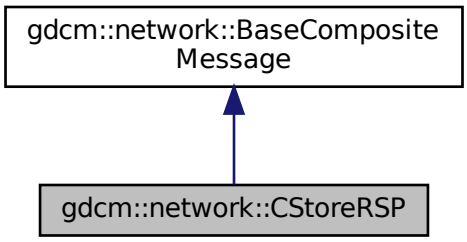
CStoreRSP this file defines the messages for the cecho action.

```
#include <gdcmCStoreMessages.h>
```

Inheritance diagram for gdcm::network::CStoreRSP:



Collaboration diagram for gdcm::network::CStoreRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const DataSet *inDataSet, const BasePDU *inPC)

10.70.1 Detailed Description

CStoreRSP this file defines the messages for the cecho action.

10.70.2 Member Function Documentation

10.70.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::CStoreRSP::ConstructPDV (
            const DataSet * inDataSet,
            const BasePDU * inPC )
```

The documentation for this class was generated from the following file:

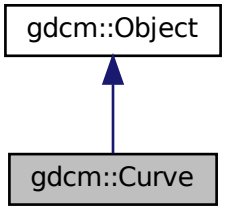
- gdcmCStoreMessages.h

10.71 gdcm::Curve Class Reference

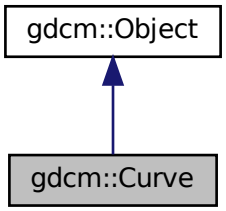
Curve class to handle element 50xx,3000 Curve Data.

`#include <gdcmCurve.h>`

Inheritance diagram for gdcm::Curve:



Collaboration diagram for gdcm::Curve:



Public Member Functions

- Curve ()
- Curve (Curve const &ov)
- ~Curve () override
- void Decode (std::istream &is, std::ostream &os)
- void GetAsPoints (float *array) const
- std::vector< unsigned short > const & GetCurveDataDescriptor () const
- unsigned short GetDataValueRepresentation () const
- unsigned short GetDimensions () const

- unsigned short GetGroup () const
- unsigned short GetNumberOfPoints () const
- const char * GetTypeOfData () const
- const char * GetTypeOfDataDescription () const
- bool IsEmpty () const
- void Print (std::ostream &) const override
- void SetCoordinateStartValue (unsigned short v)
- void SetCoordinateStepValue (unsigned short v)
- void SetCurve (const char *array, unsigned int length)
- void SetCurveDataDescriptor (const uint16_t *values, size_t num)
- void SetCurveDescription (const char *curvedescription)
- void SetDataValueRepresentation (unsigned short datavaluerepresentation)
- void SetDimensions (unsigned short dimensions)
- void SetGroup (unsigned short group)
- void SetNumberOfPoints (unsigned short numberofpoints)
- void SetTypeOfData (const char *typeofdata)
- void Update (const DataElement &de)

Static Public Member Functions

- static unsigned int GetNumberOfCurves (DataSet const &ds)

Additional Inherited Members

10.71.1 Detailed Description

Curve class to handle element 50xx,3000 Curve Data.

WARNING: This is deprecated and lastly defined in PS 3.3 - 2004

Examples:

- GE_DLX-8-MONO2-Multiframe-Jpeg_Lossless.dcm
- GE_DLX-8-MONO2-Multiframe.dcm
- gdcmSampleData/Philips_Medical_Images/integris_HV_5000/xa_integris.dcm
- TOSHIBA-CurveData[1-3].dcm

10.71.2 Constructor & Destructor Documentation

10.71.2.1 Curve() [1/2]

```
gdcm::Curve::Curve ( )
```

10.71.2.2 ~Curve()

```
gdcm::Curve::~Curve ( )  [override]
```

10.71.2.3 Curve() [2/2]

```
gdcm::Curve::Curve (
            Curve const & ov )
```

10.71.3 Member Function Documentation

10.71.3.1 Decode()

```
void gdcm::Curve::Decode (
            std::istream & is,
            std::ostream & os )
```

10.71.3.2 GetAsPoints()

```
void gdcm::Curve::GetAsPoints (
            float * array ) const
```

10.71.3.3 GetCurveDataDescriptor()

```
std::vector<unsigned short> const& gdcm::Curve::GetCurveDataDescriptor ( ) const
```

10.71.3.4 GetDataValueRepresentation()

```
unsigned short gdcm::Curve::GetDataValueRepresentation ( ) const
```

10.71.3.5 GetDimensions()

```
unsigned short gdcm::Curve::GetDimensions ( ) const
```

10.71.3.6 GetGroup()

```
unsigned short gdcm::Curve::GetGroup ( ) const
```

10.71.3.7 GetNumberOfCurves()

```
static unsigned int gdcm::Curve::GetNumberOfCurves (
            DataSet const & ds )  [static]
```

10.71.3.8 GetNumberOfPoints()

```
unsigned short gdcm::Curve::GetNumberOfPoints ( ) const
```

10.71.3.9 GetTypeOfData()

```
const char* gdcm::Curve::GetTypeOfData ( ) const
```

10.71.3.10 GetTypeOfDataDescription()

```
const char* gdcm::Curve::GetTypeOfDataDescription ( ) const
```

10.71.3.11 IsEmpty()

```
bool gdcm::Curve::IsEmpty ( ) const
```

10.71.3.12 Print()

```
void gdcm::Curve::Print (
            std::ostream &  ) const  [override], [virtual]
```

Reimplemented from gdcm::Object.

10.71.3.13 SetCoordinateStartValue()

```
void gdcm::Curve::SetCoordinateStartValue (
            unsigned short v )
```

10.71.3.14 SetCoordinateStepValue()

```
void gdcm::Curve::SetCoordinateStepValue (
            unsigned short v )
```

10.71.3.15 SetCurve()

```
void gdcm::Curve::SetCurve (
            const char * array,
            unsigned int length )
```

10.71.3.16 SetCurveDataDescriptor()

```
void gdcm::Curve::SetCurveDataDescriptor (
            const uint16_t * values,
            size_t num )
```

10.71.3.17 SetCurveDescription()

```
void gdcm::Curve::SetCurveDescription (
            const char * curvedescription )
```

10.71.3.18 SetDataValueRepresentation()

```
void gdcm::Curve::SetDataValueRepresentation (
            unsigned short datavaluerepresentation )
```

10.71.3.19 SetDimensions()

```
void gdcm::Curve::SetDimensions (
            unsigned short dimensions )
```

10.71.3.20 SetGroup()

```
void gdcm::Curve::SetGroup (
            unsigned short group )
```

10.71.3.21 SetNumberOfPoints()

```
void gdcm::Curve::SetNumberOfPoints (
            unsigned short numberofpoints )
```

10.71.3.22 SetTypeOfData()

```
void gdcm::Curve::SetTypeOfData (
            const char * typeofdata )
```

10.71.3.23 Update()

```
void gdcm::Curve::Update (
            const DataElement & de )
```

The documentation for this class was generated from the following file:

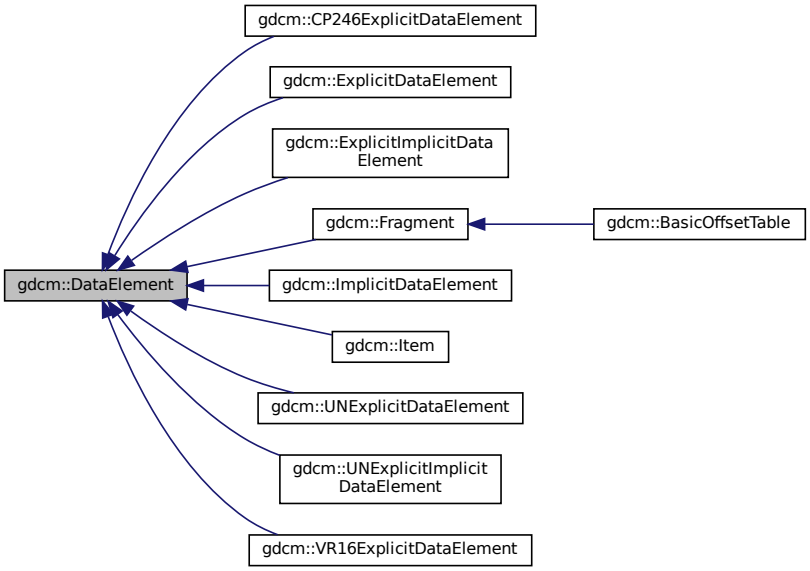
- gdcmCurve.h

10.72 gdcm::DataElement Class Reference

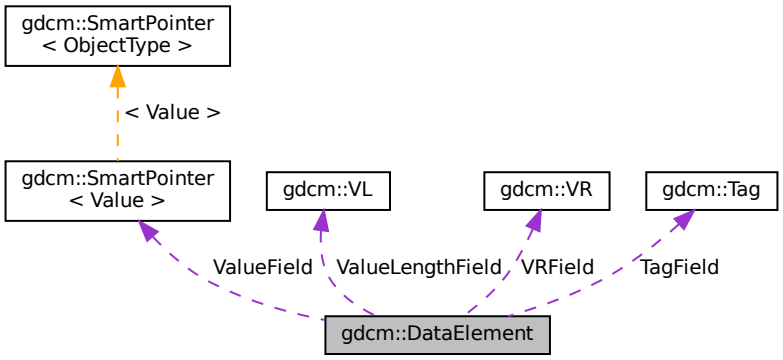
Class to represent a Data Element either Implicit or Explicit.

```
#include <gdcmDataElement.h>
```

Inheritance diagram for gdcm::DataElement:



Collaboration diagram for gdcm::DataElement:



Public Member Functions

- DataElement (const DataElement &_val)
- DataElement (const Tag &t=Tag(0), const VL &vl=0, const VR &vr=VR::INVALID)
- void Clear ()

  Clear Data Element (make Value empty and invalidate Tag & VR)
- void Empty ()

  Make Data Element empty (no Value)
- const ByteValue * GetByteValue () const
- template<typename TDE >
  VL GetLength () const
- SequenceOfFragments * GetSequenceOfFragments ()
- const SequenceOfFragments * GetSequenceOfFragments () const
- Tag & GetTag ()
- const Tag & GetTag () const

  Get Tag.
- Value & GetValue ()
- Value const & GetValue () const

  Set/Get Value (bytes array, SQ of items, SQ of fragments):
- SmartPointer< SequenceOfItems > GetValueAsSQ () const
- VL & GetVL ()
- const VL & GetVL () const

  Get VL.
- VR const & GetVR () const
- bool IsEmpty () const

  Check if Data Element is empty.
- bool IsUndefinedLength () const

  return if Value Length if of undefined length
- bool operator< (const DataElement &de) const
- DataElement & operator= (const DataElement &)=default

- bool operator== (const DataElement &de) const
- template<typename TDE , typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TDE , typename TSwap >
  std::istream & ReadOrSkip (std::istream &is, std::set< Tag > const &skiptags)
- template<typename TDE , typename TSwap >
  std::istream & ReadPreValue (std::istream &is, std::set< Tag > const &skiptags)
- template<typename TDE , typename TSwap >
  std::istream & ReadValue (std::istream &is, std::set< Tag > const &skiptags)
- template<typename TDE , typename TSwap >
  std::istream & ReadValueWithLength (std::istream &is, VL &length, std::set< Tag > const &skiptags)
- template<typename TDE , typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)
- void SetByteValue (const char *array, VL length)
- void SetTag (const Tag &t)
- void SetValue (Value const &vl)
- void SetVL (const VL &vl)
- void SetVLToUndefined ()
- void SetVR (VR const &vr)
- template<typename TDE , typename TSwap >
  const std::ostream & Write (std::ostream &os) const

Protected Types

- typedef SmartPointer< Value > ValuePtr

Protected Member Functions

- void SetValueFieldLength (VL vl, bool readvalues)

Protected Attributes

- Tag TagField
- ValuePtr ValueField
- VL ValueLengthField
- VR VRField

Friends

- std::ostream & operator<< (std::ostream &_os, const DataElement &_val)

10.72.1 Detailed Description

Class to represent a Data Element either Implicit or Explicit.

DATA ELEMENT: A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly.

Design:

- A DataElement in GDCM always store VL (Value Length) on a 32 bits integer even when VL is 16 bits
- A DataElement always store the VR even for Implicit TS, in which case VR is defaulted to VR::INVALID
- For Item start/end (See 0xfffe tags), Value is NULL

See also

ExplicitDataElement ImplicitDataElement

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, LargeVRDSExplicit.cxx, ReadAndDumpDICOMDIR.cxx, StreamImageReaderTest.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.72.2 Member Typedef Documentation

10.72.2.1 ValuePtr

```
typedef SmartPointer<Value> gdcm::DataElement::ValuePtr  [protected]
```

10.72.3 Constructor & Destructor Documentation

10.72.3.1 DataElement() [1/2]

```
gdcm::DataElement::DataElement (
            const Tag & t = Tag(0),
            const VL & vl = 0,
            const VR & vr = VR::INVALID )  [inline]
```

10.72.3.2 DataElement() [2/2]

```
gdcm::DataElement::DataElement (
            const DataElement & _val )  [inline]
```

10.72.4 Member Function Documentation

10.72.4.1 Clear()

```
void gdcm::DataElement::Clear ( )  [inline]
```

Clear Data Element (make Value empty and invalidate Tag & VR)

10.72.4.2 Empty()

```
void gdcm::DataElement::Empty ( )  [inline]
```

Make Data Element empty (no Value)

10.72.4.3 GetByteValue()

```
const ByteValue* gdcm::DataElement::GetByteValue ( ) const  [inline]
```

Return the Value of DataElement as a ByteValue (if possible)

Warning

: You need to check for NULL return value

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, PatchFile.cxx, ReadExplicitLengthSQIVR.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFrom↩DataElement(), gdcm::Element< TVR, TVM >::SetFromDataElement(), and gdcm::Element< TVR, VM::VM1_n >::↩SetFromDataElement().

10.72.4.4 GetLength()

```
template<typename TDE >
VL gdcm::DataElement::GetLength ( ) const  [inline]
```

10.72.4.5 GetSequenceOfFragments() [1/2]

```
SequenceOfFragments* gdcm::DataElement::GetSequenceOfFragments ( )
```

10.72.4.6 GetSequenceOfFragments() [2/2]

```
const SequenceOfFragments* gdcm::DataElement::GetSequenceOfFragments ( ) const
```

Return the Value of DataElement as a Sequence Of Fragments (if possible)

Warning

: You need to check for NULL return value

Examples

FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, and GetJPEGSamplePrecision.cxx.

10.72.4.7 GetTag() [1/2]

```
Tag& gdcm::DataElement::GetTag ( )  [inline]
```

10.72.4.8 GetTag() [2/2]

```
const Tag& gdcm::DataElement::GetTag ( ) const  [inline]
```

Get Tag.

Examples

DumpGEMSMovieGroup.cxx, DuplicatePCDE.cxx, and pmsct_rgb1.cxx.

Referenced by gdcm::DataSet::Insert(), gdcm::FileMetaInformation::Insert(), gdcm::CommandDataSet::Insert(), operator<(), gdcm::SequenceOfItems::Read(), gdcm::SequenceOfFragments::ReadValue(), gdcm::FileMeta↩ Information::Replace(), gdcm::CommandDataSet::Replace(), gdcm::Attribute< Group, Element, TVR, TVM >::↩ SetFromDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement(), and gdcm::↩ Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataElement().

10.72.4.9 GetValue() [1/2]

```
Value& gdcm::DataElement::GetValue ( )  [inline]
```

References gdcmAssertAlwaysMacro.

10.72.4.10 GetValue() [2/2]

```
Value const& gdcm::DataElement::GetValue ( ) const  [inline]
```

Set/Get Value (bytes array, SQ of items, SQ of fragments):

Examples

ReadAndDumpDICOMDIR.cxx.

References gdcmAssertAlwaysMacro.

Referenced by gdcm::DataSet::InsertDataElement(), gdcm::Element< TVR, TVM >::SetFromDataElement(), and gdcm::Element< TVR, VM::VM1_n >::SetFromDataElement().

10.72.4.11 GetValueAsSQ()

```
SmartPointer<SequenceOfItems> gdcm::DataElement::GetValueAsSQ ( ) const
```

Interpret the Value stored in the DataElement. This is more robust (but also more expensive) to call this function rather than the simplest form: GetSequenceOfItems() It also return NULL when the Value is NOT of type SequenceOfItems

Warning

in case GetSequenceOfItems() succeed the function return this value, otherwise it creates a new SequenceOfItems, you should handle that in your case, for instance: SmartPointer<SequenceOfItems> sqi = de.GetValueAsSQ();

Examples

ChangeSequenceUltrasound.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpPhilipsECHO.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, ExtractEncryptedContent.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, LargeVRDSExplicit.cxx, ReadAndDumpDICOMDIR.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.72.4.12 GetVL() [1/2]

```
VL& gdcm::DataElement::GetVL ( )  [inline]
```

10.72.4.13 GetVL() [2/2]

```
const VL& gdcm::DataElement::GetVL ( ) const  [inline]
```

Get VL.

Referenced by gdcm::DataSet::InsertDataElement(), gdcm::SequenceOfItems::Read(), and gdcm::SequenceOf↩ Fragments::ReadValue().

10.72.4.14 GetVR()

```
VR const& gdcm::DataElement::GetVR ( ) const  [inline]
```

Get VR do not set VR::SQ on bytevalue data element

Examples

DuplicatePCDE.cxx, and GenFakeIdentifyFile.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsData↩ Element(), gdcm::Element< TVR, TVM >::GetAsDataElement(), gdcm::Element< TVR, VM::VM1_n >::GetAsData↩ Element(), gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromData↩ Element(), gdcm::Element< TVR, TVM >::SetFromDataElement(), and gdcm::Element< TVR, VM::VM1_n >::Set↩ FromDataElement().

10.72.4.15 IsEmpty()

```
bool gdcm::DataElement::IsEmpty ( ) const  [inline]
```

Check if Data Element is empty.

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpImageHeaderInfo.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, ELSCINT1WaveToText.cxx, FixJAIBugJPEGLS.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::DataSet::InsertDataElement(), gdcm::Attribute< Group, Element, TVR, TVM >::SetFromData↩ Element(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement(), and gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataElement().

10.72.4.16 IsUndefinedLength()

```
bool gdcm::DataElement::IsUndefinedLength ( ) const  [inline]
```

return if Value Length if of undefined length

10.72.4.17 operator<()

```
bool gdcm::DataElement::operator< (
            const DataElement & de ) const  [inline]
```

References GetTag().

10.72.4.18 operator=()

```
DataElement& gdcm::DataElement::operator= (
            const DataElement &  )  [default]
```

10.72.4.19 operator==()

```
bool gdcm::DataElement::operator== (
            const DataElement & de ) const  [inline]
```

References TagField, ValueField, ValueLengthField, and VRField.

10.72.4.20 Read()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::Read (
            std::istream & is )  [inline]
```

Examples

DumpSiemensBase64.cxx.

10.72.4.21 ReadOrSkip()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::ReadOrSkip (
             std::istream & is,
             std::set< Tag > const & skiptags )  [inline]
```

10.72.4.22 ReadPreValue()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::ReadPreValue (
             std::istream & is,
             std::set< Tag > const & skiptags )  [inline]
```

10.72.4.23 ReadValue()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::ReadValue (
             std::istream & is,
             std::set< Tag > const & skiptags )  [inline]
```

10.72.4.24 ReadValueWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::ReadValueWithLength (
             std::istream & is,
             VL & length,
             std::set< Tag > const & skiptags )  [inline]
```

10.72.4.25 ReadWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataElement::ReadWithLength (
             std::istream & is,
             VL & length )  [inline]
```

10.72.4.26 SetByteValue()

```
void gdcm::DataElement::SetByteValue (
            const char * array,
            VL length )  [inline]
```

Set the byte value

Warning

user need to read DICOM standard for an understanding of:

- even padding
- \0 vs space padding By default even padding is achieved using \0 regardless of the of VR

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FileChangeTS.cs, FileChangeTSLossy.cs, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSubSequenceData.cxx, NewSequence.cs, StreamImageReaderTest.cxx, iU22tomultisc.cxx, and rle2img.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsDataElement(), gdcm::Element< TVR, TVM >::GetAsDataElement(), and gdcm::Element< TVR, VM::VM1_n >::GetAsDataElement().

10.72.4.27 SetTag()

```
void gdcm::DataElement::SetTag (
            const Tag & t )  [inline]
```

Set Tag Use with cautious (need to match Part 6)

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, GenFakeIdentifyFile.cxx, and GetSubSequenceData.cxx.

10.72.4.28 SetValue()

```
void gdcm::DataElement::SetValue (
            Value const & vl )  [inline]
```

Warning

you need to set the ValueLengthField explicitly

Examples

DuplicatePCDE.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, and GenSeqs.cxx.

References gdcm::Value::GetLength().

10.72.4.29 SetValueFieldLength()

```
void gdcm::DataElement::SetValueFieldLength (
            VL vl,
            bool readvalues )  [protected]
```

10.72.4.30 SetVL()

```
void gdcm::DataElement::SetVL (
            const VL & vl )  [inline]
```

Set VL Use with cautious (need to match Part 6), advanced user only

See also

SetByteValue

10.72.4.31 SetVLToUndefined()

```
void gdcm::DataElement::SetVLToUndefined ( )
```

Examples

Fake_Image_Using_Stream_Image_Writer.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, and NewSequence.cs.

10.72.4.32 SetVR()

```
void gdcm::DataElement::SetVR (
            VR const & vr )  [inline]
```

Set VR Use with cautious (need to match Part 6), advanced user only

Precondition

vr is a VR::VRALL (not a dual one such as OB_OW)

Examples

Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSubSequenceData.cxx, NewSequence.cs, StreamImageReaderTest.cxx, iU22tomultisc.cxx, and rle2img.cxx.

References gdcm::VR::IsVRFile().

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsDataElement(), gdcm::Element< TVR, TVM >::GetAsDataElement(), and gdcm::Element< TVR, VM::VM1_n >::GetAsDataElement().

10.72.4.33 Write()

```
template<typename TDE , typename TSwap >
const std::ostream& gdcm::DataElement::Write (
            std::ostream & os ) const  [inline]
```

10.72.5 Friends And Related Function Documentation

10.72.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const DataElement & _val )  [friend]
```

10.72.6 Member Data Documentation

10.72.6.1 TagField

```
Tag gdcm::DataElement::TagField  [protected]
```

Referenced by operator==().

10.72.6.2 ValueField

```
ValuePtr gdcm::DataElement::ValueField  [protected]
```

Referenced by operator==().

10.72.6.3 ValueLengthField

```
VL gdcm::DataElement::ValueLengthField  [protected]
```

Referenced by operator==().

10.72.6.4 VRField

```
VR gdcm::DataElement::VRField  [protected]
```

Referenced by operator==().

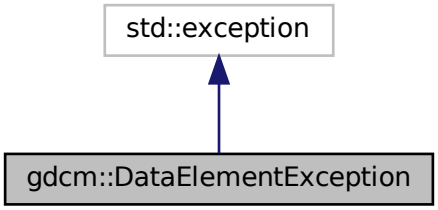
The documentation for this class was generated from the following file:

- gdcmDataElement.h

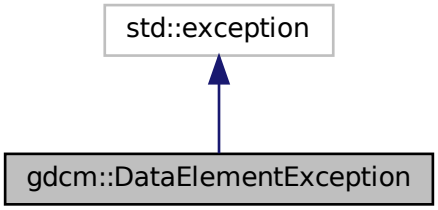
10.73 gdcm::DataElementException Class Reference

`#include <gdcmDataSet.h>`

Inheritance diagram for gdcm::DataElementException:



Collaboration diagram for gdcm::DataElementException:



The documentation for this class was generated from the following file:

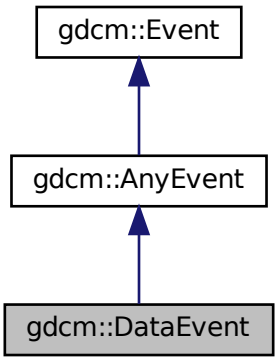
- gdcmDataSet.h

10.74 gdcm::DataEvent Class Reference

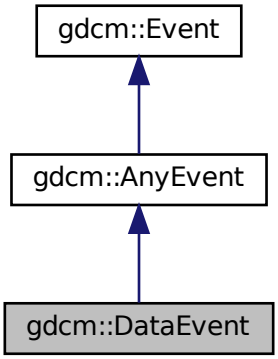
DataEvent.

`#include <gdcmDataEvent.h>`

Inheritance diagram for gdcm::DataEvent:



Collaboration diagram for gdcm::DataEvent:



Public Types

- typedef DataEvent Self
- typedef AnyEvent Superclass

Public Member Functions

- DataEvent (const char *bytes=nullptr, size_t len=0)
- DataEvent (const Self &s)
- ~DataEvent () override=default
- bool CheckEvent (const ::gdcm::Event *e) const override
- const char * GetData () const
- size_t GetDataLength () const
- const char * GetEventName () const override
- ::gdcm::Event * MakeObject () const override
- void operator= (const Self &)=delete
- void SetData (const char *bytes, size_t len)

10.74.1 Detailed Description

DataEvent.

10.74.2 Member Typedef Documentation

10.74.2.1 Self

```
typedef DataEvent gdcm::DataEvent::Self
```

10.74.2.2 Superclass

```
typedef AnyEvent gdcm::DataEvent::Superclass
```

10.74.3 Constructor & Destructor Documentation

10.74.3.1 DataEvent() [1/2]

```
gdcm::DataEvent::DataEvent (
            const char * bytes = nullptr,
            size_t len = 0 )  [inline]
```

10.74.3.2 ~DataEvent()

```
gdcm::DataEvent::~DataEvent ( )  [override], [default]
```

10.74.3.3 DataEvent() [2/2]

```
gdcm::DataEvent::DataEvent (
            const Self & s )  [inline]
```

10.74.4 Member Function Documentation

10.74.4.1 CheckEvent()

```
bool gdcm::DataEvent::CheckEvent (
            const ::gdcm::Event * e ) const  [inline], [override]
```

10.74.4.2 GetData()

```
const char* gdcm::DataEvent::GetData ( ) const  [inline]
```

10.74.4.3 GetDataLength()

```
size_t gdcm::DataEvent::GetDataLength ( ) const  [inline]
```

10.74.4.4 GetEventName()

```
const char* gdcm::DataEvent::GetEventName ( ) const  [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements gdcm::Event.

10.74.4.5 MakeObject()

```
::gdcm::Event* gdcm::DataEvent::MakeObject ( ) const  [inline], [override], [virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implements gdcm::Event.

10.74.4.6 operator=()

```
void gdcm::DataEvent::operator= (
             const Self &  )  [delete]
```

10.74.4.7 SetData()

```
void gdcm::DataEvent::SetData (
             const char * bytes,
             size_t len )  [inline]
```

The documentation for this class was generated from the following file:

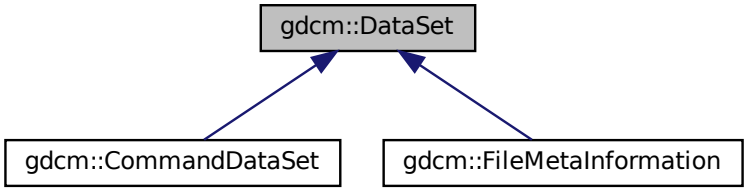
- gdcmDataEvent.h

10.75 gdcm::DataSet Class Reference

Class to represent a Data Set (which contains Data Elements)

```
#include <gdcmDataSet.h>
```

Inheritance diagram for gdcm::DataSet:



Public Types

- typedef DataElementSet::const_iterator ConstIterator
- typedef std::set< DataElement > DataElementSet
- typedef DataElementSet::iterator Iterator
- typedef DataElementSet::size_type SizeType

Public Member Functions

- Iterator Begin ()
- ConstIterator Begin () const
- void Clear ()
- template<typename TDE >
  unsigned int ComputeGroupLength (Tag const &tag) const
- Iterator End ()
- ConstIterator End () const
- bool FindDataElement (const PrivateTag &t) const

  Look up if private tag 't' is present in the dataset:
- bool FindDataElement (const Tag &t) const
- const DataElement & FindNextDataElement (const Tag &t) const
- const DataElement & GetDataElement (const PrivateTag &t) const

  Return the dataelement.
- const DataElement & GetDataElement (const Tag &t) const
- DataElementSet & GetDES ()
- const DataElementSet & GetDES () const
- template<typename TDE >
  VL GetLength () const
- MediaStorage GetMediaStorage () const
- std::string GetPrivateCreator (const Tag &t) const

  Return the private creator of the private tag 't':
- void Insert (const DataElement &de)
- bool IsEmpty () const

  Returns if the dataset is empty.
- const DataElement & operator() (uint16_t group, uint16_t element) const
- DataSet & operator= (DataSet const &)=default
- const DataElement & operator[ ] (const Tag &t) const
- void Print (std::ostream &os, std::string const &indent="") const
- template<typename TDE , typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TDE , typename TSwap >
  std::istream & ReadNested (std::istream &is)
- template<typename TDE , typename TSwap >
  std::istream & ReadSelectedPrivateTags (std::istream &is, const std::set< PrivateTag > &tags, bool readvalues=true)
- template<typename TDE , typename TSwap >
  std::istream & ReadSelectedPrivateTagsWithLength (std::istream &is, const std::set< PrivateTag > &tags, VL &length, bool readvalues=true)
- template<typename TDE , typename TSwap >
  std::istream & ReadSelectedTags (std::istream &is, const std::set< Tag > &tags, bool readvalues=true)

- template<typename TDE , typename TSwap >
  std::istream & ReadSelectedTagsWithLength (std::istream &is, const std::set< Tag > &tags, VL &length, bool readvalues=true)
- template<typename TDE , typename TSwap >
  std::istream & ReadUpToTag (std::istream &is, const Tag &t, std::set< Tag > const &skiptags)
- template<typename TDE , typename TSwap >
  std::istream & ReadUpToTagWithLength (std::istream &is, const Tag &t, std::set< Tag > const &skiptags, VL &length)
- template<typename TDE , typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)
- SizeType Remove (const Tag &tag)

  Completely remove a dataelement from the dataset.
- void Replace (const DataElement &de)

  Replace a dataelement with another one.
- void ReplaceEmpty (const DataElement &de)

  Only replace a DICOM attribute when it is missing or empty.
- SizeType Size () const
- template<typename TDE , typename TSwap >
  std::ostream const & Write (std::ostream &os) const

Protected Member Functions

- Tag ComputeDataElement (const PrivateTag &t) const
- const DataElement & GetDEEnd () const
- void InsertDataElement (const DataElement &de)

Friends

- class CSAHeader
- std::ostream & operator<< (std::ostream &_os, const DataSet &)

10.75.1 Detailed Description

Class to represent a Data Set (which contains Data Elements)

A Data Set represents an instance of a real world Information Object

Note

DATA SET: Exchanged information consisting of a structured set of Attribute values directly or indirectly related to Information Objects. The value of each Attribute in a Data Set is expressed as a Data Element. A collection of Data Elements ordered by increasing Data Element Tag number that is an encoding of the values of Attributes of a real world object.

Implementation note. If one do: DataSet ds; ds.SetLength(0); ds.Read(is); setting length to 0 actually means try to read is as if it was a root DataSet. Other value are undefined (nested dataset with undefined length) or defined length (different from 0) means nested dataset with defined length.

Warning

a DataSet does not have a Transfer Syntax type, only a File does.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, PatchFile.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndPrintAttributes.cxx, SortImage.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, VolumeSorter.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.75.2 Member Typedef Documentation

10.75.2.1 ConstIterator

```
typedef DataElementSet::const_iterator gdcm::DataSet::ConstIterator
```

Examples

DumpVisusChange.cxx.

10.75.2.2 DataElementSet

```
typedef std::set<DataElement> gdcm::DataSet::DataElementSet
```

10.75.2.3 Iterator

```
typedef DataElementSet::iterator gdcm::DataSet::Iterator
```

10.75.2.4 SizeType

```
typedef DataElementSet::size_type gdcm::DataSet::SizeType
```

10.75.3 Member Function Documentation

10.75.3.1 Begin() [1/2]

```
Iterator gdcm::DataSet::Begin ( )  [inline]
```

10.75.3.2 Begin() [2/2]

```
ConstIterator gdcm::DataSet::Begin ( ) const  [inline]
```

Examples

DiffFile.cxx, and DuplicatePCDE.cxx.

10.75.3.3 Clear()

```
void gdcm::DataSet::Clear ( )  [inline]
```

Referenced by gdcm::Item::Read().

10.75.3.4 ComputeDataElement()

```
Tag gdcm::DataSet::ComputeDataElement (
            const PrivateTag & t ) const  [protected]
```

10.75.3.5 ComputeGroupLength()

```
template<typename TDE >
unsigned int gdcm::DataSet::ComputeGroupLength (
            Tag const & tag ) const  [inline]
```

References gdcm::Tag::GetElement(), and gdcm::Tag::GetGroup().

10.75.3.6 End() [1/2]

```
Iterator gdcm::DataSet::End ( )  [inline]
```

10.75.3.7 End() [2/2]

```
ConstIterator gdcm::DataSet::End ( ) const  [inline]
```

Examples

DiffFile.cxx, and DuplicatePCDE.cxx.

10.75.3.8 FindDataElement() [1/2]

```
bool gdcm::DataSet::FindDataElement (
            const PrivateTag & t ) const
```

Look up if private tag 't' is present in the dataset:

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, LargeVRDSExplicit.cxx, MrProtocol.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndPrintAttributes.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet(), and gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataSet().

10.75.3.9 FindDataElement() [2/2]

```
bool gdcm::DataSet::FindDataElement (
            const Tag & t ) const  [inline]
```

10.75.3.10 FindNextDataElement()

```
const DataElement& gdcm::DataSet::FindNextDataElement (
            const Tag & t ) const  [inline]
```

Examples

DuplicatePCDE.cxx.

10.75.3.11 GetDataElement() [1/2]

```
const DataElement& gdcm::DataSet::GetDataElement (
            const PrivateTag & t ) const
```

Return the dataelement.

10.75.3.12 GetDataElement() [2/2]

```
const DataElement& gdcm::DataSet::GetDataElement (
            const Tag & t ) const  [inline]
```

Return the DataElement with Tag 't'

Warning

: This only search at the 'root level' of the DataSet

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, DeriveSeries.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, LargeVRDSExplicit.cxx, MrProtocol.cxx, PatchFile.cxx, ReadAndDumpDICOMDIR.cxx, ReadExplicitLengthSQIVR.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

Referenced by gdcm::Attribute< Group, Element, TVR, TVM >::Set(), gdcm::Attribute< Group, Element, TVR, VM::↩ VM1 >::Set(), gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Set(), gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet(), gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet(), and gdcm::↩ Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataSet().

10.75.3.13 GetDEEnd()

```
const DataElement& gdcm::DataSet::GetDEEnd ( ) const  [protected]
```

10.75.3.14 GetDES() [1/2]

```
DataElementSet& gdcm::DataSet::GetDES ( )  [inline]
```

10.75.3.15 GetDES() [2/2]

```
const DataElementSet& gdcm::DataSet::GetDES ( ) const  [inline]
```

Examples

ReadAndDumpDICOMDIR.cxx.

10.75.3.16 GetLength()

```
template<typename TDE >
VL gdcm::DataSet::GetLength ( ) const  [inline]
```

References gdcm::VL::GetLength().

10.75.3.17 GetMediaStorage()

```
MediaStorage gdcm::DataSet::GetMediaStorage ( ) const
```

10.75.3.18 GetPrivateCreator()

```
std::string gdcm::DataSet::GetPrivateCreator (
            const Tag & t ) const
```

Return the private creator of the private tag 't':

Examples

DuplicatePCDE.cxx.

10.75.3.19 Insert()

```
void gdcm::DataSet::Insert (
            const DataElement & de )  [inline]
```

Insert a DataElement in the DataSet.

Warning

: Tag need to be >= 0x8 to be considered valid data element

Examples

CreateJPIPDataSet.cxx, DumpSiemensBase64.cxx, DuplicatePCDE.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, NewSequence.cs, StreamImageReaderTest.cxx, and TemplateEmptyImage.cxx.

References gdcmErrorMacro, gdcm::Tag::GetGroup(), and gdcm::DataElement::GetTag().

10.75.3.20 InsertDataElement()

```
void gdcm::DataSet::InsertDataElement (
            const DataElement & de )  [inline], [protected]
```

References gdcmWarningMacro, gdcm::Value::GetLength(), gdcm::DataElement::GetValue(), gdcm::DataElement::GetVL(), and gdcm::DataElement::IsEmpty().

10.75.3.21 IsEmpty()

```
bool gdcm::DataSet::IsEmpty ( ) const  [inline]
```

Returns if the dataset is empty.

Referenced by gdcm::Item::Read().

10.75.3.22 operator()()

```
const DataElement& gdcm::DataSet::operator() (
            uint16_t group,
            uint16_t element ) const  [inline]
```

10.75.3.23 operator=()

```
DataSet& gdcm::DataSet::operator= (
            DataSet const &  )  [default]
```

10.75.3.24 operator[]()

```
const DataElement& gdcm::DataSet::operator[] (
            const Tag & t ) const  [inline]
```

10.75.3.25 Print()

```
void gdcm::DataSet::Print (
            std::ostream & os,
            std::string const & indent = "" ) const  [inline]
```

10.75.3.26 Read()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::Read (
            std::istream & is )
```

Examples

DumpToshibaDTI.cxx, and DumpToshibaDTI2.cxx.

10.75.3.27 ReadNested()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadNested (
            std::istream & is )
```

10.75.3.28 ReadSelectedPrivateTags()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadSelectedPrivateTags (
             std::istream & is,
             const std::set< PrivateTag > & tags,
             bool readvalues = true )
```

10.75.3.29 ReadSelectedPrivateTagsWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadSelectedPrivateTagsWithLength (
             std::istream & is,
             const std::set< PrivateTag > & tags,
             VL & length,
             bool readvalues = true )
```

10.75.3.30 ReadSelectedTags()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadSelectedTags (
             std::istream & is,
             const std::set< Tag > & tags,
             bool readvalues = true )
```

10.75.3.31 ReadSelectedTagsWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadSelectedTagsWithLength (
             std::istream & is,
             const std::set< Tag > & tags,
             VL & length,
             bool readvalues = true )
```

10.75.3.32 ReadUpToTag()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadUpToTag (
             std::istream & is,
             const Tag & t,
             std::set< Tag > const & skiptags )
```

10.75.3.33 ReadUpToTagWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadUpToTagWithLength (
             std::istream & is,
             const Tag & t,
             std::set< Tag > const & skiptags,
             VL & length )
```

10.75.3.34 ReadWithLength()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::DataSet::ReadWithLength (
             std::istream & is,
             VL & length )
```

10.75.3.35 Remove()

```
SizeType gdcm::DataSet::Remove (
             const Tag & tag )  [inline]
```

Completely remove a dataelement from the dataset.

Examples

ClinicalTrialIdentificationWorkflow.cs, GenFakeIdentifyFile.cxx, LargeVRDSExplicit.cxx, MergeTwoFiles.cxx, ReformatFile.cs, StandardizeFiles.cs, pmsct_rgb1.cxx, and rle2img.cxx.

10.75.3.36 Replace()

```
void gdcm::DataSet::Replace (
             const DataElement & de )  [inline]
```

Replace a dataelement with another one.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenFakeIdentifyFile.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, PatchFile.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

References gdcmAssertAlwaysMacro.

10.75.3.37 ReplaceEmpty()

```
void gdcm::DataSet::ReplaceEmpty (
            const DataElement & de )  [inline]
```

Only replace a DICOM attribute when it is missing or empty.

Examples

rle2img.cxx.

References gdcmAssertAlwaysMacro.

10.75.3.38 Size()

```
SizeType gdcm::DataSet::Size ( ) const  [inline]
```

Examples

DumpGEMSMovieGroup.cxx.

Referenced by gdcm::SequenceOfItems::Read().

10.75.3.39 Write()

```
template<typename TDE , typename TSwap >
std::ostream const& gdcm::DataSet::Write (
            std::ostream & os ) const
```

10.75.4 Friends And Related Function Documentation

10.75.4.1 CSAHeader

```
friend class CSAHeader  [friend]
```

10.75.4.2 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const DataSet & val )  [friend]
```

The documentation for this class was generated from the following file:

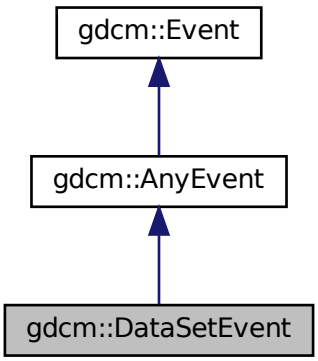
- gdcmDataSet.h

10.76 gdcm::DataSetEvent Class Reference

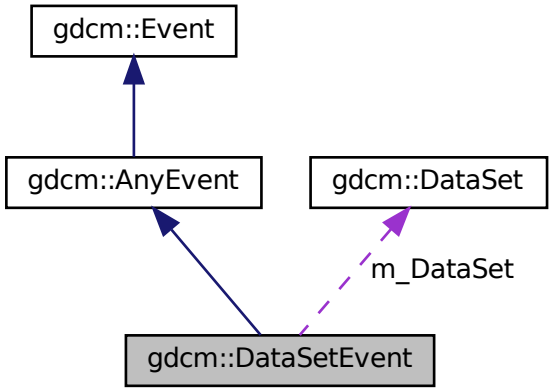
DataSetEvent.

```
#include <gdcmDataSetEvent.h>
```

Inheritance diagram for gdcm::DataSetEvent:



Collaboration diagram for gdcm::DataSetEvent:



Public Types

- typedef DataSetEvent Self
- typedef AnyEvent Superclass

Public Member Functions

- DataSetEvent (const Self &s)
- DataSetEvent (DataSet const *ds=nullptr)
- ~DataSetEvent () override=default
- bool CheckEvent (const ::gdcm::Event *e) const override
- DataSet const & GetDataSet () const
- const char * GetEventName () const override
- ::gdcm::Event * MakeObject () const override
- void operator= (const Self &)=delete

Public Attributes

- const DataSet * m_DataSet

10.76.1 Detailed Description

DataSetEvent.

Special type of event triggered during the DataSet store/move process

See also

10.76.2 Member Typedef Documentation

10.76.2.1 Self

```
typedef DataSetEvent gdcm::DataSetEvent::Self
```

10.76.2.2 Superclass

```
typedef AnyEvent gdcm::DataSetEvent::Superclass
```

10.76.3 Constructor & Destructor Documentation

10.76.3.1 DataSetEvent() [1/2]

```
gdcm::DataSetEvent::DataSetEvent (
            DataSet const * ds = nullptr )  [inline]
```

10.76.3.2 ~DataSetEvent()

```
gdcm::DataSetEvent::~DataSetEvent ( )  [override], [default]
```

10.76.3.3 DataSetEvent() [2/2]

```
gdcm::DataSetEvent::DataSetEvent (
            const Self & s )  [inline]
```

10.76.4 Member Function Documentation

10.76.4.1 CheckEvent()

```
bool gdcm::DataSetEvent::CheckEvent (
            const ::gdcm::Event * e ) const  [inline], [override]
```

10.76.4.2 GetDataSet()

```
DataSet const& gdcm::DataSetEvent::GetDataSet ( ) const  [inline]
```

References m_DataSet.

10.76.4.3 GetEventName()

```
const char* gdcm::DataSetEvent::GetEventName ( ) const  [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements gdcm::Event.

10.76.4.4 MakeObject()

```
::gdcm::Event* gdcm::DataSetEvent::MakeObject ( ) const  [inline], [override], [virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implements gdcm::Event.

10.76.4.5 operator=()

```
void gdcm::DataSetEvent::operator= (
            const Self &  )  [delete]
```

10.76.5 Member Data Documentation

10.76.5.1 m_DataSet

```
const DataSet* gdcm::DataSetEvent::m_DataSet
```

Referenced by GetDataSet().

The documentation for this class was generated from the following file:

- gdcmDataSetEvent.h

10.77 gdcm::DataSetHelper Class Reference

DataSetHelper (internal class, not intended for user level)

```
#include <gdcmDataSetHelper.h>
```

Static Public Member Functions

- static VR ComputeVR (File const &file, DataSet const &ds, const Tag &tag)

10.77.1 Detailed Description

DataSetHelper (internal class, not intended for user level)

10.77.2 Member Function Documentation

10.77.2.1 ComputeVR()

```
static VR gdcm::DataSetHelper::ComputeVR (
            File const & file,
            DataSet const & ds,
            const Tag & tag )  [static]
```

ds -> current dataset, which is not the same as the root dataset return VR::INVALID in case of error

The documentation for this class was generated from the following file:

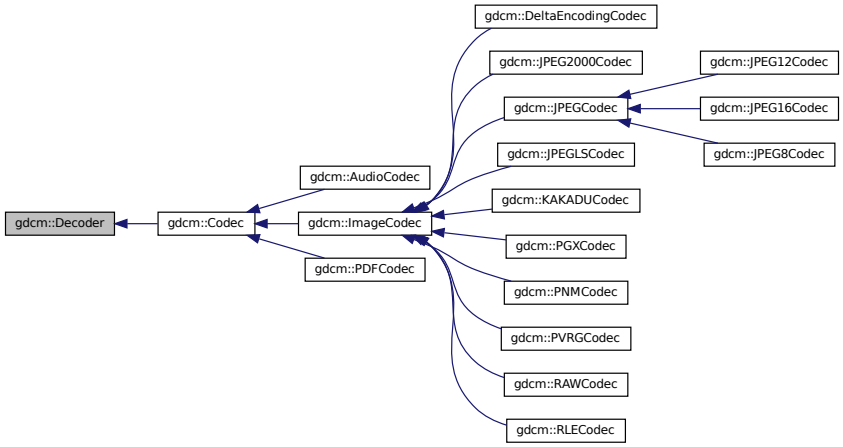
- gdcmDataSetHelper.h

10.78 gdcm::Decoder Class Reference

Decoder.

`#include <gdcmDecoder.h>`

Inheritance diagram for gdcm::Decoder:



Public Member Functions

- virtual ~Decoder ()=default
- virtual bool CanDecode (TransferSyntax const &) const =0

  Return whether this decoder support this transfer syntax (can decode it)
- virtual bool Decode (DataElement const &, DataElement &)

  Decode.

Protected Member Functions

- virtual bool DecodeByStreams (std::istream &, std::ostream &)

10.78.1 Detailed Description

Decoder.

10.78.2 Constructor & Destructor Documentation

10.78.2.1 ~Decoder()

```
virtual gdcm::Decoder::~Decoder ( )  [virtual], [default]
```

10.78.3 Member Function Documentation

10.78.3.1 CanDecode()

```
virtual bool gdcm::Decoder::CanDecode (
            TransferSyntax const &  ) const  [pure virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, gdcm::JPEG2000Codec, gdcm::PDFCodec, gdcm::ImageCodec, and gdcm::AudioCodec.

10.78.3.2 Decode()

```
virtual bool gdcm::Decoder::Decode (
            DataElement const & ,
            DataElement &  )  [inline], [virtual]
```

Decode.

Reimplemented in gdcm::ImageCodec, gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PDFCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, gdcm::JPEG2000Codec, gdcm::AudioCodec, and gdcm::DeltaEncodingCodec.

10.78.3.3 DecodeByStreams()

```
virtual bool gdcm::Decoder::DecodeByStreams (
            std::istream & ,
            std::ostream &  )  [inline], [protected], [virtual]
```

Reimplemented in gdcm::ImageCodec, gdcm::RLECodec, gdcm::RAWCodec, gdcm::JPEGCodec, gdcm::JPEG8Codec, gdcm::JPEG2000Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

The documentation for this class was generated from the following file:

- gdcmDecoder.h

10.79 gdcm::DefinedTerms Class Reference

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data Element with Defined Terms that does not contain a Value equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation Type ID (4008,0210) is an example of a Data Element having Defined Terms. It is defined to have a Value that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data Element has Defined Terms other Interpretation Type IDs may be defined by the implementor.

`#include <gdcmDefinedTerms.h>`

Public Member Functions

- DefinedTerms ()=default

10.79.1 Detailed Description

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data Element with Defined Terms that does not contain a Value equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation Type ID (4008,0210) is an example of a Data Element having Defined Terms. It is defined to have a Value that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data Element has Defined Terms other Interpretation Type IDs may be defined by the implementor.

10.79.2 Constructor & Destructor Documentation

10.79.2.1 DefinedTerms()

`gdcm::DefinedTerms::DefinedTerms ( ) [default]`

The documentation for this class was generated from the following file:

- gdcmDefinedTerms.h

10.80 gdcm::Defs Class Reference

FIXME I do not like the name 'Defs'.

`#include <gdcmDefs.h>`

Public Member Functions

- Defs ()
- Defs (const Defs &val)=delete
- ~Defs ()
- const IOD & GetIODFromFile (const File &file) const
- IODs & GetIODs ()
- const IODs & GetIODs () const
- Macros & GetMacros ()
- const Macros & GetMacros () const
- Modules & GetModules ()
- const Modules & GetModules () const
- Type GetTypeFromTag (const File &file, const Tag &tag) const
- bool IsEmpty () const
- Defs & operator= (const Defs &val)=delete
- bool Verify (const DataSet &ds) const
- bool Verify (const File &file) const

Static Public Member Functions

- static const char * GetIODNameFromMediaStorage (MediaStorage const &ms)

Protected Member Functions

- void LoadDefaults ()
- void LoadFromFile (const char *filename)

Friends

- class Global

10.80.1 Detailed Description

FIXME I do not like the name 'Defs'.

Note

bla

Examples

GenerateStandardSOPClasses.cxx.

10.80.2 Constructor & Destructor Documentation

10.80.2.1 Defs() [1/2]

```
gdcm::Defs::Defs ( )
```

10.80.2.2 ~Defs()

```
gdcm::Defs::~Defs ( )
```

10.80.2.3 Defs() [2/2]

```
gdcm::Defs::Defs (
            const Defs & val )  [delete]
```

10.80.3 Member Function Documentation

10.80.3.1 GetIODFromFile()

```
const IOD& gdcm::Defs::GetIODFromFile (
            const File & file ) const
```

10.80.3.2 GetIODNameFromMediaStorage()

```
static const char* gdcm::Defs::GetIODNameFromMediaStorage (
            MediaStorage const & ms )  [static]
```

Examples

GenerateStandardSOPClasses.cxx.

10.80.3.3 GetIODs() [1/2]

```
IODs& gdcm::Defs::GetIODs ( )  [inline]
```

10.80.3.4 GetIODs() [2/2]

```
const IODs& gdcm::Defs::GetIODs ( ) const  [inline]
```

10.80.3.5 GetMacros() [1/2]

```
Macros& gdcm::Defs::GetMacros ( )  [inline]
```

10.80.3.6 GetMacros() [2/2]

```
const Macros& gdcm::Defs::GetMacros ( ) const  [inline]
```

Users should not directly use Macro. Macro are simply a way for DICOM WG to re-use Tables. Macros are conviently wrapped within Modules. See gdcm::Module API directly

10.80.3.7 GetModules() [1/2]

```
Modules& gdcm::Defs::GetModules ( )  [inline]
```

10.80.3.8 GetModules() [2/2]

```
const Modules& gdcm::Defs::GetModules ( ) const  [inline]
```

10.80.3.9 GetTypeFromTag()

```
Type gdcm::Defs::GetTypeFromTag (
            const File & file,
            const Tag & tag ) const
```

10.80.3.10 IsEmpty()

```
bool gdcm::Defs::IsEmpty ( ) const  [inline]
```

10.80.3.11 LoadDefaults()

```
void gdcm::Defs::LoadDefaults ( )  [protected]
```

10.80.3.12 LoadFromFile()

```
void gdcm::Defs::LoadFromFile (
            const char * filename )  [protected]
```

10.80.3.13 operator=()

```
Defs& gdcm::Defs::operator= (
            const Defs & val )  [delete]
```

10.80.3.14 Verify() [1/2]

```
bool gdcm::Defs::Verify (
            const DataSet & ds ) const
```

10.80.3.15 Verify() [2/2]

```
bool gdcm::Defs::Verify (
            const File & file ) const
```

10.80.4 Friends And Related Function Documentation

10.80.4.1 Global

```
friend class Global  [friend]
```

The documentation for this class was generated from the following file:

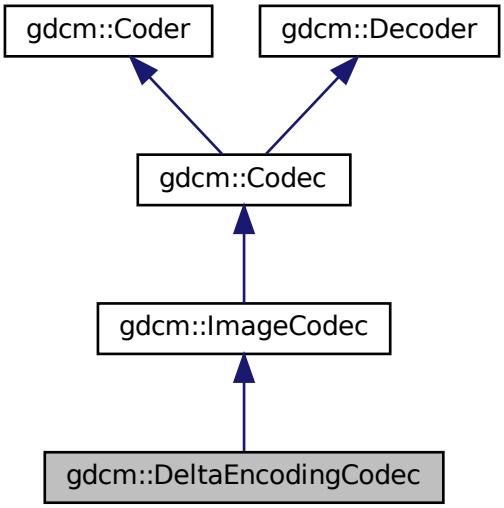
- gdcmDefs.h

10.81 gdcm::DeltaEncodingCodec Class Reference

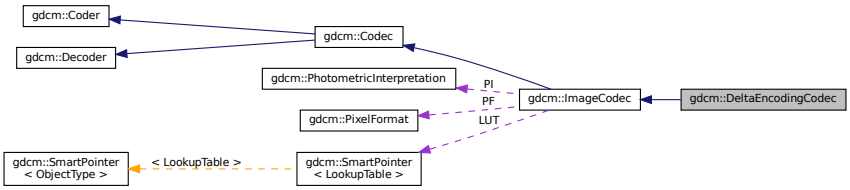
DeltaEncodingCodec compression used by some private vendor.

`#include <gdcmDeltaEncodingCodec.h>`

Inheritance diagram for gdcm::DeltaEncodingCodec:



Collaboration diagram for gdcm::DeltaEncodingCodec:



Public Member Functions

- DeltaEncodingCodec ()
- ~DeltaEncodingCodec ()
- bool CanDecode (TransferSyntax const &ts)
- bool Decode (DataElement const &is, DataElement &os)

  Decode.

Protected Member Functions

- bool Decode (std::istream &is, std::ostream &os)

Additional Inherited Members

10.81.1 Detailed Description

DeltaEncodingCodec compression used by some private vendor.

10.81.2 Constructor & Destructor Documentation

10.81.2.1 DeltaEncodingCodec()

```
gdcm::DeltaEncodingCodec::DeltaEncodingCodec ( )
```

10.81.2.2 ~DeltaEncodingCodec()

```
gdcm::DeltaEncodingCodec::~DeltaEncodingCodec ( )
```

10.81.3 Member Function Documentation

10.81.3.1 CanDecode()

```
bool gdcm::DeltaEncodingCodec::CanDecode (
            TransferSyntax const & ts )
```

10.81.3.2 Decode() [1/2]

```
bool gdcm::DeltaEncodingCodec::Decode (
            DataElement const & ,
            DataElement &  )  [virtual]
```

Decode.

Reimplemented from gdcm::Decoder.

10.81.3.3 Decode() [2/2]

```
bool gdcm::DeltaEncodingCodec::Decode (
            std::istream & is,
            std::ostream & os )  [protected]
```

The documentation for this class was generated from the following file:

- gdcmDeltaEncodingCodec.h

10.82 gdcm::DICOMDIR Class Reference

DICOMDIR class.

```
#include <gdcmDICOMDIR.h>
```

Public Member Functions

- DICOMDIR ()=default
- DICOMDIR (FileSet fs)

10.82.1 Detailed Description

DICOMDIR class.

Structured for handling DICOMDIR

10.82.2 Constructor & Destructor Documentation

10.82.2.1 DICOMDIR() [1/2]

```
gdcm::DICOMDIR::DICOMDIR ( )  [default]
```

10.82.2.2 DICOMDIR() [2/2]

```
gdcm::DICOMDIR::DICOMDIR (
            FileSet fs )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmDICOMDIR.h

10.83 gdcm::DICOMDIRGenerator Class Reference

DICOMDIRGenerator class.

```
#include <gdcmDICOMDIRGenerator.h>
```

Public Types

- typedef Directory::FilenamesType FilenamesType
- typedef Directory::FilenameType FilenameType

Public Member Functions

- DICOMDIRGenerator ()
- ~DICOMDIRGenerator ()
- bool Generate ()

  Main function to generate the DICOMDIR.
- File & GetFile ()
- void SetDescriptor (const char *d)
- void SetFile (const File &f)

  Set/Get file. The DICOMDIR file will be valid once a call to Generate has been done.
- void SetFilenames (FilenamesType const &fns)

  Set the list of filenames from which the DICOMDIR should be generated from.
- void SetRootDirectory (FilenameType const &root)

  Set the root directory from which the filenames should be considered.

Protected Member Functions

- bool AddImageDirectoryRecord ()
- bool AddPatientDirectoryRecord ()
- bool AddSeriesDirectoryRecord ()
- bool AddStudyDirectoryRecord ()
- Scanner & GetScanner ()

10.83.1 Detailed Description

DICOMDIRGenerator class.

This is a STD-GEN-CD DICOMDIR generator. ref: PS 3.11-2008 Annex D (Normative) - General Purpose CD-R and DVD Interchange Profiles

Note

PS 3.11 - 2008 / D.3.2 Physical Medium And Medium Format The STD-GEN-CD and STD-GEN-SEC-CD application profiles require the 120 mm CD-R physical medium with the ISO/IEC 9660 Media Format, as defined in PS3.12. See also PS 3.12 - 2008 / Annex F 120mm CD-R Medium (Normative) and PS 3.10 - 2008 / 8 DICOM File Service / 8.1 FILE-SET

Warning

: PS 3.11 - 2008 / D.3.1 SOP Classes and Transfer Syntaxes Composite Image & Stand-alone Storage are required to be stored as Explicit VR Little Endian Uncompressed (1.2.840.10008.1.2.1). When a DICOM file is found using another Transfer Syntax the generator will simply stops.

- Input files should be Explicit VR Little Endian
- filenames should be valid VR::CS value (16 bytes, upper case ...)

Bug : There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the Scanner does not allow us See PS 3.11 / Table D.3-2 STD-GEN Additional DICOMDIR Keys

10.83.2 Member Typedef Documentation

10.83.2.1 FilenamesType

```
typedef Directory::FilenamesType gdcm::DICOMDIRGenerator::FilenamesType
```

10.83.2.2 FilenameType

```
typedef Directory::FilenameType gdcm::DICOMDIRGenerator::FilenameType
```

10.83.3 Constructor & Destructor Documentation

10.83.3.1 DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::DICOMDIRGenerator ( )
```

10.83.3.2 ~DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::~DICOMDIRGenerator ( )
```

10.83.4 Member Function Documentation

10.83.4.1 AddImageDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddImageDirectoryRecord ( )  [protected]
```

10.83.4.2 AddPatientDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddPatientDirectoryRecord ( )  [protected]
```

10.83.4.3 AddSeriesDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddSeriesDirectoryRecord ( )  [protected]
```

10.83.4.4 AddStudyDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddStudyDirectoryRecord ( )  [protected]
```

10.83.4.5 Generate()

```
bool gdcm::DICOMDIRGenerator::Generate ( )
```

Main function to generate the DICOMDIR.

10.83.4.6 GetFile()

```
File& gdcm::DICOMDIRGenerator::GetFile ( )
```

10.83.4.7 GetScanner()

```
Scanner& gdcm::DICOMDIRGenerator::GetScanner ( )  [protected]
```

10.83.4.8 SetDescriptor()

```
void gdcm::DICOMDIRGenerator::SetDescriptor (
            const char * d )
```

Set the File Set ID.

Warning

this need to be a valid VR::CS value

10.83.4.9 SetFile()

```
void gdcm::DICOMDIRGenerator::SetFile (
            const File & f )
```

Set/Get file. The DICOMDIR file will be valid once a call to Generate has been done.

10.83.4.10 SetFilenames()

```
void gdcm::DICOMDIRGenerator::SetFilenames (
            FilenamesType const & fns )
```

Set the list of filenames from which the DICOMDIR should be generated from.

10.83.4.11 SetRootDirectory()

```
void gdcm::DICOMDIRGenerator::SetRootDirectory (
            FilenameType const & root )
```

Set the root directory from which the filenames should be considered.

The documentation for this class was generated from the following file:

- gdcmDICOMDIRGenerator.h

10.84 gdcm::Dict Class Reference

Class to represent a map of DictEntry.

```
#include <gdcmDict.h>
```

Public Types

- typedef MapDictEntry::const_iterator ConstIterator
- typedef MapDictEntry::iterator Iterator
- typedef std::map< Tag, DictEntry > MapDictEntry

Public Member Functions

- Dict ()
- Dict (const Dict &_val)=delete
- void AddDictEntry (const Tag &tag, const DictEntry &de)
- ConstIterator Begin () const
- ConstIterator End () const
- const DictEntry & GetDictEntry (const Tag &tag) const
- const DictEntry & GetDictEntryByKeyword (const char *keyword, Tag &tag) const
- const DictEntry & GetDictEntryByName (const char *name, Tag &tag) const
- const char * GetKeywordFromTag (Tag const &tag) const

  Function to return the Keyword from a Tag.
- bool IsEmpty () const
- Dict & operator= (const Dict &_val)=delete

Protected Member Functions

- void LoadDefault ()

Friends

- class Dicts
- std::ostream & operator<< (std::ostream &_os, const Dict &_val)

10.84.1 Detailed Description

Class to represent a map of DictEntry.

Note

bla TODO FIXME: For Element == 0x0 need to return Name = Group Length ValueRepresentation = UL Value↩ Multiplicity = 1

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, PublicDict.cxx, and ReadAndPrintAttributes.cxx.

10.84.2 Member Typedef Documentation

10.84.2.1 ConstIterator

```
typedef MapDictEntry::const_iterator gdcm::Dict::ConstIterator
```

10.84.2.2 Iterator

```
typedef MapDictEntry::iterator gdcm::Dict::Iterator
```

10.84.2.3 MapDictEntry

```
typedef std::map<Tag, DictEntry> gdcm::Dict::MapDictEntry
```

10.84.3 Constructor & Destructor Documentation

10.84.3.1 Dict() [1/2]

```
gdcm::Dict::Dict ( )  [inline]
```

10.84.3.2 Dict() [2/2]

```
gdcm::Dict::Dict (
            const Dict & _val )  [delete]
```

10.84.4 Member Function Documentation

10.84.4.1 AddDictEntry()

```
void gdcm::Dict::AddDictEntry (
            const Tag & tag,
            const DictEntry & de )  [inline]
```

10.84.4.2 Begin()

```
ConstIterator gdcm::Dict::Begin ( ) const  [inline]
```

Examples

GenAllVR.cxx, and GenFakeIdentifyFile.cxx.

10.84.4.3 End()

```
ConstIterator gdcm::Dict::End ( ) const  [inline]
```

Examples

GenAllVR.cxx, and GenFakeIdentifyFile.cxx.

10.84.4.4 GetDictEntry()

```
const DictEntry& gdcm::Dict::GetDictEntry (
            const Tag & tag ) const  [inline]
```

Examples

GenFakeIdentifyFile.cxx, and PublicDict.cxx.

10.84.4.5 GetDictEntryByKeyword()

```
const DictEntry& gdcm::Dict::GetDictEntryByKeyword (
            const char * keyword,
            Tag & tag ) const  [inline]
```

Lookup DictEntry by keyword. Even if DICOM standard defines keyword as being unique. The lookup table is built on Tag. Therefore looking up a DictEntry by Keyword is more inefficient than looking up by Tag.

10.84.4.6 GetDictEntryByName()

```
const DictEntry& gdcm::Dict::GetDictEntryByName (
            const char * name,
            Tag & tag ) const  [inline]
```

Inefficient way of looking up tag by name. Technically DICOM does not guarantee uniqueness (and Curve / Overlay are there to prove it). But most of the time name is in fact uniq and can be uniquely link to a tag

Examples

ReadAndPrintAttributes.cxx.

10.84.4.7 GetKeywordFromTag()

```
const char* gdcm::Dict::GetKeywordFromTag (
            Tag const & tag ) const  [inline]
```

Function to return the Keyword from a Tag.

10.84.4.8 IsEmpty()

```
bool gdcm::Dict::IsEmpty ( ) const  [inline]
```

10.84.4.9 LoadDefault()

```
void gdcm::Dict::LoadDefault ( )  [protected]
```

10.84.4.10 operator=()

```
Dict& gdcm::Dict::operator= (
            const Dict & _val )  [delete]
```

10.84.5 Friends And Related Function Documentation

10.84.5.1 Dicts

```
friend class Dicts  [friend]
```

10.84.5.2 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Dict & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmDict.h

10.85 gdcm::DictConverter Class Reference

Class to convert a .dic file into something else:

```
#include <gdcmDictConverter.h>
```

Public Types

- enum OutputTypes {
  DICT_DEFAULT = 0 ,
  DICT_DEBUG ,
  DICT_XML }

Public Member Functions

- DictConverter ()
- ~DictConverter ()
- void Convert ()
- const std::string & GetDictName () const
- const std::string & GetInputFilename () const
- const std::string & GetOutputFilename () const
- int GetOutputType () const
- void SetDictName (const char *name)
- void SetInputFileName (const char *filename)
- void SetOutputFileName (const char *filename)
- void SetOutputType (int type)

Static Public Member Functions

- static bool Readuint16 (const char *raw, uint16_t &ov)
- static bool ReadVM (const char *raw, VM::VMType &type)
- static bool ReadVR (const char *raw, VR::VRType &type)

Protected Member Functions

- void AddGroupLength ()
- bool ConvertToCXX (const char *raw, std::string &cxx)
- bool ConvertToXML (const char *raw, std::string &cxx)
- void WriteFooter ()
- void WriteHeader ()

10.85.1 Detailed Description

Class to convert a .dic file into something else:

- CXX code : embed dict into shared lib (DICT_DEFAULT)
- Debug mode (DICT_DEBUG)
- XML dict (DICT_XML)

Note

10.85.2 Member Enumeration Documentation

10.85.2.1 OutputTypes

enum gdcm::DictConverter::OutputTypes

Enumerator

DICT_DEFAULT	
DICT_DEBUG	
DICT_XML	

10.85.3 Constructor & Destructor Documentation

10.85.3.1 DictConverter()

```
gdcm::DictConverter::DictConverter ( )
```

10.85.3.2 ~DictConverter()

```
gdcm::DictConverter::~DictConverter ( )
```

10.85.4 Member Function Documentation

10.85.4.1 AddGroupLength()

```
void gdcm::DictConverter::AddGroupLength ( )  [protected]
```

10.85.4.2 Convert()

```
void gdcm::DictConverter::Convert ( )
```

10.85.4.3 ConvertToCXX()

```
bool gdcm::DictConverter::ConvertToCXX (
            const char * raw,
            std::string & cxx )  [protected]
```

10.85.4.4 ConvertToXML()

```
bool gdcm::DictConverter::ConvertToXML (
            const char * raw,
            std::string & cxx )  [protected]
```

10.85.4.5 GetDictName()

```
const std::string& gdcm::DictConverter::GetDictName ( ) const
```

10.85.4.6 GetInputFilename()

```
const std::string& gdcm::DictConverter::GetInputFilename ( ) const
```

10.85.4.7 GetOutputFilename()

```
const std::string& gdcm::DictConverter::GetOutputFilename ( ) const
```

10.85.4.8 GetOutputType()

```
int gdcm::DictConverter::GetOutputType ( ) const  [inline]
```

10.85.4.9 Readuint16()

```
static bool gdcm::DictConverter::Readuint16 (
            const char * raw,
            uint16_t & ov )  [static]
```

10.85.4.10 ReadVM()

```
static bool gdcm::DictConverter::ReadVM (
            const char * raw,
            VM::VMType & type )  [static]
```

10.85.4.11 ReadVR()

```
static bool gdcm::DictConverter::ReadVR (
            const char * raw,
            VR::VRType & type )  [static]
```

10.85.4.12 SetDictName()

```
void gdcm::DictConverter::SetDictName (
            const char * name )
```

10.85.4.13 SetInputFileName()

```
void gdcm::DictConverter::SetInputFileName (
            const char * filename )
```

10.85.4.14 SetOutputFileName()

```
void gdcm::DictConverter::SetOutputFileName (
            const char * filename )
```

10.85.4.15 SetOutputType()

```
void gdcm::DictConverter::SetOutputType (
            int type )  [inline]
```

10.85.4.16 WriteFooter()

```
void gdcm::DictConverter::WriteFooter ( )  [protected]
```

10.85.4.17 WriteHeader()

```
void gdcm::DictConverter::WriteHeader ( )  [protected]
```

The documentation for this class was generated from the following file:

- gdcmDictConverter.h

10.86 gdcm::DictEntry Class Reference

Class to represent an Entry in the Dict.

`#include <gdcmDictEntry.h>`

Public Member Functions

- DictEntry (const char *name="", const char *keyword="", VR const &vr=VR::INVALID, VM const &vm=VM::VM0, bool ret=false)
- const char * GetKeyword () const

  same as GetName but without spaces...
- const char * GetName () const

  Set/Get Name.
- bool GetRetired () const

  Set/Get Retired flag.
- const VM & GetVM () const

  Set/Get VM.
- const VR & GetVR () const

  Set/Get VR.
- bool IsUnique () const
- void SetElementXX (bool v)

  Set whether element is shared in multiple elements (Source Image IDs typically)
- void SetGroupXX (bool v)

  Set whether element is shared in multiple groups (Curve/Overlay typically)
- void SetKeyword (const char *keyword)
- void SetName (const char *name)
- void SetRetired (bool retired)
- void SetVM (VM const &vm)
- void SetVR (const VR &vr)

Friends

- class Dict
- std::ostream & operator<< (std::ostream &_os, const DictEntry &_val)

10.86.1 Detailed Description

Class to represent an Entry in the Dict.

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from gdcm::Tag to the needed information

Note

bla TODO FIXME: Need a PublicDictEntry...indeed DictEntry has a notion of retired which does not exist in PrivateDictEntry...

See also

gdcm::Dict

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, and PublicDict.cxx.

10.86.2 Constructor & Destructor Documentation

10.86.2.1 DictEntry()

```
gdcm::DictEntry::DictEntry (
            const char * name = "",
            const char * keyword = "",
            VR const & vr = VR::INVALID,
            VM const & vm = VM::VM0,
            bool ret = false )  [inline]
```

10.86.3 Member Function Documentation

10.86.3.1 GetKeyword()

```
const char* gdcm::DictEntry::GetKeyword ( ) const  [inline]
```

same as GetName but without spaces...

10.86.3.2 GetName()

```
const char* gdcm::DictEntry::GetName ( ) const  [inline]
```

Set/Get Name.

Referenced by gdcm::PrivateDict::PrintXML().

10.86.3.3 GetRetired()

```
bool gdcm::DictEntry::GetRetired ( ) const  [inline]
```

Set/Get Retired flag.

Examples

GenAllVR.cxx.

10.86.3.4 GetVM()

```
const VM& gdcm::DictEntry::GetVM ( ) const  [inline]
```

Set/Get VM.

Referenced by gdcm::PrivateDict::AddDictEntry(), and gdcm::PrivateDict::PrintXML().

10.86.3.5 GetVR()

```
const VR& gdcm::DictEntry::GetVR ( ) const  [inline]
```

Set/Get VR.

Examples

GenAllVR.cxx, and GenFakeIdentifyFile.cxx.

Referenced by gdcm::PrivateDict::AddDictEntry(), and gdcm::PrivateDict::PrintXML().

10.86.3.6 IsUnique()

```
bool gdcm::DictEntry::IsUnique ( ) const  [inline]
```

Return whether the name of the DataElement can be considered to be unique. As of 2008 all elements name were unique (except the expclitely 'XX' ones)

10.86.3.7 SetElementXX()

```
void gdcm::DictEntry::SetElementXX (
            bool v )  [inline]
```

Set whether element is shared in multiple elements (Source Image IDs typically)

10.86.3.8 SetGroupXX()

```
void gdcm::DictEntry::SetGroupXX (
            bool v )  [inline]
```

Set whether element is shared in multiple groups (Curve/Overlay typically)

10.86.3.9 SetKeyword()

```
void gdcm::DictEntry::SetKeyword (
            const char * keyword )  [inline]
```

10.86.3.10 SetName()

```
void gdcm::DictEntry::SetName (
            const char * name )  [inline]
```

10.86.3.11 SetRetired()

```
void gdcm::DictEntry::SetRetired (
            bool retired )  [inline]
```

10.86.3.12 SetVM()

```
void gdcm::DictEntry::SetVM (
            VM const & vm )  [inline]
```

Referenced by gdcm::PrivateDict::AddDictEntry().

10.86.3.13 SetVR()

```
void gdcm::DictEntry::SetVR (
            const VR & vr )  [inline]
```

Referenced by gdcm::PrivateDict::AddDictEntry().

10.86.4 Friends And Related Function Documentation

10.86.4.1 Dict

```
friend class Dict  [friend]
```

10.86.4.2 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const DictEntry & _val )  [friend]
```

The documentation for this class was generated from the following file:

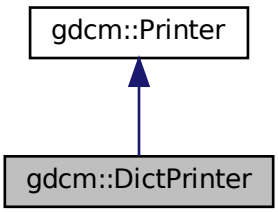
- gdcmDictEntry.h

10.87 gdcm::DictPrinter Class Reference

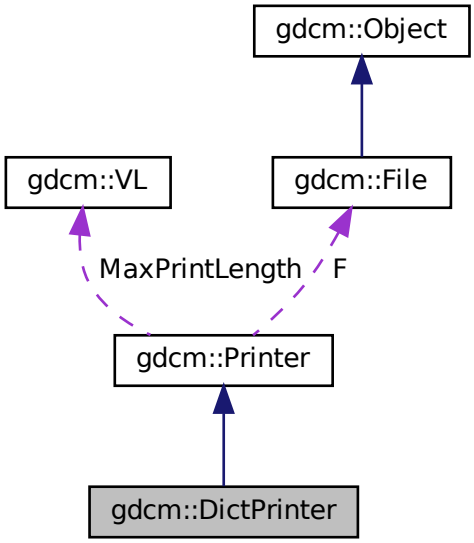
DictPrinter class.

```
#include <gdcmDictPrinter.h>
```

Inheritance diagram for gdcm::DictPrinter:



Collaboration diagram for gdcm::DictPrinter:



Public Member Functions

- DictPrinter ()
- ~DictPrinter ()
- void Print (std::ostream &os)

Protected Member Functions

- void PrintDataElement2 (std::ostream &os, const DataSet &ds, const DataElement &ide)
- void PrintDataSet2 (std::ostream &os, const DataSet &ds)

Additional Inherited Members

10.87.1 Detailed Description

DictPrinter class.

10.87.2 Constructor & Destructor Documentation

10.87.2.1 DictPrinter()

```
gdcm::DictPrinter::DictPrinter ( )
```

10.87.2.2 ~DictPrinter()

```
gdcm::DictPrinter::~DictPrinter ( )
```

10.87.3 Member Function Documentation

10.87.3.1 Print()

```
void gdcm::DictPrinter::Print (
            std::ostream & os )
```

10.87.3.2 PrintDataElement2()

```
void gdcm::DictPrinter::PrintDataElement2 (
            std::ostream & os,
            const DataSet & ds,
            const DataElement & ide )  [protected]
```

10.87.3.3 PrintDataSet2()

```
void gdcm::DictPrinter::PrintDataSet2 (
            std::ostream & os,
            const DataSet & ds )  [protected]
```

The documentation for this class was generated from the following file:

- gdcmDictPrinter.h

10.88 gdcm::Dicts Class Reference

Class to manipulate the sum of knowledge (all the dict user load)

`#include <gdcmDicts.h>`

Public Member Functions

- Dicts ()
- Dicts (const Dicts &_val)=delete
- ~Dicts ()
- const CSAHeaderDict & GetCSAHeaderDict () const
- const DictEntry & GetDictEntry (const PrivateTag &tag) const
- const DictEntry & GetDictEntry (const Tag &tag, const char *owner=nullptr) const

  THREAD SAFE.
- PrivateDict & GetPrivateDict ()
- const PrivateDict & GetPrivateDict () const
- const Dict & GetPublicDict () const
- bool IsEmpty () const
- Dicts & operator= (const Dicts &_val)=delete

Protected Types

- enum ConstructorType {
  PHILIPS ,
  GEMS ,
  SIEMENS }

Protected Member Functions

- void LoadDefaults ()

Static Protected Member Functions

- static const char * GetConstructorString (ConstructorType type)

Friends

- class Global
- std::ostream & operator<< (std::ostream &_os, const Dicts &d)

10.88.1 Detailed Description

Class to manipulate the sum of knowledge (all the dict user load)

Note

bla

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, PublicDict.cxx, and ReadAndPrintAttributes.cxx.

10.88.2 Member Enumeration Documentation

10.88.2.1 ConstructorType

```
enum gdcm::Dicts::ConstructorType  [protected]
```

Enumerator

PHILIPS	
GEMS	
SIEMENS	

10.88.3 Constructor & Destructor Documentation

10.88.3.1 Dicts() [1/2]

```
gdcm::Dicts::Dicts ( )
```

10.88.3.2 ~Dicts()

```
gdcm::Dicts::~Dicts ( )
```

10.88.3.3 Dicts() [2/2]

```
gdcm::Dicts::Dicts (
            const Dicts & _val )  [delete]
```

10.88.4 Member Function Documentation

10.88.4.1 GetConstructorString()

```
static const char* gdcm::Dicts::GetConstructorString (
            ConstructorType type )  [static], [protected]
```

10.88.4.2 GetCSAHeaderDict()

```
const CSAHeaderDict& gdcm::Dicts::GetCSAHeaderDict ( ) const
```

Examples

MrProtocol.cxx.

10.88.4.3 GetDictEntry() [1/2]

```
const DictEntry& gdcm::Dicts::GetDictEntry (
            const PrivateTag & tag ) const
```

10.88.4.4 GetDictEntry() [2/2]

```
const DictEntry& gdcm::Dicts::GetDictEntry (
            const Tag & tag,
            const char * owner = nullptr ) const
```

THREAD SAFE.

works for both public and private dicts: owner is null for public dict

Warning

owner need to be set to appropriate owner for call to work. see

Examples

PublicDict.cxx.

10.88.4.5 GetPrivateDict() [1/2]

```
PrivateDict& gdcm::Dicts::GetPrivateDict ( )
```

10.88.4.6 GetPrivateDict() [2/2]

```
const PrivateDict& gdcm::Dicts::GetPrivateDict ( ) const
```

10.88.4.7 GetPublicDict()

```
const Dict& gdcm::Dicts::GetPublicDict ( ) const
```

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, PublicDict.cxx, and ReadAndPrintAttributes.cxx.

10.88.4.8 IsEmpty()

```
bool gdcm::Dicts::IsEmpty ( ) const  [inline]
```

10.88.4.9 LoadDefaults()

```
void gdcm::Dicts::LoadDefaults ( )  [protected]
```

10.88.4.10 operator=()

```
Dicts& gdcm::Dicts::operator= (
            const Dicts & _val )  [delete]
```

10.88.5 Friends And Related Function Documentation

10.88.5.1 Global

```
friend class Global  [friend]
```

10.88.5.2 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Dicts & d )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmDicts.h

10.89 gdcm::network::DIMSE Class Reference

DIMSE.

```
#include <gdcmDIMSE.h>
```

Public Types

- enum CommandTypes {
  C_STORE_RQ = 0x0001 ,
  C_STORE_RSP = 0x8001 ,
  C_GET_RQ = 0x0010 ,
  C_GET_RSP = 0x8010 ,
  C_FIND_RQ = 0x0020 ,
  C_FIND_RSP = 0x8020 ,
  C_MOVE_RQ = 0x0021 ,
  C_MOVE_RSP = 0x8021 ,
  C_ECHO_RQ = 0x0030 ,
  C_ECHO_RSP = 0x8030 ,
  N_EVENT_REPORT_RQ = 0x0100 ,
  N_EVENT_REPORT_RSP = 0x8100 ,
  N_GET_RQ = 0x0110 ,
  N_GET_RSP = 0x8110 ,
  N_SET_RQ = 0x0120 ,
  N_SET_RSP = 0x8120 ,
  N_ACTION_RQ = 0x0130 ,
  N_ACTION_RSP = 0x8130 ,
  N_CREATE_RQ = 0x0140 ,
  N_CREATE_RSP = 0x8140 ,
  N_DELETE_RQ = 0x0150 ,
  N_DELETE_RSP = 0x8150 ,
  C_CANCEL_RQ = 0x0FFF }

10.89.1 Detailed Description

DIMSE.

PS 3.7 - 2009 Annex E Command Dictionary (Normative) E.1 REGISTRY OF DICOM COMMAND ELEMENTS Table E.1-1 COMMAND FIELDS (PART 1)

10.89.2 Member Enumeration Documentation

10.89.2.1 CommandTypes

enum gdcm::network::DIMSE::CommandTypes

Enumerator

C_STORE_RQ	
C_STORE_RSP	
C_GET_RQ	
C_GET_RSP	
C_FIND_RQ	
C_FIND_RSP	
C_MOVE_RQ	
C_MOVE_RSP	
C_ECHO_RQ	
C_ECHO_RSP	
N_EVENT_REPORT_RQ	
N_EVENT_REPORT_RSP	
N_GET_RQ	
N_GET_RSP	
N_SET_RQ	
N_SET_RSP	
N_ACTION_RQ	
N_ACTION_RSP	
N_CREATE_RQ	
N_CREATE_RSP	
N_DELETE_RQ	
N_DELETE_RSP	
C_CANCEL_RQ	

The documentation for this class was generated from the following file:

- gdcmDIMSE.h

10.90 gdcm::DirectionCosines Class Reference

class to handle DirectionCosines

`#include <gdcmDirectionCosines.h>`

Public Member Functions

- DirectionCosines ()
- DirectionCosines (const double dircos[6])
- ~DirectionCosines ()
- double ComputeDistAlongNormal (const double ipp[3]) const

  Compute the distance along the normal.
- void Cross (double z[3]) const

  Compute Cross product.
- double CrossDot (DirectionCosines const &dc) const

  Compute the Dot product of the two cross vector of both DirectionCosines object.
- double Dot () const

  Compute Dot.
- bool IsValid () const

  Return whether or not this is a valid direction cosines.
- void Normalize ()

  Normalize in-place.
- operator const double * () const

  *Make the class behave like a const double *.*
- void Print (std::ostream &) const

  Print.
- bool SetFromString (const char *str)

Static Public Member Functions

- static double Dot (const double x[3], const double y[3])

  Compute Dot.
- static void Normalize (double v[3])

  Normalize in-place.

10.90.1 Detailed Description

class to handle DirectionCosines

Examples

DiscriminateVolume.cxx.

10.90.2 Constructor & Destructor Documentation

10.90.2.1 DirectionCosines() [1/2]

```
gdcm::DirectionCosines::DirectionCosines ( )
```

10.90.2.2 DirectionCosines() [2/2]

```
gdcm::DirectionCosines::DirectionCosines (
            const double dircos[6] )
```

10.90.2.3 ~DirectionCosines()

```
gdcm::DirectionCosines::~DirectionCosines ( )
```

10.90.3 Member Function Documentation

10.90.3.1 ComputeDistAlongNormal()

```
double gdcm::DirectionCosines::ComputeDistAlongNormal (
            const double ipp[3] ) const
```

Compute the distance along the normal.

10.90.3.2 Cross()

```
void gdcm::DirectionCosines::Cross (
            double z[3] ) const
```

Compute Cross product.

10.90.3.3 CrossDot()

```
double gdcm::DirectionCosines::CrossDot (
            DirectionCosines const & dc ) const
```

Compute the Dot product of the two cross vector of both DirectionCosines object.

Examples

DiscriminateVolume.cxx.

10.90.3.4 Dot() [1/2]

```
double gdcm::DirectionCosines::Dot ( ) const
```

Compute Dot.

10.90.3.5 Dot() [2/2]

```
static double gdcm::DirectionCosines::Dot (
            const double x[3],
            const double y[3] )  [static]
```

Compute Dot.

10.90.3.6 IsValid()

```
bool gdcm::DirectionCosines::IsValid ( ) const
```

Return whether or not this is a valid direction cosines.

10.90.3.7 Normalize() [1/2]

```
void gdcm::DirectionCosines::Normalize ( )
```

Normalize in-place.

10.90.3.8 Normalize() [2/2]

```
static void gdcm::DirectionCosines::Normalize (
            double v[3] )  [static]
```

Normalize in-place.

10.90.3.9 operator const double *()

```
gdcm::DirectionCosines::operator const double * ( ) const  [inline]
```

Make the class behave like a const double *.

10.90.3.10 Print()

```
void gdcm::DirectionCosines::Print (
            std::ostream &  ) const
```

Print.

10.90.3.11 SetFromString()

```
bool gdcm::DirectionCosines::SetFromString (
            const char * str )
```

Initialize from string str. It requires 6 floating point separated by a backslash character.

Examples

DiscriminateVolume.cxx.

The documentation for this class was generated from the following file:

- gdcmDirectionCosines.h

10.91 gdcm::Directory Class Reference

Class for manipulation directories.

```
#include <gdcmDirectory.h>
```

Public Types

- typedef std::vector< FilenameType > FilenamesType
- typedef std::string FilenameType

Public Member Functions

- Directory ()=default
- ~Directory ()=default
- FilenamesType const & GetDirectories () const

  Return the Directories traversed.
- FilenamesType const & GetFilenames () const

  Set/Get the file names within the directory.
- FilenameType const & GetToplevel () const

  Get the name of the toplevel directory.
- unsigned int Load (FilenameType const &name, bool recursive=false)
- void Print (std::ostream &os=std::cout) const

  Print.

Protected Member Functions

- unsigned int Explore (FilenameType const &name, bool recursive)

  Return number of file found when 'recursive'ly exploring directory `name`

Friends

- std::ostream & operator<< (std::ostream &_os, const Directory &d)

10.91.1 Detailed Description

Class for manipulation directories.

Note

This implementation provide a cross platform implementation for manipulating directories: basically traversing directories and harvesting files

will not take into account unix type hidden file recursive option will not look into UNIX type hidden directory (those starting with a '.')

Since python or C# provide there own equivalent implementation, in which case gdcm::Directory does not make much sense.

Examples

DiscriminateVolume.cxx, DumpToSQLITE3.cxx, DumpVisusChange.cxx, GenerateRTSTRUCT.cxx, ReadUTF8QtDir.cxx, SortImage.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, reslicesphere.cxx, and threadgdcm.cxx.

10.91.2 Member Typedef Documentation

10.91.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcm::Directory::FilenamesType
```

Examples

DiscriminateVolume.cxx, and GenerateRTSTRUCT.cxx.

10.91.2.2 FilenameType

```
typedef std::string gdcm::Directory::FilenameType
```

10.91.3 Constructor & Destructor Documentation

10.91.3.1 Directory()

```
gdcm::Directory::Directory ( )  [default]
```

10.91.3.2 ~Directory()

```
gdcm::Directory::~Directory ( )  [default]
```

10.91.4 Member Function Documentation

10.91.4.1 Explore()

```
unsigned int gdcm::Directory::Explore (
            FilenameType const & name,
            bool recursive )  [protected]
```

Return number of file found when 'recursive'ly exploring directory `name`

10.91.4.2 GetDirectories()

```
FilenamesType const& gdcm::Directory::GetDirectories ( ) const  [inline]
```

Return the Directories traversed.

10.91.4.3 GetFilenames()

```
FilenamesType const& gdcm::Directory::GetFilenames ( ) const  [inline]
```

Set/Get the file names within the directory.

Examples

DiscriminateVolume.cxx, DumpToSQLITE3.cxx, DumpVisusChange.cxx, GenerateRTSTRUCT.cxx, ReadUTF8QtDir.cxx, SortImage.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, reslicesphere.cxx, and threadgdcm.cxx.

10.91.4.4 GetToplevel()

```
FilenameType const& gdcm::Directory::GetToplevel ( ) const  [inline]
```

Get the name of the toplevel directory.

10.91.4.5 Load()

```
unsigned int gdcm::Directory::Load (
            FilenameType const & name,
            bool recursive = false )
```

construct a list of filenames and subdirectory beneath directory: name

Warning

: hidden file and hidden directory are not loaded.

Examples

DecompressImageMultiframe.cs, DiscriminateVolume.cxx, DumpToSQLITE3.cxx, DumpVisusChange.cxx, GenerateRTSTRUCT.cxx, ReadUTF8QtDir.cxx, SortImage.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, reslicesphere.cxx, and threadgdcm.cxx.

10.91.4.6 Print()

```
void gdcm::Directory::Print (
            std::ostream & os = std::cout ) const
```

Print.

Examples

SortImage.cxx.

10.91.5 Friends And Related Function Documentation

10.91.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Directory & d )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmDirectory.h

10.92 gdcm::DirectoryHelper Class Reference

DirectoryHelper.

`#include <gdcmDirectoryHelper.h>`

Static Public Member Functions

- static Directory::FilenamesType GetCTImageSeriesUIDs (const std::string &inDirectory)
- static Directory::FilenamesType GetFilenamesFromSeriesUIDs (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string GetFrameOfReference (const std::vector< DataSet > &inDS)
- static Directory::FilenamesType GetMRImageSeriesUIDs (const std::string &inDirectory)
- static Directory::FilenamesType GetRTStructSeriesUIDs (const std::string &inDirectory)
- static Directory::FilenamesType GetSeriesUIDsBySOPClassUID (const std::string &inDirectory, const std::string &inSOPClassUID)
- static std::string GetSOPClassUID (const std::vector< DataSet > &inDS)
- static std::string GetStringValueFromTag (const Tag &t, const DataSet &ds)
- static std::vector< DataSet > LoadImageFromFiles (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string RetrieveSOPInstanceUIDFromIndex (int inIndex, const std::vector< DataSet > &inDS)
- static std::string RetrieveSOPInstanceUIDFromZPosition (double inZPos, const std::vector< DataSet > &inDS)

10.92.1 Detailed Description

DirectoryHelper.

this class is designed to help mitigate some of the commonly performed operations on directories. namely: 1) the ability to determine the number of series in a directory by what type of series is present 2) the ability to find all ct series in a directory 3) the ability to find all mr series in a directory 4) to load a set of DataSets from a series that's already been sorted by the IPP sorter 5) For rtstruct stuff, you need to know the sopinstanceuid of each z plane, so there's a retrieval function for that 6) then a few other functions for rtstruct writeouts

10.92.2 Member Function Documentation

10.92.2.1 GetCTImageSeriesUIDs()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetCTImageSeriesUIDs (
            const std::string & inDirectory )  [static]
```

10.92.2.2 GetFilenamesFromSeriesUIDs()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetFilenamesFromSeriesUIDs (
            const std::string & inDirectory,
            const std::string & inSeriesUID )  [static]
```

Examples

GenerateRTSTRUCT.cxx.

10.92.2.3 GetFrameOfReference()

```
static std::string gdcm::DirectoryHelper::GetFrameOfReference (
            const std::vector< DataSet > & inDS )  [static]
```

10.92.2.4 GetMRImageSeriesUIDs()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetMRImageSeriesUIDs (
            const std::string & inDirectory )  [static]
```

10.92.2.5 GetRTStructSeriesUIDs()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetRTStructSeriesUIDs (
            const std::string & inDirectory )  [static]
```

Examples

GenerateRTSTRUCT.cxx.

10.92.2.6 GetSeriesUIDsBySOPClassUID()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetSeriesUIDsBySOPClassUID (
            const std::string & inDirectory,
            const std::string & inSOPClassUID )  [static]
```

10.92.2.7 GetSOPClassUID()

```
static std::string gdcm::DirectoryHelper::GetSOPClassUID (
            const std::vector< DataSet > & inDS )  [static]
```

10.92.2.8 GetStringValueFromTag()

```
static std::string gdcm::DirectoryHelper::GetStringValueFromTag (
            const Tag & t,
            const DataSet & ds )  [static]
```

10.92.2.9 LoadImageFromFiles()

```
static std::vector<DataSet> gdcm::DirectoryHelper::LoadImageFromFiles (
            const std::string & inDirectory,
            const std::string & inSeriesUID )  [static]
```

10.92.2.10 RetrieveSOPInstanceUIDFromIndex()

```
static std::string gdcm::DirectoryHelper::RetrieveSOPInstanceUIDFromIndex (
            int inIndex,
            const std::vector< DataSet > & inDS )  [static]
```

10.92.2.11 RetrieveSOPInstanceUIDFromZPosition()

```
static std::string gdcm::DirectoryHelper::RetrieveSOPInstanceUIDFromZPosition (
            double inZPos,
            const std::vector< DataSet > & inDS )  [static]
```

The documentation for this class was generated from the following file:

- gdcmDirectoryHelper.h

10.93 gdcm::DummyValueGenerator Class Reference

Class for generating dummy value.

`#include <gdcmDummyValueGenerator.h>`

Static Public Member Functions

- static const char * Generate (const char *input)

10.93.1 Detailed Description

Class for generating dummy value.

See also

Anonymizer

10.93.2 Member Function Documentation

10.93.2.1 Generate()

```
static const char* gdcm::DummyValueGenerator::Generate (
            const char * input )  [static]
```

Generate a dummy value from an input value. This is guarantee to always return the same output value when input is identical. Return an array of bytes that can be used for anonymization purpose, return NULL on error NOT THREAD SAFE

The documentation for this class was generated from the following file:

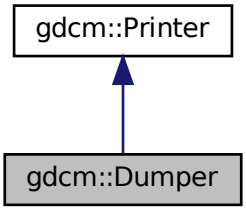
- gdcmDummyValueGenerator.h

10.94 gdcm::Dumper Class Reference

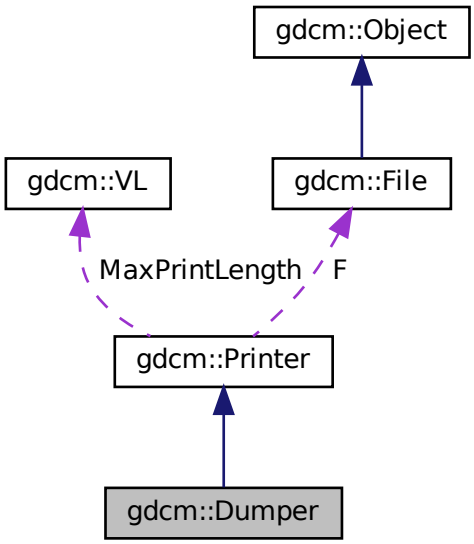
Codec class.

```
#include <gdcmDumper.h>
```

Inheritance diagram for gdcm::Dumper:



Collaboration diagram for gdcm::Dumper:



Public Member Functions

- Dumper ()
- ~Dumper ()=default

Additional Inherited Members

10.94.1 Detailed Description

Codec class.

Note

Use it to simply dump value read from the file. No interpretation is done. But it is real fast ! Almost no overhead

10.94.2 Constructor & Destructor Documentation

10.94.2.1 Dumper()

```
gdcm::Dumper::Dumper ( )  [inline]
```

10.94.2.2 ~Dumper()

```
gdcm::Dumper::~Dumper ( )  [default]
```

The documentation for this class was generated from the following file:

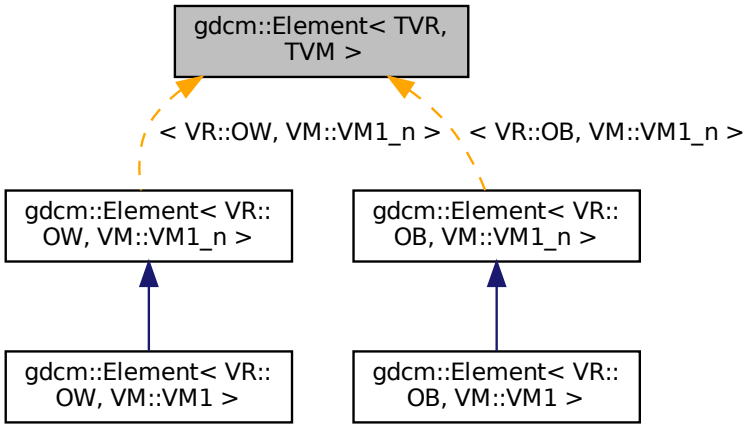
- gdcmDumper.h

10.95 gdcm::Element< TVR, TVM > Class Template Reference

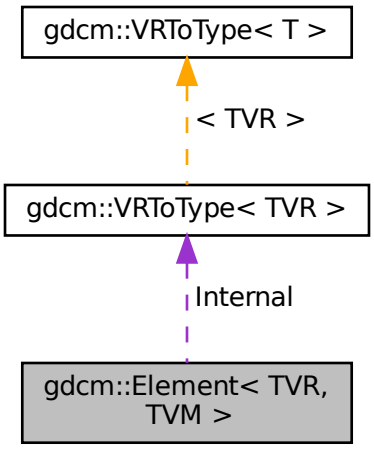
Element class.

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, TVM >:



Collaboration diagram for gdcm::Element< TVR, TVM >:



Public Types

- typedef VRToType< TVR >::Type Type

Public Member Functions

- DataElement GetAsDataElement () const
- unsigned long GetLength () const
- VRToType< TVR >::Type & GetValue (unsigned int idx=0)
- const VRToType< TVR >::Type & GetValue (unsigned int idx=0) const
- const VRToType< TVR >::Type * GetValues () const
- VRToType< TVR >::Type operator[] (unsigned int idx) const
- void Print (std::ostream &_os) const
- void Read (std::istream &_is)
- void Set (Value const &v)
- void SetFromDataElement (DataElement const &de)
- void SetValue (typename VRToType< TVR >::Type v, unsigned int idx=0)
- void Write (std::ostream &_os) const

Static Public Member Functions

- static VM GetVM ()
- static VR GetVR ()

Public Attributes

- VRToType< TVR >::Type Internal [VMToLength< TVM >::Length]

Protected Member Functions

- void SetNoSwap (Value const &v)

10.95.1 Detailed Description

template<long long TVR, int TVM>
class gdcm::Element< TVR, TVM >

Element class.

Note

TODO

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Im
csa2img.cxx, and iU22tomultisc.cxx.

10.95.2 Member Typedef Documentation

10.95.2.1 Type

```
template<long long TVR, int TVM>
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

10.95.3 Member Function Documentation

10.95.3.1 GetAsDataElement()

```
template<long long TVR, int TVM>
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement ( ) const  [inline]
```

Examples

Extracting_All_Resolution.cxx, and Fake_Image_Using_Stream_Image_Writer.cxx.

References gdcm::DataElement::GetVR(), gdcm::DataElement::SetByteValue(), and gdcm::DataElement::SetVR().

10.95.3.2 GetLength()

```
template<long long TVR, int TVM>
unsigned long gdcm::Element< TVR, TVM >::GetLength ( ) const  [inline]
```

Examples

DumpGEMSMovieGroup.cxx.

10.95.3.3 GetValue() [1/2]

```
template<long long TVR, int TVM>
VRToType<TVR>::Type& gdcm::Element< TVR, TVM >::GetValue (
            unsigned int idx = 0 )  [inline]
```

10.95.3.4 GetValue() [2/2]

```
template<long long TVR, int TVM>
const VRToType<TVR>::Type& gdcm::Element< TVR, TVM >::GetValue (
            unsigned int idx = 0 ) const  [inline]
```

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, and csa2img.cxx.

10.95.3.5 GetValues()

```
template<long long TVR, int TVM>
const VRToType<TVR>::Type* gdcm::Element< TVR, TVM >::GetValues ( ) const  [inline]
```

10.95.3.6 GetVM()

```
template<long long TVR, int TVM>
static VM gdcm::Element< TVR, TVM >::GetVM ( )  [inline], [static]
```

10.95.3.7 GetVR()

```
template<long long TVR, int TVM>
static VR gdcm::Element< TVR, TVM >::GetVR ( )  [inline], [static]
```

10.95.3.8 operator[]()

```
template<long long TVR, int TVM>
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::operator[] (
            unsigned int idx ) const  [inline]
```

10.95.3.9 Print()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Print (
            std::ostream & _os ) const  [inline]
```

Examples

DumpGEMSMovieGroup.cxx.

10.95.3.10 Read()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Read (
            std::istream & _is )  [inline]
```

10.95.3.11 Set()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Set (
            Value const & v )  [inline]
```

Examples

csa2img.cxx.

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.95.3.12 SetFromDataElement()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetFromDataElement (
            DataElement< TVR, TVM > const & de )  [inline]
```

Examples

DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, and iU22tomultisc.cxx.

References gdcm::DataElement::GetByteValue(), gdcm::DataElement::GetValue(), and gdcm::DataElement::GetVR().

10.95.3.13 SetNoSwap()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetNoSwap (
            Value const & v )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), and gdcm::ByteValue::GetPointer().

10.95.3.14 SetValue()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetValue (
            typename VRToType< TVR >::Type v,
            unsigned int idx = 0 )  [inline]
```

Examples

Extracting_All_Resolution.cxx, and Fake_Image_Using_Stream_Image_Writer.cxx.

10.95.3.15 Write()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Write (
            std::ostream & _os ) const  [inline]
```

10.95.4 Member Data Documentation

10.95.4.1 Internal

```
template<long long TVR, int TVM>
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

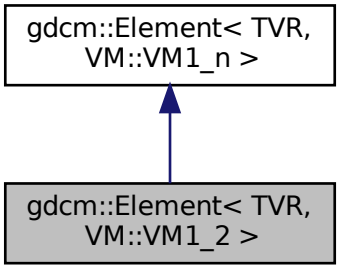
The documentation for this class was generated from the following file:

- gdcmElement.h

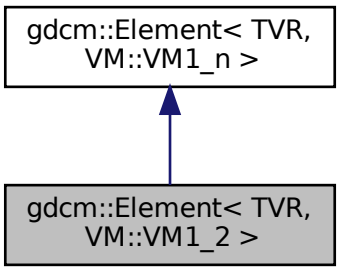
10.96 gdcm::Element< TVR, VM::VM1_2 > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM1_2 >:



Collaboration diagram for gdcm::Element< TVR, VM::VM1_2 >:



Public Types

- typedef Element< TVR, VM::VM1_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.96.1 Member Typedef Documentation

10.96.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM1_2 >::Parent
```

10.96.2 Member Function Documentation

10.96.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_2 >::SetLength (
            int len )  [inline]
```

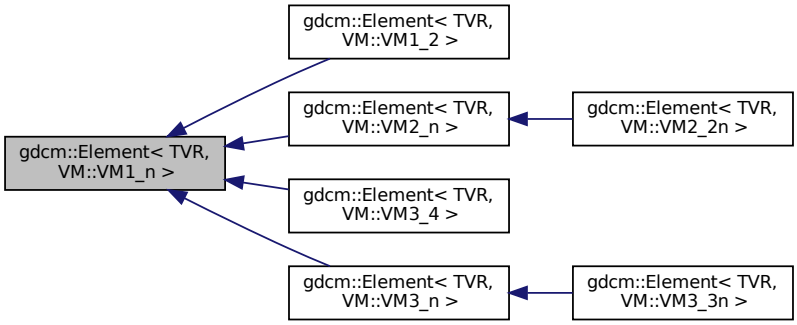
The documentation for this class was generated from the following file:

- gdcmElement.h

10.97 gdcm::Element< TVR, VM::VM1_n > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM1_n >:



Public Types

- typedef VRToType< TVR >::Type Type

Public Member Functions

- Element ()
- Element (const Element &_val)
- ~Element ()
- DataElement GetAsDataElement () const
- unsigned long GetLength () const
- VRToType< TVR >::Type & GetValue (unsigned int idx=0)
- const VRToType< TVR >::Type & GetValue (unsigned int idx=0) const
- Element & operator= (const Element &_val)
- VRToType< TVR >::Type operator[] (unsigned int idx) const
- void Print (std::ostream &_os) const
- void Read (std::istream &_is)
- void Set (Value const &v)
- void SetArray (const Type *array, unsigned long len, bool save=false)
- void SetFromDataElement (DataElement const &de)
- void SetLength (unsigned long len)
- void SetValue (typename VRToType< TVR >::Type v, unsigned int idx=0)
- void Write (std::ostream &_os) const
- void WriteASCII (std::ostream &os) const

Static Public Member Functions

- static VM GetVM ()
- static VR GetVR ()

Protected Member Functions

- void SetNoSwap (Value const &v)

10.97.1 Member Typedef Documentation

10.97.1.1 Type

```
template<long long TVR>
typedef VRToType<TVR>::Type gdcm::Element< TVR, VM::VM1_n >::Type
```

10.97.2 Constructor & Destructor Documentation

10.97.2.1 Element() [1/2]

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::Element ( )  [inline], [explicit]
```

10.97.2.2 ~Element()

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::~Element ( )  [inline]
```

10.97.2.3 Element() [2/2]

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::Element (
            const Element< TVR, VM::VM1_n > & _val )  [inline]
```

10.97.3 Member Function Documentation

10.97.3.1 GetAsDataElement()

```
template<long long TVR>
DataElement gdcm::Element< TVR, VM::VM1_n >::GetAsDataElement ( ) const  [inline]
```

References gdcm::DataElement::GetVR(), gdcm::DataElement::SetByteValue(), and gdcm::DataElement::SetVR().

10.97.3.2 GetLength()

```
template<long long TVR>
unsigned long gdcm::Element< TVR, VM::VM1_n >::GetLength ( ) const  [inline]
```

10.97.3.3 GetValue() [1/2]

```
template<long long TVR>
VRToType<TVR>::Type& gdcm::Element< TVR, VM::VM1_n >::GetValue (
            unsigned int idx = 0 )  [inline]
```

10.97.3.4 GetValue() [2/2]

```
template<long long TVR>
const VRToType<TVR>::Type& gdcm::Element< TVR, VM::VM1_n >::GetValue (
            unsigned int idx = 0 ) const  [inline]
```

10.97.3.5 GetVM()

```
template<long long TVR>
static VM gdcm::Element< TVR, VM::VM1_n >::GetVM ( )  [inline], [static]
```

10.97.3.6 GetVR()

```
template<long long TVR>
static VR gdcm::Element< TVR, VM::VM1_n >::GetVR ( )  [inline], [static]
```

10.97.3.7 operator=()

```
template<long long TVR>
Element& gdcm::Element< TVR, VM::VM1_n >::operator= (
            const Element< TVR, VM::VM1_n > & _val )  [inline]
```

10.97.3.8 operator[]()

```
template<long long TVR>
VRToType<TVR>::Type gdcm::Element< TVR, VM::VM1_n >::operator[] (
            unsigned int idx ) const  [inline]
```

10.97.3.9 Print()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Print (
            std::ostream & _os ) const  [inline]
```

10.97.3.10 Read()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Read (
            std::istream & _is )  [inline]
```

10.97.3.11 Set()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Set (
            Value const & v )  [inline]
```

References gdcm::ByteValue::GetLength(), gdcm::ByteValue::GetPointer(), gdcm::ByteValue::GetVoidPointer(), and gdcm::VRBINARY.

10.97.3.12 SetArray()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetArray (
            const Type * array,
            unsigned long len,
            bool save = false )  [inline]
```

10.97.3.13 SetFromDataElement()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetFromDataElement (
            DataElement< TVR, VM::VM1_n > const & de )  [inline]
```

References gdcm::DataElement::GetByteValue(), gdcm::DataElement::GetValue(), and gdcm::DataElement::GetVR().

10.97.3.14 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetLength (
            unsigned long len )  [inline]
```

10.97.3.15 SetNoSwap()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetNoSwap (
            Value const & v )  [inline], [protected]
```

References gdcm::ByteValue::GetLength(), gdcm::ByteValue::GetPointer(), and gdcm::VRBINARY.

10.97.3.16 SetValue()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetValue (
            typename VRToType< TVR >::Type v,
            unsigned int idx = 0 )  [inline]
```

10.97.3.17 Write()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Write (
             std::ostream & _os ) const  [inline]
```

10.97.3.18 WriteASCII()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::WriteASCII (
             std::ostream & os ) const  [inline]
```

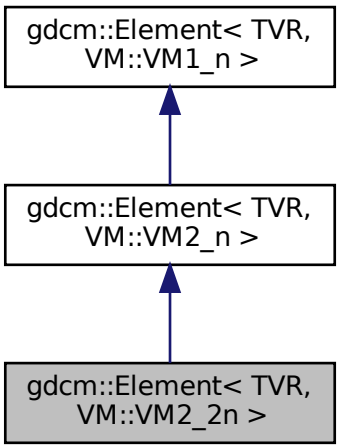
The documentation for this class was generated from the following file:

- gdcmElement.h

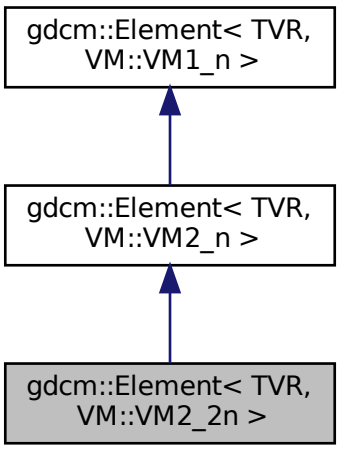
10.98 gdcm::Element< TVR, VM::VM2_2n > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM2_2n >:



Collaboration diagram for gdcm::Element< TVR, VM::VM2_2n >:



Public Types

- typedef Element< TVR, VM::VM2_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.98.1 Member Typedef Documentation

10.98.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM2_n> gdcm::Element< TVR, VM::VM2_2n >::Parent
```

10.98.2 Member Function Documentation

10.98.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM2_2n >::SetLength (
            int len )  [inline]
```

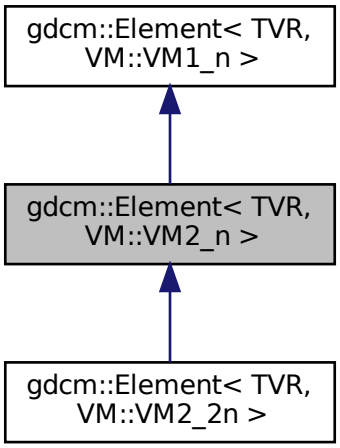
The documentation for this class was generated from the following file:

- gdcmElement.h

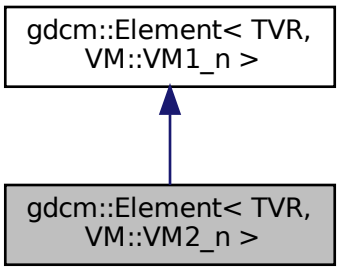
10.99 gdcm::Element< TVR, VM::VM2_n > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM2_n >:



Collaboration diagram for gdcm::Element< TVR, VM::VM2_n >:



Public Types

- typedef Element< TVR, VM::VM1_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.99.1 Member Typedef Documentation

10.99.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM2_n >::Parent
```

10.99.2 Member Function Documentation

10.99.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM2_n >::SetLength (
             int len )  [inline]
```

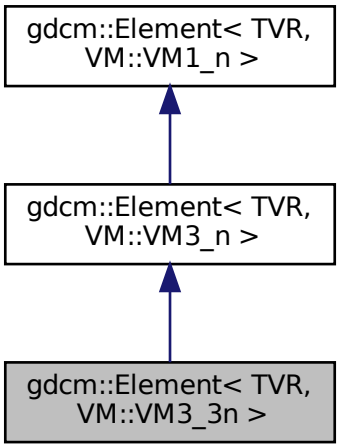
The documentation for this class was generated from the following file:

- gdcmElement.h

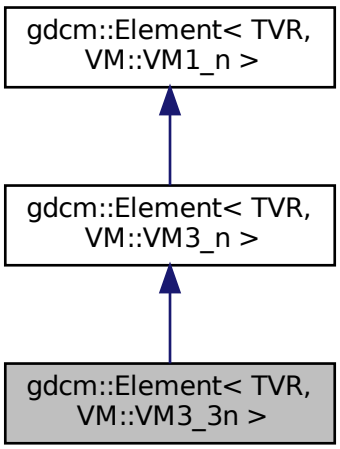
10.100 gdcm::Element< TVR, VM::VM3_3n > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM3_3n >:



Collaboration diagram for gdcm::Element< TVR, VM::VM3_3n >:



Public Types

- typedef Element< TVR, VM::VM3_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.100.1 Member Typedef Documentation

10.100.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM3_n> gdcm::Element< TVR, VM::VM3_3n >::Parent
```

10.100.2 Member Function Documentation

10.100.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_3n >::SetLength (
            int len )  [inline]
```

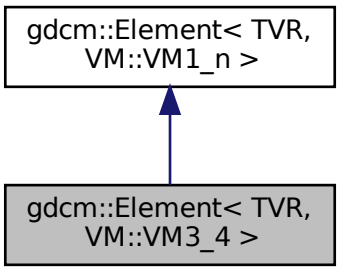
The documentation for this class was generated from the following file:

- gdcmElement.h

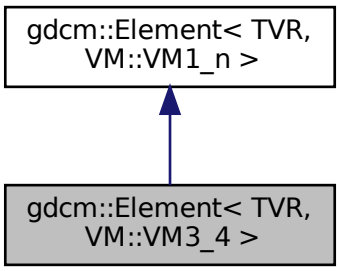
10.101 gdcm::Element< TVR, VM::VM3_4 > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM3_4 >:



Collaboration diagram for gdcm::Element< TVR, VM::VM3_4 >:



Public Types

- typedef Element< TVR, VM::VM1_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.101.1 Member Typedef Documentation

10.101.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM3_4 >::Parent
```

10.101.2 Member Function Documentation

10.101.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_4 >::SetLength (
            int len )  [inline]
```

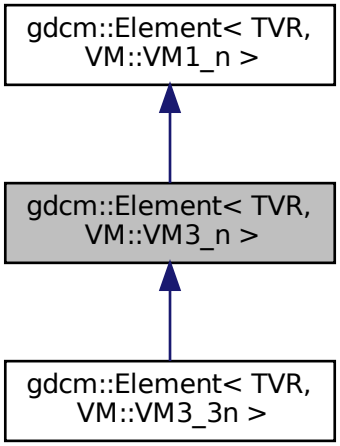
The documentation for this class was generated from the following file:

- gdcmElement.h

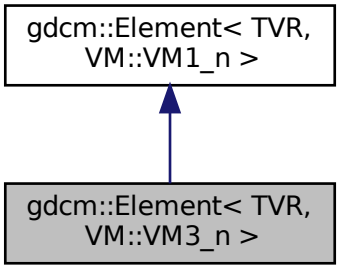
10.102 gdcm::Element< TVR, VM::VM3_n > Class Template Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< TVR, VM::VM3_n >:



Collaboration diagram for gdcm::Element< TVR, VM::VM3_n >:



Public Types

- typedef Element< TVR, VM::VM1_n > Parent

Public Member Functions

- void SetLength (int len)

Additional Inherited Members

10.102.1 Member Typedef Documentation

10.102.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM3_n >::Parent
```

10.102.2 Member Function Documentation

10.102.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_n >::SetLength (
            int len )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmElement.h

10.103 gdcm::Element< VR::AS, VM::VM5 > Class Reference

```
#include <gdcmElement.h>
```

Public Member Functions

- unsigned long GetLength () const
- void Print (std::ostream &_os) const

Public Attributes

- char Internal [VMToLength< VM::VM5 >::Length *sizeof(VRToType< VR::AS >::Type)]

10.103.1 Member Function Documentation

10.103.1.1 GetLength()

```
unsigned long gdcm::Element< VR::AS, VM::VM5 >::GetLength ( ) const  [inline]
```

10.103.1.2 Print()

```
void gdcm::Element< VR::AS, VM::VM5 >::Print (
            std::ostream & _os ) const  [inline]
```

10.103.2 Member Data Documentation

10.103.2.1 Internal

```
char gdcm::Element< VR::AS, VM::VM5 >::Internal[VMToLength< VM::VM5 >::Length *sizeof(VRToType<
VR::AS >::Type)]
```

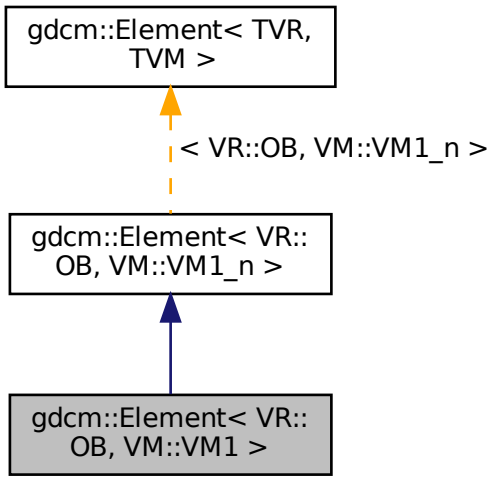
The documentation for this class was generated from the following file:

- gdcmElement.h

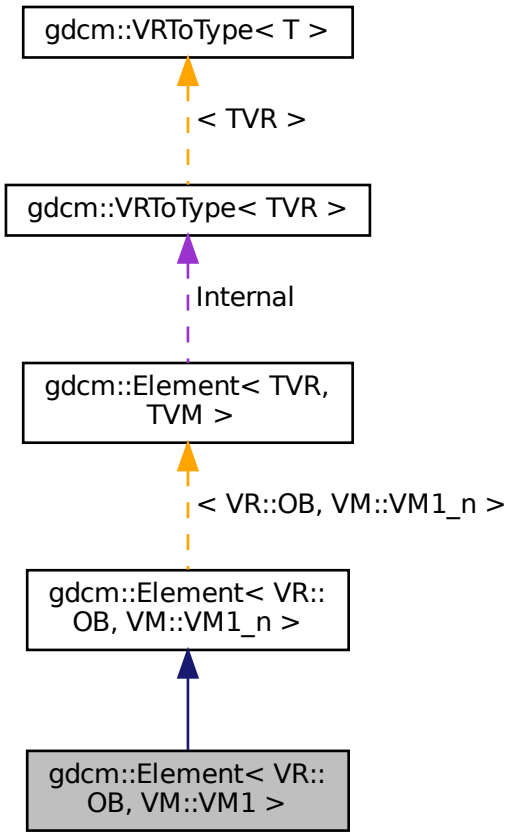
10.104 gdcm::Element< VR::OB, VM::VM1 > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< VR::OB, VM::VM1 >:



Collaboration diagram for gdcm::Element< VR::OB, VM::VM1 >:



Additional Inherited Members

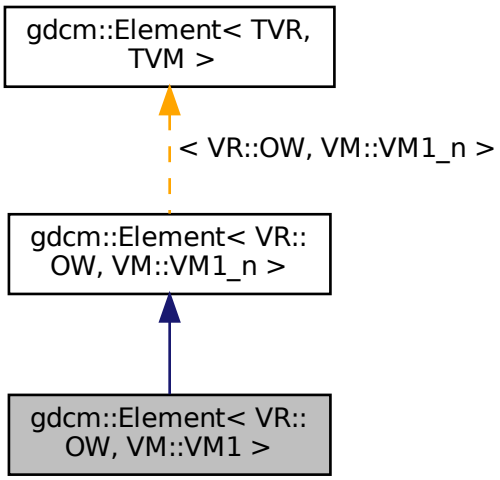
The documentation for this class was generated from the following file:

- gdcmElement.h

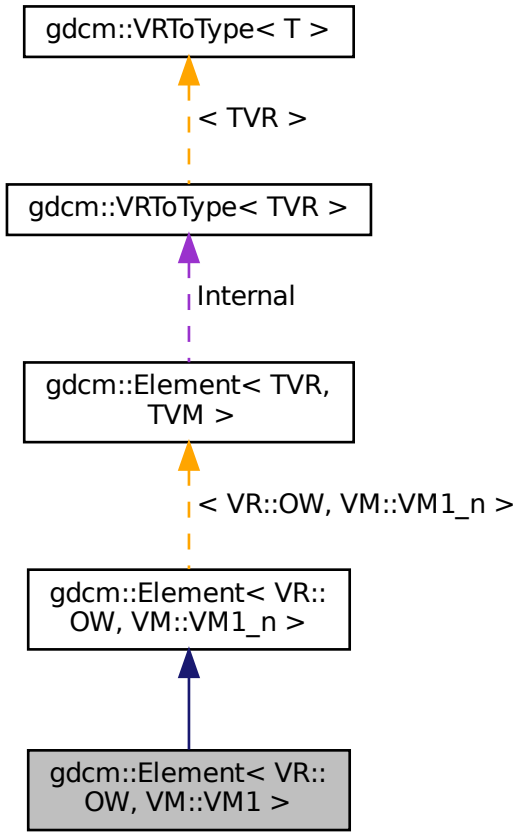
10.105 gdcm::Element< VR::OW, VM::VM1 > Class Reference

`#include <gdcmElement.h>`

Inheritance diagram for gdcm::Element< VR::OW, VM::VM1 >:



Collaboration diagram for gdcm::Element< VR::OW, VM::VM1 >:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmElement.h

10.106 gdcm::ElementDisableCombinations< TVR, TVM > Class Template Reference

A class which is used to produce compile errors for an invalid combination of template parameters.

`#include <gdcmElement.h>`

10.106.1 Detailed Description

template<long long TVR, int TVM>
class gdcm::ElementDisableCombinations< TVR, TVM >

A class which is used to produce compile errors for an invalid combination of template parameters.

Invalid combinations have specialized declarations with no definition.

The documentation for this class was generated from the following file:

- gdcmElement.h

10.107 gdcm::ElementDisableCombinations< VR::OB, VM::VM1_n > Class Reference

`#include <gdcmElement.h>`

The documentation for this class was generated from the following file:

- gdcmElement.h

10.108 gdcm::ElementDisableCombinations< VR::OW, VM::VM1_n > Class Reference

`#include <gdcmElement.h>`

The documentation for this class was generated from the following file:

- gdcmElement.h

10.109 gdcm::EmptyMaskGenerator Class Reference

EmptyMaskGenerator Main class to generate a Empty Mask Series from an input Series. This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM Series within the same input directory.

`#include <gdcmEmptyMaskGenerator.h>`

Public Types

- enum SOPClassUIDMode {
  UseOriginalSOPClassUID = 0 ,
  UseGrayscaleSecondaryImageStorage }

Public Member Functions

- EmptyMaskGenerator ()
- ~EmptyMaskGenerator ()
- bool Execute ()

  Main loop.
- void SetInputDirectory (const char *dirname)

  Specify input directory.
- void SetOutputDirectory (const char *dirname)

  Specify output directory.
- void SetSOPClassUIDMode (SOPClassUIDMode mode)

10.109.1 Detailed Description

EmptyMaskGenerator Main class to generate a Empty Mask Series from an input Series. This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM Series within the same input directory.

The class allow two mode of operations:

- UseOriginalSOPClassUID
- UseGrayscaleSecondaryImageStorage

UseOriginalSOPClassUID is the mode where original attributes are copied from the original DICOM instance.

UseGrayscaleSecondaryImageStorage is the mode where attributes are generated so as to create a Multiframe↩ GrayscaleByteSecondaryCaptureImageStorage (MultiframeGrayscaleWordSecondaryCaptureImageStorage) instance.

In both mode:

- the Study references (StudyInstanceUID and StudyID) are preserved.
- the PatientID reference is preserved.
- the Image Type attribute will be setup so that the fourth element is set to 'MASK'.
- a new Series Instance UID is generated. It is thus required to run the process over all files using the same input Series Instance UID so that a proper mapping from the old Series UID is done to the new one. Since a new Series Instance UID is generated, there is no sense to preserve the original Frame of Reference UID, although it would have made sense here.

Examples

EmptyMask.cxx.

10.109.2 Member Enumeration Documentation

10.109.2.1 SOPClassUIDMode

```
enum gdcm::EmptyMaskGenerator::SOPClassUIDMode
```

Enumerator

UseOriginalSOPClassUID	
UseGrayscaleSecondaryImageStorage	

10.109.3 Constructor & Destructor Documentation

10.109.3.1 EmptyMaskGenerator()

```
gdcm::EmptyMaskGenerator::EmptyMaskGenerator ( )
```

10.109.3.2 ~EmptyMaskGenerator()

```
gdcm::EmptyMaskGenerator::~EmptyMaskGenerator ( )
```

10.109.4 Member Function Documentation

10.109.4.1 Execute()

```
bool gdcm::EmptyMaskGenerator::Execute ( )
```

Main loop.

Examples

EmptyMask.cxx.

10.109.4.2 SetInputDirectory()

```
void gdcm::EmptyMaskGenerator::SetInputDirectory (
            const char * dirname )
```

Specify input directory.

Examples

EmptyMask.cxx.

10.109.4.3 SetOutputDirectory()

```
void gdcm::EmptyMaskGenerator::SetOutputDirectory (
            const char * dirname )
```

Specify output directory.

Examples

EmptyMask.cxx.

10.109.4.4 SetSOPClassUIDMode()

```
void gdcm::EmptyMaskGenerator::SetSOPClassUIDMode (
            SOPClassUIDMode mode )
```

Select generation of SOP Class UID method: Default is UseOriginalSOPClassUID

Examples

EmptyMask.cxx.

The documentation for this class was generated from the following file:

- gdcmEmptyMaskGenerator.h

10.110 gdcm::EncapsulatedDocument Class Reference

EncapsulatedDocument.

```
#include <gdcmEncapsulatedDocument.h>
```

Public Member Functions

- EncapsulatedDocument ()=default

10.110.1 Detailed Description

EncapsulatedDocument.

10.110.2 Constructor & Destructor Documentation

10.110.2.1 EncapsulatedDocument()

```
gdcm::EncapsulatedDocument::EncapsulatedDocument ( )  [default]
```

The documentation for this class was generated from the following file:

- gdcmEncapsulatedDocument.h

10.111 gdcm::EncodingImplementation< T > Class Template Reference

EncodingImplementation.

10.111.1 Detailed Description

template<long long T>
class gdcm::EncodingImplementation< T >

EncodingImplementation.

Note

TODO

The documentation for this class was generated from the following file:

- gdcmElement.h

10.112 gdcm::EncodingImplementation< VR::VRASCII > Class Reference

`#include <gdcmElement.h>`

Public Member Functions

- template<> void Write (const double *data, unsigned long length, std::ostream &_os)

Static Public Member Functions

- template<typename T >
  static void Read (T *data, unsigned long length, std::istream &_is)
- template<typename T >
  static void ReadComputeLength (T *data, unsigned int &length, std::istream &_is)
- template<typename T >
  static void ReadNoSwap (T *data, unsigned long length, std::istream &_is)
- template<typename T >
  static void Write (const T *data, unsigned long length, std::ostream &_os)

10.112.1 Member Function Documentation

10.112.1.1 Read()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::Read (
            T * data,
            unsigned long length,
            std::istream & _is )  [inline], [static]
```

10.112.1.2 ReadComputeLength()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::ReadComputeLength (
            T * data,
            unsigned int & length,
            std::istream & _is )  [inline], [static]
```

References gdcm::backslash().

10.112.1.3 ReadNoSwap()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::ReadNoSwap (
            T * data,
            unsigned long length,
            std::istream & _is )  [inline], [static]
```

10.112.1.4 Write() [1/2]

```
template<>
void gdcm::EncodingImplementation< VR::VRASCII >::Write (
            const double * data,
            unsigned long length,
            std::ostream & _os )  [inline]
```

References gdcm::x16printf().

10.112.1.5 Write() [2/2]

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::Write (
            const T * data,
            unsigned long length,
            std::ostream & _os )  [inline], [static]
```

The documentation for this class was generated from the following file:

- gdcmElement.h

10.113 gdcm::EncodingImplementation< VR::VRBINARY > Class Reference

`#include <gdcmElement.h>`

Static Public Member Functions

- template<typename T >
  static void Read (T *data, unsigned long length, std::istream &_is)
- template<typename T >
  static void ReadComputeLength (T *data, unsigned int &length, std::istream &_is)
- template<typename T >
  static void ReadNoSwap (T *data, unsigned long length, std::istream &_is)
- template<typename T >
  static void Write (const T *data, unsigned long length, std::ostream &_os)

10.113.1 Member Function Documentation

10.113.1.1 Read()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::Read (
             T * data,
             unsigned long length,
             std::istream & _is )  [inline], [static]
```

10.113.1.2 ReadComputeLength()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::ReadComputeLength (
             T * data,
             unsigned int & length,
             std::istream & _is )  [inline], [static]
```

10.113.1.3 ReadNoSwap()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::ReadNoSwap (
             T * data,
             unsigned long length,
             std::istream & _is )  [inline], [static]
```

10.113.1.4 Write()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::Write (
             const T * data,
             unsigned long length,
             std::ostream & _os )  [inline], [static]
```

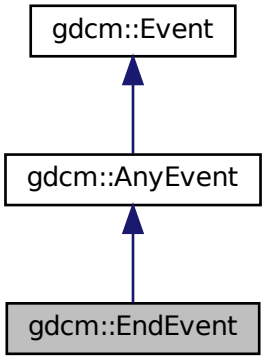
The documentation for this class was generated from the following file:

- gdcmElement.h

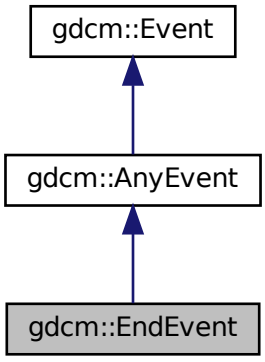
10.114 gdcm::EndEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::EndEvent:



Collaboration diagram for gdcm::EndEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.115 gdcm::EnumeratedValues Class Reference

Element. A Data Element with Enumerated Values that does not have a Value equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

`#include <gdcmEnumeratedValues.h>`

Public Member Functions

- EnumeratedValues ()=default

10.115.1 Detailed Description

Element. A Data Element with Enumerated Values that does not have a Value equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

1. Patient Sex (0010, 0040) is an example of a Data Element having Enumerated Values. It is defined to have a Value that is either "M", "F", or "O" (see PS 3.3). No other Value shall be given to this Data Element.
2. Future modifications of this standard may add to the set of allowed values for Data Elements with Enumerated Values. Such additions by themselves may or may not require a change in SOP Class UIDs, depending on the semantics of the Data Element.

10.115.2 Constructor & Destructor Documentation

10.115.2.1 EnumeratedValues()

`gdcm::EnumeratedValues::EnumeratedValues ( ) [default]`

The documentation for this class was generated from the following file:

- gdcmEnumeratedValues.h

10.116 gdcm::EquipmentManufacturer Class Reference

`#include <gdcmEquipmentManufacturer.h>`

Public Types

- enum Type {
  UNKNOWN = 0 ,
  FUJI ,
  GEMS ,
  HITACHI ,
  KODAK ,
  MARCONI ,
  PMS ,
  SIEMENS ,
  TOSHIBA }

Static Public Member Functions

- static Type Compute (DataSet const &ds)

10.116.1 Detailed Description

10.116.2 Member Enumeration Documentation

10.116.2.1 Type

enum gdcm::EquipmentManufacturer::Type

Enumerator

UNKNOWN	
FUJI	
GEMS	
HITACHI	
KODAK	
MARCONI	
PMS	
SIEMENS	
TOSHIBA	

10.116.3 Member Function Documentation

10.116.3.1 Compute()

```
static Type gdcm::EquipmentManufacturer::Compute (
            DataSet const & ds )  [static]
```

The documentation for this class was generated from the following file:

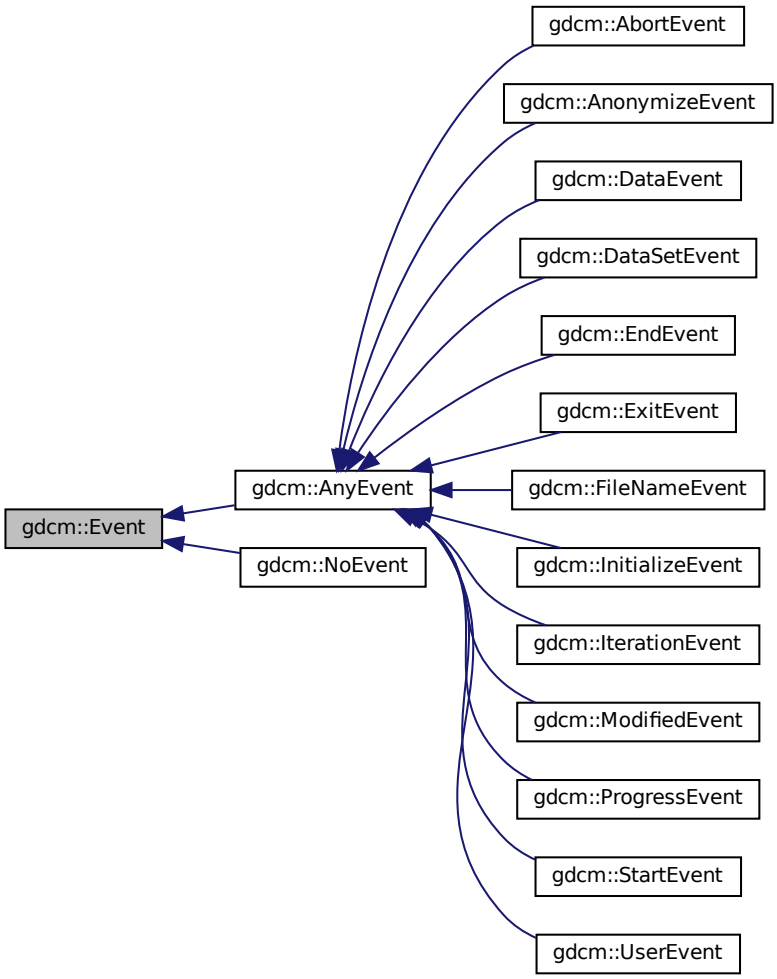
- gdcmEquipmentManufacturer.h

10.117 gdcm::Event Class Reference

superclass for callback/observer methods

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::Event:



Public Member Functions

- Event ()
- Event (const Event &)
- virtual ~Event ()
- virtual bool CheckEvent (const Event *) const =0
- virtual const char * GetEventName () const =0
- virtual Event * MakeObject () const =0
- void operator= (const Event &)=delete
- virtual void Print (std::ostream &os) const

10.117.1 Detailed Description

superclass for callback/observer methods

See also

Command Subject

Examples

SimpleScanner.cxx.

10.117.2 Constructor & Destructor Documentation

10.117.2.1 Event() [1/2]

```
gdcm::Event::Event ( )
```

10.117.2.2 ~Event()

```
virtual gdcm::Event::~Event ( )  [virtual]
```

10.117.2.3 Event() [2/2]

```
gdcm::Event::Event (
            const Event &  )
```

10.117.3 Member Function Documentation

10.117.3.1 CheckEvent()

```
virtual bool gdcm::Event::CheckEvent (
            const Event *  ) const  [pure virtual]
```

Check if given event matches or derives from this event.

10.117.3.2 GetEventName()

```
virtual const char* gdcm::Event::GetEventName ( ) const  [pure virtual]
```

Return the StringName associated with the event.

Implemented in gdcm::AnonymizeEvent, gdcm::DataSetEvent, gdcm::ProgressEvent, gdcm::FileNameEvent, and gdcm::DataEvent.

10.117.3.3 MakeObject()

```
virtual Event* gdcm::Event::MakeObject ( ) const  [pure virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implemented in gdcm::AnonymizeEvent, gdcm::DataSetEvent, gdcm::ProgressEvent, gdcm::FileNameEvent, and gdcm::DataEvent.

10.117.3.4 operator=()

```
void gdcm::Event::operator= (
            const Event &  )  [delete]
```

10.117.3.5 Print()

```
virtual void gdcm::Event::Print (
            std::ostream & os ) const  [virtual]
```

Print Event information. This method can be overridden by specific Event subtypes. The default is to print out the type of the event.

Referenced by gdcm::operator<<().

The documentation for this class was generated from the following file:

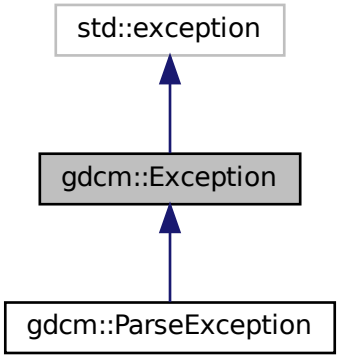
- gdcmEvent.h

10.118 gdcm::Exception Class Reference

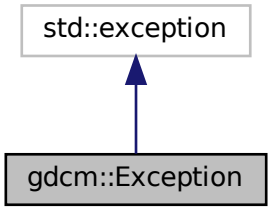
Exception.

`#include <gdcmException.h>`

Inheritance diagram for gdcm::Exception:



Collaboration diagram for gdcm::Exception:



Public Member Functions

- Exception (const char *desc="None", const char *file=__FILE__, unsigned int lineNumber=__LINE__, const char *func="")
- ~Exception () override throw ()
- const char * GetDescription () const

  Return the Description.
- const char * what () const override throw ()

  what implementation

10.118.1 Detailed Description

Exception.

Standard exception handling object.

Note

Its copy-constructor and assignment operator are generated by the compiler.

10.118.2 Constructor & Destructor Documentation

10.118.2.1 Exception()

```
gdcm::Exception::Exception (
            const char * desc = "None",
            const char * file = __FILE__,
            unsigned int lineNumber = __LINE__,
            const char * func = "" )  [inline], [explicit]
```

Explicit constructor, initializing the description and the text returned by what().

Note

The last parameter is ignored for the time being. It may be used to specify the function where the exception was thrown.

10.118.2.2 ~Exception()

```
gdcm::Exception::~Exception ( ) throw ( )   [inline], [override]
```

10.118.3 Member Function Documentation

10.118.3.1 GetDescription()

```
const char* gdcm::Exception::GetDescription ( ) const  [inline]
```

Return the Description.

Referenced by gdcm::SequenceOfItems::Read().

10.118.3.2 what()

```
const char* gdcm::Exception::what ( ) const throw ( )   [inline], [override]
```

what implementation

Referenced by gdcm::SequenceOfFragments::ReadValue().

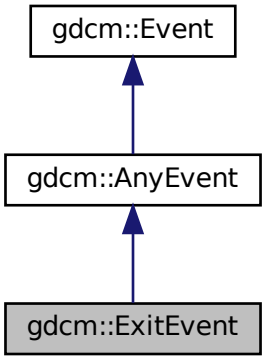
The documentation for this class was generated from the following file:

- gdcmException.h

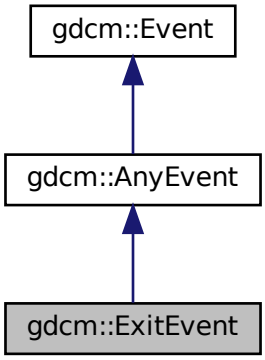
10.119 gdcm::ExitEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::ExitEvent:



Collaboration diagram for gdcm::ExitEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

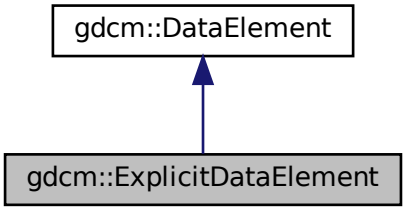
- gdcmEvent.h

10.120 gdcm::ExplicitDataElement Class Reference

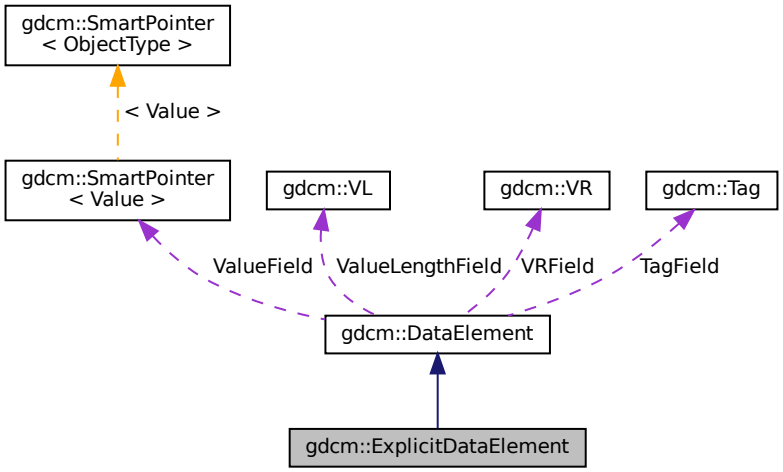
Class to read/write a DataElement as Explicit Data Element.

`#include <gdcmExplicitDataElement.h>`

Inheritance diagram for gdcm::ExplicitDataElement:



Collaboration diagram for gdcm::ExplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)
- template<typename TSwap >
  const std::ostream & Write (std::ostream &os) const

Additional Inherited Members

10.120.1 Detailed Description

Class to read/write a DataElement as Explicit Data Element.

Note

bla

Examples

DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, and ReadAndDumpDICOMDIR2.cxx.

10.120.2 Member Function Documentation

10.120.2.1 GetLength()

```
VL gdcm::ExplicitDataElement::GetLength ( ) const
```

10.120.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::ExplicitDataElement::Read (
             std::istream & is )
```

10.120.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::ExplicitDataElement::ReadPreValue (
             std::istream & is )
```

10.120.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::ExplicitDataElement::ReadValue (
             std::istream & is,
             bool readvalues = true )
```

10.120.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::ExplicitDataElement::ReadWithLength (
             std::istream & is,
             VL & length )
```

10.120.2.6 Write()

```
template<typename TSwap >
const std::ostream& gdcm::ExplicitDataElement::Write (
             std::ostream & os ) const
```

The documentation for this class was generated from the following file:

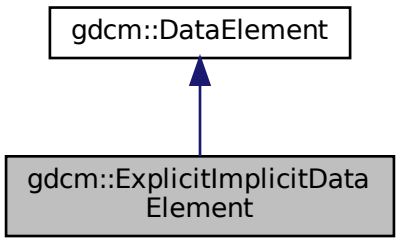
- gdcmExplicitDataElement.h

10.121 gdcm::ExplicitImplicitDataElement Class Reference

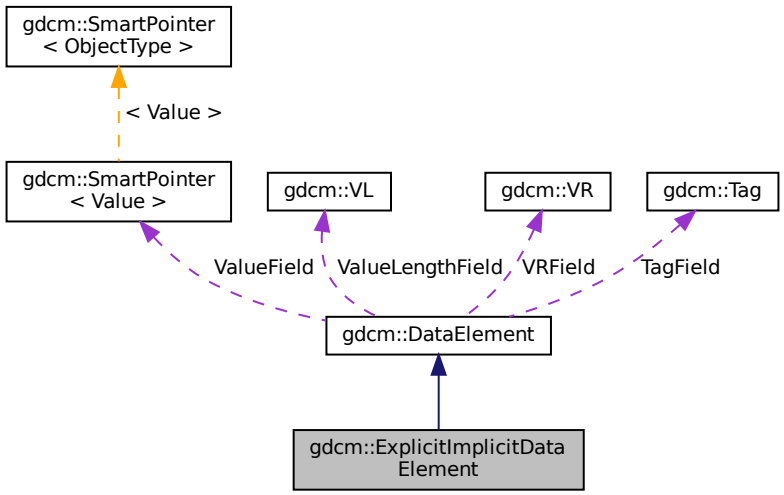
Class to read/write a DataElement as ExplicitImplicit Data Element.

```
#include <gdcmExplicitImplicitDataElement.h>
```

Inheritance diagram for gdcm::ExplicitImplicitDataElement:



Collaboration diagram for gdcm::ExplicitImplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)

Additional Inherited Members

10.121.1 Detailed Description

Class to read/write a DataElement as ExplicitImplicit Data Element.

Note

This only happen for some Philips images Should I derive from ExplicitDataElement instead ? This is the class that is the closest the GDCM1.x parser. At each element we try first to read it as explicit, if this fails, then we try again as an implicit element.

10.121.2 Member Function Documentation

10.121.2.1 GetLength()

```
VL gdcm::ExplicitImplicitDataElement::GetLength ( ) const
```

10.121.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::ExplicitImplicitDataElement::Read (
             std::istream & is )
```

10.121.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::ExplicitImplicitDataElement::ReadPreValue (
             std::istream & is )
```

10.121.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::ExplicitImplicitDataElement::ReadValue (
             std::istream & is,
             bool readvalues = true )
```

10.121.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::ExplicitImplicitDataElement::ReadWithLength (
             std::istream & is,
             VL & length )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmExplicitImplicitDataElement.h

10.122 gdcm::Fiducials Class Reference

Fiducials.

`#include <gdcmFiducials.h>`

Public Member Functions

- Fiducials ()=default

10.122.1 Detailed Description

Fiducials.

10.122.2 Constructor & Destructor Documentation

10.122.2.1 Fiducials()

`gdcm::Fiducials::Fiducials ( ) [default]`

The documentation for this class was generated from the following file:

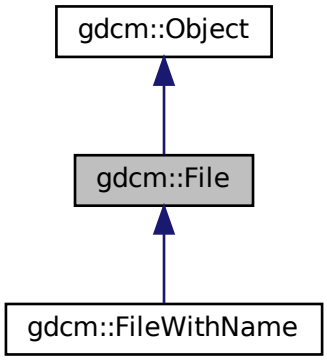
- gdcmFiducials.h

10.123 gdcm::File Class Reference

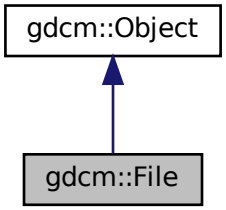
a DICOM File

`#include <gdcmFile.h>`

Inheritance diagram for gdcm::File:



Collaboration diagram for gdcm::File:



Public Member Functions

- File ()
- ~File () override
- DataSet & GetDataSet ()

  Get Data Set.
- const DataSet & GetDataSet () const

  Get Data Set.
- FileMetaInformation & GetHeader ()

  Get File Meta Information.
- const FileMetaInformation & GetHeader () const

  Get File Meta Information.

- std::istream & Read (std::istream &is)

  Read.
- void SetDataSet (const DataSet &ds)

  Set Data Set.
- void SetHeader (const FileMetaInformation &fmi)

  Set File Meta Information.
- std::ostream const & Write (std::ostream &os) const

  Write.

Friends

- std::ostream & operator<< (std::ostream &os, const File &val)

Additional Inherited Members

10.123.1 Detailed Description

a DICOM File

See PS 3.10 File: A File is an ordered string of zero or more bytes, where the first byte is at the beginning of the file and the last byte at the end of the File. Files are identified by a unique File ID and may by written, read and/or deleted.

See also

Reader Writer

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpGEMSMovieGroup.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, EncapsulateFileInRawData.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, PatchFile.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndPrintAttributes.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, and iU22tomultisc.cxx.

10.123.2 Constructor & Destructor Documentation

10.123.2.1 File()

```
gdcm::File::File ( )
```

10.123.2.2 ~File()

```
gdcm::File::~File ( )  [override]
```

10.123.3 Member Function Documentation

10.123.3.1 GetDataSet() [1/2]

```
DataSet& gdcm::File::GetDataSet ( )  [inline]
```

Get Data Set.

10.123.3.2 GetDataSet() [2/2]

```
const DataSet& gdcm::File::GetDataSet ( ) const  [inline]
```

Get Data Set.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, PatchFile.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, ReadAndPrintAttributes.cxx, ReadExplicitLengthSQIVR.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.123.3.3 GetHeader() [1/2]

```
FileMetaInformation& gdcm::File::GetHeader ( )  [inline]
```

Get File Meta Information.

10.123.3.4 GetHeader() [2/2]

```
const FileMetaInformation& gdcm::File::GetHeader ( ) const  [inline]
```

Get File Meta Information.

Examples

CreateJPIPDataSet.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixJAIBugJPEGLS.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GetJPEGSamplePrecision.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, MpegVideoInfo.cs, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, StreamImageReaderTest.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.123.3.5 Read()

```
std::istream& gdcm::File::Read (
            std::istream & is )
```

Read.

10.123.3.6 SetDataSet()

```
void gdcm::File::SetDataSet (
            const DataSet & ds )  [inline]
```

Set Data Set.

10.123.3.7 SetHeader()

```
void gdcm::File::SetHeader (
            const FileMetaInformation & fmi )  [inline]
```

Set File Meta Information.

10.123.3.8 Write()

```
std::ostream const& gdcm::File::Write (
            std::ostream & os ) const
```

Write.

10.123.4 Friends And Related Function Documentation

10.123.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const File & val )  [friend]
```

The documentation for this class was generated from the following file:

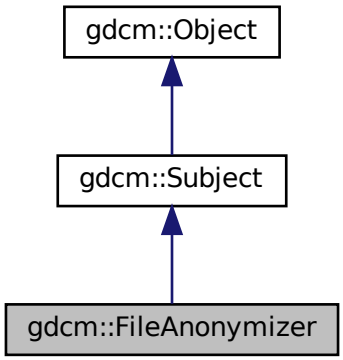
- gdcmFile.h

10.124 gdcm::FileAnonymizer Class Reference

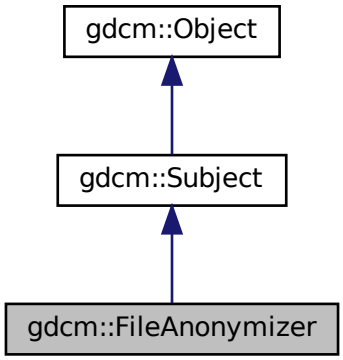
FileAnonymizer.

```
#include <gdcmFileAnonymizer.h>
```

Inheritance diagram for gdcm::FileAnonymizer:



Collaboration diagram for gdcm::FileAnonymizer:



Public Member Functions

- FileAnonymizer ()
- ~FileAnonymizer () override
- void Empty (Tag const &t)
- void Remove (Tag const &t)

  remove a tag (even a SQ can be removed)
- void Replace (Tag const &t, const char *value_data, VL const &vl)
- void Replace (Tag const &t, const char *value_str)
- void SetInputFileName (const char *filename_native)

  Set input filename.
- void SetOutputFileName (const char *filename_native)

  Set output filename.
- bool Write ()

  Write the output file.

Additional Inherited Members

10.124.1 Detailed Description

FileAnonymizer.

This Anonymizer is a file-based Anonymizer. It requires a valid DICOM file and will use the Value Length to skip over any information.

It will not load the DICOM dataset taken from SetInputFileName() into memory and should consume much less memory than Anonymizer.

Warning

: Each time you call Replace() with a value. This value will copied, and stored in memory. The behavior is not ideal for extremely large data (larger than memory size). This class is really meant to take a large DICOM input file and then only changed some small attribute.

caveats:

- This class will NOT work with unordered attributes in a DICOM File,
- This class does neither recompute nor update the Group Length element,
- This class currently does not update the File Meta Information header.
- Only strict inplace Replace operation is supported when input and output file are the same.

Examples

MakeTemplate.cxx.

10.124.2 Constructor & Destructor Documentation

10.124.2.1 FileAnonymizer()

```
gdcm::FileAnonymizer::FileAnonymizer ( )
```

10.124.2.2 ~FileAnonymizer()

```
gdcm::FileAnonymizer::~FileAnonymizer ( )  [override]
```

10.124.3 Member Function Documentation

10.124.3.1 Empty()

```
void gdcm::FileAnonymizer::Empty (
            Tag const & t )
```

Make Tag t empty Warning: does not handle SQ element

Examples

MakeTemplate.cxx.

10.124.3.2 Remove()

```
void gdcm::FileAnonymizer::Remove (
            Tag const & t )
```

remove a tag (even a SQ can be removed)

10.124.3.3 Replace() [1/2]

```
void gdcm::FileAnonymizer::Replace (
            Tag const & t,
            const char * value_data,
            VL const & vl )
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

10.124.3.4 Replace() [2/2]

```
void gdcm::FileAnonymizer::Replace (
            Tag const & t,
            const char * value_str )
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCII WARNING: Do not ever try to write a value in a SQ Data Element !

10.124.3.5 SetInputFileName()

```
void gdcm::FileAnonymizer::SetInputFileName (
            const char * filename_native )
```

Set input filename.

Examples

FileAnonymize.cs, and MakeTemplate.cxx.

10.124.3.6 SetOutputFileName()

```
void gdcm::FileAnonymizer::SetOutputFileName (
            const char * filename_native )
```

Set output filename.

Examples

MakeTemplate.cxx.

10.124.3.7 Write()

```
bool gdcm::FileAnonymizer::Write ( )
```

Write the output file.

Examples

MakeTemplate.cxx.

The documentation for this class was generated from the following file:

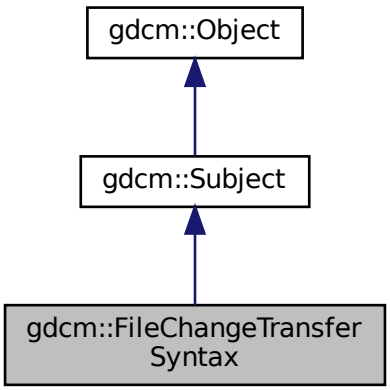
- gdcmFileAnonymizer.h

10.125 gdcm::FileChangeTransferSyntax Class Reference

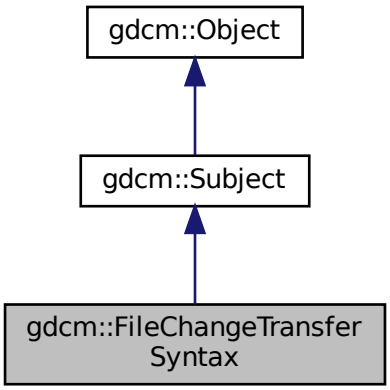
FileChangeTransferSyntax.

```
#include <gdcmFileChangeTransferSyntax.h>
```

Inheritance diagram for gdcm::FileChangeTransferSyntax:



Collaboration diagram for gdcm::FileChangeTransferSyntax:



Public Member Functions

- FileChangeTransferSyntax ()
- ~FileChangeTransferSyntax () override
- bool Change ()

  Change the transfer syntax.
- ImageCodec * GetCodec ()
- void SetInputFileName (const char *filename_native)

  Set input filename (raw DICOM)
- void SetOutputFileName (const char *filename_native)

  Set output filename (target compressed DICOM)
- void SetTransferSyntax (TransferSyntax const &ts)

  Specify the Target Transfer Syntax.

Static Public Member Functions

- static SmartPointer< FileChangeTransferSyntax > New ()

  for wrapped language: instantiate a reference counted object

Additional Inherited Members

10.125.1 Detailed Description

FileChangeTransferSyntax.

This class is a file-based (limited) replacement of the in-memory ImageChangeTransferSyntax.

This class provide a file-based compression-only mechanism. It will take in an uncompressed DICOM image file (Pixel Data element). Then produced as output a compressed DICOM file (Transfer Syntax will be updated).

Currently it supports the following transfer syntax:

- JPEGLosslessProcess14_1

10.125.2 Constructor & Destructor Documentation

10.125.2.1 FileChangeTransferSyntax()

```
gdcm::FileChangeTransferSyntax::FileChangeTransferSyntax ( )
```

10.125.2.2 ~FileChangeTransferSyntax()

```
gdcm::FileChangeTransferSyntax::~FileChangeTransferSyntax ( )  [override]
```

10.125.3 Member Function Documentation

10.125.3.1 Change()

```
bool gdcm::FileChangeTransferSyntax::Change ( )
```

Change the transfer syntax.

10.125.3.2 GetCodec()

```
ImageCodec* gdcm::FileChangeTransferSyntax::GetCodec ( )
```

Retrieve the actual codec (valid after calling SetTransferSyntax) Only advanced users should call this function.

10.125.3.3 New()

```
static SmartPointer<FileChangeTransferSyntax> gdcm::FileChangeTransferSyntax::New ( )  [inline],
[static]
```

for wrapped language: instantiate a reference counted object

10.125.3.4 SetInputFileName()

```
void gdcm::FileChangeTransferSyntax::SetInputFileName (
            const char * filename_native )
```

Set input filename (raw DICOM)

10.125.3.5 SetOutputFileName()

```
void gdcm::FileChangeTransferSyntax::SetOutputFileName (
            const char * filename_native )
```

Set output filename (target compressed DICOM)

10.125.3.6 SetTransferSyntax()

```
void gdcm::FileChangeTransferSyntax::SetTransferSyntax (
            TransferSyntax const & ts )
```

Specify the Target Transfer Syntax.

The documentation for this class was generated from the following file:

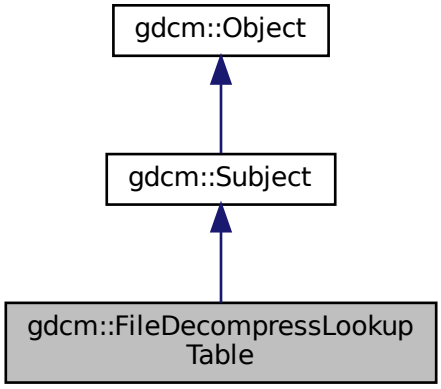
- gdcmFileChangeTransferSyntax.h

10.126 gdcm::FileDecompressLookupTable Class Reference

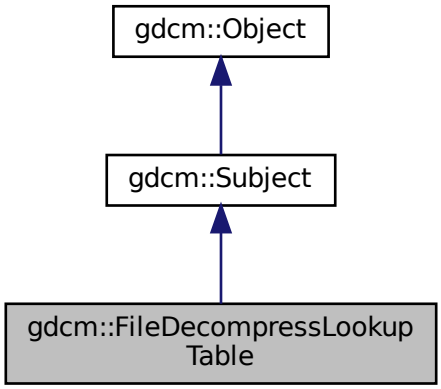
FileDecompressLookupTable class.

`#include <gdcmFileDecompressLookupTable.h>`

Inheritance diagram for gdcm::FileDecompressLookupTable:



Collaboration diagram for gdcm::FileDecompressLookupTable:



Public Member Functions

- FileDecompressLookupTable ()=default
- ~FileDecompressLookupTable () override=default
- bool Change ()

  Decompress.
- File & GetFile ()
- Pixmap & GetPixmap ()
- const Pixmap & GetPixmap () const
- void SetFile (const File &f)

  Set/Get File.
- void SetPixmap (Pixmap const &img)

Additional Inherited Members

10.126.1 Detailed Description

FileDecompressLookupTable class.

It decompress the segmented LUT into linearized one (only PALETTE_COLOR images) Output will be a PhotometricInterpretation=RGB image

10.126.2 Constructor & Destructor Documentation

10.126.2.1 FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::FileDecompressLookupTable ( )  [default]
```

10.126.2.2 ~FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::~FileDecompressLookupTable ( )  [override], [default]
```

10.126.3 Member Function Documentation

10.126.3.1 Change()

```
bool gdcm::FileDecompressLookupTable::Change ( )
```

Decompress.

10.126.3.2 GetFile()

```
File& gdcm::FileDecompressLookupTable::GetFile ( )  [inline]
```

10.126.3.3 GetPixmap() [1/2]

```
Pixmap& gdcm::FileDecompressLookupTable::GetPixmap ( )  [inline]
```

10.126.3.4 GetPixmap() [2/2]

```
const Pixmap& gdcm::FileDecompressLookupTable::GetPixmap ( ) const  [inline]
```

10.126.3.5 SetFile()

```
void gdcm::FileDecompressLookupTable::SetFile (
            const File & f )  [inline]
```

Set/Get File.

10.126.3.6 SetPixmap()

```
void gdcm::FileDecompressLookupTable::SetPixmap (
            Pixmap const & img )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmFileDecompressLookupTable.h

10.127 gdcm::FileDerivation Class Reference

FileDerivation class.

`#include <gdcmFileDerivation.h>`

Public Member Functions

- FileDerivation ()
- ~FileDerivation ()
- bool AddReference (const char *referencedsopclassuid, const char *referencedsopinstanceuid)
- bool Derive ()

  Change.
- File & GetFile ()
- const File & GetFile () const
- void SetAppendDerivationHistory (bool b)
- void SetDerivationCodeSequenceCodeValue (unsigned int codevalue)

  Specify the Derivation Code Sequence Code Value. Eg 113040.
- void SetDerivationDescription (const char *dd)

  Specify the Derivation Description. Eg "lossy conversion".
- void SetFile (const File &f)

  Set/Get File.
- void SetPurposeOfReferenceCodeSequenceCodeValue (unsigned int codevalue)

  Specify the Purpose Of Reference Code Value. Eg. 121320.

Protected Member Functions

- bool AddDerivationDescription ()
- bool AddPurposeOfReferenceCodeSequence (DataSet &ds)
- bool AddSourceImageSequence ()

10.127.1 Detailed Description

FileDerivation class.

See PS 3.16 - 2008 For the list of Code Value that can be used for in Derivation Code Sequence

URL: `http://medical.nema.org/medical/dicom/2008/08_16pu.pdf`

DICOM Part 16 has two Context Groups CID 7202 and CID 7203 which contain a set of codes defining reason for a source image reference (ie. reason code for referenced image sequence) and a coded description of the deriation applied to the new image data from the original. Both these context groups are extensible.

File Derivation is compulsory when creating a lossy derived image.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

10.127.2 Constructor & Destructor Documentation

10.127.2.1 FileDerivation()

```
gdcm::FileDerivation::FileDerivation ( )
```

10.127.2.2 ~FileDerivation()

```
gdcm::FileDerivation::~FileDerivation ( )
```

10.127.3 Member Function Documentation

10.127.3.1 AddDerivationDescription()

```
bool gdcm::FileDerivation::AddDerivationDescription ( )  [protected]
```

10.127.3.2 AddPurposeOfReferenceCodeSequence()

```
bool gdcm::FileDerivation::AddPurposeOfReferenceCodeSequence (
            DataSet & ds )  [protected]
```

10.127.3.3 AddReference()

```
bool gdcm::FileDerivation::AddReference (
            const char * referencedsopclassuid,
            const char * referencedsopinstanceuid )
```

Create the proper reference. Need to pass the original SOP Class UID and the original SOP Instance UID, so that those value can be used as Reference.

Warning

referencedsopclassuid and referencedsopinstanceuid needs to be \0 padded. This is not compatible with how ByteValue->GetPointer works.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

10.127.3.4 AddSourceImageSequence()

```
bool gdcm::FileDerivation::AddSourceImageSequence ( )  [protected]
```

10.127.3.5 Derive()

```
bool gdcm::FileDerivation::Derive ( )
```

Change.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

10.127.3.6 GetFile() [1/2]

```
File& gdcm::FileDerivation::GetFile ( )  [inline]
```

Examples

GenFakeImage.cxx.

10.127.3.7 GetFile() [2/2]

```
const File& gdcm::FileDerivation::GetFile ( ) const  [inline]
```

10.127.3.8 SetAppendDerivationHistory()

```
void gdcm::FileDerivation::SetAppendDerivationHistory (
            bool b )
```

Specify if Derivation history should be appended (default false) When false, this is an error if input already has a derivation history When true, both Purpose of Reference Code Value and Derivation Code Sequence Code Value can have their history appended.

10.127.3.9 SetDerivationCodeSequenceCodeValue()

```
void gdcm::FileDerivation::SetDerivationCodeSequenceCodeValue (
            unsigned int codevalue )
```

Specify the Derivation Code Sequence Code Value. Eg 113040.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

10.127.3.10 SetDerivationDescription()

```
void gdcm::FileDerivation::SetDerivationDescription (
            const char * dd )
```

Specify the Derivation Description. Eg "lossy conversion".

10.127.3.11 SetFile()

```
void gdcm::FileDerivation::SetFile (
            const File & f )  [inline]
```

Set/Get File.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

10.127.3.12 SetPurposeOfReferenceCodeSequenceCodeValue()

```
void gdcm::FileDerivation::SetPurposeOfReferenceCodeSequenceCodeValue (
            unsigned int codevalue )
```

Specify the Purpose Of Reference Code Value. Eg. 121320.

Examples

DeriveSeries.cxx, and GenFakeImage.cxx.

The documentation for this class was generated from the following file:

- gdcmFileDerivation.h

10.128 gdcm::FileExplicitFilter Class Reference

FileExplicitFilter class.

```
#include <gdcmFileExplicitFilter.h>
```

Public Member Functions

- FileExplicitFilter ()
- ~FileExplicitFilter ()=default
- bool Change ()

  Set FMI Transfer Syntax.
- File & GetFile ()
- void SetChangePrivateTags (bool b)

  Decide whether or not to VR'ify private tags.
- void SetFile (const File &f)

  Set/Get File.
- void SetRecomputeItemLength (bool b)

  By default set Sequence & Item length to Undefined to avoid recomputing length:
- void SetRecomputeSequenceLength (bool b)
- void SetUseVRUN (bool b)

  When VR=16bits in explicit but Implicit has a 32bits length, use VR=UN.

Protected Member Functions

- bool ChangeFMI ()
- bool ProcessDataSet (DataSet &ds, Dicts const &dicts)

10.128.1 Detailed Description

FileExplicitFilter class.

After changing a file from Implicit to Explicit representation (see ImageChangeTransferSyntax) one operation is to make sure the VR of each DICOM attribute are accurate and do match the one from PS 3.6. Indeed when a file is written in Implicit representation, the VR is not stored directly in the file.

Warning

changing an implicit dataset to an explicit dataset is NOT a trivial task of simply changing the VR to the dict one:

- One has to make sure SQ is properly set
- One has to recompute the explicit length SQ
- One has to make sure that VR is valid for the encoding
- One has to make sure that VR 16bits can store the original value length

Examples

GenAllVR.cxx, and LargeVRDSExplicit.cxx.

10.128.2 Constructor & Destructor Documentation

10.128.2.1 FileExplicitFilter()

```
gdcm::FileExplicitFilter::FileExplicitFilter ( )  [inline]
```

10.128.2.2 ~FileExplicitFilter()

```
gdcm::FileExplicitFilter::~FileExplicitFilter ( )  [default]
```

10.128.3 Member Function Documentation

10.128.3.1 Change()

```
bool gdcm::FileExplicitFilter::Change ( )
```

Set FMI Transfer Syntax.

Change

Examples

GenAllVR.cxx, and LargeVRDSExplicit.cxx.

10.128.3.2 ChangeFMI()

```
bool gdcm::FileExplicitFilter::ChangeFMI ( )  [protected]
```

10.128.3.3 GetFile()

```
File& gdcm::FileExplicitFilter::GetFile ( )  [inline]
```

10.128.3.4 ProcessDataSet()

```
bool gdcm::FileExplicitFilter::ProcessDataSet (
            DataSet & ds,
            Dicts const & dicts )  [protected]
```

10.128.3.5 SetChangePrivateTags()

```
void gdcm::FileExplicitFilter::SetChangePrivateTags (
            bool b )  [inline]
```

Decide whether or not to VR'ify private tags.

10.128.3.6 SetFile()

```
void gdcm::FileExplicitFilter::SetFile (
            const File & f )  [inline]
```

Set/Get File.

Examples

GenAllVR.cxx, and LargeVRDSExplicit.cxx.

10.128.3.7 SetRecomputeItemLength()

```
void gdcm::FileExplicitFilter::SetRecomputeItemLength (
            bool b )
```

By default set Sequence & Item length to Undefined to avoid recomputing length:

10.128.3.8 SetRecomputeSequenceLength()

```
void gdcm::FileExplicitFilter::SetRecomputeSequenceLength (
            bool b )
```

10.128.3.9 SetUseVRUN()

```
void gdcm::FileExplicitFilter::SetUseVRUN (
            bool b )  [inline]
```

When VR=16bits in explicit but Implicit has a 32bits length, use VR=UN.

The documentation for this class was generated from the following file:

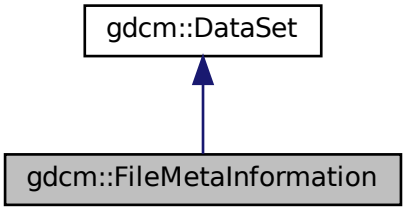
- gdcmFileExplicitFilter.h

10.129 gdcm::FileMetaInformation Class Reference

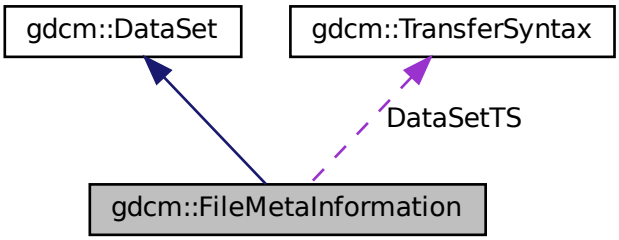
Class to represent a File Meta Information.

```
#include <gdcmFileMetaInformation.h>
```

Inheritance diagram for gdcm::FileMetaInformation:



Collaboration diagram for gdcm::FileMetaInformation:



Public Member Functions

- FileMetaInformation ()
- FileMetaInformation (FileMetaInformation const &fmi)
- ~FileMetaInformation ()
- void FillFromDataSet (DataSet const &ds)

  Construct a FileMetaInformation from an already existing DataSet:
- const TransferSyntax & GetDataSetTransferSyntax () const
- VL GetFullLength () const
- MediaStorage GetMediaStorage () const
- std::string GetMediaStorageAsString () const
- TransferSyntax::NegociatedType GetMetaInformationTS () const
- Preamble & GetPreamble ()
- const Preamble & GetPreamble () const

  Get Preamble.
- void Insert (const DataElement &de)
- bool IsValid () const
- FileMetaInformation & operator= (const FileMetaInformation &fmi)
- std::istream & Read (std::istream &is)

  Read.
- std::istream & ReadCompat (std::istream &is)
- void Replace (const DataElement &de)
- void SetDataSetTransferSyntax (const TransferSyntax &ts)
- void SetPreamble (const Preamble &p)
- std::ostream & Write (std::ostream &os) const

  Write.

Static Public Member Functions

- static void AppendImplementationClassUID (const char *imp)
- static const char * GetImplementationClassUID ()
- static const char * GetImplementationVersionName ()
- static const char * GetSourceApplicationEntityTitle ()
- static void SetImplementationClassUID (const char *imp)

  Override the GDCM default values:
- static void SetImplementationVersionName (const char *version)
- static void SetSourceApplicationEntityTitle (const char *title)

Protected Member Functions

- void ComputeDataSetMediaStorageSOPClass ()
- void ComputeDataSetTransferSyntax ()
- void Default ()
- template<typename TSwap >
  std::istream & ReadCompatInternal (std::istream &is)

Static Protected Member Functions

- static const char * GetFileMetaInformationVersion ()
- static const char * GetGDCMImplementationClassUID ()
- static const char * GetGDCMImplementationVersionName ()
- static const char * GetGDCMSourceApplicationEntityTitle ()

Protected Attributes

- MediaStorage::MSType DataSetMS
- TransferSyntax DataSetTS
- TransferSyntax::NegociatedType MetaInformationTS

Friends

- std::ostream & operator<< (std::ostream &_os, const FileMetaInformation &_val)

Additional Inherited Members

10.129.1 Detailed Description

Class to represent a File Meta Information.

FileMetaInformation is a Explicit Structured Set. Whenever the file contains an ImplicitDataElement DataSet, a conversion will take place.

Definition: The File Meta Information includes identifying information on the encapsulated Data Set. This header consists of a 128 byte File Preamble, followed by a 4 byte DICOM prefix, followed by the File Meta Elements shown in Table 7.1-1. This header shall be present in every DICOM file.

See also

Writer Reader

Examples

DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, and ReadAndDumpDICOMDIR.cxx.

10.129.2 Constructor & Destructor Documentation

10.129.2.1 FileMetaInformation() [1/2]

```
gdcm::FileMetaInformation::FileMetaInformation ( )
```

10.129.2.2 ~FileMetaInformation()

```
gdcm::FileMetaInformation::~FileMetaInformation ( )
```

10.129.2.3 FileMetaInformation() [2/2]

```
gdcm::FileMetaInformation::FileMetaInformation (
            FileMetaInformation const & fmi )  [inline]
```

References DataSetMS, DataSetTS, and MetaInformationTS.

10.129.3 Member Function Documentation

10.129.3.1 AppendImplementationClassUID()

```
static void gdcm::FileMetaInformation::AppendImplementationClassUID (
            const char * imp )  [static]
```

10.129.3.2 ComputeDataSetMediaStorageSOPClass()

```
void gdcm::FileMetaInformation::ComputeDataSetMediaStorageSOPClass ( )  [protected]
```

10.129.3.3 ComputeDataSetTransferSyntax()

```
void gdcm::FileMetaInformation::ComputeDataSetTransferSyntax ( )  [protected]
```

10.129.3.4 Default()

```
void gdcm::FileMetaInformation::Default ( )  [protected]
```

10.129.3.5 FillFromDataSet()

```
void gdcm::FileMetaInformation::FillFromDataSet (
            DataSet const & ds )
```

Construct a FileMetaInformation from an already existing DataSet:

10.129.3.6 GetDataSetTransferSyntax()

```
const TransferSyntax& gdcm::FileMetaInformation::GetDataSetTransferSyntax ( ) const  [inline]
```

Examples

GetJPEGSamplePrecision.cxx, and MergeTwoFiles.cxx.

10.129.3.7 GetFileMetaInformationVersion()

```
static const char* gdcm::FileMetaInformation::GetFileMetaInformationVersion ( )  [static], [protected]
```

10.129.3.8 GetFullLength()

```
VL gdcm::FileMetaInformation::GetFullLength ( ) const  [inline]
```

References gdcm::VL::GetLength().

10.129.3.9 GetGDCMImplementationClassUID()

```
static const char* gdcm::FileMetaInformation::GetGDCMImplementationClassUID ( )  [static], [protected]
```

10.129.3.10 GetGDCMImplementationVersionName()

```
static const char* gdcm::FileMetaInformation::GetGDCMImplementationVersionName ( )  [static],
[protected]
```

10.129.3.11 GetGDCMSourceApplicationEntityTitle()

```
static const char* gdcm::FileMetaInformation::GetGDCMSourceApplicationEntityTitle ( )  [static],
[protected]
```

10.129.3.12 GetImplementationClassUID()

```
static const char* gdcm::FileMetaInformation::GetImplementationClassUID ( )  [static]
```

10.129.3.13 GetImplementationVersionName()

```
static const char* gdcm::FileMetaInformation::GetImplementationVersionName ( )  [static]
```

10.129.3.14 GetMediaStorage()

```
MediaStorage gdcm::FileMetaInformation::GetMediaStorage ( ) const
```

10.129.3.15 GetMediaStorageAsString()

```
std::string gdcm::FileMetaInformation::GetMediaStorageAsString ( ) const
```

10.129.3.16 GetMetaInformationTS()

```
TransferSyntax::NegociatedType gdcm::FileMetaInformation::GetMetaInformationTS ( ) const  [inline]
```

10.129.3.17 GetPreamble() [1/2]

```
Preamble& gdcm::FileMetaInformation::GetPreamble ( )  [inline]
```

10.129.3.18 GetPreamble() [2/2]

```
const Preamble& gdcm::FileMetaInformation::GetPreamble ( ) const  [inline]
```

Get Preamble.

10.129.3.19 GetSourceApplicationEntityTitle()

```
static const char* gdcm::FileMetaInformation::GetSourceApplicationEntityTitle ( )  [static]
```

10.129.3.20 Insert()

```
void gdcm::FileMetaInformation::Insert (
            const DataElement & de )  [inline]
```

References gdcmErrorMacro, gdcm::Tag::GetGroup(), and gdcm::DataElement::GetTag().

10.129.3.21 IsValid()

```
bool gdcm::FileMetaInformation::IsValid ( ) const  [inline]
```

10.129.3.22 operator=()

```
FileMetaInformation& gdcm::FileMetaInformation::operator= (
            const FileMetaInformation & fmi )  [inline]
```

References DataSetMS, DataSetTS, and MetaInformationTS.

10.129.3.23 Read()

```
std::istream& gdcm::FileMetaInformation::Read (
            std::istream & is )
```

Read.

10.129.3.24 ReadCompat()

```
std::istream& gdcm::FileMetaInformation::ReadCompat (
            std::istream & is )
```

10.129.3.25 ReadCompatInternal()

```
template<typename TSwap >
std::istream& gdcm::FileMetaInformation::ReadCompatInternal (
            std::istream & is )  [protected]
```

10.129.3.26 Replace()

```
void gdcm::FileMetaInformation::Replace (
            const DataElement & de )  [inline]
```

Examples

LargeVRDSExplicit.cxx.

References gdcm::DataElement::GetTag().

10.129.3.27 SetDataSetTransferSyntax()

```
void gdcm::FileMetaInformation::SetDataSetTransferSyntax (
            const TransferSyntax & ts )
```

Examples

CreateJPIPDataSet.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixJAIBugJPEGLS.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MpegVideoInfo.cs, QIDO-RS.cxx, StreamImageReaderTest.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.129.3.28 SetImplementationClassUID()

```
static void gdcm::FileMetaInformation::SetImplementationClassUID (
            const char * imp )  [static]
```

Override the GDCM default values:

10.129.3.29 SetImplementationVersionName()

```
static void gdcm::FileMetaInformation::SetImplementationVersionName (
            const char * version )  [static]
```

10.129.3.30 SetPreamble()

```
void gdcm::FileMetaInformation::SetPreamble (
            const Preamble & p )  [inline]
```

10.129.3.31 SetSourceApplicationEntityTitle()

```
static void gdcm::FileMetaInformation::SetSourceApplicationEntityTitle (
            const char * title )  [static]
```

Examples

ClinicalTrialIdentificationWorkflow.cs, FixJAIBugJPEGLS.cxx, GenerateDICOMDIR.cs, ReformatFile.cs, and StandardizeFiles.cs.

10.129.3.32 Write()

```
std::ostream& gdcm::FileMetaInformation::Write (
            std::ostream & os ) const
```

Write.

10.129.4 Friends And Related Function Documentation

10.129.4.1 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const FileMetaInformation & _val )  [friend]
```

10.129.5 Member Data Documentation

10.129.5.1 DataSetMS

```
MediaStorage::MSType gdcm::FileMetaInformation::DataSetMS  [protected]
```

Referenced by FileMetaInformation(), and operator=().

10.129.5.2 DataSetTS

```
TransferSyntax gdcm::FileMetaInformation::DataSetTS  [protected]
```

Referenced by FileMetaInformation(), and operator=().

10.129.5.3 MetaInformationTS

```
TransferSyntax::NegociatedType gdcm::FileMetaInformation::MetaInformationTS  [protected]
```

Referenced by FileMetaInformation(), and operator=().

The documentation for this class was generated from the following file:

- gdcmFileMetaInformation.h

10.130 gdcm::Filename Class Reference

Class to manipulate file name's.

```
#include <gdcmFilename.h>
```

Public Member Functions

- Filename (const char *filename="")
- bool EndWith (const char ending[ ]) const

  Does the filename ends with a particular string ?
- const char * GetExtension ()

  return only the extension part of a filename
- const char * GetFileName () const

  Return the full filename.
- const char * GetName ()

  return only the name part of a filename
- const char * GetPath ()

  Return only the path component of a filename.
- bool IsEmpty () const

  return whether the filename is empty
- bool IsIdentical (Filename const &fn) const
- operator const char * () const
- const char * ToUnixSlashes ()

  Convert backslash (windows style) to UNIX style slash.
- const char * ToWindowsSlashes ()

  Convert forward slash (UNIX style) to windows style slash.

Static Public Member Functions

- static const char * Join (const char *path, const char *filename)

10.130.1 Detailed Description

Class to manipulate file name's.

Note

OS independent representation of a filename (to query path, name and extension from a filename)

10.130.2 Constructor & Destructor Documentation

10.130.2.1 Filename()

```
gdcm::Filename::Filename (
            const char * filename = "" )  [inline]
```

10.130.3 Member Function Documentation

10.130.3.1 EndWith()

```
bool gdcm::Filename::EndWith (
            const char ending[] ) const
```

Does the filename ends with a particular string ?

10.130.3.2 GetExtension()

```
const char* gdcm::Filename::GetExtension ( )
```

return only the extension part of a filename

10.130.3.3 GetFileName()

```
const char* gdcm::Filename::GetFileName ( ) const  [inline]
```

Return the full filename.

10.130.3.4 GetName()

```
const char* gdcm::Filename::GetName ( )
```

return only the name part of a filename

10.130.3.5 GetPath()

```
const char* gdcm::Filename::GetPath ( )
```

Return only the path component of a filename.

Examples

ClinicalTrialIdentificationWorkflow.cs.

10.130.3.6 IsEmpty()

```
bool gdcm::Filename::IsEmpty ( ) const  [inline]
```

return whether the filename is empty

10.130.3.7 IsIdentical()

```
bool gdcm::Filename::IsIdentical (
            Filename const & fn ) const
```

10.130.3.8 Join()

```
static const char* gdcm::Filename::Join (
            const char * path,
            const char * filename )  [static]
```

Join two paths NOT THREAD SAFE

Examples

BasicAnonymizer.cs, and ClinicalTrialIdentificationWorkflow.cs.

10.130.3.9 operator const char *()

```
gdcm::Filename::operator const char * ( ) const  [inline]
```

Simple operator to allow Filename myfilename("..."); const char * s = myfilename;

10.130.3.10 ToUnixSlashes()

```
const char* gdcm::Filename::ToUnixSlashes ( )
```

Convert backslash (windows style) to UNIX style slash.

10.130.3.11 ToWindowsSlashes()

```
const char* gdcm::Filename::ToWindowsSlashes ( )
```

Convert forward slash (UNIX style) to windows style slash.

The documentation for this class was generated from the following file:

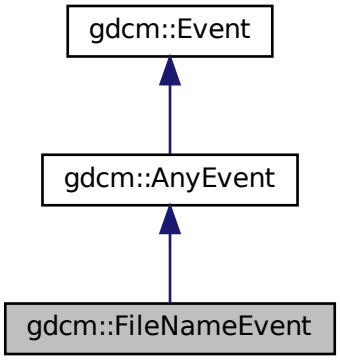
- gdcmFilename.h

10.131 gdcm::FileNameEvent Class Reference

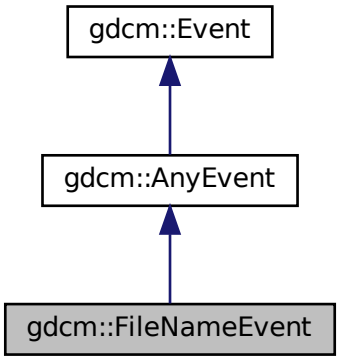
FileNameEvent.

```
#include <gdcmFileNameEvent.h>
```

Inheritance diagram for gdcm::FileNameEvent:



Collaboration diagram for gdcm::FileNameEvent:



Public Types

- typedef FileNameEvent Self
- typedef AnyEvent Superclass

Public Member Functions

- FileNameEvent (const char *s="")
- FileNameEvent (const Self &s)
- ~FileNameEvent () override=default
- bool CheckEvent (const ::gdcm::Event *e) const override
- const char * GetEventName () const override
- const char * GetFileName () const
- ::gdcm::Event * MakeObject () const override
- void operator= (const Self &)=delete
- void SetFileName (const char *f)

10.131.1 Detailed Description

FileNameEvent.

Special type of event triggered during processing of FileSet

See also

AnyEvent

Examples

SimpleScanner.cxx.

10.131.2 Member Typedef Documentation

10.131.2.1 Self

```
typedef FileNameEvent gdcm::FileNameEvent::Self
```

10.131.2.2 Superclass

```
typedef AnyEvent gdcm::FileNameEvent::Superclass
```

10.131.3 Constructor & Destructor Documentation

10.131.3.1 FileNameEvent() [1/2]

```
gdcm::FileNameEvent::FileNameEvent (
            const char * s = "" )  [inline]
```

10.131.3.2 ~FileNameEvent()

```
gdcm::FileNameEvent::~FileNameEvent ( )  [override], [default]
```

10.131.3.3 FileNameEvent() [2/2]

```
gdcm::FileNameEvent::FileNameEvent (
            const Self & s )  [inline]
```

10.131.4 Member Function Documentation

10.131.4.1 CheckEvent()

```
bool gdcm::FileNameEvent::CheckEvent (
            const ::gdcm::Event * e ) const  [inline], [override]
```

10.131.4.2 GetEventName()

```
const char* gdcm::FileNameEvent::GetEventName ( ) const  [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements gdcm::Event.

10.131.4.3 GetFileName()

```
const char* gdcm::FileNameEvent::GetFileName ( ) const  [inline]
```

Examples

SimpleScanner.cxx.

10.131.4.4 MakeObject()

```
::gdcm::Event* gdcm::FileNameEvent::MakeObject ( ) const  [inline], [override], [virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implements gdcm::Event.

10.131.4.5 operator=()

```
void gdcm::FileNameEvent::operator= (
            const Self &  )  [delete]
```

10.131.4.6 SetFileName()

```
void gdcm::FileNameEvent::SetFileName (
            const char * f )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmFileNameEvent.h

10.132 gdcm::FilenameGenerator Class Reference

FilenameGenerator.

```
#include <gdcmFilenameGenerator.h>
```

Public Types

- typedef std::vector< FilenameType > FilenamesType
- typedef std::string FilenameType
- typedef FilenamesType::size_type SizeType

Public Member Functions

- FilenameGenerator ()
- ~FilenameGenerator ()=default
- bool Generate ()

  Generate (return success)
- const char * GetFilename (SizeType n) const

  Get a particular filename (call after Generate)
- FilenamesType const & GetFilenames () const

  Return all filenames.
- SizeType GetNumberOfFilenames () const
- const char * GetPattern () const
- const char * GetPrefix () const
- void SetNumberOfFilenames (SizeType nfiles)

  Set/Get the number of filenames to generate.
- void SetPattern (const char *pattern)

  Set/Get pattern.
- void SetPrefix (const char *prefix)

  Set/Get prefix.

10.132.1 Detailed Description

FilenameGenerator.

class to generate filenames based on a pattern (C-style)

Output will be:

for i = 0, number of filenames: outfilename[i] = prefix + (pattern % i)

where pattern % i means C-style snprintf of Pattern using value 'i'

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.2 Member Typedef Documentation

10.132.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcm::FilenameGenerator::FilenamesType
```

10.132.2.2 FilenameType

```
typedef std::string gdcm::FilenameGenerator::FilenameType
```

10.132.2.3 SizeType

```
typedef FilenamesType::size_type gdcm::FilenameGenerator::SizeType
```

10.132.3 Constructor & Destructor Documentation

10.132.3.1 FilenameGenerator()

```
gdcm::FilenameGenerator::FilenameGenerator ( )  [inline]
```

10.132.3.2 ~FilenameGenerator()

```
gdcm::FilenameGenerator::~FilenameGenerator ( )  [default]
```

10.132.4 Member Function Documentation

10.132.4.1 Generate()

```
bool gdcm::FilenameGenerator::Generate ( )
```

Generate (return success)

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.4.2 GetFilename()

```
const char* gdcm::FilenameGenerator::GetFilename (
            SizeType n ) const
```

Get a particular filename (call after Generate)

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.4.3 GetFilenames()

```
FilenamesType const& gdcm::FilenameGenerator::GetFilenames ( ) const  [inline]
```

Return all filenames.

10.132.4.4 GetNumberOfFilenames()

```
SizeType gdcm::FilenameGenerator::GetNumberOfFilenames ( ) const
```

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.4.5 GetPattern()

```
const char* gdcm::FilenameGenerator::GetPattern ( ) const  [inline]
```

10.132.4.6 GetPrefix()

```
const char* gdcm::FilenameGenerator::GetPrefix ( ) const  [inline]
```

10.132.4.7 SetNumberOfFilenames()

```
void gdcm::FilenameGenerator::SetNumberOfFilenames (
            SizeType nfiles )
```

Set/Get the number of filenames to generate.

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.4.8 SetPattern()

```
void gdcm::FilenameGenerator::SetPattern (
            const char * pattern )  [inline]
```

Set/Get pattern.

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.132.4.9 SetPrefix()

```
void gdcm::FilenameGenerator::SetPrefix (
            const char * prefix )  [inline]
```

Set/Get prefix.

The documentation for this class was generated from the following file:

- gdcmFilenameGenerator.h

10.133 gdcm::FileSet Class Reference

```
#include <gdcmFileSet.h>
```

Public Types

- typedef std::vector< FileType > FilesType
- typedef std::string FileType

Public Member Functions

- FileSet ()
- bool AddFile (const char *filename)
- void AddFile (File const &)
- FilesType const & GetFiles () const
- void SetFiles (FilesType const &files)

Friends

- std::ostream & operator<< (std::ostream &_os, const FileSet &d)

10.133.1 Detailed Description

File-set: A File-set is a collection of DICOM Files (and possibly non-DICOM Files) that share a common naming space within which File IDs are unique.

10.133.2 Member Typedef Documentation

10.133.2.1 FilesType

```
typedef std::vector<FileType> gdcm::FileSet::FilesType
```

10.133.2.2 FileType

```
typedef std::string gdcm::FileSet::FileType
```

10.133.3 Constructor & Destructor Documentation

10.133.3.1 FileSet()

```
gdcm::FileSet::FileSet ( )  [inline]
```

10.133.4 Member Function Documentation

10.133.4.1 AddFile() [1/2]

```
bool gdcm::FileSet::AddFile (
            const char * filename )
```

Add a file 'filename' to the list of files. Return true on success, false in case filename could not be found on system.

10.133.4.2 AddFile() [2/2]

```
void gdcm::FileSet::AddFile (
            File const &  )  [inline]
```

Deprecated . Does nothing

10.133.4.3 GetFiles()

```
FilesType const& gdcm::FileSet::GetFiles ( ) const  [inline]
```

10.133.4.4 SetFiles()

```
void gdcm::FileSet::SetFiles (
            FilesType const & files )
```

10.133.5 Friends And Related Function Documentation

10.133.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const FileSet & d )  [friend]
```

The documentation for this class was generated from the following file:

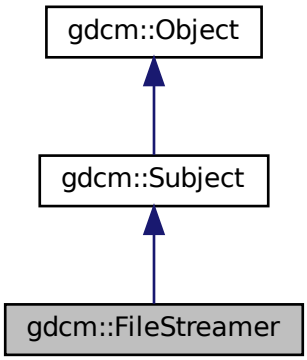
- gdcmFileSet.h

10.134 gdcm::FileStreamer Class Reference

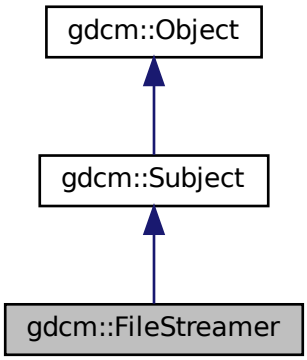
FileStreamer.

`#include <gdcmFileStreamer.h>`

Inheritance diagram for gdcm::FileStreamer:



Collaboration diagram for gdcm::FileStreamer:



Public Member Functions

- FileStreamer ()
- ~FileStreamer () override
- bool AppendToDataElement (const Tag &t, const char *array, size_t len)

  Append to previously started Tag t.
- bool AppendToGroupDataElement (const PrivateTag &pt, const char *array, size_t len)

  Append to previously started private creator.
- bool CheckDataElement (const Tag &t)
- void CheckTemplateFileName (bool check)
- bool ReserveDataElement (size_t len)
- bool ReserveGroupDataElement (unsigned short ndataelement)
- void SetOutputFileName (const char *filename_native)

  Set output filename (target file)
- void SetTemplateFileName (const char *filename_native)

  Set input DICOM template filename.
- bool StartDataElement (const Tag &t)
- bool StartGroupDataElement (const PrivateTag &pt, size_t maxsizede=0, uint8_t startoffset=0)
- bool StopDataElement (const Tag &t)

  Stop appending to tag t. This will compute the proper attribute length.
- bool StopGroupDataElement (const PrivateTag &pt)

  Stop appending to private creator.

Static Public Member Functions

- static SmartPointer< FileStreamer > New ()

  for wrapped language: instantiate a reference counted object

Additional Inherited Members

10.134.1 Detailed Description

FileStreamer.

This class let a user create a massive DICOM DataSet from a template DICOM file, by appending chunks of data.

This class support two mode of operation:

1. Creating a single DataElement by appending chunk after chunk of data.
2. Creating a set of DataElement within the same group, using a private creator for start. New DataElement are added any time the user defined maximum size for data element is reached.

Warning

any existing DataElement is removed, pick carefully which DataElement to add.

10.134.2 Constructor & Destructor Documentation

10.134.2.1 FileStreamer()

```
gdcm::FileStreamer::FileStreamer ( )
```

10.134.2.2 ~FileStreamer()

```
gdcm::FileStreamer::~FileStreamer ( )  [override]
```

10.134.3 Member Function Documentation

10.134.3.1 AppendToDataElement()

```
bool gdcm::FileStreamer::AppendToDataElement (
            const Tag & t,
            const char * array,
            size_t len )
```

Append to previously started Tag t.

10.134.3.2 AppendToGroupDataElement()

```
bool gdcm::FileStreamer::AppendToGroupDataElement (
            const PrivateTag & pt,
            const char * array,
            size_t len )
```

Append to previously started private creator.

10.134.3.3 CheckDataElement()

```
bool gdcm::FileStreamer::CheckDataElement (
            const Tag & t )
```

Decide to check the Data Element to be written (default: off) The implementation has default strategy for checking validity of DataElement. Currently it only support checking for the following tags:

- (7fe0,0010) Pixel Data

10.134.3.4 CheckTemplateFileName()

```
void gdcm::FileStreamer::CheckTemplateFileName (
            bool check )
```

Instead of simply blindly copying the input DICOM Template file, GDCM will be used to check the input file, and correct any issues recognized within the file. Only use if you do not have control over the input template file.

10.134.3.5 New()

```
static SmartPointer<FileStreamer> gdcm::FileStreamer::New ( )  [inline], [static]
```

for wrapped language: instantiate a reference counted object

10.134.3.6 ReserveDataElement()

```
bool gdcm::FileStreamer::ReserveDataElement (
            size_t len )
```

Add a hint on the final size of the dataelement. When optimally chosen, this reduce the number of file in-place copying. Should be called before StartDataElement

10.134.3.7 ReserveGroupDataElement()

```
bool gdcm::FileStreamer::ReserveGroupDataElement (
            unsigned short ndataelement )
```

Optimisation: pre-allocate the number of dataelement within the private group (ndataelement <= 256). Should be called before StartGroupDataElement

10.134.3.8 SetOutputFileName()

```
void gdcm::FileStreamer::SetOutputFileName (
            const char * filename_native )
```

Set output filename (target file)

10.134.3.9 SetTemplateFileName()

```
void gdcm::FileStreamer::SetTemplateFileName (
            const char * filename_native )
```

Set input DICOM template filename.

Examples

FileStreaming.cs.

10.134.3.10 StartDataElement()

```
bool gdcm::FileStreamer::StartDataElement (
            const Tag & t )
```

Start Single Data Element Operation This will delete any existing Tag t. Need to call it only once.

10.134.3.11 StartGroupDataElement()

```
bool gdcm::FileStreamer::StartGroupDataElement (
            const PrivateTag & pt,
            size_t maxsizede = 0,
            uint8_t startoffset = 0 )
```

Start Private Group (multiple DataElement) Operation. Each newly added DataElement will have a length lower than

Parameters

maxsizede	. When not specified, maxsizede is set to maximum size allowed by DICOM (= 2^32). startoffset can be used to specify the very first element you want to start with (instead of the first possible). Value should be in [0x0, 0xff] This will find the first available private creator.

Bug maxsizede should be a value lower than the actual total size of the buffer to be copied

10.134.3.12 StopDataElement()

```
bool gdcm::FileStreamer::StopDataElement (
            const Tag & t )
```

Stop appending to tag t. This will compute the proper attribute length.

10.134.3.13 StopGroupDataElement()

```
bool gdcm::FileStreamer::StopGroupDataElement (
            const PrivateTag & pt )
```

Stop appending to private creator.

The documentation for this class was generated from the following file:

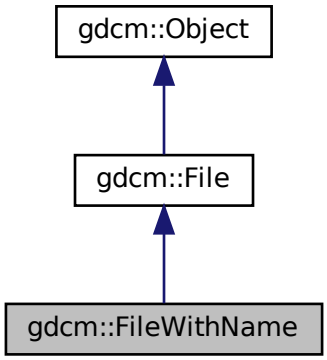
- gdcmFileStreamer.h

10.135 gdcm::FileWithName Class Reference

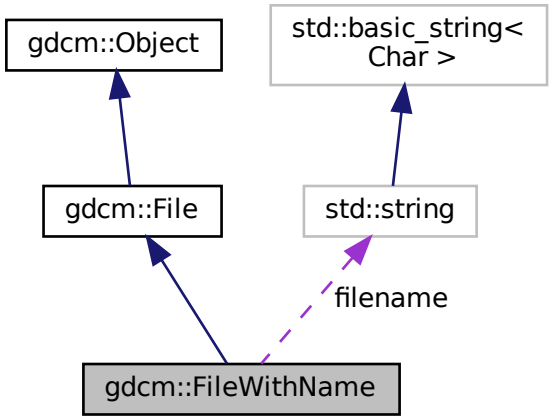
FileWithName.

```
#include <gdcmSerieHelper.h>
```

Inheritance diagram for gdcm::FileWithName:



Collaboration diagram for gdcm::FileWithName:



Public Member Functions

- FileWithName (File &f)

Public Attributes

- std::string filename

Additional Inherited Members

10.135.1 Detailed Description

FileWithName.

Backward only class do not use in newer code

10.135.2 Constructor & Destructor Documentation

10.135.2.1 FileWithName()

```
gdcm::FileWithName::FileWithName (
            File & f )  [inline]
```

10.135.3 Member Data Documentation

10.135.3.1 filename

```
std::string gdcm::FileWithName::filename
```

The documentation for this class was generated from the following file:

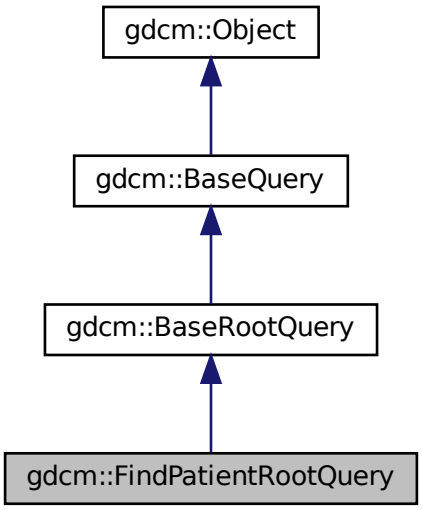
- gdcmSerieHelper.h

10.136 gdcm::FindPatientRootQuery Class Reference

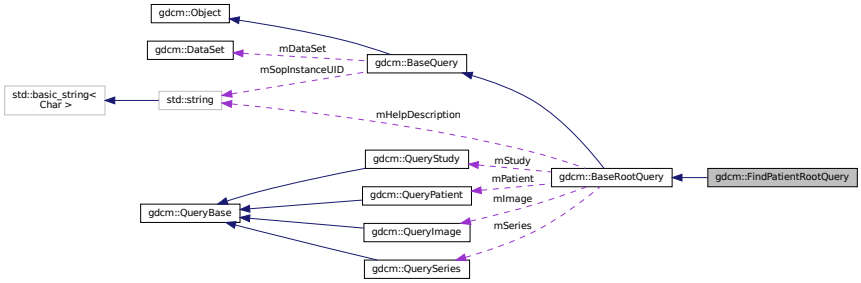
PatientRootQuery.

`#include <gdcmFindPatientRootQuery.h>`

Inheritance diagram for gdcm::FindPatientRootQuery:



Collaboration diagram for gdcm::FindPatientRootQuery:



Public Member Functions

- FindPatientRootQuery ()
- UIDs::TSName GetAbstractSyntaxUID () const override
- std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel) override
- void InitializeDataSet (const EQueryLevel &inQueryLevel) override
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.136.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

10.136.2 Constructor & Destructor Documentation

10.136.2.1 FindPatientRootQuery()

```
gdcm::FindPatientRootQuery::FindPatientRootQuery ( )
```

10.136.3 Member Function Documentation

10.136.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::FindPatientRootQuery::GetAbstractSyntaxUID ( ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.136.3.2 GetTagListByLevel()

```
std::vector<Tag> gdcm::FindPatientRootQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements gdcm::BaseRootQuery.

10.136.3.3 InitializeDataSet()

```
void gdcm::FindPatientRootQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements gdcm::BaseRootQuery.

10.136.3.4 ValidateQuery()

```
bool gdcm::FindPatientRootQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements gdcm::BaseRootQuery.

10.136.4 Friends And Related Function Documentation

10.136.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

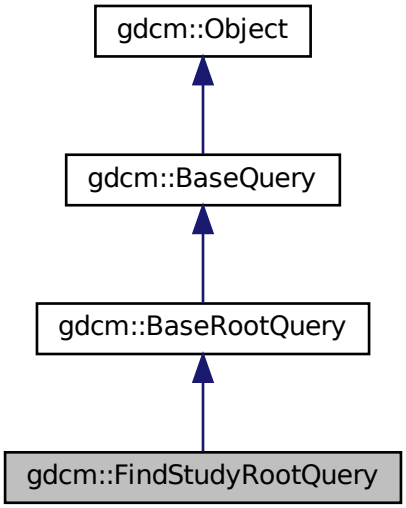
- gdcmFindPatientRootQuery.h

10.137 gdcm::FindStudyRootQuery Class Reference

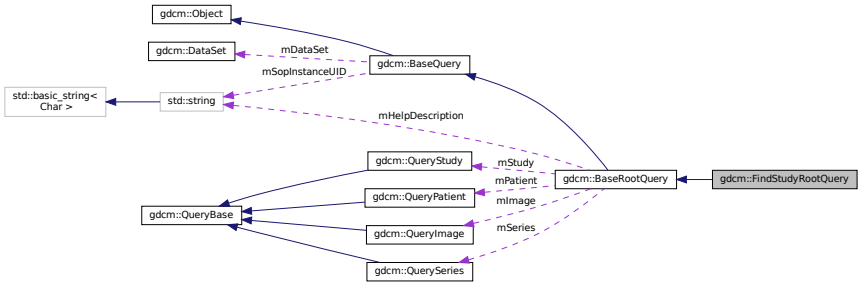
FindStudyRootQuery.

`#include <gdcmFindStudyRootQuery.h>`

Inheritance diagram for gdcm::FindStudyRootQuery:



Collaboration diagram for gdcm::FindStudyRootQuery:



Public Member Functions

- FindStudyRootQuery ()
- UIDs::TSName GetAbstractSyntaxUID () const override
- std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel) override
- void InitializeDataSet (const EQueryLevel &inQueryLevel) override
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.137.1 Detailed Description

FindStudyRootQuery.

contains: the class which will produce a dataset for C-FIND with study root

10.137.2 Constructor & Destructor Documentation

10.137.2.1 FindStudyRootQuery()

```
gdcm::FindStudyRootQuery::FindStudyRootQuery ( )
```

10.137.3 Member Function Documentation

10.137.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::FindStudyRootQuery::GetAbstractSyntaxUID ( ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.137.3.2 GetTagListByLevel()

```
std::vector<Tag> gdcm::FindStudyRootQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements gdcm::BaseRootQuery.

10.137.3.3 InitializeDataSet()

```
void gdcm::FindStudyRootQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements gdcm::BaseRootQuery.

10.137.3.4 ValidateQuery()

```
bool gdcm::FindStudyRootQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that (0008,0052) is set that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional)

Implements gdcm::BaseRootQuery.

10.137.4 Friends And Related Function Documentation

10.137.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

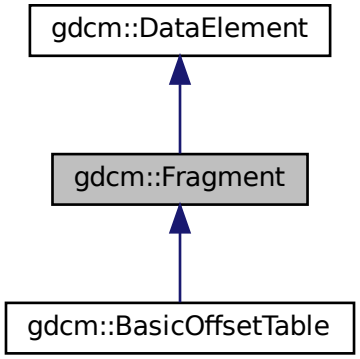
- gdcmFindStudyRootQuery.h

10.138 gdcm::Fragment Class Reference

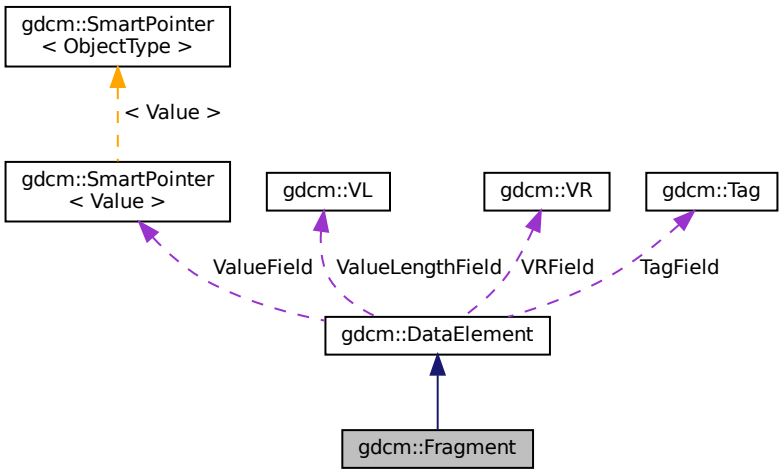
Class to represent a Fragment.

`#include <gdcmFragment.h>`

Inheritance diagram for gdcm::Fragment:



Collaboration diagram for gdcm::Fragment:



Public Member Functions

- Fragment ()
- VL ComputeLength () const
- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & ReadBacktrack (std::istream &is)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is)
- template<typename TSwap >
  std::ostream & Write (std::ostream &os) const

Friends

- std::ostream & operator<< (std::ostream &os, const Fragment &val)

Additional Inherited Members

10.138.1 Detailed Description

Class to represent a Fragment.

Examples

FixBrokenJ2K.cxx, and FixJAIBugJPEGLS.cxx.

10.138.2 Constructor & Destructor Documentation

10.138.2.1 Fragment()

```
gdcm::Fragment::Fragment ( )  [inline]
```

10.138.3 Member Function Documentation

10.138.3.1 ComputeLength()

```
VL gdcm::Fragment::ComputeLength ( ) const
```

10.138.3.2 GetLength()

```
VL gdcm::Fragment::GetLength ( ) const
```

10.138.3.3 Read()

```
template<typename TSwap >
std::istream& gdcm::Fragment::Read (
             std::istream & is )  [inline]
```

Referenced by gdcm::SequenceOfFragments::ReadValue().

10.138.3.4 ReadBacktrack()

```
template<typename TSwap >
std::istream& gdcm::Fragment::ReadBacktrack (
             std::istream & is )  [inline]
```

References gdcmErrorMacro, gdcmWarningMacro, and gdcm::ParseException::SetLastElement().

Referenced by gdcm::SequenceOfFragments::ReadValue().

10.138.3.5 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::Fragment::ReadPreValue (
             std::istream & is )  [inline]
```

10.138.3.6 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::Fragment::ReadValue (
             std::istream & is )  [inline]
```

References gdcmWarningMacro, and gdcm::ParseException::SetLastElement().

10.138.3.7 Write()

```
template<typename TSwap >
std::ostream& gdcm::Fragment::Write (
             std::ostream & os ) const  [inline]
```

References gdcm::ByteValue::ComputeLength(), gdcm::ByteValue::GetLength(), gdcm::ByteValue::Write(), and gdcm↩
::VL::Write().

10.138.4 Friends And Related Function Documentation

10.138.4.1 operator<<

```
std::ostream& operator<< (
             std::ostream & os,
             const Fragment & val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmFragment.h

10.139 gdcm::Global Class Reference

Global.

```
#include <gdcmGlobal.h>
```

Public Member Functions

- Global ()
- Global (const Global &_val)=delete
- ~Global ()
- bool Append (const char *path)
- Defs const & GetDefs () const
- Dicts & GetDicts ()
- Dicts const & GetDicts () const
- bool LoadResourcesFiles ()
- Global & operator= (const Global &_val)=delete
- bool Prepend (const char *path)

Static Public Member Functions

- static Global & GetInstance ()

  return the singleton instance

Protected Member Functions

- const char * Locate (const char *resfile) const

  Locate a resource file.

Friends

- std::ostream & operator<< (std::ostream &_os, const Global &g)

10.139.1 Detailed Description

Global.

Note

Global should be included in any translation unit that will use Dict or that implements the singleton pattern. It makes sure that the Dict singleton is created before and destroyed after all other singletons in GDCM.

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenerateStandardSOPClasses.cxx, PublicDict.cxx, and ReadAndPrintAttributes.cxx.

10.139.2 Constructor & Destructor Documentation

10.139.2.1 Global() [1/2]

```
gdcm::Global::Global ( )
```

10.139.2.2 ~Global()

```
gdcm::Global::~Global ( )
```

10.139.2.3 Global() [2/2]

```
gdcm::Global::Global (
            const Global & _val )  [delete]
```

10.139.3 Member Function Documentation

10.139.3.1 Append()

```
bool gdcm::Global::Append (
            const char * path )
```

Append path at the end of the path list

Warning

not thread safe !

10.139.3.2 GetDefs()

```
Defs const& gdcm::Global::GetDefs ( ) const
```

retrieve the default/internal (Part 3) You need to explicitly call LoadResourcesFiles before

Examples

GenerateStandardSOPClasses.cxx.

10.139.3.3 GetDicts() [1/2]

```
Dicts& gdcm::Global::GetDicts ( )
```

10.139.3.4 GetDicts() [2/2]

```
Dicts const& gdcm::Global::GetDicts ( ) const
```

retrieve the default/internal dicts (Part 6) This dict is filled up at load time

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, MrProtocol.cxx, PublicDict.cxx, and ReadAndPrintAttributes.cxx.

10.139.3.5 GetInstance()

```
static Global& gdcm::Global::GetInstance ( )  [static]
```

return the singleton instance

Examples

BasicAnonymizer.cs, ClinicalTrialIdentificationWorkflow.cs, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenerateStandardSOPClasses.
MrProtocol.cxx, PublicDict.cxx, ReadAndPrintAttributes.cxx, and TraverseModules.cxx.

10.139.3.6 LoadResourcesFiles()

```
bool gdcm::Global::LoadResourcesFiles ( )
```

Load all internal XML files, resource path need to have been set before calling this member function (see Append/↩ Prepend members func)

Warning

not thread safe !

Examples

GenerateStandardSOPClasses.cxx.

10.139.3.7 Locate()

```
const char* gdcm::Global::Locate (
            const char * resfile ) const  [protected]
```

Locate a resource file.

10.139.3.8 operator=()

```
Global& gdcm::Global::operator= (
            const Global & _val )  [delete]
```

10.139.3.9 Prepend()

```
bool gdcm::Global::Prepend (
            const char * path )
```

Prepend path at the beginning of the path list

Warning

not thread safe !

10.139.4 Friends And Related Function Documentation

10.139.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Global & g )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmGlobal.h

10.140 gdcm::GroupDict Class Reference

Class to represent the mapping from group number to its abbreviation and name.

```
#include <gdcmGroupDict.h>
```

Public Types

- typedef std::vector< std::string > GroupStringVector

Public Member Functions

- GroupDict ()
- ~GroupDict ()=default
- std::string const & GetAbbreviation (uint16_t num) const
- std::string const & GetName (uint16_t num) const
- size_t Size () const

Protected Member Functions

- void Add (std::string const &abbreviation, std::string const &name)
- void Insert (uint16_t num, std::string const &abbreviation, std::string const &name)

Friends

- std::ostream & operator<< (std::ostream &_os, const GroupDict &_val)

10.140.1 Detailed Description

Class to represent the mapping from group number to its abbreviation and name.

Note

Should I rewrite this class to use a std::map instead of std::vector for problem of memory consumption ?

10.140.2 Member Typedef Documentation

10.140.2.1 GroupStringVector

```
typedef std::vector<std::string> gdcm::GroupDict::GroupStringVector
```

10.140.3 Constructor & Destructor Documentation

10.140.3.1 GroupDict()

```
gdcm::GroupDict::GroupDict ( )  [inline]
```

10.140.3.2 ~GroupDict()

```
gdcm::GroupDict::~GroupDict ( )  [default]
```

10.140.4 Member Function Documentation

10.140.4.1 Add()

```
void gdcm::GroupDict::Add (
             std::string const & abbreviation,
             std::string const & name )  [protected]
```

10.140.4.2 GetAbbreviation()

```
std::string const& gdcm::GroupDict::GetAbbreviation (
             uint16_t num ) const
```

10.140.4.3 GetName()

```
std::string const& gdcm::GroupDict::GetName (
             uint16_t num ) const
```

10.140.4.4 Insert()

```
void gdcm::GroupDict::Insert (
             uint16_t num,
             std::string const & abbreviation,
             std::string const & name )  [protected]
```

10.140.4.5 Size()

```
size_t gdcm::GroupDict::Size ( ) const  [inline]
```

10.140.5 Friends And Related Function Documentation

10.140.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const GroupDict & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmGroupDict.h

10.141 gdcm::IconImageFilter Class Reference

IconImageFilter.

```
#include <gdcmIconImageFilter.h>
```

Public Member Functions

- IconImageFilter ()
- ~IconImageFilter ()
- bool Extract ()

  Extract all Icon found in File.
- File & GetFile ()
- const File & GetFile () const
- IconImage & GetIconImage (unsigned int i) const
- unsigned int GetNumberOfIconImages () const

  Retrieve extract IconImage (need to call Extract first)
- void SetFile (const File &f)

  Set/Get File.

Protected Member Functions

- void ExtractIconImages ()
- void ExtractVeproIconImages ()

10.141.1 Detailed Description

IconImageFilter.

This filter will extract icons from a File This filter will loop over all known sequence (public and private) that may contains an IconImage and retrieve them. The filter will fails with a value of false if no icon can be found Since it handle both public and private icon type, one should not assume the icon is in uncompress form, some private vendor store private icon in JPEG8/JPEG12

Implementation details: This filter supports the following Icons:

- (0088,0200) Icon Image Sequence
- (0009,10,GEIIS) GE IIS Thumbnail Sequence
- (6003,10,GEMS_Ultrasound_ImageGroup_001) GEMS Image Thumbnail Sequence
- (0055,30,VEPRO VIF 3.0 DATA) Icon Data
- (0055,30,VEPRO VIM 5.0 DATA) ICONDATA2

Warning

the icon stored in those private attribute do not conform to definition of Icon Image Sequence (do not simply copy/paste). For example some private icon can be expressed as 12bits pixel, while the DICOM standard only allow 8bits icons.

See also

ImageReader

Examples

ExtractIconFromFile.cxx.

10.141.2 Constructor & Destructor Documentation

10.141.2.1 IconImageFilter()

```
gdcm::IconImageFilter::IconImageFilter ( )
```

10.141.2.2 ~IconImageFilter()

```
gdcm::IconImageFilter::~IconImageFilter ( )
```

10.141.3 Member Function Documentation

10.141.3.1 Extract()

```
bool gdcm::IconImageFilter::Extract ( )
```

Extract all Icon found in File.

Examples

ExtractIconFromFile.cxx.

10.141.3.2 ExtractIconImages()

```
void gdcm::IconImageFilter::ExtractIconImages ( )  [protected]
```

10.141.3.3 ExtractVeproIconImages()

```
void gdcm::IconImageFilter::ExtractVeproIconImages ( )  [protected]
```

10.141.3.4 GetFile() [1/2]

```
File& gdcm::IconImageFilter::GetFile ( )  [inline]
```

10.141.3.5 GetFile() [2/2]

```
const File& gdcm::IconImageFilter::GetFile ( ) const  [inline]
```

10.141.3.6 GetIconImage()

```
IconImage& gdcm::IconImageFilter::GetIconImage (
            unsigned int i ) const
```

Examples

ExtractIconFromFile.cxx.

10.141.3.7 GetNumberOfIconImages()

```
unsigned int gdcm::IconImageFilter::GetNumberOfIconImages ( ) const
```

Retrieve extract IconImage (need to call Extract first)

Examples

ExtractIconFromFile.cxx.

10.141.3.8 SetFile()

```
void gdcm::IconImageFilter::SetFile (
            const File & f )  [inline]
```

Set/Get File.

Examples

ExtractIconFromFile.cxx.

The documentation for this class was generated from the following file:

- gdcmIconImageFilter.h

10.142 gdcm::IconImageGenerator Class Reference

IconImageGenerator.

```
#include <gdcmIconImageGenerator.h>
```

Public Member Functions

- IconImageGenerator ()
- ~IconImageGenerator ()
- void AutoPixelMinMax (bool b)
- void ConvertRGBToPaletteColor (bool b)
- bool Generate ()

  Generate Icon.
- const IconImage & GetIconImage () const

  Retrieve generated Icon.
- Pixmap & GetPixmap ()
- const Pixmap & GetPixmap () const
- void SetOutputDimensions (const unsigned int dims[2])

  Set Target dimension of output Icon.
- void SetOutsideValuePixel (double v)
- void SetPixelMinMax (double min, double max)
- void SetPixmap (const Pixmap &p)

  Set/Get File.

10.142.1 Detailed Description

IconImageGenerator.

This filter will generate a valid Icon from the Pixel Data element (an instance of Pixmap). To generate a valid Icon, one is only allowed the following Photometric Interpretation:

- MONOCHROME1
- MONOCHROME2
- PALETTE_COLOR

The Pixel Bits Allocated is restricted to 8bits, therefore 16 bits image needs to be rescaled. By default the filter will use the full scalar range of 16bits image to rescale to unsigned 8bits. This may not be ideal for some situation, in which case the API SetPixelMinMax can be used to overwrite the default min,max interval used.

See also

ImageReader

Examples

ExtractIconFromFile.cxx.

10.142.2 Constructor & Destructor Documentation

10.142.2.1 IconImageGenerator()

```
gdcm::IconImageGenerator::IconImageGenerator ( )
```

10.142.2.2 ~IconImageGenerator()

```
gdcm::IconImageGenerator::~IconImageGenerator ( )
```

10.142.3 Member Function Documentation

10.142.3.1 AutoPixelMinMax()

```
void gdcm::IconImageGenerator::AutoPixelMinMax (
            bool b )
```

Instead of explicitly specifying the min/max value for the rescale operation, let the internal mechanism compute the min/max of icon and rescale to best appropriate.

Examples

ExtractIconFromFile.cxx.

10.142.3.2 ConvertRGBToPaletteColor()

```
void gdcm::IconImageGenerator::ConvertRGBToPaletteColor (
            bool b )
```

Converting from RGB to PALETTE_COLOR can be a slow operation. However DICOM standard requires that color icon be described as palette. Set this boolean to false only if you understand the consequences. default value is true, false generates invalid Icon Image Sequence

10.142.3.3 Generate()

```
bool gdcm::IconImageGenerator::Generate ( )
```

Generate Icon.

Examples

ExtractIconFromFile.cxx.

10.142.3.4 GetIconImage()

```
const IconImage& gdcm::IconImageGenerator::GetIconImage ( ) const  [inline]
```

Retrieve generated Icon.

Examples

ExtractIconFromFile.cxx.

10.142.3.5 GetPixmap() [1/2]

```
Pixmap& gdcm::IconImageGenerator::GetPixmap ( )  [inline]
```

10.142.3.6 GetPixmap() [2/2]

```
const Pixmap& gdcm::IconImageGenerator::GetPixmap ( ) const  [inline]
```

10.142.3.7 SetOutputDimensions()

```
void gdcm::IconImageGenerator::SetOutputDimensions (
            const unsigned int dims[2] )
```

Set Target dimension of output Icon.

Examples

ExtractIconFromFile.cxx.

10.142.3.8 SetOutsideValuePixel()

```
void gdcm::IconImageGenerator::SetOutsideValuePixel (
            double v )
```

Set a pixel value that should be discarded. This happen typically for CT image, where a pixel has been used to pad outside the image (see Pixel Padding Value). Requires AutoPixelMinMax(true)

10.142.3.9 SetPixelMinMax()

```
void gdcm::IconImageGenerator::SetPixelMinMax (
            double min,
            double max )
```

Override default min/max to compute best rescale for 16bits -> 8bits downscale. Typically those value can be read from the SmallestImagePixelValue LargestImagePixelValue DICOM attribute.

10.142.3.10 SetPixmap()

```
void gdcm::IconImageGenerator::SetPixmap (
            const Pixmap & p )  [inline]
```

Set/Get File.

Examples

ExtractIconFromFile.cxx.

The documentation for this class was generated from the following file:

- gdcmIconImageGenerator.h

10.143 gdcm::ignore_char Struct Reference

```
#include <gdcmElement.h>
```

Public Member Functions

- ignore_char (char c)

Public Attributes

- char m_char

10.143.1 Constructor & Destructor Documentation

10.143.1.1 ignore_char()

```
gdcm::ignore_char::ignore_char (
            char c )  [inline]
```

10.143.2 Member Data Documentation

10.143.2.1 m_char

```
char gdcm::ignore_char::m_char
```

Referenced by gdcm::operator>>().

The documentation for this struct was generated from the following file:

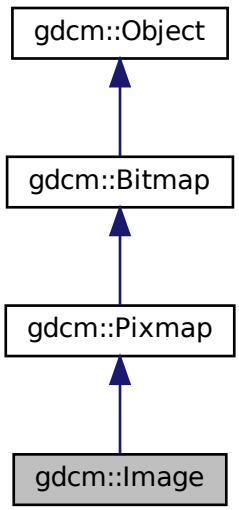
- gdcmElement.h

10.144 gdcm::Image Class Reference

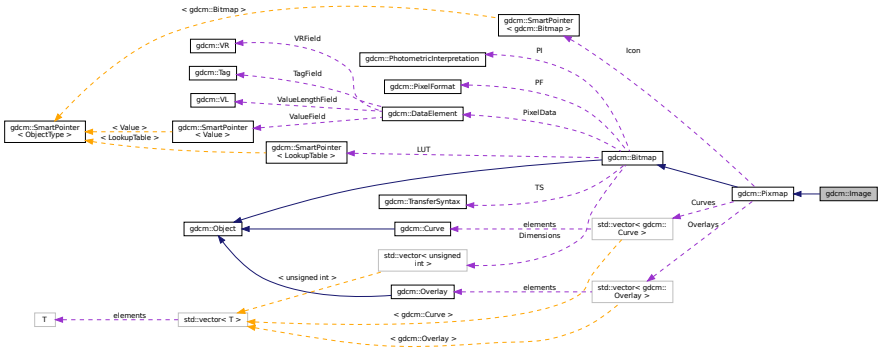
Image.

```
#include <gdcmImage.h>
```

Inheritance diagram for gdcm::Image:



Collaboration diagram for gdcm::Image:



Public Member Functions

- Image ()
- ~Image () override=default
- const double * GetDirectionCosines () const
- double GetDirectionCosines (unsigned int idx) const
- double GetIntercept () const
- const double * GetOrigin () const
- double GetOrigin (unsigned int idx) const
- double GetSlope () const
- const double * GetSpacing () const
- double GetSpacing (unsigned int idx) const
- void Print (std::ostream &os) const override

  print
- void SetDirectionCosines (const double dircos[6])
- void SetDirectionCosines (const float dircos[6])
- void SetDirectionCosines (unsigned int idx, double dircos)
- void SetIntercept (double intercept)

  intercept
- void SetOrigin (const double origin[3])
- void SetOrigin (const float origin[3])
- void SetOrigin (unsigned int idx, double ori)
- void SetSlope (double slope)

  slope
- void SetSpacing (const double spacing[3])
- void SetSpacing (unsigned int idx, double spacing)

Additional Inherited Members

10.144.1 Detailed Description

Image.

This is the container for an Image in the general sense. From this container you should be able to request information like:

- Origin
- Dimension
- PixelFormat ... But also to retrieve the image as a raw buffer (char *) Since we have to deal with both RAW data and JPEG stream (which internally encode all the above information) this API might seems redundant. One way to solve that would be to subclass Image with JPEGImage which would from the stream extract the header info and fill it to please Image...well except origin for instance

Basically you can see it as a storage for the Pixel Data element (7fe0,0010).

Warning

This class does some heuristics to guess the Spacing but is not compatible with DICOM CP-586. In case of doubt use PixmapReader instead

See also

ImageReader PixmapReader

Examples

CompressImage.cxx, ConvertToQImage.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, ExtractIconFromFile.cxx, FixJAIBugJPEGLS.cxx, GenFakeImage.cxx, GetJPEGSamplePrecision.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, PatchFile.cxx, PrintLUT.cxx, ReadMultiTimesException.cxx, TemplateEmptyImage.cxx, csa2img.cxx, iU22tomultisc.cxx, and threadgdcm.cxx.

10.144.2 Constructor & Destructor Documentation

10.144.2.1 Image()

```
gdcm::Image::Image ( )  [inline]
```

10.144.2.2 ~Image()

```
gdcm::Image::~Image ( )  [override], [default]
```

10.144.3 Member Function Documentation

10.144.3.1 GetDirectionCosines() [1/2]

```
const double* gdcm::Image::GetDirectionCosines ( ) const
```

Return a 6-tuples specifying the direction cosines A default value of (1,0,0,0,1,0) will be return when the direction cosines was not specified.

10.144.3.2 GetDirectionCosines() [2/2]

```
double gdcm::Image::GetDirectionCosines (
            unsigned int idx ) const
```

10.144.3.3 GetIntercept()

```
double gdcm::Image::GetIntercept ( ) const  [inline]
```

10.144.3.4 GetOrigin() [1/2]

```
const double* gdcm::Image::GetOrigin ( ) const
```

Return a 3-tuples specifying the origin Will return (0,0,0) if the origin was not specified.

Examples

HelloVizWorld.cxx.

10.144.3.5 GetOrigin() [2/2]

```
double gdcm::Image::GetOrigin (
            unsigned int idx ) const
```

10.144.3.6 GetSlope()

```
double gdcm::Image::GetSlope ( ) const  [inline]
```

10.144.3.7 GetSpacing() [1/2]

```
const double* gdcm::Image::GetSpacing ( ) const
```

Return a 3-tuples specifying the spacing NOTE: 3rd value can be an arbitrary 1 value when the spacing was not specified (ex. 2D image). WARNING: when the spacing is not specifier, a default value of 1 will be returned

10.144.3.8 GetSpacing() [2/2]

```
double gdcm::Image::GetSpacing (
            unsigned int idx ) const
```

10.144.3.9 Print()

```
void gdcm::Image::Print (
            std::ostream & os ) const  [override], [virtual]
```

print

Reimplemented from gdcm::Bitmap.

Examples

CompressImage.cxx, and PatchFile.cxx.

10.144.3.10 SetDirectionCosines() [1/3]

```
void gdcm::Image::SetDirectionCosines (
            const double dircos[6] )
```

10.144.3.11 SetDirectionCosines() [2/3]

```
void gdcm::Image::SetDirectionCosines (
            const float dircos[6] )
```

10.144.3.12 SetDirectionCosines() [3/3]

```
void gdcm::Image::SetDirectionCosines (
            unsigned int idx,
            double dircos )
```

10.144.3.13 SetIntercept()

```
void gdcm::Image::SetIntercept (
            double intercept )  [inline]
```

intercept

Examples

TemplateEmptyImage.cxx.

10.144.3.14 SetOrigin() [1/3]

```
void gdcm::Image::SetOrigin (
            const double origin[3] )
```

10.144.3.15 SetOrigin() [2/3]

```
void gdcm::Image::SetOrigin (
            const float origin[3] )
```

10.144.3.16 SetOrigin() [3/3]

```
void gdcm::Image::SetOrigin (
            unsigned int idx,
            double ori )
```

10.144.3.17 SetSlope()

```
void gdcm::Image::SetSlope (
            double slope )  [inline]
```

slope

Examples

TemplateEmptyImage.cxx.

10.144.3.18 SetSpacing() [1/2]

```
void gdcm::Image::SetSpacing (
            const double spacing[3] )
```

Examples

csa2img.cxx, and iU22tomultisc.cxx.

10.144.3.19 SetSpacing() [2/2]

```
void gdcm::Image::SetSpacing (
            unsigned int idx,
            double spacing )
```

The documentation for this class was generated from the following file:

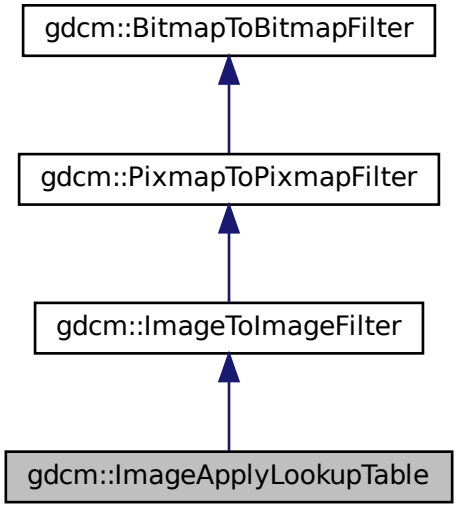
- gdcmImage.h

10.145 gdcm::ImageApplyLookupTable Class Reference

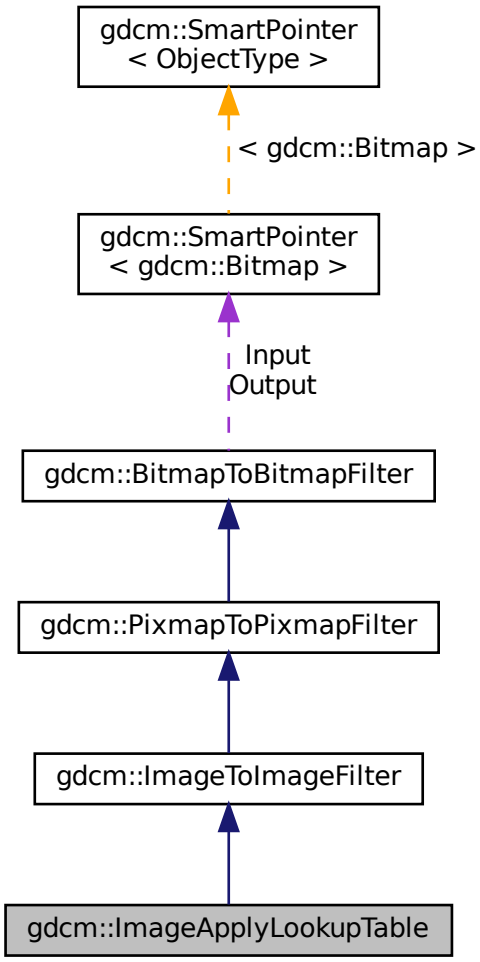
ImageApplyLookupTable class.

`#include <gdcmImageApplyLookupTable.h>`

Inheritance diagram for gdcm::ImageApplyLookupTable:



Collaboration diagram for gdcm::ImageApplyLookupTable:



Public Member Functions

- ImageApplyLookupTable ()
- ~ImageApplyLookupTable ()
- bool Apply ()

  Apply.
- void SetRGB8 (bool b)

  RGB8 ?

Additional Inherited Members

10.145.1 Detailed Description

ImageApplyLookupTable class.

It applies the LUT the PixelData (only PALETTE_COLOR images) Output will be a PhotometricInterpretation=RGB image

10.145.2 Constructor & Destructor Documentation

10.145.2.1 ImageApplyLookupTable()

```
gdcm::ImageApplyLookupTable::ImageApplyLookupTable ( )
```

10.145.2.2 ~ImageApplyLookupTable()

```
gdcm::ImageApplyLookupTable::~ImageApplyLookupTable ( )
```

10.145.3 Member Function Documentation

10.145.3.1 Apply()

```
bool gdcm::ImageApplyLookupTable::Apply ( )
```

Apply.

10.145.3.2 SetRGB8()

```
void gdcm::ImageApplyLookupTable::SetRGB8 (
            bool b )
```

RGB8 ?

The documentation for this class was generated from the following file:

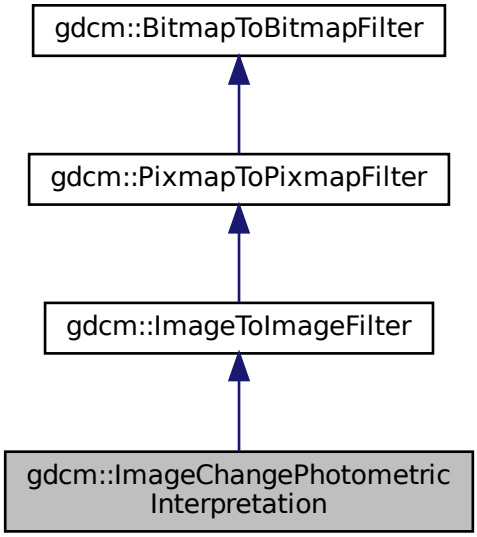
- gdcmImageApplyLookupTable.h

10.146 gdcm::ImageChangePhotometricInterpretation Class Reference

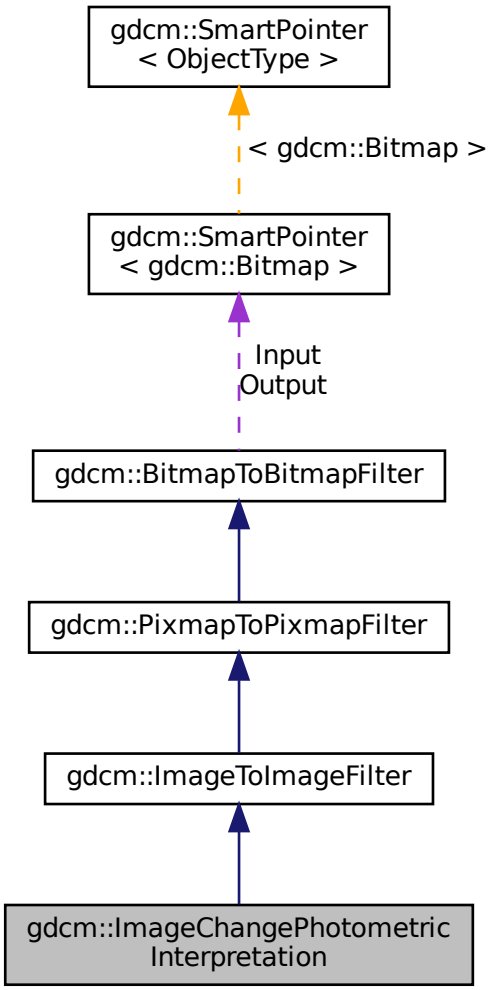
ImageChangePhotometricInterpretation class.

`#include <gdcmImageChangePhotometricInterpretation.h>`

Inheritance diagram for gdcm::ImageChangePhotometricInterpretation:



Collaboration diagram for gdcm::ImageChangePhotometricInterpretation:



Public Member Functions

- ImageChangePhotometricInterpretation ()
- ~ImageChangePhotometricInterpretation ()=default
- bool Change ()

  Change.
- const PhotometricInterpretation & GetPhotometricInterpretation () const
- void SetPhotometricInterpretation (PhotometricInterpretation const &pi)

  Set/Get requested PhotometricInterpretation.

Static Public Member Functions

- template<typename T >
  static void RGB2YBR (T ybr[3], const T rgb[3], unsigned short storedbits=8)
- template<typename T >
  static void YBR2RGB (T rgb[3], const T ybr[3], unsigned short storedbits=8)

Protected Member Functions

- bool ChangeMonochrome ()
- bool ChangeRGB2YBR ()
- bool ChangeYBR2RGB ()

Additional Inherited Members

10.146.1 Detailed Description

ImageChangePhotometricInterpretation class.

Class to change the Photometric Interpretation of an input DICOM

10.146.2 Constructor & Destructor Documentation

10.146.2.1 ImageChangePhotometricInterpretation()

```
gdcm::ImageChangePhotometricInterpretation::ImageChangePhotometricInterpretation ( )  [inline]
```

10.146.2.2 ~ImageChangePhotometricInterpretation()

```
gdcm::ImageChangePhotometricInterpretation::~ImageChangePhotometricInterpretation ( )  [default]
```

10.146.3 Member Function Documentation

10.146.3.1 Change()

```
bool gdcm::ImageChangePhotometricInterpretation::Change ( )
```

Change.

10.146.3.2 ChangeMonochrome()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeMonochrome ( )  [protected]
```

10.146.3.3 ChangeRGB2YBR()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeRGB2YBR ( )  [protected]
```

10.146.3.4 ChangeYBR2RGB()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeYBR2RGB ( )  [protected]
```

10.146.3.5 GetPhotometricInterpretation()

```
const PhotometricInterpretation& gdcm::ImageChangePhotometricInterpretation::GetPhotometric↩
Interpretation ( ) const  [inline]
```

10.146.3.6 RGB2YBR()

```
template<typename T >
void gdcm::ImageChangePhotometricInterpretation::RGB2YBR (
            T ybr[3],
            const T rgb[3],
            unsigned short storedbits = 8 )  [static]
```

colorspace conversion (based on CCIR Recommendation 601-2) -> T.871

References gdcm::Round().

10.146.3.7 SetPhotometricInterpretation()

```
void gdcm::ImageChangePhotometricInterpretation::SetPhotometricInterpretation (
            PhotometricInterpretation const & pi )  [inline]
```

Set/Get requested PhotometricInterpretation.

10.146.3.8 YBR2RGB()

```
template<typename T >
void gdcm::ImageChangePhotometricInterpretation::YBR2RGB (
            T rgb[3],
            const T ybr[3],
            unsigned short storedbits = 8 )  [static]
```

References gdcm::Round().

The documentation for this class was generated from the following file:

- gdcmImageChangePhotometricInterpretation.h

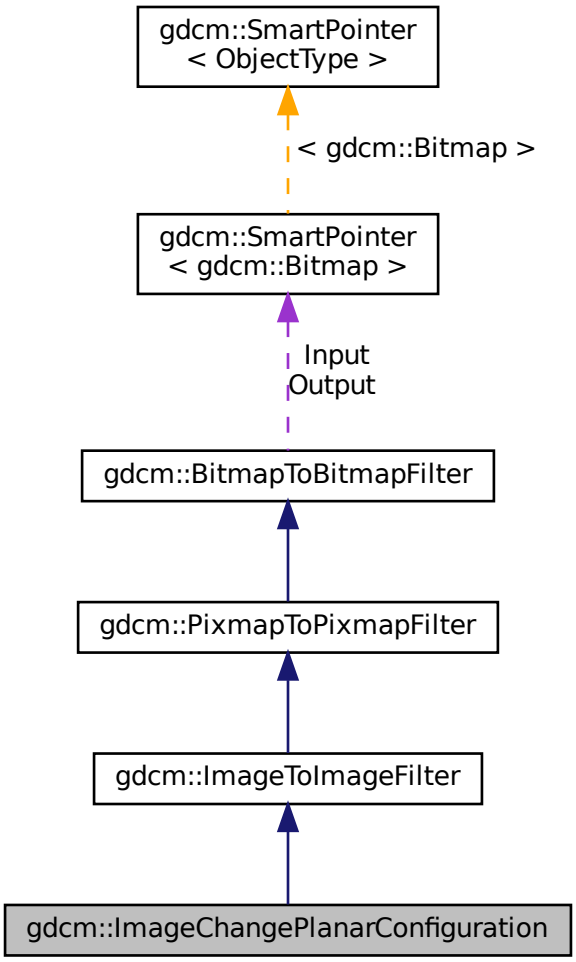
10.147 gdcm::ImageChangePlanarConfiguration Class Reference

ImageChangePlanarConfiguration class.

`#include <gdcmImageChangePlanarConfiguration.h>`

Inheritance diagram for gdcm::ImageChangePlanarConfiguration:

Collaboration diagram for gdcm::ImageChangePlanarConfiguration:



Public Member Functions

- ImageChangePlanarConfiguration ()
- ~ImageChangePlanarConfiguration ()=default
- bool Change ()

  Change.
- unsigned int GetPlanarConfiguration () const
- void SetPlanarConfiguration (unsigned int pc)

  Set/Get requested PlanarConfigation.

Static Public Member Functions

- template<typename T >
  static size_t RGBPixelsToRGBPlanes (T *r, T *g, T *b, const T *rgb, size_t s)
- template<typename T >
  static size_t RGBPlanesToRGBPixels (T *out, const T *r, const T *g, const T *b, size_t s)

Additional Inherited Members

10.147.1 Detailed Description

ImageChangePlanarConfiguration class.

Class to change the Planar configuration of an input DICOM By default it will change into the more usual representation: PlanarConfiguration = 0

10.147.2 Constructor & Destructor Documentation

10.147.2.1 ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::ImageChangePlanarConfiguration ( )  [inline]
```

10.147.2.2 ~ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::~ImageChangePlanarConfiguration ( )  [default]
```

10.147.3 Member Function Documentation

10.147.3.1 Change()

```
bool gdcm::ImageChangePlanarConfiguration::Change ( )
```

Change.

10.147.3.2 GetPlanarConfiguration()

```
unsigned int gdcm::ImageChangePlanarConfiguration::GetPlanarConfiguration ( ) const  [inline]
```

10.147.3.3 RGBPixelsToRGBPlanes()

```
template<typename T >
size_t gdcm::ImageChangePlanarConfiguration::RGBPixelsToRGBPlanes (
            T * r,
            T * g,
            T * b,
            const T * rgb,
            size_t s )  [static]
```

Convert a regular RGB pixel image (R,G,B,R,G,B...) into a planar R,G,B image (R,R..,G,G...B,B)

Warning

this works on a frame basis, you need to loop over all frames in multiple frames image to apply this function

10.147.3.4 RGBPlanesToRGBPixels()

```
template<typename T >
size_t gdcm::ImageChangePlanarConfiguration::RGBPlanesToRGBPixels (
            T * out,
            const T * r,
            const T * g,
            const T * b,
            size_t s )  [static]
```

s is the size of one plane (r,g or b). Thus the output buffer needs to be at least 3∗s bytes long s can be seen as the number of RGB pixels in the output

10.147.3.5 SetPlanarConfiguration()

```
void gdcm::ImageChangePlanarConfiguration::SetPlanarConfiguration (
            unsigned int pc )  [inline]
```

Set/Get requested PlanarConfigation.

The documentation for this class was generated from the following file:

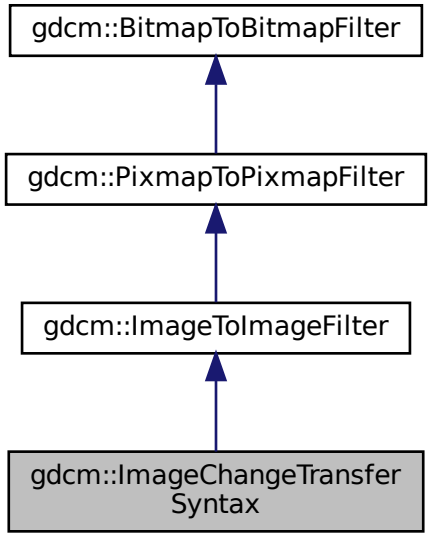
- gdcmImageChangePlanarConfiguration.h

10.148 gdcm::ImageChangeTransferSyntax Class Reference

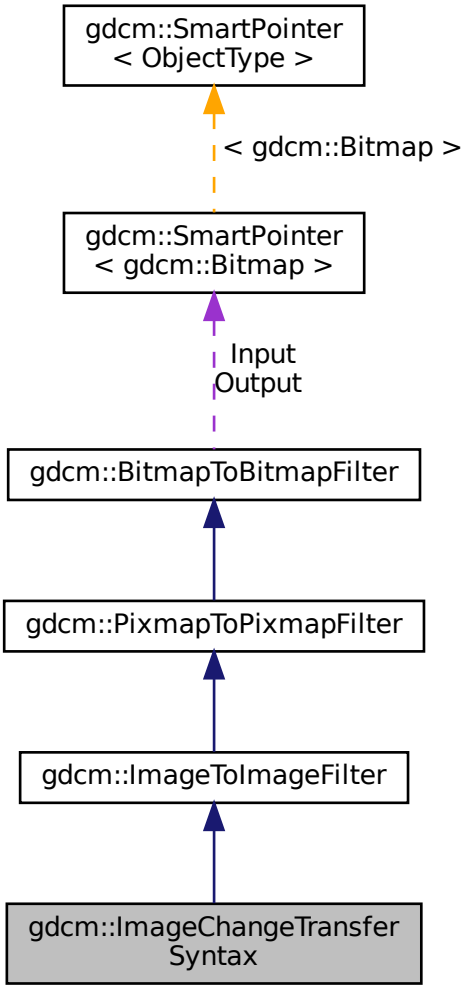
ImageChangeTransferSyntax class.

`#include <gdcmImageChangeTransferSyntax.h>`

Inheritance diagram for gdcm::ImageChangeTransferSyntax:



Collaboration diagram for gdcm::ImageChangeTransferSyntax:



Public Member Functions

- ImageChangeTransferSyntax ()
- ~ImageChangeTransferSyntax ()=default
- bool Change ()

  Change.
- const TransferSyntax & GetTransferSyntax () const

  Get Transfer Syntax.
- void SetCompressIconImage (bool b)
- void SetForce (bool f)
- void SetTransferSyntax (const TransferSyntax &ts)

Set target Transfer Syntax.

- void SetUserCodec (ImageCodec *ic)

Protected Member Functions

- bool TryJPEG2000Codec (const DataElement &pixelde, Bitmap const &input, Bitmap &output)
- bool TryJPEGCodec (const DataElement &pixelde, Bitmap const &input, Bitmap &output)
- bool TryJPEGLSCodec (const DataElement &pixelde, Bitmap const &input, Bitmap &output)
- bool TryRAWCodec (const DataElement &pixelde, Bitmap const &input, Bitmap &output)
- bool TryRLECodec (const DataElement &pixelde, Bitmap const &input, Bitmap &output)

Additional Inherited Members

10.148.1 Detailed Description

ImageChangeTransferSyntax class.

Class to change the transfer syntax of an input DICOM

If only Force param is set but no input TransferSyntax is set, it is assumed that user only wants to inspect encapsulated stream (advanced dev. option).

When using UserCodec it is very important that the TransferSyntax (as set in SetTransferSyntax) is actually understood by UserCodec (ie. UserCodec->CanCode(TransferSyntax)). Otherwise the behavior is to use a default codec.

See also

JPEGCodec JPEGLSCodec JPEG2000Codec

Examples

CompressImage.cxx.

10.148.2 Constructor & Destructor Documentation

10.148.2.1 ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::ImageChangeTransferSyntax ( )  [inline]
```

10.148.2.2 ~ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::~ImageChangeTransferSyntax ( )  [default]
```

10.148.3 Member Function Documentation

10.148.3.1 Change()

```
bool gdcm::ImageChangeTransferSyntax::Change ( )
```

Change.

Examples

CompressImage.cxx.

10.148.3.2 GetTransferSyntax()

```
const TransferSyntax& gdcm::ImageChangeTransferSyntax::GetTransferSyntax ( ) const  [inline]
```

Get Transfer Syntax.

10.148.3.3 SetCompressIconImage()

```
void gdcm::ImageChangeTransferSyntax::SetCompressIconImage (
            bool b )  [inline]
```

Decide whether or not to also compress the Icon Image using the same Transfer Syntax. Default is to simply decompress icon image

10.148.3.4 SetForce()

```
void gdcm::ImageChangeTransferSyntax::SetForce (
            bool f )  [inline]
```

When target Transfer Syntax is identical to input target syntax, no operation is actually done. This is an issue when someone wants to re-compress using GDCM internal implementation a JPEG (for example) image

10.148.3.5 SetTransferSyntax()

```
void gdcm::ImageChangeTransferSyntax::SetTransferSyntax (
            const TransferSyntax & ts )  [inline]
```

Set target Transfer Syntax.

Examples

CompressImage.cxx.

10.148.3.6 SetUserCodec()

```
void gdcm::ImageChangeTransferSyntax::SetUserCodec (
            ImageCodec * ic )  [inline]
```

Allow user to specify exactly which codec to use. this is needed to specify special qualities or compression option.

Warning

if the codec 'ic' is not compatible with the TransferSyntax requested, it will not be used. It is the user responsibility to check that UserCodec->CanCode(TransferSyntax)

10.148.3.7 TryJPEG2000Codec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEG2000Codec (
            const DataElement & pixelde,
            Bitmap const & input,
            Bitmap & output )  [protected]
```

10.148.3.8 TryJPEGCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGCodec (
            const DataElement & pixelde,
            Bitmap const & input,
            Bitmap & output )  [protected]
```

10.148.3.9 TryJPEGLSCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGLSCodec (
            const DataElement & pixelde,
            Bitmap const & input,
            Bitmap & output )  [protected]
```

10.148.3.10 TryRAWCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRAWCodec (
            const DataElement & pixelde,
            Bitmap const & input,
            Bitmap & output )  [protected]
```

10.148.3.11 TryRLECodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRLECodec (
            const DataElement & pixelde,
            Bitmap const & input,
            Bitmap & output )  [protected]
```

The documentation for this class was generated from the following file:

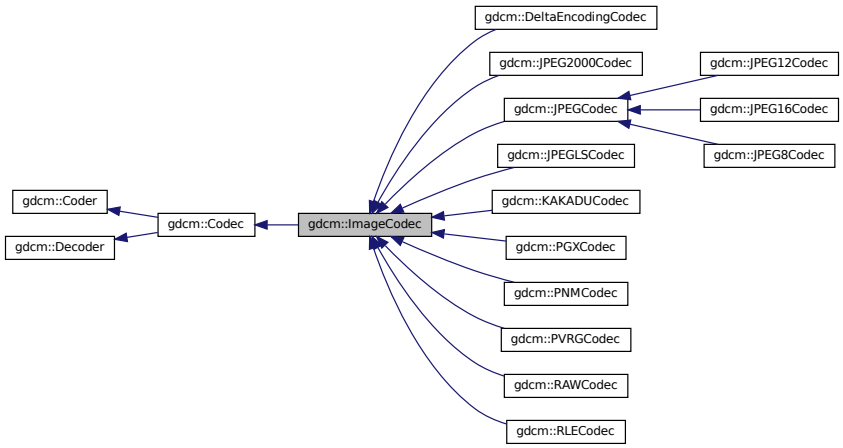
- gdcmImageChangeTransferSyntax.h

10.149 gdcm::ImageCodec Class Reference

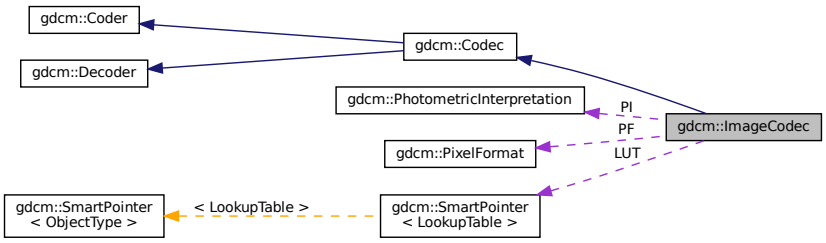
ImageCodec.

`#include <gdcmImageCodec.h>`

Inheritance diagram for gdcm::ImageCodec:



Collaboration diagram for gdcm::ImageCodec:



Public Member Functions

- ImageCodec ()
- ~ImageCodec () override
- bool CanCode (TransferSyntax const &) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &) const override

  Return whether this decoder support this transfer syntax (can decode it)
- bool CleanupUnusedBits (char *data, size_t datalen)
- virtual ImageCodec * Clone () const =0
- bool Decode (DataElement const &is_, DataElement &os) override

  Decode.
- const unsigned int * GetDimensions () const
- virtual bool GetHeaderInfo (std::istream &is_, TransferSyntax &ts)
- bool GetLossyFlag () const
- const LookupTable & GetLUT () const
- bool GetNeedByteSwap () const
- unsigned int GetNumberOfDimensions () const
- const PhotometricInterpretation & GetPhotometricInterpretation () const
- PixelFormat & GetPixelFormat ()
- const PixelFormat & GetPixelFormat () const
- unsigned int GetPlanarConfiguration () const
- bool IsLossy () const
- void SetDimensions (const std::vector< unsigned int > &d)
- void SetDimensions (const unsigned int d[3])
- void SetLossyFlag (bool l)
- void SetLUT (LookupTable const &lut)
- void SetNeedByteSwap (bool b)
- void SetNeedOverlayCleanup (bool b)
- void SetNumberOfDimensions (unsigned int dim)
- void SetPhotometricInterpretation (PhotometricInterpretation const &pi)
- virtual void SetPixelFormat (PixelFormat const &pf)
- void SetPlanarConfiguration (unsigned int pc)

Protected Types

- typedef SmartPointer< LookupTable > LUTPtr

Protected Member Functions

- virtual bool AppendFrameEncode (std::ostream &out, const char *data, size_t datalen)
- virtual bool AppendRowEncode (std::ostream &out, const char *data, size_t datalen)
- bool DecodeByStreams (std::istream &is_, std::ostream &os) override
- bool DoByteSwap (std::istream &is_, std::ostream &os)
- bool DoInvertMonochrome (std::istream &is_, std::ostream &os)
- bool DoOverlayCleanup (std::istream &is_, std::ostream &os)
- bool DoPaddedCompositePixelCode (std::istream &is_, std::ostream &os)
- bool DoPlanarConfiguration (std::istream &is_, std::ostream &os)
- bool DoSimpleCopy (std::istream &is_, std::ostream &os)
- bool DoYBR (std::istream &is_, std::ostream &os)
- bool DoYBRFull422 (std::istream &is_, std::ostream &os)
- virtual bool IsFrameEncoder ()
- virtual bool IsRowEncoder ()
- virtual bool IsValid (PhotometricInterpretation const &pi)
- virtual bool StartEncode (std::ostream &os)
- virtual bool StopEncode (std::ostream &os)

Protected Attributes

- unsigned int Dimensions [3]
- bool LossyFlag
- LUTPtr LUT
- bool NeedByteSwap
- bool NeedOverlayCleanup
- unsigned int NumberOfDimensions
- PixelFormat PF
- PhotometricInterpretation PI
- unsigned int PlanarConfiguration
- bool RequestPaddedCompositePixelCode
- bool RequestPlanarConfiguration

Friends

- class FileChangeTransferSyntax
- class ImageChangePhotometricInterpretation

10.149.1 Detailed Description

ImageCodec.

Note

Main codec, this is a central place for all implementation

10.149.2 Member Typedef Documentation

10.149.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcm::ImageCodec::LUTPtr  [protected]
```

10.149.3 Constructor & Destructor Documentation

10.149.3.1 ImageCodec()

```
gdcm::ImageCodec::ImageCodec ( )
```

10.149.3.2 ~ImageCodec()

```
gdcm::ImageCodec::~ImageCodec ( )  [override]
```

10.149.4 Member Function Documentation

10.149.4.1 AppendFrameEncode()

```
virtual bool gdcm::ImageCodec::AppendFrameEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.2 AppendRowEncode()

```
virtual bool gdcm::ImageCodec::AppendRowEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.3 CanCode()

```
bool gdcm::ImageCodec::CanCode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements gdcm::Coder.

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.4 CanDecode()

```
bool gdcm::ImageCodec::CanDecode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements gdcm::Decoder.

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.5 CleanupUnusedBits()

```
bool gdcm::ImageCodec::CleanupUnusedBits (
            char * data,
            size_t datalen )
```

10.149.4.6 Clone()

```
virtual ImageCodec* gdcm::ImageCodec::Clone ( ) const  [pure virtual]
```

Implemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.7 Decode()

```
bool gdcm::ImageCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::Decoder.

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PVRGCodec, gdcm::KAKADUCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.8 DecodeByStreams()

```
bool gdcm::ImageCodec::DecodeByStreams (
            std::istream & is_,
            std::ostream & os )  [override], [protected], [virtual]
```

Reimplemented from gdcm::Decoder.

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::JPEGCodec, gdcm::JPEG8Codec, gdcm::JPEG2000Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

10.149.4.9 DoByteSwap()

```
bool gdcm::ImageCodec::DoByteSwap (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.10 DoInvertMonochrome()

```
bool gdcm::ImageCodec::DoInvertMonochrome (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.11 DoOverlayCleanup()

```
bool gdcm::ImageCodec::DoOverlayCleanup (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.12 DoPaddedCompositePixelCode()

```
bool gdcm::ImageCodec::DoPaddedCompositePixelCode (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.13 DoPlanarConfiguration()

```
bool gdcm::ImageCodec::DoPlanarConfiguration (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.14 DoSimpleCopy()

```
bool gdcm::ImageCodec::DoSimpleCopy (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.15 DoYBR()

```
bool gdcm::ImageCodec::DoYBR (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.16 DoYBRFull422()

```
bool gdcm::ImageCodec::DoYBRFull422 (
            std::istream & is_,
            std::ostream & os )  [protected]
```

10.149.4.17 GetDimensions()

```
const unsigned int* gdcm::ImageCodec::GetDimensions ( ) const  [inline]
```

10.149.4.18 GetHeaderInfo()

```
virtual bool gdcm::ImageCodec::GetHeaderInfo (
            std::istream & is_,
            TransferSyntax & ts )  [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::RAWCodec, gdcm::PNMCodec, gdcm::PGXCodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, gdcm::JPEG8Codec, gdcm::JPEG2000Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

10.149.4.19 GetLossyFlag()

```
bool gdcm::ImageCodec::GetLossyFlag ( ) const
```

10.149.4.20 GetLUT()

```
const LookupTable& gdcm::ImageCodec::GetLUT ( ) const  [inline]
```

10.149.4.21 GetNeedByteSwap()

```
bool gdcm::ImageCodec::GetNeedByteSwap ( ) const  [inline]
```

10.149.4.22 GetNumberOfDimensions()

```
unsigned int gdcm::ImageCodec::GetNumberOfDimensions ( ) const
```

10.149.4.23 GetPhotometricInterpretation()

```
const PhotometricInterpretation& gdcm::ImageCodec::GetPhotometricInterpretation ( ) const
```

10.149.4.24 GetPixelFormat() [1/2]

```
PixelFormat& gdcm::ImageCodec::GetPixelFormat ( )  [inline]
```

Examples

GetJPEGSamplePrecision.cxx.

10.149.4.25 GetPixelFormat() [2/2]

```
const PixelFormat& gdcm::ImageCodec::GetPixelFormat ( ) const  [inline]
```

10.149.4.26 GetPlanarConfiguration()

```
unsigned int gdcm::ImageCodec::GetPlanarConfiguration ( ) const  [inline]
```

10.149.4.27 IsFrameEncoder()

```
virtual bool gdcm::ImageCodec::IsFrameEncoder ( )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.28 IsLossy()

```
bool gdcm::ImageCodec::IsLossy ( ) const
```

10.149.4.29 IsRowEncoder()

```
virtual bool gdcm::ImageCodec::IsRowEncoder ( )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.30 IsValid()

```
virtual bool gdcm::ImageCodec::IsValid (
            PhotometricInterpretation const & pi )  [protected], [virtual]
```

Reimplemented in gdcm::JPEGCodec.

10.149.4.31 SetDimensions() [1/2]

```
void gdcm::ImageCodec::SetDimensions (
            const std::vector< unsigned int > & d )
```

10.149.4.32 SetDimensions() [2/2]

```
void gdcm::ImageCodec::SetDimensions (
            const unsigned int d[3] )
```

Examples

ExtractIconFromFile.cxx.

10.149.4.33 SetLossyFlag()

```
void gdcm::ImageCodec::SetLossyFlag (
            bool l )
```

10.149.4.34 SetLUT()

```
void gdcm::ImageCodec::SetLUT (
            LookupTable const & lut )  [inline]
```

Examples

ExtractIconFromFile.cxx.

10.149.4.35 SetNeedByteSwap()

```
void gdcm::ImageCodec::SetNeedByteSwap (
            bool b )  [inline]
```

10.149.4.36 SetNeedOverlayCleanup()

```
void gdcm::ImageCodec::SetNeedOverlayCleanup (
            bool b )  [inline]
```

10.149.4.37 SetNumberOfDimensions()

```
void gdcm::ImageCodec::SetNumberOfDimensions (
            unsigned int dim )
```

10.149.4.38 SetPhotometricInterpretation()

```
void gdcm::ImageCodec::SetPhotometricInterpretation (
            PhotometricInterpretation const & pi )
```

Examples

ExtractIconFromFile.cxx.

10.149.4.39 SetPixelFormat()

```
virtual void gdcm::ImageCodec::SetPixelFormat (
            PixelFormat const & pf )  [inline], [virtual]
```

Reimplemented in gdcm::JPEGCodec.

Examples

ExtractIconFromFile.cxx.

10.149.4.40 SetPlanarConfiguration()

```
void gdcm::ImageCodec::SetPlanarConfiguration (
            unsigned int pc )  [inline]
```

10.149.4.41 StartEncode()

```
virtual bool gdcm::ImageCodec::StartEncode (
            std::ostream & os )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.4.42 StopEncode()

```
virtual bool gdcm::ImageCodec::StopEncode (
            std::ostream & os )  [protected], [virtual]
```

Reimplemented in gdcm::RLECodec, gdcm::JPEGLSCodec, gdcm::JPEGCodec, and gdcm::JPEG2000Codec.

10.149.5 Friends And Related Function Documentation

10.149.5.1 FileChangeTransferSyntax

```
friend class FileChangeTransferSyntax  [friend]
```

This is a high level API to encode in a streaming fashion. Each plugin will handle differently the caching mechanism so that a limited memory is used when compressing dataset. Codec will fall into two categories:

- Full row encoder: only a single scanline (row) of data is needed to be loaded at a time;
- Full frame encoder (default): a complete frame (row x col) is needed to be loaded at a time

10.149.5.2 ImageChangePhotometricInterpretation

```
friend class ImageChangePhotometricInterpretation  [friend]
```

10.149.6 Member Data Documentation

10.149.6.1 Dimensions

```
unsigned int gdcm::ImageCodec::Dimensions[3]  [protected]
```

10.149.6.2 LossyFlag

```
bool gdcm::ImageCodec::LossyFlag  [protected]
```

10.149.6.3 LUT

```
LUTPtr gdcm::ImageCodec::LUT  [protected]
```

10.149.6.4 NeedByteSwap

```
bool gdcm::ImageCodec::NeedByteSwap  [protected]
```

10.149.6.5 NeedOverlayCleanup

```
bool gdcm::ImageCodec::NeedOverlayCleanup  [protected]
```

10.149.6.6 NumberOfDimensions

```
unsigned int gdcm::ImageCodec::NumberOfDimensions  [protected]
```

10.149.6.7 PF

```
PixelFormat gdcm::ImageCodec::PF  [protected]
```

10.149.6.8 PI

```
PhotometricInterpretation gdcm::ImageCodec::PI  [protected]
```

10.149.6.9 PlanarConfiguration

```
unsigned int gdcm::ImageCodec::PlanarConfiguration  [protected]
```

10.149.6.10 RequestPaddedCompositePixelCode

```
bool gdcm::ImageCodec::RequestPaddedCompositePixelCode  [protected]
```

10.149.6.11 RequestPlanarConfiguration

```
bool gdcm::ImageCodec::RequestPlanarConfiguration  [protected]
```

The documentation for this class was generated from the following file:

- gdcmImageCodec.h

10.150 gdcm::ImageConverter Class Reference

Image Converter.

```
#include <gdcmImageConverter.h>
```

Public Member Functions

- ImageConverter ()
- ~ImageConverter ()
- void Convert ()
- const Image & GetOuput () const
- void SetInput (Image const &input)

10.150.1 Detailed Description

Image Converter.

Note

This is the class used to convert from on Image to another This is typically used to convert let say YBR JPEG compressed Image to a RAW RGB Image. So that the buffer can be directly pass to third party application. This filter is application level and not integrated directly in GDCM

10.150.2 Constructor & Destructor Documentation

10.150.2.1 ImageConverter()

```
gdcm::ImageConverter::ImageConverter ( )
```

10.150.2.2 ~ImageConverter()

```
gdcm::ImageConverter::~ImageConverter ( )
```

10.150.3 Member Function Documentation

10.150.3.1 Convert()

```
void gdcm::ImageConverter::Convert ( )
```

10.150.3.2 GetOuput()

```
const Image& gdcm::ImageConverter::GetOuput ( ) const
```

10.150.3.3 SetInput()

```
void gdcm::ImageConverter::SetInput (
            Image const & input )
```

The documentation for this class was generated from the following file:

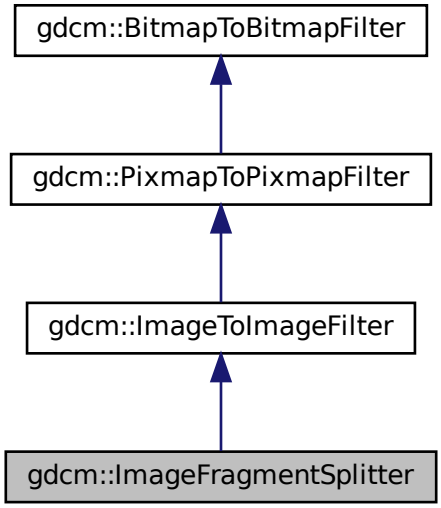
- gdcmImageConverter.h

10.151 gdcm::ImageFragmentSplitter Class Reference

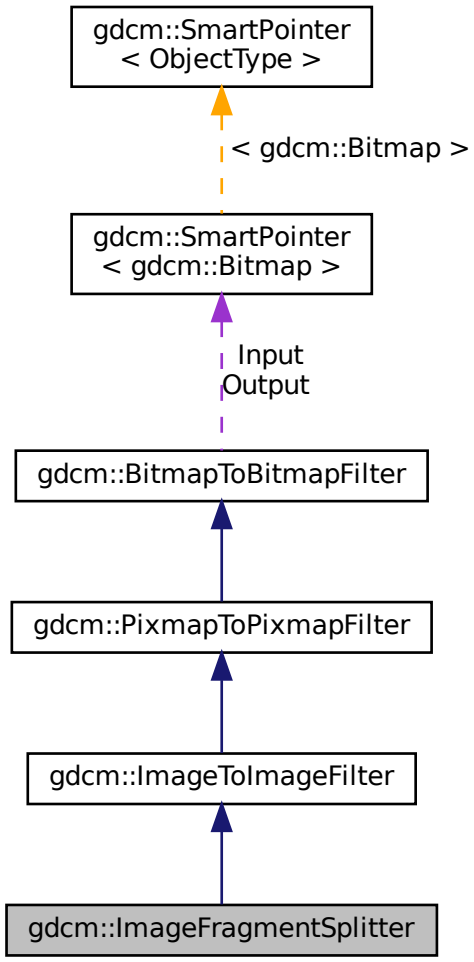
ImageFragmentSplitter class.

`#include <gdcmImageFragmentSplitter.h>`

Inheritance diagram for gdcm::ImageFragmentSplitter:



Collaboration diagram for gdcm::ImageFragmentSplitter:



Public Member Functions

- ImageFragmentSplitter ()
- ~ImageFragmentSplitter ()=default
- unsigned int GetFragmentSizeMax () const
- void SetForce (bool f)
- void SetFragmentSizeMax (unsigned int fragsize)

  FragmentSizeMax needs to be an even number.
- bool Split ()

  Split.

Additional Inherited Members

10.151.1 Detailed Description

ImageFragmentSplitter class.

For single frame image, DICOM standard allow splitting the frame into multiple fragments

10.151.2 Constructor & Destructor Documentation

10.151.2.1 ImageFragmentSplitter()

```
gdcm::ImageFragmentSplitter::ImageFragmentSplitter ( )  [inline]
```

10.151.2.2 ~ImageFragmentSplitter()

```
gdcm::ImageFragmentSplitter::~ImageFragmentSplitter ( )  [default]
```

10.151.3 Member Function Documentation

10.151.3.1 GetFragmentSizeMax()

```
unsigned int gdcm::ImageFragmentSplitter::GetFragmentSizeMax ( ) const  [inline]
```

10.151.3.2 SetForce()

```
void gdcm::ImageFragmentSplitter::SetForce (
            bool f )  [inline]
```

When file already has all it's segment < FragmentSizeMax there is not need to run the filter. Unless the user explicitly say 'force' recomputation !

10.151.3.3 SetFragmentSizeMax()

```
void gdcm::ImageFragmentSplitter::SetFragmentSizeMax (
            unsigned int fragsize )
```

FragmentSizeMax needs to be an even number.

10.151.3.4 Split()

```
bool gdcm::ImageFragmentSplitter::Split ( )
```

Split.

The documentation for this class was generated from the following file:

- gdcmImageFragmentSplitter.h

10.152 gdcm::ImageHelper Class Reference

ImageHelper (internal class, not intended for user level)

```
#include <gdcmImageHelper.h>
```

Static Public Member Functions

- static MediaStorage ComputeMediaStorageFromModality (const char *modality, unsigned int dimension=2, PixelFormat const &pf=PixelFormat(), PhotometricInterpretation const &pi=PhotometricInterpretation(), double rescaleintercept=0, double rescaleslope=1)

  Moved from MediaStorage here, since we need extra info stored in PixelFormat & PhotometricInterpretation.
- static bool ComputeSpacingFromImagePositionPatient (const std::vector< double > &imageposition, std::vector< double > &spacing)

  DO NOT USE.
- static std::vector< unsigned int > GetDimensionsValue (const File &f)
- static bool GetDirectionCosinesFromDataSet (DataSet const &ds, std::vector< double > &dircos)
- static std::vector< double > GetDirectionCosinesValue (File const &f)
- static bool GetForcePixelSpacing ()
- static bool GetForceRescaleInterceptSlope ()
- static SmartPointer< LookupTable > GetLUT (File const &f)

  returns the lookup table of an image file
- static std::vector< double > GetOriginValue (File const &f)

  Set/Get Origin (IPP) from/to a file.
- static PhotometricInterpretation GetPhotometricInterpretationValue (File const &f)
- static PixelFormat GetPixelFormatValue (const File &f)
- static unsigned int GetPlanarConfigurationValue (const File &f)

- static bool GetPMSRescaleInterceptSlope ()
- static const ByteValue * GetPointerFromElement (Tag const &tag, File const &f)
- static bool GetRealWorldValueMappingContent (File const &f, RealWorldValueMappingContent &rwvmc)
- static std::vector< double > GetRescaleInterceptSlopeValue (File const &f)
- static std::vector< double > GetSpacingValue (File const &f)

  Set/Get Spacing from/to a File.
- static void SetDimensionsValue (File &f, const Pixmap &img)
- static void SetDirectionCosinesValue (DataSet &ds, const std::vector< double > &dircos)
- static void SetForcePixelSpacing (bool)
- static void SetForceRescaleInterceptSlope (bool)
- static void SetOriginValue (DataSet &ds, const Image &img)
- static void SetPMSRescaleInterceptSlope (bool)
- static void SetRescaleInterceptSlopeValue (File &f, const Image &img)
- static void SetSpacingValue (DataSet &ds, const std::vector< double > &spacing)

Static Protected Member Functions

- static Tag GetSpacingTagFromMediaStorage (MediaStorage const &ms)
- static Tag GetZSpacingTagFromMediaStorage (MediaStorage const &ms)

10.152.1 Detailed Description

ImageHelper (internal class, not intended for user level)

Helper for writing World images in DICOM. DICOM has a 'template' approach to image where MR Image Storage are distinct object from Enhanced MR Image Storage. For example the Pixel Spacing in one object is not at the same position (ie Tag) as in the other this class is the central (read: fragile) place where all the dispatching is done from a unified view of a world image (typically VTK or ITK point of view) down to the low level DICOM point of view.

Warning

: do not expect the API of this class to be maintained at any point, since as Modalities are added the API might have to be augmented or behavior changed to cope with new modalities.

10.152.2 Member Function Documentation

10.152.2.1 ComputeMediaStorageFromModality()

```
static MediaStorage gdcm::ImageHelper::ComputeMediaStorageFromModality (
            const char * modality,
            unsigned int dimension = 2,
            PixelFormat const & pf = PixelFormat(),
            PhotometricInterpretation const & pi = PhotometricInterpretation(),
            double rescaleintercept = 0,
            double rescaleslope = 1 )  [static]
```

Moved from MediaStorage here, since we need extra info stored in PixelFormat & PhotometricInterpretation.

10.152.2.2 ComputeSpacingFromImagePositionPatient()

```
static bool gdcm::ImageHelper::ComputeSpacingFromImagePositionPatient (
            const std::vector< double > & imageposition,
            std::vector< double > & spacing )  [static]
```

DO NOT USE.

10.152.2.3 GetDimensionsValue()

```
static std::vector<unsigned int> gdcm::ImageHelper::GetDimensionsValue (
            const File & f )  [static]
```

This function checks tags (0x0028, 0x0010) and (0x0028, 0x0011) for the rows and columns of the image in pixels (as opposed to actual distances). The output is {col , row}

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.152.2.4 GetDirectionCosinesFromDataSet()

```
static bool gdcm::ImageHelper::GetDirectionCosinesFromDataSet (
            DataSet const & ds,
            std::vector< double > & dircos )  [static]
```

10.152.2.5 GetDirectionCosinesValue()

```
static std::vector<double> gdcm::ImageHelper::GetDirectionCosinesValue (
            File const & f )  [static]
```

Get Direction Cosines (IOP) from/to a file Requires a file because mediastorage must be known

10.152.2.6 GetForcePixelSpacing()

```
static bool gdcm::ImageHelper::GetForcePixelSpacing ( )  [static]
```

10.152.2.7 GetForceRescaleInterceptSlope()

```
static bool gdcm::ImageHelper::GetForceRescaleInterceptSlope ( )  [static]
```

10.152.2.8 GetLUT()

```
static SmartPointer<LookupTable> gdcm::ImageHelper::GetLUT (
            File const & f )  [static]
```

returns the lookup table of an image file

10.152.2.9 GetOriginValue()

```
static std::vector<double> gdcm::ImageHelper::GetOriginValue (
            File const & f )  [static]
```

Set/Get Origin (IPP) from/to a file.

10.152.2.10 GetPhotometricInterpretationValue()

```
static PhotometricInterpretation gdcm::ImageHelper::GetPhotometricInterpretationValue (
            File const & f )  [static]
```

10.152.2.11 GetPixelFormatValue()

```
static PixelFormat gdcm::ImageHelper::GetPixelFormatValue (
            const File & f )  [static]
```

This function returns pixel information about an image from its dataset That includes samples per pixel and bit depth (in that order)

10.152.2.12 GetPlanarConfigurationValue()

```
static unsigned int gdcm::ImageHelper::GetPlanarConfigurationValue (
            const File & f )  [static]
```

10.152.2.13 GetPMSRescaleInterceptSlope()

```
static bool gdcm::ImageHelper::GetPMSRescaleInterceptSlope ( )  [static]
```

10.152.2.14 GetPointerFromElement()

```
static const ByteValue* gdcm::ImageHelper::GetPointerFromElement (
            Tag const & tag,
            File const & f )  [static]
```

10.152.2.15 GetRealWorldValueMappingContent()

```
static bool gdcm::ImageHelper::GetRealWorldValueMappingContent (
            File const & f,
            RealWorldValueMappingContent & rwvmc )  [static]
```

10.152.2.16 GetRescaleInterceptSlopeValue()

```
static std::vector<double> gdcm::ImageHelper::GetRescaleInterceptSlopeValue (
            File const & f )  [static]
```

Set/Get shift/scale from/to a file

Warning

this function reads/sets the Slope/Intercept in appropriate class storage, but also Grid Scaling in RT Dose Storage Can't take a dataset because the mediastorage of the file must be known

10.152.2.17 GetSpacingTagFromMediaStorage()

```
static Tag gdcm::ImageHelper::GetSpacingTagFromMediaStorage (
            MediaStorage const & ms )  [static], [protected]
```

10.152.2.18 GetSpacingValue()

```
static std::vector<double> gdcm::ImageHelper::GetSpacingValue (
            File const & f )  [static]
```

Set/Get Spacing from/to a File.

10.152.2.19 GetZSpacingTagFromMediaStorage()

```
static Tag gdcm::ImageHelper::GetZSpacingTagFromMediaStorage (
            MediaStorage const & ms )  [static], [protected]
```

10.152.2.20 SetDimensionsValue()

```
static void gdcm::ImageHelper::SetDimensionsValue (
            File & f,
            const Pixmap & img )  [static]
```

10.152.2.21 SetDirectionCosinesValue()

```
static void gdcm::ImageHelper::SetDirectionCosinesValue (
            DataSet & ds,
            const std::vector< double > & dircos )  [static]
```

Set Direction Cosines (IOP) from/to a file When IOD does not defines what is IOP (eg. typically Secondary Capture Image Storage) this call will simply remove the IOP attribute. Else in case of MR/CT image storage, this call will properly lookup the correct attribute to store the IOP.

10.152.2.22 SetForcePixelSpacing()

```
static void gdcm::ImageHelper::SetForcePixelSpacing (
            bool  )  [static]
```

GDCM 1.x compatibility issue: When using ReWrite an MR Image Storage would be rewritten as Secondary Capture Object while still having a Pixel Spacing tag (0028,0030). If you have deal with those files, use this very special flag to handle them Unless explicitly set elsewhere by the standard, it will use value from 0028,0030 / 0018,0088 for the Pixel Spacing of the Image

10.152.2.23 SetForceRescaleInterceptSlope()

```
static void gdcm::ImageHelper::SetForceRescaleInterceptSlope (
            bool  )  [static]
```

GDCM 1.x compatibility issue: Do not use anymore. This hack was used for some MR Image Storage generated by Philips Modality. When "Combine MR Rescaling" is set to TRUE, rescaling is removed. But when set to FALSE, the Modality LUT was exported. Internally GDCM now handles this gracefully.

10.152.2.24 SetOriginValue()

```
static void gdcm::ImageHelper::SetOriginValue (
            DataSet & ds,
            const Image & img )  [static]
```

10.152.2.25 SetPMSRescaleInterceptSlope()

```
static void gdcm::ImageHelper::SetPMSRescaleInterceptSlope (
            bool  )  [static]
```

Since GDCM 2.6.1 Philips Medical System are read using the Private Field For Rescale Slope/Intercept by default. This mechanism can be deactivated using the following API: This option has no effect when ForceRescaleInterceptSlope is set to true GDCM will only read those private attribute but never write them out.

10.152.2.26 SetRescaleInterceptSlopeValue()

```
static void gdcm::ImageHelper::SetRescaleInterceptSlopeValue (
            File & f,
            const Image & img )  [static]
```

10.152.2.27 SetSpacingValue()

```
static void gdcm::ImageHelper::SetSpacingValue (
            DataSet & ds,
            const std::vector< double > & spacing )  [static]
```

The documentation for this class was generated from the following file:

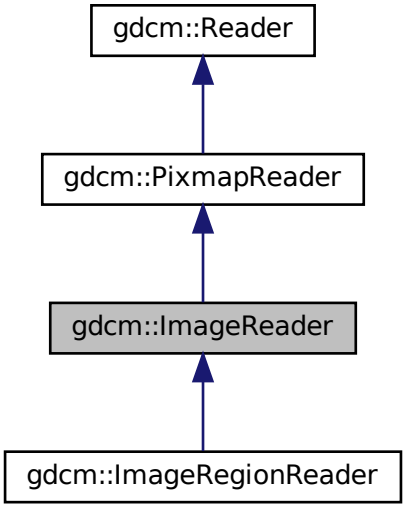
- gdcmImageHelper.h

10.153 gdcm::ImageReader Class Reference

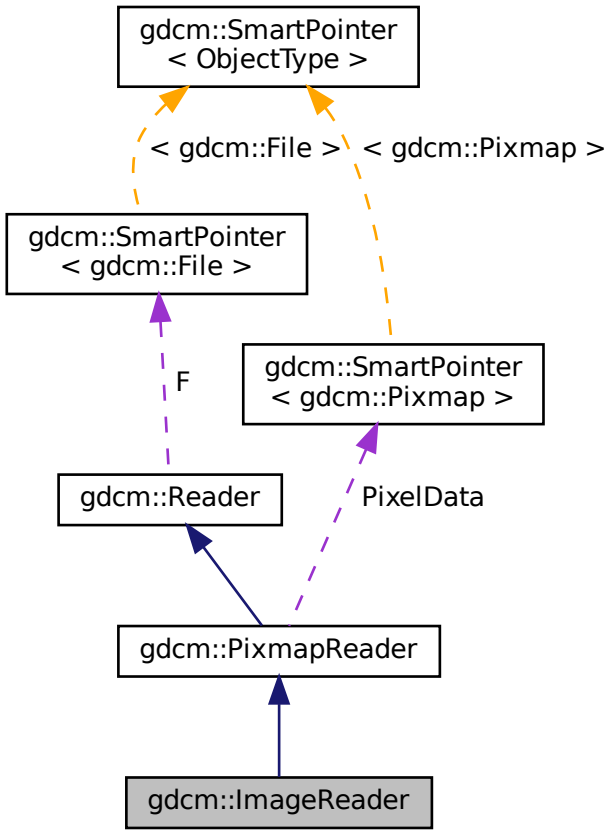
ImageReader.

`#include <gdcmImageReader.h>`

Inheritance diagram for gdcm::ImageReader:



Collaboration diagram for gdcm::ImageReader:



Public Member Functions

- ImageReader ()
- ~ImageReader () override
- Image & GetImage ()
- const Image & GetImage () const

  Return the read image.
- bool Read () override

Protected Member Functions

- bool ReadACRNEMAImage () override
- bool ReadImage (MediaStorage const &ms) override

Additional Inherited Members

10.153.1 Detailed Description

ImageReader.

Note

its role is to convert the DICOM DataSet into a Image representation Image is different from Pixmap has it has a position and a direction in Space.

See also

Image

Examples

CheckBigEndianBug.cxx, CompressImage.cxx, ConvertToQImage.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GetJPEGSamplePrecision.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, PatchFile.cxx, PrintLUT.cxx, ReadMultiTimesException.cxx, and threadgdcm.cxx.

10.153.2 Constructor & Destructor Documentation

10.153.2.1 ImageReader()

```
gdcm::ImageReader::ImageReader ( )
```

10.153.2.2 ~ImageReader()

```
gdcm::ImageReader::~ImageReader ( )  [override]
```

10.153.3 Member Function Documentation

10.153.3.1 GetImage() [1/2]

```
Image& gdcm::ImageReader::GetImage ( )
```

10.153.3.2 GetImage() [2/2]

```
const Image& gdcm::ImageReader::GetImage ( ) const
```

Return the read image.

Examples

CompressImage.cxx, ConvertToQImage.cxx, ExtractIconFromFile.cxx, FixJAIBugJPEGLS.cxx, GetJPEGSamplePrecision.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, PatchFile.cxx, PrintLUT.cxx, ReadMultiTimesException.cxx, TemplateEmptyImage.cxx, and threadgdcm.cxx.

10.153.3.3 Read()

```
bool gdcm::ImageReader::Read ( )  [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an Image.

Reimplemented from gdcm::Reader.

Reimplemented in gdcm::ImageRegionReader.

Examples

CheckBigEndianBug.cxx, CompressImage.cxx, ConvertToQImage.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GetJPEGSamplePrecision.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, PatchFile.cxx, PrintLUT.cxx, ReadMultiTimesException.cxx, and threadgdcm.cxx.

10.153.3.4 ReadACRNEMAImage()

```
bool gdcm::ImageReader::ReadACRNEMAImage ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::PixmapReader.

10.153.3.5 ReadImage()

```
bool gdcm::ImageReader::ReadImage (
            MediaStorage const & ms )  [override], [protected], [virtual]
```

Reimplemented from gdcm::PixmapReader.

The documentation for this class was generated from the following file:

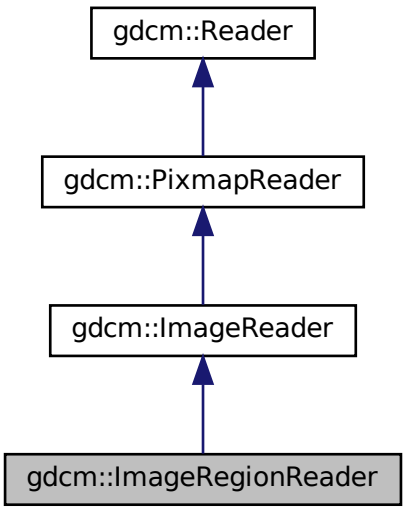
- gdcmImageReader.h

10.154 gdcm::ImageRegionReader Class Reference

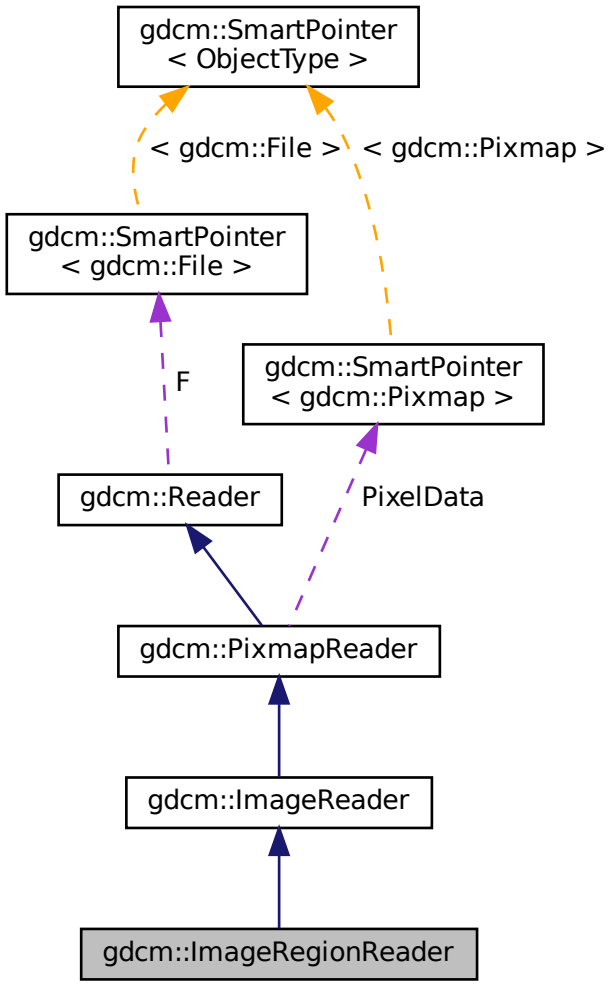
ImageRegionReader.

```
#include <gdcmImageRegionReader.h>
```

Inheritance diagram for gdcm::ImageRegionReader:



Collaboration diagram for gdcm::ImageRegionReader:



Public Member Functions

- ImageRegionReader ()
- ~ImageRegionReader () override
- size_t ComputeBufferLength () const
- Region const & GetRegion () const
- bool ReadInformation ()
- bool ReadIntoBuffer (char *inreadbuffer, size_t buflen)
- void SetRegion (Region const &region)

  Set/Get Region to be read.

Protected Member Functions

- bool Read () override

  To prevent user from calling super class Read() function.

Additional Inherited Members

10.154.1 Detailed Description

ImageRegionReader.

This class is able to read a region from a DICOM file containing an image. This implementation requires that the information stored in the DICOM header are consistent with what is in the encapsulated Pixel Data. This is technically not required by DICOM standard, which makes this implementation illegal with regards to the famous JPEG note: `http://dicom.nema.org/medical/dicom/current/output/chtml/part05/sect_8.↩2.html#para_4bcb841e-c6bf-4e26-82a5-3fad3c942da0`

See also

ImageReader

Examples

TemplateEmptyImage.cxx.

10.154.2 Constructor & Destructor Documentation

10.154.2.1 ImageRegionReader()

```
gdcm::ImageRegionReader::ImageRegionReader ( )
```

10.154.2.2 ~ImageRegionReader()

```
gdcm::ImageRegionReader::~ImageRegionReader ( )  [override]
```

10.154.3 Member Function Documentation

10.154.3.1 ComputeBufferLength()

```
size_t gdcm::ImageRegionReader::ComputeBufferLength ( ) const
```

Explicit call which will compute the minimal buffer length that can hold the whole uncompressed image as defined by Region `region`.

Returns

0 upon error

10.154.3.2 GetRegion()

```
Region const& gdcm::ImageRegionReader::GetRegion ( ) const
```

10.154.3.3 Read()

```
bool gdcm::ImageRegionReader::Read ( )  [override], [protected], [virtual]
```

To prevent user from calling super class Read() function.

Reimplemented from gdcm::ImageReader.

10.154.3.4 ReadInformation()

```
bool gdcm::ImageRegionReader::ReadInformation ( )
```

Read meta information (not Pixel Data) from the DICOM file.

Returns

false upon error

Examples

TemplateEmptyImage.cxx.

10.154.3.5 ReadIntoBuffer()

```
bool gdcm::ImageRegionReader::ReadIntoBuffer (
            char * inreadbuffer,
            size_t buflen )
```

Read into buffer: For Python, the `buflen` param is deduced directly from the input bytearray passed as parameter (function only takes one param).

Returns

false upon error

10.154.3.6 SetRegion()

```
void gdcm::ImageRegionReader::SetRegion (
            Region const & region )
```

Set/Get Region to be read.

The documentation for this class was generated from the following file:

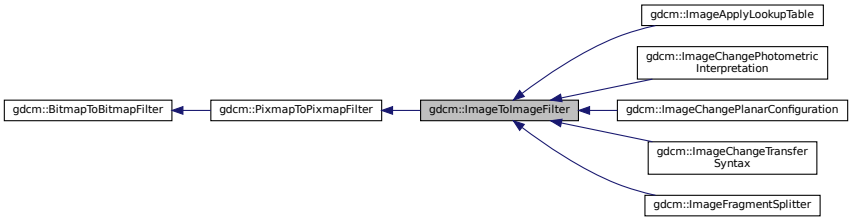
- gdcmImageRegionReader.h

10.155 gdcm::ImageToImageFilter Class Reference

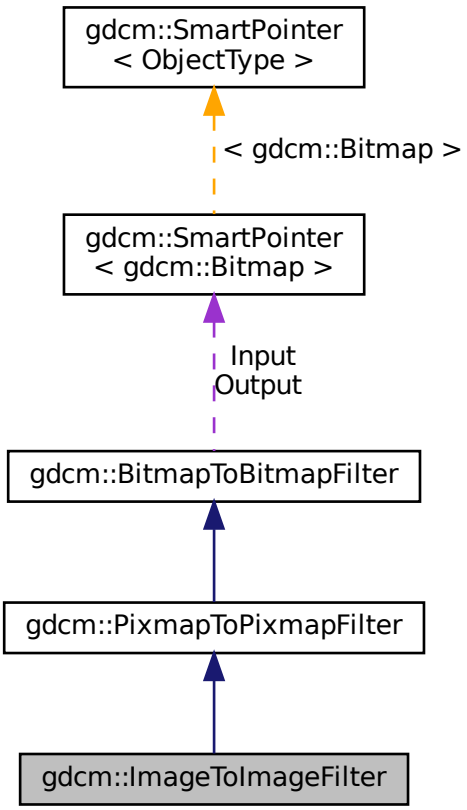
ImageToImageFilter class.

`#include <gdcmImageToImageFilter.h>`

Inheritance diagram for gdcm::ImageToImageFilter:



Collaboration diagram for gdcm::ImageToImageFilter:



Public Member Functions

- ImageToImageFilter ()
- ~ImageToImageFilter ()=default
- Image & GetInput ()
- const Image & GetOutput () const

  Get Output image.

Additional Inherited Members

10.155.1 Detailed Description

ImageToImageFilter class.

Super class for all filter taking an image and producing an output image

10.155.2 Constructor & Destructor Documentation

10.155.2.1 ImageToImageFilter()

```
gdcm::ImageToImageFilter::ImageToImageFilter ( )
```

10.155.2.2 ~ImageToImageFilter()

```
gdcm::ImageToImageFilter::~ImageToImageFilter ( )  [default]
```

10.155.3 Member Function Documentation

10.155.3.1 GetInput()

```
Image& gdcm::ImageToImageFilter::GetInput ( )
```

10.155.3.2 GetOutput()

```
const Image& gdcm::ImageToImageFilter::GetOutput ( ) const
```

Get Output image.

Examples

CompressImage.cxx.

The documentation for this class was generated from the following file:

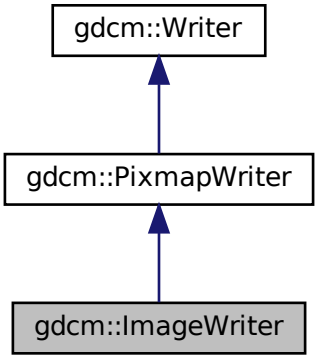
- gdcmImageToImageFilter.h

10.156 gdcm::ImageWriter Class Reference

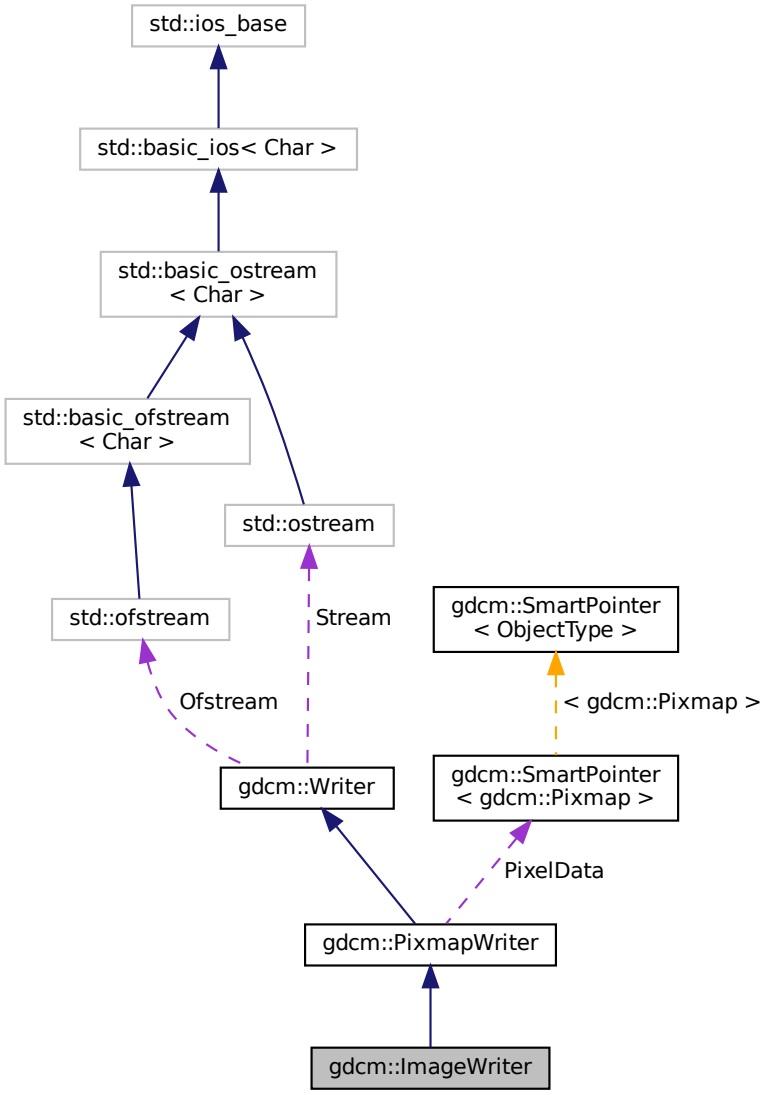
ImageWriter.

`#include <gdcmImageWriter.h>`

Inheritance diagram for gdcm::ImageWriter:



Collaboration diagram for gdcm::ImageWriter:



Public Member Functions

- ImageWriter ()
- ~ImageWriter () override
- MediaStorage ComputeTargetMediaStorage ()
- const Image & GetImage () const override
- Image & GetImage () override
- bool Write () override

  Write.

Additional Inherited Members

10.156.1 Detailed Description

ImageWriter.

This is an extended version of the PixmapWriter. Pay attention that:

1. It will populate missing attribute for Secondary Capture Image Storage instances,
2. It may also change an input MR Image Storage instance into a pseudo Enhanced MR Image Storage instance whenever Modality LUT is required.
3. Some DataElement related to gdcm::Image may be slightly altered.

Examples

CompressImage.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, TemplateEmptyImage.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.156.2 Constructor & Destructor Documentation

10.156.2.1 ImageWriter()

```
gdcm::ImageWriter::ImageWriter ( )
```

10.156.2.2 ~ImageWriter()

```
gdcm::ImageWriter::~ImageWriter ( )  [override]
```

10.156.3 Member Function Documentation

10.156.3.1 ComputeTargetMediaStorage()

```
MediaStorage gdcm::ImageWriter::ComputeTargetMediaStorage ( )
```

internal function used to compute a target MediaStorage the most appropriate User may want to call this function ahead of time (before Write)

Examples

TemplateEmptyImage.cxx.

10.156.3.2 GetImage() [1/2]

```
const Image& gdcm::ImageWriter::GetImage ( ) const  [inline], [override], [virtual]
```

Set/Get Image to be written It will overwrite anything Image infos found in DataSet (see parent class to see how to pass dataset)

Reimplemented from gdcm::PixmapWriter.

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.156.3.3 GetImage() [2/2]

```
Image& gdcm::ImageWriter::GetImage ( )  [inline], [override], [virtual]
```

Reimplemented from gdcm::PixmapWriter.

10.156.3.4 Write()

```
bool gdcm::ImageWriter::Write ( )  [override], [virtual]
```

Write.

Reimplemented from gdcm::Writer.

Examples

CompressImage.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, TemplateEmptyImage.cxx, csa2img.cxx, and iU22tomultisc.cxx.

The documentation for this class was generated from the following file:

- gdcmImageWriter.h

10.157 gdcm::network::ImplementationClassUIDSub Class Reference

ImplementationClassUIDSub.

`#include <gdcmImplementationClassUIDSub.h>`

Public Member Functions

- ImplementationClassUIDSub ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.157.1 Detailed Description

ImplementationClassUIDSub.

PS 3.7 Table D.3-1 IMPLEMENTATION CLASS UID SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

10.157.2 Constructor & Destructor Documentation

10.157.2.1 ImplementationClassUIDSub()

```
gdcm::network::ImplementationClassUIDSub::ImplementationClassUIDSub ( )
```

10.157.3 Member Function Documentation

10.157.3.1 Print()

```
void gdcm::network::ImplementationClassUIDSub::Print (
            std::ostream & os ) const
```

10.157.3.2 Read()

```
std::istream& gdcm::network::ImplementationClassUIDSub::Read (
             std::istream & is )
```

10.157.3.3 Size()

```
size_t gdcm::network::ImplementationClassUIDSub::Size ( ) const
```

10.157.3.4 Write()

```
const std::ostream& gdcm::network::ImplementationClassUIDSub::Write (
             std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmImplementationClassUIDSub.h

10.158 gdcm::network::ImplementationUIDSub Class Reference

ImplementationUIDSub.

`#include <gdcmImplementationUIDSub.h>`

Public Member Functions

- ImplementationUIDSub ()
- const std::ostream & Write (std::ostream &os) const

10.158.1 Detailed Description

ImplementationUIDSub.

Table D.3-2 IMPLEMENTATION UID SUB-ITEM FIELDS (A-ASSOCIATE-AC)

10.158.2 Constructor & Destructor Documentation

10.158.2.1 ImplementationUIDSub()

```
gdcm::network::ImplementationUIDSub::ImplementationUIDSub ( )
```

10.158.3 Member Function Documentation

10.158.3.1 Write()

```
const std::ostream& gdcm::network::ImplementationUIDSub::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmImplementationUIDSub.h

10.159 gdcm::network::ImplementationVersionNameSub Class Reference

ImplementationVersionNameSub.

```
#include <gdcmImplementationVersionNameSub.h>
```

Public Member Functions

- ImplementationVersionNameSub ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.159.1 Detailed Description

ImplementationVersionNameSub.

Table D.3-3 IMPLEMENTATION VERSION NAME SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

10.159.2 Constructor & Destructor Documentation

10.159.2.1 ImplementationVersionNameSub()

```
gdcm::network::ImplementationVersionNameSub::ImplementationVersionNameSub ( )
```

10.159.3 Member Function Documentation

10.159.3.1 Print()

```
void gdcm::network::ImplementationVersionNameSub::Print (
            std::ostream & os ) const
```

10.159.3.2 Read()

```
std::istream& gdcm::network::ImplementationVersionNameSub::Read (
            std::istream & is )
```

10.159.3.3 Size()

```
size_t gdcm::network::ImplementationVersionNameSub::Size ( ) const
```

10.159.3.4 Write()

```
const std::ostream& gdcm::network::ImplementationVersionNameSub::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

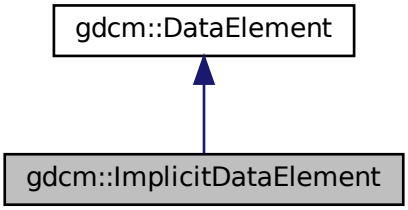
- gdcmImplementationVersionNameSub.h

10.160 gdcm::ImplicitDataElement Class Reference

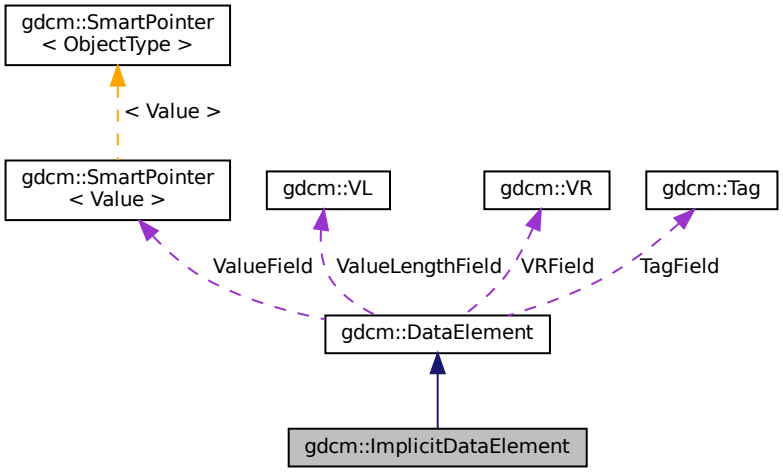
Class to represent an *Implicit VR* Data Element.

`#include <gdcmImplicitDataElement.h>`

Inheritance diagram for gdcm::ImplicitDataElement:



Collaboration diagram for gdcm::ImplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)

- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadValueWithLength (std::istream &is, VL &length, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length, bool readvalues=true)
- template<typename TSwap >
  const std::ostream & Write (std::ostream &os) const

Additional Inherited Members

10.160.1 Detailed Description

Class to represent an *Implicit VR* Data Element.

Note

bla

10.160.2 Member Function Documentation

10.160.2.1 GetLength()

```
VL gdcm::ImplicitDataElement::GetLength ( ) const
```

10.160.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::ImplicitDataElement::Read (
             std::istream & is )
```

10.160.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::ImplicitDataElement::ReadPreValue (
             std::istream & is )
```

10.160.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::ImplicitDataElement::ReadValue (
             std::istream & is,
             bool readvalues = true )
```

10.160.2.5 ReadValueWithLength()

```
template<typename TSwap >
std::istream& gdcm::ImplicitDataElement::ReadValueWithLength (
             std::istream & is,
             VL & length,
             bool readvalues = true )
```

10.160.2.6 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::ImplicitDataElement::ReadWithLength (
             std::istream & is,
             VL & length,
             bool readvalues = true )
```

10.160.2.7 Write()

```
template<typename TSwap >
const std::ostream& gdcm::ImplicitDataElement::Write (
             std::ostream & os ) const
```

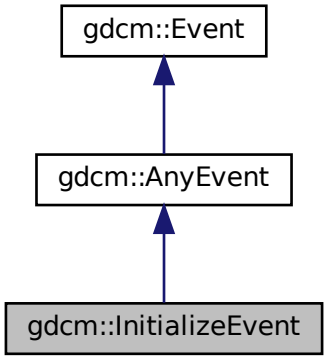
The documentation for this class was generated from the following file:

- gdcmImplicitDataElement.h

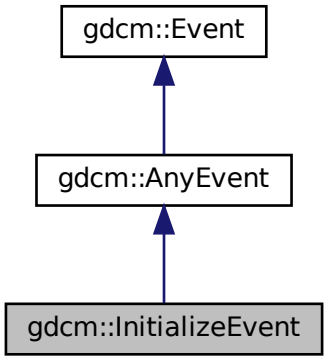
10.161 gdcm::InitializeEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::InitializeEvent:



Collaboration diagram for gdcm::InitializeEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.162 gdcm::IOD Class Reference

Class for representing a IOD.

`#include <gdcmIOD.h>`

Public Types

- typedef std::vector< IODEntry > MapIODEntry
- typedef MapIODEntry::size_type SizeType

Public Member Functions

- IOD ()=default
- void AddIODEntry (const IODEntry &iode)
- void Clear ()
- const IODEntry & GetIODEntry (SizeType idx) const
- SizeType GetNumberOfIODs () const
- Type GetTypeFromTag (const Defs &defs, const Tag &tag) const

Friends

- std::ostream & operator<< (std::ostream &_os, const IOD &_val)

10.162.1 Detailed Description

Class for representing a IOD.

Note

bla

See also

Dict

10.162.2 Member Typedef Documentation

10.162.2.1 MapIODEntry

```
typedef std::vector<IODEntry> gdcm::IOD::MapIODEntry
```

10.162.2.2 SizeType

```
typedef MapIODEntry::size_type gdcm::IOD::SizeType
```

10.162.3 Constructor & Destructor Documentation

10.162.3.1 IOD()

```
gdcm::IOD::IOD ( )  [default]
```

10.162.4 Member Function Documentation

10.162.4.1 AddIODEntry()

```
void gdcm::IOD::AddIODEntry (
            const IODEntry & iode )  [inline]
```

10.162.4.2 Clear()

```
void gdcm::IOD::Clear ( )  [inline]
```

10.162.4.3 GetIODEntry()

```
const IODEntry& gdcm::IOD::GetIODEntry (
            SizeType idx ) const  [inline]
```

10.162.4.4 GetNumberOfIODs()

```
SizeType gdcm::IOD::GetNumberOfIODs ( ) const  [inline]
```

10.162.4.5 GetTypeFromTag()

```
Type gdcm::IOD::GetTypeFromTag (
             const Defs & defs,
             const Tag & tag ) const
```

10.162.5 Friends And Related Function Documentation

10.162.5.1 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const IOD & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmIOD.h

10.163 gdcm::IODEntry Class Reference

Class for representing a IODEntry.

`#include <gdcmIODEntry.h>`

Public Member Functions

- IODEntry (const char *name="", const char *ref="", const char *usag="")
- const char * GetIE () const
- const char * GetName () const
- const char * GetRef () const
- const char * GetUsage () const
- Usage::UsageType GetUsageType () const
- void SetIE (const char *ie)
- void SetName (const char *name)
- void SetRef (const char *ref)
- void SetUsage (const char *usag)

Friends

- std::ostream & operator<< (std::ostream &_os, const IODEntry &_val)

10.163.1 Detailed Description

Class for representing a IODEntry.

Note

A.1.3 IOD Module Table and Functional Group Macro Table This Section of each IOD defines in a tabular form the Modules comprising the IOD. The following information must be specified for each Module in the table:

- The name of the Module or Functional Group
- A reference to the Section in Annex C which defines the Module or Functional Group
- The usage of the Module or Functional Group; whether it is:
- Mandatory (see A.1.3.1) , abbreviated M
- Conditional (see A.1.3.2) , abbreviated C
- User Option (see A.1.3.3) , abbreviated U The Modules referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each IOD, Mandatory Modules shall be supported per the definitions, semantics and requirements defined in Annex C. PS 3.3 - 2008 Page 96
- Standard - A.1.3.2 CONDITIONAL MODULES Conditional Modules are Mandatory Modules if specific conditions are met. If the specified conditions are not met, this Module shall not be supported; that is, no information defined in that Module shall be sent. A.1.3.3 USER OPTION MODULES User Option Modules may or may not be supported. If an optional Module is supported, the Attribute Types specified in the Modules in Annex C shall be supported.

See also

DictEntry

10.163.2 Constructor & Destructor Documentation

10.163.2.1 IODEntry()

```
gdcm::IODEntry::IODEntry (
            const char * name = "",
            const char * ref = "",
            const char * usag = "" )  [inline]
```

10.163.3 Member Function Documentation

10.163.3.1 GetIE()

```
const char* gdcm::IODEntry::GetIE ( ) const  [inline]
```

10.163.3.2 GetName()

```
const char* gdcm::IODEntry::GetName ( ) const  [inline]
```

10.163.3.3 GetRef()

```
const char* gdcm::IODEntry::GetRef ( ) const  [inline]
```

10.163.3.4 GetUsage()

```
const char* gdcm::IODEntry::GetUsage ( ) const  [inline]
```

10.163.3.5 GetUsageType()

```
Usage::UsageType gdcm::IODEntry::GetUsageType ( ) const
```

10.163.3.6 SetIE()

```
void gdcm::IODEntry::SetIE (
            const char * ie )  [inline]
```

10.163.3.7 SetName()

```
void gdcm::IODEntry::SetName (
            const char * name )  [inline]
```

10.163.3.8 SetRef()

```
void gdcm::IODEntry::SetRef (
            const char * ref )  [inline]
```

10.163.3.9 SetUsage()

```
void gdcm::IODEntry::SetUsage (
            const char * usag )  [inline]
```

10.163.4 Friends And Related Function Documentation

10.163.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const IODEntry & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmIODEntry.h

10.164 gdcm::IODs Class Reference

Class for representing a IODs.

```
#include <gdcmIODs.h>
```

Public Types

- typedef std::map< IODName, IOD > IODMapType
- typedef IODMapType::const_iterator IODMapTypeConstIterator
- typedef std::string IODName

Public Member Functions

- IODs ()=default
- void AddIOD (const char *name, const IOD &module)
- IODMapTypeConstIterator Begin () const
- void Clear ()
- IODMapTypeConstIterator End () const
- const IOD & GetIOD (const char *name) const

Friends

- std::ostream & operator<< (std::ostream &_os, const IODs &_val)

10.164.1 Detailed Description

Class for representing a IODs.

Note

bla

See also

IOD

10.164.2 Member Typedef Documentation

10.164.2.1 IODMapType

```
typedef std::map<IODName, IOD> gdcm::IODs::IODMapType
```

10.164.2.2 IODMapTypeConstIterator

```
typedef IODMapType::const_iterator gdcm::IODs::IODMapTypeConstIterator
```

Examples

TraverseModules.cxx.

10.164.2.3 IODName

```
typedef std::string gdcm::IODs::IODName
```

Examples

TraverseModules.cxx.

10.164.3 Constructor & Destructor Documentation

10.164.3.1 IODs()

```
gdcm::IODs::IODs ( )  [default]
```

10.164.4 Member Function Documentation

10.164.4.1 AddIOD()

```
void gdcm::IODs::AddIOD (
            const char * name,
            const IOD & module )  [inline]
```

10.164.4.2 Begin()

```
IODMapTypeConstIterator gdcm::IODs::Begin ( ) const  [inline]
```

10.164.4.3 Clear()

```
void gdcm::IODs::Clear ( )  [inline]
```

10.164.4.4 End()

```
IODMapTypeConstIterator gdcm::IODs::End ( ) const  [inline]
```

10.164.4.5 GetIOD()

```
const IOD& gdcm::IODs::GetIOD (
            const char * name ) const  [inline]
```

10.164.5 Friends And Related Function Documentation

10.164.5.1 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const IODs & _val )  [friend]
```

The documentation for this class was generated from the following file:

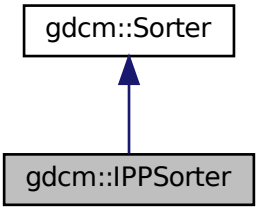
- gdcmIODs.h

10.165 gdcm::IPPSorter Class Reference

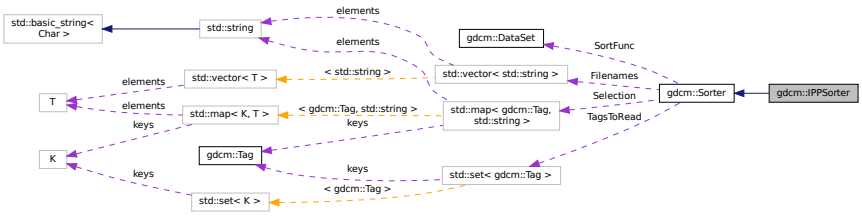
IPPSorter.

```
#include <gdcmIPPSorter.h>
```

Inheritance diagram for gdcm::IPPSorter:



Collaboration diagram for gdcm::IPPSorter:



Public Member Functions

- IPPSorter ()
- double GetDirectionCosinesTolerance () const
- double GetZSpacing () const
- double GetZSpacingTolerance () const
- void SetComputeZSpacing (bool b)
- void SetDirectionCosinesTolerance (double tol)
- void SetDropDuplicatePositions (bool b)
- void SetZSpacingTolerance (double tol)
- bool Sort (std::vector< std::string > const &filenames) override

Protected Attributes

- bool ComputeZSpacing
- double DirCosTolerance
- bool DropDuplicatePositions
- double ZSpacing
- double ZTolerance

Additional Inherited Members

10.165.1 Detailed Description

IPPSorter.

Implement a simple Image Position (Patient) sorter, along the Image Orientation (Patient) direction. This algorithm does NOT support duplicate and will FAIL in case of duplicate IPP.

Warning

See special note for SetZSpacingTolerance when computing the ZSpacing from the IPP of each DICOM files (default tolerance for consistent spacing is: 1e-6mm)

For more information on Spacing, and how it is defined in DICOM, advanced users may refers to:

`http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing`

Bug There are currently a couple of bugs in this implementation:

- Gantry Tilt is not considered (always an error)
- Application programmer should only sort valid DataSet (eg. MRImageStorage, CTImageStorage, PETImage↩ Storage)

Examples

Compute3DSpacing.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.165.2 Constructor & Destructor Documentation

10.165.2.1 IPPSorter()

```
gdcm::IPPSorter::IPPSorter ( )
```

10.165.3 Member Function Documentation

10.165.3.1 GetDirectionCosinesTolerance()

```
double gdcm::IPPSorter::GetDirectionCosinesTolerance ( ) const  [inline]
```

10.165.3.2 GetZSpacing()

```
double gdcm::IPPSorter::GetZSpacing ( ) const  [inline]
```

Read-only function to provide access to the computed value for the Z-Spacing The ComputeZSpacing must have been set to true before execution of sort algorithm. Call this function *after* calling Sort(); Z-Spacing will be 0 on 2 occasions:

- Sorting simply failed, potentially duplicate IPP => ZSpacing = 0
- ZSpacing could not be computed (Z-Spacing is not constant, or ZTolerance is too low)

Examples

Compute3DSpacing.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.165.3.3 GetZSpacingTolerance()

```
double gdcm::IPPSorter::GetZSpacingTolerance ( ) const  [inline]
```

10.165.3.4 SetComputeZSpacing()

```
void gdcm::IPPSorter::SetComputeZSpacing (
            bool b )  [inline]
```

Functions related to Z-Spacing computation Set to true when sort algorithm should also perform a regular Z-Spacing computation using the Image Position (Patient) Potential reason for failure:

1. ALL slices are taken into account, if one slice if missing then ZSpacing will be set to 0 since the spacing will not be found to be regular along the Series

Examples

Compute3DSpacing.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.165.3.5 SetDirectionCosinesTolerance()

```
void gdcm::IPPSorter::SetDirectionCosinesTolerance (
            double tol )  [inline]
```

Sometimes IOP along a series is slightly changing for example: "0.999081\\0.0426953\\0.00369272\\-0.0419025\\0.↩
955059\\0.293439", "0.999081\\0.0426953\\0.00369275\\-0.0419025\\0.955059\\0.293439", "0.999081\\0.0426952\\0.↩
00369272\\-0.0419025\\0.955059\\0.293439", We need an API to define the tolerance which is allowed. Internally the cross vector of each direction cosines is computed. The tolerance then define the distance in between 1.0 to the dot product of those cross vectors. In a perfect world this dot product is of course 1.0 which imply a DirectionCosines tolerance of exactly 0.0 (default).

10.165.3.6 SetDropDuplicatePositions()

```
void gdcm::IPPSorter::SetDropDuplicatePositions (
            bool b )  [inline]
```

Makes the IPPSorter ignore multiple images located at the same position. Only the first occurrence will be kept. DropDuplicatePositions defaults to false.

10.165.3.7 SetZSpacingTolerance()

```
void gdcm::IPPSorter::SetZSpacingTolerance (
            double tol )  [inline]
```

1. Another reason for failure is that that Z-Spacing is only slightly changing (eg 1e-3) along the series, a human can determine that this is ok and change the tolerance from its default value: 1e-6

Examples

Compute3DSpacing.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.165.3.8 Sort()

```
bool gdcm::IPPSorter::Sort (
            std::vector< std::string > const & filenames )  [override], [virtual]
```

Main entry point to the sorter. It will execute the filter, option should be set before running this function (SetZSpacingTolerance, ...) Return value indicate if sorting could be achieved,. Warning this does *NOT* imply that spacing is consistent, it only means the file are sorted according to IPP You should check if ZSpacing is 0 or not to deduce if file are actually a 3D volume

Reimplemented from gdcm::Sorter.

Examples

Compute3DSpacing.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.165.4 Member Data Documentation

10.165.4.1 ComputeZSpacing

```
bool gdcm::IPPSorter::ComputeZSpacing  [protected]
```

10.165.4.2 DirCosTolerance

```
double gdcm::IPPSorter::DirCosTolerance  [protected]
```

10.165.4.3 DropDuplicatePositions

```
bool gdcm::IPPSorter::DropDuplicatePositions  [protected]
```

10.165.4.4 ZSpacing

```
double gdcm::IPPSorter::ZSpacing  [protected]
```

10.165.4.5 ZTolerance

```
double gdcm::IPPSorter::ZTolerance  [protected]
```

The documentation for this class was generated from the following file:

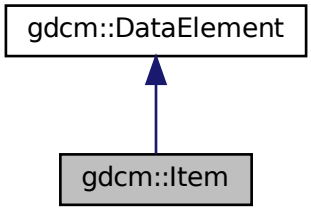
- gdcmIPPSorter.h

10.166 gdcm::Item Class Reference

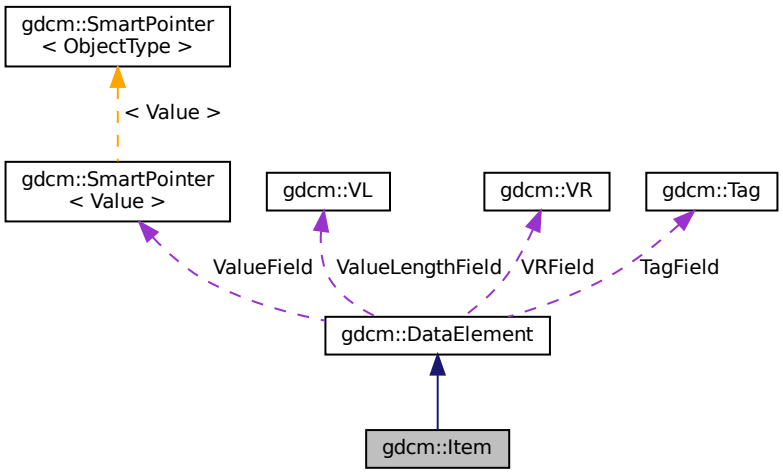
Class to represent an Item.

```
#include <gdcmItem.h>
```

Inheritance diagram for gdcm::Item:



Collaboration diagram for gdcm::Item:



Public Member Functions

- Item ()
- Item (Item const &val)
- void Clear ()
- bool FindDataElement (const Tag &t) const
- const DataElement & GetDataElement (const Tag &t) const
- template<typename TDE >
  VL GetLength () const
- DataSet & GetNestedDataSet ()
- const DataSet & GetNestedDataSet () const
- void InsertDataElement (const DataElement &de)
- template<typename TDE , typename TSwap >
  std::istream & Read (std::istream &is)
- void SetNestedDataSet (const DataSet &nested)
- template<typename TDE , typename TSwap >
  const std::ostream & Write (std::ostream &os) const

Friends

- std::ostream & operator<< (std::ostream &os, const Item &val)

Additional Inherited Members

10.166.1 Detailed Description

Class to represent an Item.

A component of the value of a Data Element that is of Value Representation Sequence of Items. An Item contains a Data Set . See PS 3.5 7.5.1 Item Encoding Rules Each Item of a Data Element of VR SQ shall be encoded as a DICOM Standard Data Element with a specific Data Element Tag of Value (FFFE,E000). The Item Tag is followed by a 4 byte Item Length field encoded in one of the following two ways Explicit/ Implicit

Note

ITEM: A component of the Value of a Data Element that is of Value Representation Sequence of Items. An Item contains a Data Set.

Examples

ChangeSequenceUltrasound.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cx GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSequenceUltrasound.cxx, LargeVRDSExplicit.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.166.2 Constructor & Destructor Documentation

10.166.2.1 Item() [1/2]

```
gdcm::Item::Item ( )  [inline]
```

10.166.2.2 Item() [2/2]

```
gdcm::Item::Item (
            Item const & val )  [inline]
```

10.166.3 Member Function Documentation

10.166.3.1 Clear()

```
void gdcm::Item::Clear ( )  [inline]
```

Referenced by gdcm::SequenceOfItems::Read().

10.166.3.2 FindDataElement()

```
bool gdcm::Item::FindDataElement (
            const Tag & t ) const  [inline]
```

10.166.3.3 GetDataElement()

```
const DataElement& gdcm::Item::GetDataElement (
            const Tag & t ) const  [inline]
```

10.166.3.4 GetLength()

```
template<typename TDE >
VL gdcm::Item::GetLength ( ) const
```

10.166.3.5 GetNestedDataSet() [1/2]

```
DataSet& gdcm::Item::GetNestedDataSet ( )  [inline]
```

10.166.3.6 GetNestedDataSet() [2/2]

```
const DataSet& gdcm::Item::GetNestedDataSet ( ) const  [inline]
```

Examples

ChangeSequenceUltrasound.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cx GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenSeqs.cxx, GetSequenceUltrasound.cxx, LargeVRDSExplicit.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

Referenced by gdcm::SequenceOfItems::Read().

10.166.3.7 InsertDataElement()

```
void gdcm::Item::InsertDataElement (
            const DataElement & de )  [inline]
```

10.166.3.8 Read()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::Item::Read (
            std::istream & is )  [inline]
```

References gdcm::ByteSwapFilter::ByteSwap(), gdcm::DataSet::Clear(), gdcmDebugMacro, gdcmErrorMacro, gdcm↩WarningMacro, gdcm::DataSet::IsEmpty(), and gdcm::ByteSwapFilter::SetByteSwapTag().

Referenced by gdcm::SequenceOfItems::Read().

10.166.3.9 SetNestedDataSet()

```
void gdcm::Item::SetNestedDataSet (
            const DataSet & nested )  [inline]
```

10.166.3.10 Write()

```
template<typename TDE , typename TSwap >
const std::ostream& gdcm::Item::Write (
            std::ostream & os ) const  [inline]
```

References gdcmWarningMacro, gdcm::VL::GetLength(), gdcm::Tag::Write(), and gdcm::VL::Write().

10.166.4 Friends And Related Function Documentation

10.166.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const Item & val )  [friend]
```

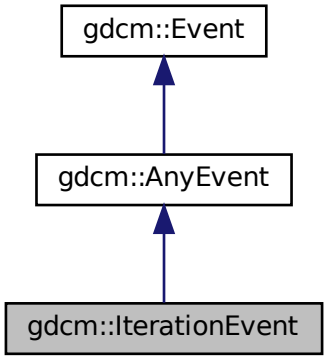
The documentation for this class was generated from the following file:

- gdcmItem.h

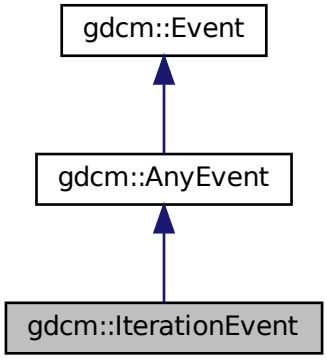
10.167 gdcm::IterationEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::IterationEvent:



Collaboration diagram for gdcm::IterationEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

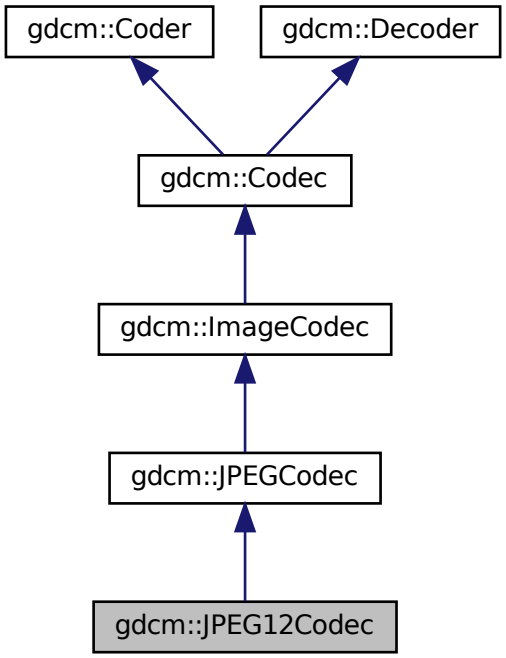
- gdcmEvent.h

10.168 gdcm::JPEG12Codec Class Reference

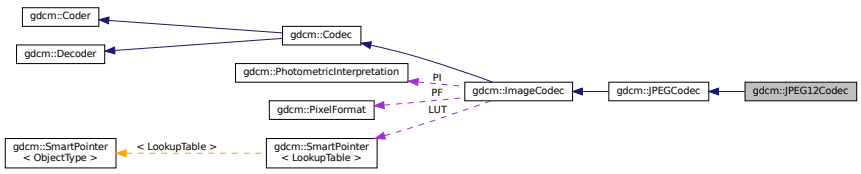
Class to do JPEG 12bits (lossy & lossless)

`#include <gdcmJPEG12Codec.h>`

Inheritance diagram for gdcm::JPEG12Codec:



Collaboration diagram for gdcm::JPEG12Codec:



Public Member Functions

- JPEG12Codec ()

- ~JPEG12Codec () override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool InternalCode (const char *input, unsigned long len, std::ostream &os) override

Protected Member Functions

- bool EncodeBuffer (std::ostream &os, const char *data, size_t datalen) override
- bool IsStateSuspension () const override

Additional Inherited Members

10.168.1 Detailed Description

Class to do JPEG 12bits (lossy & lossless)

Note

internal class

10.168.2 Constructor & Destructor Documentation

10.168.2.1 JPEG12Codec()

```
gdcm::JPEG12Codec::JPEG12Codec ( )
```

10.168.2.2 ~JPEG12Codec()

```
gdcm::JPEG12Codec::~JPEG12Codec ( )  [override]
```

10.168.3 Member Function Documentation

10.168.3.1 DecodeByStreams()

```
bool gdcm::JPEG12Codec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.168.3.2 EncodeBuffer()

```
bool gdcm::JPEG12Codec::EncodeBuffer (
            std::ostream & os,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

10.168.3.3 GetHeaderInfo()

```
bool gdcm::JPEG12Codec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.168.3.4 InternalCode()

```
bool gdcm::JPEG12Codec::InternalCode (
            const char * input,
            unsigned long len,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::Coder.

10.168.3.5 IsStateSuspension()

```
bool gdcm::JPEG12Codec::IsStateSuspension ( ) const  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

The documentation for this class was generated from the following file:

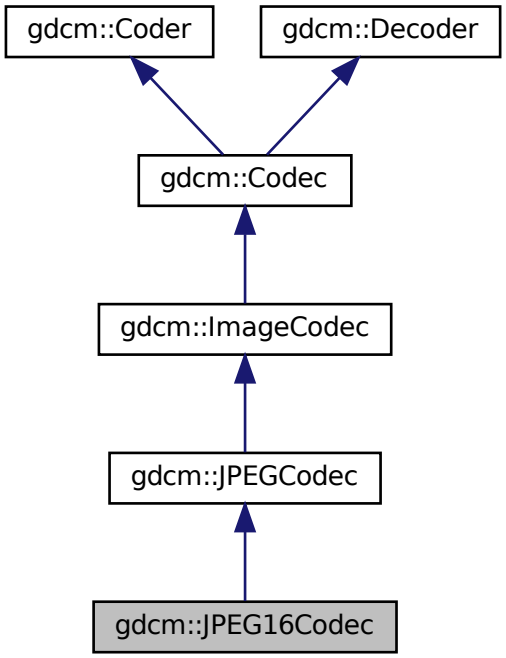
- gdcmJPEG12Codec.h

10.169 gdcm::JPEG16Codec Class Reference

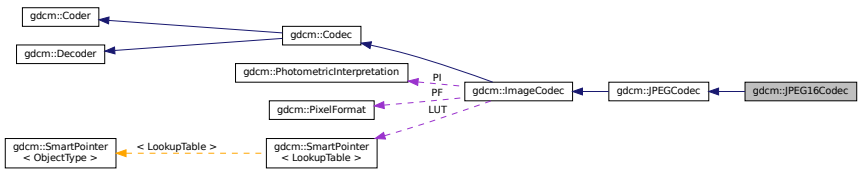
Class to do JPEG 16bits (lossless)

`#include <gdcmJPEG16Codec.h>`

Inheritance diagram for gdcm::JPEG16Codec:



Collaboration diagram for gdcm::JPEG16Codec:



Public Member Functions

- JPEG16Codec ()

- ~JPEG16Codec () override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool InternalCode (const char *input, unsigned long len, std::ostream &os) override

Protected Member Functions

- bool EncodeBuffer (std::ostream &os, const char *data, size_t datalen) override
- bool IsStateSuspension () const override

Additional Inherited Members

10.169.1 Detailed Description

Class to do JPEG 16bits (lossless)

Note

internal class

10.169.2 Constructor & Destructor Documentation

10.169.2.1 JPEG16Codec()

```
gdcm::JPEG16Codec::JPEG16Codec ( )
```

10.169.2.2 ~JPEG16Codec()

```
gdcm::JPEG16Codec::~JPEG16Codec ( )  [override]
```

10.169.3 Member Function Documentation

10.169.3.1 DecodeByStreams()

```
bool gdcm::JPEG16Codec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.169.3.2 EncodeBuffer()

```
bool gdcm::JPEG16Codec::EncodeBuffer (
            std::ostream & os,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

10.169.3.3 GetHeaderInfo()

```
bool gdcm::JPEG16Codec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.169.3.4 InternalCode()

```
bool gdcm::JPEG16Codec::InternalCode (
            const char * input,
            unsigned long len,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::Coder.

10.169.3.5 IsStateSuspension()

```
bool gdcm::JPEG16Codec::IsStateSuspension ( ) const  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

The documentation for this class was generated from the following file:

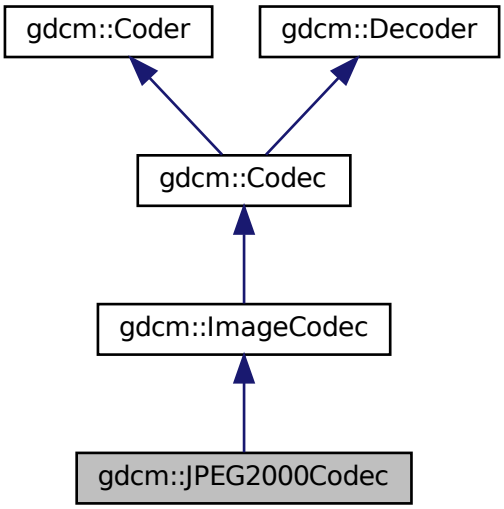
- gdcmJPEG16Codec.h

10.170 gdcm::JPEG2000Codec Class Reference

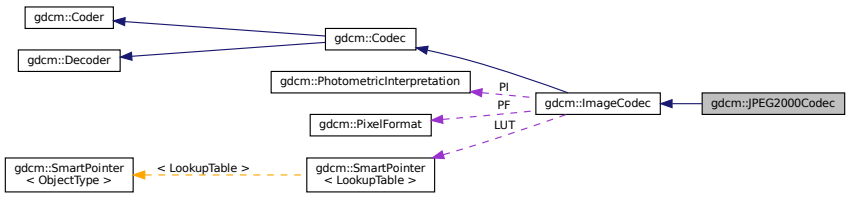
Class to do JPEG 2000.

`#include <gdcmJPEG2000Codec.h>`

Inheritance diagram for gdcm::JPEG2000Codec:



Collaboration diagram for gdcm::JPEG2000Codec:



Public Member Functions

- JPEG2000Codec ()
- ~JPEG2000Codec () override
- bool CanCode (TransferSyntax const &ts) const override

  Return whether this coder support this transfer syntax (can code it)

- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- double GetQuality (unsigned int idx=0) const
- double GetRate (unsigned int idx=0) const
- void SetMCT (unsigned int mct)
- void SetNumberOfResolutions (unsigned int nres)
- void SetNumberOfThreadsForDecompression (int nThreads)
- void SetQuality (unsigned int idx, double q)
- void SetRate (unsigned int idx, double rate)
- void SetReversible (bool res)
- void SetTileSize (unsigned int tx, unsigned int ty)

Protected Member Functions

- bool AppendFrameEncode (std::ostream &out, const char *data, size_t datalen) override
- bool AppendRowEncode (std::ostream &out, const char *data, size_t datalen) override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool DecodeExtent (char *buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool IsFrameEncoder () override
- bool IsRowEncoder () override
- bool StartEncode (std::ostream &) override
- bool StopEncode (std::ostream &) override

Friends

- class Bitmap
- class ImageRegionReader

Additional Inherited Members

10.170.1 Detailed Description

Class to do JPEG 2000.

Note

the class will produce JPC (JPEG 2000 codestream), since some private implementor are using full jp2 file the decoder tolerate jp2 input this is an implementation of an ImageCodec

10.170.2 Constructor & Destructor Documentation

10.170.2.1 JPEG2000Codec()

```
gdcm::JPEG2000Codec::JPEG2000Codec ( )
```

10.170.2.2 ~JPEG2000Codec()

```
gdcm::JPEG2000Codec::~JPEG2000Codec ( )  [override]
```

10.170.3 Member Function Documentation

10.170.3.1 AppendFrameEncode()

```
bool gdcm::JPEG2000Codec::AppendFrameEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.2 AppendRowEncode()

```
bool gdcm::JPEG2000Codec::AppendRowEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.3 CanCode()

```
bool gdcm::JPEG2000Codec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.170.3.4 CanDecode()

```
bool gdcm::JPEG2000Codec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.170.3.5 Clone()

```
ImageCodec* gdcm::JPEG2000Codec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.170.3.6 Code()

```
bool gdcm::JPEG2000Codec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.170.3.7 Decode()

```
bool gdcm::JPEG2000Codec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.170.3.8 DecodeByStreams()

```
bool gdcm::JPEG2000Codec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.9 DecodeExtent()

```
bool gdcm::JPEG2000Codec::DecodeExtent (
            char * buffer,
            unsigned int xmin,
            unsigned int xmax,
            unsigned int ymin,
            unsigned int ymax,
            unsigned int zmin,
            unsigned int zmax,
            std::istream & is )  [protected]
```

10.170.3.10 GetHeaderInfo()

```
bool gdcm::JPEG2000Codec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.11 GetQuality()

```
double gdcm::JPEG2000Codec::GetQuality (
            unsigned int idx = 0 ) const
```

10.170.3.12 GetRate()

```
double gdcm::JPEG2000Codec::GetRate (
            unsigned int idx = 0 ) const
```

10.170.3.13 IsFrameEncoder()

```
bool gdcm::JPEG2000Codec::IsFrameEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.14 IsRowEncoder()

```
bool gdcm::JPEG2000Codec::IsRowEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.15 SetMCT()

```
void gdcm::JPEG2000Codec::SetMCT (
            unsigned int mct )
```

10.170.3.16 SetNumberOfResolutions()

```
void gdcm::JPEG2000Codec::SetNumberOfResolutions (
            unsigned int nres )
```

10.170.3.17 SetNumberOfThreadsForDecompression()

```
void gdcm::JPEG2000Codec::SetNumberOfThreadsForDecompression (
            int nThreads )
```

Set Number of threads

Parameters

nThreads	: number of threads for decompression codec, if 0 or 1 decompression is done in current thread, if negative value is set determine how many virtual threads are available

10.170.3.18 SetQuality()

```
void gdcm::JPEG2000Codec::SetQuality (
            unsigned int idx,
            double q )
```

10.170.3.19 SetRate()

```
void gdcm::JPEG2000Codec::SetRate (
            unsigned int idx,
            double rate )
```

10.170.3.20 SetReversible()

```
void gdcm::JPEG2000Codec::SetReversible (
            bool res )
```

10.170.3.21 SetTileSize()

```
void gdcm::JPEG2000Codec::SetTileSize (
            unsigned int tx,
            unsigned int ty )
```

10.170.3.22 StartEncode()

```
bool gdcm::JPEG2000Codec::StartEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.3.23 StopEncode()

```
bool gdcm::JPEG2000Codec::StopEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.170.4 Friends And Related Function Documentation

10.170.4.1 Bitmap

```
friend class Bitmap  [friend]
```

10.170.4.2 ImageRegionReader

```
friend class ImageRegionReader  [friend]
```

The documentation for this class was generated from the following file:

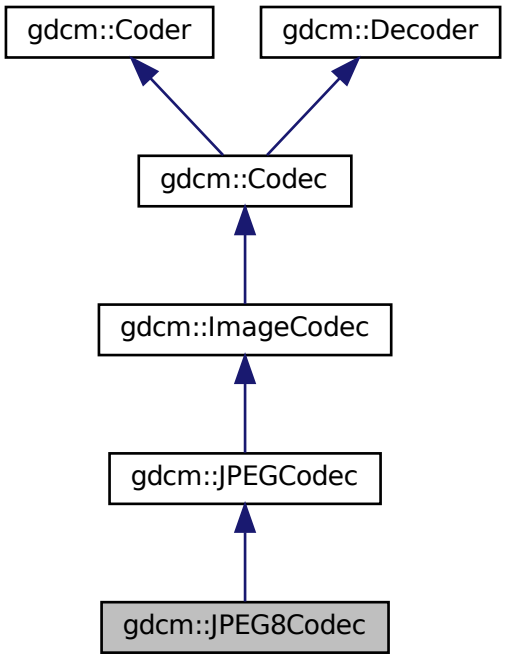
- gdcmJPEG2000Codec.h

10.171 gdcm::JPEG8Codec Class Reference

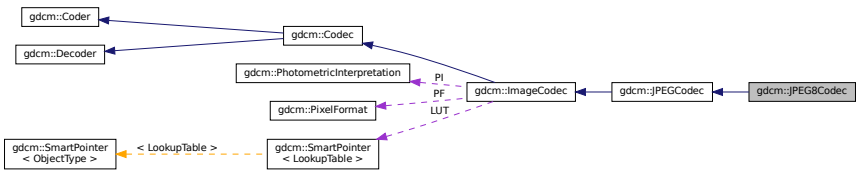
Class to do JPEG 8bits (lossy & lossless)

```
#include <gdcmJPEG8Codec.h>
```

Inheritance diagram for gdcm::JPEG8Codec:



Collaboration diagram for gdcm::JPEG8Codec:



Public Member Functions

- JPEG8Codec ()
- ~JPEG8Codec () override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool InternalCode (const char *input, unsigned long len, std::ostream &os) override

Protected Member Functions

- bool EncodeBuffer (std::ostream &os, const char *data, size_t datalen) override
- bool IsStateSuspension () const override

Additional Inherited Members

10.171.1 Detailed Description

Class to do JPEG 8bits (lossy & lossless)

Note

internal class

10.171.2 Constructor & Destructor Documentation

10.171.2.1 JPEG8Codec()

```
gdcm::JPEG8Codec::JPEG8Codec ( )
```

10.171.2.2 ~JPEG8Codec()

```
gdcm::JPEG8Codec::~JPEG8Codec ( )  [override]
```

10.171.3 Member Function Documentation

10.171.3.1 DecodeByStreams()

```
bool gdcm::JPEG8Codec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.171.3.2 EncodeBuffer()

```
bool gdcm::JPEG8Codec::EncodeBuffer (
            std::ostream & os,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

10.171.3.3 GetHeaderInfo()

```
bool gdcm::JPEG8Codec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.171.3.4 InternalCode()

```
bool gdcm::JPEG8Codec::InternalCode (
            const char * input,
            unsigned long len,
            std::ostream & os )  [override], [virtual]
```

Reimplemented from gdcm::Coder.

10.171.3.5 IsStateSuspension()

```
bool gdcm::JPEG8Codec::IsStateSuspension ( ) const  [override], [protected], [virtual]
```

Reimplemented from gdcm::JPEGCodec.

The documentation for this class was generated from the following file:

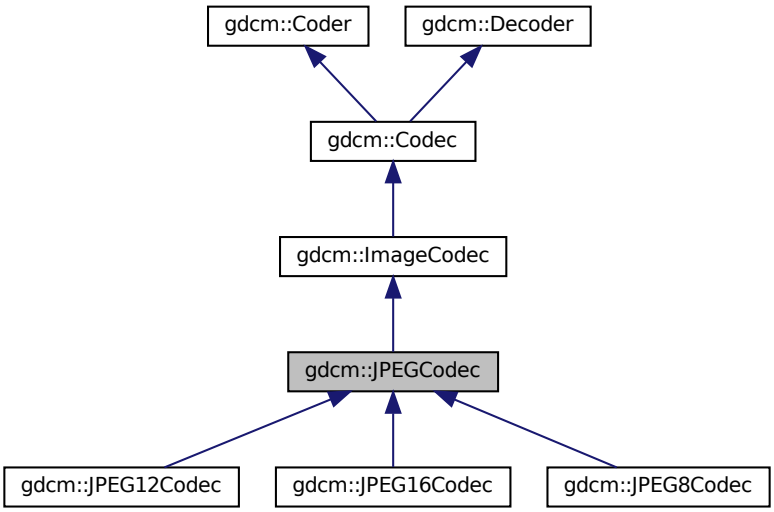
- gdcmJPEG8Codec.h

10.172 gdcm::JPEGCodec Class Reference

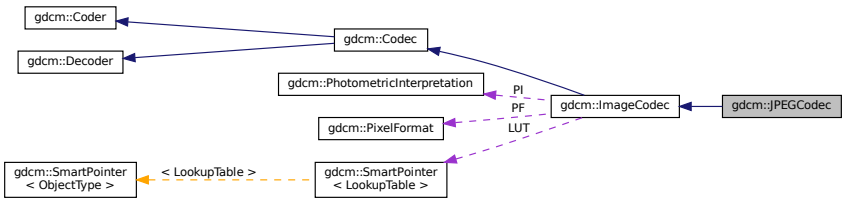
JPEG codec.

`#include <gdcmJPEGCodec.h>`

Inheritance diagram for gdcm::JPEGCodec:



Collaboration diagram for gdcm::JPEGCodec:



Public Member Functions

- JPEGCodec ()
- ~JPEGCodec () override
- bool CanCode (TransferSyntax const &ts) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &ts) const override

Return whether this decoder support this transfer syntax (can decode it)

- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Compress into JPEG.
- void ComputeOffsetTable (bool b)

  Compute the offset table:
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- virtual bool EncodeBuffer (std::ostream &out, const char *inbuffer, size_t inlen)
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool GetLossless () const
- double GetQuality () const
- void SetLossless (bool l)
- void SetPixelFormat (PixelFormat const &pf) override
- void SetQuality (double q)

Protected Member Functions

- bool AppendFrameEncode (std::ostream &out, const char *data, size_t datalen) override
- bool AppendRowEncode (std::ostream &out, const char *data, size_t datalen) override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool DecodeExtent (char *buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool IsFrameEncoder () override
- bool IsRowEncoder () override
- virtual bool IsStateSuspension () const
- bool IsValid (PhotometricInterpretation const &pi) override
- void SetBitSample (int bit)
- bool StartEncode (std::ostream &) override
- bool StopEncode (std::ostream &) override

Protected Attributes

- int BitSample
- int Quality

Friends

- class ImageRegionReader

Additional Inherited Members

10.172.1 Detailed Description

JPEG codec.

Class to do JPEG (8bits, 12bits, 16bits lossy & lossless). It redispatch in between the different codec implementation: JPEG8Codec, JPEG12Codec & JPEG16Codec It also support inconsistency in between DICOM header and JPEG compressed stream ImageCodec implementation for the JPEG case

Note

Things you should know if you ever want to dive into DICOM/JPEG world (among other):

- http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/625e46919f208
- http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/75fdfccc65a62
- http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/2d525ef6a2f09
- http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/6b93af410f8c9

Examples

GetJPEGSamplePrecision.cxx.

10.172.2 Constructor & Destructor Documentation

10.172.2.1 JPEGCodec()

```
gdcm::JPEGCodec::JPEGCodec ( )
```

10.172.2.2 ~JPEGCodec()

```
gdcm::JPEGCodec::~JPEGCodec ( )  [override]
```

10.172.3 Member Function Documentation

10.172.3.1 AppendFrameEncode()

```
bool gdcm::JPEGCodec::AppendFrameEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.2 AppendRowEncode()

```
bool gdcm::JPEGCodec::AppendRowEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.3 CanCode()

```
bool gdcm::JPEGCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.172.3.4 CanDecode()

```
bool gdcm::JPEGCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.172.3.5 Clone()

```
ImageCodec* gdcm::JPEGCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.172.3.6 Code()

```
bool gdcm::JPEGCodec::Code (
            DataElement const & in,
            DataElement & out )  [override], [virtual]
```

Compress into JPEG.

Reimplemented from gdcm::Coder.

10.172.3.7 ComputeOffsetTable()

```
void gdcm::JPEGCodec::ComputeOffsetTable (
            bool b )
```

Compute the offset table:

10.172.3.8 Decode()

```
bool gdcm::JPEGCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.172.3.9 DecodeByStreams()

```
bool gdcm::JPEGCodec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.10 DecodeExtent()

```
bool gdcm::JPEGCodec::DecodeExtent (
            char * buffer,
            unsigned int xmin,
            unsigned int xmax,
            unsigned int ymin,
            unsigned int ymax,
            unsigned int zmin,
            unsigned int zmax,
            std::istream & is )  [protected]
```

10.172.3.11 EncodeBuffer()

```
virtual bool gdcm::JPEGCodec::EncodeBuffer (
            std::ostream & out,
            const char * inbuffer,
            size_t inlen )  [virtual]
```

Reimplemented in gdcm::JPEG8Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

10.172.3.12 GetHeaderInfo()

```
bool gdcm::JPEGCodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

Examples

GetJPEGSamplePrecision.cxx.

10.172.3.13 GetLossless()

```
bool gdcm::JPEGCodec::GetLossless ( ) const
```

10.172.3.14 GetQuality()

```
double gdcm::JPEGCodec::GetQuality ( ) const
```

10.172.3.15 IsFrameEncoder()

```
bool gdcm::JPEGCodec::IsFrameEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.16 IsRowEncoder()

```
bool gdcm::JPEGCodec::IsRowEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.17 IsStateSuspension()

```
virtual bool gdcm::JPEGCodec::IsStateSuspension ( ) const  [protected], [virtual]
```

Reimplemented in gdcm::JPEG8Codec, gdcm::JPEG16Codec, and gdcm::JPEG12Codec.

10.172.3.18 IsValid()

```
bool gdcm::JPEGCodec::IsValid (
            PhotometricInterpretation const & pi )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.19 SetBitSample()

```
void gdcm::JPEGCodec::SetBitSample (
            int bit )  [protected]
```

10.172.3.20 SetLossless()

```
void gdcm::JPEGCodec::SetLossless (
            bool l )
```

10.172.3.21 SetPixelFormat()

```
void gdcm::JPEGCodec::SetPixelFormat (
            PixelFormat const & pf )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

Examples

GetJPEGSamplePrecision.cxx.

10.172.3.22 SetQuality()

```
void gdcm::JPEGCodec::SetQuality (
            double q )
```

10.172.3.23 StartEncode()

```
bool gdcm::JPEGCodec::StartEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.3.24 StopEncode()

```
bool gdcm::JPEGCodec::StopEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.172.4 Friends And Related Function Documentation

10.172.4.1 ImageRegionReader

```
friend class ImageRegionReader  [friend]
```

10.172.5 Member Data Documentation

10.172.5.1 BitSample

```
int gdcm::JPEGCodec::BitSample  [protected]
```

10.172.5.2 Quality

```
int gdcm::JPEGCodec::Quality  [protected]
```

The documentation for this class was generated from the following file:

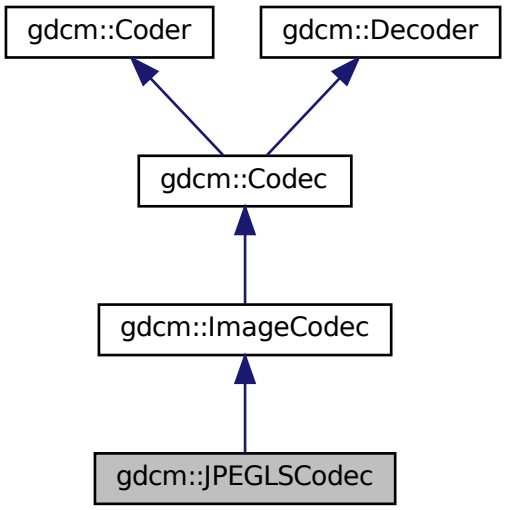
- gdcmJPEGCodec.h

10.173 gdcm::JPEGLSCodec Class Reference

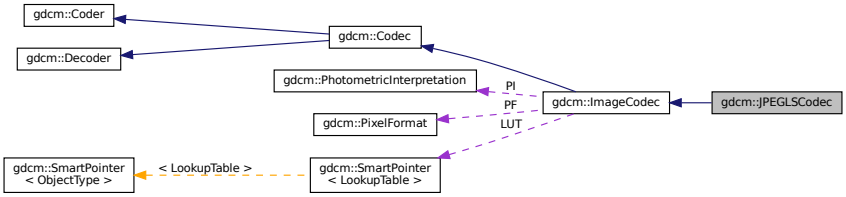
JPEG-LS.

```
#include <gdcmJPEGLSCodec.h>
```

Inheritance diagram for gdcm::JPEGLSCodec:



Collaboration diagram for gdcm::JPEGLSCodec:



Public Member Functions

- JPEGLSCodec ()
- ~JPEGLSCodec () override
- bool CanCode (TransferSyntax const &ts) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.

- bool Decode (DataElement const &in, char *outBuffer, size_t inBufferLength, uint32_t inXMin, uint32_t inXMax, uint32_t inYMin, uint32_t inYMax, uint32_t inZMin, uint32_t inZMax)
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- unsigned long GetBufferLength () const
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool GetLossless () const
- void SetBufferLength (unsigned long l)
- void SetLossless (bool l)
- void SetLossyError (int error)

  [0-3] generally

Protected Member Functions

- bool AppendFrameEncode (std::ostream &out, const char *data, size_t datalen) override
- bool AppendRowEncode (std::ostream &out, const char *data, size_t datalen) override
- bool DecodeExtent (char *buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool IsFrameEncoder () override
- bool IsRowEncoder () override
- bool StartEncode (std::ostream &) override
- bool StopEncode (std::ostream &) override

Friends

- class ImageRegionReader

Additional Inherited Members

10.173.1 Detailed Description

JPEG-LS.

Note

codec that implement the JPEG-LS compression this is an implementation of ImageCodec for JPEG-LS

It uses the CharLS JPEG-LS implementation `https://github.com/team-charls/charls`

10.173.2 Constructor & Destructor Documentation

10.173.2.1 JPEGLSCodec()

```
gdcm::JPEGLSCodec::JPEGLSCodec ( )
```

10.173.2.2 ~JPEGLSCodec()

```
gdcm::JPEGLSCodec::~JPEGLSCodec ( )  [override]
```

10.173.3 Member Function Documentation

10.173.3.1 AppendFrameEncode()

```
bool gdcm::JPEGLSCodec::AppendFrameEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.2 AppendRowEncode()

```
bool gdcm::JPEGLSCodec::AppendRowEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.3 CanCode()

```
bool gdcm::JPEGLSCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.173.3.4 CanDecode()

```
bool gdcm::JPEGLSCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.173.3.5 Clone()

```
ImageCodec* gdcm::JPEGLSCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.173.3.6 Code()

```
bool gdcm::JPEGLSCodec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.173.3.7 Decode() [1/2]

```
bool gdcm::JPEGLSCodec::Decode (
            DataElement const & in,
            char * outBuffer,
            size_t inBufferLength,
            uint32_t inXMin,
            uint32_t inXMax,
            uint32_t inYMin,
            uint32_t inYMax,
            uint32_t inZMin,
            uint32_t inZMax )
```

10.173.3.8 Decode() [2/2]

```
bool gdcm::JPEGLSCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.173.3.9 DecodeExtent()

```
bool gdcm::JPEGLSCodec::DecodeExtent (
            char * buffer,
            unsigned int xmin,
            unsigned int xmax,
            unsigned int ymin,
            unsigned int ymax,
            unsigned int zmin,
            unsigned int zmax,
            std::istream & is )  [protected]
```

10.173.3.10 GetBufferLength()

```
unsigned long gdcm::JPEGLSCodec::GetBufferLength ( ) const  [inline]
```

10.173.3.11 GetHeaderInfo()

```
bool gdcm::JPEGLSCodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.12 GetLossless()

```
bool gdcm::JPEGLSCodec::GetLossless ( ) const
```

10.173.3.13 IsFrameEncoder()

```
bool gdcm::JPEGLSCodec::IsFrameEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.14 IsRowEncoder()

```
bool gdcm::JPEGLSCodec::IsRowEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.15 SetBufferLength()

```
void gdcm::JPEGLSCodec::SetBufferLength (
            unsigned long l )  [inline]
```

10.173.3.16 SetLossless()

```
void gdcm::JPEGLSCodec::SetLossless (
            bool l )
```

10.173.3.17 SetLossyError()

```
void gdcm::JPEGLSCodec::SetLossyError (
            int error )
```

[0-3] generally

10.173.3.18 StartEncode()

```
bool gdcm::JPEGLSCodec::StartEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.3.19 StopEncode()

```
bool gdcm::JPEGLSCodec::StopEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.173.4 Friends And Related Function Documentation

10.173.4.1 ImageRegionReader

```
friend class ImageRegionReader  [friend]
```

The documentation for this class was generated from the following file:

- gdcmJPEGLSCodec.h

10.174 gdcm::JSON Class Reference

```
#include <gdcmJSON.h>
```

Public Member Functions

- JSON ()
- ~JSON ()
- bool Code (DataSet const &in, std::ostream &os)
- bool Decode (std::istream &is, DataSet &out)
- bool GetPrettyPrint () const
- void PrettyPrintOff ()
- void PrettyPrintOn ()
- void SetPrettyPrint (bool onoff)

10.174.1 Detailed Description

Examples

QIDO-RS.cxx.

10.174.2 Constructor & Destructor Documentation

10.174.2.1 JSON()

```
gdcm::JSON::JSON ( )
```

10.174.2.2 ~JSON()

```
gdcm::JSON::~JSON ( )
```

10.174.3 Member Function Documentation

10.174.3.1 Code()

```
bool gdcm::JSON::Code (
            DataSet const & in,
            std::ostream & os )
```

Examples

QIDO-RS.cxx.

10.174.3.2 Decode()

```
bool gdcm::JSON::Decode (
            std::istream & is,
            DataSet & out )
```

Examples

QIDO-RS.cxx.

10.174.3.3 GetPrettyPrint()

```
bool gdcm::JSON::GetPrettyPrint ( ) const
```

10.174.3.4 PrettyPrintOff()

```
void gdcm::JSON::PrettyPrintOff ( )
```

10.174.3.5 PrettyPrintOn()

```
void gdcm::JSON::PrettyPrintOn ( )
```

Examples

QIDO-RS.cxx.

10.174.3.6 SetPrettyPrint()

```
void gdcm::JSON::SetPrettyPrint (
            bool onoff )
```

The documentation for this class was generated from the following file:

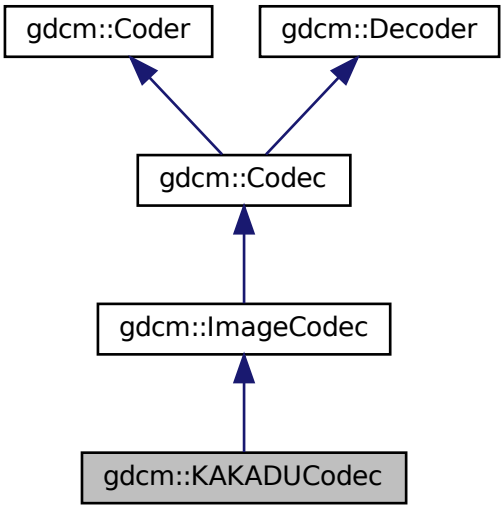
- gdcmJSON.h

10.175 gdcm::KAKADUCodec Class Reference

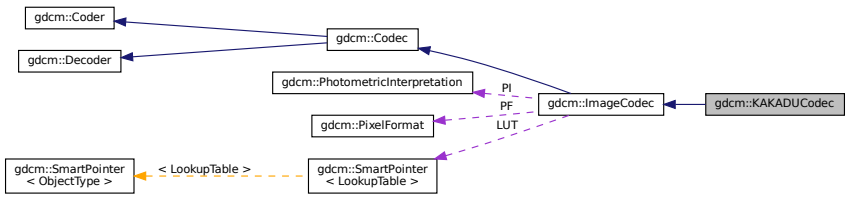
KAKADUCodec.

```
#include <gdcmKAKADUCodec.h>
```

Inheritance diagram for gdcm::KAKADUCodec:



Collaboration diagram for gdcm::KAKADUCodec:



Public Member Functions

- KAKADUCodec ()
- ~KAKADUCodec () override
- bool CanCode (TransferSyntax const &ts) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.

Additional Inherited Members

10.175.1 Detailed Description

KAKADUCodec.

10.175.2 Constructor & Destructor Documentation

10.175.2.1 KAKADUCodec()

```
gdcm::KAKADUCodec::KAKADUCodec ( )
```

10.175.2.2 ~KAKADUCodec()

```
gdcm::KAKADUCodec::~KAKADUCodec ( )  [override]
```

10.175.3 Member Function Documentation

10.175.3.1 CanCode()

```
bool gdcm::KAKADUCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.175.3.2 CanDecode()

```
bool gdcm::KAKADUCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.175.3.3 Clone()

```
ImageCodec* gdcm::KAKADUCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.175.3.4 Code()

```
bool gdcm::KAKADUCodec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.175.3.5 Decode()

```
bool gdcm::KAKADUCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

The documentation for this class was generated from the following file:

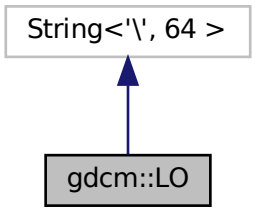
- gdcmKAKADUCodec.h

10.176 gdcm::LO Class Reference

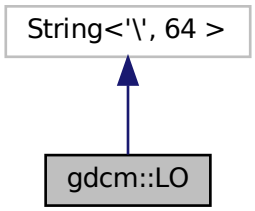
LO.

`#include <gdcmLO.h>`

Inheritance diagram for gdcm::LO:



Collaboration diagram for gdcm::LO:



Public Types

- typedef Superclass::const_iterator const_iterator
- typedef Superclass::const_reference const_reference
- typedef Superclass::const_reverse_iterator const_reverse_iterator
- typedef Superclass::difference_type difference_type
- typedef Superclass::iterator iterator
- typedef Superclass::pointer pointer
- typedef Superclass::reference reference
- typedef Superclass::reverse_iterator reverse_iterator
- typedef Superclass::size_type size_type
- typedef String<'\\', 64 > Superclass
- typedef Superclass::value_type value_type

Public Member Functions

- LO ()
- LO (const Superclass &s, size_type pos=0, size_type n=npos)
- LO (const value_type *s)
- LO (const value_type *s, size_type n)
- bool IsValid () const

10.176.1 Detailed Description

LO.

Note

TODO

10.176.2 Member Typedef Documentation

10.176.2.1 const_iterator

```
typedef Superclass::const_iterator gdcm::LO::const_iterator
```

10.176.2.2 const_reference

```
typedef Superclass::const_reference gdcm::LO::const_reference
```

10.176.2.3 const_reverse_iterator

```
typedef Superclass::const_reverse_iterator gdcm::LO::const_reverse_iterator
```

10.176.2.4 difference_type

```
typedef Superclass::difference_type gdcm::LO::difference_type
```

10.176.2.5 iterator

```
typedef Superclass::iterator gdcm::LO::iterator
```

10.176.2.6 pointer

```
typedef Superclass::pointer gdcm::LO::pointer
```

10.176.2.7 reference

```
typedef Superclass::reference gdcm::LO::reference
```

10.176.2.8 reverse_iterator

```
typedef Superclass::reverse_iterator gdcm::LO::reverse_iterator
```

10.176.2.9 size_type

```
typedef Superclass::size_type gdcm::LO::size_type
```

10.176.2.10 Superclass

```
typedef String<'\\',64> gdcm::LO::Superclass
```

10.176.2.11 value_type

```
typedef Superclass::value_type gdcm::LO::value_type
```

10.176.3 Constructor & Destructor Documentation

10.176.3.1 LO() [1/4]

```
gdcm::LO::LO ( )  [inline]
```

10.176.3.2 LO() [2/4]

```
gdcm::LO::LO (
            const value_type * s )  [inline]
```

10.176.3.3 LO() [3/4]

```
gdcm::LO::LO (
            const value_type * s,
            size_type n )  [inline]
```

10.176.3.4 LO() [4/4]

```
gdcm::LO::LO (
            const Superclass & s,
            size_type pos = 0,
            size_type n = npos )  [inline]
```

10.176.4 Member Function Documentation

10.176.4.1 IsValid()

```
bool gdcm::LO::IsValid ( ) const  [inline]
```

References gdcm::String< TDelimiter, TMaxLength, TPadChar >::IsValid().

The documentation for this class was generated from the following file:

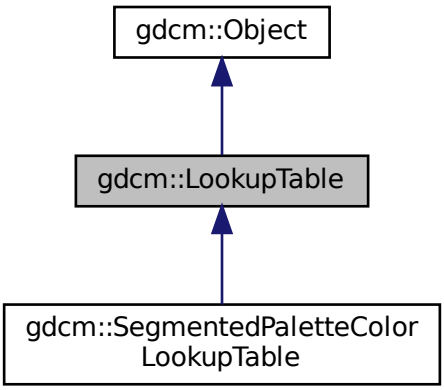
- gdcmLO.h

10.177 gdcm::LookupTable Class Reference

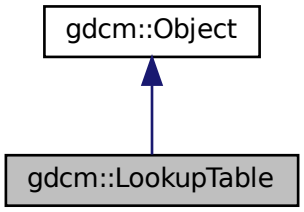
LookupTable class.

`#include <gdcmLookupTable.h>`

Inheritance diagram for gdcm::LookupTable:



Collaboration diagram for gdcm::LookupTable:



Public Types

- enum LookupTableType {
  RED = 0 ,
  GREEN ,
  BLUE ,
  GRAY ,
  UNKNOWN }

Public Member Functions

- LookupTable ()
- LookupTable (LookupTable const &lut)
- ~LookupTable () override
- void Allocate (unsigned short bitsample=8)

  Allocate the LUT.
- void Clear ()

  Clear the LUT.
- bool Decode (char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const
- void Decode (std::istream &is, std::ostream &os) const

  Decode the LUT.
- bool Decode8 (char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const

  Decode into RGB 8 bits space.
- unsigned short GetBitSample () const

  return the bit sample
- bool GetBufferAsRGBA (unsigned char *rgba) const

  return the LUT as RGBA buffer
- void GetLUT (LookupTableType type, unsigned char *array, unsigned int &length) const
- void GetLUTDescriptor (LookupTableType type, unsigned short &length, unsigned short &subscript, unsigned short &bitsize) const
- unsigned int GetLUTLength (LookupTableType type) const
- const unsigned char * GetPointer () const

  return a raw pointer to the LUT
- void InitializeBlueLUT (unsigned short length, unsigned short subscript, unsigned short bitsize)
- bool Initialized () const

  return whether the LUT has been initialized
- void InitializeGreenLUT (unsigned short length, unsigned short subscript, unsigned short bitsize)
- void InitializeLUT (LookupTableType type, unsigned short length, unsigned short subscript, unsigned short bitsize)

  Generic interface:
- void InitializeRedLUT (unsigned short length, unsigned short subscript, unsigned short bitsize)

  RED / GREEN / BLUE specific:
- bool IsRGB8 () const

  Return whether 16 bits LUT is in RGB 8 bits space.
- void Print (std::ostream &) const override
- void SetBlueLUT (const unsigned char *blue, unsigned int length)
- void SetGreenLUT (const unsigned char *green, unsigned int length)
- virtual void SetLUT (LookupTableType type, const unsigned char *array, unsigned int length)
- void SetRedLUT (const unsigned char *red, unsigned int length)
- bool WriteBufferAsRGBA (const unsigned char *rgba)

  Write the LUT as RGBA.

Protected Attributes

- unsigned short BitSample
- bool IncompleteLUT:1
- LookupTableInternal * Internal

Additional Inherited Members

10.177.1 Detailed Description

LookupTable class.

Examples

PrintLUT.cxx.

10.177.2 Member Enumeration Documentation

10.177.2.1 LookupTableType

```
enum gdcm::LookupTable::LookupTableType
```

Enumerator

RED	
GREEN	
BLUE	
GRAY	
UNKNOWN	

10.177.3 Constructor & Destructor Documentation

10.177.3.1 LookupTable() [1/2]

```
gdcm::LookupTable::LookupTable ( )
```

10.177.3.2 ~LookupTable()

```
gdcm::LookupTable::~LookupTable ( )  [override]
```

10.177.3.3 LookupTable() [2/2]

```
gdcm::LookupTable::LookupTable (
            LookupTable const & lut )  [inline]
```

10.177.4 Member Function Documentation

10.177.4.1 Allocate()

```
void gdcm::LookupTable::Allocate (
            unsigned short bitsample = 8 )
```

Allocate the LUT.

10.177.4.2 Clear()

```
void gdcm::LookupTable::Clear ( )
```

Clear the LUT.

10.177.4.3 Decode() [1/2]

```
bool gdcm::LookupTable::Decode (
            char * outputbuffer,
            size_t outlen,
            const char * inputbuffer,
            size_t inlen ) const
```

Decode the LUT outputbuffer will contains the RGB decoded PALETTE COLOR input image of size inlen the outputbuffer should be at least 3 times the size of inlen

10.177.4.4 Decode() [2/2]

```
void gdcm::LookupTable::Decode (
            std::istream & is,
            std::ostream & os ) const
```

Decode the LUT.

10.177.4.5 Decode8()

```
bool gdcm::LookupTable::Decode8 (
            char * outputbuffer,
            size_t outlen,
            const char * inputbuffer,
            size_t inlen ) const
```

Decode into RGB 8 bits space.

10.177.4.6 GetBitSample()

```
unsigned short gdcm::LookupTable::GetBitSample ( ) const  [inline]
```

return the bit sample

10.177.4.7 GetBufferAsRGBA()

```
bool gdcm::LookupTable::GetBufferAsRGBA (
            unsigned char * rgba ) const
```

return the LUT as RGBA buffer

10.177.4.8 GetLUT()

```
void gdcm::LookupTable::GetLUT (
            LookupTableType type,
            unsigned char * array,
            unsigned int & length ) const
```

Examples

ExtractImageRegionWithLUT.cs.

10.177.4.9 GetLUTDescriptor()

```
void gdcm::LookupTable::GetLUTDescriptor (
             LookupTableType type,
             unsigned short & length,
             unsigned short & subscript,
             unsigned short & bitsize ) const
```

10.177.4.10 GetLUTLength()

```
unsigned int gdcm::LookupTable::GetLUTLength (
             LookupTableType type ) const
```

10.177.4.11 GetPointer()

```
const unsigned char* gdcm::LookupTable::GetPointer ( ) const
```

return a raw pointer to the LUT

10.177.4.12 InitializeBlueLUT()

```
void gdcm::LookupTable::InitializeBlueLUT (
             unsigned short length,
             unsigned short subscript,
             unsigned short bitsize )
```

10.177.4.13 Initialized()

```
bool gdcm::LookupTable::Initialized ( ) const
```

return whether the LUT has been initialized

10.177.4.14 InitializeGreenLUT()

```
void gdcm::LookupTable::InitializeGreenLUT (
            unsigned short length,
            unsigned short subscript,
            unsigned short bitsize )
```

10.177.4.15 InitializeLUT()

```
void gdcm::LookupTable::InitializeLUT (
            LookupTableType type,
            unsigned short length,
            unsigned short subscript,
            unsigned short bitsize )
```

Generic interface:

10.177.4.16 InitializeRedLUT()

```
void gdcm::LookupTable::InitializeRedLUT (
            unsigned short length,
            unsigned short subscript,
            unsigned short bitsize )
```

RED / GREEN / BLUE specific:

10.177.4.17 IsRGB8()

```
bool gdcm::LookupTable::IsRGB8 ( ) const
```

Return whether 16 bits LUT is in RGB 8 bits space.

10.177.4.18 Print()

```
void gdcm::LookupTable::Print (
            std::ostream &  ) const  [override], [virtual]
```

Reimplemented from gdcm::Object.

Reimplemented in gdcm::SegmentedPaletteColorLookupTable.

Examples

PrintLUT.cxx.

10.177.4.19 SetBlueLUT()

```
void gdcm::LookupTable::SetBlueLUT (
            const unsigned char * blue,
            unsigned int length )
```

10.177.4.20 SetGreenLUT()

```
void gdcm::LookupTable::SetGreenLUT (
            const unsigned char * green,
            unsigned int length )
```

10.177.4.21 SetLUT()

```
virtual void gdcm::LookupTable::SetLUT (
            LookupTableType type,
            const unsigned char * array,
            unsigned int length )  [virtual]
```

Reimplemented in gdcm::SegmentedPaletteColorLookupTable.

10.177.4.22 SetRedLUT()

```
void gdcm::LookupTable::SetRedLUT (
            const unsigned char * red,
            unsigned int length )
```

10.177.4.23 WriteBufferAsRGBA()

```
bool gdcm::LookupTable::WriteBufferAsRGBA (
            const unsigned char * rgba )
```

Write the LUT as RGBA.

10.177.5 Member Data Documentation

10.177.5.1 BitSample

```
unsigned short gdcm::LookupTable::BitSample  [protected]
```

10.177.5.2 IncompleteLUT

```
bool gdcm::LookupTable::IncompleteLUT  [protected]
```

10.177.5.3 Internal

```
LookupTableInternal* gdcm::LookupTable::Internal  [protected]
```

The documentation for this class was generated from the following file:

- gdcmLookupTable.h

10.178 gdcm::Scanner::ltstr Struct Reference

```
#include <gdcmScanner.h>
```

Public Member Functions

- bool operator() (const char *s1, const char *s2) const

10.178.1 Member Function Documentation

10.178.1.1 operator()()

```
bool gdcm::Scanner::ltstr::operator() (
            const char * s1,
            const char * s2 ) const  [inline]
```

The documentation for this struct was generated from the following file:

- gdcmScanner.h

10.179 gdcm::StrictScanner::ltstr Struct Reference

`#include <gdcmStrictScanner.h>`

Public Member Functions

- bool operator() (const char *s1, const char *s2) const

10.179.1 Member Function Documentation

10.179.1.1 operator()()

```
bool gdcm::StrictScanner::ltstr::operator() (
            const char * s1,
            const char * s2 ) const  [inline]
```

The documentation for this struct was generated from the following file:

- gdcmStrictScanner.h

10.180 gdcm::Macro Class Reference

Class for representing a Macro.

`#include <gdcmMacro.h>`

Public Types

- typedef std::vector< std::string > ArrayIncludeMacrosType
- typedef std::map< Tag, MacroEntry > MapModuleEntry

Public Member Functions

- Macro ()=default
- void AddMacroEntry (const Tag &tag, const MacroEntry &module)

  Will add a ModuleEntry directly at root-level. See Macro for nested-included level.
- void Clear ()
- bool FindMacroEntry (const Tag &tag) const
- const MacroEntry & GetMacroEntry (const Tag &tag) const
- const char * GetName () const
- void SetName (const char *name)
- bool Verify (const DataSet &ds, Usage const &usage) const

Friends

- std::ostream & operator<< (std::ostream &_os, const Macro &_val)

10.180.1 Detailed Description

Class for representing a Macro.

Note

Attribute Macro: a set of Attributes that are described in a single table that is referenced by multiple Module or other tables.

See also

Module

10.180.2 Member Typedef Documentation

10.180.2.1 ArrayIncludeMacrosType

```
typedef std::vector<std::string> gdcm::Macro::ArrayIncludeMacrosType
```

10.180.2.2 MapModuleEntry

```
typedef std::map<Tag, MacroEntry> gdcm::Macro::MapModuleEntry
```

10.180.3 Constructor & Destructor Documentation

10.180.3.1 Macro()

```
gdcm::Macro::Macro ( )  [default]
```

10.180.4 Member Function Documentation

10.180.4.1 AddMacroEntry()

```
void gdcm::Macro::AddMacroEntry (
            const Tag & tag,
            const MacroEntry & module )  [inline]
```

Will add a ModuleEntry directly at root-level. See Macro for nested-included level.

10.180.4.2 Clear()

```
void gdcm::Macro::Clear ( )  [inline]
```

10.180.4.3 FindMacroEntry()

```
bool gdcm::Macro::FindMacroEntry (
            const Tag & tag ) const
```

Find or Get a ModuleEntry. ModuleEntry are either search are root-level or within nested-macro included in module.

10.180.4.4 GetMacroEntry()

```
const MacroEntry& gdcm::Macro::GetMacroEntry (
            const Tag & tag ) const
```

10.180.4.5 GetName()

```
const char* gdcm::Macro::GetName ( ) const  [inline]
```

10.180.4.6 SetName()

```
void gdcm::Macro::SetName (
            const char * name )  [inline]
```

10.180.4.7 Verify()

```
bool gdcm::Macro::Verify (
            const DataSet & ds,
            Usage const & usage ) const
```

10.180.5 Friends And Related Function Documentation

10.180.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Macro & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmMacro.h

10.181 gdcm::Macros Class Reference

Class for representing a Modules.

```
#include <gdcmMacros.h>
```

Public Types

- typedef std::map< std::string, Macro > ModuleMapType

Public Member Functions

- Macros ()=default
- void AddMacro (const char *ref, const Macro &module)
- void Clear ()
- const Macro & GetMacro (const char *name) const
- bool IsEmpty () const

Friends

- std::ostream & operator<< (std::ostream &_os, const Macros &_val)

10.181.1 Detailed Description

Class for representing a Modules.

Note

bla

See also

Module

10.181.2 Member Typedef Documentation

10.181.2.1 ModuleMapType

```
typedef std::map<std::string, Macro> gdcm::Macros::ModuleMapType
```

10.181.3 Constructor & Destructor Documentation

10.181.3.1 Macros()

```
gdcm::Macros::Macros ( )  [default]
```

10.181.4 Member Function Documentation

10.181.4.1 AddMacro()

```
void gdcm::Macros::AddMacro (
            const char * ref,
            const Macro & module )  [inline]
```

10.181.4.2 Clear()

```
void gdcm::Macros::Clear ( )  [inline]
```

10.181.4.3 GetMacro()

```
const Macro& gdcm::Macros::GetMacro (
            const char * name ) const  [inline]
```

10.181.4.4 IsEmpty()

```
bool gdcm::Macros::IsEmpty ( ) const  [inline]
```

10.181.5 Friends And Related Function Documentation

10.181.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Macros & _val )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmMacros.h

10.182 gdcm::network::MaximumLengthSub Class Reference

MaximumLengthSub.

```
#include <gdcmMaximumLengthSub.h>
```

Public Member Functions

- MaximumLengthSub ()
- uint32_t GetMaximumLength () const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetMaximumLength (uint32_t maximumlength)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.182.1 Detailed Description

MaximumLengthSub.

Annex D Table D.1-1 MAXIMUM LENGTH SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

or

Table D.1-2 Maximum length sub-item fields (A-ASSOCIATE-AC)

10.182.2 Constructor & Destructor Documentation

10.182.2.1 MaximumLengthSub()

```
gdcm::network::MaximumLengthSub::MaximumLengthSub ( )
```

10.182.3 Member Function Documentation

10.182.3.1 GetMaximumLength()

```
uint32_t gdcm::network::MaximumLengthSub::GetMaximumLength ( ) const  [inline]
```

10.182.3.2 Print()

```
void gdcm::network::MaximumLengthSub::Print (
            std::ostream & os ) const
```

10.182.3.3 Read()

```
std::istream& gdcm::network::MaximumLengthSub::Read (
              std::istream & is )
```

10.182.3.4 SetMaximumLength()

```
void gdcm::network::MaximumLengthSub::SetMaximumLength (
              uint32_t maximumlength )
```

10.182.3.5 Size()

```
size_t gdcm::network::MaximumLengthSub::Size ( ) const
```

10.182.3.6 Write()

```
const std::ostream& gdcm::network::MaximumLengthSub::Write (
              std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmMaximumLengthSub.h

10.183 gdcm::MD5 Class Reference

Class for MD5.

```
#include <gdcmMD5.h>
```

Static Public Member Functions

- static bool Compute (const char *buffer, size_t buf_len, char digest_str[33])
- static bool ComputeFile (const char *filename, char digest_str[33])

  Compute md5 from a file `filename`

10.183.1 Detailed Description

Class for MD5.

Warning

this class is able to pick from two implementations:

1. a lightweight md5 implementation (when GDCM_BUILD_TESTING is turned ON)
2. the one from OpenSSL (when GDCM_USE_SYSTEM_OPENSSL is turned ON)

In all other cases it will return an error

10.183.2 Member Function Documentation

10.183.2.1 Compute()

```
static bool gdcm::MD5::Compute (
             const char * buffer,
             size_t buf_len,
             char digest_str[33] )  [static]
```

10.183.2.2 ComputeFile()

```
static bool gdcm::MD5::ComputeFile (
             const char * filename,
             char digest_str[33] )  [static]
```

Compute md5 from a file `filename`

The documentation for this class was generated from the following file:

- gdcmMD5.h

10.184 gdcm::MediaStorage Class Reference

MediaStorage.

```
#include <gdcmMediaStorage.h>
```

Public Types

- enum MSType {
  MediaStorageDirectoryStorage = 0 ,
  ComputedRadiographyImageStorage ,
  DigitalXRayImageStorageForPresentation ,
  DigitalXRayImageStorageForProcessing ,
  DigitalMammographyImageStorageForPresentation ,
  DigitalMammographyImageStorageForProcessing ,
  DigitalIntraoralXrayImageStorageForPresentation ,
  DigitalIntraoralXRayImageStorageForProcessing ,
  CTImageStorage ,
  EnhancedCTImageStorage ,
  UltrasoundImageStorageRetired ,
  UltrasoundImageStorage ,
  UltrasoundMultiFrameImageStorageRetired ,
  UltrasoundMultiFrameImageStorage ,
  MRImageStorage ,
  EnhancedMRImageStorage ,
  MRSpectroscopyStorage ,
  NuclearMedicineImageStorageRetired ,
  SecondaryCaptureImageStorage ,
  MultiframeSingleBitSecondaryCaptureImageStorage ,
  MultiframeGrayscaleByteSecondaryCaptureImageStorage ,
  MultiframeGrayscaleWordSecondaryCaptureImageStorage ,
  MultiframeTrueColorSecondaryCaptureImageStorage ,
  StandaloneOverlayStorage ,
  StandaloneCurveStorage ,
  LeadECGWaveformStorage ,
  GeneralECGWaveformStorage ,
  AmbulatoryECGWaveformStorage ,
  HemodynamicWaveformStorage ,
  CardiacElectrophysiologyWaveformStorage ,
  BasicVoiceAudioWaveformStorage ,
  StandaloneModalityLUTStorage ,
  StandaloneVOILUTStorage ,
  GrayscaleSoftcopyPresentationStateStorageSOPClass ,
  XRayAngiographicImageStorage ,
  XRayRadiofluoroscopingImageStorage ,
  XRayAngiographicBiPlaneImageStorageRetired ,
  NuclearMedicineImageStorage ,
  RawDataStorage ,
  SpacialRegistrationStorage ,
  SpacialFiducialsStorage ,
  PETImageStorage ,
  RTImageStorage ,
  RTDoseStorage ,
  RTStructureSetStorage ,
  RTPlanStorage ,
  CSANonImageStorage ,
  Philips3D ,
  EnhancedSR ,
  BasicTextSR ,
  HardcopyGrayscaleImageStorage ,

ComprehensiveSR ,
DetachedStudyManagementSOPClass ,
EncapsulatedPDFStorage ,
EncapsulatedCDAStorage ,
StudyComponentManagementSOPClass ,
DetachedVisitManagementSOPClass ,
DetachedPatientManagementSOPClass ,
VideoEndoscopicImageStorage ,
GeneralElectricMagneticResonanceImageStorage ,
GEPrivate3DModelStorage ,
ToshibaPrivateDataStorage ,
MammographyCADSR ,
KeyObjectSelectionDocument ,
HangingProtocolStorage ,
ModalityPerformedProcedureStepSOPClass ,
PhilipsPrivateMRSyntheticImageStorage ,
VLPhotographicImageStorage ,
SegmentationStorage ,
RTIonPlanStorage ,
XRay3DAngiographicImageStorage ,
EnhancedXAImageStorage ,
RTIonBeamsTreatmentRecordStorage ,
SurfaceSegmentationStorage ,
VLWholeSlideMicroscopyImageStorage ,
RTTreatmentSummaryRecordStorage ,
EnhancedUSVolumeStorage ,
XRayRadiationDoseSR ,
VLEndoscopicImageStorage ,
BreastTomosynthesisImageStorage ,
FujiPrivateCRImageStorage ,
OphthalmicPhotography8BitImageStorage ,
OphthalmicTomographyImageStorage ,
VLMicroscopicImageStorage ,
EnhancedPETImageStorage ,
VideoPhotographicImageStorage ,
XRay3DCraniofacialImageStorage ,
IVOCTForPresentation ,
IVOCTForProcessing ,
LegacyConvertedEnhancedCTImageStorage ,
LegacyConvertedEnhancedMRImageStorage ,
LegacyConvertedEnhancedPETImageStorage ,
BreastProjectionXRayImageStorageForPresentation ,
BreastProjectionXRayImageStorageForProcessing ,
HardcopyColorImageStorage ,
EnhancedMRColorImageStorage ,
FujiPrivateMammoCRImageStorage ,
OphthalmicPhotography16BitImageStorage ,
VideoMicroscopicImageStorage ,
MS_END }

- enum ObjectType {
NoObject = 0 ,
Video ,
Waveform ,
Audio ,

PDF ,
URI ,
Segmentation ,
ObjectEnd }

Public Member Functions

- MediaStorage (MSType type=MS_END)
- const char * GetModality () const
- unsigned int GetModalityDimension () const
- const char * GetString () const

  Return the Media String of the object.
- void GuessFromModality (const char *modality, unsigned int dimension=2)
- bool IsUndefined () const
- operator MSType () const
- bool SetFromDataSet (DataSet const &ds)
- bool SetFromFile (File const &file)
- bool SetFromHeader (FileMetaInformation const &fmi)
- bool SetFromModality (DataSet const &ds)

Static Public Member Functions

- static const char * GetMSString (MSType ts)

  Return the Media String associated. Will return NULL for MS_END.
- static MSType GetMSType (const char *str)
- static unsigned int GetNumberOfModality ()
- static unsigned int GetNumberOfMSString ()
- static unsigned int GetNumberOfMSType ()
- static bool IsImage (MSType ts)

Protected Member Functions

- void SetFromSourceImageSequence (DataSet const &ds)

Friends

- std::ostream & operator<< (std::ostream &os, const MediaStorage &ms)

10.184.1 Detailed Description

MediaStorage.

Note

FIXME There should not be any notion of Image and/or PDF at that point Only the codec can answer yes I support this Media Storage or not... For instance an ImageCodec will answer yes to most of them while a PDFCodec will answer only for the Encapsulated PDF

See also

UIDs

Examples

CreateJPIPDataSet.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenerateStandardSOPClasses.cxx, GetSubSequenceData.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, TestReader.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, and iU22tomultisc.cxx.

10.184.2 Member Enumeration Documentation

10.184.2.1 MSType

`enum gdcm::MediaStorage::MSType`

Enumerator

MediaStorageDirectoryStorage	
ComputedRadiographyImageStorage	
DigitalXRayImageStorageForPresentation	
DigitalXRayImageStorageForProcessing	
DigitalMammographyImageStorageForPresentation	
DigitalMammographyImageStorageForProcessing	
DigitalIntraoralXrayImageStorageForPresentation	
DigitalIntraoralXRayImageStorageForProcessing	
CTImageStorage	
EnhancedCTImageStorage	
UltrasoundImageStorageRetired	
UltrasoundImageStorage	
UltrasoundMultiFrameImageStorageRetired	
UltrasoundMultiFrameImageStorage	
MRImageStorage	

Enumerator

EnhancedMRImageStorage	
MRSpectroscopyStorage	
NuclearMedicineImageStorageRetired	
SecondaryCaptureImageStorage	
MultiframeSingleBitSecondaryCaptureImageStorage	
MultiframeGrayscaleByteSecondaryCaptureImageStorage	
MultiframeGrayscaleWordSecondaryCaptureImageStorage	
MultiframeTrueColorSecondaryCaptureImageStorage	
StandaloneOverlayStorage	
StandaloneCurveStorage	
LeadECGWaveformStorage	
GeneralECGWaveformStorage	
AmbulatoryECGWaveformStorage	
HemodynamicWaveformStorage	
CardiacElectrophysiologyWaveformStorage	
BasicVoiceAudioWaveformStorage	
StandaloneModalityLUTStorage	
StandaloneVOILUTStorage	
GrayscaleSoftcopyPresentationStateStorageSOPClass	
XRayAngiographicImageStorage	
XRayRadiofluoroscopingImageStorage	
XRayAngiographicBiPlaneImageStorageRetired	
NuclearMedicineImageStorage	
RawDataStorage	
SpacialRegistrationStorage	
SpacialFiducialsStorage	
PETImageStorage	
RTImageStorage	
RTDoseStorage	
RTStructureSetStorage	
RTPlanStorage	
CSANonImageStorage	
Philips3D	
EnhancedSR	
BasicTextSR	
HardcopyGrayscaleImageStorage	
ComprehensiveSR	
DetachedStudyManagementSOPClass	
EncapsulatedPDFStorage	
EncapsulatedCDAStorage	
StudyComponentManagementSOPClass	
DetachedVisitManagementSOPClass	
DetachedPatientManagementSOPClass	

Enumerator

VideoEndoscopicImageStorage	
GeneralElectricMagneticResonanceImageStorage	
GEPrivate3DModelStorage	
ToshibaPrivateDataStorage	
MammographyCADSR	
KeyObjectSelectionDocument	
HangingProtocolStorage	
ModalityPerformedProcedureStepSOPClass	
PhilipsPrivateMRSyntheticImageStorage	
VLPhotographicImageStorage	
SegmentationStorage	
RTIonPlanStorage	
XRay3DAngiographicImageStorage	
EnhancedXAImageStorage	
RTIonBeamsTreatmentRecordStorage	
SurfaceSegmentationStorage	
VLWholeSlideMicroscopyImageStorage	
RTTreatmentSummaryRecordStorage	
EnhancedUSVolumeStorage	
XRayRadiationDoseSR	
VLEndoscopicImageStorage	
BreastTomosynthesisImageStorage	
FujiPrivateCRImageStorage	
OphthalmicPhotography8BitImageStorage	
OphthalmicTomographyImageStorage	
VLMicroscopicImageStorage	
EnhancedPETImageStorage	
VideoPhotographicImageStorage	
XRay3DCraniofacialImageStorage	
IVOCTForPresentation	
IVOCTForProcessing	
LegacyConvertedEnhancedCTImageStorage	
LegacyConvertedEnhancedMRImageStorage	
LegacyConvertedEnhancedPETImageStorage	
BreastProjectionXRayImageStorageForPresentation	
BreastProjectionXRayImageStorageForProcessing	
HardcopyColorImageStorage	
EnhancedMRColorImageStorage	
FujiPrivateMammoCRImageStorage	
OphthalmicPhotography16BitImageStorage	
VideoMicroscopicImageStorage	
MS_END	

Examples

GenerateStandardSOPClasses.cxx.

10.184.2.2 ObjectType

```
enum gdcm::MediaStorage::ObjectType
```

Enumerator

NoObject	
Video	
Waveform	
Audio	
PDF	
URI	
Segmentation	
ObjectEnd	

10.184.3 Constructor & Destructor Documentation

10.184.3.1 MediaStorage()

```
gdcm::MediaStorage::MediaStorage (
            MSType type = MS_END )  [inline]
```

10.184.4 Member Function Documentation

10.184.4.1 GetModality()

```
const char* gdcm::MediaStorage::GetModality ( ) const
```

10.184.4.2 GetModalityDimension()

```
unsigned int gdcm::MediaStorage::GetModalityDimension ( ) const
```

10.184.4.3 GetMSString()

```
static const char* gdcm::MediaStorage::GetMSString (
            MSType ts )  [static]
```

Return the Media String associated. Will return NULL for MS_END.

Examples

GenerateStandardSOPClasses.cxx.

10.184.4.4 GetMSType()

```
static MSType gdcm::MediaStorage::GetMSType (
            const char * str )  [static]
```

Examples

MetaImageMD5Activiz.cs, and TestReader.cxx.

10.184.4.5 GetNumberOfModality()

```
static unsigned int gdcm::MediaStorage::GetNumberOfModality ( )  [static]
```

10.184.4.6 GetNumberOfMSString()

```
static unsigned int gdcm::MediaStorage::GetNumberOfMSString ( )  [static]
```

10.184.4.7 GetNumberOfMSType()

```
static unsigned int gdcm::MediaStorage::GetNumberOfMSType ( )  [static]
```

10.184.4.8 GetString()

```
const char* gdcm::MediaStorage::GetString ( ) const
```

Return the Media String of the object.

Examples

CreateJPIPDataSet.cxx, EncapsulateFileInRawData.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, GetSubSequenceData.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, and iU22tomultisc.cxx.

10.184.4.9 GuessFromModality()

```
void gdcm::MediaStorage::GuessFromModality (
            const char * modality,
            unsigned int dimension = 2 )
```

10.184.4.10 IsImage()

```
static bool gdcm::MediaStorage::IsImage (
            MSType ts )  [static]
```

Returns whether DICOM has a Pixel Data element (7fe0,0010)

Warning

MRSpectroscopyStorage could be image but are not

Examples

MetaImageMD5Activiz.cs.

10.184.4.11 IsUndefined()

```
bool gdcm::MediaStorage::IsUndefined ( ) const  [inline]
```

Examples

TestReader.cxx.

10.184.4.12 operator MSType()

```
gdcm::MediaStorage::operator MSType ( ) const  [inline]
```

10.184.4.13 SetFromDataSet()

```
bool gdcm::MediaStorage::SetFromDataSet (
            DataSet const & ds )
```

Advanced user only (functions should be protected level...) Those function are lower level than SetFromFile

10.184.4.14 SetFromFile()

```
bool gdcm::MediaStorage::SetFromFile (
            File const & file )
```

Attempt to set the MediaStorage from a file: WARNING: When no MediaStorage & Modality are found BUT a PixelData element is found then MediaStorage is set to the default SecondaryCaptureImageStorage (return value is false in this case)

Examples

ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, TestReader.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.184.4.15 SetFromHeader()

```
bool gdcm::MediaStorage::SetFromHeader (
            FileMetaInformation const & fmi )
```

10.184.4.16 SetFromModality()

```
bool gdcm::MediaStorage::SetFromModality (
            DataSet const & ds )
```

10.184.4.17 SetFromSourceImageSequence()

```
void gdcm::MediaStorage::SetFromSourceImageSequence (
            DataSet const & ds )  [protected]
```

10.184.5 Friends And Related Function Documentation

10.184.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const MediaStorage & ms )  [friend]
```

The documentation for this class was generated from the following file:

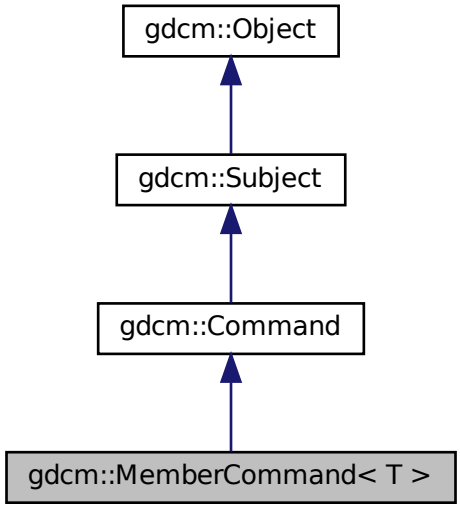
- gdcmMediaStorage.h

10.185 gdcm::MemberCommand< T > Class Template Reference

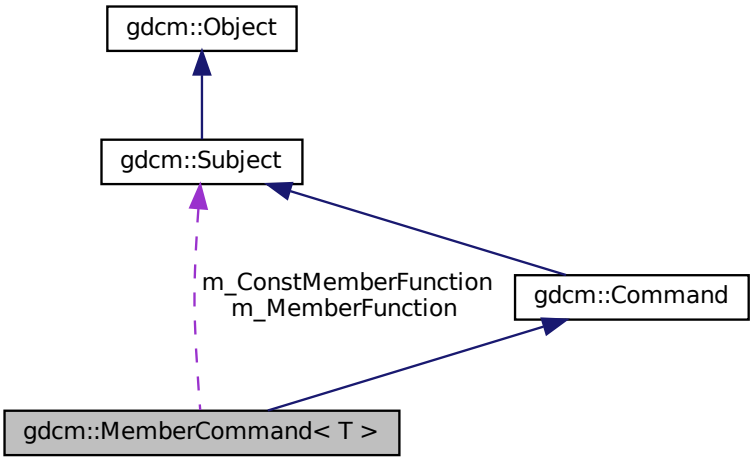
Command subclass that calls a pointer to a member function.

```
#include <gdcmCommand.h>
```

Inheritance diagram for gdcm::MemberCommand< T >:



Collaboration diagram for gdcm::MemberCommand< T >:



Public Types

- typedef MemberCommand Self

- typedef void(T::* TConstMemberFunctionPointer) (const Subject *, const Event &)
- typedef void(T::* TMemberFunctionPointer) (Subject *, const Event &)

Public Member Functions

- MemberCommand (const Self &)=delete
- void Execute (const Subject *caller, const Event &event) override
- void Execute (Subject *caller, const Event &event) override
- void operator= (const Self &)=delete
- void SetCallbackFunction (T *object, TConstMemberFunctionPointer memberFunction)
- void SetCallbackFunction (T *object, TMemberFunctionPointer memberFunction)

Static Public Member Functions

- static SmartPointer< MemberCommand > New ()

Protected Member Functions

- MemberCommand ()
- ~MemberCommand () override=default

Protected Attributes

- TConstMemberFunctionPointer m_ConstMemberFunction
- TMemberFunctionPointer m_MemberFunction
- T * m_This

10.185.1 Detailed Description

template<class T>
class gdcm::MemberCommand< T >

Command subclass that calls a pointer to a member function.

MemberCommand calls a pointer to a member function with the same arguments as Execute on Command.

10.185.2 Member Typedef Documentation

10.185.2.1 Self

```
template<class T >
typedef MemberCommand gdcm::MemberCommand< T >::Self
```

Standard class typedefs.

10.185.2.2 TConstMemberFunctionPointer

```
template<class T >
typedef void(T::* gdcm::MemberCommand< T >::TConstMemberFunctionPointer) (const Subject *, const
Event &)
```

10.185.2.3 TMemberFunctionPointer

```
template<class T >
typedef void(T::* gdcm::MemberCommand< T >::TMemberFunctionPointer) (Subject *, const Event &)
```

pointer to a member function that takes a Subject* and the event

10.185.3 Constructor & Destructor Documentation

10.185.3.1 MemberCommand() [1/2]

```
template<class T >
gdcm::MemberCommand< T >::MemberCommand (
            const Self &  )  [delete]
```

10.185.3.2 MemberCommand() [2/2]

```
template<class T >
gdcm::MemberCommand< T >::MemberCommand ( )  [inline], [protected]
```

Referenced by gdcm::MemberCommand< T >::New().

10.185.3.3 ~MemberCommand()

```
template<class T >
gdcm::MemberCommand< T >::~MemberCommand ( )  [override], [protected], [default]
```

10.185.4 Member Function Documentation

10.185.4.1 Execute() [1/2]

```
template<class T >
void gdcm::MemberCommand< T >::Execute (
            const Subject * caller,
            const Event & event )  [inline], [override], [virtual]
```

Invoke the member function with a const object.

Implements gdcm::Command.

References gdcm::MemberCommand< T >::m_ConstMemberFunction.

10.185.4.2 Execute() [2/2]

```
template<class T >
void gdcm::MemberCommand< T >::Execute (
            Subject * caller,
            const Event & event )  [inline], [override], [virtual]
```

Invoke the member function.

Implements gdcm::Command.

References gdcm::MemberCommand< T >::m_MemberFunction.

10.185.4.3 New()

```
template<class T >
static SmartPointer<MemberCommand> gdcm::MemberCommand< T >::New ( )  [inline], [static]
```

Method for creation through the object factory.

References gdcm::MemberCommand< T >::MemberCommand().

10.185.4.4 operator=()

```
template<class T >
void gdcm::MemberCommand< T >::operator= (
            const Self &  )  [delete]
```

10.185.4.5 SetCallbackFunction() [1/2]

```
template<class T >
void gdcm::MemberCommand< T >::SetCallbackFunction (
            T * object,
            TConstMemberFunctionPointer memberFunction )  [inline]
```

References gdcm::MemberCommand< T >::m_ConstMemberFunction, and gdcm::MemberCommand< T >::m_This.

10.185.4.6 SetCallbackFunction() [2/2]

```
template<class T >
void gdcm::MemberCommand< T >::SetCallbackFunction (
            T * object,
            TMemberFunctionPointer memberFunction )  [inline]
```

Run-time type information (and related methods). Set the callback function along with the object that it will be invoked on.

References gdcm::MemberCommand< T >::m_MemberFunction, and gdcm::MemberCommand< T >::m_This.

10.185.5 Member Data Documentation

10.185.5.1 m_ConstMemberFunction

```
template<class T >
TConstMemberFunctionPointer gdcm::MemberCommand< T >::m_ConstMemberFunction  [protected]
```

Referenced by gdcm::MemberCommand< T >::Execute(), and gdcm::MemberCommand< T >::SetCallback↩ Function().

10.185.5.2 m_MemberFunction

```
template<class T >
TMemberFunctionPointer gdcm::MemberCommand< T >::m_MemberFunction  [protected]
```

Referenced by gdcm::MemberCommand< T >::Execute(), and gdcm::MemberCommand< T >::SetCallback↩ Function().

10.185.5.3 m_This

```
template<class T >
T* gdcm::MemberCommand< T >::m_This  [protected]
```

Referenced by gdcm::MemberCommand< T >::SetCallbackFunction().

The documentation for this class was generated from the following file:

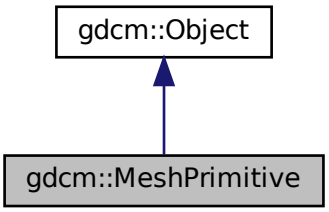
- gdcmCommand.h

10.186 gdcm::MeshPrimitive Class Reference

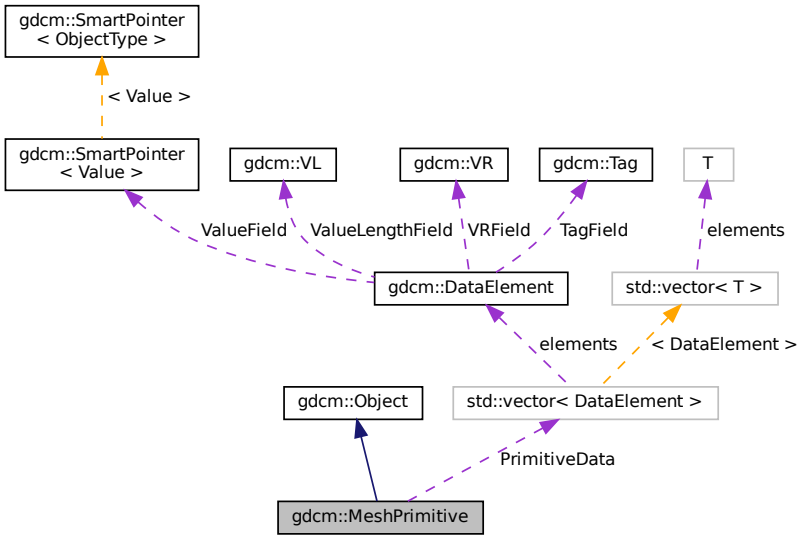
This class defines surface mesh primitives.

```
#include <gdcmMeshPrimitive.h>
```

Inheritance diagram for gdcm::MeshPrimitive:



Collaboration diagram for gdcm::MeshPrimitive:



Public Types

- enum MPType {
  VERTEX = 0 ,
  EDGE ,
  TRIANGLE ,
  TRIANGLE_STRIP ,
  TRIANGLE_FAN ,
  LINE ,
  FACET ,
  MPType_END }

  This enumeration defines primitive types.
- typedef std::vector< DataElement > PrimitivesData

Public Member Functions

- MeshPrimitive ()
- ~MeshPrimitive () override
- void AddPrimitiveData (DataElement const &de)
- unsigned int GetNumberOfPrimitivesData () const
- DataElement & GetPrimitiveData ()
- const DataElement & GetPrimitiveData () const
- DataElement & GetPrimitiveData (const unsigned int idx)
- const DataElement & GetPrimitiveData (const unsigned int idx) const
- PrimitivesData & GetPrimitivesData ()
- const PrimitivesData & GetPrimitivesData () const

- MPType GetPrimitiveType () const
- void SetPrimitiveData (const unsigned int idx, DataElement const &de)
- void SetPrimitiveData (DataElement const &de)
- void SetPrimitivesData (PrimitivesData const &DEs)
- void SetPrimitiveType (const MPType type)

Static Public Member Functions

- static MPType GetMPType (const char *type)
- static const char * GetMPTypeString (const MPType type)

Protected Attributes

- PrimitivesData PrimitiveData
- MPType PrimitiveType

Additional Inherited Members

10.186.1 Detailed Description

This class defines surface mesh primitives.

It is designed from surface mesh primitives macro.

See also

PS 3.3 C.27.4

10.186.2 Member Typedef Documentation

10.186.2.1 PrimitivesData

```
typedef std::vector< DataElement > gdcm::MeshPrimitive::PrimitivesData
```

10.186.3 Member Enumeration Documentation

10.186.3.1 MPType

```
enum gdcm::MeshPrimitive::MPType
```

This enumeration defines primitive types.

See also

PS 3.3 C.27.4.1

Enumerator

VERTEX	
EDGE	
TRIANGLE	
TRIANGLE_STRIP	
TRIANGLE_FAN	
LINE	
FACET	
MPType_END	

10.186.4 Constructor & Destructor Documentation

10.186.4.1 MeshPrimitive()

```
gdcm::MeshPrimitive::MeshPrimitive ( )
```

10.186.4.2 ~MeshPrimitive()

```
gdcm::MeshPrimitive::~MeshPrimitive ( )  [override]
```

10.186.5 Member Function Documentation

10.186.5.1 AddPrimitiveData()

```
void gdcm::MeshPrimitive::AddPrimitiveData (
            DataElement const & de )
```

10.186.5.2 GetMPType()

```
static MPType gdcm::MeshPrimitive::GetMPType (
            const char * type )  [static]
```

10.186.5.3 GetMPTypeString()

```
static const char* gdcm::MeshPrimitive::GetMPTypeString (
            const MPType type )  [static]
```

10.186.5.4 GetNumberOfPrimitivesData()

```
unsigned int gdcm::MeshPrimitive::GetNumberOfPrimitivesData ( ) const
```

10.186.5.5 GetPrimitiveData() [1/4]

```
DataElement& gdcm::MeshPrimitive::GetPrimitiveData ( )
```

10.186.5.6 GetPrimitiveData() [2/4]

```
const DataElement& gdcm::MeshPrimitive::GetPrimitiveData ( ) const
```

10.186.5.7 GetPrimitiveData() [3/4]

```
DataElement& gdcm::MeshPrimitive::GetPrimitiveData (
            const unsigned int idx )
```

10.186.5.8 GetPrimitiveData() [4/4]

```
const DataElement& gdcm::MeshPrimitive::GetPrimitiveData (
            const unsigned int idx ) const
```

10.186.5.9 GetPrimitivesData() [1/2]

```
PrimitivesData& gdcm::MeshPrimitive::GetPrimitivesData ( )
```

10.186.5.10 GetPrimitivesData() [2/2]

```
const PrimitivesData& gdcm::MeshPrimitive::GetPrimitivesData ( ) const
```

10.186.5.11 GetPrimitiveType()

```
MPType gdcm::MeshPrimitive::GetPrimitiveType ( ) const
```

10.186.5.12 SetPrimitiveData() [1/2]

```
void gdcm::MeshPrimitive::SetPrimitiveData (
            const unsigned int idx,
            DataElement const & de )
```

10.186.5.13 SetPrimitiveData() [2/2]

```
void gdcm::MeshPrimitive::SetPrimitiveData (
            DataElement const & de )
```

10.186.5.14 SetPrimitivesData()

```
void gdcm::MeshPrimitive::SetPrimitivesData (
            PrimitivesData const & DEs )
```

10.186.5.15 SetPrimitiveType()

```
void gdcm::MeshPrimitive::SetPrimitiveType (
            const MPType type )
```

10.186.6 Member Data Documentation

10.186.6.1 PrimitiveData

```
PrimitivesData gdcm::MeshPrimitive::PrimitiveData  [protected]
```

10.186.6.2 PrimitiveType

```
MPType gdcm::MeshPrimitive::PrimitiveType  [protected]
```

The documentation for this class was generated from the following file:

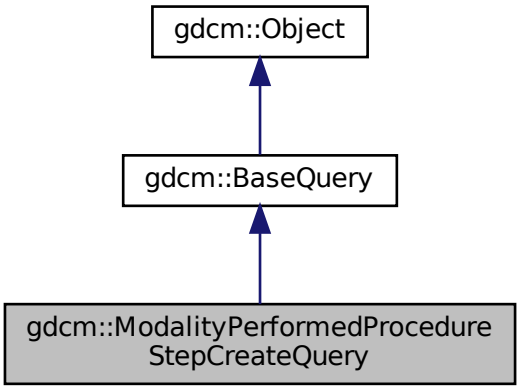
- gdcmMeshPrimitive.h

10.187 gdcm::ModalityPerformedProcedureStepCreateQuery Class Reference

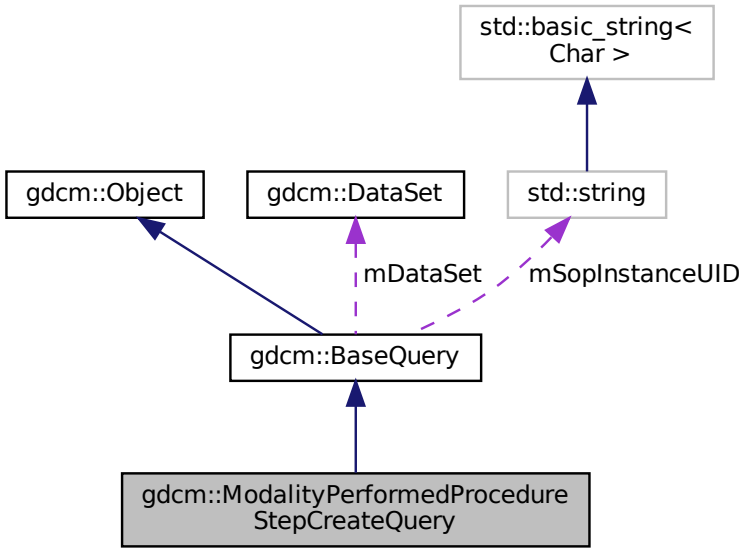
ModalityPerformedProcedureStepCreateQuery.

```
#include <gdcmModalityPerformedProcedureStepCreateQuery.h>
```

Inheritance diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:



Collaboration diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:



Public Member Functions

- ModalityPerformedProcedureStepCreateQuery (const std::string &iSopInstanceUID)
- UIDs::TSName GetAbstractSyntaxUID () const override
- gdcm::DataSet GetRequiredDataSet () const
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.187.1 Detailed Description

ModalityPerformedProcedureStepCreateQuery.

contains: the class which will produce a dataset for n-create for Modality Performed Procedure Step sop class

10.187.2 Constructor & Destructor Documentation

10.187.2.1 ModalityPerformedProcedureStepCreateQuery()

```
gdcm::ModalityPerformedProcedureStepCreateQuery::ModalityPerformedProcedureStepCreateQuery (
            const std::string & iSopInstanceUID )
```

10.187.3 Member Function Documentation

10.187.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::ModalityPerformedProcedureStepCreateQuery::GetAbstractSyntaxUID ( ) const  [override],
[virtual]
```

Implements gdcm::BaseQuery.

10.187.3.2 GetRequiredDataSet()

```
gdcm::DataSet gdcm::ModalityPerformedProcedureStepCreateQuery::GetRequiredDataSet ( ) const
```

10.187.3.3 ValidateQuery()

```
bool gdcm::ModalityPerformedProcedureStepCreateQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.187.4 Friends And Related Function Documentation

10.187.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

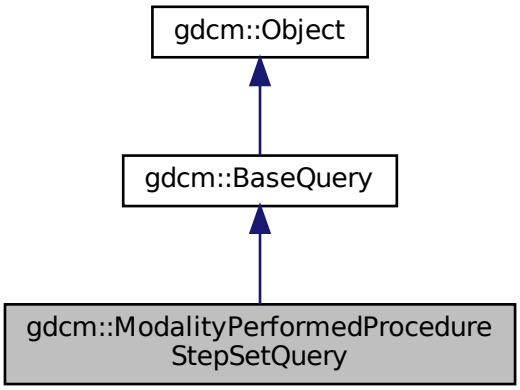
- gdcmModalityPerformedProcedureStepCreateQuery.h

10.188 gdcm::ModalityPerformedProcedureStepSetQuery Class Reference

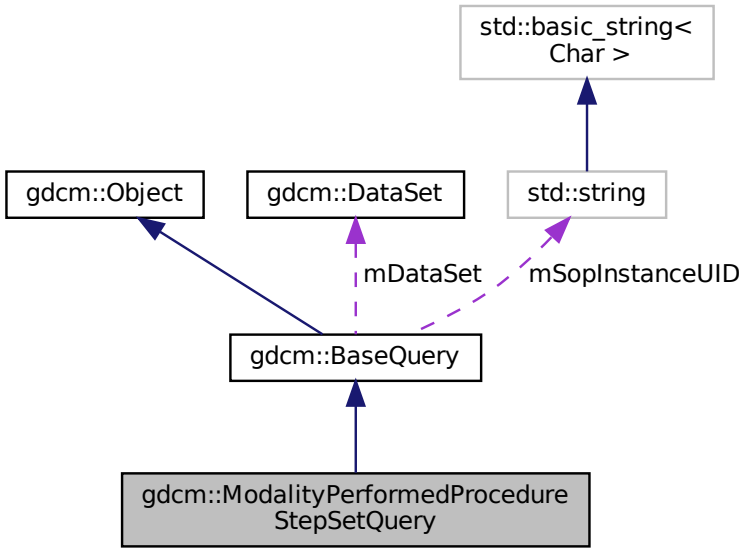
ModalityPerformedProcedureStepSetQuery.

```
#include <gdcmModalityPerformedProcedureStepSetQuery.h>
```

Inheritance diagram for gdcm::ModalityPerformedProcedureStepSetQuery:



Collaboration diagram for gdcm::ModalityPerformedProcedureStepSetQuery:



Public Member Functions

- ModalityPerformedProcedureStepSetQuery (const std::string &iSopInstanceUID)
- UIDs::TSName GetAbstractSyntaxUID () const override
- gdcm::DataSet GetRequiredDataSet () const
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.188.1 Detailed Description

ModalityPerformedProcedureStepSetQuery.

contains: the class which will produce a dataset for n-set for Modality Performed Procedure Step sop class

10.188.2 Constructor & Destructor Documentation

10.188.2.1 ModalityPerformedProcedureStepSetQuery()

```
gdcm::ModalityPerformedProcedureStepSetQuery::ModalityPerformedProcedureStepSetQuery (
            const std::string & iSopInstanceUID )
```

10.188.3 Member Function Documentation

10.188.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::ModalityPerformedProcedureStepSetQuery::GetAbstractSyntaxUID ( ) const  [override],
[virtual]
```

Implements gdcm::BaseQuery.

10.188.3.2 GetRequiredDataSet()

```
gdcm::DataSet gdcm::ModalityPerformedProcedureStepSetQuery::GetRequiredDataSet ( ) const
```

10.188.3.3 ValidateQuery()

```
bool gdcm::ModalityPerformedProcedureStepSetQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.188.4 Friends And Related Function Documentation

10.188.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

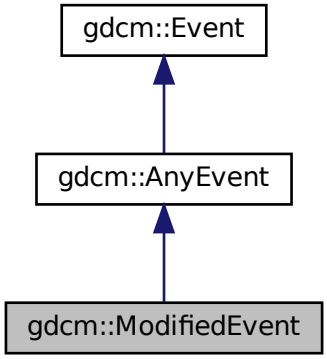
The documentation for this class was generated from the following file:

- gdcmModalityPerformedProcedureStepSetQuery.h

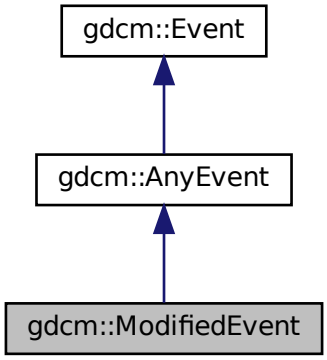
10.189 gdcm::ModifiedEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::ModifiedEvent:



Collaboration diagram for gdcm::ModifiedEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.190 gdcm::Module Class Reference

Class for representing a Module.

`#include <gdcmModule.h>`

Public Types

- typedef std::vector< std::string > ArrayIncludeMacrosType
- typedef std::map< Tag, ModuleEntry > MapModuleEntry

Public Member Functions

- Module ()=default
- void AddMacro (const char *include)
- void AddModuleEntry (const Tag &tag, const ModuleEntry &module)

  Will add a ModuleEntry directly at root-level. See Macro for nested-included level.
- void Clear ()
- bool FindModuleEntryInMacros (Macros const &macros, const Tag &tag) const
- const ModuleEntry & GetModuleEntryInMacros (Macros const &macros, const Tag &tag) const
- const char * GetName () const
- void SetName (const char *name)
- bool Verify (const DataSet &ds, Usage const &usage) const

Friends

- std::ostream & operator<< (std::ostream &_os, const Module &_val)

10.190.1 Detailed Description

Class for representing a Module.

Note

Module: A set of Attributes within an Information Entity or Normalized IOD which are logically related to each other.

See also

Macro

10.190.2 Member Typedef Documentation

10.190.2.1 ArrayIncludeMacrosType

```
typedef std::vector<std::string> gdcm::Module::ArrayIncludeMacrosType
```

10.190.2.2 MapModuleEntry

```
typedef std::map<Tag, ModuleEntry> gdcm::Module::MapModuleEntry
```

10.190.3 Constructor & Destructor Documentation

10.190.3.1 Module()

```
gdcm::Module::Module ( )  [default]
```

10.190.4 Member Function Documentation

10.190.4.1 AddMacro()

```
void gdcm::Module::AddMacro (
            const char * include )  [inline]
```

10.190.4.2 AddModuleEntry()

```
void gdcm::Module::AddModuleEntry (
            const Tag & tag,
            const ModuleEntry & module )  [inline]
```

Will add a ModuleEntry directly at root-level. See Macro for nested-included level.

10.190.4.3 Clear()

```
void gdcm::Module::Clear ( )  [inline]
```

10.190.4.4 FindModuleEntryInMacros()

```
bool gdcm::Module::FindModuleEntryInMacros (
            Macros const & macros,
            const Tag & tag ) const
```

Find or Get a ModuleEntry. ModuleEntry are either search are root-level or within nested-macro included in module.

10.190.4.5 GetModuleEntryInMacros()

```
const ModuleEntry& gdcm::Module::GetModuleEntryInMacros (
            Macros const & macros,
            const Tag & tag ) const
```

10.190.4.6 GetName()

```
const char* gdcm::Module::GetName ( ) const  [inline]
```

10.190.4.7 SetName()

```
void gdcm::Module::SetName (
            const char * name )  [inline]
```

10.190.4.8 Verify()

```
bool gdcm::Module::Verify (
            const DataSet & ds,
            Usage const & usage ) const
```

10.190.5 Friends And Related Function Documentation

10.190.5.1 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const Module & _val )  [friend]
```

The documentation for this class was generated from the following file:

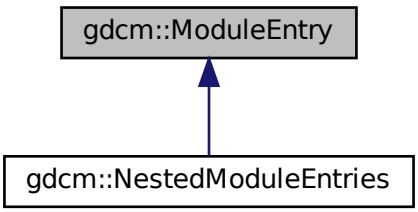
- gdcmModule.h

10.191 gdcm::ModuleEntry Class Reference

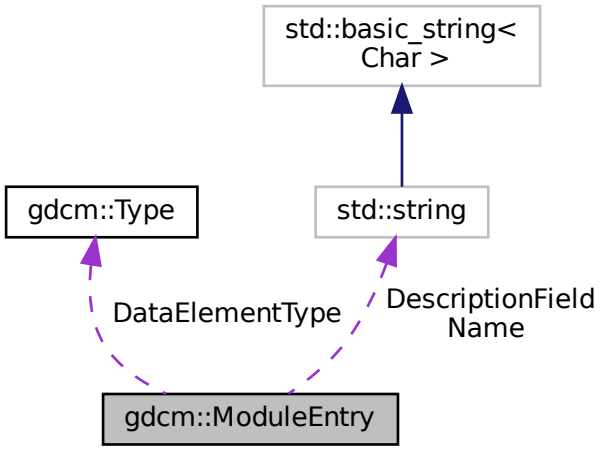
Class for representing a ModuleEntry.

`#include <gdcmModuleEntry.h>`

Inheritance diagram for gdcm::ModuleEntry:



Collaboration diagram for gdcm::ModuleEntry:



Public Types

- typedef std::string Description

Public Member Functions

- ModuleEntry (const char *name="", const char *type="3", const char *description="")
- virtual ~ModuleEntry ()=default
- const Description & GetDescription () const
- const char * GetName () const
- const Type & GetType () const
- void SetDescription (const char *d)
- void SetName (const char *name)
- void SetType (const Type &type)

Protected Attributes

- Type DataElementType
- Description DescriptionField
- std::string Name

Friends

- std::ostream & operator<< (std::ostream &_os, const ModuleEntry &_val)

10.191.1 Detailed Description

Class for representing a ModuleEntry.

Note

bla

See also

DictEntry

10.191.2 Member Typedef Documentation

10.191.2.1 Description

```
typedef std::string gdcm::ModuleEntry::Description
```

10.191.3 Constructor & Destructor Documentation

10.191.3.1 ModuleEntry()

```
gdcm::ModuleEntry::ModuleEntry (
            const char * name = "",
            const char * type = "3",
            const char * description = "" )  [inline]
```

References gdcm::Type::GetTypeType().

10.191.3.2 ~ModuleEntry()

```
virtual gdcm::ModuleEntry::~ModuleEntry ( )  [virtual], [default]
```

10.191.4 Member Function Documentation

10.191.4.1 GetDescription()

```
const Description& gdcm::ModuleEntry::GetDescription ( ) const  [inline]
```

10.191.4.2 GetName()

```
const char* gdcm::ModuleEntry::GetName ( ) const  [inline]
```

10.191.4.3 GetType()

```
const Type& gdcm::ModuleEntry::GetType ( ) const  [inline]
```

10.191.4.4 SetDescription()

```
void gdcm::ModuleEntry::SetDescription (
            const char * d )  [inline]
```

10.191.4.5 SetName()

```
void gdcm::ModuleEntry::SetName (
            const char * name )  [inline]
```

10.191.4.6 SetType()

```
void gdcm::ModuleEntry::SetType (
            const Type & type )  [inline]
```

10.191.5 Friends And Related Function Documentation

10.191.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const ModuleEntry & _val )  [friend]
```

10.191.6 Member Data Documentation

10.191.6.1 DataElementType

```
Type gdcm::ModuleEntry::DataElementType  [protected]
```

10.191.6.2 DescriptionField

```
Description gdcm::ModuleEntry::DescriptionField  [protected]
```

10.191.6.3 Name

```
std::string gdcm::ModuleEntry::Name  [protected]
```

The documentation for this class was generated from the following file:

- gdcmModuleEntry.h

10.192 gdcm::Modules Class Reference

Class for representing a Modules.

```
#include <gdcmModules.h>
```

Public Types

- typedef std::map< std::string, Module > ModuleMapType

Public Member Functions

- Modules ()=default
- void AddModule (const char *ref, const Module &module)
- void Clear ()
- const Module & GetModule (const char *name) const
- bool IsEmpty () const

Friends

- std::ostream & operator<< (std::ostream &_os, const Modules &_val)

10.192.1 Detailed Description

Class for representing a Modules.

Note

bla

See also

Module

10.192.2 Member Typedef Documentation

10.192.2.1 ModuleMapType

```
typedef std::map<std::string, Module> gdcm::Modules::ModuleMapType
```

10.192.3 Constructor & Destructor Documentation

10.192.3.1 Modules()

```
gdcm::Modules::Modules ( )  [default]
```

10.192.4 Member Function Documentation

10.192.4.1 AddModule()

```
void gdcm::Modules::AddModule (
            const char * ref,
            const Module & module )  [inline]
```

10.192.4.2 Clear()

```
void gdcm::Modules::Clear ( )  [inline]
```

10.192.4.3 GetModule()

```
const Module& gdcm::Modules::GetModule (
            const char * name ) const  [inline]
```

10.192.4.4 IsEmpty()

```
bool gdcm::Modules::IsEmpty ( ) const  [inline]
```

10.192.5 Friends And Related Function Documentation

10.192.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Modules & _val )  [friend]
```

The documentation for this class was generated from the following file:

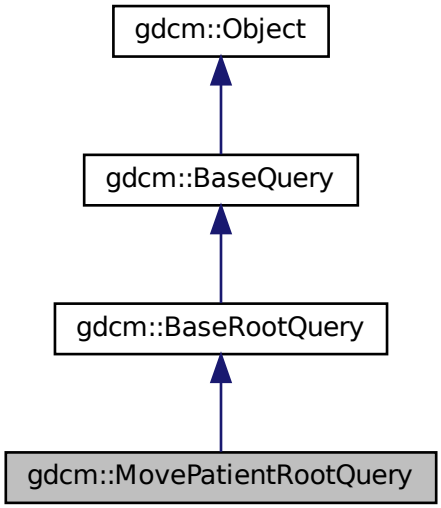
- gdcmModules.h

10.193 gdcm::MovePatientRootQuery Class Reference

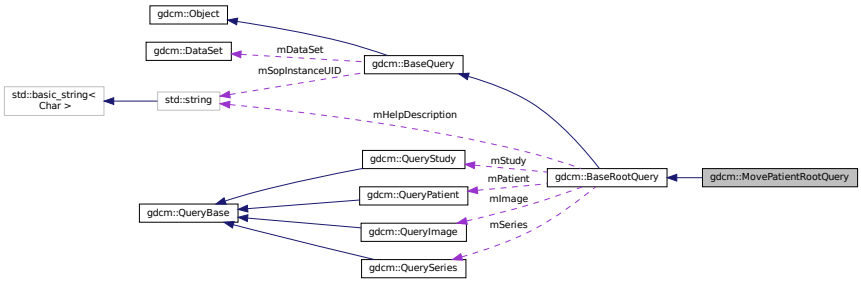
MovePatientRootQuery.

`#include <gdcmMovePatientRootQuery.h>`

Inheritance diagram for gdcm::MovePatientRootQuery:



Collaboration diagram for gdcm::MovePatientRootQuery:



Public Member Functions

- MovePatientRootQuery ()
- UIDs::TSName GetAbstractSyntaxUID () const override
- std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel) override
- void InitializeDataSet (const EQueryLevel &inQueryLevel) override
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.193.1 Detailed Description

MovePatientRootQuery.

contains: the class which will produce a dataset for c-move with patient root

10.193.2 Constructor & Destructor Documentation

10.193.2.1 MovePatientRootQuery()

```
gdcm::MovePatientRootQuery::MovePatientRootQuery ( )
```

10.193.3 Member Function Documentation

10.193.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::MovePatientRootQuery::GetAbstractSyntaxUID ( ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.193.3.2 GetTagListByLevel()

```
std::vector<Tag> gdcm::MovePatientRootQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements gdcm::BaseRootQuery.

10.193.3.3 InitializeDataSet()

```
void gdcm::MovePatientRootQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements gdcm::BaseRootQuery.

10.193.3.4 ValidateQuery()

```
bool gdcm::MovePatientRootQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements gdcm::BaseRootQuery.

10.193.4 Friends And Related Function Documentation

10.193.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

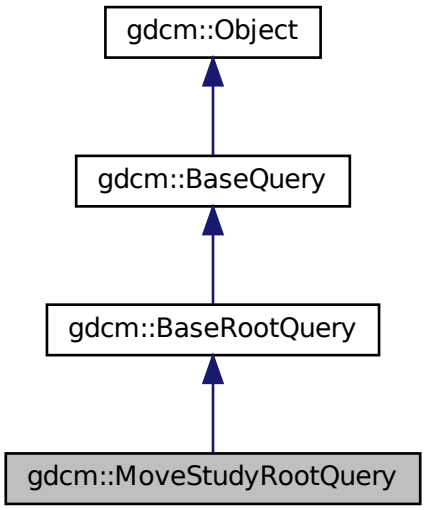
- gdcmMovePatientRootQuery.h

10.194 gdcm::MoveStudyRootQuery Class Reference

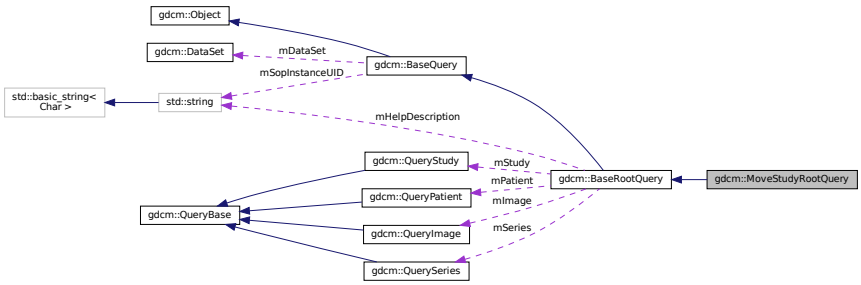
MoveStudyRootQuery.

`#include <gdcmMoveStudyRootQuery.h>`

Inheritance diagram for gdcm::MoveStudyRootQuery:



Collaboration diagram for gdcm::MoveStudyRootQuery:



Public Member Functions

- MoveStudyRootQuery ()
- UIDs::TSName GetAbstractSyntaxUID () const override
- std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel) override
- void InitializeDataSet (const EQueryLevel &inQueryLevel) override
- bool ValidateQuery (bool inStrict=true) const override

Friends

- class QueryFactory

Additional Inherited Members

10.194.1 Detailed Description

MoveStudyRootQuery.

contains: the class which will produce a dataset for C-MOVE with study root

10.194.2 Constructor & Destructor Documentation

10.194.2.1 MoveStudyRootQuery()

```
gdcm::MoveStudyRootQuery::MoveStudyRootQuery ( )
```

10.194.3 Member Function Documentation

10.194.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::MoveStudyRootQuery::GetAbstractSyntaxUID ( ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.194.3.2 GetTagListByLevel()

```
std::vector<Tag> gdcm::MoveStudyRootQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements gdcm::BaseRootQuery.

10.194.3.3 InitializeDataSet()

```
void gdcm::MoveStudyRootQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements gdcm::BaseRootQuery.

10.194.3.4 ValidateQuery()

```
bool gdcm::MoveStudyRootQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements gdcm::BaseRootQuery.

10.194.4 Friends And Related Function Documentation

10.194.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

- gdcmMoveStudyRootQuery.h

10.195 gdcm::MrProtocol Class Reference

Class for MrProtocol.

```
#include <gdcmMrProtocol.h>
```

Classes

- struct Slice
- struct SliceArray
- struct Vector3

Public Member Functions

- MrProtocol ()
- ~MrProtocol ()
- bool FindMrProtocolByName (const char *name) const
- const char * GetMrProtocolByName (const char *name) const
- bool GetSliceArray (MrProtocol::SliceArray &sa) const
- int GetVersion () const
- bool Load (const ByteValue *bv, const char *str, int version)
- void Print (std::ostream &os) const

Friends

- std::ostream & operator<< (std::ostream &_os, const MrProtocol &d)

10.195.1 Detailed Description

Class for MrProtocol.

Examples

MrProtocol.cxx.

10.195.2 Constructor & Destructor Documentation

10.195.2.1 MrProtocol()

```
gdcm::MrProtocol::MrProtocol ( )
```

10.195.2.2 ~MrProtocol()

```
gdcm::MrProtocol::~MrProtocol ( )
```

10.195.3 Member Function Documentation

10.195.3.1 FindMrProtocolByName()

```
bool gdcm::MrProtocol::FindMrProtocolByName (
            const char * name ) const
```

10.195.3.2 GetMrProtocolByName()

```
const char* gdcm::MrProtocol::GetMrProtocolByName (
            const char * name ) const
```

10.195.3.3 GetSliceArray()

```
bool gdcm::MrProtocol::GetSliceArray (
            MrProtocol::SliceArray & sa ) const
```

10.195.3.4 GetVersion()

```
int gdcm::MrProtocol::GetVersion ( ) const
```

10.195.3.5 Load()

```
bool gdcm::MrProtocol::Load (
            const ByteValue * bv,
            const char * str,
            int version )
```

10.195.3.6 Print()

```
void gdcm::MrProtocol::Print (
            std::ostream & os ) const
```

10.195.4 Friends And Related Function Documentation

10.195.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const MrProtocol & d )  [friend]
```

The documentation for this class was generated from the following file:

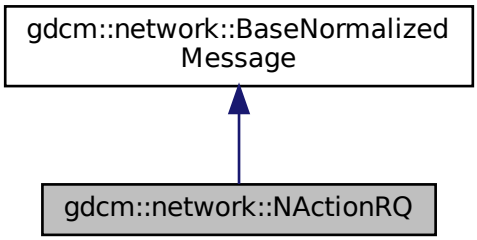
- gdcmMrProtocol.h

10.196 gdcm::network::NActionRQ Class Reference

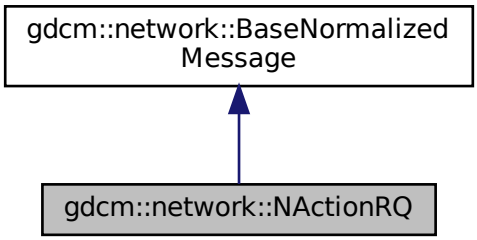
NActionRQ.

`#include <gdcmNActionMessages.h>`

Inheritance diagram for gdcm::network::NActionRQ:



Collaboration diagram for gdcm::network::NActionRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.196.1 Detailed Description

NActionRQ.

this file defines the messages for the NAction action

10.196.2 Member Function Documentation

10.196.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NActionRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

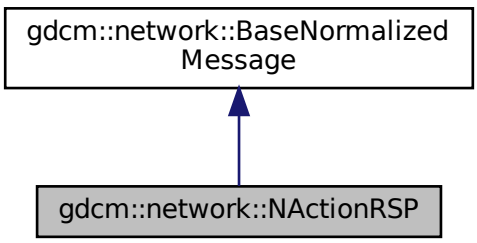
- gdcmNActionMessages.h

10.197 gdcm::network::NActionRSP Class Reference

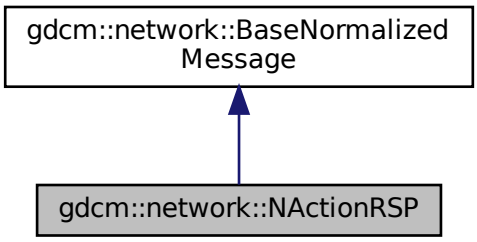
NActionRSP this file defines the messages for the NAction action.

```
#include <gdcmNActionMessages.h>
```

Inheritance diagram for gdcm::network::NActionRSP:



Collaboration diagram for gdcm::network::NActionRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.197.1 Detailed Description

NActionRSP this file defines the messages for the NAction action.

10.197.2 Member Function Documentation

10.197.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NActionRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

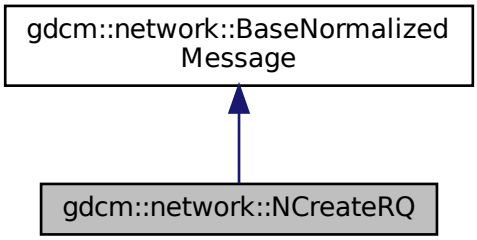
- gdcmNActionMessages.h

10.198 gdcm::network::NCreateRQ Class Reference

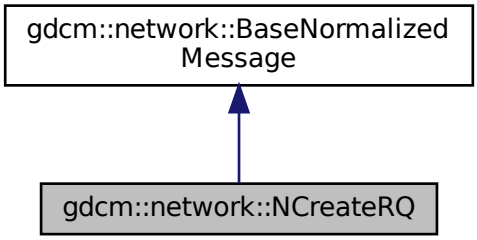
NCreateRQ.

`#include <gdcmNCreateMessages.h>`

Inheritance diagram for gdcm::network::NCreateRQ:



Collaboration diagram for gdcm::network::NCreateRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.198.1 Detailed Description

NCreateRQ.

this file defines the messages for the ncreate action

10.198.2 Member Function Documentation

10.198.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NCreateRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

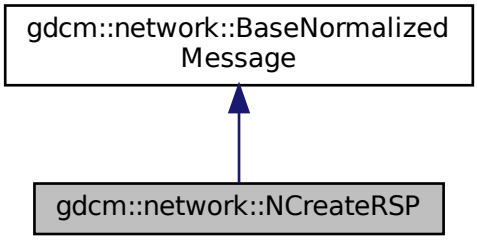
- gdcmNCreateMessages.h

10.199 gdcm::network::NCreateRSP Class Reference

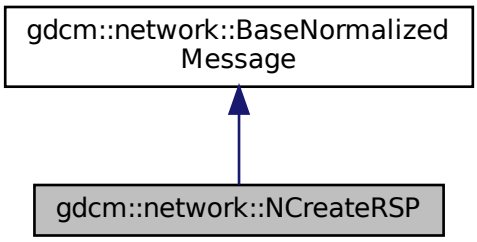
NCreateRSP this file defines the messages for the ncreate action.

```
#include <gdcmNCreateMessages.h>
```

Inheritance diagram for gdcm::network::NCreateRSP:



Collaboration diagram for gdcm::network::NCreateRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.199.1 Detailed Description

NCreateRSP this file defines the messages for the ncreate action.

10.199.2 Member Function Documentation

10.199.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NCreateRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

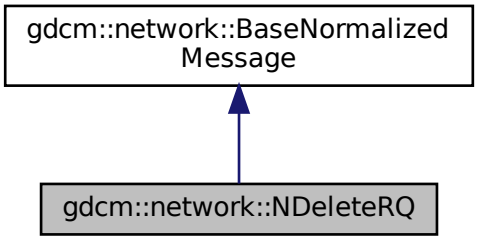
- gdcmNCreateMessages.h

10.200 gdcm::network::NDeleteRQ Class Reference

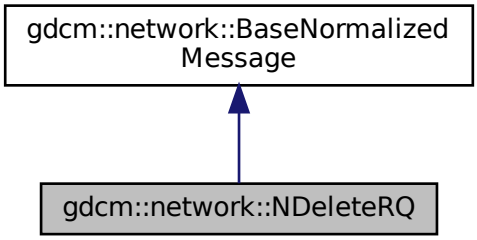
NDeleteRQ.

`#include <gdcmNDeleteMessages.h>`

Inheritance diagram for gdcm::network::NDeleteRQ:



Collaboration diagram for gdcm::network::NDeleteRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.200.1 Detailed Description

NDeleteRQ.

this file defines the messages for the ndelete action

10.200.2 Member Function Documentation

10.200.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NDeleteRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

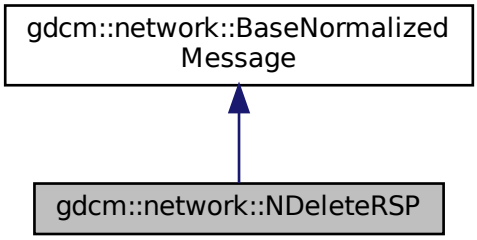
- gdcmNDeleteMessages.h

10.201 gdcm::network::NDeleteRSP Class Reference

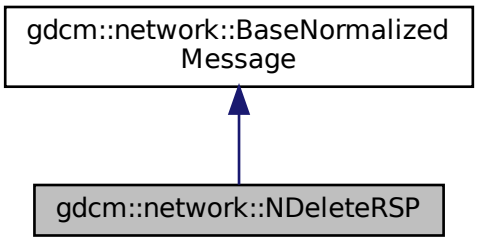
NDeleteRSP this file defines the messages for the ndelete action.

```
#include <gdcmNDeleteMessages.h>
```

Inheritance diagram for gdcm::network::NDeleteRSP:



Collaboration diagram for gdcm::network::NDeleteRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.201.1 Detailed Description

NDeleteRSP this file defines the messages for the ndelete action.

10.201.2 Member Function Documentation

10.201.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NDeleteRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

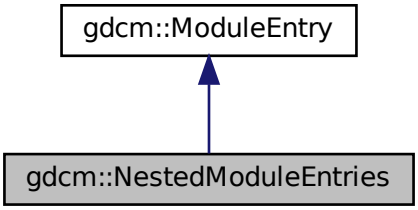
- gdcmNDeleteMessages.h

10.202 gdcm::NestedModuleEntries Class Reference

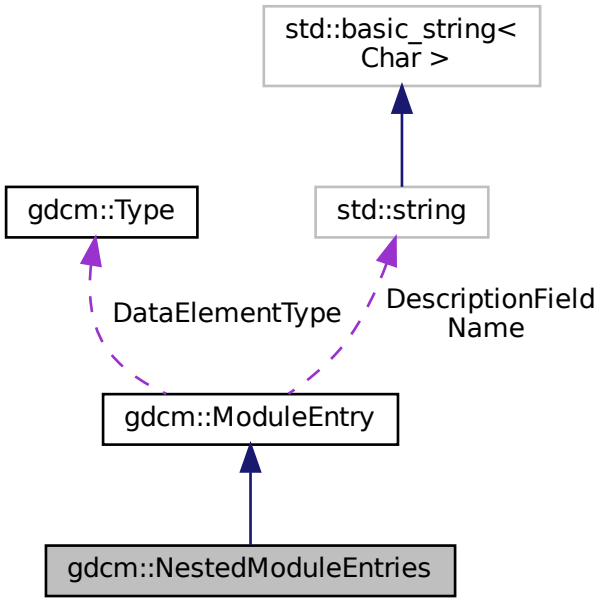
Class for representing a NestedModuleEntries.

`#include <gdcmNestedModuleEntries.h>`

Inheritance diagram for gdcm::NestedModuleEntries:



Collaboration diagram for gdcm::NestedModuleEntries:



Public Types

- typedef std::vector< ModuleEntry >::size_type SizeType

Public Member Functions

- NestedModuleEntries (const char *name="", const char *type="3", const char *description="")
- void AddModuleEntry (const ModuleEntry &me)
- ModuleEntry & GetModuleEntry (SizeType idx)
- const ModuleEntry & GetModuleEntry (SizeType idx) const
- SizeType GetNumberOfModuleEntries ()

Friends

- std::ostream & operator<< (std::ostream &_os, const NestedModuleEntries &_val)

Additional Inherited Members

10.202.1 Detailed Description

Class for representing a NestedModuleEntries.

Note

bla

See also

ModuleEntry

10.202.2 Member Typedef Documentation

10.202.2.1 SizeType

```
typedef std::vector<ModuleEntry>::size_type gdcm::NestedModuleEntries::SizeType
```

10.202.3 Constructor & Destructor Documentation

10.202.3.1 NestedModuleEntries()

```
gdcm::NestedModuleEntries::NestedModuleEntries (
            const char * name = "",
            const char * type = "3",
            const char * description = "" )  [inline]
```

10.202.4 Member Function Documentation

10.202.4.1 AddModuleEntry()

```
void gdcm::NestedModuleEntries::AddModuleEntry (
            const ModuleEntry & me )  [inline]
```

10.202.4.2 GetModuleEntry() [1/2]

```
ModuleEntry& gdcm::NestedModuleEntries::GetModuleEntry (
            SizeType idx )  [inline]
```

10.202.4.3 GetModuleEntry() [2/2]

```
const ModuleEntry& gdcm::NestedModuleEntries::GetModuleEntry (
            SizeType idx ) const  [inline]
```

10.202.4.4 GetNumberOfModuleEntries()

```
SizeType gdcm::NestedModuleEntries::GetNumberOfModuleEntries ( )  [inline]
```

10.202.5 Friends And Related Function Documentation

10.202.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const NestedModuleEntries & _val )  [friend]
```

The documentation for this class was generated from the following file:

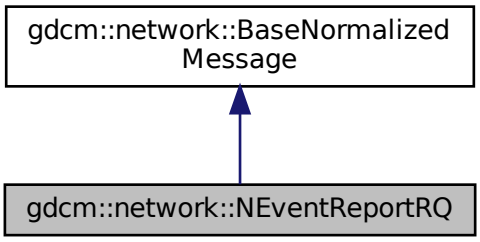
- gdcmNestedModuleEntries.h

10.203 gdcm::network::NEventReportRQ Class Reference

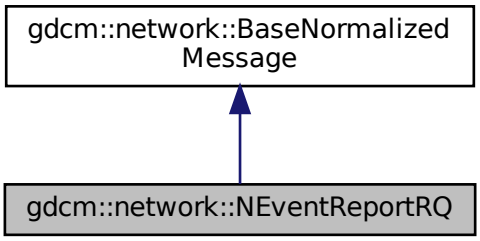
NEventReportRQ.

```
#include <gdcmNEventReportMessages.h>
```

Inheritance diagram for gdcm::network::NEventReportRQ:



Collaboration diagram for gdcm::network::NEventReportRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.203.1 Detailed Description

NEventReportRQ.

this file defines the messages for the neventreport action

10.203.2 Member Function Documentation

10.203.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NEventReportRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

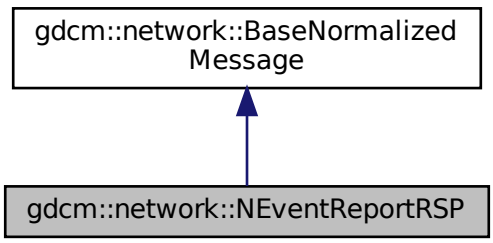
- gdcmNEventReportMessages.h

10.204 gdcm::network::NEventReportRSP Class Reference

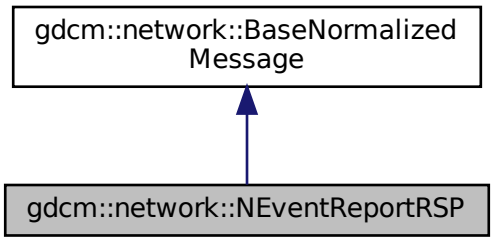
NEventReportRSP this file defines the messages for the neventreport action.

```
#include <gdcmNEventReportMessages.h>
```

Inheritance diagram for gdcm::network::NEventReportRSP:



Collaboration diagram for gdcm::network::NEventReportRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.204.1 Detailed Description

NEventReportRSP this file defines the messages for the neventreport action.

10.204.2 Member Function Documentation

10.204.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NEventReportRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

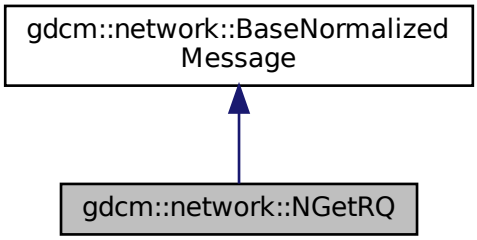
- gdcmNEventReportMessages.h

10.205 gdcm::network::NGetRQ Class Reference

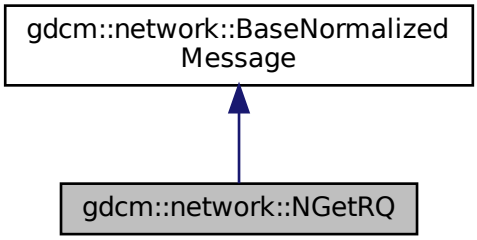
NGetRQ.

`#include <gdcmNGetMessages.h>`

Inheritance diagram for gdcm::network::NGetRQ:



Collaboration diagram for gdcm::network::NGetRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.205.1 Detailed Description

NGetRQ.

this file defines the messages for the nget action

10.205.2 Member Function Documentation

10.205.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NGetRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

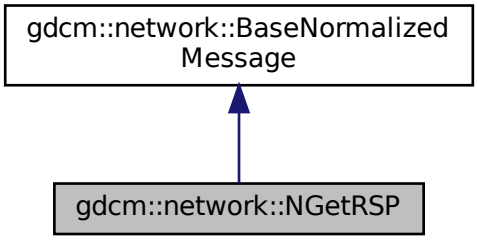
- gdcmNGetMessages.h

10.206 gdcm::network::NGetRSP Class Reference

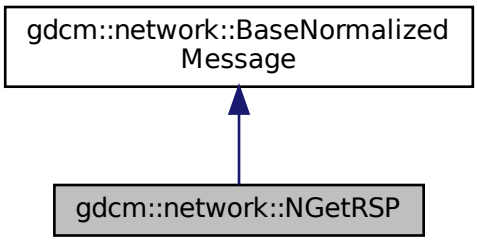
NGetRSP this file defines the messages for the nget action.

```
#include <gdcmNGetMessages.h>
```

Inheritance diagram for gdcm::network::NGetRSP:



Collaboration diagram for gdcm::network::NGetRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.206.1 Detailed Description

NGetRSP this file defines the messages for the nget action.

10.206.2 Member Function Documentation

10.206.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NGetRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

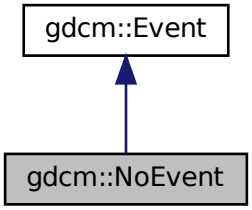
The documentation for this class was generated from the following file:

- gdcmNGetMessages.h

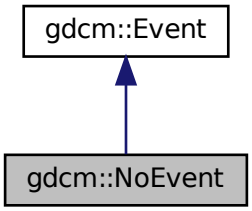
10.207 gdcm::NoEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::NoEvent:



Collaboration diagram for gdcm::NoEvent:



Additional Inherited Members

10.207.1 Detailed Description

Define some common GDCM events

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.208 gdcm::network::NormalizedMessageFactory Class Reference

`#include <gdcmNormalizedMessageFactory.h>`

Static Public Member Functions

- static std::vector< PresentationDataValue > ConstructNAction (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< PresentationDataValue > ConstructNCreate (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< PresentationDataValue > ConstructNDelete (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< PresentationDataValue > ConstructNEventReport (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< PresentationDataValue > ConstructNGet (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< PresentationDataValue > ConstructNSet (const ULConnection &inConnection, const BaseQuery *inQuery)

10.208.1 Member Function Documentation

10.208.1.1 ConstructNAction()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::Construct↩
NAction (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.208.1.2 ConstructNCreate()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::Construct↩
NCreate (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.208.1.3 ConstructNDelete()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::Construct↩
NDelete (
              const ULConnection & inConnection,
              const BaseQuery * inQuery )  [static]
```

10.208.1.4 ConstructNEventReport()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::Construct↩
NEventReport (
              const ULConnection & inConnection,
              const BaseQuery * inQuery )  [static]
```

10.208.1.5 ConstructNGet()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::ConstructNGet
(
              const ULConnection & inConnection,
              const BaseQuery * inQuery )  [static]
```

10.208.1.6 ConstructNSet()

```
static std::vector<PresentationDataValue> gdcm::network::NormalizedMessageFactory::ConstructNSet
(
              const ULConnection & inConnection,
              const BaseQuery * inQuery )  [static]
```

The documentation for this class was generated from the following file:

- gdcmNormalizedMessageFactory.h

10.209 gdcm::NormalizedNetworkFunctions Class Reference

Normalized Network Functions.

```
#include <gdcmNormalizedNetworkFunctions.h>
```

Static Public Member Functions

- static BaseQuery * ConstructQuery (const std::string &sopInstanceUID, const DataSet &queryds, ENQueryType queryType=eCreateMMPS)
- static bool NAction (const char *remote, uint16_t portno, const BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)
- static bool NCreate (const char *remote, uint16_t portno, BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)
- static bool NDelete (const char *remote, uint16_t portno, const BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)
- static bool NEventReport (const char *remote, uint16_t portno, const BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)
- static bool NGet (const char *remote, uint16_t portno, const BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)
- static bool NSet (const char *remote, uint16_t portno, const BaseQuery *query, std::vector< DataSet > &retDataSets, const char *aetitle, const char *call)

10.209.1 Detailed Description

Normalized Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- N-EVENT-REPORT
- N-GET
- N-SET
- N-ACTION
- N-CREATE
- N-DELETE

10.209.2 Member Function Documentation

10.209.2.1 ConstructQuery()

```
static BaseQuery* gdcm::NormalizedNetworkFunctions::ConstructQuery (
            const std::string & sopInstanceUID,
            const DataSet & queryds,
            ENQueryType queryType = eCreateMMPS )  [static]
```

10.209.2.2 NAction()

```
static bool gdcm::NormalizedNetworkFunctions::NAction (
            const char * remote,
            uint16_t portno,
            const BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

10.209.2.3 NCreate()

```
static bool gdcm::NormalizedNetworkFunctions::NCreate (
            const char * remote,
            uint16_t portno,
            BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

10.209.2.4 NDelete()

```
static bool gdcm::NormalizedNetworkFunctions::NDelete (
            const char * remote,
            uint16_t portno,
            const BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

10.209.2.5 NEventReport()

```
static bool gdcm::NormalizedNetworkFunctions::NEventReport (
            const char * remote,
            uint16_t portno,
            const BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

10.209.2.6 NGet()

```
static bool gdcm::NormalizedNetworkFunctions::NGet (
            const char * remote,
            uint16_t portno,
            const BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

10.209.2.7 NSet()

```
static bool gdcm::NormalizedNetworkFunctions::NSet (
            const char * remote,
            uint16_t portno,
            const BaseQuery * query,
            std::vector< DataSet > & retDataSets,
            const char * aetitle,
            const char * call )  [static]
```

The documentation for this class was generated from the following file:

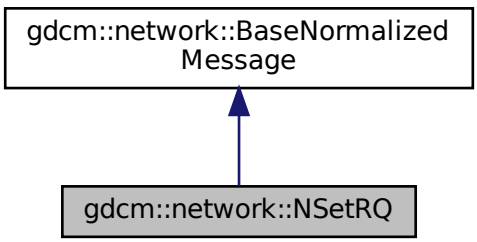
- gdcmNormalizedNetworkFunctions.h

10.210 gdcm::network::NSetRQ Class Reference

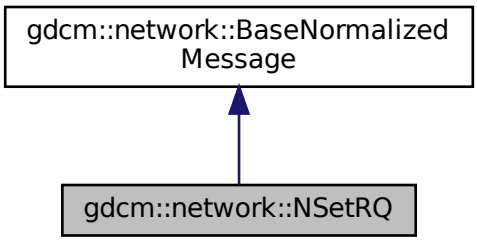
NSetRQ.

`#include <gdcmNSetMessages.h>`

Inheritance diagram for gdcm::network::NSetRQ:



Collaboration diagram for gdcm::network::NSetRQ:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery) override

10.210.1 Detailed Description

NSetRQ.

this file defines the messages for the nset action

10.210.2 Member Function Documentation

10.210.2.1 ConstructPDV()

```
std::vector<PresentationDataValue> gdcm::network::NSetRQ::ConstructPDV (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [override], [virtual]
```

Implements gdcm::network::BaseNormalizedMessage.

The documentation for this class was generated from the following file:

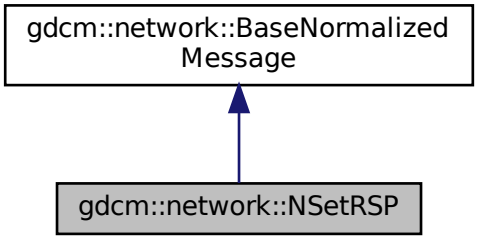
- gdcmNSetMessages.h

10.211 gdcm::network::NSetRSP Class Reference

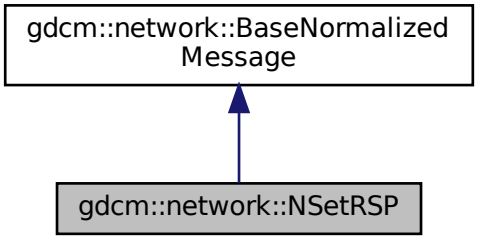
NSetRSP this file defines the messages for the nset action.

`#include <gdcmNSetMessages.h>`

Inheritance diagram for gdcm::network::NSetRSP:



Collaboration diagram for gdcm::network::NSetRSP:



Public Member Functions

- std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)

10.211.1 Detailed Description

NSetRSP this file defines the messages for the nset action.

10.211.2 Member Function Documentation

10.211.2.1 ConstructPDVByDataSet()

```
std::vector<PresentationDataValue> gdcm::network::NSetRSP::ConstructPDVByDataSet (
            const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

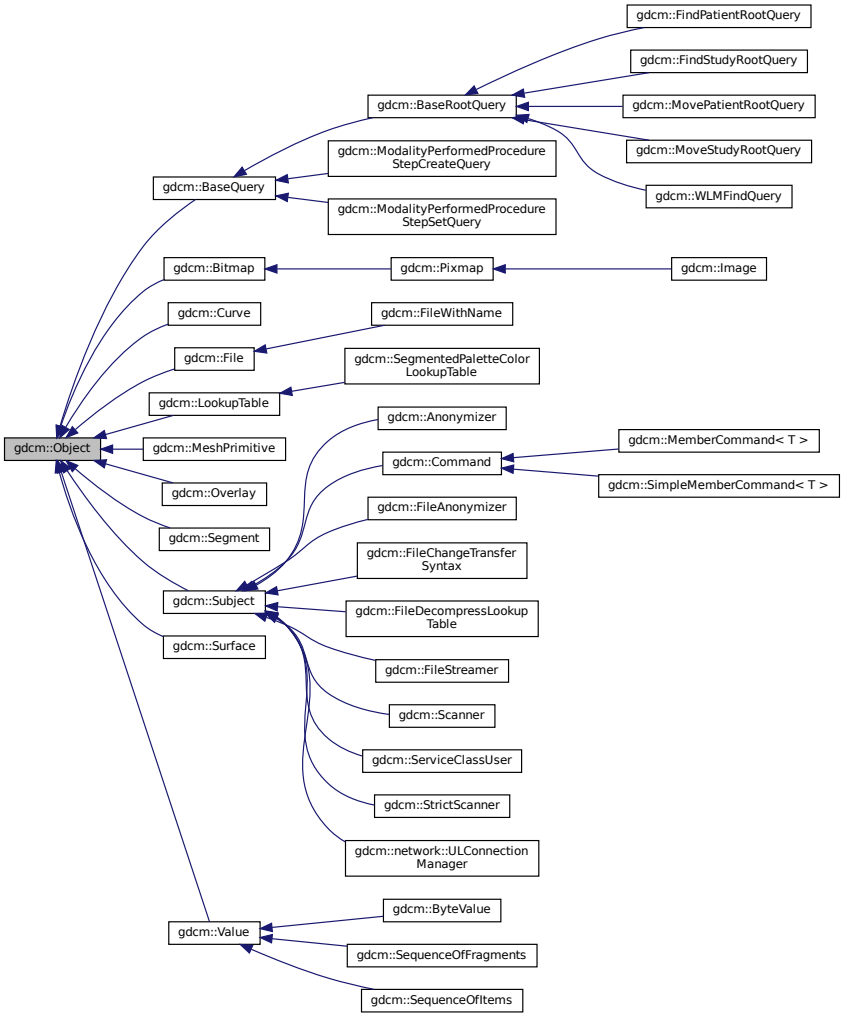
- gdcmNSetMessages.h

10.212 gdcm::Object Class Reference

Object.

```
#include <gdcmObject.h>
```

Inheritance diagram for gdcm::Object:



Public Member Functions

- Object ()
- Object (const Object &)

  Special requirement for copy/cstor, assignment operator.
- virtual ~Object ()
- void operator= (const Object &)
- virtual void Print (std::ostream &) const

Protected Member Functions

- void Register ()
- void UnRegister ()

Friends

- std::ostream & operator<< (std::ostream &os, const Object &obj)
- template<class ObjectType >
  class SmartPointer

10.212.1 Detailed Description

Object.

Note

main superclass for object that want to use SmartPointer invasive ref counting system

See also

SmartPointer

10.212.2 Constructor & Destructor Documentation

10.212.2.1 Object() [1/2]

```
gdcm::Object::Object ( )  [inline]
```

10.212.2.2 ~Object()

```
virtual gdcm::Object::~Object ( )  [inline], [virtual]
```

10.212.2.3 Object() [2/2]

```
gdcm::Object::Object (
            const Object &  )  [inline]
```

Special requirement for copy/cstor, assignment operator.

10.212.3 Member Function Documentation

10.212.3.1 operator=()

```
void gdcm::Object::operator= (
            const Object &  )  [inline]
```

10.212.3.2 Print()

```
virtual void gdcm::Object::Print (
            std::ostream &  ) const  [inline], [virtual]
```

Reimplemented in gdcm::BaseQuery, gdcm::StrictScanner, gdcm::Scanner, gdcm::Image, gdcm::SequenceOfItems, gdcm::SequenceOfFragments, gdcm::ByteValue, gdcm::SegmentedPaletteColorLookupTable, gdcm::Pixmap, gdcm::Overlay, gdcm::LookupTable, gdcm::Curve, and gdcm::Bitmap.

Examples

ReadAndDumpDICOMDIR.cxx.

10.212.3.3 Register()

```
void gdcm::Object::Register ( )  [inline], [protected]
```

10.212.3.4 UnRegister()

```
void gdcm::Object::UnRegister ( )  [inline], [protected]
```

10.212.4 Friends And Related Function Documentation

10.212.4.1 operator<<

```
std::ostream& operator<< (
             std::ostream & os,
             const Object & obj )  [friend]
```

10.212.4.2 SmartPointer

```
template<class ObjectType >
friend class SmartPointer  [friend]
```

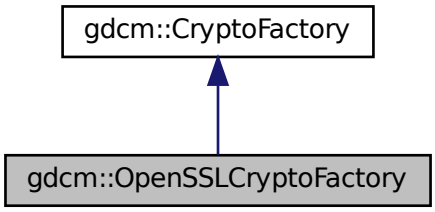
The documentation for this class was generated from the following file:

- gdcmObject.h

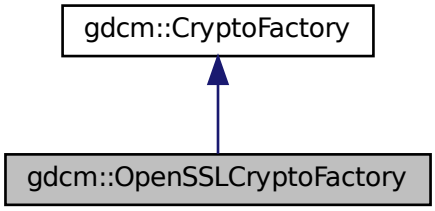
10.213 gdcm::OpenSSLCryptoFactory Class Reference

`#include <gdcmOpenSSLCryptoFactory.h>`

Inheritance diagram for gdcm::OpenSSLCryptoFactory:



Collaboration diagram for gdcm::OpenSSLCryptoFactory:



Public Member Functions

- OpenSSLCryptoFactory (CryptoLib id)
- CryptographicMessageSyntax * CreateCMSProvider ()

Protected Member Functions

- void InitOpenSSL ()

Additional Inherited Members

10.213.1 Constructor & Destructor Documentation

10.213.1.1 OpenSSLCryptoFactory()

```
gdcm::OpenSSLCryptoFactory::OpenSSLCryptoFactory (
            CryptoLib id )  [inline]
```

References gdcmDebugMacro.

10.213.2 Member Function Documentation

10.213.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax* gdcm::OpenSSLCryptoFactory::CreateCMSProvider ( )  [inline], [virtual]
```

Implements gdcm::CryptoFactory.

10.213.2.2 InitOpenSSL()

```
void gdcm::OpenSSLCryptoFactory::InitOpenSSL ( )  [protected]
```

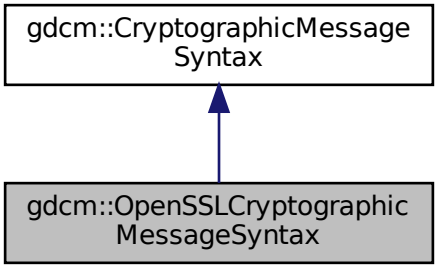
The documentation for this class was generated from the following file:

- gdcmOpenSSLCryptoFactory.h

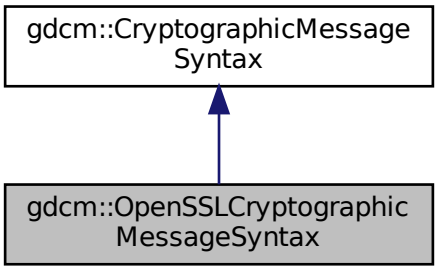
10.214 gdcm::OpenSSLCryptographicMessageSyntax Class Reference

`#include <gdcmOpenSSLCryptographicMessageSyntax.h>`

Inheritance diagram for gdcm::OpenSSLCryptographicMessageSyntax:



Collaboration diagram for gdcm::OpenSSLCryptographicMessageSyntax:



Public Member Functions

- OpenSSLCryptographicMessageSyntax ()
- ~OpenSSLCryptographicMessageSyntax ()
- bool Decrypt (char *output, size_t &outlen, const char *array, size_t len) const

  decrypt content from a PKCS#7 envelopedData structure
- bool Encrypt (char *output, size_t &outlen, const char *array, size_t len) const

  create a CMS envelopedData structure

- CipherTypes GetCipherType () const
- bool ParseCertificateFile (const char *filename)
- bool ParseKeyFile (const char *filename)
- void SetCipherType (CipherTypes type)
- bool SetPassword (const char *pass, size_t passLen)

Additional Inherited Members

10.214.1 Constructor & Destructor Documentation

10.214.1.1 OpenSSLCryptographicMessageSyntax()

```
gdcm::OpenSSLCryptographicMessageSyntax::OpenSSLCryptographicMessageSyntax ( )
```

10.214.1.2 ~OpenSSLCryptographicMessageSyntax()

```
gdcm::OpenSSLCryptographicMessageSyntax::~OpenSSLCryptographicMessageSyntax ( )
```

10.214.2 Member Function Documentation

10.214.2.1 Decrypt()

```
bool gdcm::OpenSSLCryptographicMessageSyntax::Decrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.214.2.2 Encrypt()

```
bool gdcm::OpenSSLCryptographicMessageSyntax::Encrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

create a CMS envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.214.2.3 GetCipherType()

```
CipherTypes gdcm::OpenSSLCryptographicMessageSyntax::GetCipherType ( ) const  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.214.2.4 ParseCertificateFile()

```
bool gdcm::OpenSSLCryptographicMessageSyntax::ParseCertificateFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.214.2.5 ParseKeyFile()

```
bool gdcm::OpenSSLCryptographicMessageSyntax::ParseKeyFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.214.2.6 SetCipherType()

```
void gdcm::OpenSSLCryptographicMessageSyntax::SetCipherType (
            CipherTypes type )  [virtual]
```

Set Cipher Type. Default is: AES256_CIPHER

Implements gdcm::CryptographicMessageSyntax.

10.214.2.7 SetPassword()

```
bool gdcm::OpenSSLCryptographicMessageSyntax::SetPassword (
            const char * pass,
            size_t passLen )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

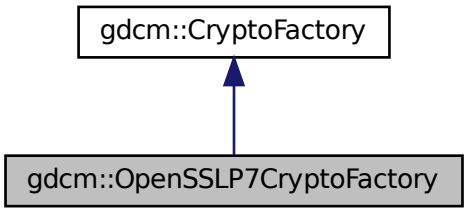
The documentation for this class was generated from the following file:

- gdcmOpenSSLCryptographicMessageSyntax.h

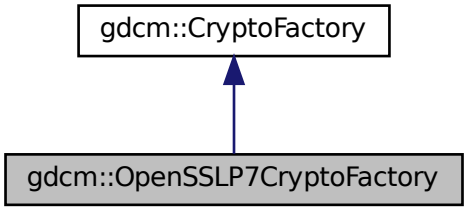
10.215 gdcm::OpenSSLP7CryptoFactory Class Reference

```
#include <gdcmOpenSSLP7CryptoFactory.h>
```

Inheritance diagram for gdcm::OpenSSLP7CryptoFactory:



Collaboration diagram for gdcm::OpenSSLP7CryptoFactory:



Public Member Functions

- OpenSSLP7CryptoFactory (CryptoLib id)
- CryptographicMessageSyntax * CreateCMSProvider ()

Additional Inherited Members

10.215.1 Constructor & Destructor Documentation

10.215.1.1 OpenSSLP7CryptoFactory()

```
gdcm::OpenSSLP7CryptoFactory::OpenSSLP7CryptoFactory (
            CryptoLib id )  [inline]
```

References gdcmDebugMacro.

10.215.2 Member Function Documentation

10.215.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax* gdcm::OpenSSLP7CryptoFactory::CreateCMSProvider ( )  [inline], [virtual]
```

Implements gdcm::CryptoFactory.

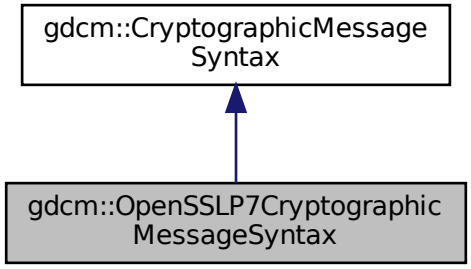
The documentation for this class was generated from the following file:

- gdcmOpenSSLP7CryptoFactory.h

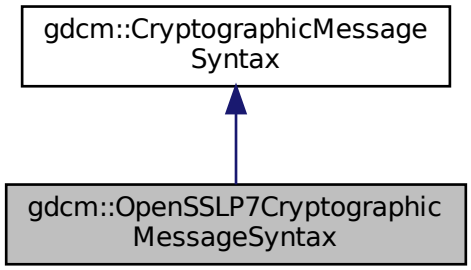
10.216 gdcm::OpenSSLP7CryptographicMessageSyntax Class Reference

`#include <gdcmOpenSSLP7CryptographicMessageSyntax.h>`

Inheritance diagram for gdcm::OpenSSLP7CryptographicMessageSyntax:



Collaboration diagram for gdcm::OpenSSLP7CryptographicMessageSyntax:



Public Member Functions

- OpenSSLP7CryptographicMessageSyntax ()
- ~OpenSSLP7CryptographicMessageSyntax ()
- bool Decrypt (char *output, size_t &outlen, const char *array, size_t len) const

  decrypt content from a PKCS#7 envelopedData structure
- bool Encrypt (char *output, size_t &outlen, const char *array, size_t len) const

  create a PKCS#7 envelopedData structure

- CipherTypes GetCipherType () const
- bool ParseCertificateFile (const char *filename)
- bool ParseKeyFile (const char *filename)
- void SetCipherType (CipherTypes type)
- bool SetPassword (const char *, size_t)

Additional Inherited Members

10.216.1 Detailed Description

Class for CryptographicMessageSyntax encryption. This is just a simple wrapper around openssl PKCS7_encrypt functionalities

See online documentation `http://www.openssl.org/docs/crypto/PKCS7_encrypt.html`

10.216.2 Constructor & Destructor Documentation

10.216.2.1 OpenSSLP7CryptographicMessageSyntax()

```
gdcm::OpenSSLP7CryptographicMessageSyntax::OpenSSLP7CryptographicMessageSyntax ( )
```

10.216.2.2 ~OpenSSLP7CryptographicMessageSyntax()

```
gdcm::OpenSSLP7CryptographicMessageSyntax::~OpenSSLP7CryptographicMessageSyntax ( )
```

10.216.3 Member Function Documentation

10.216.3.1 Decrypt()

```
bool gdcm::OpenSSLP7CryptographicMessageSyntax::Decrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.216.3.2 Encrypt()

```
bool gdcm::OpenSSLP7CryptographicMessageSyntax::Encrypt (
            char * output,
            size_t & outlen,
            const char * array,
            size_t len ) const  [virtual]
```

create a PKCS#7 envelopedData structure

Implements gdcm::CryptographicMessageSyntax.

10.216.3.3 GetCipherType()

```
CipherTypes gdcm::OpenSSLP7CryptographicMessageSyntax::GetCipherType ( ) const  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.216.3.4 ParseCertificateFile()

```
bool gdcm::OpenSSLP7CryptographicMessageSyntax::ParseCertificateFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.216.3.5 ParseKeyFile()

```
bool gdcm::OpenSSLP7CryptographicMessageSyntax::ParseKeyFile (
            const char * filename )  [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

10.216.3.6 SetCipherType()

```
void gdcm::OpenSSLP7CryptographicMessageSyntax::SetCipherType (
            CipherTypes type )  [virtual]
```

Set Cipher Type. Default is: AES256_CIPHER

Implements gdcm::CryptographicMessageSyntax.

10.216.3.7 SetPassword()

```
bool gdcm::OpenSSLP7CryptographicMessageSyntax::SetPassword (
            const char * ,
            size_t  )  [inline], [virtual]
```

Implements gdcm::CryptographicMessageSyntax.

References gdcmWarningMacro.

The documentation for this class was generated from the following file:

- gdcmOpenSSLP7CryptographicMessageSyntax.h

10.217 gdcm::Orientation Class Reference

class to handle Orientation

```
#include <gdcmOrientation.h>
```

Public Types

- enum OrientationType {
  UNKNOWN ,
  AXIAL ,
  CORONAL ,
  SAGITTAL ,
  OBLIQUE }

Public Member Functions

- Orientation ()
- ~Orientation ()
- void Print (std::ostream &) const

  Print.

Static Public Member Functions

- static const char * GetLabel (OrientationType type)

  Return the label of an Orientation.
- static double GetObliquityThresholdCosineValue ()
- static OrientationType GetType (const double dircos[6])
- static void SetObliquityThresholdCosineValue (double val)

  ObliquityThresholdCosineValue stuff.

Static Protected Member Functions

- static char GetMajorAxisFromPatientRelativeDirectionCosine (double x, double y, double z)

Friends

- std::ostream & operator<< (std::ostream &_os, const Orientation &o)

10.217.1 Detailed Description

class to handle Orientation

10.217.2 Member Enumeration Documentation

10.217.2.1 OrientationType

```
enum gdcm::Orientation::OrientationType
```

Enumerator

UNKNOWN	
AXIAL	
CORONAL	
SAGITTAL	
OBLIQUE	

10.217.3 Constructor & Destructor Documentation

10.217.3.1 Orientation()

```
gdcm::Orientation::Orientation ( )
```

10.217.3.2 ~Orientation()

```
gdcm::Orientation::~Orientation ( )
```

10.217.4 Member Function Documentation

10.217.4.1 GetLabel()

```
static const char* gdcm::Orientation::GetLabel (
            OrientationType type )  [static]
```

Return the label of an Orientation.

Examples

FixOrientation.cxx.

10.217.4.2 GetMajorAxisFromPatientRelativeDirectionCosine()

```
static char gdcm::Orientation::GetMajorAxisFromPatientRelativeDirectionCosine (
            double x,
            double y,
            double z )  [static], [protected]
```

10.217.4.3 GetObliquityThresholdCosineValue()

```
static double gdcm::Orientation::GetObliquityThresholdCosineValue ( )  [static]
```

10.217.4.4 GetType()

```
static OrientationType gdcm::Orientation::GetType (
            const double dircos[6] )  [static]
```

Return the type of orientation from a direction cosines Input is an array of 6 double

Examples

FixOrientation.cxx.

10.217.4.5 Print()

```
void gdcm::Orientation::Print (
            std::ostream &  ) const
```

Print.

10.217.4.6 SetObliquityThresholdCosineValue()

```
static void gdcm::Orientation::SetObliquityThresholdCosineValue (
            double val )  [static]
```

ObliquityThresholdCosineValue stuff.

10.217.5 Friends And Related Function Documentation

10.217.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Orientation & o )  [friend]
```

The documentation for this class was generated from the following file:

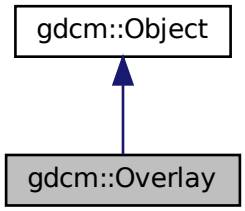
- gdcmOrientation.h

10.218 gdcm::Overlay Class Reference

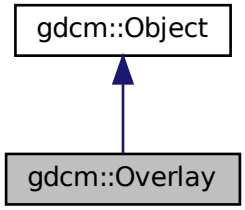
Overlay class.

```
#include <gdcmOverlay.h>
```

Inheritance diagram for gdcm::Overlay:



Collaboration diagram for gdcm::Overlay:



Public Types

- enum OverlayType {
  Invalid = 0 ,
  Graphics = 1 ,
  ROI = 2 }

Public Member Functions

- Overlay ()
- Overlay (Overlay const &ov)
- ~Overlay () override
- void Decompress (std::ostream &os) const

  Decode the internal OverlayData (packed bits) into unpacked representation.
- unsigned short GetBitPosition () const

  return bit position

- unsigned short GetBitsAllocated () const

  return bits allocated
- unsigned short GetColumns () const

  get columns
- const char * GetDescription () const

  get description
- unsigned short GetGroup () const

  Get Group number.
- const signed short * GetOrigin () const

  get origin
- const ByteValue & GetOverlayData () const
- unsigned short GetRows () const

  get rows
- const char * GetType () const

  get type
- OverlayType GetTypeAsEnum () const
- bool GetUnpackBuffer (char *buffer, size_t len) const
- size_t GetUnpackBufferLength () const
- bool GrabOverlayFromPixelData (DataSet const &ds)
- bool IsEmpty () const

  Return whether or not the Overlay is empty:
- bool IsInPixelData () const

  return if the Overlay is stored in the pixel data or not
- void IsInPixelData (bool b)

  Set whether or no the OverlayData is in the Pixel Data:
- bool IsZero () const

  return true if all bits are set to 0
- Overlay & operator= (Overlay const &ov)
- void Print (std::ostream &) const override

  Print.
- void SetBitPosition (unsigned short bitposition)

  set bit position
- void SetBitsAllocated (unsigned short bitsallocated)

  set bits allocated
- void SetColumns (unsigned short columns)

  set columns
- void SetDescription (const char *description)

  set description
- void SetFrameOrigin (unsigned short frameorigin)

  set frame origin
- void SetGroup (unsigned short group)

  Set Group number.
- void SetNumberOfFrames (unsigned int numberofframes)

  set number of frames
- void SetOrigin (const signed short origin[2])

  set origin
- void SetOverlay (const char *array, size_t length)

set overlay from byte array + length

- void SetRows (unsigned short rows)

  set rows

- void SetType (const char *type)

  set type

- void Update (const DataElement &de)

  Update overlay from data element de:

Static Public Member Functions

- static const char * GetOverlayTypeAsString (OverlayType ot)
- static OverlayType GetOverlayTypeFromString (const char *)

Additional Inherited Members

10.218.1 Detailed Description

Overlay class.

Note

see AreOverlaysInPixelData

Todo Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

Example:

10.218.2 Member Enumeration Documentation

10.218.2.1 OverlayType

`enum gdcm::Overlay::OverlayType`

Enumerator

Invalid	
Graphics	
ROI	

10.218.3 Constructor & Destructor Documentation

10.218.3.1 Overlay() [1/2]

```
gdcm::Overlay::Overlay ( )
```

10.218.3.2 ~Overlay()

```
gdcm::Overlay::~Overlay ( )  [override]
```

10.218.3.3 Overlay() [2/2]

```
gdcm::Overlay::Overlay (
            Overlay const & ov )
```

10.218.4 Member Function Documentation

10.218.4.1 Decompress()

```
void gdcm::Overlay::Decompress (
            std::ostream & os ) const
```

Decode the internal OverlayData (packed bits) into unpacked representation.

10.218.4.2 GetBitPosition()

```
unsigned short gdcm::Overlay::GetBitPosition ( ) const
```

return bit position

10.218.4.3 GetBitsAllocated()

```
unsigned short gdcm::Overlay::GetBitsAllocated ( ) const
```

return bits allocated

10.218.4.4 GetColumns()

```
unsigned short gdcm::Overlay::GetColumns ( ) const
```

get columns

10.218.4.5 GetDescription()

```
const char* gdcm::Overlay::GetDescription ( ) const
```

get description

10.218.4.6 GetGroup()

```
unsigned short gdcm::Overlay::GetGroup ( ) const
```

Get Group number.

10.218.4.7 GetOrigin()

```
const signed short* gdcm::Overlay::GetOrigin ( ) const
```

get origin

10.218.4.8 GetOverlayData()

```
const ByteValue& gdcm::Overlay::GetOverlayData ( ) const
```

Return the Overlay Data as ByteValue: Not thread safe

10.218.4.9 GetOverlayTypeAsString()

```
static const char* gdcm::Overlay::GetOverlayTypeAsString (
            OverlayType ot )  [static]
```

10.218.4.10 GetOverlayTypeFromString()

```
static OverlayType gdcm::Overlay::GetOverlayTypeFromString (
            const char *  )  [static]
```

10.218.4.11 GetRows()

```
unsigned short gdcm::Overlay::GetRows ( ) const
```

get rows

10.218.4.12 GetType()

```
const char* gdcm::Overlay::GetType ( ) const
```

get type

10.218.4.13 GetTypeAsEnum()

```
OverlayType gdcm::Overlay::GetTypeAsEnum ( ) const
```

10.218.4.14 GetUnpackBuffer()

```
bool gdcm::Overlay::GetUnpackBuffer (
            char * buffer,
            size_t len ) const
```

Retrieve the unpack buffer for Overlay. This is an error if the size if below GetUnpackBufferLength()

10.218.4.15 GetUnpackBufferLength()

```
size_t gdcm::Overlay::GetUnpackBufferLength ( ) const
```

Retrieve the size of the buffer needed to hold the Overlay as specified by Col & Row parameters

10.218.4.16 GrabOverlayFromPixelData()

```
bool gdcm::Overlay::GrabOverlayFromPixelData (
            DataSet const & ds )
```

10.218.4.17 IsEmpty()

```
bool gdcm::Overlay::IsEmpty ( ) const
```

Return whether or not the Overlay is empty:

10.218.4.18 IsInPixelData() [1/2]

```
bool gdcm::Overlay::IsInPixelData ( ) const
```

return if the Overlay is stored in the pixel data or not

10.218.4.19 IsInPixelData() [2/2]

```
void gdcm::Overlay::IsInPixelData (
            bool b )
```

Set whether or no the OverlayData is in the Pixel Data:

10.218.4.20 IsZero()

```
bool gdcm::Overlay::IsZero ( ) const
```

return true if all bits are set to 0

10.218.4.21 operator=()

```
Overlay& gdcm::Overlay::operator= (
            Overlay const & ov )
```

10.218.4.22 Print()

```
void gdcm::Overlay::Print (
            std::ostream &  ) const  [override], [virtual]
```

Print.

Reimplemented from gdcm::Object.

10.218.4.23 SetBitPosition()

```
void gdcm::Overlay::SetBitPosition (
            unsigned short bitposition )
```

set bit position

10.218.4.24 SetBitsAllocated()

```
void gdcm::Overlay::SetBitsAllocated (
            unsigned short bitsallocated )
```

set bits allocated

10.218.4.25 SetColumns()

```
void gdcm::Overlay::SetColumns (
            unsigned short columns )
```

set columns

10.218.4.26 SetDescription()

```
void gdcm::Overlay::SetDescription (
            const char * description )
```

set description

10.218.4.27 SetFrameOrigin()

```
void gdcm::Overlay::SetFrameOrigin (
            unsigned short frameorigin )
```

set frame origin

10.218.4.28 SetGroup()

```
void gdcm::Overlay::SetGroup (
            unsigned short group )
```

Set Group number.

10.218.4.29 SetNumberOfFrames()

```
void gdcm::Overlay::SetNumberOfFrames (
            unsigned int numberofframes )
```

set number of frames

10.218.4.30 SetOrigin()

```
void gdcm::Overlay::SetOrigin (
            const signed short origin[2] )
```

set origin

10.218.4.31 SetOverlay()

```
void gdcm::Overlay::SetOverlay (
            const char * array,
            size_t length )
```

set overlay from byte array + length

10.218.4.32 SetRows()

```
void gdcm::Overlay::SetRows (
            unsigned short rows )
```

set rows

10.218.4.33 SetType()

```
void gdcm::Overlay::SetType (
            const char * type )
```

set type

10.218.4.34 Update()

```
void gdcm::Overlay::Update (
            const DataElement & de )
```

Update overlay from data element de:

The documentation for this class was generated from the following file:

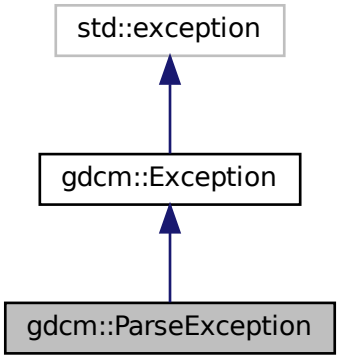
- gdcmOverlay.h

10.219 gdcm::ParseException Class Reference

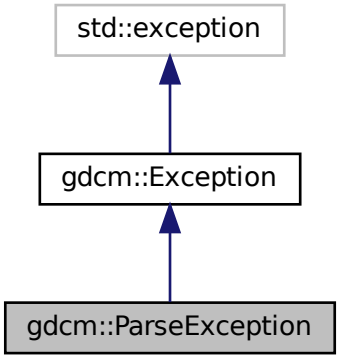
ParseException Standard exception handling object.

`#include <gdcmParseException.h>`

Inheritance diagram for gdcm::ParseException:



Collaboration diagram for gdcm::ParseException:



Public Member Functions

- ParseException ()=default
- ParseException (const ParseException &orig)
- ~ParseException () override throw ()
- const DataElement & GetLastElement () const
- ParseException & operator= (const ParseException &orig)
- void SetLastElement (DataElement &de)

10.219.1 Detailed Description

ParseException Standard exception handling object.

10.219.2 Constructor & Destructor Documentation

10.219.2.1 ParseException() [1/2]

```
gdcm::ParseException::ParseException ( )  [default]
```

10.219.2.2 ~ParseException()

```
gdcm::ParseException::~ParseException ( ) throw ( )   [inline], [override]
```

10.219.2.3 ParseException() [2/2]

```
gdcm::ParseException::ParseException (
            const ParseException & orig )  [inline]
```

10.219.3 Member Function Documentation

10.219.3.1 GetLastElement()

```
const DataElement& gdcm::ParseException::GetLastElement ( ) const  [inline]
```

10.219.3.2 operator=()

```
ParseException& gdcm::ParseException::operator= (
            const ParseException & orig )  [inline]
```

Assignment operator.

10.219.3.3 SetLastElement()

```
void gdcm::ParseException::SetLastElement (
            DataElement & de )  [inline]
```

Equivalence operator.

Referenced by gdcm::BasicOffsetTable::Read(), gdcm::Fragment::ReadBacktrack(), and gdcm::Fragment::ReadValue().

The documentation for this class was generated from the following file:

- gdcmParseException.h

10.220 gdcm::Parser Class Reference

Parser ala XML_Parser from expat (SAX)

```
#include <gdcmParser.h>
```

Public Types

- typedef void(∗ EndElementHandler) (void ∗userData, const Tag &name)
- enum ErrorType {
  NoError ,
  NoMemoryError ,
  SyntaxError ,
  NoElementsError ,
  TagMismatchError ,
  DuplicateAttributeError ,
  JunkAfterDocElementError ,
  UndefinedEntityError ,
  UnexpectedStateError }
- typedef void(∗ StartElementHandler) (void ∗userData, const Tag &tag, const char ∗atts[ ])

Public Member Functions

- Parser ()
- ~Parser ()
- unsigned long GetCurrentByteIndex () const
- ErrorType GetErrorCode () const
- void * GetUserData () const
- bool Parse (const char *s, int len, bool isFinal)
- void SetElementHandler (StartElementHandler start, EndElementHandler end)
- void SetUserData (void *userData)

Static Public Member Functions

- static const char * GetErrorString (ErrorType const &err)

Protected Member Functions

- char * GetBuffer (int len)
- bool ParseBuffer (int len, bool isFinal)
- ErrorType Process ()

10.220.1 Detailed Description

Parser ala XML_Parser from expat (SAX)

Detailed description here

Note

Simple API for DICOM

10.220.2 Member Typedef Documentation

10.220.2.1 EndElementHandler

```
typedef void(* gdcm::Parser::EndElementHandler) (void *userData, const Tag &name)
```

10.220.2.2 StartElementHandler

```
typedef void(* gdcm::Parser::StartElementHandler) (void *userData, const Tag &tag, const char
*atts[])
```

10.220.3 Member Enumeration Documentation

10.220.3.1 ErrorType

enum gdcm::Parser::ErrorType

Enumerator

NoError	
NoMemoryError	
SyntaxError	
NoElementsError	
TagMismatchError	
DuplicateAttributeError	
JunkAfterDocElementError	
UndefinedEntityError	
UnexpectedStateError	

10.220.4 Constructor & Destructor Documentation

10.220.4.1 Parser()

```
gdcm::Parser::Parser ( )  [inline]
```

10.220.4.2 ~Parser()

```
gdcm::Parser::~Parser ( )  [inline]
```

10.220.5 Member Function Documentation

10.220.5.1 GetBuffer()

```
char* gdcm::Parser::GetBuffer (
            int len )  [protected]
```

10.220.5.2 GetCurrentByteIndex()

```
unsigned long gdcm::Parser::GetCurrentByteIndex ( ) const
```

10.220.5.3 GetErrorCode()

```
ErrorType gdcm::Parser::GetErrorCode ( ) const
```

10.220.5.4 GetErrorString()

```
static const char* gdcm::Parser::GetErrorString (
            ErrorType const & err )  [static]
```

10.220.5.5 GetUserData()

```
void* gdcm::Parser::GetUserData ( ) const
```

10.220.5.6 Parse()

```
bool gdcm::Parser::Parse (
            const char * s,
            int len,
            bool isFinal )
```

10.220.5.7 ParseBuffer()

```
bool gdcm::Parser::ParseBuffer (
            int len,
            bool isFinal )  [protected]
```

10.220.5.8 Process()

```
ErrorType gdcm::Parser::Process ( )  [protected]
```

10.220.5.9 SetElementHandler()

```
void gdcm::Parser::SetElementHandler (
            StartElementHandler start,
            EndElementHandler end )
```

10.220.5.10 SetUserData()

```
void gdcm::Parser::SetUserData (
            void * userData )
```

The documentation for this class was generated from the following file:

- gdcmParser.h

10.221 gdcm::Patient Class Reference

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

`#include <gdcmPatient.h>`

Public Member Functions

- Patient ()=default

10.221.1 Detailed Description

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

10.221.2 Constructor & Destructor Documentation

10.221.2.1 Patient()

```
gdcm::Patient::Patient ( )  [default]
```

The documentation for this class was generated from the following file:

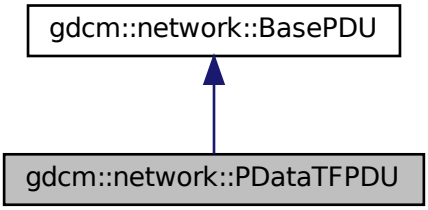
- gdcmPatient.h

10.222 gdcm::network::PDataTFPDU Class Reference

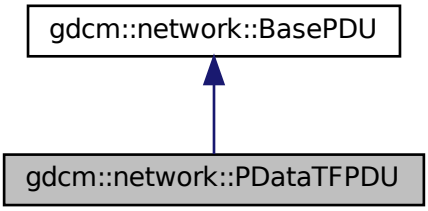
PDataTFPDU.

`#include <gdcmPDataTFPDU.h>`

Inheritance diagram for gdcm::network::PDataTFPDU:



Collaboration diagram for gdcm::network::PDataTFPDU:



Public Types

- typedef std::vector< PresentationDataValue >::size_type SizeType

Public Member Functions

- PDataTFPDU ()
- void AddPresentationDataValue (PresentationDataValue const &pdv)
- SizeType GetNumberOfPresentationDataValues () const
- PresentationDataValue const & GetPresentationDataValue (SizeType i) const
- bool IsLastFragment () const override
- void Print (std::ostream &os) const override
- std::istream & Read (std::istream &is) override
- size_t Size () const override
- const std::ostream & Write (std::ostream &os) const override

Protected Member Functions

- std::istream & ReadInto (std::istream &is, std::ostream &os)

10.222.1 Detailed Description

PDataTFPDU.

Table 9-22 P-DATA-TF PDU FIELDS

10.222.2 Member Typedef Documentation

10.222.2.1 SizeType

```
typedef std::vector<PresentationDataValue>::size_type gdcm::network::PDataTFPDU::SizeType
```

10.222.3 Constructor & Destructor Documentation

10.222.3.1 PDataTFPDU()

```
gdcm::network::PDataTFPDU::PDataTFPDU ( )
```

10.222.4 Member Function Documentation

10.222.4.1 AddPresentationDataValue()

```
void gdcm::network::PDataTFPDU::AddPresentationDataValue (
            PresentationDataValue const & pdv )  [inline]
```

10.222.4.2 GetNumberOfPresentationDataValues()

```
SizeType gdcm::network::PDataTFPDU::GetNumberOfPresentationDataValues ( ) const  [inline]
```

10.222.4.3 GetPresentationDataValue()

```
PresentationDataValue const& gdcm::network::PDataTFPDU::GetPresentationDataValue (
            SizeType i ) const  [inline]
```

10.222.4.4 IsLastFragment()

```
bool gdcm::network::PDataTFPDU::IsLastFragment ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.222.4.5 Print()

```
void gdcm::network::PDataTFPDU::Print (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.222.4.6 Read()

```
std::istream& gdcm::network::PDataTFPDU::Read (
            std::istream & is )  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.222.4.7 ReadInto()

```
std::istream& gdcm::network::PDataTFPDU::ReadInto (
            std::istream & is,
            std::ostream & os )  [protected]
```

10.222.4.8 Size()

```
size_t gdcm::network::PDataTFPDU::Size ( ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

10.222.4.9 Write()

```
const std::ostream& gdcm::network::PDataTFPDU::Write (
            std::ostream & os ) const  [override], [virtual]
```

Implements gdcm::network::BasePDU.

The documentation for this class was generated from the following file:

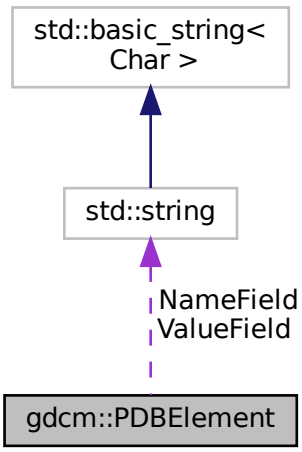
- gdcmPDataTFPDU.h

10.223 gdcm::PDBElement Class Reference

Class to represent a PDB Element.

```
#include <gdcmPDBElement.h>
```

Collaboration diagram for gdcm::PDBElement:



Public Member Functions

- PDBElement ()=default
- const char * GetName () const

  Set/Get Name.
- const char * GetValue () const

  Set/Get Value.
- bool operator== (const PDBElement &de) const
- void SetName (const char *name)
- void SetValue (const char *value)

Protected Attributes

- std::string NameField
- std::string ValueField

Friends

- std::ostream & operator<< (std::ostream &os, const PDBElement &val)

10.223.1 Detailed Description

Class to represent a PDB Element.

See also

PDBHeader

10.223.2 Constructor & Destructor Documentation

10.223.2.1 PDBElement()

```
gdcm::PDBElement::PDBElement ( )  [default]
```

10.223.3 Member Function Documentation

10.223.3.1 GetName()

```
const char* gdcm::PDBElement::GetName ( ) const  [inline]
```

Set/Get Name.

10.223.3.2 GetValue()

```
const char* gdcm::PDBElement::GetValue ( ) const  [inline]
```

Set/Get Value.

10.223.3.3 operator==()

```
bool gdcm::PDBElement::operator== (
            const PDBElement & de ) const  [inline]
```

References NameField, and ValueField.

10.223.3.4 SetName()

```
void gdcm::PDBElement::SetName (
            const char * name )  [inline]
```

10.223.3.5 SetValue()

```
void gdcm::PDBElement::SetValue (
            const char * value )  [inline]
```

10.223.4 Friends And Related Function Documentation

10.223.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const PDBElement & val )  [friend]
```

10.223.5 Member Data Documentation

10.223.5.1 NameField

```
std::string gdcm::PDBElement::NameField  [protected]
```

Referenced by operator==().

10.223.5.2 ValueField

```
std::string gdcm::PDBElement::ValueField  [protected]
```

Referenced by operator==().

The documentation for this class was generated from the following file:

- gdcmPDBElement.h

10.224 gdcm::PDBHeader Class Reference

Class for PDBHeader.

```
#include <gdcmPDBHeader.h>
```

Public Member Functions

- PDBHeader ()=default
- ~PDBHeader ()=default
- bool FindPDBElementByName (const char *name)

  Return true if the PDB element matching name is found or not.
- const PDBElement & GetPDBElementByName (const char *name)
- bool LoadFromDataElement (DataElement const &de)

  Load the PDB Header from a DataElement of a DataSet.
- void Print (std::ostream &os) const

  Print.

Static Public Member Functions

- static const PrivateTag & GetPDBInfoTag ()

  Return the Private Tag where the PDB header is stored within a DICOM DataSet.

Protected Member Functions

- const PDBElement & GetPDBEEnd () const

Friends

- std::ostream & operator<< (std::ostream &_os, const PDBHeader &d)

10.224.1 Detailed Description

Class for PDBHeader.

GEMS MR Image have an Attribute (0025,1b,GEMS_SERS_01) which store the Acquisition parameter of the MR Image. It is compressed and can therefore not be used as is. This class de-encapsulated the Protocol Data Block and allow users to query element by name.

Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

: the API of this class might change.

See also

CSAHeader

10.224.2 Constructor & Destructor Documentation

10.224.2.1 PDBHeader()

```
gdcm::PDBHeader::PDBHeader ( )  [default]
```

10.224.2.2 ~PDBHeader()

```
gdcm::PDBHeader::~PDBHeader ( )  [default]
```

10.224.3 Member Function Documentation

10.224.3.1 FindPDBElementByName()

```
bool gdcm::PDBHeader::FindPDBElementByName (
            const char * name )
```

Return true if the PDB element matching name is found or not.

10.224.3.2 GetPDBEEnd()

```
const PDBElement& gdcm::PDBHeader::GetPDBEEnd ( ) const  [protected]
```

10.224.3.3 GetPDBElementByName()

```
const PDBElement& gdcm::PDBHeader::GetPDBElementByName (
            const char * name )
```

Lookup in the PDB header if a PDB element match the name 'name':

Warning

Case Sensitive

10.224.3.4 GetPDBInfoTag()

```
static const PrivateTag& gdcm::PDBHeader::GetPDBInfoTag ( )  [static]
```

Return the Private Tag where the PDB header is stored within a DICOM DataSet.

10.224.3.5 LoadFromDataElement()

```
bool gdcm::PDBHeader::LoadFromDataElement (
            DataElement const & de )
```

Load the PDB Header from a DataElement of a DataSet.

10.224.3.6 Print()

```
void gdcm::PDBHeader::Print (
            std::ostream & os ) const
```

Print.

10.224.4 Friends And Related Function Documentation

10.224.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const PDBHeader & d )  [friend]
```

The documentation for this class was generated from the following file:

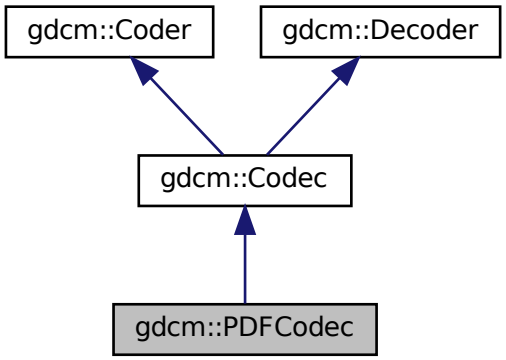
- gdcmPDBHeader.h

10.225 gdcm::PDFCodec Class Reference

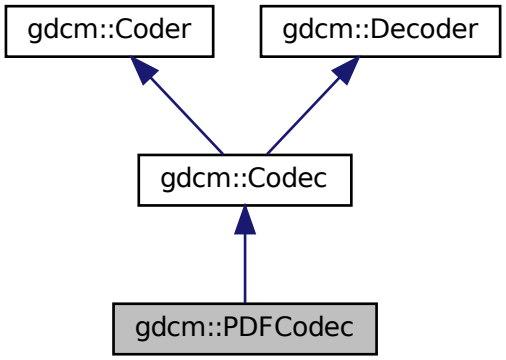
PDFCodec class.

```
#include <gdcmPDFCodec.h>
```

Inheritance diagram for gdcm::PDFCodec:



Collaboration diagram for gdcm::PDFCodec:



Public Member Functions

- PDFCodec ()
- ~PDFCodec () override
- bool CanCode (TransferSyntax const &) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &) const override

  Return whether this decoder support this transfer syntax (can decode it)
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.

Additional Inherited Members

10.225.1 Detailed Description

PDFCodec class.

10.225.2 Constructor & Destructor Documentation

10.225.2.1 PDFCodec()

```
gdcm::PDFCodec::PDFCodec ( )
```

10.225.2.2 ~PDFCodec()

```
gdcm::PDFCodec::~PDFCodec ( )  [override]
```

10.225.3 Member Function Documentation

10.225.3.1 CanCode()

```
bool gdcm::PDFCodec::CanCode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements gdcm::Coder.

10.225.3.2 CanDecode()

```
bool gdcm::PDFCodec::CanDecode (
            TransferSyntax const &  ) const  [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements gdcm::Decoder.

10.225.3.3 Decode()

```
bool gdcm::PDFCodec::Decode (
             DataElement const & ,
             DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::Decoder.

The documentation for this class was generated from the following file:

- gdcmPDFCodec.h

10.226 gdcm::network::PDUFactory Class Reference

PDUFactory basically, given an initial byte, construct the.

```
#include <gdcmPDUFactory.h>
```

Static Public Member Functions

- static BasePDU * ConstructAbortPDU ()
- static BasePDU * ConstructPDU (uint8_t itemtype)
- static BasePDU * ConstructReleasePDU ()
- static std::vector< BasePDU * > CreateCEchoPDU (const ULConnection &inConnection)
- static std::vector< BasePDU * > CreateCFindPDU (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)
- static std::vector< BasePDU * > CreateCMovePDU (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)
- static std::vector< BasePDU * > CreateCStoreRQPDU (const ULConnection &inConnection, const File &file, bool writeDataSet=true)
- static std::vector< BasePDU * > CreateCStoreRSPPDU (const DataSet *inDataSet, const BasePDU *inPC)
- static std::vector< BasePDU * > CreateNActionPDU (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< BasePDU * > CreateNCreatePDU (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< BasePDU * > CreateNDeletePDU (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< BasePDU * > CreateNEventReportPDU (const ULConnection &inConnection, const BaseQuery *inQuery)
- static std::vector< BasePDU * > CreateNGetPDU (const ULConnection &inConnection, const BaseQuery *in↩ Query)
- static std::vector< BasePDU * > CreateNSetPDU (const ULConnection &inConnection, const BaseQuery *in↩ Query)
- static EEventID DetermineEventByPDU (const BasePDU *inPDU)
- static std::vector< PresentationDataValue > GetPDVs (const std::vector< BasePDU * > &inDataPDUs)

10.226.1 Detailed Description

PDUFactory basically, given an initial byte, construct the.

appropriate PDU. This way, the event loop doesn't have to know about all the different PDU types.

10.226.2 Member Function Documentation

10.226.2.1 ConstructAbortPDU()

```
static BasePDU* gdcm::network::PDUFactory::ConstructAbortPDU ( )  [static]
```

10.226.2.2 ConstructPDU()

```
static BasePDU* gdcm::network::PDUFactory::ConstructPDU (
            uint8_t itemtype )  [static]
```

10.226.2.3 ConstructReleasePDU()

```
static BasePDU* gdcm::network::PDUFactory::ConstructReleasePDU ( )  [static]
```

10.226.2.4 CreateCEchoPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateCEchoPDU (
            const ULConnection & inConnection )  [static]
```

10.226.2.5 CreateCFindPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateCFindPDU (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [static]
```

10.226.2.6 CreateCMovePDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateCMovePDU (
            const ULConnection & inConnection,
            const BaseRootQuery * inRootQuery )  [static]
```

10.226.2.7 CreateCStoreRQPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateCStoreRQPDU (
            const ULConnection & inConnection,
            const File & file,
            bool writeDataSet = true )  [static]
```

10.226.2.8 CreateCStoreRSPPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateCStoreRSPPDU (
            const DataSet * inDataSet,
            const BasePDU * inPC )  [static]
```

10.226.2.9 CreateNActionPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNActionPDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.10 CreateNCreatePDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNCreatePDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.11 CreateNDeletePDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNDeletePDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.12 CreateNEventReportPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNEventReportPDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.13 CreateNGetPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNGetPDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.14 CreateNSetPDU()

```
static std::vector<BasePDU*> gdcm::network::PDUFactory::CreateNSetPDU (
            const ULConnection & inConnection,
            const BaseQuery * inQuery )  [static]
```

10.226.2.15 DetermineEventByPDU()

```
static EEventID gdcm::network::PDUFactory::DetermineEventByPDU (
            const BasePDU * inPDU )  [static]
```

10.226.2.16 GetPDVs()

```
static std::vector<PresentationDataValue> gdcm::network::PDUFactory::GetPDVs (
            const std::vector< BasePDU * > & inDataPDUs )  [static]
```

The documentation for this class was generated from the following file:

- gdcmPDUFactory.h

10.227 gdcm::PersonName Class Reference

PersonName class.

```
#include <gdcmPersonName.h>
```

Public Member Functions

- unsigned int GetMaxLength () const
- unsigned int GetNumberOfComponents () const
- void Print (std::ostream &os) const
- void SetBlob (const std::vector< char > &v)
- void SetComponents (const char *comp1="", const char *comp2="", const char *comp3="", const char *comp4="", const char *comp5="")
- void SetComponents (const char *components[])

Public Attributes

- char Component [MaxNumberOfComponents][MaxLength+1]

Static Public Attributes

- static const unsigned int MaxLength = 64
- static const unsigned int MaxNumberOfComponents = 5
- static const char Padding = ' '
- static const char Separator = '^'

10.227.1 Detailed Description

PersonName class.

10.227.2 Member Function Documentation

10.227.2.1 GetMaxLength()

```
unsigned int gdcm::PersonName::GetMaxLength ( ) const  [inline]
```

10.227.2.2 GetNumberOfComponents()

```
unsigned int gdcm::PersonName::GetNumberOfComponents ( ) const  [inline]
```

10.227.2.3 Print()

```
void gdcm::PersonName::Print (
            std::ostream & os ) const  [inline]
```

10.227.2.4 SetBlob()

```
void gdcm::PersonName::SetBlob (
            const std::vector< char > & v )  [inline]
```

10.227.2.5 SetComponents() [1/2]

```
void gdcm::PersonName::SetComponents (
            const char * comp1 = "",
            const char * comp2 = "",
            const char * comp3 = "",
            const char * comp4 = "",
            const char * comp5 = "" )  [inline]
```

10.227.2.6 SetComponents() [2/2]

```
void gdcm::PersonName::SetComponents (
            const char * components[] )  [inline]
```

10.227.3 Member Data Documentation

10.227.3.1 Component

```
char gdcm::PersonName::Component[MaxNumberOfComponents][MaxLength+1]
```

10.227.3.2 MaxLength

```
const unsigned int gdcm::PersonName::MaxLength = 64  [static]
```

10.227.3.3 MaxNumberOfComponents

```
const unsigned int gdcm::PersonName::MaxNumberOfComponents = 5  [static]
```

10.227.3.4 Padding

```
const char gdcm::PersonName::Padding = ' '  [static]
```

10.227.3.5 Separator

```
const char gdcm::PersonName::Separator = '^'  [static]
```

The documentation for this class was generated from the following file:

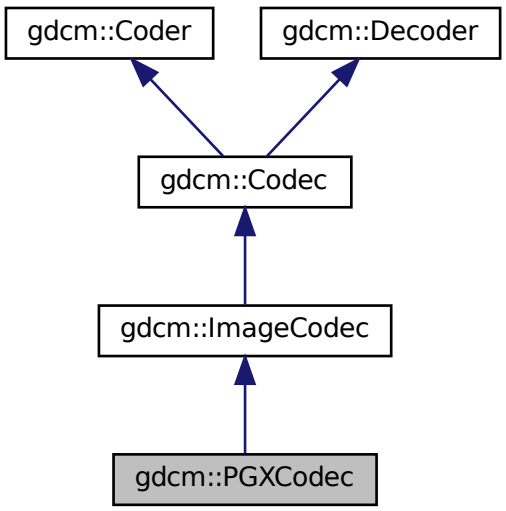
- gdcmPersonName.h

10.228 gdcm::PGXCodec Class Reference

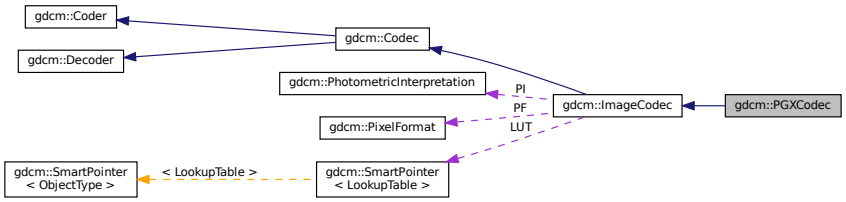
Class to do PGX.

`#include <gdcmPGXCodec.h>`

Inheritance diagram for gdcm::PGXCodec:



Collaboration diagram for gdcm::PGXCodec:



Public Member Functions

- PGXCodec ()
- ~PGXCodec () override
- bool CanCode (TransferSyntax const &ts) const override

  Return whether this coder support this transfer syntax (can code it)
- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool Read (const char *filename, DataElement &out) const
- bool Write (const char *filename, const DataElement &out) const

Additional Inherited Members

10.228.1 Detailed Description

Class to do PGX.

See PGX as used in JPEG 2000 implementation and reference images

10.228.2 Constructor & Destructor Documentation

10.228.2.1 PGXCodec()

```
gdcm::PGXCodec::PGXCodec ( )
```

10.228.2.2 ~PGXCodec()

```
gdcm::PGXCodec::~PGXCodec ( )  [override]
```

10.228.3 Member Function Documentation

10.228.3.1 CanCode()

```
bool gdcm::PGXCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.228.3.2 CanDecode()

```
bool gdcm::PGXCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.228.3.3 Clone()

```
ImageCodec* gdcm::PGXCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.228.3.4 GetHeaderInfo()

```
bool gdcm::PGXCodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.228.3.5 Read()

```
bool gdcm::PGXCodec::Read (
            const char * filename,
            DataElement & out ) const
```

10.228.3.6 Write()

```
bool gdcm::PGXCodec::Write (
            const char * filename,
            const DataElement & out ) const
```

The documentation for this class was generated from the following file:

- gdcmPGXCodec.h

10.229 gdcm::PhotometricInterpretation Class Reference

Class to represent an PhotometricInterpretation.

```
#include <gdcmPhotometricInterpretation.h>
```

Public Types

- enum PIType {
  UNKNOWN = 0 ,
  MONOCHROME1 ,
  MONOCHROME2 ,
  PALETTE_COLOR ,
  RGB ,
  HSV ,
  ARGB ,
  CMYK ,
  YBR_FULL ,
  YBR_FULL_422 ,
  YBR_PARTIAL_422 ,
  YBR_PARTIAL_420 ,
  YBR_ICT ,
  YBR_RCT ,
  PI_END }

Public Member Functions

- PhotometricInterpretation (PIType pi=UNKNOWN)
- unsigned short GetSamplesPerPixel () const

  return the value for Sample Per Pixel associated with a particular Photometric Interpretation
- const char * GetString () const
- PIType GetType () const
- bool IsLossless () const
- bool IsLossy () const
- bool IsSameColorSpace (PhotometricInterpretation const &pi) const
- operator PIType () const

Static Public Member Functions

- static const char * GetPIString (PIType pi)
- static PIType GetPIType (const char *pi)
- static bool IsRetired (PIType pi)

Friends

- std::ostream & operator<< (std::ostream &os, const PhotometricInterpretation &pi)

10.229.1 Detailed Description

Class to represent an PhotometricInterpretation.

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, HelloVizWorld.cxx, csa2img.cxx, and iU22tomultisc.cxx.

10.229.2 Member Enumeration Documentation

Enumerator

10.229.2.1 PIType

```
enum gdcm::PhotometricInterpretation::PIType
```

Enumerator

UNKNOWN	
MONOCHROME1	
MONOCHROME2	
PALETTE_COLOR	
RGB	
HSV	
ARGB	
CMYK	
YBR_FULL	
YBR_FULL_422	
YBR_PARTIAL_422	
YBR_PARTIAL_420	
YBR_ICT	
YBR_RCT	
PI_END	

10.229.3 Constructor & Destructor Documentation

10.229.3.1 PhotometricInterpretation()

```
gdcm::PhotometricInterpretation::PhotometricInterpretation (
            PIType pi = UNKNOWN )  [inline]
```

10.229.4 Member Function Documentation

10.229.4.1 GetPIString()

```
static const char* gdcm::PhotometricInterpretation::GetPIString (
            PIType pi )  [static]
```

10.229.4.2 GetPIType()

```
static PIType gdcm::PhotometricInterpretation::GetPIType (
            const char * pi )  [static]
```

10.229.4.3 GetSamplesPerPixel()

```
unsigned short gdcm::PhotometricInterpretation::GetSamplesPerPixel ( ) const
```

return the value for Sample Per Pixel associated with a particular Photometric Interpretation

10.229.4.4 GetString()

```
const char* gdcm::PhotometricInterpretation::GetString ( ) const
```

10.229.4.5 GetType()

```
PIType gdcm::PhotometricInterpretation::GetType ( ) const  [inline]
```

10.229.4.6 IsLossless()

```
bool gdcm::PhotometricInterpretation::IsLossless ( ) const
```

10.229.4.7 IsLossy()

```
bool gdcm::PhotometricInterpretation::IsLossy ( ) const
```

10.229.4.8 IsRetired()

```
static bool gdcm::PhotometricInterpretation::IsRetired (
            PIType pi )  [static]
```

10.229.4.9 IsSameColorSpace()

```
bool gdcm::PhotometricInterpretation::IsSameColorSpace (
            PhotometricInterpretation const & pi ) const
```

10.229.4.10 operator PIType()

```
gdcm::PhotometricInterpretation::operator PIType ( ) const  [inline]
```

10.229.5 Friends And Related Function Documentation

10.229.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const PhotometricInterpretation & pi )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmPhotometricInterpretation.h

10.230 gdcm::PixelFormat Class Reference

PixelFormat.

```
#include <gdcmPixelFormat.h>
```

Public Types

- enum ScalarType {
  UINT8 ,
  INT8 ,
  UINT12 ,
  INT12 ,
  UINT16 ,
  INT16 ,
  UINT32 ,
  INT32 ,
  UINT64 ,
  INT64 ,
  FLOAT16 ,
  FLOAT32 ,
  FLOAT64 ,
  SINGLEBIT ,
  UNKNOWN }

Public Member Functions

- PixelFormat ()
- PixelFormat (ScalarType st)
- PixelFormat (unsigned short samplesperpixel, unsigned short bitsallocated=8, unsigned short bitsstored=8, unsigned short highbit=7, unsigned short pixelrepresentation=0)
- unsigned short GetBitsAllocated () const

  BitsAllocated see Tag (0028,0100) US Bits Allocated.
- unsigned short GetBitsStored () const

  BitsStored see Tag (0028,0101) US Bits Stored.
- unsigned short GetHighBit () const

  HighBit see Tag (0028,0102) US High Bit.
- int64_t GetMax () const

  return the max possible of the pixel
- int64_t GetMin () const

  return the min possible of the pixel
- unsigned short GetPixelRepresentation () const

  PixelRepresentation: 0 or 1, see Tag (0028,0103) US Pixel Representation.
- uint8_t GetPixelSize () const
- unsigned short GetSamplesPerPixel () const
- ScalarType GetScalarType () const

  ScalarType does not take into account the sample per pixel.
- const char * GetScalarTypeAsString () const
- bool IsCompatible (const TransferSyntax &ts) const
- bool IsValid () const

  return IsValid
- operator ScalarType () const
- bool operator!= (const PixelFormat &pf) const
- bool operator!= (ScalarType st) const
- bool operator== (const PixelFormat &pf) const
- bool operator== (ScalarType st) const
- void Print (std::ostream &os) const

  Print.
- void SetBitsAllocated (unsigned short ba)
- void SetBitsStored (unsigned short bs)
- void SetHighBit (unsigned short hb)
- void SetPixelRepresentation (unsigned short pr)
- void SetSamplesPerPixel (unsigned short spp)
- void SetScalarType (ScalarType st)

Protected Member Functions

- bool Validate ()

  When image with 24/24/23 was read, need to validate.

Friends

- class Bitmap
- std::ostream & operator<< (std::ostream &_os, const PixelFormat &pf)

10.230.1 Detailed Description

PixelFormat.

By default the Pixel Type will be instantiated with the following parameters:

- SamplesPerPixel : 1
- BitsAllocated : 8
- BitsStored : 8
- HighBit : 7
- PixelRepresentation : 0

Fundamentally PixelFormat is very close to what DICOM allows. It will be very hard to extend this class for the upcoming DICOM standard where Floating 32 and 64bits will be allowed.

It is also very hard for this class to fully support 64bits integer type (see GetMin / GetMax signature restricted to 64bits signed).

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, FixJAIBugJPEGLS.cxx, GetJPEGSamplePrecision.cxx, TemplateEmptyImage.cxx, csa2img.cxx, iU22tomultisc.cxx, and threadgdcm.cxx.

10.230.2 Member Enumeration Documentation

10.230.2.1 ScalarType

`enum gdcm::PixelFormat::ScalarType`

Enumerator

UINT8	
INT8	
UINT12	
INT12	
UINT16	
INT16	
UINT32	
INT32	
UINT64	
INT64	
FLOAT16	
FLOAT32	
FLOAT64	
SINGLEBIT	
UNKNOWN	

10.230.3 Constructor & Destructor Documentation

10.230.3.1 PixelFormat() [1/3]

```
gdcm::PixelFormat::PixelFormat ( )  [inline]
```

10.230.3.2 PixelFormat() [2/3]

```
gdcm::PixelFormat::PixelFormat (
            unsigned short samplesperpixel,
            unsigned short bitsallocated = 8,
            unsigned short bitsstored = 8,
            unsigned short highbit = 7,
            unsigned short pixelrepresentation = 0 )  [inline], [explicit]
```

10.230.3.3 PixelFormat() [3/3]

```
gdcm::PixelFormat::PixelFormat (
            ScalarType st )
```

10.230.4 Member Function Documentation

10.230.4.1 GetBitsAllocated()

```
unsigned short gdcm::PixelFormat::GetBitsAllocated ( ) const  [inline]
```

BitsAllocated see Tag (0028,0100) US Bits Allocated.

Examples

GetJPEGSamplePrecision.cxx.

10.230.4.2 GetBitsStored()

```
unsigned short gdcm::PixelFormat::GetBitsStored ( ) const  [inline]
```

BitsStored see Tag (0028,0101) US Bits Stored.

Examples

GetJPEGSamplePrecision.cxx.

10.230.4.3 GetHighBit()

```
unsigned short gdcm::PixelFormat::GetHighBit ( ) const  [inline]
```

HighBit see Tag (0028,0102) US High Bit.

10.230.4.4 GetMax()

```
int64_t gdcm::PixelFormat::GetMax ( ) const
```

return the max possible of the pixel

10.230.4.5 GetMin()

```
int64_t gdcm::PixelFormat::GetMin ( ) const
```

return the min possible of the pixel

10.230.4.6 GetPixelRepresentation()

```
unsigned short gdcm::PixelFormat::GetPixelRepresentation ( ) const  [inline]
```

PixelRepresentation: 0 or 1, see Tag (0028,0103) US Pixel Representation.

10.230.4.7 GetPixelSize()

```
uint8_t gdcm::PixelFormat::GetPixelSize ( ) const
```

return the size of the pixel This is the number of words it would take to store one pixel

Warning

the return value takes into account the SamplesPerPixel

in the rare case when BitsAllocated == 12, the function assume word padding and value returned will be identical as if BitsAllocated == 16

Examples

threadgdcm.cxx.

10.230.4.8 GetSamplesPerPixel()

```
unsigned short gdcm::PixelFormat::GetSamplesPerPixel ( ) const
```

Samples Per Pixel see (0028,0002) US Samples Per Pixel DICOM - only allows 1, 3 and 4 as valid value. Other value are undefined behavior.

Examples

threadgdcm.cxx.

10.230.4.9 GetScalarType()

```
ScalarType gdcm::PixelFormat::GetScalarType ( ) const
```

ScalarType does not take into account the sample per pixel.

10.230.4.10 GetScalarTypeAsString()

```
const char* gdcm::PixelFormat::GetScalarTypeAsString ( ) const
```

10.230.4.11 IsCompatible()

```
bool gdcm::PixelFormat::IsCompatible (
            const TransferSyntax & ts ) const
```

10.230.4.12 IsValid()

```
bool gdcm::PixelFormat::IsValid ( ) const
```

return IsValid

10.230.4.13 operator ScalarType()

```
gdcm::PixelFormat::operator ScalarType ( ) const  [inline]
```

10.230.4.14 operator"!=() [1/2]

```
bool gdcm::PixelFormat::operator!= (
            const PixelFormat & pf ) const  [inline]
```

10.230.4.15 operator"!=() [2/2]

```
bool gdcm::PixelFormat::operator!= (
            ScalarType st ) const  [inline]
```

10.230.4.16 operator==() [1/2]

```
bool gdcm::PixelFormat::operator== (
            const PixelFormat & pf ) const  [inline]
```

10.230.4.17 operator==() [2/2]

```
bool gdcm::PixelFormat::operator== (
            ScalarType st ) const  [inline]
```

10.230.4.18 Print()

```
void gdcm::PixelFormat::Print (
            std::ostream & os ) const
```

Print.

10.230.4.19 SetBitsAllocated()

```
void gdcm::PixelFormat::SetBitsAllocated (
            unsigned short ba )  [inline]
```

10.230.4.20 SetBitsStored()

```
void gdcm::PixelFormat::SetBitsStored (
            unsigned short bs )  [inline]
```

10.230.4.21 SetHighBit()

```
void gdcm::PixelFormat::SetHighBit (
            unsigned short hb )  [inline]
```

10.230.4.22 SetPixelRepresentation()

```
void gdcm::PixelFormat::SetPixelRepresentation (
            unsigned short pr )  [inline]
```

Examples

TemplateEmptyImage.cxx.

10.230.4.23 SetSamplesPerPixel()

```
void gdcm::PixelFormat::SetSamplesPerPixel (
            unsigned short spp )  [inline]
```

Examples

CreateARGBImage.cxx, CreateCMYKImage.cxx, and GenFakeImage.cxx.

References gdcmAssertMacro.

10.230.4.24 SetScalarType()

```
void gdcm::PixelFormat::SetScalarType (
            ScalarType st )
```

Set PixelFormat based only on the ScalarType

Warning

: You need to call SetScalarType *before* SetSamplesPerPixel

10.230.4.25 Validate()

```
bool gdcm::PixelFormat::Validate ( )  [protected]
```

When image with 24/24/23 was read, need to validate.

Referenced by gdcm::Bitmap::SetPixelFormat().

10.230.5 Friends And Related Function Documentation

10.230.5.1 Bitmap

```
friend class Bitmap  [friend]
```

10.230.5.2 operator<<

```
std::ostream& operator<< (
             std::ostream & _os,
             const PixelFormat & pf )  [friend]
```

The documentation for this class was generated from the following file:

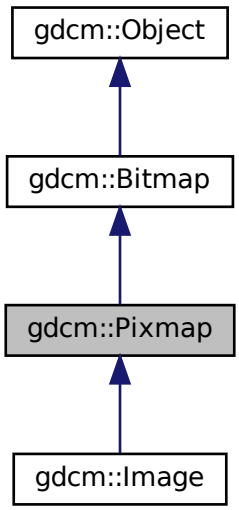
- gdcmPixelFormat.h

10.231 gdcm::Pixmap Class Reference

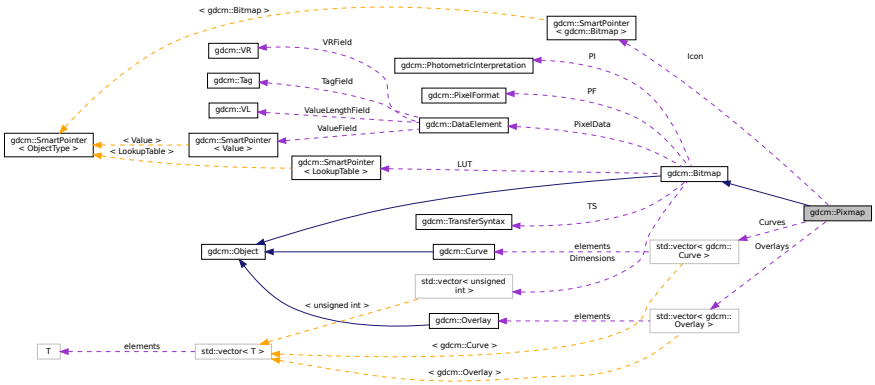
Pixmap class.

`#include <gdcmPixmap.h>`

Inheritance diagram for gdcm::Pixmap:



Collaboration diagram for gdcm::Pixmap:



Public Member Functions

- Pixmap ()
- ~Pixmap () override
- bool AreOverlaysInPixelData () const override

  returns if Overlays are stored in the unused bit of the pixel data:
- Curve & GetCurve (size_t i=0)

  Curve: group 50xx.
- const Curve & GetCurve (size_t i=0) const
- IconImage & GetIconImage ()
- const IconImage & GetIconImage () const

  Set/Get Icon Image.
- size_t GetNumberOfCurves () const
- size_t GetNumberOfOverlays () const
- Overlay & GetOverlay (size_t i=0)

  Overlay: group 60xx.
- const Overlay & GetOverlay (size_t i=0) const
- void Print (std::ostream &) const override
- void RemoveOverlay (size_t i)
- void SetIconImage (IconImage const &ii)
- void SetNumberOfCurves (size_t n)
- void SetNumberOfOverlays (size_t n)
- bool UnusedBitsPresentInPixelData () const override

  returns if there are unused bits in the pixel data

Protected Attributes

- std::vector< Curve > Curves
- SmartPointer< IconImage > Icon
- std::vector< Overlay > Overlays

Additional Inherited Members

10.231.1 Detailed Description

Pixmap class.

A bitmap based image. Used as parent for both IconImage and the main Pixel Data Image It does not contains any World Space information (IPP, IOP)

See also

PixmapReader

10.231.2 Constructor & Destructor Documentation

10.231.2.1 Pixmap()

```
gdcm::Pixmap::Pixmap ( )
```

10.231.2.2 ~Pixmap()

```
gdcm::Pixmap::~Pixmap ( )  [override]
```

10.231.3 Member Function Documentation

10.231.3.1 AreOverlaysInPixelData()

```
bool gdcm::Pixmap::AreOverlaysInPixelData ( ) const  [override], [virtual]
```

returns if Overlays are stored in the unused bit of the pixel data:

Reimplemented from gdcm::Bitmap.

10.231.3.2 GetCurve() [1/2]

```
Curve& gdcm::Pixmap::GetCurve (
            size_t i = 0 )  [inline]
```

Curve: group 50xx.

10.231.3.3 GetCurve() [2/2]

```
const Curve& gdcm::Pixmap::GetCurve (
            size_t i = 0 ) const  [inline]
```

10.231.3.4 GetIconImage() [1/2]

```
IconImage& gdcm::Pixmap::GetIconImage ( )  [inline]
```

10.231.3.5 GetIconImage() [2/2]

```
const IconImage& gdcm::Pixmap::GetIconImage ( ) const  [inline]
```

Set/Get Icon Image.

10.231.3.6 GetNumberOfCurves()

```
size_t gdcm::Pixmap::GetNumberOfCurves ( ) const  [inline]
```

10.231.3.7 GetNumberOfOverlays()

```
size_t gdcm::Pixmap::GetNumberOfOverlays ( ) const  [inline]
```

10.231.3.8 GetOverlay() [1/2]

```
Overlay& gdcm::Pixmap::GetOverlay (
            size_t i = 0 )  [inline]
```

Overlay: group 60xx.

10.231.3.9 GetOverlay() [2/2]

```
const Overlay& gdcm::Pixmap::GetOverlay (
            size_t i = 0 ) const  [inline]
```

10.231.3.10 Print()

```
void gdcm::Pixmap::Print (
            std::ostream &  ) const  [override], [virtual]
```

Reimplemented from gdcm::Bitmap.

10.231.3.11 RemoveOverlay()

```
void gdcm::Pixmap::RemoveOverlay (
            size_t i )  [inline]
```

10.231.3.12 SetIconImage()

```
void gdcm::Pixmap::SetIconImage (
            IconImage const & ii )  [inline]
```

10.231.3.13 SetNumberOfCurves()

```
void gdcm::Pixmap::SetNumberOfCurves (
            size_t n )  [inline]
```

10.231.3.14 SetNumberOfOverlays()

```
void gdcm::Pixmap::SetNumberOfOverlays (
            size_t n )  [inline]
```

10.231.3.15 UnusedBitsPresentInPixelData()

```
bool gdcm::Pixmap::UnusedBitsPresentInPixelData ( ) const  [override], [virtual]
```

returns if there are unused bits in the pixel data

Reimplemented from gdcm::Bitmap.

10.231.4 Member Data Documentation

10.231.4.1 Curves

```
std::vector<Curve> gdcm::Pixmap::Curves  [protected]
```

10.231.4.2 Icon

```
SmartPointer<IconImage> gdcm::Pixmap::Icon  [protected]
```

10.231.4.3 Overlays

```
std::vector<Overlay> gdcm::Pixmap::Overlays  [protected]
```

The documentation for this class was generated from the following file:

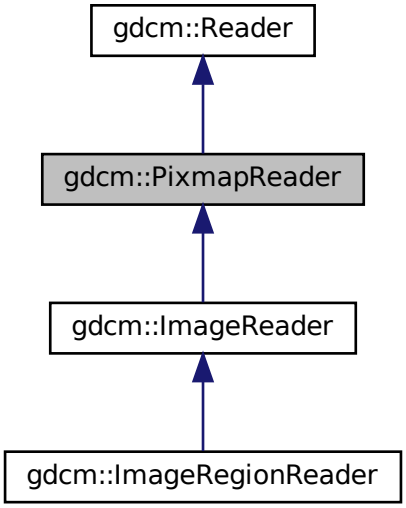
- gdcmPixmap.h

10.232 gdcm::PixmapReader Class Reference

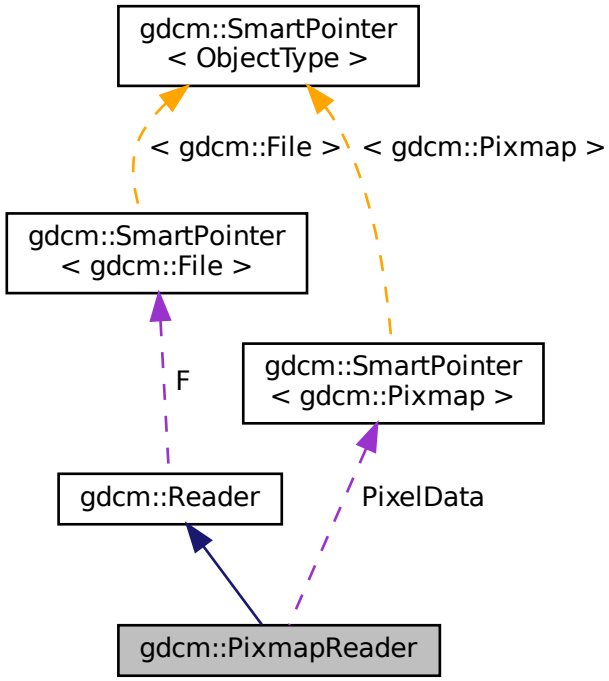
PixmapReader.

```
#include <gdcmPixmapReader.h>
```

Inheritance diagram for gdcm::PixmapReader:



Collaboration diagram for gdcm::PixmapReader:



Public Member Functions

- PixmapReader ()
- ~PixmapReader () override
- Pixmap & GetPixmap ()
- const Pixmap & GetPixmap () const

  Return the read image (need to call Read() first)
- bool Read () override

Protected Member Functions

- virtual bool ReadACRNEMAImage ()
- virtual bool ReadImage (MediaStorage const &ms)
- bool ReadImageInternal (MediaStorage const &ms, bool handlepixeldata=true)

Protected Attributes

- SmartPointer< Pixmap > PixelData

10.232.1 Detailed Description

PixmapReader.

Note

its role is to convert the DICOM DataSet into a Pixmap representation By default it is also loading the lookup table and overlay when found as they impact the rendering or the image

See PS 3.3-2008, Table C.7-11b IMAGE PIXEL MACRO ATTRIBUTES for the list of attribute that belong to what gdcm calls a 'Pixmap'

Warning

the API ReadUpToTag and ReadSelectedTag

See also

Pixmap

10.232.2 Constructor & Destructor Documentation

10.232.2.1 PixmapReader()

```
gdcm::PixmapReader::PixmapReader ( )
```

10.232.2.2 ~PixmapReader()

```
gdcm::PixmapReader::~PixmapReader ( )  [override]
```

10.232.3 Member Function Documentation

10.232.3.1 GetPixmap() [1/2]

```
Pixmap& gdcm::PixmapReader::GetPixmap ( )
```

10.232.3.2 GetPixmap() [2/2]

```
const Pixmap& gdcm::PixmapReader::GetPixmap ( ) const
```

Return the read image (need to call Read() first)

10.232.3.3 Read()

```
bool gdcm::PixmapReader::Read ( )  [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an Pixmap.

Reimplemented from gdcm::Reader.

10.232.3.4 ReadACRNEMAImage()

```
virtual bool gdcm::PixmapReader::ReadACRNEMAImage ( )  [protected], [virtual]
```

Reimplemented in gdcm::ImageReader.

10.232.3.5 ReadImage()

```
virtual bool gdcm::PixmapReader::ReadImage (
            MediaStorage const & ms )  [protected], [virtual]
```

Reimplemented in gdcm::ImageReader.

10.232.3.6 ReadImageInternal()

```
bool gdcm::PixmapReader::ReadImageInternal (
            MediaStorage const & ms,
            bool handlepixeldata = true )  [protected]
```

10.232.4 Member Data Documentation

10.232.4.1 PixelData

```
SmartPointer<Pixmap> gdcm::PixmapReader::PixelData  [protected]
```

The documentation for this class was generated from the following file:

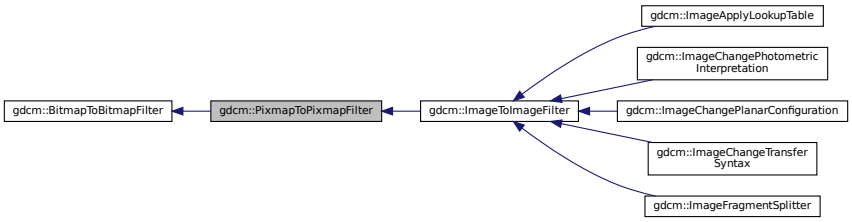
- gdcmPixmapReader.h

10.233 gdcm::PixmapToPixmapFilter Class Reference

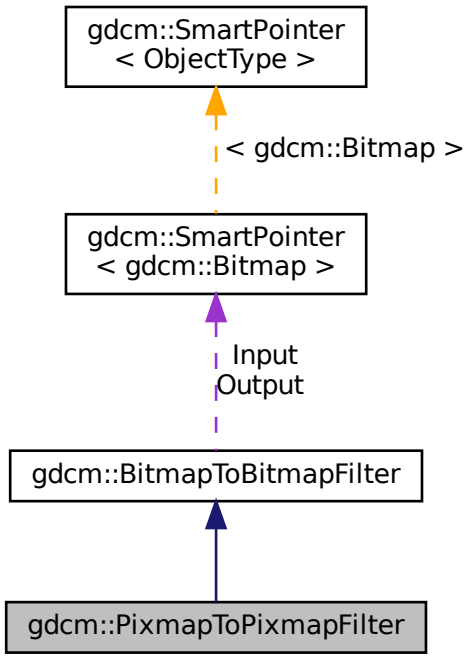
PixmapToPixmapFilter class.

```
#include <gdcmPixmapToPixmapFilter.h>
```

Inheritance diagram for gdcm::PixmapToPixmapFilter:



Collaboration diagram for gdcm::PixmapToPixmapFilter:



Public Member Functions

- PixmapToPixmapFilter ()
- ~PixmapToPixmapFilter ()=default
- Pixmap & GetInput ()
- const Pixmap & GetOutput () const

  Get Output image.
- const Pixmap & GetOutputAsPixmap () const

Additional Inherited Members

10.233.1 Detailed Description

PixmapToPixmapFilter class.

Super class for all filter taking an image and producing an output image

10.233.2 Constructor & Destructor Documentation

10.233.2.1 PixmapToPixmapFilter()

```
gdcm::PixmapToPixmapFilter::PixmapToPixmapFilter ( )
```

10.233.2.2 ~PixmapToPixmapFilter()

```
gdcm::PixmapToPixmapFilter::~PixmapToPixmapFilter ( )  [default]
```

10.233.3 Member Function Documentation

10.233.3.1 GetInput()

```
Pixmap& gdcm::PixmapToPixmapFilter::GetInput ( )
```

10.233.3.2 GetOutput()

```
const Pixmap& gdcm::PixmapToPixmapFilter::GetOutput ( ) const
```

Get Output image.

10.233.3.3 GetOutputAsPixmap()

```
const Pixmap& gdcm::PixmapToPixmapFilter::GetOutputAsPixmap ( ) const
```

The documentation for this class was generated from the following file:

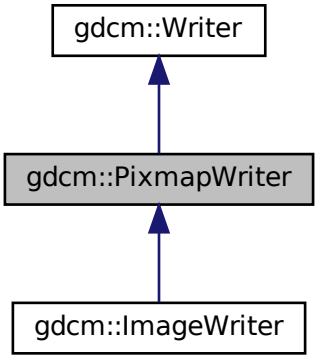
- gdcmPixmapToPixmapFilter.h

10.234 gdcm::PixmapWriter Class Reference

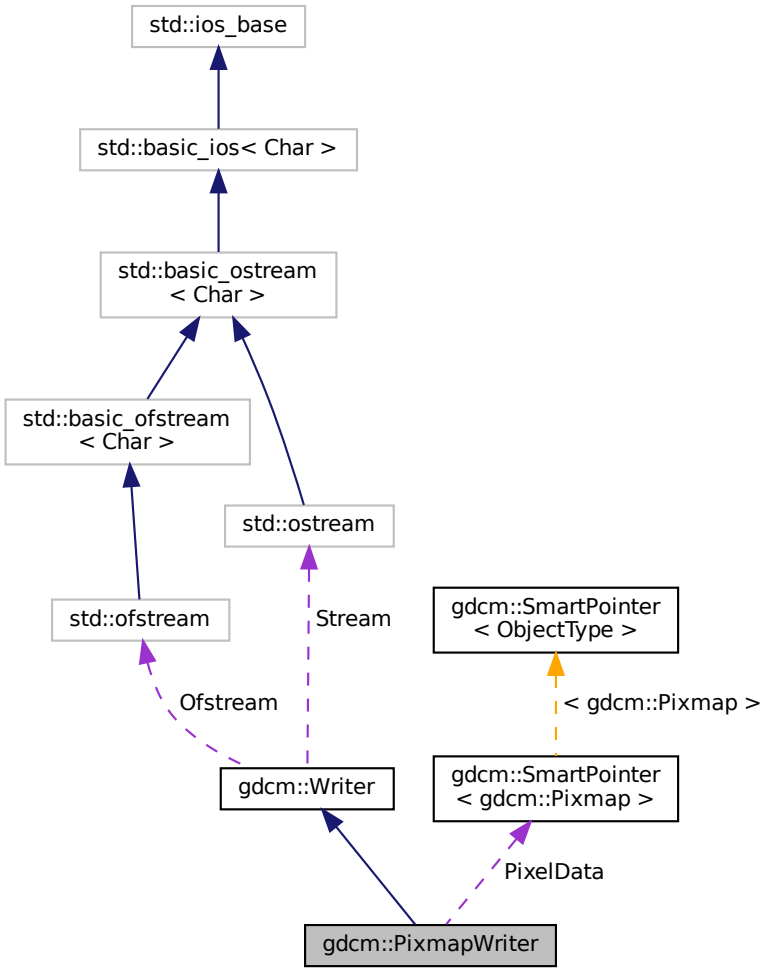
PixmapWriter.

`#include <gdcmPixmapWriter.h>`

Inheritance diagram for gdcm::PixmapWriter:



Collaboration diagram for gdcm::PixmapWriter:



Public Member Functions

- PixmapWriter ()
- ~PixmapWriter () override
- virtual Pixmap & GetImage ()
- virtual const Pixmap & GetImage () const
- Pixmap & GetPixmap ()
- const Pixmap & GetPixmap () const
- virtual void SetImage (Pixmap const &img)
- void SetPixmap (Pixmap const &img)
- bool Write () override

  Write.

Protected Member Functions

- void DoIconImage (DataSet &ds, Pixmap const &image)
- bool PrepareWrite (MediaStorage const &refms)

Protected Attributes

- SmartPointer< Pixmap > PixelData

10.234.1 Detailed Description

PixmapWriter.

This class will takes two inputs:

1. The DICOM DataSet
2. The Image input It will override any info from the Image over the DataSet.

For instance when one read in a lossy compressed image and write out as unencapsulated (ie implicitly lossless) then some attribute are definitely needed to mark this dataset as Lossy (typically 0028,2114)

10.234.2 Constructor & Destructor Documentation

10.234.2.1 PixmapWriter()

```
gdcm::PixmapWriter::PixmapWriter ( )
```

10.234.2.2 ~PixmapWriter()

```
gdcm::PixmapWriter::~PixmapWriter ( )  [override]
```

10.234.3 Member Function Documentation

10.234.3.1 DoIconImage()

```
void gdcm::PixmapWriter::DoIconImage (
            DataSet & ds,
            Pixmap const & image )  [protected]
```

10.234.3.2 GetImage() [1/2]

```
virtual Pixmap& gdcm::PixmapWriter::GetImage ( )  [inline], [virtual]
```

Reimplemented in gdcm::ImageWriter.

10.234.3.3 GetImage() [2/2]

```
virtual const Pixmap& gdcm::PixmapWriter::GetImage ( ) const  [inline], [virtual]
```

Set/Get Pixmap to be written It will overwrite anything Pixmap infos found in DataSet (see parent class to see how to pass dataset)

Reimplemented in gdcm::ImageWriter.

10.234.3.4 GetPixmap() [1/2]

```
Pixmap& gdcm::PixmapWriter::GetPixmap ( )  [inline]
```

10.234.3.5 GetPixmap() [2/2]

```
const Pixmap& gdcm::PixmapWriter::GetPixmap ( ) const  [inline]
```

10.234.3.6 PrepareWrite()

```
bool gdcm::PixmapWriter::PrepareWrite (
            MediaStorage const & refms )  [protected]
```

10.234.3.7 SetImage()

```
virtual void gdcm::PixmapWriter::SetImage (
            Pixmap const & img )  [virtual]
```

Examples

CompressImage.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, MergeTwoFiles.cxx, and TemplateEmptyImage.cxx.

10.234.3.8 SetPixmap()

```
void gdcm::PixmapWriter::SetPixmap (
            Pixmap const & img )
```

10.234.3.9 Write()

```
bool gdcm::PixmapWriter::Write ( )  [override], [virtual]
```

Write.

Reimplemented from gdcm::Writer.

10.234.4 Member Data Documentation

10.234.4.1 PixelData

```
SmartPointer<Pixmap> gdcm::PixmapWriter::PixelData  [protected]
```

The documentation for this class was generated from the following file:

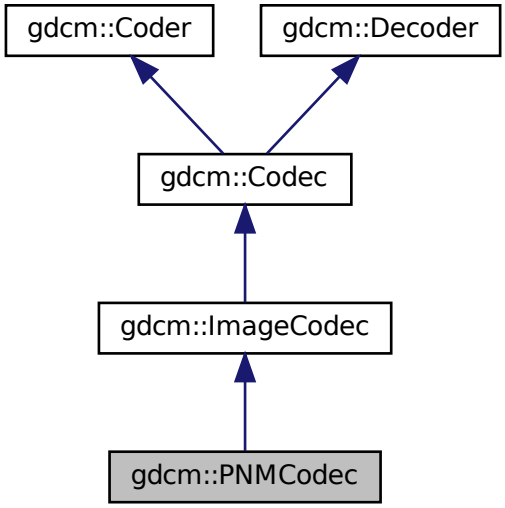
- gdcmPixmapWriter.h

10.235 gdcm::PNMCodec Class Reference

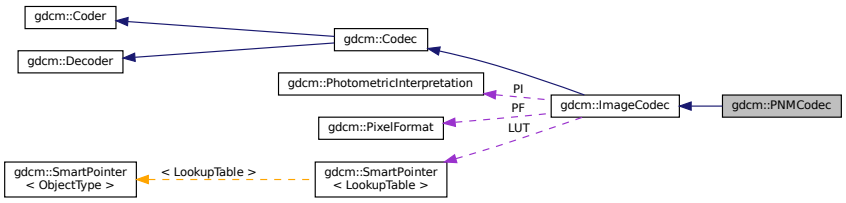
Class to do PNM.

`#include <gdcmPNMCodec.h>`

Inheritance diagram for gdcm::PNMCodec:



Collaboration diagram for gdcm::PNMCodec:



Public Member Functions

- PNMCodec ()
- ~PNMCodec () override
- bool CanCode (TransferSyntax const &ts) const override

Return whether this coder support this transfer syntax (can code it)

- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- unsigned long GetBufferLength () const
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- bool Read (const char *filename, DataElement &out) const
- void SetBufferLength (unsigned long l)
- bool Write (const char *filename, const DataElement &out) const

Additional Inherited Members

10.235.1 Detailed Description

Class to do PNM.

PNM is the Portable anymap file format. The main web page can be found at: `http://netpbm.sourceforge.net/`

Note

Only support P5 & P6 PNM file (binary grayscale and binary rgb)

Examples

ExtractIconFromFile.cxx.

10.235.2 Constructor & Destructor Documentation

10.235.2.1 PNMCodec()

```
gdcm::PNMCodec::PNMCodec ( )
```

10.235.2.2 ~PNMCodec()

```
gdcm::PNMCodec::~PNMCodec ( )  [override]
```

10.235.3 Member Function Documentation

10.235.3.1 CanCode()

```
bool gdcm::PNMCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.235.3.2 CanDecode()

```
bool gdcm::PNMCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.235.3.3 Clone()

```
ImageCodec* gdcm::PNMCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.235.3.4 GetBufferLength()

```
unsigned long gdcm::PNMCodec::GetBufferLength ( ) const  [inline]
```

10.235.3.5 GetHeaderInfo()

```
bool gdcm::PNMCodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.235.3.6 Read()

```
bool gdcm::PNMCodec::Read (
             const char * filename,
             DataElement & out ) const
```

10.235.3.7 SetBufferLength()

```
void gdcm::PNMCodec::SetBufferLength (
             unsigned long l )  [inline]
```

10.235.3.8 Write()

```
bool gdcm::PNMCodec::Write (
             const char * filename,
             const DataElement & out ) const
```

Examples

ExtractIconFromFile.cxx.

The documentation for this class was generated from the following file:

- gdcmPNMCodec.h

10.236 gdcm::Preamble Class Reference

DICOM Preamble (Part 10)

```
#include <gdcmPreamble.h>
```

Public Member Functions

- Preamble ()
- Preamble (Preamble const &)
- ~Preamble ()
- void Clear ()

  Clear.
- void Create ()
- const char * GetInternal () const

  Get internal pointer to preamble.
- VL GetLength () const

  Return size of Preamble.
- bool IsEmpty () const

  Check if Preamble is empty.
- Preamble & operator= (Preamble const &)
- void Print (std::ostream &os) const

  Print Preamble.
- std::istream & Read (std::istream &is)

  Read Preamble.
- void Remove ()
- void Valid ()

  Set Preamble to the default one.
- std::ostream const & Write (std::ostream &os) const

  Write Preamble.

Protected Member Functions

- bool IsValid () const

Friends

- std::ostream & operator<< (std::ostream &_os, const Preamble &_val)

10.236.1 Detailed Description

DICOM Preamble (Part 10)

10.236.2 Constructor & Destructor Documentation

10.236.2.1 Preamble() [1/2]

```
gdcm::Preamble::Preamble ( )
```

10.236.2.2 ~Preamble()

```
gdcm::Preamble::~Preamble ( )
```

10.236.2.3 Preamble() [2/2]

```
gdcm::Preamble::Preamble (
            Preamble const &  )  [inline]
```

10.236.3 Member Function Documentation

10.236.3.1 Clear()

```
void gdcm::Preamble::Clear ( )
```

Clear.

10.236.3.2 Create()

```
void gdcm::Preamble::Create ( )
```

10.236.3.3 GetInternal()

```
const char* gdcm::Preamble::GetInternal ( ) const  [inline]
```

Get internal pointer to preamble.

10.236.3.4 GetLength()

```
VL gdcm::Preamble::GetLength ( ) const  [inline]
```

Return size of Preamble.

10.236.3.5 IsEmpty()

```
bool gdcm::Preamble::IsEmpty ( ) const  [inline]
```

Check if Preamble is empty.

10.236.3.6 IsValid()

```
bool gdcm::Preamble::IsValid ( ) const  [inline], [protected]
```

10.236.3.7 operator=()

```
Preamble& gdcm::Preamble::operator= (
            Preamble const &  )  [inline]
```

10.236.3.8 Print()

```
void gdcm::Preamble::Print (
            std::ostream & os ) const
```

Print Preamble.

10.236.3.9 Read()

```
std::istream& gdcm::Preamble::Read (
            std::istream & is )
```

Read Preamble.

10.236.3.10 Remove()

```
void gdcm::Preamble::Remove ( )
```

10.236.3.11 Valid()

```
void gdcm::Preamble::Valid ( )
```

Set Preamble to the default one.

10.236.3.12 Write()

```
std::ostream const& gdcm::Preamble::Write (
            std::ostream & os ) const
```

Write Preamble.

10.236.4 Friends And Related Function Documentation

10.236.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Preamble & _val )  [friend]
```

The documentation for this class was generated from the following file:

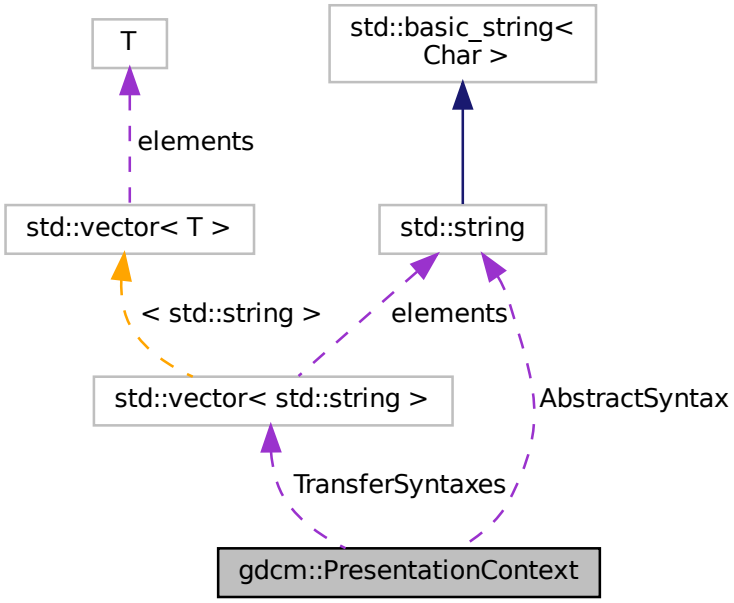
- gdcmPreamble.h

10.237 gdcm::PresentationContext Class Reference

PresentationContext.

`#include <gdcmPresentationContext.h>`

Collaboration diagram for gdcm::PresentationContext:



Public Types

- typedef TransferSyntaxArrayType::size_type SizeType
- typedef std::vector< std::string > TransferSyntaxArrayType

Public Member Functions

- PresentationContext ()
- PresentationContext (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM
- void AddTransferSyntax (const char *tsstr)
- const char * GetAbstractSyntax () const
- SizeType GetNumberOfTransferSyntaxes () const
- uint8_t GetPresentationContextID () const
- const char * GetTransferSyntax (SizeType i) const
- bool operator== (const PresentationContext &pc) const
- void Print (std::ostream &os) const
- void SetAbstractSyntax (const char *absyn)
- void SetPresentationContextID (uint8_t id)

Protected Attributes

- std::string AbstractSyntax
- uint8_t ID
- std::vector< std::string > TransferSyntaxes

10.237.1 Detailed Description

PresentationContext.

See also

PresentationContextAC PresentationContextRQ

10.237.2 Member Typedef Documentation

10.237.2.1 SizeType

```
typedef TransferSyntaxArrayType::size_type gdcm::PresentationContext::SizeType
```

10.237.2.2 TransferSyntaxArrayType

```
typedef std::vector<std::string> gdcm::PresentationContext::TransferSyntaxArrayType
```

10.237.3 Constructor & Destructor Documentation

10.237.3.1 PresentationContext() [1/2]

```
gdcm::PresentationContext::PresentationContext ( )
```

10.237.3.2 PresentationContext() [2/2]

```
gdcm::PresentationContext::PresentationContext (
            UIDs::TSName asname,
            UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM )
```

Initialize Presentation Context with AbstractSyntax set to asname and with a single TransferSyntax set to tsname (default to Implicit VR LittleEndian when not specified).

10.237.4 Member Function Documentation

10.237.4.1 AddTransferSyntax()

```
void gdcm::PresentationContext::AddTransferSyntax (
            const char * tsstr )
```

10.237.4.2 GetAbstractSyntax()

```
const char* gdcm::PresentationContext::GetAbstractSyntax ( ) const  [inline]
```

10.237.4.3 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::PresentationContext::GetNumberOfTransferSyntaxes ( ) const  [inline]
```

10.237.4.4 GetPresentationContextID()

```
uint8_t gdcm::PresentationContext::GetPresentationContextID ( ) const
```

10.237.4.5 GetTransferSyntax()

```
const char* gdcm::PresentationContext::GetTransferSyntax (
            SizeType i ) const  [inline]
```

10.237.4.6 operator==()

```
bool gdcm::PresentationContext::operator== (
            const PresentationContext & pc ) const  [inline]
```

References AbstractSyntax, and TransferSyntaxes.

10.237.4.7 Print()

```
void gdcm::PresentationContext::Print (
            std::ostream & os ) const
```

10.237.4.8 SetAbstractSyntax()

```
void gdcm::PresentationContext::SetAbstractSyntax (
            const char * absyn )  [inline]
```

10.237.4.9 SetPresentationContextID()

```
void gdcm::PresentationContext::SetPresentationContextID (
            uint8_t id )
```

10.237.5 Member Data Documentation

10.237.5.1 AbstractSyntax

```
std::string gdcm::PresentationContext::AbstractSyntax  [protected]
```

Referenced by operator==().

10.237.5.2 ID

```
uint8_t gdcm::PresentationContext::ID  [protected]
```

10.237.5.3 TransferSyntaxes

```
std::vector<std::string> gdcm::PresentationContext::TransferSyntaxes  [protected]
```

Referenced by operator==().

The documentation for this class was generated from the following file:

- gdcmPresentationContext.h

10.238 gdcm::network::PresentationContextAC Class Reference

PresentationContextAC.

```
#include <gdcmPresentationContextAC.h>
```

Public Member Functions

- PresentationContextAC ()
- uint8_t GetPresentationContextID () const
- uint8_t GetReason () const
- TransferSyntaxSub const & GetTransferSyntax () const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetPresentationContextID (uint8_t id)
- void SetReason (uint8_t r)
- void SetTransferSyntax (TransferSyntaxSub const &ts)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.238.1 Detailed Description

PresentationContextAC.

Table 9-18 PRESENTATION CONTEXT ITEM FIELDS

See also

PresentationContext

10.238.2 Constructor & Destructor Documentation

10.238.2.1 PresentationContextAC()

```
gdcm::network::PresentationContextAC::PresentationContextAC ( )
```

10.238.3 Member Function Documentation

10.238.3.1 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationContextAC::GetPresentationContextID ( ) const  [inline]
```

10.238.3.2 GetReason()

```
uint8_t gdcm::network::PresentationContextAC::GetReason ( ) const  [inline]
```

10.238.3.3 GetTransferSyntax()

```
TransferSyntaxSub const& gdcm::network::PresentationContextAC::GetTransferSyntax ( ) const  [inline]
```

10.238.3.4 Print()

```
void gdcm::network::PresentationContextAC::Print (
            std::ostream & os ) const
```

10.238.3.5 Read()

```
std::istream& gdcm::network::PresentationContextAC::Read (
            std::istream & is )
```

10.238.3.6 SetPresentationContextID()

```
void gdcm::network::PresentationContextAC::SetPresentationContextID (
            uint8_t id )
```

10.238.3.7 SetReason()

```
void gdcm::network::PresentationContextAC::SetReason (
            uint8_t r )  [inline]
```

10.238.3.8 SetTransferSyntax()

```
void gdcm::network::PresentationContextAC::SetTransferSyntax (
            TransferSyntaxSub const & ts )
```

10.238.3.9 Size()

```
size_t gdcm::network::PresentationContextAC::Size ( ) const
```

10.238.3.10 Write()

```
const std::ostream& gdcm::network::PresentationContextAC::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmPresentationContextAC.h

10.239 gdcm::PresentationContextGenerator Class Reference

PresentationContextGenerator.

```
#include <gdcmPresentationContextGenerator.h>
```

Public Types

- typedef std::vector< PresentationContext > PresentationContextArrayType
- typedef PresentationContextArrayType::size_type SizeType

Public Member Functions

- PresentationContextGenerator ()
- bool AddFromFile (const File &file)
- bool GenerateFromFilenames (const Directory::FilenamesType &files)
- bool GenerateFromUID (UIDs::TSName asname)

  Generate the PresentationContext array from a UID (eg. VerificationSOPClass)
- PresentationContextArrayType const & GetPresentationContexts ()
- void SetDefaultTransferSyntax (const TransferSyntax &ts)

  Not implemented for now. GDCM internally uses Implicit Little Endian.
- void SetMergeModeToAbstractSyntax ()
- void SetMergeModeToTransferSyntax ()

Protected Member Functions

- bool AddPresentationContext (const char *absyn, const char *ts)
- const char * GetDefaultTransferSyntax () const

10.239.1 Detailed Description

PresentationContextGenerator.

This class is responsible for generating the proper PresentationContext that will be used in subsequent operation during a DICOM Query/Retrieve association. The step of the association is very sensible as special care need to be taken to explicitly define what instance are going to be send and how they are encoded.

For example a PresentationContext will express that negotiation requires that CT Image Storage are send using JPEG Lossless, while US Image Storage are sent using RLE Transfer Syntax.

Two very different API are exposed one which will always default to little endian transfer syntax see GenerateFromUID() This API is used for C-ECHO, C-FIND and C-MOVE (SCU). Another API: GenerateFromFilenames() is used for C-STORE (SCU) as it will loop over all filenames argument to detect the actual encoding. and therefore find the proper encoding to be used.

Two modes are available. The default mode (SetMergeModeToAbstractSyntax) append PresentationContext (one AbstractSyntax and one TransferSyntax), as long a they are different. Eg MR Image Storage/JPEG2000 and MR Image Storage/JPEGLossless would be considered different. the other mode SetMergeModeToTransferSyntax merge any new TransferSyntax to the already existing PresentationContext in order to re-use the same AbstractSyntax.

See also

PresentationContext

Examples

CStoreQtProgress.cxx.

10.239.2 Member Typedef Documentation

10.239.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContext> gdcm::PresentationContextGenerator::PresentationContextArrayType
```

10.239.2.2 SizeType

```
typedef PresentationContextArrayType::size_type gdcm::PresentationContextGenerator::SizeType
```

10.239.3 Constructor & Destructor Documentation

10.239.3.1 PresentationContextGenerator()

```
gdcm::PresentationContextGenerator::PresentationContextGenerator ( )
```

10.239.4 Member Function Documentation

10.239.4.1 AddFromFile()

```
bool gdcm::PresentationContextGenerator::AddFromFile (
            const File & file )
```

Add a single PresentationContext from a single File. Call multiple times when dealing with multiple files.

10.239.4.2 AddPresentationContext()

```
bool gdcm::PresentationContextGenerator::AddPresentationContext (
            const char * absyn,
            const char * ts )  [protected]
```

10.239.4.3 GenerateFromFilenames()

```
bool gdcm::PresentationContextGenerator::GenerateFromFilenames (
            const Directory::FilenamesType & files )
```

Generate the PresentationContext array from a File-Set. File specified needs to be valid DICOM files. Used for C-STORE operations

Examples

CStoreQtProgress.cxx.

10.239.4.4 GenerateFromUID()

```
bool gdcm::PresentationContextGenerator::GenerateFromUID (
            UIDs::TSName asname )
```

Generate the PresentationContext array from a UID (eg. VerificationSOPClass)

10.239.4.5 GetDefaultTransferSyntax()

```
const char* gdcm::PresentationContextGenerator::GetDefaultTransferSyntax ( ) const  [protected]
```

10.239.4.6 GetPresentationContexts()

```
PresentationContextArrayType const& gdcm::PresentationContextGenerator::GetPresentationContexts (
) [inline]
```

Examples

CStoreQtProgress.cxx.

10.239.4.7 SetDefaultTransferSyntax()

```
void gdcm::PresentationContextGenerator::SetDefaultTransferSyntax (
            const TransferSyntax & ts )
```

Not implemented for now. GDCM internally uses Implicit Little Endian.

10.239.4.8 SetMergeModeToAbstractSyntax()

```
void gdcm::PresentationContextGenerator::SetMergeModeToAbstractSyntax ( )
```

10.239.4.9 SetMergeModeToTransferSyntax()

```
void gdcm::PresentationContextGenerator::SetMergeModeToTransferSyntax ( )
```

The documentation for this class was generated from the following file:

- gdcmPresentationContextGenerator.h

10.240 gdcm::network::PresentationContextRQ Class Reference

PresentationContextRQ.

```
#include <gdcmPresentationContextRQ.h>
```

Public Types

- typedef std::vector< TransferSyntaxSub >::size_type SizeType

Public Member Functions

- PresentationContextRQ ()
- PresentationContextRQ (const PresentationContext &pc)
- PresentationContextRQ (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDI
- void AddTransferSyntax (TransferSyntaxSub const &ts)
- AbstractSyntax & GetAbstractSyntax ()
- AbstractSyntax const & GetAbstractSyntax () const
- SizeType GetNumberOfTransferSyntaxes () const
- uint8_t GetPresentationContextID () const
- TransferSyntaxSub & GetTransferSyntax (SizeType i)
- TransferSyntaxSub const & GetTransferSyntax (SizeType i) const
- std::vector< TransferSyntaxSub > const & GetTransferSyntaxes () const
- bool operator== (const PresentationContextRQ &pc) const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetAbstractSyntax (AbstractSyntax const &absyn)
- void SetPresentationContextID (uint8_t id)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.240.1 Detailed Description

PresentationContextRQ.

Table 9-13 PRESENTATION CONTEXT ITEM FIELDS

See also

PresentationContextAC

10.240.2 Member Typedef Documentation

10.240.2.1 SizeType

```
typedef std::vector<TransferSyntaxSub>::size_type gdcm::network::PresentationContextRQ::SizeType
```

10.240.3 Constructor & Destructor Documentation

10.240.3.1 PresentationContextRQ() [1/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ ( )
```

10.240.3.2 PresentationContextRQ() [2/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
            UIDs::TSName asname,
            UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM )
```

Initialize Presentation Context with AbstractSyntax set to asname and with a single TransferSyntax set to tsname (dfault to Implicit VR LittleEndian when not specified).

10.240.3.3 PresentationContextRQ() [3/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
            const PresentationContext & pc )
```

10.240.4 Member Function Documentation

10.240.4.1 AddTransferSyntax()

```
void gdcm::network::PresentationContextRQ::AddTransferSyntax (
            TransferSyntaxSub const & ts )
```

10.240.4.2 GetAbstractSyntax() [1/2]

```
AbstractSyntax& gdcm::network::PresentationContextRQ::GetAbstractSyntax ( )  [inline]
```

10.240.4.3 GetAbstractSyntax() [2/2]

```
AbstractSyntax const& gdcm::network::PresentationContextRQ::GetAbstractSyntax ( ) const  [inline]
```

10.240.4.4 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::network::PresentationContextRQ::GetNumberOfTransferSyntaxes ( ) const  [inline]
```

10.240.4.5 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationContextRQ::GetPresentationContextID ( ) const
```

10.240.4.6 GetTransferSyntax() [1/2]

```
TransferSyntaxSub& gdcm::network::PresentationContextRQ::GetTransferSyntax (
            SizeType i )  [inline]
```

10.240.4.7 GetTransferSyntax() [2/2]

```
TransferSyntaxSub const& gdcm::network::PresentationContextRQ::GetTransferSyntax (
            SizeType i ) const  [inline]
```

10.240.4.8 GetTransferSyntaxes()

```
std::vector<TransferSyntaxSub> const& gdcm::network::PresentationContextRQ::GetTransferSyntaxes (
) const  [inline]
```

10.240.4.9 operator==()

```
bool gdcm::network::PresentationContextRQ::operator== (
            const PresentationContextRQ & pc ) const  [inline]
```

10.240.4.10 Print()

```
void gdcm::network::PresentationContextRQ::Print (
            std::ostream & os ) const
```

10.240.4.11 Read()

```
std::istream& gdcm::network::PresentationContextRQ::Read (
            std::istream & is )
```

10.240.4.12 SetAbstractSyntax()

```
void gdcm::network::PresentationContextRQ::SetAbstractSyntax (
            AbstractSyntax const & absyn )
```

10.240.4.13 SetPresentationContextID()

```
void gdcm::network::PresentationContextRQ::SetPresentationContextID (
            uint8_t id )
```

10.240.4.14 Size()

```
size_t gdcm::network::PresentationContextRQ::Size ( ) const
```

10.240.4.15 Write()

```
const std::ostream& gdcm::network::PresentationContextRQ::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmPresentationContextRQ.h

10.241 gdcm::network::PresentationDataValue Class Reference

PresentationDataValue.

```
#include <gdcmPresentationDataValue.h>
```

Public Member Functions

- PresentationDataValue ()
- const std::string & GetBlob () const
- bool GetIsCommand () const
- bool GetIsLastFragment () const
- uint8_t GetMessageHeader () const
- uint8_t GetPresentationContextID () const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- std::istream & ReadInto (std::istream &is, std::ostream &os)
- void SetBlob (const std::string &partialblob)
- void SetCommand (bool inCommand)
- void SetDataSet (const DataSet &ds)
- void SetLastFragment (bool inLast)
- void SetMessageHeader (uint8_t messageheader)
- void SetPresentationContextID (uint8_t id)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

Static Public Member Functions

- static DataSet ConcatenatePDVBlobs (const std::vector< PresentationDataValue > &inPDVs)
- static DataSet ConcatenatePDVBlobsAsExplicit (const std::vector< PresentationDataValue > &inPDVs)

10.241.1 Detailed Description

PresentationDataValue.

Table 9-23 PRESENTATION-DATA-VALUE ITEM FIELDS

10.241.2 Constructor & Destructor Documentation

10.241.2.1 PresentationDataValue()

```
gdcm::network::PresentationDataValue::PresentationDataValue ( )
```

10.241.3 Member Function Documentation

10.241.3.1 ConcatenatePDVBlobs()

```
static DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobs (
            const std::vector< PresentationDataValue > & inPDVs )  [static]
```

Warning

DataSet will be read as Implicit Little Endian TS

10.241.3.2 ConcatenatePDVBlobsAsExplicit()

```
static DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobsAsExplicit (
            const std::vector< PresentationDataValue > & inPDVs )  [static]
```

10.241.3.3 GetBlob()

```
const std::string& gdcm::network::PresentationDataValue::GetBlob ( ) const
```

10.241.3.4 GetIsCommand()

```
bool gdcm::network::PresentationDataValue::GetIsCommand ( ) const
```

10.241.3.5 GetIsLastFragment()

```
bool gdcm::network::PresentationDataValue::GetIsLastFragment ( ) const
```

10.241.3.6 GetMessageHeader()

```
uint8_t gdcm::network::PresentationDataValue::GetMessageHeader ( ) const  [inline]
```

10.241.3.7 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationDataValue::GetPresentationContextID ( ) const  [inline]
```

10.241.3.8 Print()

```
void gdcm::network::PresentationDataValue::Print (
             std::ostream & os ) const
```

10.241.3.9 Read()

```
std::istream& gdcm::network::PresentationDataValue::Read (
             std::istream & is )
```

10.241.3.10 ReadInto()

```
std::istream& gdcm::network::PresentationDataValue::ReadInto (
            std::istream & is,
            std::ostream & os )
```

10.241.3.11 SetBlob()

```
void gdcm::network::PresentationDataValue::SetBlob (
            const std::string & partialblob )
```

10.241.3.12 SetCommand()

```
void gdcm::network::PresentationDataValue::SetCommand (
            bool inCommand )
```

10.241.3.13 SetDataSet()

```
void gdcm::network::PresentationDataValue::SetDataSet (
            const DataSet & ds )
```

Set DataSet. Write DataSet in implicit.

Warning

size of dataset should be below maxpdusize

10.241.3.14 SetLastFragment()

```
void gdcm::network::PresentationDataValue::SetLastFragment (
            bool inLast )
```

10.241.3.15 SetMessageHeader()

```
void gdcm::network::PresentationDataValue::SetMessageHeader (
            uint8_t messageheader )  [inline]
```

10.241.3.16 SetPresentationContextID()

```
void gdcm::network::PresentationDataValue::SetPresentationContextID (
            uint8_t id )  [inline]
```

10.241.3.17 Size()

```
size_t gdcm::network::PresentationDataValue::Size ( ) const
```

10.241.3.18 Write()

```
const std::ostream& gdcm::network::PresentationDataValue::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

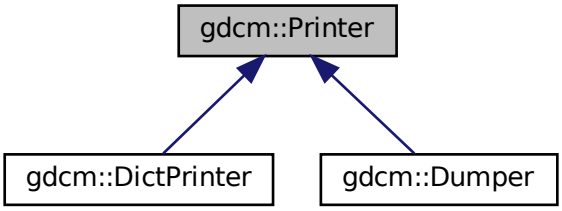
- gdcmPresentationDataValue.h

10.242 gdcm::Printer Class Reference

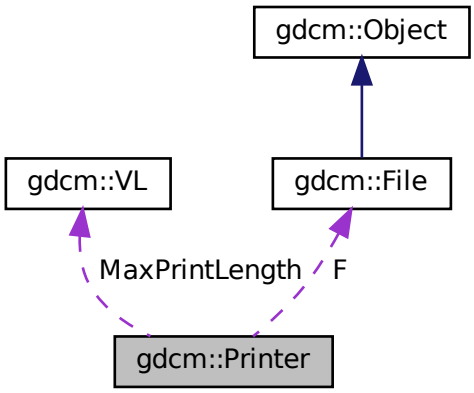
Printer class.

`#include <gdcmPrinter.h>`

Inheritance diagram for gdcm::Printer:



Collaboration diagram for gdcm::Printer:



Public Types

- enum PrintStyles {
  VERBOSE_STYLE = 0 ,
  CONDENSED_STYLE ,
  XML ,
  CXX }

Public Member Functions

- Printer ()
- ~Printer ()
- PrintStyles GetPrintStyle () const

  Get PrintStyle value.
- void Print (std::ostream &os)

  Print.
- void PrintDataSet (const DataSet &ds, std::ostream &os, const std::string &s="")

  Print an individual dataset.
- void SetColor (bool c)

  Set color mode or not.
- void SetFile (File const &f)

  Set file.
- void SetStyle (PrintStyles ps)

  Set PrintStyle value.

Protected Member Functions

- VR PrintDataElement (std::ostringstream &os, const Dicts &dicts, const DataSet &ds, const DataElement &de, std::ostream &out, std::string const &indent)
- void PrintSQ (const SequenceOfItems *sqi, std::ostream &os, std::string const &indent)

Protected Attributes

- const File * F
- VL MaxPrintLength
- PrintStyles PrintStyle

10.242.1 Detailed Description

Printer class.

Examples

DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, and DumpToshibaDTI2.cxx.

10.242.2 Member Enumeration Documentation

10.242.2.1 PrintStyles

```
enum gdcm::Printer::PrintStyles
```

Enumerator

VERBOSE_STYLE	
CONDENSED_STYLE	
XML	
CXX	

10.242.3 Constructor & Destructor Documentation

10.242.3.1 Printer()

```
gdcm::Printer::Printer ( )
```

10.242.3.2 ~Printer()

```
gdcm::Printer::~Printer ( )
```

10.242.4 Member Function Documentation

10.242.4.1 GetPrintStyle()

```
PrintStyles gdcm::Printer::GetPrintStyle ( ) const  [inline]
```

Get PrintStyle value.

10.242.4.2 Print()

```
void gdcm::Printer::Print (
            std::ostream & os )
```

Print.

Examples

DumpSiemensBase64.cxx.

10.242.4.3 PrintDataElement()

```
VR gdcm::Printer::PrintDataElement (
            std::ostringstream & os,
            const Dicts & dicts,
            const DataSet & ds,
            const DataElement & de,
            std::ostream & out,
            std::string const & indent )  [protected]
```

10.242.4.4 PrintDataSet()

```
void gdcm::Printer::PrintDataSet (
            const DataSet & ds,
            std::ostream & os,
            const std::string & s = "" )
```

Print an individual dataset.

10.242.4.5 PrintSQ()

```
void gdcm::Printer::PrintSQ (
            const SequenceOfItems * sqi,
            std::ostream & os,
            std::string const & indent )  [protected]
```

10.242.4.6 SetColor()

```
void gdcm::Printer::SetColor (
            bool c )
```

Set color mode or not.

10.242.4.7 SetFile()

```
void gdcm::Printer::SetFile (
            File const & f )  [inline]
```

Set file.

Examples

DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, and DumpToshibaDTI2.cxx.

10.242.4.8 SetStyle()

```
void gdcm::Printer::SetStyle (
            PrintStyles ps )  [inline]
```

Set PrintStyle value.

10.242.5 Member Data Documentation

10.242.5.1 F

```
const File* gdcm::Printer::F  [protected]
```

10.242.5.2 MaxPrintLength

```
VL gdcm::Printer::MaxPrintLength  [protected]
```

10.242.5.3 PrintStyle

```
PrintStyles gdcm::Printer::PrintStyle  [protected]
```

The documentation for this class was generated from the following file:

- gdcmPrinter.h

10.243 gdcm::PrivateDict Class Reference

Private Dict.

```
#include <gdcmDict.h>
```

Public Member Functions

- PrivateDict ()=default
- ~PrivateDict ()=default
- void AddDictEntry (const PrivateTag &tag, const DictEntry &de)
- bool FindDictEntry (const PrivateTag &tag) const
- const DictEntry & GetDictEntry (const PrivateTag &tag) const
- bool IsEmpty () const
- void PrintXML () const
- bool RemoveDictEntry (const PrivateTag &tag)

Protected Member Functions

- void LoadDefault ()

Friends

- class Dicts
- std::ostream & operator<< (std::ostream &os, const PrivateDict &val)

10.243.1 Detailed Description

Private Dict.

10.243.2 Constructor & Destructor Documentation

10.243.2.1 PrivateDict()

```
gdcm::PrivateDict::PrivateDict ( )  [default]
```

10.243.2.2 ~PrivateDict()

```
gdcm::PrivateDict::~PrivateDict ( )  [default]
```

10.243.3 Member Function Documentation

10.243.3.1 AddDictEntry()

```
void gdcm::PrivateDict::AddDictEntry (
            const PrivateTag & tag,
            const DictEntry & de )  [inline]
```

References gdcm::DictEntry::GetVM(), gdcm::DictEntry::GetVR(), gdcm::DictEntry::SetVM(), gdcm::DictEntry::SetVR(), and gdcm::VR::UN.

10.243.3.2 FindDictEntry()

```
bool gdcm::PrivateDict::FindDictEntry (
            const PrivateTag & tag ) const  [inline]
```

10.243.3.3 GetDictEntry()

```
const DictEntry& gdcm::PrivateDict::GetDictEntry (
            const PrivateTag & tag ) const  [inline]
```

10.243.3.4 IsEmpty()

```
bool gdcm::PrivateDict::IsEmpty ( ) const  [inline]
```

10.243.3.5 LoadDefault()

```
void gdcm::PrivateDict::LoadDefault ( )  [protected]
```

10.243.3.6 PrintXML()

```
void gdcm::PrivateDict::PrintXML ( ) const  [inline]
```

References gdcm::Tag::GetElement(), gdcm::Tag::GetGroup(), gdcm::DictEntry::GetName(), gdcm::PrivateTag::Get↩Owner(), gdcm::DictEntry::GetVM(), and gdcm::DictEntry::GetVR().

10.243.3.7 RemoveDictEntry()

```
bool gdcm::PrivateDict::RemoveDictEntry (
            const PrivateTag & tag )  [inline]
```

Remove entry 'tag'. Return true on success (element was found and remove). return false if element was not found.

10.243.4 Friends And Related Function Documentation

10.243.4.1 Dicts

```
friend class Dicts  [friend]
```

10.243.4.2 operator<<

```
std::ostream& operator<< (
             std::ostream & os,
             const PrivateDict & val )  [friend]
```

The documentation for this class was generated from the following file:

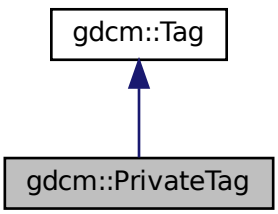
- gdcmDict.h

10.244 gdcm::PrivateTag Class Reference

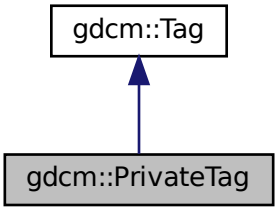
Class to represent a Private DICOM Data Element (Attribute) Tag (Group, Element, Owner)

```
#include <gdcmPrivateTag.h>
```

Inheritance diagram for gdcm::PrivateTag:



Collaboration diagram for gdcm::PrivateTag:



Public Member Functions

- PrivateTag (Tag const &t, const char *owner="")
- PrivateTag (uint16_t group=0, uint16_t element=0, const char *owner="")
- DataElement GetAsDataElement () const
- const char * GetOwner () const
- bool operator< (const PrivateTag &_val) const
- bool ReadFromCommaSeparatedString (const char *str)
- void SetOwner (const char *owner)

Friends

- std::ostream & operator<< (std::ostream &_os, const PrivateTag &_val)

10.244.1 Detailed Description

Class to represent a Private DICOM Data Element (Attribute) Tag (Group, Element, Owner)

Note

private tag have element value in: [0x10,0xff], for instance 0x0009,0x0000 is NOT a private tag

Examples

ChangePrivateTags.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, ELSCINT1WaveToText.cxx, MrProtocol.cxx, PublicDict.cxx, csa2img.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.244.2 Constructor & Destructor Documentation

10.244.2.1 PrivateTag() [1/2]

```
gdcm::PrivateTag::PrivateTag (
            uint16_t group = 0,
            uint16_t element = 0,
            const char * owner = "" )  [inline]
```

10.244.2.2 PrivateTag() [2/2]

```
gdcm::PrivateTag::PrivateTag (
            Tag const & t,
            const char * owner = "" )  [inline]
```

References gdcm::Tag::GetElement().

10.244.3 Member Function Documentation

10.244.3.1 GetAsDataElement()

```
DataElement gdcm::PrivateTag::GetAsDataElement ( ) const
```

10.244.3.2 GetOwner()

```
const char* gdcm::PrivateTag::GetOwner ( ) const  [inline]
```

Examples

PublicDict.cxx.

Referenced by gdcm::PrivateDict::PrintXML().

10.244.3.3 operator<()

```
bool gdcm::PrivateTag::operator< (
            const PrivateTag & _val ) const
```

10.244.3.4 ReadFromCommaSeparatedString()

```
bool gdcm::PrivateTag::ReadFromCommaSeparatedString (
            const char * str )
```

Read PrivateTag from a string. Element number will be truncated to 8bits. Eg: "1234,5678,GDCM" is private tag: (1234,78,"GDCM")

10.244.3.5 SetOwner()

```
void gdcm::PrivateTag::SetOwner (
            const char * owner )  [inline]
```

10.244.4 Friends And Related Function Documentation

10.244.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const PrivateTag & _val )  [friend]
```

The documentation for this class was generated from the following file:

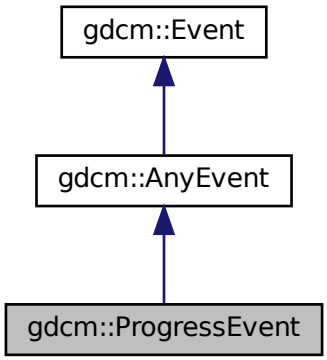
- gdcmPrivateTag.h

10.245 gdcm::ProgressEvent Class Reference

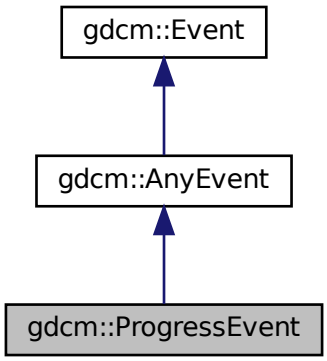
ProgressEvent.

`#include <gdcmProgressEvent.h>`

Inheritance diagram for gdcm::ProgressEvent:



Collaboration diagram for gdcm::ProgressEvent:



Public Types

- typedef ProgressEvent Self
- typedef AnyEvent Superclass

Public Member Functions

- ProgressEvent (const Self &s)
- ProgressEvent (double p=0)
- ~ProgressEvent () override=default
- bool CheckEvent (const ::gdcm::Event *e) const override
- const char * GetEventName () const override
- double GetProgress () const
- ::gdcm::Event * MakeObject () const override
- void operator= (const Self &)=delete
- void SetProgress (double p)

10.245.1 Detailed Description

ProgressEvent.

Special type of event triggered during

See also

AnyEvent

10.245.2 Member Typedef Documentation

10.245.2.1 Self

```
typedef ProgressEvent gdcm::ProgressEvent::Self
```

10.245.2.2 Superclass

```
typedef AnyEvent gdcm::ProgressEvent::Superclass
```

10.245.3 Constructor & Destructor Documentation

10.245.3.1 ProgressEvent() [1/2]

```
gdcm::ProgressEvent::ProgressEvent (
            double p = 0 )  [inline]
```

10.245.3.2 ~ProgressEvent()

```
gdcm::ProgressEvent::~ProgressEvent ( )  [override], [default]
```

10.245.3.3 ProgressEvent() [2/2]

```
gdcm::ProgressEvent::ProgressEvent (
            const Self & s )  [inline]
```

10.245.4 Member Function Documentation

10.245.4.1 CheckEvent()

```
bool gdcm::ProgressEvent::CheckEvent (
            const ::gdcm::Event * e ) const  [inline], [override]
```

10.245.4.2 GetEventName()

```
const char* gdcm::ProgressEvent::GetEventName ( ) const  [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements gdcm::Event.

10.245.4.3 GetProgress()

```
double gdcm::ProgressEvent::GetProgress ( ) const  [inline]
```

10.245.4.4 MakeObject()

```
::gdcm::Event* gdcm::ProgressEvent::MakeObject ( ) const  [inline], [override], [virtual]
```

Create an Event of this type This method work as a Factory for creating events of each particular type.

Implements gdcm::Event.

10.245.4.5 operator=()

```
void gdcm::ProgressEvent::operator= (
            const Self &  )  [delete]
```

10.245.4.6 SetProgress()

```
void gdcm::ProgressEvent::SetProgress (
            double p )  [inline]
```

The documentation for this class was generated from the following file:

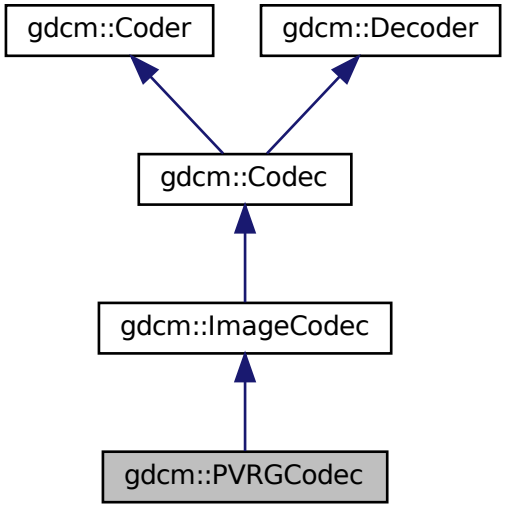
- gdcmProgressEvent.h

10.246 gdcm::PVRGCodec Class Reference

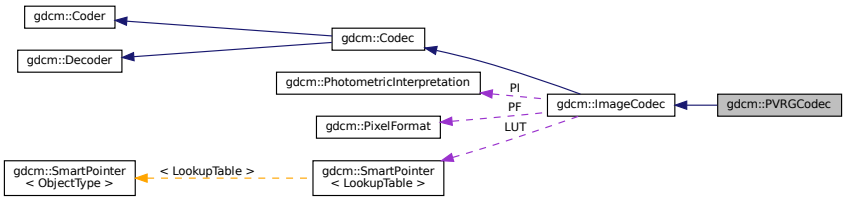
PVRGCodec.

`#include <gdcmPVRGCodec.h>`

Inheritance diagram for gdcm::PVRGCodec:



Collaboration diagram for gdcm::PVRGCodec:



Public Member Functions

- PVRGCodec ()
- ~PVRGCodec () override
- bool CanCode (TransferSyntax const &ts) const override

Return whether this coder support this transfer syntax (can code it)

- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- void SetLossyFlag (bool l)

Additional Inherited Members

10.246.1 Detailed Description

PVRGCodec.

Note

pvrg is a broken implementation of the JPEG standard. It is known to have a bug in the 16bits lossless implementation of the standard.

In an ideal world, you should not need this codec at all. But to support some broken file such as:

PHILIPS_Gyroscan-12-Jpeg_Extended_Process_2_4.dcm

we have to...

10.246.2 Constructor & Destructor Documentation

10.246.2.1 PVRGCodec()

```
gdcm::PVRGCodec::PVRGCodec ( )
```

10.246.2.2 ~PVRGCodec()

```
gdcm::PVRGCodec::~PVRGCodec ( )  [override]
```

10.246.3 Member Function Documentation

10.246.3.1 CanCode()

```
bool gdcm::PVRGCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.246.3.2 CanDecode()

```
bool gdcm::PVRGCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.246.3.3 Clone()

```
ImageCodec* gdcm::PVRGCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.246.3.4 Code()

```
bool gdcm::PVRGCodec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.246.3.5 Decode()

```
bool gdcm::PVRGCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.246.3.6 SetLossyFlag()

```
void gdcm::PVRGCodec::SetLossyFlag (
            bool l )
```

The documentation for this class was generated from the following file:

- gdcmPVRGCodec.h

10.247 gdcm::PythonFilter Class Reference

PythonFilter PythonFilter is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a DataElement into a string, typically this is a nice feature to have for wrapped language.

```
#include <gdcmPythonFilter.h>
```

Public Member Functions

- PythonFilter ()
- ~PythonFilter ()
- File & GetFile ()
- const File & GetFile () const
- void SetDicts (const Dicts &dicts)
- void SetFile (const File &f)
- PyObject * ToPyObject (const Tag &t) const
- void UseDictAlways (bool)

10.247.1 Detailed Description

PythonFilter PythonFilter is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a DataElement into a string, typically this is a nice feature to have for wrapped language.

10.247.2 Constructor & Destructor Documentation

10.247.2.1 PythonFilter()

```
gdcm::PythonFilter::PythonFilter ( )
```

10.247.2.2 ~PythonFilter()

```
gdcm::PythonFilter::~PythonFilter ( )
```

10.247.3 Member Function Documentation

10.247.3.1 GetFile() [1/2]

```
File& gdcm::PythonFilter::GetFile ( )
```

10.247.3.2 GetFile() [2/2]

```
const File& gdcm::PythonFilter::GetFile ( ) const
```

10.247.3.3 SetDicts()

```
void gdcm::PythonFilter::SetDicts (
            const Dicts & dicts )
```

10.247.3.4 SetFile()

```
void gdcm::PythonFilter::SetFile (
            const File & f )
```

10.247.3.5 ToPyObject()

```
PyObject* gdcm::PythonFilter::ToPyObject (
            const Tag & t ) const
```

10.247.3.6 UseDictAlways()

```
void gdcm::PythonFilter::UseDictAlways (
            bool  )  [inline]
```

The documentation for this class was generated from the following file:

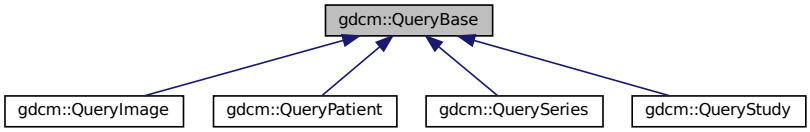
- gdcmPythonFilter.h

10.248 gdcm::QueryBase Class Reference

QueryBase.

```
#include <gdcmQueryBase.h>
```

Inheritance diagram for gdcm::QueryBase:



Public Member Functions

- virtual ~QueryBase ()=default
- std::vector< Tag > GetAllRequiredTags (const ERootType &inRootType) const
- std::vector< Tag > GetAllTags (const ERootType &inRootType) const
- virtual std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const =0

  Return all Unique Key for a particular Query Root type (from the same level and above).
- virtual const char * GetName () const =0
- virtual std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const =0
- virtual DataElement GetQueryLevel () const =0
- virtual std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const =0
- virtual std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const =0

10.248.1 Detailed Description

QueryBase.

contains: the base class for constructing a query dataset for a C-FIND and a C-MOVE

There are four levels of C-FIND and C-MOVE query:

- Patient
- Study
- Series
- Image

Each one has its own required and optional tags. This class provides an interface for getting those tags. This is an interface class.

See 3.4 C 6.1 and 3.4 C 6.2 for the patient and study root query types. These sections define the tags allowed by a particular query. The caller must pass in which root type they want, patient or study. A third root type, Modality Worklist Query, isn't yet supported.

This class (or rather it's derived classes) will be held in the RootQuery types. These query types actually make the dataset, and will use this dataset to list the required, unique, and optional tags for each type of query. This design is somewhat overly complicated, but is kept so that if we ever wanted to try to guess the query type from the given tags, we could do so.

10.248.2 Constructor & Destructor Documentation

10.248.2.1 ~QueryBase()

```
virtual gdcm::QueryBase::~QueryBase ( )  [virtual], [default]
```

10.248.3 Member Function Documentation

10.248.3.1 GetAllRequiredTags()

```
std::vector<Tag> gdcm::QueryBase::GetAllRequiredTags (
            const ERootType & inRootType ) const
```

In order to validate a query dataset we need to check that there exists at least one required (or unique) key

10.248.3.2 GetAllTags()

```
std::vector<Tag> gdcm::QueryBase::GetAllTags (
            const ERootType & inRootType ) const
```

In order to validate a query dataset, just check for the presence of a tag, not it's requirement level in the spec

10.248.3.3 GetHierachicalSearchTags()

```
virtual std::vector<Tag> gdcm::QueryBase::GetHierachicalSearchTags (
            const ERootType & inRootType ) const  [pure virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

10.248.3.4 GetName()

```
virtual const char* gdcm::QueryBase::GetName ( ) const  [pure virtual]
```

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

10.248.3.5 GetOptionalTags()

```
virtual std::vector<Tag> gdcm::QueryBase::GetOptionalTags (
            const ERootType & inRootType ) const  [pure virtual]
```

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

10.248.3.6 GetQueryLevel()

```
virtual DataElement gdcm::QueryBase::GetQueryLevel ( ) const  [pure virtual]
```

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

10.248.3.7 GetRequiredTags()

```
virtual std::vector<Tag> gdcm::QueryBase::GetRequiredTags (
            const ERootType & inRootType ) const  [pure virtual]
```

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

10.248.3.8 GetUniqueTags()

```
virtual std::vector<Tag> gdcm::QueryBase::GetUniqueTags (
            const ERootType & inRootType ) const  [pure virtual]
```

Implemented in gdcm::QueryStudy, gdcm::QuerySeries, gdcm::QueryPatient, and gdcm::QueryImage.

The documentation for this class was generated from the following file:

- gdcmQueryBase.h

10.249 gdcm::QueryFactory Class Reference

QueryFactory.h.

```
#include <gdcmQueryFactory.h>
```

Static Public Member Functions

- static ECharSet GetCharacterFromCurrentLocale ()
- static void ListCharSets (std::ostream &os)

  List all possible CharSet.
- static DataElement ProduceCharacterSetDataElement (const std::vector< ECharSet > &inCharSetType)
- static BaseQuery * ProduceQuery (const std::string &sopInstanceUID, ENQueryType inQueryType)
- static BaseRootQuery * ProduceQuery (ERootType inRootType, EQueryType inQueryType, EQueryLevel in↩ QueryLevel)

10.249.1 Detailed Description

QueryFactory.h.

Note

contains: a class to produce a query based off of user-entered information

Essentially, this class is used to construct a query based off of user input (typically from the command line; if in code directly, the query itself could just be instantiated)

In theory, could also be used as the interface to validate incoming datasets as belonging to a particular query style

10.249.2 Member Function Documentation

10.249.2.1 GetCharacterFromCurrentLocale()

```
static ECharSet gdcm::QueryFactory::GetCharacterFromCurrentLocale ( )  [static]
```

This function will return the corresponding ECharSet associated with the current locale of the running system (based on the value of locale()).

10.249.2.2 ListCharSets()

```
static void gdcm::QueryFactory::ListCharSets (
            std::ostream & os )  [static]
```

List all possible CharSet.

10.249.2.3 ProduceCharacterSetDataElement()

```
static DataElement gdcm::QueryFactory::ProduceCharacterSetDataElement (
            const std::vector< ECharSet > & inCharSetType )  [static]
```

This function will produce the appropriate dataelement given a list of charsets. The first charset will be used directly, while the second and subsequent will be prepended with "ISO2022 ". Redundant character sets are not permitted, so if they are encountered, they will just be skipped. if UTF8 or GB18030 is used, no subsequent character sets will be used if the vector passed in is empty, then the dataelement that's passed out will be empty and Latin1 is the presumed encoding

10.249.2.4 ProduceQuery() [1/2]

```
static BaseQuery* gdcm::QueryFactory::ProduceQuery (
            const std::string & sopInstanceUID,
            ENQueryType inQueryType )  [static]
```

10.249.2.5 ProduceQuery() [2/2]

```
static BaseRootQuery* gdcm::QueryFactory::ProduceQuery (
            ERootType inRootType,
            EQueryType inQueryType,
            EQueryLevel inQueryLevel )  [static]
```

this function will produce a query (basically, a wrapper to a dataset that can validate whether or not the query is a valid cfind/cmove query) and the level of the query (patient, study, series, image). If the user provides an invalid instantiation (ie, study root type, query level of patient), then the result is NULL.

The documentation for this class was generated from the following file:

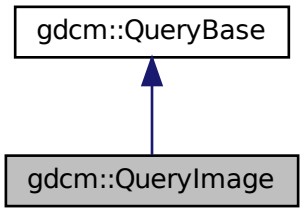
- gdcmQueryFactory.h

10.250 gdcm::QueryImage Class Reference

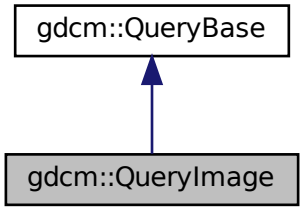
QueryImage.

`#include <gdcmQueryImage.h>`

Inheritance diagram for gdcm::QueryImage:



Collaboration diagram for gdcm::QueryImage:



Public Member Functions

- std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const override

  Return all Unique Key for a particular Query Root type (from the same level and above).
- const char * GetName () const override
- std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const override
- DataElement GetQueryLevel () const override
- std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const override
- std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const override

10.250.1 Detailed Description

QueryImage.

contains: class to construct an image-based query for C-FIND and C-MOVE

10.250.2 Member Function Documentation

10.250.2.1 GetHierachicalSearchTags()

```
std::vector<Tag> gdcm::QueryImage::GetHierachicalSearchTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements gdcm::QueryBase.

10.250.2.2 GetName()

```
const char* gdcm::QueryImage::GetName ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.250.2.3 GetOptionalTags()

```
std::vector<Tag> gdcm::QueryImage::GetOptionalTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.250.2.4 GetQueryLevel()

```
DataElement gdcm::QueryImage::GetQueryLevel ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.250.2.5 GetRequiredTags()

```
std::vector<Tag> gdcm::QueryImage::GetRequiredTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.250.2.6 GetUniqueTags()

```
std::vector<Tag> gdcm::QueryImage::GetUniqueTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

The documentation for this class was generated from the following file:

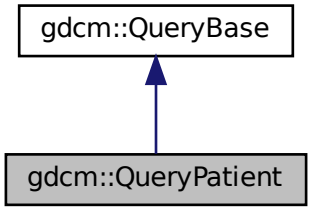
- gdcmQueryImage.h

10.251 gdcm::QueryPatient Class Reference

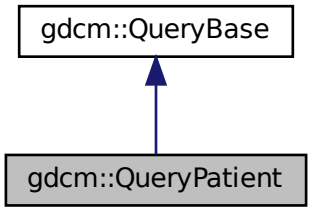
QueryPatient.

```
#include <gdcmQueryPatient.h>
```

Inheritance diagram for gdcm::QueryPatient:



Collaboration diagram for gdcm::QueryPatient:



Public Member Functions

- std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const override
  Return all Unique Key for a particular Query Root type (from the same level and above).
- const char * GetName () const override
- std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const override
- DataElement GetQueryLevel () const override
- std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const override
- std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const override

10.251.1 Detailed Description

QueryPatient.

contains: class to construct a patient-based query for c-find and c-move

10.251.2 Member Function Documentation

10.251.2.1 GetHierachicalSearchTags()

```
std::vector<Tag> gdcm::QueryPatient::GetHierachicalSearchTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements gdcm::QueryBase.

10.251.2.2 GetName()

```
const char* gdcm::QueryPatient::GetName ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.251.2.3 GetOptionalTags()

```
std::vector<Tag> gdcm::QueryPatient::GetOptionalTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.251.2.4 GetQueryLevel()

```
DataElement gdcm::QueryPatient::GetQueryLevel ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.251.2.5 GetRequiredTags()

```
std::vector<Tag> gdcm::QueryPatient::GetRequiredTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.251.2.6 GetUniqueTags()

```
std::vector<Tag> gdcm::QueryPatient::GetUniqueTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

The documentation for this class was generated from the following file:

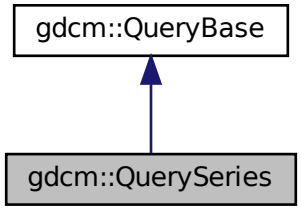
- gdcmQueryPatient.h

10.252 gdcm::QuerySeries Class Reference

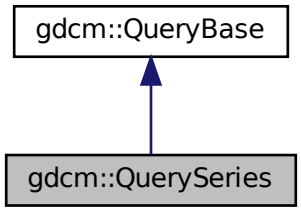
QuerySeries.

`#include <gdcmQuerySeries.h>`

Inheritance diagram for gdcm::QuerySeries:



Collaboration diagram for gdcm::QuerySeries:



Public Member Functions

- std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const override
  Return all Unique Key for a particular Query Root type (from the same level and above).
- const char * GetName () const override
- std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const override
- DataElement GetQueryLevel () const override
- std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const override
- std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const override

10.252.1 Detailed Description

QuerySeries.

contains: class to construct a series-based query for c-find and c-move

10.252.2 Member Function Documentation

10.252.2.1 GetHierachicalSearchTags()

```
std::vector<Tag> gdcm::QuerySeries::GetHierachicalSearchTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements gdcm::QueryBase.

10.252.2.2 GetName()

```
const char* gdcm::QuerySeries::GetName ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.252.2.3 GetOptionalTags()

```
std::vector<Tag> gdcm::QuerySeries::GetOptionalTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.252.2.4 GetQueryLevel()

```
DataElement gdcm::QuerySeries::GetQueryLevel ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.252.2.5 GetRequiredTags()

```
std::vector<Tag> gdcm::QuerySeries::GetRequiredTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.252.2.6 GetUniqueTags()

```
std::vector<Tag> gdcm::QuerySeries::GetUniqueTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

The documentation for this class was generated from the following file:

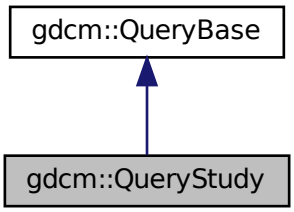
- gdcmQuerySeries.h

10.253 gdcm::QueryStudy Class Reference

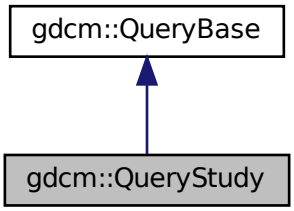
QueryStudy.h.

```
#include <gdcmQueryStudy.h>
```

Inheritance diagram for gdcm::QueryStudy:



Collaboration diagram for gdcm::QueryStudy:



Public Member Functions

- std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const override
  Return all Unique Key for a particular Query Root type (from the same level and above).
- const char * GetName () const override
- std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const override
- DataElement GetQueryLevel () const override
- std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const override
- std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const override

10.253.1 Detailed Description

QueryStudy.h.

contains: class to construct a study-based query for C-FIND and C-MOVE

10.253.2 Member Function Documentation

10.253.2.1 GetHierachicalSearchTags()

```
std::vector<Tag> gdcm::QueryStudy::GetHierachicalSearchTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements gdcm::QueryBase.

10.253.2.2 GetName()

```
const char* gdcm::QueryStudy::GetName ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.253.2.3 GetOptionalTags()

```
std::vector<Tag> gdcm::QueryStudy::GetOptionalTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.253.2.4 GetQueryLevel()

```
DataElement gdcm::QueryStudy::GetQueryLevel ( ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.253.2.5 GetRequiredTags()

```
std::vector<Tag> gdcm::QueryStudy::GetRequiredTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

10.253.2.6 GetUniqueTags()

```
std::vector<Tag> gdcm::QueryStudy::GetUniqueTags (
            const ERootType & inRootType ) const  [override], [virtual]
```

Implements gdcm::QueryBase.

The documentation for this class was generated from the following file:

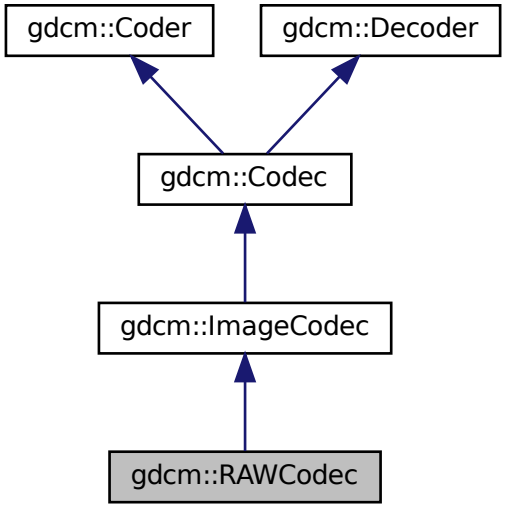
- gdcmQueryStudy.h

10.254 gdcm::RAWCodec Class Reference

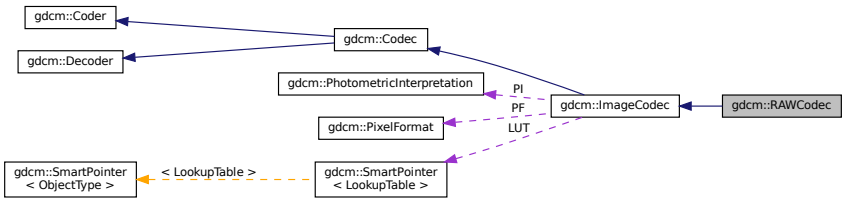
RAWCodec class.

`#include <gdcmRAWCodec.h>`

Inheritance diagram for gdcm::RAWCodec:



Collaboration diagram for gdcm::RAWCodec:



Public Member Functions

- RAWCodec ()
- ~RAWCodec () override
- bool CanCode (TransferSyntax const &ts) const override

Return whether this coder support this transfer syntax (can code it)

- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- bool DecodeBytes (const char *inBytes, size_t inBufferLength, char *outBytes, size_t inOutBufferLength)
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override

Protected Member Functions

- bool DecodeByStreams (std::istream &is, std::ostream &os) override

Additional Inherited Members

10.254.1 Detailed Description

RAWCodec class.

10.254.2 Constructor & Destructor Documentation

10.254.2.1 RAWCodec()

```
gdcm::RAWCodec::RAWCodec ( )
```

10.254.2.2 ~RAWCodec()

```
gdcm::RAWCodec::~RAWCodec ( )  [override]
```

10.254.3 Member Function Documentation

10.254.3.1 CanCode()

```
bool gdcm::RAWCodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.254.3.2 CanDecode()

```
bool gdcm::RAWCodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.254.3.3 Clone()

```
ImageCodec* gdcm::RAWCodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.254.3.4 Code()

```
bool gdcm::RAWCodec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.254.3.5 Decode()

```
bool gdcm::RAWCodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.254.3.6 DecodeByStreams()

```
bool gdcm::RAWCodec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.254.3.7 DecodeBytes()

```
bool gdcm::RAWCodec::DecodeBytes (
            const char * inBytes,
            size_t inBufferLength,
            char * outBytes,
            size_t inOutBufferLength )
```

Used by the ImageStreamReader– converts a read in buffer into one with the proper encodings.

10.254.3.8 GetHeaderInfo()

```
bool gdcm::RAWCodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

The documentation for this class was generated from the following file:

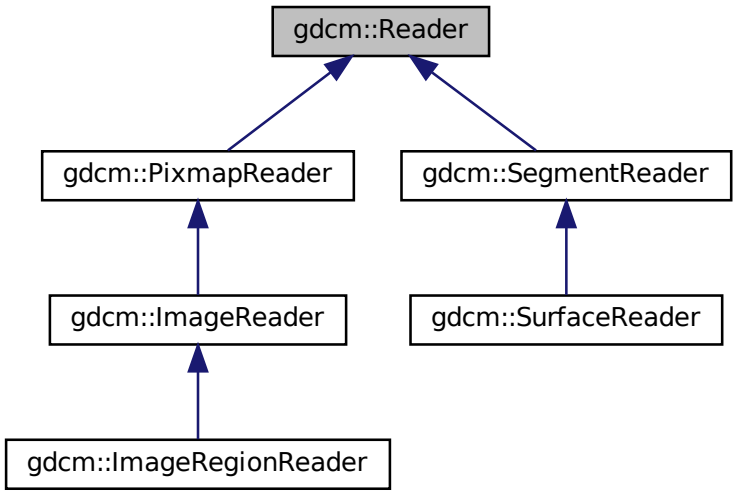
- gdcmRAWCodec.h

10.255 gdcm::Reader Class Reference

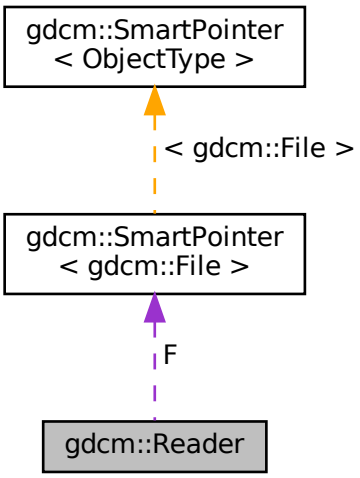
Reader ala DOM (Document Object Model)

`#include <gdcmReader.h>`

Inheritance diagram for gdcm::Reader:



Collaboration diagram for gdcm::Reader:



Public Member Functions

- Reader ()
- virtual ~Reader ()
- bool CanRead () const
- File & GetFile ()

  Set/Get File.
- const File & GetFile () const

  Set/Get File.
- size_t GetStreamCurrentPosition () const
- virtual bool Read ()

  Main function to read a file.
- bool ReadSelectedPrivateTags (std::set< PrivateTag > const &ptags, bool readvalues=true)

  Will only read the specified selected private tags.
- bool ReadSelectedTags (std::set< Tag > const &tags, bool readvalues=true)

  Will only read the specified selected tags.
- bool ReadUpToTag (const Tag &tag, std::set< Tag > const &skiptags=std::set< Tag >())
- void SetFile (File &file)

  Set/Get File.
- void SetFileName (const char *filename_native)
- void SetStream (std::istream &input_stream)

  Set the open-ed stream directly.

Protected Member Functions

- std::istream * GetStreamPtr () const
- bool ReadDataSet ()
- bool ReadMetaInformation ()
- bool ReadPreamble ()

Protected Attributes

- SmartPointer< File > F

Friends

- class StreamImageReader

10.255.1 Detailed Description

Reader ala DOM (Document Object Model)

This class is a non-validating reader, it will only performs well- formedness check only, and to some extent catch known error (non well-formed document).

Detailed description here

A DataSet DOES NOT contains group 0x0002 (see FileMetaInformation)

This is really a DataSet reader. This will not make sure the dataset conform to any IOD at all. This is a completely different step. The reasoning was that user could control the IOD there lib would handle and thus we would not be able to read a DataSet if the IOD was not found Instead we separate the reading from the validation.

Note

From GDCM1.x. Users will realize that one feature is missing from this DOM implementation. In GDCM 1.x user used to be able to control the size of the Value to be read. By default it was 0xfff. The main author of GDCM2 thought this was too dangerous and harmful and therefore this feature did not make it into GDCM2

Warning

GDCM will not produce warning for unorder (non-alphabetical order).

See also

Writer FileMetaInformation DataSet File

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, FixBrokenJ2K.cxx, FixOrientation.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, PatchFile.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, ReadAndPrintAttributes.cxx, ReadExplicitLengthSQIVR.cxx, ReadUTF8QtDir.cxx, TestReader.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.255.2 Constructor & Destructor Documentation

10.255.2.1 Reader()

```
gdcm::Reader::Reader ( )
```

10.255.2.2 ~Reader()

```
virtual gdcm::Reader::~Reader ( )  [virtual]
```

10.255.3 Member Function Documentation

10.255.3.1 CanRead()

```
bool gdcm::Reader::CanRead ( ) const
```

Test whether this is a DICOM file

Warning

need to call either SetFileName or SetStream first

Examples

ReadUTF8QtDir.cxx.

10.255.3.2 GetFile() [1/2]

```
File& gdcm::Reader::GetFile ( )  [inline]
```

Set/Get File.

10.255.3.3 GetFile() [2/2]

```
const File& gdcm::Reader::GetFile ( ) const  [inline]
```

Set/Get File.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CompressImage.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, PatchFile.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, ReadAndPrintAttributes.cxx, ReadExplicitLengthSQIVR.cxx, TestReader.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.255.3.4 GetStreamCurrentPosition()

```
size_t gdcm::Reader::GetStreamCurrentPosition ( ) const
```

For wrapped language. return type is compatible with System::FileSize return type Use native std::streampos / std↩ ::streamoff directly from the stream from C++

10.255.3.5 GetStreamPtr()

```
std::istream* gdcm::Reader::GetStreamPtr ( ) const  [inline], [protected]
```

10.255.3.6 Read()

```
virtual bool gdcm::Reader::Read ( )  [virtual]
```

Main function to read a file.

Reimplemented in gdcm::SurfaceReader, gdcm::SegmentReader, gdcm::PixmapReader, gdcm::ImageRegionReader, and gdcm::ImageReader.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, FixBrokenJ2K.cxx, FixOrientation.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, PatchFile.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, ReadAndPrintAttributes.cxx, ReadExplicitLengthSQIVR.cxx, TestReader.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.255.3.7 ReadDataSet()

```
bool gdcm::Reader::ReadDataSet ( )  [protected]
```

10.255.3.8 ReadMetaInformation()

```
bool gdcm::Reader::ReadMetaInformation ( )  [protected]
```

10.255.3.9 ReadPreamble()

```
bool gdcm::Reader::ReadPreamble ( )  [protected]
```

10.255.3.10 ReadSelectedPrivateTags()

```
bool gdcm::Reader::ReadSelectedPrivateTags (
            std::set< PrivateTag > const & ptags,
            bool readvalues = true )
```

Will only read the specified selected private tags.

10.255.3.11 ReadSelectedTags()

```
bool gdcm::Reader::ReadSelectedTags (
            std::set< Tag > const & tags,
            bool readvalues = true )
```

Will only read the specified selected tags.

10.255.3.12 ReadUpToTag()

```
bool gdcm::Reader::ReadUpToTag (
            const Tag & tag,
            std::set< Tag > const & skiptags = std::set< Tag >() )
```

Will read only up to Tag

Parameters

tag	and skipping any tag specified in
skiptags	

Examples

DumpVisusChange.cxx.

10.255.3.13 SetFile()

```
void gdcm::Reader::SetFile (
            File & file )  [inline]
```

Set/Get File.

10.255.3.14 SetFileName()

```
void gdcm::Reader::SetFileName (
            const char * filename_native )
```

Set the filename to open. This will create a std::ifstream internally See SetStream if you are dealing with different std::istream object

Examples

BasicImageAnonymizer.cs, ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, CheckBigEndianBug.cxx, ClinicalTrialAnnotate.cxx, CompressImage.cxx, ConvertToQImage.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, DiffFile.cxx, DumpADAC.cxx, DumpCSA.cs, DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, DumpImageHeaderInfo.cxx, DumpPhilipsECHO.cxx, DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, DumpVisusChange.cxx, DuplicatePCDE.cxx, ELSCINT1WaveToText.cxx, ExtractEncryptedContent.cxx, ExtractIconFromFile.cxx, ExtractImageRegion.cs, ExtractImageRegionWithLUT.cs, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, MrProtocol.cxx, NewSequence.cs, PatchFile.cxx, PrintLUT.cxx, QIDO-RS.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.cxx, ReadAndPrintAttributes.cxx, ReadExplicitLengthSQIVR.cxx, ReadMultiTimesException.cxx, ReadUTF8QtDir.cxx, SimplePrintPatientName.cs, TemplateEmptyImage.cxx, TestReader.cxx, csa2img.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, rle2img.cxx, and threadgdcm.cxx.

10.255.3.15 SetStream()

```
void gdcm::Reader::SetStream (
            std::istream & input_stream )  [inline]
```

Set the open-ed stream directly.

Examples

ReadUTF8QtDir.cxx.

10.255.4 Friends And Related Function Documentation

10.255.4.1 StreamImageReader

```
friend class StreamImageReader  [friend]
```

10.255.5 Member Data Documentation

10.255.5.1 F

```
SmartPointer<File> gdcm::Reader::F  [protected]
```

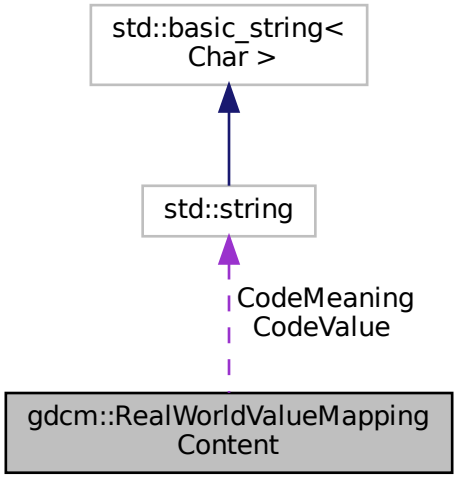
The documentation for this class was generated from the following file:

- gdcmReader.h

10.256 gdcm::RealWorldValueMappingContent Struct Reference

`#include <gdcmImageHelper.h>`

Collaboration diagram for gdcm::RealWorldValueMappingContent:



Public Attributes

- std::string CodeMeaning
- std::string CodeValue
- double RealWorldValueIntercept
- double RealWorldValueSlope

10.256.1 Member Data Documentation

10.256.1.1 CodeMeaning

`std::string gdcm::RealWorldValueMappingContent::CodeMeaning`

10.256.1.2 CodeValue

```
std::string gdcm::RealWorldValueMappingContent::CodeValue
```

10.256.1.3 RealWorldValueIntercept

```
double gdcm::RealWorldValueMappingContent::RealWorldValueIntercept
```

10.256.1.4 RealWorldValueSlope

```
double gdcm::RealWorldValueMappingContent::RealWorldValueSlope
```

The documentation for this struct was generated from the following file:

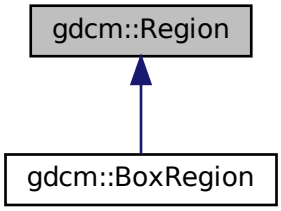
- gdcmImageHelper.h

10.257 gdcm::Region Class Reference

Class for manipulation region.

```
#include <gdcmRegion.h>
```

Inheritance diagram for gdcm::Region:



Public Member Functions

- Region ()
- virtual ∼Region ()
- virtual size_t Area () const =0

  compute the area
- virtual Region ∗ Clone () const =0
- virtual BoxRegion ComputeBoundingBox ()=0

  Return the Axis-Aligned minimum bounding box for all regions.
- virtual bool Empty () const =0

  return whether this domain is empty:
- virtual bool IsValid () const =0

  return whether this is valid domain
- virtual void Print (std::ostream &os=std::cout) const

  Print.

10.257.1 Detailed Description

Class for manipulation region.

10.257.2 Constructor & Destructor Documentation

10.257.2.1 Region()

```
gdcm::Region::Region ( )
```

10.257.2.2 ∼Region()

```
virtual gdcm::Region::~Region ( )  [virtual]
```

10.257.3 Member Function Documentation

10.257.3.1 Area()

```
virtual size_t gdcm::Region::Area ( ) const  [pure virtual]
```

compute the area

Implemented in gdcm::BoxRegion.

10.257.3.2 Clone()

```
virtual Region* gdcm::Region::Clone ( ) const  [pure virtual]
```

Implemented in gdcm::BoxRegion.

10.257.3.3 ComputeBoundingBox()

```
virtual BoxRegion gdcm::Region::ComputeBoundingBox ( )  [pure virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implemented in gdcm::BoxRegion.

10.257.3.4 Empty()

```
virtual bool gdcm::Region::Empty ( ) const  [pure virtual]
```

return whether this domain is empty:

Implemented in gdcm::BoxRegion.

10.257.3.5 IsValid()

```
virtual bool gdcm::Region::IsValid ( ) const  [pure virtual]
```

return whether this is valid domain

Implemented in gdcm::BoxRegion.

10.257.3.6 Print()

```
virtual void gdcm::Region::Print (
            std::ostream & os = std::cout ) const  [virtual]
```

Print.

Reimplemented in gdcm::BoxRegion.

Referenced by gdcm::operator<<().

The documentation for this class was generated from the following file:

- gdcmRegion.h

10.258 gdcm::Rescaler Class Reference

Rescale class.

```
#include <gdcmRescaler.h>
```

Public Member Functions

- Rescaler ()
- ~Rescaler ()=default
- PixelFormat::ScalarType ComputeInterceptSlopePixelType ()
- PixelFormat ComputePixelTypeFromMinMax ()
- double GetIntercept () const
- double GetSlope () const
- bool InverseRescale (char *out, const char *in, size_t n)

  Inverse transform.
- bool Rescale (char *out, const char *in, size_t n)

  Direct transform.
- void SetIntercept (double i)

  Set Intercept: used for both direct&inverse transformation.
- void SetMinMaxForPixelType (double min, double max)
- void SetPixelFormat (PixelFormat const &pf)

  Set Pixel Format of input data.
- void SetSlope (double s)

  Set Slope: user for both direct&inverse transformation.
- void SetTargetPixelType (PixelFormat const &targetst)
- void SetUseTargetPixelType (bool b)

  Override default behavior of Rescale.

Protected Member Functions

- template<typename TIn >
  void InverseRescaleFunctionIntoBestFit (char *out, const TIn *in, size_t n)
- template<typename TIn >
  void RescaleFunctionIntoBestFit (char *out, const TIn *in, size_t n)

10.258.1 Detailed Description

Rescale class.

This class is meant to apply the linear transform of Stored Pixel Value to Real World Value. This is mostly found in CT or PET dataset, where the value are stored using one type, but need to be converted to another scale using a linear transform. There are basically two cases: In CT: the linear transform is generally integer based. E.g. the Stored Pixel Type is unsigned short 12bits, but to get Hounsfield unit, one need to apply the linear transform:

$$RWV = 1. * SV - 1024$$

So the best scalar to store the Real World Value will be 16 bits signed type.

In PET: the linear transform is generally floating point based. Since the dynamic range can be quite high, the Rescale Slope / Rescale Intercept can be changing throughout the Series. So it is important to read all linear transform and deduce the best Pixel Type only at the end (when all the images to be read have been parsed).

Warning

Internally any time a floating point value is found either in the Rescale Slope or the Rescale Intercept it is assumed that the best matching output pixel type is FLOAT64 (in previous implementation it was FLOAT32). Because VR:DS is closer to a 64bits floating point type FLOAT64 is thus a best matching pixel type for the floating point transformation.

Example: Let say input is FLOAT64, and we want UINT16 as output, we would do:

```
Rescaler ir;
ir.SetIntercept( 0 );
ir.SetSlope( 5.6789 );
ir.SetPixelFormat( FLOAT64 );
ir.SetMinMaxForPixelType( ((PixelFormat)UINT16).GetMin(), ((PixelFormat)UINT16).GetMax() );
ir.InverseRescale(output,input,numberofbytes );
```

Note

handle floating point transformation back and forth to integer properly (no loss)

See also

Unpacker12Bits

10.258.2 Constructor & Destructor Documentation

10.258.2.1 Rescaler()

```
gdcm::Rescaler::Rescaler ( )  [inline]
```

10.258.2.2 ~Rescaler()

```
gdcm::Rescaler::~Rescaler ( )  [default]
```

10.258.3 Member Function Documentation

10.258.3.1 ComputeInterceptSlopePixelType()

```
PixelFormat::ScalarType gdcm::Rescaler::ComputeInterceptSlopePixelType ( )
```

Compute the Pixel Format of the output data Used for direct transformation

10.258.3.2 ComputePixelTypeFromMinMax()

```
PixelFormat gdcm::Rescaler::ComputePixelTypeFromMinMax ( )
```

Compute the Pixel Format of the output data Used for inverse transformation

10.258.3.3 GetIntercept()

```
double gdcm::Rescaler::GetIntercept ( ) const  [inline]
```

10.258.3.4 GetSlope()

```
double gdcm::Rescaler::GetSlope ( ) const  [inline]
```

10.258.3.5 InverseRescale()

```
bool gdcm::Rescaler::InverseRescale (
            char * out,
            const char * in,
            size_t n )
```

Inverse transform.

10.258.3.6 InverseRescaleFunctionIntoBestFit()

```
template<typename TIn >
void gdcm::Rescaler::InverseRescaleFunctionIntoBestFit (
            char * out,
            const TIn * in,
            size_t n )  [protected]
```

10.258.3.7 Rescale()

```
bool gdcm::Rescaler::Rescale (
            char * out,
            const char * in,
            size_t n )
```

Direct transform.

10.258.3.8 RescaleFunctionIntoBestFit()

```
template<typename TIn >
void gdcm::Rescaler::RescaleFunctionIntoBestFit (
            char * out,
            const TIn * in,
            size_t n )  [protected]
```

10.258.3.9 SetIntercept()

```
void gdcm::Rescaler::SetIntercept (
            double i )  [inline]
```

Set Intercept: used for both direct&inverse transformation.

10.258.3.10 SetMinMaxForPixelType()

```
void gdcm::Rescaler::SetMinMaxForPixelType (
            double min,
            double max )
```

Set target interval for output data. A best match will be computed (if possible) Used for inverse transformation

10.258.3.11 SetPixelFormat()

```
void gdcm::Rescaler::SetPixelFormat (
            PixelFormat const & pf )  [inline]
```

Set Pixel Format of input data.

10.258.3.12 SetSlope()

```
void gdcm::Rescaler::SetSlope (
            double s )  [inline]
```

Set Slope: user for both direct&inverse transformation.

10.258.3.13 SetTargetPixelType()

```
void gdcm::Rescaler::SetTargetPixelType (
            PixelFormat const & targetst )
```

By default (when UseTargetPixelType is false), a best matching Target Pixel Type is computed. However user can override this auto selection by switching UseTargetPixelType:true and also specifying the specifix Target Pixel Type

10.258.3.14 SetUseTargetPixelType()

```
void gdcm::Rescaler::SetUseTargetPixelType (
            bool b )
```

Override default behavior of Rescale.

The documentation for this class was generated from the following file:

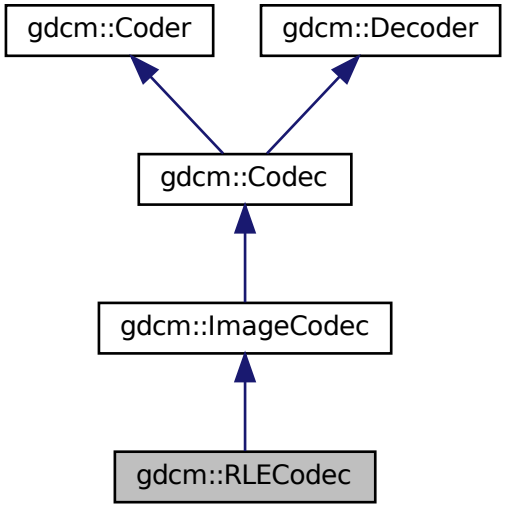
- gdcmRescaler.h

10.259 gdcm::RLECodec Class Reference

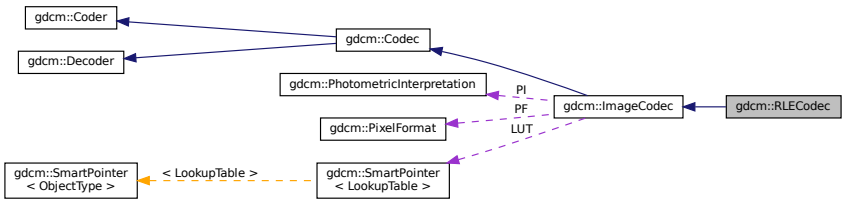
Class to do RLE.

`#include <gdcmRLECodec.h>`

Inheritance diagram for gdcm::RLECodec:



Collaboration diagram for gdcm::RLECodec:



Public Member Functions

- RLECodec ()
- ~RLECodec () override
- bool CanCode (TransferSyntax const &ts) const override

Return whether this coder support this transfer syntax (can code it)

- bool CanDecode (TransferSyntax const &ts) const override

  Return whether this decoder support this transfer syntax (can decode it)
- ImageCodec * Clone () const override
- bool Code (DataElement const &in, DataElement &out) override

  Code.
- bool Decode (DataElement const &is, DataElement &os) override

  Decode.
- unsigned long GetBufferLength () const
- bool GetHeaderInfo (std::istream &is, TransferSyntax &ts) override
- void SetBufferLength (unsigned long l)
- void SetLength (unsigned long l)

Protected Member Functions

- bool AppendFrameEncode (std::ostream &out, const char *data, size_t datalen) override
- bool AppendRowEncode (std::ostream &out, const char *data, size_t datalen) override
- bool DecodeByStreams (std::istream &is, std::ostream &os) override
- bool DecodeExtent (char *buffer, unsigned int XMin, unsigned int XMax, unsigned int YMin, unsigned int YMax, unsigned int ZMin, unsigned int ZMax, std::istream &is)
- bool IsFrameEncoder () override
- bool IsRowEncoder () override
- bool StartEncode (std::ostream &) override
- bool StopEncode (std::ostream &) override

Friends

- class ImageRegionReader

Additional Inherited Members

10.259.1 Detailed Description

Class to do RLE.

Note

ANSI X3.9 A.4.2 RLE Compression Annex G defines a RLE Compression Transfer Syntax. This transfer Syntax is identified by the UID value "1.2.840.10008.1.2.5". If the object allows multi-frame images in the pixel data field, then each frame shall be encoded separately. Each frame shall be encoded in one and only one Fragment (see PS 3.5.8.2).

10.259.2 Constructor & Destructor Documentation

10.259.2.1 RLECodec()

```
gdcm::RLECodec::RLECodec ( )
```

10.259.2.2 ~RLECodec()

```
gdcm::RLECodec::~RLECodec ( )  [override]
```

10.259.3 Member Function Documentation

10.259.3.1 AppendFrameEncode()

```
bool gdcm::RLECodec::AppendFrameEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.2 AppendRowEncode()

```
bool gdcm::RLECodec::AppendRowEncode (
            std::ostream & out,
            const char * data,
            size_t datalen )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.3 CanCode()

```
bool gdcm::RLECodec::CanCode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from gdcm::ImageCodec.

10.259.3.4 CanDecode()

```
bool gdcm::RLECodec::CanDecode (
            TransferSyntax const &  ) const  [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from gdcm::ImageCodec.

10.259.3.5 Clone()

```
ImageCodec* gdcm::RLECodec::Clone ( ) const  [override], [virtual]
```

Implements gdcm::ImageCodec.

10.259.3.6 Code()

```
bool gdcm::RLECodec::Code (
            DataElement const & in_,
            DataElement & out_ )  [override], [virtual]
```

Code.

Reimplemented from gdcm::Coder.

10.259.3.7 Decode()

```
bool gdcm::RLECodec::Decode (
            DataElement const & ,
            DataElement &  )  [override], [virtual]
```

Decode.

Reimplemented from gdcm::ImageCodec.

10.259.3.8 DecodeByStreams()

```
bool gdcm::RLECodec::DecodeByStreams (
            std::istream & is,
            std::ostream & os )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.9 DecodeExtent()

```
bool gdcm::RLECodec::DecodeExtent (
            char * buffer,
            unsigned int XMin,
            unsigned int XMax,
            unsigned int YMin,
            unsigned int YMax,
            unsigned int ZMin,
            unsigned int ZMax,
            std::istream & is )  [protected]
```

10.259.3.10 GetBufferLength()

```
unsigned long gdcm::RLECodec::GetBufferLength ( ) const  [inline]
```

10.259.3.11 GetHeaderInfo()

```
bool gdcm::RLECodec::GetHeaderInfo (
            std::istream & is,
            TransferSyntax & ts )  [override], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.12 IsFrameEncoder()

```
bool gdcm::RLECodec::IsFrameEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.13 IsRowEncoder()

```
bool gdcm::RLECodec::IsRowEncoder ( )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.14 SetBufferLength()

```
void gdcm::RLECodec::SetBufferLength (
            unsigned long l )  [inline]
```

10.259.3.15 SetLength()

```
void gdcm::RLECodec::SetLength (
            unsigned long l )  [inline]
```

10.259.3.16 StartEncode()

```
bool gdcm::RLECodec::StartEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.3.17 StopEncode()

```
bool gdcm::RLECodec::StopEncode (
            std::ostream &  )  [override], [protected], [virtual]
```

Reimplemented from gdcm::ImageCodec.

10.259.4 Friends And Related Function Documentation

10.259.4.1 ImageRegionReader

```
friend class ImageRegionReader  [friend]
```

The documentation for this class was generated from the following file:

- gdcmRLECodec.h

10.260 gdcm::network::RoleSelectionSub Class Reference

RoleSelectionSub.

```
#include <gdcmRoleSelectionSub.h>
```

Public Member Functions

- RoleSelectionSub ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetTuple (const char *uid, uint8_t scurole, uint8_t scprole)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.260.1 Detailed Description

RoleSelectionSub.

PS 3.7 Table D.3-9 SCP/SCU ROLE SELECTION SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

10.260.2 Constructor & Destructor Documentation

10.260.2.1 RoleSelectionSub()

```
gdcm::network::RoleSelectionSub::RoleSelectionSub ( )
```

10.260.3 Member Function Documentation

10.260.3.1 Print()

```
void gdcm::network::RoleSelectionSub::Print (
             std::ostream & os ) const
```

10.260.3.2 Read()

```
std::istream& gdcm::network::RoleSelectionSub::Read (
             std::istream & is )
```

10.260.3.3 SetTuple()

```
void gdcm::network::RoleSelectionSub::SetTuple (
             const char * uid,
             uint8_t scurole,
             uint8_t scprole )
```

10.260.3.4 Size()

```
size_t gdcm::network::RoleSelectionSub::Size ( ) const
```

10.260.3.5 Write()

```
const std::ostream& gdcm::network::RoleSelectionSub::Write (
             std::ostream & os ) const
```

The documentation for this class was generated from the following file:

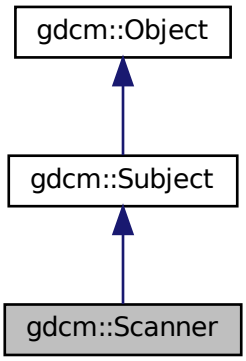
- gdcmRoleSelectionSub.h

10.261 gdcm::Scanner Class Reference

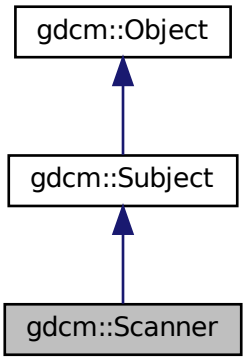
Scanner.

`#include <gdcmScanner.h>`

Inheritance diagram for gdcm::Scanner:



Collaboration diagram for gdcm::Scanner:



Classes

- struct ltstr

Public Types

- typedef MappingType::const_iterator ConstIterator
- typedef std::map< const char *, TagToValue, ltstr > MappingType
- typedef std::map< Tag, const char * > TagToValue
- typedef TagToValue::value_type TagToValueValueType
- typedef std::set< std::string > ValuesType

Public Member Functions

- Scanner ()
- ~Scanner () override
- void AddPrivateTag (PrivateTag const &t)
- void AddSkipTag (Tag const &t)

  Add a tag that will need to be skipped. Those are root level skip tags.
- void AddTag (Tag const &t)

  Add a tag that will need to be read. Those are root level tags.
- ConstIterator Begin () const
- void ClearSkipTags ()
- void ClearTags ()
- ConstIterator End () const
- Directory::FilenamesType GetAllFilenamesFromTagToValue (Tag const &t, const char *valueref) const
- const char * GetFilenameFromTagToValue (Tag const &t, const char *valueref) const
- Directory::FilenamesType const & GetFilenames () const
- Directory::FilenamesType GetKeys () const
- TagToValue const & GetMapping (const char *filename) const

  Get the std::map mapping filenames to value for file 'filename'.
- TagToValue const & GetMappingFromTagToValue (Tag const &t, const char *value) const

  See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.
- MappingType const & GetMappings () const

  Mappings are the mapping from a particular tag to the map, mapping filename to value:
- Directory::FilenamesType GetOrderedValues (Tag const &t) const
- const char * GetValue (const char *filename, Tag const &t) const
- ValuesType const & GetValues () const

  Get all the values found (in lexicographic order)
- ValuesType GetValues (Tag const &t) const

  Get all the values found (in lexicographic order) associated with Tag 't'.
- bool IsKey (const char *filename) const
- void Print (std::ostream &os) const override

  Print result.
- void PrintTable (std::ostream &os) const
- bool Scan (Directory::FilenamesType const &filenames)

  Start the scan !

Static Public Member Functions

- static SmartPointer< Scanner > New ()

  for wrapped language: instantiate a reference counted object

Protected Member Functions

- void ProcessPublicTag (StringFilter &sf, const char *filename)

Friends

- std::ostream & operator<< (std::ostream &_os, const Scanner &s)

10.261.1 Detailed Description

Scanner.

This filter is meant for quickly browsing a FileSet (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM Attribute.

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of StringFilter

Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- ProgressEvent
- StartEvent
- EndEvent

Examples

DiscriminateVolume.cxx, DumpToSQLITE3.cxx, SortImage.cxx, and VolumeSorter.cxx.

10.261.2 Member Typedef Documentation

10.261.2.1 ConstIterator

```
typedef MappingType::const_iterator gdcm::Scanner::ConstIterator
```

10.261.2.2 MappingType

```
typedef std::map<const char *,TagToValue, ltstr> gdcm::Scanner::MappingType
```

10.261.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdcm::Scanner::TagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char * and not std::string since we are pointing to existing std::string (hold in a std::vector) this avoid an extra copy of the byte array. Tag are used as Tag class since sizeof(tag) <= sizeof(pointer)

10.261.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdcm::Scanner::TagToValueValueType
```

10.261.2.5 ValuesType

```
typedef std::set< std::string > gdcm::Scanner::ValuesType
```

10.261.3 Constructor & Destructor Documentation

10.261.3.1 Scanner()

```
gdcm::Scanner::Scanner ( )  [inline]
```

10.261.3.2 ~Scanner()

```
gdcm::Scanner::~Scanner ( )  [override]
```

10.261.4 Member Function Documentation

10.261.4.1 AddPrivateTag()

```
void gdcm::Scanner::AddPrivateTag (
            PrivateTag const & t )
```

10.261.4.2 AddSkipTag()

```
void gdcm::Scanner::AddSkipTag (
            Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

10.261.4.3 AddTag()

```
void gdcm::Scanner::AddTag (
            Tag const & t )
```

Add a tag that will need to be read. Those are root level tags.

Examples

DiscriminateVolume.cxx, DumpToSQLITE3.cxx, SortImage.cxx, and VolumeSorter.cxx.

10.261.4.4 Begin()

```
ConstIterator gdcm::Scanner::Begin ( ) const  [inline]
```

10.261.4.5 ClearSkipTags()

```
void gdcm::Scanner::ClearSkipTags ( )
```

10.261.4.6 ClearTags()

```
void gdcm::Scanner::ClearTags ( )
```

10.261.4.7 End()

```
ConstIterator gdcm::Scanner::End ( ) const  [inline]
```

10.261.4.8 GetAllFilenamesFromTagToValue()

```
Directory::FilenamesType gdcm::Scanner::GetAllFilenamesFromTagToValue (
            Tag const & t,
            const char * valueref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valueref'

10.261.4.9 GetFilenameFromTagToValue()

```
const char* gdcm::Scanner::GetFilenameFromTagToValue (
            Tag const & t,
            const char * valueref ) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

10.261.4.10 GetFilenames()

```
Directory::FilenamesType const& gdcm::Scanner::GetFilenames ( ) const  [inline]
```

10.261.4.11 GetKeys()

```
Directory::FilenamesType gdcm::Scanner::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

Examples

VolumeSorter.cxx.

10.261.4.12 GetMapping()

```
TagToValue const& gdcm::Scanner::GetMapping (
            const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

Examples

DumpToSQLITE3.cxx.

10.261.4.13 GetMappingFromTagToValue()

```
TagToValue const& gdcm::Scanner::GetMappingFromTagToValue (
            Tag const & t,
            const char * value ) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.

10.261.4.14 GetMappings()

```
MappingType const& gdcm::Scanner::GetMappings ( ) const  [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

10.261.4.15 GetOrderedValues()

```
Directory::FilenamesType gdcm::Scanner::GetOrderedValues (
            Tag const & t ) const
```

Get all the values found (in a vector) associated with Tag 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)

10.261.4.16 GetValue()

```
const char* gdcm::Scanner::GetValue (
            const char * filename,
            Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the TagToValue hash table.

Warning

Tag 't' should have been added via AddTag() prior to the Scan() call !

10.261.4.17 GetValues() [1/2]

```
ValuesType const& gdcm::Scanner::GetValues ( ) const  [inline]
```

Get all the values found (in lexicographic order)

Examples

SortImage.cxx, and VolumeSorter.cxx.

10.261.4.18 GetValues() [2/2]

```
ValuesType gdcm::Scanner::GetValues (
            Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with Tag 't'.

10.261.4.19 IsKey()

```
bool gdcm::Scanner::IsKey (
            const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only of file can be found, which means the file was indeed a DICOM file that could be processed

Examples

DumpToSQLITE3.cxx.

10.261.4.20 New()

```
static SmartPointer<Scanner> gdcm::Scanner::New ( )  [inline], [static]
```

for wrapped language: instantiate a reference counted object

10.261.4.21 Print()

```
void gdcm::Scanner::Print (
            std::ostream & os ) const  [override], [virtual]
```

Print result.

Reimplemented from gdcm::Object.

10.261.4.22 PrintTable()

```
void gdcm::Scanner::PrintTable (
            std::ostream & os ) const
```

10.261.4.23 ProcessPublicTag()

```
void gdcm::Scanner::ProcessPublicTag (
            StringFilter & sf,
            const char * filename )  [protected]
```

10.261.4.24 Scan()

```
bool gdcm::Scanner::Scan (
            Directory::FilenamesType const & filenames )
```

Start the scan !

Examples

DiscriminateVolume.cxx, DumpToSQLITE3.cxx, SortImage.cxx, and VolumeSorter.cxx.

10.261.5 Friends And Related Function Documentation

10.261.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Scanner & s )  [friend]
```

The documentation for this class was generated from the following file:

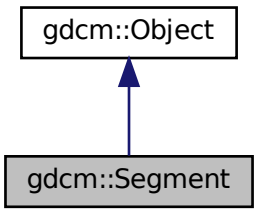
- gdcmScanner.h

10.262 gdcm::Segment Class Reference

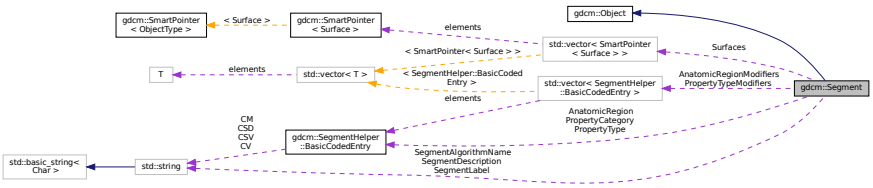
This class defines a segment.

`#include <gdcmSegment.h>`

Inheritance diagram for gdcm::Segment:



Collaboration diagram for gdcm::Segment:



Public Types

- enum ALGOType {
  AUTOMATIC = 0 ,
  SEMIAUTOMATIC ,
  MANUAL ,
  ALGOType_END }
- typedef std::vector< SegmentHelper::BasicCodedEntry > BasicCodedEntryVector
- typedef std::vector< SmartPointer< Surface > > SurfaceVector

Public Member Functions

- Segment ()
- ~Segment () override
- void AddSurface (SmartPointer< Surface > surface)
- SegmentHelper::BasicCodedEntry & GetAnatomicRegion ()
- SegmentHelper::BasicCodedEntry const & GetAnatomicRegion () const
- BasicCodedEntryVector & GetAnatomicRegionModifiers ()
- BasicCodedEntryVector const & GetAnatomicRegionModifiers () const
- SegmentHelper::BasicCodedEntry & GetPropertyCategory ()
- SegmentHelper::BasicCodedEntry const & GetPropertyCategory () const
- SegmentHelper::BasicCodedEntry & GetPropertyType ()
- SegmentHelper::BasicCodedEntry const & GetPropertyType () const
- BasicCodedEntryVector & GetPropertyTypeModifiers ()
- BasicCodedEntryVector const & GetPropertyTypeModifiers () const
- const char * GetSegmentAlgorithmName () const
- ALGOType GetSegmentAlgorithmType () const
- const char * GetSegmentDescription () const
- const char * GetSegmentLabel () const
- unsigned short GetSegmentNumber () const
- SmartPointer< Surface > GetSurface (const unsigned int idx=0) const
- unsigned long GetSurfaceCount ()
- SurfaceVector & GetSurfaces ()
- SurfaceVector const & GetSurfaces () const
- void SetAnatomicRegion (SegmentHelper::BasicCodedEntry const &BSE)
- void SetAnatomicRegionModifiers (BasicCodedEntryVector const &BSEV)
- void SetPropertyCategory (SegmentHelper::BasicCodedEntry const &BSE)
- void SetPropertyType (SegmentHelper::BasicCodedEntry const &BSE)
- void SetPropertyTypeModifiers (BasicCodedEntryVector const &BSEV)
- void SetSegmentAlgorithmName (const char *name)
- void SetSegmentAlgorithmType (ALGOType type)
- void SetSegmentAlgorithmType (const char *typeStr)
- void SetSegmentDescription (const char *description)
- void SetSegmentLabel (const char *label)
- void SetSegmentNumber (const unsigned short num)
- void SetSurfaceCount (const unsigned long nb)

Static Public Member Functions

- static ALGOType GetALGOType (const char *type)
- static const char * GetALGOTypeString (ALGOType type)

Protected Attributes

- SegmentHelper::BasicCodedEntry AnatomicRegion
- BasicCodedEntryVector AnatomicRegionModifiers
- SegmentHelper::BasicCodedEntry PropertyCategory
- SegmentHelper::BasicCodedEntry PropertyType
- BasicCodedEntryVector PropertyTypeModifiers
- std::string SegmentAlgorithmName
- ALGOType SegmentAlgorithmType
- std::string SegmentDescription
- std::string SegmentLabel
- unsigned short SegmentNumber
- unsigned long SurfaceCount
- SurfaceVector Surfaces

Additional Inherited Members

10.262.1 Detailed Description

This class defines a segment.

It mainly contains attributes of group 0x0062. In addition, it can be associated with surface.

See also

PS 3.3 C.8.20.2 and C.8.23

10.262.2 Member Typedef Documentation

10.262.2.1 BasicCodedEntryVector

```
typedef std::vector< SegmentHelper::BasicCodedEntry > gdcm::Segment::BasicCodedEntryVector
```

10.262.2.2 SurfaceVector

```
typedef std::vector< SmartPointer< Surface > > gdcm::Segment::SurfaceVector
```

10.262.3 Member Enumeration Documentation

10.262.3.1 ALGOType

```
enum gdcm::Segment::ALGOType
```

Enumerator

AUTOMATIC	
SEMIAUTOMATIC	
MANUAL	
ALGOType_END	

10.262.4 Constructor & Destructor Documentation

10.262.4.1 Segment()

```
gdcm::Segment::Segment ( )
```

10.262.4.2 ~Segment()

```
gdcm::Segment::~Segment ( )  [override]
```

10.262.5 Member Function Documentation

10.262.5.1 AddSurface()

```
void gdcm::Segment::AddSurface (
            SmartPointer< Surface > surface )
```

10.262.5.2 GetALGOType()

```
static ALGOType gdcm::Segment::GetALGOType (
            const char * type )  [static]
```

10.262.5.3 GetALGOTypeString()

```
static const char* gdcm::Segment::GetALGOTypeString (
            ALGOType type )  [static]
```

10.262.5.4 GetAnatomicRegion() [1/2]

```
SegmentHelper::BasicCodedEntry& gdcm::Segment::GetAnatomicRegion ( )
```

10.262.5.5 GetAnatomicRegion() [2/2]

```
SegmentHelper::BasicCodedEntry const& gdcm::Segment::GetAnatomicRegion ( ) const
```

10.262.5.6 GetAnatomicRegionModifiers() [1/2]

```
BasicCodedEntryVector& gdcm::Segment::GetAnatomicRegionModifiers ( )
```

10.262.5.7 GetAnatomicRegionModifiers() [2/2]

```
BasicCodedEntryVector const& gdcm::Segment::GetAnatomicRegionModifiers ( ) const
```

10.262.5.8 GetPropertyCategory() [1/2]

```
SegmentHelper::BasicCodedEntry& gdcm::Segment::GetPropertyCategory ( )
```

10.262.5.9 GetPropertyCategory() [2/2]

```
SegmentHelper::BasicCodedEntry const& gdcm::Segment::GetPropertyCategory ( ) const
```

10.262.5.10 GetPropertyType() [1/2]

```
SegmentHelper::BasicCodedEntry& gdcm::Segment::GetPropertyType ( )
```

10.262.5.11 GetPropertyType() [2/2]

```
SegmentHelper::BasicCodedEntry const& gdcm::Segment::GetPropertyType ( ) const
```

10.262.5.12 GetPropertyTypeModifiers() [1/2]

```
BasicCodedEntryVector& gdcm::Segment::GetPropertyTypeModifiers ( )
```

10.262.5.13 GetPropertyTypeModifiers() [2/2]

```
BasicCodedEntryVector const& gdcm::Segment::GetPropertyTypeModifiers ( ) const
```

10.262.5.14 GetSegmentAlgorithmName()

```
const char* gdcm::Segment::GetSegmentAlgorithmName ( ) const
```

10.262.5.15 GetSegmentAlgorithmType()

```
ALGOType gdcm::Segment::GetSegmentAlgorithmType ( ) const
```

10.262.5.16 GetSegmentDescription()

```
const char* gdcm::Segment::GetSegmentDescription ( ) const
```

10.262.5.17 GetSegmentLabel()

```
const char* gdcm::Segment::GetSegmentLabel ( ) const
```

10.262.5.18 GetSegmentNumber()

```
unsigned short gdcm::Segment::GetSegmentNumber ( ) const
```

10.262.5.19 GetSurface()

```
SmartPointer< Surface > gdcm::Segment::GetSurface (
            const unsigned int idx = 0 ) const
```

10.262.5.20 GetSurfaceCount()

```
unsigned long gdcm::Segment::GetSurfaceCount ( )
```

10.262.5.21 GetSurfaces() [1/2]

```
SurfaceVector& gdcm::Segment::GetSurfaces ( )
```

10.262.5.22 GetSurfaces() [2/2]

```
SurfaceVector const& gdcm::Segment::GetSurfaces ( ) const
```

10.262.5.23 SetAnatomicRegion()

```
void gdcm::Segment::SetAnatomicRegion (
            SegmentHelper::BasicCodedEntry const & BSE )
```

10.262.5.24 SetAnatomicRegionModifiers()

```
void gdcm::Segment::SetAnatomicRegionModifiers (
            BasicCodedEntryVector const & BSEV )
```

10.262.5.25 SetPropertyCategory()

```
void gdcm::Segment::SetPropertyCategory (
            SegmentHelper::BasicCodedEntry const & BSE )
```

10.262.5.26 SetPropertyType()

```
void gdcm::Segment::SetPropertyType (
            SegmentHelper::BasicCodedEntry const & BSE )
```

10.262.5.27 SetPropertyTypeModifiers()

```
void gdcm::Segment::SetPropertyTypeModifiers (
            BasicCodedEntryVector const & BSEV )
```

10.262.5.28 SetSegmentAlgorithmName()

```
void gdcm::Segment::SetSegmentAlgorithmName (
            const char * name )
```

10.262.5.29 SetSegmentAlgorithmType() [1/2]

```
void gdcm::Segment::SetSegmentAlgorithmType (
            ALGOType type )
```

10.262.5.30 SetSegmentAlgorithmType() [2/2]

```
void gdcm::Segment::SetSegmentAlgorithmType (
            const char * typeStr )
```

10.262.5.31 SetSegmentDescription()

```
void gdcm::Segment::SetSegmentDescription (
            const char * description )
```

10.262.5.32 SetSegmentLabel()

```
void gdcm::Segment::SetSegmentLabel (
            const char * label )
```

10.262.5.33 SetSegmentNumber()

```
void gdcm::Segment::SetSegmentNumber (
            const unsigned short num )
```

10.262.5.34 SetSurfaceCount()

```
void gdcm::Segment::SetSurfaceCount (
            const unsigned long nb )
```

10.262.6 Member Data Documentation

10.262.6.1 AnatomicRegion

```
SegmentHelper::BasicCodedEntry gdcm::Segment::AnatomicRegion  [protected]
```

10.262.6.2 AnatomicRegionModifiers

BasicCodedEntryVector gdcm::Segment::AnatomicRegionModifiers [protected]

10.262.6.3 PropertyCategory

SegmentHelper::BasicCodedEntry gdcm::Segment::PropertyCategory [protected]

10.262.6.4 PropertyType

SegmentHelper::BasicCodedEntry gdcm::Segment::PropertyType [protected]

10.262.6.5 PropertyTypeModifiers

BasicCodedEntryVector gdcm::Segment::PropertyTypeModifiers [protected]

10.262.6.6 SegmentAlgorithmName

std::string gdcm::Segment::SegmentAlgorithmName [protected]

10.262.6.7 SegmentAlgorithmType

ALGOType gdcm::Segment::SegmentAlgorithmType [protected]

10.262.6.8 SegmentDescription

std::string gdcm::Segment::SegmentDescription [protected]

10.262.6.9 SegmentLabel

```
std::string gdcm::Segment::SegmentLabel  [protected]
```

10.262.6.10 SegmentNumber

```
unsigned short gdcm::Segment::SegmentNumber  [protected]
```

10.262.6.11 SurfaceCount

```
unsigned long gdcm::Segment::SurfaceCount  [protected]
```

10.262.6.12 Surfaces

```
SurfaceVector gdcm::Segment::Surfaces  [protected]
```

The documentation for this class was generated from the following file:

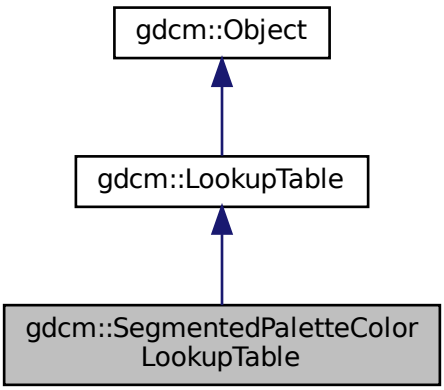
- gdcmSegment.h

10.263 gdcm::SegmentedPaletteColorLookupTable Class Reference

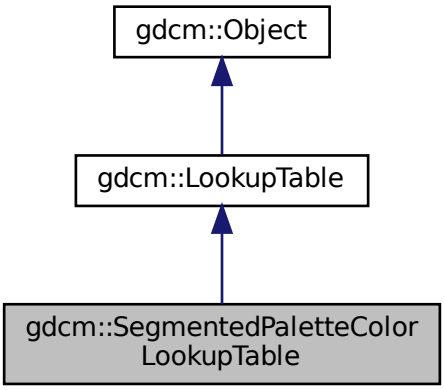
SegmentedPaletteColorLookupTable class.

`#include <gdcmSegmentedPaletteColorLookupTable.h>`

Inheritance diagram for gdcm::SegmentedPaletteColorLookupTable:



Collaboration diagram for gdcm::SegmentedPaletteColorLookupTable:



Public Member Functions

- SegmentedPaletteColorLookupTable ()
- ~SegmentedPaletteColorLookupTable () override
- void Print (std::ostream &) const override
- void SetLUT (LookupTableType type, const unsigned char *array, unsigned int length) override

  Initialize a SegmentedPaletteColorLookupTable.

Additional Inherited Members

10.263.1 Detailed Description

SegmentedPaletteColorLookupTable class.

10.263.2 Constructor & Destructor Documentation

10.263.2.1 SegmentedPaletteColorLookupTable()

```
gdcm::SegmentedPaletteColorLookupTable::SegmentedPaletteColorLookupTable ( )
```

10.263.2.2 ~SegmentedPaletteColorLookupTable()

```
gdcm::SegmentedPaletteColorLookupTable::~SegmentedPaletteColorLookupTable ( )  [override]
```

10.263.3 Member Function Documentation

10.263.3.1 Print()

```
void gdcm::SegmentedPaletteColorLookupTable::Print (
            std::ostream &  ) const  [inline], [override], [virtual]
```

Reimplemented from gdcm::LookupTable.

10.263.3.2 SetLUT()

```
void gdcm::SegmentedPaletteColorLookupTable::SetLUT (
            LookupTableType type,
            const unsigned char * array,
            unsigned int length )  [override], [virtual]
```

Initialize a SegmentedPaletteColorLookupTable.

Reimplemented from gdcm::LookupTable.

The documentation for this class was generated from the following file:

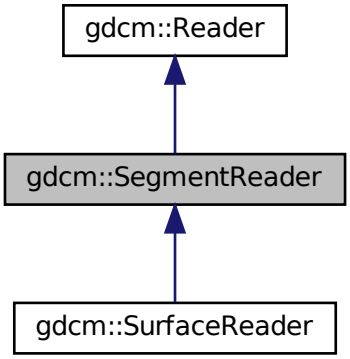
- gdcmSegmentedPaletteColorLookupTable.h

10.264 gdcm::SegmentReader Class Reference

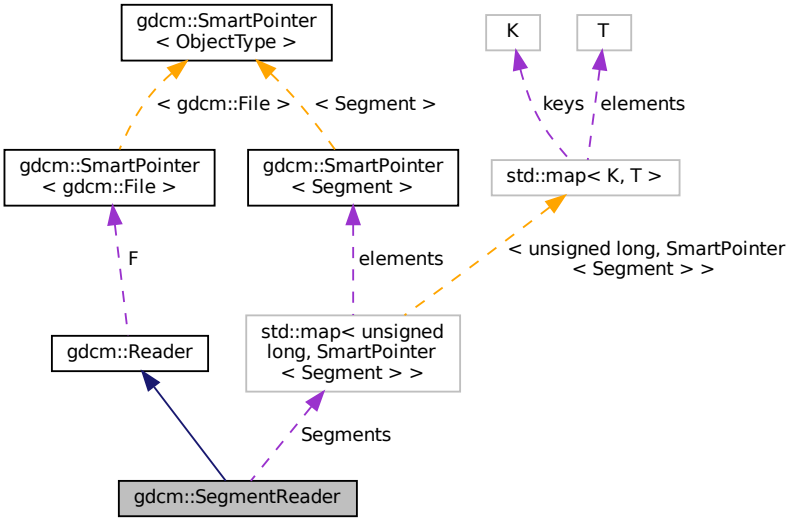
This class defines a segment reader.

`#include <gdcmSegmentReader.h>`

Inheritance diagram for gdcm::SegmentReader:



Collaboration diagram for gdcm::SegmentReader:



Public Types

- typedef std::vector< SmartPointer< Segment > > SegmentVector

Public Member Functions

- SegmentReader ()
- ~SegmentReader () override
- SegmentVector GetSegments ()
- const SegmentVector GetSegments () const
- bool Read () override

  Read.

Protected Types

- typedef std::map< unsigned long, SmartPointer< Segment > > SegmentMap

Protected Member Functions

- bool ReadSegment (const Item &segmentItem, const unsigned int idx)
- bool ReadSegments ()

Protected Attributes

- SegmentMap Segments

10.264.1 Detailed Description

This class defines a segment reader.

It reads attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

10.264.2 Member Typedef Documentation

10.264.2.1 SegmentMap

```
typedef std::map< unsigned long, SmartPointer< Segment > > gdcm::SegmentReader::SegmentMap  [protected]
```

10.264.2.2 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcm::SegmentReader::SegmentVector
```

10.264.3 Constructor & Destructor Documentation

10.264.3.1 SegmentReader()

```
gdcm::SegmentReader::SegmentReader ( )
```

10.264.3.2 ~SegmentReader()

```
gdcm::SegmentReader::~SegmentReader ( )  [override]
```

10.264.4 Member Function Documentation

10.264.4.1 GetSegments() [1/2]

```
SegmentVector gdcm::SegmentReader::GetSegments ( )
```

10.264.4.2 GetSegments() [2/2]

```
const SegmentVector gdcm::SegmentReader::GetSegments ( ) const
```

10.264.4.3 Read()

```
bool gdcm::SegmentReader::Read ( )  [override], [virtual]
```

Read.

Reimplemented from gdcm::Reader.

Reimplemented in gdcm::SurfaceReader.

10.264.4.4 ReadSegment()

```
bool gdcm::SegmentReader::ReadSegment (
            const Item & segmentItem,
            const unsigned int idx )  [protected]
```

10.264.4.5 ReadSegments()

```
bool gdcm::SegmentReader::ReadSegments ( )  [protected]
```

10.264.5 Member Data Documentation

10.264.5.1 Segments

```
SegmentMap gdcm::SegmentReader::Segments  [protected]
```

The documentation for this class was generated from the following file:

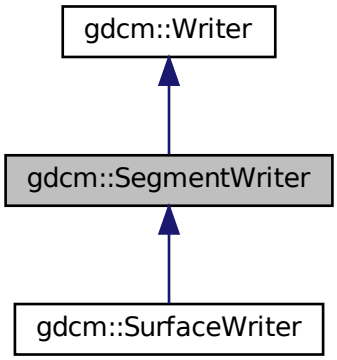
- gdcmSegmentReader.h

10.265 gdcm::SegmentWriter Class Reference

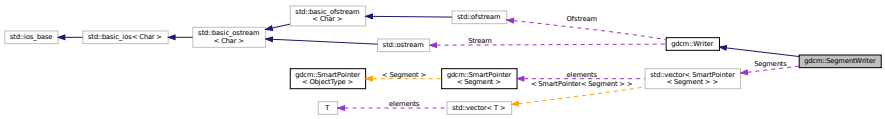
This class defines a segment writer.

`#include <gdcmSegmentWriter.h>`

Inheritance diagram for gdcm::SegmentWriter:



Collaboration diagram for gdcm::SegmentWriter:



Public Types

- typedef std::vector< SmartPointer< Segment > > SegmentVector

Public Member Functions

- SegmentWriter ()
- ~SegmentWriter () override
- void AddSegment (SmartPointer< Segment > segment)
- unsigned int GetNumberOfSegments () const
- SmartPointer< Segment > GetSegment (const unsigned int idx=0) const
- SegmentVector & GetSegments ()
- const SegmentVector & GetSegments () const
- void SetNumberOfSegments (const unsigned int size)
- void SetSegments (SegmentVector &segments)
- bool Write () override

  Write.

Protected Member Functions

- bool PrepareWrite ()

Protected Attributes

- SegmentVector Segments

10.265.1 Detailed Description

This class defines a segment writer.

It writes attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

10.265.2 Member Typedef Documentation

10.265.2.1 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcm::SegmentWriter::SegmentVector
```

10.265.3 Constructor & Destructor Documentation

10.265.3.1 SegmentWriter()

```
gdcm::SegmentWriter::SegmentWriter ( )
```

10.265.3.2 ~SegmentWriter()

```
gdcm::SegmentWriter::~SegmentWriter ( )  [override]
```

10.265.4 Member Function Documentation

10.265.4.1 AddSegment()

```
void gdcm::SegmentWriter::AddSegment (
            SmartPointer< Segment > segment )
```

10.265.4.2 GetNumberOfSegments()

```
unsigned int gdcm::SegmentWriter::GetNumberOfSegments ( ) const
```

10.265.4.3 GetSegment()

```
SmartPointer< Segment > gdcm::SegmentWriter::GetSegment (
            const unsigned int idx = 0 ) const
```

10.265.4.4 GetSegments() [1/2]

```
SegmentVector& gdcm::SegmentWriter::GetSegments ( )
```

10.265.4.5 GetSegments() [2/2]

```
const SegmentVector& gdcm::SegmentWriter::GetSegments ( ) const
```

10.265.4.6 PrepareWrite()

```
bool gdcm::SegmentWriter::PrepareWrite ( )  [protected]
```

10.265.4.7 SetNumberOfSegments()

```
void gdcm::SegmentWriter::SetNumberOfSegments (
            const unsigned int size )
```

10.265.4.8 SetSegments()

```
void gdcm::SegmentWriter::SetSegments (
            SegmentVector & segments )
```

10.265.4.9 Write()

```
bool gdcm::SegmentWriter::Write ( )  [override], [virtual]
```

Write.

Reimplemented from gdcm::Writer.

Reimplemented in gdcm::SurfaceWriter.

10.265.5 Member Data Documentation

10.265.5.1 Segments

```
SegmentVector gdcm::SegmentWriter::Segments  [protected]
```

The documentation for this class was generated from the following file:

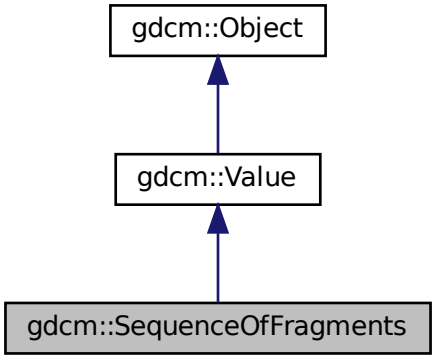
- gdcmSegmentWriter.h

10.266 gdcm::SequenceOfFragments Class Reference

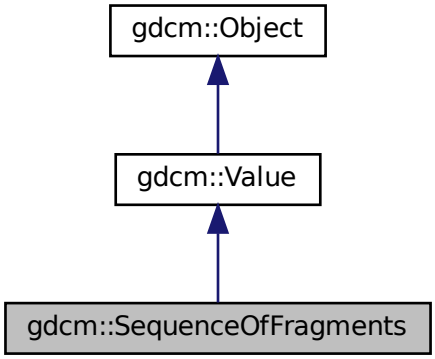
Class to represent a Sequence Of Fragments.

`#include <gdcmSequenceOfFragments.h>`

Inheritance diagram for gdcm::SequenceOfFragments:



Collaboration diagram for gdcm::SequenceOfFragments:



Public Types

- typedef FragmentVector::const_iterator ConstIterator
- typedef std::vector< Fragment > FragmentVector
- typedef FragmentVector::iterator Iterator
- typedef FragmentVector::size_type SizeType

Public Member Functions

- SequenceOfFragments ()

  constructor (UndefinedLength by default)
- void AddFragment (Fragment const &item)

  Appends a Fragment to the already added ones.
- Iterator Begin ()
- ConstIterator Begin () const
- void Clear () override

  Clear.
- unsigned long ComputeByteLength () const
- VL ComputeLength () const
- Iterator End ()
- ConstIterator End () const
- bool GetBuffer (char *buffer, unsigned long length) const
- bool GetFragBuffer (unsigned int fragNb, char *buffer, unsigned long &length) const
- const Fragment & GetFragment (SizeType num) const
- VL GetLength () const override

  Returns the SQ length, as read from disk.
- SizeType GetNumberOfFragments () const
- BasicOffsetTable & GetTable ()
- const BasicOffsetTable & GetTable () const
- bool operator== (const Value &val) const override
- void Print (std::ostream &os) const override
- template<typename TSwap >
  std::istream & Read (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool)
- void SetLength (VL length) override

  Sets the actual SQ length.
- template<typename TSwap >
  std::ostream const & Write (std::ostream &os) const
- bool WriteBuffer (std::ostream &os) const

Static Public Member Functions

- static SmartPointer< SequenceOfFragments > New ()

Additional Inherited Members

10.266.1 Detailed Description

Class to represent a Sequence Of Fragments.

Todo I do not enforce that Sequence of Fragments ends with a SQ end del

Examples

FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, and GetJPEGSamplePrecision.cxx.

10.266.2 Member Typedef Documentation

10.266.2.1 ConstIterator

```
typedef FragmentVector::const_iterator gdcm::SequenceOfFragments::ConstIterator
```

10.266.2.2 FragmentVector

```
typedef std::vector<Fragment> gdcm::SequenceOfFragments::FragmentVector
```

10.266.2.3 Iterator

```
typedef FragmentVector::iterator gdcm::SequenceOfFragments::Iterator
```

10.266.2.4 SizeType

```
typedef FragmentVector::size_type gdcm::SequenceOfFragments::SizeType
```

10.266.3 Constructor & Destructor Documentation

10.266.3.1 SequenceOfFragments()

```
gdcm::SequenceOfFragments::SequenceOfFragments ( )  [inline]
```

constructor (UndefinedLength by default)

10.266.4 Member Function Documentation

10.266.4.1 AddFragment()

```
void gdcm::SequenceOfFragments::AddFragment (
            Fragment const & item )
```

Appends a Fragment to the already added ones.

10.266.4.2 Begin() [1/2]

```
Iterator gdcm::SequenceOfFragments::Begin ( )  [inline]
```

10.266.4.3 Begin() [2/2]

```
ConstIterator gdcm::SequenceOfFragments::Begin ( ) const  [inline]
```

10.266.4.4 Clear()

```
void gdcm::SequenceOfFragments::Clear ( )  [override], [virtual]
```

Clear.

Implements gdcm::Value.

10.266.4.5 ComputeByteLength()

```
unsigned long gdcm::SequenceOfFragments::ComputeByteLength ( ) const
```

10.266.4.6 ComputeLength()

```
VL gdcm::SequenceOfFragments::ComputeLength ( ) const
```

10.266.4.7 End() [1/2]

```
Iterator gdcm::SequenceOfFragments::End ( )  [inline]
```

10.266.4.8 End() [2/2]

```
ConstIterator gdcm::SequenceOfFragments::End ( ) const  [inline]
```

10.266.4.9 GetBuffer()

```
bool gdcm::SequenceOfFragments::GetBuffer (
            char * buffer,
            unsigned long length ) const
```

10.266.4.10 GetFragBuffer()

```
bool gdcm::SequenceOfFragments::GetFragBuffer (
            unsigned int fragNb,
            char * buffer,
            unsigned long & length ) const
```

10.266.4.11 GetFragment()

```
const Fragment& gdcm::SequenceOfFragments::GetFragment (
            SizeType num ) const
```

Examples

FixBrokenJ2K.cxx, and FixJAIBugJPEGLS.cxx.

10.266.4.12 GetLength()

```
VL gdcm::SequenceOfFragments::GetLength ( ) const  [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements gdcm::Value.

10.266.4.13 GetNumberOfFragments()

```
SizeType gdcm::SequenceOfFragments::GetNumberOfFragments ( ) const
```

Examples

FixJAIBugJPEGLS.cxx.

10.266.4.14 GetTable() [1/2]

```
BasicOffsetTable& gdcm::SequenceOfFragments::GetTable ( )  [inline]
```

10.266.4.15 GetTable() [2/2]

```
const BasicOffsetTable& gdcm::SequenceOfFragments::GetTable ( ) const  [inline]
```

10.266.4.16 New()

```
static SmartPointer<SequenceOfFragments> gdcm::SequenceOfFragments::New ( )  [inline], [static]
```

10.266.4.17 operator==()

```
bool gdcm::SequenceOfFragments::operator== (
            const Value & val ) const  [inline], [override], [virtual]
```

Implements gdcm::Value.

10.266.4.18 Print()

```
void gdcm::SequenceOfFragments::Print (
            std::ostream & os ) const  [inline], [override], [virtual]
```

Reimplemented from gdcm::Object.

10.266.4.19 Read()

```
template<typename TSwap >
std::istream& gdcm::SequenceOfFragments::Read (
            std::istream & is,
            bool readvalues = true )  [inline]
```

10.266.4.20 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::SequenceOfFragments::ReadPreValue (
            std::istream & is )  [inline]
```

References gdcmDebugMacro.

10.266.4.21 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::SequenceOfFragments::ReadValue (
            std::istream & is,
            bool  )  [inline]
```

References gdcmAssertAlwaysMacro, gdcmDebugMacro, gdcmWarningMacro, gdcm::Tag::GetElement(), gdcm::Tag↩ ::GetGroup(), gdcm::ByteValue::GetLength(), gdcm::ByteValue::GetPointer(), gdcm::DataElement::GetTag(), gdcm::↩ DataElement::GetVL(), gdcm::Fragment::Read(), gdcm::Fragment::ReadBacktrack(), and gdcm::Exception::what().

10.266.4.22 SetLength()

```
void gdcm::SequenceOfFragments::SetLength (
            VL length )  [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements gdcm::Value.

10.266.4.23 Write()

```
template<typename TSwap >
std::ostream const& gdcm::SequenceOfFragments::Write (
             std::ostream & os ) const  [inline]
```

References gdcm::Tag::Write(), and gdcm::VL::Write().

10.266.4.24 WriteBuffer()

```
bool gdcm::SequenceOfFragments::WriteBuffer (
             std::ostream & os ) const
```

Examples

GetJPEGSamplePrecision.cxx.

The documentation for this class was generated from the following file:

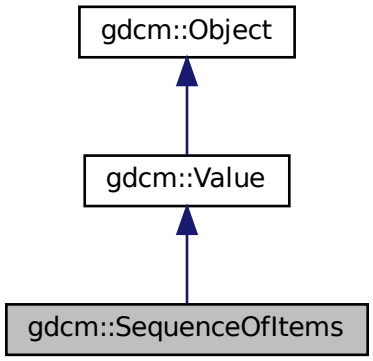
- gdcmSequenceOfFragments.h

10.267 gdcm::SequenceOfItems Class Reference

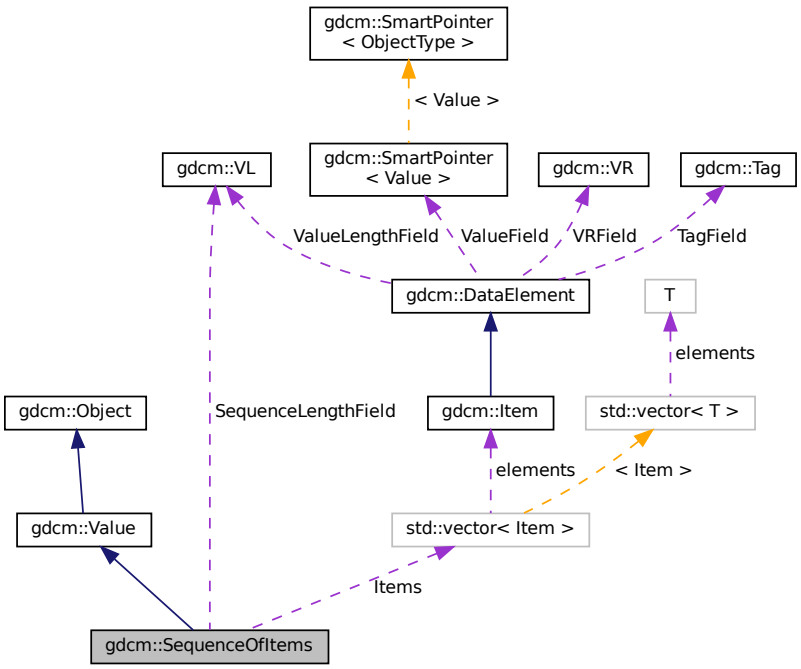
Class to represent a Sequence Of Items.

`#include <gdcmSequenceOfItems.h>`

Inheritance diagram for gdcm::SequenceOfItems:



Collaboration diagram for gdcm::SequenceOfItems:



Public Types

- typedef ItemVector::const_iterator ConstIterator
- typedef std::vector< Item > ItemVector
- typedef ItemVector::iterator Iterator
- typedef ItemVector::size_type SizeType

Public Member Functions

- SequenceOfItems ()

  constructor (UndefinedLength by default)
- void AddItem (Item const &item)

  Appends an Item to the already added ones.
- Item & AddNewUndefinedLengthItem ()

  Appends an Item to the already added ones.
- Iterator Begin ()
- ConstIterator Begin () const
- void Clear () override

  remove all items within the sequence
- template<typename TDE >
  VL ComputeLength () const

- Iterator End ()
- ConstIterator End () const
- bool FindDataElement (const Tag &t) const
- Item & GetItem (SizeType position)
- const Item & GetItem (SizeType position) const
- VL GetLength () const override

  Returns the SQ length, as read from disk.
- SizeType GetNumberOfItems () const
- bool IsEmpty () const
- bool IsUndefinedLength () const

  return if Value Length if of undefined length
- SequenceOfItems & operator= (const SequenceOfItems &val)
- bool operator== (const Value &val) const override
- void Print (std::ostream &os) const override
- template<typename TDE , typename TSwap >
  std::istream & Read (std::istream &is, bool readvalues=true)
- bool RemoveItemByIndex (const SizeType index)
- void SetLength (VL length) override

  Sets the actual SQ length.
- void SetLengthToUndefined ()

  Properly set the Sequence of Item to be undefined length.
- void SetNumberOfItems (SizeType n)
- template<typename TDE , typename TSwap >
  std::ostream const & Write (std::ostream &os) const

Static Public Member Functions

- static SmartPointer< SequenceOfItems > New ()

Public Attributes

- ItemVector Items

  Vector of Sequence Items.
- VL SequenceLengthField

  Total length of the Sequence (or 0xffffffff) if undefined.

Additional Inherited Members

10.267.1 Detailed Description

Class to represent a Sequence Of Items.

(value representation : SQ)

- a Value Representation for Data Elements that contains a sequence of Data Sets.
- Sequence of Item allows for Nested Data Sets

See PS 3.5, 7.4.6 Data Element Type Within a Sequence

Note

SEQUENCE OF ITEMS (VALUE REPRESENTATION SQ) A Value Representation for Data Elements that contain a sequence of Data Sets. Sequence of Items allows for Nested Data Sets.

Examples

DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, and GetSequenceUltrasound.cxx.

10.267.2 Member Typedef Documentation

10.267.2.1 ConstIterator

```
typedef ItemVector::const_iterator gdcm::SequenceOfItems::ConstIterator
```

10.267.2.2 ItemVector

```
typedef std::vector< Item > gdcm::SequenceOfItems::ItemVector
```

10.267.2.3 Iterator

```
typedef ItemVector::iterator gdcm::SequenceOfItems::Iterator
```

10.267.2.4 SizeType

```
typedef ItemVector::size_type gdcm::SequenceOfItems::SizeType
```

Examples

DumpGEMSMovieGroup.cxx.

10.267.3 Constructor & Destructor Documentation

10.267.3.1 SequenceOfItems()

```
gdcm::SequenceOfItems::SequenceOfItems ( )  [inline]
```

constructor (UndefinedLength by default)

10.267.4 Member Function Documentation

10.267.4.1 AddItem()

```
void gdcm::SequenceOfItems::AddItem (
            Item const & item )
```

Appends an Item to the already added ones.

Examples

Extracting_All_Resolution.cxx.

10.267.4.2 AddNewUndefinedLengthItem()

```
Item& gdcm::SequenceOfItems::AddNewUndefinedLengthItem ( )
```

Appends an Item to the already added ones.

10.267.4.3 Begin() [1/2]

```
Iterator gdcm::SequenceOfItems::Begin ( )  [inline]
```

10.267.4.4 Begin() [2/2]

```
ConstIterator gdcm::SequenceOfItems::Begin ( ) const  [inline]
```

10.267.4.5 Clear()

```
void gdcm::SequenceOfItems::Clear ( )  [override], [virtual]
```

remove all items within the sequence

Implements gdcm::Value.

10.267.4.6 ComputeLength()

```
template<typename TDE >
VL gdcm::SequenceOfItems::ComputeLength ( ) const
```

10.267.4.7 End() [1/2]

```
Iterator gdcm::SequenceOfItems::End ( )  [inline]
```

10.267.4.8 End() [2/2]

```
ConstIterator gdcm::SequenceOfItems::End ( ) const  [inline]
```

10.267.4.9 FindDataElement()

```
bool gdcm::SequenceOfItems::FindDataElement (
            const Tag & t ) const
```

10.267.4.10 GetItem() [1/2]

```
Item& gdcm::SequenceOfItems::GetItem (
            SizeType position )
```

10.267.4.11 GetItem() [2/2]

```
const Item& gdcm::SequenceOfItems::GetItem (
            SizeType position ) const
```

Examples

DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, ExtractEncryptedContent.cxx, and GetSequenceUltrasound.cxx.

10.267.4.12 GetLength()

```
VL gdcm::SequenceOfItems::GetLength ( ) const  [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements gdcm::Value.

10.267.4.13 GetNumberOfItems()

```
SizeType gdcm::SequenceOfItems::GetNumberOfItems ( ) const  [inline]
```

Examples

DumpExamCard.cxx, DumpGEMSMovieGroup.cxx, ExtractEncryptedContent.cxx, and GetSequenceUltrasound.cxx.

10.267.4.14 IsEmpty()

```
bool gdcm::SequenceOfItems::IsEmpty ( ) const  [inline]
```

10.267.4.15 IsUndefinedLength()

```
bool gdcm::SequenceOfItems::IsUndefinedLength ( ) const  [inline]
```

return if Value Length if of undefined length

10.267.4.16 New()

```
static SmartPointer<SequenceOfItems> gdcm::SequenceOfItems::New ( )  [inline], [static]
```

Examples

NewSequence.cs.

10.267.4.17 operator=()

```
SequenceOfItems& gdcm::SequenceOfItems::operator= (
            const SequenceOfItems & val )  [inline]
```

References Items, and SequenceLengthField.

10.267.4.18 operator==()

```
bool gdcm::SequenceOfItems::operator== (
            const Value & val ) const  [inline], [override], [virtual]
```

Implements gdcm::Value.

References Items, and SequenceLengthField.

10.267.4.19 Print()

```
void gdcm::SequenceOfItems::Print (
            std::ostream & os ) const  [inline], [override], [virtual]
```

Reimplemented from gdcm::Object.

10.267.4.20 Read()

```
template<typename TDE , typename TSwap >
std::istream& gdcm::SequenceOfItems::Read (
            std::istream & is,
            bool readvalues = true )  [inline]
```

References gdcm::Item::Clear(), gdcmDebugMacro, gdcmWarningMacro, gdcm::Exception::GetDescription(), gdcm::Item::GetNestedDataSet(), gdcm::DataElement::GetTag(), gdcm::DataElement::GetVL(), gdcm::Item::Read(), and gdcm::DataSet::Size().

10.267.4.21 RemoveItemByIndex()

```
bool gdcm::SequenceOfItems::RemoveItemByIndex (
            const SizeType index )
```

Remove an Item as specified by its index, if index > size, false is returned Index starts at 1 not 0

10.267.4.22 SetLength()

```
void gdcm::SequenceOfItems::SetLength (
            VL length )  [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements gdcm::Value.

10.267.4.23 SetLengthToUndefined()

```
void gdcm::SequenceOfItems::SetLengthToUndefined ( )
```

Properly set the Sequence of Item to be undefined length.

10.267.4.24 SetNumberOfItems()

```
void gdcm::SequenceOfItems::SetNumberOfItems (
            SizeType n )  [inline]
```

10.267.4.25 Write()

```
template<typename TDE , typename TSwap >
std::ostream const& gdcm::SequenceOfItems::Write (
            std::ostream & os ) const  [inline]
```

References gdcm::Tag::Write(), and gdcm::VL::Write().

10.267.5 Member Data Documentation

10.267.5.1 Items

```
ItemVector gdcm::SequenceOfItems::Items
```

Vector of Sequence Items.

Referenced by operator=(), and operator==().

10.267.5.2 SequenceLengthField

```
VL gdcm::SequenceOfItems::SequenceLengthField
```

Total length of the Sequence (or 0xffffffff) if undefined.

Referenced by operator=(), and operator==().

The documentation for this class was generated from the following file:

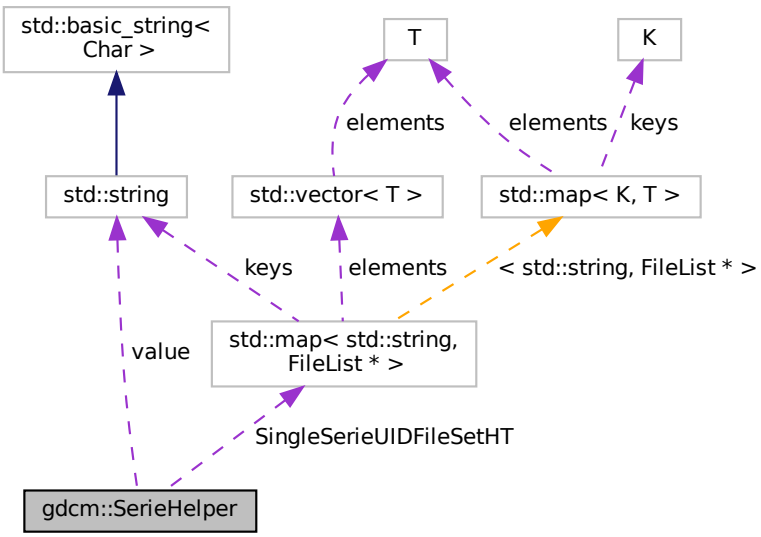
- gdcmSequenceOfItems.h

10.268 gdcm::SerieHelper Class Reference

SerieHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

```
#include <gdcmSerieHelper.h>
```

Collaboration diagram for gdcm::SerieHelper:



Public Member Functions

- SerieHelper ()
- ~SerieHelper ()
- void AddRestriction (const std::string &tag)
- void AddRestriction (uint16_t group, uint16_t elem, std::string const &value, int op)
- void Clear ()
- void CreateDefaultUniqueSeriesIdentifier ()
- std::string CreateUniqueSeriesIdentifier (File *inFile)
- FileList * GetFirstSingleSerieUIDFileSet ()
- FileList * GetNextSingleSerieUIDFileSet ()
- void OrderFileList (FileList *fileSet)
- void SetDirectory (std::string const &dir, bool recursive=false)
- void SetLoadMode (int)
- void SetUseSeriesDetails (bool useSeriesDetails)

Protected Types

- using Rule = struct RuleStructure{ uint16_t group
- typedef std::vector< Rule > SerieRestrictions
- typedef std::map< std::string, FileList * > SingleSerieUIDFileSetmap

Protected Member Functions

- bool AddFile (FileWithName &header)
- void AddFileName (std::string const &filename)
- void AddRestriction (const Tag &tag)
- bool FileNameOrdering (FileList *fileList)
- bool ImageNumberOrdering (FileList *fileList)
- bool ImagePositionPatientOrdering (FileList *fileSet)
- bool UserOrdering (FileList *fileSet)

Protected Attributes

- uint16_t elem
- SingleSerieUIDFileSetmap::iterator ItFileSetHt
- int op
- SingleSerieUIDFileSetmap SingleSerieUIDFileSetHT
- std::string value

10.268.1 Detailed Description

SerieHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

Instead see ImageHelper or IPPSorter

10.268.2 Member Typedef Documentation

10.268.2.1 Rule

```
using gdcm::SerieHelper::Rule = struct RuleStructure{ uint16_t group  [protected]
```

10.268.2.2 SerieRestrictions

```
typedef std::vector<Rule> gdcm::SerieHelper::SerieRestrictions  [protected]
```

10.268.2.3 SingleSerieUIDFileSetmap

```
typedef std::map<std::string, FileList *> gdcm::SerieHelper::SingleSerieUIDFileSetmap  [protected]
```

10.268.3 Constructor & Destructor Documentation

10.268.3.1 SerieHelper()

```
gdcm::SerieHelper::SerieHelper ( )
```

10.268.3.2 ~SerieHelper()

```
gdcm::SerieHelper::~SerieHelper ( )
```

10.268.4 Member Function Documentation

10.268.4.1 AddFile()

```
bool gdcm::SerieHelper::AddFile (
            FileWithName & header )  [protected]
```

10.268.4.2 AddFileName()

```
void gdcm::SerieHelper::AddFileName (
            std::string const & filename )  [protected]
```

10.268.4.3 AddRestriction() [1/3]

```
void gdcm::SerieHelper::AddRestriction (
            const std::string & tag )
```

10.268.4.4 AddRestriction() [2/3]

```
void gdcm::SerieHelper::AddRestriction (
            const Tag & tag )  [protected]
```

10.268.4.5 AddRestriction() [3/3]

```
void gdcm::SerieHelper::AddRestriction (
            uint16_t group,
            uint16_t elem,
            std::string const & value,
            int op )
```

10.268.4.6 Clear()

```
void gdcm::SerieHelper::Clear ( )
```

10.268.4.7 CreateDefaultUniqueSeriesIdentifier()

```
void gdcm::SerieHelper::CreateDefaultUniqueSeriesIdentifier ( )
```

10.268.4.8 CreateUniqueSeriesIdentifier()

```
std::string gdcm::SerieHelper::CreateUniqueSeriesIdentifier (
            File * inFile )
```

10.268.4.9 FileNameOrdering()

```
bool gdcm::SerieHelper::FileNameOrdering (
            FileList * fileList )  [protected]
```

10.268.4.10 GetFirstSingleSerieUIDFileSet()

```
FileList* gdcm::SerieHelper::GetFirstSingleSerieUIDFileSet ( )
```

10.268.4.11 GetNextSingleSerieUIDFileSet()

```
FileList* gdcm::SerieHelper::GetNextSingleSerieUIDFileSet ( )
```

10.268.4.12 ImageNumberOrdering()

```
bool gdcm::SerieHelper::ImageNumberOrdering (
            FileList * fileList )  [protected]
```

10.268.4.13 ImagePositionPatientOrdering()

```
bool gdcm::SerieHelper::ImagePositionPatientOrdering (
            FileList * fileSet )  [protected]
```

10.268.4.14 OrderFileList()

```
void gdcm::SerieHelper::OrderFileList (
            FileList * fileSet )
```

10.268.4.15 SetDirectory()

```
void gdcm::SerieHelper::SetDirectory (
            std::string const & dir,
            bool recursive = false )
```

10.268.4.16 SetLoadMode()

```
void gdcm::SerieHelper::SetLoadMode (
            int  )  [inline]
```

10.268.4.17 SetUseSeriesDetails()

```
void gdcm::SerieHelper::SetUseSeriesDetails (
            bool useSeriesDetails )
```

10.268.4.18 UserOrdering()

```
bool gdcm::SerieHelper::UserOrdering (
            FileList * fileSet )  [protected]
```

10.268.5 Member Data Documentation

10.268.5.1 elem

```
uint16_t gdcm::SerieHelper::elem  [protected]
```

10.268.5.2 ItFileSetHt

```
SingleSerieUIDFileSetmap::iterator gdcm::SerieHelper::ItFileSetHt  [protected]
```

10.268.5.3 op

```
int gdcm::SerieHelper::op  [protected]
```

10.268.5.4 SingleSerieUIDFileSetHT

```
SingleSerieUIDFileSetmap gdcm::SerieHelper::SingleSerieUIDFileSetHT  [protected]
```

10.268.5.5 value

```
std::string gdcm::SerieHelper::value  [protected]
```

The documentation for this class was generated from the following file:

- gdcmSerieHelper.h

10.269 gdcm::Series Class Reference

Series.

```
#include <gdcmSeries.h>
```

Public Member Functions

- Series ()=default

10.269.1 Detailed Description

Series.

10.269.2 Constructor & Destructor Documentation

10.269.2.1 Series()

```
gdcm::Series::Series ( )  [default]
```

The documentation for this class was generated from the following file:

- gdcmSeries.h

10.270 gdcm::network::ServiceClassApplicationInformation Class Reference

```
#include <gdcmServiceClassApplicationInformation.h>
```

Public Member Functions

- ServiceClassApplicationInformation ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetTuple (uint8_t levelofsupport, uint8_t levelofdigitalsig, uint8_t elementcoercion)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.270.1 Detailed Description

PS 3.4 Table B.3-1 SERVICE-CLASS-APPLICATION-INFORMATION (A-ASSOCIATE-RQ)

10.270.2 Constructor & Destructor Documentation

10.270.2.1 ServiceClassApplicationInformation()

```
gdcm::network::ServiceClassApplicationInformation::ServiceClassApplicationInformation ( )
```

10.270.3 Member Function Documentation

10.270.3.1 Print()

```
void gdcm::network::ServiceClassApplicationInformation::Print (
            std::ostream & os ) const
```

10.270.3.2 Read()

```
std::istream& gdcm::network::ServiceClassApplicationInformation::Read (
            std::istream & is )
```

10.270.3.3 SetTuple()

```
void gdcm::network::ServiceClassApplicationInformation::SetTuple (
            uint8_t levelofsupport,
            uint8_t levelofdigitalsig,
            uint8_t elementcoercion )
```

10.270.3.4 Size()

```
size_t gdcm::network::ServiceClassApplicationInformation::Size ( ) const
```

10.270.3.5 Write()

```
const std::ostream& gdcm::network::ServiceClassApplicationInformation::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

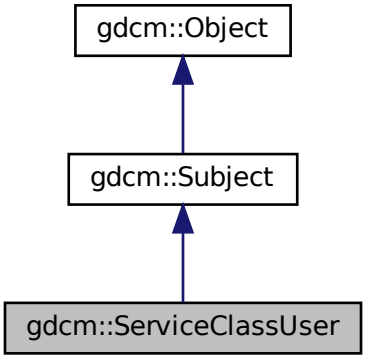
- gdcmServiceClassApplicationInformation.h

10.271 gdcm::ServiceClassUser Class Reference

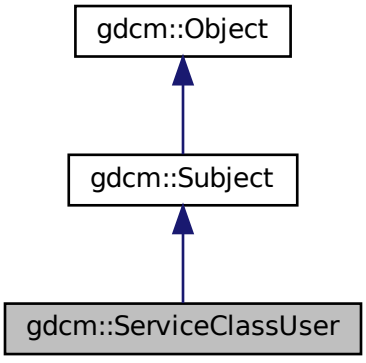
ServiceClassUser.

`#include <gdcmServiceClassUser.h>`

Inheritance diagram for gdcm::ServiceClassUser:



Collaboration diagram for gdcm::ServiceClassUser:



Public Member Functions

- ServiceClassUser ()
- ServiceClassUser (const ServiceClassUser &)=delete
- ~ServiceClassUser () override
- const char * GetAETitle () const
- const char * GetCalledAETitle () const
- double GetTimeout () const
- bool InitializeConnection ()
- bool IsPresentationContextAccepted (const PresentationContext &pc) const

  Return if the passed in presentation was accepted during association negotiation.
- void operator= (const ServiceClassUser &)=delete
- bool SendEcho ()

  C-ECHO.
- bool SendFind (const BaseRootQuery *query, std::vector< DataSet > &retDatasets)

  C-FIND a query, return result are in retDatasets.
- bool SendMove (const BaseRootQuery *query, const char *outputdir)

  Execute a C-MOVE, based on query, return files are written in outputdir.
- bool SendMove (const BaseRootQuery *query, std::vector< DataSet > &retDatasets)

  Execute a C-MOVE, based on query, returned dataset are Implicit.
- bool SendMove (const BaseRootQuery *query, std::vector< File > &retFile)

  Execute a C-MOVE, based on query, returned Files are stored in vector.
- bool SendStore (const char *filename)

  Execute a C-STORE on file on disk, named filename.
- bool SendStore (DataSet const &ds)

  Execute a C-STORE on a DataSet, the transfer syntax used will be Implicit.
- bool SendStore (File const &file)
- void SetAETitle (const char *aetitle)

  set calling ae title
- void SetCalledAETitle (const char *aetitle)

  set called ae title
- void SetHostname (const char *hostname)

  Set the name of the called hostname (hostname or IP address)
- void SetPort (uint16_t port)

  Set port of remote host (called application)
- void SetPortSCP (uint16_t portscp)

  Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE)
- void SetPresentationContexts (std::vector< PresentationContext > const &pcs)

  Set the Presentation Context used for the Association.
- void SetTimeout (double t)

  set/get Timeout
- bool StartAssociation ()

  Start the association. Need to call SetPresentationContexts before.
- bool StopAssociation ()

  Stop the running association.

Static Public Member Functions

- static SmartPointer< ServiceClassUser > New ()

  for wrapped language: instantiate a reference counted object

Additional Inherited Members

10.271.1 Detailed Description

ServiceClassUser.

Examples

CStoreQtProgress.cxx.

10.271.2 Constructor & Destructor Documentation

10.271.2.1 ServiceClassUser() [1/2]

```
gdcm::ServiceClassUser::ServiceClassUser ( )
```

Construct a SCU with default:

- hostname = localhost
- port = 104

10.271.2.2 ~ServiceClassUser()

```
gdcm::ServiceClassUser::~ServiceClassUser ( )  [override]
```

10.271.2.3 ServiceClassUser() [2/2]

```
gdcm::ServiceClassUser::ServiceClassUser (
            const ServiceClassUser &  )  [delete]
```

10.271.3 Member Function Documentation

10.271.3.1 GetAETitle()

```
const char* gdcm::ServiceClassUser::GetAETitle ( ) const
```

10.271.3.2 GetCalledAETitle()

```
const char* gdcm::ServiceClassUser::GetCalledAETitle ( ) const
```

10.271.3.3 GetTimeout()

```
double gdcm::ServiceClassUser::GetTimeout ( ) const
```

10.271.3.4 InitializeConnection()

```
bool gdcm::ServiceClassUser::InitializeConnection ( )
```

Will try to connect This will setup the actual timeout used during the whole connection time. Need to call SetTimeout first

Examples

CStoreQtProgress.cxx.

10.271.3.5 IsPresentationContextAccepted()

```
bool gdcm::ServiceClassUser::IsPresentationContextAccepted (
            const PresentationContext & pc ) const
```

Return if the passed in presentation was accepted during association negotiation.

10.271.3.6 New()

```
static SmartPointer<ServiceClassUser> gdcm::ServiceClassUser::New ( )  [inline], [static]
```

for wrapped language: instantiate a reference counted object

10.271.3.7 operator=()

```
void gdcm::ServiceClassUser::operator= (
            const ServiceClassUser &  )  [delete]
```

10.271.3.8 SendEcho()

```
bool gdcm::ServiceClassUser::SendEcho ( )
```

C-ECHO.

10.271.3.9 SendFind()

```
bool gdcm::ServiceClassUser::SendFind (
            const BaseRootQuery * query,
            std::vector< DataSet > & retDatasets )
```

C-FIND a query, return result are in retDatasets.

10.271.3.10 SendMove() [1/3]

```
bool gdcm::ServiceClassUser::SendMove (
            const BaseRootQuery * query,
            const char * outputdir )
```

Execute a C-MOVE, based on query, return files are written in outputdir.

10.271.3.11 SendMove() [2/3]

```
bool gdcm::ServiceClassUser::SendMove (
            const BaseRootQuery * query,
            std::vector< DataSet > & retDatasets )
```

Execute a C-MOVE, based on query, returned dataset are Implicit.

10.271.3.12 SendMove() [3/3]

```
bool gdcm::ServiceClassUser::SendMove (
            const BaseRootQuery * query,
            std::vector< File > & retFile )
```

Execute a C-MOVE, based on query, returned Files are stored in vector.

10.271.3.13 SendStore() [1/3]

```
bool gdcm::ServiceClassUser::SendStore (
            const char * filename )
```

Execute a C-STORE on file on disk, named filename.

Examples

CStoreQtProgress.cxx.

10.271.3.14 SendStore() [2/3]

```
bool gdcm::ServiceClassUser::SendStore (
            DataSet const & ds )
```

Execute a C-STORE on a DataSet, the transfer syntax used will be Implicit.

10.271.3.15 SendStore() [3/3]

```
bool gdcm::ServiceClassUser::SendStore (
            File const & file )
```

Execute a C-STORE on a File, the transfer syntax used for the query is based on the file.

10.271.3.16 SetAETitle()

```
void gdcm::ServiceClassUser::SetAETitle (
            const char * aetitle )
```

set calling ae title

10.271.3.17 SetCalledAETitle()

```
void gdcm::ServiceClassUser::SetCalledAETitle (
            const char * aetitle )
```

set called ae title

Examples

CStoreQtProgress.cxx.

10.271.3.18 SetHostname()

```
void gdcm::ServiceClassUser::SetHostname (
            const char * hostname )
```

Set the name of the called hostname (hostname or IP address)

Examples

CStoreQtProgress.cxx.

10.271.3.19 SetPort()

```
void gdcm::ServiceClassUser::SetPort (
            uint16_t port )
```

Set port of remote host (called application)

Examples

CStoreQtProgress.cxx.

10.271.3.20 SetPortSCP()

```
void gdcm::ServiceClassUser::SetPortSCP (
            uint16_t portscp )
```

Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE)

10.271.3.21 SetPresentationContexts()

```
void gdcm::ServiceClassUser::SetPresentationContexts (
            std::vector< PresentationContext > const & pcs )
```

Set the Presentation Context used for the Association.

Examples

CStoreQtProgress.cxx.

10.271.3.22 SetTimeout()

```
void gdcm::ServiceClassUser::SetTimeout (
            double t )
```

set/get Timeout

Examples

CStoreQtProgress.cxx.

10.271.3.23 StartAssociation()

```
bool gdcm::ServiceClassUser::StartAssociation ( )
```

Start the association. Need to call SetPresentationContexts before.

Examples

CStoreQtProgress.cxx.

10.271.3.24 StopAssociation()

```
bool gdcm::ServiceClassUser::StopAssociation ( )
```

Stop the running association.

Examples

CStoreQtProgress.cxx.

The documentation for this class was generated from the following file:

- gdcmServiceClassUser.h

10.272 gdcm::SHA1 Class Reference

Class for SHA1.

```
#include <gdcmSHA1.h>
```

Public Member Functions

- SHA1 ()
- SHA1 (const SHA1 &)=delete
- ~SHA1 ()
- void operator= (const SHA1 &)=delete

Static Public Member Functions

- static bool Compute (const char *buffer, unsigned long buf_len, char digest_str[20 *2+1])
- static bool ComputeFile (const char *filename, char digest_str[20 *2+1])

10.272.1 Detailed Description

Class for SHA1.

Warning

this class is able to pick from one implementation:

1. the one from OpenSSL (when GDCM_USE_SYSTEM_OPENSSL is turned ON)

In all other cases it will return an error

10.272.2 Constructor & Destructor Documentation

10.272.2.1 SHA1() [1/2]

```
gdcm::SHA1::SHA1 ( )
```

10.272.2.2 ~SHA1()

```
gdcm::SHA1::~SHA1 ( )
```

10.272.2.3 SHA1() [2/2]

```
gdcm::SHA1::SHA1 (
            const SHA1 &  )  [delete]
```

10.272.3 Member Function Documentation

10.272.3.1 Compute()

```
static bool gdcm::SHA1::Compute (
            const char * buffer,
            unsigned long buf_len,
            char digest_str[20 *2+1] )  [static]
```

10.272.3.2 ComputeFile()

```
static bool gdcm::SHA1::ComputeFile (
            const char * filename,
            char digest_str[20 *2+1] )  [static]
```

10.272.3.3 operator=()

```
void gdcm::SHA1::operator= (
            const SHA1 &  )  [delete]
```

The documentation for this class was generated from the following file:

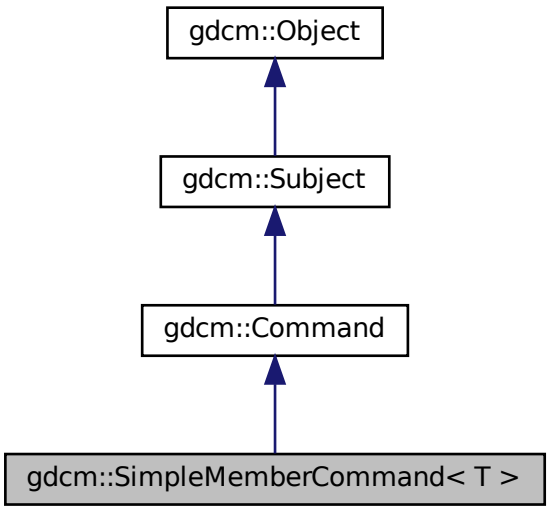
- gdcmSHA1.h

10.273 gdcm::SimpleMemberCommand< T > Class Template Reference

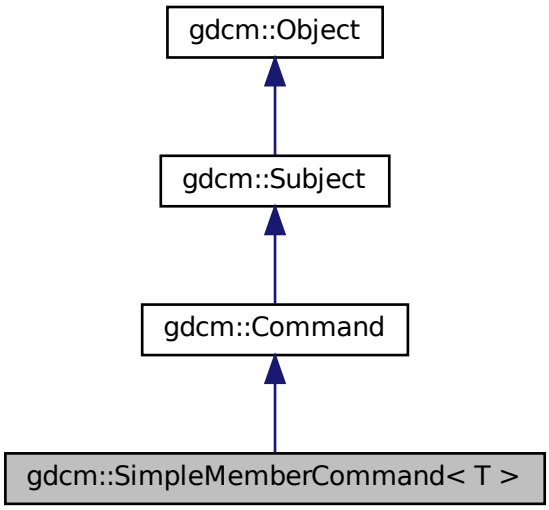
Command subclass that calls a pointer to a member function.

`#include <gdcmCommand.h>`

Inheritance diagram for gdcm::SimpleMemberCommand< T >:



Collaboration diagram for gdcm::SimpleMemberCommand< T >:



Public Types

- typedef SimpleMemberCommand Self
- typedef void(T::* TMemberFunctionPointer) ()

Public Member Functions

- SimpleMemberCommand (const Self &)=delete
- void Execute (const Subject *, const Event &) override
- void Execute (Subject *, const Event &) override
- void operator= (const Self &)=delete
- void SetCallbackFunction (T *object, TMemberFunctionPointer memberFunction)

Static Public Member Functions

- static SmartPointer< SimpleMemberCommand > New ()

Protected Member Functions

- SimpleMemberCommand ()
- ~SimpleMemberCommand () override=default

Protected Attributes

- TMemberFunctionPointer m_MemberFunction
- T * m_This

10.273.1 Detailed Description

template<typename T>
class gdcm::SimpleMemberCommand< T >

Command subclass that calls a pointer to a member function.

SimpleMemberCommand calls a pointer to a member function with no arguments.

10.273.2 Member Typedef Documentation

10.273.2.1 Self

```
template<typename T >
typedef SimpleMemberCommand gdcm::SimpleMemberCommand< T >::Self
```

Standard class typedefs.

10.273.2.2 TMemberFunctionPointer

```
template<typename T >
typedef void(T::* gdcm::SimpleMemberCommand< T >::TMemberFunctionPointer) ()
```

A method callback.

10.273.3 Constructor & Destructor Documentation

10.273.3.1 SimpleMemberCommand() [1/2]

```
template<typename T >
gdcm::SimpleMemberCommand< T >::SimpleMemberCommand (
            const Self &  )  [delete]
```

10.273.3.2 SimpleMemberCommand() [2/2]

```
template<typename T >
gdcm::SimpleMemberCommand< T >::SimpleMemberCommand ( )  [inline], [protected]
```

Referenced by gdcm::SimpleMemberCommand< T >::New().

10.273.3.3 ~SimpleMemberCommand()

```
template<typename T >
gdcm::SimpleMemberCommand< T >::~SimpleMemberCommand ( )  [override], [protected], [default]
```

10.273.4 Member Function Documentation

10.273.4.1 Execute() [1/2]

```
template<typename T >
void gdcm::SimpleMemberCommand< T >::Execute (
            const Subject * caller,
            const Event & event )  [inline], [override], [virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a const Object

Implements gdcm::Command.

References gdcm::SimpleMemberCommand< T >::m_MemberFunction.

10.273.4.2 Execute() [2/2]

```
template<typename T >
void gdcm::SimpleMemberCommand< T >::Execute (
            Subject * ,
            const Event &  )  [inline], [override], [virtual]
```

Invoke the callback function.

Implements gdcm::Command.

References gdcm::SimpleMemberCommand< T >::m_MemberFunction.

10.273.4.3 New()

```
template<typename T >
static SmartPointer<SimpleMemberCommand> gdcm::SimpleMemberCommand< T >::New ( )  [inline],
[static]
```

Run-time type information (and related methods). Method for creation through the object factory.

References gdcm::SimpleMemberCommand< T >::SimpleMemberCommand().

10.273.4.4 operator=()

```
template<typename T >
void gdcm::SimpleMemberCommand< T >::operator= (
            const Self &  )  [delete]
```

10.273.4.5 SetCallbackFunction()

```
template<typename T >
void gdcm::SimpleMemberCommand< T >::SetCallbackFunction (
            T * object,
            TMemberFunctionPointer memberFunction )  [inline]
```

Specify the callback function.

References gdcm::SimpleMemberCommand< T >::m_MemberFunction, and gdcm::SimpleMemberCommand< T >::m_This.

10.273.5 Member Data Documentation

10.273.5.1 m_MemberFunction

```
template<typename T >
TMemberFunctionPointer gdcm::SimpleMemberCommand< T >::m_MemberFunction  [protected]
```

Referenced by gdcm::SimpleMemberCommand< T >::Execute(), and gdcm::SimpleMemberCommand< T >::SetCallbackFunction().

10.273.5.2 m_This

```
template<typename T >
T* gdcm::SimpleMemberCommand< T >::m_This  [protected]
```

Referenced by gdcm::SimpleMemberCommand< T >::SetCallbackFunction().

The documentation for this class was generated from the following file:

- gdcmCommand.h

10.274 gdcm::SimpleSubjectWatcher Class Reference

SimpleSubjectWatcher.

```
#include <gdcmSimpleSubjectWatcher.h>
```

Public Member Functions

- SimpleSubjectWatcher (const SimpleSubjectWatcher &)=delete
- SimpleSubjectWatcher (Subject *s, const char *comment="")
- virtual ~SimpleSubjectWatcher ()
- void operator= (const SimpleSubjectWatcher &)=delete

Protected Member Functions

- virtual void EndFilter ()
- virtual void ShowAbort ()
- virtual void ShowAnonymization (Subject *caller, const Event &evt)
- virtual void ShowData (Subject *caller, const Event &evt)
- virtual void ShowDataSet (Subject *caller, const Event &evt)
- virtual void ShowFileName (Subject *caller, const Event &evt)
- virtual void ShowIteration ()
- virtual void ShowProgress (Subject *caller, const Event &evt)
- virtual void StartFilter ()
- void TestAbortOff ()
- void TestAbortOn ()

10.274.1 Detailed Description

SimpleSubjectWatcher.

This is a typical Subject Watcher class. It will observe all events.

Examples

SimpleScanner.cxx.

10.274.2 Constructor & Destructor Documentation

10.274.2.1 SimpleSubjectWatcher() [1/2]

```
gdcm::SimpleSubjectWatcher::SimpleSubjectWatcher (
            Subject * s,
            const char * comment = "" )
```

10.274.2.2 ~SimpleSubjectWatcher()

```
virtual gdcm::SimpleSubjectWatcher::~SimpleSubjectWatcher ( )  [virtual]
```

10.274.2.3 SimpleSubjectWatcher() [2/2]

```
gdcm::SimpleSubjectWatcher::SimpleSubjectWatcher (
            const SimpleSubjectWatcher &  )  [delete]
```

10.274.3 Member Function Documentation

10.274.3.1 EndFilter()

```
virtual void gdcm::SimpleSubjectWatcher::EndFilter ( )  [protected], [virtual]
```

10.274.3.2 operator=()

```
void gdcm::SimpleSubjectWatcher::operator= (
            const SimpleSubjectWatcher &  )  [delete]
```

10.274.3.3 ShowAbort()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAbort ( )  [protected], [virtual]
```

10.274.3.4 ShowAnonymization()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAnonymization (
            Subject * caller,
            const Event & evt )  [protected], [virtual]
```

10.274.3.5 ShowData()

```
virtual void gdcm::SimpleSubjectWatcher::ShowData (
            Subject * caller,
            const Event & evt )  [protected], [virtual]
```

10.274.3.6 ShowDataSet()

```
virtual void gdcm::SimpleSubjectWatcher::ShowDataSet (
            Subject * caller,
            const Event & evt )  [protected], [virtual]
```

10.274.3.7 ShowFileName()

```
virtual void gdcm::SimpleSubjectWatcher::ShowFileName (
            Subject * caller,
            const Event & evt )  [protected], [virtual]
```

Examples

SimpleScanner.cxx.

10.274.3.8 ShowIteration()

```
virtual void gdcm::SimpleSubjectWatcher::ShowIteration ( )  [protected], [virtual]
```

10.274.3.9 ShowProgress()

```
virtual void gdcm::SimpleSubjectWatcher::ShowProgress (
            Subject * caller,
            const Event & evt )  [protected], [virtual]
```

10.274.3.10 StartFilter()

```
virtual void gdcm::SimpleSubjectWatcher::StartFilter ( )  [protected], [virtual]
```

10.274.3.11 TestAbortOff()

```
void gdcm::SimpleSubjectWatcher::TestAbortOff ( )  [protected]
```

10.274.3.12 TestAbortOn()

```
void gdcm::SimpleSubjectWatcher::TestAbortOn ( )  [protected]
```

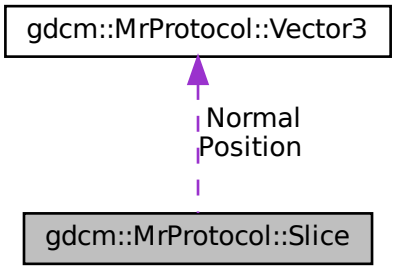
The documentation for this class was generated from the following file:

- gdcmSimpleSubjectWatcher.h

10.275 gdcm::MrProtocol::Slice Struct Reference

`#include <gdcmMrProtocol.h>`

Collaboration diagram for gdcm::MrProtocol::Slice:



Public Attributes

- Vector3 Normal
- Vector3 Position

10.275.1 Member Data Documentation

10.275.1.1 Normal

`Vector3 gdcm::MrProtocol::Slice::Normal`

10.275.1.2 Position

`Vector3 gdcm::MrProtocol::Slice::Position`

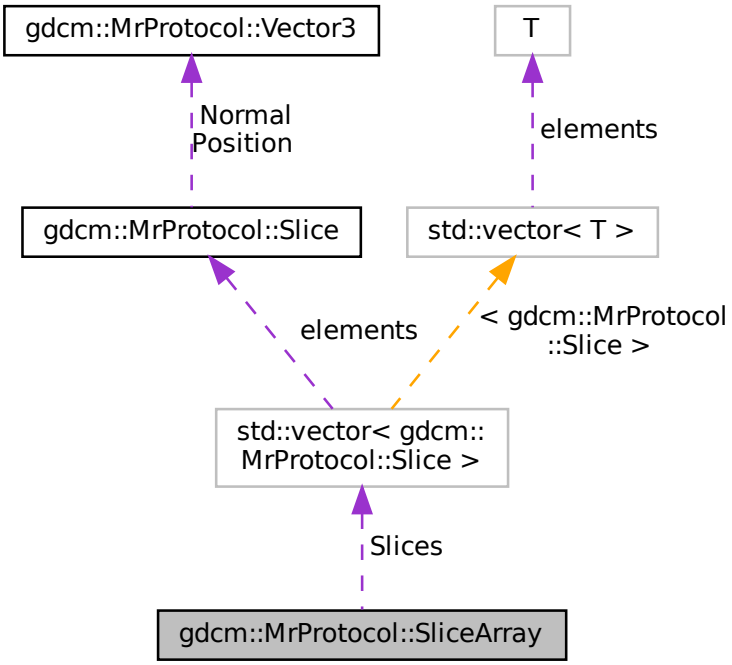
The documentation for this struct was generated from the following file:

- gdcmMrProtocol.h

10.276 gdcm::MrProtocol::SliceArray Struct Reference

`#include <gdcmMrProtocol.h>`

Collaboration diagram for gdcm::MrProtocol::SliceArray:



Public Attributes

- std::vector< Slice > Slices

10.276.1 Member Data Documentation

10.276.1.1 Slices

`std::vector< Slice > gdcm::MrProtocol::SliceArray::Slices`

The documentation for this struct was generated from the following file:

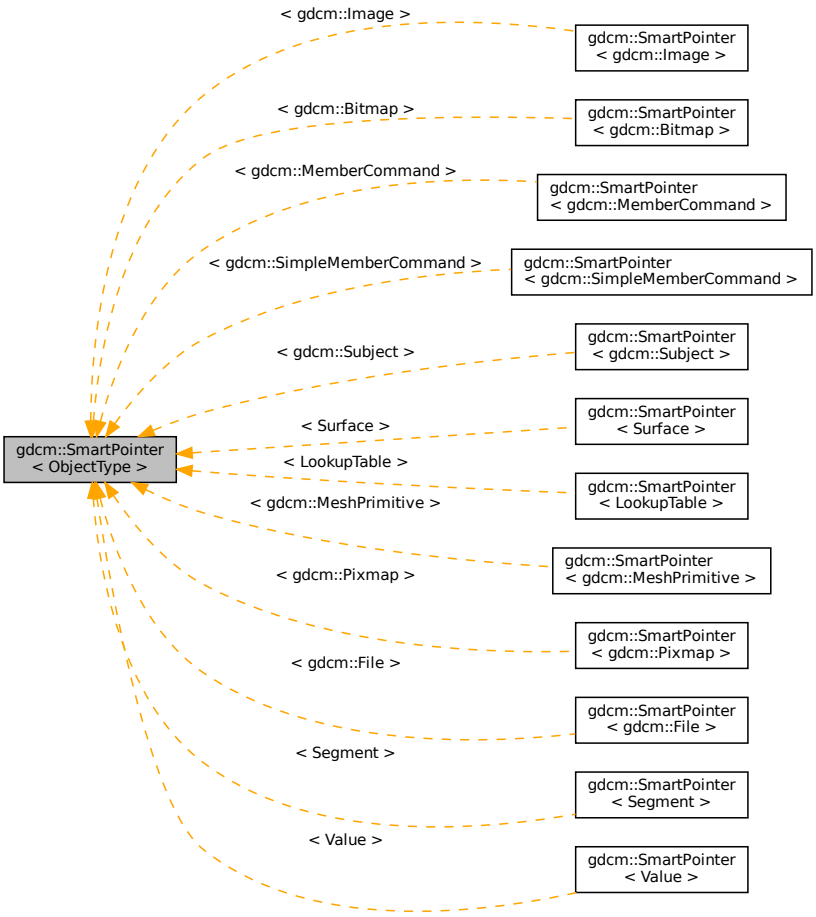
- gdcmMrProtocol.h

10.277 gdcm::SmartPointer< ObjectType > Class Template Reference

Class for Smart Pointer.

`#include <gdcmSmartPointer.h>`

Inheritance diagram for gdcm::SmartPointer< ObjectType >:



Public Member Functions

- SmartPointer ()
- SmartPointer (const SmartPointer< ObjectType > &p)
- SmartPointer (ObjectType *p)
- SmartPointer (ObjectType const &p)
- ~SmartPointer ()
- ObjectType * GetPointer () const

  Explicit function to retrieve the pointer.

- operator ObjectType * () const

  Return pointer to object.
- ObjectType & operator* () const
- ObjectType * operator-> () const

  Overload operator ->
- SmartPointer & operator= (ObjectType *r)

  Overload operator assignment.
- SmartPointer & operator= (ObjectType const &r)
- SmartPointer & operator= (SmartPointer const &r)

  Overload operator assignment.

10.277.1 Detailed Description

template<class ObjectType>
class gdcm::SmartPointer< ObjectType >

Class for Smart Pointer.

Will only work for subclass of gdcm::Object See tr1/shared_ptr for a more general approach (not invasive) #include <tr1/memory> { shared_ptr<Bla> b(new Bla); }

Note

Class partly based on post by Bill Hubauer: `http://groups.google.com/group/comp.lang.c++/msg/173ddc38a827a930`

See also

`http://www.davethehat.com/articles/smartp.htm`

and itk::SmartPointer

Examples

CStoreQtProgress.cxx, ChangeSequenceUltrasound.cxx, DumpGEMSMovieGroup.cxx, DumpToshibaDTI.cxx, DumpToshibaDTI2.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, LargeVRDSExplicit.cxx, ReadAndDumpDICOMDIR.cxx, SimpleScanner.cxx, gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.277.2 Constructor & Destructor Documentation

10.277.2.1 SmartPointer() [1/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer ( )  [inline]
```

10.277.2.2 SmartPointer() [2/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
            const SmartPointer< ObjectType > & p )  [inline]
```

10.277.2.3 SmartPointer() [3/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
            ObjectType * p )  [inline]
```

10.277.2.4 SmartPointer() [4/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
            ObjectType const & p )  [inline]
```

10.277.2.5 ~SmartPointer()

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::~SmartPointer ( )  [inline]
```

10.277.3 Member Function Documentation

10.277.3.1 GetPointer()

```
template<class ObjectType >
ObjectType* gdcm::SmartPointer< ObjectType >::GetPointer ( ) const  [inline]
```

Explicit function to retrieve the pointer.

10.277.3.2 operator ObjectType *()

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::operator ObjectType * ( ) const  [inline]
```

Return pointer to object.

10.277.3.3 operator*()

```
template<class ObjectType >
ObjectType& gdcm::SmartPointer< ObjectType >::operator* ( ) const  [inline]
```

10.277.3.4 operator->()

```
template<class ObjectType >
ObjectType* gdcm::SmartPointer< ObjectType >::operator-> ( ) const  [inline]
```

Overload operator ->

10.277.3.5 operator=() [1/3]

```
template<class ObjectType >
SmartPointer& gdcm::SmartPointer< ObjectType >::operator= (
            ObjectType * r )  [inline]
```

Overload operator assignment.

10.277.3.6 operator=() [2/3]

```
template<class ObjectType >
SmartPointer& gdcm::SmartPointer< ObjectType >::operator= (
            ObjectType const & r )  [inline]
```

References gdcm::SmartPointer< ObjectType >::operator=().

10.277.3.7 operator=() [3/3]

```
template<class ObjectType >
SmartPointer& gdcm::SmartPointer< ObjectType >::operator= (
            SmartPointer< ObjectType > const & r )  [inline]
```

Overload operator assignment.

Referenced by gdcm::SmartPointer< ObjectType >::operator=().

The documentation for this class was generated from the following files:

- gdcmObject.h
- gdcmSmartPointer.h

10.278 gdcm::network::SOPClassExtendedNegociationSub Class Reference

SOPClassExtendedNegociationSub.

```
#include <gdcmSOPClassExtendedNegociationSub.h>
```

Public Member Functions

- SOPClassExtendedNegociationSub ()
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetTuple (const char *uid, uint8_t levelofsupport=3, uint8_t levelofdigitalsig=0, uint8_t elementcoercion=2)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.278.1 Detailed Description

SOPClassExtendedNegociationSub.

PS 3.7 Table D.3-11 SOP CLASS EXTENDED NEGOTIATION SUB-ITEM FIELDS (A-ASSOCIATE-RQ and A-↩ ASSOCIATE-AC)

10.278.2 Constructor & Destructor Documentation

10.278.2.1 SOPClassExtendedNegociationSub()

```
gdcm::network::SOPClassExtendedNegociationSub::SOPClassExtendedNegociationSub ( )
```

10.278.3 Member Function Documentation

10.278.3.1 Print()

```
void gdcm::network::SOPClassExtendedNegociationSub::Print (
            std::ostream & os ) const
```

10.278.3.2 Read()

```
std::istream& gdcm::network::SOPClassExtendedNegociationSub::Read (
            std::istream & is )
```

10.278.3.3 SetTuple()

```
void gdcm::network::SOPClassExtendedNegociationSub::SetTuple (
            const char * uid,
            uint8_t levelofsupport = 3,
            uint8_t levelofdigitalsig = 0,
            uint8_t elementcoercion = 2 )
```

10.278.3.4 Size()

```
size_t gdcm::network::SOPClassExtendedNegociationSub::Size ( ) const
```

10.278.3.5 Write()

```
const std::ostream& gdcm::network::SOPClassExtendedNegociationSub::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmSOPClassExtendedNegociationSub.h

10.279 gdcm::SOPClassUIDToIOD Class Reference

Class convert a class SOP Class UID into IOD.

```
#include <gdcmSOPClassUIDToIOD.h>
```

Public Types

- typedef const char * const(SOPClassUIDToIODType)[2]

Static Public Member Functions

- static const char * GetIOD (UIDs const &uid)
- static const char * GetIODFromSOPClassUID (const char *sopclassuid)
- static unsigned int GetNumberOfSOPClassToIOD ()

  Return the number of SOP Class UID listed internally.
- static const char * GetSOPClassUIDFromIOD (const char *iod)
- static SOPClassUIDToIODType & GetSOPClassUIDToIOD (unsigned int i)
- static SOPClassUIDToIODType * GetSOPClassUIDToIODs ()

10.279.1 Detailed Description

Class convert a class SOP Class UID into IOD.

Reference PS 3.4 Table B.5-1 STANDARD SOP CLASSES

10.279.2 Member Typedef Documentation

10.279.2.1 const

```
typedef const char* gdcm::SOPClassUIDToIOD::const(SOPClassUIDToIODType)[2]
```

10.279.3 Member Function Documentation

10.279.3.1 GetIOD()

```
static const char* gdcm::SOPClassUIDToIOD::GetIOD (
            UIDs const & uid )  [static]
```

Return the associated IOD based on a SOP Class UID uid (there is a one-to-one mapping from SOP Class UID to matching IOD)

Examples

GenerateStandardSOPClasses.cxx.

10.279.3.2 GetIODFromSOPClassUID()

```
static const char* gdcm::SOPClassUIDToIOD::GetIODFromSOPClassUID (
            const char * sopclassuid )  [static]
```

10.279.3.3 GetNumberOfSOPClassToIOD()

```
static unsigned int gdcm::SOPClassUIDToIOD::GetNumberOfSOPClassToIOD ( )  [static]
```

Return the number of SOP Class UID listed internally.

10.279.3.4 GetSOPClassUIDFromIOD()

```
static const char* gdcm::SOPClassUIDToIOD::GetSOPClassUIDFromIOD (
            const char * iod )  [static]
```

10.279.3.5 GetSOPClassUIDToIOD()

```
static SOPClassUIDToIODType& gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIOD (
            unsigned int i )  [static]
```

10.279.3.6 GetSOPClassUIDToIODs()

```
static SOPClassUIDToIODType* gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIODs ( )  [static]
```

The documentation for this class was generated from the following file:

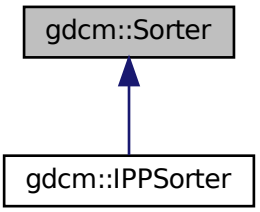
- gdcmSOPClassUIDToIOD.h

10.280 gdcm::Sorter Class Reference

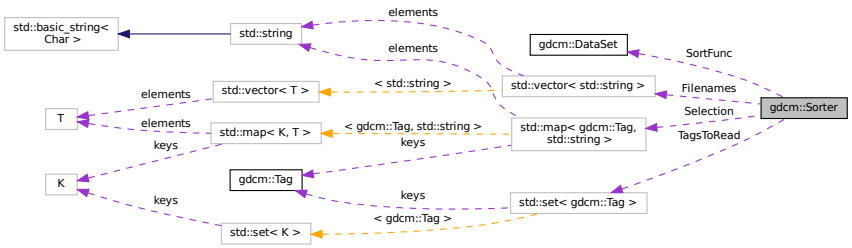
Sorter.

```
#include <gdcmSorter.h>
```

Inheritance diagram for gdcm::Sorter:



Collaboration diagram for gdcm::Sorter:



Public Types

- typedef bool(∗ SortFunction) (DataSet const &, DataSet const &)

  Set the sort function which compares one dataset to the other.

Public Member Functions

- Sorter ()
- virtual ~Sorter ()
- bool AddSelect (Tag const &tag, const char *value)

  UNSUPPORTED FOR NOW.
- const std::vector< std::string > & GetFilenames () const
- void Print (std::ostream &os) const

  Print.
- void SetSortFunction (SortFunction f)
- void SetTagsToRead (std::set< Tag > const &tags)
- virtual bool Sort (std::vector< std::string > const &filenames)

  Typically the output of Directory::GetFilenames()
- virtual bool StableSort (std::vector< std::string > const &filenames)

Protected Types

- typedef std::map< Tag, std::string > SelectionMap

Protected Attributes

- std::vector< std::string > Filenames
- std::map< Tag, std::string > Selection
- SortFunction SortFunc
- std::set< Tag > TagsToRead

Friends

- std::ostream & operator<< (std::ostream &_os, const Sorter &s)

10.280.1 Detailed Description

Sorter.

General class to do sorting using a custom function You simply need to provide a function of type: Sorter::SortFunction

Warning

implementation details. For now there is no cache mechanism. Which means that every time you call Sort, all files specified as input parameter are *read*

See also

Scanner

Examples

SortImage.cxx, and VolumeSorter.cxx.

10.280.2 Member Typedef Documentation

10.280.2.1 SelectionMap

```
typedef std::map<Tag,std::string> gdcm::Sorter::SelectionMap  [protected]
```

10.280.2.2 SortFunction

```
typedef bool(* gdcm::Sorter::SortFunction) (DataSet const &, DataSet const &)
```

Set the sort function which compares one dataset to the other.

10.280.3 Constructor & Destructor Documentation

10.280.3.1 Sorter()

```
gdcm::Sorter::Sorter ( )
```

10.280.3.2 ~Sorter()

```
virtual gdcm::Sorter::~Sorter ( )  [virtual]
```

10.280.4 Member Function Documentation

10.280.4.1 AddSelect()

```
bool gdcm::Sorter::AddSelect (
            Tag const & tag,
            const char * value )
```

UNSUPPORTED FOR NOW.

10.280.4.2 GetFilenames()

```
const std::vector<std::string>& gdcm::Sorter::GetFilenames ( ) const  [inline]
```

Return the list of filenames as sorted by the specific algorithm used. Empty by default (before Sort() is called)

Examples

Compute3DSpacing.cxx, SortImage.cxx, VolumeSorter.cxx, gdcmorthoplanes.cxx, and reslicesphere.cxx.

10.280.4.3 Print()

```
void gdcm::Sorter::Print (
            std::ostream & os ) const
```

Print.

Examples

SortImage.cxx, VolumeSorter.cxx, and gdcmorthoplanes.cxx.

10.280.4.4 SetSortFunction()

```
void gdcm::Sorter::SetSortFunction (
            SortFunction f )
```

Examples

SortImage.cxx, and VolumeSorter.cxx.

10.280.4.5 SetTagsToRead()

```
void gdcm::Sorter::SetTagsToRead (
            std::set< Tag > const & tags )
```

Specify a set of tags to be read in during the sort procedure. By default this set is empty, in which case the entire image, including pixel data, is read in.

10.280.4.6 Sort()

```
virtual bool gdcm::Sorter::Sort (
            std::vector< std::string > const & filenames )  [virtual]
```

Typically the output of Directory::GetFilenames()

Reimplemented in gdcm::IPPSorter.

Examples

SortImage.cxx.

10.280.4.7 StableSort()

```
virtual bool gdcm::Sorter::StableSort (
            std::vector< std::string > const & filenames )  [virtual]
```

Examples

SortImage.cxx, and VolumeSorter.cxx.

10.280.5 Friends And Related Function Documentation

10.280.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Sorter & s )  [friend]
```

10.280.6 Member Data Documentation

10.280.6.1 Filenames

```
std::vector<std::string> gdcm::Sorter::Filenames  [protected]
```

10.280.6.2 Selection

```
std::map<Tag,std::string> gdcm::Sorter::Selection  [protected]
```

10.280.6.3 SortFunc

```
SortFunction gdcm::Sorter::SortFunc  [protected]
```

10.280.6.4 TagsToRead

```
std::set<Tag> gdcm::Sorter::TagsToRead  [protected]
```

The documentation for this class was generated from the following file:

- gdcmSorter.h

10.281 gdcm::Spacing Class Reference

Class for Spacing.

```
#include <gdcmSpacing.h>
```

Public Types

- enum SpacingType {
  DETECTOR = 0 ,
  MAGNIFIED ,
  CALIBRATED ,
  UNKNOWN }

Public Member Functions

- Spacing ()
- ~Spacing ()

Static Public Member Functions

- static Attribute< 0x28, 0x34 > ComputePixelAspectRatioFromPixelSpacing (const Attribute< 0x28, 0x30 > &pixelspacing)

10.281.1 Detailed Description

Class for Spacing.

It all began with a mail to WG6:

Subject: Imager Pixel Spacing vs Pixel Spacing Body: [Apologies for the duplicate post, namely to David Clunie & OFFIS team]

I have been trying to understand CP-586 in the following two cases:

On the one hand:

- DISCIMG/IMAGES/CRIMAGE taken from `http://dclunie.com/images/pixelspacingtestimages.zip`

And on the other hand:

- `http://gdcm.sourceforge.net/thingies/cr_pixelspacing.dcm`

If I understand correctly the CP, one is required to use Pixel Spacing for measurement ('true size' print) instead of Imager Pixel Spacing, since the two attributes are present and Pixel Spacing is different from Imager Pixel Spacing.

If this is correct, then the test data DISCIMG/IMAGES/CRIMAGE is incorrect. If this is incorrect (ie. I need to use Imager Pixel Spacing), then the display of cr_pixelspacing.dcm for measurement will be incorrect.

Could someone please let me know what am I missing here? I could not find any information in any header that would allow me to differentiate those.

Thank you for your time,

Ref: `http://lists.nema.org/scripts/lyris.pl?sub=488573&id=400720477`

See PS 3.3-2008, Table C.7-11b IMAGE PIXEL MACRO ATTRIBUTES

Ratio of the vertical size and horizontal size of the pixels in the image specified by a pair of integer values where the first value is the vertical pixel size, and the second value is the horizontal pixel size. Required if the aspect ratio values do not have a ratio of 1:1 and the physical pixel spacing is not specified by Pixel Spacing (0028,0030), or Imager Pixel Spacing (0018,1164) or Nominal Scanned Pixel Spacing (0018,2010), either for the entire Image or per-frame in a Functional Group Macro. See C.7.6.3.1.7.

PS 3.3-2008 10.7.1.3 Pixel Spacing Value Order and Valid Values All pixel spacing related attributes shall have non-zero values, except when there is only a single row or column or pixel of data present, in which case the corresponding value may be zero.

Ref: `http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing`

10.281.2 Member Enumeration Documentation

10.281.2.1 SpacingType

`enum gdcm::Spacing::SpacingType`

Enumerator

DETECTOR	
MAGNIFIED	
CALIBRATED	
UNKNOWN	

10.281.3 Constructor & Destructor Documentation

10.281.3.1 Spacing()

```
gdcm::Spacing::Spacing ( )
```

10.281.3.2 ~Spacing()

```
gdcm::Spacing::~Spacing ( )
```

10.281.4 Member Function Documentation

10.281.4.1 ComputePixelAspectRatioFromPixelSpacing()

```
static Attribute<0x28,0x34> gdcm::Spacing::ComputePixelAspectRatioFromPixelSpacing (
            const Attribute< 0x28, 0x30 > & pixelspacing )  [static]
```

The documentation for this class was generated from the following file:

- gdcmSpacing.h

10.282 gdcm::Spectroscopy Class Reference

Spectroscopy class.

```
#include <gdcmSpectroscopy.h>
```

Public Member Functions

- Spectroscopy ()=default

10.282.1 Detailed Description

Spectroscopy class.

10.282.2 Constructor & Destructor Documentation

10.282.2.1 Spectroscopy()

```
gdcm::Spectroscopy::Spectroscopy ( )  [default]
```

The documentation for this class was generated from the following file:

- gdcmSpectroscopy.h

10.283 gdcm::SplitMosaicFilter Class Reference

SplitMosaicFilter class.

```
#include <gdcmSplitMosaicFilter.h>
```

Public Member Functions

- SplitMosaicFilter ()
- ~SplitMosaicFilter ()
- bool ComputeMOSAICDimensions (unsigned int dims[3])
- bool ComputeMOSAICSliceNormal (double dims[3], bool &inverted)

  Extract the value for SliceNormalVector (CSA header)
- bool ComputeMOSAICSlicePosition (double pos[3], bool inverted)

  Extract the value for ImagePositionPatient (requires inverted flag)
- File & GetFile ()
- const File & GetFile () const
- Image & GetImage ()
- const Image & GetImage () const
- void SetFile (const File &f)
- void SetImage (const Image &image)
- bool Split ()

  Split the SIEMENS MOSAIC image.

Static Public Member Functions

- static bool GetAcquisitionSize (unsigned int size[2], DataSet const &ds)

  Get the Acquisition Matrix (non zero value):
- static unsigned int GetNumberOfImagesInMosaic (File const &file)

  Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.

10.283.1 Detailed Description

SplitMosaicFilter class.

Class to reshuffle bytes for a SIEMENS Mosaic image Siemens CSA Image Header CSA:= Common Siemens Architecture, sometimes also known as Common syngo Architecture

Warning

when private attributes are not found, the acquisition matrix is used to compute the NumberOfImagesInMosaic. This means trailing black slices will be considered in the volume (instead of discarded). CSA 0029,1010 is needed for correct NumberOfImagesInMosaic CSA 0029,1020 is needed to compute the correct origin without above info default are taken (may not be accurate).

10.283.2 Constructor & Destructor Documentation

10.283.2.1 SplitMosaicFilter()

```
gdcm::SplitMosaicFilter::SplitMosaicFilter ( )
```

10.283.2.2 ~SplitMosaicFilter()

```
gdcm::SplitMosaicFilter::~SplitMosaicFilter ( )
```

10.283.3 Member Function Documentation

10.283.3.1 ComputeMOSAICDimensions()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICDimensions (
            unsigned int dims[3] )
```

Compute the new dimensions according to private information stored in the MOSAIC header.

10.283.3.2 ComputeMOSAICSliceNormal()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSliceNormal (
            double dims[3],
            bool & inverted )
```

Extract the value for SliceNormalVector (CSA header)

10.283.3.3 ComputeMOSAICSlicePosition()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSlicePosition (
            double pos[3],
            bool inverted )
```

Extract the value for ImagePositionPatient (requires inverted flag)

10.283.3.4 GetAcquisitionSize()

```
static bool gdcm::SplitMosaicFilter::GetAcquisitionSize (
            unsigned int size[2],
            DataSet const & ds )  [static]
```

Get the Acquisition Matrix (non zero value):

10.283.3.5 GetFile() [1/2]

```
File& gdcm::SplitMosaicFilter::GetFile ( )  [inline]
```

10.283.3.6 GetFile() [2/2]

```
const File& gdcm::SplitMosaicFilter::GetFile ( ) const  [inline]
```

10.283.3.7 GetImage() [1/2]

```
Image& gdcm::SplitMosaicFilter::GetImage ( )  [inline]
```

10.283.3.8 GetImage() [2/2]

```
const Image& gdcm::SplitMosaicFilter::GetImage ( ) const  [inline]
```

10.283.3.9 GetNumberOfImagesInMosaic()

```
static unsigned int gdcm::SplitMosaicFilter::GetNumberOfImagesInMosaic (
            File const & file )  [static]
```

Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.

10.283.3.10 SetFile()

```
void gdcm::SplitMosaicFilter::SetFile (
            const File & f )  [inline]
```

10.283.3.11 SetImage()

```
void gdcm::SplitMosaicFilter::SetImage (
            const Image & image )
```

10.283.3.12 Split()

```
bool gdcm::SplitMosaicFilter::Split ( )
```

Split the SIEMENS MOSAIC image.

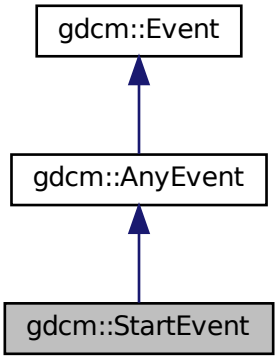
The documentation for this class was generated from the following file:

- gdcmSplitMosaicFilter.h

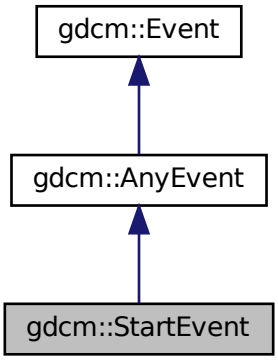
10.284 gdcm::StartEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::StartEvent:



Collaboration diagram for gdcm::StartEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.285 gdcm::static_assert_test< x > Struct Template Reference

`#include <gdcmStaticAssert.h>`

The documentation for this struct was generated from the following file:

- gdcmStaticAssert.h

10.286 gdcm::STATIC_ASSERTION_FAILURE< x > Struct Template Reference

The documentation for this struct was generated from the following file:

- gdcmStaticAssert.h

10.287 gdcm::STATIC_ASSERTION_FAILURE< true > Struct Reference

`#include <gdcmStaticAssert.h>`

Public Types

- enum { value = 1 }

10.287.1 Member Enumeration Documentation

10.287.1.1 anonymous enum

`anonymous enum`

Enumerator

value	

The documentation for this struct was generated from the following file:

- gdcmStaticAssert.h

10.288 gdcm::StreamImageReader Class Reference

StreamImageReader.

`#include <gdcmStreamImageReader.h>`

Public Member Functions

- StreamImageReader ()
- virtual ~StreamImageReader ()
- bool CanReadImage () const
- void DefinePixelExtent (uint16_t inXMin, uint16_t inXMax, uint16_t inYMin, uint16_t inYMax, uint16_t inZMin=0, uint16_t inZMax=1)
- uint32_t DefineProperBufferLength () const
- std::vector< unsigned int > GetDimensionsValueForResolution (unsigned int)
- File const & GetFile () const
- bool Read (char *inReadBuffer, const std::size_t &inBufferLength)
- virtual bool ReadImageInformation ()
- void SetFileName (const char *inFileName)
- void SetStream (std::istream &inStream)

10.288.1 Detailed Description

StreamImageReader.

Note

its role is to convert the DICOM DataSet into a Image representation via an ITK streaming (ie, multithreaded) interface Image is different from Pixmap has it has a position and a direction in Space. Currently, this class is thread safe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

See also

Image

Examples

StreamImageReaderTest.cxx.

10.288.2 Constructor & Destructor Documentation

10.288.2.1 StreamImageReader()

```
gdcm::StreamImageReader::StreamImageReader ( )
```

10.288.2.2 ~StreamImageReader()

```
virtual gdcm::StreamImageReader::~StreamImageReader ( )  [virtual]
```

10.288.3 Member Function Documentation

10.288.3.1 CanReadImage()

```
bool gdcm::StreamImageReader::CanReadImage ( ) const
```

Only RAW images are currently readable by the stream reader. As more streaming codecs are added, then this function will be updated to reflect those changes. Calling this function prior to reading will ensure that only streamable files are streamed. Make sure to call ReadImageInformation prior to calling this function.

Examples

StreamImageReaderTest.cxx.

10.288.3.2 DefinePixelExtent()

```
void gdcm::StreamImageReader::DefinePixelExtent (
            uint16_t inXMin,
            uint16_t inXMax,
            uint16_t inYMin,
            uint16_t inYMax,
            uint16_t inZMin = 0,
            uint16_t inZMax = 1 )
```

Defines an image extent for the Read function. DICOM states that an image can have no more than 2^16 pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation.

Examples

StreamImageReaderTest.cxx.

10.288.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageReader::DefineProperBufferLength ( ) const
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. Call this function to determine the size of the char* buffer that will need to be passed in to ReadImageSubregion(). If the return is 0, then that means that the pixel extent was not defined prior

Examples

StreamImageReaderTest.cxx.

10.288.3.4 GetDimensionsValueForResolution()

```
std::vector<unsigned int> gdcm::StreamImageReader::GetDimensionsValueForResolution (
            unsigned int  )
```

10.288.3.5 GetFile()

```
File const& gdcm::StreamImageReader::GetFile ( ) const
```

Returns the dataset read by ReadImageInformation Couple this with the ImageHelper to get statistics about the image, like pixel extent, to be able to initialize buffers for reading

Examples

StreamImageReaderTest.cxx.

10.288.3.6 Read()

```
bool gdcm::StreamImageReader::Read (
            char * inReadBuffer,
            const std::size_t & inBufferLength )
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from char* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the metaimageio in itk MUST have an extent defined, or else Read will return false. If no particular extent is required, use ImageReader instead.

Examples

StreamImageReaderTest.cxx.

10.288.3.7 ReadImageInformation()

```
virtual bool gdcm::StreamImageReader::ReadImageInformation ( )  [virtual]
```

Set the spacing and dimension information for the set filename. returns false if the file is not initialized or not an image, with the pixel (7fe0,0010) tag.

Examples

StreamImageReaderTest.cxx.

10.288.3.8 SetFileName()

```
void gdcm::StreamImageReader::SetFileName (
            const char * inFileName )
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal Reader class to be able to get non-pixel image information.

Examples

ExtractOneFrame.cs, and StreamImageReaderTest.cxx.

10.288.3.9 SetStream()

```
void gdcm::StreamImageReader::SetStream (
            std::istream & inStream )
```

The documentation for this class was generated from the following file:

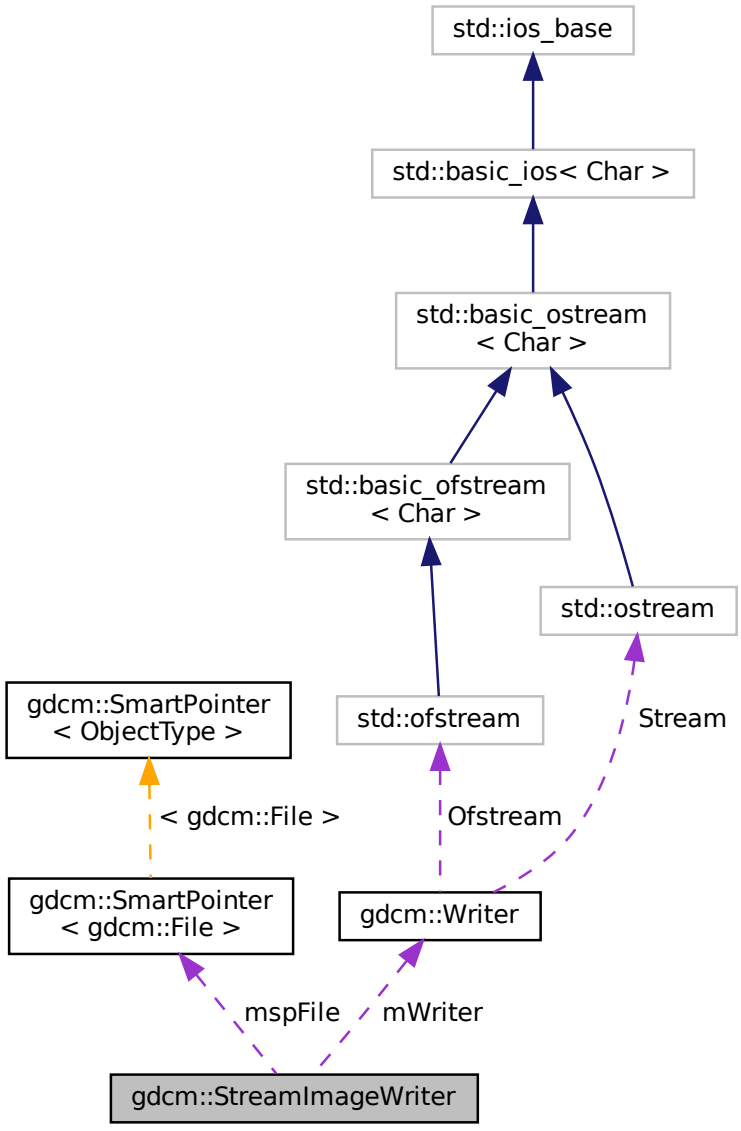
- gdcmStreamImageReader.h

10.289 gdcm::StreamImageWriter Class Reference

StreamImageReader.

`#include <gdcmStreamImageWriter.h>`

Collaboration diagram for gdcm::StreamImageWriter:



Public Member Functions

- StreamImageWriter ()
- virtual ~StreamImageWriter ()
- bool CanWriteFile () const
- void DefinePixelExtent (uint16_t inXMin, uint16_t inXMax, uint16_t inYMin, uint16_t inYMax, uint16_t inZMin=0, uint16_t inZMax=1)
- uint32_t DefineProperBufferLength ()
- void SetFile (const File &inFile)
- void SetFileName (const char *inFileName)
- void SetStream (std::ostream &inStream)
- bool Write (void *inWriteBuffer, const std::size_t &inBufferLength)
- virtual bool WriteImageInformation ()

Protected Member Functions

- virtual bool WriteImageSubregionRAW (char *inWriteBuffer, const std::size_t &inBufferLength)
- int WriteRawHeader (RAWCodec *inCodec, std::ostream *inStream)

Protected Attributes

- int mElementOffsets
- int mElementOffsets1
- SmartPointer< File > mspFile
- Writer mWriter
- uint16_t mXMax
- uint16_t mXMin
- uint16_t mYMax
- uint16_t mYMin
- uint16_t mZMax
- uint16_t mZMin

10.289.1 Detailed Description

StreamImageReader.

Note

its role is to convert the DICOM DataSet into a Image representation via an ITK streaming (ie, multithreaded) interface Image is different from Pixmap has it has a position and a direction in Space. Currently, this class is threadsafe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

See also

Image

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.2 Constructor & Destructor Documentation

10.289.2.1 StreamImageWriter()

```
gdcm::StreamImageWriter::StreamImageWriter ( )
```

10.289.2.2 ~StreamImageWriter()

```
virtual gdcm::StreamImageWriter::~StreamImageWriter ( )  [virtual]
```

10.289.3 Member Function Documentation

10.289.3.1 CanWriteFile()

```
bool gdcm::StreamImageWriter::CanWriteFile ( ) const
```

This function determines if a file can even be written using the streaming writer unlike the reader, can be called before WriteImageInformation, but must be called after SetFile.

Examples

Extracting_All_Resolution.cxx, and Fake_Image_Using_Stream_Image_Writer.cxx.

10.289.3.2 DefinePixelExtent()

```
void gdcm::StreamImageWriter::DefinePixelExtent (
            uint16_t inXMin,
            uint16_t inXMax,
            uint16_t inYMin,
            uint16_t inYMax,
            uint16_t inZMin = 0,
            uint16_t inZMax = 1 )
```

Defines an image extent for the Read function. DICOM states that an image can have no more than 2^16 pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation. 15 nov 2010: added z dimension, defaults to being 1 plane large

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageWriter::DefineProperBufferLength ( )
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. If the return is 0, then that means that the pixel extent was not defined prior this return is for RAW inputs which are then encoded by the writer, but are used to ensure that the writer gets the proper buffer size

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.4 SetFile()

```
void gdcm::StreamImageWriter::SetFile (
            const File & inFile )
```

Set the image information to be written to disk that is everything but the pixel information: (7fe0,0010) PixelData

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.5 SetFileName()

```
void gdcm::StreamImageWriter::SetFileName (
            const char * inFileName )
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal Reader class to be able to get non-pixel image information.

10.289.3.6 SetStream()

```
void gdcm::StreamImageWriter::SetStream (
            std::ostream & inStream )
```

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.7 Write()

```
bool gdcm::StreamImageWriter::Write (
            void * inWriteBuffer,
            const std::size_t & inBufferLength )
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from void* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the metaimageio in itk MUST have an extent defined, or else Read will return false. If no particular extent is required, use ImageReader instead.

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.8 WriteImageInformation()

```
virtual bool gdcm::StreamImageWriter::WriteImageInformation ( )  [virtual]
```

Write the header information to disk, and a bunch of zeros for the actual pixel information Of course, if we're doing a non-compressed format, that works but if it's compressed, we have to force the ordering of chunks that are written.

Examples

Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.289.3.9 WriteImageSubregionRAW()

```
virtual bool gdcm::StreamImageWriter::WriteImageSubregionRAW (
            char * inWriteBuffer,
            const std::size_t & inBufferLength )  [protected], [virtual]
```

Using the min, max, etc set by DefinePixelExtent, this will fill the given buffer Make sure to call DefinePixelExtent and to initialize the buffer with the amount given by DefineProperBufferLength prior to calling this. reads by the RAW codec; other codecs are added once implemented

10.289.3.10 WriteRawHeader()

```
int gdcm::StreamImageWriter::WriteRawHeader (
            RAWCodec * inCodec,
            std::ostream * inStream )  [protected]
```

when writing a raw file, we know the full extent, and can just write the first 12 bytes out (the tag, the VR, and the size) when we do compressed files, we'll do it in chunks, as described in 2009-3, part 5, Annex A, section 4. Pass the raw codec so that in the rare case of a bigendian explicit raw, the first 12 bytes written out should still be kosher. returns -1 if there's any failure, or the complete offset (12 bytes) if it works. Those 12 bytes are then added to the position in order to determine where to write.

10.289.4 Member Data Documentation

10.289.4.1 mElementOffsets

```
int gdcm::StreamImageWriter::mElementOffsets  [protected]
```

The result of WriteRawHeader (or another header, when that's implemented) This result is saved so that the first N bytes aren't constantly being rewritten for each chunk that's passed in. For compressed data, the offset table will require rewrites of data.

10.289.4.2 mElementOffsets1

```
int gdcm::StreamImageWriter::mElementOffsets1  [protected]
```

10.289.4.3 mspFile

```
SmartPointer<File> gdcm::StreamImageWriter::mspFile  [protected]
```

10.289.4.4 mWriter

```
Writer gdcm::StreamImageWriter::mWriter  [protected]
```

10.289.4.5 mXMax

```
uint16_t gdcm::StreamImageWriter::mXMax  [protected]
```

10.289.4.6 mXMin

```
uint16_t gdcm::StreamImageWriter::mXMin  [protected]
```

10.289.4.7 mYMax

```
uint16_t gdcm::StreamImageWriter::mYMax  [protected]
```

10.289.4.8 mYMin

```
uint16_t gdcm::StreamImageWriter::mYMin  [protected]
```

10.289.4.9 mZMax

```
uint16_t gdcm::StreamImageWriter::mZMax  [protected]
```

10.289.4.10 mZMin

```
uint16_t gdcm::StreamImageWriter::mZMin  [protected]
```

The documentation for this class was generated from the following file:

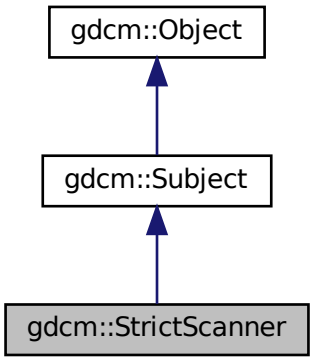
- gdcmStreamImageWriter.h

10.290 gdcm::StrictScanner Class Reference

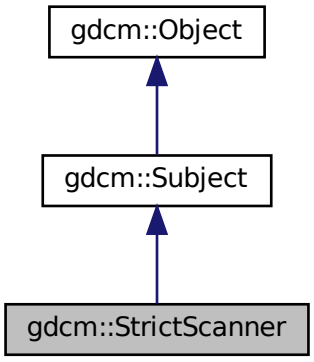
StrictScanner.

`#include <gdcmStrictScanner.h>`

Inheritance diagram for gdcm::StrictScanner:



Collaboration diagram for gdcm::StrictScanner:



Classes

- struct ltstr

Public Types

- typedef MappingType::const_iterator ConstIterator
- typedef std::map< const char *, TagToValue, ltstr > MappingType
- typedef std::map< Tag, const char * > TagToValue
- typedef TagToValue::value_type TagToValueValueType
- typedef std::set< std::string > ValuesType

Public Member Functions

- StrictScanner ()
- ~StrictScanner () override
- void AddPrivateTag (PrivateTag const &t)
- void AddSkipTag (Tag const &t)

  Add a tag that will need to be skipped. Those are root level skip tags.
- void AddTag (Tag const &t)

  Add a tag that will need to be read. Those are root level skip tags.
- ConstIterator Begin () const
- void ClearSkipTags ()
- void ClearTags ()
- ConstIterator End () const
- Directory::FilenamesType GetAllFilenamesFromTagToValue (Tag const &t, const char *valueref) const
- const char * GetFilenameFromTagToValue (Tag const &t, const char *valueref) const
- Directory::FilenamesType const & GetFilenames () const
- Directory::FilenamesType GetKeys () const
- TagToValue const & GetMapping (const char *filename) const

  Get the std::map mapping filenames to value for file 'filename'.
- TagToValue const & GetMappingFromTagToValue (Tag const &t, const char *value) const

  See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.
- MappingType const & GetMappings () const

  Mappings are the mapping from a particular tag to the map, mapping filename to value:
- Directory::FilenamesType GetOrderedValues (Tag const &t) const
- const char * GetValue (const char *filename, Tag const &t) const
- ValuesType const & GetValues () const

  Get all the values found (in lexicographic order)
- ValuesType GetValues (Tag const &t) const

  Get all the values found (in lexicographic order) associated with Tag 't'.
- bool IsKey (const char *filename) const
- void Print (std::ostream &os) const override

  Print result.
- void PrintTable (std::ostream &os) const
- bool Scan (Directory::FilenamesType const &filenames)

  Start the scan !

Static Public Member Functions

- static SmartPointer< StrictScanner > New ()

  for wrapped language: instantiate a reference counted object

Protected Member Functions

- void ProcessPublicTag (StringFilter &sf, const char *filename)

Friends

- std::ostream & operator<< (std::ostream &_os, const StrictScanner &s)

10.290.1 Detailed Description

StrictScanner.

This filter is meant for quickly browsing a FileSet (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM Attribute.

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of StringFilter

Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- ProgressEvent
- StartEvent
- EndEvent

Examples

SimpleScanner.cxx.

10.290.2 Member Typedef Documentation

10.290.2.1 ConstIterator

```
typedef MappingType::const_iterator gdcm::StrictScanner::ConstIterator
```

10.290.2.2 MappingType

```
typedef std::map<const char *,TagToValue, ltstr> gdcm::StrictScanner::MappingType
```

10.290.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdcm::StrictScanner::TagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char * and not std::string since we are pointing to existing std::string (hold in a std::vector) this avoid an extra copy of the byte array. Tag are used as Tag class since sizeof(tag) <= sizeof(pointer)

10.290.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdcm::StrictScanner::TagToValueValueType
```

10.290.2.5 ValuesType

```
typedef std::set< std::string > gdcm::StrictScanner::ValuesType
```

10.290.3 Constructor & Destructor Documentation

10.290.3.1 StrictScanner()

```
gdcm::StrictScanner::StrictScanner ( )  [inline]
```

10.290.3.2 ~StrictScanner()

```
gdcm::StrictScanner::~StrictScanner ( )  [override]
```

10.290.4 Member Function Documentation

10.290.4.1 AddPrivateTag()

```
void gdcm::StrictScanner::AddPrivateTag (
            PrivateTag const & t )
```

10.290.4.2 AddSkipTag()

```
void gdcm::StrictScanner::AddSkipTag (
            Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

10.290.4.3 AddTag()

```
void gdcm::StrictScanner::AddTag (
            Tag const & t )
```

Add a tag that will need to be read. Those are root level skip tags.

Examples

SimpleScanner.cxx.

10.290.4.4 Begin()

```
ConstIterator gdcm::StrictScanner::Begin ( ) const  [inline]
```

10.290.4.5 ClearSkipTags()

```
void gdcm::StrictScanner::ClearSkipTags ( )
```

10.290.4.6 ClearTags()

```
void gdcm::StrictScanner::ClearTags ( )
```

10.290.4.7 End()

```
ConstIterator gdcm::StrictScanner::End ( ) const  [inline]
```

10.290.4.8 GetAllFilenamesFromTagToValue()

```
Directory::FilenamesType gdcm::StrictScanner::GetAllFilenamesFromTagToValue (
            Tag const & t,
            const char * valueref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valueref'

10.290.4.9 GetFilenameFromTagToValue()

```
const char* gdcm::StrictScanner::GetFilenameFromTagToValue (
            Tag const & t,
            const char * valueref ) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

10.290.4.10 GetFilenames()

```
Directory::FilenamesType const& gdcm::StrictScanner::GetFilenames ( ) const  [inline]
```

10.290.4.11 GetKeys()

```
Directory::FilenamesType gdcm::StrictScanner::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

10.290.4.12 GetMapping()

```
TagToValue const& gdcm::StrictScanner::GetMapping (
            const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

Examples

SimpleScanner.cxx.

10.290.4.13 GetMappingFromTagToValue()

```
TagToValue const& gdcm::StrictScanner::GetMappingFromTagToValue (
            Tag const & t,
            const char * value ) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.

10.290.4.14 GetMappings()

```
MappingType const& gdcm::StrictScanner::GetMappings ( ) const  [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

10.290.4.15 GetOrderedValues()

```
Directory::FilenamesType gdcm::StrictScanner::GetOrderedValues (
            Tag const & t ) const
```

Get all the values found (in a vector) associated with Tag 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)

10.290.4.16 GetValue()

```
const char* gdcm::StrictScanner::GetValue (
            const char * filename,
            Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the TagToValue hash table.

Warning

Tag 't' should have been added via AddTag() prior to the Scan() call !

10.290.4.17 GetValues() [1/2]

```
ValuesType const& gdcm::StrictScanner::GetValues ( ) const  [inline]
```

Get all the values found (in lexicographic order)

10.290.4.18 GetValues() [2/2]

```
ValuesType gdcm::StrictScanner::GetValues (
            Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with Tag 't'.

10.290.4.19 IsKey()

```
bool gdcm::StrictScanner::IsKey (
            const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only of file can be found, which means the file was indeed a DICOM file that could be processed

Examples

SimpleScanner.cxx.

10.290.4.20 New()

```
static SmartPointer<StrictScanner> gdcm::StrictScanner::New ( )  [inline], [static]
```

for wrapped language: instantiate a reference counted object

10.290.4.21 Print()

```
void gdcm::StrictScanner::Print (
            std::ostream & os ) const  [override], [virtual]
```

Print result.

Reimplemented from gdcm::Object.

10.290.4.22 PrintTable()

```
void gdcm::StrictScanner::PrintTable (
            std::ostream & os ) const
```

10.290.4.23 ProcessPublicTag()

```
void gdcm::StrictScanner::ProcessPublicTag (
            StringFilter & sf,
            const char * filename )  [protected]
```

10.290.4.24 Scan()

```
bool gdcm::StrictScanner::Scan (
            Directory::FilenamesType const & filenames )
```

Start the scan !

Examples

SimpleScanner.cxx.

10.290.5 Friends And Related Function Documentation

10.290.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const StrictScanner & s )  [friend]
```

The documentation for this class was generated from the following file:

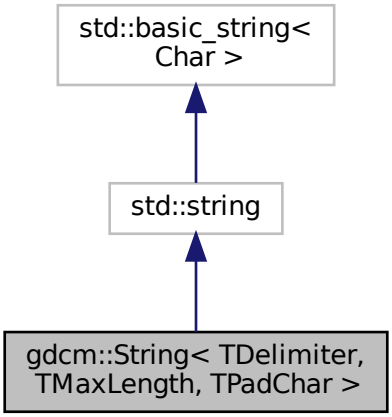
- gdcmStrictScanner.h

10.291 gdcm::String< TDelimiter, TMaxLength, TPadChar > Class Template Reference

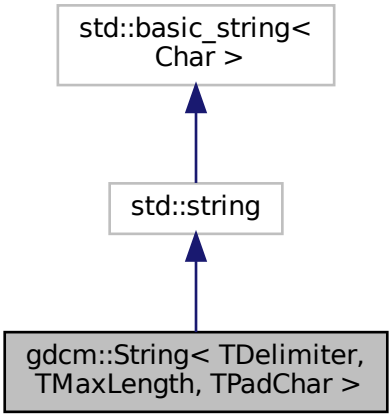
String.

`#include <gdcmString.h>`

Inheritance diagram for gdcm::String< TDelimiter, TMaxLength, TPadChar >:



Collaboration diagram for gdcm::String< TDelimiter, TMaxLength, TPadChar >:



Public Types

- typedef std::string::const_iterator const_iterator
- typedef std::string::const_reference const_reference
- typedef std::string::const_reverse_iterator const_reverse_iterator
- typedef std::string::difference_type difference_type
- typedef std::string::iterator iterator
- typedef std::string::pointer pointer
- typedef std::string::reference reference
- typedef std::string::reverse_iterator reverse_iterator
- typedef std::string::size_type size_type
- typedef std::string::value_type value_type

Public Member Functions

- String ()

  String constructors.
- String (const std::string &s, size_type pos=0, size_type n=npos)
- String (const value_type *s)
- String (const value_type *s, size_type n)
- bool IsValid () const

  return if string is valid
- operator const char * () const

  WARNING: Trailing \0 might be lost in this operation:
- std::string Trim () const
- gdcm::String< TDelimiter, TMaxLength, TPadChar > Truncate () const

Static Public Member Functions

- static std::string Trim (const char *input)

10.291.1 Detailed Description

template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
class gdcm::String< TDelimiter, TMaxLength, TPadChar >

String.

Note

TDelimiter template parameter is used to separate multiple String (VM1 >) TMaxLength is only a hint. No one actually respect the max length TPadChar is the string padding (0 or space)

Examples

TemplateEmptyImage.cxx.

10.291.2 Member Typedef Documentation

10.291.2.1 const_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::const_iterator
```

10.291.2.2 const_reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::const_reference
```

10.291.2.3 const_reverse_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >↩
::const_reverse_iterator
```

10.291.2.4 difference_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::difference_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::difference_type
```

10.291.2.5 iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::iterator
```

10.291.2.6 pointer

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::pointer gdcm::String< TDelimiter, TMaxLength, TPadChar >::pointer
```

10.291.2.7 reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::reference
```

10.291.2.8 reverse_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::reverse_iterator
```

10.291.2.9 size_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::size_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::size_type
```

10.291.2.10 value_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::value_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::value_type
```

10.291.3 Constructor & Destructor Documentation

10.291.3.1 String() [1/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String ( )  [inline]
```

String constructors.

10.291.3.2 String() [2/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
            const value_type * s )  [inline]
```

10.291.3.3 String() [3/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
            const value_type * s,
            size_type n )  [inline]
```

10.291.3.4 String() [4/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
            const std::string & s,
            size_type pos = 0,
            size_type n = npos )  [inline]
```

10.291.4 Member Function Documentation

10.291.4.1 IsValid()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
bool gdcm::String< TDelimiter, TMaxLength, TPadChar >::IsValid ( ) const  [inline]
```

return if string is valid

Referenced by gdcm::LO::IsValid(), and gdcm::String< TDelimiter, TMaxLength, TPadChar >::Truncate().

10.291.4.2 operator const char *()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::operator const char * ( ) const  [inline]
```

WARNING: Trailing \0 might be lost in this operation:

10.291.4.3 Trim() [1/2]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
std::string gdcm::String< TDelimiter, TMaxLength, TPadChar >::Trim ( ) const  [inline]
```

Trim function is required to return a std::string object, otherwise we could not create a gdcm::String object with an odd number of bytes...

Examples

DumpExamCard.cxx, and DumpPhilipsECHO.cxx.

10.291.4.4 Trim() [2/2]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
static std::string gdcm::String< TDelimiter, TMaxLength, TPadChar >::Trim (
            const char * input )  [inline], [static]
```

10.291.4.5 Truncate()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String<TDelimiter, TMaxLength, TPadChar> gdcm::String< TDelimiter, TMaxLength, TPadChar
>::Truncate ( ) const  [inline]
```

References gdcm::String< TDelimiter, TMaxLength, TPadChar >::IsValid().

The documentation for this class was generated from the following file:

- gdcmString.h

10.292 gdcm::StringFilter Class Reference

StringFilter.

```
#include <gdcmStringFilter.h>
```

Public Member Functions

- StringFilter ()
- ~StringFilter ()
- bool ExecuteQuery (std::string const &query, std::string &value) const
- std::string FromString (const Tag &t, const char *value, size_t len)

  Convert to string the char array defined by the pair (value,len)
- File & GetFile ()
- const File & GetFile () const
- void SetDicts (const Dicts &dicts)

  Allow user to pass in there own dicts.
- void SetFile (const File &f)

  Set/Get File.
- std::string ToString (const DataElement &de) const
- std::string ToString (const PrivateTag &t) const
- std::string ToString (const Tag &t) const

  Directly from a Tag:
- std::pair< std::string, std::string > ToStringPair (const DataElement &de) const
- std::pair< std::string, std::string > ToStringPair (const Tag &t) const

  Directly from a Tag:
- void UseDictAlways (bool)

Protected Member Functions

- bool ExecuteQuery (std::string const &query, DataSet const &ds, std::string &value) const
- std::pair< std::string, std::string > ToStringPair (const Tag &t, DataSet const &ds) const

10.292.1 Detailed Description

StringFilter.

StringFilter is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a DataElement into a string, typically this is a nice feature to have for wrapped language

Examples

DumpVisusChange.cxx, and ReadAndPrintAttributes.cxx.

10.292.2 Constructor & Destructor Documentation

10.292.2.1 StringFilter()

```
gdcm::StringFilter::StringFilter ( )
```

10.292.2.2 ~StringFilter()

```
gdcm::StringFilter::~StringFilter ( )
```

10.292.3 Member Function Documentation

10.292.3.1 ExecuteQuery() [1/2]

```
bool gdcm::StringFilter::ExecuteQuery (
            std::string const & query,
            DataSet const & ds,
            std::string & value ) const  [protected]
```

10.292.3.2 ExecuteQuery() [2/2]

```
bool gdcm::StringFilter::ExecuteQuery (
            std::string const & query,
            std::string & value ) const
```

Execute the XPATH query to find a value (as string) return false when attribute is not found (or an error in the XPATH query) You need to make sure that your XPATH query is syntatically correct

10.292.3.3 FromString()

```
std::string gdcm::StringFilter::FromString (
            const Tag & t,
            const char * value,
            size_t len )
```

Convert to string the char array defined by the pair (value,len)

10.292.3.4 GetFile() [1/2]

```
File& gdcm::StringFilter::GetFile ( )  [inline]
```

10.292.3.5 GetFile() [2/2]

```
const File& gdcm::StringFilter::GetFile ( ) const  [inline]
```

10.292.3.6 SetDicts()

```
void gdcm::StringFilter::SetDicts (
            const Dicts & dicts )
```

Allow user to pass in there own dicts.

10.292.3.7 SetFile()

```
void gdcm::StringFilter::SetFile (
            const File & f )  [inline]
```

Set/Get File.

Examples

DumpVisusChange.cxx, ReadAndPrintAttributes.cxx, and SimplePrintPatientName.cs.

10.292.3.8 ToString() [1/3]

```
std::string gdcm::StringFilter::ToString (
            const DataElement & de ) const
```

Convert to string the ByteValue contained in a DataElement. The DataElement must be coming from the actual DataSet associated with File (see SetFile).

Examples

DumpVisusChange.cxx, and ReadAndPrintAttributes.cxx.

10.292.3.9 ToString() [2/3]

```
std::string gdcm::StringFilter::ToString (
            const PrivateTag & t ) const
```

10.292.3.10 ToString() [3/3]

```
std::string gdcm::StringFilter::ToString (
            const Tag & t ) const
```

Directly from a Tag:

10.292.3.11 ToStringPair() [1/3]

```
std::pair<std::string, std::string> gdcm::StringFilter::ToStringPair (
            const DataElement & de ) const
```

Convert to string the ByteValue contained in a DataElement the returned elements are: pair.first : the name as found in the dictionary of DataElement pari.second : the value encoded into a string (US,UL...) are properly converted

Examples

ReadAndPrintAttributes.cxx.

10.292.3.12 ToStringPair() [2/3]

```
std::pair<std::string, std::string> gdcm::StringFilter::ToStringPair (
            const Tag & t ) const
```

Directly from a Tag:

10.292.3.13 ToStringPair() [3/3]

```
std::pair<std::string, std::string> gdcm::StringFilter::ToStringPair (
            const Tag & t,
            DataSet const & ds ) const  [protected]
```

10.292.3.14 UseDictAlways()

```
void gdcm::StringFilter::UseDictAlways (
            bool  )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmStringFilter.h

10.293 gdcm::Study Class Reference

Study.

`#include <gdcmStudy.h>`

Public Member Functions

- Study ()=default

10.293.1 Detailed Description

Study.

10.293.2 Constructor & Destructor Documentation

10.293.2.1 Study()

`gdcm::Study::Study ( ) [default]`

The documentation for this class was generated from the following file:

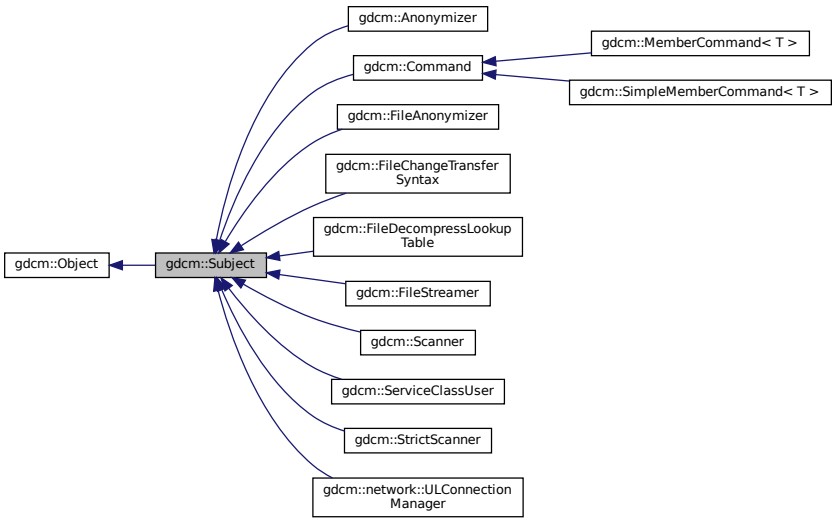
- gdcmStudy.h

10.294 gdcm::Subject Class Reference

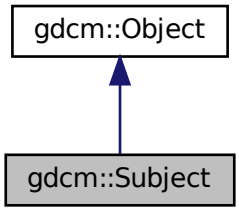
Subject.

`#include <gdcmSubject.h>`

Inheritance diagram for gdcm::Subject:



Collaboration diagram for gdcm::Subject:



Public Member Functions

- Subject ()
- ~Subject () override
- unsigned long AddObserver (const Event &event, Command *)
- unsigned long AddObserver (const Event &event, Command *) const
- Command * GetCommand (unsigned long tag)
- bool HasObserver (const Event &event) const
- void InvokeEvent (const Event &)
- void InvokeEvent (const Event &) const
- void RemoveAllObservers ()
- void RemoveObserver (unsigned long tag)

Additional Inherited Members

10.294.1 Detailed Description

Subject.

See also

Command Event

Examples

SimpleScanner.cxx.

10.294.2 Constructor & Destructor Documentation

10.294.2.1 Subject()

```
gdcm::Subject::Subject ( )
```

10.294.2.2 ~Subject()

```
gdcm::Subject::~Subject ( )  [override]
```

10.294.3 Member Function Documentation

10.294.3.1 AddObserver() [1/2]

```
unsigned long gdcm::Subject::AddObserver (
            const Event & event,
            Command *  )
```

Allow people to add/remove/invoke observers (callbacks) to any GDCM object. This is an implementation of the subject/observer design pattern. An observer is added by specifying an event to respond to and an gdcm::Command to execute. It returns an unsigned long tag which can be used later to remove the event or retrieve the command. The memory for the Command becomes the responsibility of this object, so don't pass the same instance of a command to two different objects

10.294.3.2 AddObserver() [2/2]

```
unsigned long gdcm::Subject::AddObserver (
            const Event & event,
            Command *  ) const
```

10.294.3.3 GetCommand()

```
Command* gdcm::Subject::GetCommand (
            unsigned long tag )
```

Get the command associated with the given tag. NOTE: This returns a pointer to a Command, but it is safe to assign this to a Command::Pointer. Since Command inherits from LightObject, at this point in the code, only a pointer or a reference to the Command can be used.

10.294.3.4 HasObserver()

```
bool gdcm::Subject::HasObserver (
            const Event & event ) const
```

Return true if an observer is registered for this event.

10.294.3.5 InvokeEvent() [1/2]

```
void gdcm::Subject::InvokeEvent (
            const Event &  )
```

Call Execute on all the Commands observing this event id.

10.294.3.6 InvokeEvent() [2/2]

```
void gdcm::Subject::InvokeEvent (
            const Event &  ) const
```

Call Execute on all the Commands observing this event id. The actions triggered by this call doesn't modify this object.

10.294.3.7 RemoveAllObservers()

```
void gdcm::Subject::RemoveAllObservers ( )
```

Remove all observers .

10.294.3.8 RemoveObserver()

```
void gdcm::Subject::RemoveObserver (
            unsigned long tag )
```

Remove the observer with this tag value.

The documentation for this class was generated from the following file:

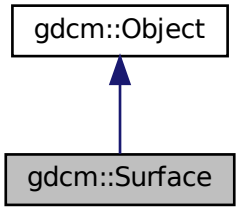
- gdcmSubject.h

10.295 gdcm::Surface Class Reference

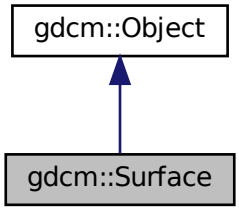
This class defines a SURFACE IE.

`#include <gdcmSurface.h>`

Inheritance diagram for gdcm::Surface:



Collaboration diagram for gdcm::Surface:



Public Types

- enum STATES {
  NO = 0 ,
  YES ,
  UNKNOWN ,
  STATES_END }
- enum VIEWType {
  SURFACE = 0 ,
  WIREFRAME ,
  POINTS ,
  VIEWType_END }

  Enumeration for Recommended Presentation Type.

Public Member Functions

- Surface ()
- ~Surface () override
- SegmentHelper::BasicCodedEntry & GetAlgorithmFamily ()
- SegmentHelper::BasicCodedEntry const & GetAlgorithmFamily () const
- const char * GetAlgorithmName () const
- const char * GetAlgorithmVersion () const
- const float * GetAxisOfRotation () const
- const float * GetCenterOfRotation () const
- STATES GetFiniteVolume () const
- STATES GetManifold () const
- float GetMaximumPointDistance () const
- float GetMeanPointDistance () const
- MeshPrimitive & GetMeshPrimitive ()
- MeshPrimitive const & GetMeshPrimitive () const
- unsigned long GetNumberOfSurfacePoints () const
- unsigned long GetNumberOfVectors () const
- DataElement & GetPointCoordinatesData ()
- const DataElement & GetPointCoordinatesData () const
- const float * GetPointPositionAccuracy () const
- const float * GetPointsBoundingBoxCoordinates () const
- SegmentHelper::BasicCodedEntry & GetProcessingAlgorithm ()
- SegmentHelper::BasicCodedEntry const & GetProcessingAlgorithm () const
- const unsigned short * GetRecommendedDisplayCIELabValue () const
- unsigned short GetRecommendedDisplayCIELabValue (const unsigned int idx) const
- unsigned short GetRecommendedDisplayGrayscaleValue () const
- float GetRecommendedPresentationOpacity () const
- VIEWType GetRecommendedPresentationType () const
- const char * GetSurfaceComments () const
- unsigned long GetSurfaceNumber () const
- bool GetSurfaceProcessing () const
- const char * GetSurfaceProcessingDescription () const
- float GetSurfaceProcessingRatio () const
- const float * GetVectorAccuracy () const
- DataElement & GetVectorCoordinateData ()

- const DataElement & GetVectorCoordinateData () const
- unsigned short GetVectorDimensionality () const
- void SetAlgorithmFamily (SegmentHelper::BasicCodedEntry const &BSE)
- void SetAlgorithmName (const char *str)
- void SetAlgorithmVersion (const char *str)
- void SetAxisOfRotation (const float *axis)
- void SetCenterOfRotation (const float *center)
- void SetFiniteVolume (STATES state)
- void SetManifold (STATES state)
- void SetMaximumPointDistance (float maximum)
- void SetMeanPointDistance (float average)
- void SetMeshPrimitive (MeshPrimitive &mp)
- void SetNumberOfSurfacePoints (const unsigned long nb)
- void SetNumberOfVectors (const unsigned long nb)
- void SetPointCoordinatesData (DataElement const &de)
- void SetPointPositionAccuracy (const float *accuracies)
- void SetPointsBoundingBoxCoordinates (const float *coordinates)
- void SetProcessingAlgorithm (SegmentHelper::BasicCodedEntry const &BSE)
- void SetRecommendedDisplayCIELabValue (const std::vector< unsigned short > &vl)
- void SetRecommendedDisplayCIELabValue (const unsigned short vl, const unsigned int idx=0)
- void SetRecommendedDisplayCIELabValue (const unsigned short vl[3])
- void SetRecommendedDisplayGrayscaleValue (const unsigned short vl)
- void SetRecommendedPresentationOpacity (const float opacity)
- void SetRecommendedPresentationType (VIEWType type)
- void SetSurfaceComments (const char *comment)
- void SetSurfaceNumber (const unsigned long nb)
- void SetSurfaceProcessing (bool b)
- void SetSurfaceProcessingDescription (const char *description)
- void SetSurfaceProcessingRatio (const float ratio)
- void SetVectorAccuracy (const float *accuracy)
- void SetVectorCoordinateData (DataElement const &de)
- void SetVectorDimensionality (const unsigned short dim)

Static Public Member Functions

- static STATES GetSTATES (const char *state)
- static const char * GetSTATESString (STATES state)
- static VIEWType GetVIEWType (const char *type)
- static const char * GetVIEWTypeString (VIEWType type)

Additional Inherited Members

10.295.1 Detailed Description

This class defines a SURFACE IE.

This members are taken from required surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

10.295.2 Member Enumeration Documentation

10.295.2.1 STATES

enum gdcm::Surface::STATES

Enumerator

NO	
YES	
UNKNOWN	
STATES_END	

10.295.2.2 VIEWType

enum gdcm::Surface::VIEWType

Enumeration for Recommended Presentation Type.

See also

Tag(0x0066, 0x000D) and PS 3.3 C.27.1.1.3

Enumerator

SURFACE	
WIREFRAME	
POINTS	
VIEWType_END	

10.295.3 Constructor & Destructor Documentation

10.295.3.1 Surface()

gdcm::Surface::Surface ( )

10.295.3.2 ~Surface()

```
gdcm::Surface::~Surface ( )  [override]
```

10.295.4 Member Function Documentation

10.295.4.1 GetAlgorithmFamily() [1/2]

```
SegmentHelper::BasicCodedEntry& gdcm::Surface::GetAlgorithmFamily ( )
```

10.295.4.2 GetAlgorithmFamily() [2/2]

```
SegmentHelper::BasicCodedEntry const& gdcm::Surface::GetAlgorithmFamily ( ) const
```

10.295.4.3 GetAlgorithmName()

```
const char* gdcm::Surface::GetAlgorithmName ( ) const
```

10.295.4.4 GetAlgorithmVersion()

```
const char* gdcm::Surface::GetAlgorithmVersion ( ) const
```

10.295.4.5 GetAxisOfRotation()

```
const float* gdcm::Surface::GetAxisOfRotation ( ) const
```

Note

Pointer is null if undefined

10.295.4.6 GetCenterOfRotation()

```
const float* gdcm::Surface::GetCenterOfRotation ( ) const
```

Note

Pointer is null if undefined

10.295.4.7 GetFiniteVolume()

```
STATES gdcm::Surface::GetFiniteVolume ( ) const
```

10.295.4.8 GetManifold()

```
STATES gdcm::Surface::GetManifold ( ) const
```

10.295.4.9 GetMaximumPointDistance()

```
float gdcm::Surface::GetMaximumPointDistance ( ) const
```

10.295.4.10 GetMeanPointDistance()

```
float gdcm::Surface::GetMeanPointDistance ( ) const
```

10.295.4.11 GetMeshPrimitive() [1/2]

```
MeshPrimitive& gdcm::Surface::GetMeshPrimitive ( )
```

10.295.4.12 GetMeshPrimitive() [2/2]

```
MeshPrimitive const& gdcm::Surface::GetMeshPrimitive ( ) const
```

10.295.4.13 GetNumberOfSurfacePoints()

```
unsigned long gdcm::Surface::GetNumberOfSurfacePoints ( ) const
```

10.295.4.14 GetNumberOfVectors()

```
unsigned long gdcm::Surface::GetNumberOfVectors ( ) const
```

10.295.4.15 GetPointCoordinatesData() [1/2]

```
DataElement& gdcm::Surface::GetPointCoordinatesData ( )
```

10.295.4.16 GetPointCoordinatesData() [2/2]

```
const DataElement& gdcm::Surface::GetPointCoordinatesData ( ) const
```

10.295.4.17 GetPointPositionAccuracy()

```
const float* gdcm::Surface::GetPointPositionAccuracy ( ) const
```

Note

Pointer is null if undefined

10.295.4.18 GetPointsBoundingBoxCoordinates()

```
const float* gdcm::Surface::GetPointsBoundingBoxCoordinates ( ) const
```

Note

Pointer is null if undefined

10.295.4.19 GetProcessingAlgorithm() [1/2]

```
SegmentHelper::BasicCodedEntry& gdcm::Surface::GetProcessingAlgorithm ( )
```

10.295.4.20 GetProcessingAlgorithm() [2/2]

```
SegmentHelper::BasicCodedEntry const& gdcm::Surface::GetProcessingAlgorithm ( ) const
```

10.295.4.21 GetRecommendedDisplayCIELabValue() [1/2]

```
const unsigned short* gdcm::Surface::GetRecommendedDisplayCIELabValue ( ) const
```

10.295.4.22 GetRecommendedDisplayCIELabValue() [2/2]

```
unsigned short gdcm::Surface::GetRecommendedDisplayCIELabValue (
            const unsigned int idx ) const
```

10.295.4.23 GetRecommendedDisplayGrayscaleValue()

```
unsigned short gdcm::Surface::GetRecommendedDisplayGrayscaleValue ( ) const
```

10.295.4.24 GetRecommendedPresentationOpacity()

```
float gdcm::Surface::GetRecommendedPresentationOpacity ( ) const
```

10.295.4.25 GetRecommendedPresentationType()

```
VIEWType gdcm::Surface::GetRecommendedPresentationType ( ) const
```

10.295.4.26 GetSTATES()

```
static STATES gdcm::Surface::GetSTATES (
            const char * state )  [static]
```

10.295.4.27 GetSTATESString()

```
static const char* gdcm::Surface::GetSTATESString (
            STATES state )  [static]
```

10.295.4.28 GetSurfaceComments()

```
const char* gdcm::Surface::GetSurfaceComments ( ) const
```

10.295.4.29 GetSurfaceNumber()

```
unsigned long gdcm::Surface::GetSurfaceNumber ( ) const
```

10.295.4.30 GetSurfaceProcessing()

```
bool gdcm::Surface::GetSurfaceProcessing ( ) const
```

10.295.4.31 GetSurfaceProcessingDescription()

```
const char* gdcm::Surface::GetSurfaceProcessingDescription ( ) const
```

10.295.4.32 GetSurfaceProcessingRatio()

```
float gdcm::Surface::GetSurfaceProcessingRatio ( ) const
```

10.295.4.33 GetVectorAccuracy()

```
const float* gdcm::Surface::GetVectorAccuracy ( ) const
```

10.295.4.34 GetVectorCoordinateData() [1/2]

```
DataElement& gdcm::Surface::GetVectorCoordinateData ( )
```

10.295.4.35 GetVectorCoordinateData() [2/2]

```
const DataElement& gdcm::Surface::GetVectorCoordinateData ( ) const
```

10.295.4.36 GetVectorDimensionality()

```
unsigned short gdcm::Surface::GetVectorDimensionality ( ) const
```

10.295.4.37 GetVIEWType()

```
static VIEWType gdcm::Surface::GetVIEWType (
            const char * type )  [static]
```

10.295.4.38 GetVIEWTypeString()

```
static const char* gdcm::Surface::GetVIEWTypeString (
            VIEWType type )  [static]
```

10.295.4.39 SetAlgorithmFamily()

```
void gdcm::Surface::SetAlgorithmFamily (
            SegmentHelper::BasicCodedEntry const & BSE )
```

10.295.4.40 SetAlgorithmName()

```
void gdcm::Surface::SetAlgorithmName (
            const char * str )
```

10.295.4.41 SetAlgorithmVersion()

```
void gdcm::Surface::SetAlgorithmVersion (
            const char * str )
```

10.295.4.42 SetAxisOfRotation()

```
void gdcm::Surface::SetAxisOfRotation (
            const float * axis )
```

10.295.4.43 SetCenterOfRotation()

```
void gdcm::Surface::SetCenterOfRotation (
            const float * center )
```

10.295.4.44 SetFiniteVolume()

```
void gdcm::Surface::SetFiniteVolume (
            STATES state )
```

10.295.4.45 SetManifold()

```
void gdcm::Surface::SetManifold (
            STATES state )
```

10.295.4.46 SetMaximumPointDistance()

```
void gdcm::Surface::SetMaximumPointDistance (
            float maximum )
```

10.295.4.47 SetMeanPointDistance()

```
void gdcm::Surface::SetMeanPointDistance (
            float average )
```

10.295.4.48 SetMeshPrimitive()

```
void gdcm::Surface::SetMeshPrimitive (
            MeshPrimitive & mp )
```

10.295.4.49 SetNumberOfSurfacePoints()

```
void gdcm::Surface::SetNumberOfSurfacePoints (
            const unsigned long nb )
```

10.295.4.50 SetNumberOfVectors()

```
void gdcm::Surface::SetNumberOfVectors (
            const unsigned long nb )
```

10.295.4.51 SetPointCoordinatesData()

```
void gdcm::Surface::SetPointCoordinatesData (
            DataElement const & de )
```

10.295.4.52 SetPointPositionAccuracy()

```
void gdcm::Surface::SetPointPositionAccuracy (
            const float * accuracies )
```

10.295.4.53 SetPointsBoundingBoxCoordinates()

```
void gdcm::Surface::SetPointsBoundingBoxCoordinates (
            const float * coordinates )
```

10.295.4.54 SetProcessingAlgorithm()

```
void gdcm::Surface::SetProcessingAlgorithm (
            SegmentHelper::BasicCodedEntry const & BSE )
```

10.295.4.55 SetRecommendedDisplayCIELabValue() [1/3]

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
            const std::vector< unsigned short > & vl )
```

10.295.4.56 SetRecommendedDisplayCIELabValue() [2/3]

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
            const unsigned short vl,
            const unsigned int idx = 0 )
```

10.295.4.57 SetRecommendedDisplayCIELabValue() [3/3]

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
            const unsigned short vl[3] )
```

10.295.4.58 SetRecommendedDisplayGrayscaleValue()

```
void gdcm::Surface::SetRecommendedDisplayGrayscaleValue (
            const unsigned short vl )
```

10.295.4.59 SetRecommendedPresentationOpacity()

```
void gdcm::Surface::SetRecommendedPresentationOpacity (
            const float opacity )
```

10.295.4.60 SetRecommendedPresentationType()

```
void gdcm::Surface::SetRecommendedPresentationType (
            VIEWType type )
```

10.295.4.61 SetSurfaceComments()

```
void gdcm::Surface::SetSurfaceComments (
            const char * comment )
```

10.295.4.62 SetSurfaceNumber()

```
void gdcm::Surface::SetSurfaceNumber (
            const unsigned long nb )
```

10.295.4.63 SetSurfaceProcessing()

```
void gdcm::Surface::SetSurfaceProcessing (
            bool b )
```

10.295.4.64 SetSurfaceProcessingDescription()

```
void gdcm::Surface::SetSurfaceProcessingDescription (
            const char * description )
```

10.295.4.65 SetSurfaceProcessingRatio()

```
void gdcm::Surface::SetSurfaceProcessingRatio (
            const float ratio )
```

10.295.4.66 SetVectorAccuracy()

```
void gdcm::Surface::SetVectorAccuracy (
            const float * accuracy )
```

10.295.4.67 SetVectorCoordinateData()

```
void gdcm::Surface::SetVectorCoordinateData (
            DataElement const & de )
```

10.295.4.68 SetVectorDimensionality()

```
void gdcm::Surface::SetVectorDimensionality (
            const unsigned short dim )
```

The documentation for this class was generated from the following file:

- gdcmSurface.h

10.296 gdcm::SurfaceHelper Class Reference

SurfaceHelper.

`#include <gdcmSurfaceHelper.h>`

Public Types

- typedef std::vector< unsigned short > ColorArray

Static Public Member Functions

- template<typename T , typename U >
  static std::vector< T > RecommendedDisplayCIELabToRGB (const ColorArray &CIELab, const U rangeMax=255)

  Convert a DICOM CIE-Lab (after reading) color into RGB.
- template<typename U >
  static std::vector< float > RecommendedDisplayCIELabToRGB (const ColorArray &CIELab, const U rangeMax=255)

  Convert a DICOM CIE-Lab (after reading) color into RGB.
- template<typename T , typename U >
  static ColorArray RGBToRecommendedDisplayCIELab (const std::vector< T > &RGB, const U rangeMax=255)

  Convert a RGB color into DICOM CIE-Lab (ready to write).
- template<typename T , typename U >
  static unsigned short RGBToRecommendedDisplayGrayscale (const std::vector< T > &RGB, const U rangeMax=255)

  Convert a RGB color into DICOM grayscale (ready to write).

10.296.1 Detailed Description

SurfaceHelper.

Helper class for Surface object

10.296.2 Member Typedef Documentation

10.296.2.1 ColorArray

```
typedef std::vector< unsigned short > gdcm::SurfaceHelper::ColorArray
```

10.296.3 Member Function Documentation

10.296.3.1 RecommendedDisplayCIELabToRGB() [1/2]

```
template<typename T , typename U >
std::vector< T > gdcm::SurfaceHelper::RecommendedDisplayCIELabToRGB (
            const ColorArray & CIELab,
            const U rangeMax = 255 )  [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

Parameters

CIELab	DICOM CIE-Lab array.
rangeMax	Max value of the RGB range.

Template Parameters

T	Type of CIELab components.
U	Type of rangeMax value.

10.296.3.2 RecommendedDisplayCIELabToRGB() [2/2]

```
template<typename U >
std::vector< float > gdcm::SurfaceHelper::RecommendedDisplayCIELabToRGB (
```

```
            const ColorArray & CIELab,
            const U rangeMax = 255 )  [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

Parameters

CIELab	DICOM CIE-Lab array.
rangeMax	Max value of the RGB range.

Template Parameters

U	Type of rangeMax value.

10.296.3.3 RGBToRecommendedDisplayCIELab()

```
template<typename T , typename U >
SurfaceHelper::ColorArray gdcm::SurfaceHelper::RGBToRecommendedDisplayCIELab (
            const std::vector< T > & RGB,
            const U rangeMax = 255 )  [static]
```

Convert a RGB color into DICOM CIE-Lab (ready to write).

See also

PS 3.3 C.10.7.1.1

Parameters

RGB	RGB array.
rangeMax	Max value of the RGB range.

Template Parameters

T	Type of RGB components.
U	Type of rangeMax value.

10.296.3.4 RGBToRecommendedDisplayGrayscale()

```
template<typename T , typename U >
unsigned short gdcm::SurfaceHelper::RGBToRecommendedDisplayGrayscale (
             const std::vector< T > & RGB,
             const U rangeMax = 255 )  [static]
```

Convert a RGB color into DICOM grayscale (ready to write).

See also

PS 3.3 C.27.1 tag(0062,000C)

Parameters

RGB	RGB array.
rangeMax	Max value of the RGB range.

Template Parameters

T	Type of RGB components.
U	Type of rangeMax value.

The documentation for this class was generated from the following file:

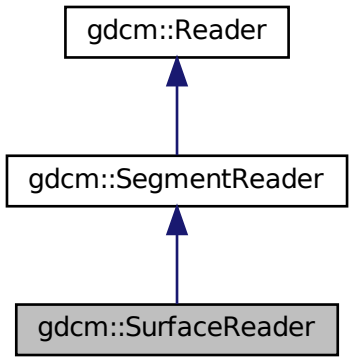
- gdcmSurfaceHelper.h

10.297 gdcm::SurfaceReader Class Reference

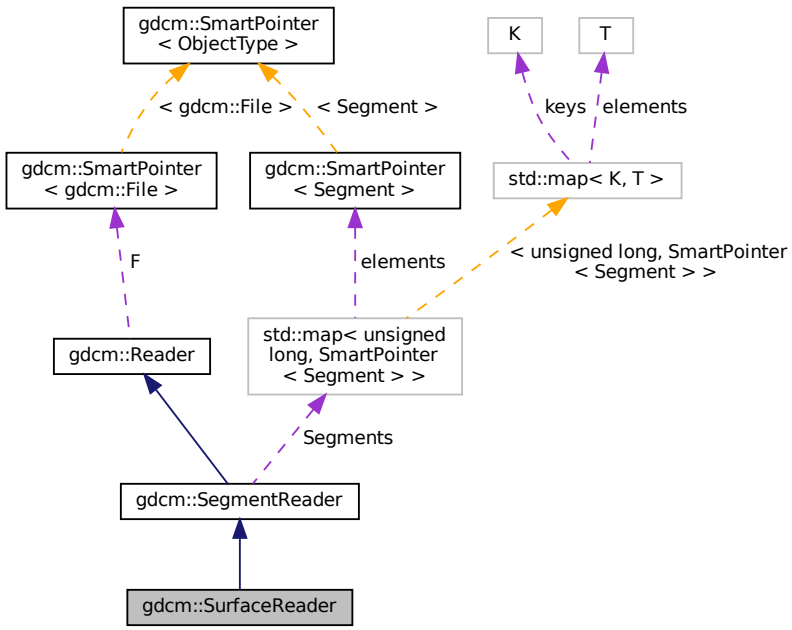
This class defines a SURFACE IE reader.

```
#include <gdcmSurfaceReader.h>
```

Inheritance diagram for gdcm::SurfaceReader:



Collaboration diagram for gdcm::SurfaceReader:



Public Member Functions

- SurfaceReader ()

- ~SurfaceReader () override
- unsigned long GetNumberOfSurfaces () const
- bool Read () override

  Read.

Protected Member Functions

- bool ReadPointMacro (SmartPointer< Surface > surface, const DataSet &surfaceDS)
- bool ReadSurface (const Item &surfaceItem, const unsigned long idx)
- bool ReadSurfaces ()

Additional Inherited Members

10.297.1 Detailed Description

This class defines a SURFACE IE reader.

It reads surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

10.297.2 Constructor & Destructor Documentation

10.297.2.1 SurfaceReader()

```
gdcm::SurfaceReader::SurfaceReader ( )
```

10.297.2.2 ~SurfaceReader()

```
gdcm::SurfaceReader::~SurfaceReader ( )  [override]
```

10.297.3 Member Function Documentation

10.297.3.1 GetNumberOfSurfaces()

```
unsigned long gdcm::SurfaceReader::GetNumberOfSurfaces ( ) const
```

10.297.3.2 Read()

```
bool gdcm::SurfaceReader::Read ( )  [override], [virtual]
```

Read.

Reimplemented from gdcm::SegmentReader.

10.297.3.3 ReadPointMacro()

```
bool gdcm::SurfaceReader::ReadPointMacro (
            SmartPointer< Surface > surface,
            const DataSet & surfaceDS )  [protected]
```

10.297.3.4 ReadSurface()

```
bool gdcm::SurfaceReader::ReadSurface (
            const Item & surfaceItem,
            const unsigned long idx )  [protected]
```

10.297.3.5 ReadSurfaces()

```
bool gdcm::SurfaceReader::ReadSurfaces ( )  [protected]
```

The documentation for this class was generated from the following file:

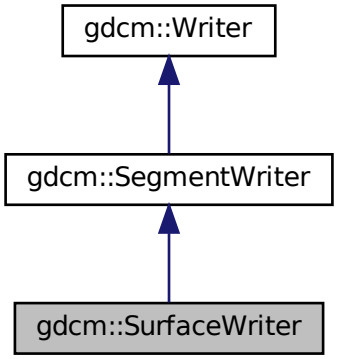
- gdcmSurfaceReader.h

10.298 gdcm::SurfaceWriter Class Reference

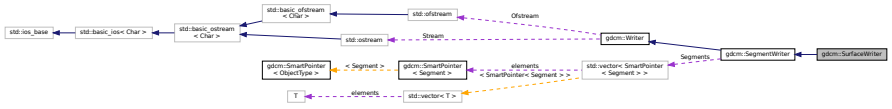
This class defines a SURFACE IE writer.

`#include <gdcmSurfaceWriter.h>`

Inheritance diagram for gdcm::SurfaceWriter:



Collaboration diagram for gdcm::SurfaceWriter:



Public Member Functions

- SurfaceWriter ()
- ~SurfaceWriter () override
- unsigned long GetNumberOfSurfaces ()
- void SetNumberOfSurfaces (const unsigned long nb)
- bool Write () override

  Write.

Protected Member Functions

- void ComputeNumberOfSurfaces ()
- bool PrepareWrite ()
- bool PrepareWritePointMacro (SmartPointer< Surface > surface, DataSet &surfaceDS, const TransferSyntax &ts)

Protected Attributes

- unsigned long NumberOfSurfaces

Additional Inherited Members

10.298.1 Detailed Description

This class defines a SURFACE IE writer.

It writes surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

10.298.2 Constructor & Destructor Documentation

10.298.2.1 SurfaceWriter()

```
gdcm::SurfaceWriter::SurfaceWriter ( )
```

10.298.2.2 ~SurfaceWriter()

```
gdcm::SurfaceWriter::~SurfaceWriter ( )  [override]
```

10.298.3 Member Function Documentation

10.298.3.1 ComputeNumberOfSurfaces()

```
void gdcm::SurfaceWriter::ComputeNumberOfSurfaces ( )  [protected]
```

10.298.3.2 GetNumberOfSurfaces()

```
unsigned long gdcm::SurfaceWriter::GetNumberOfSurfaces ( )
```

10.298.3.3 PrepareWrite()

```
bool gdcm::SurfaceWriter::PrepareWrite ( )  [protected]
```

10.298.3.4 PrepareWritePointMacro()

```
bool gdcm::SurfaceWriter::PrepareWritePointMacro (
            SmartPointer< Surface > surface,
            DataSet & surfaceDS,
            const TransferSyntax & ts )  [protected]
```

10.298.3.5 SetNumberOfSurfaces()

```
void gdcm::SurfaceWriter::SetNumberOfSurfaces (
            const unsigned long nb )
```

10.298.3.6 Write()

```
bool gdcm::SurfaceWriter::Write ( )  [override], [virtual]
```

Write.

Reimplemented from gdcm::SegmentWriter.

10.298.4 Member Data Documentation

10.298.4.1 NumberOfSurfaces

```
unsigned long gdcm::SurfaceWriter::NumberOfSurfaces  [protected]
```

The documentation for this class was generated from the following file:

- gdcmSurfaceWriter.h

10.299 gdcm::SwapCode Class Reference

SwapCode representation.

```
#include <gdcmSwapCode.h>
```

Public Types

- enum SwapCodeType {
  Unknown = 0 ,
  LittleEndian = 1234 ,
  BigEndian = 4321 ,
  BadLittleEndian = 3412 ,
  BadBigEndian = 2143 }

Public Member Functions

- SwapCode (SwapCodeType sc=Unknown)
- operator SwapCode::SwapCodeType () const

Static Public Member Functions

- static const char * GetSwapCodeString (SwapCode const &sc)

Static Protected Member Functions

- static int GetIndex (SwapCode const &sc)

Friends

- std::ostream & operator<< (std::ostream &os, const SwapCode &sc)

10.299.1 Detailed Description

SwapCode representation.

Examples

TestByteSwap.cxx.

10.299.2 Member Enumeration Documentation

10.299.2.1 SwapCodeType

```
enum gdcm::SwapCode::SwapCodeType
```

Enumerator

Unknown	
LittleEndian	
BigEndian	
BadLittleEndian	
BadBigEndian	

10.299.3 Constructor & Destructor Documentation

10.299.3.1 SwapCode()

```
gdcm::SwapCode::SwapCode (
            SwapCodeType sc = Unknown )  [inline]
```

10.299.4 Member Function Documentation

10.299.4.1 GetIndex()

```
static int gdcm::SwapCode::GetIndex (
            SwapCode const & sc )  [static], [protected]
```

10.299.4.2 GetSwapCodeString()

```
static const char* gdcm::SwapCode::GetSwapCodeString (
            SwapCode const & sc )  [static]
```

10.299.4.3 operator SwapCode::SwapCodeType()

```
gdcm::SwapCode::operator SwapCode::SwapCodeType ( ) const  [inline]
```

10.299.5 Friends And Related Function Documentation

10.299.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const SwapCode & sc )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmSwapCode.h

10.300 gdcm::SwapperDoOp Class Reference

```
#include <gdcmSwapper.h>
```

Static Public Member Functions

- template<typename T >
  static T Swap (T val)
- template<typename T >
  static void SwapArray (T *array, size_t n)

10.300.1 Member Function Documentation

10.300.1.1 Swap()

```
template<typename T >
static T gdcm::SwapperDoOp::Swap (
            T val )  [static]
```

10.300.1.2 SwapArray()

```
template<typename T >
static void gdcm::SwapperDoOp::SwapArray (
            T * array,
            size_t n )  [inline], [static]
```

The documentation for this class was generated from the following file:

- gdcmSwapper.h

10.301 gdcm::SwapperNoOp Class Reference

```
#include <gdcmSwapper.h>
```

Static Public Member Functions

- template<typename T >
  static T Swap (T val)
- template<typename T >
  static void SwapArray (T *, size_t)

10.301.1 Detailed Description

Examples

DumpSiemensBase64.cxx, DumpToshibaDTI.cxx, and DumpToshibaDTI2.cxx.

10.301.2 Member Function Documentation

10.301.2.1 Swap()

```
template<typename T >
static T gdcm::SwapperNoOp::Swap (
             T val )  [inline], [static]
```

10.301.2.2 SwapArray()

```
template<typename T >
static void gdcm::SwapperNoOp::SwapArray (
             T * ,
             size_t  )  [inline], [static]
```

The documentation for this class was generated from the following file:

- gdcmSwapper.h

10.302 gdcm::System Class Reference

Class to do system operation.

```
#include <gdcmSystem.h>
```

Static Public Member Functions

- static std::wstring ConvertToUNC (const char *utf8path)
- static bool DeleteDirectory (const char *source)

  remove a directory named source
- static size_t EncodeBytes (char *out, const unsigned char *data, int size)
- static bool FileExists (const char *filename)

  Check whether the specified file exist on the system.
- static bool FileIsDirectory (const char *name)

  Check whether the file specified is a directory:
- static bool FileIsSymlink (const char *name)

  Check whether name is a symlink.
- static size_t FileSize (const char *filename)
- static time_t FileTime (const char *filename)
- static bool FormatDateTime (char date[22], time_t t, long milliseconds=0)
- static bool GetCurrentDateTime (char date[22])
- static const char * GetCurrentModuleFileName ()
- static const char * GetCurrentProcessFileName ()
- static const char * GetCurrentResourcesDirectory ()
- static const char * GetCWD ()

- static bool GetHostName (char hostname[255])
- static const char * GetLastSystemError ()

  Return the last error.
- static const char * GetLocaleCharset ()

  return `locale charmap`
- static const char * GetTimezoneOffsetFromUTC ()
- static bool MakeDirectory (const char *path)

  Create a directory name path.
- static bool ParseDateTime (time_t &timep, const char date[22])

  Parse a date stored as ASCII text into a time_t structured (discard millisecond if any)
- static bool ParseDateTime (time_t &timep, long &milliseconds, const char date[22])
- static bool RemoveFile (const char *source)

  remove a file named source
- static int StrCaseCmp (const char *s1, const char *s2)

  consistent func for C99 spec of strcasecmp/strncasecmp
- static int StrNCaseCmp (const char *s1, const char *s2, size_t n)
- static char * StrSep (char **stringp, const char *delim)
- static char * StrTokR (char *ptr, const char *sep, char **end)

  strtok_r

Static Protected Member Functions

- static bool GetPermissions (const char *file, unsigned short &mode)

  NOT THREAD SAFE.
- static bool SetPermissions (const char *file, unsigned short mode)

10.302.1 Detailed Description

Class to do system operation.

OS independent functionalities

10.302.2 Member Function Documentation

10.302.2.1 ConvertToUNC()

```
static std::wstring gdcm::System::ConvertToUNC (
            const char * utf8path )  [static]
```

When needed convert a PATH into a UNC equivalent. This allow transparent support for path longer that MAX_PATH. Only on _MSC_VER compiler, return empty string otherwise.

10.302.2.2 DeleteDirectory()

```
static bool gdcm::System::DeleteDirectory (
            const char * source )  [static]
```

remove a directory named source

10.302.2.3 EncodeBytes()

```
static size_t gdcm::System::EncodeBytes (
            char * out,
            const unsigned char * data,
            int size )  [static]
```

Used internally by the UIDGenerator class to convert a uuid tape to a DICOM VR:UI type

10.302.2.4 FileExists()

```
static bool gdcm::System::FileExists (
            const char * filename )  [static]
```

Check whether the specified file exist on the system.

Examples

DumpVisusChange.cxx, EncapsulateFileInRawData.cxx, MagnifyFile.cxx, and gdcmorthoplanes.cxx.

10.302.2.5 FileIsDirectory()

```
static bool gdcm::System::FileIsDirectory (
            const char * name )  [static]
```

Check whether the file specified is a directory:

Examples

DumpVisusChange.cxx, gdcmorthoplanes.cxx, and threadgdcm.cxx.

10.302.2.6 FileIsSymlink()

```
static bool gdcm::System::FileIsSymlink (
            const char * name )  [static]
```

Check whether name is a symlink.

10.302.2.7 FileSize()

```
static size_t gdcm::System::FileSize (
            const char * filename )  [static]
```

Return the filesize. 0 if file does not exist.

Warning

you need to use FileExists to differentiate between empty file and missing file.

for very large size file and on system where size_t is not appropriate to store off_t value the function will return 0.

Examples

CheckBigEndianBug.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, EncapsulateFileInRawData.cxx, and SimpleScanner.cxx.

10.302.2.8 FileTime()

```
static time_t gdcm::System::FileTime (
            const char * filename )  [static]
```

Return the time of last modification of file 0 if the file does not exist

10.302.2.9 FormatDateTime()

```
static bool gdcm::System::FormatDateTime (
            char date[22],
            time_t t,
            long milliseconds = 0 )  [static]
```

format as ASCII text a time_t with milliseconds See VR::DT from DICOM PS 3.5 milliseconds is in the range [0, 999999]

10.302.2.10 GetCurrentDateTime()

```
static bool gdcm::System::GetCurrentDateTime (
            char date[22] )  [static]
```

Return the current data time, and format it as ASCII text. This is simply a call to gettimeofday + FormatDateTime, since WIN32 do not have an implementation for gettimeofday, this is more portable. The call time(0) is not precise for our resolution

Examples

TemplateEmptyImage.cxx.

10.302.2.11 GetCurrentModuleFileName()

```
static const char* gdcm::System::GetCurrentModuleFileName ( )  [static]
```

Return the directory the current module is located: NOT THREAD SAFE

10.302.2.12 GetCurrentProcessFileName()

```
static const char* gdcm::System::GetCurrentProcessFileName ( )  [static]
```

Return the directory the current process (executable) is located: NOT THREAD SAFE

10.302.2.13 GetCurrentResourcesDirectory()

```
static const char* gdcm::System::GetCurrentResourcesDirectory ( )  [static]
```

On some system (Apple) return the path to the current bundled 'Resources' directory NOT THREAD SAFE

10.302.2.14 GetCWD()

```
static const char* gdcm::System::GetCWD ( )  [static]
```

Return current working directory Warning: if current working path is too long (>2048 bytes) the call will fail and call will return NULL NOT THREAD SAFE

10.302.2.15 GetHostName()

```
static bool gdcm::System::GetHostName (
            char hostname[255] )  [static]
```

Retrieve the hostname, only the first 255 byte are copied. This may come handy to specify the Station Name

10.302.2.16 GetLastSystemError()

```
static const char* gdcm::System::GetLastSystemError ( )  [static]
```

Return the last error.

10.302.2.17 GetLocaleCharset()

```
static const char* gdcm::System::GetLocaleCharset ( )  [static]
```

return `locale charmap`

10.302.2.18 GetPermissions()

```
static bool gdcm::System::GetPermissions (
            const char * file,
            unsigned short & mode )  [static], [protected]
```

NOT THREAD SAFE.

10.302.2.19 GetTimezoneOffsetFromUTC()

```
static const char* gdcm::System::GetTimezoneOffsetFromUTC ( )  [static]
```

Return the value for Timezone Offset From UTC as string.

Warning

not thread safe

10.302.2.20 MakeDirectory()

```
static bool gdcm::System::MakeDirectory (
            const char * path )  [static]
```

Create a directory name path.

10.302.2.21 ParseDateTime() [1/2]

```
static bool gdcm::System::ParseDateTime (
            time_t & timep,
            const char date[22] )  [static]
```

Parse a date stored as ASCII text into a time_t structured (discard millisecond if any)

10.302.2.22 ParseDateTime() [2/2]

```
static bool gdcm::System::ParseDateTime (
            time_t & timep,
            long & milliseconds,
            const char date[22] )  [static]
```

Parse a date stored as ASCII text into a time_t structured and millisecond

See also

FormatDateTime

10.302.2.23 RemoveFile()

```
static bool gdcm::System::RemoveFile (
            const char * source )  [static]
```

remove a file named source

10.302.2.24 SetPermissions()

```
static bool gdcm::System::SetPermissions (
            const char * file,
            unsigned short mode )  [static], [protected]
```

10.302.2.25 StrCaseCmp()

```
static int gdcm::System::StrCaseCmp (
            const char * s1,
            const char * s2 )  [static]
```

consistent func for C99 spec of strcasecmp/strncasecmp

10.302.2.26 StrNCaseCmp()

```
static int gdcm::System::StrNCaseCmp (
            const char * s1,
            const char * s2,
            size_t n )  [static]
```

Precondition

n != 0

10.302.2.27 StrSep()

```
static char* gdcm::System::StrSep (
            char ** stringp,
            const char * delim )  [static]
```

strsep param stringp is passed by pointer, it may be modified, you'll need to make a copy, in case you want to free the memory pointed at

10.302.2.28 StrTokR()

```
static char* gdcm::System::StrTokR (
            char * ptr,
            const char * sep,
            char ** end )  [static]
```

strtok_r

The documentation for this class was generated from the following file:

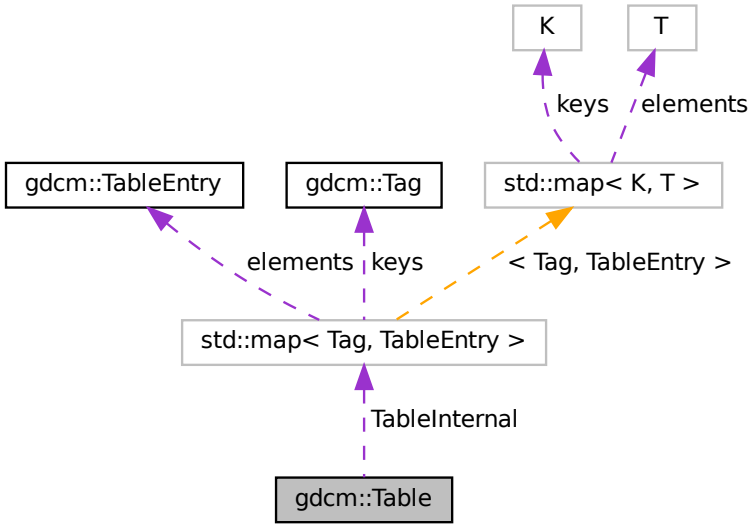
- gdcmSystem.h

10.303 gdcm::Table Class Reference

Table.

`#include <gdcmTable.h>`

Collaboration diagram for gdcm::Table:



Public Types

- typedef std::map< Tag, TableEntry > MapTableEntry

Public Member Functions

- Table ()=default
- Table (const Table &_val)=delete
- ~Table ()=default
- const TableEntry & GetTableEntry (const Tag &tag) const
- void InsertEntry (Tag const &tag, TableEntry const &te)
- Table & operator= (const Table &_val)=delete

Public Attributes

- MapTableEntry TableInternal

Friends

- std::ostream & operator<< (std::ostream &_os, const Table &_val)

10.303.1 Detailed Description

Table.

10.303.2 Member Typedef Documentation

10.303.2.1 MapTableEntry

```
typedef std::map<Tag, TableEntry> gdcm::Table::MapTableEntry
```

10.303.3 Constructor & Destructor Documentation

10.303.3.1 Table() [1/2]

```
gdcm::Table::Table ( )  [default]
```

10.303.3.2 ~Table()

```
gdcm::Table::~Table ( )  [default]
```

10.303.3.3 Table() [2/2]

```
gdcm::Table::Table (
            const Table & _val )  [delete]
```

10.303.4 Member Function Documentation

10.303.4.1 GetTableEntry()

```
const TableEntry& gdcm::Table::GetTableEntry (
            const Tag & tag ) const  [inline]
```

References TableInternal.

10.303.4.2 InsertEntry()

```
void gdcm::Table::InsertEntry (
            Tag const & tag,
            TableEntry const & te )  [inline]
```

References TableInternal.

10.303.4.3 operator=()

```
Table& gdcm::Table::operator= (
            const Table & _val )  [delete]
```

10.303.5 Friends And Related Function Documentation

10.303.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Table & _val )  [friend]
```

10.303.6 Member Data Documentation

10.303.6.1 TableInternal

```
MapTableEntry gdcm::Table::TableInternal
```

Referenced by GetTableEntry(), and InsertEntry().

The documentation for this class was generated from the following file:

- gdcmTable.h

10.304 gdcm::TableEntry Class Reference

TableEntry.

```
#include <gdcmTableEntry.h>
```

Public Member Functions

- TableEntry (const char *attribute=nullptr, Type const &type=Type(), const char *des=nullptr)
- ~TableEntry ()=default

10.304.1 Detailed Description

TableEntry.

10.304.2 Constructor & Destructor Documentation

10.304.2.1 TableEntry()

```
gdcm::TableEntry::TableEntry (
            const char * attribute = nullptr,
            Type const & type = Type(),
            const char * des = nullptr )  [inline]
```

10.304.2.2 ~TableEntry()

```
gdcm::TableEntry::~TableEntry ( )  [default]
```

The documentation for this class was generated from the following file:

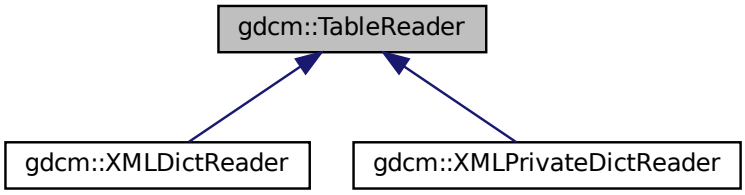
- gdcmTableEntry.h

10.305 gdcm::TableReader Class Reference

Class for representing a TableReader.

`#include <gdcmTableReader.h>`

Inheritance diagram for gdcm::TableReader:



Public Member Functions

- TableReader (Defs &defs)
- virtual ~TableReader ()=default
- virtual void CharacterDataHandler (const char *data, int length)
- virtual void EndElement (const char *name)
- const Defs & GetDefs () const
- const char * GetFilename ()
- void HandleIOD (const char **atts)
- void HandleIODEntry (const char **atts)
- void HandleMacro (const char **atts)
- void HandleMacroEntry (const char **atts)
- void HandleMacroEntryDescription (const char **atts)
- void HandleModule (const char **atts)
- void HandleModuleEntry (const char **atts)
- void HandleModuleEntryDescription (const char **atts)
- void HandleModuleInclude (const char **atts)
- int Read ()
- void SetFilename (const char *filename)
- virtual void StartElement (const char *name, const char **atts)

10.305.1 Detailed Description

Class for representing a TableReader.

Note

This class is an empty shell meant to be derived

10.305.2 Constructor & Destructor Documentation

10.305.2.1 TableReader()

```
gdcm::TableReader::TableReader (
            Defs & defs )  [inline]
```

10.305.2.2 ~TableReader()

```
virtual gdcm::TableReader::~TableReader ( )  [virtual], [default]
```

10.305.3 Member Function Documentation

10.305.3.1 CharacterDataHandler()

```
virtual void gdcm::TableReader::CharacterDataHandler (
            const char * data,
            int length )  [virtual]
```

Reimplemented in gdcm::XMLPrivateDictReader, and gdcm::XMLDictReader.

10.305.3.2 EndElement()

```
virtual void gdcm::TableReader::EndElement (
            const char * name )  [virtual]
```

Reimplemented in gdcm::XMLPrivateDictReader, and gdcm::XMLDictReader.

10.305.3.3 GetDefs()

```
const Defs& gdcm::TableReader::GetDefs ( ) const  [inline]
```

10.305.3.4 GetFilename()

```
const char* gdcm::TableReader::GetFilename ( )  [inline]
```

10.305.3.5 HandleIOD()

```
void gdcm::TableReader::HandleIOD (
            const char ** atts )
```

10.305.3.6 HandleIODEntry()

```
void gdcm::TableReader::HandleIODEntry (
            const char ** atts )
```

10.305.3.7 HandleMacro()

```
void gdcm::TableReader::HandleMacro (
            const char ** atts )
```

10.305.3.8 HandleMacroEntry()

```
void gdcm::TableReader::HandleMacroEntry (
            const char ** atts )
```

10.305.3.9 HandleMacroEntryDescription()

```
void gdcm::TableReader::HandleMacroEntryDescription (
            const char ** atts )
```

10.305.3.10 HandleModule()

```
void gdcm::TableReader::HandleModule (
            const char ** atts )
```

10.305.3.11 HandleModuleEntry()

```
void gdcm::TableReader::HandleModuleEntry (
            const char ** atts )
```

10.305.3.12 HandleModuleEntryDescription()

```
void gdcm::TableReader::HandleModuleEntryDescription (
            const char ** atts )
```

10.305.3.13 HandleModuleInclude()

```
void gdcm::TableReader::HandleModuleInclude (
            const char ** atts )
```

10.305.3.14 Read()

```
int gdcm::TableReader::Read ( )
```

10.305.3.15 SetFilename()

```
void gdcm::TableReader::SetFilename (
            const char * filename )  [inline]
```

10.305.3.16 StartElement()

```
virtual void gdcm::TableReader::StartElement (
            const char * name,
            const char ** atts )  [virtual]
```

Reimplemented in gdcm::XMLPrivateDictReader, and gdcm::XMLDictReader.

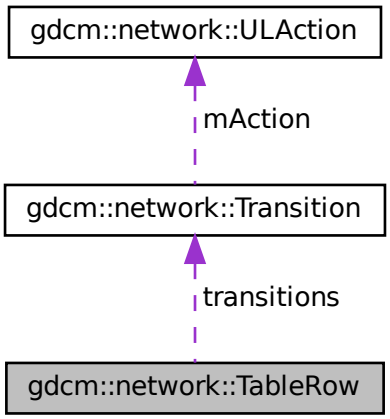
The documentation for this class was generated from the following file:

- gdcmTableReader.h

10.306 gdcm::network::TableRow Class Reference

```
#include <gdcmULTransitionTable.h>
```

Collaboration diagram for gdcm::network::TableRow:



Public Member Functions

- TableRow ()
- ~TableRow ()

Public Attributes

- Transition * transitions [cMaxStateID]

10.306.1 Constructor & Destructor Documentation

10.306.1.1 TableRow()

```
gdcm::network::TableRow::TableRow ( )  [inline]
```

References gdcm::network::cMaxStateID, and transitions.

10.306.1.2 ~TableRow()

```
gdcm::network::TableRow::~TableRow ( )  [inline]
```

References gdcm::network::cMaxStateID, and transitions.

10.306.2 Member Data Documentation

10.306.2.1 transitions

```
Transition* gdcm::network::TableRow::transitions[cMaxStateID]
```

Referenced by TableRow(), and ~TableRow().

The documentation for this class was generated from the following file:

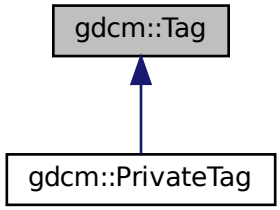
- gdcmULTransitionTable.h

10.307 gdcm::Tag Class Reference

Class to represent a DICOM Data Element (Attribute) Tag (Group, Element).

`#include <gdcmTag.h>`

Inheritance diagram for gdcm::Tag:



Public Member Functions

- Tag (const Tag &_val)
- Tag (uint16_t group, uint16_t element)

  Constructor with 2∗uint16_t.
- Tag (uint32_t tag=0)

  Constructor with 1∗uint32_t Prefer the cstor that takes two uint16_t.
- uint16_t GetElement () const

  Returns the 'Element number' of the given Tag.
- uint32_t GetElementTag () const

  Returns the full tag value of the given Tag.
- uint16_t GetGroup () const

  Returns the 'Group number' of the given Tag.
- uint32_t GetLength () const

  return the length of tag (read: size on disk)
- Tag GetPrivateCreator () const

  Return the Private Creator Data Element tag of a private data element.
- bool IsGroupLength () const

  return whether the tag correspond to a group length tag:
- bool IsGroupXX (const Tag &t) const

  e.g 6002,3000 belong to groupXX: 6000,3000
- bool IsIllegal () const

  return if the tag is considered to be an illegal tag
- bool IsPrivate () const
- bool IsPrivateCreator () const
- bool IsPublic () const
- bool operator!= (const Tag &_val) const
- bool operator< (const Tag &_val) const
- bool operator<= (const Tag &t2) const
- Tag & operator= (const Tag &_val)
- bool operator== (const Tag &_val) const
- uint16_t & operator[ ] (const unsigned int &_id)

  Returns the Group or Element of the given Tag, depending on id (0/1)
- const uint16_t & operator[ ] (const unsigned int &_id) const

  Returns the Group or Element of the given Tag, depending on id (0/1)
- std::string PrintAsContinuousString () const
- std::string PrintAsContinuousUpperCaseString () const

  Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.
- std::string PrintAsPipeSeparatedString () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)

  Read a tag from binary representation.
- bool ReadFromCommaSeparatedString (const char ∗str)
- bool ReadFromContinuousString (const char ∗str)
- bool ReadFromPipeSeparatedString (const char ∗str)
- void SetElement (uint16_t element)

  Sets the 'Element number' of the given Tag.
- void SetElementTag (uint16_t group, uint16_t element)

Sets the 'Group number' & 'Element number' of the given Tag.

- void SetElementTag (uint32_t tag)

  Sets the full tag value of the given Tag.
- void SetGroup (uint16_t group)

  Sets the 'Group number' of the given Tag.
- void SetPrivateCreator (Tag const &t)

  Set private creator:
- template<typename TSwap >
  const std::ostream & Write (std::ostream &os) const

  Write a tag in binary rep.

Friends

- std::ostream & operator<< (std::ostream &_os, const Tag &_val)
- std::istream & operator>> (std::istream &_is, Tag &_val)

10.307.1 Detailed Description

Class to represent a DICOM Data Element (Attribute) Tag (Group, Element).

Basically an uint32_t which can also be expressed as two uint16_t (group and element)

Note

DATA ELEMENT TAG: A unique identifier for a Data Element composed of an ordered pair of numbers (a Group Number followed by an Element Number). GROUP NUMBER: The first number in the ordered pair of numbers that makes up a Data Element Tag. ELEMENT NUMBER: The second number in the ordered pair of numbers that makes up a Data Element Tag.

Examples

ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DumpToSQLITE3.cxx, DuplicatePCDE.cxx, EncapsulateFileInRawData.cxx, ExtractEncryptedContent.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_V FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetJPEGSamplePrecision.cxx, GetSequenceUltrasound.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, PatchFile.cxx, PublicDict.cxx, ReadAndDumpDICOMDIR.cxx, ReadAndDumpDICOMDIR2.c ReadExplicitLengthSQIVR.cxx, SimpleScanner.cxx, SortImage.cxx, StreamImageReaderTest.cxx, VolumeSorter.cxx, gdcmrtionplan.cxx, gdcmrtplan.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.307.2 Constructor & Destructor Documentation

10.307.2.1 Tag() [1/3]

```
gdcm::Tag::Tag (
            uint16_t group,
            uint16_t element )  [inline]
```

Constructor with 2∗uint16_t.

10.307.2.2 Tag() [2/3]

```
gdcm::Tag::Tag (
            uint32_t tag = 0 )  [inline]
```

Constructor with 1∗uint32_t Prefer the cstor that takes two uint16_t.

10.307.2.3 Tag() [3/3]

```
gdcm::Tag::Tag (
            const Tag & _val )  [inline]
```

References tag.

10.307.3 Member Function Documentation

10.307.3.1 GetElement()

```
uint16_t gdcm::Tag::GetElement ( ) const  [inline]
```

Returns the 'Element number' of the given Tag.

Examples

DuplicatePCDE.cxx, and PublicDict.cxx.

Referenced by gdcm::PrivateTag::PrivateTag(), gdcm::DataSet::ComputeGroupLength(), IsGroupXX(), gdcm::PrivateDict::PrintXML(), gdcm::SequenceOfFragments::ReadValue(), and SetPrivateCreator().

10.307.3.2 GetElementTag()

```
uint32_t gdcm::Tag::GetElementTag ( ) const  [inline]
```

Returns the full tag value of the given Tag.

10.307.3.3 GetGroup()

```
uint16_t gdcm::Tag::GetGroup ( ) const  [inline]
```

Returns the 'Group number' of the given Tag.

Examples

DuplicatePCDE.cxx, and GenAllVR.cxx.

Referenced by gdcm::DataSet::ComputeGroupLength(), gdcm::DataSet::Insert(), gdcm::FileMetaInformation::Insert(), gdcm::CommandDataSet::Insert(), IsGroupXX(), gdcm::PrivateDict::PrintXML(), gdcm::SequenceOfFragments::ReadValue(), and SetPrivateCreator().

10.307.3.4 GetLength()

```
uint32_t gdcm::Tag::GetLength ( ) const  [inline]
```

return the length of tag (read: size on disk)

10.307.3.5 GetPrivateCreator()

```
Tag gdcm::Tag::GetPrivateCreator ( ) const  [inline]
```

Return the Private Creator Data Element tag of a private data element.

References SetElement().

10.307.3.6 IsGroupLength()

```
bool gdcm::Tag::IsGroupLength ( ) const  [inline]
```

return whether the tag correspond to a group length tag:

10.307.3.7 IsGroupXX()

```
bool gdcm::Tag::IsGroupXX (
            const Tag & t ) const  [inline]
```

e.g 6002,3000 belong to groupXX: 6000,3000

References GetElement(), GetGroup(), and IsPrivate().

10.307.3.8 IsIllegal()

```
bool gdcm::Tag::IsIllegal ( ) const  [inline]
```

return if the tag is considered to be an illegal tag

10.307.3.9 IsPrivate()

```
bool gdcm::Tag::IsPrivate ( ) const  [inline]
```

PRIVATE DATA ELEMENT: Additional Data Element, defined by an implementor, to communicate information that is not contained in Standard Data Elements. Private Data elements have odd Group Numbers.

Examples

DuplicatePCDE.cxx.

Referenced by IsGroupXX(), and SetPrivateCreator().

10.307.3.10 IsPrivateCreator()

```
bool gdcm::Tag::IsPrivateCreator ( ) const  [inline]
```

Returns if tag is a Private Creator (xxxx,00yy), where xxxx is odd number and yy in [0x10,0xFF]

Examples

DuplicatePCDE.cxx.

10.307.3.11 IsPublic()

```
bool gdcm::Tag::IsPublic ( ) const  [inline]
```

STANDARD DATA ELEMENT: A Data Element defined in the DICOM Standard, and therefore listed in the DICOM Data Element Dictionary in PS 3.6. Is the Tag from the Public dict...well the implementation is buggy it does not prove the element is indeed in the dict...

10.307.3.12 operator"!=()

```
bool gdcm::Tag::operator!= (
            const Tag & _val ) const  [inline]
```

References tag.

10.307.3.13 operator<()

```
bool gdcm::Tag::operator< (
            const Tag & _val ) const  [inline]
```

DICOM Standard expects the Data Element to be sorted by Tags All other comparison can be constructed from this one and operator ==

References tag, and tags.

10.307.3.14 operator<=()

```
bool gdcm::Tag::operator<= (
            const Tag & t2 ) const  [inline]
```

10.307.3.15 operator=()

```
Tag& gdcm::Tag::operator= (
            const Tag & _val )  [inline]
```

References tag.

10.307.3.16 operator==()

```
bool gdcm::Tag::operator== (
            const Tag & _val ) const  [inline]
```

References tag.

10.307.3.17 operator[]() [1/2]

```
uint16_t& gdcm::Tag::operator[] (
            const unsigned int & _id )  [inline]
```

Returns the Group or Element of the given Tag, depending on id (0/1)

10.307.3.18 operator[]() [2/2]

```
const uint16_t& gdcm::Tag::operator[] (
            const unsigned int & _id ) const  [inline]
```

Returns the Group or Element of the given Tag, depending on id (0/1)

10.307.3.19 PrintAsContinuousString()

```
std::string gdcm::Tag::PrintAsContinuousString ( ) const
```

Print tag value with no separating comma: eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

10.307.3.20 PrintAsContinuousUpperCaseString()

```
std::string gdcm::Tag::PrintAsContinuousUpperCaseString ( ) const
```

Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.

10.307.3.21 PrintAsPipeSeparatedString()

```
std::string gdcm::Tag::PrintAsPipeSeparatedString ( ) const
```

Print as a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

ReadFromPipeSeparatedString

10.307.3.22 Read()

```
template<typename TSwap >
std::istream& gdcm::Tag::Read (
             std::istream & is )  [inline]
```

Read a tag from binary representation.

10.307.3.23 ReadFromCommaSeparatedString()

```
bool gdcm::Tag::ReadFromCommaSeparatedString (
             const char * str )
```

Read from a comma separated string. This is a highly user oriented function, the string should be formatted as↩ : 1234,5678 to specify the tag (0x1234,0x5678) The notation comes from the DICOM standard, and is handy to use from a command line program

10.307.3.24 ReadFromContinuousString()

```
bool gdcm::Tag::ReadFromContinuousString (
             const char * str )
```

Read From XML formatted tag value eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

10.307.3.25 ReadFromPipeSeparatedString()

```
bool gdcm::Tag::ReadFromPipeSeparatedString (
             const char * str )
```

Read from a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

ReadFromCommaSeparatedString

10.307.3.26 SetElement()

```
void gdcm::Tag::SetElement (
            uint16_t element )  [inline]
```

Sets the 'Element number' of the given Tag.

Examples

DuplicatePCDE.cxx, and PublicDict.cxx.

Referenced by GetPrivateCreator().

10.307.3.27 SetElementTag() [1/2]

```
void gdcm::Tag::SetElementTag (
            uint16_t group,
            uint16_t element )  [inline]
```

Sets the 'Group number' & 'Element number' of the given Tag.

10.307.3.28 SetElementTag() [2/2]

```
void gdcm::Tag::SetElementTag (
            uint32_t tag )  [inline]
```

Sets the full tag value of the given Tag.

10.307.3.29 SetGroup()

```
void gdcm::Tag::SetGroup (
            uint16_t group )  [inline]
```

Sets the 'Group number' of the given Tag.

10.307.3.30 SetPrivateCreator()

```
void gdcm::Tag::SetPrivateCreator (
            Tag const & t )  [inline]
```

Set private creator:

Examples

DuplicatePCDE.cxx.

References GetElement(), GetGroup(), and IsPrivate().

10.307.3.31 Write()

```
template<typename TSwap >
const std::ostream& gdcm::Tag::Write (
            std::ostream & os ) const  [inline]
```

Write a tag in binary rep.

Referenced by gdcm::Item::Write(), gdcm::SequenceOfFragments::Write(), and gdcm::SequenceOfItems::Write().

10.307.4 Friends And Related Function Documentation

10.307.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Tag & _val )  [friend]
```

10.307.4.2 operator>>

```
std::istream& operator>> (
            std::istream & _is,
            Tag & _val )  [friend]
```

10.307.5 Member Data Documentation

10.307.5.1 bytes

```
char gdcm::Tag::bytes[4]
```

10.307.5.2 tag

```
uint32_t gdcm::Tag::tag
```

Referenced by Tag(), operator!=(), operator<(), operator=(), and operator==().

10.307.5.3 tags

```
uint16_t gdcm::Tag::tags[2]
```

Referenced by operator<().

The documentation for this class was generated from the following file:

- gdcmTag.h

10.308 gdcm::TagPath Class Reference

class to handle a path of tag.

```
#include <gdcmTagPath.h>
```

Public Member Functions

- TagPath ()
- ~TagPath ()
- bool ConstructFromString (const char *path)
- bool ConstructFromTagList (Tag const *l, unsigned int n)

  Construct from a list of tags.
- void Print (std::ostream &) const
- bool Push (Tag const &t)
- bool Push (unsigned int itemnum)

Static Public Member Functions

- static bool IsValid (const char *path)

  Return if path is valid or not.

10.308.1 Detailed Description

class to handle a path of tag.

Any Resemblance to Existing XPath is Purely Coincidental `ftp://medical.nema.org/medical/dicom/supps/sup118_pc.pdf`

10.308.2 Constructor & Destructor Documentation

10.308.2.1 TagPath()

```
gdcm::TagPath::TagPath ( )
```

10.308.2.2 ~TagPath()

```
gdcm::TagPath::~TagPath ( )
```

10.308.3 Member Function Documentation

10.308.3.1 ConstructFromString()

```
bool gdcm::TagPath::ConstructFromString (
            const char * path )
```

"/0018,0018/"... No space allowed, comma is use to separate tag group from tag element and slash is used to separate tag return false if invalid

10.308.3.2 ConstructFromTagList()

```
bool gdcm::TagPath::ConstructFromTagList (
            Tag const * l,
            unsigned int n )
```

Construct from a list of tags.

10.308.3.3 IsValid()

```
static bool gdcm::TagPath::IsValid (
            const char * path )  [static]
```

Return if path is valid or not.

10.308.3.4 Print()

```
void gdcm::TagPath::Print (
            std::ostream &  ) const
```

10.308.3.5 Push() [1/2]

```
bool gdcm::TagPath::Push (
            Tag const & t )
```

10.308.3.6 Push() [2/2]

```
bool gdcm::TagPath::Push (
            unsigned int itemnum )
```

The documentation for this class was generated from the following file:

- gdcmTagPath.h

10.309 gdcm::Testing Class Reference

class for testing

`#include <gdcmTesting.h>`

Public Types

- typedef const char *const (* MD5DataImagesType)[2]
- typedef const char *const (* MediaStorageDataFilesType)[2]

  return the table that map the media storage (as string) of a filename (gdcmData)

Public Member Functions

- Testing ()=default
- ~Testing ()=default
- void Print (std::ostream &os=std::cout)

  Print.

Static Public Member Functions

- static bool ComputeFileMD5 (const char *filename, char digest_str[33])
- static bool ComputeMD5 (const char *buffer, size_t buf_len, char digest_str[33])
- static const char * GetDataExtraRoot ()

  Return the GDCM DATA EXTRA ROOT.
- static const char * GetDataRoot ()

  Return the GDCM DATA ROOT.
- static const char * GetFileName (unsigned int file)
- static const char *const * GetFileNames ()

  return the table of fullpath to gdcmData DICOM files:
- static int GetLossyFlagFromFile (const char *filepath)
- static const char *const * GetMD5DataImage (unsigned int file)
- static MD5DataImagesType GetMD5DataImages ()
- static const char * GetMD5FromBrokenFile (const char *filepath)
- static const char * GetMD5FromFile (const char *filepath)
- static const char *const * GetMediaStorageDataFile (unsigned int file)
- static MediaStorageDataFilesType GetMediaStorageDataFiles ()
- static const char * GetMediaStorageFromFile (const char *filepath)
- static unsigned int GetNumberOfFileNames ()
- static unsigned int GetNumberOfMD5DataImages ()
- static unsigned int GetNumberOfMediaStorageDataFiles ()
- static const char * GetPixelSpacingDataRoot ()

  Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset)
- static std::streamoff GetSelectedPrivateGroupOffsetFromFile (const char *filepath)
- static std::streamoff GetSelectedTagsOffsetFromFile (const char *filepath)
- static const char * GetSourceDirectory ()

- static std::streamoff GetStreamOffsetFromFile (const char *filepath)
- static const char * GetTempDirectory (const char *subdir=nullptr)
- static const wchar_t * GetTempDirectoryW (const wchar_t *subdir=nullptr)

  NOT THREAD SAFE.
- static const char * GetTempFilename (const char *filename, const char *subdir=nullptr)

  NOT THREAD SAFE.
- static const wchar_t * GetTempFilenameW (const wchar_t *filename, const wchar_t *subdir=nullptr)

  NOT THREAD SAFE.

10.309.1 Detailed Description

class for testing

this class is used for the nightly regression system for GDCM It makes heavily use of md5 computation

See also

gdcm::MD5 class for md5 computation

10.309.2 Member Typedef Documentation

10.309.2.1 MD5DataImagesType

```
typedef const char* const(* gdcm::Testing::MD5DataImagesType)[2]
```

return the table that map the md5 (as in md5sum) of the Pixel Data associated to a filename

10.309.2.2 MediaStorageDataFilesType

```
typedef const char* const(* gdcm::Testing::MediaStorageDataFilesType)[2]
```

return the table that map the media storage (as string) of a filename (gdcmData)

10.309.3 Constructor & Destructor Documentation

10.309.3.1 Testing()

```
gdcm::Testing::Testing ( )  [default]
```

10.309.3.2 ~Testing()

```
gdcm::Testing::~Testing ( )  [default]
```

10.309.4 Member Function Documentation

10.309.4.1 ComputeFileMD5()

```
static bool gdcm::Testing::ComputeFileMD5 (
            const char * filename,
            char digest_str[33] )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.309.4.2 ComputeMD5()

```
static bool gdcm::Testing::ComputeMD5 (
            const char * buffer,
            size_t buf_len,
            char digest_str[33] )  [static]
```

MD5 stuff digest_str needs to be at least : strlen = [2*16+1]; string will be \0 padded. (md5 are 32 bytes long) Testing is not meant to be shipped with an installed GDCM release, always prefer the gdcm::MD5 API when doing md5 computation.

10.309.4.3 GetDataExtraRoot()

```
static const char* gdcm::Testing::GetDataExtraRoot ( )  [static]
```

Return the GDCM DATA EXTRA ROOT.

Examples

DiscriminateVolume.cxx, VolumeSorter.cxx, and reslicesphere.cxx.

10.309.4.4 GetDataRoot()

```
static const char* gdcm::Testing::GetDataRoot ( )  [static]
```

Return the GDCM DATA ROOT.

Examples

Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, and MagnifyFile.cxx.

10.309.4.5 GetFileName()

```
static const char* gdcm::Testing::GetFileName (
            unsigned int file )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.309.4.6 GetFileNames()

```
static const char* const* gdcm::Testing::GetFileNames ( )  [static]
```

return the table of fullpath to gdcmData DICOM files:

Examples

TestReader.cxx.

10.309.4.7 GetLossyFlagFromFile()

```
static int gdcm::Testing::GetLossyFlagFromFile (
            const char * filepath )  [static]
```

Return the lossy flag of the given filename -1 -> Error 0 -> Lossless 1 -> Lossy

10.309.4.8 GetMD5DataImage()

```
static const char* const* gdcm::Testing::GetMD5DataImage (
            unsigned int file )  [static]
```

10.309.4.9 GetMD5DataImages()

```
static MD5DataImagesType gdcm::Testing::GetMD5DataImages ( )  [static]
```

10.309.4.10 GetMD5FromBrokenFile()

```
static const char* gdcm::Testing::GetMD5FromBrokenFile (
            const char * filepath )  [static]
```

Return what should have been the md5 of file 'filepath' This is based on current GDCM implementation to decipher a broken DICOM file.

10.309.4.11 GetMD5FromFile()

```
static const char* gdcm::Testing::GetMD5FromFile (
            const char * filepath )  [static]
```

10.309.4.12 GetMediaStorageDataFile()

```
static const char* const* gdcm::Testing::GetMediaStorageDataFile (
            unsigned int file )  [static]
```

10.309.4.13 GetMediaStorageDataFiles()

```
static MediaStorageDataFilesType gdcm::Testing::GetMediaStorageDataFiles ( )  [static]
```

10.309.4.14 GetMediaStorageFromFile()

```
static const char* gdcm::Testing::GetMediaStorageFromFile (
            const char * filepath )  [static]
```

Examples

MetaImageMD5Activiz.cs, and TestReader.cxx.

10.309.4.15 GetNumberOfFileNames()

```
static unsigned int gdcm::Testing::GetNumberOfFileNames ( )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.309.4.16 GetNumberOfMD5DataImages()

```
static unsigned int gdcm::Testing::GetNumberOfMD5DataImages ( )  [static]
```

10.309.4.17 GetNumberOfMediaStorageDataFiles()

```
static unsigned int gdcm::Testing::GetNumberOfMediaStorageDataFiles ( )  [static]
```

10.309.4.18 GetPixelSpacingDataRoot()

```
static const char* gdcm::Testing::GetPixelSpacingDataRoot ( )  [static]
```

Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset)

10.309.4.19 GetSelectedPrivateGroupOffsetFromFile()

```
static std::streamoff gdcm::Testing::GetSelectedPrivateGroupOffsetFromFile (
            const char * filepath )  [static]
```

Return the offset just after private attribute (0009,0010,"GEMS_IDEN_01") if found. Otherwise the offset of the next attribute -1 if not found

10.309.4.20 GetSelectedTagsOffsetFromFile()

```
static std::streamoff gdcm::Testing::GetSelectedTagsOffsetFromFile (
            const char * filepath )  [static]
```

Return the offset just after Pixel Data Length (7fe0,0000) if found. Otherwise the offset of the very first pixel cell in Pixel Data -1 if not found

10.309.4.21 GetSourceDirectory()

```
static const char* gdcm::Testing::GetSourceDirectory ( )  [static]
```

Examples

BasicAnonymizer.cs, and ClinicalTrialIdentificationWorkflow.cs.

10.309.4.22 GetStreamOffsetFromFile()

```
static std::streamoff gdcm::Testing::GetStreamOffsetFromFile (
            const char * filepath )  [static]
```

Return the offset of the very first pixel cell in the PixelData -1 if not found

10.309.4.23 GetTempDirectory()

```
static const char* gdcm::Testing::GetTempDirectory (
            const char * subdir = nullptr )  [static]
```

NOT THREAD SAFE Returns the temp directory as used in testing needing to output data:

Examples

MetaImageMD5Activiz.cs.

10.309.4.24 GetTempDirectoryW()

```
static const wchar_t* gdcm::Testing::GetTempDirectoryW (
            const wchar_t * subdir = nullptr )  [static]
```

NOT THREAD SAFE.

10.309.4.25 GetTempFilename()

```
static const char* gdcm::Testing::GetTempFilename (
            const char * filename,
            const char * subdir = nullptr )  [static]
```

NOT THREAD SAFE.

Examples

MetaImageMD5Activiz.cs.

10.309.4.26 GetTempFilenameW()

```
static const wchar_t* gdcm::Testing::GetTempFilenameW (
            const wchar_t * filename,
            const wchar_t * subdir = nullptr )  [static]
```

NOT THREAD SAFE.

10.309.4.27 Print()

```
void gdcm::Testing::Print (
            std::ostream & os = std::cout )
```

Print.

The documentation for this class was generated from the following file:

- gdcmTesting.h

10.310 gdcm::Trace Class Reference

Trace.

`#include <gdcmTrace.h>`

Public Member Functions

- Trace ()
- ~Trace ()

Static Public Member Functions

- static void DebugOff ()
- static void DebugOn ()
- static void ErrorOff ()
- static void ErrorOn ()
- static bool GetDebugFlag ()
- static std::ostream & GetDebugStream ()
- static bool GetErrorFlag ()
- static std::ostream & GetErrorStream ()
- static std::ostream & GetStream ()
- static bool GetWarningFlag ()
- static std::ostream & GetWarningStream ()
- static void SetDebug (bool debug)

  Turn debug messages on (default: false)
- static void SetDebugStream (std::ostream &os)

  Explicitly set the stream which receive Debug messages:
- static void SetError (bool debug)

  Turn error messages on (default: true)
- static void SetErrorStream (std::ostream &os)

  Explicitly set the stream which receive Error messages:
- static void SetStream (std::ostream &os)
- static void SetStreamToFile (const char *filename)
- static void SetWarning (bool debug)

  Turn warning messages on (default: true)
- static void SetWarningStream (std::ostream &os)

  Explicitly set the stream which receive Warning messages:
- static void WarningOff ()
- static void WarningOn ()

10.310.1 Detailed Description

Trace.

Debug / Warning and Error are encapsulated in this class by default the Trace class will redirect any debug/warning/error to std::cerr. Unless SetStream was specified with another (open) stream or SetStreamToFile was specified to a writable file on the system.

Warning

All string messages are removed during compilation time when compiled with CMAKE_BUILD_TYPE being set to either:

- Release
- MinSizeRel It is recommended to compile with RelWithDebInfo and/or Debug during prototyping of applications.

10.310.2 Constructor & Destructor Documentation

10.310.2.1 Trace()

```
gdcm::Trace::Trace ( )
```

10.310.2.2 ~Trace()

```
gdcm::Trace::~Trace ( )
```

10.310.3 Member Function Documentation

10.310.3.1 DebugOff()

```
static void gdcm::Trace::DebugOff ( )  [static]
```

Examples

MetaImageMD5Activiz.cs, and TestReader.cxx.

10.310.3.2 DebugOn()

```
static void gdcm::Trace::DebugOn ( )  [static]
```

Examples

CreateFakePET.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

10.310.3.3 ErrorOff()

```
static void gdcm::Trace::ErrorOff ( )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.310.3.4 ErrorOn()

```
static void gdcm::Trace::ErrorOn ( )  [static]
```

10.310.3.5 GetDebugFlag()

```
static bool gdcm::Trace::GetDebugFlag ( )  [static]
```

10.310.3.6 GetDebugStream()

```
static std::ostream& gdcm::Trace::GetDebugStream ( )  [static]
```

10.310.3.7 GetErrorFlag()

```
static bool gdcm::Trace::GetErrorFlag ( )  [static]
```

10.310.3.8 GetErrorStream()

```
static std::ostream& gdcm::Trace::GetErrorStream ( )  [static]
```

10.310.3.9 GetStream()

```
static std::ostream& gdcm::Trace::GetStream ( )  [static]
```

10.310.3.10 GetWarningFlag()

```
static bool gdcm::Trace::GetWarningFlag ( )  [static]
```

10.310.3.11 GetWarningStream()

```
static std::ostream& gdcm::Trace::GetWarningStream ( )  [static]
```

10.310.3.12 SetDebug()

```
static void gdcm::Trace::SetDebug (
            bool debug )  [static]
```

Turn debug messages on (default: false)

Examples

DumpToSQLITE3.cxx.

10.310.3.13 SetDebugStream()

```
static void gdcm::Trace::SetDebugStream (
            std::ostream & os )  [static]
```

Explicitly set the stream which receive Debug messages:

10.310.3.14 SetError()

```
static void gdcm::Trace::SetError (
            bool debug )  [static]
```

Turn error messages on (default: true)

10.310.3.15 SetErrorStream()

```
static void gdcm::Trace::SetErrorStream (
            std::ostream & os )  [static]
```

Explicitly set the stream which receive Error messages:

Examples

CStoreQtProgress.cxx.

10.310.3.16 SetStream()

```
static void gdcm::Trace::SetStream (
            std::ostream & os )  [static]
```

Explicitly set the ostream for gdcm::Trace to report to This will set the DebugStream, WarningStream and ErrorStream at once:

10.310.3.17 SetStreamToFile()

```
static void gdcm::Trace::SetStreamToFile (
            const char * filename )  [static]
```

Explicitly set the filename for gdcm::Trace to report to The file will be created (it will not append to existing file)

10.310.3.18 SetWarning()

```
static void gdcm::Trace::SetWarning (
            bool debug )  [static]
```

Turn warning messages on (default: true)

Examples

DumpToSQLITE3.cxx.

10.310.3.19 SetWarningStream()

```
static void gdcm::Trace::SetWarningStream (
            std::ostream & os )  [static]
```

Explicitly set the stream which receive Warning messages:

10.310.3.20 WarningOff()

```
static void gdcm::Trace::WarningOff ( )  [static]
```

Examples

MetaImageMD5Activiz.cs, and TestReader.cxx.

10.310.3.21 WarningOn()

```
static void gdcm::Trace::WarningOn ( )  [static]
```

Examples

Fake_Image_Using_Stream_Image_Writer.cxx, and StreamImageReaderTest.cxx.

The documentation for this class was generated from the following file:

- gdcmTrace.h

10.311 gdcm::TransferSyntax Class Reference

Class to manipulate Transfer Syntax.

```
#include <gdcmTransferSyntax.h>
```

Public Types

- enum NegociatedType {
  Unknown = 0 ,
  Explicit ,
  Implicit }
- enum TSType {
  ImplicitVRLittleEndian = 0 ,
  ImplicitVRBigEndianPrivateGE ,
  ExplicitVRLittleEndian ,
  DeflatedExplicitVRLittleEndian ,
  ExplicitVRBigEndian ,
  JPEGBaselineProcess1 ,
  JPEGExtendedProcess2_4 ,
  JPEGExtendedProcess3_5 ,
  JPEGSpectralSelectionProcess6_8 ,
  JPEGFullProgressionProcess10_12 ,
  JPEGLosslessProcess14 ,
  JPEGLosslessProcess14_1 ,
  JPEGLSLossless ,
  JPEGLSNearLossless ,
  JPEG2000Lossless ,
  JPEG2000 ,
  JPEG2000Part2Lossless ,
  JPEG2000Part2 ,
  RLELossless ,
  MPEG2MainProfile ,
  ImplicitVRBigEndianACRNEMA ,
  WeirdPapryus ,
  CT_private_ELE ,
  JPIPReferenced ,
  MPEG2MainProfileHighLevel ,
  MPEG4AVCH264HighProfileLevel4_1 ,
  MPEG4AVCH264BDcompatibleHighProfileLevel4_1 ,
  TS_END }

Public Member Functions

- TransferSyntax (TSType type=ImplicitVRLittleEndian)
- bool CanStoreLossy () const
- NegociatedType GetNegociatedType () const
- const char * GetString () const
- SwapCode GetSwapCode () const
- bool IsEncapsulated () const
- bool IsEncoded () const
- bool IsExplicit () const
- bool IsImplicit () const
- bool IsLossless () const
- bool IsLossy () const
- bool IsValid () const
- operator TSType () const

Static Public Member Functions

- static const char * GetTSString (TSType ts)
- static TSType GetTSType (const char *str)

Friends

- std::ostream & operator<< (std::ostream &os, const TransferSyntax &ts)

10.311.1 Detailed Description

Class to manipulate Transfer Syntax.

Note

TRANSFER SYNTAX (Standard and Private): A set of encoding rules that allow Application Entities to unambiguously negotiate the encoding techniques (e.g., Data Element structure, byte ordering, compression) they are able to support, thereby allowing these Application Entities to communicate.

Todo : The implementation is completely retarded -> see gdcm::UIDs for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

Need a notion of Private Syntax. As defined in PS 3.5. Section 9.2

See also

UIDs

Examples

GetJPEGSamplePrecision.cxx, LargeVRDSExplicit.cxx, and MakeTemplate.cxx.

10.311.2 Member Enumeration Documentation

10.311.2.1 NegociatedType

`enum gdcm::TransferSyntax::NegociatedType`

Enumerator

Unknown	
Explicit	
Implicit	

10.311.2.2 TSType

enum gdcm::TransferSyntax::TSType

Enumerator

ImplicitVRLittleEndian	
ImplicitVRBigEndianPrivateGE	
ExplicitVRLittleEndian	
DeflatedExplicitVRLittleEndian	
ExplicitVRBigEndian	
JPEGBaselineProcess1	
JPEGExtendedProcess2_4	
JPEGExtendedProcess3_5	
JPEGSpectralSelectionProcess6_8	
JPEGFullProgressionProcess10_12	
JPEGLosslessProcess14	
JPEGLosslessProcess14_1	
JPEGLSLossless	
JPEGLSNearLossless	
JPEG2000Lossless	
JPEG2000	
JPEG2000Part2Lossless	
JPEG2000Part2	
RLELossless	
MPEG2MainProfile	
ImplicitVRBigEndianACRNEMA	
WeirdPapryus	
CT_private_ELE	
JPIPReferenced	
MPEG2MainProfileHighLevel	
MPEG4AVCH264HighProfileLevel4_1	
MPEG4AVCH264BDcompatibleHighProfileLevel4_1	
TS_END	

10.311.3 Constructor & Destructor Documentation

10.311.3.1 TransferSyntax()

```
gdcm::TransferSyntax::TransferSyntax (
            TSType type = ImplicitVRLittleEndian )  [inline]
```

10.311.4 Member Function Documentation

10.311.4.1 CanStoreLossy()

```
bool gdcm::TransferSyntax::CanStoreLossy ( ) const
```

return true if TransFer Syntax Allow storing of Lossy Pixel Data

10.311.4.2 GetNegociatedType()

```
NegociatedType gdcm::TransferSyntax::GetNegociatedType ( ) const
```

10.311.4.3 GetString()

```
const char* gdcm::TransferSyntax::GetString ( ) const  [inline]
```

References GetTSString().

10.311.4.4 GetSwapCode()

```
SwapCode gdcm::TransferSyntax::GetSwapCode ( ) const
```

Deprecated Return the SwapCode associated with the Transfer Syntax. Be careful with the special GE private syntax the DataSet is written in little endian but the Pixel Data is in Big Endian.

10.311.4.5 GetTSString()

```
static const char* gdcm::TransferSyntax::GetTSString (
            TSType ts )  [static]
```

Examples

LargeVRDSExplicit.cxx.

Referenced by GetString().

10.311.4.6 GetTSType()

```
static TSType gdcm::TransferSyntax::GetTSType (
            const char * str )  [static]
```

10.311.4.7 IsEncapsulated()

```
bool gdcm::TransferSyntax::IsEncapsulated ( ) const
```

Examples

ExtractIconFromFile.cxx.

10.311.4.8 IsEncoded()

```
bool gdcm::TransferSyntax::IsEncoded ( ) const
```

10.311.4.9 IsExplicit()

```
bool gdcm::TransferSyntax::IsExplicit ( ) const
```

10.311.4.10 IsImplicit()

```
bool gdcm::TransferSyntax::IsImplicit ( ) const
```

10.311.4.11 IsLossless()

```
bool gdcm::TransferSyntax::IsLossless ( ) const
```

Return true if the transfer syntax algorithm is a lossless algorithm

10.311.4.12 IsLossy()

```
bool gdcm::TransferSyntax::IsLossy ( ) const
```

Return true if the transfer syntax algorithm is a lossy algorithm

10.311.4.13 IsValid()

```
bool gdcm::TransferSyntax::IsValid ( ) const  [inline]
```

10.311.4.14 operator TSType()

```
gdcm::TransferSyntax::operator TSType ( ) const  [inline]
```

10.311.5 Friends And Related Function Documentation

10.311.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const TransferSyntax & ts )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmTransferSyntax.h

10.312 gdcm::network::TransferSyntaxSub Class Reference

TransferSyntaxSub.

`#include <gdcmTransferSyntaxSub.h>`

Public Member Functions

- TransferSyntaxSub ()
- const char * GetName () const
- bool operator== (const TransferSyntaxSub &ts) const
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- void SetName (const char *name)
- void SetNameFromUID (UIDs::TSName tsname)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.312.1 Detailed Description

TransferSyntaxSub.

Table 9-15 TRANSFER SYNTAX SUB-ITEM FIELDS

TODO what is the goal of :

Table 9-19 TRANSFER SYNTAX SUB-ITEM FIELDS

10.312.2 Constructor & Destructor Documentation

10.312.2.1 TransferSyntaxSub()

`gdcm::network::TransferSyntaxSub::TransferSyntaxSub ( )`

10.312.3 Member Function Documentation

10.312.3.1 GetName()

```
const char* gdcm::network::TransferSyntaxSub::GetName ( ) const  [inline]
```

10.312.3.2 operator==()

```
bool gdcm::network::TransferSyntaxSub::operator== (
            const TransferSyntaxSub & ts ) const  [inline]
```

10.312.3.3 Print()

```
void gdcm::network::TransferSyntaxSub::Print (
            std::ostream & os ) const
```

10.312.3.4 Read()

```
std::istream& gdcm::network::TransferSyntaxSub::Read (
            std::istream & is )
```

10.312.3.5 SetName()

```
void gdcm::network::TransferSyntaxSub::SetName (
            const char * name )
```

10.312.3.6 SetNameFromUID()

```
void gdcm::network::TransferSyntaxSub::SetNameFromUID (
            UIDs::TSName tsname )
```

10.312.3.7 Size()

```
size_t gdcm::network::TransferSyntaxSub::Size ( ) const
```

10.312.3.8 Write()

```
const std::ostream& gdcm::network::TransferSyntaxSub::Write (
            std::ostream & os ) const
```

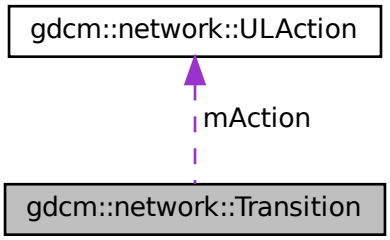
The documentation for this class was generated from the following file:

- gdcmTransferSyntaxSub.h

10.313 gdcm::network::Transition Struct Reference

```
#include <gdcmULTransitionTable.h>
```

Collaboration diagram for gdcm::network::Transition:



Public Member Functions

- Transition ()
- Transition (int inEndState, ULAction ∗inAction)
- ∼Transition ()

Static Public Member Functions

- static Transition ∗ MakeNew (int inEndState, ULAction ∗inAction)

Public Attributes

- ULAction * mAction
- int mEnd

10.313.1 Constructor & Destructor Documentation

10.313.1.1 Transition() [1/2]

```
gdcm::network::Transition::Transition ( )  [inline]
```

References gdcm::network::eStaDoesNotExist, mAction, and mEnd.

Referenced by MakeNew().

10.313.1.2 ~Transition()

```
gdcm::network::Transition::~Transition ( )  [inline]
```

References mAction.

10.313.1.3 Transition() [2/2]

```
gdcm::network::Transition::Transition (
            int inEndState,
            ULAction * inAction )  [inline]
```

References mAction, and mEnd.

10.313.2 Member Function Documentation

10.313.2.1 MakeNew()

```
static Transition* gdcm::network::Transition::MakeNew (
            int inEndState,
            ULAction * inAction )  [inline], [static]
```

References Transition().

10.313.3 Member Data Documentation

10.313.3.1 mAction

```
ULAction* gdcm::network::Transition::mAction
```

Referenced by Transition(), and ~Transition().

10.313.3.2 mEnd

```
int gdcm::network::Transition::mEnd
```

Referenced by Transition().

The documentation for this struct was generated from the following file:

- gdcmULTransitionTable.h

10.314 gdcm::Type Class Reference

Type.

```
#include <gdcmType.h>
```

Public Types

- enum TypeType {
  T1 = 0 ,
  T1C ,
  T2 ,
  T2C ,
  T3 ,
  UNKNOWN }

Public Member Functions

- Type (TypeType type=UNKNOWN)
- operator TypeType () const

Static Public Member Functions

- static const char * GetTypeString (TypeType type)
- static TypeType GetTypeType (const char *type)

Friends

- std::ostream & operator<< (std::ostream &os, const Type &vr)

10.314.1 Detailed Description

Type.

Note

PS 3.5 7.4 DATA ELEMENT TYPE 7.4.1 TYPE 1 REQUIRED DATA ELEMENTS 7.4.2 TYPE 1C CONDITIONAL DATA ELEMENTS 7.4.3 TYPE 2 REQUIRED DATA ELEMENTS 7.4.4 TYPE 2C CONDITIONAL DATA ELEMENTS 7.4.5 TYPE 3 OPTIONAL DATA ELEMENTS

The intent of Type 2 Data Elements is to allow a zero length to be conveyed when the operator or application does not know its value or has a specific reason for not specifying its value. It is the intent that the device should support these Data Elements.

10.314.2 Member Enumeration Documentation

10.314.2.1 TypeType

`enum gdcm::Type::TypeType`

Enumerator

T1	
T1C	
T2	
T2C	
T3	
UNKNOWN	

10.314.3 Constructor & Destructor Documentation

10.314.3.1 Type()

```
gdcm::Type::Type (
            TypeType type = UNKNOWN )  [inline]
```

10.314.4 Member Function Documentation

10.314.4.1 GetTypeString()

```
static const char* gdcm::Type::GetTypeString (
            TypeType type )  [static]
```

10.314.4.2 GetTypeType()

```
static TypeType gdcm::Type::GetTypeType (
            const char * type )  [static]
```

Referenced by gdcm::ModuleEntry::ModuleEntry().

10.314.4.3 operator TypeType()

```
gdcm::Type::operator TypeType ( ) const  [inline]
```

10.314.5 Friends And Related Function Documentation

10.314.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const Type & vr )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmType.h

10.315 gdcm::UI Struct Reference

`#include <gdcmVR.h>`

Public Attributes

- char Internal [64+1]

Friends

- std::ostream & operator<< (std::ostream &_os, const UI &_val)

10.315.1 Friends And Related Function Documentation

10.315.1.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const UI & _val )  [friend]
```

10.315.2 Member Data Documentation

10.315.2.1 Internal

```
char gdcm::UI::Internal[64+1]
```

The documentation for this struct was generated from the following file:

- gdcmVR.h

10.316 gdcm::UIDGenerator Class Reference

Class for generating unique UID.

`#include <gdcmUIDGenerator.h>`

Public Member Functions

- UIDGenerator ()

  By default the root of a UID is a GDCM Root...
- const char * Generate ()

Static Public Member Functions

- static const char * GetGDCMUID ()

  Return the default (GDCM) root UID:
- static const char * GetRoot ()
- static bool IsValid (const char *uid)
- static void SetRoot (const char *root)

Static Protected Member Functions

- static bool GenerateUUID (unsigned char *uuid_data)

10.316.1 Detailed Description

Class for generating unique UID.

Note

bla Usage: When constructing a Series or Study UID, user *has* to keep around the UID, otherwise the UID Generator will simply forget the value and create a new UID.

Examples

CreateJPIPDataSet.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer
GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, StreamImageReaderTest.cxx,
TemplateEmptyImage.cxx, and uid_unique.cxx.

10.316.2 Constructor & Destructor Documentation

10.316.2.1 UIDGenerator()

```
gdcm::UIDGenerator::UIDGenerator ( )  [inline]
```

By default the root of a UID is a GDCM Root...

10.316.3 Member Function Documentation

10.316.3.1 Generate()

```
const char* gdcm::UIDGenerator::Generate ( )
```

Internally uses a std::string, so two calls have the same pointer ! save into a std::string In summary do not write code like that: const char *uid1 = uid.Generate(); const char *uid2 = uid.Generate(); since uid1 == uid2

Examples

CreateJPIPDataSet.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GetSubSequenceData.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, and uid_unique.cxx.

10.316.3.2 GenerateUUID()

```
static bool gdcm::UIDGenerator::GenerateUUID (
            unsigned char * uuid_data )  [static], [protected]
```

10.316.3.3 GetGDCMUID()

```
static const char* gdcm::UIDGenerator::GetGDCMUID ( )  [static]
```

Return the default (GDCM) root UID:

10.316.3.4 GetRoot()

```
static const char* gdcm::UIDGenerator::GetRoot ( )  [static]
```

Examples

ClinicalTrialIdentificationWorkflow.cs, ReformatFile.cs, and StandardizeFiles.cs.

10.316.3.5 IsValid()

```
static bool gdcm::UIDGenerator::IsValid (
            const char * uid )  [static]
```

Find out if the string is a valid UID or not

Todo : Move that in DataStructureAndEncoding (see FileMetaInformation::CheckFileMetaInformation)

10.316.3.6 SetRoot()

```
static void gdcm::UIDGenerator::SetRoot (
            const char * root )  [static]
```

The current implementation in GDCM make use of the UUID implementation (RFC 4122) and has been successfully been tested for a root of size 26 bytes. Any longer root should work (the Generate() function will return a string), but will truncate the high bits of the 128bits UUID until the generated string fits on 64 bits. The authors disclaims any responsabitlity for garanteeing uniqueness of UIDs when the root is longer than 26 bytes.

Examples

ClinicalTrialIdentificationWorkflow.cs, ReformatFile.cs, StandardizeFiles.cs, and uid_unique.cxx.

The documentation for this class was generated from the following file:

- gdcmUIDGenerator.h

10.317 gdcm::UIDs Class Reference

all known uids

```
#include <gdcmUIDs.h>
```

Public Types

- typedef const char *const (* TransferSyntaxStringsType)[2]
- enum TSName {
  VerificationSOPClass = 1 ,
  ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM = 2 ,
  ExplicitVRLittleEndian = 3 ,
  DeflatedExplicitVRLittleEndian = 4 ,
  ExplicitVRBigEndian = 5 ,
  JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression = 6 ,
  JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only = 7 ,
  JPEGExtendedProcess35Retired = 8 ,
  JPEGSpectralSelectionNonHierarchicalProcess68Retired = 9 ,
  JPEGSpectralSelectionNonHierarchicalProcess79Retired = 10 ,
  JPEGFullProgressionNonHierarchicalProcess1012Retired = 11 ,
  JPEGFullProgressionNonHierarchicalProcess1113Retired = 12 ,
  JPEGLosslessNonHierarchicalProcess14 = 13 ,
  JPEGLosslessNonHierarchicalProcess15Retired = 14 ,
  JPEGExtendedHierarchicalProcess1618Retired = 15 ,
  JPEGExtendedHierarchicalProcess1719Retired = 16 ,
  JPEGSpectralSelectionHierarchicalProcess2022Retired = 17 ,
  JPEGSpectralSelectionHierarchicalProcess2123Retired = 18 ,
  JPEGFullProgressionHierarchicalProcess2426Retired = 19 ,
  JPEGFullProgressionHierarchicalProcess2527Retired = 20 ,
  JPEGLosslessHierarchicalProcess28Retired = 21 ,
  JPEGLosslessHierarchicalProcess29Retired = 22 ,
  JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLosslessJPEGImageCompr
  = 23 ,
  JPEGLSLosslessImageCompression = 24 ,
  JPEGLSLossyNearLosslessImageCompression = 25 ,
  JPEG2000ImageCompressionLosslessOnly = 26 ,
  JPEG2000ImageCompression = 27 ,
  JPEG2000Part2MulticomponentImageCompressionLosslessOnly = 28 ,
  JPEG2000Part2MulticomponentImageCompression = 29 ,
  JPIPReferenced = 30 ,
  JPIPReferencedDeflate = 31 ,
  MPEG2MainProfileMainLevel = 32 ,
  RLELossless = 33 ,
  RFC2557MIMEencapsulation = 34 ,
  XMLEncoding = 35 ,
  MediaStorageDirectoryStorage = 36 ,
  TalairachBrainAtlasFrameofReference = 37 ,
  SPM2T1FrameofReference = 38 ,
  SPM2T2FrameofReference = 39 ,
  SPM2PDFrameofReference = 40 ,
  SPM2EPIFrameofReference = 41 ,
  SPM2FILT1FrameofReference = 42 ,
  SPM2PETFrameofReference = 43 ,
  SPM2TRANSMFrameofReference = 44 ,
  SPM2SPECTFrameofReference = 45 ,
  SPM2GRAYFrameofReference = 46 ,
  SPM2WHITEFrameofReference = 47 ,
  SPM2CSFFrameofReference = 48 ,
  SPM2BRAINMASKFrameofReference = 49 ,

SPM2AVG305T1FrameofReference = 50 ,
SPM2AVG152T1FrameofReference = 51 ,
SPM2AVG152T2FrameofReference = 52 ,
SPM2AVG152PDFrameofReference = 53 ,
SPM2SINGLESUBJT1FrameofReference = 54 ,
ICBM452T1FrameofReference = 55 ,
ICBMSingleSubjectMRIFrameofReference = 56 ,
BasicStudyContentNotificationSOPClassRetired = 57 ,
StorageCommitmentPushModelSOPClass = 58 ,
StorageCommitmentPushModelSOPInstance = 59 ,
StorageCommitmentPullModelSOPClassRetired = 60 ,
StorageCommitmentPullModelSOPInstanceRetired = 61 ,
ProceduralEventLoggingSOPClass = 62 ,
ProceduralEventLoggingSOPInstance = 63 ,
SubstanceAdministrationLoggingSOPClass = 64 ,
SubstanceAdministrationLoggingSOPInstance = 65 ,
DICOMUIDRegistry = 66 ,
DICOMControlledTerminology = 67 ,
DICOMApplicationContextName = 68 ,
DetachedPatientManagementSOPClassRetired = 69 ,
DetachedPatientManagementMetaSOPClassRetired = 70 ,
DetachedVisitManagementSOPClassRetired = 71 ,
DetachedStudyManagementSOPClassRetired = 72 ,
StudyComponentManagementSOPClassRetired = 73 ,
ModalityPerformedProcedureStepSOPClass = 74 ,
ModalityPerformedProcedureStepRetrieveSOPClass = 75 ,
ModalityPerformedProcedureStepNotificationSOPClass = 76 ,
DetachedResultsManagementSOPClassRetired = 77 ,
DetachedResultsManagementMetaSOPClassRetired = 78 ,
DetachedStudyManagementMetaSOPClassRetired = 79 ,
DetachedInterpretationManagementSOPClassRetired = 80 ,
StorageServiceClass = 81 ,
BasicFilmSessionSOPClass = 82 ,
BasicFilmBoxSOPClass = 83 ,
BasicGrayscaleImageBoxSOPClass = 84 ,
BasicColorImageBoxSOPClass = 85 ,
ReferencedImageBoxSOPClassRetired = 86 ,
BasicGrayscalePrintManagementMetaSOPClass = 87 ,
ReferencedGrayscalePrintManagementMetaSOPClassRetired = 88 ,
PrintJobSOPClass = 89 ,
BasicAnnotationBoxSOPClass = 90 ,
PrinterSOPClass = 91 ,
PrinterConfigurationRetrievalSOPClass = 92 ,
PrinterSOPInstance = 93 ,
PrinterConfigurationRetrievalSOPInstance = 94 ,
BasicColorPrintManagementMetaSOPClass = 95 ,
ReferencedColorPrintManagementMetaSOPClassRetired = 96 ,
VOILUTBoxSOPClass = 97 ,
PresentationLUTSOPClass = 98 ,
ImageOverlayBoxSOPClassRetired = 99 ,
BasicPrintImageOverlayBoxSOPClassRetired = 100 ,
PrintQueueSOPInstanceRetired = 101 ,
PrintQueueManagementSOPClassRetired = 102 ,
StoredPrintStorageSOPClassRetired = 103 ,

HardcopyGrayscaleImageStorageSOPClassRetired = 104 ,
HardcopyColorImageStorageSOPClassRetired = 105 ,
PullPrintRequestSOPClassRetired = 106 ,
PullStoredPrintManagementMetaSOPClassRetired = 107 ,
MediaCreationManagementSOPClassUID = 108 ,
ComputedRadiographyImageStorage = 109 ,
DigitalXRayImageStorageForPresentation = 110 ,
DigitalXRayImageStorageForProcessing = 111 ,
DigitalMammographyXRayImageStorageForPresentation = 112 ,
DigitalMammographyXRayImageStorageForProcessing = 113 ,
DigitalIntraoralXRayImageStorageForPresentation = 114 ,
DigitalIntraoralXRayImageStorageForProcessing = 115 ,
CTImageStorage = 116 ,
EnhancedCTImageStorage = 117 ,
UltrasoundMultiframeImageStorageRetired = 118 ,
UltrasoundMultiframeImageStorage = 119 ,
MRImageStorage = 120 ,
EnhancedMRImageStorage = 121 ,
MRSpectroscopyStorage = 122 ,
NuclearMedicineImageStorageRetired = 123 ,
UltrasoundImageStorageRetired = 124 ,
UltrasoundImageStorage = 125 ,
SecondaryCaptureImageStorage = 126 ,
MultiframeSingleBitSecondaryCaptureImageStorage = 127 ,
MultiframeGrayscaleByteSecondaryCaptureImageStorage = 128 ,
MultiframeGrayscaleWordSecondaryCaptureImageStorage = 129 ,
MultiframeTrueColorSecondaryCaptureImageStorage = 130 ,
StandaloneOverlayStorageRetired = 131 ,
StandaloneCurveStorageRetired = 132 ,
WaveformStorageTrialRetired = 133 ,
ECG12leadWaveformStorage = 134 ,
GeneralECGWaveformStorage = 135 ,
AmbulatoryECGWaveformStorage = 136 ,
HemodynamicWaveformStorage = 137 ,
CardiacElectrophysiologyWaveformStorage = 138 ,
BasicVoiceAudioWaveformStorage = 139 ,
StandaloneModalityLUTStorageRetired = 140 ,
StandaloneVOILUTStorageRetired = 141 ,
GrayscaleSoftcopyPresentationStateStorageSOPClass = 142 ,
ColorSoftcopyPresentationStateStorageSOPClass = 143 ,
PseudoColorSoftcopyPresentationStateStorageSOPClass = 144 ,
BlendingSoftcopyPresentationStateStorageSOPClass = 145 ,
XRayAngiographicImageStorage = 146 ,
EnhancedXAImageStorage = 147 ,
XRayRadiofluoroscopicImageStorage = 148 ,
EnhancedXRFImageStorage = 149 ,
XRay3DAngiographicImageStorage = 150 ,
XRay3DCraniofacialImageStorage = 151 ,
XRayAngiographicBiPlaneImageStorageRetired = 152 ,
NuclearMedicineImageStorage = 153 ,
RawDataStorage = 154 ,
SpatialRegistrationStorage = 155 ,
SpatialFiducialsStorage = 156 ,
DeformableSpatialRegistrationStorage = 157 ,

SegmentationStorage = 158 ,
RealWorldValueMappingStorage = 159 ,
VLImageStorageTrialRetired = 160 ,
VLMultiframeImageStorageTrialRetired = 161 ,
VLEndoscopicImageStorage = 162 ,
VideoEndoscopicImageStorage = 163 ,
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uid_1_2_840_10008_5_1_4_1_1_4_3 = 408 ,
uid_1_2_840_10008_15_1_1 = 409 }

Public Member Functions

- const char * GetName () const
- const char * GetString () const
- operator TSType () const
- bool SetFromUID (const char *str)

Static Public Member Functions

- static unsigned int GetNumberOfTransferSyntaxStrings ()
- static const char *const * GetTransferSyntaxString (unsigned int ts)
- static TransferSyntaxStringsType GetTransferSyntaxStrings ()
- static const char * GetUIDName (unsigned int ts)
- static const char * GetUIDString (unsigned int ts)

10.317.1 Detailed Description

all known uids

Examples

GenerateStandardSOPClasses.cxx.

10.317.2 Member Typedef Documentation

10.317.2.1 TransferSyntaxStringsType

```
typedef const char* const(* gdcm::UIDs::TransferSyntaxStringsType)[2]
```

10.317.3 Member Enumeration Documentation

10.317.3.1 TSName

enum gdcm::UIDs::TSName

Enumerator

VerificationSOPClass	
ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM	
ExplicitVRLittleEndian	
DeflatedExplicitVRLittleEndian	
ExplicitVRBigEndian	
JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression	
JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only	
JPEGExtendedProcess35Retired	
JPEGSpectralSelectionNonHierarchicalProcess68Retired	
JPEGSpectralSelectionNonHierarchicalProcess79Retired	
JPEGFullProgressionNonHierarchicalProcess1012Retired	
JPEGFullProgressionNonHierarchicalProcess1113Retired	
JPEGLosslessNonHierarchicalProcess14	
JPEGLosslessNonHierarchicalProcess15Retired	
JPEGExtendedHierarchicalProcess1618Retired	
JPEGExtendedHierarchicalProcess1719Retired	
JPEGSpectralSelectionHierarchicalProcess2022Retired	
JPEGSpectralSelectionHierarchicalProcess2123Retired	
JPEGFullProgressionHierarchicalProcess2426Retired	
JPEGFullProgressionHierarchicalProcess2527Retired	
JPEGLosslessHierarchicalProcess28Retired	
JPEGLosslessHierarchicalProcess29Retired	
JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLossless↩ JPEGImageCompression	
JPEGLSLosslessImageCompression	
JPEGLSLossyNearLosslessImageCompression	
JPEG2000ImageCompressionLosslessOnly	
JPEG2000ImageCompression	
JPEG2000Part2MulticomponentImageCompressionLosslessOnly	
JPEG2000Part2MulticomponentImageCompression	
JPIPReferenced	
JPIPReferencedDeflate	
MPEG2MainProfileMainLevel	
RLELossless	
RFC2557MIMEencapsulation	
XMLEncoding	

Enumerator

MediaStorageDirectoryStorage	
TalairachBrainAtlasFrameofReference	
SPM2T1FrameofReference	
SPM2T2FrameofReference	
SPM2PDFrameofReference	
SPM2EPIFrameofReference	
SPM2FILT1FrameofReference	
SPM2PETFrameofReference	
SPM2TRANSMFrameofReference	
SPM2SPECTFrameofReference	
SPM2GRAYFrameofReference	
SPM2WHITEFrameofReference	
SPM2CSFFrameofReference	
SPM2BRAINMASKFrameofReference	
SPM2AVG305T1FrameofReference	
SPM2AVG152T1FrameofReference	
SPM2AVG152T2FrameofReference	
SPM2AVG152PDFrameofReference	
SPM2SINGLESUBJT1FrameofReference	
ICBM452T1FrameofReference	
ICBMSingleSubjectMRIFrameofReference	
BasicStudyContentNotificationSOPClassRetired	
StorageCommitmentPushModelSOPClass	
StorageCommitmentPushModelSOPInstance	
StorageCommitmentPullModelSOPClassRetired	
StorageCommitmentPullModelSOPInstanceRetired	
ProceduralEventLoggingSOPClass	
ProceduralEventLoggingSOPInstance	
SubstanceAdministrationLoggingSOPClass	
SubstanceAdministrationLoggingSOPInstance	
DICOMUIDRegistry	
DICOMControlledTerminology	
DICOMApplicationContextName	
DetachedPatientManagementSOPClassRetired	
DetachedPatientManagementMetaSOPClassRetired	
DetachedVisitManagementSOPClassRetired	
DetachedStudyManagementSOPClassRetired	
StudyComponentManagementSOPClassRetired	
ModalityPerformedProcedureStepSOPClass	
ModalityPerformedProcedureStepRetrieveSOPClass	
ModalityPerformedProcedureStepNotificationSOPClass	
DetachedResultsManagementSOPClassRetired	
DetachedResultsManagementMetaSOPClassRetired	
DetachedStudyManagementMetaSOPClassRetired	

Enumerator

DetachedInterpretationManagementSOPClassRetired	
StorageServiceClass	
BasicFilmSessionSOPClass	
BasicFilmBoxSOPClass	
BasicGrayscaleImageBoxSOPClass	
BasicColorImageBoxSOPClass	
ReferencedImageBoxSOPClassRetired	
BasicGrayscalePrintManagementMetaSOPClass	
ReferencedGrayscalePrintManagementMetaSOPClassRetired	
PrintJobSOPClass	
BasicAnnotationBoxSOPClass	
PrinterSOPClass	
PrinterConfigurationRetrievalSOPClass	
PrinterSOPInstance	
PrinterConfigurationRetrievalSOPInstance	
BasicColorPrintManagementMetaSOPClass	
ReferencedColorPrintManagementMetaSOPClassRetired	
VOILUTBoxSOPClass	
PresentationLUTSOPClass	
ImageOverlayBoxSOPClassRetired	
BasicPrintImageOverlayBoxSOPClassRetired	
PrintQueueSOPInstanceRetired	
PrintQueueManagementSOPClassRetired	
StoredPrintStorageSOPClassRetired	
HardcopyGrayscaleImageStorageSOPClassRetired	
HardcopyColorImageStorageSOPClassRetired	
PullPrintRequestSOPClassRetired	
PullStoredPrintManagementMetaSOPClassRetired	
MediaCreationManagementSOPClassUID	
ComputedRadiographyImageStorage	
DigitalXRayImageStorageForPresentation	
DigitalXRayImageStorageForProcessing	
DigitalMammographyXRayImageStorageForPresentation	
DigitalMammographyXRayImageStorageForProcessing	
DigitalIntraoralXRayImageStorageForPresentation	
DigitalIntraoralXRayImageStorageForProcessing	
CTImageStorage	
EnhancedCTImageStorage	
UltrasoundMultiframeImageStorageRetired	
UltrasoundMultiframeImageStorage	
MRImageStorage	
EnhancedMRImageStorage	
MRSpectroscopyStorage	

Enumerator

NuclearMedicineImageStorageRetired	
UltrasoundImageStorageRetired	
UltrasoundImageStorage	
SecondaryCaptureImageStorage	
MultiframeSingleBitSecondaryCaptureImageStorage	
MultiframeGrayscaleByteSecondaryCaptureImageStorage	
MultiframeGrayscaleWordSecondaryCaptureImageStorage	
MultiframeTrueColorSecondaryCaptureImageStorage	
StandaloneOverlayStorageRetired	
StandaloneCurveStorageRetired	
WaveformStorageTrialRetired	
ECG12leadWaveformStorage	
GeneralECGWaveformStorage	
AmbulatoryECGWaveformStorage	
HemodynamicWaveformStorage	
CardiacElectrophysiologyWaveformStorage	
BasicVoiceAudioWaveformStorage	
StandaloneModalityLUTStorageRetired	
StandaloneVOILUTStorageRetired	
GrayscaleSoftcopyPresentationStateStorageSOPClass	
ColorSoftcopyPresentationStateStorageSOPClass	
PseudoColorSoftcopyPresentationStateStorageSOPClass	
BlendingSoftcopyPresentationStateStorageSOPClass	
XRayAngiographicImageStorage	
EnhancedXAImageStorage	
XRayRadiofluoroscopicImageStorage	
EnhancedXRFImageStorage	
XRay3DAngiographicImageStorage	
XRay3DCraniofacialImageStorage	
XRayAngiographicBiPlaneImageStorageRetired	
NuclearMedicineImageStorage	
RawDataStorage	
SpatialRegistrationStorage	
SpatialFiducialsStorage	
DeformableSpatialRegistrationStorage	
SegmentationStorage	
RealWorldValueMappingStorage	
VLImageStorageTrialRetired	
VLMultiframeImageStorageTrialRetired	
VLEndoscopicImageStorage	
VideoEndoscopicImageStorage	
VLMicroscopicImageStorage	
VideoMicroscopicImageStorage	

Enumerator

VLSlideCoordinatesMicroscopicImageStorage	
VLPhotographicImageStorage	
VideoPhotographicImageStorage	
OphthalmicPhotography8BitImageStorage	
OphthalmicPhotography16BitImageStorage	
StereometricRelationshipStorage	
OphthalmicTomographyImageStorage	
TextSRStorageTrialRetired	
AudioSRStorageTrialRetired	
DetailSRStorageTrialRetired	
ComprehensiveSRStorageTrialRetired	
BasicTextSRStorage	
EnhancedSRStorage	
ComprehensiveSRStorage	
ProcedureLogStorage	
MammographyCADSRStorage	
KeyObjectSelectionDocumentStorage	
ChestCADSRStorage	
XRayRadiationDoseSRStorage	
EncapsulatedPDFStorage	
EncapsulatedCDAStorage	
PositronEmissionTomographyImageStorage	
StandalonePETCurveStorageRetired	
RTImageStorage	
RTDoseStorage	
RTStructureSetStorage	
RTBeamsTreatmentRecordStorage	
RTPlanStorage	
RTBrachyTreatmentRecordStorage	
RTTreatmentSummaryRecordStorage	
RTIonPlanStorage	
RTIonBeamsTreatmentRecordStorage	
PatientRootQueryRetrieveInformationModelFIND	
PatientRootQueryRetrieveInformationModelMOVE	
PatientRootQueryRetrieveInformationModelGET	
StudyRootQueryRetrieveInformationModelFIND	
StudyRootQueryRetrieveInformationModelMOVE	
StudyRootQueryRetrieveInformationModelGET	
PatientStudyOnlyQueryRetrieveInformationModelFINDRetired	
PatientStudyOnlyQueryRetrieveInformationModelMOVERetired	
PatientStudyOnlyQueryRetrieveInformationModelGETRetired	
ModalityWorklistInformationModelFIND	
GeneralPurposeWorklistInformationModelFIND	

Enumerator

GeneralPurposeScheduledProcedureStepSOPClass	
GeneralPurposePerformedProcedureStepSOPClass	
GeneralPurposeWorklistManagementMetaSOPClass	
InstanceAvailabilityNotificationSOPClass	
RTBeamsDeliveryInstructionStorageSupplement74FrozenDraft	
RTConventionalMachineVerificationSupplement74FrozenDraft	
RTIonMachineVerificationSupplement74FrozenDraft	
UnifiedWorklistandProcedureStepServiceClass	
UnifiedProcedureStepPushSOPClass	
UnifiedProcedureStepWatchSOPClass	
UnifiedProcedureStepPullSOPClass	
UnifiedProcedureStepEventSOPClass	
UnifiedWorklistandProcedureStepSOPInstance	
GeneralRelevantPatientInformationQuery	
BreastImagingRelevantPatientInformationQuery	
CardiacRelevantPatientInformationQuery	
HangingProtocolStorage	
HangingProtocolInformationModelFIND	
HangingProtocolInformationModelMOVE	
ProductCharacteristicsQuerySOPClass	
SubstanceApprovalQuerySOPClass	
dicomDeviceName	
dicomDescription	
dicomManufacturer	
dicomManufacturerModelName	
dicomSoftwareVersion	
dicomVendorData	
dicomAETitle	
dicomNetworkConnectionReference	
dicomApplicationCluster	
dicomAssociationInitiator	
dicomAssociationAcceptor	
dicomHostname	
dicomPort	
dicomSOPClass	
dicomTransferRole	
dicomTransferSyntax	
dicomPrimaryDeviceType	
dicomRelatedDeviceReference	
dicomPreferredCalledAETitle	
dicomTLSCyphersuite	
dicomAuthorizedNodeCertificateReference	
dicomThisNodeCertificateReference	
dicomInstalled	

Enumerator

dicomStationName	
dicomDeviceSerialNumber	
dicomInstitutionName	
dicomInstitutionAddress	
dicomInstitutionDepartmentName	
dicomIssuerOfPatientID	
dicomPreferredCallingAETitle	
dicomSupportedCharacterSet	
dicomConfigurationRoot	
dicomDevicesRoot	
dicomUniqueAETitlesRegistryRoot	
dicomDevice	
dicomNetworkAE	
dicomNetworkConnection	
dicomUniqueAETitle	
dicomTransferCapability	
VLWholeSlideMicroscopyImageStorage	
EnhancedUSVolumeStorage	
SurfaceSegmentationStorage	
BreastTomosynthesisImageStorage	
LegacyConvertedEnhancedCTImageStorage	
LegacyConvertedEnhancedMRImageStorage	
LegacyConvertedEnhancedPETImageStorage	
MPEG2MainProfileHighLevel	
MPEG4AVCH_264HighProfileLevel4_1	
MPEG4AVCH_264BDcompatibleHighProfileLevel4_1	
PETColorPaletteSOPInstance	
HotMetalBlueColorPaletteSOPInstance	
PET20StepColorPaletteSOPInstance	
SpringColorPaletteSOPInstance	
SummerColorPaletteSOPInstance	
FallColorPaletteSOPInstance	
WinterColorPaletteSOPInstance	
Papyrus3ImplicitVRLittleEndian	
AdultMouseAnatomyOntology	
UberonOntology	
IntegratedTaxonomicInformationSystemITISTaxonomicSerialNumberTSN	
MouseGenomeInitiativeMGI	
PubChemCompoundCID	
ICD11	
NewYorkUniversityMelanomaClinicalCooperativeGroup	
MayoClinicNonradiologicalImagesSBSAnatomicalSurfaceRegionGuide	
ImageBiomarkerStandardisationInitiative	
RadiomicsOntology	

Enumerator

DisplaySystemSOPClass	
DisplaySystemSOPInstance	
GeneralAudioWaveformStorage	
ArterialPulseWaveformStorage	
RespiratoryWaveformStorage	
XAXRFGrayscaleSoftcopyPresentationStateStorage	
GrayscalePlanarMPRVolumetricPresentationStateStorage	
MPEG4AVCH_264HighProfileLevel4_2For2DVideo	
MPEG4AVCH_264HighProfileLevel4_2For3DVideo	
MPEG4AVCH_264StereoHighProfileLevel4_2	
HEVCH_265MainProfileLevel5_1	
HEVCH_265Main10ProfileLevel5_1	
HotIronColorPaletteSOPInstance	
CompositingPlanarMPRVolumetricPresentationStateStorage	
AdvancedBlendingPresentationStateStorage	
VolumeRenderingVolumetricPresentationStateStorage	
SegmentedVolumeRenderingVolumetricPresentationStateStorage	
MultipleVolumeRenderingVolumetricPresentationStateStorage	
Null0	
BreastProjectionXRayImageStorageForPresentation	
BreastProjectionXRayImageStorageForProcessing	
IntravascularOpticalCoherenceTomographyImageStorageForPresentation	
IntravascularOpticalCoherenceTomographyImageStorageForProcessing	
ParametricMapStorage	
Null1	
TractographyResultsStorage	
SurfaceScanMeshStorage	
SurfaceScanPointCloudStorage	
WideFieldOphthalmicPhotographyStereographicProjectionImageStorage	
WideFieldOphthalmicPhotography3DCoordinatesImageStorage	
OphthalmicOpticalCoherenceTomographyEnFaceImageStorage	
OphthalmicOpticalCoherenceTomographyBscanVolumeAnalysisStorage	
LensometryMeasurementsStorage	
AutorefractionMeasurementsStorage	
KeratometryMeasurementsStorage	
SubjectiveRefractionMeasurementsStorage	
VisualAcuityMeasurementsStorage	
SpectaclePrescriptionReportStorage	
OphthalmicAxialMeasurementsStorage	
IntraocularLensCalculationsStorage	
MacularGridThicknessandVolumeReportStorage	
OphthalmicVisualFieldStaticPerimetryMeasurementsStorage	
OphthalmicThicknessMapStorage	

Enumerator

CornealTopographyMapStorage	
Comprehensive3DSRStorage	
ExtensibleSRStorage	
RadiopharmaceuticalRadiationDoseSRStorage	
ColonCADSRStorage	
ImplantationPlanSRStorage	
AcquisitionContextSRStorage	
SimplifiedAdultEchoSRStorage	
PatientRadiationDoseSRStorage	
PlannedImagingAgentAdministrationSRStorage	
PerformedImagingAgentAdministrationSRStorage	
ContentAssessmentResultsStorage	
EncapsulatedSTLStorage	
EnhancedPETImageStorage	
BasicStructuredDisplayStorage	
CTDefinedProcedureProtocolStorage	
CTPerformedProcedureProtocolStorage	
ProtocolApprovalStorage	
ProtocolApprovalInformationModelFIND	
ProtocolApprovalInformationModelMOVE	
ProtocolApprovalInformationModelGET	
RTPhysicianIntentStorage	
RTSegmentAnnotationStorage	
DICOSCTImageStorage	
DICOSDigitalXRayImageStorageForPresentation	
DICOSDigitalXRayImageStorageForProcessing	
DICOSThreatDetectionReportStorage	
DICOS2DAITStorage	
DICOS3DAITStorage	
DICOSQuadrupoleResonanceQRStorage	
EddyCurrentImageStorage	
EddyCurrentMultiframeImageStorage	
CompositeInstanceRootRetrieveMOVE	
CompositeInstanceRootRetrieveGET	
CompositeInstanceRetrieveWithoutBulkDataGET	
DefinedProcedureProtocolInformationModelFIND	
DefinedProcedureProtocolInformationModelMOVE	
DefinedProcedureProtocolInformationModelGET	
UPSFilteredGlobalSubscriptionSOPInstance	
UnifiedWorklistandProcedureStepServiceClass1	
UnifiedProcedureStepPushSOPClass1	
UnifiedProcedureStepWatchSOPClass1	
UnifiedProcedureStepPullSOPClass1	

Enumerator

UnifiedProcedureStepEventSOPClass1	
RTBeamsDeliveryInstructionStorage	
RTConventionalMachineVerification	
RTIonMachineVerification	
RTBrachyApplicationSetupDeliveryInstructionStorage	
HangingProtocolInformationModelGET	
ColorPaletteStorage	
ColorPaletteQueryRetrieveInformationModelFIND	
ColorPaletteQueryRetrieveInformationModelMOVE	
ColorPaletteQueryRetrieveInformationModelGET	
GenericImplantTemplateStorage	
GenericImplantTemplateInformationModelFIND	
GenericImplantTemplateInformationModelMOVE	
GenericImplantTemplateInformationModelGET	
ImplantAssemblyTemplateStorage	
ImplantAssemblyTemplateInformationModelFIND	
ImplantAssemblyTemplateInformationModelMOVE	
ImplantAssemblyTemplateInformationModelGET	
ImplantTemplateGroupStorage	
ImplantTemplateGroupInformationModelFIND	
ImplantTemplateGroupInformationModelMOVE	
ImplantTemplateGroupInformationModelGET	
NativeDICOMModel	
AbstractMultiDimensionalImageModel	
DICOMContentMappingResource	
EnhancedMRColorImageStorage	
UniversalCoordinatedTime	

10.317.3.2 TSType

`enum gdcm::UIDs::TSType`

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Enumerator

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Enumerator

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Enumerator

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uid_1_2_840_10008_15_0_3_16	
uid_1_2_840_10008_15_0_3_17	
uid_1_2_840_10008_15_0_3_18	
uid_1_2_840_10008_15_0_3_19	
uid_1_2_840_10008_15_0_3_20	
uid_1_2_840_10008_15_0_3_21	
uid_1_2_840_10008_15_0_3_22	
uid_1_2_840_10008_15_0_3_23	
uid_1_2_840_10008_15_0_3_24	
uid_1_2_840_10008_15_0_3_25	
uid_1_2_840_10008_15_0_3_26	
uid_1_2_840_10008_15_0_3_27	
uid_1_2_840_10008_15_0_3_28	
uid_1_2_840_10008_15_0_3_29	
uid_1_2_840_10008_15_0_3_30	
uid_1_2_840_10008_15_0_3_31	
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uid_1_2_840_10008_15_0_4_2	
uid_1_2_840_10008_15_0_4_3	
uid_1_2_840_10008_15_0_4_4	
uid_1_2_840_10008_15_0_4_5	
uid_1_2_840_10008_15_0_4_6	
uid_1_2_840_10008_15_0_4_7	
uid_1_2_840_10008_15_0_4_8	
uid_1_2_840_10008_5_1_4_1_1_77_1_6	
uid_1_2_840_10008_5_1_4_1_1_6_2	
uid_1_2_840_10008_5_1_4_1_1_66_5	
uid_1_2_840_10008_5_1_4_1_1_13_1_3	
uid_1_2_840_10008_5_1_4_1_1_2_2	
uid_1_2_840_10008_5_1_4_1_1_4_4	
uid_1_2_840_10008_5_1_4_1_1_128_1	
uid_1_2_840_10008_1_2_4_101	
uid_1_2_840_10008_1_2_4_102	

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uid_1_2_840_10008_1_5_6	
uid_1_2_840_10008_1_5_7	
uid_1_2_840_10008_1_5_8	
uid_1_2_840_10008_1_20	
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uid_1_2_840_10008_2_16_7	
uid_1_2_840_10008_2_16_8	
uid_1_2_840_10008_2_16_9	
uid_1_2_840_10008_2_16_10	
uid_1_2_840_10008_2_16_11	
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uid_1_2_840_10008_2_16_13	
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uid_1_2_840_10008_5_1_4_1_1_40	
uid_1_2_840_10008_5_1_4_1_1_66_6	
uid_1_2_840_10008_5_1_4_1_1_68_1	

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uid_1_2_840_10008_5_1_4_1_1_77_1_5_5	
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uid_1_2_840_10008_5_1_4_1_1_82_1	
uid_1_2_840_10008_5_1_4_1_1_88_34	
uid_1_2_840_10008_5_1_4_1_1_88_35	
uid_1_2_840_10008_5_1_4_1_1_88_68	
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uid_1_2_840_10008_5_1_4_1_1_481_11	
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uid_1_2_840_10008_5_1_4_1_1_501_3	

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uid_1_2_840_10008_5_1_4_45_4	
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uid_1_2_840_10008_7_1_2	
uid_1_2_840_10008_8_1_1	
uid_1_2_840_10008_5_1_4_1_1_4_3	
uid_1_2_840_10008_15_1_1	

10.317.4 Member Function Documentation

10.317.4.1 GetName()

```
const char* gdcm::UIDs::GetName ( ) const
```

When object is Initialize function return the well known name associated with uid return NULL when not initialized

Examples

GenerateStandardSOPClasses.cxx.

Referenced by gdcm::operator<<().

10.317.4.2 GetNumberOfTransferSyntaxStrings()

```
static unsigned int gdcm::UIDs::GetNumberOfTransferSyntaxStrings ( )  [static]
```

10.317.4.3 GetString()

```
const char* gdcm::UIDs::GetString ( ) const
```

When object is Initialize function return the uid return NULL when not initialized

Examples

GenerateStandardSOPClasses.cxx.

Referenced by gdcm::operator<<().

10.317.4.4 GetTransferSyntaxString()

```
static const char* const* gdcm::UIDs::GetTransferSyntaxString (
            unsigned int ts )  [static]
```

10.317.4.5 GetTransferSyntaxStrings()

```
static TransferSyntaxStringsType gdcm::UIDs::GetTransferSyntaxStrings ( )  [static]
```

10.317.4.6 GetUIDName()

```
static const char* gdcm::UIDs::GetUIDName (
            unsigned int ts )  [static]
```

10.317.4.7 GetUIDString()

```
static const char* gdcm::UIDs::GetUIDString (
            unsigned int ts )  [static]
```

10.317.4.8 operator TSType()

```
gdcm::UIDs::operator TSType ( ) const  [inline]
```

10.317.4.9 SetFromUID()

```
bool gdcm::UIDs::SetFromUID (
            const char * str )
```

Initialize object from a string (a uid number) return false on error, and internal state is set to 0

Examples

GenerateStandardSOPClasses.cxx.

The documentation for this class was generated from the following file:

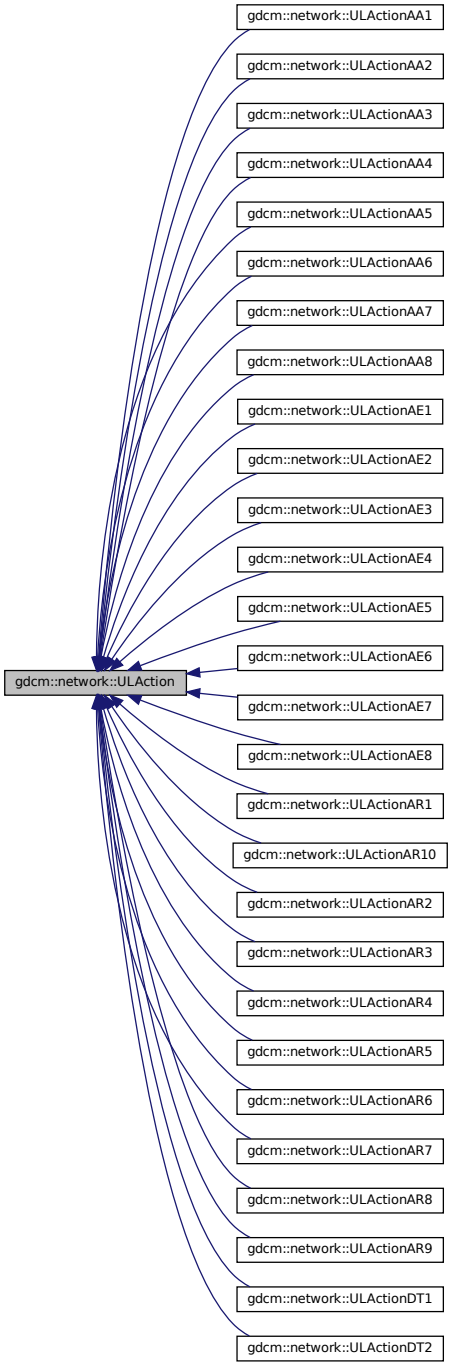
- gdcmUIDs.h

10.318 gdcm::network::ULAction Class Reference

ULAction.

`#include <gdcmULAction.h>`

Inheritance diagram for gdcm::network::ULAction:



Public Member Functions

- ULAction ()=default
- ULAction (const ULAction &inAction)=delete
- virtual ~ULAction ()=default
- void operator= (const ULAction &)=delete
- virtual EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaiting↩ ForEvent, EEventID &outRaisedEvent)=0

10.318.1 Detailed Description

ULAction.

A ULConnection in a given ULState can perform certain ULActions. This base class provides the interface for running those ULActions on a given ULConnection.

Essentially, the ULConnectionManager will take this object, determined from the current ULState of the ULConnection, and pass the ULConnection object to the ULAction. The ULAction will then invoke whatever necessary commands are required by a given action.

The result of a ULAction is a ULEvent (ie, what happened as a result of the action).

This ULEvent is passed to the ULState, so that the transition to the next state can occur.

Actions are associated with Payloads – be those filestreams, AETitles to establish connections, whatever. The actual parameters that the user will pass via an action will come through a Payload object, which should, in itself, be some gdcm-based object (but not all objects can be payloads; sending a single dataelement as a payload isn't meaningful). As such, each action has its own particular payload.

For the sake of keeping files together, both the particular payload class and the action class will be defined in the same header file. Payloads should JUST be data (or streams), NO METHODS.

Some actions perform changes that should raise events on the local system, and some actions perform changes that will require waiting for events from the remote system.

Therefore, this base action has been modified so that those events are set by each action. When the event loop runs an action, it will then test to see if a local event was raised by the action, and if so, perform the appropriate subsequent action. If the action requires waiting for a response from the remote system, then the event loop will sit there (presumably with the ARTIM timer running) and wait for a response from the remote system. Once a response is obtained, then the the rest of the state transitions can happen.

10.318.2 Constructor & Destructor Documentation

10.318.2.1 ULAction() [1/2]

```
gdcm::network::ULAction::ULAction ( )  [default]
```

10.318.2.2 ~ULAction()

```
virtual gdcm::network::ULAction::~ULAction ( )  [virtual], [default]
```

10.318.2.3 ULAction() [2/2]

```
gdcm::network::ULAction::ULAction (
            const ULAction & inAction )  [delete]
```

10.318.3 Member Function Documentation

10.318.3.1 operator=()

```
void gdcm::network::ULAction::operator= (
            const ULAction &  )  [delete]
```

10.318.3.2 PerformAction()

```
virtual EStateID gdcm::network::ULAction::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [pure virtual]
```

Implemented in gdcm::network::ULActionDT2, gdcm::network::ULActionDT1, gdcm::network::ULActionAR10, gdcm::network::ULActionAR9, gdcm::network::ULActionAR8, gdcm::network::ULActionAR7, gdcm::network::ULActionAR6, gdcm::network::ULActionAR5, gdcm::network::ULActionAR4, gdcm::network::ULActionAR3, gdcm::network::ULActionAR2, gdcm::network::ULActionAR1, gdcm::network::ULActionAE8, gdcm::network::ULActionAE7, gdcm::network::ULActionAE6, gdcm::network::ULActionAE5, gdcm::network::ULActionAE4, gdcm::network::ULActionAE3, gdcm::network::ULActionAE2, gdcm::network::ULActionAE1, gdcm::network::ULActionAA8, gdcm::network::ULActionAA7, gdcm::network::ULActionAA6, gdcm::network::ULActionAA5, gdcm::network::ULActionAA4, gdcm::network::ULActionAA3, gdcm::network::ULActionAA2, and gdcm::network::ULActionAA1.

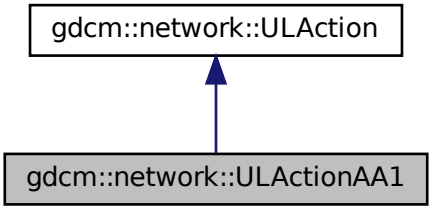
The documentation for this class was generated from the following file:

- gdcmULAction.h

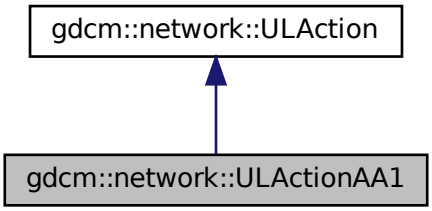
10.319 gdcm::network::ULActionAA1 Class Reference

`#include <gdcmULActionAA.h>`

Inheritance diagram for gdcm::network::ULActionAA1:



Collaboration diagram for gdcm::network::ULActionAA1:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.319.1 Member Function Documentation

10.319.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA1::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

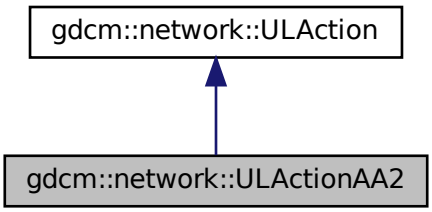
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

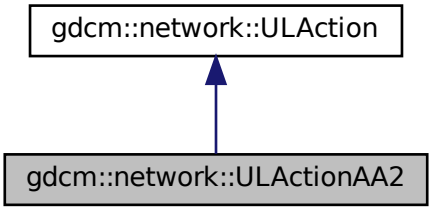
10.320 gdcm::network::ULActionAA2 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA2:



Collaboration diagram for gdcm::network::ULActionAA2:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.320.1 Member Function Documentation

10.320.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA2::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

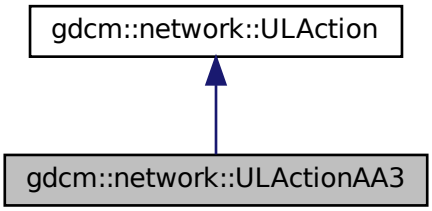
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

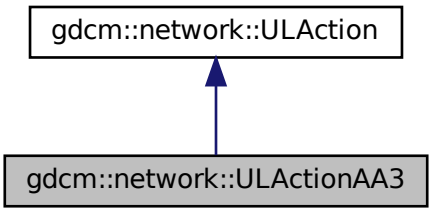
10.321 gdcm::network::ULActionAA3 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA3:



Collaboration diagram for gdcm::network::ULActionAA3:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.321.1 Member Function Documentation

10.321.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA3::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

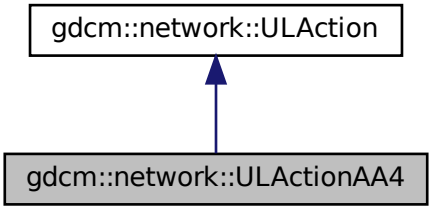
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

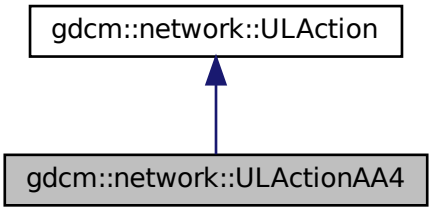
10.322 gdcm::network::ULActionAA4 Class Reference

`#include <gdcmULActionAA.h>`

Inheritance diagram for gdcm::network::ULActionAA4:



Collaboration diagram for gdcm::network::ULActionAA4:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.322.1 Member Function Documentation

10.322.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA4::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

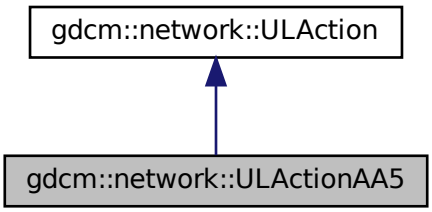
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

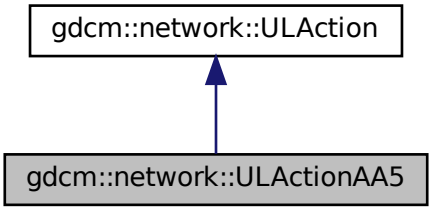
10.323 gdcm::network::ULActionAA5 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA5:



Collaboration diagram for gdcm::network::ULActionAA5:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.323.1 Member Function Documentation

10.323.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA5::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

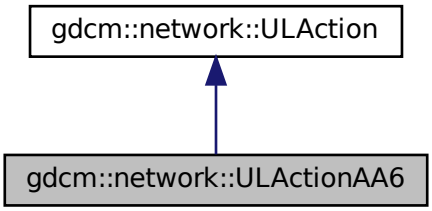
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

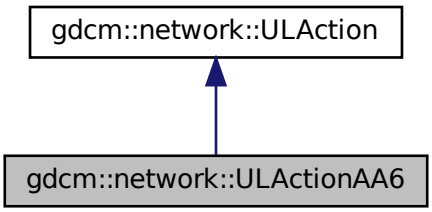
10.324 gdcm::network::ULActionAA6 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA6:



Collaboration diagram for gdcm::network::ULActionAA6:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.324.1 Member Function Documentation

10.324.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA6::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

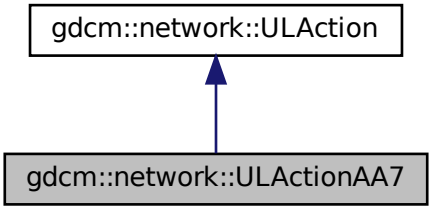
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

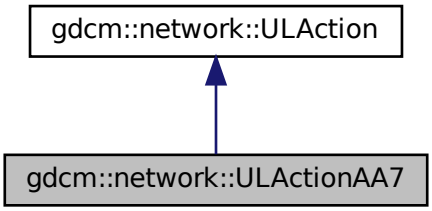
10.325 gdcm::network::ULActionAA7 Class Reference

`#include <gdcmULActionAA.h>`

Inheritance diagram for gdcm::network::ULActionAA7:



Collaboration diagram for gdcm::network::ULActionAA7:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.325.1 Member Function Documentation

10.325.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA7::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

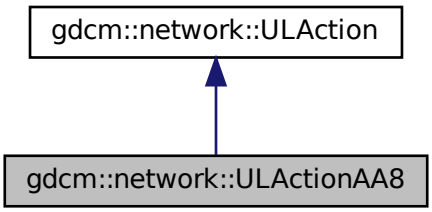
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

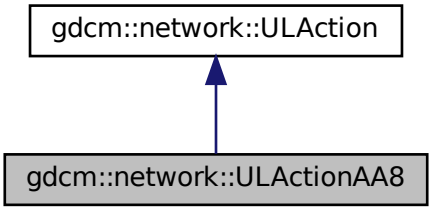
10.326 gdcm::network::ULActionAA8 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA8:



Collaboration diagram for gdcm::network::ULActionAA8:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.326.1 Member Function Documentation

10.326.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA8::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

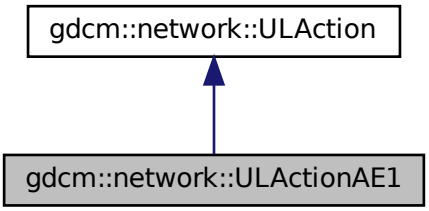
The documentation for this class was generated from the following file:

- gdcmULActionAA.h

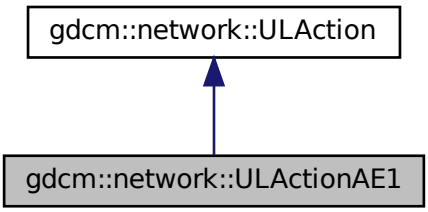
10.327 gdcm::network::ULActionAE1 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE1:



Collaboration diagram for gdcm::network::ULActionAE1:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.327.1 Member Function Documentation

10.327.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE1::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

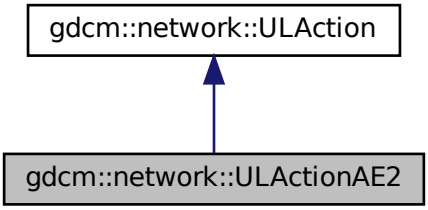
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

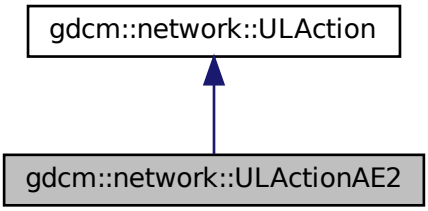
10.328 gdcm::network::ULActionAE2 Class Reference

`#include <gdcmULActionAE.h>`

Inheritance diagram for gdcm::network::ULActionAE2:



Collaboration diagram for gdcm::network::ULActionAE2:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.328.1 Member Function Documentation

10.328.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE2::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

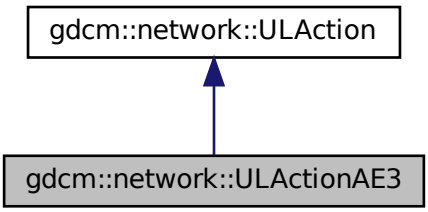
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

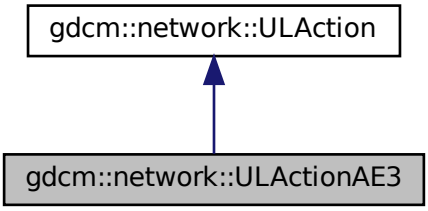
10.329 gdcm::network::ULActionAE3 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE3:



Collaboration diagram for gdcm::network::ULActionAE3:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.329.1 Member Function Documentation

10.329.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE3::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

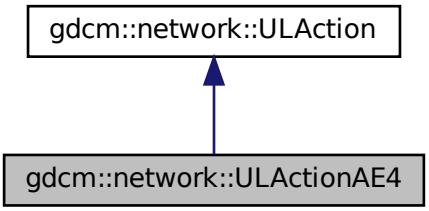
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

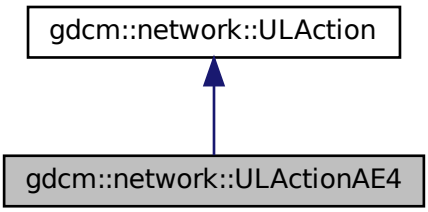
10.330 gdcm::network::ULActionAE4 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE4:



Collaboration diagram for gdcm::network::ULActionAE4:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.330.1 Member Function Documentation

10.330.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE4::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

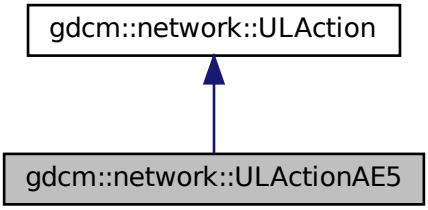
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

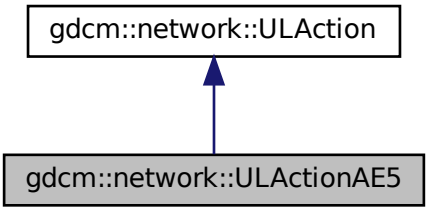
10.331 gdcm::network::ULActionAE5 Class Reference

`#include <gdcmULActionAE.h>`

Inheritance diagram for gdcm::network::ULActionAE5:



Collaboration diagram for gdcm::network::ULActionAE5:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.331.1 Member Function Documentation

10.331.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE5::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

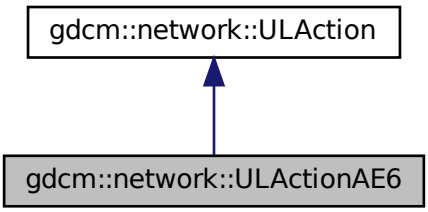
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

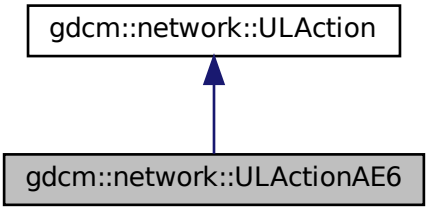
10.332 gdcm::network::ULActionAE6 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE6:



Collaboration diagram for gdcm::network::ULActionAE6:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.332.1 Member Function Documentation

10.332.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE6::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

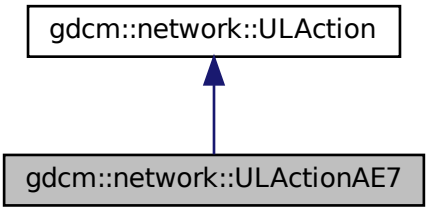
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

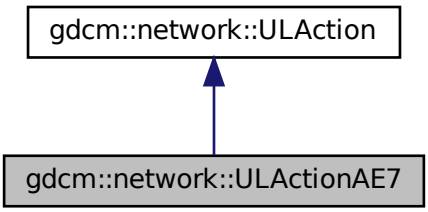
10.333 gdcm::network::ULActionAE7 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE7:



Collaboration diagram for gdcm::network::ULActionAE7:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.333.1 Member Function Documentation

10.333.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE7::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

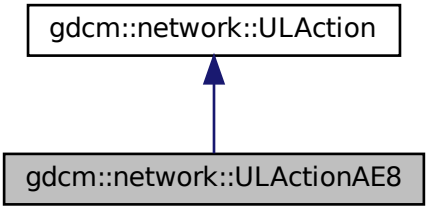
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

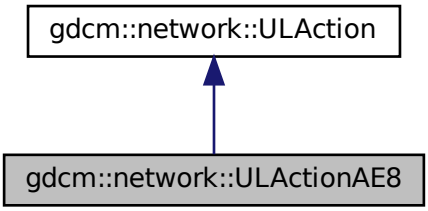
10.334 gdcm::network::ULActionAE8 Class Reference

`#include <gdcmULActionAE.h>`

Inheritance diagram for gdcm::network::ULActionAE8:



Collaboration diagram for gdcm::network::ULActionAE8:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.334.1 Member Function Documentation

10.334.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE8::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

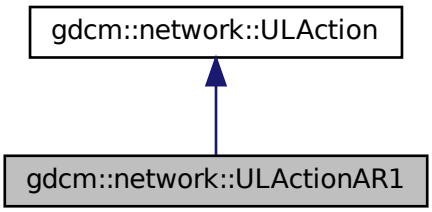
The documentation for this class was generated from the following file:

- gdcmULActionAE.h

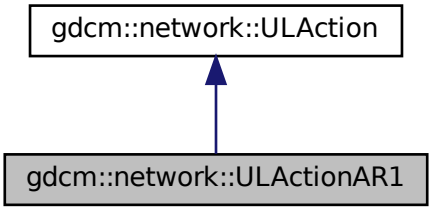
10.335 gdcm::network::ULActionAR1 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR1:



Collaboration diagram for gdcm::network::ULActionAR1:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.335.1 Member Function Documentation

10.335.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR1::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

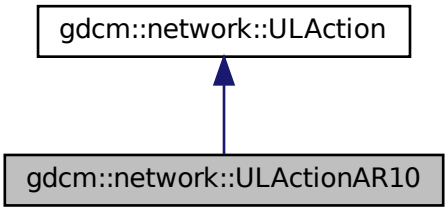
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

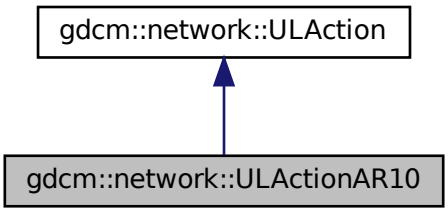
10.336 gdcm::network::ULActionAR10 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR10:



Collaboration diagram for gdcm::network::ULActionAR10:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.336.1 Member Function Documentation

10.336.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR10::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

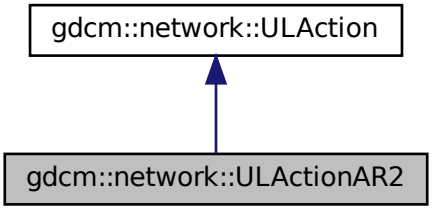
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

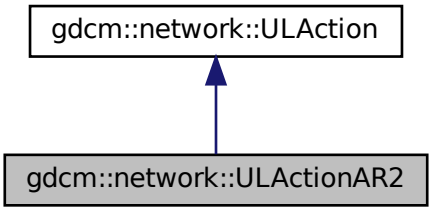
10.337 gdcm::network::ULActionAR2 Class Reference

`#include <gdcmULActionAR.h>`

Inheritance diagram for gdcm::network::ULActionAR2:



Collaboration diagram for gdcm::network::ULActionAR2:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.337.1 Member Function Documentation

10.337.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR2::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

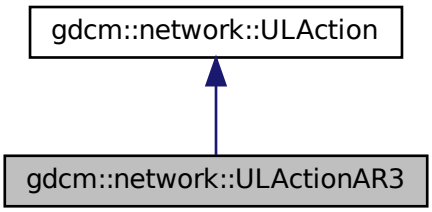
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

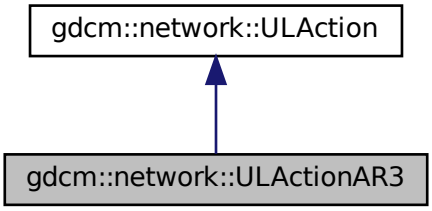
10.338 gdcm::network::ULActionAR3 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR3:



Collaboration diagram for gdcm::network::ULActionAR3:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.338.1 Member Function Documentation

10.338.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR3::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

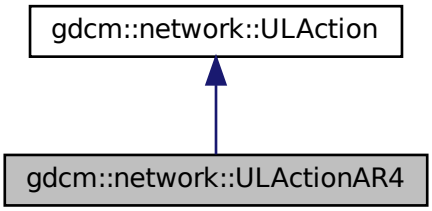
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

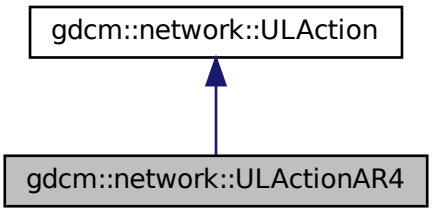
10.339 gdcm::network::ULActionAR4 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR4:



Collaboration diagram for gdcm::network::ULActionAR4:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.339.1 Member Function Documentation

10.339.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR4::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

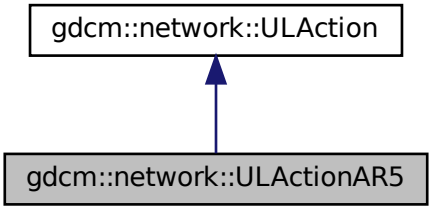
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

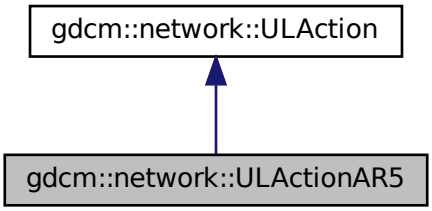
10.340 gdcm::network::ULActionAR5 Class Reference

`#include <gdcmULActionAR.h>`

Inheritance diagram for gdcm::network::ULActionAR5:



Collaboration diagram for gdcm::network::ULActionAR5:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.340.1 Member Function Documentation

10.340.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR5::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

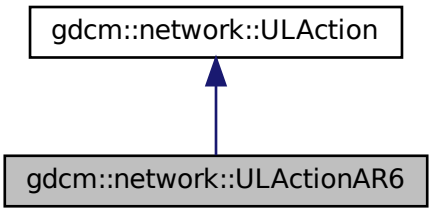
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

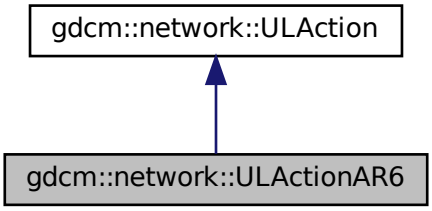
10.341 gdcm::network::ULActionAR6 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR6:



Collaboration diagram for gdcm::network::ULActionAR6:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.341.1 Member Function Documentation

10.341.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR6::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

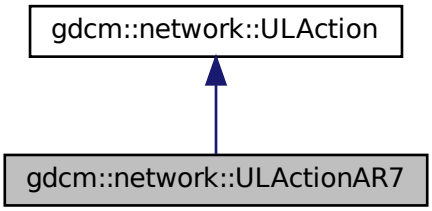
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

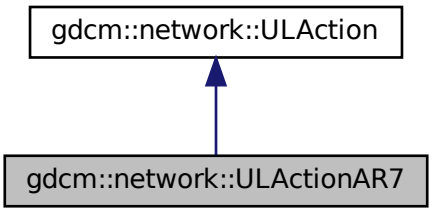
10.342 gdcm::network::ULActionAR7 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR7:



Collaboration diagram for gdcm::network::ULActionAR7:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.342.1 Member Function Documentation

10.342.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR7::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

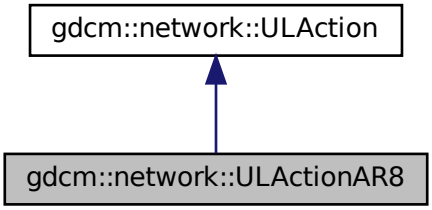
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

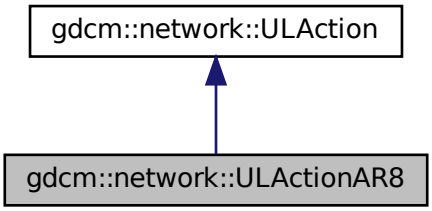
10.343 gdcm::network::ULActionAR8 Class Reference

`#include <gdcmULActionAR.h>`

Inheritance diagram for gdcm::network::ULActionAR8:



Collaboration diagram for gdcm::network::ULActionAR8:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.343.1 Member Function Documentation

10.343.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR8::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

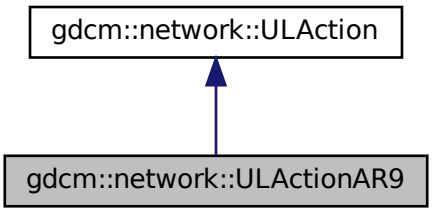
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

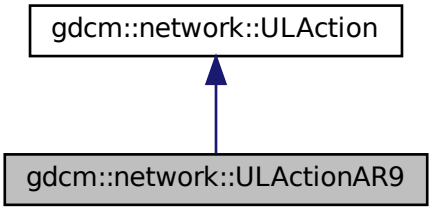
10.344 gdcm::network::ULActionAR9 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR9:



Collaboration diagram for gdcm::network::ULActionAR9:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.344.1 Member Function Documentation

10.344.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR9::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

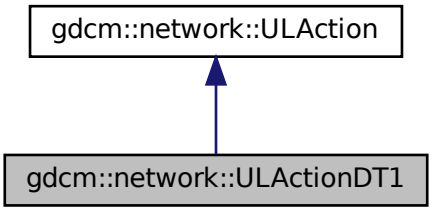
The documentation for this class was generated from the following file:

- gdcmULActionAR.h

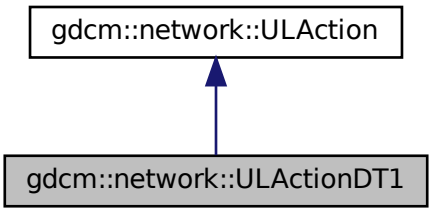
10.345 gdcm::network::ULActionDT1 Class Reference

```
#include <gdcmULActionDT.h>
```

Inheritance diagram for gdcm::network::ULActionDT1:



Collaboration diagram for gdcm::network::ULActionDT1:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingFor↩ Event, EEventID &outRaisedEvent) override

10.345.1 Member Function Documentation

10.345.1.1 PerformAction()

```
EStateID gdcm::network::ULActionDT1::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

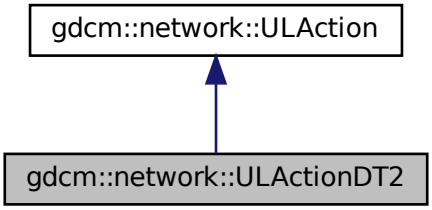
The documentation for this class was generated from the following file:

- gdcmULActionDT.h

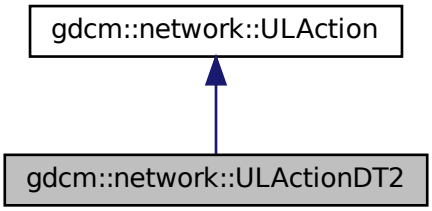
10.346 gdcm::network::ULActionDT2 Class Reference

`#include <gdcmULActionDT.h>`

Inheritance diagram for gdcm::network::ULActionDT2:



Collaboration diagram for gdcm::network::ULActionDT2:



Public Member Functions

- EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override

10.346.1 Member Function Documentation

10.346.1.1 PerformAction()

```
EStateID gdcm::network::ULActionDT2::PerformAction (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent )  [override], [virtual]
```

Implements gdcm::network::ULAction.

The documentation for this class was generated from the following file:

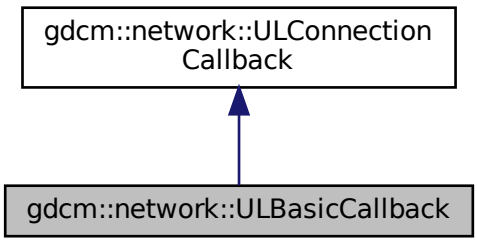
- gdcmULActionDT.h

10.347 gdcm::network::ULBasicCallback Class Reference

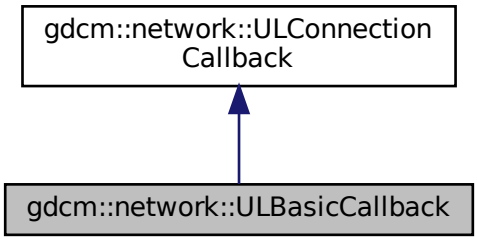
ULBasicCallback.

`#include <gdcmULBasicCallback.h>`

Inheritance diagram for gdcm::network::ULBasicCallback:



Collaboration diagram for gdcm::network::ULBasicCallback:



Public Member Functions

- ULBasicCallback ()=default
- ~ULBasicCallback () override=default
- std::vector< DataSet > const & GetDataSets () const
- std::vector< DataSet > const & GetResponses () const
- void HandleDataSet (const DataSet &inDataSet) override
- void HandleResponse (const DataSet &inDataSet) override

Additional Inherited Members

10.347.1 Detailed Description

ULBasicCallback.

This is the most basic of callbacks for how the ULConnectionManager handles incoming datasets. DataSets are just concatenated to the mDataSets vector, and the result can be pulled out of the vector by later code. Alternatives to this method include progress updates, saving to disk, etc. This class is NOT THREAD SAFE. Access the dataset vector after the entire set of datasets has been returned by the ULConnectionManager.

10.347.2 Constructor & Destructor Documentation

10.347.2.1 ULBasicCallback()

```
gdcm::network::ULBasicCallback::ULBasicCallback ( )  [default]
```

10.347.2.2 ~ULBasicCallback()

```
gdcm::network::ULBasicCallback::~ULBasicCallback ( )  [override], [default]
```

10.347.3 Member Function Documentation

10.347.3.1 GetDataSets()

```
std::vector<DataSet> const& gdcm::network::ULBasicCallback::GetDataSets ( ) const
```

10.347.3.2 GetResponses()

```
std::vector<DataSet> const& gdcm::network::ULBasicCallback::GetResponses ( ) const
```

10.347.3.3 HandleDataSet()

```
void gdcm::network::ULBasicCallback::HandleDataSet (
            const DataSet & inDataSet )  [override], [virtual]
```

Implements gdcm::network::ULConnectionCallback.

10.347.3.4 HandleResponse()

```
void gdcm::network::ULBasicCallback::HandleResponse (
            const DataSet & inDataSet )  [override], [virtual]
```

Implements gdcm::network::ULConnectionCallback.

The documentation for this class was generated from the following file:

- gdcmULBasicCallback.h

10.348 gdcm::network::ULConnection Class Reference

ULConnection.

```
#include <gdcmULConnection.h>
```

Public Member Functions

- ULConnection (const ULConnection &)=delete
- ULConnection (const ULConnectionInfo &inUserInformation)
- virtual ~ULConnection ()
- void AddAcceptedPresentationContext (const PresentationContextAC &inPC)
- PresentationContextRQ FindContext (const DataElement &de) const
- std::vector< PresentationContextAC > & GetAcceptedPresentationContexts ()
- std::vector< PresentationContextAC > const & GetAcceptedPresentationContexts () const
- const ULConnectionInfo & GetConnectionInfo () const
- uint32_t GetMaxPDUSize () const
- const PresentationContextAC * GetPresentationContextACByID (uint8_t id) const
- uint8_t GetPresentationContextIDFromPresentationContext (PresentationContextRQ const &pc) const

  return 0 upon error
- const PresentationContextRQ * GetPresentationContextRQByID (uint8_t id) const
- std::vector< PresentationContextRQ > const & GetPresentationContexts () const
- std::iostream * GetProtocol ()
- EStateID GetState () const
- ARTIMTimer & GetTimer ()
- bool InitializeConnection ()

  used to establish scu connections
- bool InitializeIncomingConnection ()

  used to establish scp connections
- void operator= (const ULConnection &)=delete
- void SetMaxPDUSize (uint32_t inSize)
- void SetPresentationContexts (const std::vector< PresentationContext > &inContexts)
- void SetPresentationContexts (const std::vector< PresentationContextRQ > &inContexts)
- void SetState (const EStateID &inState)
- void StopProtocol ()

Friends

- class ULActionAE6
- class ULConnectionManager

10.348.1 Detailed Description

ULConnection.

This is the class that contains the socket to another machine, and passes data through itself, as well as maintaining a sense of state.

The ULConnectionManager tells the ULConnection what data can actually be sent.

This class is done this way so that it can be eventually be replaced with a ULSecureConnection, if such a protocol is warranted, so that all data that passes through can be managed through a secure connection. For now, this class provides a simple pass-through mechanism to the socket itself.

So, for instance, a gdcm object will be passes to this object, and it will then get passed along the connection, if that connection is in the proper state to do so.

For right now, this class is not directly intended to be inherited from, but the potential for future ULSecureConnection warrants the addition, rather than having everything be managed from within the ULConnectionManager (or this class) without a wrapper.

10.348.2 Constructor & Destructor Documentation

10.348.2.1 ULConnection() [1/2]

```
gdcm::network::ULConnection::ULConnection (
            const ULConnectionInfo & inUserInformation )
```

10.348.2.2 ~ULConnection()

```
virtual gdcm::network::ULConnection::~ULConnection ( )  [virtual]
```

10.348.2.3 ULConnection() [2/2]

```
gdcm::network::ULConnection::ULConnection (
            const ULConnection &  )  [delete]
```

10.348.3 Member Function Documentation

10.348.3.1 AddAcceptedPresentationContext()

```
void gdcm::network::ULConnection::AddAcceptedPresentationContext (
            const PresentationContextAC & inPC )
```

10.348.3.2 FindContext()

```
PresentationContextRQ gdcm::network::ULConnection::FindContext (
            const DataElement & de ) const
```

10.348.3.3 GetAcceptedPresentationContexts() [1/2]

```
std::vector<PresentationContextAC>& gdcm::network::ULConnection::GetAcceptedPresentationContexts
( )
```

10.348.3.4 GetAcceptedPresentationContexts() [2/2]

```
std::vector<PresentationContextAC> const& gdcm::network::ULConnection::GetAcceptedPresentation↩
Contexts ( ) const
```

10.348.3.5 GetConnectionInfo()

```
const ULConnectionInfo& gdcm::network::ULConnection::GetConnectionInfo ( ) const
```

10.348.3.6 GetMaxPDUSize()

```
uint32_t gdcm::network::ULConnection::GetMaxPDUSize ( ) const
```

10.348.3.7 GetPresentationContextACByID()

```
const PresentationContextAC* gdcm::network::ULConnection::GetPresentationContextACByID (
            uint8_t id ) const
```

10.348.3.8 GetPresentationContextIDFromPresentationContext()

```
uint8_t gdcm::network::ULConnection::GetPresentationContextIDFromPresentationContext (
            PresentationContextRQ const & pc ) const
```

return 0 upon error

10.348.3.9 GetPresentationContextRQByID()

```
const PresentationContextRQ* gdcm::network::ULConnection::GetPresentationContextRQByID (
            uint8_t id ) const
```

10.348.3.10 GetPresentationContexts()

```
std::vector<PresentationContextRQ> const& gdcm::network::ULConnection::GetPresentationContexts (
) const
```

10.348.3.11 GetProtocol()

```
std::iostream* gdcm::network::ULConnection::GetProtocol ( )
```

10.348.3.12 GetState()

```
EStateID gdcm::network::ULConnection::GetState ( ) const
```

10.348.3.13 GetTimer()

```
ARTIMTimer& gdcm::network::ULConnection::GetTimer ( )
```

10.348.3.14 InitializeConnection()

```
bool gdcm::network::ULConnection::InitializeConnection ( )
```

used to establish scu connections

10.348.3.15 InitializeIncomingConnection()

```
bool gdcm::network::ULConnection::InitializeIncomingConnection ( )
```

used to establish scp connections

10.348.3.16 operator=()

```
void gdcm::network::ULConnection::operator= (
            const ULConnection &  )  [delete]
```

10.348.3.17 SetMaxPDUSize()

```
void gdcm::network::ULConnection::SetMaxPDUSize (
            uint32_t inSize )
```

10.348.3.18 SetPresentationContexts() [1/2]

```
void gdcm::network::ULConnection::SetPresentationContexts (
            const std::vector< PresentationContext > & inContexts )
```

10.348.3.19 SetPresentationContexts() [2/2]

```
void gdcm::network::ULConnection::SetPresentationContexts (
            const std::vector< PresentationContextRQ > & inContexts )
```

10.348.3.20 SetState()

```
void gdcm::network::ULConnection::SetState (
            const EStateID & inState )
```

10.348.3.21 StopProtocol()

```
void gdcm::network::ULConnection::StopProtocol ( )
```

10.348.4 Friends And Related Function Documentation

10.348.4.1 ULActionAE6

```
friend class ULActionAE6  [friend]
```

10.348.4.2 ULConnectionManager

```
friend class ULConnectionManager  [friend]
```

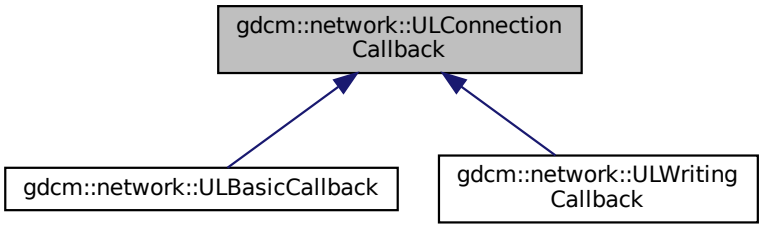
The documentation for this class was generated from the following file:

- gdcmULConnection.h

10.349 gdcm::network::ULConnectionCallback Class Reference

```
#include <gdcmULConnectionCallback.h>
```

Inheritance diagram for gdcm::network::ULConnectionCallback:



Public Member Functions

- ULConnectionCallback ()
- virtual ~ULConnectionCallback ()=default
- bool DataSetHandles () const
- virtual void HandleDataSet (const DataSet &inDataSet)=0
- virtual void HandleResponse (const DataSet &inDataSet)=0
- void ResetHandledDataSet ()
- void SetImplicitFlag (const bool imp)

Protected Member Functions

- void DataSetHandled ()

Protected Attributes

- bool mImplicit

10.349.1 Detailed Description

When a dataset comes back from a query/move/etc, the result can either be stored entirely in memory, or could be stored on disk. This class provides a mechanism to indicate what the ULConnectionManager should do with datasets that are produced through query results. The ULConnectionManager will call the HandleDataSet function during the course of receiving datasets. Particular implementations should fill in what that function does, including updating progress, etc. NOTE: since cmove requires that multiple event loops be employed, the callback function MUST set mHandledData↩ Set to true. otherwise, the cmove event loop handler will not know data was received, and proceed to end the loop prematurely.

10.349.2 Constructor & Destructor Documentation

10.349.2.1 ULConnectionCallback()

```
gdcm::network::ULConnectionCallback::ULConnectionCallback ( )  [inline]
```

10.349.2.2 ~ULConnectionCallback()

```
virtual gdcm::network::ULConnectionCallback::~ULConnectionCallback ( )  [virtual], [default]
```

10.349.3 Member Function Documentation

10.349.3.1 DataSetHandled()

```
void gdcm::network::ULConnectionCallback::DataSetHandled ( )  [inline], [protected]
```

10.349.3.2 DataSetHandles()

```
bool gdcm::network::ULConnectionCallback::DataSetHandles ( ) const  [inline]
```

10.349.3.3 HandleDataSet()

```
virtual void gdcm::network::ULConnectionCallback::HandleDataSet (
            const DataSet & inDataSet )  [pure virtual]
```

Implemented in gdcm::network::ULWritingCallback, and gdcm::network::ULBasicCallback.

10.349.3.4 HandleResponse()

```
virtual void gdcm::network::ULConnectionCallback::HandleResponse (
            const DataSet & inDataSet )  [pure virtual]
```

Implemented in gdcm::network::ULWritingCallback, and gdcm::network::ULBasicCallback.

10.349.3.5 ResetHandledDataSet()

```
void gdcm::network::ULConnectionCallback::ResetHandledDataSet ( )  [inline]
```

10.349.3.6 SetImplicitFlag()

```
void gdcm::network::ULConnectionCallback::SetImplicitFlag (
            const bool imp )  [inline]
```

10.349.4 Member Data Documentation

10.349.4.1 mImplicit

```
bool gdcm::network::ULConnectionCallback::mImplicit  [protected]
```

The documentation for this class was generated from the following file:

- gdcmULConnectionCallback.h

10.350 gdcm::network::ULConnectionInfo Class Reference

ULConnectionInfo.

```
#include <gdcmULConnectionInfo.h>
```

Public Member Functions

- ULConnectionInfo ()
- const char * GetCalledAETitle () const
- std::string GetCalledComputerName () const
- unsigned long GetCalledIPAddress () const
- int GetCalledIPPort () const
- const char * GetCallingAETitle () const
- unsigned long GetMaxPDULength () const
- bool Initialize (UserInformation const &inUserInformation, const char *inCalledAETitle, const char *inCalling↩ AETitle, unsigned long inCalledIPAddress, int inCalledIPPort, std::string inCalledComputerName)
- void SetMaxPDULength (unsigned long inMaxPDULength)

10.350.1 Detailed Description

ULConnectionInfo.

this class contains all the information about a particular connection as established by the user. That is, it's: User Information Calling AE Title Called AE Title IP address/computer name IP Port A connection must be established with this information, that's subsequently placed into various primitives for actual communication.

10.350.2 Constructor & Destructor Documentation

10.350.2.1 ULConnectionInfo()

```
gdcm::network::ULConnectionInfo::ULConnectionInfo ( )
```

10.350.3 Member Function Documentation

10.350.3.1 GetCalledAETitle()

```
const char* gdcm::network::ULConnectionInfo::GetCalledAETitle ( ) const
```

10.350.3.2 GetCalledComputerName()

```
std::string gdcm::network::ULConnectionInfo::GetCalledComputerName ( ) const
```

10.350.3.3 GetCalledIPAddress()

```
unsigned long gdcm::network::ULConnectionInfo::GetCalledIPAddress ( ) const
```

10.350.3.4 GetCalledIPPort()

```
int gdcm::network::ULConnectionInfo::GetCalledIPPort ( ) const
```

10.350.3.5 GetCallingAETitle()

```
const char* gdcm::network::ULConnectionInfo::GetCallingAETitle ( ) const
```

10.350.3.6 GetMaxPDULength()

```
unsigned long gdcm::network::ULConnectionInfo::GetMaxPDULength ( ) const
```

10.350.3.7 Initialize()

```
bool gdcm::network::ULConnectionInfo::Initialize (
             UserInformation const & inUserInformation,
             const char * inCalledAETitle,
             const char * inCallingAETitle,
             unsigned long inCalledIPAddress,
             int inCalledIPPort,
             std::string inCalledComputerName )
```

10.350.3.8 SetMaxPDULength()

```
void gdcm::network::ULConnectionInfo::SetMaxPDULength (
             unsigned long inMaxPDULength )
```

The documentation for this class was generated from the following file:

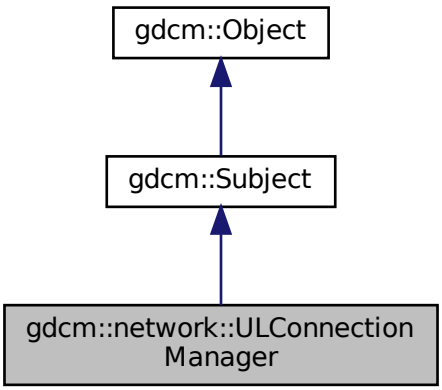
- gdcmULConnectionInfo.h

10.351 gdcm::network::ULConnectionManager Class Reference

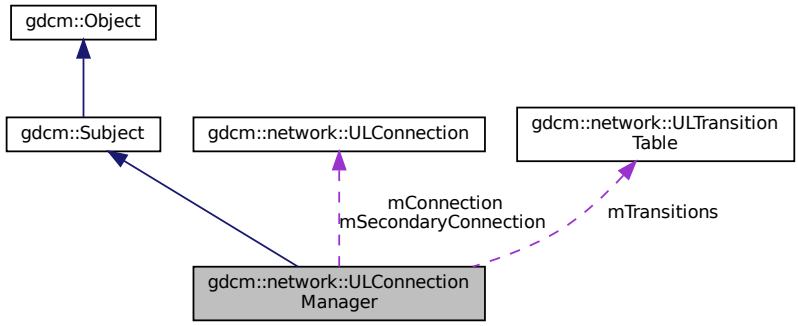
ULConnectionManager.

`#include <gdcmULConnectionManager.h>`

Inheritance diagram for gdcm::network::ULConnectionManager:



Collaboration diagram for gdcm::network::ULConnectionManager:



Public Member Functions

- ULConnectionManager ()
- ~ULConnectionManager () override
- bool BreakConnection (const double &inTimeout)
- void BreakConnectionNow ()
- bool EstablishConnection (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16_t inConnectPort, double inTimeout, std::vector< PresentationContext > const &pcVector)
- bool EstablishConnectionMove (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16_t inConnectPort, double inTimeout, uint16_t inReturnPort, std::vector< PresentationContext > const &pcVector)
- std::vector< PresentationDataValue > SendEcho ()
- std::vector< DataSet > SendFind (const BaseRootQuery *inRootQuery)
- void SendFind (const BaseRootQuery *inRootQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendMove (const BaseRootQuery *inRootQuery)
- bool SendMove (const BaseRootQuery *inRootQuery, ULConnectionCallback *inCallback)

  return false upon error
- std::vector< DataSet > SendNAction (const BaseQuery *inQuery)
- void SendNAction (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendNCreate (const BaseQuery *inQuery)
- void SendNCreate (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendNDelete (const BaseQuery *inQuery)
- void SendNDelete (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendNEventReport (const BaseQuery *inQuery)
- void SendNEventReport (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendNGet (const BaseQuery *inQuery)
- void SendNGet (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendNSet (const BaseQuery *inQuery)
- void SendNSet (const BaseQuery *inQuery, ULConnectionCallback *inCallback)
- std::vector< DataSet > SendStore (const File &file, std::istream *pStream=nullptr, std::streampos dataSetOffset=0)
- void SendStore (const File &file, ULConnectionCallback *inCallback, std::istream *pStream=nullptr, std::streampos dataSetOffset=0)

  callback based API

Protected Member Functions

- ULConnectionManager (const ULConnectionManager &inCM)
- EStateID RunEventLoop (ULEvent &inEvent, ULConnection *inWhichConnection, ULConnectionCallback *inCallback, const bool &startWaiting)
- EStateID RunMoveEventLoop (ULEvent &inEvent, ULConnectionCallback *inCallback)

Protected Attributes

- ULConnection * mConnection
- ULConnection * mSecondaryConnection
- ULTransitionTable mTransitions

10.351.1 Detailed Description

ULConnectionManager.

The ULConnectionManager performs actions on the ULConnection given inputs from the user and from the state of what's going on around the connection (ie, timeouts of the ARTIM timer, responses from the peer across the connection, etc).

Its inputs are ULEvents, and it performs ULActions.

10.351.2 Constructor & Destructor Documentation

10.351.2.1 ULConnectionManager() [1/2]

```
gdcm::network::ULConnectionManager::ULConnectionManager (
            const ULConnectionManager & inCM )  [protected]
```

10.351.2.2 ULConnectionManager() [2/2]

```
gdcm::network::ULConnectionManager::ULConnectionManager ( )
```

10.351.2.3 ~ULConnectionManager()

```
gdcm::network::ULConnectionManager::~ULConnectionManager ( )  [override]
```

10.351.3 Member Function Documentation

10.351.3.1 BreakConnection()

```
bool gdcm::network::ULConnectionManager::BreakConnection (
            const double & inTimeout )
```

10.351.3.2 BreakConnectionNow()

```
void gdcm::network::ULConnectionManager::BreakConnectionNow ( )
```

10.351.3.3 EstablishConnection()

```
bool gdcm::network::ULConnectionManager::EstablishConnection (
            const std::string & inAETitle,
            const std::string & inConnectAETitle,
            const std::string & inComputerName,
            long inIPAddress,
            uint16_t inConnectPort,
            double inTimeout,
            std::vector< PresentationContext > const & pcVector )
```

returns true if a connection of the given AETitle (ie, 'this' program) is able to connect to the given AETitle and Port in a certain amount of time providing the connection type will establish the proper exchange syntax with a server; if a different functionality is required, a different connection should be established. returns false if the connection type is 'move'– have to give a return port for move to work as specified.

10.351.3.4 EstablishConnectionMove()

```
bool gdcm::network::ULConnectionManager::EstablishConnectionMove (
            const std::string & inAETitle,
            const std::string & inConnectAETitle,
            const std::string & inComputerName,
            long inIPAddress,
            uint16_t inConnectPort,
            double inTimeout,
            uint16_t inReturnPort,
            std::vector< PresentationContext > const & pcVector )
```

returns true for above reasons, but contains the special 'move' port

10.351.3.5 RunEventLoop()

```
EStateID gdcm::network::ULConnectionManager::RunEventLoop (
            ULEvent & inEvent,
            ULConnection * inWhichConnection,
            ULConnectionCallback * inCallback,
            const bool & startWaiting )  [protected]
```

10.351.3.6 RunMoveEventLoop()

```
EStateID gdcm::network::ULConnectionManager::RunMoveEventLoop (
            ULEvent & inEvent,
            ULConnectionCallback * inCallback )  [protected]
```

10.351.3.7 SendEcho()

```
std::vector<PresentationDataValue> gdcm::network::ULConnectionManager::SendEcho ( )
```

10.351.3.8 SendFind() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendFind (
            const BaseRootQuery * inRootQuery )
```

10.351.3.9 SendFind() [2/2]

```
void gdcm::network::ULConnectionManager::SendFind (
            const BaseRootQuery * inRootQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.10 SendMove() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendMove (
            const BaseRootQuery * inRootQuery )
```

10.351.3.11 SendMove() [2/2]

```
bool gdcm::network::ULConnectionManager::SendMove (
            const BaseRootQuery * inRootQuery,
            ULConnectionCallback * inCallback )
```

return false upon error

10.351.3.12 SendNAction() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNAction (
            const BaseQuery * inQuery )
```

10.351.3.13 SendNAction() [2/2]

```
void gdcm::network::ULConnectionManager::SendNAction (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.14 SendNCreate() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNCreate (
            const BaseQuery * inQuery )
```

10.351.3.15 SendNCreate() [2/2]

```
void gdcm::network::ULConnectionManager::SendNCreate (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.16 SendNDelete() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNDelete (
            const BaseQuery * inQuery )
```

10.351.3.17 SendNDelete() [2/2]

```
void gdcm::network::ULConnectionManager::SendNDelete (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.18 SendNEventReport() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNEventReport (
            const BaseQuery * inQuery )
```

10.351.3.19 SendNEventReport() [2/2]

```
void gdcm::network::ULConnectionManager::SendNEventReport (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.20 SendNGet() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNGet (
            const BaseQuery * inQuery )
```

10.351.3.21 SendNGet() [2/2]

```
void gdcm::network::ULConnectionManager::SendNGet (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.22 SendNSet() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendNSet (
            const BaseQuery * inQuery )
```

10.351.3.23 SendNSet() [2/2]

```
void gdcm::network::ULConnectionManager::SendNSet (
            const BaseQuery * inQuery,
            ULConnectionCallback * inCallback )
```

10.351.3.24 SendStore() [1/2]

```
std::vector<DataSet> gdcm::network::ULConnectionManager::SendStore (
            const File & file,
            std::istream * pStream = nullptr,
            std::streampos dataSetOffset = 0 )
```

10.351.3.25 SendStore() [2/2]

```
void gdcm::network::ULConnectionManager::SendStore (
            const File & file,
            ULConnectionCallback * inCallback,
            std::istream * pStream = nullptr,
            std::streampos dataSetOffset = 0 )
```

callback based API

10.351.4 Member Data Documentation

10.351.4.1 mConnection

```
ULConnection* gdcm::network::ULConnectionManager::mConnection  [protected]
```

10.351.4.2 mSecondaryConnection

```
ULConnection* gdcm::network::ULConnectionManager::mSecondaryConnection  [protected]
```

10.351.4.3 mTransitions

```
ULTransitionTable gdcm::network::ULConnectionManager::mTransitions  [protected]
```

The documentation for this class was generated from the following file:

- gdcmULConnectionManager.h

10.352 gdcm::network::ULEvent Class Reference

ULEvent.

```
#include <gdcmULEvent.h>
```

Public Member Functions

- ULEvent (const EEventID &inEventID, BasePDU *inBasePDU, std::istream *iStream=nullptr, std::streampos posDataSet=0)
- ULEvent (const EEventID &inEventID, std::vector< BasePDU * > inBasePDU, std::istream *iStream=nullptr, std::streampos posDataSet=0)
- ~ULEvent ()
- std::streampos GetDataSetPos () const
- EEventID GetEvent () const
- std::istream * GetIStream () const
- std::vector< BasePDU * > const & GetPDUs () const
- void SetEvent (const EEventID &inEvent)
- void SetPDU (std::vector< BasePDU * > const &inPDU)

10.352.1 Detailed Description

ULEvent.

base class for network events.

An event consists of the event ID and the data associated with that event.

Note that once a PDU is created, it is now the responsibility of the associated event to destroy it!

10.352.2 Constructor & Destructor Documentation

10.352.2.1 ULEvent() [1/2]

```
gdcm::network::ULEvent::ULEvent (
            const EEventID & inEventID,
            std::vector< BasePDU * > inBasePDU,
            std::istream * iStream = nullptr,
            std::streampos posDataSet = 0 )  [inline]
```

10.352.2.2 ULEvent() [2/2]

```
gdcm::network::ULEvent::ULEvent (
            const EEventID & inEventID,
            BasePDU * inBasePDU,
            std::istream * iStream = nullptr,
            std::streampos posDataSet = 0 )  [inline]
```

10.352.2.3 ~ULEvent()

```
gdcm::network::ULEvent::~ULEvent ( )  [inline]
```

10.352.3 Member Function Documentation

10.352.3.1 GetDataSetPos()

```
std::streampos gdcm::network::ULEvent::GetDataSetPos ( ) const  [inline]
```

10.352.3.2 GetEvent()

```
EEventID gdcm::network::ULEvent::GetEvent ( ) const  [inline]
```

10.352.3.3 GetIStream()

```
std::istream* gdcm::network::ULEvent::GetIStream ( ) const  [inline]
```

10.352.3.4 GetPDUs()

```
std::vector<BasePDU*> const& gdcm::network::ULEvent::GetPDUs ( ) const  [inline]
```

10.352.3.5 SetEvent()

```
void gdcm::network::ULEvent::SetEvent (
            const EEventID & inEvent )  [inline]
```

10.352.3.6 SetPDU()

```
void gdcm::network::ULEvent::SetPDU (
            std::vector< BasePDU * > const & inPDU )  [inline]
```

The documentation for this class was generated from the following file:

- gdcmULEvent.h

10.353 gdcm::network::ULTransitionTable Class Reference

ULTransitionTable The transition table of all the ULEvents, new ULActions, and ULStates.

`#include <gdcmULTransitionTable.h>`

Public Member Functions

- ULTransitionTable ()
- void HandleEvent (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) const
- void PrintTable () const

10.353.1 Detailed Description

ULTransitionTable The transition table of all the ULEvents, new ULActions, and ULStates.

Based roughly on the solutions in player2.cpp in the boost examples and this so question: http↩
://stackoverflow.com/questions/1647631/c-state-machine-design

The transition table is constructed of TableRows. Each row is based on an event, and an event handler in the Transition↩
Table object takes a given event, and then finds the given row.

Then, given the current state of the connection, determines the appropriate action to take and then the state to transition to next.

10.353.2 Constructor & Destructor Documentation

10.353.2.1 ULTransitionTable()

```
gdcm::network::ULTransitionTable::ULTransitionTable ( )
```

10.353.3 Member Function Documentation

10.353.3.1 HandleEvent()

```
void gdcm::network::ULTransitionTable::HandleEvent (
            Subject * s,
            ULEvent & inEvent,
            ULConnection & inConnection,
            bool & outWaitingForEvent,
            EEventID & outRaisedEvent ) const
```

10.353.3.2 PrintTable()

```
void gdcm::network::ULTransitionTable::PrintTable ( ) const
```

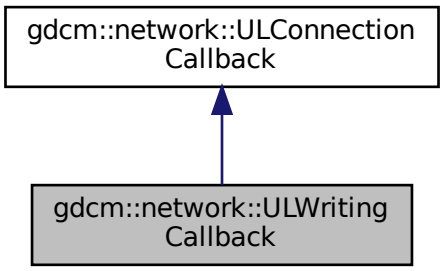
The documentation for this class was generated from the following file:

- gdcmULTransitionTable.h

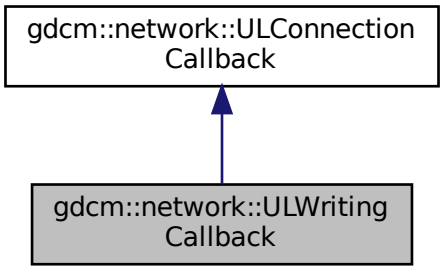
10.354 gdcm::network::ULWritingCallback Class Reference

`#include <gdcmULWritingCallback.h>`

Inheritance diagram for gdcm::network::ULWritingCallback:



Collaboration diagram for gdcm::network::ULWritingCallback:



Public Member Functions

- ULWritingCallback ()=default
- ~ULWritingCallback () override=default
- void HandleDataSet (const DataSet &inDataSet) override
- void HandleResponse (const DataSet &inDataSet) override
- void SetDirectory (const std::string &inDirectoryName)

  provide the directory into which all files are written.

Additional Inherited Members

10.354.1 Constructor & Destructor Documentation

10.354.1.1 ULWritingCallback()

```
gdcm::network::ULWritingCallback::ULWritingCallback ( )  [default]
```

10.354.1.2 ~ULWritingCallback()

```
gdcm::network::ULWritingCallback::~ULWritingCallback ( )  [override], [default]
```

10.354.2 Member Function Documentation

10.354.2.1 HandleDataSet()

```
void gdcm::network::ULWritingCallback::HandleDataSet (
            const DataSet & inDataSet )  [override], [virtual]
```

Implements gdcm::network::ULConnectionCallback.

10.354.2.2 HandleResponse()

```
void gdcm::network::ULWritingCallback::HandleResponse (
            const DataSet & inDataSet )  [override], [virtual]
```

Implements gdcm::network::ULConnectionCallback.

10.354.2.3 SetDirectory()

```
void gdcm::network::ULWritingCallback::SetDirectory (
            const std::string & inDirectoryName )  [inline]
```

provide the directory into which all files are written.

The documentation for this class was generated from the following file:

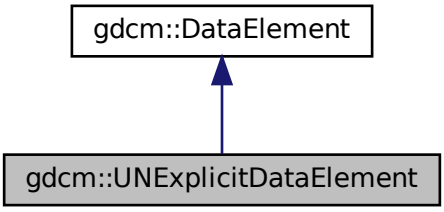
- gdcmULWritingCallback.h

10.355 gdcm::UNExplicitDataElement Class Reference

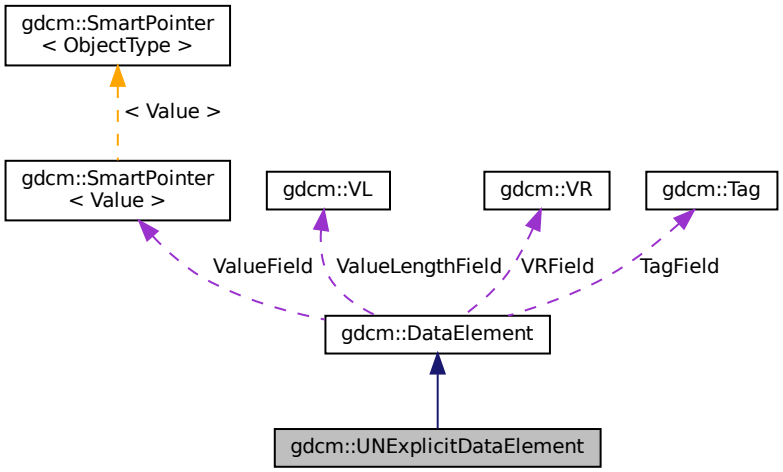
Class to read/write a DataElement as UNExplicit Data Element.

```
#include <gdcmUNExplicitDataElement.h>
```

Inheritance diagram for gdcm::UNExplicitDataElement:



Collaboration diagram for gdcm::UNExplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)

Additional Inherited Members

10.355.1 Detailed Description

Class to read/write a DataElement as UNExplicit Data Element.

Note

bla

10.355.2 Member Function Documentation

10.355.2.1 GetLength()

```
VL gdcm::UNExplicitDataElement::GetLength ( ) const
```

10.355.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitDataElement::Read (
             std::istream & is )
```

10.355.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitDataElement::ReadPreValue (
             std::istream & is )
```

10.355.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitDataElement::ReadValue (
             std::istream & is,
             bool readvalues = true )
```

10.355.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitDataElement::ReadWithLength (
             std::istream & is,
             VL & length )
```

The documentation for this class was generated from the following file:

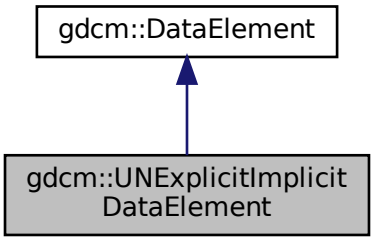
- gdcmUNExplicitDataElement.h

10.356 gdcm::UNExplicitImplicitDataElement Class Reference

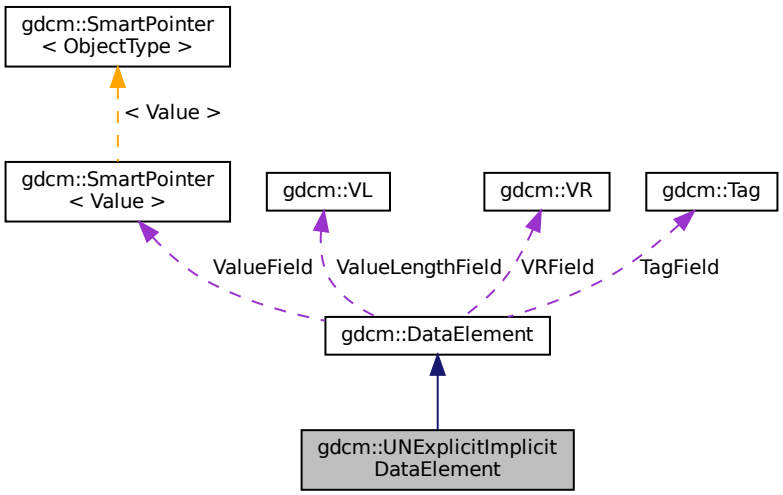
Class to read/write a DataElement as ExplicitImplicit Data Element.

`#include <gdcmUNExplicitImplicitDataElement.h>`

Inheritance diagram for gdcm::UNExplicitImplicitDataElement:



Collaboration diagram for gdcm::UNExplicitImplicitDataElement:



Public Member Functions

- VL GetLength () const

- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is)

Additional Inherited Members

10.356.1 Detailed Description

Class to read/write a DataElement as ExplicitImplicit Data Element.

This class gather two known bugs:

1. GDCM 1.2.0 would rewrite VR=UN Value Length on 2 bytes instead of 4 bytes
2. GDCM 1.2.0 would also rewrite DataElement as Implicit when the VR would not be known this would only happen in some very rare cases. gdcm 2.X design could handle bug #1 or #2 exclusively, this class can now handle file which have both issues. See: gdcmData/TheralysGDCM120Bug.dcm

10.356.2 Member Function Documentation

10.356.2.1 GetLength()

```
VL gdcm::UNExplicitImplicitDataElement::GetLength ( ) const
```

10.356.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitImplicitDataElement::Read (
            std::istream & is )
```

10.356.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitImplicitDataElement::ReadPreValue (
            std::istream & is )
```

10.356.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::UNExplicitImplicitDataElement::ReadValue (
             std::istream & is )
```

The documentation for this class was generated from the following file:

- gdcmUNExplicitImplicitDataElement.h

10.357 gdcm::Unpacker12Bits Class Reference

Pack/Unpack 12 bits pixel into 16bits.

```
#include <gdcmUnpacker12Bits.h>
```

Static Public Member Functions

- static bool Pack (char *out, const char *in, size_t n)
- static bool Unpack (char *out, const char *in, size_t n)

10.357.1 Detailed Description

Pack/Unpack 12 bits pixel into 16bits.

- You can only pack an even number of 16bits, which means a multiple of 4 (expressed in bytes)
- You can only unpack a multiple of 3 bytes

This class has no purpose in general purpose DICOM implementation. However to be able to cope with some early ACR-NEMA file generated by a well-known private vendor, one would need to unpack 12bits Stored Pixel Value into a more standard 16bits Stored Pixel Value.

See also

Rescaler

10.357.2 Member Function Documentation

10.357.2.1 Pack()

```
static bool gdcm::Unpacker12Bits::Pack (
            char * out,
            const char * in,
            size_t n )  [static]
```

Pack an array of 16bits where all values are 12bits into a pack form. n is the length in bytes of array in, out will be a fake 8bits array of size (n / 2) ∗ 3

10.357.2.2 Unpack()

```
static bool gdcm::Unpacker12Bits::Unpack (
            char * out,
            const char * in,
            size_t n )  [static]
```

Unpack an array of 'packed' 12bits data into a more conventional 16bits array. n is the length in bytes of array in, out will be a 16bits array of size (n / 3) ∗ 2

The documentation for this class was generated from the following file:

- gdcmUnpacker12Bits.h

10.358 gdcm::Usage Class Reference

Usage.

```
#include <gdcmUsage.h>
```

Public Types

- enum UsageType {
  Mandatory ,
  Conditional ,
  UserOption ,
  Invalid }

Public Member Functions

- Usage (UsageType type=Invalid)
- operator UsageType () const

Static Public Member Functions

- static const char * GetUsageString (UsageType type)
- static UsageType GetUsageType (const char *type)

Friends

- std::ostream & operator<< (std::ostream &os, const Usage &vr)

10.358.1 Detailed Description

Usage.

Note

A.1.3 IOD Module Table and Functional Group Macro Table This Section of each IOD defines in a tabular form the Modules comprising the IOD. The following information must be specified for each Module in the table:

- The name of the Module or Functional Group
- A reference to the Section in Annex C which defines the Module or Functional Group
- The usage of the Module or Functional Group; whether it is:
- Mandatory (see A.1.3.1) , abbreviated M
- Conditional (see A.1.3.2) , abbreviated C
- User Option (see A.1.3.3) , abbreviated U The Modules referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each IOD, Mandatory Modules shall be supported per the definitions, semantics and requirements defined in Annex C.

A.1.3.2 CONDITIONAL MODULES Conditional Modules are Mandatory Modules if specific conditions are met. If the specified conditions are not met, this Module shall not be supported; that is, no information defined in that Module shall be sent. A.1.3.3 USER OPTION MODULES User Option Modules may or may not be supported. If an optional Module is supported, the Attribute Types specified in the Modules in Annex C shall be supported.

10.358.2 Member Enumeration Documentation

10.358.2.1 UsageType

`enum gdcm::Usage::UsageType`

Enumerator

Mandatory	
Conditional	
UserOption	
Invalid	

10.358.3 Constructor & Destructor Documentation

10.358.3.1 Usage()

```
gdcm::Usage::Usage (
            UsageType type = Invalid )  [inline]
```

10.358.4 Member Function Documentation

10.358.4.1 GetUsageString()

```
static const char* gdcm::Usage::GetUsageString (
            UsageType type )  [static]
```

10.358.4.2 GetUsageType()

```
static UsageType gdcm::Usage::GetUsageType (
            const char * type )  [static]
```

10.358.4.3 operator UsageType()

```
gdcm::Usage::operator UsageType ( ) const  [inline]
```

10.358.5 Friends And Related Function Documentation

10.358.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const Usage & vr )  [friend]
```

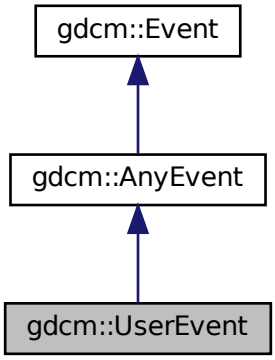
The documentation for this class was generated from the following file:

- gdcmUsage.h

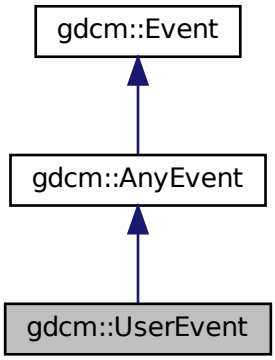
10.359 gdcm::UserEvent Class Reference

`#include <gdcmEvent.h>`

Inheritance diagram for gdcm::UserEvent:



Collaboration diagram for gdcm::UserEvent:



Additional Inherited Members

The documentation for this class was generated from the following file:

- gdcmEvent.h

10.360 gdcm::network::UserInformation Class Reference

UserInformation.

`#include <gdcmUserInformation.h>`

Public Member Functions

- UserInformation ()
- UserInformation (const UserInformation &)=delete
- ~UserInformation ()
- void AddRoleSelectionSub (RoleSelectionSub const &r)
- void AddSOPClassExtendedNegociationSub (SOPClassExtendedNegociationSub const &s)
- MaximumLengthSub & GetMaximumLengthSub ()
- const MaximumLengthSub & GetMaximumLengthSub () const
- UserInformation & operator= (const UserInformation &)
- void Print (std::ostream &os) const
- std::istream & Read (std::istream &is)
- size_t Size () const
- const std::ostream & Write (std::ostream &os) const

10.360.1 Detailed Description

UserInformation.

Table 9-16 USER INFORMATION ITEM FIELDS

TODO what is the goal of :

Table 9-20 USER INFORMATION ITEM FIELDS

10.360.2 Constructor & Destructor Documentation

10.360.2.1 UserInformation() [1/2]

`gdcm::network::UserInformation::UserInformation ( )`

10.360.2.2 ~UserInformation()

`gdcm::network::UserInformation::~UserInformation ( )`

10.360.2.3 UserInformation() [2/2]

```
gdcm::network::UserInformation::UserInformation (
            const UserInformation &  )  [delete]
```

10.360.3 Member Function Documentation

10.360.3.1 AddRoleSelectionSub()

```
void gdcm::network::UserInformation::AddRoleSelectionSub (
            RoleSelectionSub const & r )
```

10.360.3.2 AddSOPClassExtendedNegociationSub()

```
void gdcm::network::UserInformation::AddSOPClassExtendedNegociationSub (
            SOPClassExtendedNegociationSub const & s )
```

10.360.3.3 GetMaximumLengthSub() [1/2]

```
MaximumLengthSub& gdcm::network::UserInformation::GetMaximumLengthSub ( )  [inline]
```

10.360.3.4 GetMaximumLengthSub() [2/2]

```
const MaximumLengthSub& gdcm::network::UserInformation::GetMaximumLengthSub ( ) const  [inline]
```

10.360.3.5 operator=()

```
UserInformation& gdcm::network::UserInformation::operator= (
            const UserInformation &  )
```

10.360.3.6 Print()

```
void gdcm::network::UserInformation::Print (
            std::ostream & os ) const
```

10.360.3.7 Read()

```
std::istream& gdcm::network::UserInformation::Read (
            std::istream & is )
```

10.360.3.8 Size()

```
size_t gdcm::network::UserInformation::Size ( ) const
```

10.360.3.9 Write()

```
const std::ostream& gdcm::network::UserInformation::Write (
            std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- gdcmUserInformation.h

10.361 gdcm::UUIDGenerator Class Reference

Class for generating unique UUID.

`#include <gdcmUUIDGenerator.h>`

Public Member Functions

- const char * Generate ()

Static Public Member Functions

- static bool IsValid (const char *uid)

  Find out if the string is a valid UUID or not.

10.361.1 Detailed Description

Class for generating unique UUID.

generate DCE 1.1 uid

10.361.2 Member Function Documentation

10.361.2.1 Generate()

```
const char* gdcm::UUIDGenerator::Generate ( )
```

Return the generated uuid NOT THREAD SAFE

10.361.2.2 IsValid()

```
static bool gdcm::UUIDGenerator::IsValid (
            const char * uid )  [static]
```

Find out if the string is a valid UUID or not.

The documentation for this class was generated from the following file:

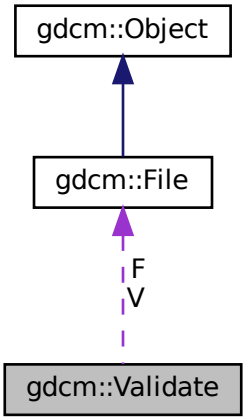
- gdcmUUIDGenerator.h

10.362 gdcm::Validate Class Reference

Validate class.

`#include <gdcmValidate.h>`

Collaboration diagram for gdcm::Validate:



Public Member Functions

- Validate ()
- ~Validate ()
- const File & GetValidatedFile ()
- void SetFile (File const &f)
- void Validation ()

Protected Attributes

- const File * F
- File V

10.362.1 Detailed Description

Validate class.

10.362.2 Constructor & Destructor Documentation

10.362.2.1 Validate()

```
gdcm::Validate::Validate ( )
```

10.362.2.2 ~Validate()

```
gdcm::Validate::~Validate ( )
```

10.362.3 Member Function Documentation

10.362.3.1 GetValidatedFile()

```
const File& gdcm::Validate::GetValidatedFile ( )  [inline]
```

10.362.3.2 SetFile()

```
void gdcm::Validate::SetFile (
            File const & f )  [inline]
```

10.362.3.3 Validation()

```
void gdcm::Validate::Validation ( )
```

10.362.4 Member Data Documentation

10.362.4.1 F

```
const File* gdcm::Validate::F  [protected]
```

10.362.4.2 V

```
File gdcm::Validate::V  [protected]
```

The documentation for this class was generated from the following file:

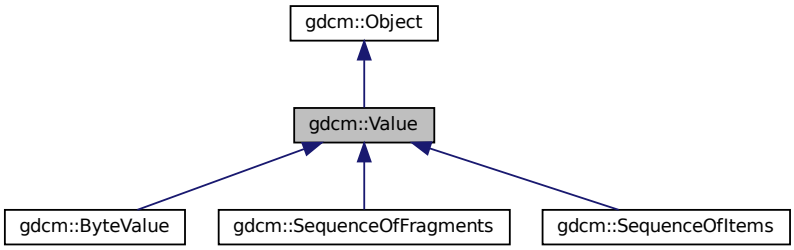
- gdcmValidate.h

10.363 gdcm::Value Class Reference

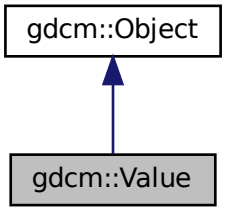
Class to represent the value of a Data Element.

`#include <gdcmValue.h>`

Inheritance diagram for gdcm::Value:



Collaboration diagram for gdcm::Value:



Public Member Functions

- Value ()=default
- ~Value () override=default
- virtual void Clear ()=0
- virtual VL GetLength () const =0
- virtual bool operator== (const Value &val) const =0
- virtual void SetLength (VL l)=0

Protected Member Functions

- virtual void SetLengthOnly (VL l)

Friends

- class DataElement

10.363.1 Detailed Description

Class to represent the value of a Data Element.

Note

VALUE: A component of a Value Field. A Value Field may consist of one or more of these components.

10.363.2 Constructor & Destructor Documentation

10.363.2.1 Value()

```
gdcm::Value::Value ( )  [default]
```

10.363.2.2 ~Value()

```
gdcm::Value::~Value ( )  [override], [default]
```

10.363.3 Member Function Documentation

10.363.3.1 Clear()

```
virtual void gdcm::Value::Clear ( )  [pure virtual]
```

Implemented in gdcm::SequenceOfItems, gdcm::SequenceOfFragments, and gdcm::ByteValue.

10.363.3.2 GetLength()

```
virtual VL gdcm::Value::GetLength ( ) const  [pure virtual]
```

Implemented in gdcm::SequenceOfItems, gdcm::SequenceOfFragments, and gdcm::ByteValue.

Referenced by gdcm::DataSet::InsertDataElement(), and gdcm::DataElement::SetValue().

10.363.3.3 operator==()

```
virtual bool gdcm::Value::operator== (
            const Value & val ) const  [pure virtual]
```

Implemented in gdcm::SequenceOfItems, gdcm::SequenceOfFragments, and gdcm::ByteValue.

10.363.3.4 SetLength()

```
virtual void gdcm::Value::SetLength (
            VL l )  [pure virtual]
```

Implemented in gdcm::ByteValue, gdcm::SequenceOfItems, and gdcm::SequenceOfFragments.

10.363.3.5 SetLengthOnly()

```
virtual void gdcm::Value::SetLengthOnly (
            VL l )  [protected], [virtual]
```

Reimplemented in gdcm::ByteValue.

10.363.4 Friends And Related Function Documentation

10.363.4.1 DataElement

```
friend class DataElement  [friend]
```

The documentation for this class was generated from the following file:

- gdcmValue.h

10.364 gdcm::ValueIO< TDE, TSwap, TType > Class Template Reference

Class to dispatch template calls.

`#include <gdcmValueIO.h>`

Static Public Member Functions

- static std::istream & Read (std::istream &is, Value &v, bool readvalues)
- static const std::ostream & Write (std::ostream &os, const Value &v)

10.364.1 Detailed Description

template<typename TDE, typename TSwap, typename TType = uint8_t>
class gdcm::ValueIO< TDE, TSwap, TType >

Class to dispatch template calls.

10.364.2 Member Function Documentation

10.364.2.1 Read()

```
template<typename TDE , typename TSwap , typename TType = uint8_t>
static std::istream& gdcm::ValueIO< TDE, TSwap, TType >::Read (
            std::istream & is,
            Value & v,
            bool readvalues )  [static]
```

10.364.2.2 Write()

```
template<typename TDE , typename TSwap , typename TType = uint8_t>
static const std::ostream& gdcm::ValueIO< TDE, TSwap, TType >::Write (
            std::ostream & os,
            const Value & v )  [static]
```

The documentation for this class was generated from the following file:

- gdcmValueIO.h

10.365 gdcm::MrProtocol::Vector3 Struct Reference

`#include <gdcmMrProtocol.h>`

Public Attributes

- double dCor
- double dSag
- double dTra

10.365.1 Member Data Documentation

10.365.1.1 dCor

`double gdcm::MrProtocol::Vector3::dCor`

10.365.1.2 dSag

`double gdcm::MrProtocol::Vector3::dSag`

10.365.1.3 dTra

`double gdcm::MrProtocol::Vector3::dTra`

The documentation for this struct was generated from the following file:

- gdcmMrProtocol.h

10.366 gdcm::Version Class Reference

major/minor and build version

`#include <gdcmVersion.h>`

Public Member Functions

- Version ()=default
- ~Version ()=default
- void Print (std::ostream &os=std::cout) const

Static Public Member Functions

- static int GetBuildVersion ()
- static int GetMajorVersion ()
- static int GetMinorVersion ()
- static const char * GetVersion ()

Friends

- std::ostream & operator<< (std::ostream &_os, const Version &v)

10.366.1 Detailed Description

major/minor and build version

10.366.2 Constructor & Destructor Documentation

10.366.2.1 Version()

```
gdcm::Version::Version ( )  [default]
```

10.366.2.2 ~Version()

```
gdcm::Version::~Version ( )  [default]
```

10.366.3 Member Function Documentation

10.366.3.1 GetBuildVersion()

```
static int gdcm::Version::GetBuildVersion ( )  [static]
```

10.366.3.2 GetMajorVersion()

```
static int gdcm::Version::GetMajorVersion ( )  [static]
```

10.366.3.3 GetMinorVersion()

```
static int gdcm::Version::GetMinorVersion ( )  [static]
```

10.366.3.4 GetVersion()

```
static const char* gdcm::Version::GetVersion ( )  [static]
```

10.366.3.5 Print()

```
void gdcm::Version::Print (
            std::ostream & os = std::cout ) const
```

10.366.4 Friends And Related Function Documentation

10.366.4.1 operator<<

```
std::ostream& operator<< (
            std::ostream & _os,
            const Version & v )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmVersion.h

10.367 gdcm::VL Class Reference

Value Length.

`#include <gdcmVL.h>`

Public Types

- typedef uint32_t Type

Public Member Functions

- VL (uint32_t vl=0)
- VL GetLength () const
- bool IsOdd () const

  Return whether or not the VL is odd or not.
- bool IsUndefined () const
- operator uint32_t () const
- VL & operator++ ()
- VL operator++ (int)
- VL & operator+= (VL const &vl)

  += operator
- template<typename TSwap >
  std::istream & Read (std::istream &is)
- template<typename TSwap >
  std::istream & Read16 (std::istream &is)
- void SetToUndefined ()
- template<typename TSwap >
  const std::ostream & Write (std::ostream &os) const
- template<typename TSwap >
  const std::ostream & Write16 (std::ostream &os) const

Static Public Member Functions

- static uint16_t GetVL16Max ()
- static uint32_t GetVL32Max ()

Friends

- std::ostream & operator<< (std::ostream &os, const VL &vl)

10.367.1 Detailed Description

Value Length.

Warning

this is a 4bytes value ! Do not try to use it for 2bytes value length

Examples

ReadAndDumpDICOMDIR2.cxx, and rle2img.cxx.

10.367.2 Member Typedef Documentation

10.367.2.1 Type

```
typedef uint32_t gdcm::VL::Type
```

10.367.3 Constructor & Destructor Documentation

10.367.3.1 VL()

```
gdcm::VL::VL (
             uint32_t vl = 0 )  [inline]
```

10.367.4 Member Function Documentation

10.367.4.1 GetLength()

```
VL gdcm::VL::GetLength ( ) const  [inline]
```

Examples

ReadAndDumpDICOMDIR2.cxx.

Referenced by gdcm::FileMetaInformation::GetFullLength(), gdcm::DataSet::GetLength(), and gdcm::Item::Write().

10.367.4.2 GetVL16Max()

```
static uint16_t gdcm::VL::GetVL16Max ( )  [inline], [static]
```

10.367.4.3 GetVL32Max()

```
static uint32_t gdcm::VL::GetVL32Max ( )  [inline], [static]
```

10.367.4.4 IsOdd()

```
bool gdcm::VL::IsOdd ( ) const  [inline]
```

Return whether or not the VL is odd or not.

10.367.4.5 IsUndefined()

```
bool gdcm::VL::IsUndefined ( ) const  [inline]
```

10.367.4.6 operator uint32_t()

```
gdcm::VL::operator uint32_t ( ) const  [inline]
```

10.367.4.7 operator++() [1/2]

```
VL& gdcm::VL::operator++ ( )  [inline]
```

10.367.4.8 operator++() [2/2]

```
VL gdcm::VL::operator++ (
             int  )  [inline]
```

10.367.4.9 operator+=()

```
VL& gdcm::VL::operator+= (
            VL const & vl )  [inline]
```

+= operator

10.367.4.10 Read()

```
template<typename TSwap >
std::istream& gdcm::VL::Read (
            std::istream & is )  [inline]
```

10.367.4.11 Read16()

```
template<typename TSwap >
std::istream& gdcm::VL::Read16 (
            std::istream & is )  [inline]
```

10.367.4.12 SetToUndefined()

```
void gdcm::VL::SetToUndefined ( )  [inline]
```

10.367.4.13 Write()

```
template<typename TSwap >
const std::ostream& gdcm::VL::Write (
            std::ostream & os ) const  [inline]
```

Referenced by gdcm::Fragment::Write(), gdcm::Item::Write(), gdcm::SequenceOfFragments::Write(), and gdcm::↩ SequenceOfItems::Write().

10.367.4.14 Write16()

```
template<typename TSwap >
const std::ostream& gdcm::VL::Write16 (
            std::ostream & os ) const  [inline]
```

10.367.5 Friends And Related Function Documentation

10.367.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const VL & vl )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmVL.h

10.368 gdcm::VM Class Reference

Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

```
#include <gdcmVM.h>
```

Public Types

- enum VMType {
  VM0 = 0 ,
  VM1 = 1 ,
  VM2 = 2 ,
  VM3 = 4 ,
  VM4 = 8 ,
  VM5 = 16 ,
  VM6 = 32 ,
  VM8 = 64 ,
  VM9 = 128 ,
  VM10 = 256 ,
  VM12 = 512 ,
  VM16 = 1024 ,
  VM18 = 2048 ,
  VM24 = 4096 ,
  VM28 = 8192 ,
  VM32 = 16384 ,
  VM35 = 32768 ,
  VM99 = 65536 ,
  VM256 = 131072 ,
  VM1_2 = VM1 | VM2 ,
  VM1_3 = VM1 | VM2 | VM3 ,
  VM1_4 = VM1 | VM2 | VM3 | VM4 ,
  VM1_5 = VM1 | VM2 | VM3 | VM4 | VM5 ,

VM1_8 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 ,
VM1_32 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 ,
VM1_99 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 ,
VM1_n = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM2_2n = VM2 | VM4 | VM6 | VM8 | VM16 | VM24 | VM32 | VM256 ,
VM2_n = VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM3_4 = VM3 | VM4 ,
VM3_3n = VM3 | VM6 | VM9 | VM24 | VM99 | VM256 ,
VM3_n = VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM4_4n = VM4 | VM16 | VM24 | VM32 | VM256 ,
VM6_6n = VM6 | VM12 | VM18 | VM24 ,
VM6_n = VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM7_7n ,
VM30_30n ,
VM47_47n ,
VM_END = VM1_n + 1 }

Public Member Functions

- VM (VMType type=VM0)
- bool Compatible (VM const &vm) const
- unsigned int GetLength () const
- operator VMType () const

Static Public Member Functions

- static size_t GetNumberOfElementsFromArray (const char *array, size_t length)
- static const char * GetVMString (VMType vm)
- static VMType GetVMType (const char *vm)
- static VMType GetVMTypeFromLength (size_t length, unsigned int size)
- static bool IsValid (int vm1, VMType vm2)

Static Protected Member Functions

- static unsigned int GetIndex (VMType vm)

Friends

- std::ostream & operator<< (std::ostream &os, const VM &vm)

10.368.1 Detailed Description

Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

Some private dict define some more: 4-4n 1-4 1-5 256 9 3-4

even more:

7-7n 10 18 12 35 47_47n 30_30n 28

6-6n

10.368.2 Member Enumeration Documentation

10.368.2.1 VMType

enum gdcm::VM::VMType

Enumerator

VM0	
VM1	
VM2	
VM3	
VM4	
VM5	
VM6	
VM8	
VM9	
VM10	
VM12	
VM16	
VM18	
VM24	
VM28	
VM32	
VM35	
VM99	
VM256	
VM1_2	
VM1_3	
VM1_4	
VM1_5	
VM1_8	
VM1_32	
VM1_99	
VM1_n	
VM2_2n	
VM2_n	
VM3_4	
VM3_3n	
VM3_n	
VM4_4n	
VM6_6n	
VM6_n	
VM7_7n	
VM30_30n	
VM47_47n	
VM_END	

10.368.3 Constructor & Destructor Documentation

10.368.3.1 VM()

```
gdcm::VM::VM (
            VMType type = VM0 )  [inline]
```

10.368.4 Member Function Documentation

10.368.4.1 Compatible()

```
bool gdcm::VM::Compatible (
            VM const & vm ) const
```

WARNING: Implementation deficiency The Compatible function is poorly implemented, the reference vm should be coming from the dictionary, while the passed in value is the value guess from the file.

10.368.4.2 GetIndex()

```
static unsigned int gdcm::VM::GetIndex (
            VMType vm )  [static], [protected]
```

10.368.4.3 GetLength()

```
unsigned int gdcm::VM::GetLength ( ) const
```

10.368.4.4 GetNumberOfElementsFromArray()

```
static size_t gdcm::VM::GetNumberOfElementsFromArray (
            const char * array,
            size_t length )  [static]
```

10.368.4.5 GetVMString()

```
static const char* gdcm::VM::GetVMString (
            VMType vm )  [static]
```

Return the string as written in the official DICOM dict from a custom enum type

10.368.4.6 GetVMType()

```
static VMType gdcm::VM::GetVMType (
            const char * vm )  [static]
```

10.368.4.7 GetVMTypeFromLength()

```
static VMType gdcm::VM::GetVMTypeFromLength (
            size_t length,
            unsigned int size )  [static]
```

10.368.4.8 IsValid()

```
static bool gdcm::VM::IsValid (
            int vm1,
            VMType vm2 )  [static]
```

Check if vm1 is valid compare to vm2, i.e vm1 is element of vm2 vm1 is typically deduce from counting in a ValueField

10.368.4.9 operator VMType()

```
gdcm::VM::operator VMType ( ) const  [inline]
```

10.368.5 Friends And Related Function Documentation

10.368.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const VM & vm )  [friend]
```

The documentation for this class was generated from the following file:

- gdcmVM.h

10.369 gdcm::VMToLength< T > Struct Template Reference

The documentation for this struct was generated from the following file:

- gdcmVM.h

10.370 gdcm::VR Class Reference

VR class.

`#include <gdcmVR.h>`

Public Types

- enum VRType : long long {
  INVALID = 0 ,
  AE = 1 ,
  AS = 2 ,
  AT = 4 ,
  CS = 8 ,
  DA = 16 ,
  DS = 32 ,
  DT = 64 ,
  FD = 128 ,
  FL = 256 ,
  IS = 512 ,
  LO = 1024 ,
  LT = 2048 ,
  OB = 4096 ,
  OD = 134217728 ,
  OF = 8192 ,
  OL = 268435456 ,
  OV = 2147483648 ,
  OW = 16384 ,
  PN = 32768 ,
  SH = 65536 ,
  SL = 131072 ,
  SQ = 262144 ,
  SS = 524288 ,
  ST = 1048576 ,
  SV = 4294967296 ,
  TM = 2097152 ,
  UC = 536870912 ,
  UI = 4194304 ,
  UL = 8388608 ,
  UN = 16777216 ,
  UR = 1073741824 ,
  US = 33554432 ,
  UT = 67108864 ,

UV = 8589934592 ,
OB_OW = OB | OW ,
US_SS = US | SS ,
US_SS_OW = US | SS | OW ,
US_OW = US | OW ,
VL16 = AE | AS | AT | CS | DA | DS | DT | FD | FL | IS | LO | LT | PN | SH | SL | SS | ST | TM | UI | UL | US ,
VL32 = OB | OW | OD | OF | OL | OV | SQ | SV | UC | UN | UR | UT | UV ,
VRASCII = AE | AS | CS | DA | DS | DT | IS | LO | LT | PN | SH | ST | TM | UC | UI | UR | UT ,
VRBINARY = AT | FL | FD | OB | OD | OF | OL | OV | OW | SL | SQ | SS | SV | UL | UN | US | UV ,
VR_VM1 = AS | LT | ST | UT | SQ | OF | OL | OV | OD | OW | OB | UN ,
VRALL = VRASCII | VRBINARY ,
VR_END = UV+1 }

Public Member Functions

- VR (VRType vr=INVALID)
- bool Compatible (VR const &vr) const
- int GetLength () const
- unsigned int GetSize () const
- unsigned int GetSizeof () const
- bool IsDual () const
- bool IsVRFile () const
- operator VRType () const
- std::istream & Read (std::istream &is)
- const std::ostream & Write (std::ostream &os) const

Static Public Member Functions

- static bool CanDisplay (VRType vr)
- static uint32_t GetLength (VRType vr)
- static const char * GetVRString (VRType vr)
- static const char * GetVRStringFromFile (VRType vr)
- static VRType GetVRType (const char *vr)
- static VRType GetVRTypeFromFile (const char *vr)
- static bool IsASCII (VRType vr)
- static bool IsASCII2 (VRType vr)
- static bool IsBinary (VRType vr)
- static bool IsBinary2 (VRType vr)
- static bool IsSwap (const char *vr)
- static bool IsValid (const char *vr)
- static bool IsValid (const char *vr1, VRType vr2)

Friends

- std::ostream & operator<< (std::ostream &os, const VR &vr)

10.370.1 Detailed Description

VR class.

This is adapted from DICOM standard The biggest difference is the INVALID VR and the composite one that differ from standard (more like an addition) This allow us to represent all the possible case express in the DICOMV3 dict

Note

VALUE REPRESENTATION (VR) Specifies the data type and format of the Value(s) contained in the Value Field of a Data Element. VALUE REPRESENTATION FIELD: The field where the Value Representation of a Data Element is stored in the encoding of a Data Element structure with explicit VR.

Examples

GenAllVR.cxx, and GenFakeIdentifyFile.cxx.

10.370.2 Member Enumeration Documentation

10.370.2.1 VRType

```
enum gdcm::VR::VRType :  long long
```

Enumerator

INVALID	
AE	
AS	
AT	
CS	
DA	
DS	
DT	
FD	
FL	
IS	
LO	
LT	
OB	
OD	
OF	
OL	
OV	
OW	
PN	
SH	

Enumerator

SL	
SQ	
SS	
ST	
SV	
TM	
UC	
UI	
UL	
UN	
UR	
US	
UT	
UV	
OB_OW	
US_SS	
US_SS_OW	
US_OW	
VL16	
VL32	
VRASCII	
VRBINARY	
VR_VM1	
VRALL	
VR_END	

Examples

NewSequence.cs.

10.370.3 Constructor & Destructor Documentation

10.370.3.1 VR()

```
gdcm::VR::VR (
            VRType vr = INVALID )  [inline]
```

10.370.4 Member Function Documentation

10.370.4.1 CanDisplay()

```
static bool gdcm::VR::CanDisplay (
            VRType vr )  [static]
```

10.370.4.2 Compatible()

```
bool gdcm::VR::Compatible (
            VR const & vr ) const
```

10.370.4.3 GetLength() [1/2]

```
int gdcm::VR::GetLength ( ) const  [inline]
```

10.370.4.4 GetLength() [2/2]

```
static uint32_t gdcm::VR::GetLength (
            VRType vr )  [inline], [static]
```

10.370.4.5 GetSize()

```
unsigned int gdcm::VR::GetSize ( ) const  [inline]
```

References AE, AS, AT, CS, DA, DS, DT, FD, FL, INVALID, IS, LT, OB, OB_OW, OD, OF, OL, OV, OW, PN, SH, SL, SQ, SS, ST, SV, TM, UC, UL, UN, UR, US, US_OW, US_SS, US_SS_OW, UT, UV, VL16, VL32, VR_END, VR_VM1, VRALL, VRASCII, VRBINARY, and VRTypeTemplateCase.

10.370.4.6 GetSizeof()

```
unsigned int gdcm::VR::GetSizeof ( ) const
```

10.370.4.7 GetVRString()

```
static const char* gdcm::VR::GetVRString (
            VRType vr )  [static]
```

10.370.4.8 GetVRStringFromFile()

```
static const char* gdcm::VR::GetVRStringFromFile (
            VRType vr )  [static]
```

10.370.4.9 GetVRType()

```
static VRType gdcm::VR::GetVRType (
            const char * vr )  [static]
```

10.370.4.10 GetVRTypeFromFile()

```
static VRType gdcm::VR::GetVRTypeFromFile (
            const char * vr )  [static]
```

10.370.4.11 IsASCII()

```
static bool gdcm::VR::IsASCII (
            VRType vr )  [static]
```

10.370.4.12 IsASCII2()

```
static bool gdcm::VR::IsASCII2 (
            VRType vr )  [static]
```

10.370.4.13 IsBinary()

```
static bool gdcm::VR::IsBinary (
            VRType vr )  [static]
```

10.370.4.14 IsBinary2()

```
static bool gdcm::VR::IsBinary2 (
            VRType vr )  [static]
```

10.370.4.15 IsDual()

```
bool gdcm::VR::IsDual ( ) const
```

10.370.4.16 IsSwap()

```
static bool gdcm::VR::IsSwap (
            const char * vr )  [static]
```

10.370.4.17 IsValid() [1/2]

```
static bool gdcm::VR::IsValid (
            const char * vr )  [static]
```

10.370.4.18 IsValid() [2/2]

```
static bool gdcm::VR::IsValid (
            const char * vr1,
            VRType vr2 )  [static]
```

10.370.4.19 IsVRFile()

```
bool gdcm::VR::IsVRFile ( ) const
```

Referenced by gdcm::DataElement::SetVR().

10.370.4.20 operator VRType()

```
gdcm::VR::operator VRType ( ) const  [inline]
```

10.370.4.21 Read()

```
std::istream& gdcm::VR::Read (
            std::istream & is )  [inline]
```

References gdcmDebugMacro, INVALID, and VR_END.

10.370.4.22 Write()

```
const std::ostream& gdcm::VR::Write (
            std::ostream & os ) const  [inline]
```

References gdcmAssertAlwaysMacro, and INVALID.

10.370.5 Friends And Related Function Documentation

10.370.5.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const VR & vr )  [friend]
```

The documentation for this class was generated from the following file:

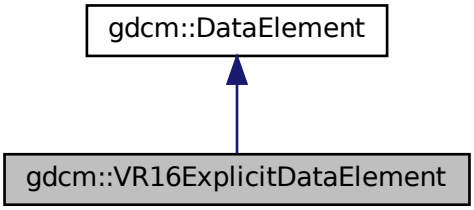
- gdcmVR.h

10.371 gdcm::VR16ExplicitDataElement Class Reference

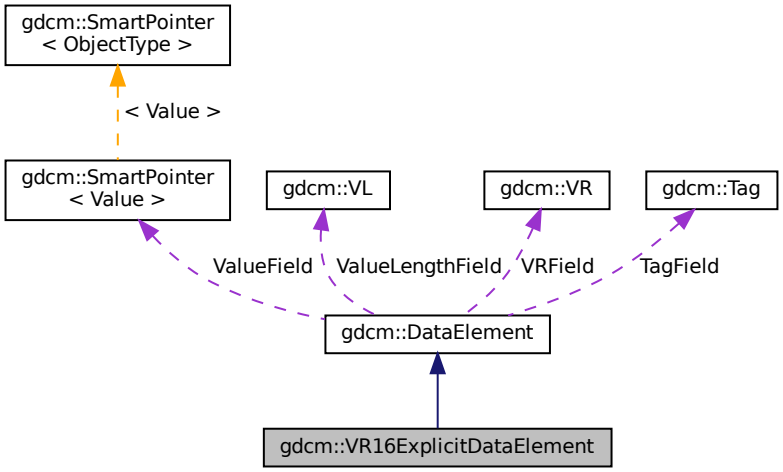
Class to read/write a DataElement as Explicit Data Element.

`#include <gdcmVR16ExplicitDataElement.h>`

Inheritance diagram for gdcm::VR16ExplicitDataElement:



Collaboration diagram for gdcm::VR16ExplicitDataElement:



Public Member Functions

- VL GetLength () const
- template<typename TSwap >
  std::istream & Read (std::istream &is)

- template<typename TSwap >
  std::istream & ReadPreValue (std::istream &is)
- template<typename TSwap >
  std::istream & ReadValue (std::istream &is, bool readvalues=true)
- template<typename TSwap >
  std::istream & ReadWithLength (std::istream &is, VL &length)

Additional Inherited Members

10.371.1 Detailed Description

Class to read/write a DataElement as Explicit Data Element.

Note

This class support 16 bits when finding an unknown VR: For instance: Siemens_CT_Sensation64_has_VR_RT.↩ dcm

10.371.2 Member Function Documentation

10.371.2.1 GetLength()

```
VL gdcm::VR16ExplicitDataElement::GetLength ( ) const
```

10.371.2.2 Read()

```
template<typename TSwap >
std::istream& gdcm::VR16ExplicitDataElement::Read (
            std::istream & is )
```

10.371.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream& gdcm::VR16ExplicitDataElement::ReadPreValue (
            std::istream & is )
```

10.371.2.4 ReadValue()

```
template<typename TSwap >
std::istream& gdcm::VR16ExplicitDataElement::ReadValue (
             std::istream & is,
             bool readvalues = true )
```

10.371.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream& gdcm::VR16ExplicitDataElement::ReadWithLength (
             std::istream & is,
             VL & length )
```

The documentation for this class was generated from the following file:

- gdcmVR16ExplicitDataElement.h

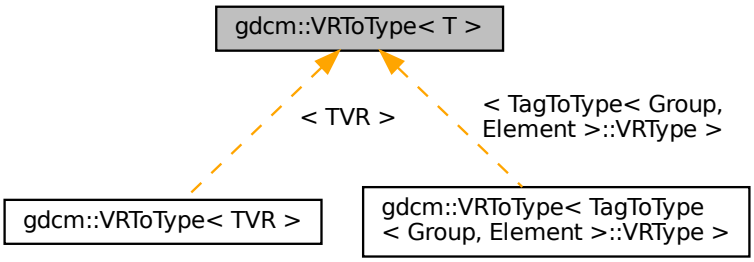
10.372 gdcm::VRToEncoding< T > Struct Template Reference

The documentation for this struct was generated from the following file:

- gdcmVR.h

10.373 gdcm::VRToType< T > Struct Template Reference

Inheritance diagram for gdcm::VRToType< T >:



The documentation for this struct was generated from the following file:

- gdcmVR.h

10.374 gdcm::VRVLSize< T > Class Template Reference

The documentation for this class was generated from the following file:

- gdcmAttribute.h

10.375 gdcm::VRVLSize< 0 > Class Reference

`#include <gdcmAttribute.h>`

Static Public Member Functions

- static uint16_t Read (std::istream &_is)
- static void Write (std::ostream &os)

10.375.1 Member Function Documentation

10.375.1.1 Read()

```
static uint16_t gdcm::VRVLSize< 0 >::Read (
            std::istream & _is )  [inline], [static]
```

10.375.1.2 Write()

```
static void gdcm::VRVLSize< 0 >::Write (
            std::ostream & os )  [inline], [static]
```

The documentation for this class was generated from the following file:

- gdcmAttribute.h

10.376 gdcm::VRVLSize< 1 > Class Reference

`#include <gdcmAttribute.h>`

Static Public Member Functions

- static uint32_t Read (std::istream &_is)
- static void Write (std::ostream &os)

10.376.1 Member Function Documentation

10.376.1.1 Read()

```
static uint32_t gdcm::VRVLSize< 1 >::Read (
            std::istream & _is )  [inline], [static]
```

10.376.1.2 Write()

```
static void gdcm::VRVLSize< 1 >::Write (
            std::ostream & os )  [inline], [static]
```

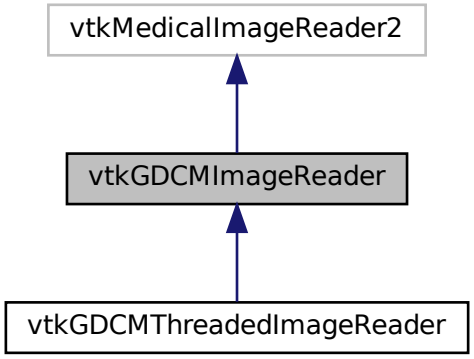
The documentation for this class was generated from the following file:

- gdcmAttribute.h

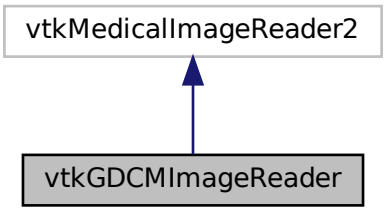
10.377 vtkGDCMImageReader Class Reference

```
#include <vtkGDCMImageReader.h>
```

Inheritance diagram for vtkGDCMImageReader:



Collaboration diagram for vtkGDCMImageReader:



Public Member Functions

- virtual int CanReadFile (const char *fname)
- virtual const char * GetDescriptiveName ()
- virtual const char * GetFileExtensions ()
- vtkImageData * GetIconImage ()
- vtkImageData * GetOverlay (int i)
- virtual void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetCurve (vtkPolyData *pd)
- virtual void SetFileNames (vtkStringArray *)
- virtual void SetMedicalImageProperties (vtkMedicalImageProperties *pd)
- vtkBooleanMacro (ApplyLookupTable, int)
- int vtkBooleanMacro (ApplyYBRToRGB, int)
- vtkBooleanMacro (LoadIconImage, int)
- vtkBooleanMacro (LoadOverlays, int)
- vtkBooleanMacro (LossyFlag, int)
- vtkGetMacro (ApplyLookupTable, int)
- vtkGetMacro (ApplyYBRToRGB, int) vtkSetMacro(ApplyYBRToRGB
- vtkGetMacro (ImageFormat, int)
- vtkGetMacro (LoadIconImage, int)
- vtkGetMacro (LoadOverlays, int)
- vtkGetMacro (LossyFlag, int)
- vtkGetMacro (NumberOfIconImages, int)
- vtkGetMacro (NumberOfOverlays, int)
- vtkGetMacro (PlanarConfiguration, int)
- vtkGetMacro (Scale, double)
- vtkGetMacro (Shift, double)
- vtkGetObjectMacro (Curve, vtkPolyData)
- vtkGetObjectMacro (DirectionCosines, vtkMatrix4x4)
- vtkGetObjectMacro (FileNames, vtkStringArray)
- vtkGetObjectMacro (MedicalImageProperties, vtkMedicalImageProperties)
- vtkGetVector3Macro (ImagePositionPatient, double)
- vtkGetVector6Macro (ImageOrientationPatient, double)
- vtkSetMacro (ApplyLookupTable, int)

- vtkSetMacro (LoadIconImage, int)
- vtkSetMacro (LoadOverlays, int)
- vtkSetMacro (LossyFlag, int)
- vtkTypeMacro (vtkGDCMImageReader, vtkMedicalImageReader2)

Static Public Member Functions

- static vtkGDCMImageReader * New ()

Protected Member Functions

- vtkGDCMImageReader ()
- ~vtkGDCMImageReader ()
- void ExecuteData (vtkDataObject *out)
- void ExecuteInformation ()
- void FillMedicalImageInformation (const gdcm::ImageReader &reader)
- int LoadSingleFile (const char *filename, char *pointer, unsigned long &outlen)
- int RequestDataCompat ()
- int RequestInformationCompat ()
- void SetFilePattern (const char *)
- void SetFilePrefix (const char *)
- vtkGetStringMacro (FilePattern)
- vtkGetStringMacro (FilePrefix)
- vtkSetVector6Macro (ImageOrientationPatient, double)

Protected Attributes

- int ApplyInverseVideo
- int ApplyLookupTable
- int ApplyPlanarConfiguration
- int ApplyShiftScale
- int ApplyYBRToRGB
- vtkPolyData * Curve
- vtkMatrix4x4 * DirectionCosines
- vtkStringArray * FileNames
- int ForceRescale
- int IconDataScalarType
- int IconImageDataExtent [6]
- int IconNumberOfScalarComponents
- int ImageFormat
- double ImageOrientationPatient [6]
- double ImagePositionPatient [3]
- int LoadIconImage
- int LoadOverlays
- int LossyFlag
- vtkMedicalImageProperties * MedicalImageProperties
- int NumberOfIconImages
- int NumberOfOverlays
- int PlanarConfiguration
- double Scale
- double Shift

10.377.1 Detailed Description

Examples

AWTMedical3.java, Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, HelloActiviz.cs, HelloActiviz2.cs, HelloActiviz3.cs, HelloActiviz4.cs, HelloActiviz5.cs, HelloVTKWorld.cs, HelloVTKWorld.java, MIPViewer.java, MPRViewer.java, MPRViewer2.java, MagnifyFile.cxx, MetaImageMD5Activiz.cs, ReadSeriesIntoVTK.java, RefCounting.cs, gdcmorthoplanes.cxx, gdcmreslice.cxx, gdcmtexture.cxx, gdcmvolume.cxx, offscreenimage.cxx, and reslicesphere.cxx.

10.377.2 Constructor & Destructor Documentation

10.377.2.1 vtkGDCMImageReader()

```
vtkGDCMImageReader::vtkGDCMImageReader ( )  [protected]
```

Examples

HelloActiviz2.cs.

10.377.2.2 ~vtkGDCMImageReader()

```
vtkGDCMImageReader::~vtkGDCMImageReader ( )  [protected]
```

10.377.3 Member Function Documentation

10.377.3.1 CanReadFile()

```
virtual int vtkGDCMImageReader::CanReadFile (
            const char * fname )  [virtual]
```

Examples

AWTMedical3.java, and MetaImageMD5Activiz.cs.

10.377.3.2 ExecuteData()

```
void vtkGDCMImageReader::ExecuteData (
            vtkDataObject * out )  [protected]
```

10.377.3.3 ExecuteInformation()

```
void vtkGDCMImageReader::ExecuteInformation ( )  [protected]
```

10.377.3.4 FillMedicalImageInformation()

```
void vtkGDCMImageReader::FillMedicalImageInformation (
            const gdcm::ImageReader & reader )  [protected]
```

10.377.3.5 GetDescriptiveName()

```
virtual const char* vtkGDCMImageReader::GetDescriptiveName ( )  [inline], [virtual]
```

10.377.3.6 GetFileExtensions()

```
virtual const char* vtkGDCMImageReader::GetFileExtensions ( )  [inline], [virtual]
```

10.377.3.7 GetIconImage()

```
vtkImageData* vtkGDCMImageReader::GetIconImage ( )
```

10.377.3.8 GetOverlay()

```
vtkImageData* vtkGDCMImageReader::GetOverlay (
            int i )
```

10.377.3.9 LoadSingleFile()

```
int vtkGDCMImageReader::LoadSingleFile (
            const char * filename,
            char * pointer,
            unsigned long & outlen )  [protected]
```

10.377.3.10 New()

```
static vtkGDCMImageReader* vtkGDCMImageReader::New ( )  [static]
```

Examples

Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, HelloActiviz.cs, HelloActiviz3.cs, HelloActiviz4.cs, HelloActiviz5.cs, HelloVTKWorld.cs, MagnifyFile.cxx, MetaImageMD5Activiz.cs, RefCounting.cs, gdcmorthoplanes.cxx, gdcmreslice.cxx, gdcmtexture.cxx, gdcmvolume.cxx, offscreenimage.cxx, and reslicesphere.cxx.

10.377.3.11 PrintSelf()

```
virtual void vtkGDCMImageReader::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

Reimplemented in vtkGDCMThreadedImageReader.

10.377.3.12 RequestDataCompat()

```
int vtkGDCMImageReader::RequestDataCompat ( )  [protected]
```

10.377.3.13 RequestInformationCompat()

```
int vtkGDCMImageReader::RequestInformationCompat ( )  [protected]
```

10.377.3.14 SetCurve()

```
virtual void vtkGDCMImageReader::SetCurve (
            vtkPolyData * pd )  [virtual]
```

10.377.3.15 SetFileNames()

```
virtual void vtkGDCMImageReader::SetFileNames (
            vtkStringArray *  )  [virtual]
```

Examples

AWTMedical3.java, HelloActiviz3.cs, HelloActiviz4.cs, HelloActiviz5.cs, MIPViewer.java, MPRViewer.java, MPRViewer2.java, ReadSeriesIntoVTK.java, and gdcmorthoplanes.cxx.

10.377.3.16 SetFilePattern()

```
void vtkGDCMImageReader::SetFilePattern (
            const char *  )  [inline], [protected]
```

10.377.3.17 SetFilePrefix()

```
void vtkGDCMImageReader::SetFilePrefix (
            const char *  )  [inline], [protected]
```

10.377.3.18 SetMedicalImageProperties()

```
virtual void vtkGDCMImageReader::SetMedicalImageProperties (
            vtkMedicalImageProperties * pd )  [virtual]
```

10.377.3.19 vtkBooleanMacro() [1/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
            ApplyLookupTable ,
            int  )
```

10.377.3.20 vtkBooleanMacro() [2/5]

```
int vtkGDCMImageReader::vtkBooleanMacro (
            ApplyYBRToRGB ,
            int  )
```

10.377.3.21 vtkBooleanMacro() [3/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
            LoadIconImage ,
            int  )
```

10.377.3.22 vtkBooleanMacro() [4/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
            LoadOverlays ,
            int  )
```

10.377.3.23 vtkBooleanMacro() [5/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
            LossyFlag ,
            int  )
```

10.377.3.24 vtkGetMacro() [1/11]

```
vtkGDCMImageReader::vtkGetMacro (
            ApplyLookupTable ,
            int  )
```

10.377.3.25 vtkGetMacro() [2/11]

```
vtkGDCMImageReader::vtkGetMacro (
            ApplyYBRToRGB ,
            int  )
```

10.377.3.26 vtkGetMacro() [3/11]

```
vtkGDCMImageReader::vtkGetMacro (
            ImageFormat ,
            int  )
```

10.377.3.27 vtkGetMacro() [4/11]

```
vtkGDCMImageReader::vtkGetMacro (
            LoadIconImage ,
            int  )
```

10.377.3.28 vtkGetMacro() [5/11]

```
vtkGDCMImageReader::vtkGetMacro (
            LoadOverlays ,
            int  )
```

10.377.3.29 vtkGetMacro() [6/11]

```
vtkGDCMImageReader::vtkGetMacro (
            LossyFlag ,
            int  )
```

10.377.3.30 vtkGetMacro() [7/11]

```
vtkGDCMImageReader::vtkGetMacro (
            NumberOfIconImages ,
            int  )
```

10.377.3.31 vtkGetMacro() [8/11]

```
vtkGDCMImageReader::vtkGetMacro (
            NumberOfOverlays ,
            int  )
```

10.377.3.32 vtkGetMacro() [9/11]

```
vtkGDCMImageReader::vtkGetMacro (
            PlanarConfiguration ,
            int  )
```

10.377.3.33 vtkGetMacro() [10/11]

```
vtkGDCMImageReader::vtkGetMacro (
            Scale ,
            double  )
```

10.377.3.34 vtkGetMacro() [11/11]

```
vtkGDCMImageReader::vtkGetMacro (
            Shift ,
            double  )
```

10.377.3.35 vtkGetObjectMacro() [1/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
            Curve ,
            vtkPolyData  )
```

10.377.3.36 vtkGetObjectMacro() [2/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
            DirectionCosines ,
            vtkMatrix4x4  )
```

10.377.3.37 vtkGetObjectMacro() [3/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
            FileNames ,
            vtkStringArray  )
```

10.377.3.38 vtkGetObjectMacro() [4/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
            MedicalImageProperties ,
            vtkMedicalImageProperties  )
```

10.377.3.39 vtkGetStringMacro() [1/2]

```
vtkGDCMImageReader::vtkGetStringMacro (
            FilePattern  )  [protected]
```

10.377.3.40 vtkGetStringMacro() [2/2]

```
vtkGDCMImageReader::vtkGetStringMacro (
            FilePrefix  )  [protected]
```

10.377.3.41 vtkGetVector3Macro()

```
vtkGDCMImageReader::vtkGetVector3Macro (
            ImagePositionPatient ,
            double  )
```

10.377.3.42 vtkGetVector6Macro()

```
vtkGDCMImageReader::vtkGetVector6Macro (
            ImageOrientationPatient ,
            double  )
```

10.377.3.43 vtkSetMacro() [1/4]

```
vtkGDCMImageReader::vtkSetMacro (
            ApplyLookupTable ,
            int  )
```

10.377.3.44 vtkSetMacro() [2/4]

```
vtkGDCMImageReader::vtkSetMacro (
            LoadIconImage ,
            int  )
```

10.377.3.45 vtkSetMacro() [3/4]

```
vtkGDCMImageReader::vtkSetMacro (
            LoadOverlays ,
            int  )
```

10.377.3.46 vtkSetMacro() [4/4]

```
vtkGDCMImageReader::vtkSetMacro (
            LossyFlag ,
            int  )
```

10.377.3.47 vtkSetVector6Macro()

```
vtkGDCMImageReader::vtkSetVector6Macro (
            ImageOrientationPatient ,
            double  )  [protected]
```

10.377.3.48 vtkTypeMacro()

```
vtkGDCMImageReader::vtkTypeMacro (
            vtkGDCMImageReader ,
            vtkMedicalImageReader2  )
```

10.377.4 Member Data Documentation

10.377.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader::ApplyInverseVideo  [protected]
```

10.377.4.2 ApplyLookupTable

```
int vtkGDCMImageReader::ApplyLookupTable  [protected]
```

10.377.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader::ApplyPlanarConfiguration  [protected]
```

10.377.4.4 ApplyShiftScale

```
int vtkGDCMImageReader::ApplyShiftScale  [protected]
```

10.377.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader::ApplyYBRToRGB  [protected]
```

10.377.4.6 Curve

```
vtkPolyData* vtkGDCMImageReader::Curve  [protected]
```

10.377.4.7 DirectionCosines

```
vtkMatrix4x4* vtkGDCMImageReader::DirectionCosines  [protected]
```

10.377.4.8 FileNames

```
vtkStringArray* vtkGDCMImageReader::FileNames  [protected]
```

10.377.4.9 ForceRescale

```
int vtkGDCMImageReader::ForceRescale  [protected]
```

10.377.4.10 IconDataScalarType

```
int vtkGDCMImageReader::IconDataScalarType  [protected]
```

10.377.4.11 IconImageDataExtent

```
int vtkGDCMImageReader::IconImageDataExtent[6]  [protected]
```

10.377.4.12 IconNumberOfScalarComponents

```
int vtkGDCMImageReader::IconNumberOfScalarComponents  [protected]
```

10.377.4.13 ImageFormat

```
int vtkGDCMImageReader::ImageFormat  [protected]
```

10.377.4.14 ImageOrientationPatient

```
double vtkGDCMImageReader::ImageOrientationPatient[6]  [protected]
```

10.377.4.15 ImagePositionPatient

```
double vtkGDCMImageReader::ImagePositionPatient[3]  [protected]
```

10.377.4.16 LoadIconImage

```
int vtkGDCMImageReader::LoadIconImage  [protected]
```

10.377.4.17 LoadOverlays

```
int vtkGDCMImageReader::LoadOverlays  [protected]
```

10.377.4.18 LossyFlag

```
int vtkGDCMImageReader::LossyFlag  [protected]
```

10.377.4.19 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMImageReader::MedicalImageProperties  [protected]
```

10.377.4.20 NumberOfIconImages

```
int vtkGDCMImageReader::NumberOfIconImages  [protected]
```

10.377.4.21 NumberOfOverlays

```
int vtkGDCMImageReader::NumberOfOverlays  [protected]
```

10.377.4.22 PlanarConfiguration

```
int vtkGDCMImageReader::PlanarConfiguration  [protected]
```

10.377.4.23 Scale

```
double vtkGDCMImageReader::Scale  [protected]
```

10.377.4.24 Shift

```
double vtkGDCMImageReader::Shift  [protected]
```

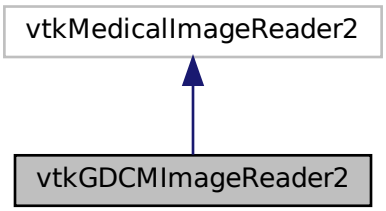
The documentation for this class was generated from the following file:

- vtkGDCMImageReader.h

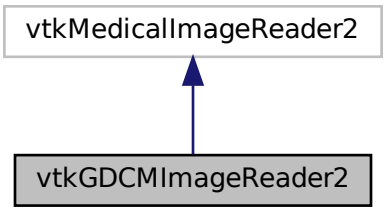
10.378 vtkGDCMImageReader2 Class Reference

```
#include <vtkGDCMImageReader2.h>
```

Inheritance diagram for vtkGDCMImageReader2:



Collaboration diagram for vtkGDCMImageReader2:



Public Member Functions

- virtual int CanReadFile (const char ∗fname)
- virtual const char ∗ GetDescriptiveName ()
- virtual const char ∗ GetFileExtensions ()
- vtkImageData ∗ GetIconImage ()
- vtkAlgorithmOutput ∗ GetIconImagePort ()
- vtkImageData ∗ GetOverlay (int i)
- vtkAlgorithmOutput ∗ GetOverlayPort (int index)
- virtual void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetCurve (vtkPolyData ∗pd)
- virtual void SetMedicalImageProperties (vtkMedicalImageProperties ∗pd)
- vtkBooleanMacro (ApplyLookupTable, int)
- int vtkBooleanMacro (ApplyYBRToRGB, int)
- vtkBooleanMacro (LoadIconImage, int)
- vtkBooleanMacro (LoadOverlays, int)
- vtkBooleanMacro (LossyFlag, int)
- vtkGetMacro (ApplyLookupTable, int)
- vtkGetMacro (ApplyYBRToRGB, int) vtkSetMacro(ApplyYBRToRGB
- vtkGetMacro (ImageFormat, int)
- vtkGetMacro (LoadIconImage, int)
- vtkGetMacro (LoadOverlays, int)
- vtkGetMacro (LossyFlag, int)
- vtkGetMacro (NumberOfIconImages, int)
- vtkGetMacro (NumberOfOverlays, int)
- vtkGetMacro (PlanarConfiguration, int)
- vtkGetMacro (Scale, double)
- vtkGetMacro (Shift, double)
- vtkGetObjectMacro (Curve, vtkPolyData)
- vtkGetObjectMacro (DirectionCosines, vtkMatrix4x4)
- vtkGetVector3Macro (ImagePositionPatient, double)
- vtkGetVector6Macro (ImageOrientationPatient, double)
- vtkSetMacro (ApplyLookupTable, int)
- vtkSetMacro (LoadIconImage, int)
- vtkSetMacro (LoadOverlays, int)
- vtkSetMacro (LossyFlag, int)
- vtkTypeMacro (vtkGDCMImageReader2, vtkMedicalImageReader2)

Static Public Member Functions

- static vtkGDCMImageReader2 * New ()

Protected Member Functions

- vtkGDCMImageReader2 ()
- ~vtkGDCMImageReader2 ()
- void FillMedicalImageInformation (const gdcm::ImageReader &reader)
- int LoadSingleFile (const char *filename, char *pointer, unsigned long &outlen)
- int ProcessRequest (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *output↩ Vector)
- int RequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *output↩ Vector)
- int RequestDataCompat ()
- int RequestInformation (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector)
- int RequestInformationCompat ()
- void SetFilePattern (const char *)
- void SetFilePrefix (const char *)
- vtkGetStringMacro (FilePattern)
- vtkGetStringMacro (FilePrefix)
- vtkSetVector6Macro (ImageOrientationPatient, double)

Protected Attributes

- int ApplyInverseVideo
- int ApplyLookupTable
- int ApplyPlanarConfiguration
- int ApplyShiftScale
- int ApplyYBRToRGB
- vtkPolyData * Curve
- vtkMatrix4x4 * DirectionCosines
- int ForceRescale
- int IconDataScalarType
- int IconImageDataExtent [6]
- int IconNumberOfScalarComponents
- int ImageFormat
- double ImageOrientationPatient [6]
- double ImagePositionPatient [3]
- int LoadIconImage
- int LoadOverlays
- int LossyFlag
- int NumberOfIconImages
- int NumberOfOverlays
- int PlanarConfiguration
- double Scale
- double Shift

10.378.1 Detailed Description

Examples

Compute3DSpacing.cxx.

10.378.2 Constructor & Destructor Documentation

10.378.2.1 vtkGDCMImageReader2()

```
vtkGDCMImageReader2::vtkGDCMImageReader2 ( )  [protected]
```

10.378.2.2 ~vtkGDCMImageReader2()

```
vtkGDCMImageReader2::~vtkGDCMImageReader2 ( )  [protected]
```

10.378.3 Member Function Documentation

10.378.3.1 CanReadFile()

```
virtual int vtkGDCMImageReader2::CanReadFile (
            const char * fname )  [virtual]
```

10.378.3.2 FillMedicalImageInformation()

```
void vtkGDCMImageReader2::FillMedicalImageInformation (
            const gdcm::ImageReader & reader )  [protected]
```

10.378.3.3 GetDescriptiveName()

```
virtual const char* vtkGDCMImageReader2::GetDescriptiveName ( )  [inline], [virtual]
```

10.378.3.4 GetFileExtensions()

```
virtual const char* vtkGDCMImageReader2::GetFileExtensions ( )  [inline], [virtual]
```

10.378.3.5 GetIconImage()

```
vtkImageData* vtkGDCMImageReader2::GetIconImage ( )
```

10.378.3.6 GetIconImagePort()

```
vtkAlgorithmOutput* vtkGDCMImageReader2::GetIconImagePort ( )
```

10.378.3.7 GetOverlay()

```
vtkImageData* vtkGDCMImageReader2::GetOverlay (
            int i )
```

10.378.3.8 GetOverlayPort()

```
vtkAlgorithmOutput* vtkGDCMImageReader2::GetOverlayPort (
            int index )
```

10.378.3.9 LoadSingleFile()

```
int vtkGDCMImageReader2::LoadSingleFile (
            const char * filename,
            char * pointer,
            unsigned long & outlen )  [protected]
```

10.378.3.10 New()

```
static vtkGDCMImageReader2* vtkGDCMImageReader2::New ( )  [static]
```

Examples

Compute3DSpacing.cxx.

10.378.3.11 PrintSelf()

```
virtual void vtkGDCMImageReader2::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

10.378.3.12 ProcessRequest()

```
int vtkGDCMImageReader2::ProcessRequest (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected]
```

10.378.3.13 RequestData()

```
int vtkGDCMImageReader2::RequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected]
```

10.378.3.14 RequestDataCompat()

```
int vtkGDCMImageReader2::RequestDataCompat ( )  [protected]
```

10.378.3.15 RequestInformation()

```
int vtkGDCMImageReader2::RequestInformation (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected]
```

10.378.3.16 RequestInformationCompat()

```
int vtkGDCMImageReader2::RequestInformationCompat ( )  [protected]
```

10.378.3.17 SetCurve()

```
virtual void vtkGDCMImageReader2::SetCurve (
            vtkPolyData * pd )  [virtual]
```

10.378.3.18 SetFilePattern()

```
void vtkGDCMImageReader2::SetFilePattern (
            const char *  )  [inline], [protected]
```

10.378.3.19 SetFilePrefix()

```
void vtkGDCMImageReader2::SetFilePrefix (
            const char *  )  [inline], [protected]
```

10.378.3.20 SetMedicalImageProperties()

```
virtual void vtkGDCMImageReader2::SetMedicalImageProperties (
            vtkMedicalImageProperties * pd )  [virtual]
```

10.378.3.21 vtkBooleanMacro() [1/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
            ApplyLookupTable ,
            int  )
```

10.378.3.22 vtkBooleanMacro() [2/5]

```
int vtkGDCMImageReader2::vtkBooleanMacro (
            ApplyYBRToRGB ,
            int  )
```

10.378.3.23 vtkBooleanMacro() [3/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
            LoadIconImage ,
            int  )
```

10.378.3.24 vtkBooleanMacro() [4/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
            LoadOverlays ,
            int  )
```

10.378.3.25 vtkBooleanMacro() [5/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
            LossyFlag ,
            int  )
```

10.378.3.26 vtkGetMacro() [1/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            ApplyLookupTable ,
            int  )
```

10.378.3.27 vtkGetMacro() [2/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            ApplyYBRToRGB ,
            int  )
```

10.378.3.28 vtkGetMacro() [3/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            ImageFormat ,
            int  )
```

10.378.3.29 vtkGetMacro() [4/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            LoadIconImage ,
            int  )
```

10.378.3.30 vtkGetMacro() [5/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            LoadOverlays ,
            int  )
```

10.378.3.31 vtkGetMacro() [6/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            LossyFlag ,
            int  )
```

10.378.3.32 vtkGetMacro() [7/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            NumberOfIconImages ,
            int  )
```

10.378.3.33 vtkGetMacro() [8/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            NumberOfOverlays ,
            int  )
```

10.378.3.34 vtkGetMacro() [9/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            PlanarConfiguration ,
            int  )
```

10.378.3.35 vtkGetMacro() [10/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            Scale ,
            double  )
```

10.378.3.36 vtkGetMacro() [11/11]

```
vtkGDCMImageReader2::vtkGetMacro (
            Shift ,
            double  )
```

10.378.3.37 vtkGetObjectMacro() [1/2]

```
vtkGDCMImageReader2::vtkGetObjectMacro (
            Curve ,
            vtkPolyData  )
```

10.378.3.38 vtkGetObjectMacro() [2/2]

```
vtkGDCMImageReader2::vtkGetObjectMacro (
            DirectionCosines ,
            vtkMatrix4x4  )
```

10.378.3.39 vtkGetStringMacro() [1/2]

```
vtkGDCMImageReader2::vtkGetStringMacro (
            FilePattern  )  [protected]
```

10.378.3.40 vtkGetStringMacro() [2/2]

```
vtkGDCMImageReader2::vtkGetStringMacro (
            FilePrefix  )  [protected]
```

10.378.3.41 vtkGetVector3Macro()

```
vtkGDCMImageReader2::vtkGetVector3Macro (
            ImagePositionPatient ,
            double  )
```

10.378.3.42 vtkGetVector6Macro()

```
vtkGDCMImageReader2::vtkGetVector6Macro (
            ImageOrientationPatient ,
            double  )
```

10.378.3.43 vtkSetMacro() [1/4]

```
vtkGDCMImageReader2::vtkSetMacro (
            ApplyLookupTable ,
            int  )
```

10.378.3.44 vtkSetMacro() [2/4]

```
vtkGDCMImageReader2::vtkSetMacro (
            LoadIconImage ,
            int  )
```

10.378.3.45 vtkSetMacro() [3/4]

```
vtkGDCMImageReader2::vtkSetMacro (
            LoadOverlays ,
            int  )
```

10.378.3.46 vtkSetMacro() [4/4]

```
vtkGDCMImageReader2::vtkSetMacro (
            LossyFlag ,
            int  )
```

10.378.3.47 vtkSetVector6Macro()

```
vtkGDCMImageReader2::vtkSetVector6Macro (
            ImageOrientationPatient ,
            double  )  [protected]
```

10.378.3.48 vtkTypeMacro()

```
vtkGDCMImageReader2::vtkTypeMacro (
            vtkGDCMImageReader2 ,
            vtkMedicalImageReader2  )
```

10.378.4 Member Data Documentation

10.378.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader2::ApplyInverseVideo  [protected]
```

10.378.4.2 ApplyLookupTable

```
int vtkGDCMImageReader2::ApplyLookupTable  [protected]
```

10.378.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader2::ApplyPlanarConfiguration  [protected]
```

10.378.4.4 ApplyShiftScale

```
int vtkGDCMImageReader2::ApplyShiftScale  [protected]
```

10.378.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader2::ApplyYBRToRGB  [protected]
```

10.378.4.6 Curve

```
vtkPolyData* vtkGDCMImageReader2::Curve  [protected]
```

10.378.4.7 DirectionCosines

```
vtkMatrix4x4* vtkGDCMImageReader2::DirectionCosines  [protected]
```

10.378.4.8 ForceRescale

```
int vtkGDCMImageReader2::ForceRescale  [protected]
```

10.378.4.9 IconDataScalarType

```
int vtkGDCMImageReader2::IconDataScalarType  [protected]
```

10.378.4.10 IconImageDataExtent

```
int vtkGDCMImageReader2::IconImageDataExtent[6]  [protected]
```

10.378.4.11 IconNumberOfScalarComponents

```
int vtkGDCMImageReader2::IconNumberOfScalarComponents  [protected]
```

10.378.4.12 ImageFormat

```
int vtkGDCMImageReader2::ImageFormat  [protected]
```

10.378.4.13 ImageOrientationPatient

```
double vtkGDCMImageReader2::ImageOrientationPatient[6]  [protected]
```

10.378.4.14 ImagePositionPatient

```
double vtkGDCMImageReader2::ImagePositionPatient[3]  [protected]
```

10.378.4.15 LoadIconImage

```
int vtkGDCMImageReader2::LoadIconImage  [protected]
```

10.378.4.16 LoadOverlays

```
int vtkGDCMImageReader2::LoadOverlays  [protected]
```

10.378.4.17 LossyFlag

```
int vtkGDCMImageReader2::LossyFlag  [protected]
```

10.378.4.18 NumberOfIconImages

```
int vtkGDCMImageReader2::NumberOfIconImages  [protected]
```

10.378.4.19 NumberOfOverlays

```
int vtkGDCMImageReader2::NumberOfOverlays  [protected]
```

10.378.4.20 PlanarConfiguration

```
int vtkGDCMImageReader2::PlanarConfiguration  [protected]
```

10.378.4.21 Scale

```
double vtkGDCMImageReader2::Scale  [protected]
```

10.378.4.22 Shift

```
double vtkGDCMImageReader2::Shift  [protected]
```

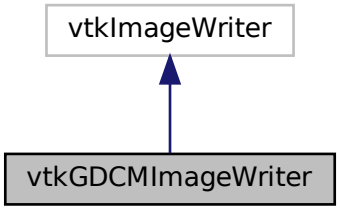
The documentation for this class was generated from the following file:

- vtkGDCMImageReader2.h

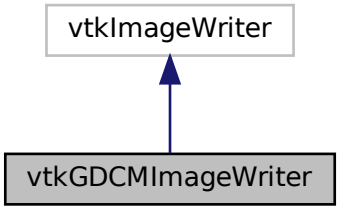
10.379 vtkGDCMImageWriter Class Reference

`#include <vtkGDCMImageWriter.h>`

Inheritance diagram for vtkGDCMImageWriter:



Collaboration diagram for vtkGDCMImageWriter:



Public Types

- enum CompressionTypes {
  NO_COMPRESSION = 0 ,
  JPEG_COMPRESSION ,
  JPEG2000_COMPRESSION ,
  JPEGLS_COMPRESSION ,
  RLE_COMPRESSION }

Public Member Functions

- virtual const char * GetDescriptiveName ()
- virtual const char * GetFileExtensions ()
- virtual void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetDirectionCosines (vtkMatrix4x4 *matrix)
- virtual void SetDirectionCosinesFromImageOrientationPatient (const double dircos[6])
- virtual void SetFileNames (vtkStringArray *)
- virtual void SetMedicalImageProperties (vtkMedicalImageProperties *)
- vtkBooleanMacro (FileLowerLeft, int)
- vtkBooleanMacro (LossyFlag, int)
- vtkGetMacro (CompressionType, int)
- vtkGetMacro (FileLowerLeft, int)
- vtkGetMacro (ImageFormat, int)
- vtkGetMacro (LossyFlag, int)
- vtkGetMacro (PlanarConfiguration, int)
- vtkGetMacro (Scale, double)
- vtkGetMacro (Shift, double)
- vtkGetObjectMacro (DirectionCosines, vtkMatrix4x4)
- vtkGetObjectMacro (FileNames, vtkStringArray)
- vtkGetObjectMacro (MedicalImageProperties, vtkMedicalImageProperties)
- vtkGetStringMacro (SeriesUID)
- vtkGetStringMacro (StudyUID)
- vtkSetMacro (CompressionType, int)
- vtkSetMacro (FileLowerLeft, int)
- vtkSetMacro (ImageFormat, int)
- vtkSetMacro (LossyFlag, int)
- vtkSetMacro (PlanarConfiguration, int)
- vtkSetMacro (Scale, double)
- vtkSetMacro (Shift, double)
- vtkSetStringMacro (SeriesUID)
- vtkSetStringMacro (StudyUID)
- vtkTypeMacro (vtkGDCMImageWriter, vtkImageWriter)
- virtual void Write ()

Static Public Member Functions

- static vtkGDCMImageWriter * New ()

Protected Member Functions

- vtkGDCMImageWriter ()
- ~vtkGDCMImageWriter ()
- virtual char * GetFileName ()
- int WriteGDCMData (vtkImageData *data, int timeStep)
- void WriteSlice (vtkImageData *data)

10.379.1 Detailed Description

Examples

Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, CreateFakePET.cxx, CreateFakeRTDOSE.cxx, HelloActiviz.cs, HelloActiviz2.cs, HelloVTKWorld.cs, HelloVTKWorld.java, HelloVTKWorld2.cs, MagnifyFile.cxx, RefCounting.cs, and gdcmorthoplanes.cxx.

10.379.2 Member Enumeration Documentation

10.379.2.1 CompressionTypes

```
enum vtkGDCMImageWriter::CompressionTypes
```

Enumerator

NO_COMPRESSION	
JPEG_COMPRESSION	
JPEG2000_COMPRESSION	
JPEGLS_COMPRESSION	
RLE_COMPRESSION	

10.379.3 Constructor & Destructor Documentation

10.379.3.1 vtkGDCMImageWriter()

```
vtkGDCMImageWriter::vtkGDCMImageWriter ( )  [protected]
```

10.379.3.2 ~vtkGDCMImageWriter()

```
vtkGDCMImageWriter::~vtkGDCMImageWriter ( )  [protected]
```

10.379.4 Member Function Documentation

10.379.4.1 GetDescriptiveName()

```
virtual const char* vtkGDCMImageWriter::GetDescriptiveName ( )  [inline], [virtual]
```

10.379.4.2 GetFileExtensions()

```
virtual const char* vtkGDCMImageWriter::GetFileExtensions ( )  [inline], [virtual]
```

10.379.4.3 GetFileName()

```
virtual char* vtkGDCMImageWriter::GetFileName ( )  [protected], [virtual]
```

10.379.4.4 New()

```
static vtkGDCMImageWriter* vtkGDCMImageWriter::New ( )  [static]
```

Examples

Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, CreateFakePET.cxx, CreateFakeRTDOSE.cxx, HelloActiviz.cs, HelloVTKWorld.cs, HelloVTKWorld2.cs, MagnifyFile.cxx, RefCounting.cs, and gdcmorthoplanes.cxx.

10.379.4.5 PrintSelf()

```
virtual void vtkGDCMImageWriter::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

10.379.4.6 SetDirectionCosines()

```
virtual void vtkGDCMImageWriter::SetDirectionCosines (
            vtkMatrix4x4 * matrix )  [virtual]
```

Examples

Convert16BitsTo8Bits.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, HelloActiviz2.cs, HelloVTKWorld.cs, HelloVTKWorld.java, MagnifyFile.cxx, and gdcmorthoplanes.cxx.

10.379.4.7 SetDirectionCosinesFromImageOrientationPatient()

```
virtual void vtkGDCMImageWriter::SetDirectionCosinesFromImageOrientationPatient (
            const double dircos[6] )  [virtual]
```

10.379.4.8 SetFileNames()

```
virtual void vtkGDCMImageWriter::SetFileNames (
            vtkStringArray * )  [virtual]
```

Examples

ConvertMultiFrameToSingleFrame.cxx, and CreateFakePET.cxx.

10.379.4.9 SetMedicalImageProperties()

```
virtual void vtkGDCMImageWriter::SetMedicalImageProperties (
            vtkMedicalImageProperties * )  [virtual]
```

Examples

Convert16BitsTo8Bits.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, HelloActiviz.cs, HelloActiviz2.cs, HelloVTKWorld.cs, HelloVTKWorld.java, MagnifyFile.cxx, and gdcmorthoplanes.cxx.

10.379.4.10 vtkBooleanMacro() [1/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
            FileLowerLeft ,
            int  )
```

10.379.4.11 vtkBooleanMacro() [2/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
            LossyFlag ,
            int  )
```

10.379.4.12 vtkGetMacro() [1/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            CompressionType ,
            int  )
```

10.379.4.13 vtkGetMacro() [2/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            FileLowerLeft ,
            int  )
```

10.379.4.14 vtkGetMacro() [3/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            ImageFormat ,
            int  )
```

10.379.4.15 vtkGetMacro() [4/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            LossyFlag ,
            int  )
```

10.379.4.16 vtkGetMacro() [5/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            PlanarConfiguration ,
            int  )
```

10.379.4.17 vtkGetMacro() [6/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            Scale ,
            double  )
```

10.379.4.18 vtkGetMacro() [7/7]

```
vtkGDCMImageWriter::vtkGetMacro (
            Shift ,
            double  )
```

10.379.4.19 vtkGetObjectMacro() [1/3]

```
vtkGDCMImageWriter::vtkGetObjectMacro (
            DirectionCosines ,
            vtkMatrix4x4  )
```

10.379.4.20 vtkGetObjectMacro() [2/3]

```
vtkGDCMImageWriter::vtkGetObjectMacro (
            FileNames ,
            vtkStringArray  )
```

10.379.4.21 vtkGetObjectMacro() [3/3]

```
vtkGDCMImageWriter::vtkGetObjectMacro (
            MedicalImageProperties ,
            vtkMedicalImageProperties  )
```

10.379.4.22 vtkGetStringMacro() [1/2]

```
vtkGDCMImageWriter::vtkGetStringMacro (
            SeriesUID  )
```

10.379.4.23 vtkGetStringMacro() [2/2]

```
vtkGDCMImageWriter::vtkGetStringMacro (
            StudyUID  )
```

10.379.4.24 vtkSetMacro() [1/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            CompressionType ,
            int  )
```

10.379.4.25 vtkSetMacro() [2/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            FileLowerLeft ,
            int  )
```

10.379.4.26 vtkSetMacro() [3/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            ImageFormat ,
            int  )
```

10.379.4.27 vtkSetMacro() [4/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            LossyFlag ,
            int  )
```

10.379.4.28 vtkSetMacro() [5/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            PlanarConfiguration ,
            int  )
```

10.379.4.29 vtkSetMacro() [6/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            Scale ,
            double  )
```

10.379.4.30 vtkSetMacro() [7/7]

```
vtkGDCMImageWriter::vtkSetMacro (
            Shift ,
            double  )
```

10.379.4.31 vtkSetStringMacro() [1/2]

```
vtkGDCMImageWriter::vtkSetStringMacro (
            SeriesUID  )
```

10.379.4.32 vtkSetStringMacro() [2/2]

```
vtkGDCMImageWriter::vtkSetStringMacro (
            StudyUID  )
```

10.379.4.33 vtkTypeMacro()

```
vtkGDCMImageWriter::vtkTypeMacro (
            vtkGDCMImageWriter ,
            vtkImageWriter  )
```

10.379.4.34 Write()

```
virtual void vtkGDCMImageWriter::Write ( )  [virtual]
```

Examples

Convert16BitsTo8Bits.cxx, ConvertMultiFrameToSingleFrame.cxx, ConvertRGBToLuminance.cxx, ConvertSingleBitTo8Bits.cxx, CreateFakePET.cxx, CreateFakeRTDOSE.cxx, HelloActiviz.cs, HelloActiviz2.cs, HelloVTKWorld.cs, HelloVTKWorld.java, HelloVTKWorld2.cs, MagnifyFile.cxx, and gdcmorthoplanes.cxx.

10.379.4.35 WriteGDCMData()

```
int vtkGDCMImageWriter::WriteGDCMData (
            vtkImageData * data,
            int timeStep )  [protected]
```

10.379.4.36 WriteSlice()

```
void vtkGDCMImageWriter::WriteSlice (
            vtkImageData * data )  [protected]
```

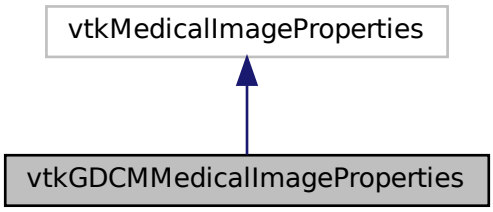
The documentation for this class was generated from the following file:

- vtkGDCMImageWriter.h

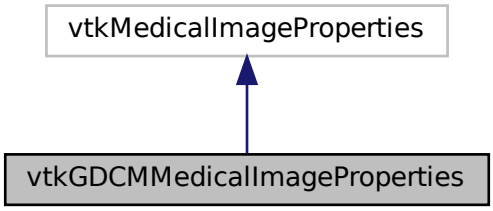
10.380 vtkGDCMMedicalImageProperties Class Reference

`#include <vtkGDCMMedicalImageProperties.h>`

Inheritance diagram for vtkGDCMMedicalImageProperties:



Collaboration diagram for vtkGDCMMedicalImageProperties:



Public Member Functions

- virtual void Clear ()
- void PrintSelf (ostream &os, vtkIndent indent)
- vtkTypeMacro (vtkGDCMMedicalImageProperties, vtkMedicalImageProperties)

Static Public Member Functions

- static vtkGDCMMedicalImageProperties * New ()

Protected Member Functions

- vtkGDCMMedicalImageProperties ()
- ~vtkGDCMMedicalImageProperties ()
- gdcm::File const & GetFile (unsigned int t)
- void PushBackFile (gdcm::File const &f)

Friends

- class vtkGDCMImageReader
- class vtkGDCMImageReader2
- class vtkGDCMImageWriter

10.380.1 Constructor & Destructor Documentation

10.380.1.1 vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::vtkGDCMMedicalImageProperties ( )  [protected]
```

10.380.1.2 ~vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::~vtkGDCMMedicalImageProperties ( )  [protected]
```

10.380.2 Member Function Documentation

10.380.2.1 Clear()

```
virtual void vtkGDCMMedicalImageProperties::Clear ( )  [virtual]
```

10.380.2.2 GetFile()

```
gdcm::File const& vtkGDCMMedicalImageProperties::GetFile (
            unsigned int t )  [protected]
```

10.380.2.3 New()

```
static vtkGDCMMedicalImageProperties* vtkGDCMMedicalImageProperties::New ( )  [static]
```

10.380.2.4 PrintSelf()

```
void vtkGDCMMedicalImageProperties::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.380.2.5 PushBackFile()

```
void vtkGDCMMedicalImageProperties::PushBackFile (
            gdcm::File const & f )  [protected]
```

10.380.2.6 vtkTypeMacro()

```
vtkGDCMMedicalImageProperties::vtkTypeMacro (
            vtkGDCMMedicalImageProperties ,
            vtkMedicalImageProperties  )
```

10.380.3 Friends And Related Function Documentation

10.380.3.1 vtkGDCMImageReader

```
friend class vtkGDCMImageReader  [friend]
```

10.380.3.2 vtkGDCMImageReader2

```
friend class vtkGDCMImageReader2  [friend]
```

10.380.3.3 vtkGDCMImageWriter

```
friend class vtkGDCMImageWriter  [friend]
```

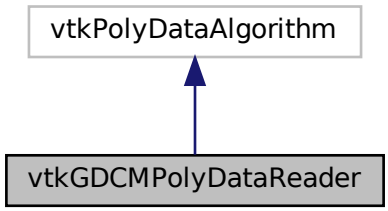
The documentation for this class was generated from the following file:

- vtkGDCMMedicalImageProperties.h

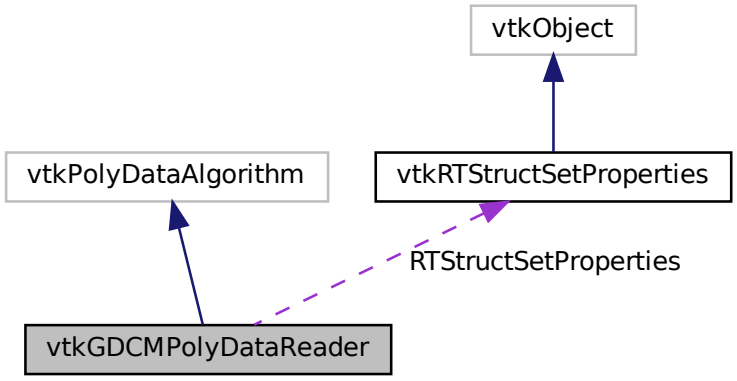
10.381 vtkGDCMPolyDataReader Class Reference

```
#include <vtkGDCMPolyDataReader.h>
```

Inheritance diagram for vtkGDCMPolyDataReader:



Collaboration diagram for vtkGDCMPolyDataReader:



Public Member Functions

- virtual void PrintSelf (ostream &os, vtkIndent indent)
- vtkGetObjectMacro (MedicalImageProperties, vtkMedicalImageProperties)
- vtkGetObjectMacro (RTStructSetProperties, vtkRTStructSetProperties)
- vtkGetStringMacro (FileName)
- vtkSetStringMacro (FileName)
- vtkTypeMacro (vtkGDCMPolyDataReader, vtkPolyDataAlgorithm)

Static Public Member Functions

- static vtkGDCMPolyDataReader * New ()

Protected Member Functions

- vtkGDCMPolyDataReader ()
- ~vtkGDCMPolyDataReader ()
- void FillMedicalImageInformation (const gdcm::Reader &reader)
- int RequestData (vtkInformation *, vtkInformationVector **, vtkInformationVector *)
- int RequestData_HemodynamicWaveformStorage (gdcm::Reader const &reader, vtkInformationVector *output↩ Vector)
- int RequestData_RTStructureSetStorage (gdcm::Reader const &reader, vtkInformationVector *outputVector)
- int RequestInformation (vtkInformation *vtkNotUsed(request), vtkInformationVector **vtkNotUsed(inputVector), vtkInformationVector *outputVector)
- int RequestInformation_HemodynamicWaveformStorage (gdcm::Reader const &reader)
- int RequestInformation_RTStructureSetStorage (gdcm::Reader const &reader)

Protected Attributes

- char * FileName
- vtkMedicalImageProperties * MedicalImageProperties
- vtkRTStructSetProperties * RTStructSetProperties

10.381.1 Detailed Description

Examples

GenerateRTSTRUCT.cxx, gdcmscene.cxx, and rtstructapp.cxx.

10.381.2 Constructor & Destructor Documentation

10.381.2.1 vtkGDCMPolyDataReader()

```
vtkGDCMPolyDataReader::vtkGDCMPolyDataReader ( )  [protected]
```

10.381.2.2 ~vtkGDCMPolyDataReader()

```
vtkGDCMPolyDataReader::~vtkGDCMPolyDataReader ( )  [protected]
```

10.381.3 Member Function Documentation

10.381.3.1 FillMedicalImageInformation()

```
void vtkGDCMPolyDataReader::FillMedicalImageInformation (
            const gdcm::Reader & reader )  [protected]
```

10.381.3.2 New()

```
static vtkGDCMPolyDataReader* vtkGDCMPolyDataReader::New ( )  [static]
```

Examples

GenerateRTSTRUCT.cxx, gdcmscene.cxx, and rtstructapp.cxx.

10.381.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataReader::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

10.381.3.4 RequestData()

```
int vtkGDCMPolyDataReader::RequestData (
            vtkInformation * ,
            vtkInformationVector ** ,
            vtkInformationVector *  )  [protected]
```

10.381.3.5 RequestData_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestData_HemodynamicWaveformStorage (
            gdcm::Reader const & reader,
            vtkInformationVector * outputVector )  [protected]
```

10.381.3.6 RequestData_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestData_RTStructureSetStorage (
            gdcm::Reader const & reader,
            vtkInformationVector * outputVector )  [protected]
```

10.381.3.7 RequestInformation()

```
int vtkGDCMPolyDataReader::RequestInformation (
            vtkInformation * vtkNotUsedrequest,
            vtkInformationVector ** vtkNotUsedinputVector,
            vtkInformationVector * outputVector )  [protected]
```

10.381.3.8 RequestInformation_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_HemodynamicWaveformStorage (
            gdcm::Reader const & reader )  [protected]
```

10.381.3.9 RequestInformation_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_RTStructureSetStorage (
            gdcm::Reader const & reader )  [protected]
```

10.381.3.10 vtkGetObjectMacro() [1/2]

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
            MedicalImageProperties ,
            vtkMedicalImageProperties  )
```

10.381.3.11 vtkGetObjectMacro() [2/2]

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
            RTStructSetProperties ,
            vtkRTStructSetProperties  )
```

10.381.3.12 vtkGetStringMacro()

```
vtkGDCMPolyDataReader::vtkGetStringMacro (
            FileName  )
```

10.381.3.13 vtkSetStringMacro()

```
vtkGDCMPolyDataReader::vtkSetStringMacro (
            FileName  )
```

10.381.3.14 vtkTypeMacro()

```
vtkGDCMPolyDataReader::vtkTypeMacro (
            vtkGDCMPolyDataReader ,
            vtkPolyDataAlgorithm  )
```

10.381.4 Member Data Documentation

10.381.4.1 FileName

```
char* vtkGDCMPolyDataReader::FileName  [protected]
```

10.381.4.2 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataReader::MedicalImageProperties  [protected]
```

10.381.4.3 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataReader::RTStructSetProperties  [protected]
```

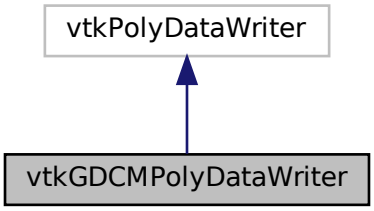
The documentation for this class was generated from the following file:

- vtkGDCMPolyDataReader.h

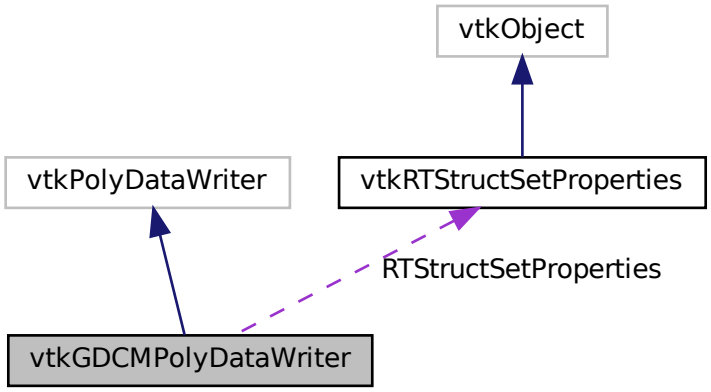
10.382 vtkGDCMPolyDataWriter Class Reference

```
#include <vtkGDCMPolyDataWriter.h>
```

Inheritance diagram for vtkGDCMPolyDataWriter:



Collaboration diagram for vtkGDCMPolyDataWriter:



Public Member Functions

- void InitializeRTStructSet (vtkStdString inDirectory, vtkStdString inStructLabel, vtkStdString inStructName, vtk↩ StringArray ∗inROINames, vtkStringArray ∗inROIAlgorithmName, vtkStringArray ∗inROIType)
- virtual void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetMedicalImageProperties (vtkMedicalImageProperties ∗pd)
- void SetNumberOfInputPorts (int n)
- virtual void SetRTStructSetProperties (vtkRTStructSetProperties ∗pd)
- vtkTypeMacro (vtkGDCMPolyDataWriter, vtkPolyDataWriter)

Static Public Member Functions

- static vtkGDCMPolyDataWriter ∗ New ()

Protected Member Functions

- vtkGDCMPolyDataWriter ()
- ∼vtkGDCMPolyDataWriter ()
- void WriteData ()
- void WriteRTSTRUCTData (gdcm::File &file, int num)
- void WriteRTSTRUCTInfo (gdcm::File &file)

Protected Attributes

- vtkMedicalImageProperties ∗ MedicalImageProperties
- vtkRTStructSetProperties ∗ RTStructSetProperties

10.382.1 Detailed Description

Examples

GenerateRTSTRUCT.cxx, and rtstructapp.cxx.

10.382.2 Constructor & Destructor Documentation

10.382.2.1 vtkGDCMPolyDataWriter()

```
vtkGDCMPolyDataWriter::vtkGDCMPolyDataWriter ( )  [protected]
```

10.382.2.2 ~vtkGDCMPolyDataWriter()

```
vtkGDCMPolyDataWriter::~vtkGDCMPolyDataWriter ( )  [protected]
```

10.382.3 Member Function Documentation

10.382.3.1 InitializeRTStructSet()

```
void vtkGDCMPolyDataWriter::InitializeRTStructSet (
            vtkStdString inDirectory,
            vtkStdString inStructLabel,
            vtkStdString inStructName,
            vtkStringArray * inROINames,
            vtkStringArray * inROIAlgorithmName,
            vtkStringArray * inROIType )
```

Examples

GenerateRTSTRUCT.cxx.

10.382.3.2 New()

```
static vtkGDCMPolyDataWriter* vtkGDCMPolyDataWriter::New ( )  [static]
```

Examples

GenerateRTSTRUCT.cxx, and rtstructapp.cxx.

10.382.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataWriter::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

10.382.3.4 SetMedicalImageProperties()

```
virtual void vtkGDCMPolyDataWriter::SetMedicalImageProperties (
            vtkMedicalImageProperties * pd )  [virtual]
```

Examples

GenerateRTSTRUCT.cxx, and rtstructapp.cxx.

10.382.3.5 SetNumberOfInputPorts()

```
void vtkGDCMPolyDataWriter::SetNumberOfInputPorts (
            int n )
```

Examples

GenerateRTSTRUCT.cxx, and rtstructapp.cxx.

10.382.3.6 SetRTStructSetProperties()

```
virtual void vtkGDCMPolyDataWriter::SetRTStructSetProperties (
            vtkRTStructSetProperties * pd )  [virtual]
```

Examples

GenerateRTSTRUCT.cxx, and rtstructapp.cxx.

10.382.3.7 vtkTypeMacro()

```
vtkGDCMPolyDataWriter::vtkTypeMacro (
            vtkGDCMPolyDataWriter ,
            vtkPolyDataWriter  )
```

10.382.3.8 WriteData()

```
void vtkGDCMPolyDataWriter::WriteData ( )  [protected]
```

10.382.3.9 WriteRTSTRUCTData()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTData (
            gdcm::File & file,
            int num )  [protected]
```

10.382.3.10 WriteRTSTRUCTInfo()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTInfo (
            gdcm::File & file )  [protected]
```

10.382.4 Member Data Documentation

10.382.4.1 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataWriter::MedicalImageProperties  [protected]
```

10.382.4.2 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataWriter::RTStructSetProperties  [protected]
```

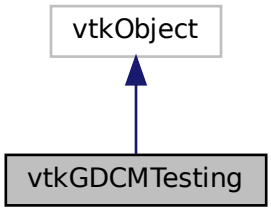
The documentation for this class was generated from the following file:

- vtkGDCMPolyDataWriter.h

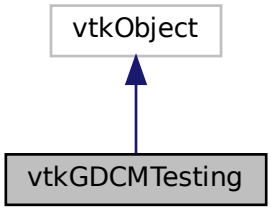
10.383 vtkGDCMTesting Class Reference

```
#include <vtkGDCMTesting.h>
```

Inheritance diagram for vtkGDCMTesting:



Collaboration diagram for vtkGDCMTesting:



Public Types

- typedef const char ∗const (∗ MD5MetaImagesType)[3]

Public Member Functions

- void PrintSelf (ostream &os, vtkIndent indent)
- vtkTypeMacro (vtkGDCMTesting, vtkObject)

Static Public Member Functions

- static const char ∗ GetGDCMDataRoot ()
- static const char ∗const ∗ GetMD5MetaImage (unsigned int file)
- static const char ∗ GetMHDMD5FromFile (const char ∗filepath)
- static unsigned int GetNumberOfMD5MetaImages ()
- static const char ∗ GetRAWMD5FromFile (const char ∗filepath)
- static const char ∗ GetVTKDataRoot ()
- static vtkGDCMTesting ∗ New ()

Protected Member Functions

- vtkGDCMTesting ()
- ∼vtkGDCMTesting ()

10.383.1 Detailed Description

Examples

HelloActiviz5.cs, HelloVTKWorld2.cs, MetaImageMD5Activiz.cs, ReadSeriesIntoVTK.java, and RefCounting.cs.

10.383.2 Member Typedef Documentation

10.383.2.1 MD5MetaImagesType

```
typedef const char* const(* vtkGDCMTesting::MD5MetaImagesType)[3]
```

10.383.3 Constructor & Destructor Documentation

10.383.3.1 vtkGDCMTesting()

```
vtkGDCMTesting::vtkGDCMTesting ( )  [protected]
```

10.383.3.2 ~vtkGDCMTesting()

```
vtkGDCMTesting::~vtkGDCMTesting ( )  [protected]
```

10.383.4 Member Function Documentation

10.383.4.1 GetGDCMDataRoot()

```
static const char* vtkGDCMTesting::GetGDCMDataRoot ( )  [static]
```

Examples

HelloActiviz5.cs, and ReadSeriesIntoVTK.java.

10.383.4.2 GetMD5MetaImage()

```
static const char* const* vtkGDCMTesting::GetMD5MetaImage (
            unsigned int file )  [static]
```

10.383.4.3 GetMHDMD5FromFile()

```
static const char* vtkGDCMTesting::GetMHDMD5FromFile (
            const char * filepath )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.383.4.4 GetNumberOfMD5MetaImages()

```
static unsigned int vtkGDCMTesting::GetNumberOfMD5MetaImages ( )  [static]
```

10.383.4.5 GetRAWMD5FromFile()

```
static const char* vtkGDCMTesting::GetRAWMD5FromFile (
            const char * filepath )  [static]
```

Examples

MetaImageMD5Activiz.cs.

10.383.4.6 GetVTKDataRoot()

```
static const char* vtkGDCMTesting::GetVTKDataRoot ( )  [static]
```

Examples

HelloActiviz5.cs, and HelloVTKWorld2.cs.

10.383.4.7 New()

```
static vtkGDCMTesting* vtkGDCMTesting::New ( )  [static]
```

Examples

RefCounting.cs.

10.383.4.8 PrintSelf()

```
void vtkGDCMTesting::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.383.4.9 vtkTypeMacro()

```
vtkGDCMTesting::vtkTypeMacro (
             vtkGDCMTesting ,
             vtkObject  )
```

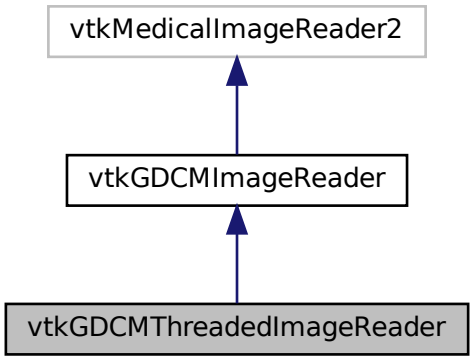
The documentation for this class was generated from the following file:

- vtkGDCMTesting.h

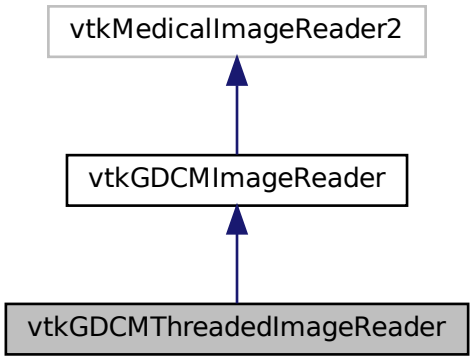
10.384 vtkGDCMThreadedImageReader Class Reference

```
#include <vtkGDCMThreadedImageReader.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader:



Collaboration diagram for vtkGDCMThreadedImageReader:



Public Member Functions

- virtual void PrintSelf (ostream &os, vtkIndent indent)
- vtkBooleanMacro (UseShiftScale, int)
- vtkGetMacro (UseShiftScale, int)
- vtkSetMacro (Scale, double)
- vtkSetMacro (Shift, double)
- vtkSetMacro (UseShiftScale, int)
- vtkTypeMacro (vtkGDCMThreadedImageReader, vtkGDCMImageReader)

Static Public Member Functions

- static vtkGDCMThreadedImageReader * New ()

Protected Member Functions

- vtkGDCMThreadedImageReader ()
- ~vtkGDCMThreadedImageReader ()
- void ExecuteData (vtkDataObject *out)
- void ExecuteInformation ()
- void ReadFiles (unsigned int nfiles, const char *filenames[])
- void RequestDataCompat ()

Additional Inherited Members

10.384.1 Constructor & Destructor Documentation

10.384.1.1 vtkGDCMThreadedImageReader()

```
vtkGDCMThreadedImageReader::vtkGDCMThreadedImageReader ( )  [protected]
```

10.384.1.2 ~vtkGDCMThreadedImageReader()

```
vtkGDCMThreadedImageReader::~vtkGDCMThreadedImageReader ( )  [protected]
```

10.384.2 Member Function Documentation

10.384.2.1 ExecuteData()

```
void vtkGDCMThreadedImageReader::ExecuteData (
            vtkDataObject * out )  [protected]
```

10.384.2.2 ExecuteInformation()

```
void vtkGDCMThreadedImageReader::ExecuteInformation ( )  [protected]
```

10.384.2.3 New()

```
static vtkGDCMThreadedImageReader* vtkGDCMThreadedImageReader::New ( )  [static]
```

10.384.2.4 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

Reimplemented from vtkGDCMImageReader.

10.384.2.5 ReadFiles()

```
void vtkGDCMThreadedImageReader::ReadFiles (
            unsigned int nfiles,
            const char * filenames[] )  [protected]
```

10.384.2.6 RequestDataCompat()

```
void vtkGDCMThreadedImageReader::RequestDataCompat ( )  [protected]
```

10.384.2.7 vtkBooleanMacro()

```
vtkGDCMThreadedImageReader::vtkBooleanMacro (
            UseShiftScale ,
            int  )
```

10.384.2.8 vtkGetMacro()

```
vtkGDCMThreadedImageReader::vtkGetMacro (
            UseShiftScale ,
            int  )
```

10.384.2.9 vtkSetMacro() [1/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
            Scale ,
            double  )
```

10.384.2.10 vtkSetMacro() [2/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
            Shift ,
            double  )
```

10.384.2.11 vtkSetMacro() [3/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
            UseShiftScale ,
            int  )
```

10.384.2.12 vtkTypeMacro()

```
vtkGDCMThreadedImageReader::vtkTypeMacro (
            vtkGDCMThreadedImageReader ,
            vtkGDCMImageReader  )
```

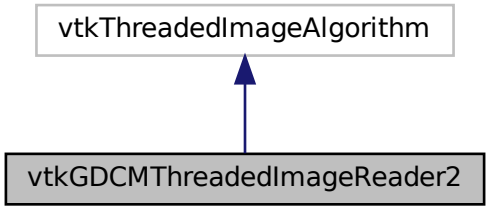
The documentation for this class was generated from the following file:

- vtkGDCMThreadedImageReader.h

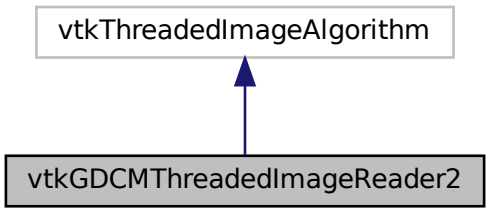
10.385 vtkGDCMThreadedImageReader2 Class Reference

```
#include <vtkGDCMThreadedImageReader2.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader2:



Collaboration diagram for vtkGDCMThreadedImageReader2:



Public Member Functions

- virtual const char * GetFileName (int i=0)
- virtual void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetFileName (const char *filename)
- virtual void SetFileNames (vtkStringArray *)
- int SplitExtent (int splitExt[6], int startExt[6], int num, int total)
- vtkBooleanMacro (FileLowerLeft, int)
- vtkBooleanMacro (LoadOverlays, int)
- vtkBooleanMacro (UseShiftScale, int)
- vtkGetMacro (DataScalarType, int)
- vtkGetMacro (FileLowerLeft, int)
- vtkGetMacro (LoadOverlays, int)
- vtkGetMacro (NumberOfOverlays, int)
- vtkGetMacro (NumberOfScalarComponents, int)
- vtkGetMacro (Scale, double)
- vtkGetMacro (Shift, double)
- vtkGetMacro (UseShiftScale, int)
- vtkGetObjectMacro (FileNames, vtkStringArray)
- vtkGetVector3Macro (DataOrigin, double)
- vtkGetVector3Macro (DataSpacing, double)
- vtkGetVector6Macro (DataExtent, int)
- vtkSetMacro (DataScalarType, int)
- vtkSetMacro (FileLowerLeft, int)
- vtkSetMacro (LoadOverlays, int)
- vtkSetMacro (NumberOfScalarComponents, int)
- vtkSetMacro (Scale, double)
- vtkSetMacro (Shift, double)
- vtkSetMacro (UseShiftScale, int)
- vtkSetVector3Macro (DataOrigin, double)
- vtkSetVector3Macro (DataSpacing, double)
- vtkSetVector6Macro (DataExtent, int)
- vtkTypeMacro (vtkGDCMThreadedImageReader2, vtkThreadedImageAlgorithm)

Static Public Member Functions

- static vtkGDCMThreadedImageReader2 * New ()

Protected Member Functions

- vtkGDCMThreadedImageReader2 ()
- ~vtkGDCMThreadedImageReader2 ()
- int RequestInformation (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector)
- void ThreadedRequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector, vtkImageData ***inData, vtkImageData **outData, int outExt[6], int id)

10.385.1 Constructor & Destructor Documentation

10.385.1.1 vtkGDCMThreadedImageReader2()

```
vtkGDCMThreadedImageReader2::vtkGDCMThreadedImageReader2 ( )  [protected]
```

10.385.1.2 ~vtkGDCMThreadedImageReader2()

```
vtkGDCMThreadedImageReader2::~vtkGDCMThreadedImageReader2 ( )  [protected]
```

10.385.2 Member Function Documentation

10.385.2.1 GetFileName()

```
virtual const char* vtkGDCMThreadedImageReader2::GetFileName (
            int i = 0 )  [virtual]
```

10.385.2.2 New()

```
static vtkGDCMThreadedImageReader2* vtkGDCMThreadedImageReader2::New ( )  [static]
```

10.385.2.3 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader2::PrintSelf (
            ostream & os,
            vtkIndent indent )  [virtual]
```

10.385.2.4 RequestInformation()

```
int vtkGDCMThreadedImageReader2::RequestInformation (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected]
```

10.385.2.5 SetFileName()

```
virtual void vtkGDCMThreadedImageReader2::SetFileName (
            const char * filename )  [virtual]
```

10.385.2.6 SetFileNames()

```
virtual void vtkGDCMThreadedImageReader2::SetFileNames (
            vtkStringArray *  )  [virtual]
```

10.385.2.7 SplitExtent()

```
int vtkGDCMThreadedImageReader2::SplitExtent (
            int splitExt[6],
            int startExt[6],
            int num,
            int total )
```

10.385.2.8 ThreadedRequestData()

```
void vtkGDCMThreadedImageReader2::ThreadedRequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector,
            vtkImageData *** inData,
            vtkImageData ** outData,
            int outExt[6],
            int id )  [protected]
```

10.385.2.9 vtkBooleanMacro() [1/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
            FileLowerLeft ,
            int  )
```

10.385.2.10 vtkBooleanMacro() [2/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
            LoadOverlays ,
            int  )
```

10.385.2.11 vtkBooleanMacro() [3/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
            UseShiftScale ,
            int  )
```

10.385.2.12 vtkGetMacro() [1/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            DataScalarType ,
            int  )
```

10.385.2.13 vtkGetMacro() [2/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            FileLowerLeft ,
            int  )
```

10.385.2.14 vtkGetMacro() [3/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            LoadOverlays ,
            int  )
```

10.385.2.15 vtkGetMacro() [4/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            NumberOfOverlays ,
            int  )
```

10.385.2.16 vtkGetMacro() [5/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            NumberOfScalarComponents ,
            int  )
```

10.385.2.17 vtkGetMacro() [6/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            Scale ,
            double  )
```

10.385.2.18 vtkGetMacro() [7/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            Shift ,
            double  )
```

10.385.2.19 vtkGetMacro() [8/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
            UseShiftScale ,
            int  )
```

10.385.2.20 vtkGetObjectMacro()

```
vtkGDCMThreadedImageReader2::vtkGetObjectMacro (
            FileNames ,
            vtkStringArray  )
```

10.385.2.21 vtkGetVector3Macro() [1/2]

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
            DataOrigin ,
            double  )
```

10.385.2.22 vtkGetVector3Macro() [2/2]

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
            DataSpacing ,
            double  )
```

10.385.2.23 vtkGetVector6Macro()

```
vtkGDCMThreadedImageReader2::vtkGetVector6Macro (
            DataExtent ,
            int  )
```

10.385.2.24 vtkSetMacro() [1/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            DataScalarType ,
            int  )
```

10.385.2.25 vtkSetMacro() [2/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            FileLowerLeft ,
            int  )
```

10.385.2.26 vtkSetMacro() [3/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            LoadOverlays ,
            int  )
```

10.385.2.27 vtkSetMacro() [4/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            NumberOfScalarComponents ,
            int  )
```

10.385.2.28 vtkSetMacro() [5/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            Scale ,
            double  )
```

10.385.2.29 vtkSetMacro() [6/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            Shift ,
            double  )
```

10.385.2.30 vtkSetMacro() [7/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
            UseShiftScale ,
            int  )
```

10.385.2.31 vtkSetVector3Macro() [1/2]

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
            DataOrigin ,
            double  )
```

10.385.2.32 vtkSetVector3Macro() [2/2]

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
            DataSpacing ,
            double  )
```

10.385.2.33 vtkSetVector6Macro()

```
vtkGDCMThreadedImageReader2::vtkSetVector6Macro (
            DataExtent ,
            int  )
```

10.385.2.34 vtkTypeMacro()

```
vtkGDCMThreadedImageReader2::vtkTypeMacro (
            vtkGDCMThreadedImageReader2 ,
            vtkThreadedImageAlgorithm  )
```

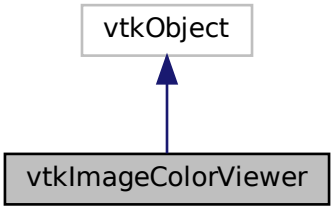
The documentation for this class was generated from the following file:

- vtkGDCMThreadedImageReader2.h

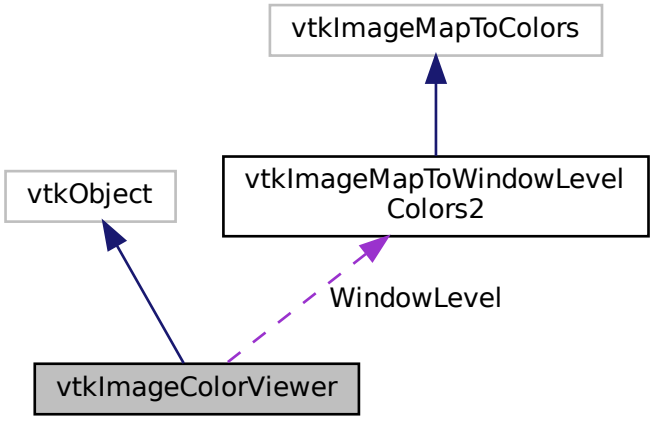
10.386 vtkImageColorViewer Class Reference

`#include <vtkImageColorViewer.h>`

Inheritance diagram for vtkImageColorViewer:



Collaboration diagram for vtkImageColorViewer:



Public Types

- enum {
  SLICE_ORIENTATION_YZ = 0 ,
  SLICE_ORIENTATION_XZ = 1 ,
  SLICE_ORIENTATION_XY = 2 }

Public Member Functions

- virtual void AddInput (vtkImageData *input)
- virtual void AddInputConnection (vtkAlgorithmOutput *input)
- virtual double GetColorLevel ()
- virtual double GetColorWindow ()
- virtual vtkImageData * GetInput ()
- virtual int GetOffScreenRendering ()
- double GetOverlayVisibility ()
- virtual int * GetPosition ()
- virtual int * GetSize ()
- virtual int GetSliceMax ()
- virtual int GetSliceMin ()
- virtual int * GetSliceRange ()
- virtual void GetSliceRange (int &min, int &max)
- virtual void GetSliceRange (int range[2])
- virtual const char * GetWindowName ()
- void PrintSelf (ostream &os, vtkIndent indent)
- virtual void Render (void)
- virtual void SetColorLevel (double s)
- virtual void SetColorWindow (double s)
- virtual void SetDisplayId (void *a)
- virtual void SetInput (vtkImageData *in)
- virtual void SetInputConnection (vtkAlgorithmOutput *input)
- virtual void SetOffScreenRendering (int)
- void SetOverlayVisibility (double vis)
- virtual void SetParentId (void *a)
- virtual void SetPosition (int a, int b)
- virtual void SetPosition (int a[2])
- virtual void SetRenderer (vtkRenderer *arg)
- virtual void SetRenderWindow (vtkRenderWindow *arg)
- virtual void SetSize (int a, int b)
- virtual void SetSize (int a[2])
- virtual void SetSlice (int s)
- virtual void SetSliceOrientation (int orientation)
- virtual void SetSliceOrientationToXY ()
- virtual void SetSliceOrientationToXZ ()
- virtual void SetSliceOrientationToYZ ()
- virtual void SetupInteractor (vtkRenderWindowInteractor *)
- virtual void SetWindowId (void *a)
- virtual void UpdateDisplayExtent ()
- VTK_LEGACY (int GetWholeZMax())
- VTK_LEGACY (int GetWholeZMin())
- VTK_LEGACY (int GetZSlice())
- VTK_LEGACY (void SetZSlice(int))
- vtkBooleanMacro (OffScreenRendering, int)
- vtkGetMacro (Slice, int)
- vtkGetMacro (SliceOrientation, int)
- vtkGetObjectMacro (ImageActor, vtkImageActor)
- vtkGetObjectMacro (InteractorStyle, vtkInteractorStyleImage)
- vtkGetObjectMacro (Renderer, vtkRenderer)
- vtkGetObjectMacro (RenderWindow, vtkRenderWindow)
- vtkGetObjectMacro (WindowLevel, vtkImageMapToWindowLevelColors2)
- vtkTypeMacro (vtkImageColorViewer, vtkObject)

Static Public Member Functions

- static vtkImageColorViewer * New ()

Protected Member Functions

- vtkImageColorViewer ()
- ~vtkImageColorViewer ()
- virtual void InstallPipeline ()
- virtual void UnInstallPipeline ()
- virtual void UpdateOrientation ()

Protected Attributes

- int FirstRender
- vtkImageActor * ImageActor
- vtkRenderWindowInteractor * Interactor
- vtkInteractorStyleImage * InteractorStyle
- vtkImageActor * OverlayImageActor
- vtkRenderer * Renderer
- vtkRenderWindow * RenderWindow
- int Slice
- int SliceOrientation
- vtkImageMapToWindowLevelColors2 * WindowLevel

Friends

- class vtkImageColorViewerCallback

10.386.1 Detailed Description

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.2 Member Enumeration Documentation

10.386.2.1 anonymous enum

```
anonymous enum
```

Enumerator

SLICE_ORIENTATION_YZ	
SLICE_ORIENTATION_XZ	
SLICE_ORIENTATION_XY	

10.386.3 Constructor & Destructor Documentation

10.386.3.1 vtkImageColorViewer()

```
vtkImageColorViewer::vtkImageColorViewer ( )  [protected]
```

10.386.3.2 ~vtkImageColorViewer()

```
vtkImageColorViewer::~vtkImageColorViewer ( )  [protected]
```

10.386.4 Member Function Documentation

10.386.4.1 AddInput()

```
virtual void vtkImageColorViewer::AddInput (
            vtkImageData * input )  [virtual]
```

10.386.4.2 AddInputConnection()

```
virtual void vtkImageColorViewer::AddInputConnection (
            vtkAlgorithmOutput * input )  [virtual]
```

10.386.4.3 GetColorLevel()

```
virtual double vtkImageColorViewer::GetColorLevel ( )  [virtual]
```

10.386.4.4 GetColorWindow()

```
virtual double vtkImageColorViewer::GetColorWindow ( )  [virtual]
```

10.386.4.5 GetInput()

```
virtual vtkImageData* vtkImageColorViewer::GetInput ( )  [virtual]
```

10.386.4.6 GetOffScreenRendering()

```
virtual int vtkImageColorViewer::GetOffScreenRendering ( )  [virtual]
```

10.386.4.7 GetOverlayVisibility()

```
double vtkImageColorViewer::GetOverlayVisibility ( )
```

10.386.4.8 GetPosition()

```
virtual int* vtkImageColorViewer::GetPosition ( )  [virtual]
```

10.386.4.9 GetSize()

```
virtual int* vtkImageColorViewer::GetSize ( )  [virtual]
```

10.386.4.10 GetSliceMax()

```
virtual int vtkImageColorViewer::GetSliceMax ( )  [virtual]
```

10.386.4.11 GetSliceMin()

```
virtual int vtkImageColorViewer::GetSliceMin ( )  [virtual]
```

10.386.4.12 GetSliceRange() [1/3]

```
virtual int* vtkImageColorViewer::GetSliceRange ( )  [virtual]
```

10.386.4.13 GetSliceRange() [2/3]

```
virtual void vtkImageColorViewer::GetSliceRange (
            int & min,
            int & max )  [virtual]
```

10.386.4.14 GetSliceRange() [3/3]

```
virtual void vtkImageColorViewer::GetSliceRange (
            int range[2] )  [inline], [virtual]
```

10.386.4.15 GetWindowName()

```
virtual const char* vtkImageColorViewer::GetWindowName ( )  [virtual]
```

10.386.4.16 InstallPipeline()

```
virtual void vtkImageColorViewer::InstallPipeline ( )  [protected], [virtual]
```

10.386.4.17 New()

```
static vtkImageColorViewer* vtkImageColorViewer::New ( )  [static]
```

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.4.18 PrintSelf()

```
void vtkImageColorViewer::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.386.4.19 Render()

```
virtual void vtkImageColorViewer::Render (
            void  )  [virtual]
```

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.4.20 SetColorLevel()

```
virtual void vtkImageColorViewer::SetColorLevel (
            double s )  [virtual]
```

10.386.4.21 SetColorWindow()

```
virtual void vtkImageColorViewer::SetColorWindow (
            double s )  [virtual]
```

10.386.4.22 SetDisplayId()

```
virtual void vtkImageColorViewer::SetDisplayId (
            void * a )  [virtual]
```

10.386.4.23 SetInput()

```
virtual void vtkImageColorViewer::SetInput (
            vtkImageData * in )  [virtual]
```

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.4.24 SetInputConnection()

```
virtual void vtkImageColorViewer::SetInputConnection (
            vtkAlgorithmOutput * input )  [virtual]
```

10.386.4.25 SetOffScreenRendering()

```
virtual void vtkImageColorViewer::SetOffScreenRendering (
            int  )  [virtual]
```

10.386.4.26 SetOverlayVisibility()

```
void vtkImageColorViewer::SetOverlayVisibility (
            double vis )
```

10.386.4.27 SetParentId()

```
virtual void vtkImageColorViewer::SetParentId (
            void * a )  [virtual]
```

10.386.4.28 SetPosition() [1/2]

```
virtual void vtkImageColorViewer::SetPosition (
            int a,
            int b )  [virtual]
```

10.386.4.29 SetPosition() [2/2]

```
virtual void vtkImageColorViewer::SetPosition (
            int a[2] )  [inline], [virtual]
```

References SetPosition().

Referenced by SetPosition().

10.386.4.30 SetRenderer()

```
virtual void vtkImageColorViewer::SetRenderer (
            vtkRenderer * arg )  [virtual]
```

10.386.4.31 SetRenderWindow()

```
virtual void vtkImageColorViewer::SetRenderWindow (
            vtkRenderWindow * arg )  [virtual]
```

10.386.4.32 SetSize() [1/2]

```
virtual void vtkImageColorViewer::SetSize (
            int a,
            int b )  [virtual]
```

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.4.33 SetSize() [2/2]

```
virtual void vtkImageColorViewer::SetSize (
            int a[2] )  [inline], [virtual]
```

References SetSize().

Referenced by SetSize().

10.386.4.34 SetSlice()

```
virtual void vtkImageColorViewer::SetSlice (
            int s )  [virtual]
```

10.386.4.35 SetSliceOrientation()

```
virtual void vtkImageColorViewer::SetSliceOrientation (
            int orientation )  [virtual]
```

10.386.4.36 SetSliceOrientationToXY()

```
virtual void vtkImageColorViewer::SetSliceOrientationToXY ( )  [inline], [virtual]
```

References SLICE_ORIENTATION_XY.

10.386.4.37 SetSliceOrientationToXZ()

```
virtual void vtkImageColorViewer::SetSliceOrientationToXZ ( )  [inline], [virtual]
```

References SLICE_ORIENTATION_XZ.

10.386.4.38 SetSliceOrientationToYZ()

```
virtual void vtkImageColorViewer::SetSliceOrientationToYZ ( )  [inline], [virtual]
```

References SLICE_ORIENTATION_YZ.

10.386.4.39 SetupInteractor()

```
virtual void vtkImageColorViewer::SetupInteractor (
            vtkRenderWindowInteractor *  )  [virtual]
```

Examples

gdcmrtionplan.cxx, and gdcmrtplan.cxx.

10.386.4.40 SetWindowId()

```
virtual void vtkImageColorViewer::SetWindowId (
            void * a )  [virtual]
```

10.386.4.41 UnInstallPipeline()

```
virtual void vtkImageColorViewer::UnInstallPipeline ( )  [protected], [virtual]
```

10.386.4.42 UpdateDisplayExtent()

```
virtual void vtkImageColorViewer::UpdateDisplayExtent ( )  [virtual]
```

10.386.4.43 UpdateOrientation()

```
virtual void vtkImageColorViewer::UpdateOrientation ( )  [protected], [virtual]
```

10.386.4.44 VTK_LEGACY() [1/4]

```
vtkImageColorViewer::VTK_LEGACY (
            int  GetWholeZMax() )
```

10.386.4.45 VTK_LEGACY() [2/4]

```
vtkImageColorViewer::VTK_LEGACY (
            int  GetWholeZMin() )
```

10.386.4.46 VTK_LEGACY() [3/4]

```
vtkImageColorViewer::VTK_LEGACY (
            int  GetZSlice() )
```

10.386.4.47 VTK_LEGACY() [4/4]

```
vtkImageColorViewer::VTK_LEGACY (
            void  SetZSliceint )
```

10.386.4.48 vtkBooleanMacro()

```
vtkImageColorViewer::vtkBooleanMacro (
            OffScreenRendering ,
            int  )
```

10.386.4.49 vtkGetMacro() [1/2]

```
vtkImageColorViewer::vtkGetMacro (
            Slice ,
            int  )
```

10.386.4.50 vtkGetMacro() [2/2]

```
vtkImageColorViewer::vtkGetMacro (
            SliceOrientation ,
            int  )
```

10.386.4.51 vtkGetObjectMacro() [1/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
            ImageActor ,
            vtkImageActor  )
```

10.386.4.52 vtkGetObjectMacro() [2/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
            InteractorStyle ,
            vtkInteractorStyleImage  )
```

10.386.4.53 vtkGetObjectMacro() [3/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
            Renderer ,
            vtkRenderer  )
```

10.386.4.54 vtkGetObjectMacro() [4/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
            RenderWindow ,
            vtkRenderWindow  )
```

10.386.4.55 vtkGetObjectMacro() [5/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
            WindowLevel ,
            vtkImageMapToWindowLevelColors2  )
```

10.386.4.56 vtkTypeMacro()

```
vtkImageColorViewer::vtkTypeMacro (
            vtkImageColorViewer ,
            vtkObject  )
```

10.386.5 Friends And Related Function Documentation

10.386.5.1 vtkImageColorViewerCallback

```
friend class vtkImageColorViewerCallback  [friend]
```

10.386.6 Member Data Documentation

10.386.6.1 FirstRender

```
int vtkImageColorViewer::FirstRender  [protected]
```

10.386.6.2 ImageActor

```
vtkImageActor* vtkImageColorViewer::ImageActor  [protected]
```

10.386.6.3 Interactor

```
vtkRenderWindowInteractor* vtkImageColorViewer::Interactor  [protected]
```

10.386.6.4 InteractorStyle

```
vtkInteractorStyleImage* vtkImageColorViewer::InteractorStyle  [protected]
```

10.386.6.5 OverlayImageActor

```
vtkImageActor* vtkImageColorViewer::OverlayImageActor  [protected]
```

10.386.6.6 Renderer

```
vtkRenderer* vtkImageColorViewer::Renderer  [protected]
```

10.386.6.7 RenderWindow

```
vtkRenderWindow* vtkImageColorViewer::RenderWindow  [protected]
```

10.386.6.8 Slice

```
int vtkImageColorViewer::Slice  [protected]
```

10.386.6.9 SliceOrientation

```
int vtkImageColorViewer::SliceOrientation  [protected]
```

10.386.6.10 WindowLevel

```
vtkImageMapToWindowLevelColors2* vtkImageColorViewer::WindowLevel  [protected]
```

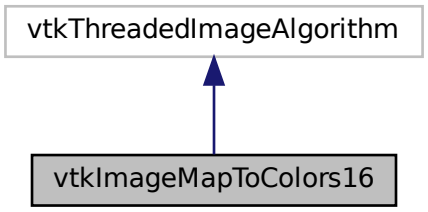
The documentation for this class was generated from the following file:

- vtkImageColorViewer.h

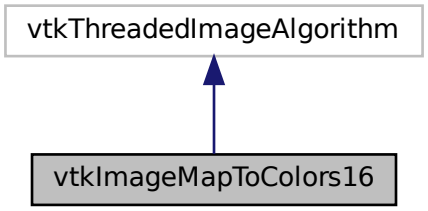
10.387 vtkImageMapToColors16 Class Reference

`#include <vtkImageMapToColors16.h>`

Inheritance diagram for vtkImageMapToColors16:



Collaboration diagram for vtkImageMapToColors16:



Public Member Functions

- virtual unsigned long GetMTime ()
- void PrintSelf (ostream &os, vtkIndent indent)
- virtual void SetLookupTable (vtkScalarsToColors *)
- void SetOutputFormatToLuminance ()
- void SetOutputFormatToLuminanceAlpha ()
- void SetOutputFormatToRGB ()
- void SetOutputFormatToRGBA ()
- vtkBooleanMacro (PassAlphaToOutput, int)
- vtkGetMacro (ActiveComponent, int)
- vtkGetMacro (OutputFormat, int)

- vtkGetMacro (PassAlphaToOutput, int)
- vtkGetObjectMacro (LookupTable, vtkScalarsToColors)
- vtkSetMacro (ActiveComponent, int)
- vtkSetMacro (OutputFormat, int)
- vtkSetMacro (PassAlphaToOutput, int)
- vtkTypeMacro (vtkImageMapToColors16, vtkThreadedImageAlgorithm)

Static Public Member Functions

- static vtkImageMapToColors16 * New ()

Protected Member Functions

- vtkImageMapToColors16 ()
- ~vtkImageMapToColors16 ()
- virtual int RequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector)
- virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *)
- void ThreadedRequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector, vtkImageData ***inData, vtkImageData **outData, int extent[6], int id)

Protected Attributes

- int ActiveComponent
- int DataWasPassed
- vtkScalarsToColors * LookupTable
- int OutputFormat
- int PassAlphaToOutput

10.387.1 Constructor & Destructor Documentation

10.387.1.1 vtkImageMapToColors16()

```
vtkImageMapToColors16::vtkImageMapToColors16 ( )  [protected]
```

10.387.1.2 ~vtkImageMapToColors16()

```
vtkImageMapToColors16::~vtkImageMapToColors16 ( )  [protected]
```

10.387.2 Member Function Documentation

10.387.2.1 GetMTime()

```
virtual unsigned long vtkImageMapToColors16::GetMTime ( )  [virtual]
```

10.387.2.2 New()

```
static vtkImageMapToColors16* vtkImageMapToColors16::New ( )  [static]
```

10.387.2.3 PrintSelf()

```
void vtkImageMapToColors16::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.387.2.4 RequestData()

```
virtual int vtkImageMapToColors16::RequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected], [virtual]
```

10.387.2.5 RequestInformation()

```
virtual int vtkImageMapToColors16::RequestInformation (
            vtkInformation * ,
            vtkInformationVector ** ,
            vtkInformationVector *  )  [protected], [virtual]
```

10.387.2.6 SetLookupTable()

```
virtual void vtkImageMapToColors16::SetLookupTable (
            vtkScalarsToColors *  )  [virtual]
```

10.387.2.7 SetOutputFormatToLuminance()

```
void vtkImageMapToColors16::SetOutputFormatToLuminance ( )  [inline]
```

10.387.2.8 SetOutputFormatToLuminanceAlpha()

```
void vtkImageMapToColors16::SetOutputFormatToLuminanceAlpha ( )  [inline]
```

10.387.2.9 SetOutputFormatToRGB()

```
void vtkImageMapToColors16::SetOutputFormatToRGB ( )  [inline]
```

10.387.2.10 SetOutputFormatToRGBA()

```
void vtkImageMapToColors16::SetOutputFormatToRGBA ( )  [inline]
```

10.387.2.11 ThreadedRequestData()

```
void vtkImageMapToColors16::ThreadedRequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector,
            vtkImageData *** inData,
            vtkImageData ** outData,
            int extent[6],
            int id )  [protected]
```

10.387.2.12 vtkBooleanMacro()

```
vtkImageMapToColors16::vtkBooleanMacro (
            PassAlphaToOutput ,
            int  )
```

10.387.2.13 vtkGetMacro() [1/3]

```
vtkImageMapToColors16::vtkGetMacro (
            ActiveComponent ,
            int  )
```

10.387.2.14 vtkGetMacro() [2/3]

```
vtkImageMapToColors16::vtkGetMacro (
            OutputFormat ,
            int  )
```

10.387.2.15 vtkGetMacro() [3/3]

```
vtkImageMapToColors16::vtkGetMacro (
            PassAlphaToOutput ,
            int  )
```

10.387.2.16 vtkGetObjectMacro()

```
vtkImageMapToColors16::vtkGetObjectMacro (
            LookupTable ,
            vtkScalarsToColors  )
```

10.387.2.17 vtkSetMacro() [1/3]

```
vtkImageMapToColors16::vtkSetMacro (
            ActiveComponent ,
            int  )
```

10.387.2.18 vtkSetMacro() [2/3]

```
vtkImageMapToColors16::vtkSetMacro (
            OutputFormat ,
            int  )
```

10.387.2.19 vtkSetMacro() [3/3]

```
vtkImageMapToColors16::vtkSetMacro (
            PassAlphaToOutput ,
            int  )
```

10.387.2.20 vtkTypeMacro()

```
vtkImageMapToColors16::vtkTypeMacro (
            vtkImageMapToColors16 ,
            vtkThreadedImageAlgorithm  )
```

10.387.3 Member Data Documentation

10.387.3.1 ActiveComponent

```
int vtkImageMapToColors16::ActiveComponent  [protected]
```

10.387.3.2 DataWasPassed

```
int vtkImageMapToColors16::DataWasPassed  [protected]
```

10.387.3.3 LookupTable

```
vtkScalarsToColors* vtkImageMapToColors16::LookupTable  [protected]
```

10.387.3.4 OutputFormat

```
int vtkImageMapToColors16::OutputFormat  [protected]
```

10.387.3.5 PassAlphaToOutput

```
int vtkImageMapToColors16::PassAlphaToOutput  [protected]
```

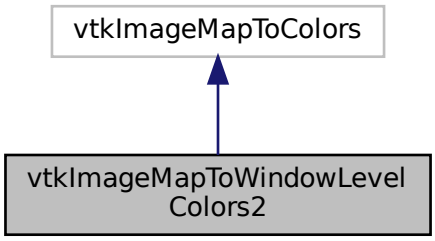
The documentation for this class was generated from the following file:

- vtkImageMapToColors16.h

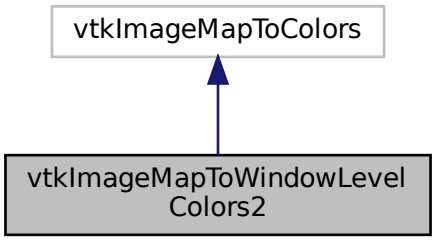
10.388 vtkImageMapToWindowLevelColors2 Class Reference

```
#include <vtkImageMapToWindowLevelColors2.h>
```

Inheritance diagram for vtkImageMapToWindowLevelColors2:



Collaboration diagram for vtkImageMapToWindowLevelColors2:



Public Member Functions

- void PrintSelf (ostream &os, vtkIndent indent)
- vtkGetMacro (Level, double)
- vtkGetMacro (Window, double)
- vtkSetMacro (Level, double)
- vtkSetMacro (Window, double)
- vtkTypeMacro (vtkImageMapToWindowLevelColors2, vtkImageMapToColors)

Static Public Member Functions

- static vtkImageMapToWindowLevelColors2 * New ()

Protected Member Functions

- vtkImageMapToWindowLevelColors2 ()
- ~vtkImageMapToWindowLevelColors2 ()
- virtual int RequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector)
- virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *)
- void ThreadedRequestData (vtkInformation *request, vtkInformationVector **inputVector, vtkInformationVector *outputVector, vtkImageData ***inData, vtkImageData **outData, int extent[6], int id)

Protected Attributes

- double Level
- double Window

10.388.1 Constructor & Destructor Documentation

10.388.1.1 vtkImageMapToWindowLevelColors2()

```
vtkImageMapToWindowLevelColors2::vtkImageMapToWindowLevelColors2 ( )  [protected]
```

10.388.1.2 ~vtkImageMapToWindowLevelColors2()

```
vtkImageMapToWindowLevelColors2::~vtkImageMapToWindowLevelColors2 ( )  [protected]
```

10.388.2 Member Function Documentation

10.388.2.1 New()

```
static vtkImageMapToWindowLevelColors2* vtkImageMapToWindowLevelColors2::New ( )  [static]
```

10.388.2.2 PrintSelf()

```
void vtkImageMapToWindowLevelColors2::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.388.2.3 RequestData()

```
virtual int vtkImageMapToWindowLevelColors2::RequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector )  [protected], [virtual]
```

10.388.2.4 RequestInformation()

```
virtual int vtkImageMapToWindowLevelColors2::RequestInformation (
            vtkInformation * ,
            vtkInformationVector ** ,
            vtkInformationVector *  )  [protected], [virtual]
```

10.388.2.5 ThreadedRequestData()

```
void vtkImageMapToWindowLevelColors2::ThreadedRequestData (
            vtkInformation * request,
            vtkInformationVector ** inputVector,
            vtkInformationVector * outputVector,
            vtkImageData *** inData,
            vtkImageData ** outData,
            int extent[6],
            int id )  [protected]
```

10.388.2.6 vtkGetMacro() [1/2]

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
            Level ,
            double  )
```

10.388.2.7 vtkGetMacro() [2/2]

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
            Window ,
            double  )
```

10.388.2.8 vtkSetMacro() [1/2]

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
            Level ,
            double  )
```

10.388.2.9 vtkSetMacro() [2/2]

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
            Window ,
            double  )
```

10.388.2.10 vtkTypeMacro()

```
vtkImageMapToWindowLevelColors2::vtkTypeMacro (
            vtkImageMapToWindowLevelColors2 ,
            vtkImageMapToColors  )
```

10.388.3 Member Data Documentation

10.388.3.1 Level

```
double vtkImageMapToWindowLevelColors2::Level  [protected]
```

10.388.3.2 Window

```
double vtkImageMapToWindowLevelColors2::Window  [protected]
```

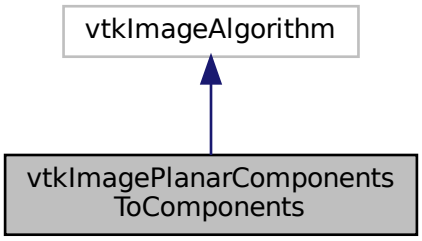
The documentation for this class was generated from the following file:

- vtkImageMapToWindowLevelColors2.h

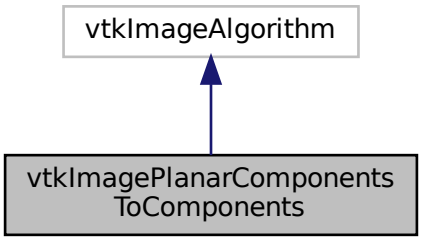
10.389 vtkImagePlanarComponentsToComponents Class Reference

```
#include <vtkImagePlanarComponentsToComponents.h>
```

Inheritance diagram for vtkImagePlanarComponentsToComponents:



Collaboration diagram for vtkImagePlanarComponentsToComponents:



Public Member Functions

- void PrintSelf (ostream &os, vtkIndent indent)
- vtkTypeMacro (vtkImagePlanarComponentsToComponents, vtkImageAlgorithm)

Static Public Member Functions

- static vtkImagePlanarComponentsToComponents * New ()

Protected Member Functions

- vtkImagePlanarComponentsToComponents ()
- ~vtkImagePlanarComponentsToComponents ()
- virtual int RequestData (vtkInformation *, vtkInformationVector **, vtkInformationVector *)

10.389.1 Constructor & Destructor Documentation

10.389.1.1 vtkImagePlanarComponentsToComponents()

```
vtkImagePlanarComponentsToComponents::vtkImagePlanarComponentsToComponents ( )  [protected]
```

10.389.1.2 ~vtkImagePlanarComponentsToComponents()

```
vtkImagePlanarComponentsToComponents::~vtkImagePlanarComponentsToComponents ( )  [inline], [protected]
```

10.389.2 Member Function Documentation

10.389.2.1 New()

```
static vtkImagePlanarComponentsToComponents* vtkImagePlanarComponentsToComponents::New ( )  [static]
```

10.389.2.2 PrintSelf()

```
void vtkImagePlanarComponentsToComponents::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.389.2.3 RequestData()

```
virtual int vtkImagePlanarComponentsToComponents::RequestData (
            vtkInformation * ,
            vtkInformationVector ** ,
            vtkInformationVector *  )  [protected], [virtual]
```

10.389.2.4 vtkTypeMacro()

```
vtkImagePlanarComponentsToComponents::vtkTypeMacro (
            vtkImagePlanarComponentsToComponents ,
            vtkImageAlgorithm  )
```

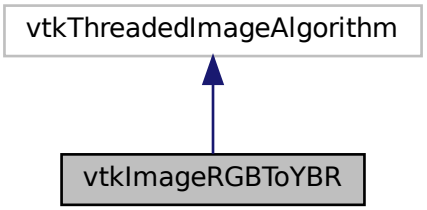
The documentation for this class was generated from the following file:

- vtkImagePlanarComponentsToComponents.h

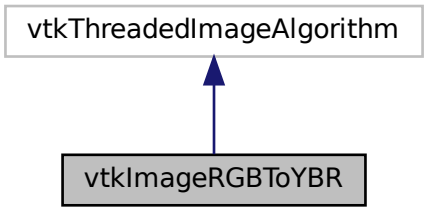
10.390 vtkImageRGBToYBR Class Reference

`#include <vtkImageRGBToYBR.h>`

Inheritance diagram for vtkImageRGBToYBR:



Collaboration diagram for vtkImageRGBToYBR:



Public Member Functions

- void PrintSelf (ostream &os, vtkIndent indent)
- vtkTypeMacro (vtkImageRGBToYBR, vtkThreadedImageAlgorithm)

Static Public Member Functions

- static vtkImageRGBToYBR * New ()

Protected Member Functions

- vtkImageRGBToYBR ()
- ~vtkImageRGBToYBR ()
- void ThreadedExecute (vtkImageData *inData, vtkImageData *outData, int ext[6], int id)

10.390.1 Constructor & Destructor Documentation

10.390.1.1 vtkImageRGBToYBR()

```
vtkImageRGBToYBR::vtkImageRGBToYBR ( )  [protected]
```

10.390.1.2 ~vtkImageRGBToYBR()

```
vtkImageRGBToYBR::~vtkImageRGBToYBR ( )  [inline], [protected]
```

10.390.2 Member Function Documentation

10.390.2.1 New()

```
static vtkImageRGBToYBR* vtkImageRGBToYBR::New ( )  [static]
```

10.390.2.2 PrintSelf()

```
void vtkImageRGBToYBR::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.390.2.3 ThreadedExecute()

```
void vtkImageRGBToYBR::ThreadedExecute (
            vtkImageData * inData,
            vtkImageData * outData,
            int ext[6],
            int id )  [protected]
```

10.390.2.4 vtkTypeMacro()

```
vtkImageRGBToYBR::vtkTypeMacro (
            vtkImageRGBToYBR ,
            vtkThreadedImageAlgorithm  )
```

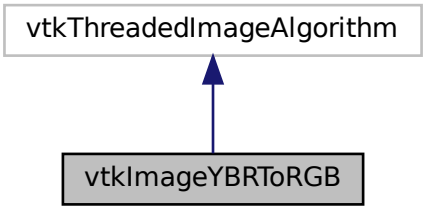
The documentation for this class was generated from the following file:

- vtkImageRGBToYBR.h

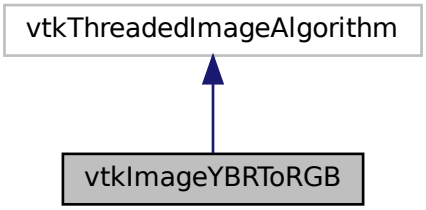
10.391 vtkImageYBRToRGB Class Reference

`#include <vtkImageYBRToRGB.h>`

Inheritance diagram for vtkImageYBRToRGB:



Collaboration diagram for vtkImageYBRToRGB:



Public Member Functions

- void PrintSelf (ostream &os, vtkIndent indent)
- vtkTypeMacro (vtkImageYBRToRGB, vtkThreadedImageAlgorithm)

Static Public Member Functions

- static vtkImageYBRToRGB * New ()

Protected Member Functions

- vtkImageYBRToRGB ()
- ~vtkImageYBRToRGB ()
- void ThreadedExecute (vtkImageData *inData, vtkImageData *outData, int ext[6], int id)

10.391.1 Constructor & Destructor Documentation

10.391.1.1 vtkImageYBRToRGB()

```
vtkImageYBRToRGB::vtkImageYBRToRGB ( )  [protected]
```

10.391.1.2 ~vtkImageYBRToRGB()

```
vtkImageYBRToRGB::~vtkImageYBRToRGB ( )  [inline], [protected]
```

10.391.2 Member Function Documentation

10.391.2.1 New()

```
static vtkImageYBRToRGB* vtkImageYBRToRGB::New ( )  [static]
```

10.391.2.2 PrintSelf()

```
void vtkImageYBRToRGB::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.391.2.3 ThreadedExecute()

```
void vtkImageYBRToRGB::ThreadedExecute (
             vtkImageData * inData,
             vtkImageData * outData,
             int ext[6],
             int id )  [protected]
```

10.391.2.4 vtkTypeMacro()

```
vtkImageYBRToRGB::vtkTypeMacro (
             vtkImageYBRToRGB ,
             vtkThreadedImageAlgorithm  )
```

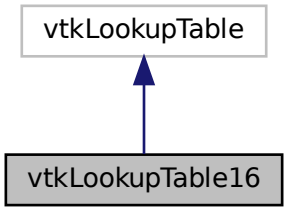
The documentation for this class was generated from the following file:

- vtkImageYBRToRGB.h

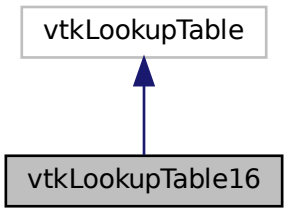
10.392 vtkLookupTable16 Class Reference

```
#include <vtkLookupTable16.h>
```

Inheritance diagram for vtkLookupTable16:



Collaboration diagram for vtkLookupTable16:



Public Member Functions

- void Build ()
- unsigned short * GetPointer (const vtkIdType id)
- void PrintSelf (ostream &os, vtkIndent indent)
- void SetNumberOfTableValues (vtkIdType number)
- vtkTypeMacro (vtkLookupTable16, vtkLookupTable)
- unsigned char * WritePointer (const vtkIdType id, const int number)

Static Public Member Functions

- static vtkLookupTable16 * New ()

Protected Member Functions

- vtkLookupTable16 (int sze=256, int ext=256)
- ~vtkLookupTable16 ()
- void MapScalarsThroughTable2 (void *input, unsigned char *output, int inputDataType, int numberOfValues, int inputIncrement, int outputFormat)

Protected Attributes

- vtkUnsignedShortArray * Table16

10.392.1 Constructor & Destructor Documentation

10.392.1.1 vtkLookupTable16()

```
vtkLookupTable16::vtkLookupTable16 (
            int sze = 256,
            int ext = 256 )  [protected]
```

10.392.1.2 ~vtkLookupTable16()

```
vtkLookupTable16::~vtkLookupTable16 ( )  [protected]
```

10.392.2 Member Function Documentation

10.392.2.1 Build()

```
void vtkLookupTable16::Build ( )
```

10.392.2.2 GetPointer()

```
unsigned short* vtkLookupTable16::GetPointer (
            const vtkIdType id )  [inline]
```

10.392.2.3 MapScalarsThroughTable2()

```
void vtkLookupTable16::MapScalarsThroughTable2 (
            void * input,
            unsigned char * output,
            int inputDataType,
            int numberOfValues,
            int inputIncrement,
            int outputFormat )  [protected]
```

10.392.2.4 New()

```
static vtkLookupTable16* vtkLookupTable16::New ( )  [static]
```

10.392.2.5 PrintSelf()

```
void vtkLookupTable16::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.392.2.6 SetNumberOfTableValues()

```
void vtkLookupTable16::SetNumberOfTableValues (
            vtkIdType number )
```

10.392.2.7 vtkTypeMacro()

```
vtkLookupTable16::vtkTypeMacro (
            vtkLookupTable16 ,
            vtkLookupTable  )
```

10.392.2.8 WritePointer()

```
unsigned char * vtkLookupTable16::WritePointer (
            const vtkIdType id,
            const int number )  [inline]
```

References Table16.

10.392.3 Member Data Documentation

10.392.3.1 Table16

```
vtkUnsignedShortArray* vtkLookupTable16::Table16  [protected]
```

Referenced by WritePointer().

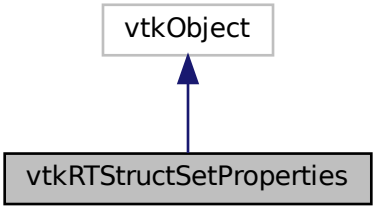
The documentation for this class was generated from the following file:

- vtkLookupTable16.h

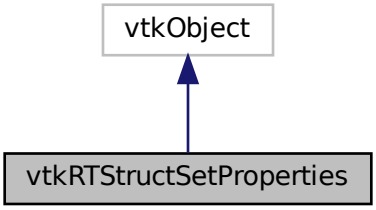
10.393 vtkRTStructSetProperties Class Reference

```
#include <vtkRTStructSetProperties.h>
```

Inheritance diagram for vtkRTStructSetProperties:



Collaboration diagram for vtkRTStructSetProperties:



Public Member Functions

- void AddContourReferencedFrameOfReference (vtkIdType pdnum, const char *classuid, const char *instanceuid)
- void AddReferencedFrameOfReference (const char *classuid, const char *instanceuid)
- void AddStructureSetROI (int roinumber, const char *reframerefuid, const char *roiname, const char *ROIGenerationAlgorithm, const char *ROIDescription=0)
- void AddStructureSetROIObservation (int refnumber, int observationnumber, const char *rtroiinterpretedtype, const char *roiinterpreter, const char *roiobservationlabel=0)
- virtual void Clear ()
- virtual void DeepCopy (vtkRTStructSetProperties *p)
- const char * GetContourReferencedFrameOfReferenceClassUID (vtkIdType pdnum, vtkIdType id)
- const char * GetContourReferencedFrameOfReferenceInstanceUID (vtkIdType pdnum, vtkIdType id)
- vtkIdType GetNumberOfContourReferencedFrameOfReferences ()
- vtkIdType GetNumberOfContourReferencedFrameOfReferences (vtkIdType pdnum)
- vtkIdType GetNumberOfReferencedFrameOfReferences ()
- vtkIdType GetNumberOfStructureSetROIs ()
- const char * GetReferencedFrameOfReferenceClassUID (vtkIdType id)
- const char * GetReferencedFrameOfReferenceInstanceUID (vtkIdType id)
- int GetStructureSetObservationNumber (vtkIdType id)
- const char * GetStructureSetROIDescription (vtkIdType id)
- const char * GetStructureSetROIGenerationAlgorithm (vtkIdType)
- const char * GetStructureSetROIName (vtkIdType)
- int GetStructureSetROINumber (vtkIdType id)
- const char * GetStructureSetROIObservationLabel (vtkIdType id)
- const char * GetStructureSetROIRefFrameRefUID (vtkIdType)
- const char * GetStructureSetRTROIInterpretedType (vtkIdType id)
- void PrintSelf (ostream &os, vtkIndent indent)
- vtkGetStringMacro (ReferenceFrameOfReferenceUID)
- vtkGetStringMacro (ReferenceSeriesInstanceUID)
- vtkGetStringMacro (SeriesInstanceUID)
- vtkGetStringMacro (SOPInstanceUID)
- vtkGetStringMacro (StructureSetDate)
- vtkGetStringMacro (StructureSetLabel)
- vtkGetStringMacro (StructureSetName)
- vtkGetStringMacro (StructureSetTime)
- vtkGetStringMacro (StudyInstanceUID)
- vtkSetStringMacro (ReferenceFrameOfReferenceUID)
- vtkSetStringMacro (ReferenceSeriesInstanceUID)
- vtkSetStringMacro (SeriesInstanceUID)
- vtkSetStringMacro (SOPInstanceUID)
- vtkSetStringMacro (StructureSetDate)
- vtkSetStringMacro (StructureSetLabel)
- vtkSetStringMacro (StructureSetName)
- vtkSetStringMacro (StructureSetTime)
- vtkSetStringMacro (StudyInstanceUID)
- vtkTypeMacro (vtkRTStructSetProperties, vtkObject)

Static Public Member Functions

- static vtkRTStructSetProperties * New ()

Protected Member Functions

- vtkRTStructSetProperties ()
- ~vtkRTStructSetProperties ()

Protected Attributes

- vtkRTStructSetPropertiesInternals * Internals
- char * ReferenceFrameOfReferenceUID
- char * ReferenceSeriesInstanceUID
- char * SeriesInstanceUID
- char * SOPInstanceUID
- char * StructureSetDate
- char * StructureSetLabel
- char * StructureSetName
- char * StructureSetTime
- char * StudyInstanceUID

10.393.1 Detailed Description

Examples

GenerateRTSTRUCT.cxx.

10.393.2 Constructor & Destructor Documentation

10.393.2.1 vtkRTStructSetProperties()

```
vtkRTStructSetProperties::vtkRTStructSetProperties ( )  [protected]
```

10.393.2.2 ~vtkRTStructSetProperties()

```
vtkRTStructSetProperties::~vtkRTStructSetProperties ( )  [protected]
```

10.393.3 Member Function Documentation

10.393.3.1 AddContourReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddContourReferencedFrameOfReference (
            vtkIdType pdnum,
            const char * classuid,
            const char * instanceuid )
```

10.393.3.2 AddReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddReferencedFrameOfReference (
            const char * classuid,
            const char * instanceuid )
```

10.393.3.3 AddStructureSetROI()

```
void vtkRTStructSetProperties::AddStructureSetROI (
            int roinumber,
            const char * refframerefuid,
            const char * roiname,
            const char * ROIGenerationAlgorithm,
            const char * ROIDescription = 0 )
```

10.393.3.4 AddStructureSetROIObservation()

```
void vtkRTStructSetProperties::AddStructureSetROIObservation (
            int refnumber,
            int observationnumber,
            const char * rtroiinterpretedtype,
            const char * roiinterpreter,
            const char * roiobservationlabel = 0 )
```

10.393.3.5 Clear()

```
virtual void vtkRTStructSetProperties::Clear ( )  [virtual]
```

10.393.3.6 DeepCopy()

```
virtual void vtkRTStructSetProperties::DeepCopy (
            vtkRTStructSetProperties * p )  [virtual]
```

10.393.3.7 GetContourReferencedFrameOfReferenceClassUID()

```
const char* vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceClassUID (
            vtkIdType pdnum,
            vtkIdType id )
```

10.393.3.8 GetContourReferencedFrameOfReferenceInstanceUID()

```
const char* vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceInstanceUID (
            vtkIdType pdnum,
            vtkIdType id )
```

10.393.3.9 GetNumberOfContourReferencedFrameOfReferences() [1/2]

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences ( )
```

10.393.3.10 GetNumberOfContourReferencedFrameOfReferences() [2/2]

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences (
            vtkIdType pdnum )
```

10.393.3.11 GetNumberOfReferencedFrameOfReferences()

```
vtkIdType vtkRTStructSetProperties::GetNumberOfReferencedFrameOfReferences ( )
```

10.393.3.12 GetNumberOfStructureSetROIs()

```
vtkIdType vtkRTStructSetProperties::GetNumberOfStructureSetROIs ( )
```

10.393.3.13 GetReferencedFrameOfReferenceClassUID()

```
const char* vtkRTStructSetProperties::GetReferencedFrameOfReferenceClassUID (
            vtkIdType id )
```

10.393.3.14 GetReferencedFrameOfReferenceInstanceUID()

```
const char* vtkRTStructSetProperties::GetReferencedFrameOfReferenceInstanceUID (
            vtkIdType id )
```

10.393.3.15 GetStructureSetObservationNumber()

```
int vtkRTStructSetProperties::GetStructureSetObservationNumber (
            vtkIdType id )
```

10.393.3.16 GetStructureSetROIDescription()

```
const char* vtkRTStructSetProperties::GetStructureSetROIDescription (
            vtkIdType id )
```

10.393.3.17 GetStructureSetROIGenerationAlgorithm()

```
const char* vtkRTStructSetProperties::GetStructureSetROIGenerationAlgorithm (
            vtkIdType  )
```

10.393.3.18 GetStructureSetROIName()

```
const char* vtkRTStructSetProperties::GetStructureSetROIName (
            vtkIdType  )
```

10.393.3.19 GetStructureSetROINumber()

```
int vtkRTStructSetProperties::GetStructureSetROINumber (
            vtkIdType id )
```

10.393.3.20 GetStructureSetROIObservationLabel()

```
const char* vtkRTStructSetProperties::GetStructureSetROIObservationLabel (
            vtkIdType id )
```

10.393.3.21 GetStructureSetROIRefFrameRefUID()

```
const char* vtkRTStructSetProperties::GetStructureSetROIRefFrameRefUID (
            vtkIdType  )
```

10.393.3.22 GetStructureSetRTROIInterpretedType()

```
const char* vtkRTStructSetProperties::GetStructureSetRTROIInterpretedType (
            vtkIdType id )
```

10.393.3.23 New()

```
static vtkRTStructSetProperties* vtkRTStructSetProperties::New ( )  [static]
```

Examples

GenerateRTSTRUCT.cxx.

10.393.3.24 PrintSelf()

```
void vtkRTStructSetProperties::PrintSelf (
            ostream & os,
            vtkIndent indent )
```

10.393.3.25 vtkGetStringMacro() [1/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            ReferenceFrameOfReferenceUID  )
```

10.393.3.26 vtkGetStringMacro() [2/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            ReferenceSeriesInstanceUID  )
```

10.393.3.27 vtkGetStringMacro() [3/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            SeriesInstanceUID  )
```

10.393.3.28 vtkGetStringMacro() [4/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            SOPInstanceUID  )
```

10.393.3.29 vtkGetStringMacro() [5/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            StructureSetDate  )
```

10.393.3.30 vtkGetStringMacro() [6/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            StructureSetLabel  )
```

10.393.3.31 vtkGetStringMacro() [7/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            StructureSetName  )
```

10.393.3.32 vtkGetStringMacro() [8/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            StructureSetTime  )
```

10.393.3.33 vtkGetStringMacro() [9/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
            StudyInstanceUID  )
```

10.393.3.34 vtkSetStringMacro() [1/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            ReferenceFrameOfReferenceUID  )
```

10.393.3.35 vtkSetStringMacro() [2/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            ReferenceSeriesInstanceUID  )
```

10.393.3.36 vtkSetStringMacro() [3/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            SeriesInstanceUID  )
```

10.393.3.37 vtkSetStringMacro() [4/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            SOPInstanceUID  )
```

10.393.3.38 vtkSetStringMacro() [5/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            StructureSetDate  )
```

10.393.3.39 vtkSetStringMacro() [6/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            StructureSetLabel  )
```

10.393.3.40 vtkSetStringMacro() [7/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            StructureSetName  )
```

10.393.3.41 vtkSetStringMacro() [8/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            StructureSetTime  )
```

10.393.3.42 vtkSetStringMacro() [9/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
            StudyInstanceUID  )
```

10.393.3.43 vtkTypeMacro()

```
vtkRTStructSetProperties::vtkTypeMacro (
            vtkRTStructSetProperties ,
            vtkObject  )
```

10.393.4 Member Data Documentation

10.393.4.1 Internals

```
vtkRTStructSetPropertiesInternals* vtkRTStructSetProperties::Internals  [protected]
```

10.393.4.2 ReferenceFrameOfReferenceUID

```
char* vtkRTStructSetProperties::ReferenceFrameOfReferenceUID  [protected]
```

10.393.4.3 ReferenceSeriesInstanceUID

```
char* vtkRTStructSetProperties::ReferenceSeriesInstanceUID  [protected]
```

10.393.4.4 SeriesInstanceUID

```
char* vtkRTStructSetProperties::SeriesInstanceUID  [protected]
```

10.393.4.5 SOPInstanceUID

```
char* vtkRTStructSetProperties::SOPInstanceUID  [protected]
```

10.393.4.6 StructureSetDate

```
char* vtkRTStructSetProperties::StructureSetDate  [protected]
```

10.393.4.7 StructureSetLabel

```
char* vtkRTStructSetProperties::StructureSetLabel  [protected]
```

10.393.4.8 StructureSetName

```
char* vtkRTStructSetProperties::StructureSetName  [protected]
```

10.393.4.9 StructureSetTime

```
char* vtkRTStructSetProperties::StructureSetTime  [protected]
```

10.393.4.10 StudyInstanceUID

```
char* vtkRTStructSetProperties::StudyInstanceUID  [protected]
```

The documentation for this class was generated from the following file:

- vtkRTStructSetProperties.h

10.394 gdcm::Waveform Class Reference

Waveform class.

```
#include <gdcmWaveform.h>
```

Public Member Functions

- Waveform ()=default

10.394.1 Detailed Description

Waveform class.

10.394.2 Constructor & Destructor Documentation

10.394.2.1 Waveform()

```
gdcm::Waveform::Waveform ( )  [default]
```

The documentation for this class was generated from the following file:

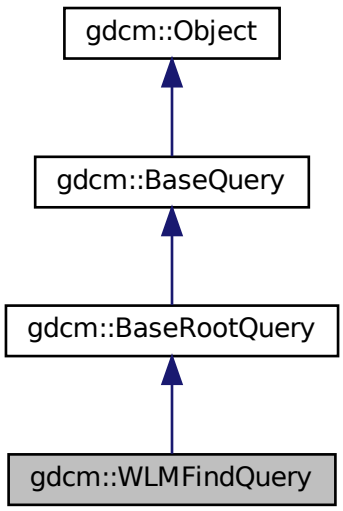
- gdcmWaveform.h

10.395 gdcm::WLMFindQuery Class Reference

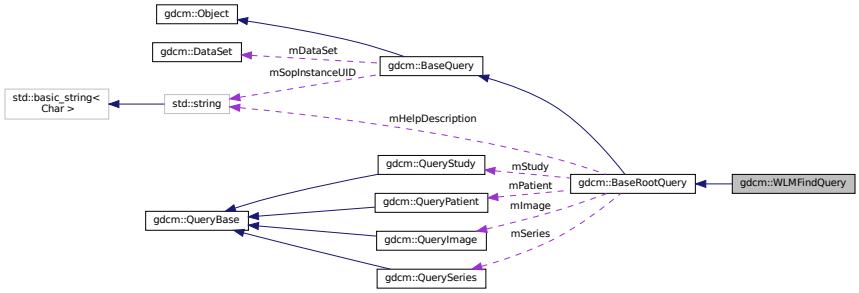
PatientRootQuery.

```
#include <gdcmWLMFindQuery.h>
```

Inheritance diagram for gdcm::WLMFindQuery:



Collaboration diagram for gdcm::WLMFindQuery:



Public Member Functions

- WLMFindQuery ()
- UIDs::TSName GetAbstractSyntaxUID () const override
- std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel) override
- void InitializeDataSet (const EQueryLevel &inQueryLevel) override
- bool ValidateQuery (bool inStrict=true) const override

Protected Member Functions

- DataSet GetValidDataSet () const

Friends

- class QueryFactory

Additional Inherited Members

10.395.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

10.395.2 Constructor & Destructor Documentation

10.395.2.1 WLMFindQuery()

```
gdcm::WLMFindQuery::WLMFindQuery ( )
```

10.395.3 Member Function Documentation

10.395.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::WLMFindQuery::GetAbstractSyntaxUID ( ) const  [override], [virtual]
```

Implements gdcm::BaseQuery.

10.395.3.2 GetTagListByLevel()

```
std::vector<Tag> gdcm::WLMFindQuery::GetTagListByLevel (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements gdcm::BaseRootQuery.

10.395.3.3 GetValidDataSet()

```
DataSet gdcm::WLMFindQuery::GetValidDataSet ( ) const  [protected]
```

10.395.3.4 InitializeDataSet()

```
void gdcm::WLMFindQuery::InitializeDataSet (
            const EQueryLevel & inQueryLevel )  [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements gdcm::BaseRootQuery.

10.395.3.5 ValidateQuery()

```
bool gdcm::WLMFindQuery::ValidateQuery (
            bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements gdcm::BaseRootQuery.

10.395.4 Friends And Related Function Documentation

10.395.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

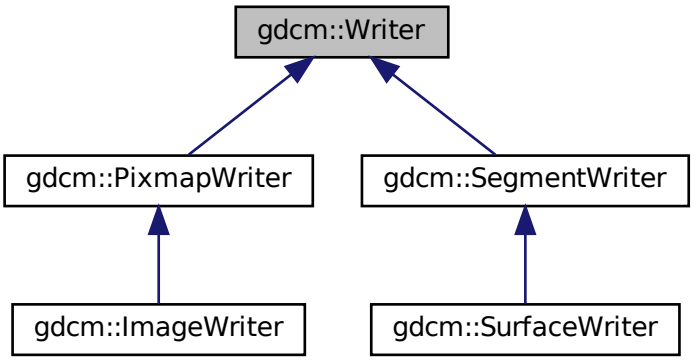
- gdcmWLMFindQuery.h

10.396 gdcm::Writer Class Reference

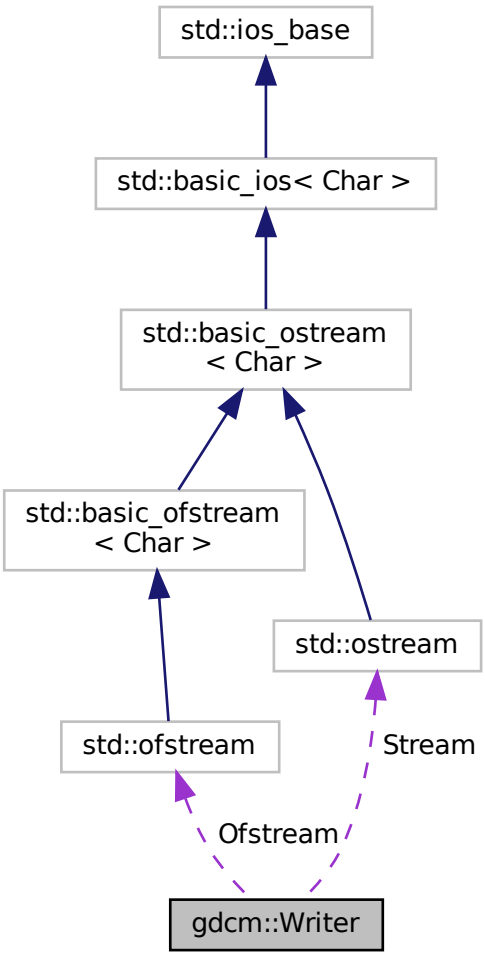
Writer ala DOM (Document Object Model)

```
#include <gdcmWriter.h>
```

Inheritance diagram for gdcm::Writer:



Collaboration diagram for gdcm::Writer:



Public Member Functions

- Writer ()
- virtual ~Writer ()
- void CheckFileMetaInformationOff ()
- void CheckFileMetaInformationOn ()
- File & GetFile ()
- void SetCheckFileMetaInformation (bool b)

  Undocumented function, do not use (= leave default)
- void SetFile (const File &f)

  Set/Get the DICOM file (DataSet + Header)

- void SetFileName (const char *filename_native)

  Set the filename of DICOM file to write:
- void SetStream (std::ostream &output_stream)

  Set user ostream buffer.
- virtual bool Write ()

  Main function to tell the writer to write.

Protected Member Functions

- bool GetCheckFileMetaInformation () const
- std::ostream * GetStreamPtr () const
- void SetWriteDataSetOnly (bool b)

Protected Attributes

- std::ofstream * Ofstream
- std::ostream * Stream

Friends

- class StreamImageWriter

10.396.1 Detailed Description

Writer ala DOM (Document Object Model)

This class is a non-validating writer, it will only performs well- formedness check only.

Detailed description here To avoid GDCM being yet another broken DICOM lib we try to be user level and avoid writing illegal stuff (odd length, non-zero value for Item start/end length ...) Therefore you cannot (well unless you are really smart) write DICOM with even length tag. All the checks are consider basics:

- Correct Meta Information Header (see gdcm::FileMetaInformation)
- Zero value for Item Length (0xfffe, 0xe00d/0xe0dd)
- Even length for any elements
- Alphabetical order for elements (guaranteed by design of internals)
- 32bits VR will be rewritten with 00

Warning

gdcm::Writer cannot write a DataSet if no SOP Instance UID (0008,0018) is found, unless a DICOMDIR is being written out

See also

Reader DataSet File

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DuplicatePCDE.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, PatchFile.cxx, QIDO-RS.cxx, StreamImageReaderTest.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.396.2 Constructor & Destructor Documentation

10.396.2.1 Writer()

```
gdcm::Writer::Writer ( )
```

10.396.2.2 ~Writer()

```
virtual gdcm::Writer::~Writer ( )  [virtual]
```

10.396.3 Member Function Documentation

10.396.3.1 CheckFileMetaInformationOff()

```
void gdcm::Writer::CheckFileMetaInformationOff ( )  [inline]
```

Examples

CreateFakeRTDOSE.cxx, FixBrokenJ2K.cxx, and HelloWorld.cxx.

10.396.3.2 CheckFileMetaInformationOn()

```
void gdcm::Writer::CheckFileMetaInformationOn ( )  [inline]
```

10.396.3.3 GetCheckFileMetaInformation()

```
bool gdcm::Writer::GetCheckFileMetaInformation ( ) const  [inline], [protected]
```

10.396.3.4 GetFile()

```
File& gdcm::Writer::GetFile ( )  [inline]
```

Examples

CreateJPIPDataSet.cxx, EncapsulateFileInRawData.cxx, Extracting_All_Resolution.cxx, Fake_Image_Using_Stream_Image_Writer GenAllVR.cxx, GenFakeIdentifyFile.cxx, GetSubSequenceData.cxx, QIDO-RS.cxx, StreamImageReaderTest.cxx, TemplateEmptyImage.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.396.3.5 GetStreamPtr()

```
std::ostream* gdcm::Writer::GetStreamPtr ( ) const  [inline], [protected]
```

10.396.3.6 SetCheckFileMetaInformation()

```
void gdcm::Writer::SetCheckFileMetaInformation (
            bool b )  [inline]
```

Undocumented function, do not use (= leave default)

Examples

GenAllVR.cxx, GenFakeIdentifyFile.cxx, and PatchFile.cxx.

10.396.3.7 SetFile()

```
void gdcm::Writer::SetFile (
            const File & f )  [inline]
```

Set/Get the DICOM file (DataSet + Header)

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CompressImage.cxx, CreateFakeRTDOSE.cxx, DeriveSeries.cxx, DuplicatePCDE.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, NewSequence.cs, PatchFile.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.396.3.8 SetFileName()

```
void gdcm::Writer::SetFileName (
            const char * filename_native )
```

Set the filename of DICOM file to write:

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CompressImage.cxx, CreateARGBImage.cxx, CreateCMYKImage.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DuplicatePCDE.cxx, EncapsulateFileInRawData.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenFakeImage.cxx, GenLongSeqs.cxx, GenSeqs.cxx, GetSubSequenceData.cxx, HelloVizWorld.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, MergeTwoFiles.cxx, PatchFile.cxx, QIDO-RS.cxx, TemplateEmptyImage.cxx, csa2img.cxx, iU22tomultisc.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.396.3.9 SetStream()

```
void gdcm::Writer::SetStream (
            std::ostream & output_stream )  [inline]
```

Set user ostream buffer.

10.396.3.10 SetWriteDataSetOnly()

```
void gdcm::Writer::SetWriteDataSetOnly (
            bool b )  [inline], [protected]
```

10.396.3.11 Write()

```
virtual bool gdcm::Writer::Write ( )  [virtual]
```

Main function to tell the writer to write.

Reimplemented in gdcm::SurfaceWriter, gdcm::SegmentWriter, gdcm::PixmapWriter, and gdcm::ImageWriter.

Examples

ChangePrivateTags.cxx, ChangeSequenceUltrasound.cxx, ClinicalTrialAnnotate.cxx, CreateFakeRTDOSE.cxx, CreateJPIPDataSet.cxx, DeriveSeries.cxx, DuplicatePCDE.cxx, EncapsulateFileInRawData.cxx, FixBrokenJ2K.cxx, FixJAIBugJPEGLS.cxx, FixOrientation.cxx, GenAllVR.cxx, GenFakeIdentifyFile.cxx, GenLongSeqs.cxx, GenSeqs.cxx, HelloWorld.cxx, LargeVRDSExplicit.cxx, MakeTemplate.cxx, PatchFile.cxx, QIDO-RS.cxx, pmsct_rgb1.cxx, and rle2img.cxx.

10.396.4 Friends And Related Function Documentation

10.396.4.1 StreamImageWriter

```
friend class StreamImageWriter  [friend]
```

10.396.5 Member Data Documentation

10.396.5.1 Ofstream

```
std::ofstream* gdcm::Writer::Ofstream  [protected]
```

10.396.5.2 Stream

```
std::ostream* gdcm::Writer::Stream  [protected]
```

The documentation for this class was generated from the following file:

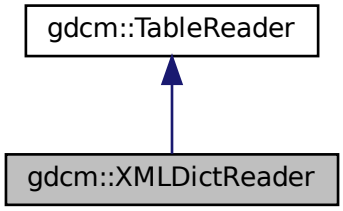
- gdcmWriter.h

10.397 gdcm::XMLDictReader Class Reference

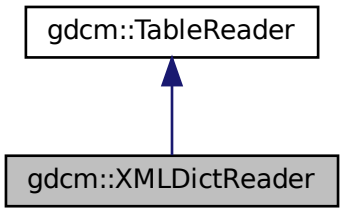
Class for representing a XMLDictReader.

```
#include <gdcmXMLDictReader.h>
```

Inheritance diagram for gdcm::XMLDictReader:



Collaboration diagram for gdcm::XMLDictReader:



Public Member Functions

- XMLDictReader ()
- ~XMLDictReader ()
- void CharacterDataHandler (const char *data, int length)
- void EndElement (const char *name)
- const Dict & GetDict ()
- void StartElement (const char *name, const char **atts)

Protected Member Functions

- void HandleDescription (const char **atts)
- void HandleEntry (const char **atts)

10.397.1 Detailed Description

Class for representing a XMLDictReader.

Note

bla Will read the DICOMV3.xml file

10.397.2 Constructor & Destructor Documentation

10.397.2.1 XMLDictReader()

```
gdcm::XMLDictReader::XMLDictReader ( )
```

10.397.2.2 ~XMLDictReader()

```
gdcm::XMLDictReader::~XMLDictReader ( )  [inline]
```

10.397.3 Member Function Documentation

10.397.3.1 CharacterDataHandler()

```
void gdcm::XMLDictReader::CharacterDataHandler (
            const char * data,
            int length )  [virtual]
```

Reimplemented from gdcm::TableReader.

10.397.3.2 EndElement()

```
void gdcm::XMLDictReader::EndElement (
            const char * name )  [virtual]
```

Reimplemented from gdcm::TableReader.

10.397.3.3 GetDict()

```
const Dict& gdcm::XMLDictReader::GetDict ( )  [inline]
```

10.397.3.4 HandleDescription()

```
void gdcm::XMLDictReader::HandleDescription (
            const char ** atts )  [protected]
```

10.397.3.5 HandleEntry()

```
void gdcm::XMLDictReader::HandleEntry (
             const char ** atts )  [protected]
```

10.397.3.6 StartElement()

```
void gdcm::XMLDictReader::StartElement (
             const char * name,
             const char ** atts )  [virtual]
```

Reimplemented from gdcm::TableReader.

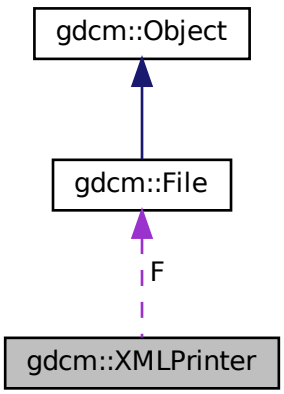
The documentation for this class was generated from the following file:

- gdcmXMLDictReader.h

10.398 gdcm::XMLPrinter Class Reference

```
#include <gdcmXMLPrinter.h>
```

Collaboration diagram for gdcm::XMLPrinter:



Public Types

- enum PrintStyles {
  OnlyUUID = 0 ,
  LOADBULKDATA = 1 }

Public Member Functions

- XMLPrinter ()
- virtual ~XMLPrinter ()
- PrintStyles GetPrintStyle () const
- virtual void HandleBulkData (const char *uuid, const TransferSyntax &ts, const char *bulkdata, size_t bulklen)
- void Print (std::ostream &os)
- void PrintDataSet (const DataSet &ds, const TransferSyntax &ts, std::ostream &os)
- void SetFile (File const &f)
- void SetStyle (PrintStyles ps)

Protected Member Functions

- VR PrintDataElement (std::ostream &os, const Dicts &dicts, const DataSet &ds, const DataElement &de, const TransferSyntax &ts)
- void PrintSQ (const SequenceOfItems *sqi, const TransferSyntax &ts, std::ostream &os)

Protected Attributes

- const File * F
- PrintStyles PrintStyle

10.398.1 Member Enumeration Documentation

10.398.1.1 PrintStyles

enum gdcm::XMLPrinter::PrintStyles

Enumerator

OnlyUUID	
LOADBULKDATA	

10.398.2 Constructor & Destructor Documentation

10.398.2.1 XMLPrinter()

```
gdcm::XMLPrinter::XMLPrinter ( )
```

10.398.2.2 ~XMLPrinter()

```
virtual gdcm::XMLPrinter::~XMLPrinter ( )  [virtual]
```

10.398.3 Member Function Documentation

10.398.3.1 GetPrintStyle()

```
PrintStyles gdcm::XMLPrinter::GetPrintStyle ( ) const  [inline]
```

10.398.3.2 HandleBulkData()

```
virtual void gdcm::XMLPrinter::HandleBulkData (
             const char * uuid,
             const TransferSyntax & ts,
             const char * bulkdata,
             size_t bulklen )  [virtual]
```

Virtual function mechanism to allow application programmer to override the default mechanism for BulkData handling. By default GDCM will simply discard the BulkData and only write the UUID

10.398.3.3 Print()

```
void gdcm::XMLPrinter::Print (
             std::ostream & os )
```

10.398.3.4 PrintDataElement()

```
VR gdcm::XMLPrinter::PrintDataElement (
            std::ostream & os,
            const Dicts & dicts,
            const DataSet & ds,
            const DataElement & de,
            const TransferSyntax & ts )  [protected]
```

10.398.3.5 PrintDataSet()

```
void gdcm::XMLPrinter::PrintDataSet (
            const DataSet & ds,
            const TransferSyntax & ts,
            std::ostream & os )
```

10.398.3.6 PrintSQ()

```
void gdcm::XMLPrinter::PrintSQ (
            const SequenceOfItems * sqi,
            const TransferSyntax & ts,
            std::ostream & os )  [protected]
```

10.398.3.7 SetFile()

```
void gdcm::XMLPrinter::SetFile (
            File const & f )  [inline]
```

10.398.3.8 SetStyle()

```
void gdcm::XMLPrinter::SetStyle (
            PrintStyles ps )  [inline]
```

10.398.4 Member Data Documentation

10.398.4.1 F

```
const File* gdcm::XMLPrinter::F  [protected]
```

10.398.4.2 PrintStyle

```
PrintStyles gdcm::XMLPrinter::PrintStyle  [protected]
```

The documentation for this class was generated from the following file:

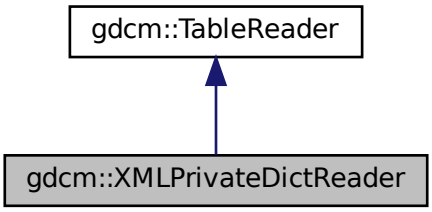
- gdcmXMLPrinter.h

10.399 gdcm::XMLPrivateDictReader Class Reference

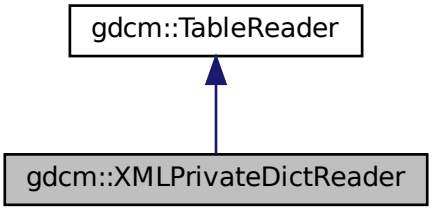
Class for representing a XMLPrivateDictReader.

`#include <gdcmXMLPrivateDictReader.h>`

Inheritance diagram for gdcm::XMLPrivateDictReader:



Collaboration diagram for gdcm::XMLPrivateDictReader:



Public Member Functions

- XMLPrivateDictReader ()
- ~XMLPrivateDictReader ()
- void CharacterDataHandler (const char *data, int length)
- void EndElement (const char *name)
- const PrivateDict & GetPrivateDict ()
- void StartElement (const char *name, const char **atts)

Protected Member Functions

- void HandleDescription (const char **atts)
- void HandleEntry (const char **atts)

10.399.1 Detailed Description

Class for representing a XMLPrivateDictReader.

Note

bla Will read the Private.xml file

10.399.2 Constructor & Destructor Documentation

10.399.2.1 XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::XMLPrivateDictReader ( )
```

10.399.2.2 ~XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::~XMLPrivateDictReader ( )  [inline]
```

10.399.3 Member Function Documentation

10.399.3.1 CharacterDataHandler()

```
void gdcm::XMLPrivateDictReader::CharacterDataHandler (
            const char * data,
            int length )  [virtual]
```

Reimplemented from gdcm::TableReader.

10.399.3.2 EndElement()

```
void gdcm::XMLPrivateDictReader::EndElement (
            const char * name )  [virtual]
```

Reimplemented from gdcm::TableReader.

10.399.3.3 GetPrivateDict()

```
const PrivateDict& gdcm::XMLPrivateDictReader::GetPrivateDict ( )  [inline]
```

10.399.3.4 HandleDescription()

```
void gdcm::XMLPrivateDictReader::HandleDescription (
            const char ** atts )  [protected]
```

10.399.3.5 HandleEntry()

```
void gdcm::XMLPrivateDictReader::HandleEntry (
            const char ** atts )  [protected]
```

10.399.3.6 StartElement()

```
void gdcm::XMLPrivateDictReader::StartElement (
            const char * name,
            const char ** atts )  [virtual]
```

Reimplemented from gdcm::TableReader.

The documentation for this class was generated from the following file:

- gdcmXMLPrivateDictReader.h

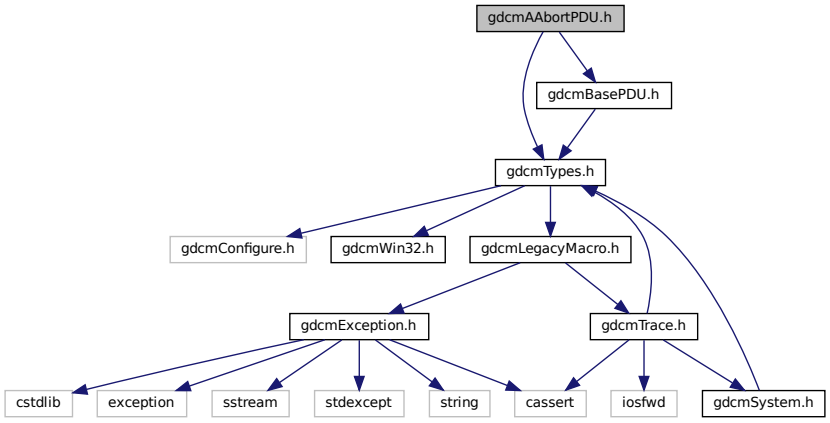
Chapter 11

File Documentation

11.1 gdcmAAbortPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAbortPDU.h:



Classes

- class gdcm::network::AAbortPDU

  AAbortPDU.

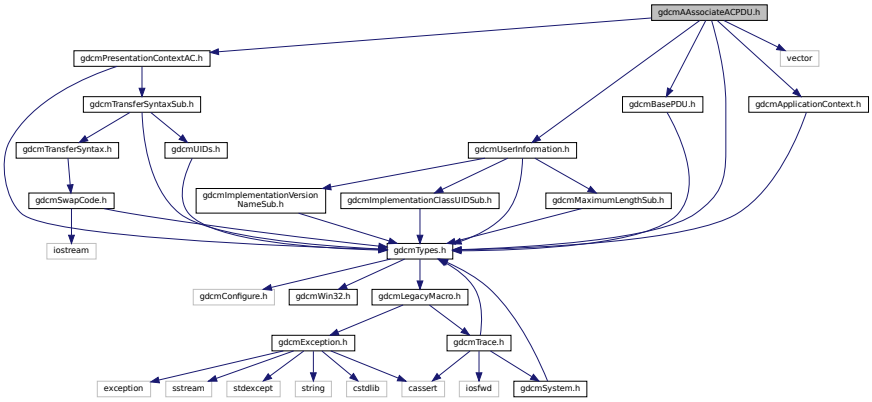
Namespaces

- gdcm
- gdcm::network

11.2 gdcmAAssociateACPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmApplicationContext.h"
#include "gdcmPresentationContextAC.h"
#include "gdcmUserInformation.h"
#include "gdcmBasePDU.h"
#include <vector>
```

Include dependency graph for gdcmAAssociateACPDU.h:



Classes

- class gdcm::network::AAssociateACPDU

  AAssociateACPDU.

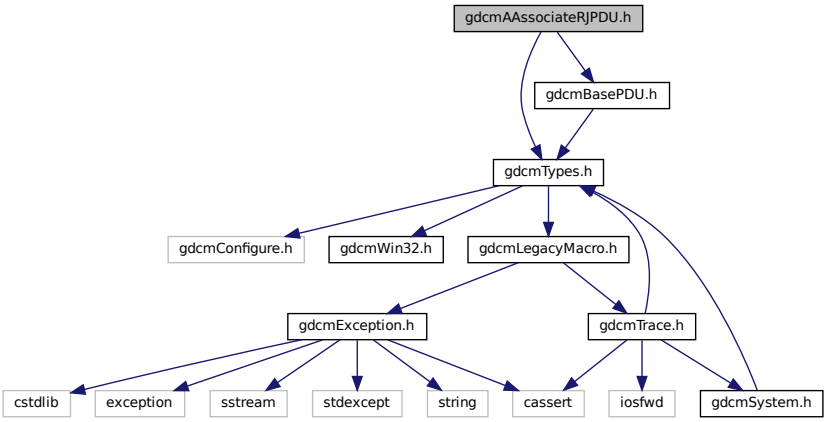
Namespaces

- gdcm
- gdcm::network

11.3 gdcmAAssociateRJPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAssociateRJPDU.h:



Classes

- class gdcm::network::AAssociateRJPDU
  AAssociateRJPDU.

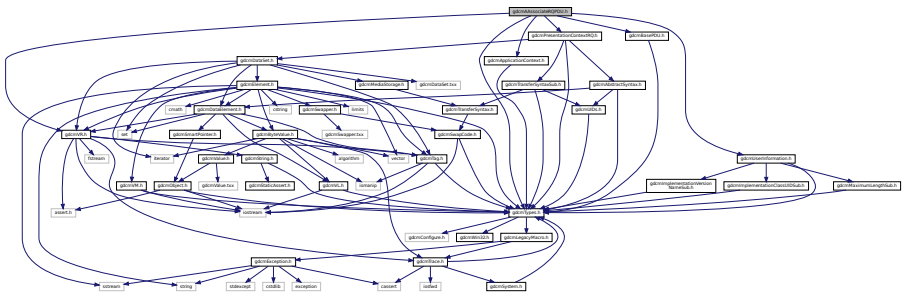
Namespaces

- gdcm
- gdcm::network

11.4 gdcmAAssociateRQPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmApplicationContext.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmUserInformation.h"
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAssociateRQPDU.h:



Classes

- class gdcm::network::AAssociateRQPDU

  AAssociateRQPDU.

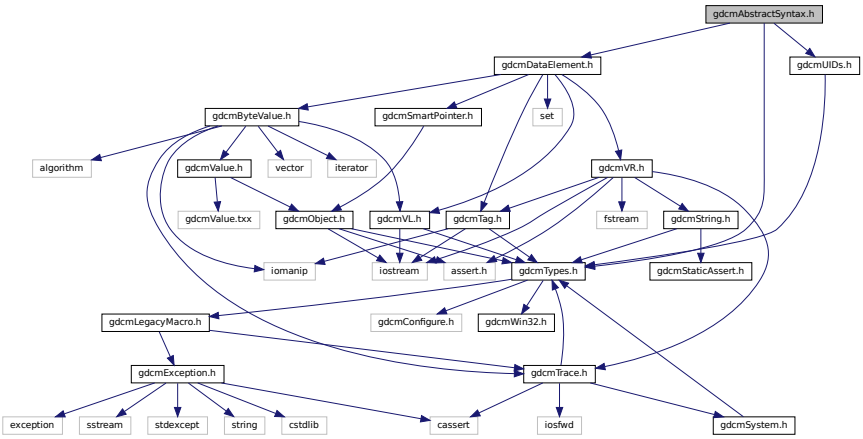
Namespaces

- gdcm
- gdcm::network

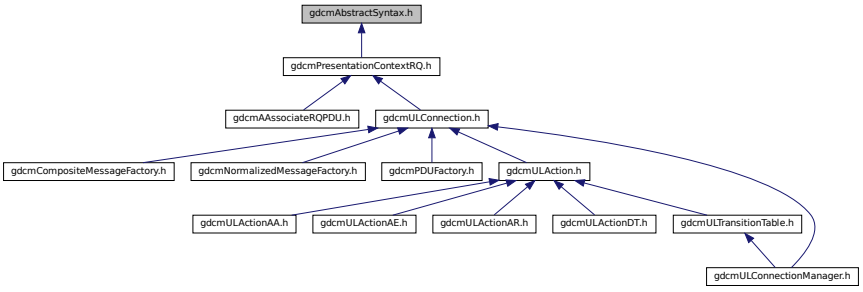
11.5 gdcmAbstractSyntax.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmUIDs.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmAbstractSyntax.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::AbstractSyntax

  AbstractSyntax.

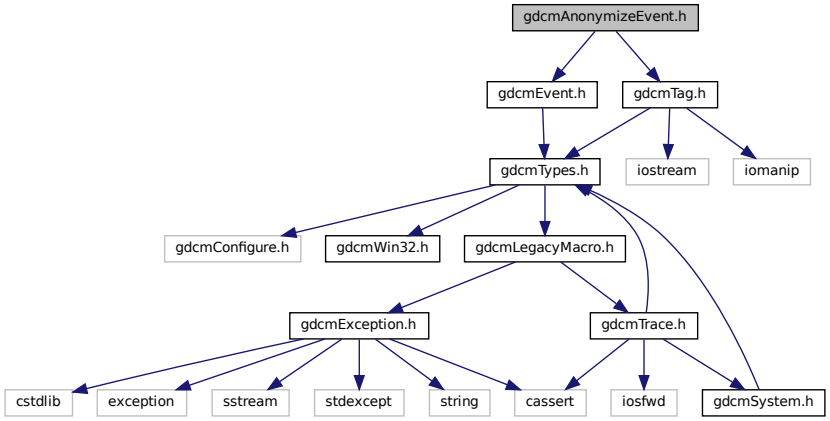
Namespaces

- gdcm
- gdcm::network

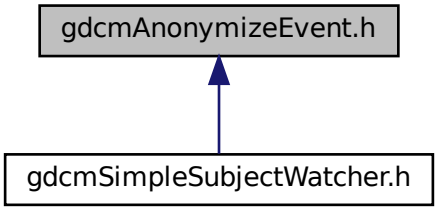
11.6 gdcmAnonymizeEvent.h File Reference

```
#include "gdcmEvent.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmAnonymizeEvent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::AnonymizeEvent

  AnonymizeEvent.

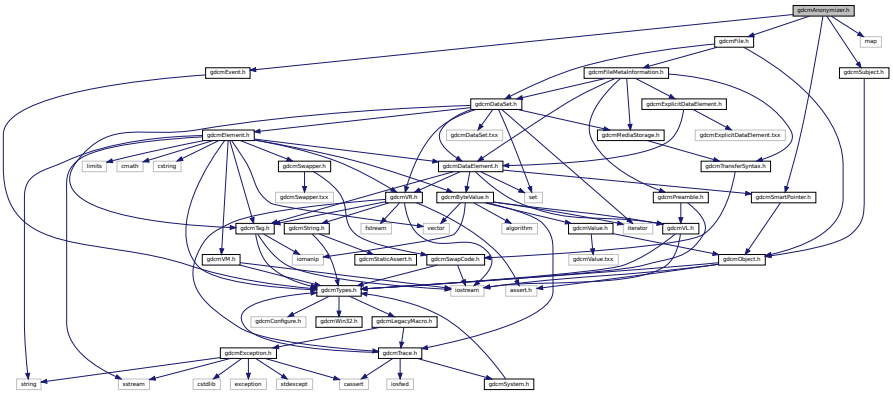
Namespaces

- gdcm

11.7 gdcmAnonymizer.h File Reference

```
#include "gdcmFile.h"
#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmSmartPointer.h"
#include <map>
```

Include dependency graph for gdcmAnonymizer.h:



Classes

- class gdcm::Anonymizer

  Anonymizer.

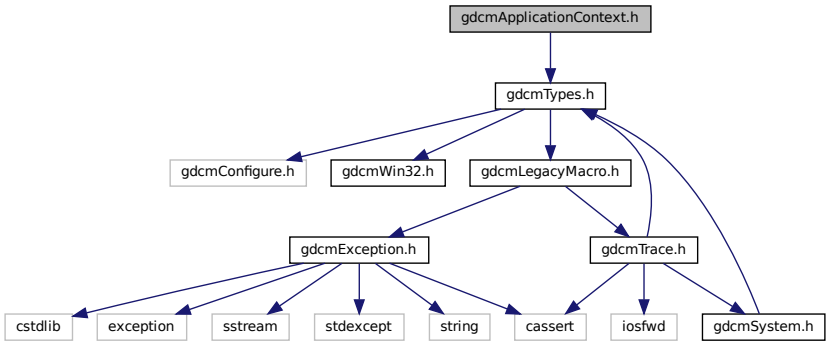
Namespaces

- gdcm

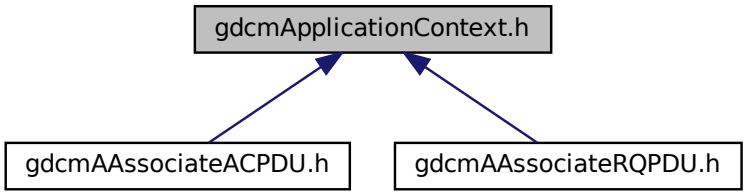
11.8 gdcmApplicationContext.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmApplicationContext.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ApplicationContext

  ApplicationContext.

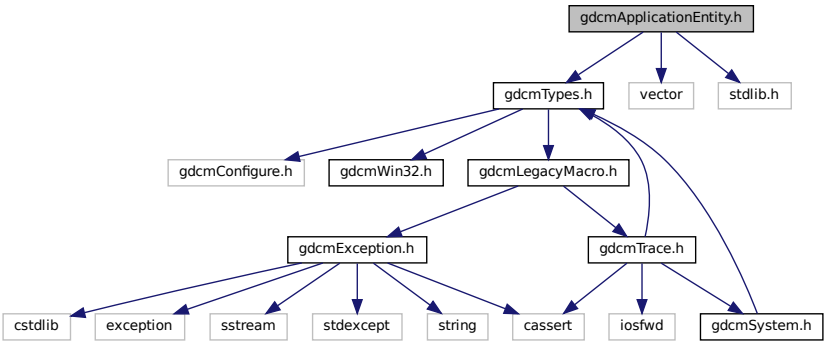
Namespaces

- gdcm
- gdcm::network

11.9 gdcmApplicationEntity.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
#include <stdlib.h>
```

Include dependency graph for gdcmApplicationEntity.h:



Classes

- class gdcm::ApplicationEntity

  ApplicationEntity.

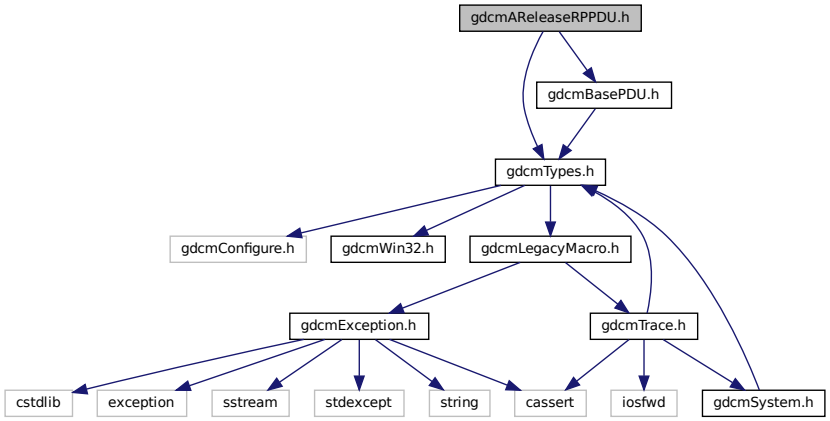
Namespaces

- gdcm

11.10 gdcmAReleaseRPPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAReleaseRPPDU.h:



Classes

- class gdcm::network::AReleaseRPPDU

  AReleaseRPPDU.

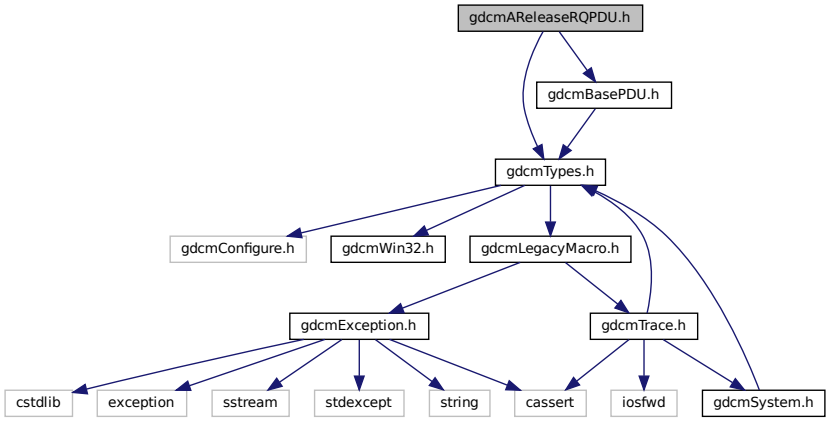
Namespaces

- gdcm
- gdcm::network

11.11 gdcmAReleaseRQPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAReleaseRQPDU.h:



Classes

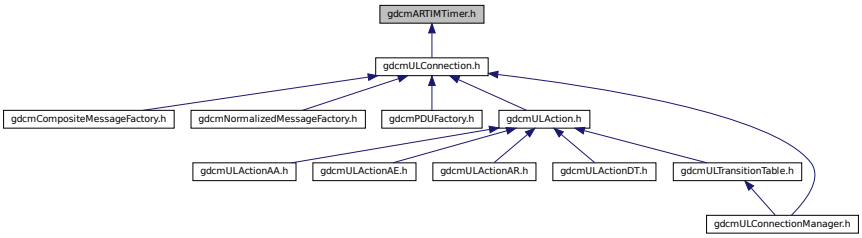
- class gdcm::network::AReleaseRQPDU
  AReleaseRQPDU.

Namespaces

- gdcm
- gdcm::network

11.12 gdcmARTIMTimer.h File Reference

This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ARTIMTimer

  ARTIMTimer.

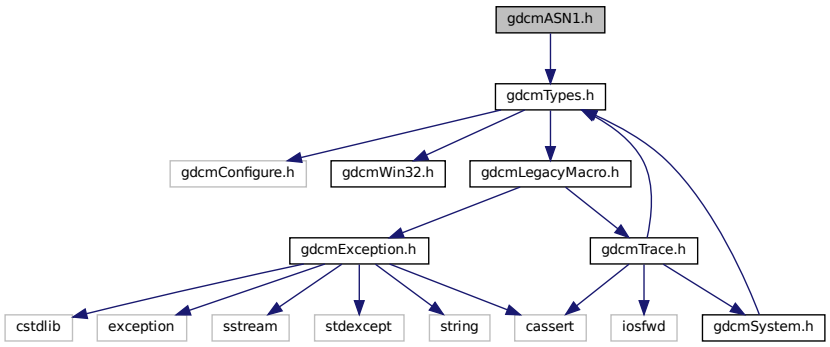
Namespaces

- gdcm
- gdcm::network

11.13 gdcmASN1.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmASN1.h:



Classes

- class gdcm::ASN1

  Class for ASN1.

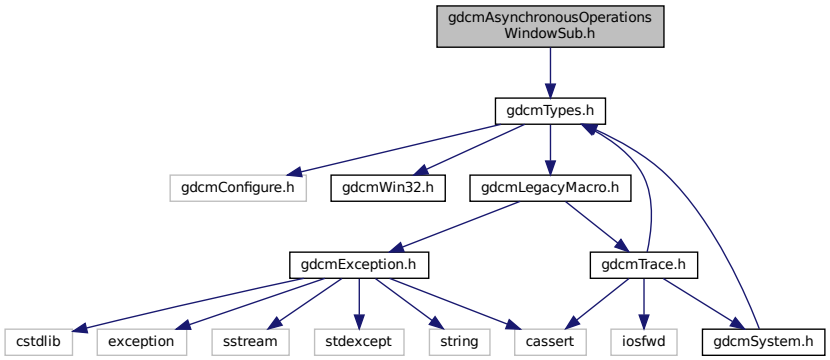
Namespaces

- gdcm

11.14 gdcmAsynchronousOperationsWindowSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmAsynchronousOperationsWindowSub.h:



Classes

- class gdcm::network::AsynchronousOperationsWindowSub

  AsynchronousOperationsWindowSub.

Namespaces

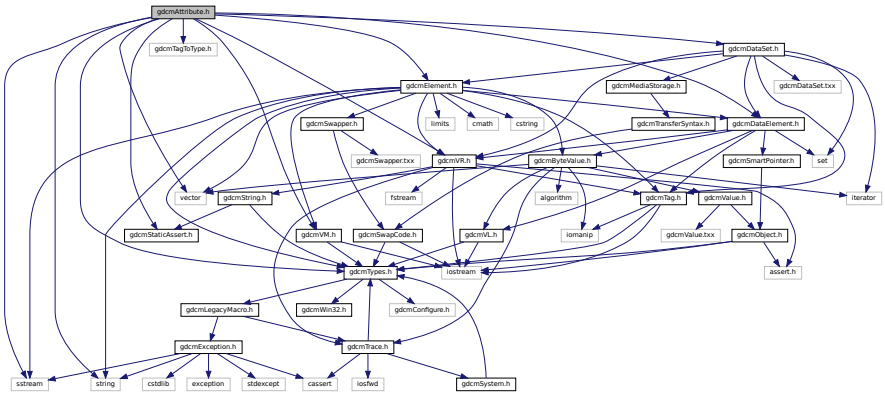
- gdcm
- gdcm::network

11.15 gdcmAttribute.h File Reference

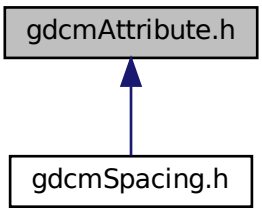
```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmTagToType.h"
#include "gdcmVM.h"
#include "gdcmElement.h"
#include "gdcmDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmStaticAssert.h"
#include <string>
#include <vector>
```

```
#include <sstream>
```

Include dependency graph for gdcmAttribute.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Attribute< Group, Element, TVR, TVM >

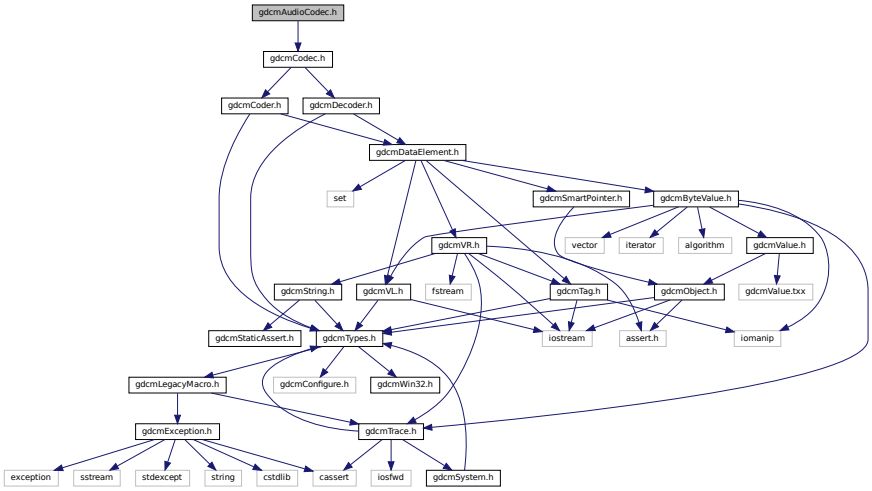
  Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.
- class gdcm::Attribute< Group, Element, TVR, VM::VM1 >
- class gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >
- class gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >
- class gdcm::Attribute< Group, Element, TVR, VM::VM1_n >
- class gdcm::Attribute< Group, Element, TVR, VM::VM2_2n >
- class gdcm::Attribute< Group, Element, TVR, VM::VM2_n >
- class gdcm::Attribute< Group, Element, TVR, VM::VM3_3n >
- class gdcm::Attribute< Group, Element, TVR, VM::VM3_n >
- class gdcm::VRVLSize< 0 >
- class gdcm::VRVLSize< 1 >

Namespaces

- gdcm

11.16 gdcmAudioCodec.h File Reference

`#include "gdcmCodec.h"`
Include dependency graph for gdcmAudioCodec.h:



Classes

- class gdcm::AudioCodec
  AudioCodec.

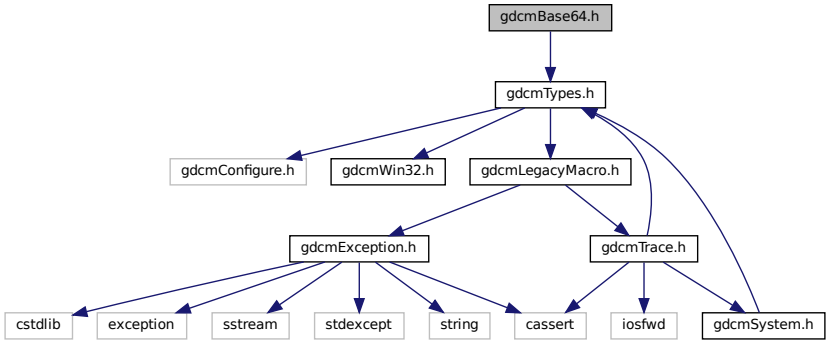
Namespaces

- gdcm

11.17 gdcmBase64.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBase64.h:



Classes

- class gdcm::Base64

  Class for Base64.

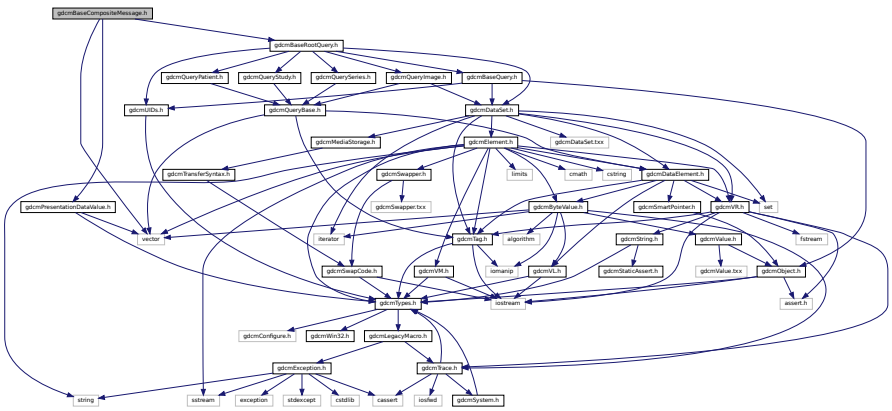
Namespaces

- gdcm

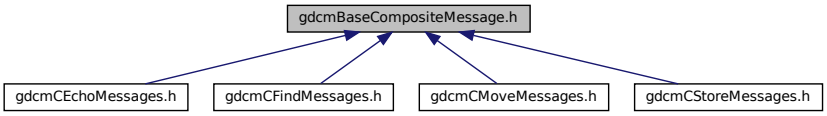
11.18 gdcmBaseCompositeMessage.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmBaseRootQuery.h"
#include <vector>
```

Include dependency graph for gdcmBaseCompositeMessage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::BaseCompositeMessage
  BaseCompositeMessage.

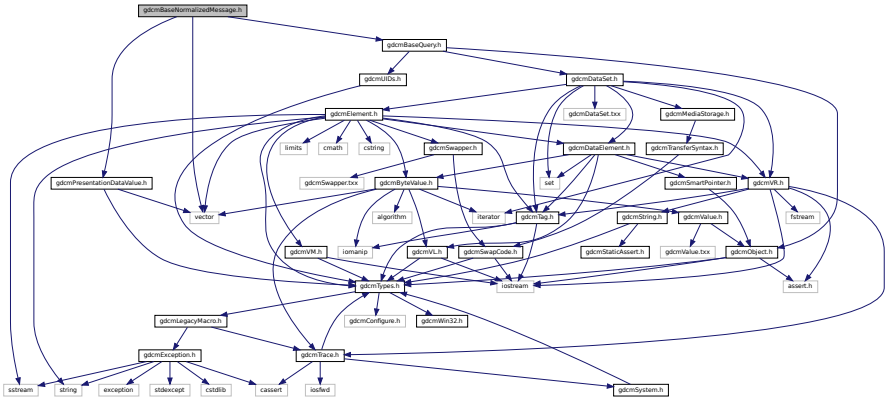
Namespaces

- gdcm
- gdcm::network

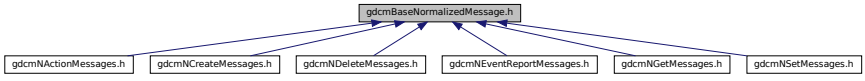
11.19 gdcmBaseNormalizedMessage.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmBaseQuery.h"
#include <vector>
```

Include dependency graph for gdcmBaseNormalizedMessage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::BaseNormalizedMessage

  BaseNormalizedMessage.

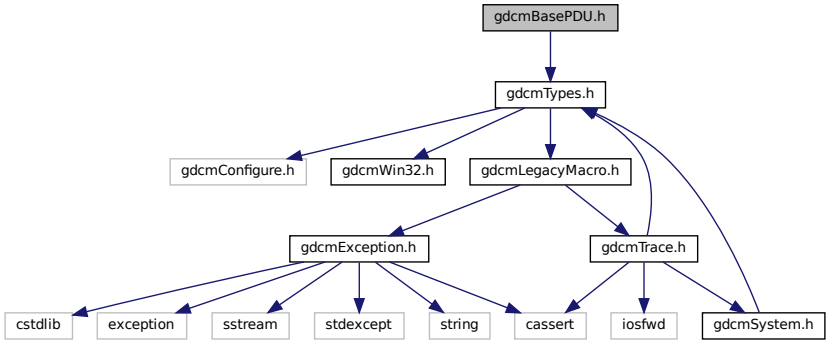
Namespaces

- gdcm
- gdcm::network

11.20 gdcmBasePDU.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBasePDU.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::network::BasePDU

  BasePDU.

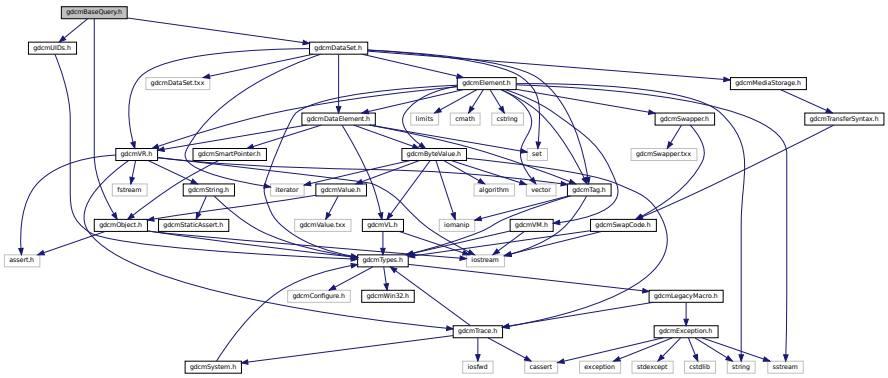
Namespaces

- gdcm
- gdcm::network

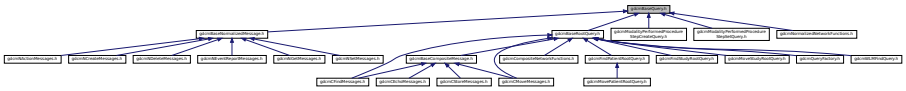
11.21 gdcmBaseQuery.h File Reference

```
#include "gdcmDataSet.h"
#include "gdcmUIDs.h"
#include "gdcmObject.h"
```

Include dependency graph for gdcmBaseQuery.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::BaseQuery

  BaseQuery.

Namespaces

- gdcm

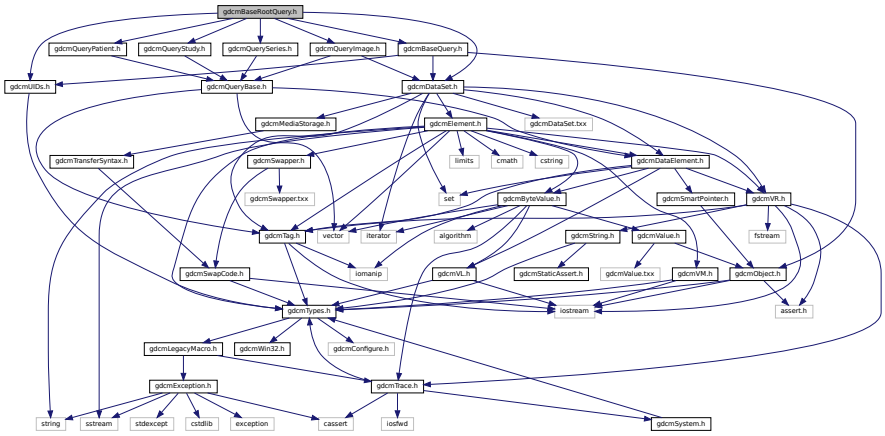
Enumerations

- enum gdcm::ENQueryType {
  gdcm::eCreateMMPS = 0 ,
  gdcm::eSetMMPS }

11.22 gdcmBaseRootQuery.h File Reference

```
#include "gdcmDataSet.h"
#include "gdcmUIDs.h"
#include "gdcmBaseQuery.h"
#include "gdcmQueryPatient.h"
#include "gdcmQueryStudy.h"
#include "gdcmQuerySeries.h"
#include "gdcmQueryImage.h"
```

Include dependency graph for gdcmBaseRootQuery.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::BaseRootQuery

  BaseRootQuery.

Namespaces

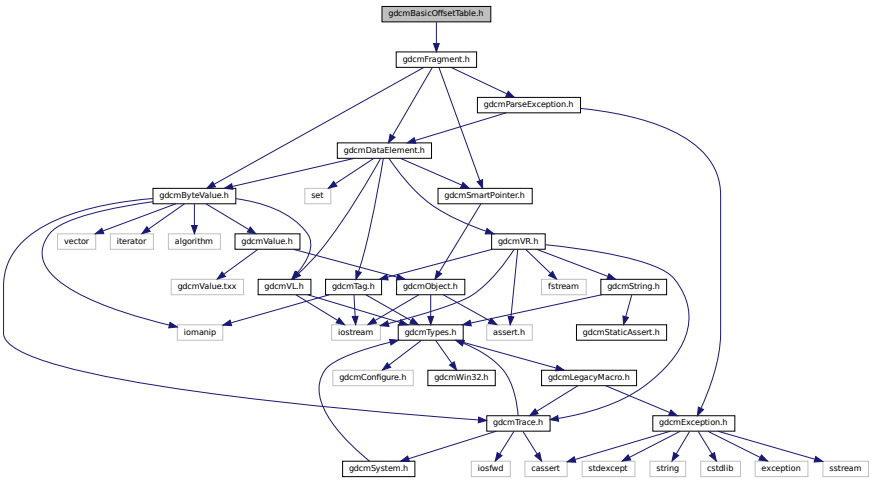
- gdcm

Enumerations

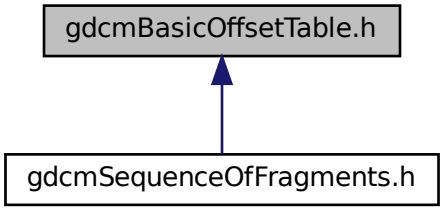
- enum gdcm::EQueryLevel {
  gdcm::ePatient = 0 ,
  gdcm::eStudy = 1 ,
  gdcm::eSeries = 2 ,
  gdcm::eImage = 3 }
- enum gdcm::EQueryType {
  gdcm::eFind = 0 ,
  gdcm::eMove ,
  gdcm::eWLMFind }

11.23 gdcmBasicOffsetTable.h File Reference

`#include "gdcmFragment.h"`
Include dependency graph for gdcmBasicOffsetTable.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::BasicOffsetTable

  Class to represent a BasicOffsetTable.

Namespaces

- gdcm

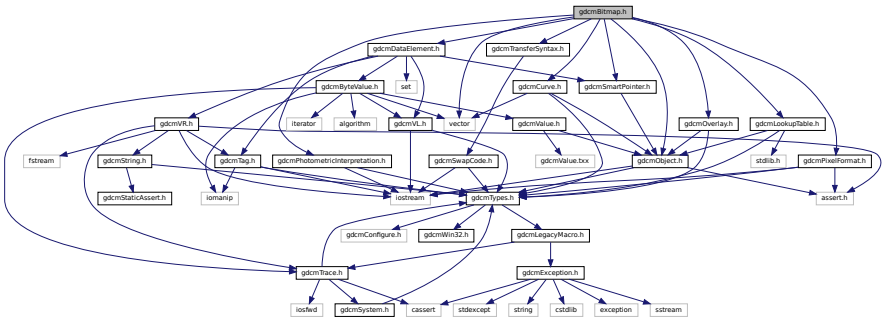
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const BasicOffsetTable &val)

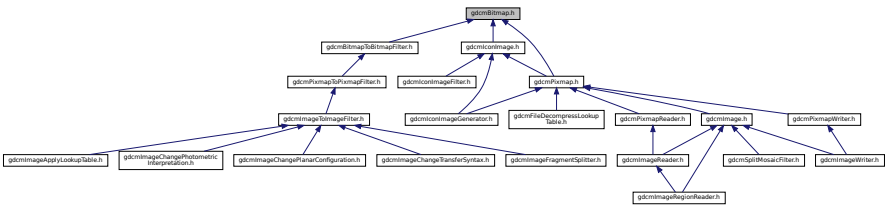
11.24 gdcmBitmap.h File Reference

```
#include "gdcmObject.h"
#include "gdcmCurve.h"
#include "gdcmDataElement.h"
#include "gdcmLookupTable.h"
#include "gdcmOverlay.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmPixelFormat.h"
#include "gdcmSmartPointer.h"
#include "gdcmTransferSyntax.h"
#include <vector>
```

Include dependency graph for gdcmBitmap.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Bitmap

  Bitmap class.

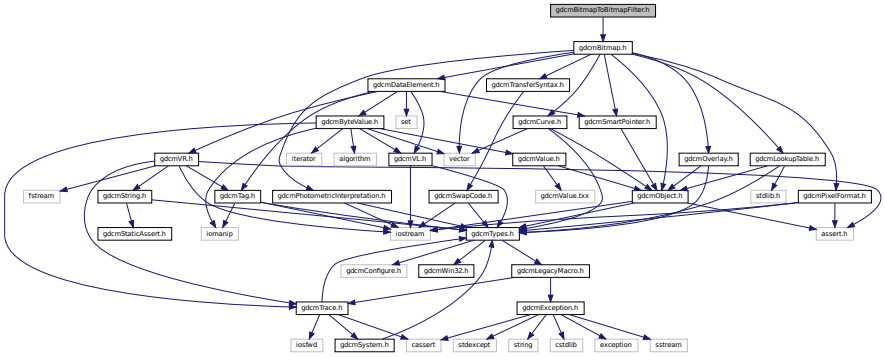
Namespaces

- gdcm

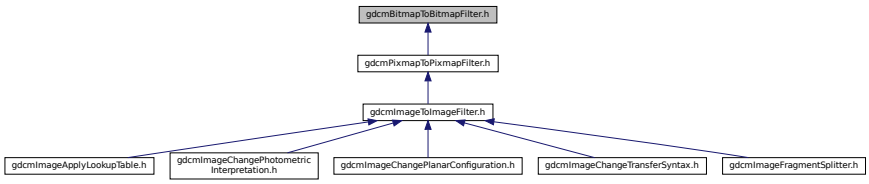
11.25 gdcmBitmapToBitmapFilter.h File Reference

```
#include "gdcmBitmap.h"
```

Include dependency graph for gdcmBitmapToBitmapFilter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::BitmapToBitmapFilter

  BitmapToBitmapFilter class.

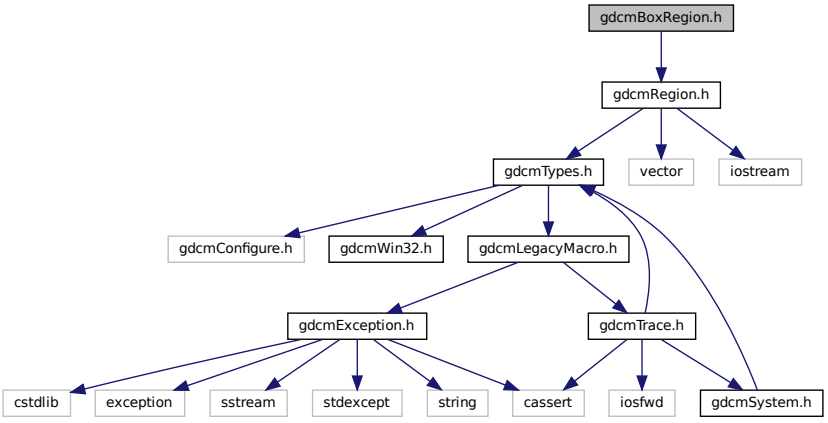
Namespaces

- gdcm

11.26 gdcmBoxRegion.h File Reference

```
#include "gdcmRegion.h"
```

Include dependency graph for gdcmBoxRegion.h:



Classes

- class gdcm::BoxRegion

  Class for manipulation box region.

Namespaces

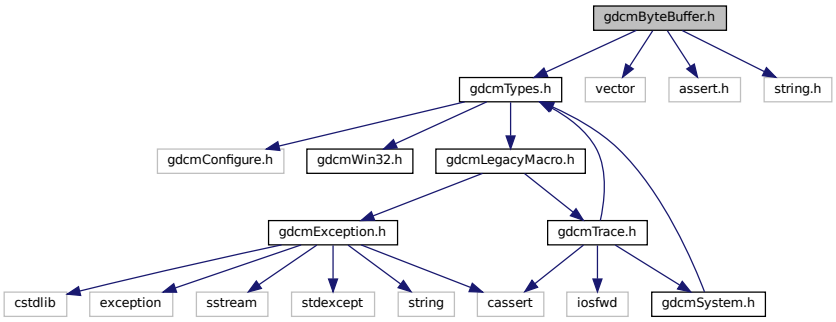
- gdcm

11.27 gdcmByteBuffer.h File Reference

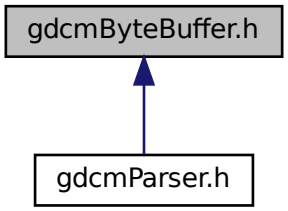
```
#include "gdcmTypes.h"
#include <vector>
#include <assert.h>
```

```
#include <string.h>
```

Include dependency graph for gdcmByteBuffer.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ByteBuffer

  ByteBuffer.

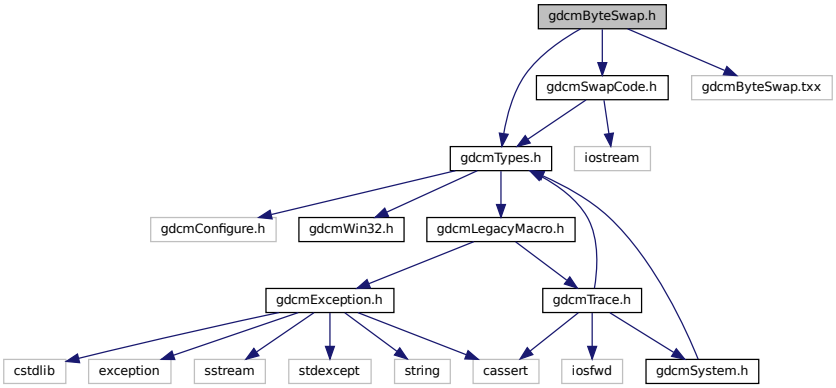
Namespaces

- gdcm

11.28 gdcmByteSwap.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmSwapCode.h"
#include "gdcmByteSwap.txx"
```

Include dependency graph for gdcmByteSwap.h:



Classes

- class gdcm::ByteSwap< T >

  ByteSwap.

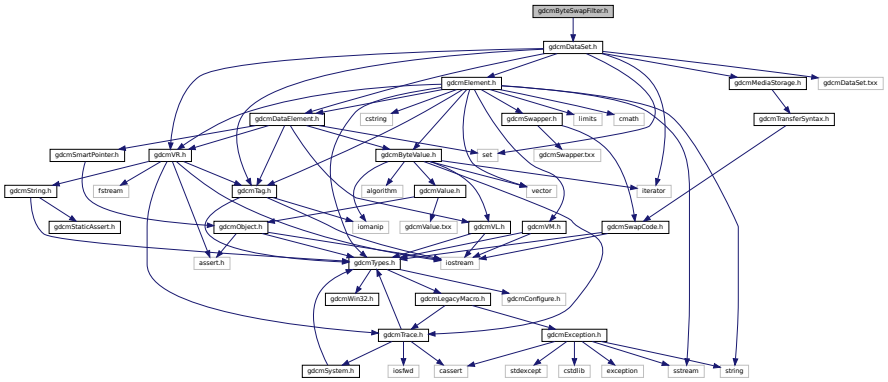
Namespaces

- gdcm

11.29 gdcmByteSwapFilter.h File Reference

```
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmByteSwapFilter.h:



Classes

- class gdcm::ByteSwapFilter

  ByteSwapFilter.

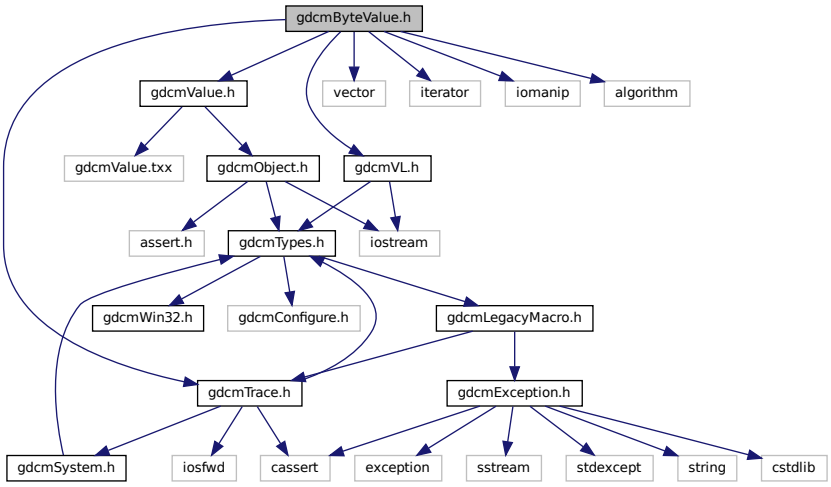
Namespaces

- gdcm

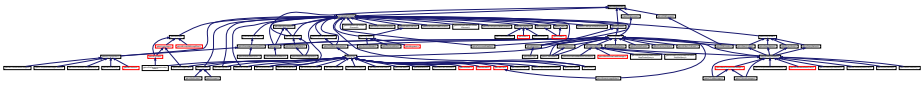
11.30 gdcmByteValue.h File Reference

```
#include "gdcmValue.h"
#include "gdcmTrace.h"
#include "gdcmVL.h"
#include <vector>
#include <iterator>
#include <iomanip>
#include <algorithm>
```

Include dependency graph for gdcmByteValue.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ByteValue

  Class to represent binary value (array of bytes)

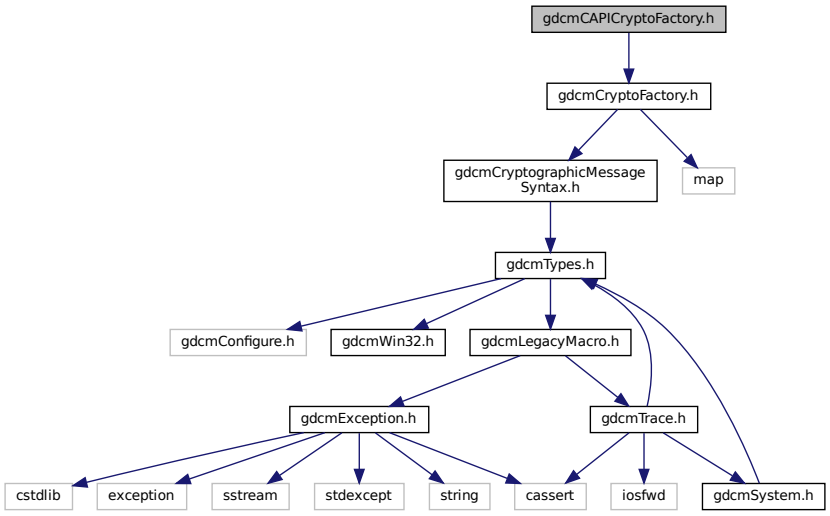
Namespaces

- gdcm

11.31 gdcmCAPICryptoFactory.h File Reference

```
#include "gdcmCryptoFactory.h"
```

Include dependency graph for gdcmCAPICryptoFactory.h:



Classes

- class gdcm::CAPICryptoFactory

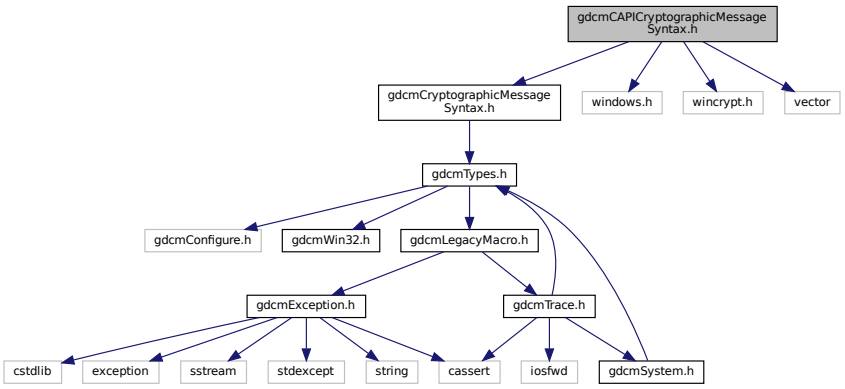
Namespaces

- gdcm

11.32 gdcmCAPICryptographicMessageSyntax.h File Reference

```
#include "gdcmCryptographicMessageSyntax.h"
#include <windows.h>
#include <wincrypt.h>
#include <vector>
```

Include dependency graph for gdcmCAPICryptographicMessageSyntax.h:



Classes

- class gdcm::CAPICryptographicMessageSyntax

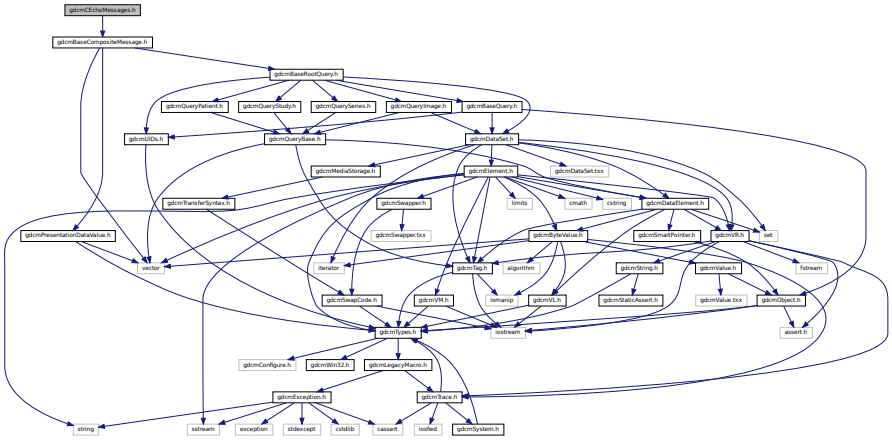
Namespaces

- gdcm

11.33 gdcmCEchoMessages.h File Reference

```
#include "gdcmBaseCompositeMessage.h"
```

Include dependency graph for gdcmCEchoMessages.h:



Classes

- class gdcm::network::CEchoRQ

  CEchoRQ.
- class gdcm::network::CEchoRSP

  CEchoRSP this file defines the messages for the cecho action.

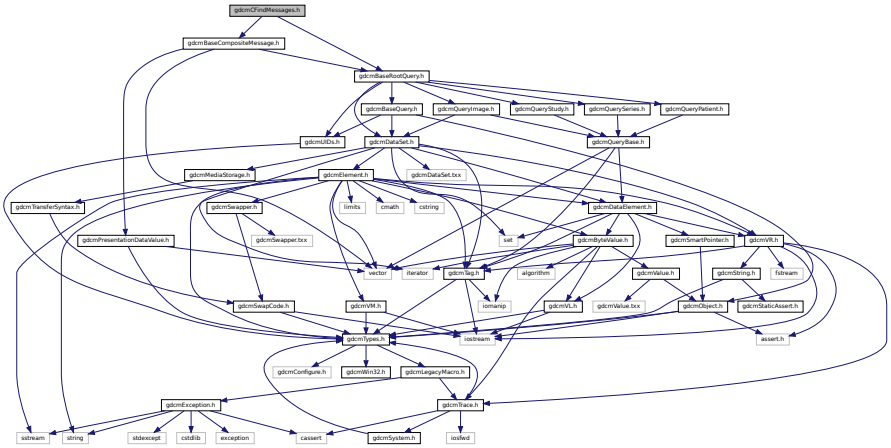
Namespaces

- gdcm
- gdcm::network

11.34 gdcmCFindMessages.h File Reference

```
#include "gdcmBaseCompositeMessage.h"
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmCFindMessages.h:



Classes

- class gdcm::network::CFindCancelRQ

  CFindCancelRQ this file defines the messages for the cfind action.
- class gdcm::network::CFindRQ

  CFindRQ.
- class gdcm::network::CFindRSP

  CFindRSP this file defines the messages for the cfind action.

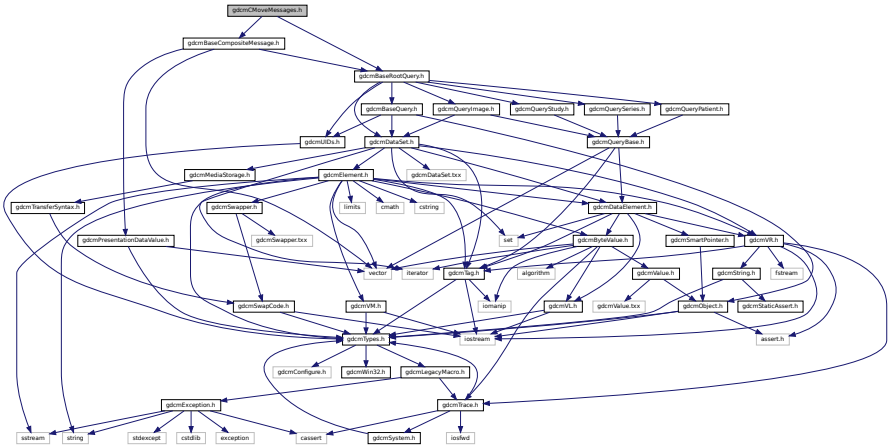
Namespaces

- gdcm
- gdcm::network

11.35 gdcmCMoveMessages.h File Reference

```
#include "gdcmBaseCompositeMessage.h"
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmCMoveMessages.h:



Classes

- class gdcm::network::CMoveCancelRq
- class gdcm::network::CMoveRQ

  CMoveRQ.
- class gdcm::network::CMoveRSP

  CMoveRSP this file defines the messages for the cmove action.

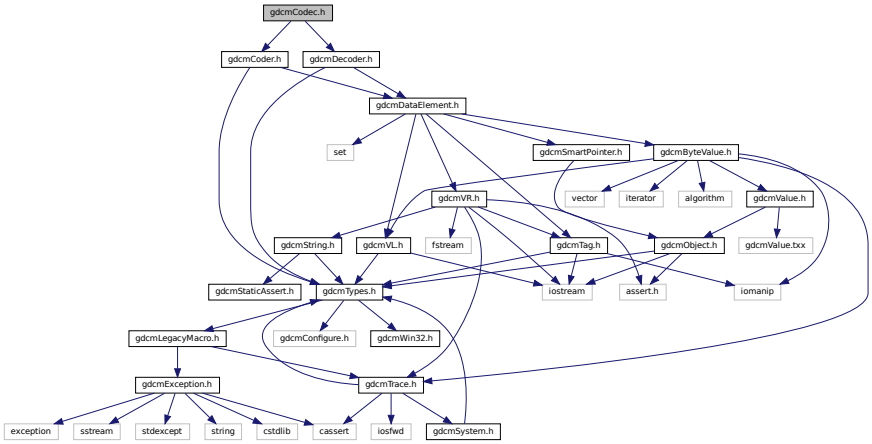
Namespaces

- gdcm
- gdcm::network

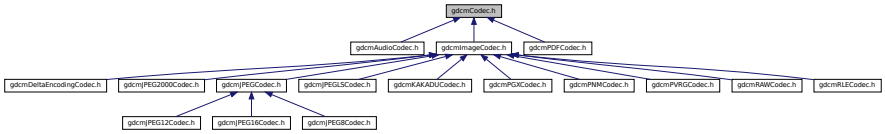
11.36 gdcmCodec.h File Reference

```
#include "gdcmCoder.h"
#include "gdcmDecoder.h"
```

Include dependency graph for gdcmCodec.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Codec

  Codec class.

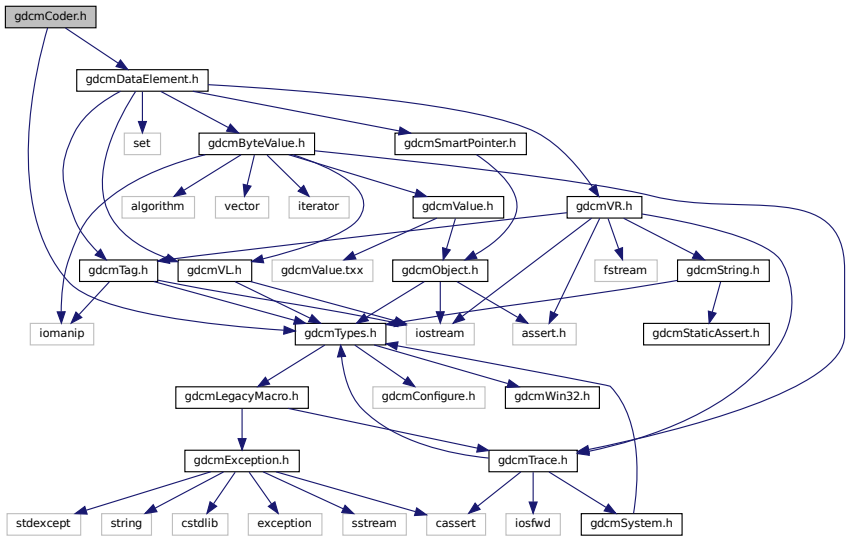
Namespaces

- gdcm

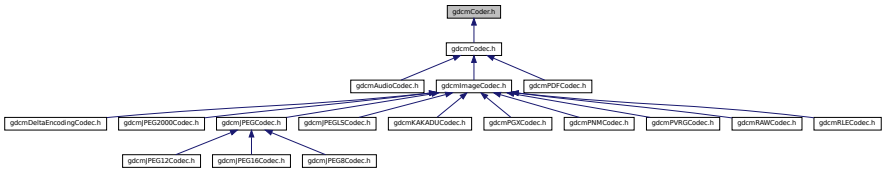
11.37 gdcmCoder.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmCoder.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Coder

  Coder.

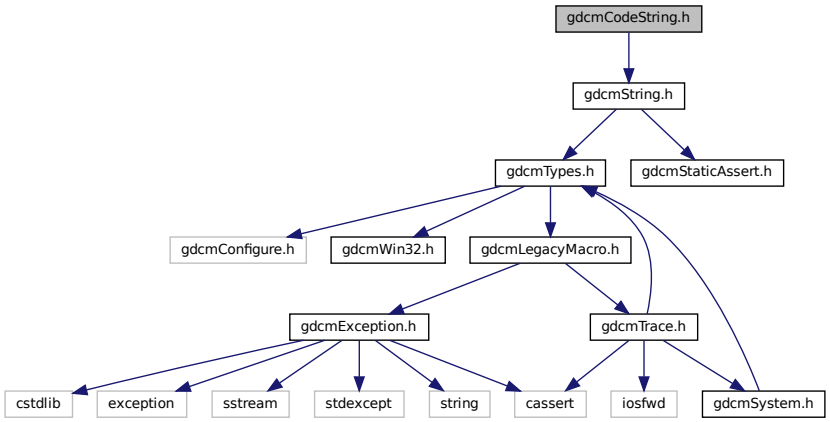
Namespaces

- gdcm

11.38 gdcmCodeString.h File Reference

```
#include "gdcmString.h"
```

Include dependency graph for gdcmCodeString.h:



Classes

- class gdcm::CodeString

  CodeString.

Namespaces

- gdcm

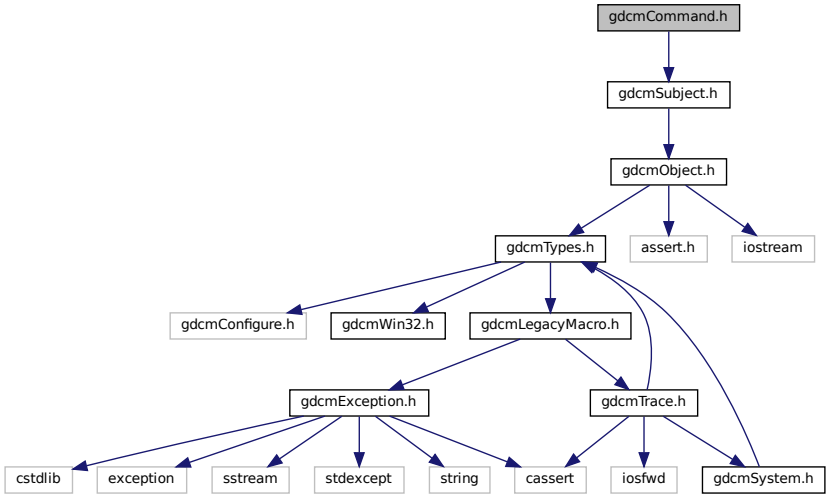
Functions

- bool gdcm::operator!= (const CodeString &ref, const CodeString &cs)
- std::ostream & gdcm::operator<< (std::ostream &os, const CodeString &str)
- bool gdcm::operator== (const CodeString &ref, const CodeString &cs)

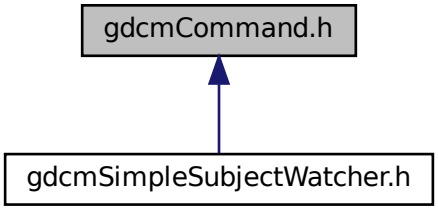
11.39 gdcmCommand.h File Reference

```
#include "gdcmSubject.h"
```

Include dependency graph for gdcmCommand.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Command

  Command superclass for callback/observer methods.
- class gdcm::MemberCommand< T >

  Command subclass that calls a pointer to a member function.
- class gdcm::SimpleMemberCommand< T >

  Command subclass that calls a pointer to a member function.

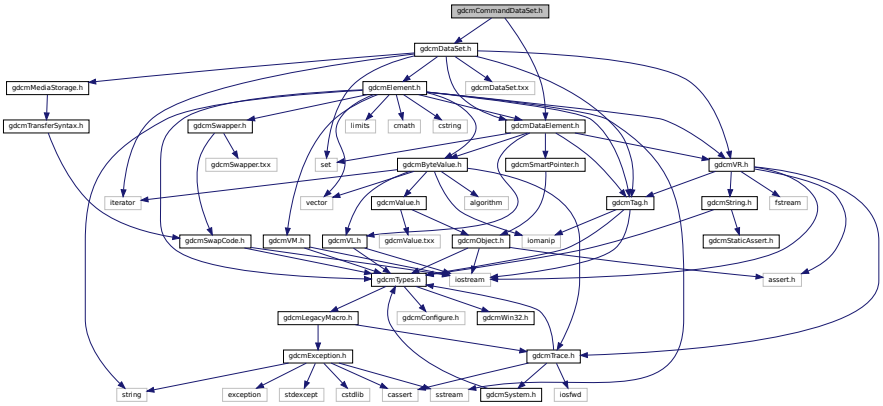
Namespaces

- gdcm

11.40 gdcmCommandDataSet.h File Reference

```
#include "gdcmDataSet.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmCommandDataSet.h:



Classes

- class gdcm::CommandDataSet

  Class to represent a Command DataSet.

Namespaces

- gdcm

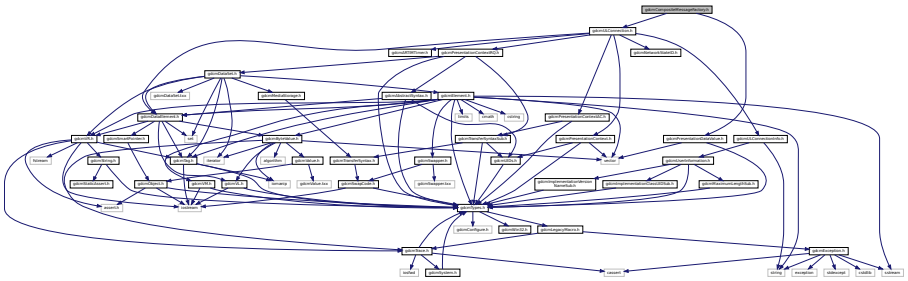
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const CommandDataSet &val)

11.41 gdcmCompositeMessageFactory.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnection.h"
```

Include dependency graph for gdcmCompositeMessageFactory.h:



Classes

- class gdcm::network::CompositeMessageFactory

  CompositeMessageFactory.

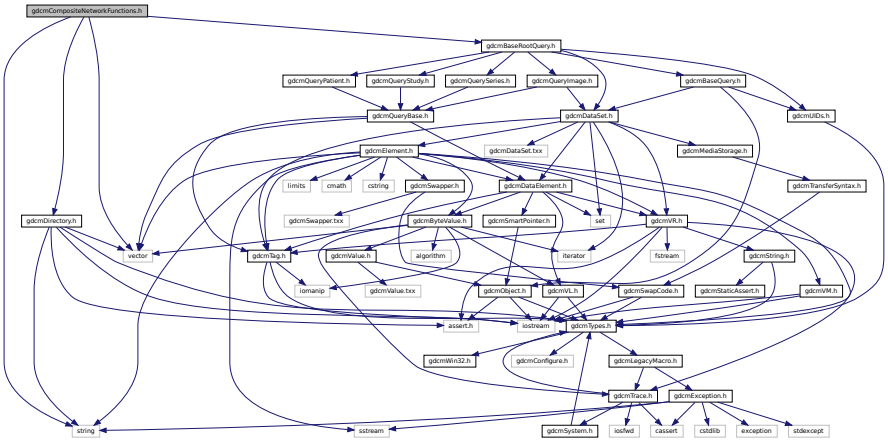
Namespaces

- gdcm
- gdcm::network

11.42 gdcmCompositeNetworkFunctions.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmBaseRootQuery.h"
#include <vector>
#include <string>
```

Include dependency graph for gdcmCompositeNetworkFunctions.h:



Classes

- class gdcm::CompositeNetworkFunctions

  Composite Network Functions.

Namespaces

- gdcm

11.43 gdcmConstCharWrapper.h File Reference

Classes

- class gdcm::ConstCharWrapper

  Do not use me.

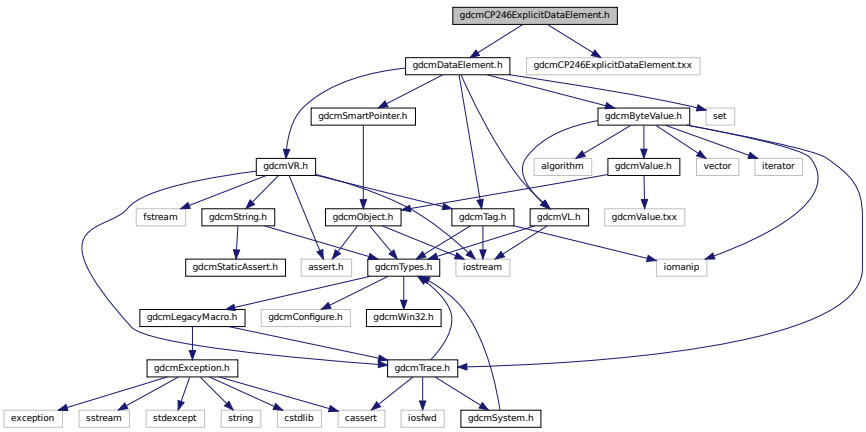
Namespaces

- gdcm

11.44 gdcmCP246ExplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmCP246ExplicitDataElement.txx"
```

Include dependency graph for gdcmCP246ExplicitDataElement.h:



Classes

- class gdcm::CP246ExplicitDataElement

  Class to read/write a DataElement as CP246Explicit Data Element.

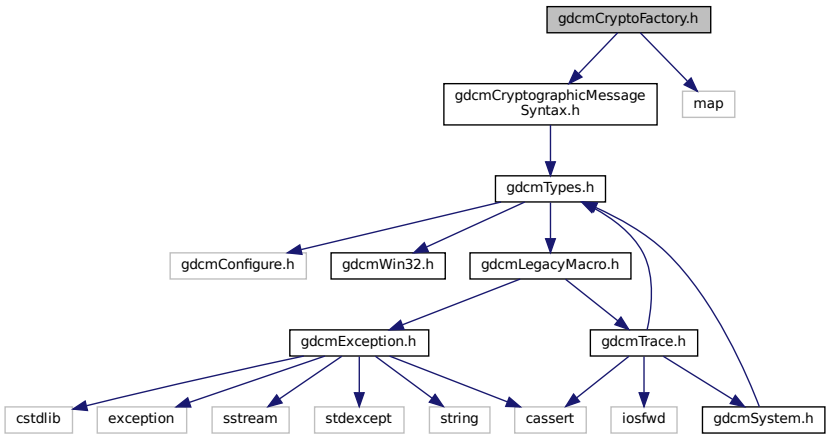
Namespaces

- gdcm

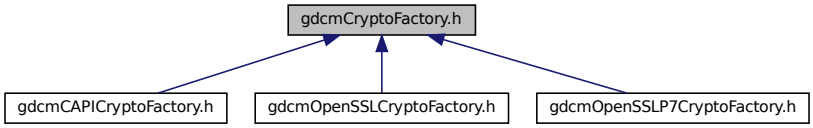
11.45 gdcmCryptoFactory.h File Reference

```
#include "gdcmCryptographicMessageSyntax.h"
#include <map>
```

Include dependency graph for gdcmCryptoFactory.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::CryptoFactory

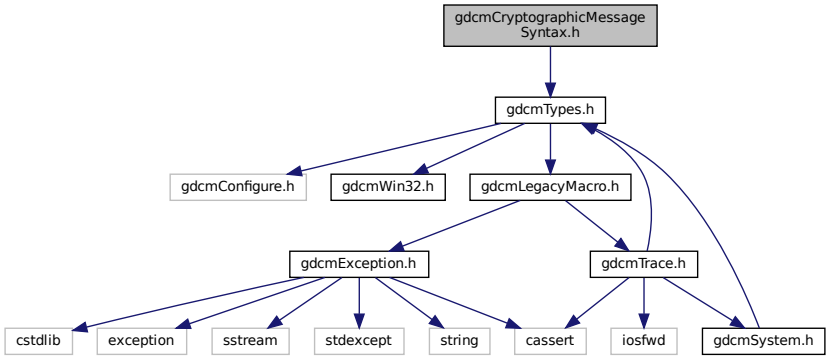
  Class to do handle the crypto factory.

Namespaces

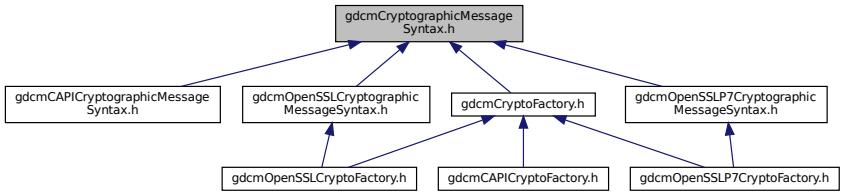
- gdcm

11.46 gdcmCryptographicMessageSyntax.h File Reference

`#include "gdcmTypes.h"`
Include dependency graph for gdcmCryptographicMessageSyntax.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::CryptographicMessageSyntax

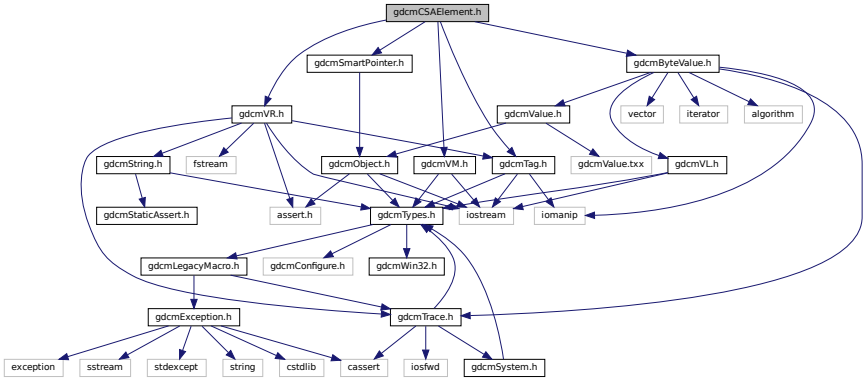
Namespaces

- gdcm

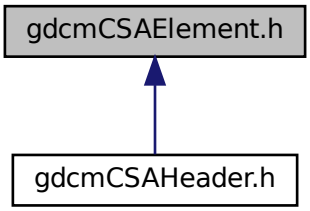
11.47 gdcmCSAElement.h File Reference

```
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmCSAElement.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::CSAElement

  Class to represent a CSA Element.

Namespaces

- gdcm

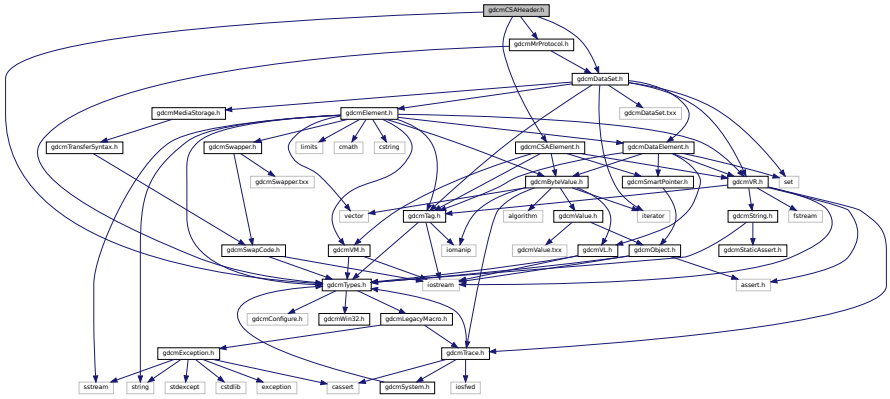
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const CSAElement &val)

11.48 gdcmCSAHeader.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDataSet.h"
#include "gdcmCSAElement.h"
#include "gdcmMrProtocol.h"
```

Include dependency graph for gdcmCSAHeader.h:



Classes

- class gdcm::CSAHeader

  Class for CSAHeader.

Namespaces

- gdcm

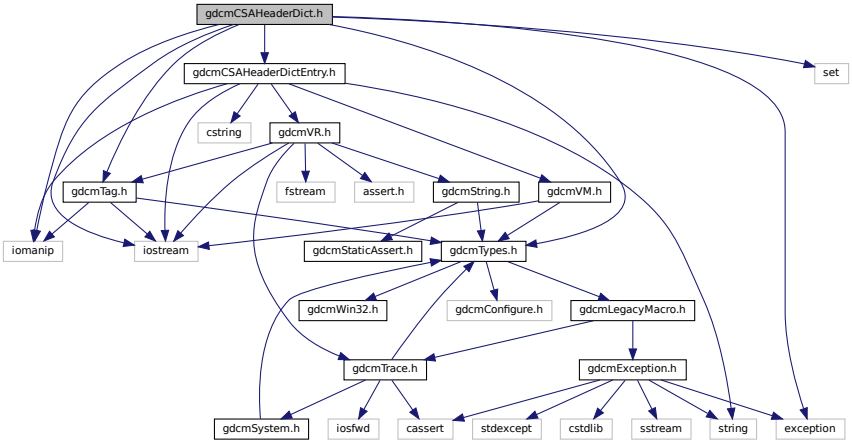
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeader &d)

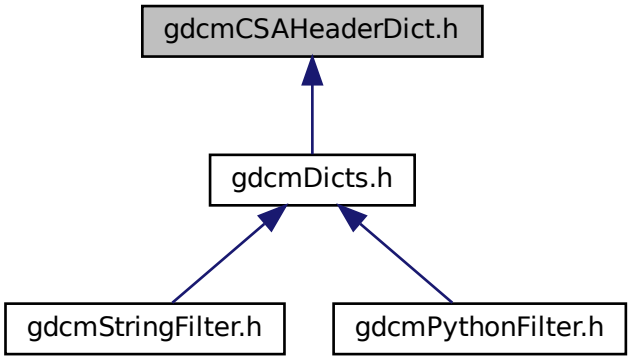
11.49 gdcmCSAHeaderDict.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmCSAHeaderDictEntry.h"
#include <iostream>
#include <iomanip>
#include <set>
#include <exception>
```

Include dependency graph for gdcmCSAHeaderDict.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::CSAHeaderDict

  Class to represent a map of CSAHeaderDictEntry.
- class gdcm::CSAHeaderDictException

Namespaces

- gdcm

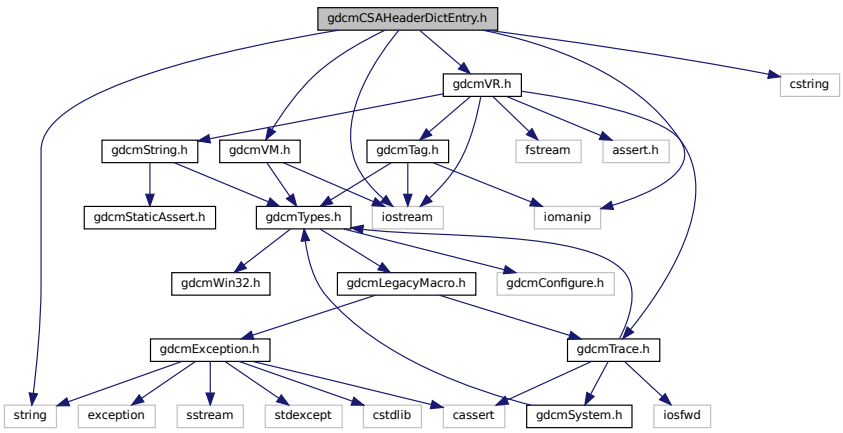
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeaderDict &val)

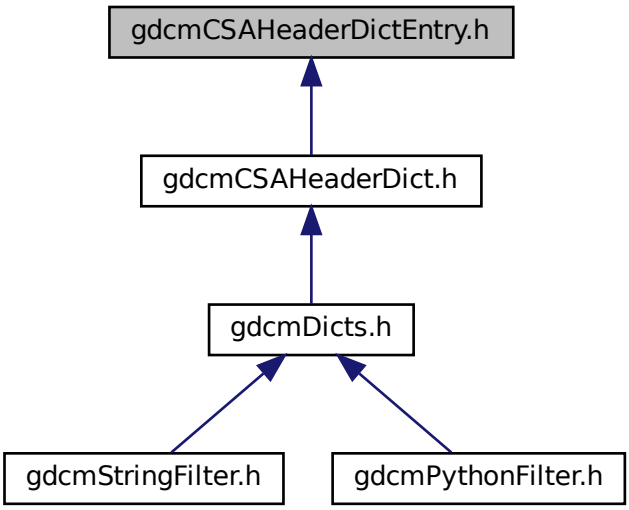
11.50 gdcmCSAHeaderDictEntry.h File Reference

```
#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
#include <iostream>
#include <iomanip>
#include <cstring>
```

Include dependency graph for gdcmCSAHeaderDictEntry.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::CSAHeaderDictEntry

  Class to represent an Entry in the Dict.

Namespaces

- gdcm

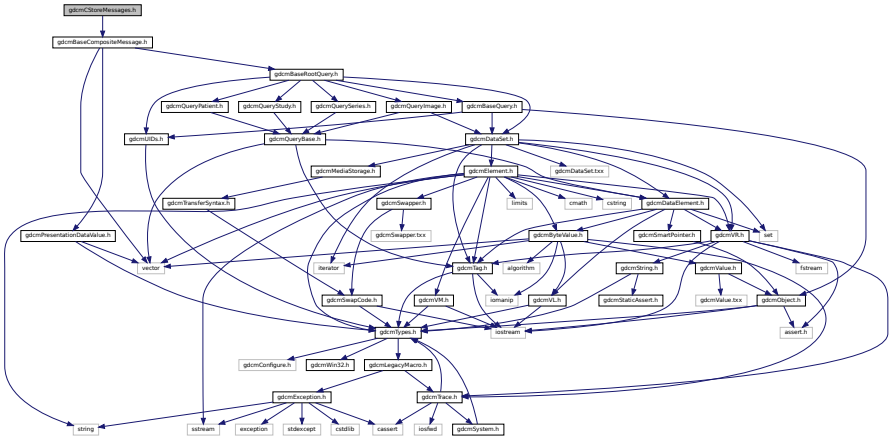
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeaderDictEntry &val)

11.51 gdcmCStoreMessages.h File Reference

```
#include "gdcmBaseCompositeMessage.h"
```

Include dependency graph for gdcmCStoreMessages.h:



Classes

- class gdcm::network::CStoreRQ

  CStoreRQ.
- class gdcm::network::CStoreRSP

  CStoreRSP this file defines the messages for the cecho action.

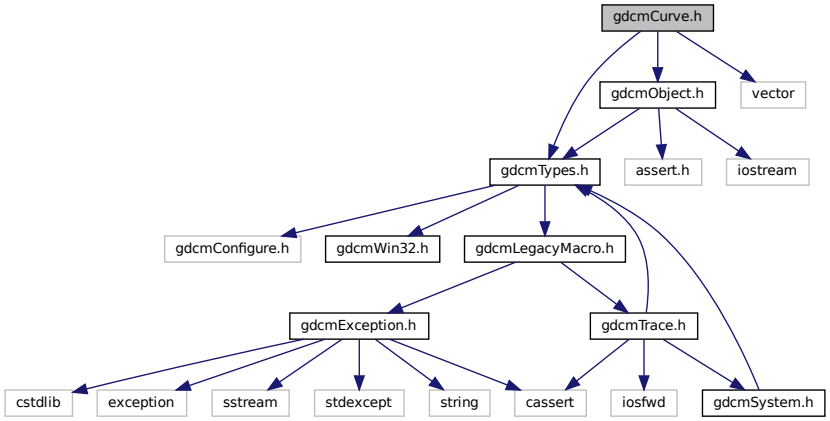
Namespaces

- gdcm
- gdcm::network

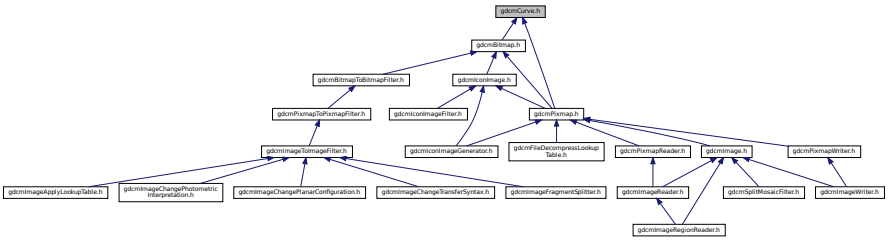
11.52 gdcmCurve.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmObject.h"
#include <vector>
```

Include dependency graph for gdcmCurve.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Curve

  Curve class to handle element 50xx,3000 Curve Data.

Namespaces

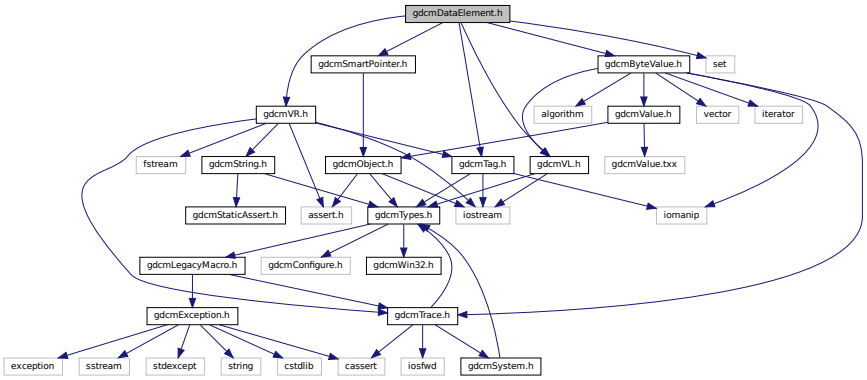
- gdcm

11.53 gdcmDataElement.h File Reference

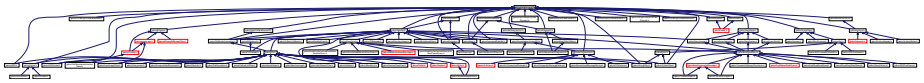
```
#include "gdcmTag.h"
#include "gdcmVL.h"
#include "gdcmVR.h"
```

```
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
#include <set>
```

Include dependency graph for gdcmDataElement.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::DataElement

  Class to represent a Data Element either Implicit or Explicit.

Namespaces

- gdcm

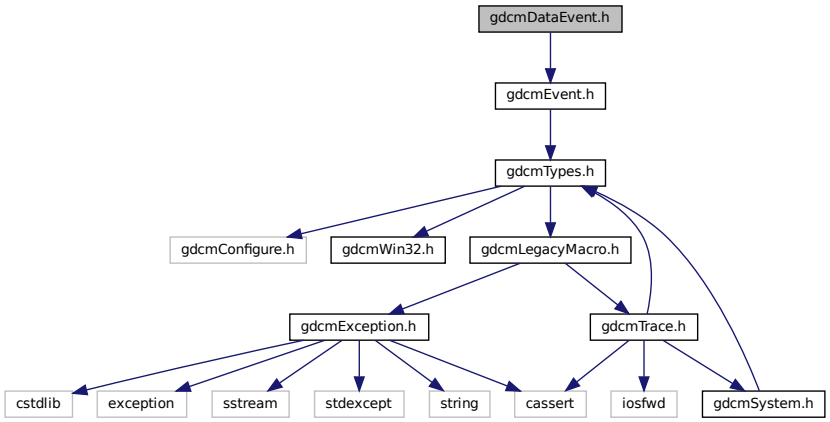
Functions

- bool gdcm::operator!= (const DataElement &lhs, const DataElement &rhs)
- std::ostream & gdcm::operator<< (std::ostream &os, const DataElement &val)

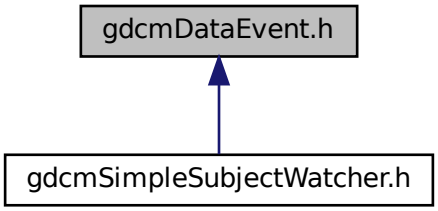
11.54 gdcmDataEvent.h File Reference

```
#include "gdcmEvent.h"
```

Include dependency graph for gdcmDataEvent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::DataEvent

  DataEvent.

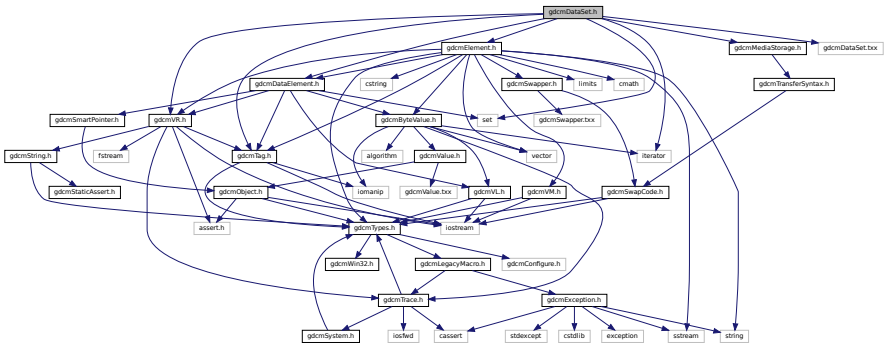
Namespaces

- gdcm

11.55 gdcmDataSet.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmElement.h"
#include "gdcmMediaStorage.h"
#include <set>
#include <iterator>
#include "gdcmDataSet.txx"
```

Include dependency graph for gdcmDataSet.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::DataElementException
- class gdcm::DataSet

  Class to represent a Data Set (which contains Data Elements)

Namespaces

- gdcm

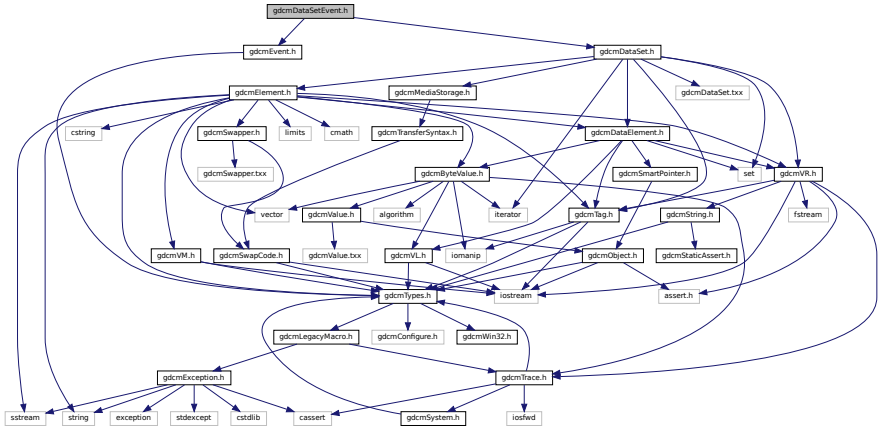
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const DataSet &val)

11.56 gdcmDataSetEvent.h File Reference

```
#include "gdcmEvent.h"
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmDataSetEvent.h:



Classes

- class gdcm::DataSetEvent

  DataSetEvent.

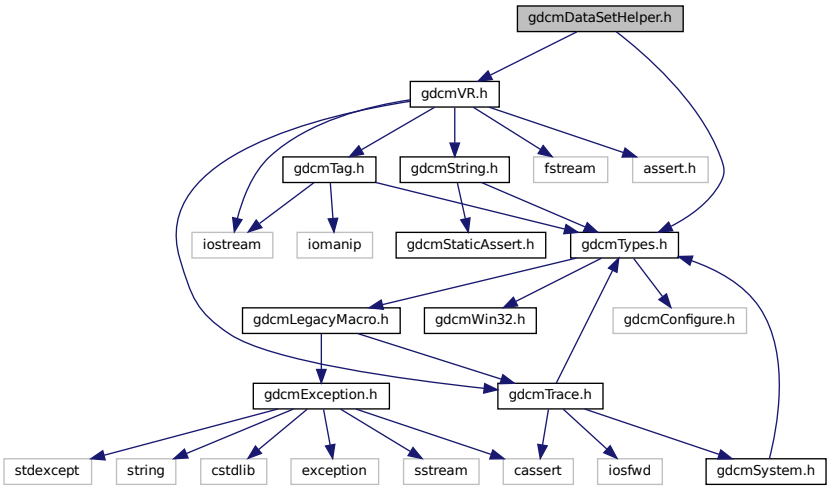
Namespaces

- gdcm

11.57 gdcmDataSetHelper.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
```

Include dependency graph for gdcmDataSetHelper.h:



Classes

- class gdcm::DataSetHelper

  DataSetHelper (internal class, not intended for user level)

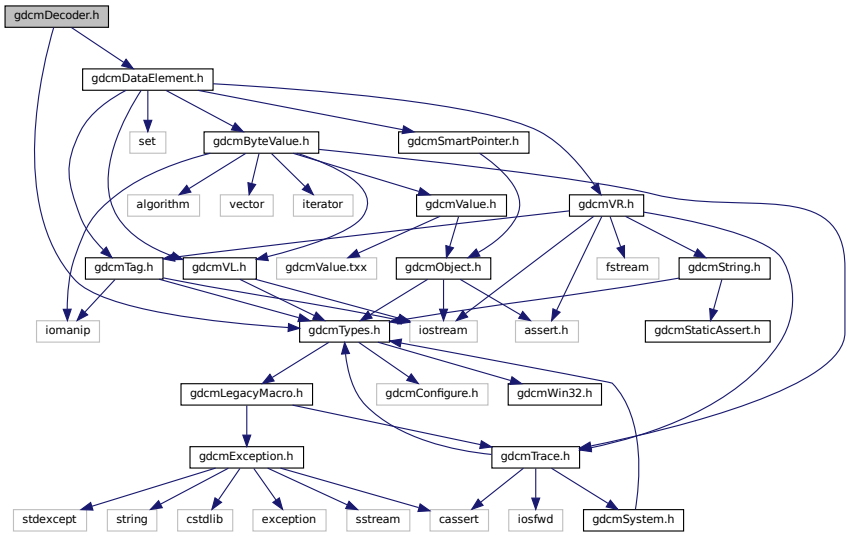
Namespaces

- gdcm

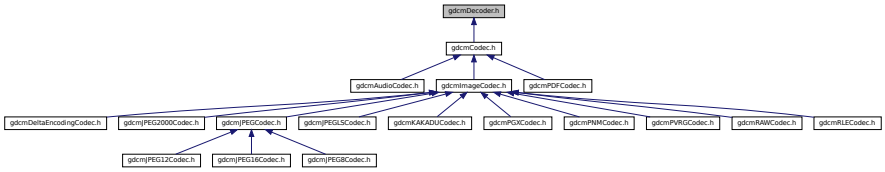
11.58 gdcmDecoder.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmDecoder.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Decoder

  Decoder.

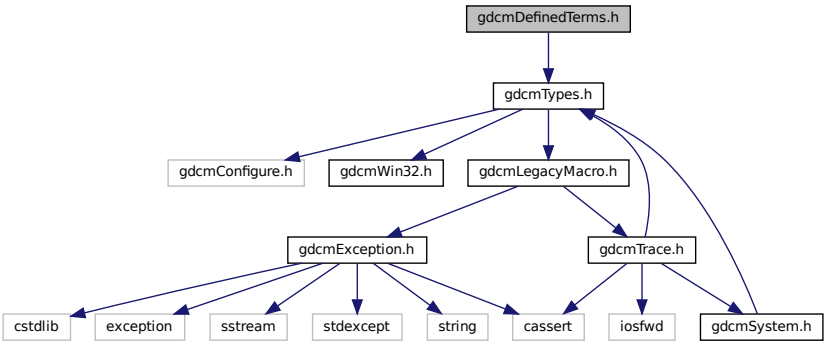
Namespaces

- gdcm

11.59 gdcmDefinedTerms.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDefinedTerms.h:



Classes

- class gdcm::DefinedTerms

  Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data Element with Defined Terms that does not contain a Value equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation Type ID (4008,0210) is an example of a Data Element having Defined Terms. It is defined to have a Value that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data Element has Defined Terms other Interpretation Type IDs may be defined by the implementor.

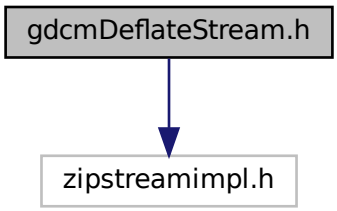
Namespaces

- gdcm

11.60 gdcmDeflateStream.h File Reference

```
#include "zipstreamimpl.h"
```

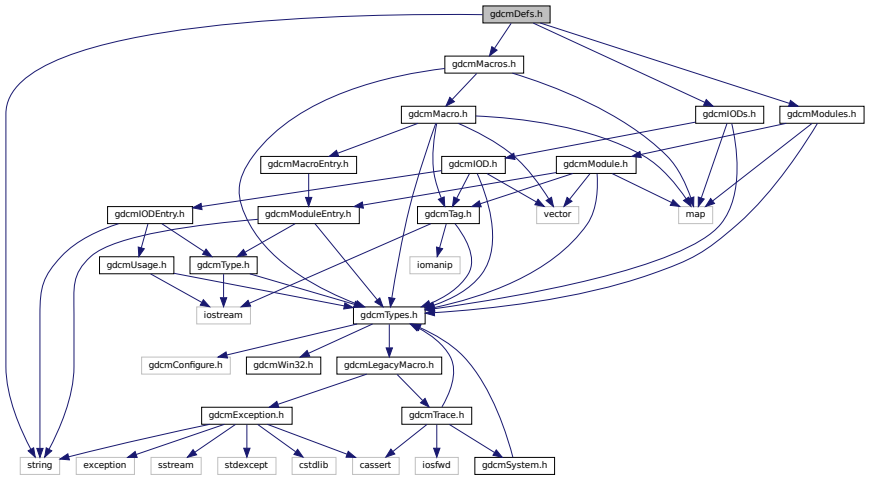
Include dependency graph for gdcmDeflateStream.h:



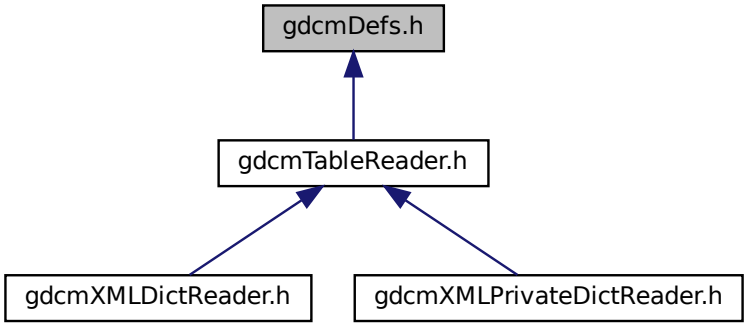
11.61 gdcmDefs.h File Reference

```
#include "gdcmModules.h"
#include "gdcmMacros.h"
#include "gdcmIODs.h"
#include <string>
```

Include dependency graph for gdcmDefs.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Defs

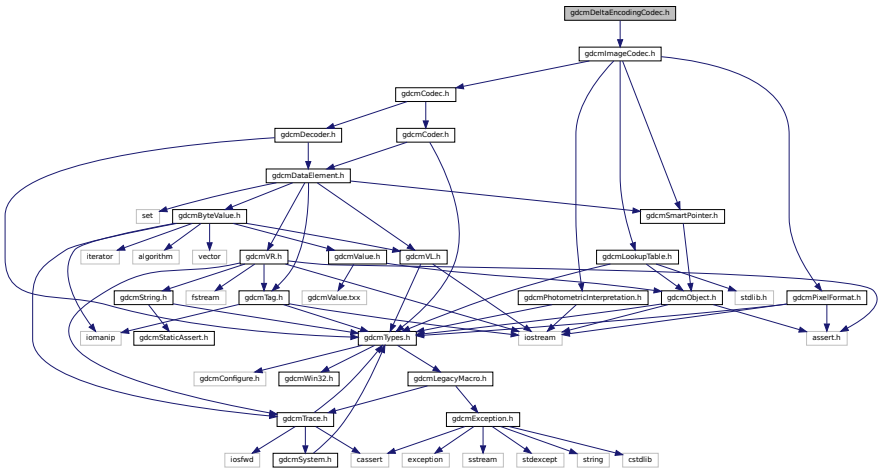
  FIXME I do not like the name 'Defs'.

Namespaces

- gdcm

11.62 gdcmDeltaEncodingCodec.h File Reference

`#include "gdcmImageCodec.h"`
Include dependency graph for gdcmDeltaEncodingCodec.h:



Classes

- class gdcm::DeltaEncodingCodec

  DeltaEncodingCodec compression used by some private vendor.

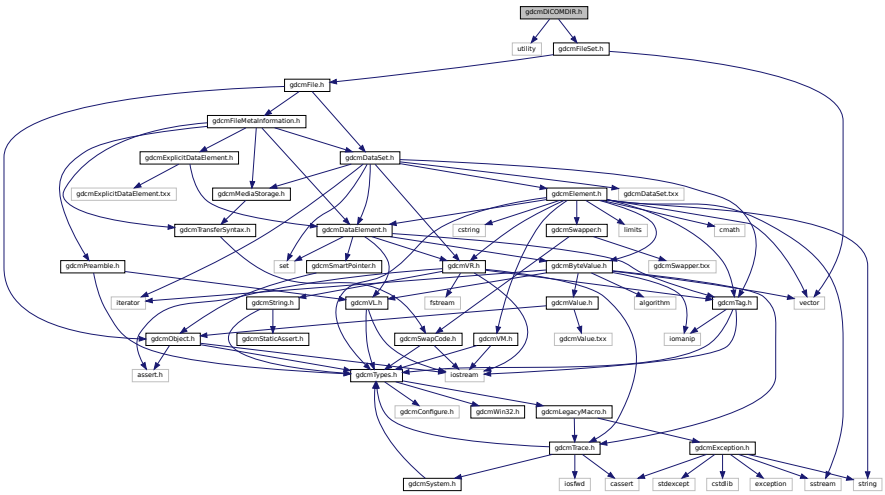
Namespaces

- gdcm

11.63 gdcmDICOMDIR.h File Reference

```
#include <utility>
#include "gdcmFileSet.h"
```

Include dependency graph for gdcmDICOMDIR.h:



Classes

- class gdcm::DICOMDIR

  DICOMDIR class.

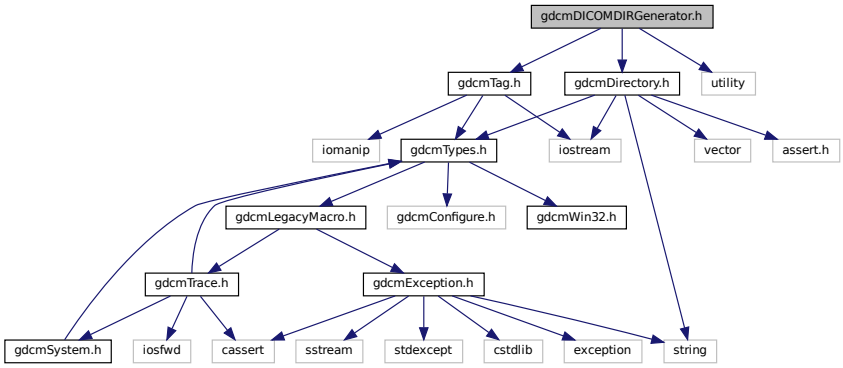
Namespaces

- gdcm

11.64 gdcmDICOMDIRGenerator.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include <utility>
```

Include dependency graph for gdcmDICOMDIRGenerator.h:



Classes

- class gdcm::DICOMDIRGenerator

  DICOMDIRGenerator class.

Namespaces

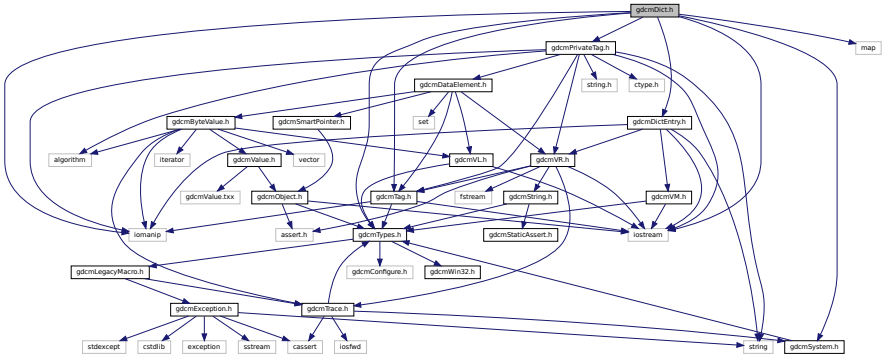
- gdcm

11.65 gdcmDict.h File Reference

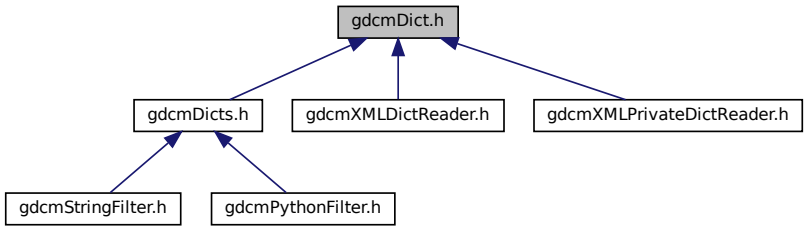
```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmDictEntry.h"
#include "gdcmSystem.h"
#include <iostream>
#include <iomanip>
```

```
#include <map>
```

Include dependency graph for gdcmDict.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Dict

  Class to represent a map of DictEntry.
- class gdcm::PrivateDict

  Private Dict.

Namespaces

- gdcm

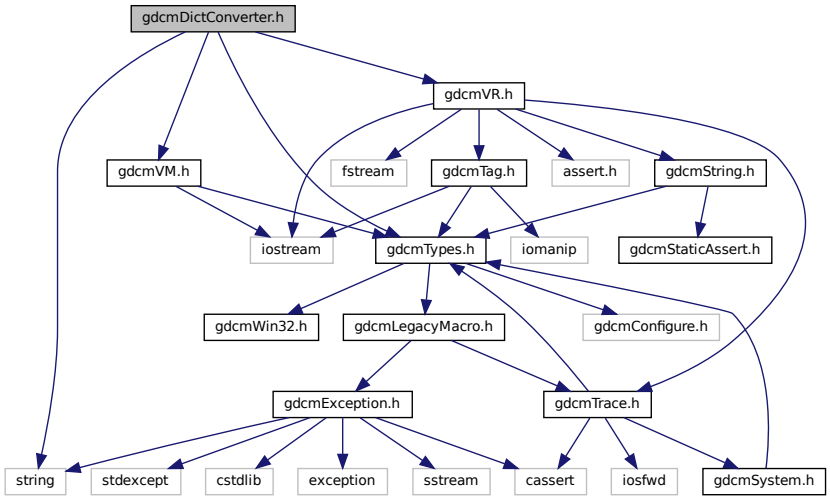
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Dict &val)
- std::ostream & gdcm::operator<< (std::ostream &os, const PrivateDict &val)

11.66 gdcmDictConverter.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
```

Include dependency graph for gdcmDictConverter.h:



Classes

- class gdcm::DictConverter

  Class to convert a .dic file into something else:

Namespaces

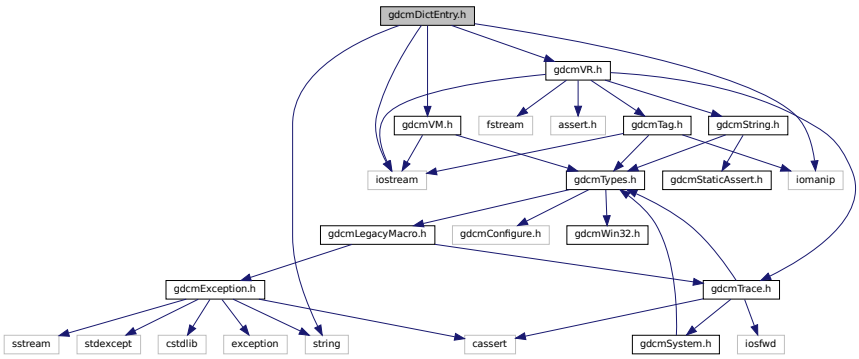
- gdcm

11.67 gdcmDictEntry.h File Reference

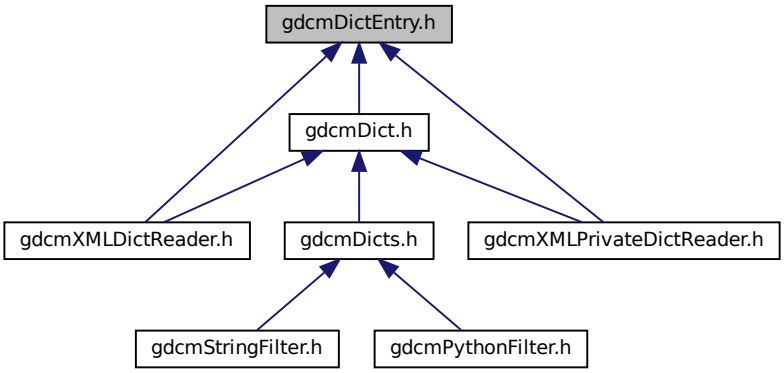
```
#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
#include <iostream>
```

```
#include <iomanip>
```

Include dependency graph for gdcmDictEntry.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::DictEntry

  Class to represent an Entry in the Dict.

Namespaces

- gdcm

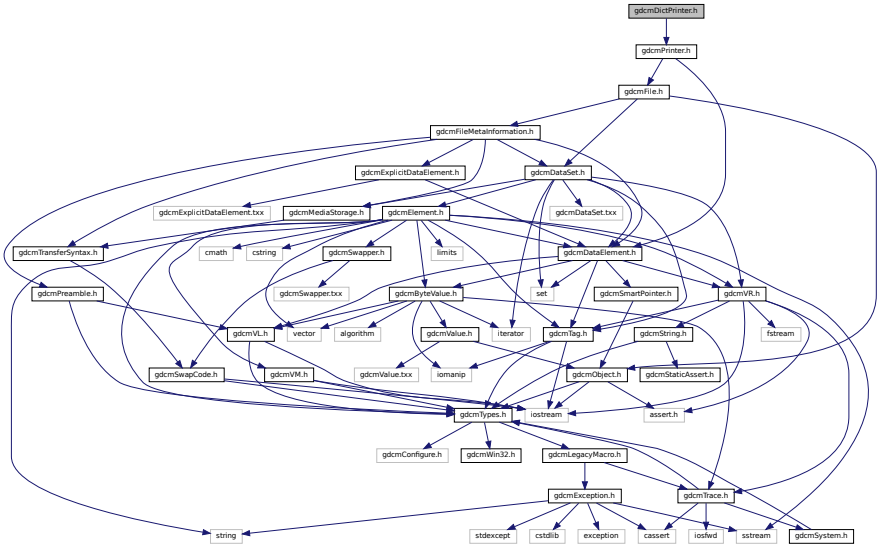
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const DictEntry &val)

11.68 gdcmDictPrinter.h File Reference

```
#include "gdcmPrinter.h"
```

Include dependency graph for gdcmDictPrinter.h:



Classes

- class gdcm::DictPrinter

  DictPrinter class.

Namespaces

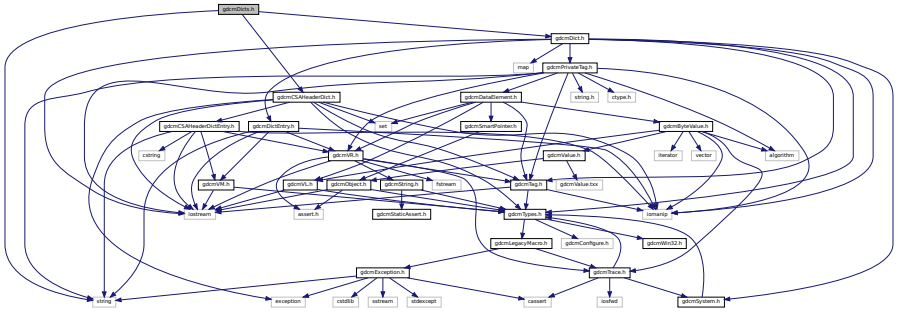
- gdcm

11.69 gdcmDicts.h File Reference

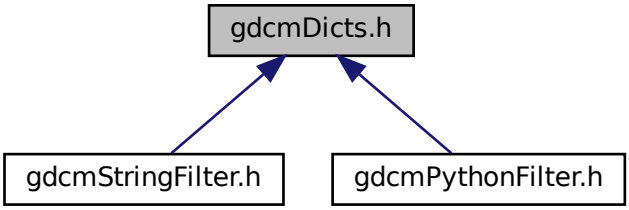
```
#include "gdcmDict.h"
#include "gdcmCSAHeaderDict.h"
```

```
#include <string>
```

Include dependency graph for gdcmDicts.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Dicts

  Class to manipulate the sum of knowledge (all the dict user load)

Namespaces

- gdcm

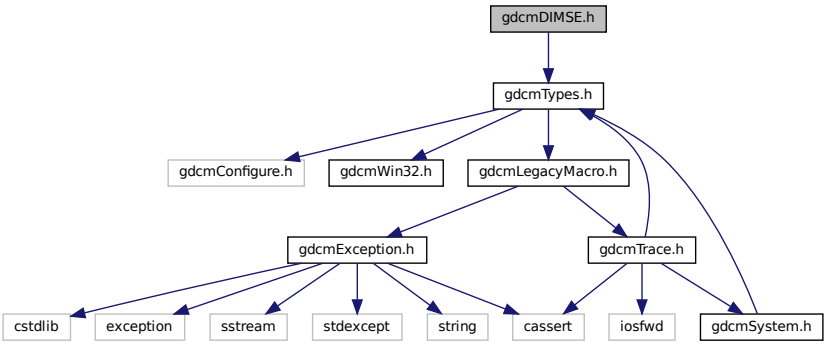
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Dicts &d)

11.70 gdcmDIMSE.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDIMSE.h:



Classes

- class gdcm::network::CEchoRQ

  CEchoRQ.
- class gdcm::network::CEchoRSP

  CEchoRSP this file defines the messages for the cecho action.
- class gdcm::network::CFind
- class gdcm::network::DIMSE

  DIMSE.

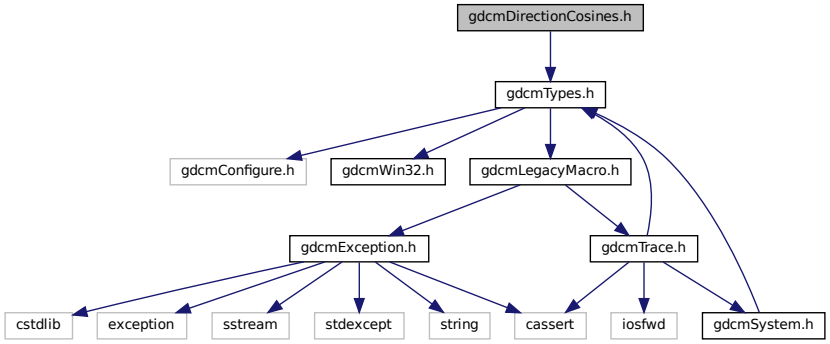
Namespaces

- gdcm
- gdcm::network

11.71 gdcmDirectionCosines.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDirectionCosines.h:



Classes

- class gdcm::DirectionCosines

  class to handle DirectionCosines

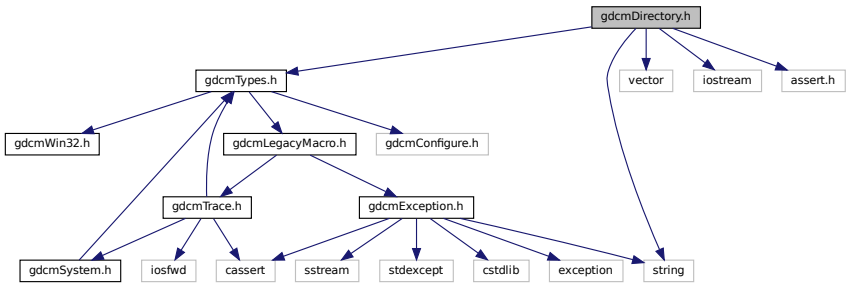
Namespaces

- gdcm

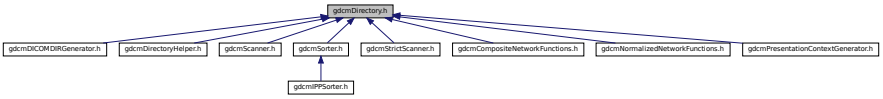
11.72 gdcmDirectory.h File Reference

```
#include "gdcmTypes.h"
#include <string>
#include <vector>
#include <iostream>
#include <assert.h>
```

Include dependency graph for gdcmDirectory.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Directory

  Class for manipulation directories.

Namespaces

- gdcm

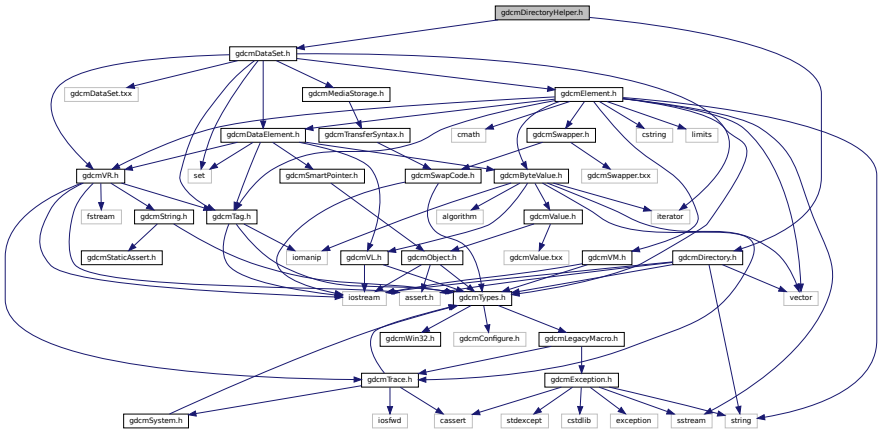
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Directory &d)

11.73 gdcmDirectoryHelper.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmDirectoryHelper.h:



Classes

- class gdcm::DirectoryHelper

  DirectoryHelper.

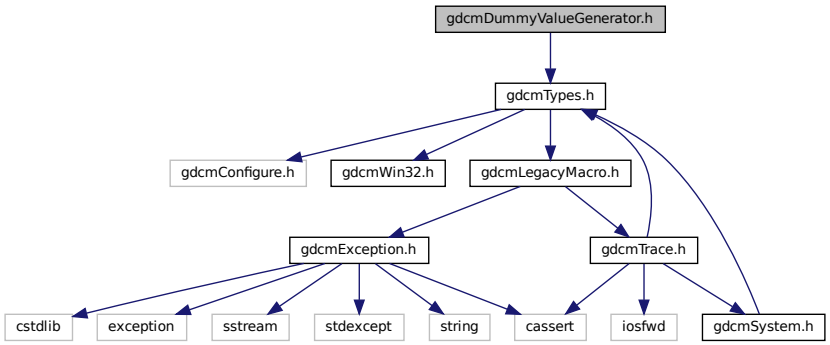
Namespaces

- gdcm

11.74 gdcmDummyValueGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDummyValueGenerator.h:



Classes

- class gdcm::DummyValueGenerator

  Class for generating dummy value.

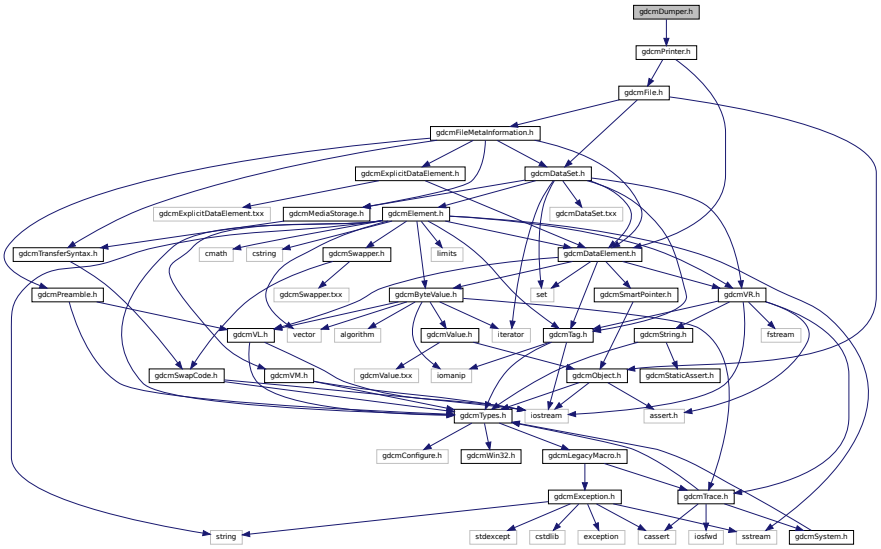
Namespaces

- gdcm

11.75 gdcmDumper.h File Reference

```
#include "gdcmPrinter.h"
```

Include dependency graph for gdcmDumper.h:



Classes

- class gdcm::Dumper

  Codec class.

Namespaces

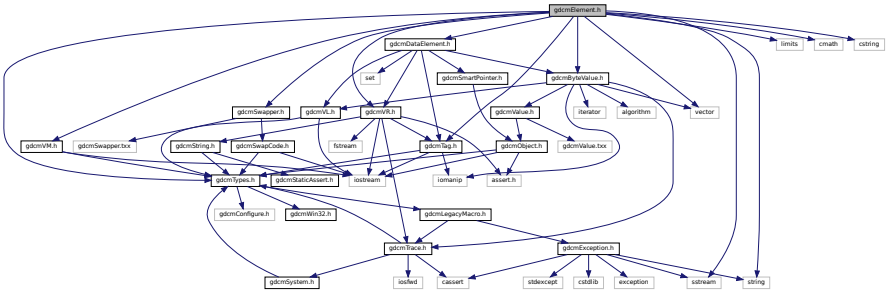
- gdcm

11.76 gdcmElement.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmByteValue.h"
#include "gdcmDataElement.h"
#include "gdcmSwapper.h"
#include <string>
#include <vector>
#include <sstream>
#include <limits>
```

```
#include <cmath>
#include <cstring>
```

Include dependency graph for gdcmElement.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::Element< TVR, TVM >

  Element class.
- class gdcm::Element< TVR, VM::VM1_2 >
- class gdcm::Element< TVR, VM::VM1_n >
- class gdcm::Element< TVR, VM::VM2_2n >
- class gdcm::Element< TVR, VM::VM2_n >
- class gdcm::Element< TVR, VM::VM3_3n >
- class gdcm::Element< TVR, VM::VM3_4 >
- class gdcm::Element< TVR, VM::VM3_n >
- class gdcm::Element< VR::AS, VM::VM5 >
- class gdcm::Element< VR::OB, VM::VM1 >
- class gdcm::Element< VR::OW, VM::VM1 >
- class gdcm::ElementDisableCombinations< TVR, TVM >

  A class which is used to produce compile errors for an invalid combination of template parameters.
- class gdcm::ElementDisableCombinations< VR::OB, VM::VM1_n >
- class gdcm::ElementDisableCombinations< VR::OW, VM::VM1_n >
- class gdcm::EncodingImplementation< VR::VRASCII >
- class gdcm::EncodingImplementation< VR::VRBINARY >
- struct gdcm::ignore_char

Namespaces

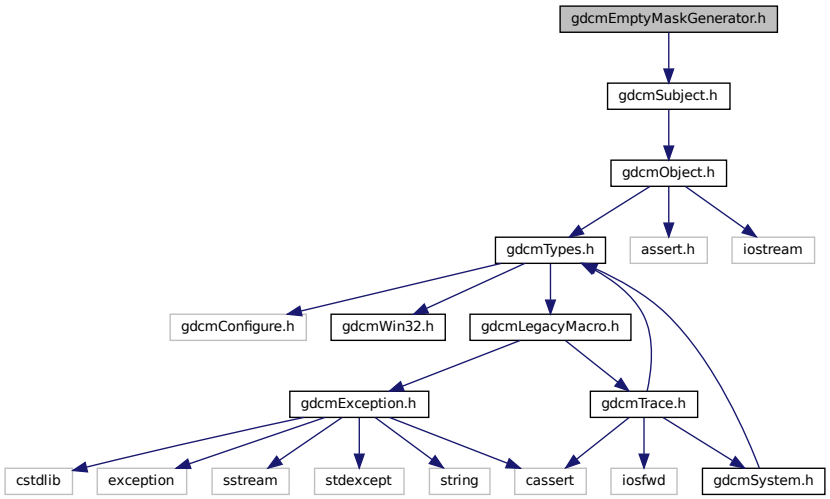
- gdcm

Functions

- static int gdcm::add1 (char *buf, int n)
- ignore_char const gdcm::backslash ('\\')
- static void gdcm::clean (char *mant)
- static int gdcm::doround (char *buf, unsigned int n)
- std::istream & gdcm::operator>> (std::istream &in, ignore_char const &ic)
- static int gdcm::roundat (char *buf, unsigned int i, int iexp)
- template<typename Float >
  static void gdcm::x16printf (char *buf, int size, Float f)

11.77 gdcmEmptyMaskGenerator.h File Reference

`#include "gdcmSubject.h"`
Include dependency graph for gdcmEmptyMaskGenerator.h:



Classes

- class gdcm::EmptyMaskGenerator

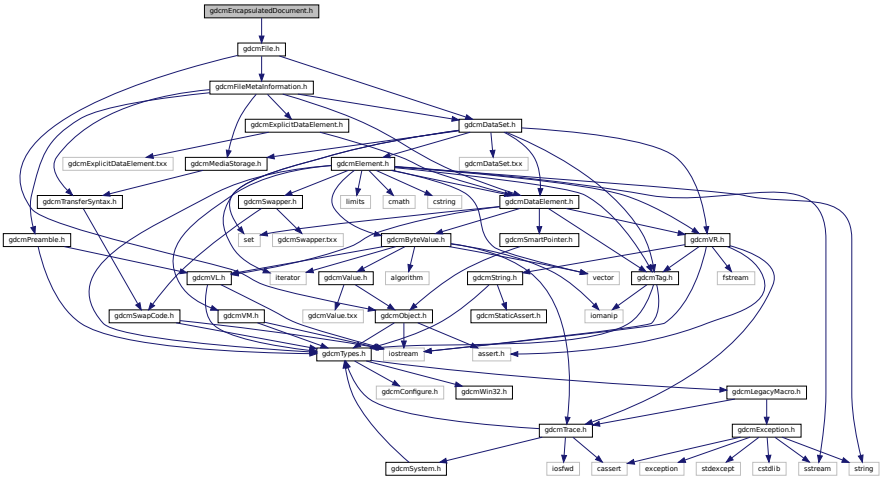
  EmptyMaskGenerator Main class to generate a Empty Mask Series from an input Series. This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM Series within the same input directory.

Namespaces

- gdcm

11.78 gdcmEncapsulatedDocument.h File Reference

`#include "gdcmFile.h"`
Include dependency graph for gdcmEncapsulatedDocument.h:



Classes

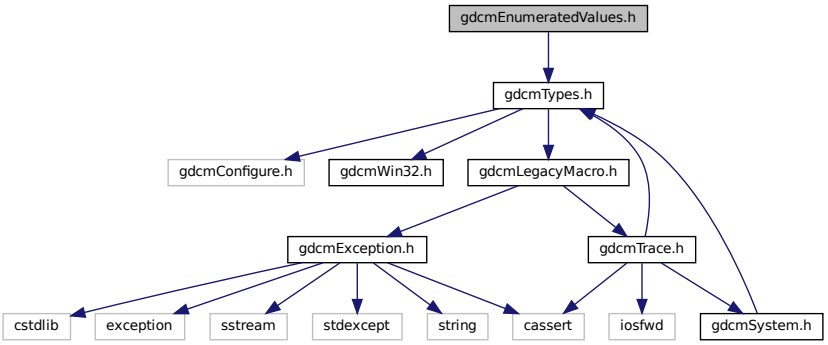
- class gdcm::EncapsulatedDocument
  EncapsulatedDocument.

Namespaces

- gdcm

11.79 gdcmEnumeratedValues.h File Reference

`#include "gdcmTypes.h"`
Include dependency graph for gdcmEnumeratedValues.h:



Classes

- class gdcm::EnumeratedValues

  Element. A Data Element with Enumerated Values that does not have a Value equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

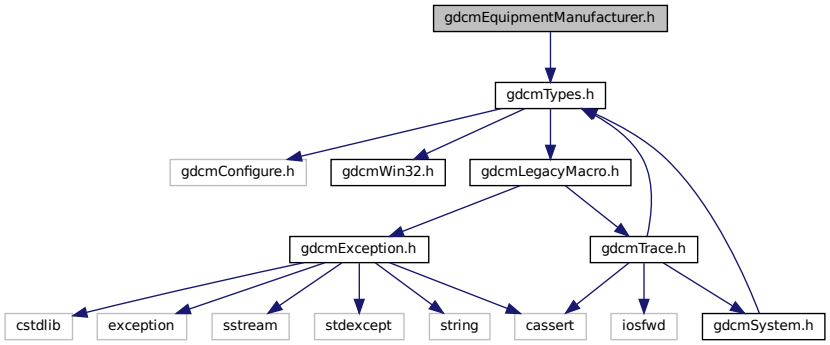
Namespaces

- gdcm

11.80 gdcmEquipmentManufacturer.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmEquipmentManufacturer.h:



Classes

- class gdcm::EquipmentManufacturer

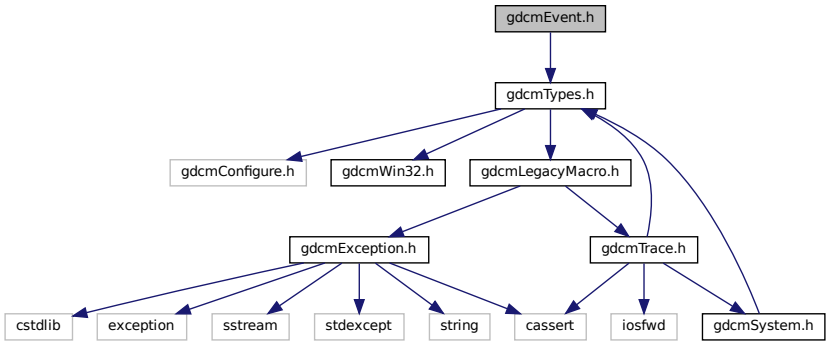
Namespaces

- gdcm

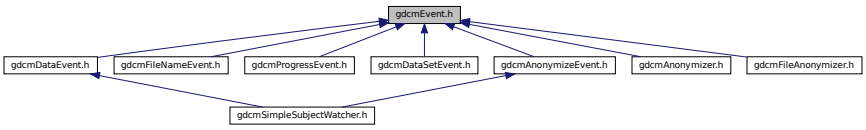
11.81 gdcmEvent.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmEvent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::AbortEvent
- class gdcm::AnyEvent
- class gdcm::EndEvent
- class gdcm::Event

  superclass for callback/observer methods
- class gdcm::ExitEvent
- class gdcm::InitializeEvent
- class gdcm::IterationEvent
- class gdcm::ModifiedEvent
- class gdcm::NoEvent
- class gdcm::StartEvent
- class gdcm::UserEvent

Namespaces

- gdcm

Macros

- #define gdcmEventMacro(classname, super)

Functions

- std::ostream & gdcm::operator<< (std::ostream &os, Event &e)

  Generic inserter operator for Event and its subclasses.

11.81.1 Macro Definition Documentation

11.81.1.1 gdcmEventMacro

```
#define gdcmEventMacro(
              classname,
              super )
```

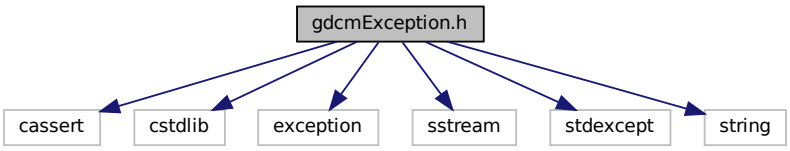
Value:

```
  \
 class  classname : public super { \
   public: \
     typedef classname Self; \
     typedef super Superclass; \
     classname() {} \
     virtual ~classname() override = default; \
     virtual const char * GetEventName() const override { return #classname; } \
     virtual bool CheckEvent(const ::gdcm::Event* e) const override \
       { return dynamic_cast<const Self*>(e) ? true : false; } \
     virtual ::gdcm::Event* MakeObject() const override \
       { return new Self; } \
     classname(const Self&s) : super(s){}; \
   private: \
     void operator=(const Self&); \
 }
```

11.82 gdcmException.h File Reference

```
#include <cassert>
#include <cstdlib>
#include <exception>
#include <sstream>
#include <stdexcept>
```

```
#include <string>
```
Include dependency graph for gdcmException.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::Exception

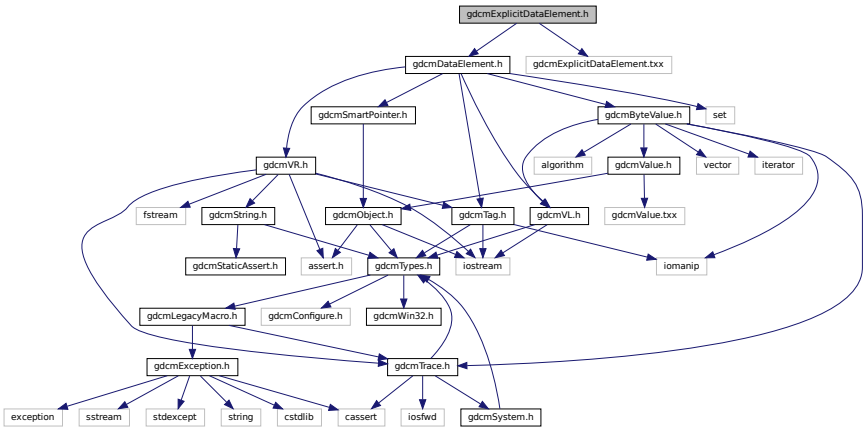
  Exception.

Namespaces

- gdcm

11.83 gdcmExplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmExplicitDataElement.txx"
```
Include dependency graph for gdcmExplicitDataElement.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::ExplicitDataElement

  Class to read/write a DataElement as Explicit Data Element.

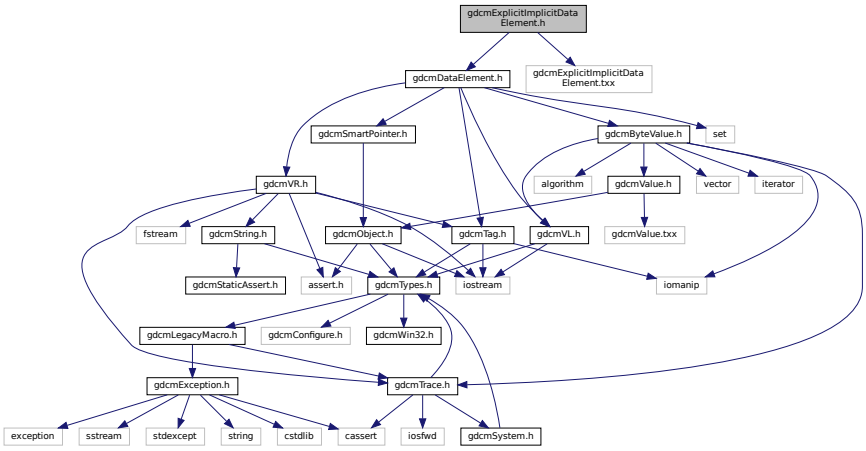
Namespaces

- gdcm

11.84 gdcmExplicitImplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmExplicitImplicitDataElement.txx"
```

Include dependency graph for gdcmExplicitImplicitDataElement.h:



Classes

- class gdcm::ExplicitImplicitDataElement

  Class to read/write a DataElement as ExplicitImplicit Data Element.

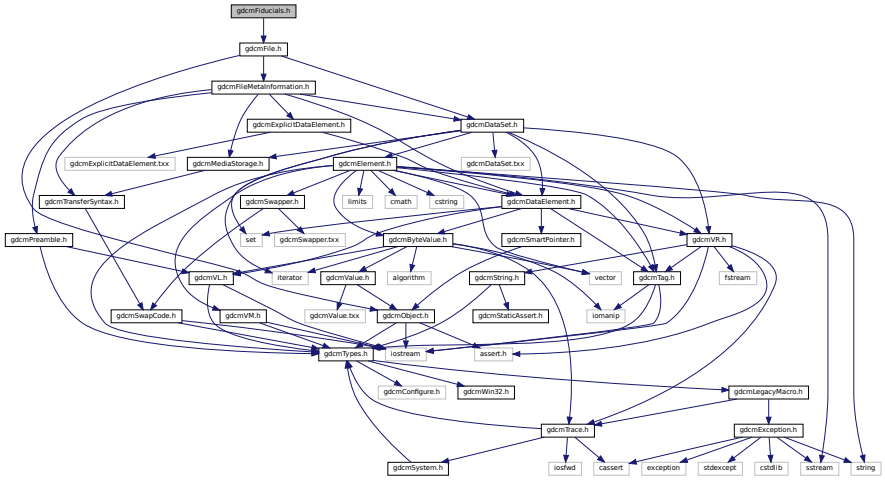
Namespaces

- gdcm

11.85 gdcmFiducials.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmFiducials.h:



Classes

- class gdcm::Fiducials

  Fiducials.

Namespaces

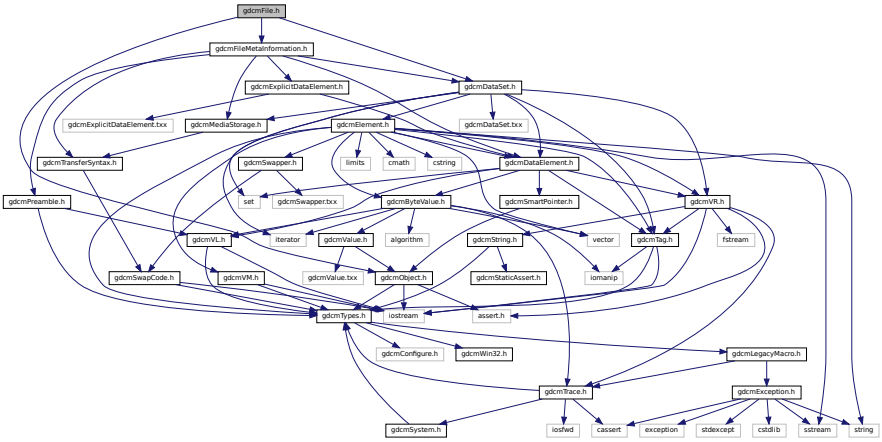
- gdcm

11.86 gdcmFile.h File Reference

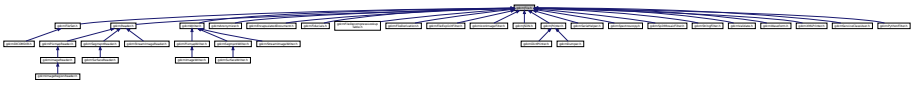
```
#include "gdcmObject.h"
#include "gdcmDataSet.h"
```

```
#include "gdcmFileMetaInformation.h"
```

Include dependency graph for gdcmFile.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::File

  a DICOM File

Namespaces

- gdcm

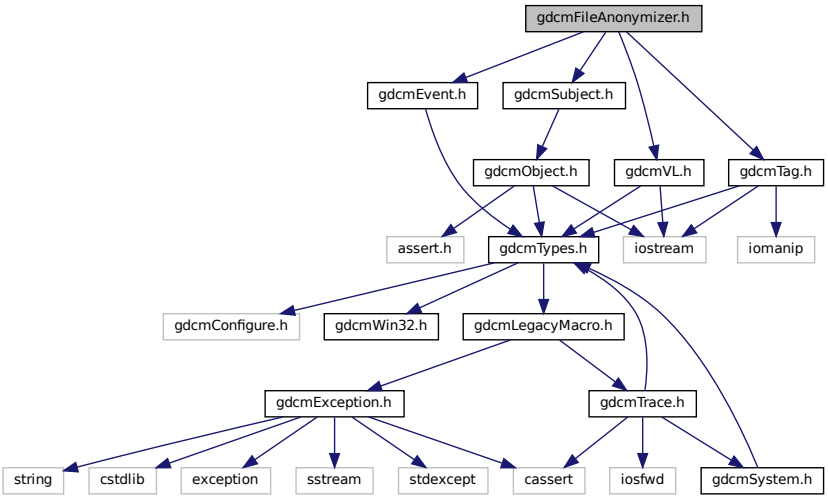
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const File &val)

11.87 gdcmFileAnonymizer.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmTag.h"
#include "gdcmVL.h"
```

Include dependency graph for gdcmFileAnonymizer.h:



Classes

- class gdcm::FileAnonymizer

  FileAnonymizer.

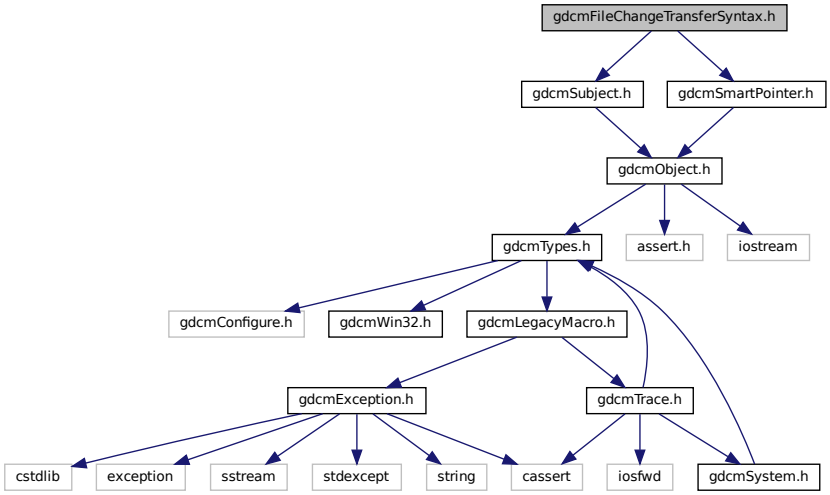
Namespaces

- gdcm

11.88 gdcmFileChangeTransferSyntax.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmFileChangeTransferSyntax.h:



Classes

- class gdcm::FileChangeTransferSyntax

  FileChangeTransferSyntax.

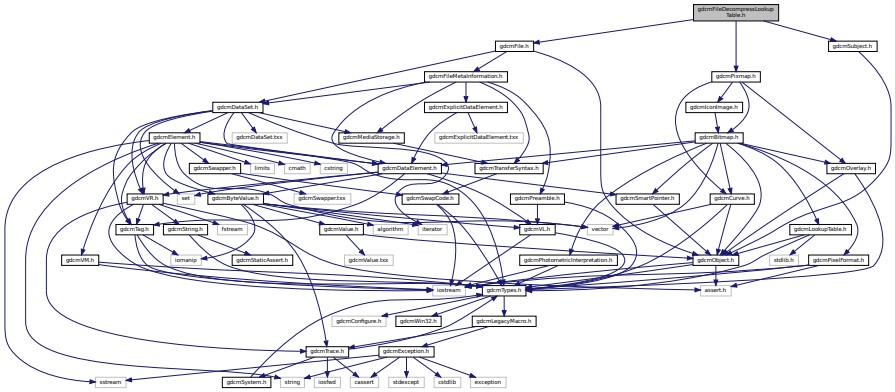
Namespaces

- gdcm

11.89 gdcmFileDecompressLookupTable.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmFile.h"
#include "gdcmPixmap.h"
```

Include dependency graph for gdcmFileDecompressLookupTable.h:



Classes

- class gdcm::FileDecompressLookupTable

  FileDecompressLookupTable class.

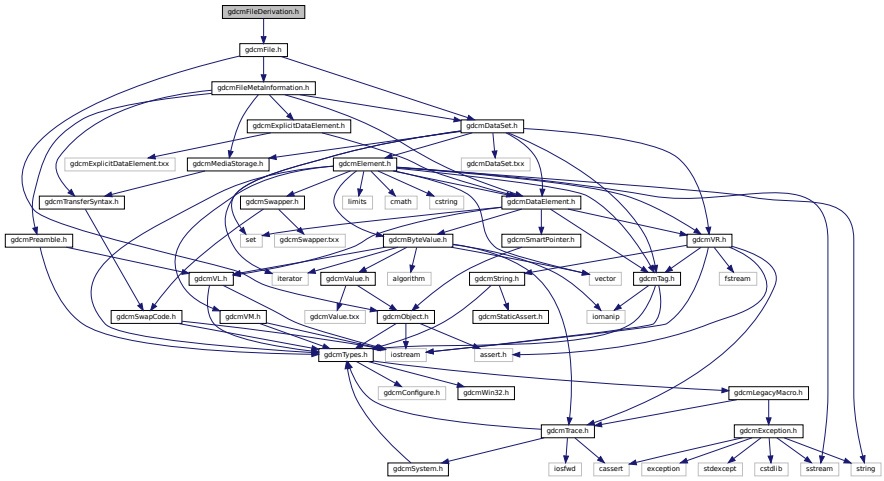
Namespaces

- gdcm

11.90 gdcmFileDerivation.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmFileDerivation.h:



Classes

- class gdcm::FileDerivation

  FileDerivation class.

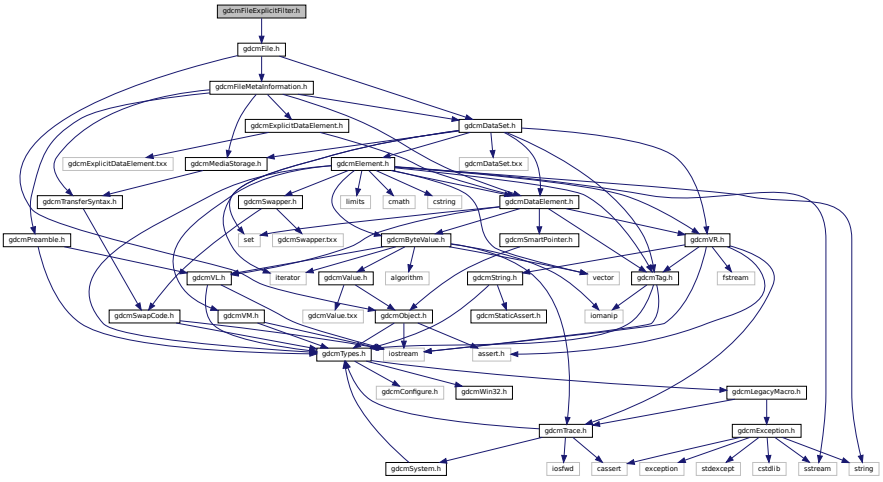
Namespaces

- gdcm

11.91 gdcmFileExplicitFilter.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmFileExplicitFilter.h:



Classes

- class gdcm::FileExplicitFilter

  FileExplicitFilter class.

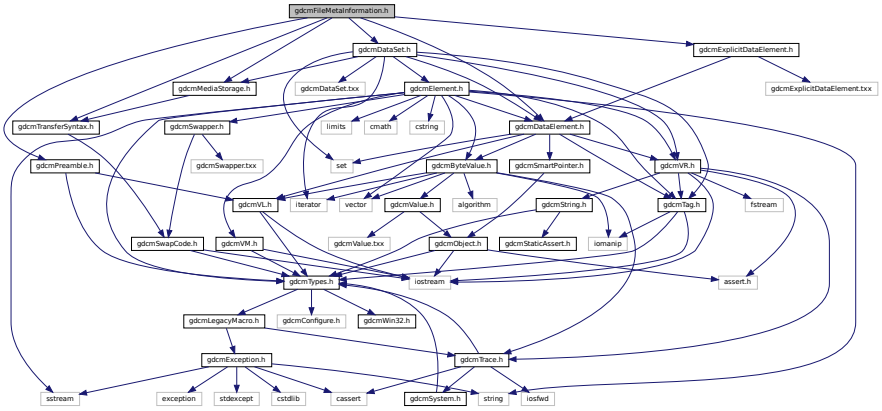
Namespaces

- gdcm

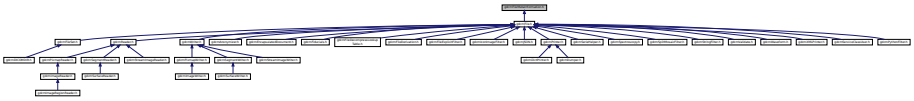
11.92 gdcmFileMetaInformation.h File Reference

```
#include "gdcmPreamble.h"
#include "gdcmDataSet.h"
#include "gdcmDataElement.h"
#include "gdcmMediaStorage.h"
#include "gdcmTransferSyntax.h"
#include "gdcmExplicitDataElement.h"
```

Include dependency graph for gdcmFileMetaInformation.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::FileMetaInformation

  Class to represent a File Meta Information.

Namespaces

- gdcm

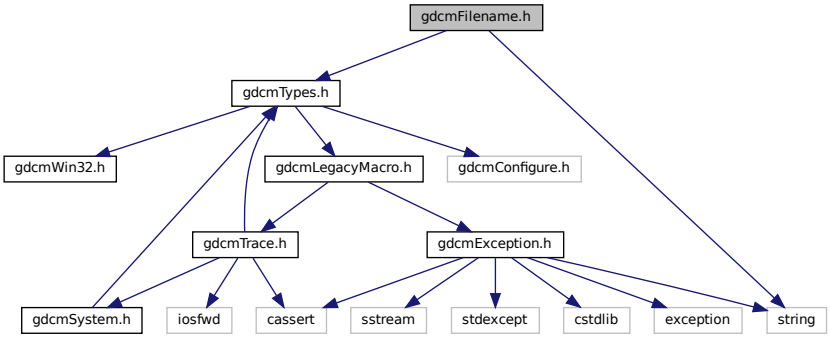
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const FileMetaInformation &val)

11.93 gdcmFilename.h File Reference

```
#include "gdcmTypes.h"
#include <string>
```

Include dependency graph for gdcmFilename.h:



Classes

- class gdcm::Filename

  Class to manipulate file name's.

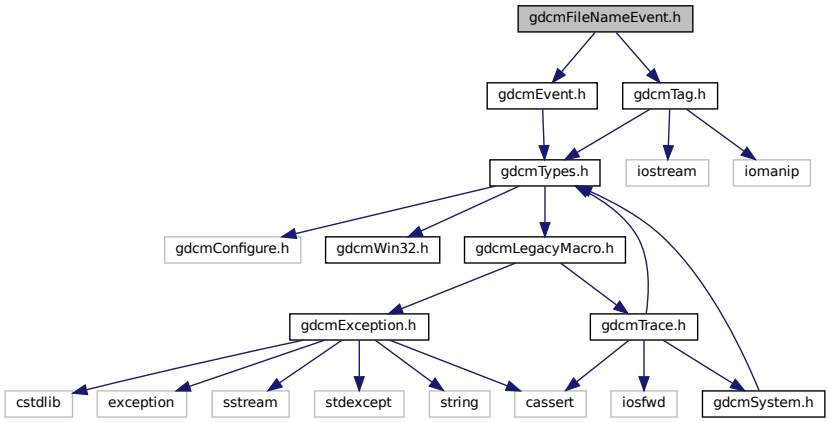
Namespaces

- gdcm

11.94 gdcmFileNameEvent.h File Reference

```
#include "gdcmEvent.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmFileNameEvent.h:



Classes

- class gdcm::FileNameEvent

  FileNameEvent.

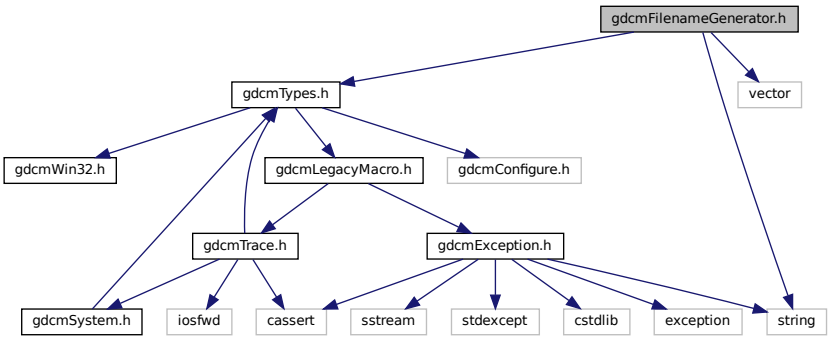
Namespaces

- gdcm

11.95 gdcmFilenameGenerator.h File Reference

```
#include "gdcmTypes.h"
#include <string>
#include <vector>
```

Include dependency graph for gdcmFilenameGenerator.h:



Classes

- class gdcm::FilenameGenerator

  FilenameGenerator.

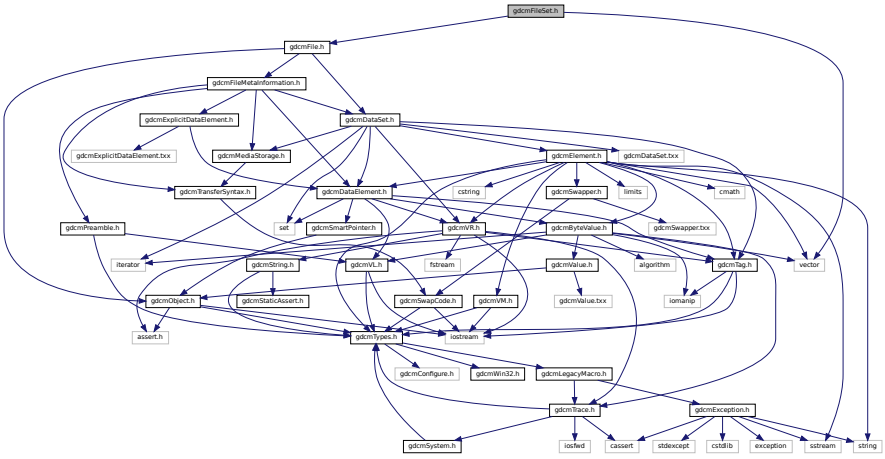
Namespaces

- gdcm

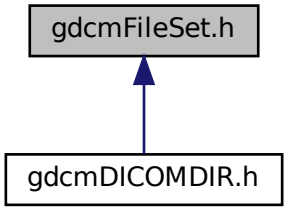
11.96 gdcmFileSet.h File Reference

```
#include "gdcmFile.h"
#include <vector>
```

Include dependency graph for gdcmFileSet.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::FileSet

Namespaces

- gdcm

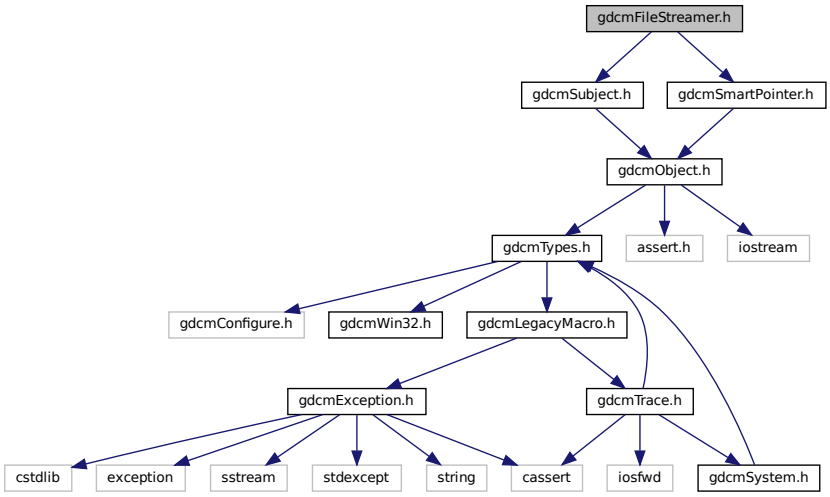
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const FileSet &f)

11.97 gdcmFileStreamer.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmFileStreamer.h:



Classes

- class gdcm::FileStreamer

  FileStreamer.

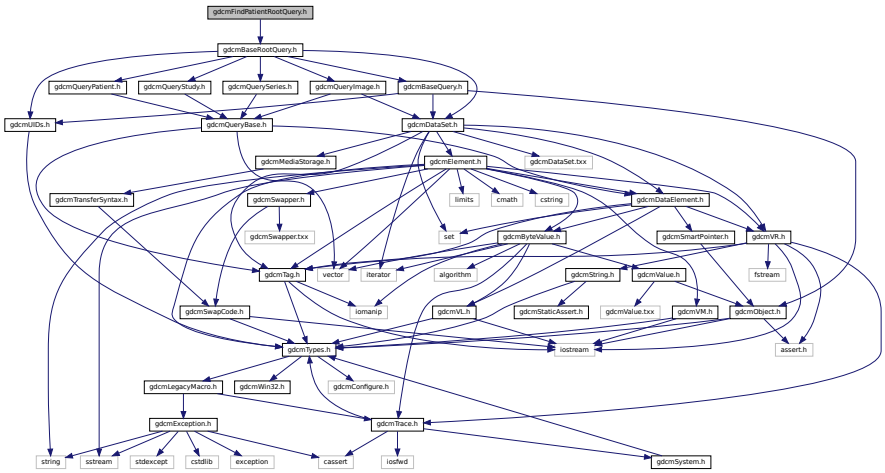
Namespaces

- gdcm

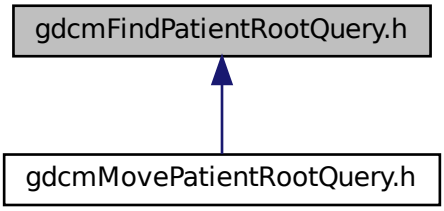
11.98 gdcmFindPatientRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmFindPatientRootQuery.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::FindPatientRootQuery

  PatientRootQuery.

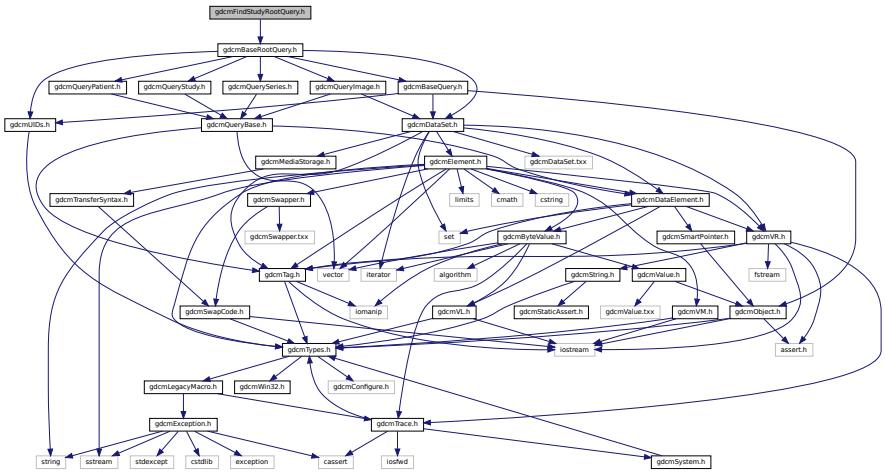
Namespaces

- gdcm

11.99 gdcmFindStudyRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmFindStudyRootQuery.h:



Classes

- class gdcm::FindStudyRootQuery

  FindStudyRootQuery.

Namespaces

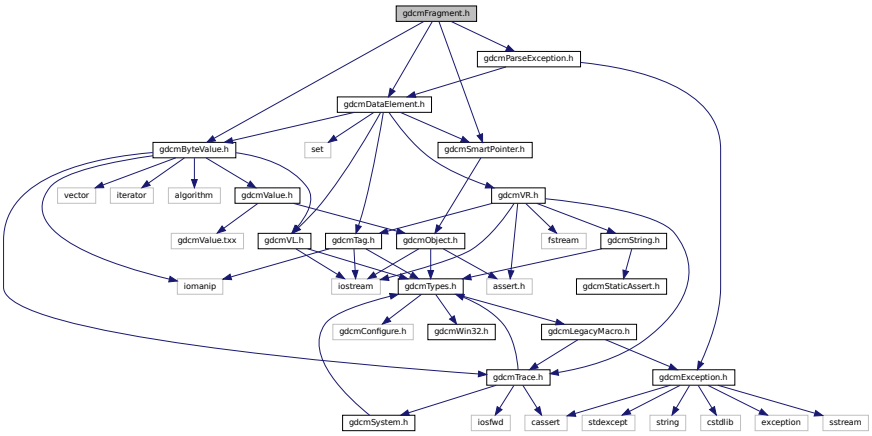
- gdcm

11.100 gdcmFragment.h File Reference

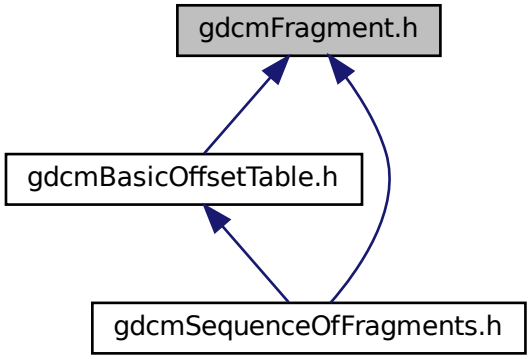
```
#include "gdcmDataElement.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
```

```
#include "gdcmParseException.h"
```

Include dependency graph for gdcmFragment.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Fragment

  Class to represent a Fragment.

Namespaces

- gdcm

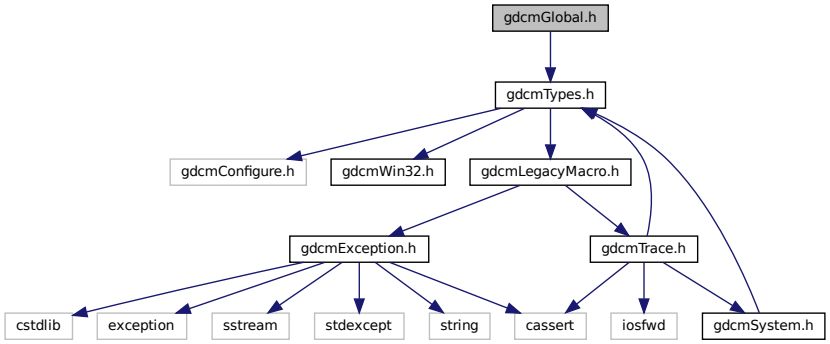
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Fragment &val)

11.101 gdcmGlobal.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmGlobal.h:



Classes

- class gdcm::Global

  Global.

Namespaces

- gdcm

Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Global &g)

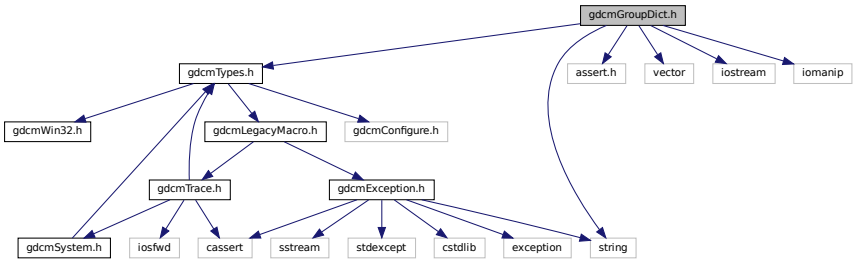
Variables

- static Global gdcm::GlobalInstance

11.102 gdcmGroupDict.h File Reference

```
#include "gdcmTypes.h"
#include <assert.h>
#include <vector>
#include <string>
#include <iostream>
#include <iomanip>
```

Include dependency graph for gdcmGroupDict.h:



Classes

- class gdcm::GroupDict

  Class to represent the mapping from group number to its abbreviation and name.

Namespaces

- gdcm

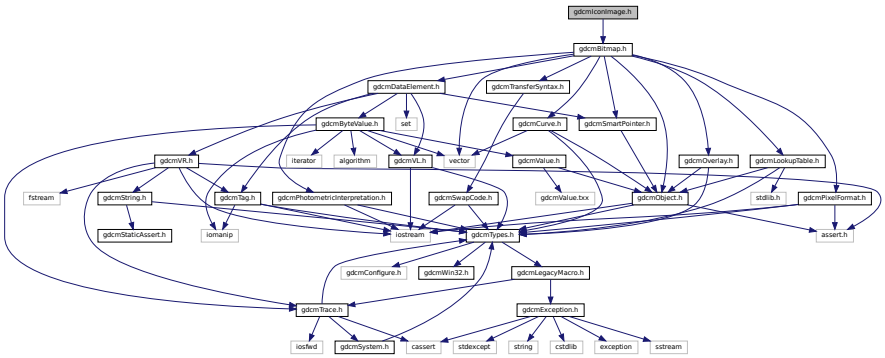
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const GroupDict &_val)

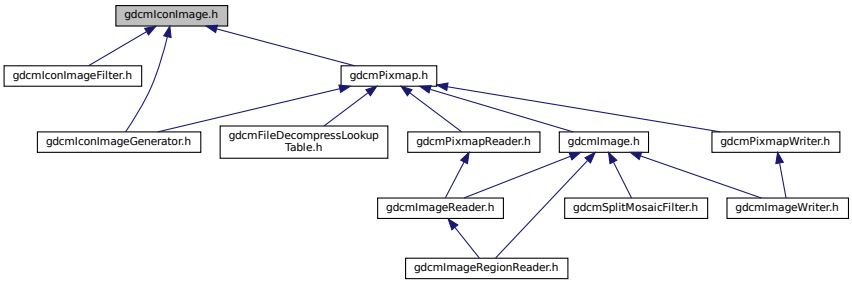
11.103 gdcmIconImage.h File Reference

```
#include "gdcmBitmap.h"
```

Include dependency graph for gdcmIconImage.h:



This graph shows which files directly or indirectly include this file:



Namespaces

- gdcm

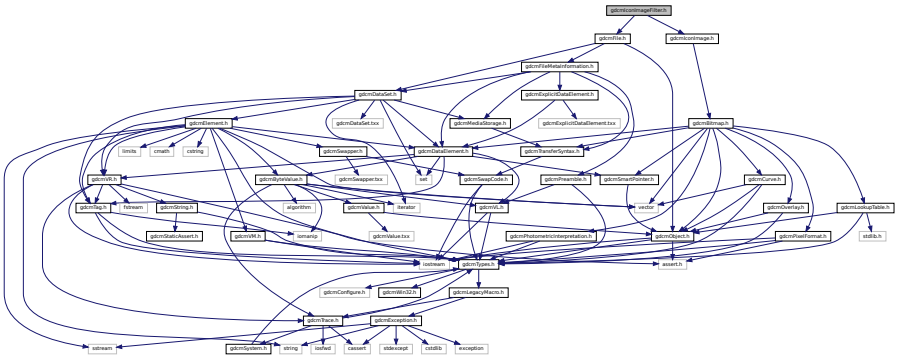
Typedefs

- typedef Bitmap gdcm::IconImage

11.104 gdcmIconImageFilter.h File Reference

```
#include "gdcmFile.h"
#include "gdcmIconImage.h"
```

Include dependency graph for gdcmIconImageFilter.h:



Classes

- class gdcm::IconImageFilter

  IconImageFilter.

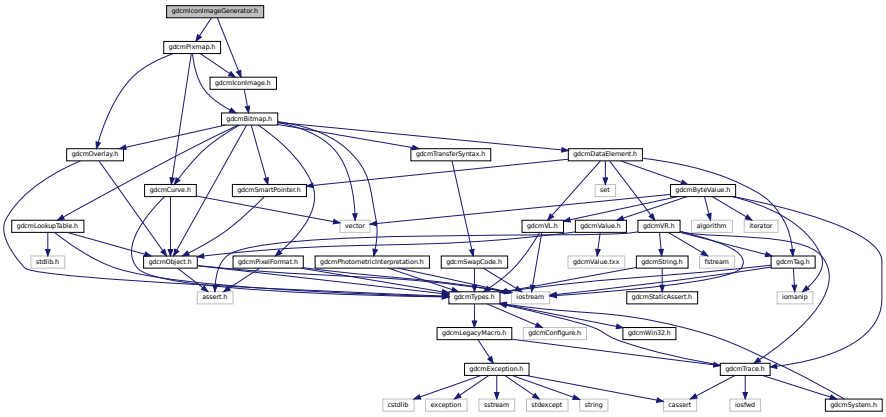
Namespaces

- gdcm

11.105 gdcmIconImageGenerator.h File Reference

```
#include "gdcmPixmap.h"
#include "gdcmIconImage.h"
```

Include dependency graph for gdcmIconImageGenerator.h:



Classes

- class gdcm::IconImageGenerator

  IconImageGenerator.

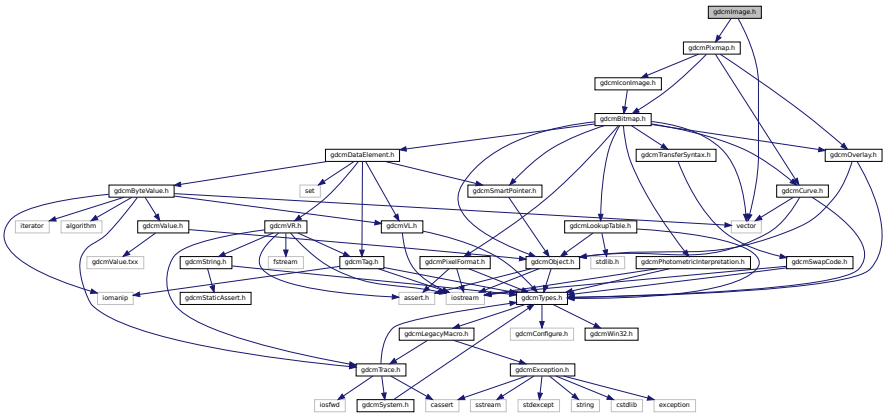
Namespaces

- gdcm

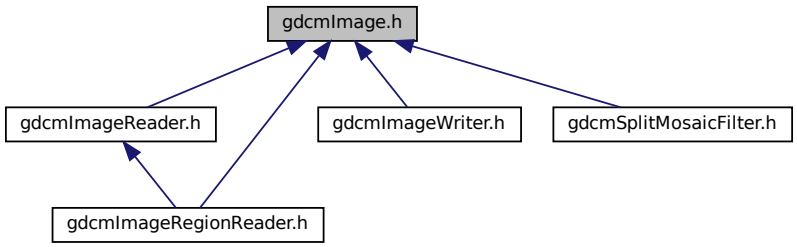
11.106 gdcmImage.h File Reference

```
#include "gdcmPixmap.h"
#include <vector>
```

Include dependency graph for gdcmImage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Image

  Image.

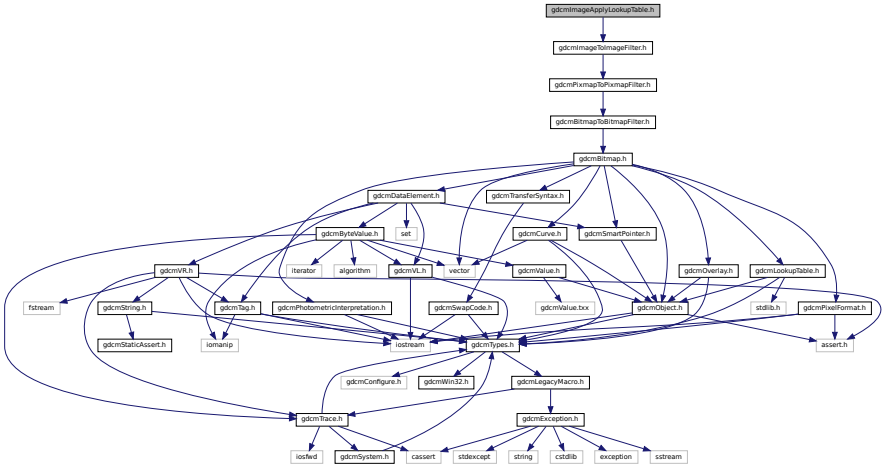
Namespaces

- gdcm

11.107 gdcmImageApplyLookupTable.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageApplyLookupTable.h:



Classes

- class gdcm::ImageApplyLookupTable

  ImageApplyLookupTable class.

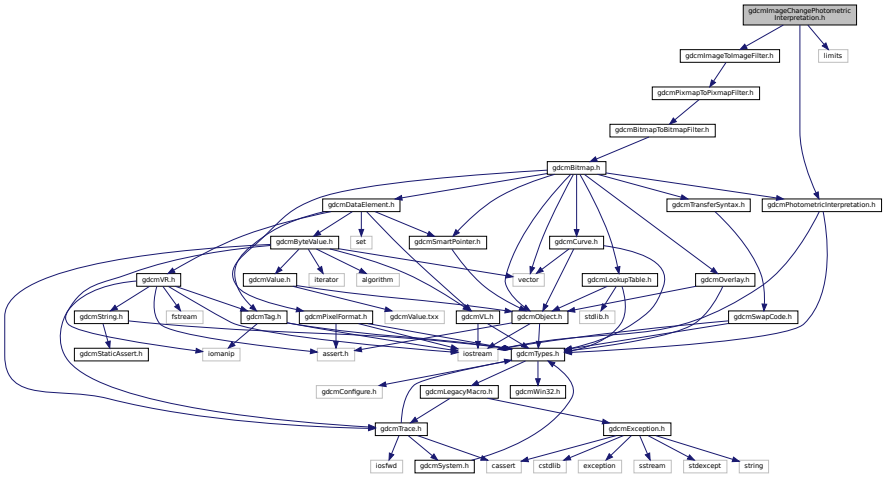
Namespaces

- gdcm

11.108 gdcmImageChangePhotometricInterpretation.h File Reference

```
#include "gdcmImageToImageFilter.h"
#include "gdcmPhotometricInterpretation.h"
#include <limits>
```

Include dependency graph for gdcmImageChangePhotometricInterpretation.h:



Classes

- class gdcm::ImageChangePhotometricInterpretation

  ImageChangePhotometricInterpretation class.

Namespaces

- gdcm

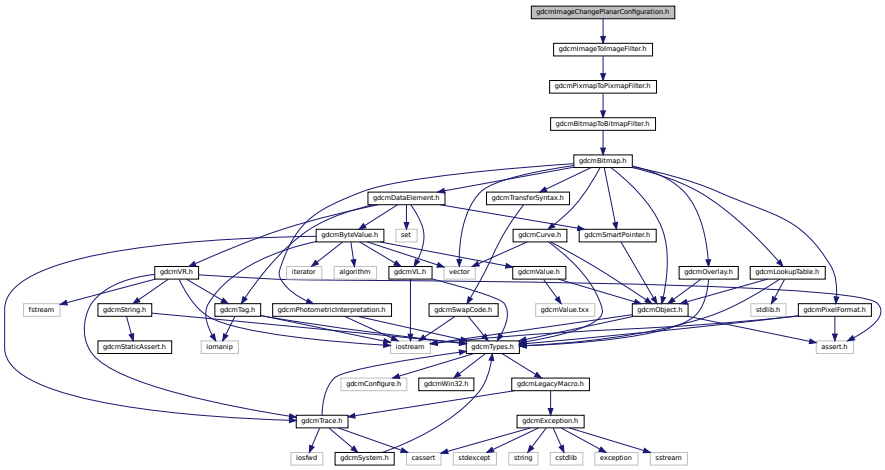
Functions

- template<typename T >
  static T gdcm::Clamp (int v)
- template<typename T >
  static int gdcm::Round (T x)

11.109 gdcmImageChangePlanarConfiguration.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageChangePlanarConfiguration.h:



Classes

- class gdcm::ImageChangePlanarConfiguration

  ImageChangePlanarConfiguration class.

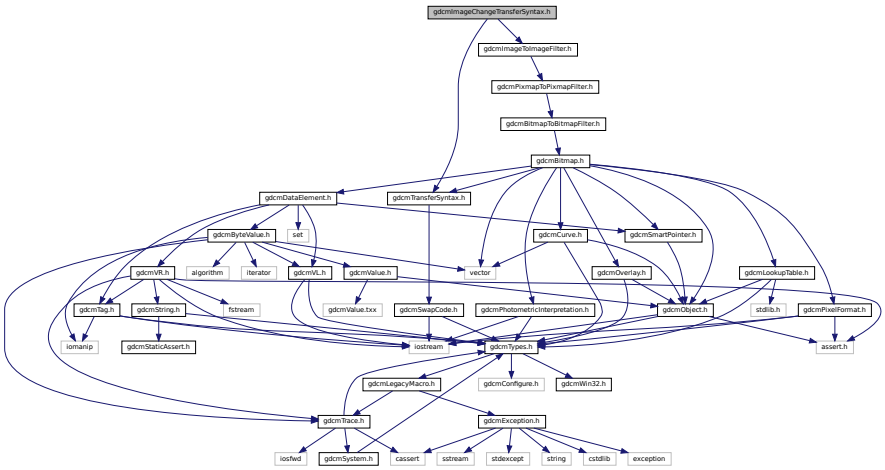
Namespaces

- gdcm

11.110 gdcmImageChangeTransferSyntax.h File Reference

```
#include "gdcmImageToImageFilter.h"
#include "gdcmTransferSyntax.h"
```

Include dependency graph for gdcmImageChangeTransferSyntax.h:



Classes

- class gdcm::ImageChangeTransferSyntax

  ImageChangeTransferSyntax class.

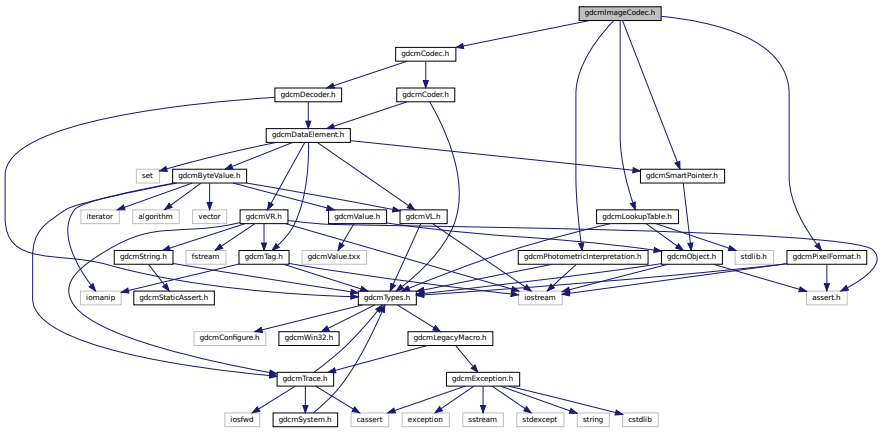
Namespaces

- gdcm

11.111 gdcmImageCodec.h File Reference

```
#include "gdcmCodec.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmLookupTable.h"
#include "gdcmSmartPointer.h"
#include "gdcmPixelFormat.h"
```

Include dependency graph for gdcmImageCodec.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::ImageCodec

  ImageCodec.

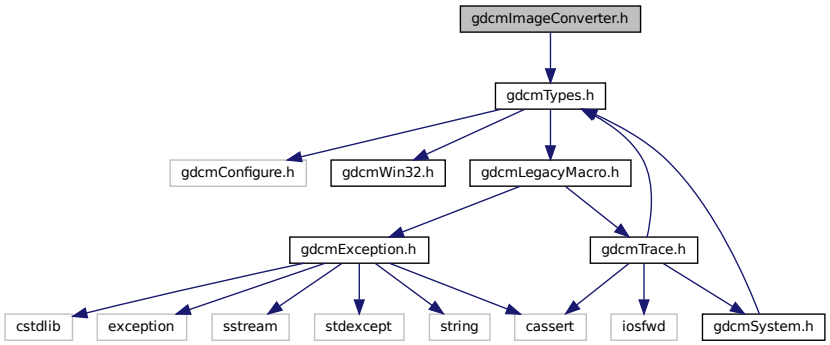
Namespaces

- gdcm

11.112 gdcmImageConverter.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImageConverter.h:



Classes

- class gdcm::ImageConverter

  Image Converter.

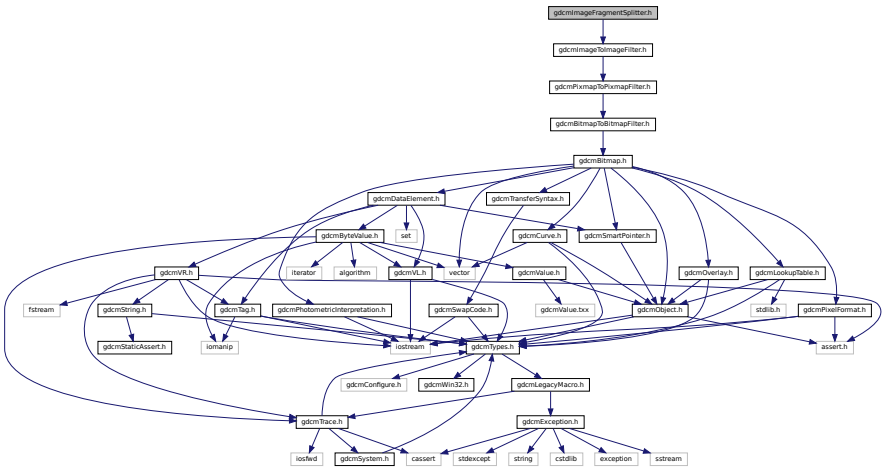
Namespaces

- gdcm

11.113 gdcmImageFragmentSplitter.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageFragmentSplitter.h:



Classes

- class gdcm::ImageFragmentSplitter

  ImageFragmentSplitter class.

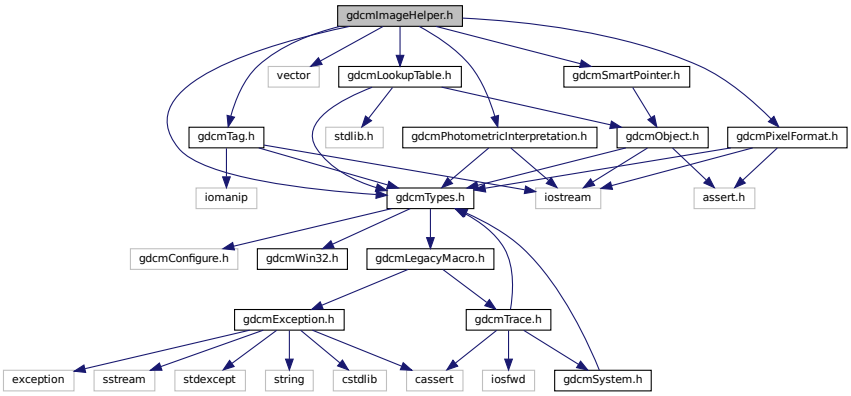
Namespaces

- gdcm

11.114 gdcmImageHelper.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include <vector>
#include "gdcmPixelFormat.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmSmartPointer.h"
#include "gdcmLookupTable.h"
```

Include dependency graph for gdcmImageHelper.h:



Classes

- class gdcm::ImageHelper

  ImageHelper (internal class, not intended for user level)
- struct gdcm::RealWorldValueMappingContent

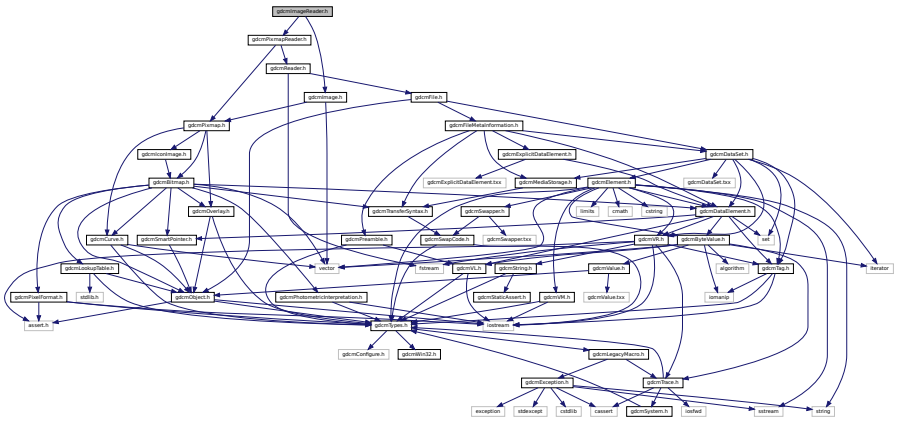
Namespaces

- gdcm

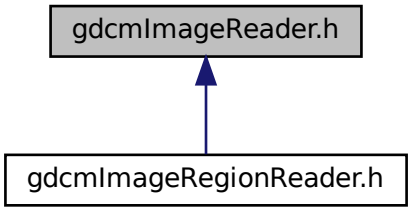
11.115 gdcmImageReader.h File Reference

```
#include "gdcmPixmapReader.h"
#include "gdcmImage.h"
```

Include dependency graph for gdcmImageReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ImageReader

  ImageReader.

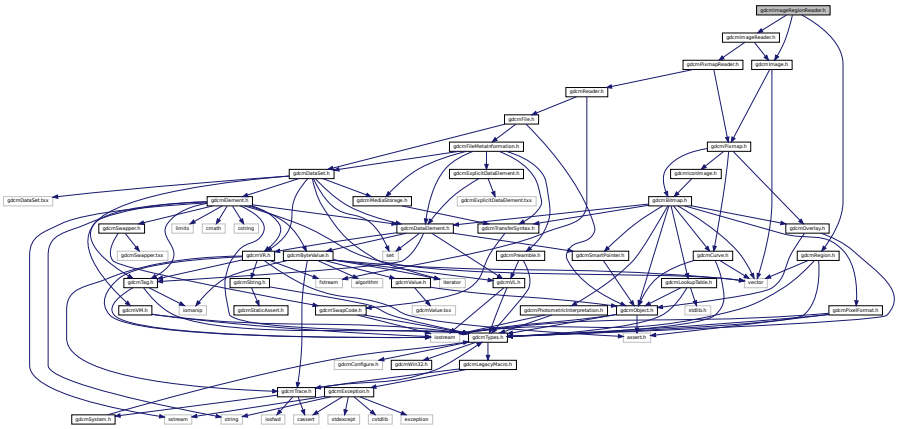
Namespaces

- gdcm

11.116 gdcmImageRegionReader.h File Reference

```
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmRegion.h"
```

Include dependency graph for gdcmImageRegionReader.h:



Classes

- class gdcm::ImageRegionReader

  ImageRegionReader.

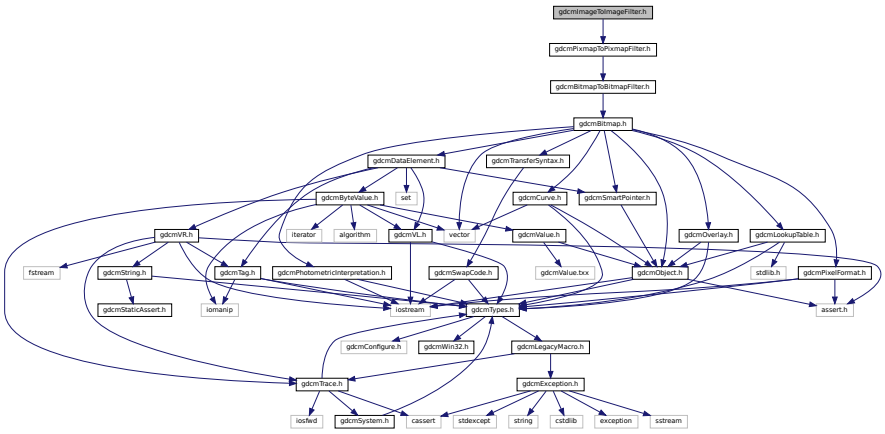
Namespaces

- gdcm

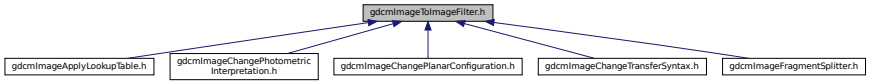
11.117 gdcmImageToImageFilter.h File Reference

```
#include "gdcmPixmapToPixmapFilter.h"
```

Include dependency graph for gdcmImageToImageFilter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ImageToImageFilter

  ImageToImageFilter class.

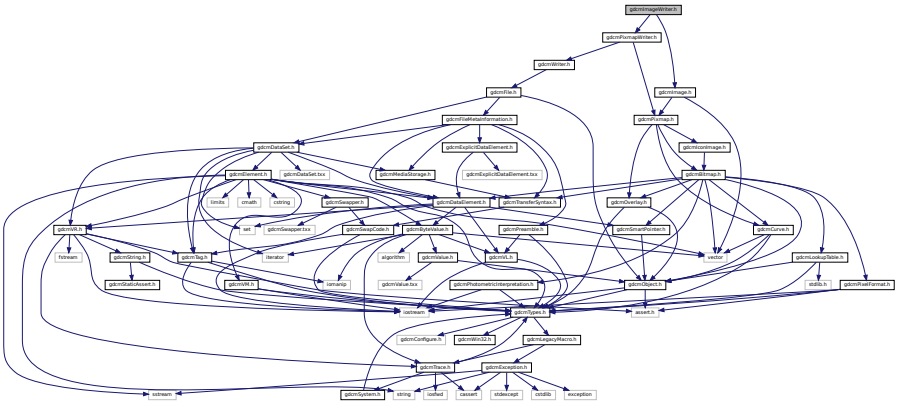
Namespaces

- gdcm

11.118 gdcmImageWriter.h File Reference

```
#include "gdcmPixmapWriter.h"
#include "gdcmImage.h"
```

Include dependency graph for gdcmImageWriter.h:



Classes

- class gdcm::ImageWriter

  ImageWriter.

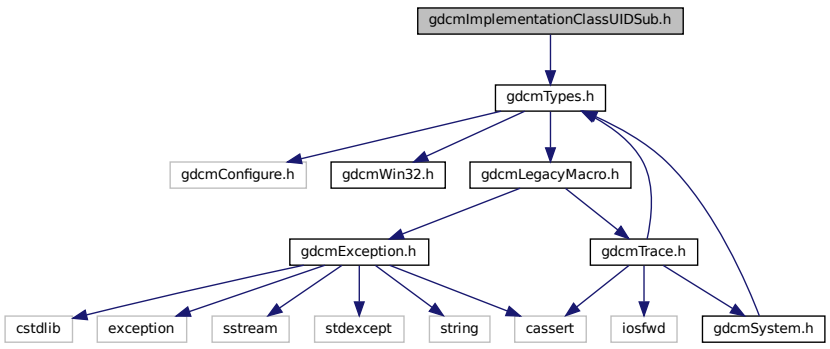
Namespaces

- gdcm

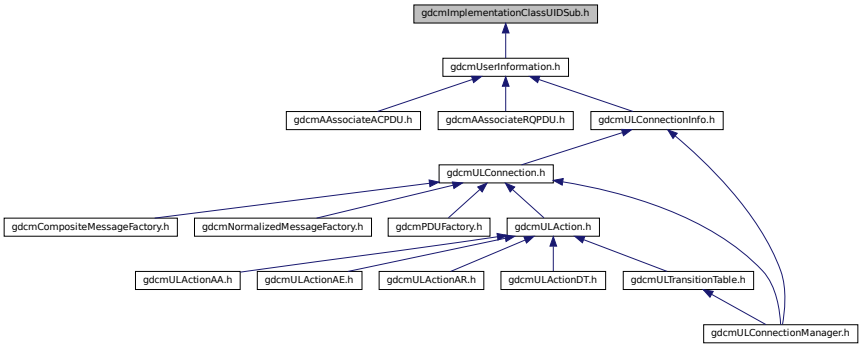
11.119 gdcmImplementationClassUIDSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationClassUIDSub.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ImplementationClassUIDSub

  ImplementationClassUIDSub.

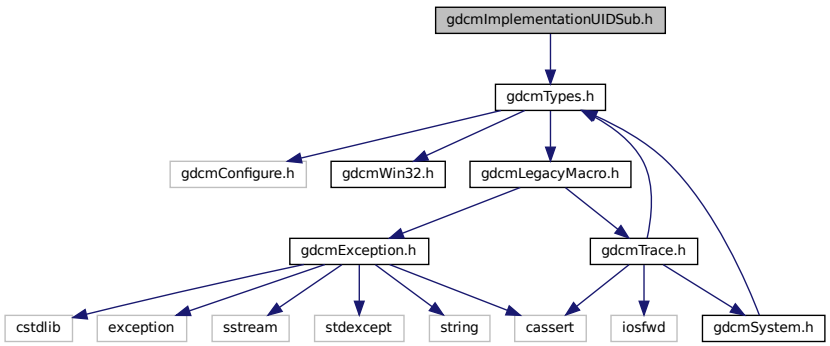
Namespaces

- gdcm
- gdcm::network

11.120 gdcmImplementationUIDSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationUIDSub.h:



Classes

- class gdcm::network::ImplementationUIDSub

  ImplementationUIDSub.

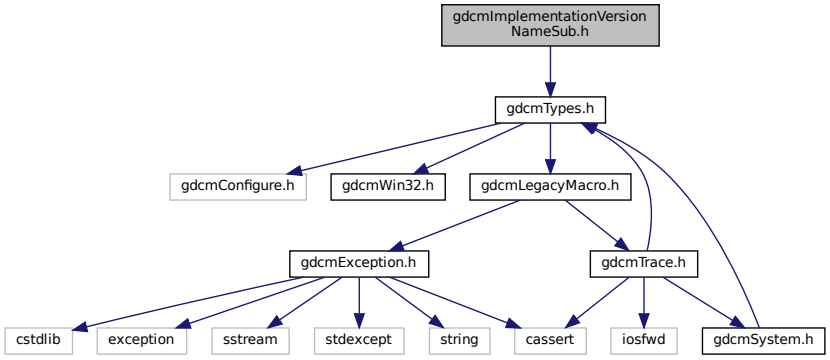
Namespaces

- gdcm
- gdcm::network

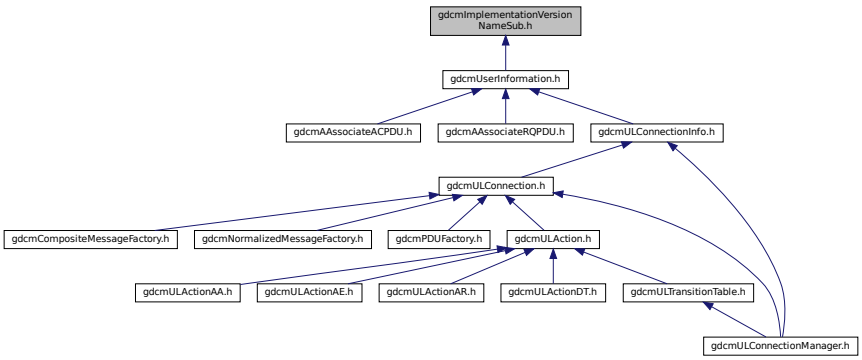
11.121 gdcmImplementationVersionNameSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationVersionNameSub.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ImplementationVersionNameSub

  ImplementationVersionNameSub.

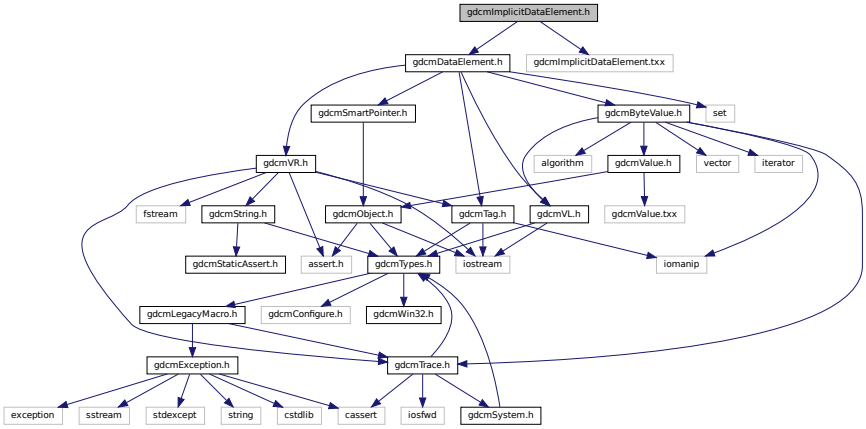
Namespaces

- gdcm
- gdcm::network

11.122 gdcmImplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmImplicitDataElement.txx"
```

Include dependency graph for gdcmImplicitDataElement.h:



Classes

- class gdcm::ImplicitDataElement

  Class to represent an Implicit VR Data Element.

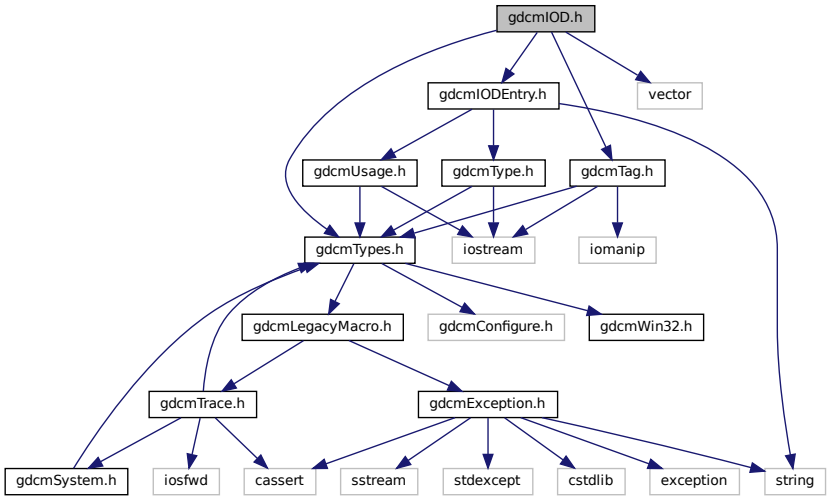
Namespaces

- gdcm

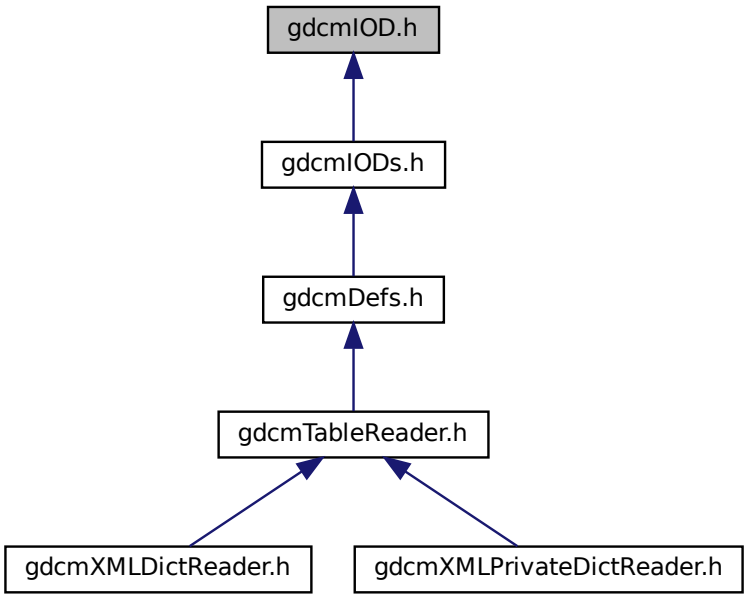
11.123 gdcmIOD.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmIODEntry.h"
#include <vector>
```

Include dependency graph for gdcmIOD.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::IOD

  Class for representing a IOD.

Namespaces

- gdcm

Functions

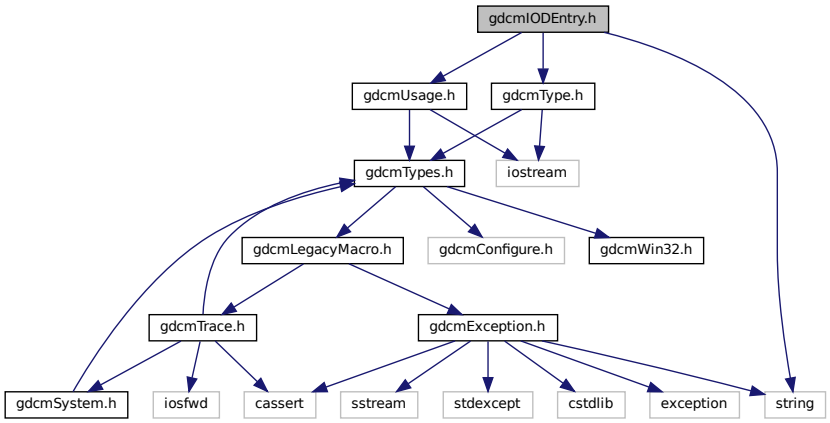
- std::ostream & gdcm::operator<< (std::ostream &_os, const IOD &_val)

11.124 gdcmIODEntry.h File Reference

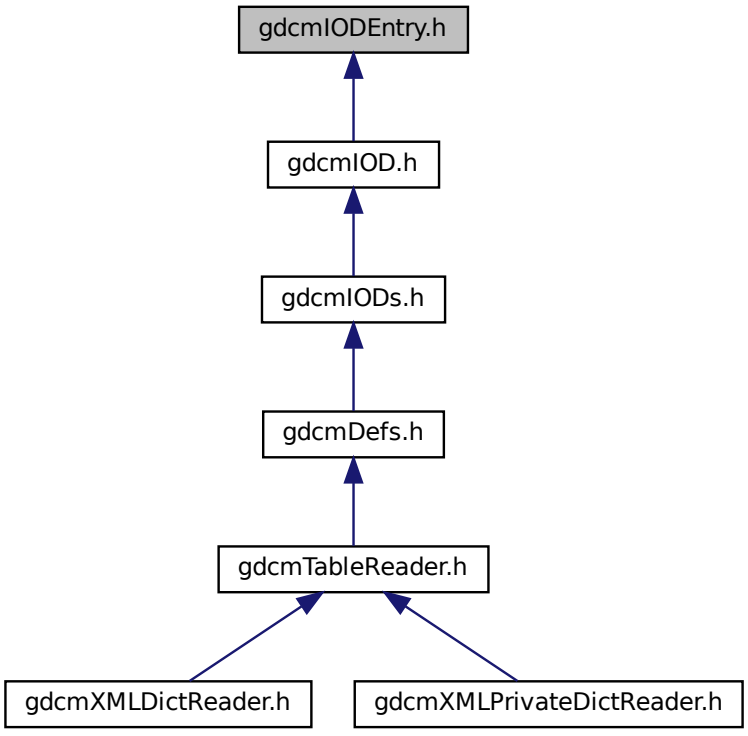
```
#include "gdcmUsage.h"
#include "gdcmType.h"
```

```
#include <string>
```

Include dependency graph for gdcmIODEntry.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::IODEntry

  Class for representing a IODEntry.

Namespaces

- gdcm

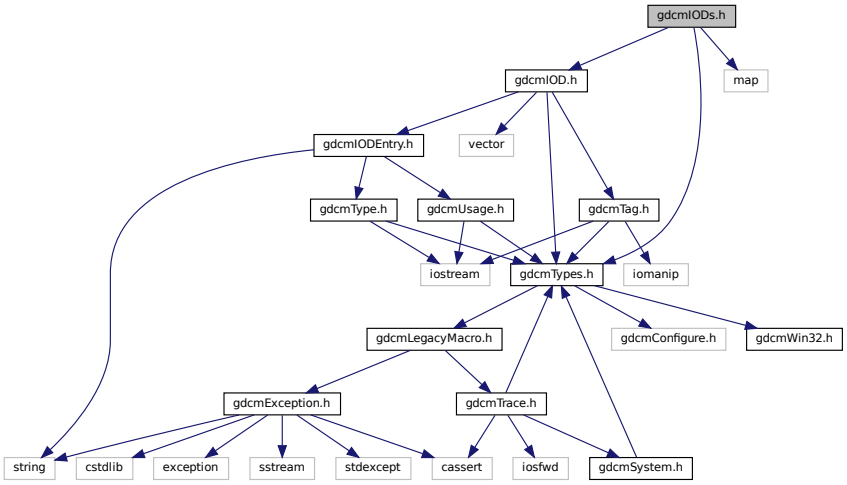
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const IODEntry &_val)

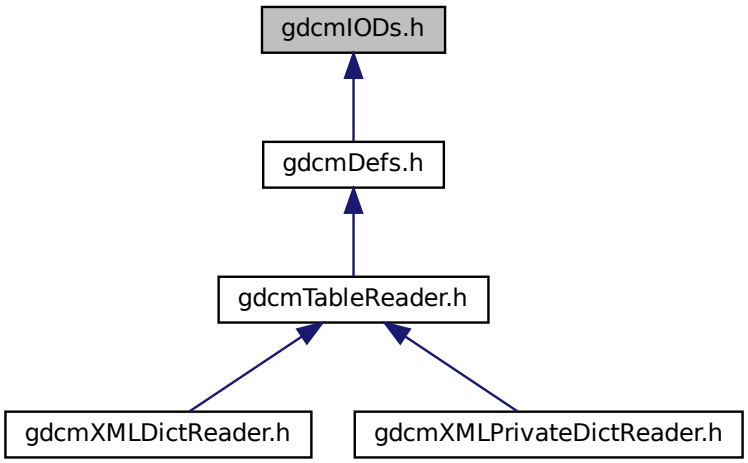
11.125 gdcmIODs.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmIOD.h"
#include <map>
```

Include dependency graph for gdcmIODs.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::IODs

  Class for representing a IODs.

Namespaces

- gdcm

Functions

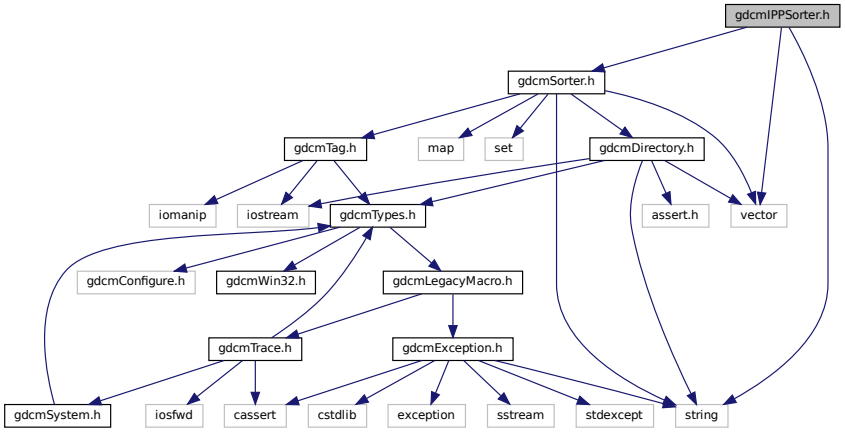
- std::ostream & gdcm::operator<< (std::ostream &_os, const IODs &_val)

11.126 gdcmIPPSorter.h File Reference

```
#include "gdcmSorter.h"
#include <vector>
```

```
#include <string>
```

Include dependency graph for gdcmIPPSorter.h:



Classes

- class gdcm::IPPSorter

  IPPSorter.

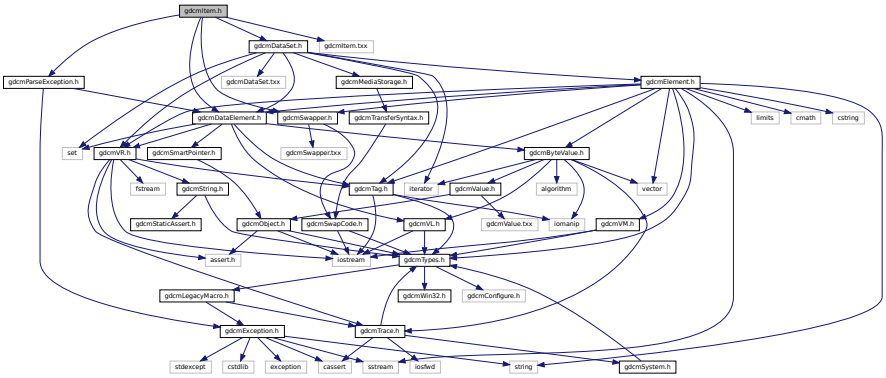
Namespaces

- gdcm

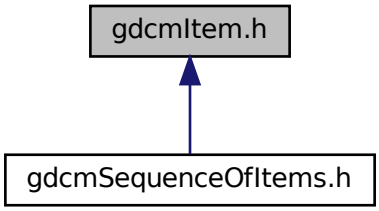
11.127 gdcmItem.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmParseException.h"
#include "gdcmSwapper.h"
#include "gdcmItem.txx"
```

Include dependency graph for gdcmItem.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Item

  Class to represent an Item.

Namespaces

- gdcm

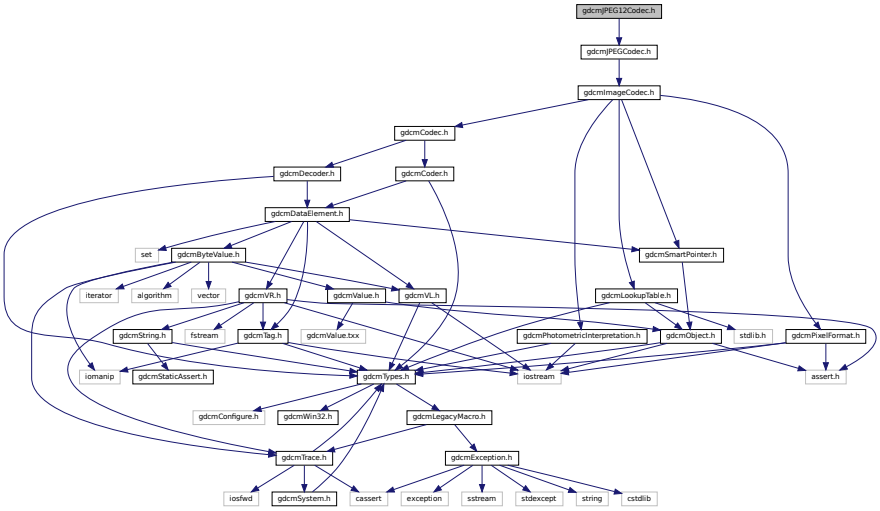
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Item &val)

11.128 gdcmJPEG12Codec.h File Reference

```
#include "gdcmJPEGCodec.h"
```

Include dependency graph for gdcmJPEG12Codec.h:



Classes

- class gdcm::JPEG12Codec

  Class to do JPEG 12bits (lossy & lossless)

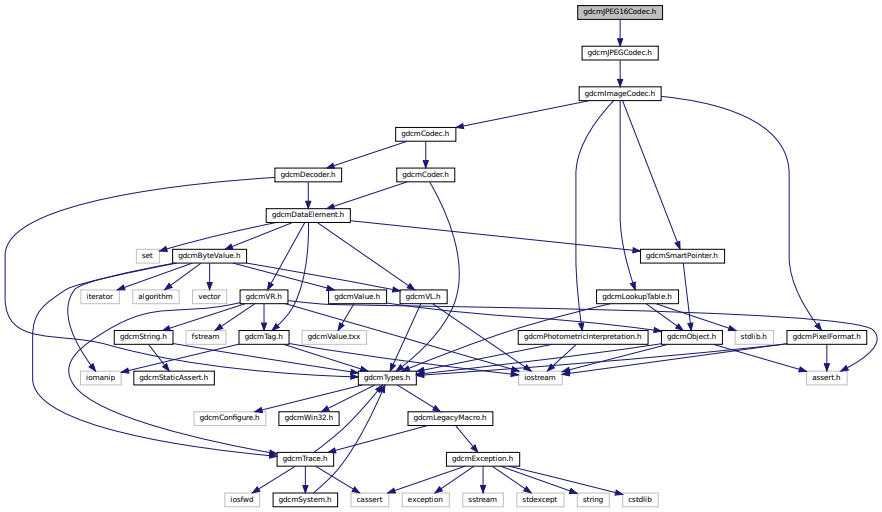
Namespaces

- gdcm

11.129 gdcmJPEG16Codec.h File Reference

```
#include "gdcmJPEGCodec.h"
```

Include dependency graph for gdcmJPEG16Codec.h:



Classes

- class gdcm::JPEG16Codec

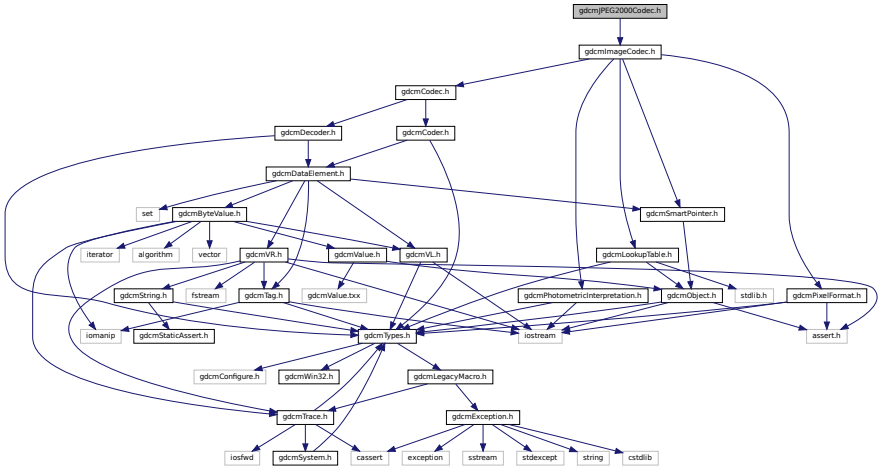
  Class to do JPEG 16bits (lossless)

Namespaces

- gdcm

11.130 gdcmJPEG2000Codec.h File Reference

`#include "gdcmImageCodec.h"`
Include dependency graph for gdcmJPEG2000Codec.h:



Classes

- class gdcm::JPEG2000Codec

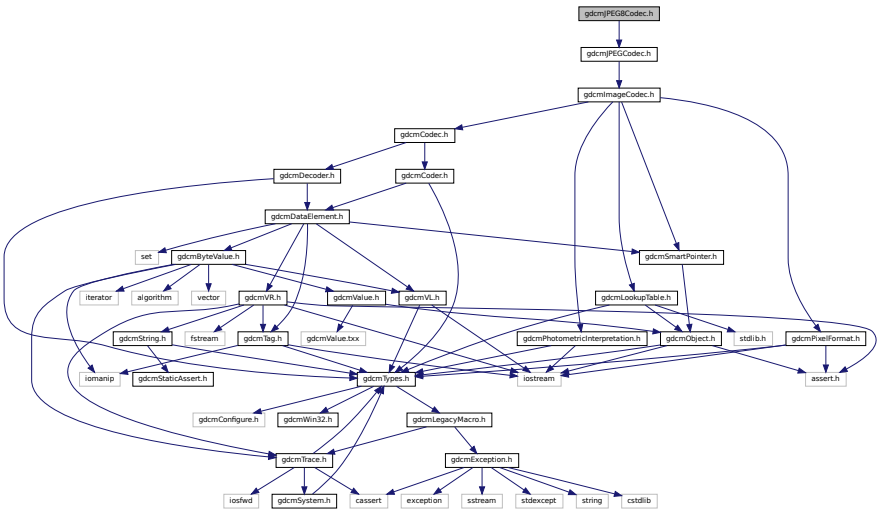
  Class to do JPEG 2000.

Namespaces

- gdcm

11.131 gdcmJPEG8Codec.h File Reference

`#include "gdcmJPEGCodec.h"`
Include dependency graph for gdcmJPEG8Codec.h:



Classes

- class gdcm::JPEG8Codec

  Class to do JPEG 8bits (lossy & lossless)

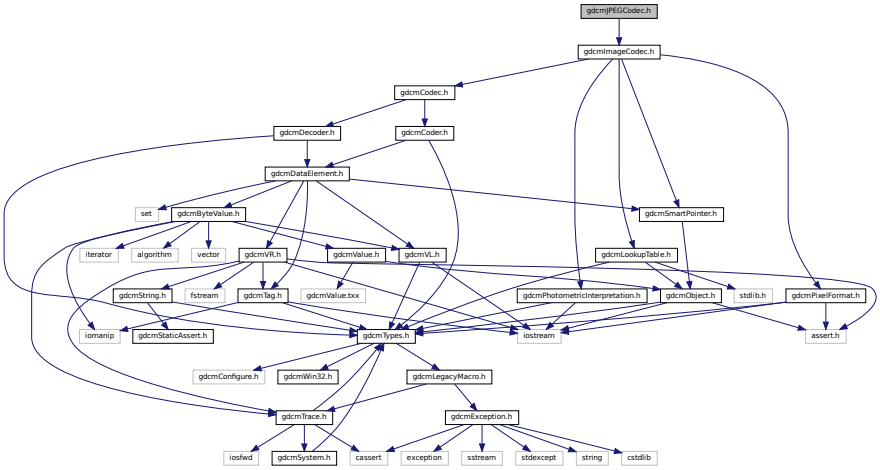
Namespaces

- gdcm

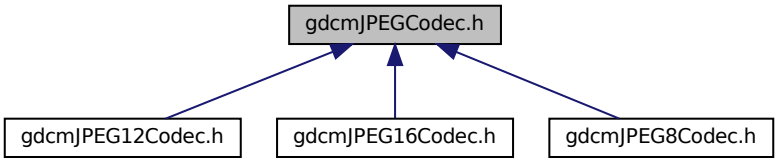
11.132 gdcmJPEGCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmJPEGCodec.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::JPEGCodec

  JPEG codec.

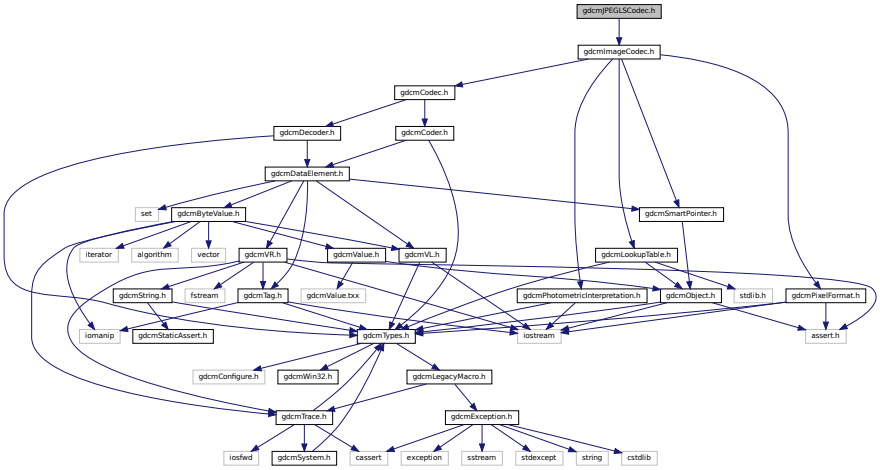
Namespaces

- gdcm

11.133 gdcmJPEGLSCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmJPEGLSCodec.h:



Classes

- class gdcm::JPEGLSCodec

  JPEG-LS.

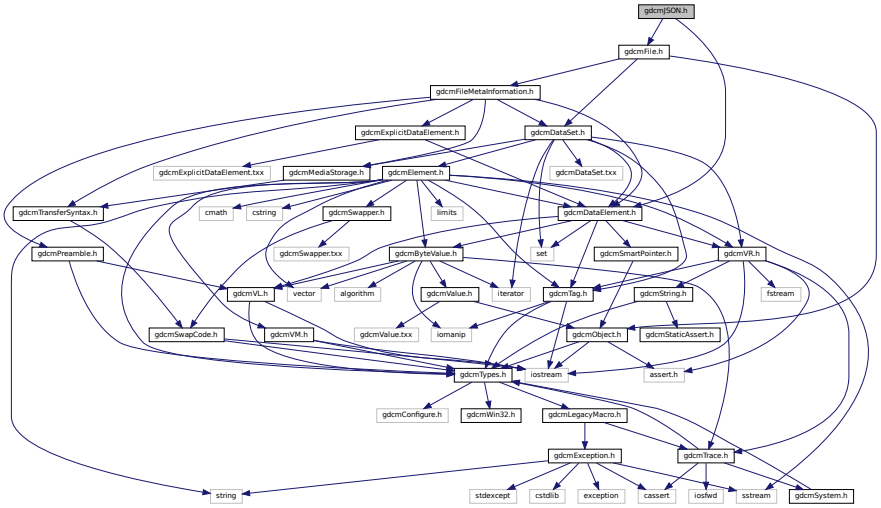
Namespaces

- gdcm

11.134 gdcmJSON.h File Reference

```
#include "gdcmFile.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmJSON.h:



Classes

- class gdcm::JSON

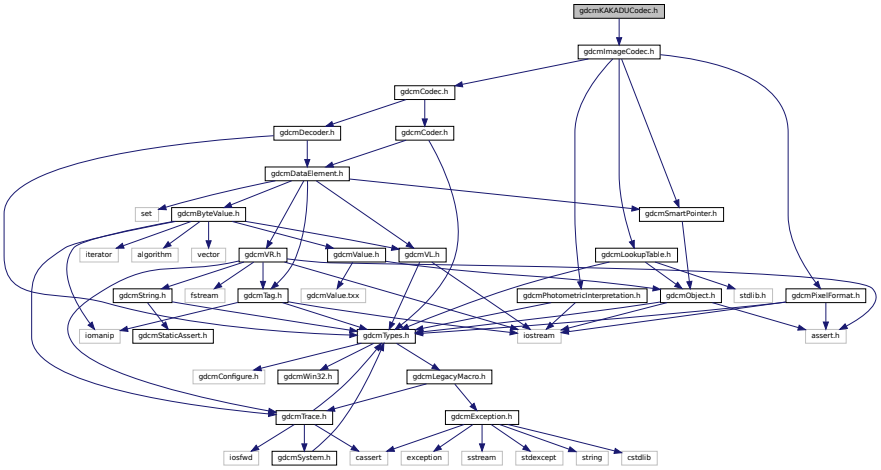
Namespaces

- gdcm

11.135 gdcmKAKADUCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmKAKADUCodec.h:



Classes

- class gdcm::KAKADUCodec
  KAKADUCodec.

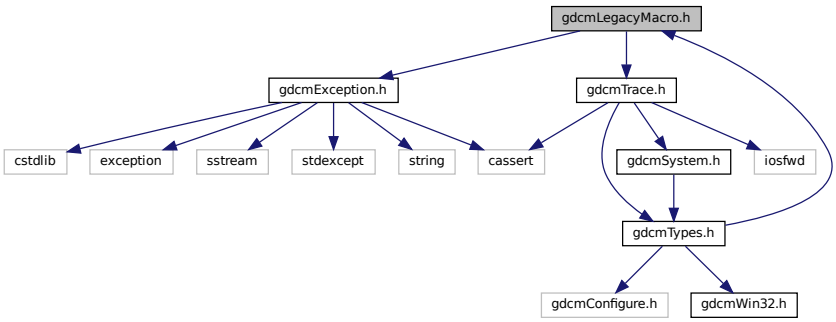
Namespaces

- gdcm

11.136 gdcmLegacyMacro.h File Reference

```
#include "gdcmException.h"
#include "gdcmTrace.h"
```

Include dependency graph for gdcmLegacyMacro.h:



This graph shows which files directly or indirectly include this file:

Macros

- #define GDCM_LEGACY(method) method;
- #define GDCM_LEGACY_BODY(method, version) gdcmWarningMacro(#method " was deprecated for " version " and will be removed in a future version.")
- #define GDCM_LEGACY_REPLACED_BODY(method, version, replace) gdcmWarningMacro(#method " was deprecated for " version " and will be removed in a future version. Use " #replace " instead.")
- #define GDCM_NOOP_STATEMENT static_assert(true, "")

11.136.1 Macro Definition Documentation

11.136.1.1 GDCM_LEGACY

```
#define GDCM_LEGACY(
              method ) method;
```

11.136.1.2 GDCM_LEGACY_BODY

```
#define GDCM_LEGACY_BODY(
              method,
              version )  gdcmWarningMacro(#method " was deprecated for " version " and will be
removed in a future version.")
```

11.136.1.3 GDCM_LEGACY_REPLACED_BODY

```
#define GDCM_LEGACY_REPLACED_BODY(
              method,
              version,
              replace )  gdcmWarningMacro(#method " was deprecated for " version " and will be
removed in a future version.  Use " #replace " instead.")
```

11.136.1.4 GDCM_NOOP_STATEMENT

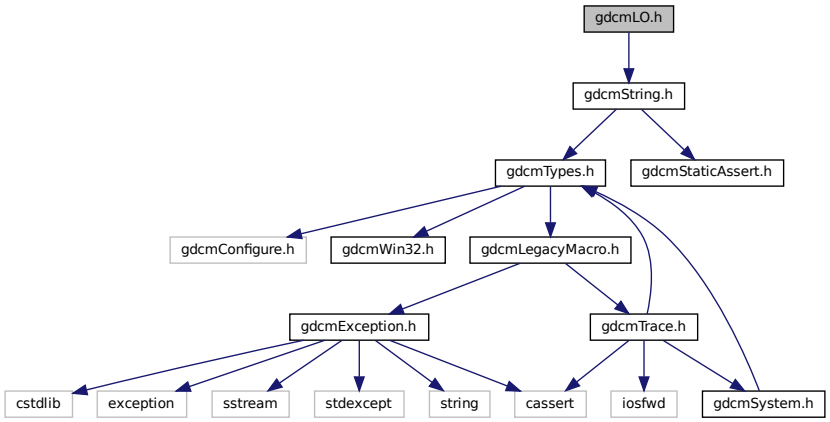
```
#define GDCM_NOOP_STATEMENT static_assert(true, "")
```

The `static_assert(true, "")` idiom is commonly employed for C++11 or greater to ensure that it is compile-time only check that can not be part of the binary file. This allows a macro to be used anywhere that a statement is expected, and to enforce consistent use of ; after a macro. The static_assert is a constexpr that can be used in places where raw statements (i.e. 'do{} while(0)') are not allowed (i.e. after class member function definitions).

11.137 gdcmLO.h File Reference

```
#include "gdcmString.h"
```

Include dependency graph for gdcmLO.h:



Classes

- class gdcm::LO
  LO.

Namespaces

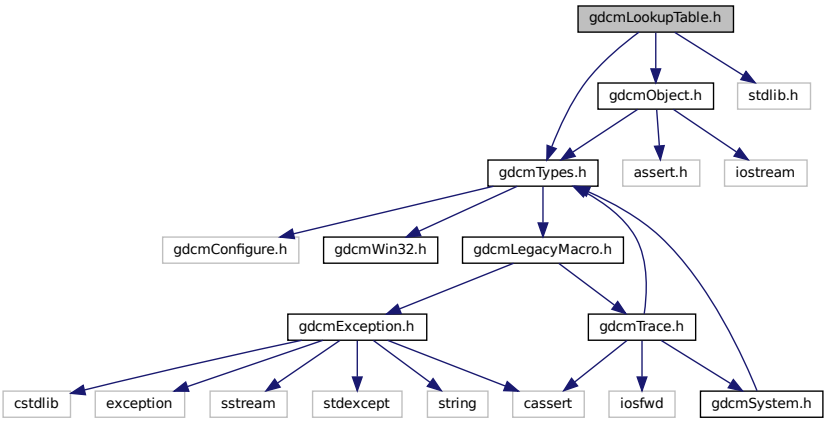
- gdcm

11.138 gdcmLookupTable.h File Reference

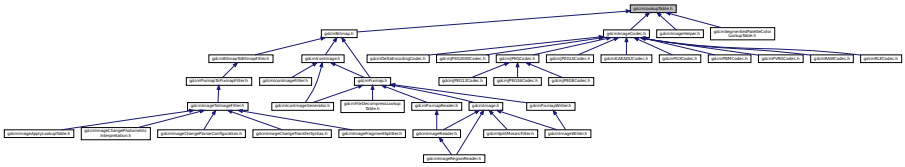
```
#include "gdcmTypes.h"
#include "gdcmObject.h"
```

```
#include <stdlib.h>
```

Include dependency graph for gdcmLookupTable.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::LookupTable

  LookupTable class.

Namespaces

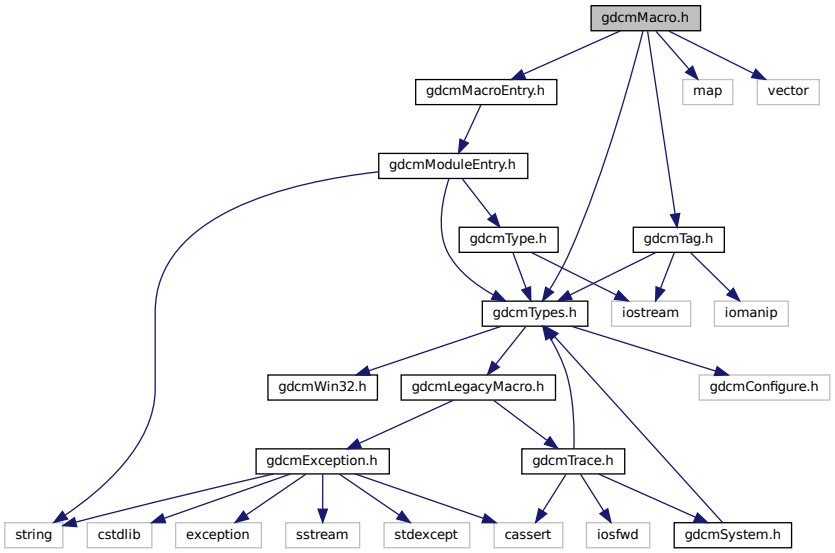
- gdcm

11.139 gdcmMacro.h File Reference

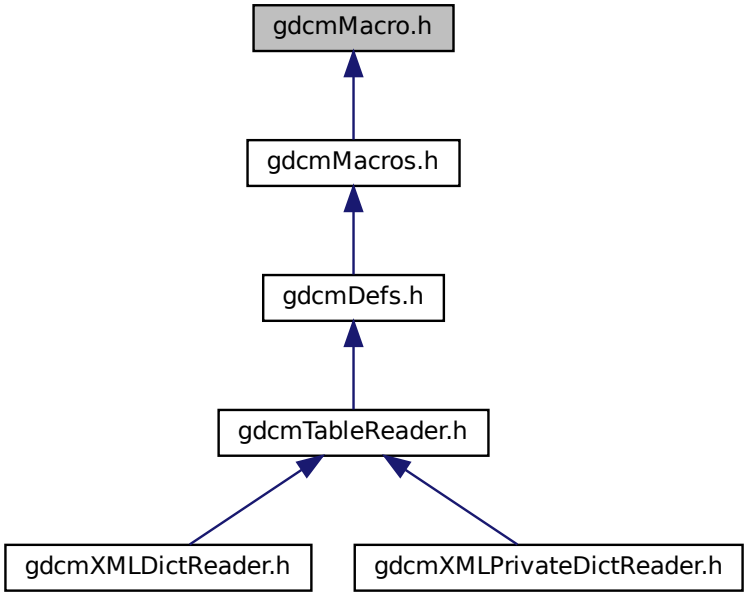
```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmMacroEntry.h"
#include <map>
```

```
#include <vector>
```

Include dependency graph for gdcmMacro.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Macro

  Class for representing a Macro.

Namespaces

- gdcm

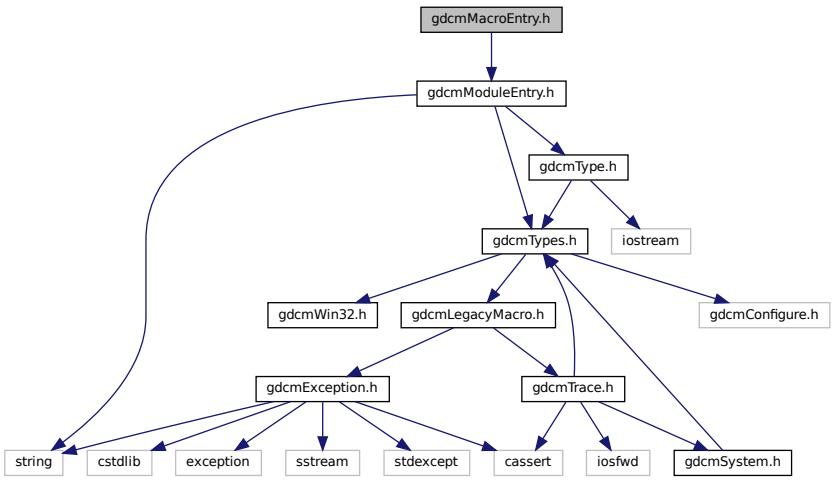
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Macro &_val)

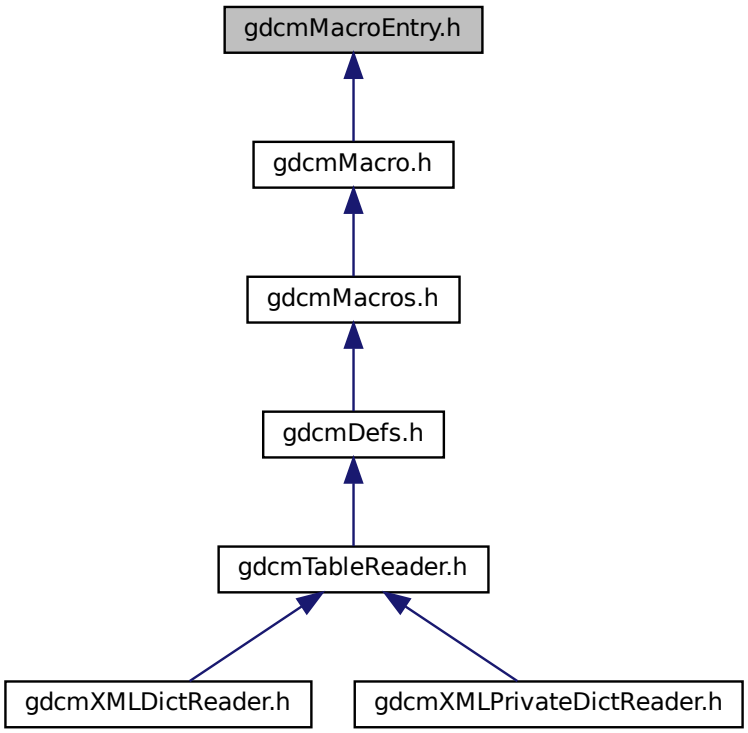
11.140 gdcmMacroEntry.h File Reference

```
#include "gdcmModuleEntry.h"
```

Include dependency graph for gdcmMacroEntry.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define GDCMMACROENTRY_H

11.140.1 Macro Definition Documentation

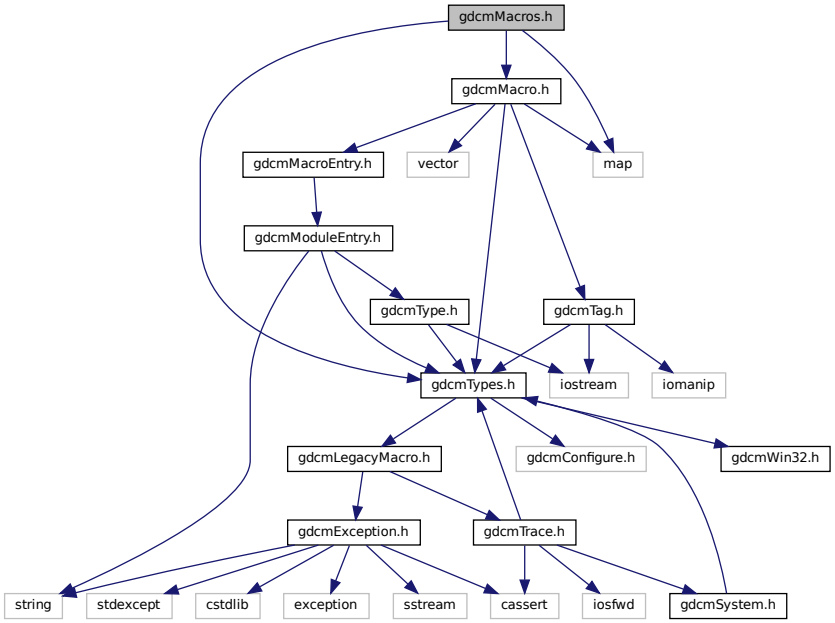
11.140.1.1 GDCMMACROENTRY_H

```
#define GDCMMACROENTRY_H
```

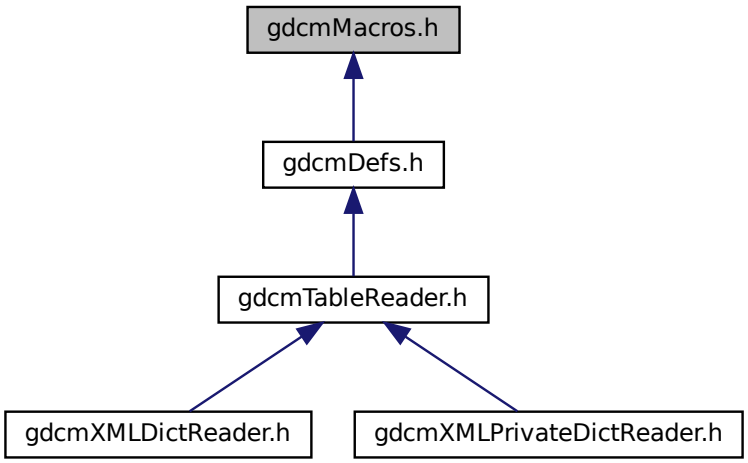
11.141 gdcmMacros.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmMacro.h"
#include <map>
```

Include dependency graph for gdcmMacros.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Macros

  Class for representing a Modules.

Namespaces

- gdcm

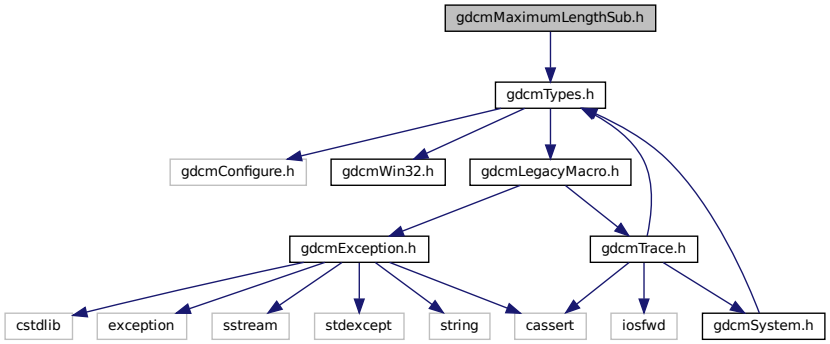
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Macros &_val)

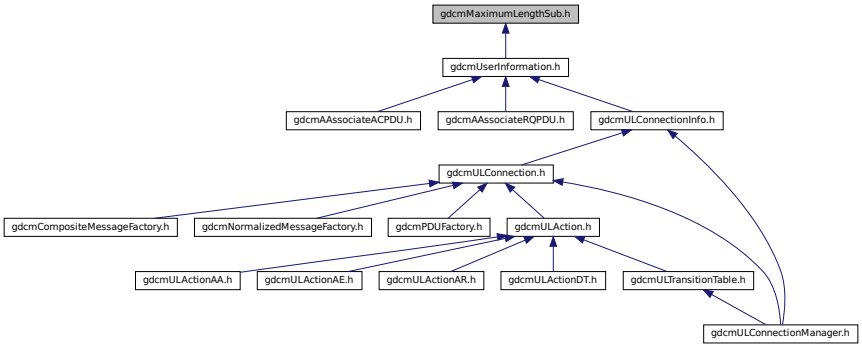
11.142 gdcmMaximumLengthSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmMaximumLengthSub.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::MaximumLengthSub

  MaximumLengthSub.

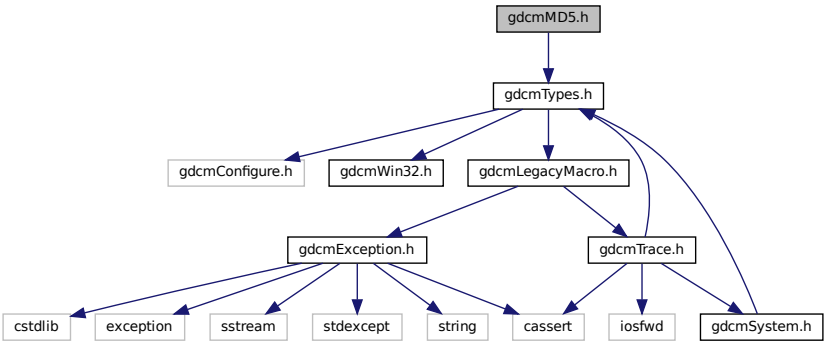
Namespaces

- gdcm
- gdcm::network

11.143 gdcmMD5.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmMD5.h:



Classes

- class gdcm::MD5

  Class for MD5.

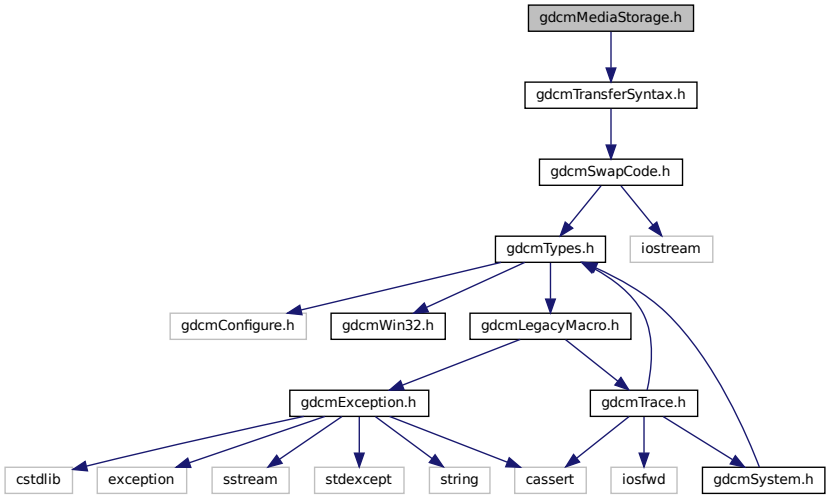
Namespaces

- gdcm

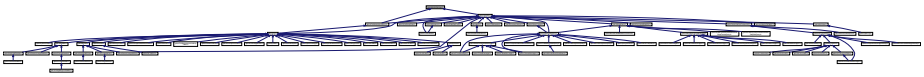
11.144 gdcmMediaStorage.h File Reference

```
#include "gdcmTransferSyntax.h"
```

Include dependency graph for gdcmMediaStorage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::MediaStorage

  MediaStorage.

Namespaces

- gdcm

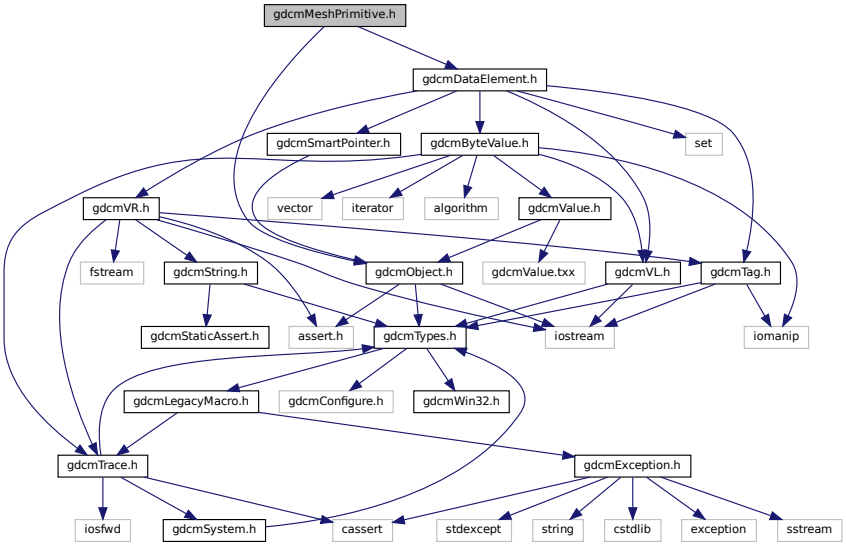
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const MediaStorage &ms)

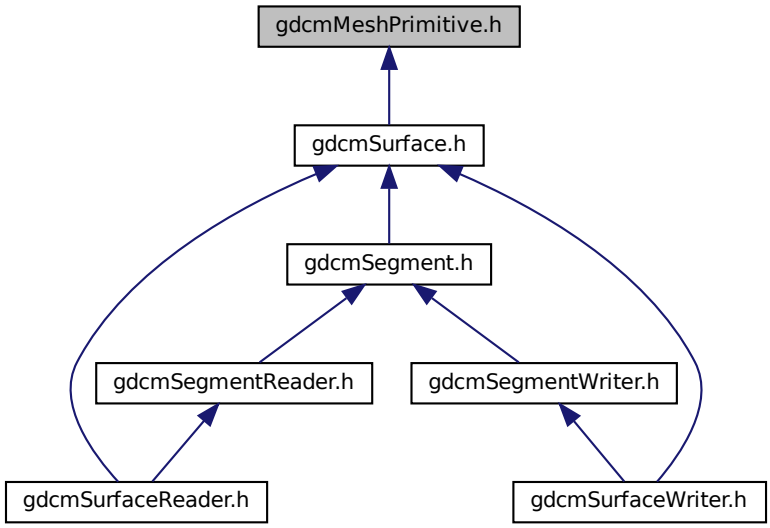
11.145 gdcmMeshPrimitive.h File Reference

```
#include <gdcmObject.h>
#include <gdcmDataElement.h>
```

Include dependency graph for gdcmMeshPrimitive.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::MeshPrimitive

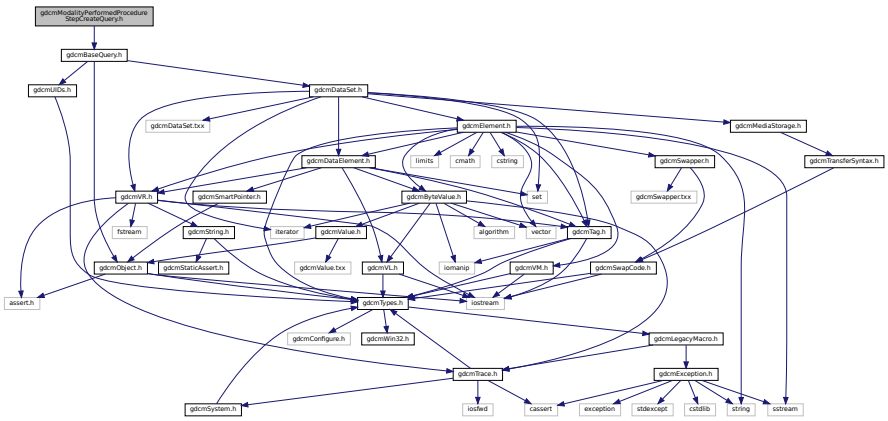
  This class defines surface mesh primitives.

Namespaces

- gdcm

11.146 gdcmModalityPerformedProcedureStepCreateQuery.h File Reference

`#include "gdcmBaseQuery.h"`
Include dependency graph for gdcmModalityPerformedProcedureStepCreateQuery.h:



Classes

- class gdcm::ModalityPerformedProcedureStepCreateQuery

  ModalityPerformedProcedureStepCreateQuery.

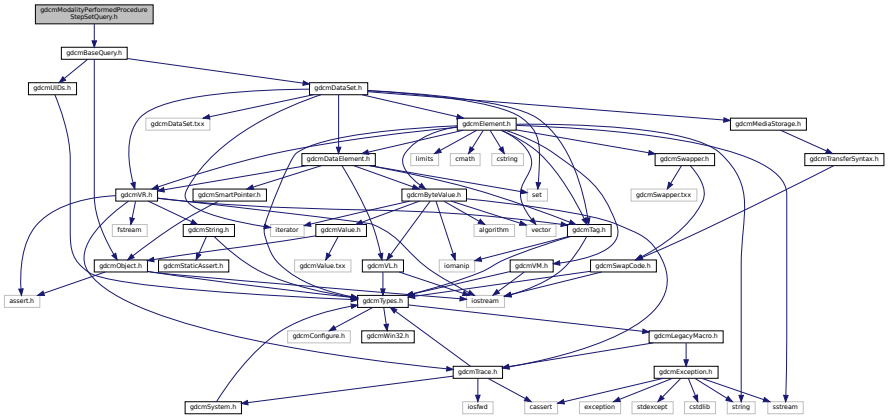
Namespaces

- gdcm

11.147 gdcmModalityPerformedProcedureStepSetQuery.h File Reference

```
#include "gdcmBaseQuery.h"
```

Include dependency graph for gdcmModalityPerformedProcedureStepSetQuery.h:



Classes

- class gdcm::ModalityPerformedProcedureStepSetQuery

  ModalityPerformedProcedureStepSetQuery.

Namespaces

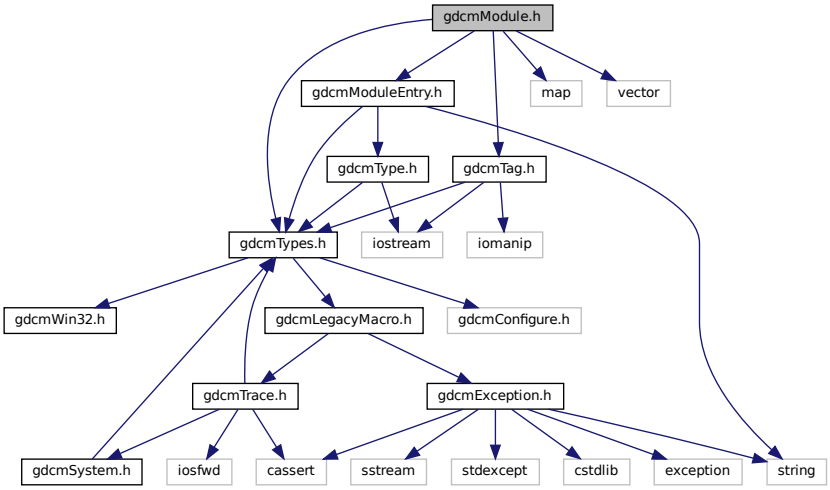
- gdcm

11.148 gdcmModule.h File Reference

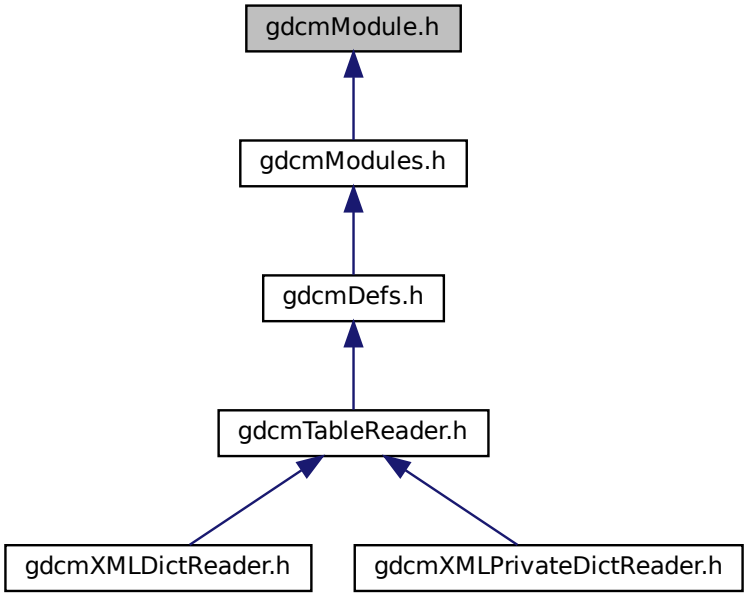
```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmModuleEntry.h"
#include <map>
```

```
#include <vector>
```

Include dependency graph for gdcmModule.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Module

  Class for representing a Module.

Namespaces

- gdcm

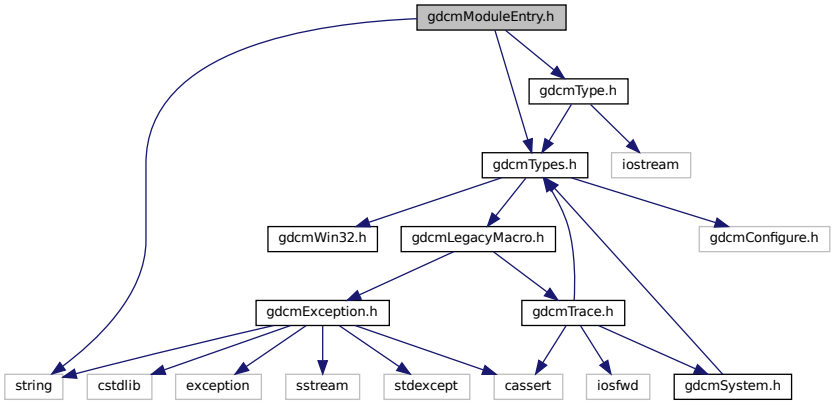
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Module &_val)

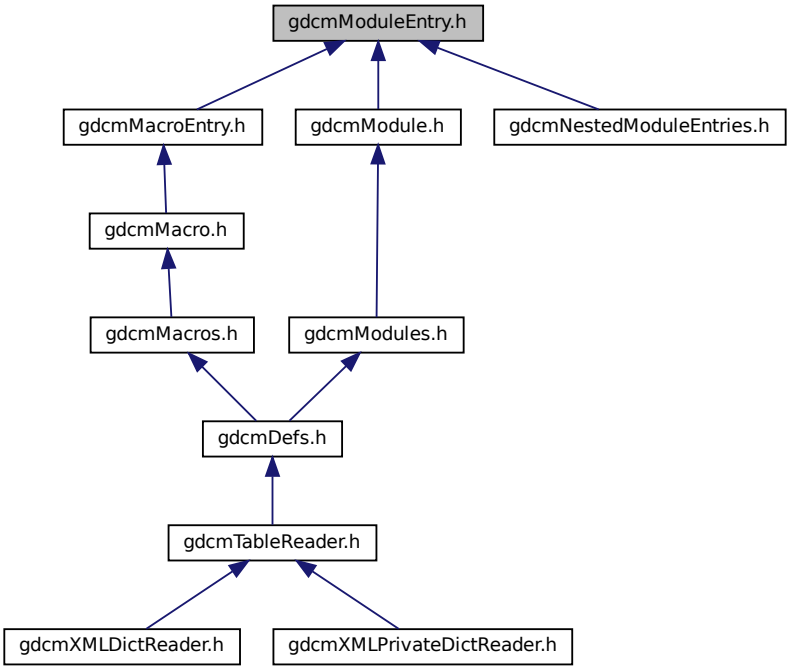
11.149 gdcmModuleEntry.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmType.h"
#include <string>
```

Include dependency graph for gdcmModuleEntry.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ModuleEntry

  Class for representing a ModuleEntry.

Namespaces

- gdcm

Typedefs

- typedef ModuleEntry gdcm::MacroEntry

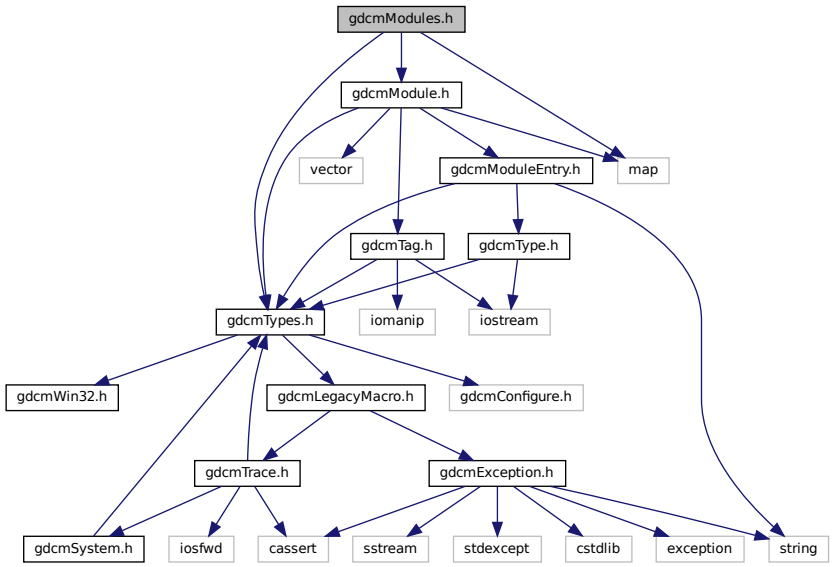
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const ModuleEntry &_val)

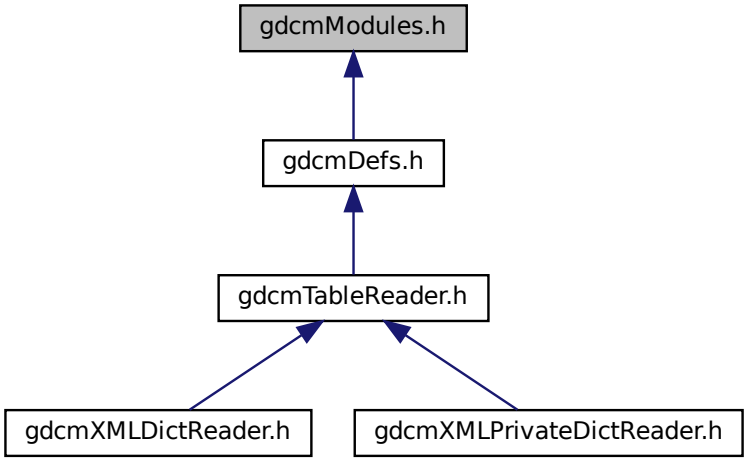
11.150 gdcmModules.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmModule.h"
#include <map>
```

Include dependency graph for gdcmModules.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Modules

  Class for representing a Modules.

Namespaces

- gdcm

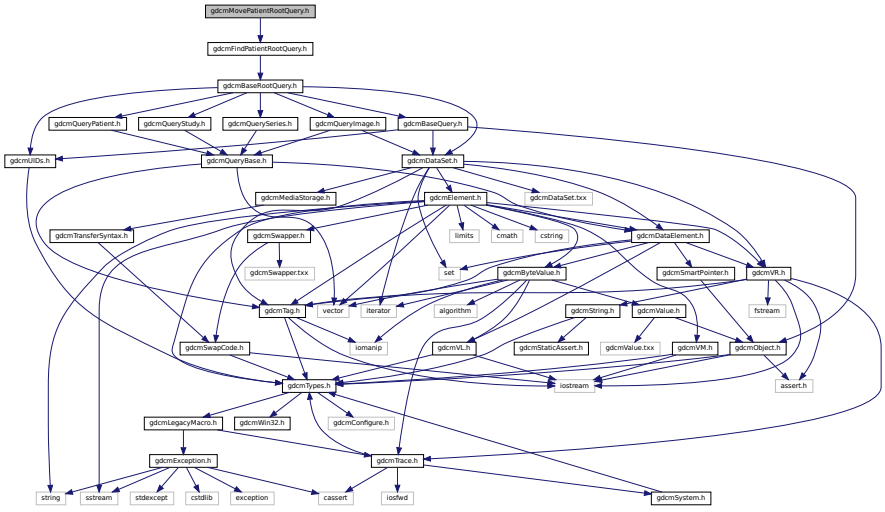
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Modules &_val)

11.151 gdcmMovePatientRootQuery.h File Reference

```
#include "gdcmFindPatientRootQuery.h"
```

Include dependency graph for gdcmMovePatientRootQuery.h:



Classes

- class gdcm::MovePatientRootQuery

  MovePatientRootQuery.

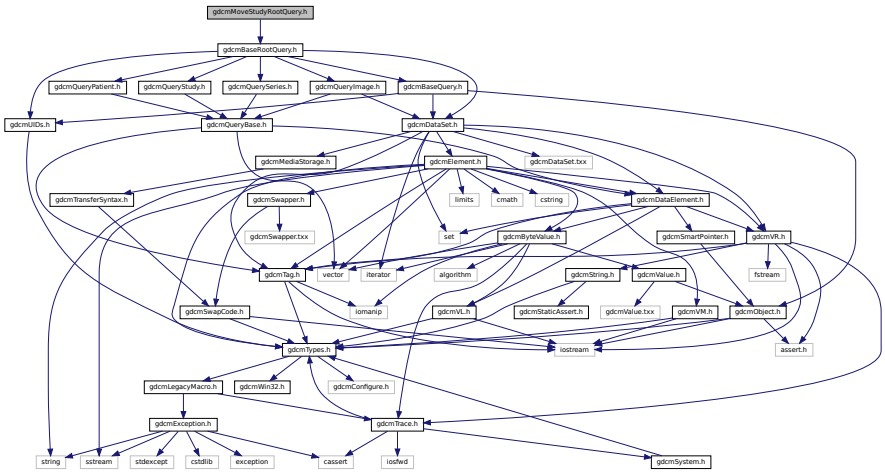
Namespaces

- gdcm

11.152 gdcmMoveStudyRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmMoveStudyRootQuery.h:



Classes

- class gdcm::MoveStudyRootQuery

  MoveStudyRootQuery.

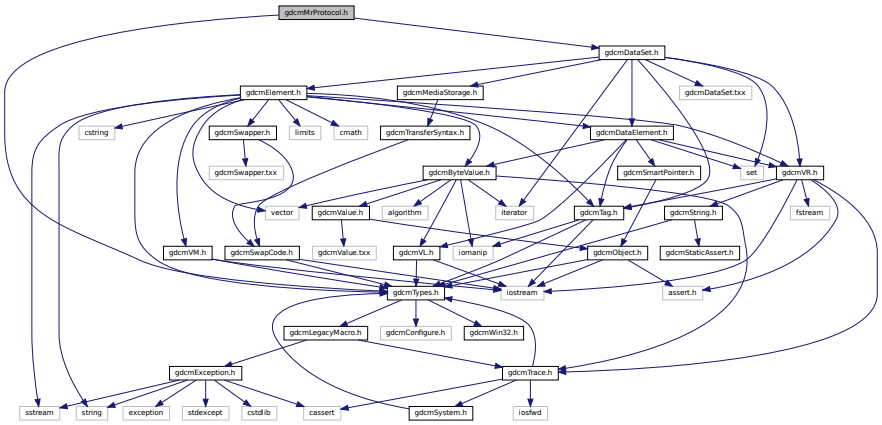
Namespaces

- gdcm

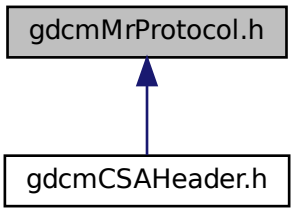
11.153 gdcmMrProtocol.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmMrProtocol.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::MrProtocol

  Class for MrProtocol.
- struct gdcm::MrProtocol::Slice
- struct gdcm::MrProtocol::SliceArray
- struct gdcm::MrProtocol::Vector3

Namespaces

- gdcm

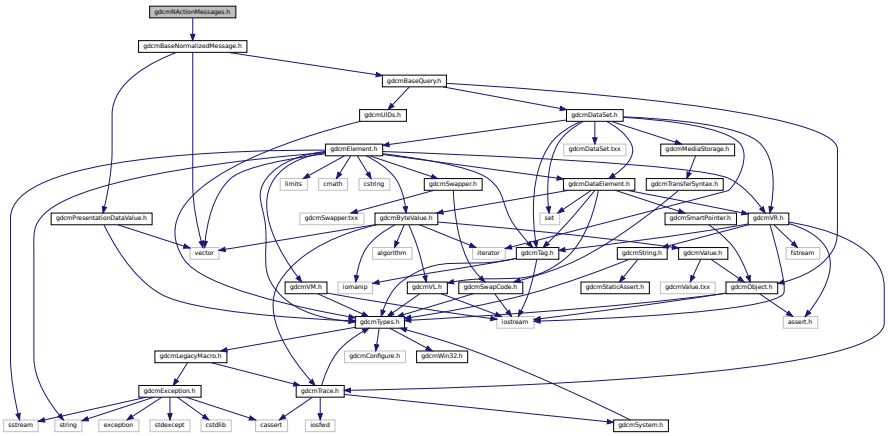
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const MrProtocol &d)

11.154 gdcmNActionMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNActionMessages.h:



Classes

- class gdcm::network::NActionRQ

  NActionRQ.
- class gdcm::network::NActionRSP

  NActionRSP this file defines the messages for the NAction action.

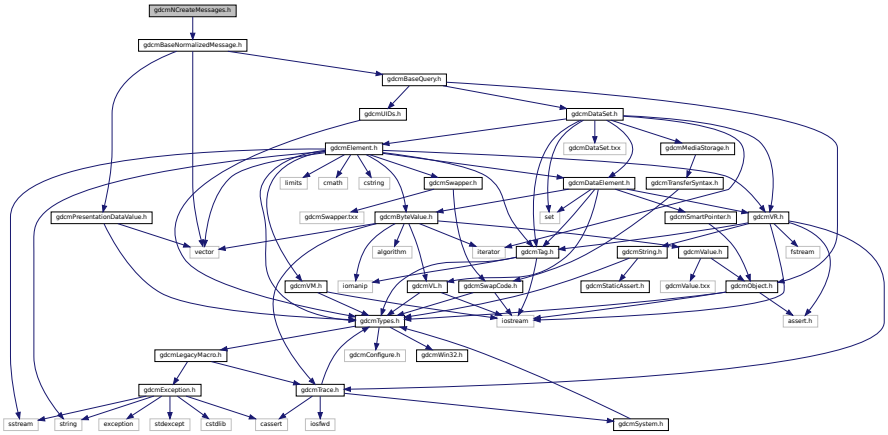
Namespaces

- gdcm
- gdcm::network

11.155 gdcmNCreateMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNCreateMessages.h:



Classes

- class gdcm::network::NCreateRQ

  NCreateRQ.
- class gdcm::network::NCreateRSP

  NCreateRSP this file defines the messages for the ncreate action.

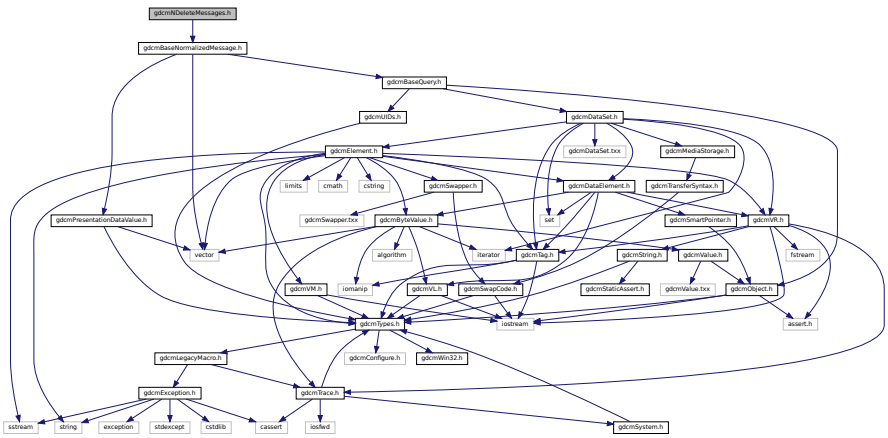
Namespaces

- gdcm
- gdcm::network

11.156 gdcmNDeleteMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNDeleteMessages.h:



Classes

- class gdcm::network::NDeleteRQ

  NDeleteRQ.
- class gdcm::network::NDeleteRSP

  NDeleteRSP this file defines the messages for the ndelete action.

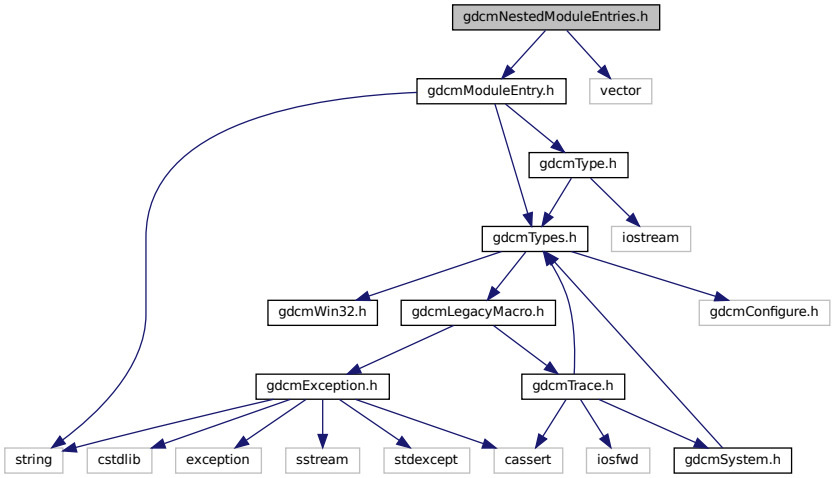
Namespaces

- gdcm
- gdcm::network

11.157 gdcmNestedModuleEntries.h File Reference

```
#include "gdcmModuleEntry.h"
#include <vector>
```

Include dependency graph for gdcmNestedModuleEntries.h:



Classes

- class gdcm::NestedModuleEntries

  Class for representing a NestedModuleEntries.

Namespaces

- gdcm

Typedefs

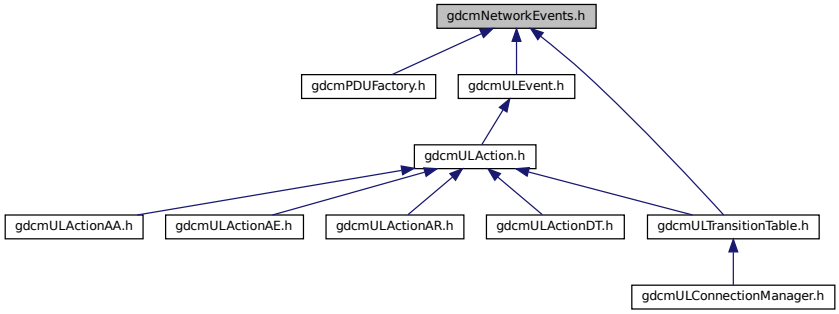
- typedef NestedModuleEntries gdcm::NestedMacroEntries

Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const NestedModuleEntries &_val)

11.158 gdcmNetworkEvents.h File Reference

This graph shows which files directly or indirectly include this file:



Namespaces

- gdcm
- gdcm::network

Enumerations

- enum gdcm::network::EEventID {
  gdcm::network::eAASSOCIATERequestLocalUser = 0 ,
  gdcm::network::eTransportConnConfirmLocal ,
  gdcm::network::eASSOCIATE_ACPDUreceived ,
  gdcm::network::eASSOCIATE_RJPDUreceived ,
  gdcm::network::eTransportConnIndicLocal ,
  gdcm::network::eAASSOCIATE_RQPDUreceived ,
  gdcm::network::eAASSOCIATEresponseAccept ,
  gdcm::network::eAASSOCIATEresponseReject ,
  gdcm::network::ePDATArequest ,
  gdcm::network::ePDATATFPDU ,
  gdcm::network::eARELEASERequest ,
  gdcm::network::eARELEASE_RQPDUReceivedOpen ,
  gdcm::network::eARELEASE_RPPDUReceived ,

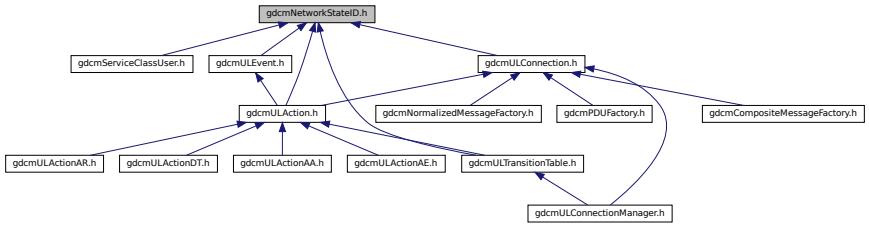
gdcm::network::eARELEASEResponse ,
gdcm::network::eAABORTRequest ,
gdcm::network::eAABORTPDUReceivedOpen ,
gdcm::network::eTransportConnectionClosed ,
gdcm::network::eARTIMTimerExpired ,
gdcm::network::eUnrecognizedPDUReceived ,
gdcm::network::eEventDoesNotExist }

Variables

- const int gdcm::network::cMaxEventID = eEventDoesNotExist

11.159 gdcmNetworkStateID.h File Reference

This graph shows which files directly or indirectly include this file:



Namespaces

- gdcm
- gdcm::network

Enumerations

- enum gdcm::network::EStateID {
  gdcm::network::eStaDoesNotExist = 0 ,
  gdcm::network::eSta1Idle = 1 ,
  gdcm::network::eSta2Open = 2 ,
  gdcm::network::eSta3WaitLocalAssoc = 4 ,
  gdcm::network::eSta4LocalAssocDone = 8 ,
  gdcm::network::eSta5WaitRemoteAssoc = 16 ,
  gdcm::network::eSta6TransferReady = 32 ,
  gdcm::network::eSta7WaitRelease = 64 ,
  gdcm::network::eSta8WaitLocalRelease = 128 ,
  gdcm::network::eSta9ReleaseCollisionRqLocal = 256 ,
  gdcm::network::eSta10ReleaseCollisionAc = 512 ,
  gdcm::network::eSta11ReleaseCollisionRq = 1024 ,
  gdcm::network::eSta12ReleaseCollisionAcLocal = 2048 ,
  gdcm::network::eSta13AwaitingClose = 4096 }

Functions

- int gdcm::network::GetStateIndex (EStateID inState)

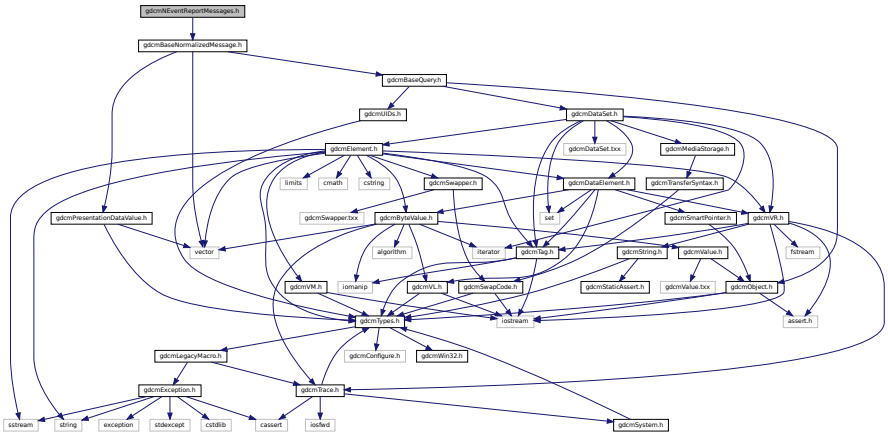
Variables

- const int gdcm::network::cMaxStateID = 13

11.160 gdcmNEventReportMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNEventReportMessages.h:



Classes

- class gdcm::network::NEventReportRQ

  NEventReportRQ.
- class gdcm::network::NEventReportRSP

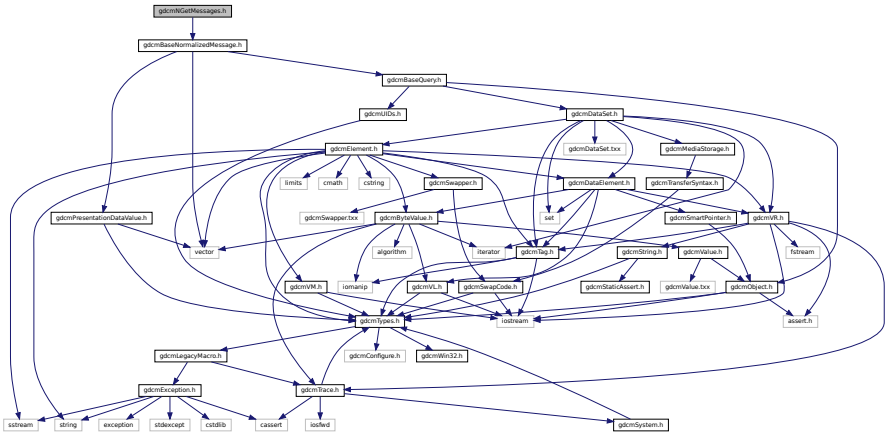
  NEventReportRSP this file defines the messages for the neventreport action.

Namespaces

- gdcm
- gdcm::network

11.161 gdcmNGetMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```
Include dependency graph for gdcmNGetMessages.h:



Classes

- class gdcm::network::NGetRQ

  NGetRQ.
- class gdcm::network::NGetRSP

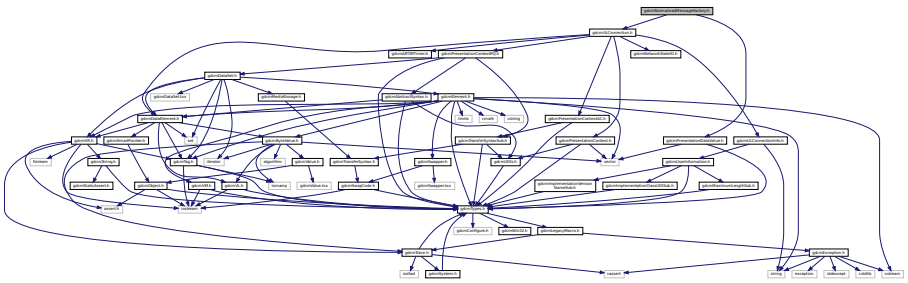
  NGetRSP this file defines the messages for the nget action.

Namespaces

- gdcm
- gdcm::network

11.162 gdcmNormalizedMessageFactory.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnection.h"
```
Include dependency graph for gdcmNormalizedMessageFactory.h:



Classes

- class gdcm::network::NormalizedMessageFactory

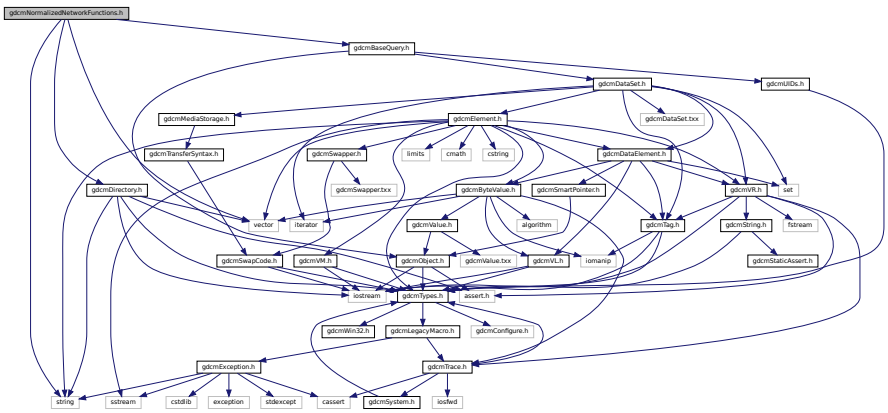
Namespaces

- gdcm
- gdcm::network

11.163 gdcmNormalizedNetworkFunctions.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmBaseQuery.h"
#include <vector>
#include <string>
```

Include dependency graph for gdcmNormalizedNetworkFunctions.h:



Classes

- class gdcm::NormalizedNetworkFunctions

  Normalized Network Functions.

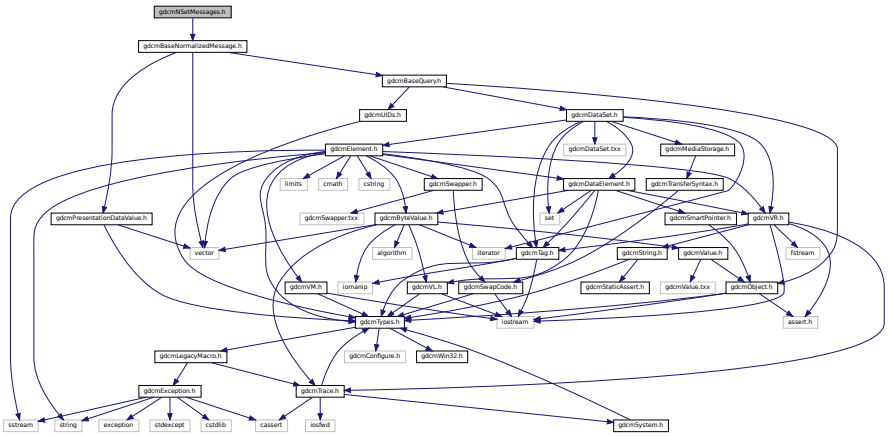
Namespaces

- gdcm

11.164 gdcmNSetMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNSetMessages.h:



Classes

- class gdcm::network::NSetRQ

  NSetRQ.
- class gdcm::network::NSetRSP

  NSetRSP this file defines the messages for the nset action.

Namespaces

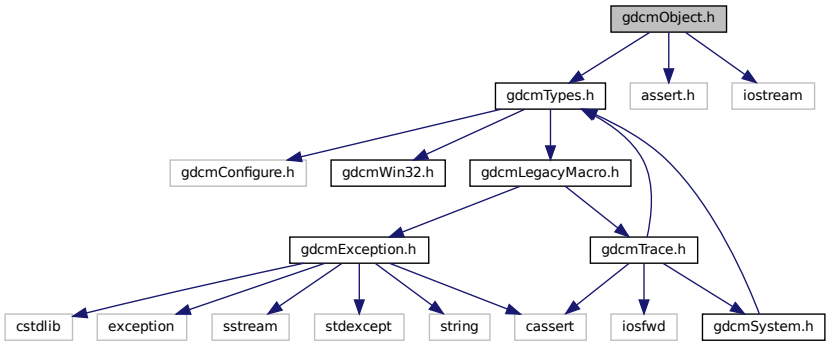
- gdcm
- gdcm::network

11.165 gdcmObject.h File Reference

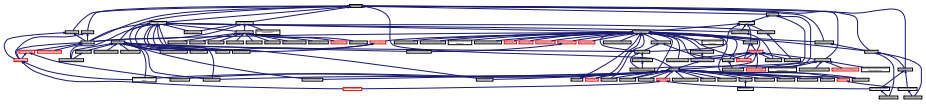
```
#include "gdcmTypes.h"
#include <assert.h>
```

```
#include <iostream>
```

Include dependency graph for gdcmObject.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Object

  Object.

Namespaces

- gdcm

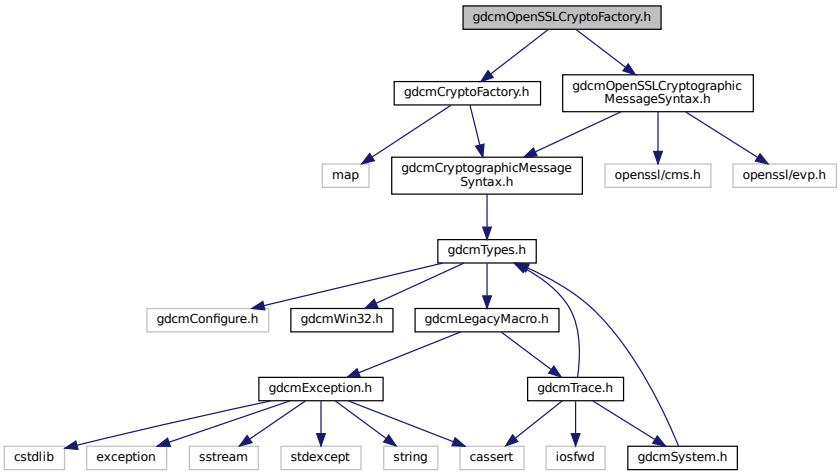
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Object &obj)

11.166 gdcmOpenSSLCryptoFactory.h File Reference

```
#include "gdcmCryptoFactory.h"
#include "gdcmOpenSSLCryptographicMessageSyntax.h"
```

Include dependency graph for gdcmOpenSSLCryptoFactory.h:



Classes

- class gdcm::OpenSSLCryptoFactory

Namespaces

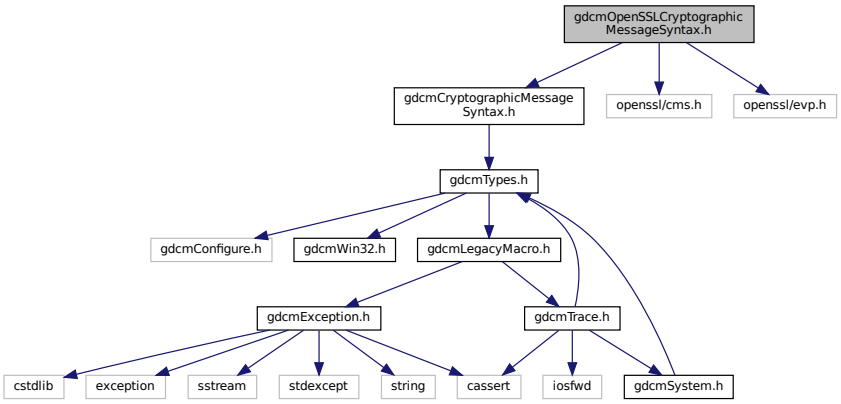
- gdcm

11.167 gdcmOpenSSLCryptographicMessageSyntax.h File Reference

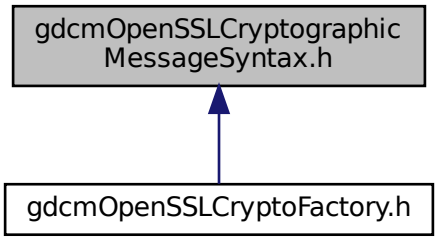
```
#include "gdcmCryptographicMessageSyntax.h"
#include <openssl/cms.h>
```

```
#include <openssl/evp.h>
```

Include dependency graph for gdcmOpenSSLCryptographicMessageSyntax.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::OpenSSLCryptographicMessageSyntax

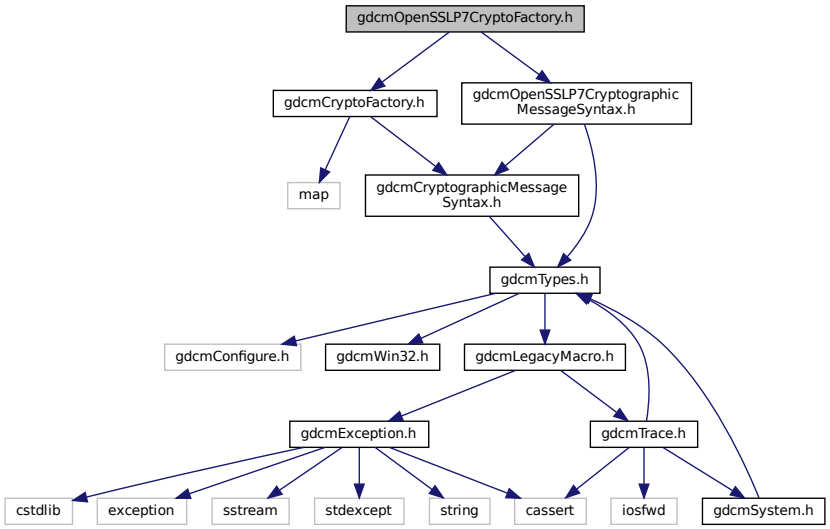
Namespaces

- gdcm

11.168 gdcmOpenSSLP7CryptoFactory.h File Reference

```
#include "gdcmCryptoFactory.h"
#include "gdcmOpenSSLP7CryptographicMessageSyntax.h"
```

Include dependency graph for gdcmOpenSSLP7CryptoFactory.h:



Classes

- class gdcm::OpenSSLP7CryptoFactory

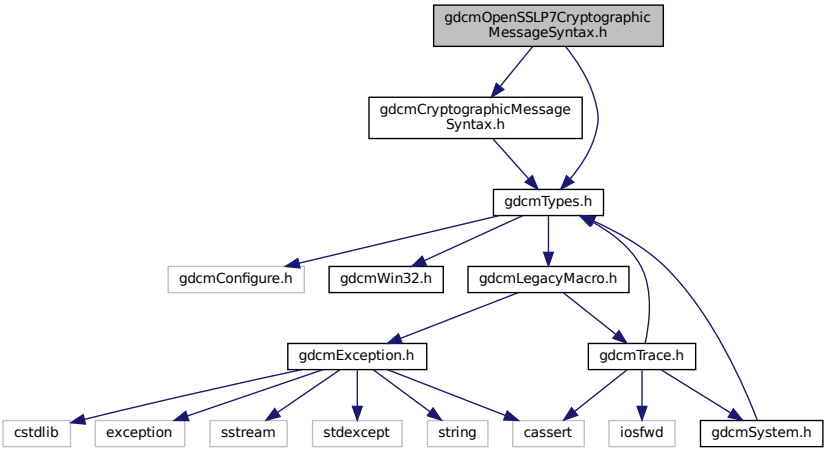
Namespaces

- gdcm

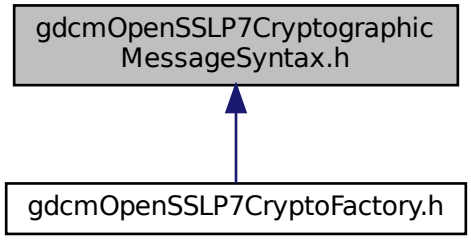
11.169 gdcmOpenSSLP7CryptographicMessageSyntax.h File Reference

```
#include "gdcmCryptographicMessageSyntax.h"
#include "gdcmTypes.h"
```

Include dependency graph for gdcmOpenSSLP7CryptographicMessageSyntax.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::OpenSSLP7CryptographicMessageSyntax

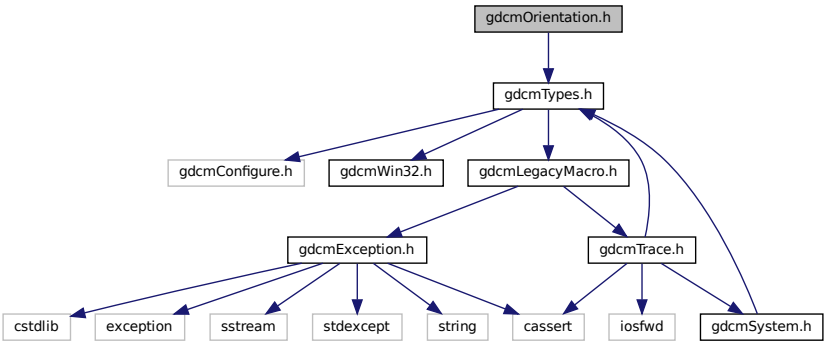
Namespaces

- gdcm

11.170 gdcmOrientation.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmOrientation.h:



Classes

- class gdcm::Orientation

  class to handle Orientation

Namespaces

- gdcm

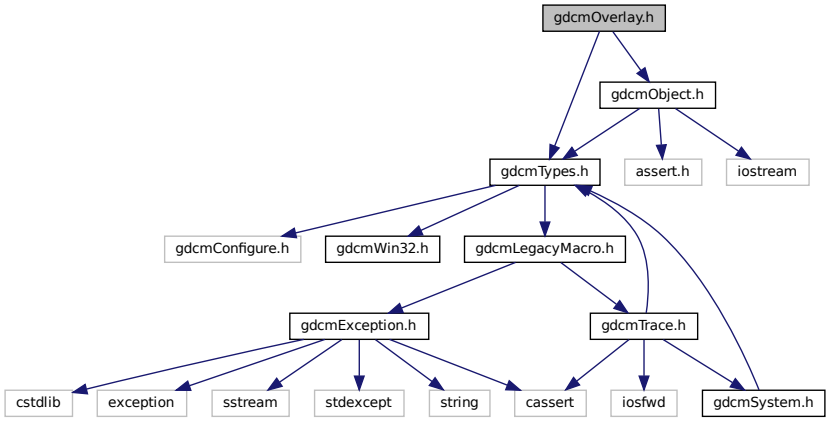
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Orientation &o)

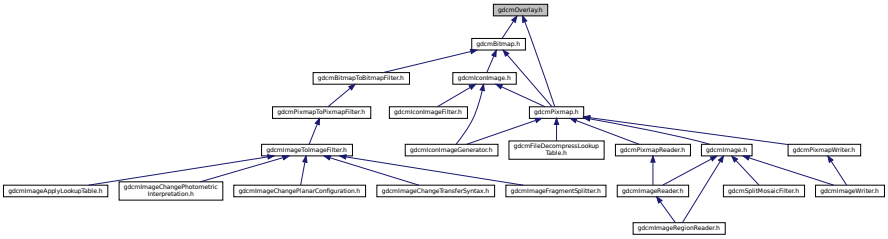
11.171 gdcmOverlay.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmObject.h"
```

Include dependency graph for gdcmOverlay.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Overlay

  Overlay class.

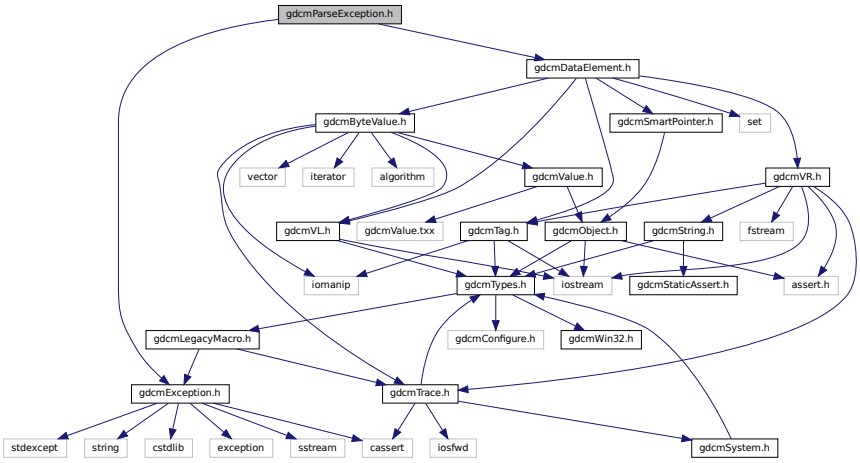
Namespaces

- gdcm

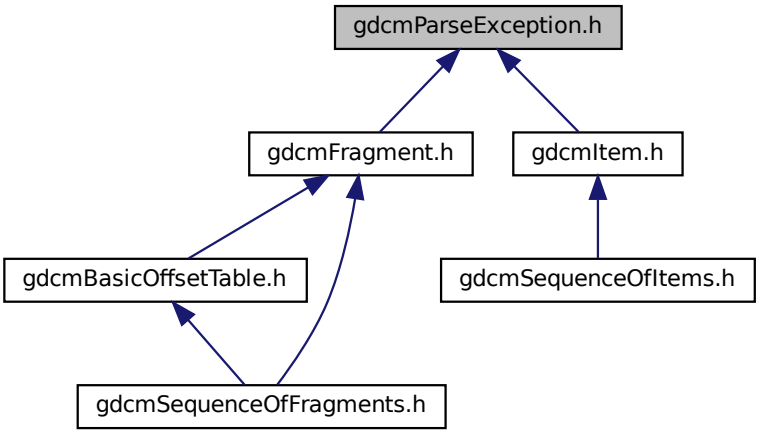
11.172 gdcmParseException.h File Reference

```
#include "gdcmException.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmParseException.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::ParseException

  ParseException *Standard exception handling object.*

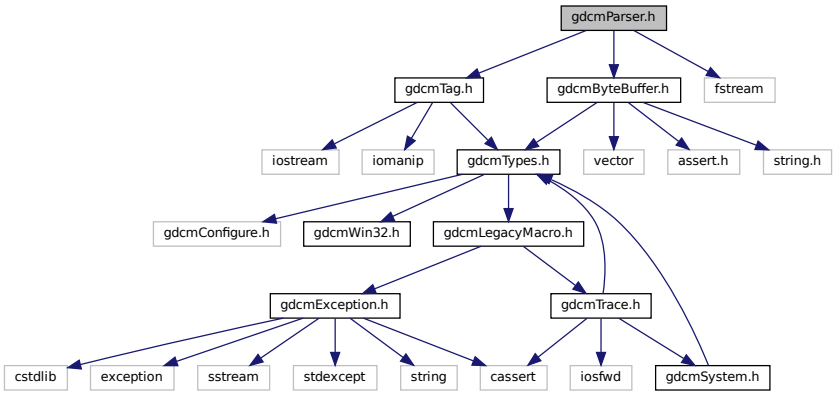
Namespaces

- gdcm

11.173 gdcmParser.h File Reference

```
#include "gdcmTag.h"
#include "gdcmByteBuffer.h"
#include <fstream>
```

Include dependency graph for gdcmParser.h:



Classes

- class gdcm::Parser

  Parser ala XML_Parser from expat (SAX)

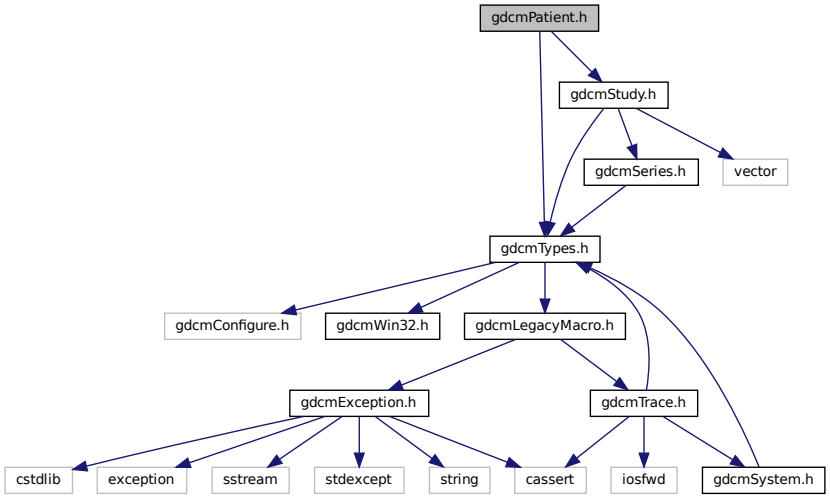
Namespaces

- gdcm

11.174 gdcmPatient.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmStudy.h"
```

Include dependency graph for gdcmPatient.h:



Classes

- class gdcm::Patient

  See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

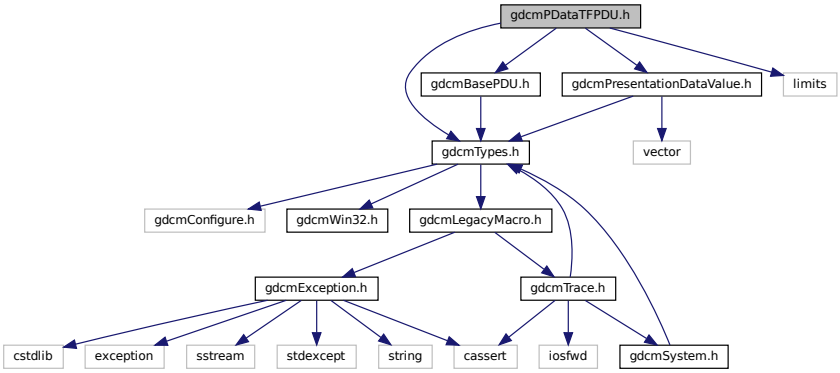
Namespaces

- gdcm

11.175 gdcmPDataTFPDU.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmBasePDU.h"
#include <limits>
```

Include dependency graph for gdcmPDataTFPDU.h:



Classes

- class gdcm::network::PDataTFPDU

  PDataTFPDU.

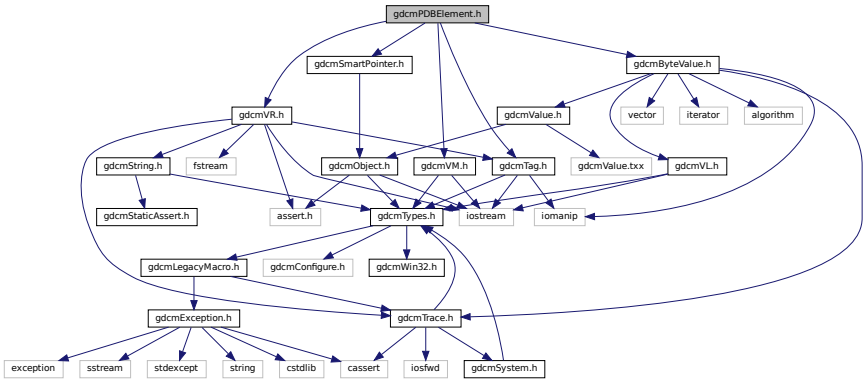
Namespaces

- gdcm
- gdcm::network

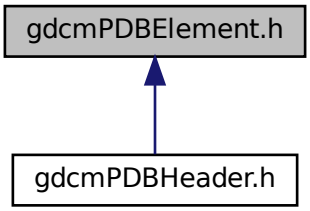
11.176 gdcmPDBElement.h File Reference

```
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmPDBElement.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PDBElement

  Class to represent a PDB Element.

Namespaces

- gdcm

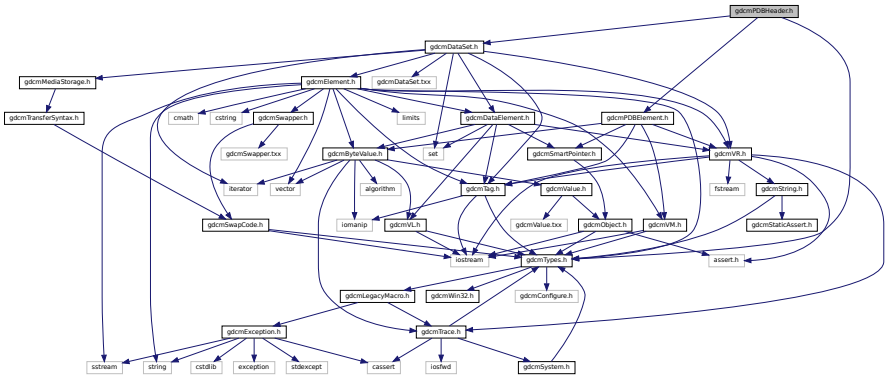
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const PDBElement &val)

11.177 gdcmPDBHeader.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDataSet.h"
#include "gdcmPDBElement.h"
```

Include dependency graph for gdcmPDBHeader.h:



Classes

- class gdcm::PDBHeader

  Class for PDBHeader.

Namespaces

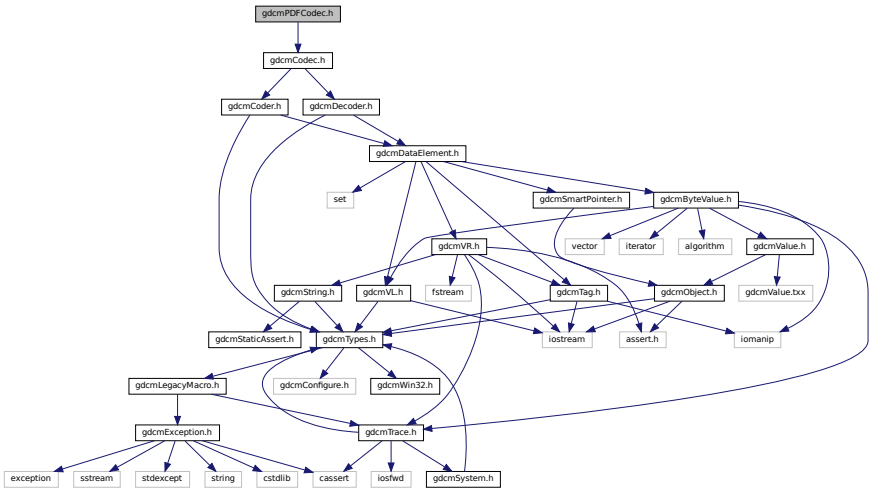
- gdcm

Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const PDBHeader &d)

11.178 gdcmPDFCodec.h File Reference

`#include "gdcmCodec.h"`
Include dependency graph for gdcmPDFCodec.h:



Classes

- class gdcm::PDFCodec

  PDFCodec class.

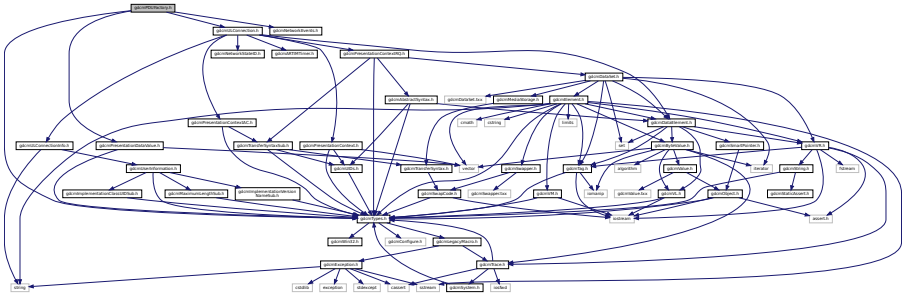
Namespaces

- gdcm

11.179 gdcmPDUFactory.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmNetworkEvents.h"
#include "gdcmULConnection.h"
#include "gdcmPresentationDataValue.h"
```

Include dependency graph for gdcmPDUFactory.h:



Classes

- class gdcm::network::PDUFactory

  PDUFactory basically, given an initial byte, construct the.

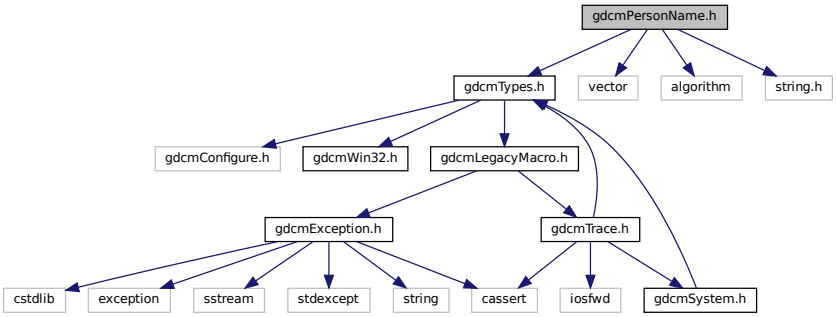
Namespaces

- gdcm
- gdcm::network

11.180 gdcmPersonName.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
#include <algorithm>
#include <string.h>
```

Include dependency graph for gdcmPersonName.h:



Classes

- class gdcm::PersonName

  PersonName class.

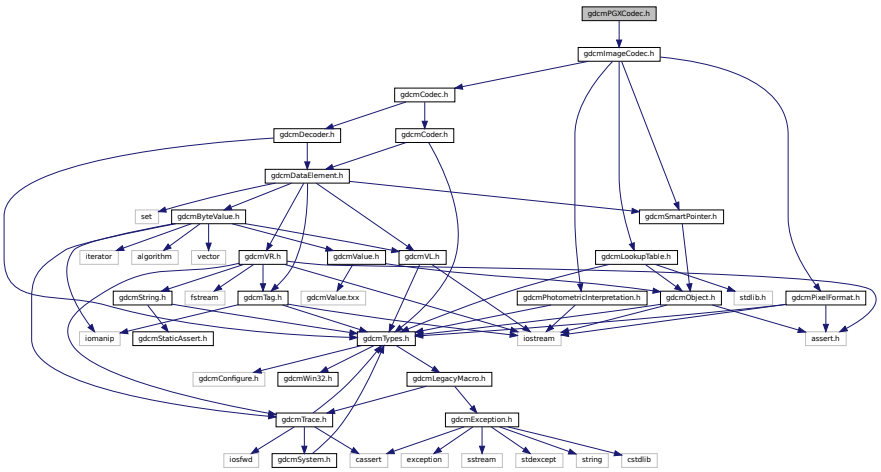
Namespaces

- gdcm

11.181 gdcmPGXCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmPGXCodec.h:



Classes

- class gdcm::PGXCodec

  Class to do PGX.

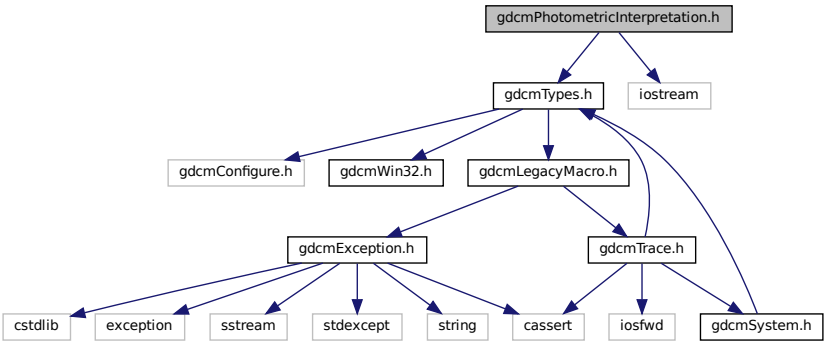
Namespaces

- gdcm

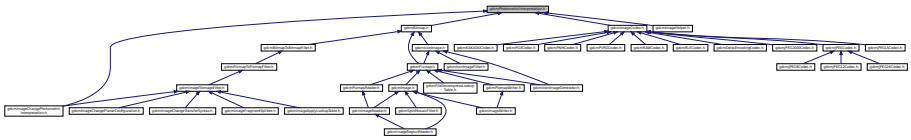
11.182 gdcmPhotometricInterpretation.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmPhotometricInterpretation.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PhotometricInterpretation

  Class to represent an PhotometricInterpretation.

Namespaces

- gdcm

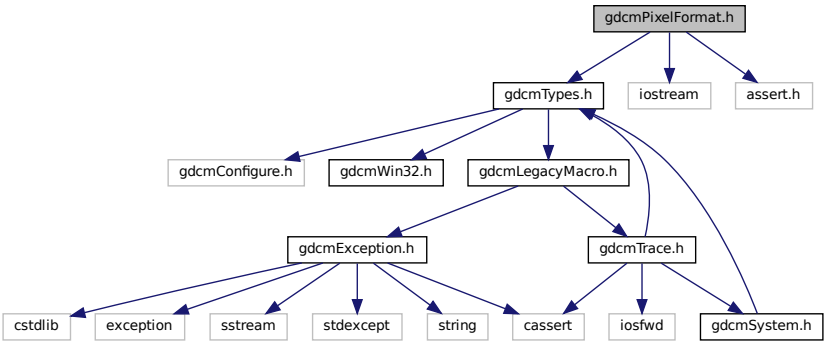
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const PhotometricInterpretation &val)

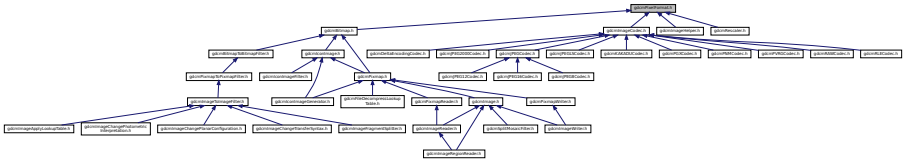
11.183 gdcmPixelFormat.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
#include <assert.h>
```

Include dependency graph for gdcmPixelFormat.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PixelFormat

  PixelFormat.

Namespaces

- gdcm

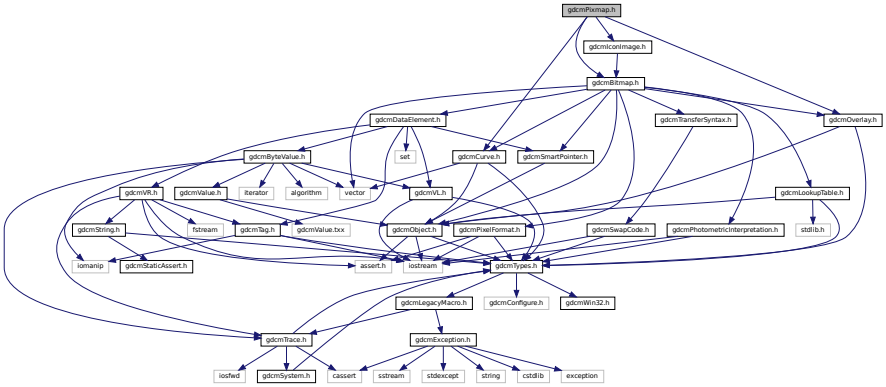
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const PixelFormat &pf)

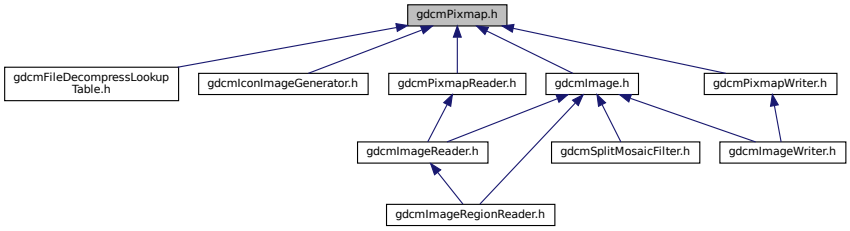
11.184 gdcmPixmap.h File Reference

```
#include "gdcmBitmap.h"
#include "gdcmCurve.h"
#include "gdcmIconImage.h"
#include "gdcmOverlay.h"
```

Include dependency graph for gdcmPixmap.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Pixmap

  Pixmap class.

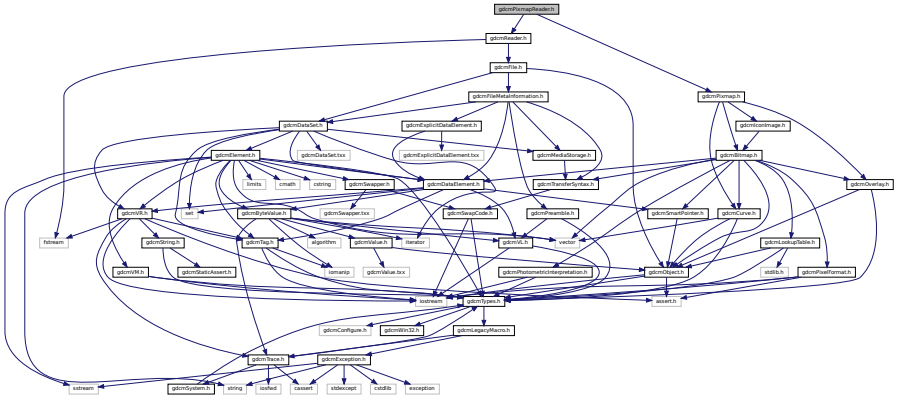
Namespaces

- gdcm

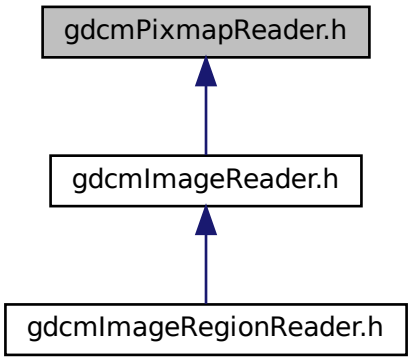
11.185 gdcmPixmapReader.h File Reference

```
#include "gdcmReader.h"
#include "gdcmPixmap.h"
```

Include dependency graph for gdcmPixmapReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PixmapReader

  PixmapReader.

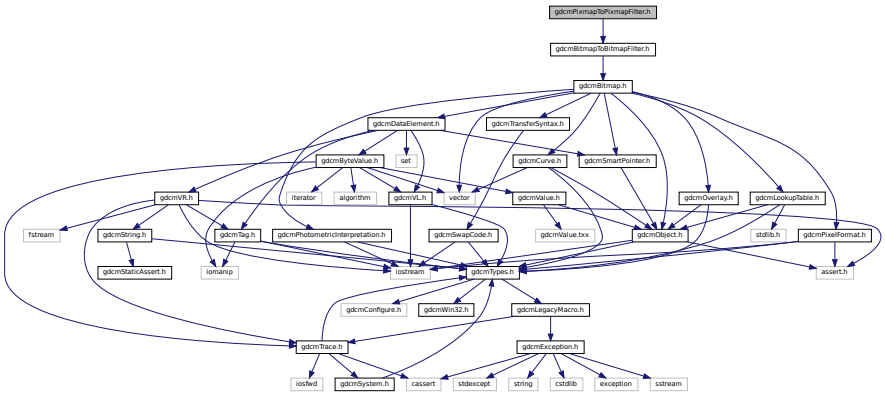
Namespaces

- gdcm

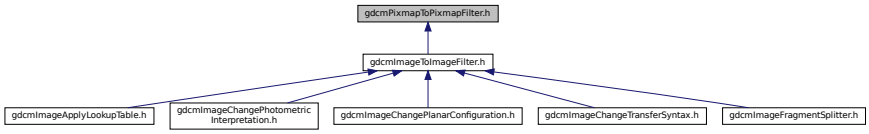
11.186 gdcmPixmapToPixmapFilter.h File Reference

```
#include "gdcmBitmapToBitmapFilter.h"
```

Include dependency graph for gdcmPixmapToPixmapFilter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PixmapToPixmapFilter

  PixmapToPixmapFilter class.

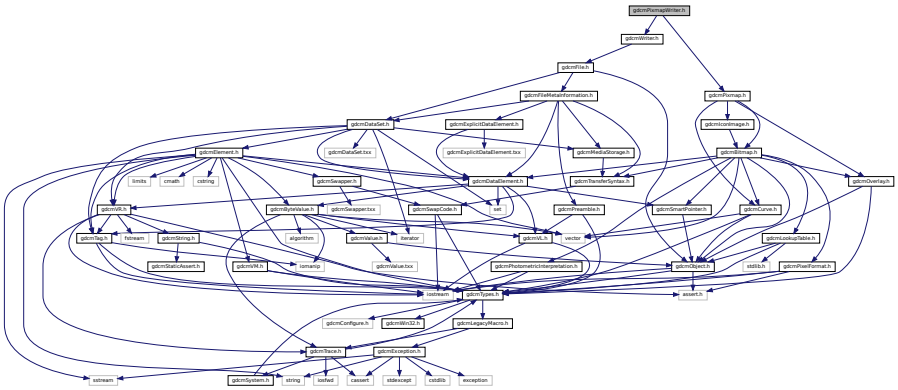
Namespaces

- gdcm

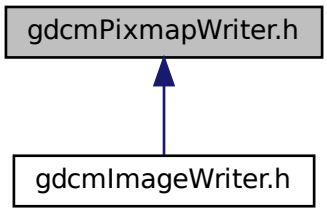
11.187 gdcmPixmapWriter.h File Reference

```
#include "gdcmWriter.h"
#include "gdcmPixmap.h"
```

Include dependency graph for gdcmPixmapWriter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PixmapWriter
  PixmapWriter.

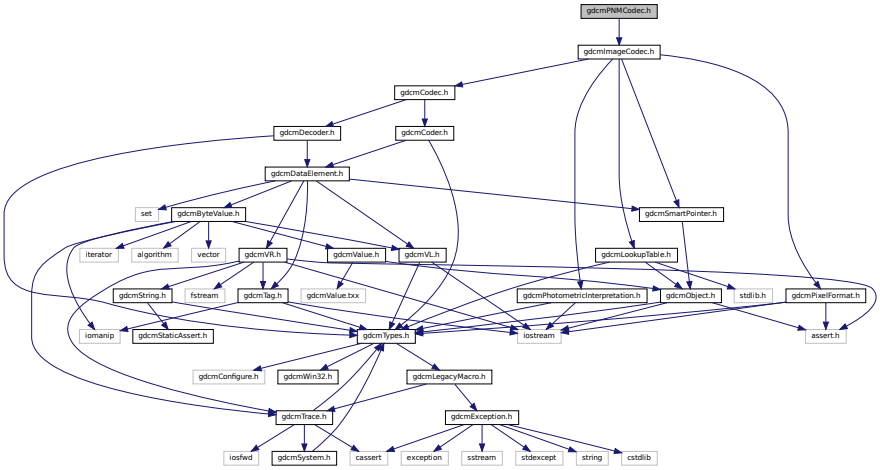
Namespaces

- gdcm

11.188 gdcmPNMCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmPNMCodec.h:



Classes

- class gdcm::PNMCodec

  Class to do PNM.

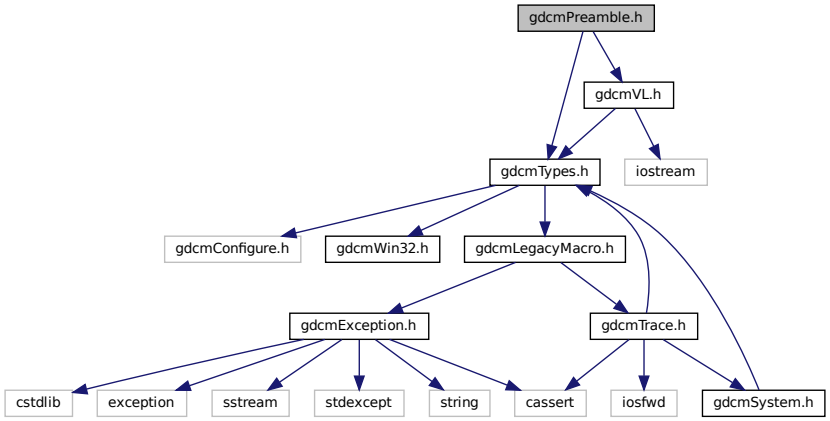
Namespaces

- gdcm

11.189 gdcmPreamble.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVL.h"
```

Include dependency graph for gdcmPreamble.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::Preamble

  DICOM Preamble (Part 10)

Namespaces

- gdcm

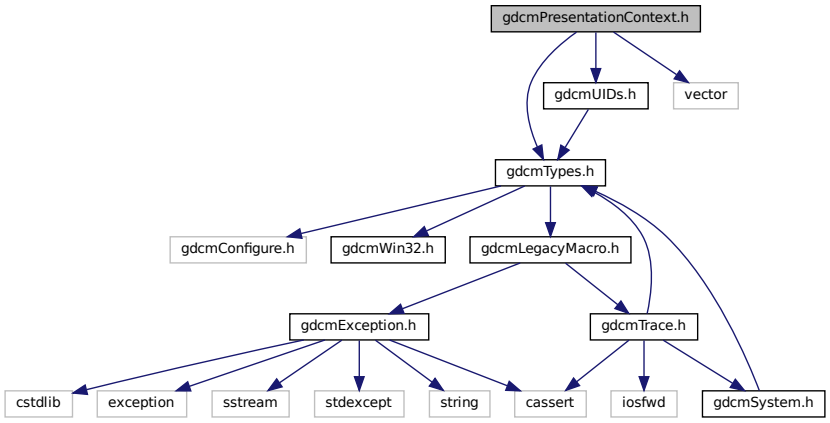
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Preamble &val)

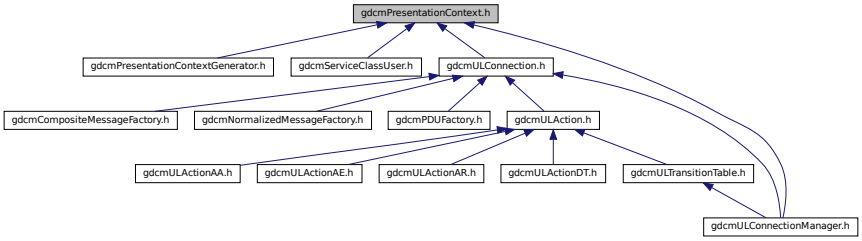
11.190 gdcmPresentationContext.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmUIDs.h"
#include <vector>
```

Include dependency graph for gdcmPresentationContext.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PresentationContext

  PresentationContext.

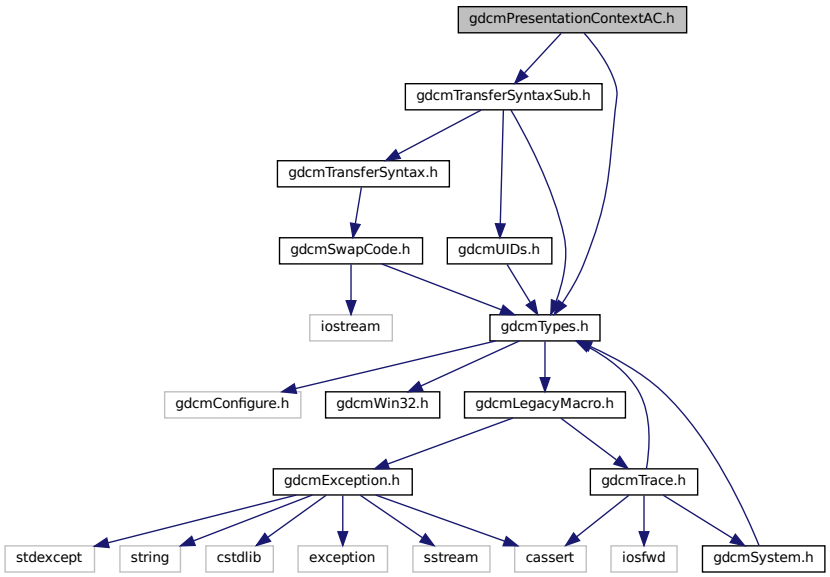
Namespaces

- gdcm

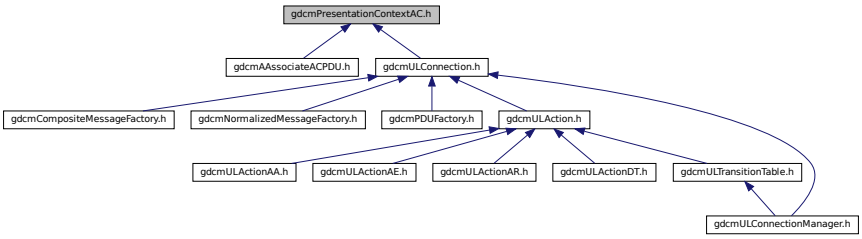
11.191 gdcmPresentationContextAC.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTransferSyntaxSub.h"
```

Include dependency graph for gdcmPresentationContextAC.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::PresentationContextAC
  PresentationContextAC.

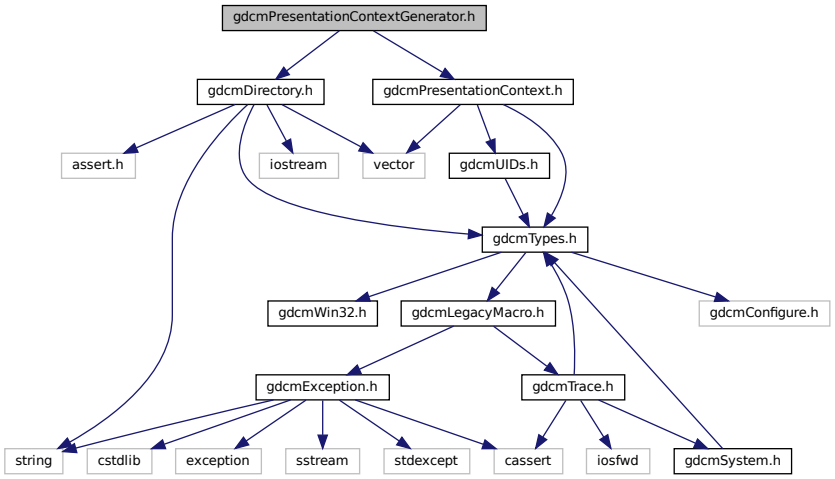
Namespaces

- gdcm
- gdcm::network

11.192 gdcmPresentationContextGenerator.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmPresentationContext.h"
```

Include dependency graph for gdcmPresentationContextGenerator.h:



Classes

- class gdcm::PresentationContextGenerator

  PresentationContextGenerator.

Namespaces

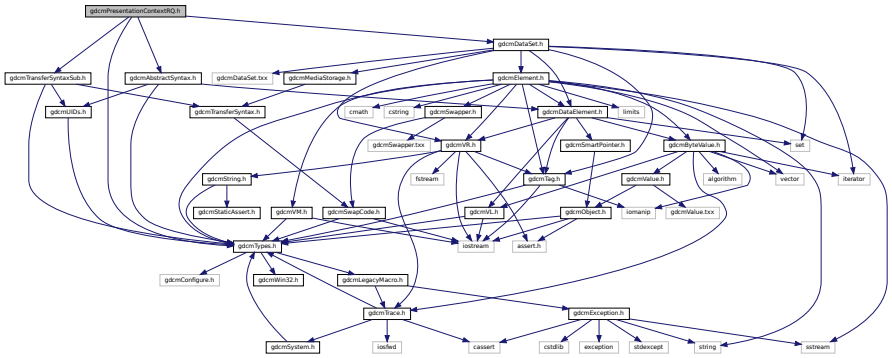
- gdcm

11.193 gdcmPresentationContextRQ.h File Reference

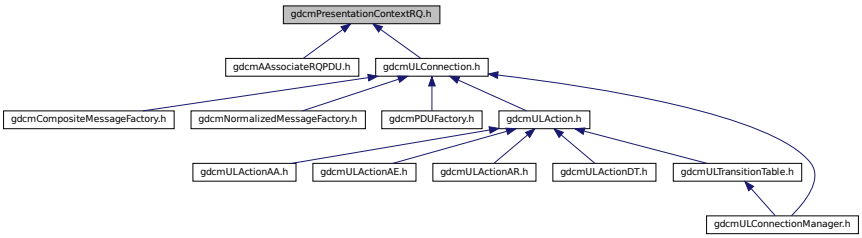
```
#include "gdcmTypes.h"
#include "gdcmAbstractSyntax.h"
#include "gdcmTransferSyntaxSub.h"
```

```
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmPresentationContextRQ.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::PresentationContextRQ
  PresentationContextRQ.

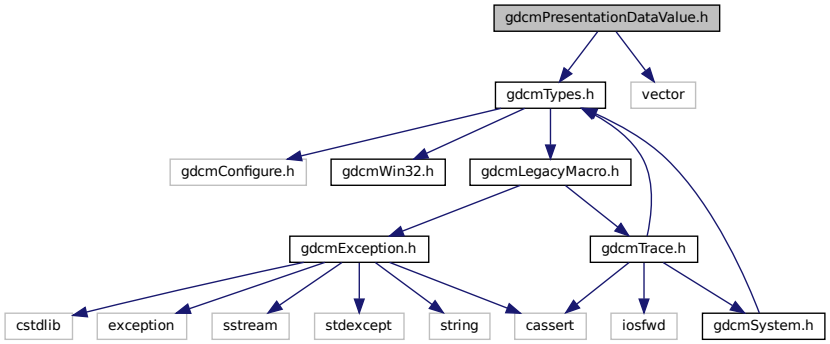
Namespaces

- gdcm
- gdcm::network

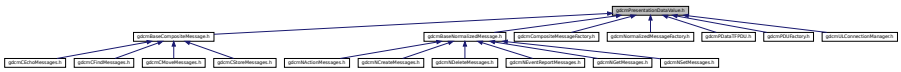
11.194 gdcmPresentationDataValue.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
```

Include dependency graph for gdcmPresentationDataValue.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::PresentationDataValue

  PresentationDataValue.

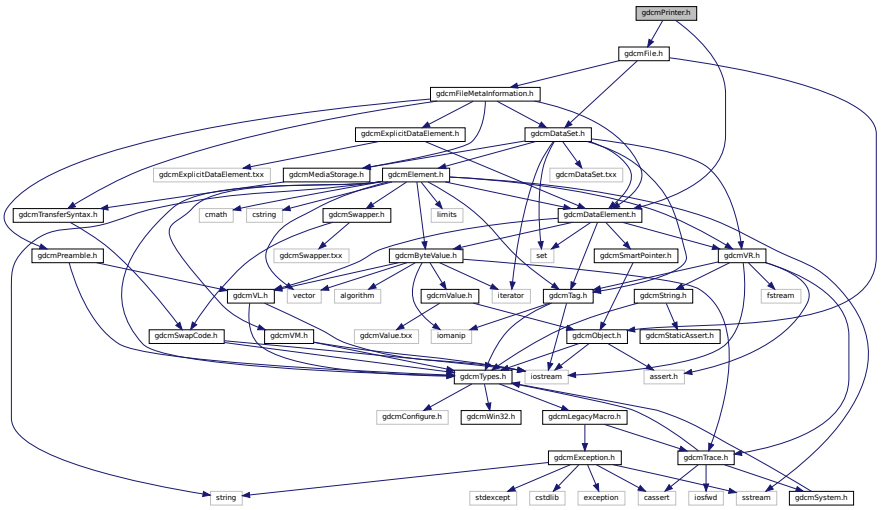
Namespaces

- gdcm
- gdcm::network

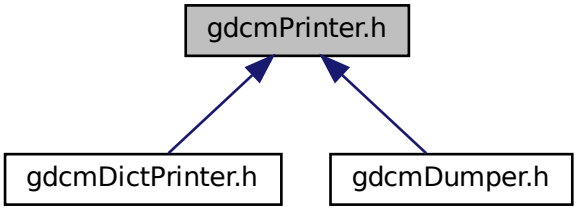
11.195 gdcmPrinter.h File Reference

```
#include "gdcmFile.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmPrinter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Printer

  Printer class.

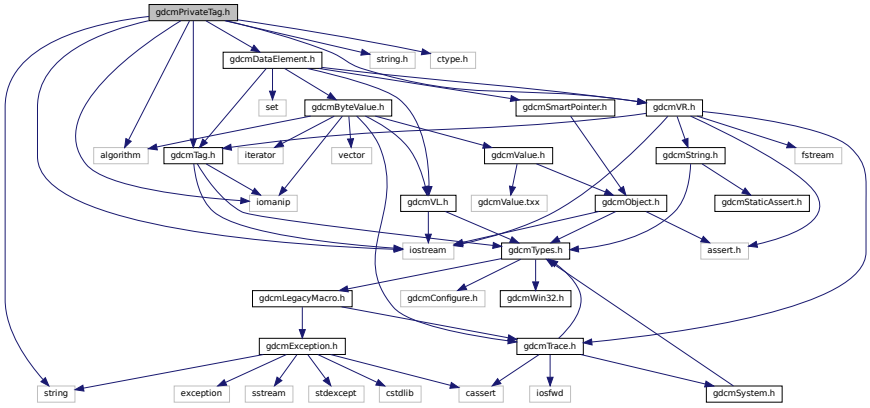
Namespaces

- gdcm

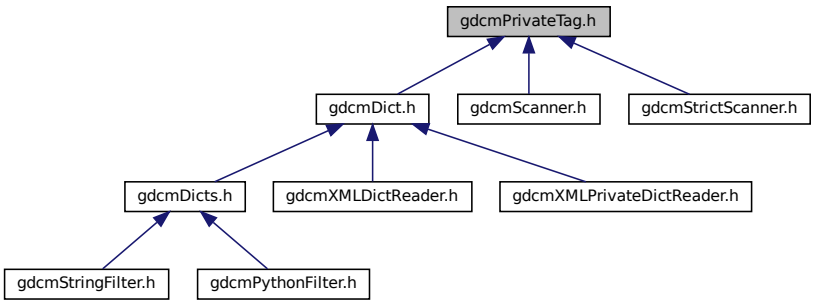
11.196 gdcmPrivateTag.h File Reference

```
#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmDataElement.h"
#include <iostream>
#include <iomanip>
#include <string>
#include <algorithm>
#include <string.h>
#include <ctype.h>
```

Include dependency graph for gdcmPrivateTag.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::PrivateTag

  Class to represent a Private DICOM Data Element (Attribute) Tag (Group, Element, Owner)

Namespaces

- gdcm

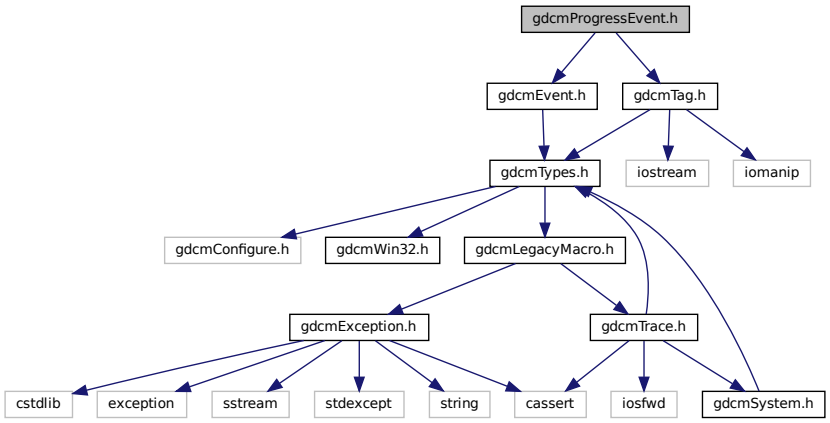
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const PrivateTag &val)

11.197 gdcmProgressEvent.h File Reference

```
#include "gdcmEvent.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmProgressEvent.h:



Classes

- class gdcm::ProgressEvent

  ProgressEvent.

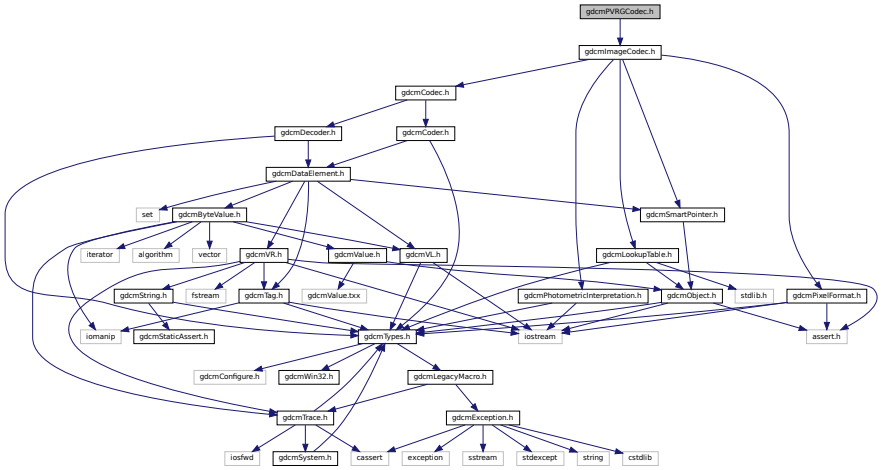
Namespaces

- gdcm

11.198 gdcmPVRGCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmPVRGCodec.h:



Classes

- class gdcm::PVRGCodec

  PVRGCodec.

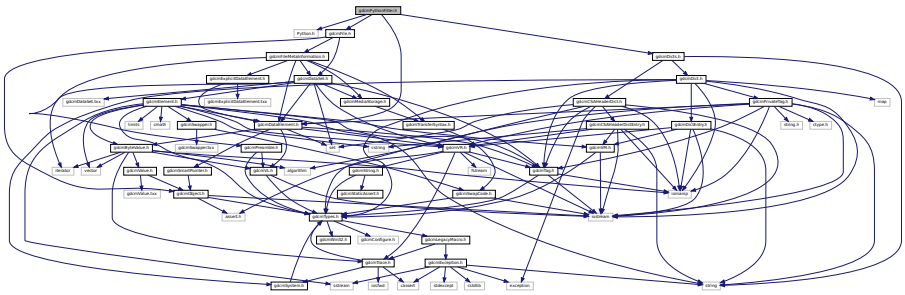
Namespaces

- gdcm

11.199 gdcmPythonFilter.h File Reference

```
#include <Python.h>
#include "gdcmDataElement.h"
#include "gdcmDicts.h"
#include "gdcmFile.h"
```

Include dependency graph for gdcmPythonFilter.h:



Classes

- class gdcm::PythonFilter

  PythonFilter PythonFilter is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a DataElement into a string, typically this is a nice feature to have for wrapped language.

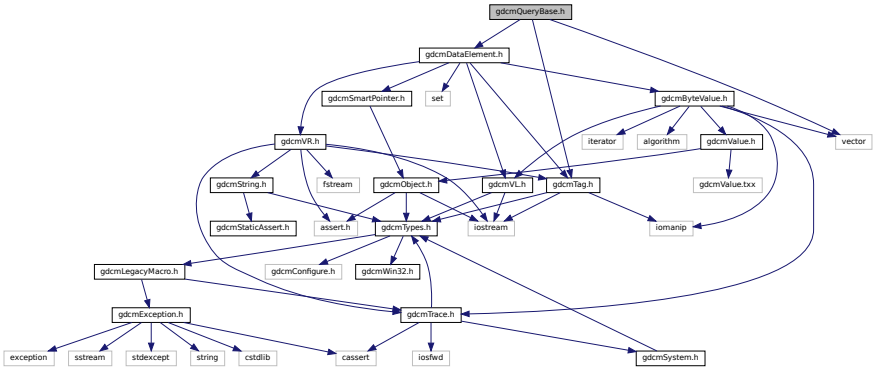
Namespaces

- gdcm

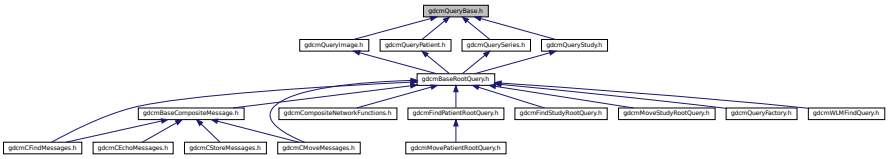
11.200 gdcmQueryBase.h File Reference

```
#include "gdcmTag.h"
#include "gdcmDataElement.h"
#include <vector>
```

Include dependency graph for gdcmQueryBase.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::QueryBase

  QueryBase.

Namespaces

- gdcm

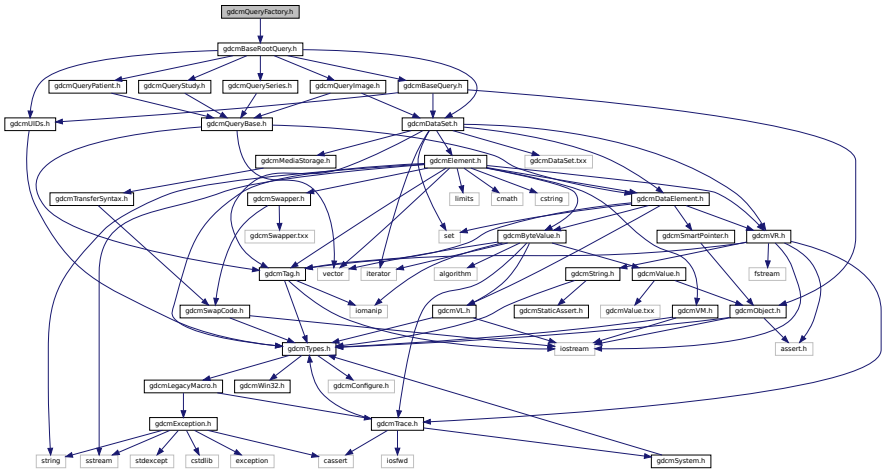
Enumerations

- enum gdcm::ERootType {
  gdcm::ePatientRootType ,
  gdcm::eStudyRootType }

11.201 gdcmQueryFactory.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmQueryFactory.h:



Classes

- class gdcm::QueryFactory

  QueryFactory.h.

Namespaces

- gdcm

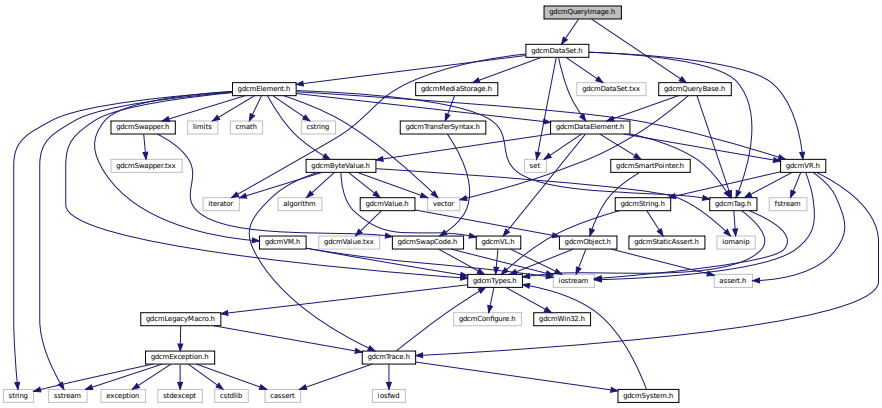
Enumerations

- enum gdcm::ECharSet {
  gdcm::eLatin1 = 0 ,
  gdcm::eLatin2 ,
  gdcm::eLatin3 ,
  gdcm::eLatin4 ,
  gdcm::eCyrillic ,
  gdcm::eArabic ,
  gdcm::eGreek ,
  gdcm::eHebrew ,
  gdcm::eLatin5 ,
  gdcm::eJapanese ,
  gdcm::eThai ,
  gdcm::eJapaneseKanjiMultibyte ,
  gdcm::eJapaneseSupplementaryKanjiMultibyte ,
  gdcm::eKoreanHangulHanjaMultibyte ,
  gdcm::eUTF8 ,
  gdcm::eGB18030 }

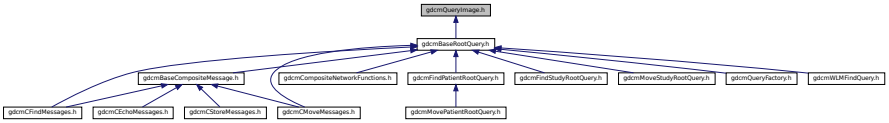
11.202 gdcmQueryImage.h File Reference

```
#include "gdcmQueryBase.h"
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmQueryImage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::QueryImage
  QueryImage.

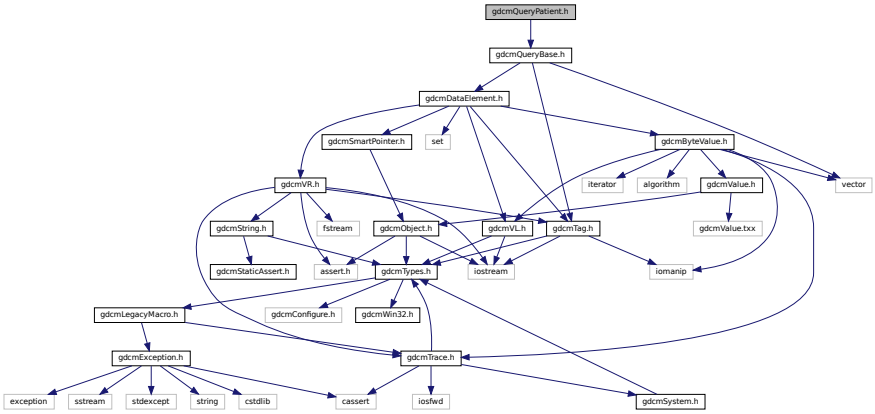
Namespaces

- gdcm

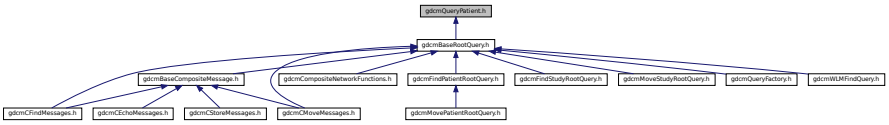
11.203 gdcmQueryPatient.h File Reference

```
#include "gdcmQueryBase.h"
```

Include dependency graph for gdcmQueryPatient.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::QueryPatient
  QueryPatient.

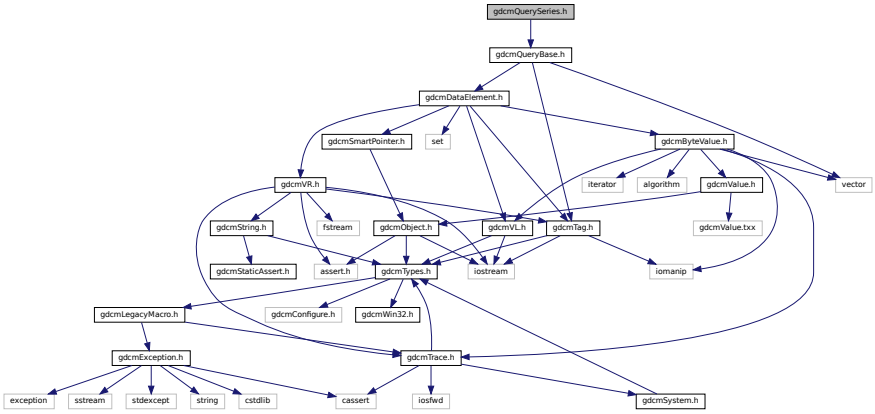
Namespaces

- gdcm

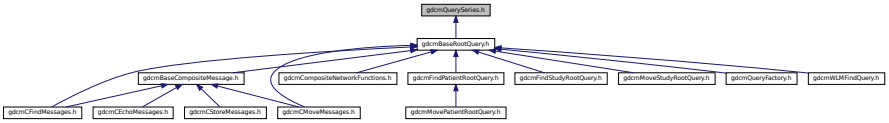
11.204 gdcmQuerySeries.h File Reference

```
#include "gdcmQueryBase.h"
```

Include dependency graph for gdcmQuerySeries.h:



This graph shows which files directly or indirectly include this file:



Classes

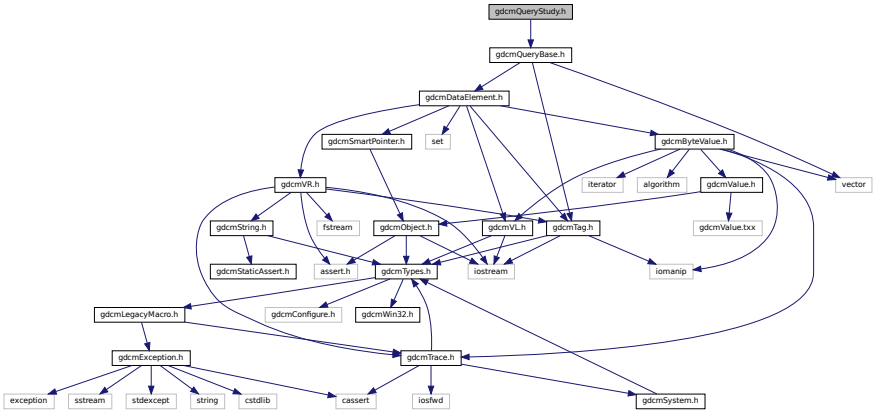
- class gdcm::QuerySeries
  QuerySeries.

Namespaces

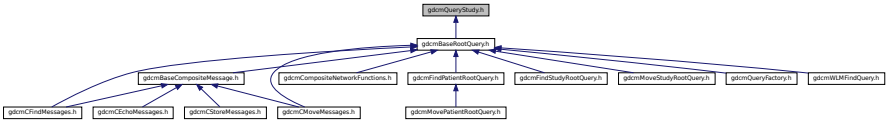
- gdcm

11.205 gdcmQueryStudy.h File Reference

`#include "gdcmQueryBase.h"`
Include dependency graph for gdcmQueryStudy.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::QueryStudy
  QueryStudy.h.

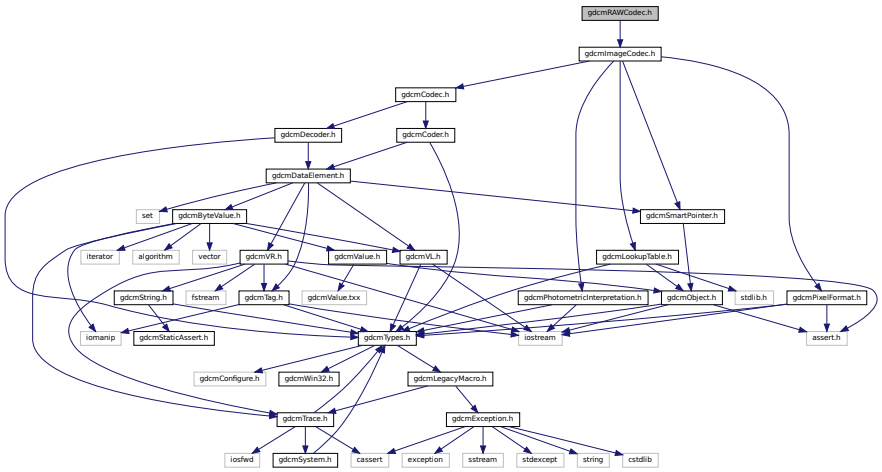
Namespaces

- gdcm

11.206 gdcmRAWCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmRAWCodec.h:



Classes

- class gdcm::RAWCodec

  RAWCodec class.

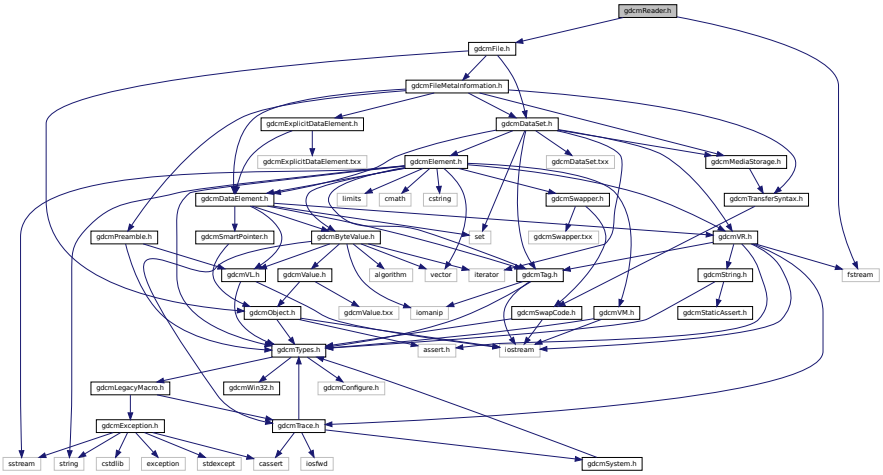
Namespaces

- gdcm

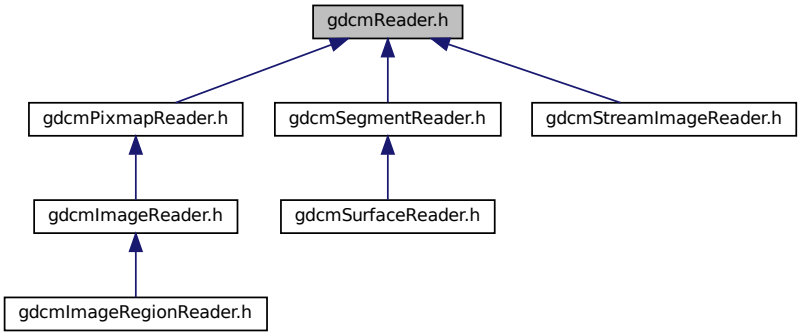
11.207 gdcmReader.h File Reference

```
#include "gdcmFile.h"
#include <fstream>
```

Include dependency graph for gdcmReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Reader

  Reader ala DOM (Document Object Model)

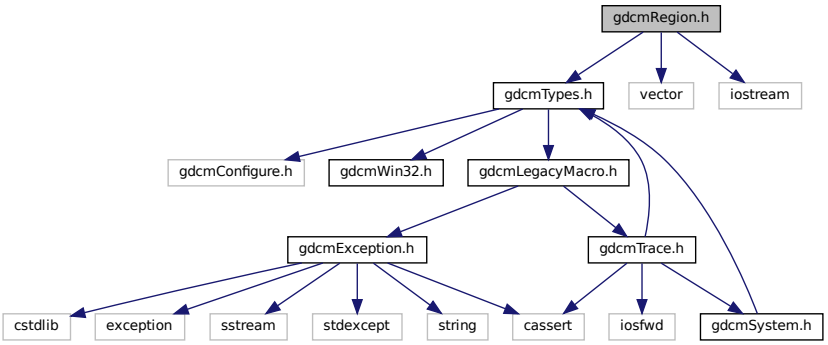
Namespaces

- gdcm

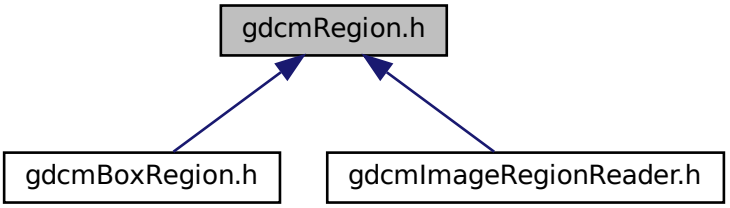
11.208 gdcmRegion.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
#include <iostream>
```

Include dependency graph for gdcmRegion.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Region

  Class for manipulation region.

Namespaces

- gdcm

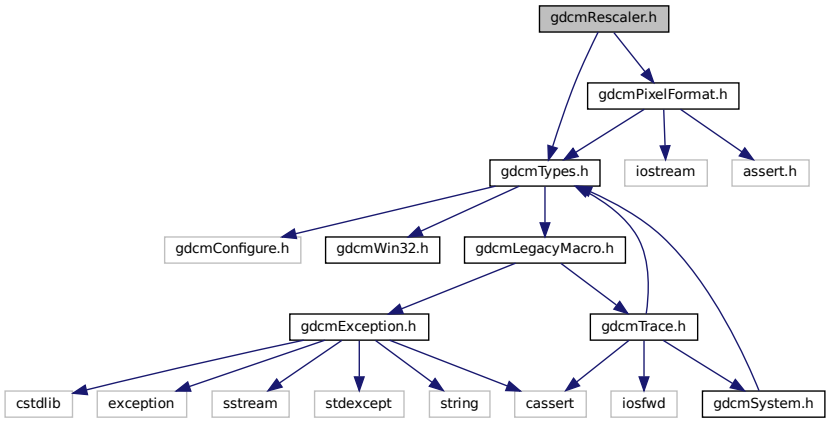
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Region &r)

11.209 gdcmRescaler.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmPixelFormat.h"
```

Include dependency graph for gdcmRescaler.h:



Classes

- class gdcm::Rescaler

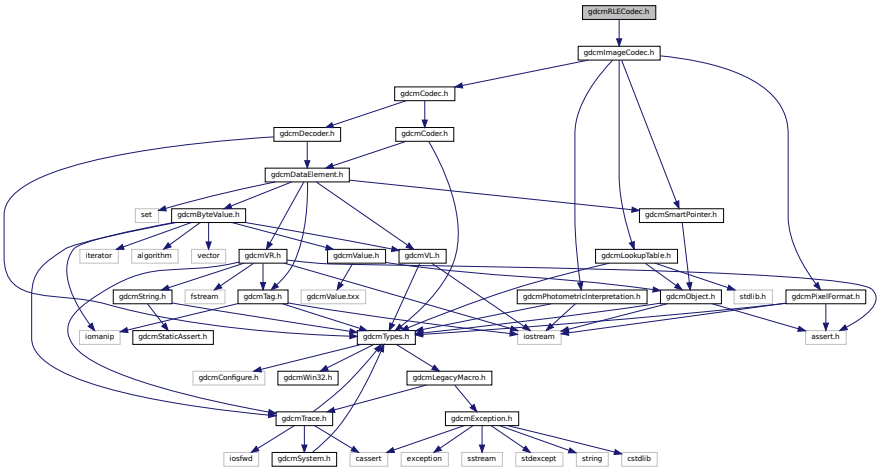
  Rescale class.

Namespaces

- gdcm

11.210 gdcmRLECodec.h File Reference

`#include "gdcmImageCodec.h"`
Include dependency graph for gdcmRLECodec.h:



Classes

- class gdcm::RLECodec

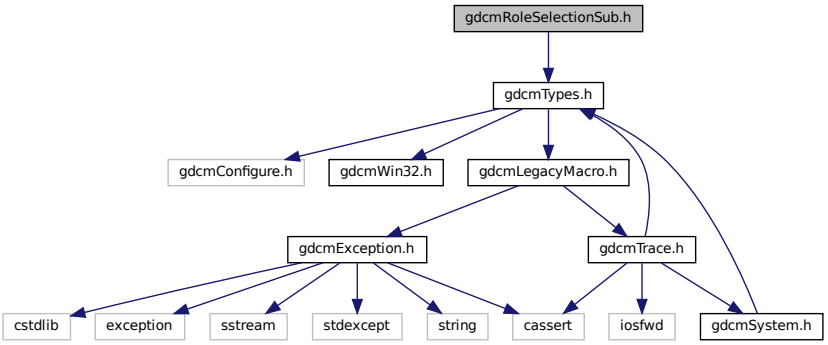
  Class to do RLE.

Namespaces

- gdcm

11.211 gdcmRoleSelectionSub.h File Reference

`#include "gdcmTypes.h"`
Include dependency graph for gdcmRoleSelectionSub.h:



Classes

- class gdcm::network::RoleSelectionSub

  RoleSelectionSub.

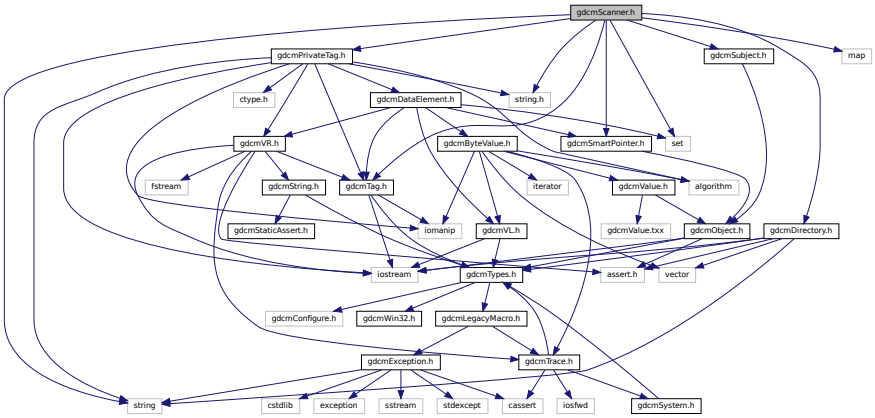
Namespaces

- gdcm
- gdcm::network

11.212 gdcmScanner.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>
#include <string.h>
```

Include dependency graph for gdcmScanner.h:



Classes

- struct gdcm::Scanner::ltstr
- class gdcm::Scanner

  Scanner.

Namespaces

- gdcm

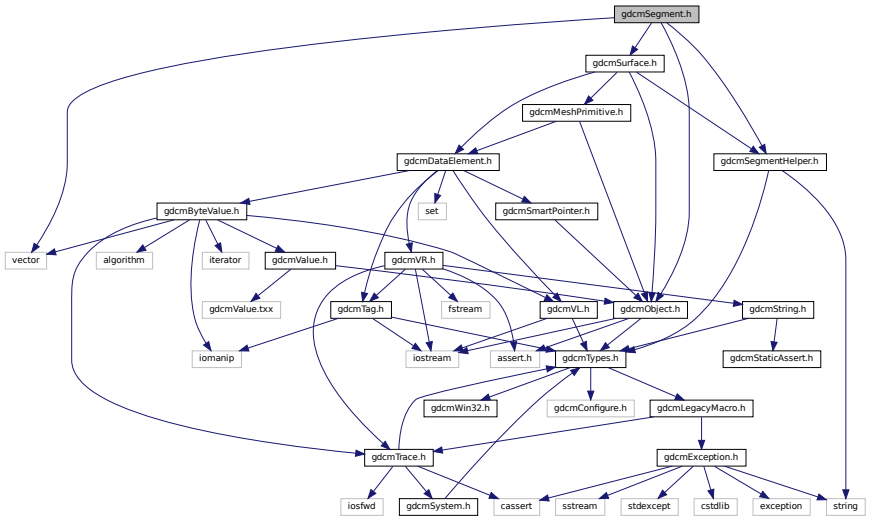
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Scanner &s)

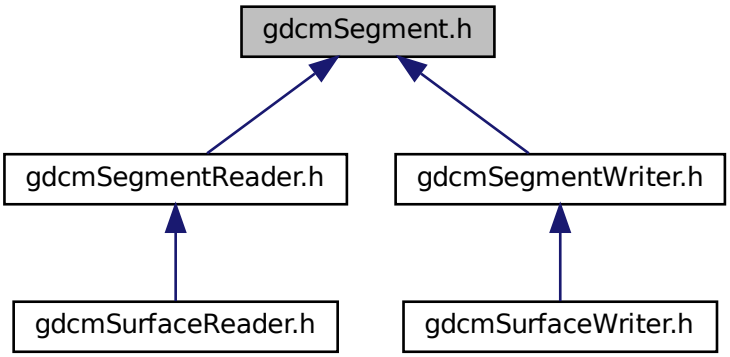
11.213 gdcmSegment.h File Reference

```
#include <vector>
#include <gdcmObject.h>
#include <gdcmSurface.h>
#include "gdcmSegmentHelper.h"
```

Include dependency graph for gdcmSegment.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Segment

  This class defines a segment.

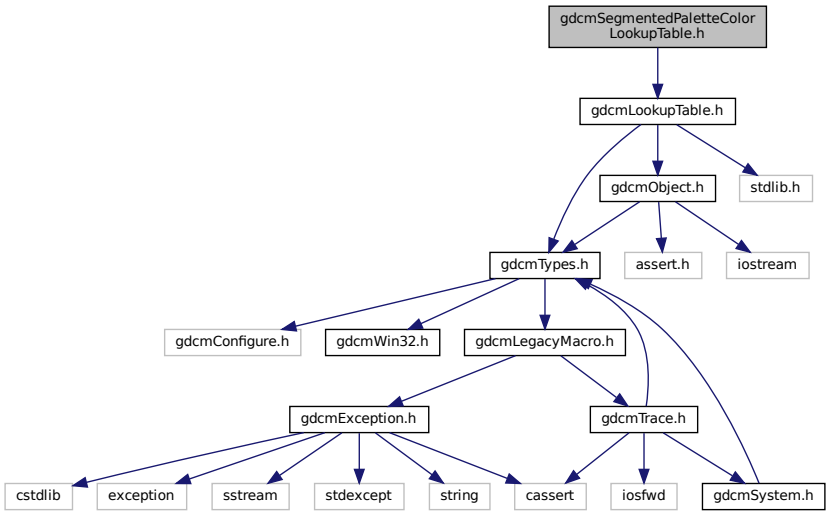
Namespaces

- gdcm

11.214 gdcmSegmentedPaletteColorLookupTable.h File Reference

```
#include "gdcmLookupTable.h"
```

Include dependency graph for gdcmSegmentedPaletteColorLookupTable.h:



Classes

- class gdcm::SegmentedPaletteColorLookupTable

  SegmentedPaletteColorLookupTable class.

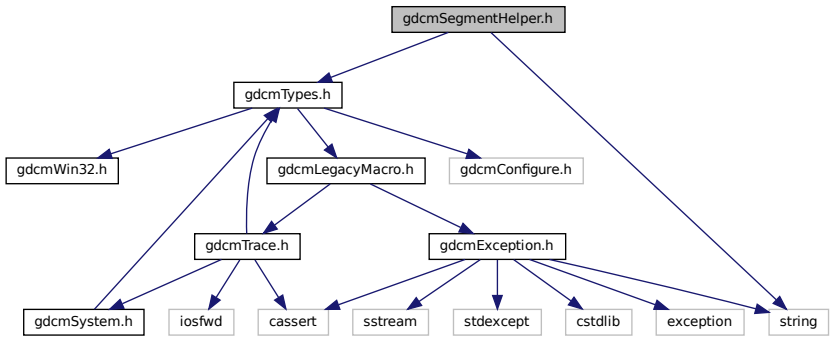
Namespaces

- gdcm

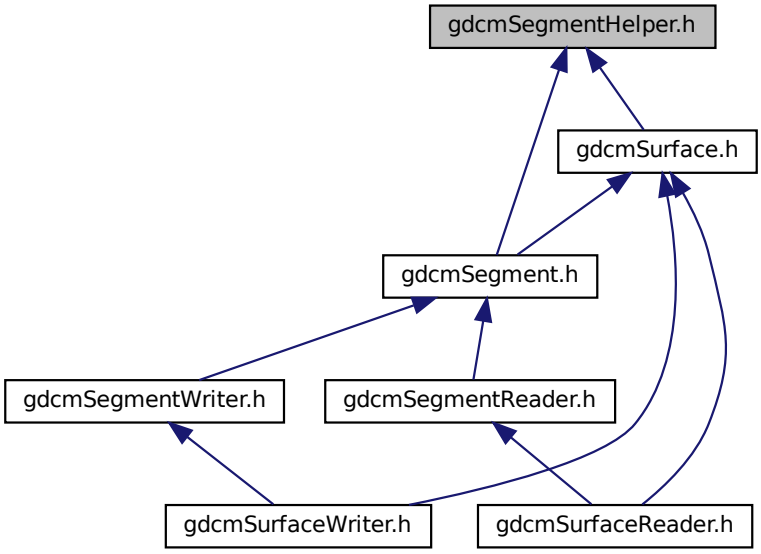
11.215 gdcmSegmentHelper.h File Reference

```
#include "gdcmTypes.h"
#include <string>
```

Include dependency graph for gdcmSegmentHelper.h:



This graph shows which files directly or indirectly include this file:



Classes

- struct gdcm::SegmentHelper::BasicCodedEntry

  This structure defines a basic coded entry with all of its attributes.

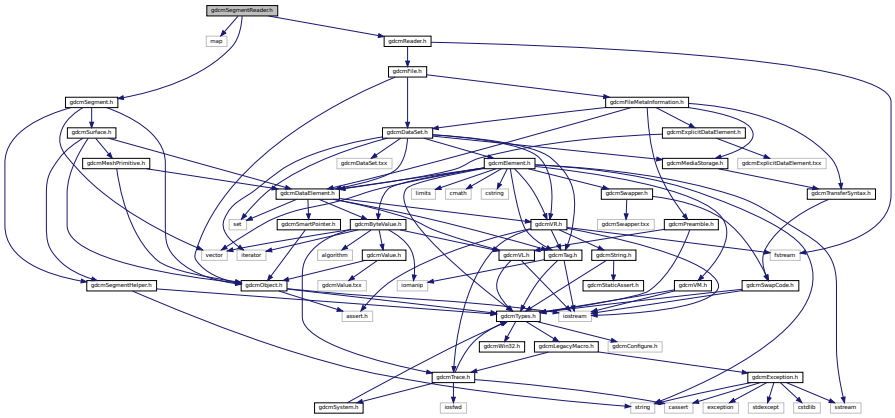
Namespaces

- gdcm
- gdcm::SegmentHelper

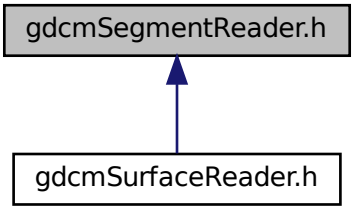
11.216 gdcmSegmentReader.h File Reference

```
#include <map>
#include <gdcmReader.h>
#include <gdcmSegment.h>
```

Include dependency graph for gdcmSegmentReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::SegmentReader

  This class defines a segment reader.

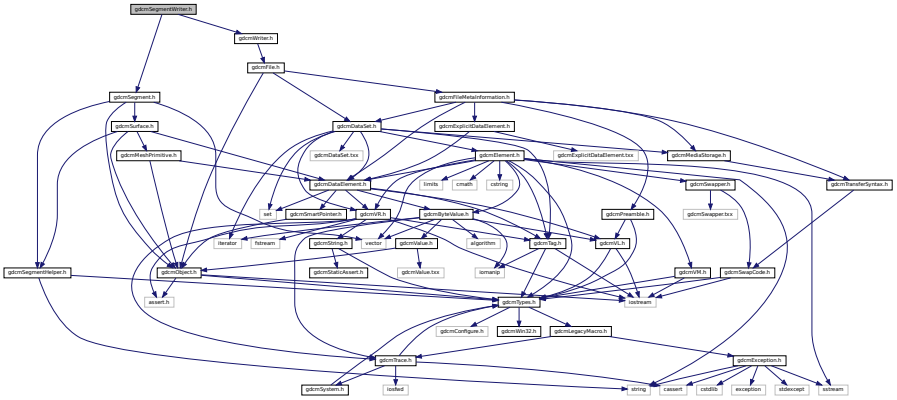
Namespaces

- gdcm

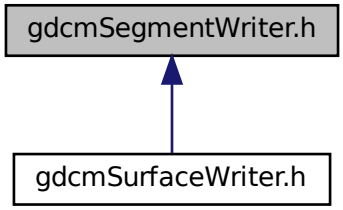
11.217 gdcmSegmentWriter.h File Reference

```
#include <gdcmWriter.h>
#include <gdcmSegment.h>
```

Include dependency graph for gdcmSegmentWriter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::SegmentWriter

  This class defines a segment writer.

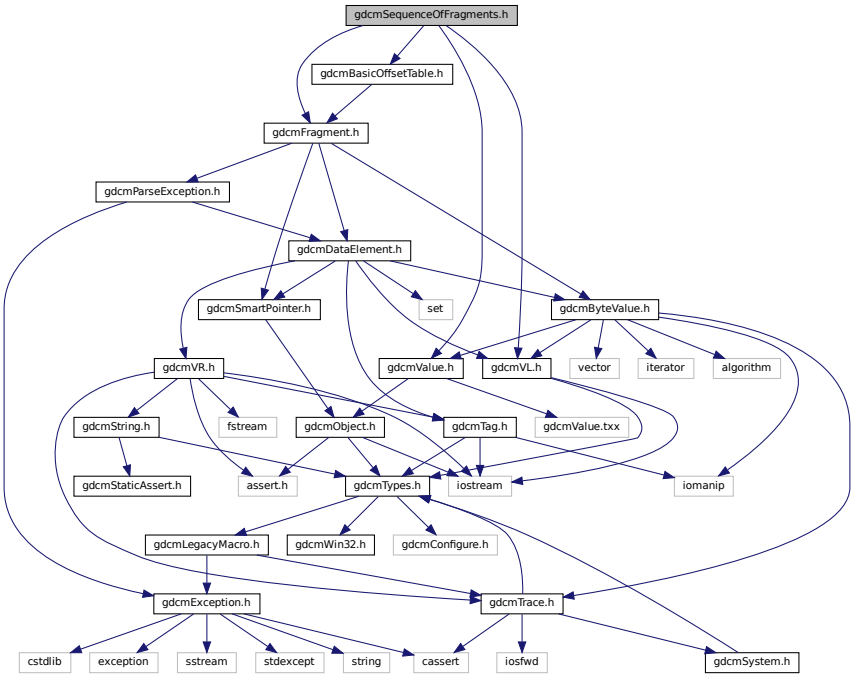
Namespaces

- gdcm

11.218 gdcmSequenceOfFragments.h File Reference

```
#include "gdcmValue.h"
#include "gdcmVL.h"
#include "gdcmFragment.h"
#include "gdcmBasicOffsetTable.h"
```

Include dependency graph for gdcmSequenceOfFragments.h:



Classes

- class gdcm::SequenceOfFragments

  Class to represent a Sequence Of Fragments.

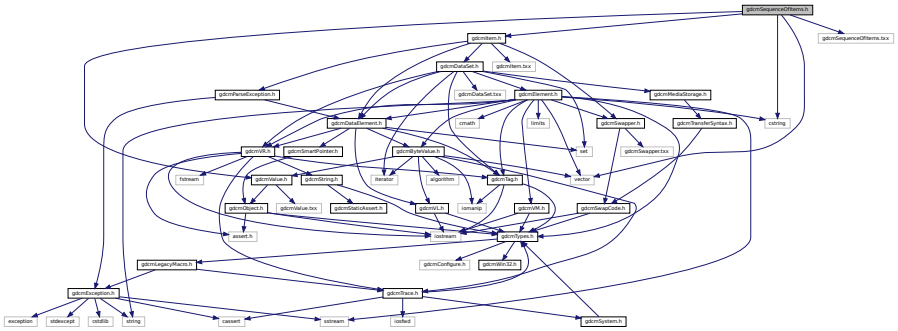
Namespaces

- gdcm

11.219 gdcmSequenceOfItems.h File Reference

```
#include "gdcmValue.h"
#include "gdcmItem.h"
#include <vector>
#include <cstring>
#include "gdcmSequenceOfItems.txx"
```

Include dependency graph for gdcmSequenceOfItems.h:



Classes

- class gdcm::SequenceOfItems

  Class to represent a Sequence Of Items.

Namespaces

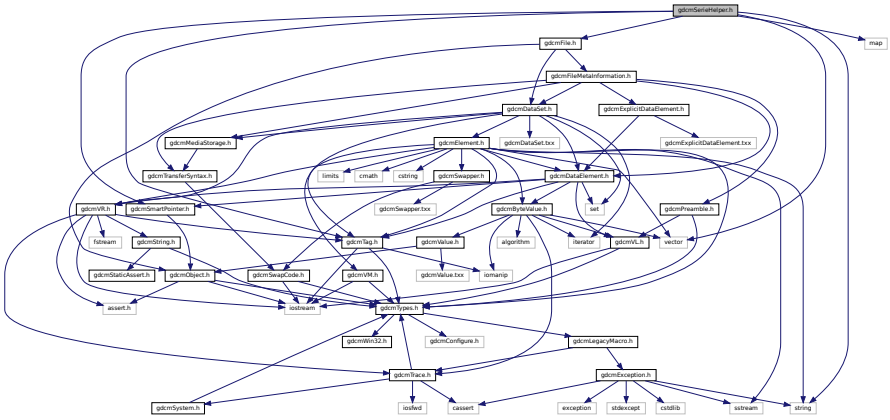
- gdcm

11.220 gdcmSerieHelper.h File Reference

```
#include "gdcmTag.h"
#include "gdcmSmartPointer.h"
#include "gdcmFile.h"
#include <vector>
#include <string>
```

```
#include <map>
```

Include dependency graph for gdcmSerieHelper.h:



Classes

- class gdcm::FileWithName

  FileWithName.
- class gdcm::SerieHelper

  SerieHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

Namespaces

- gdcm

Typedefs

- typedef bool(∗ gdcm::BOOL_FUNCTION_PFILE_PFILE_POINTER) (File ∗, File ∗)
- typedef std::vector< SmartPointer< FileWithName > > gdcm::FileList

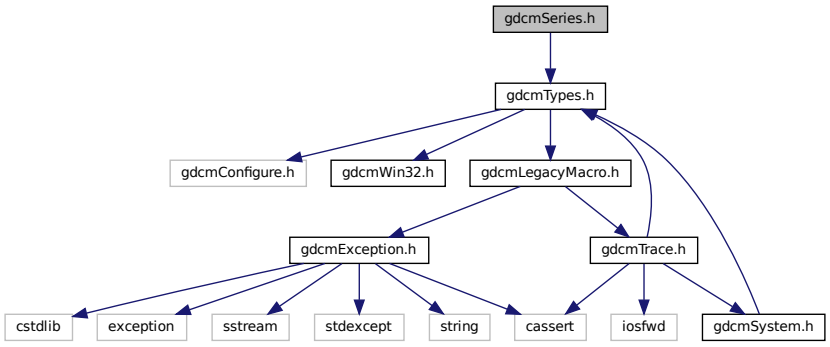
Enumerations

- enum gdcm::CompOperators {
  gdcm::GDCM_EQUAL = 0 ,
  gdcm::GDCM_DIFFERENT ,
  gdcm::GDCM_GREATER ,
  gdcm::GDCM_GREATEROREQUAL ,
  gdcm::GDCM_LESS ,
  gdcm::GDCM_LESSOREQUAL }
- enum gdcm::LodModeType {
  gdcm::LD_ALL = 0x00000000 ,
  gdcm::LD_NOSEQ = 0x00000001 ,
  gdcm::LD_NOSHADOW = 0x00000002 ,
  gdcm::LD_NOSHADOWSEQ = 0x00000004 }

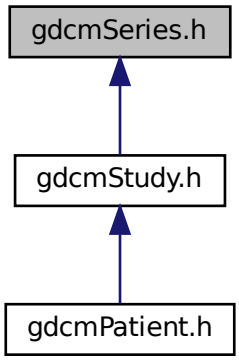
11.221 gdcmSeries.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSeries.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Series
  Series.

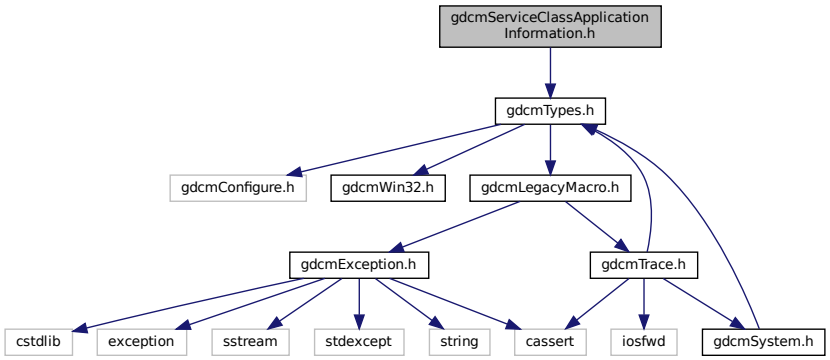
Namespaces

- gdcm

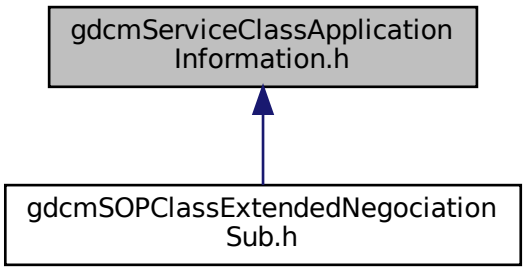
11.222 gdcmServiceClassApplicationInformation.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmServiceClassApplicationInformation.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ServiceClassApplicationInformation

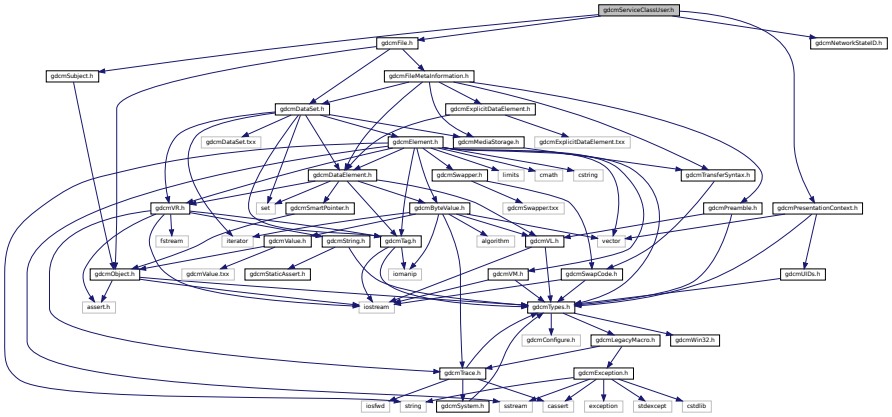
Namespaces

- gdcm
- gdcm::network

11.223 gdcmServiceClassUser.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmPresentationContext.h"
#include "gdcmFile.h"
#include "gdcmNetworkStateID.h"
```

Include dependency graph for gdcmServiceClassUser.h:



Classes

- class gdcm::ServiceClassUser

  ServiceClassUser.

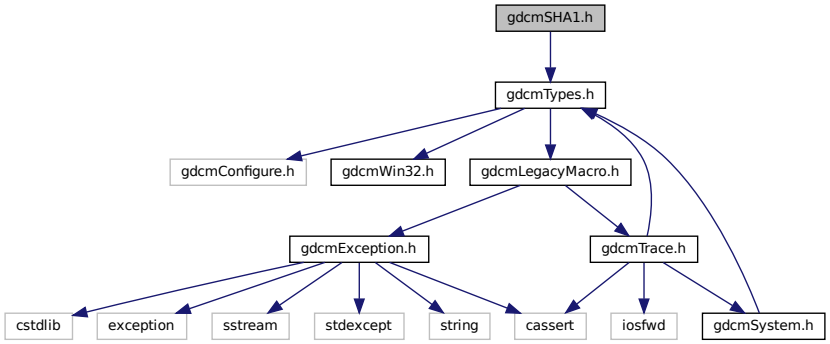
Namespaces

- gdcm
- gdcm::network

11.224 gdcmSHA1.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSHA1.h:



Classes

- class gdcm::SHA1

  Class for SHA1.

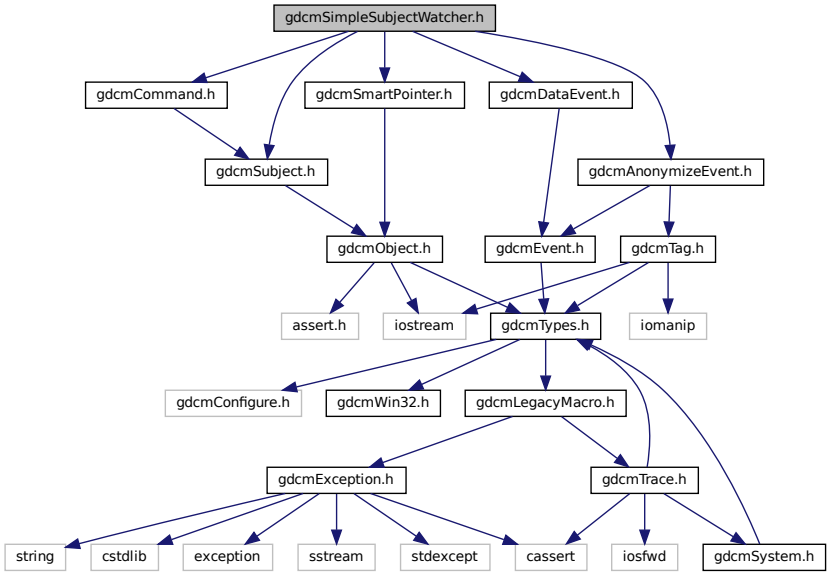
Namespaces

- gdcm

11.225 gdcmSimpleSubjectWatcher.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmCommand.h"
#include "gdcmSmartPointer.h"
#include "gdcmAnonymizeEvent.h"
#include "gdcmDataEvent.h"
```

Include dependency graph for gdcmSimpleSubjectWatcher.h:



Classes

- class gdcm::SimpleSubjectWatcher

  SimpleSubjectWatcher.

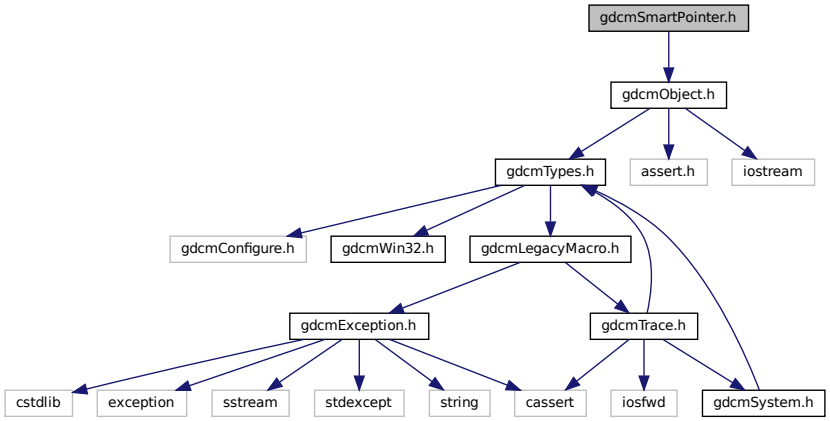
Namespaces

- gdcm

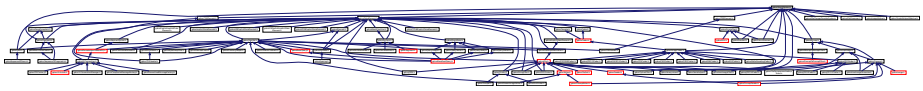
11.226 gdcmSmartPointer.h File Reference

```
#include "gdcmObject.h"
```

Include dependency graph for gdcmSmartPointer.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::SmartPointer< ObjectType >

  Class for Smart Pointer.

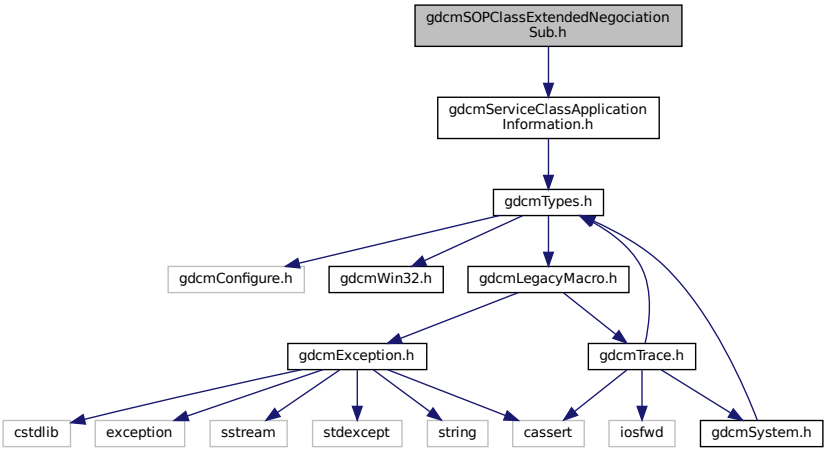
Namespaces

- gdcm

11.227 gdcmSOPClassExtendedNegociationSub.h File Reference

```
#include "gdcmServiceClassApplicationInformation.h"
```

Include dependency graph for gdcmSOPClassExtendedNegociationSub.h:



Classes

- class gdcm::network::SOPClassExtendedNegociationSub

  SOPClassExtendedNegociationSub.

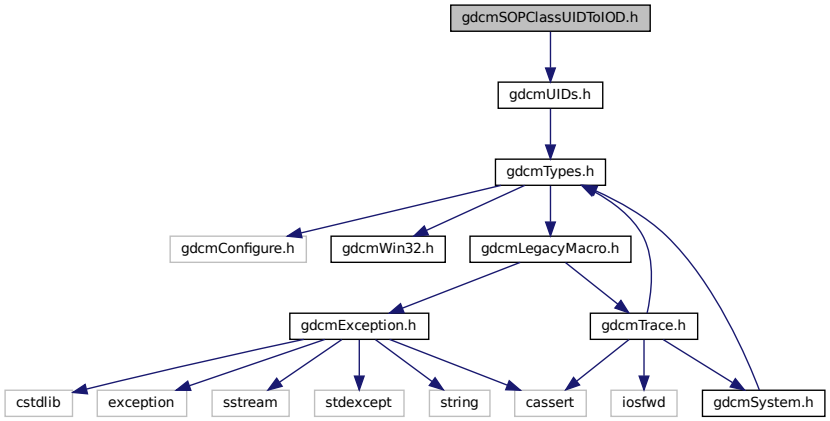
Namespaces

- gdcm
- gdcm::network

11.228 gdcmSOPClassUIDToIOD.h File Reference

```
#include "gdcmUIDs.h"
```

Include dependency graph for gdcmSOPClassUIDToIOD.h:



Classes

- class gdcm::SOPClassUIDToIOD

  Class convert a class SOP Class UID into IOD.

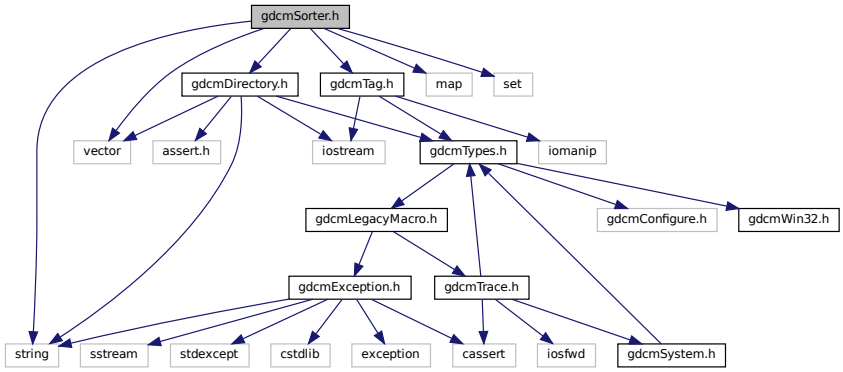
Namespaces

- gdcm

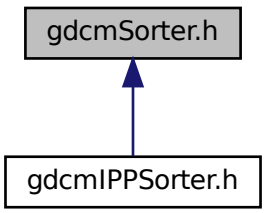
11.229 gdcmSorter.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include <vector>
#include <string>
#include <map>
#include <set>
```

Include dependency graph for gdcmSorter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Sorter

  Sorter.

Namespaces

- gdcm

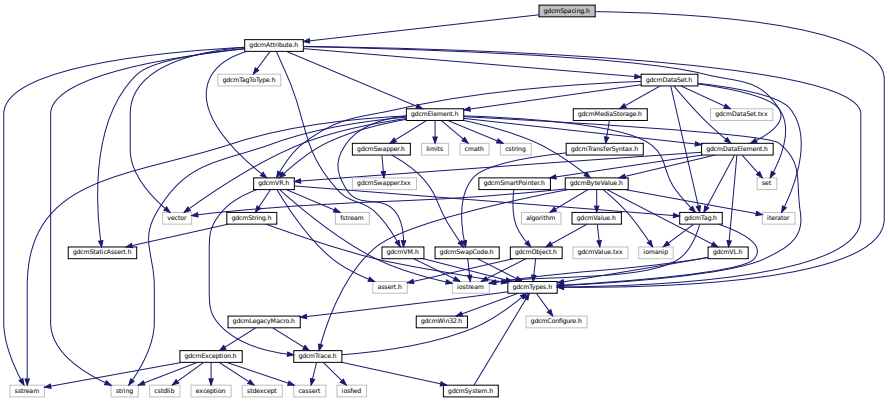
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Sorter &s)

11.230 gdcmSpacing.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmAttribute.h"
```

Include dependency graph for gdcmSpacing.h:



Classes

- class gdcm::Spacing

  Class for Spacing.

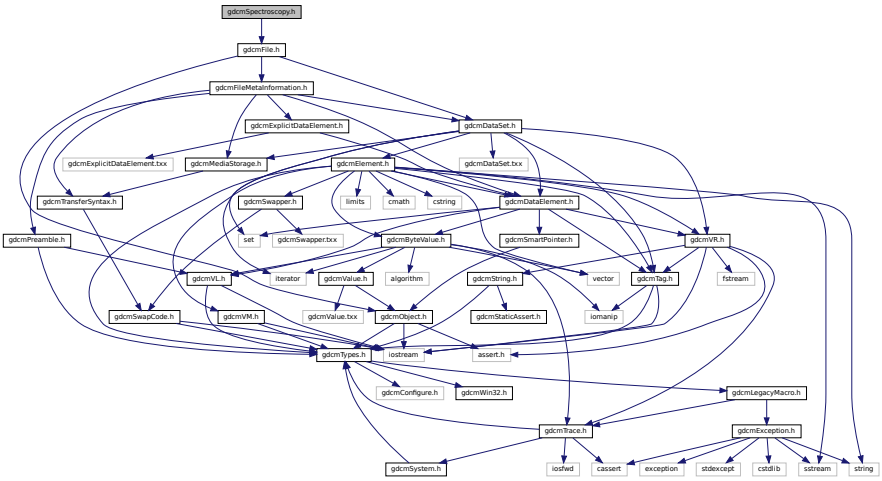
Namespaces

- gdcm

11.231 gdcmSpectroscopy.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmSpectroscopy.h:



Classes

- class gdcm::Spectroscopy

  Spectroscopy class.

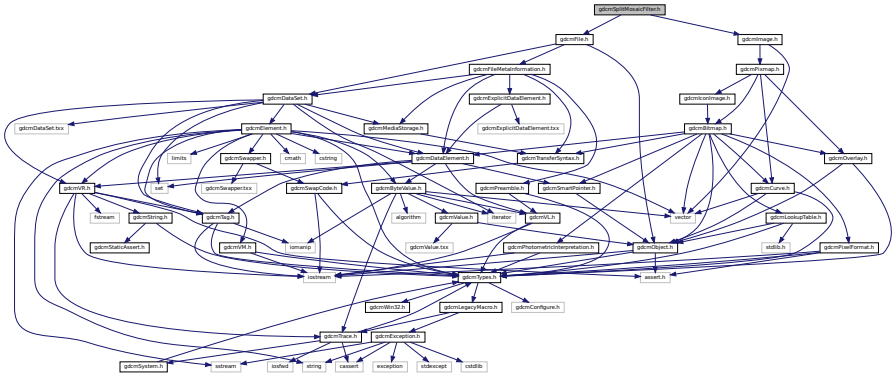
Namespaces

- gdcm

11.232 gdcmSplitMosaicFilter.h File Reference

```
#include "gdcmFile.h"
#include "gdcmImage.h"
```

Include dependency graph for gdcmSplitMosaicFilter.h:



Classes

- class gdcm::SplitMosaicFilter

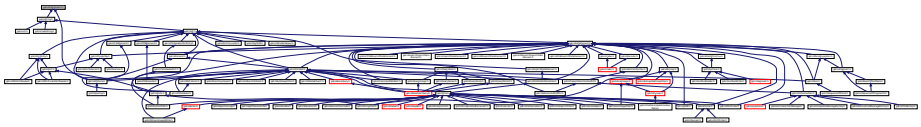
  SplitMosaicFilter class.

Namespaces

- gdcm

11.233 gdcmStaticAssert.h File Reference

This graph shows which files directly or indirectly include this file:



Classes

- struct gdcm::static_assert_test< x >
- struct gdcm::STATIC_ASSERTION_FAILURE< true >

Namespaces

- gdcm

Macros

- #define GDCM_DO_JOIN(X, Y) GDCM_DO_JOIN2(X,Y)
- #define GDCM_DO_JOIN2(X, Y) X##Y
- #define GDCM_JOIN(X, Y) GDCM_DO_JOIN(X, Y)
- #define GDCM_STATIC_ASSERT(B)

  *The GDCM_JOIN + **LINE** is needed to create a uniq identifier.*

11.233.1 Macro Definition Documentation

11.233.1.1 GDCM_DO_JOIN

```
#define GDCM_DO_JOIN(
              X,
              Y ) GDCM_DO_JOIN2(X,Y)
```

11.233.1.2 GDCM_DO_JOIN2

```
#define GDCM_DO_JOIN2(
              X,
              Y ) X##Y
```

11.233.1.3 GDCM_JOIN

```
#define GDCM_JOIN(
              X,
              Y ) GDCM_DO_JOIN( X, Y )
```

11.233.1.4 GDCM_STATIC_ASSERT

```
#define GDCM_STATIC_ASSERT(
              B )
```

Value:

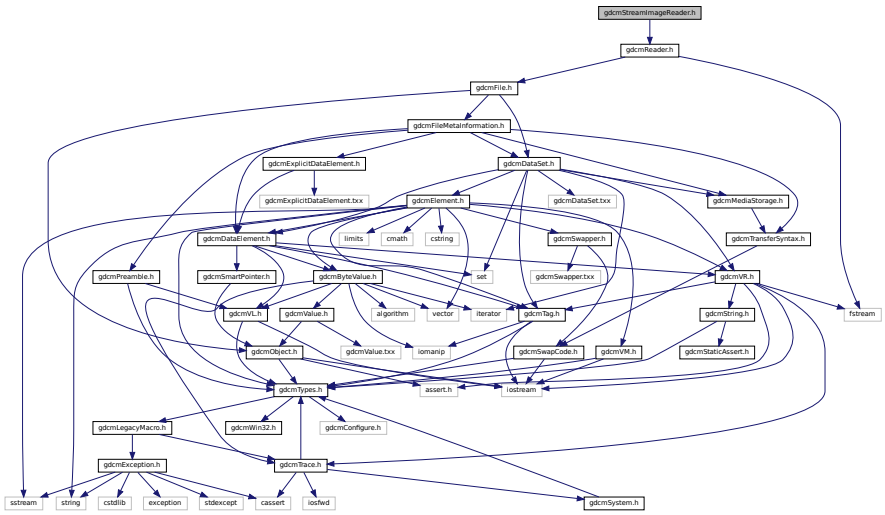
```
  typedef ::gdcm::static_assert_test<\
    sizeof(::gdcm::STATIC_ASSERTION_FAILURE< (bool)( B ) >)>\
      GDCM_JOIN(gdcm_static_assert_typedef_, __LINE__)
```

The GDCM_JOIN + **LINE** is needed to create a uniq identifier.

11.234 gdcmStreamImageReader.h File Reference

```
#include "gdcmReader.h"
```

Include dependency graph for gdcmStreamImageReader.h:



Classes

- class gdcm::StreamImageReader

  StreamImageReader.

Namespaces

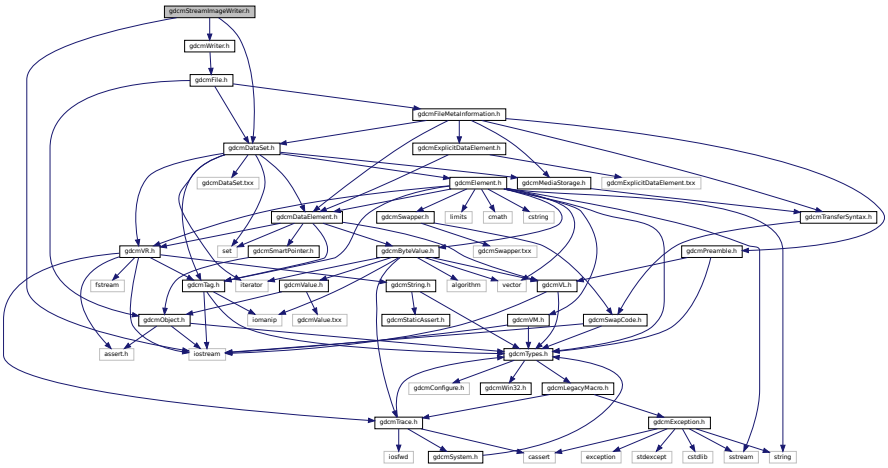
- gdcm

11.235 gdcmStreamImageWriter.h File Reference

```
#include "gdcmWriter.h"
#include <iostream>
```

```
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmStreamImageWriter.h:



Classes

- class gdcm::StreamImageWriter

  StreamImageReader.

Namespaces

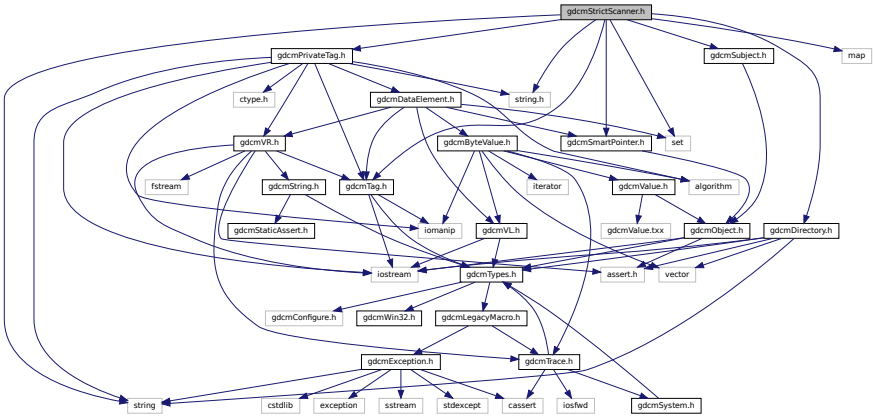
- gdcm

11.236 gdcmStrictScanner.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>
```

```
#include <string.h>
```

Include dependency graph for gdcmStrictScanner.h:



Classes

- struct gdcm::StrictScanner::ltstr
- class gdcm::StrictScanner

  StrictScanner.

Namespaces

- gdcm

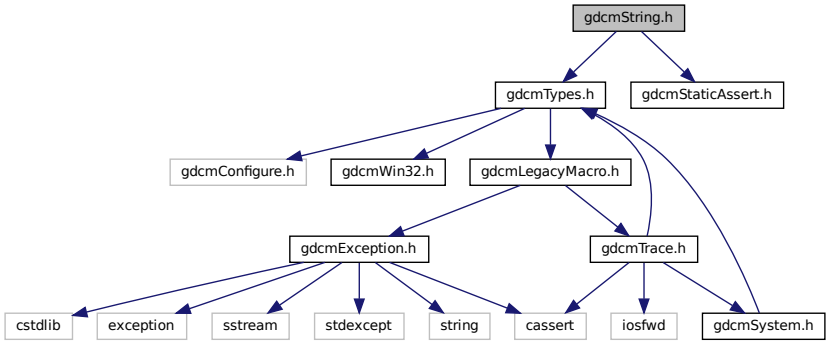
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const StrictScanner &s)

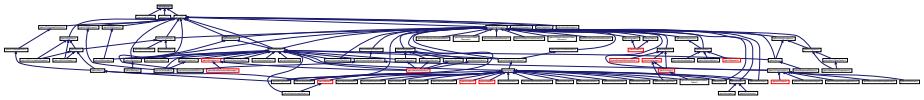
11.237 gdcmString.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmStaticAssert.h"
```

Include dependency graph for gdcmString.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::String< TDelimiter, TMaxLength, TPadChar >
  String.

Namespaces

- gdcm

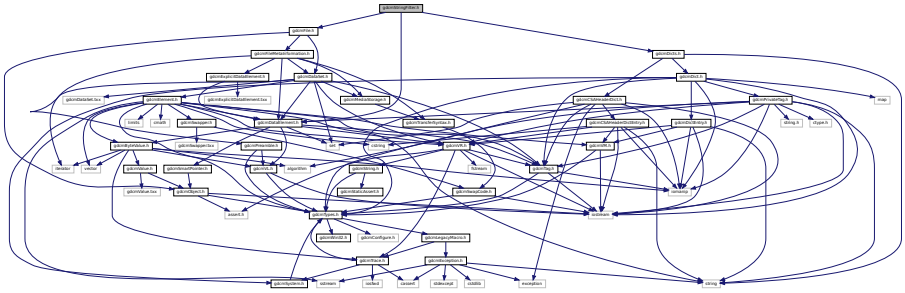
Functions

- template<char TDelimiter, unsigned int TMaxLength, char TPadChar>
  std::istream & gdcm::operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)

11.238 gdcmStringFilter.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmDicts.h"
```

```
#include "gdcmFile.h"
```
Include dependency graph for gdcmStringFilter.h:



Classes

- class gdcm::StringFilter

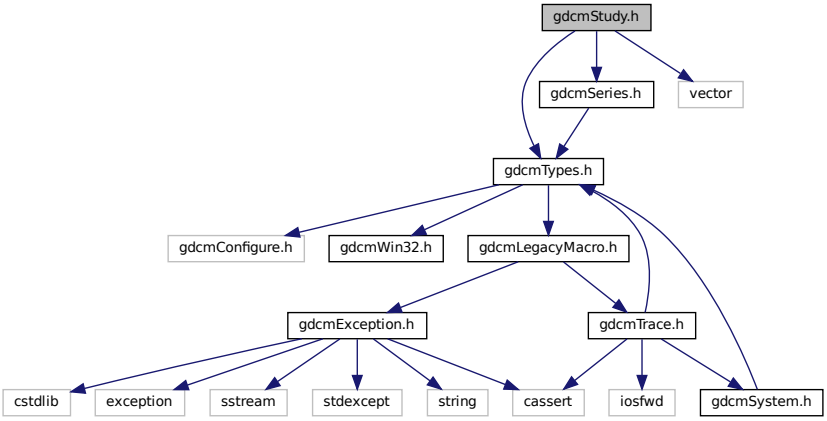
  StringFilter.

Namespaces

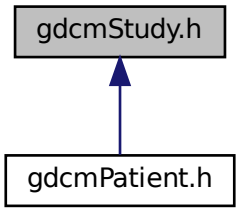
- gdcm

11.239 gdcmStudy.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmSeries.h"
#include <vector>
```
Include dependency graph for gdcmStudy.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Study
  Study.

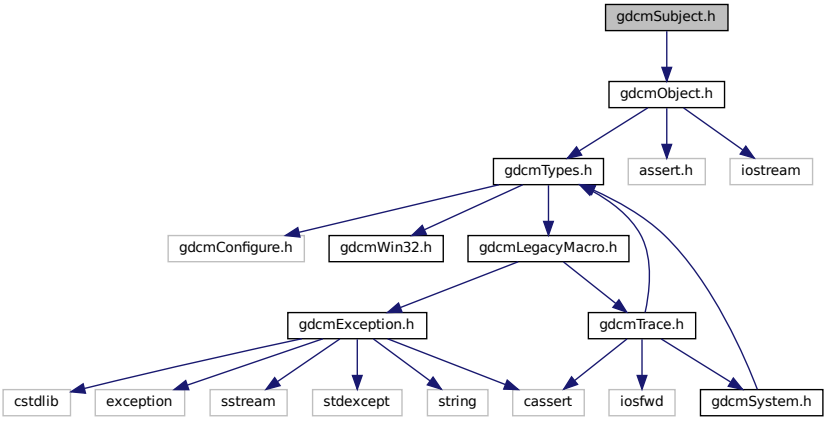
Namespaces

- gdcm

11.240 gdcmSubject.h File Reference

```
#include "gdcmObject.h"
```

Include dependency graph for gdcmSubject.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::Subject

  Subject.

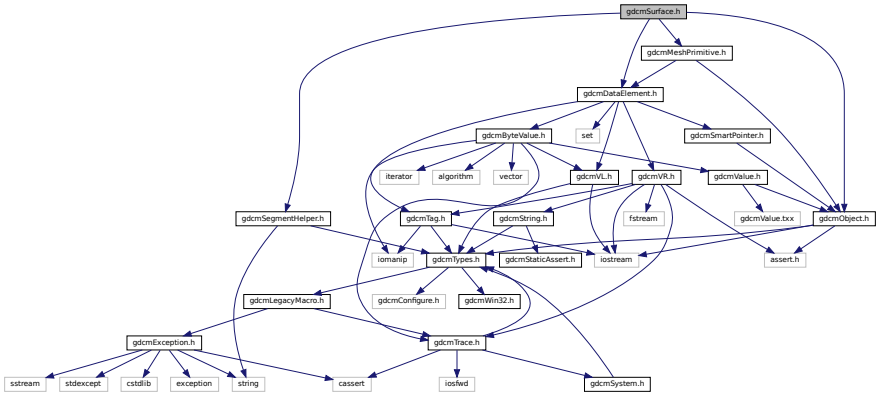
Namespaces

- gdcm

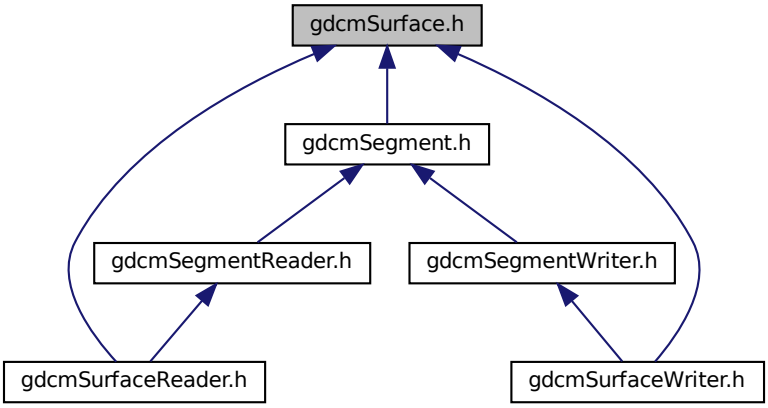
11.241 gdcmSurface.h File Reference

```
#include <gdcmObject.h>
#include <gdcmDataElement.h>
#include <gdcmMeshPrimitive.h>
#include "gdcmSegmentHelper.h"
```

Include dependency graph for gdcmSurface.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Surface

  This class defines a SURFACE IE.

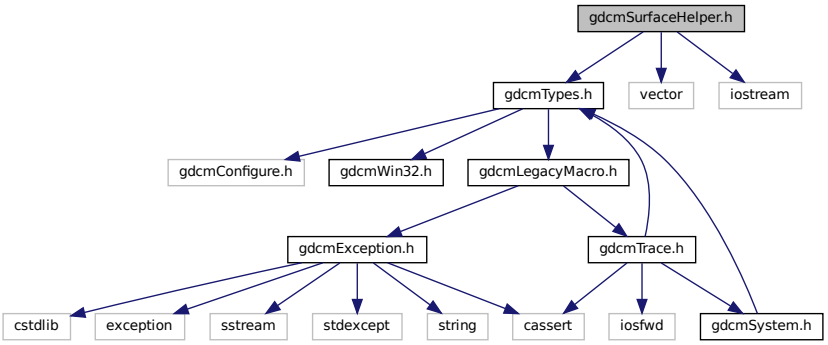
Namespaces

- gdcm

11.242 gdcmSurfaceHelper.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
#include <iostream>
```

Include dependency graph for gdcmSurfaceHelper.h:



Classes

- class gdcm::SurfaceHelper

  SurfaceHelper.

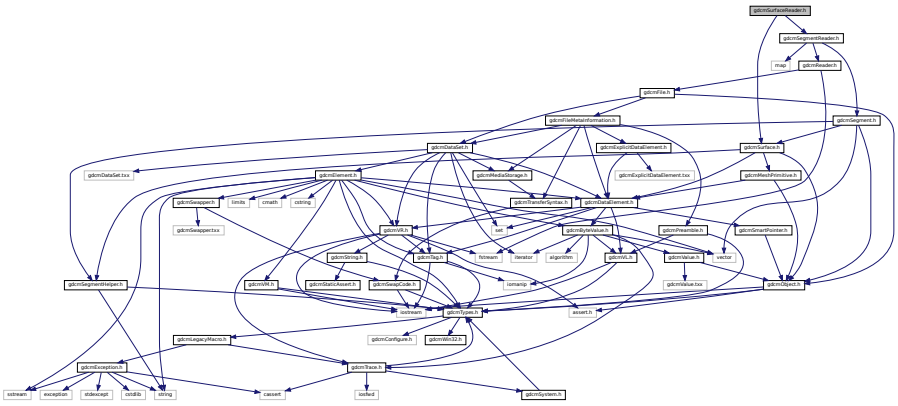
Namespaces

- gdcm

11.243 gdcmSurfaceReader.h File Reference

```
#include <gdcmSegmentReader.h>
#include <gdcmSurface.h>
```

Include dependency graph for gdcmSurfaceReader.h:



Classes

- class gdcm::SurfaceReader

  This class defines a SURFACE IE reader.

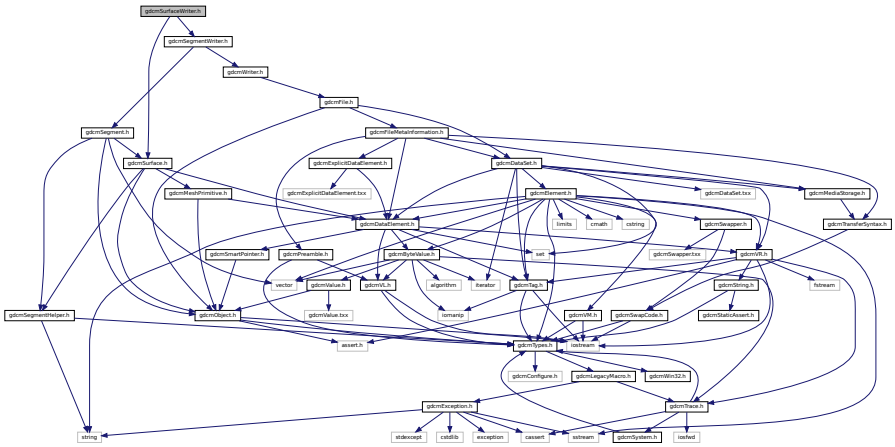
Namespaces

- gdcm

11.244 gdcmSurfaceWriter.h File Reference

```
#include <gdcmSegmentWriter.h>
#include <gdcmSurface.h>
```

Include dependency graph for gdcmSurfaceWriter.h:



Classes

- class gdcm::SurfaceWriter

  This class defines a SURFACE IE writer.

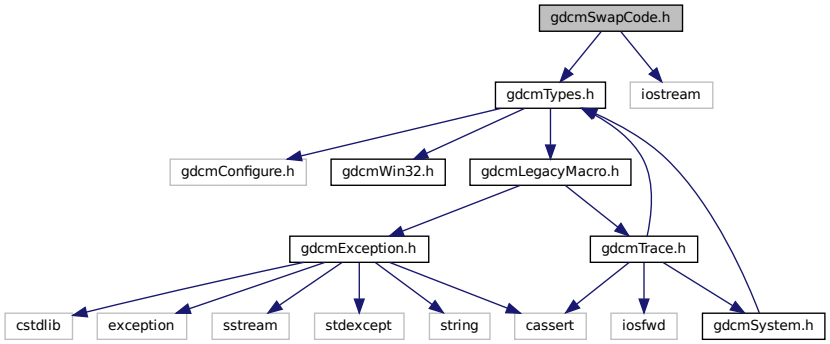
Namespaces

- gdcm

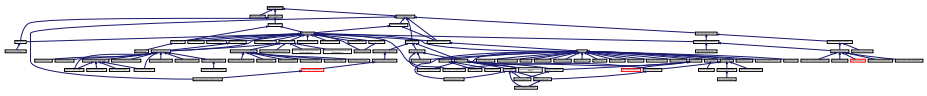
11.245 gdcmSwapCode.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmSwapCode.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::SwapCode

  SwapCode representation.

Namespaces

- gdcm

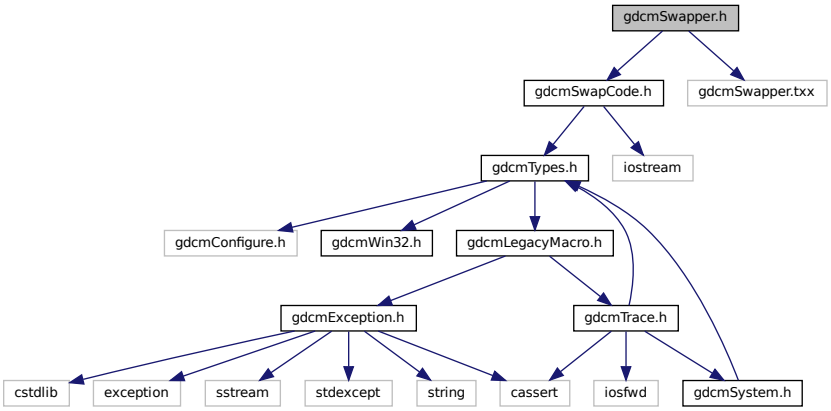
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const SwapCode &sc)

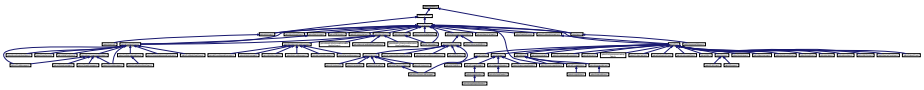
11.246 gdcmSwapper.h File Reference

```
#include "gdcmSwapCode.h"
#include "gdcmSwapper.txx"
```

Include dependency graph for gdcmSwapper.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::SwapperDoOp
- class gdcm::SwapperNoOp

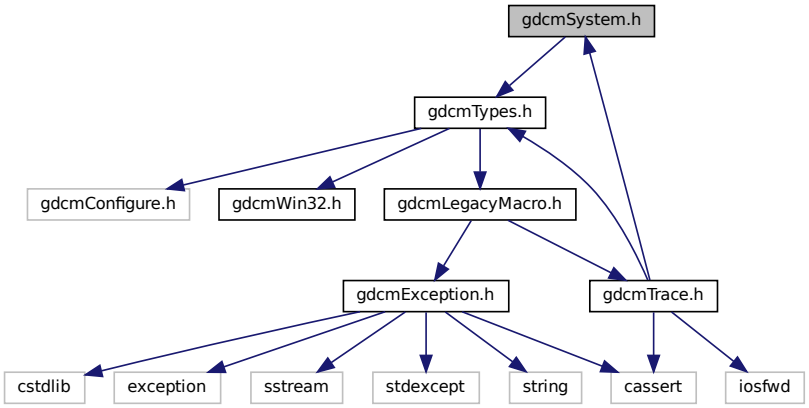
Namespaces

- gdcm

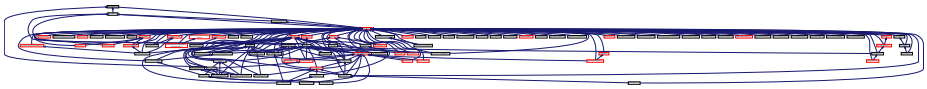
11.247 gdcmSystem.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSystem.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::System

  Class to do system operation.

Namespaces

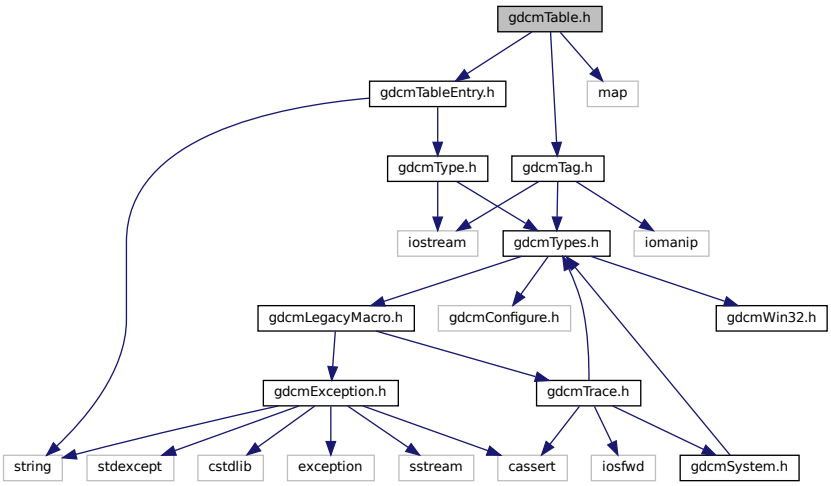
- gdcm

11.248 gdcmTable.h File Reference

```
#include "gdcmTableEntry.h"
#include "gdcmTag.h"
```

```
#include <map>
```

Include dependency graph for gdcmTable.h:



Classes

- class gdcm::Table

  Table.

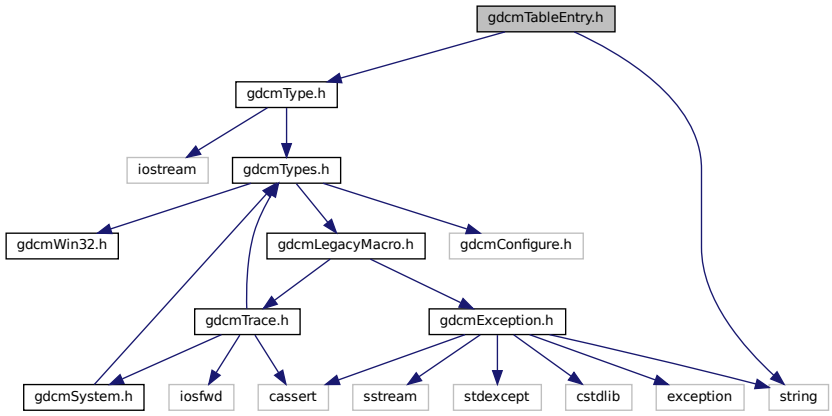
Namespaces

- gdcm

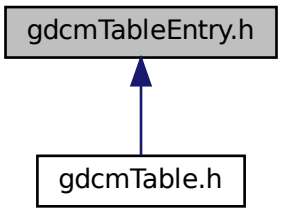
11.249 gdcmTableEntry.h File Reference

```
#include "gdcmType.h"
#include <string>
```

Include dependency graph for gdcmTableEntry.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::TableEntry
  TableEntry.

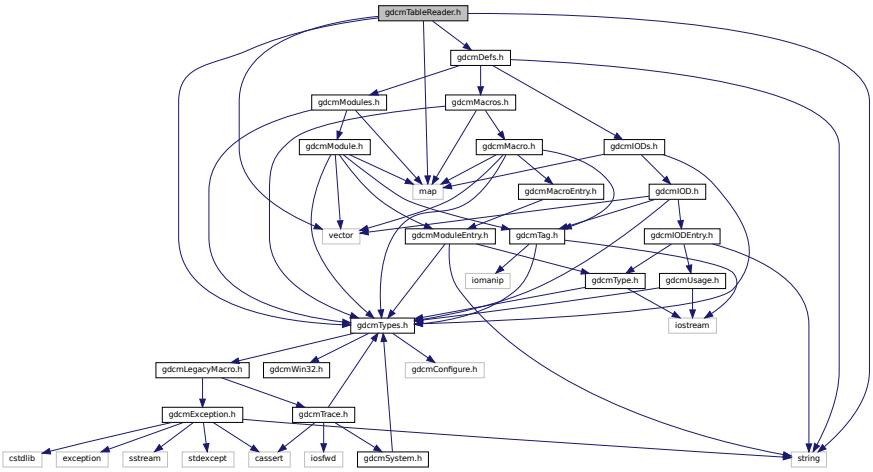
Namespaces

- gdcm

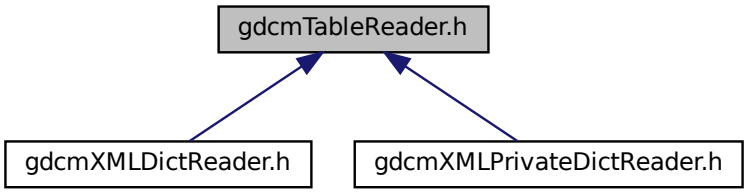
11.250 gdcmTableReader.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmDefs.h"
#include <string>
#include <vector>
#include <map>
```

Include dependency graph for gdcmTableReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::TableReader

  Class for representing a TableReader.

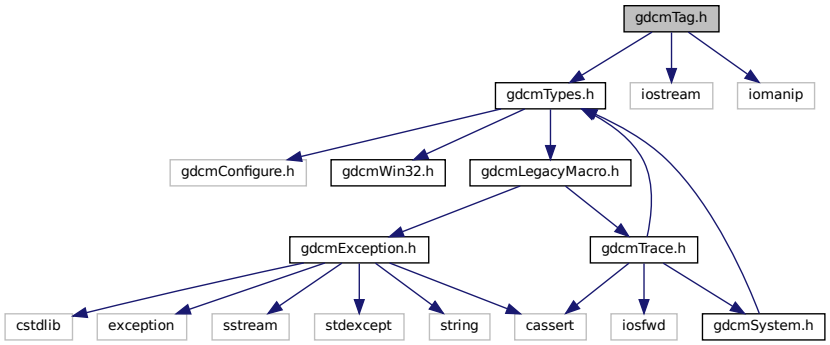
Namespaces

- gdcm

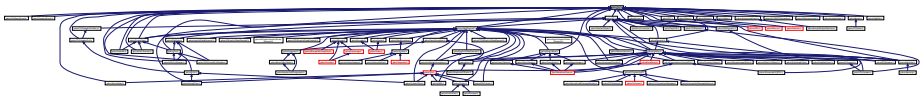
11.251 gdcmTag.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
#include <iomanip>
```

Include dependency graph for gdcmTag.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Tag

  Class to represent a DICOM Data Element (Attribute) Tag (Group, Element).

Namespaces

- gdcm

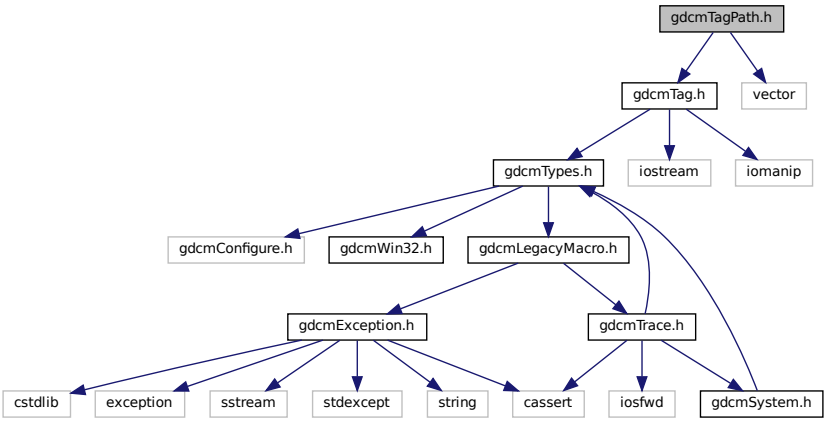
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Tag &_val)
- std::istream & gdcm::operator>> (std::istream &_is, Tag &_val)

11.252 gdcmTagPath.h File Reference

```
#include "gdcmTag.h"
#include <vector>
```

Include dependency graph for gdcmTagPath.h:



Classes

- class gdcm::TagPath

  class to handle a path of tag.

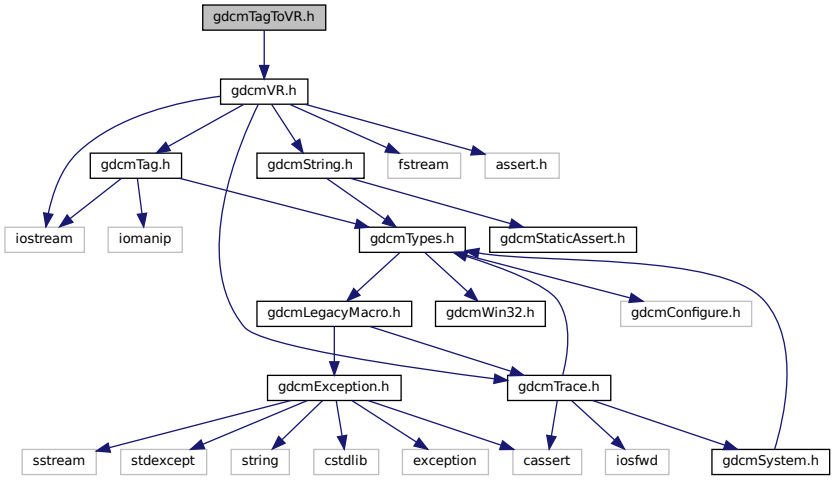
Namespaces

- gdcm

11.253 gdcmTagToVR.h File Reference

```
#include "gdcmVR.h"
```

Include dependency graph for gdcmTagToVR.h:



Namespaces

- gdcm

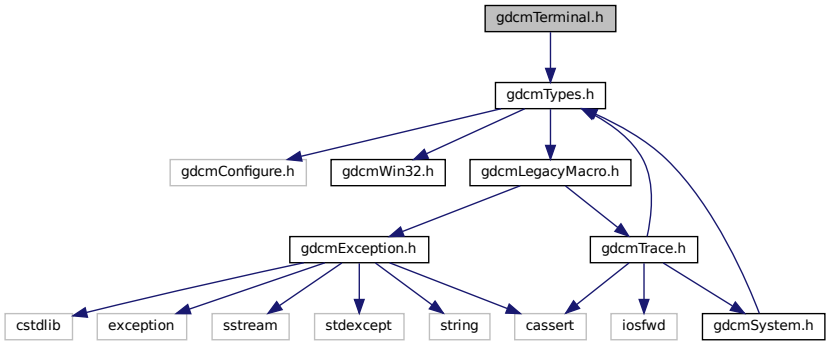
Functions

- VR::VRType gdcm::GetVRFromTag (Tag const &tag)

11.254 gdcmTerminal.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmTerminal.h:



Namespaces

- gdcm
- gdcm::terminal

  Class for Terminal.

Enumerations

- enum gdcm::terminal::Attribute {
  gdcm::terminal::reset = 0 ,
  gdcm::terminal::bright = 1 ,
  gdcm::terminal::dim = 2 ,
  gdcm::terminal::underline = 3 ,
  gdcm::terminal::blink = 5 ,
  gdcm::terminal::reverse = 7 ,
  gdcm::terminal::hidden = 8 }
- enum gdcm::terminal::Color {
  gdcm::terminal::black = 0 ,
  gdcm::terminal::red ,
  gdcm::terminal::green ,
  gdcm::terminal::yellow ,
  gdcm::terminal::blue ,
  gdcm::terminal::magenta ,
  gdcm::terminal::cyan ,
  gdcm::terminal::white }
- enum gdcm::terminal::Mode {
  gdcm::terminal::CONSOLE = 0 ,
  gdcm::terminal::VT100 }

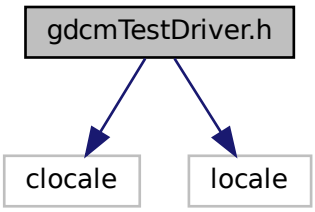
Functions

- GDCM_EXPORT std::string gdcm::terminal::setattribute (Attribute att)
- GDCM_EXPORT std::string gdcm::terminal::setbgcolor (Color c)
- GDCM_EXPORT std::string gdcm::terminal::setfgcolor (Color c)
- GDCM_EXPORT void gdcm::terminal::setmode (Mode m)

11.255 gdcmTestDriver.h File Reference

```
#include <clocale>
#include <locale>
```

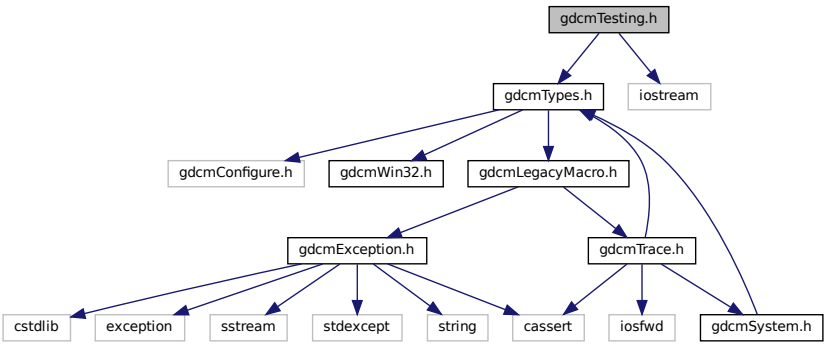
Include dependency graph for gdcmTestDriver.h:



11.256 gdcmTesting.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmTesting.h:



Classes

- class gdcm::Testing

  class for testing

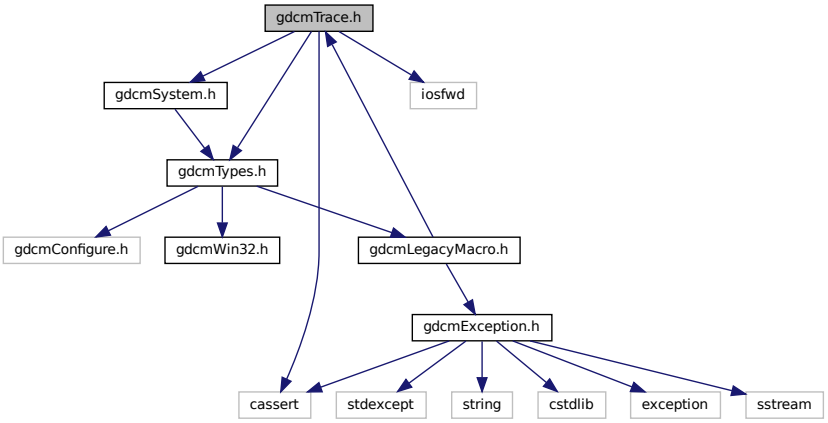
Namespaces

- gdcm

11.257 gdcmTrace.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmSystem.h"
#include <iosfwd>
#include <cassert>
```

Include dependency graph for gdcmTrace.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::Trace

  Trace.

Namespaces

- gdcm

Macros

- #define GDCM_FUNCTION "<unknown>"
- #define gdcmAssertAlwaysMacro(arg) gdcmAssertMacro(arg)

  AssertAlways.
- #define gdcmAssertMacro(arg)

Assert.

- #define gdcmDebugMacro(msg)

  Debug.

- #define gdcmErrorMacro(msg)

  Error this is pretty bad, more than just warning It could mean lost of data, something not handle...

- #define gdcmWarningMacro(msg)

  Warning.

11.257.1 Macro Definition Documentation

11.257.1.1 GDCM_FUNCTION

```
#define GDCM_FUNCTION "<unknown>"
```

11.257.1.2 gdcmAssertAlwaysMacro

```
#define gdcmAssertAlwaysMacro(
              arg ) gdcmAssertMacro(arg)
```

AssertAlways.

Parameters

arg	argument to test An easy solution to pass also a message is to do: gdcmAssertMacro("my message" && 2 < 3)

11.257.1.3 gdcmAssertMacro

```
#define gdcmAssertMacro(
              arg )
```

Value:

```
{                                                                    \
   if( !(arg) )                                                      \
   {                                                                 \
   std::ostringstream osmacro;                                       \
   osmacro « "Assert: In " __FILE__ ", line " « __LINE__          \
           « ", function " « GDCM_FUNCTION                         \
           « "\n\n";                                                \
   std::ostream &_os = gdcm::Trace::GetErrorStream();                \
   _os « osmacro.str() « std::endl;                                \
   assert ( arg );                                                   \
```

```
   }                                                                    \
}                                                                       \
GDCM_NOOP_STATEMENT
```

Assert.

Parameters

arg	argument to test An easy solution to pass also a message is to do: gdcmAssertMacro("my message" && 2 < 3)

11.257.1.4 gdcmDebugMacro

```
#define gdcmDebugMacro(
              msg )
```

Value:

```
{                                                                       \
   if( gdcm::Trace::GetDebugFlag() )                                    \
   {                                                                    \
   std::ostringstream osmacro;                                          \
   osmacro « "Debug: In " __FILE__ ", line " « __LINE__          \
           « ", function " « GDCM_FUNCTION « '\n'                \
           « "Last system error was: "                                  \
           « gdcm::System::GetLastSystemError() « '\n' « msg;   \
   std::ostream &_os = gdcm::Trace::GetDebugStream();                   \
   _os « osmacro.str() « "\n\n" « std::endl;                      \
   }                                                                    \
}                                                                       \
GDCM_NOOP_STATEMENT
```

Debug.

Parameters

msg	message part

11.257.1.5 gdcmErrorMacro

```
#define gdcmErrorMacro(
              msg )
```

Value:

```
{                                                                       \
   if( gdcm::Trace::GetErrorFlag() )                                    \
   {                                                                    \
   std::ostringstream osmacro;                                          \
   osmacro « "Error: In " __FILE__ ", line " « __LINE__          \
           « ", function " « GDCM_FUNCTION « '\n'                \
           « msg « "\n\n";                                              \
   std::ostream &_os = gdcm::Trace::GetErrorStream();                   \
   _os « osmacro.str() « std::endl;                               \
   }                                                                    \
```

```
} \
GDCM_NOOP_STATEMENT
```

Error this is pretty bad, more than just warning It could mean lost of data, something not handle...

Parameters

msg	second message part

11.257.1.6 gdcmWarningMacro

```
#define gdcmWarningMacro(
              msg )
```

Value:

```
{                                                                    \
   if( gdcm::Trace::GetWarningFlag() )                               \
   {                                                                 \
   std::ostringstream osmacro;                                       \
   osmacro « "Warning: In " __FILE__ ", line " « __LINE__       \
           « ", function " « GDCM_FUNCTION « "\n"               \
           « msg « "\n\n";                                           \
   std::ostream &_os = gdcm::Trace::GetWarningStream();              \
   _os « osmacro.str() « std::endl;                                  \
   }                                                                 \
}                                                                    \
GDCM_NOOP_STATEMENT
```

Warning.

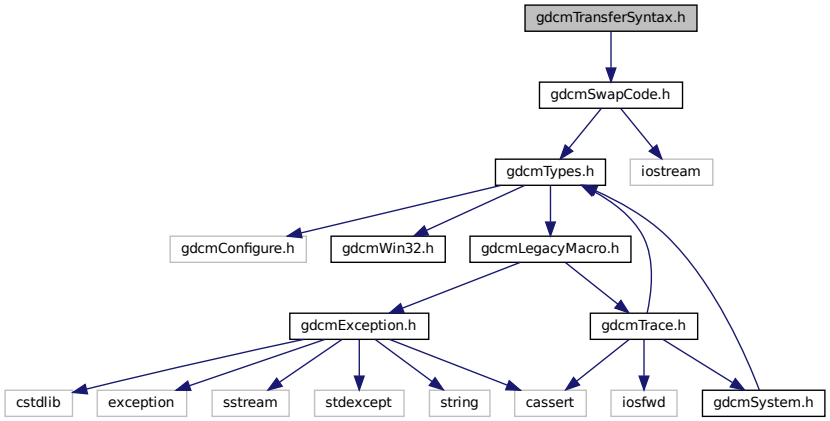
Parameters

msg	message part

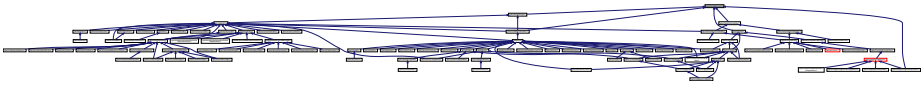
11.258 gdcmTransferSyntax.h File Reference

```
#include "gdcmSwapCode.h"
```

Include dependency graph for gdcmTransferSyntax.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::TransferSyntax

  Class to manipulate Transfer Syntax.

Namespaces

- gdcm

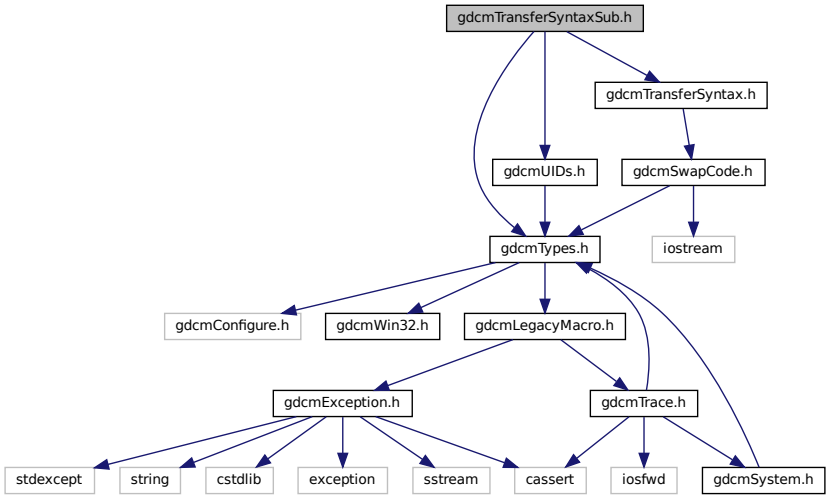
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const TransferSyntax &ts)

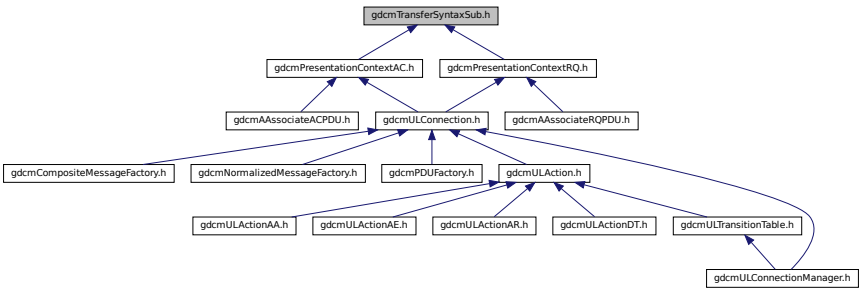
11.259 gdcmTransferSyntaxSub.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDs.h"
```

Include dependency graph for gdcmTransferSyntaxSub.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::TransferSyntaxSub

  TransferSyntaxSub.

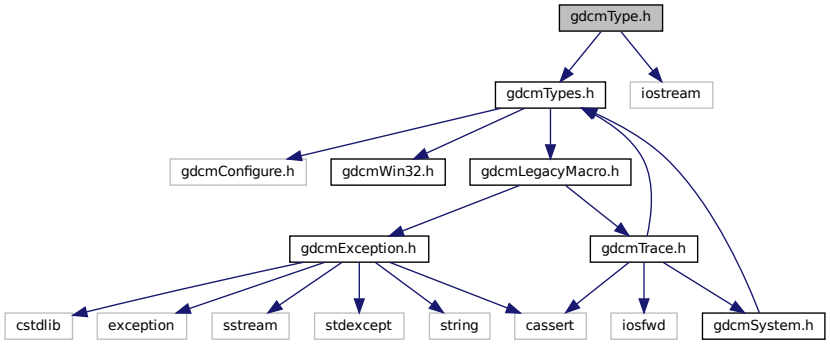
Namespaces

- gdcm
- gdcm::network

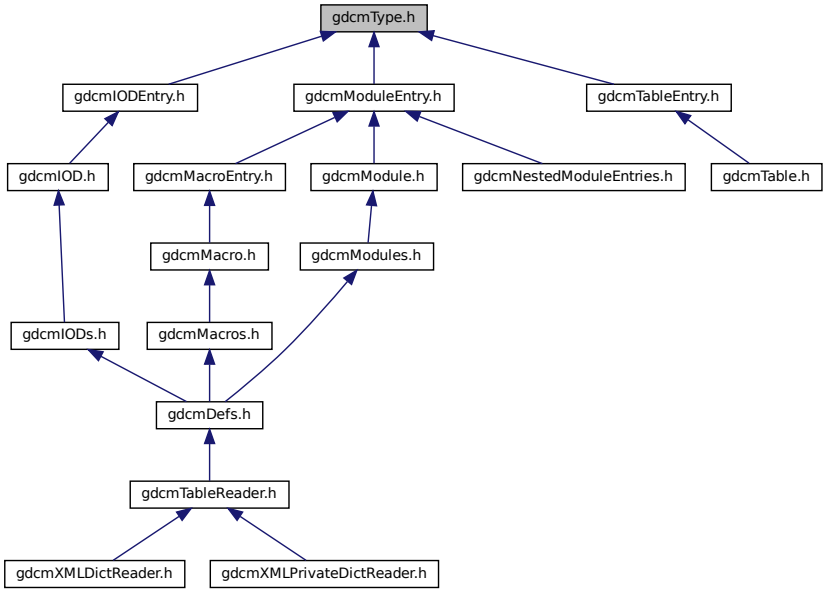
11.260 gdcmType.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmType.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Type

  Type.

Namespaces

- gdcm

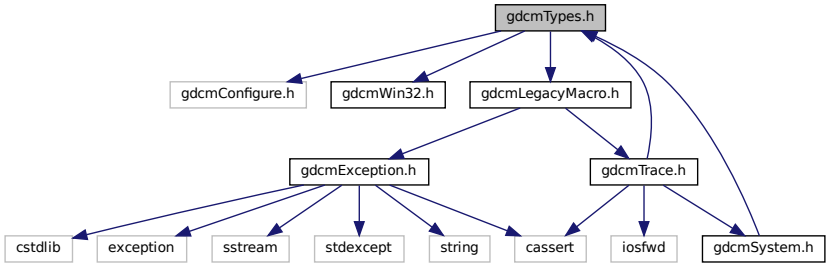
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Type &val)

11.261 gdcmTypes.h File Reference

```
#include "gdcmConfigure.h"
#include "gdcmWin32.h"
#include "gdcmLegacyMacro.h"
```

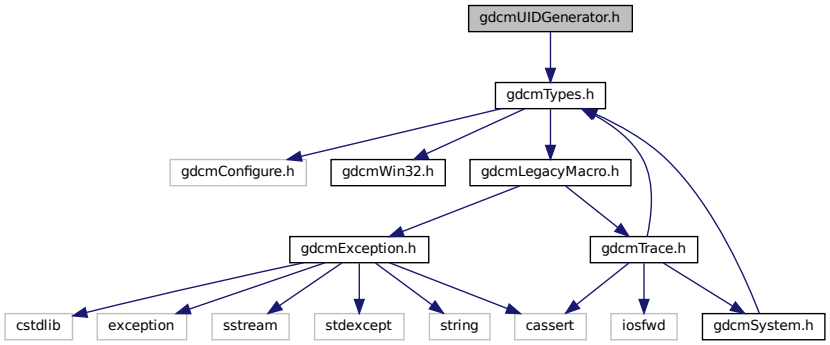
Include dependency graph for gdcmTypes.h:



11.262 gdcmUIDGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUIDGenerator.h:



Classes

- class gdcm::UIDGenerator

  Class for generating unique UID.

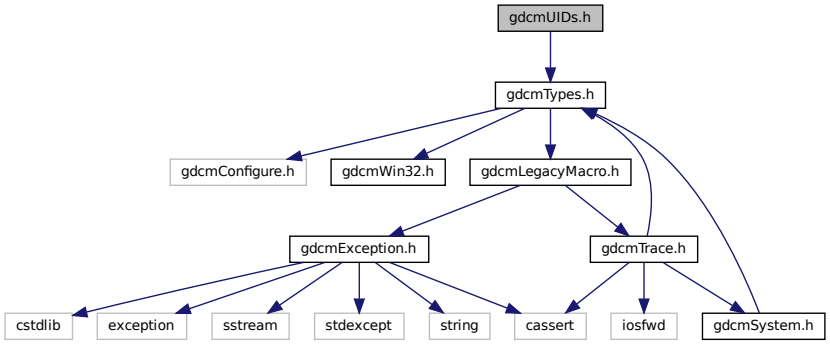
Namespaces

- gdcm

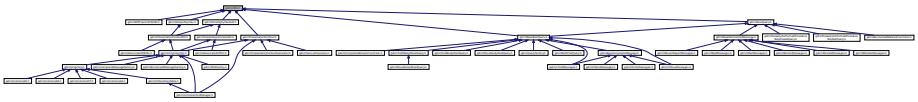
11.263 gdcmUIDs.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUIDs.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::UIDs

  all known uids

Namespaces

- gdcm

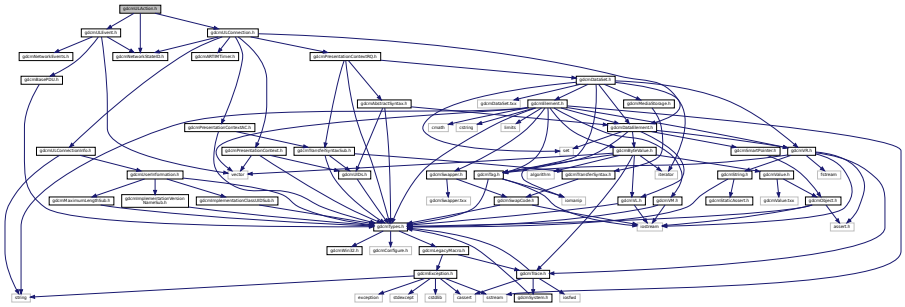
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const UIDs &uid)

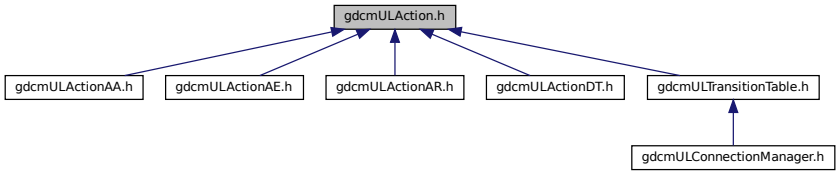
11.264 gdcmULAction.h File Reference

```
#include "gdcmNetworkStateID.h"
#include "gdcmULEvent.h"
#include "gdcmULConnection.h"
```

Include dependency graph for gdcmULAction.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ULAction

  ULAction.

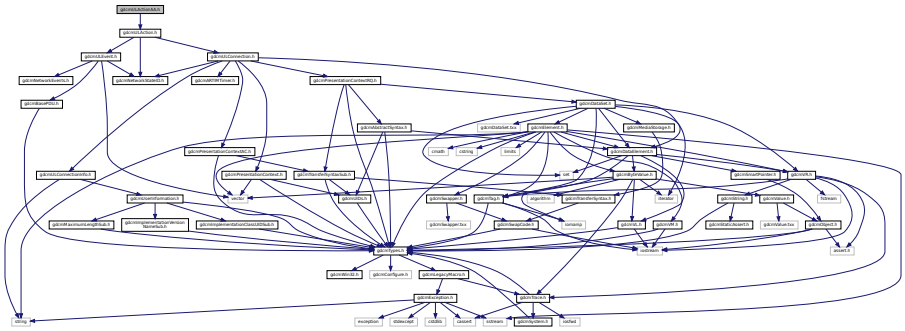
Namespaces

- gdcm
- gdcm::network

11.265 gdcmULActionAA.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAA.h:



Classes

- class gdcm::network::ULActionAA1
- class gdcm::network::ULActionAA2
- class gdcm::network::ULActionAA3
- class gdcm::network::ULActionAA4
- class gdcm::network::ULActionAA5
- class gdcm::network::ULActionAA6
- class gdcm::network::ULActionAA7
- class gdcm::network::ULActionAA8

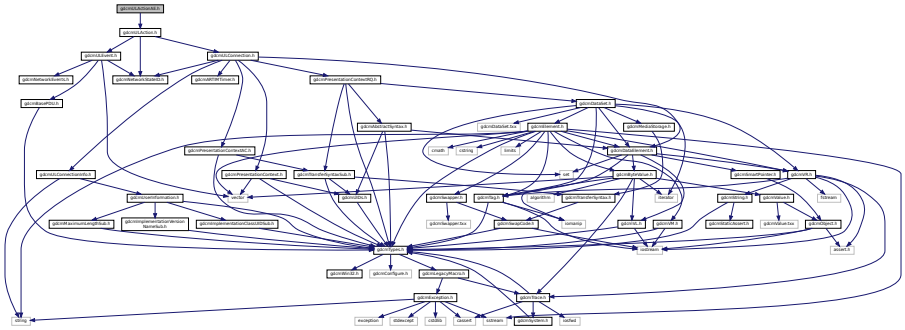
Namespaces

- gdcm
- gdcm::network

11.266 gdcmULActionAE.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAE.h:



Classes

- class gdcm::network::ULActionAE1
- class gdcm::network::ULActionAE2
- class gdcm::network::ULActionAE3
- class gdcm::network::ULActionAE4
- class gdcm::network::ULActionAE5
- class gdcm::network::ULActionAE6
- class gdcm::network::ULActionAE7
- class gdcm::network::ULActionAE8

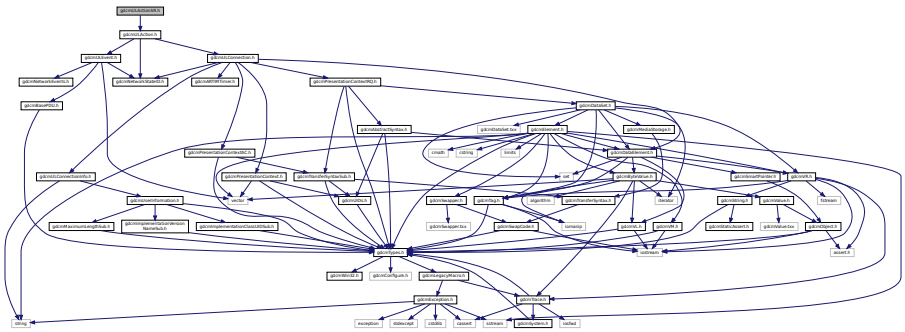
Namespaces

- gdcm
- gdcm::network

11.267 gdcmULActionAR.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAR.h:



Classes

- class gdcm::network::ULActionAR1
- class gdcm::network::ULActionAR10
- class gdcm::network::ULActionAR2
- class gdcm::network::ULActionAR3
- class gdcm::network::ULActionAR4
- class gdcm::network::ULActionAR5
- class gdcm::network::ULActionAR6
- class gdcm::network::ULActionAR7
- class gdcm::network::ULActionAR8
- class gdcm::network::ULActionAR9

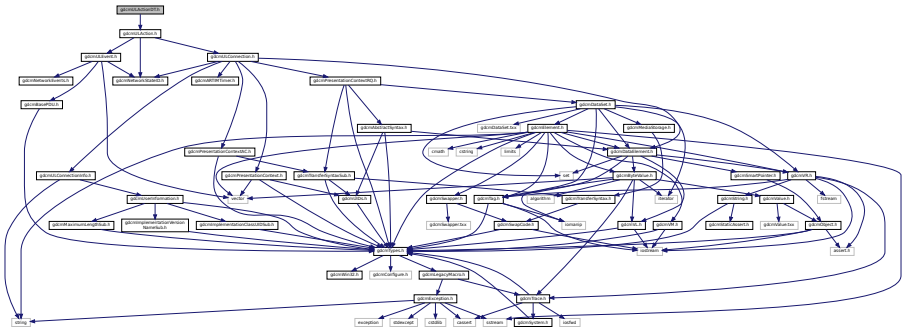
Namespaces

- gdcm
- gdcm::network

11.268 gdcmULActionDT.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionDT.h:



Classes

- class gdcm::network::ULActionDT1
- class gdcm::network::ULActionDT2

Namespaces

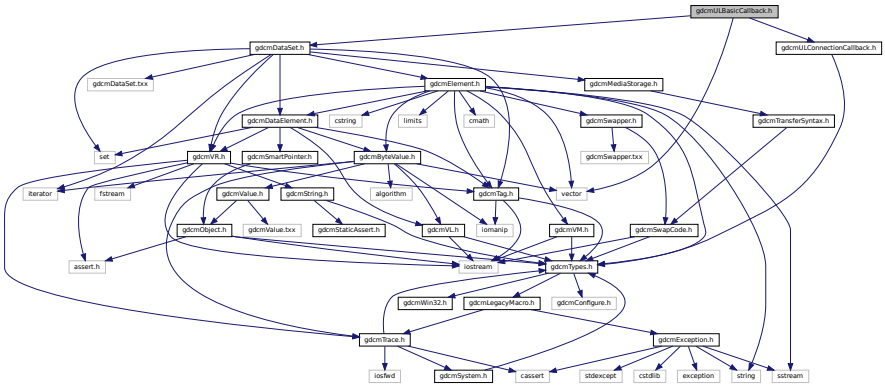
- gdcm
- gdcm::network

11.269 gdcmULBasicCallback.h File Reference

```
#include "gdcmULConnectionCallback.h"
#include "gdcmDataSet.h"
```

```
#include <vector>
```

Include dependency graph for gdcmULBasicCallback.h:



Classes

- class gdcm::network::ULBasicCallback

  ULBasicCallback.

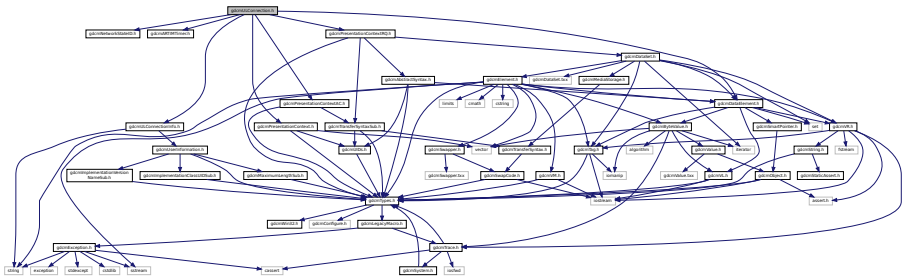
Namespaces

- gdcm
- gdcm::network

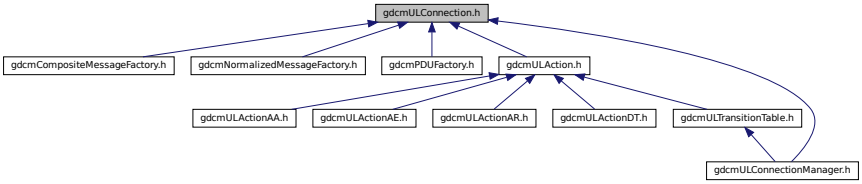
11.270 gdcmULConnection.h File Reference

```
#include "gdcmNetworkStateID.h"
#include "gdcmARTIMTimer.h"
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmDataElement.h"
#include "gdcmPresentationContextAC.h"
#include "gdcmPresentationContext.h"
```

Include dependency graph for gdcmULConnection.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ULConnection
  ULConnection.

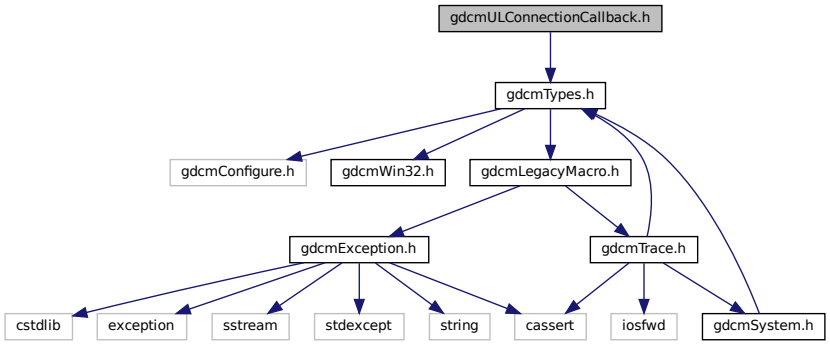
Namespaces

- gdcm
- gdcm::network

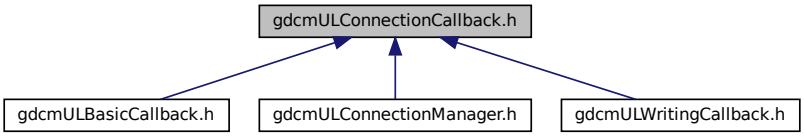
11.271 gdcmULConnectionCallback.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmULConnectionCallback.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ULConnectionCallback

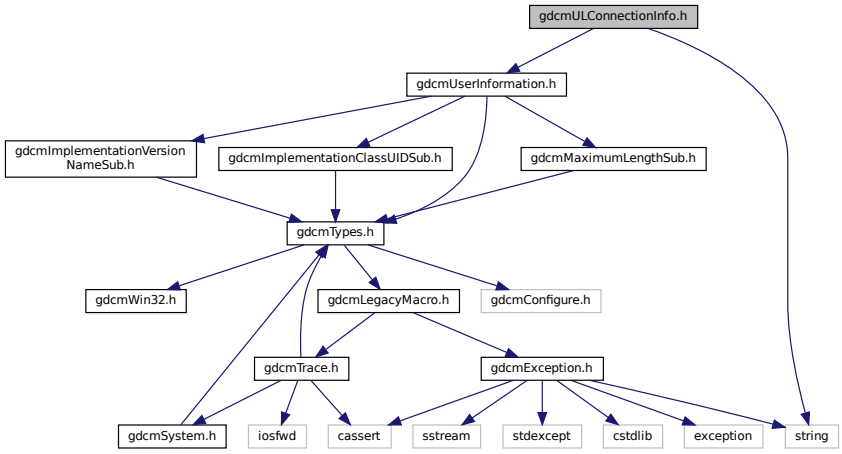
Namespaces

- gdcm
- gdcm::network

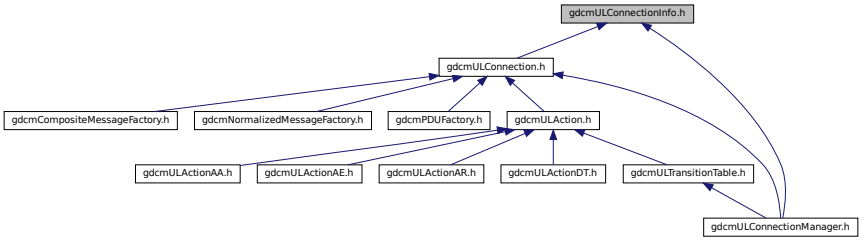
11.272 gdcmULConnectionInfo.h File Reference

```
#include "gdcmUserInformation.h"
#include <string>
```

Include dependency graph for gdcmULConnectionInfo.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ULConnectionInfo

  ULConnectionInfo.

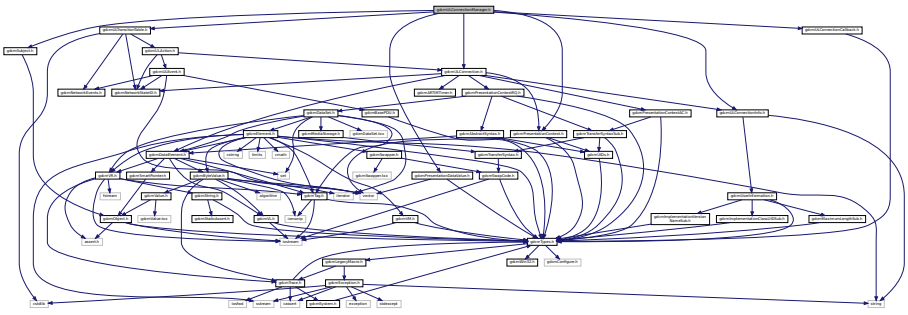
Namespaces

- gdcm
- gdcm::network

11.273 gdcmULConnectionManager.h File Reference

```
#include "gdcmULTransitionTable.h"
#include "gdcmULConnection.h"
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnectionCallback.h"
#include "gdcmSubject.h"
#include "gdcmPresentationContext.h"
```

Include dependency graph for gdcmULConnectionManager.h:



Classes

- class gdcm::network::ULConnectionManager

  ULConnectionManager.

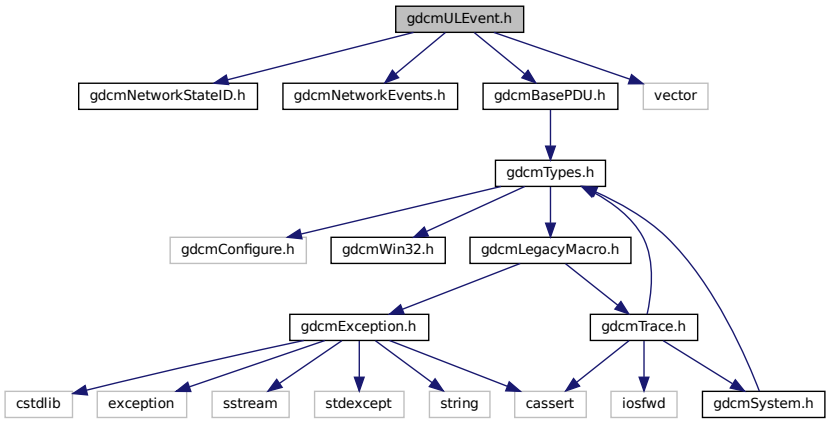
Namespaces

- gdcm
- gdcm::network

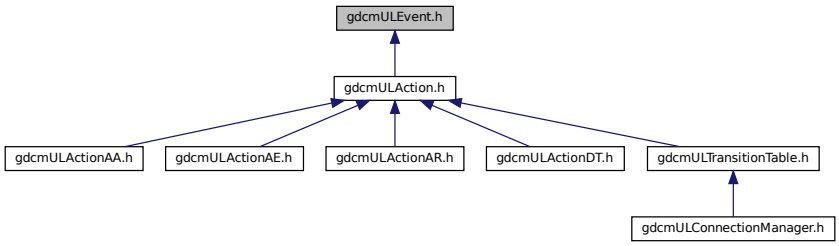
11.274 gdcmULEvent.h File Reference

```
#include "gdcmNetworkStateID.h"
#include "gdcmNetworkEvents.h"
#include "gdcmBasePDU.h"
#include <vector>
```

Include dependency graph for gdcmULEvent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::ULEvent

  ULEvent.

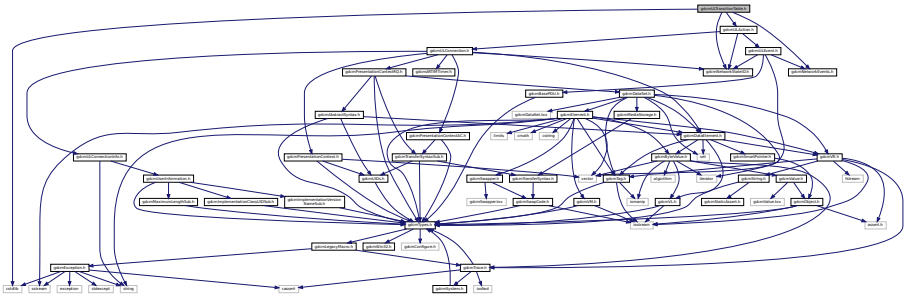
Namespaces

- gdcm
- gdcm::network

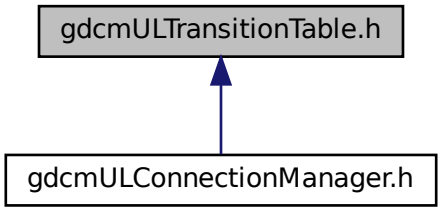
11.275 gdcmULTransitionTable.h File Reference

```
#include "gdcmNetworkStateID.h"
#include "gdcmNetworkEvents.h"
#include "gdcmULAction.h"
#include <cstdlib>
```

Include dependency graph for gdcmULTransitionTable.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::TableRow
- struct gdcm::network::Transition
- class gdcm::network::ULTransitionTable

  ULTransitionTable The transition table of all the ULEvents, new ULActions, and ULStates.

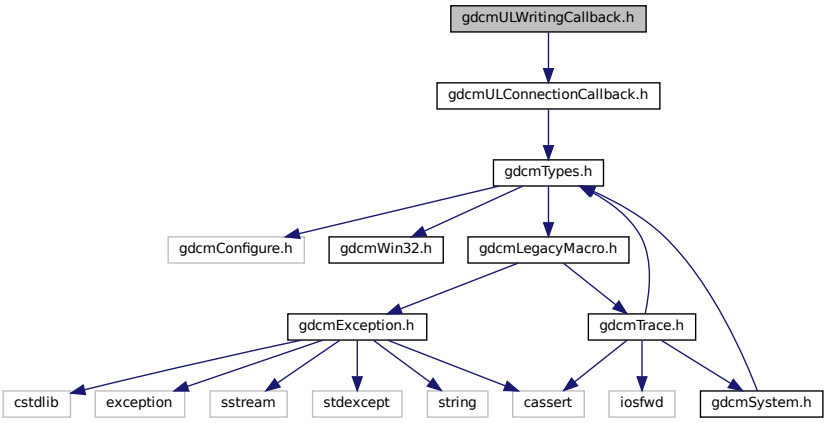
Namespaces

- gdcm
- gdcm::network

11.276 gdcmULWritingCallback.h File Reference

```
#include "gdcmULConnectionCallback.h"
```

Include dependency graph for gdcmULWritingCallback.h:



Classes

- class gdcm::network::ULWritingCallback

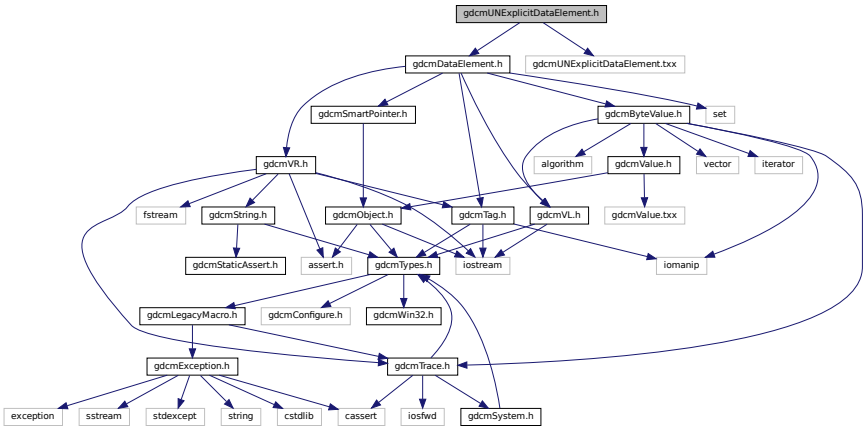
Namespaces

- gdcm
- gdcm::network

11.277 gdcmUNExplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmUNExplicitDataElement.txx"
```

Include dependency graph for gdcmUNExplicitDataElement.h:



Classes

- class gdcm::UNExplicitDataElement

  Class to read/write a DataElement as UNExplicit Data Element.

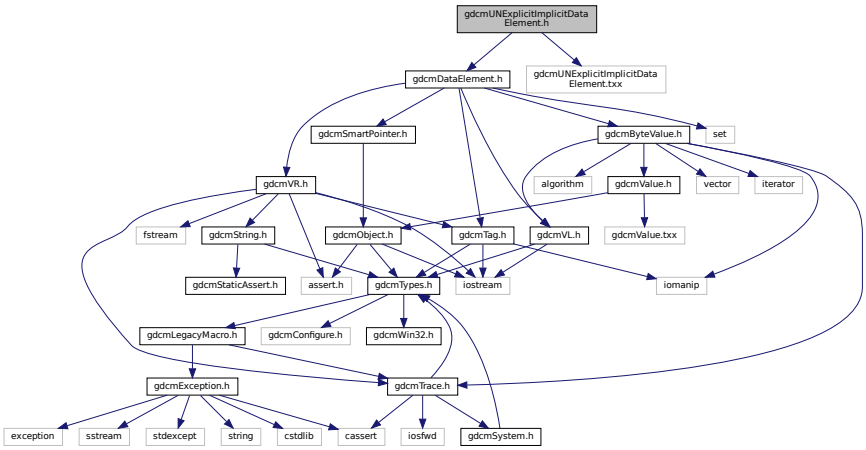
Namespaces

- gdcm

11.278 gdcmUNExplicitImplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmUNExplicitImplicitDataElement.txx"
```

Include dependency graph for gdcmUNExplicitImplicitDataElement.h:



Classes

- class gdcm::UNExplicitImplicitDataElement

  Class to read/write a DataElement as ExplicitImplicit Data Element.

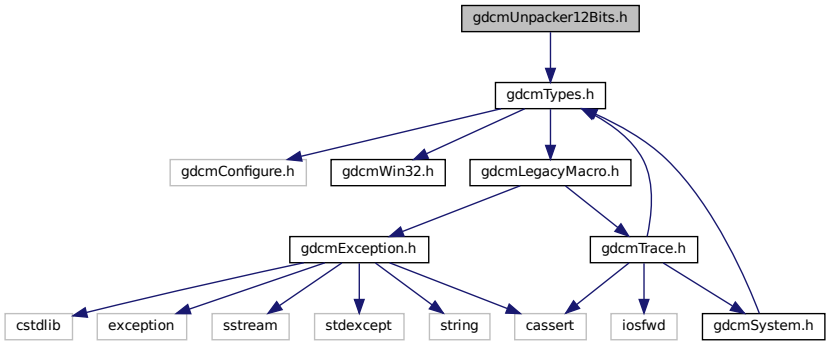
Namespaces

- gdcm

11.279 gdcmUnpacker12Bits.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUnpacker12Bits.h:



Classes

- class gdcm::Unpacker12Bits

  Pack/Unpack 12 bits pixel into 16bits.

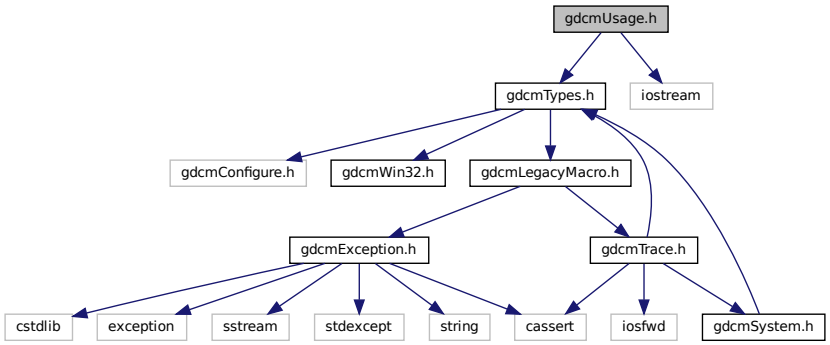
Namespaces

- gdcm

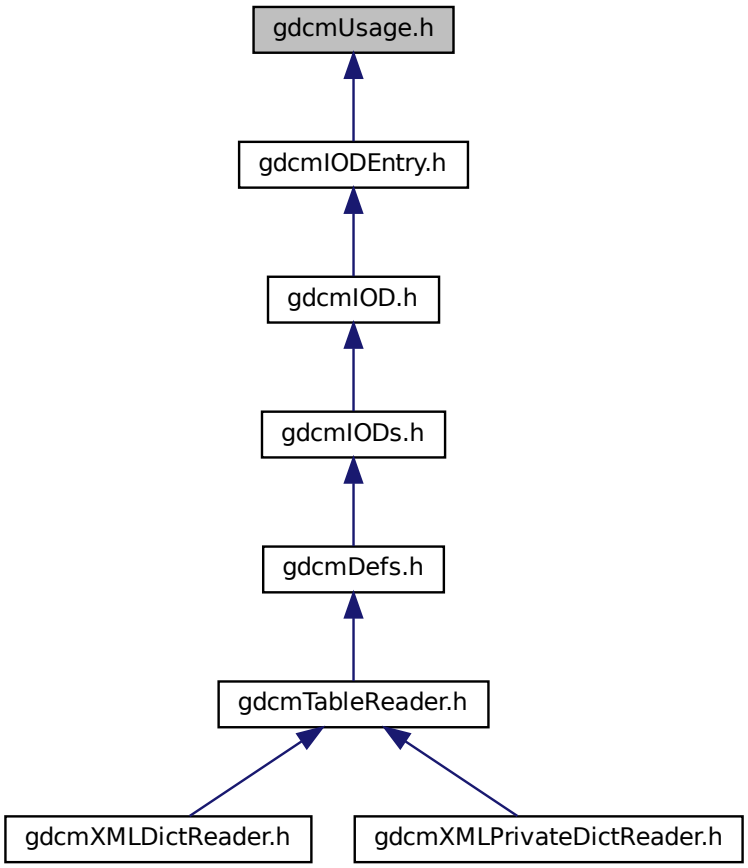
11.280 gdcmUsage.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmUsage.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Usage
  Usage.

Namespaces

- gdcm

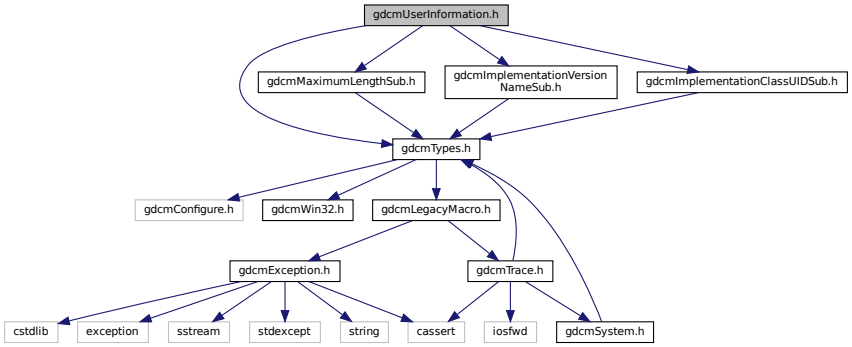
Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const Usage &val)

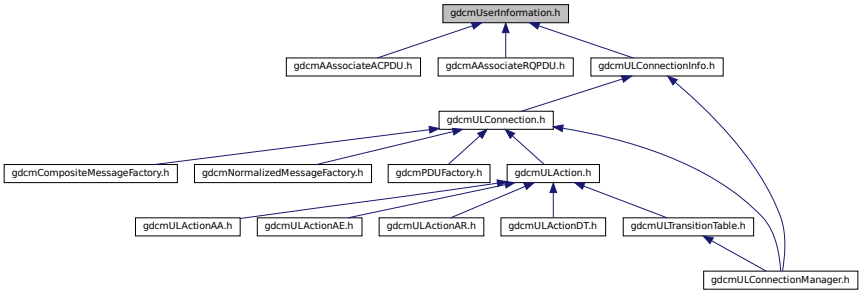
11.281 gdcmUserInformation.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmMaximumLengthSub.h"
#include "gdcmImplementationVersionNameSub.h"
#include "gdcmImplementationClassUIDSub.h"
```

Include dependency graph for gdcmUserInformation.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::network::UserInformation

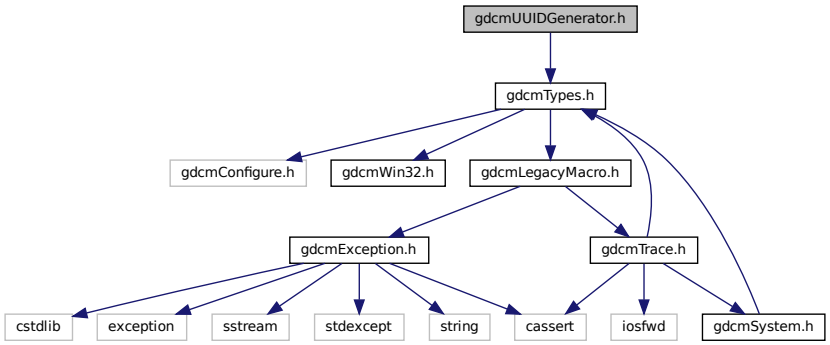
  UserInformation.

Namespaces

- gdcm
- gdcm::network

11.282 gdcmUUIDGenerator.h File Reference

`#include "gdcmTypes.h"`
Include dependency graph for gdcmUUIDGenerator.h:



Classes

- class gdcm::UUIDGenerator

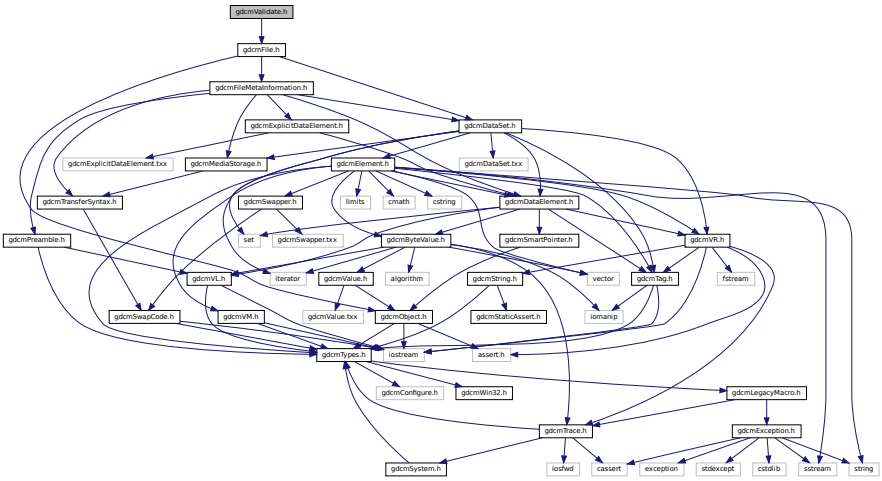
  Class for generating unique UUID.

Namespaces

- gdcm

11.283 gdcmValidate.h File Reference

`#include "gdcmFile.h"`
Include dependency graph for gdcmValidate.h:



Classes

- class gdcm::Validate

  Validate class.

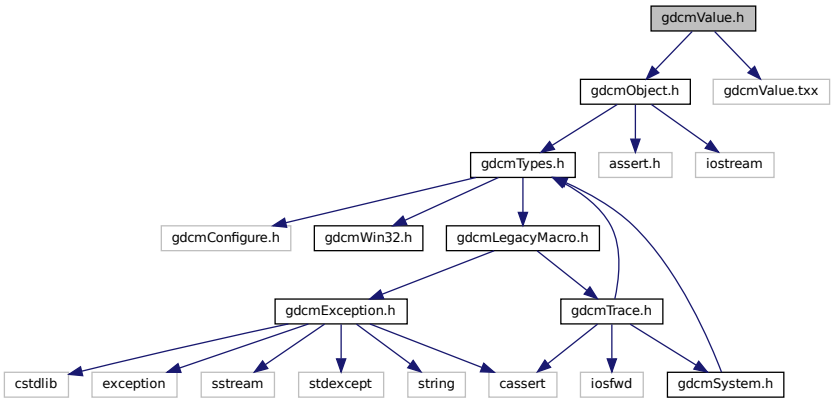
Namespaces

- gdcm

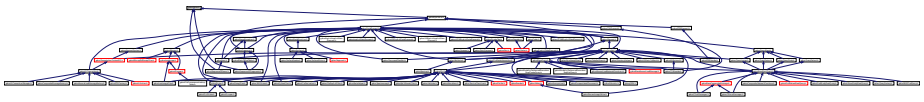
11.284 gdcmValue.h File Reference

```
#include "gdcmObject.h"
#include "gdcmValue.txx"
```

Include dependency graph for gdcmValue.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Value

  Class to represent the value of a Data Element.

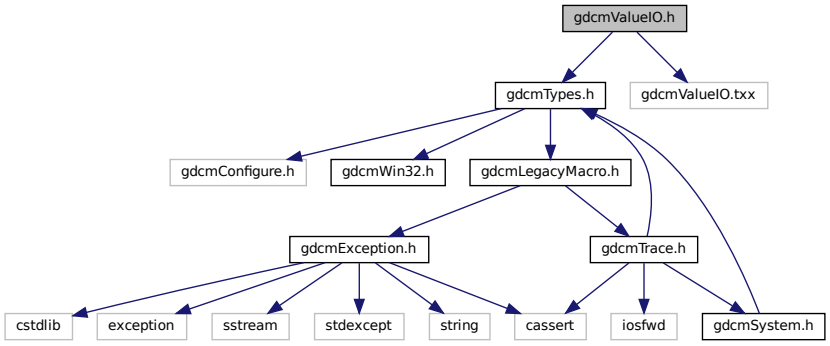
Namespaces

- gdcm

11.285 gdcmValueIO.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmValueIO.txx"
```

Include dependency graph for gdcmValueIO.h:



Classes

- class gdcm::ValueIO< TDE, TSwap, TType >

  Class to dispatch template calls.

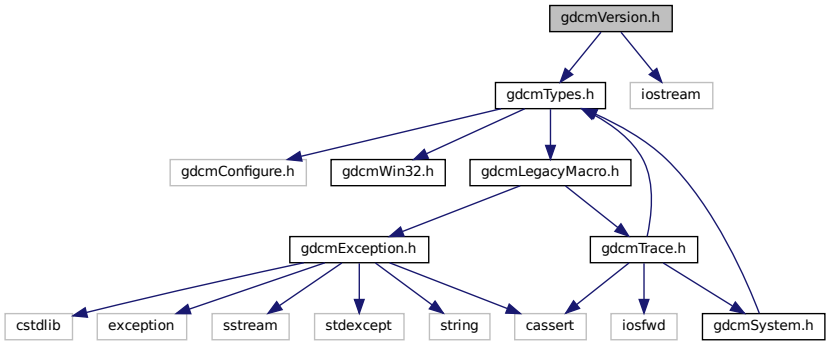
Namespaces

- gdcm

11.286 gdcmVersion.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmVersion.h:



Classes

- class gdcm::Version

  major/minor and build version

Namespaces

- gdcm

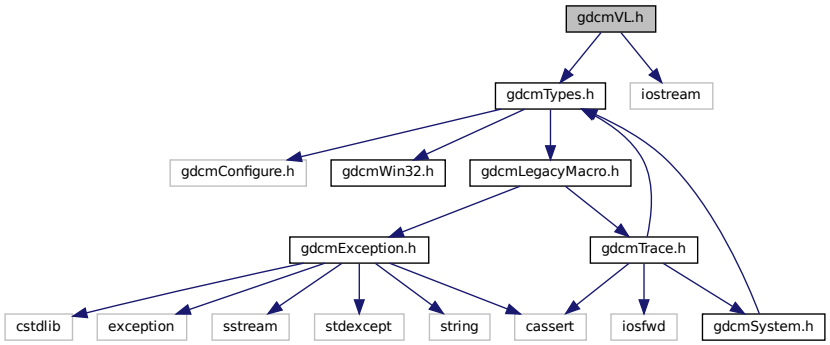
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const Version &v)

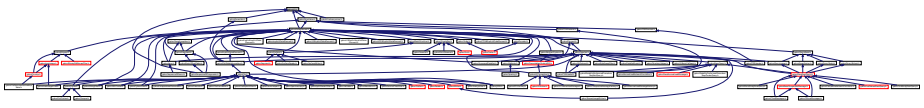
11.287 gdcmVL.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmVL.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::VL

  Value Length.

Namespaces

- gdcm

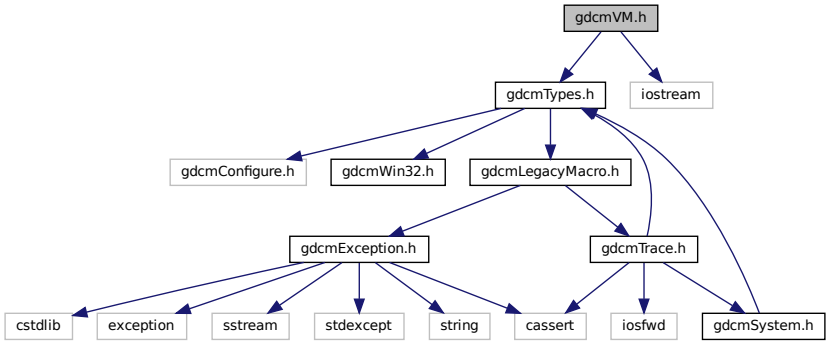
Functions

- std::ostream & gdcm::operator<< (std::ostream &os, const VL &val)

11.288 gdcmVM.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for gdcmVM.h:



This graph shows which files directly or indirectly include this file:

Classes

- class gdcm::VM

  Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

Namespaces

- gdcm

Macros

- #define TYPETOLENGTH(type, length)

Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const VM &_val)

11.288.1 Macro Definition Documentation

11.288.1.1 TYPETOLENGTH

```
#define TYPETOLENGTH(
              type,
              length )
```

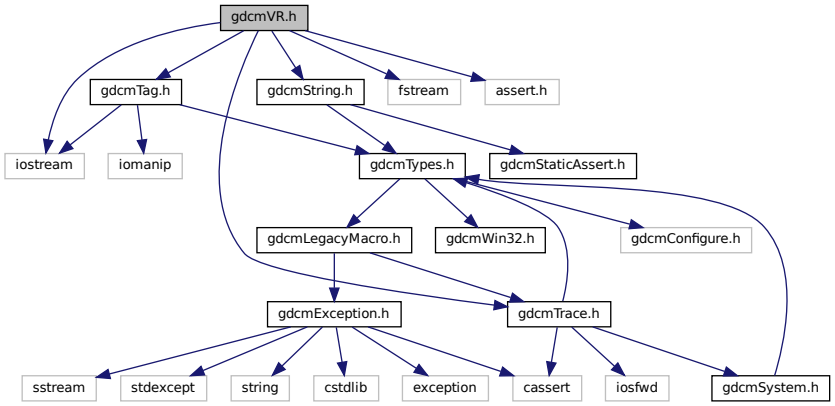
Value:

```
  template<> struct VMToLength<VM::type> \
  { enum { Length = length }; };
```

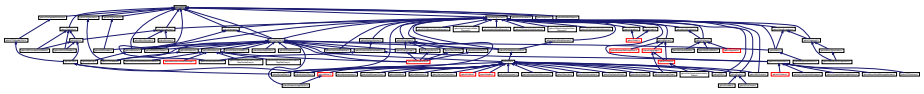
11.289 gdcmVR.h File Reference

```
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmString.h"
#include <iostream>
#include <fstream>
#include <assert.h>
```

Include dependency graph for gdcmVR.h:



This graph shows which files directly or indirectly include this file:



Classes

- struct gdcm::UI
- class gdcm::VR

  VR class.

Namespaces

- gdcm

Macros

- #define TYPETOENCODING(type, rep, rtype)
- #define VRTypeTemplateCase(type)

Typedefs

- typedef String<'\\', 16 > gdcm::AEComp
- typedef String<'\\', 64 > gdcm::ASComp
- typedef String<'\\', 16 > gdcm::CSComp
- typedef String<'\\', 64 > gdcm::DAComp
- typedef String<'\\', 64 > gdcm::DTComp
- typedef String<'\\', 64 > gdcm::LOComp
- typedef String<'\\', 64 > gdcm::LTComp
- typedef String<'\\', 64 > gdcm::PNComp
- typedef String<'\\', 64 > gdcm::SHComp
- typedef String<'\\', 64 > gdcm::STComp
- typedef String<'\\', 16 > gdcm::TMComp
- typedef String<'\\', 4294967294 > gdcm::UCComp
- typedef String<'\\', 64, 0 > gdcm::UIComp
- typedef String<'\\', 4294967294 > gdcm::URComp
- typedef String<'\\', 64 > gdcm::UTComp

Functions

- std::ostream & gdcm::operator<< (std::ostream &_os, const UI &_val)
- std::ostream & gdcm::operator<< (std::ostream &_os, const VR &val)
- gdcm::TYPETOENCODING (SQ, VRBINARY, unsigned char) TYPETOENCODING(UN

Variables

- gdcm::VRBINARY

11.289.1 Macro Definition Documentation

11.289.1.1 TYPETOENCODING

```
#define TYPETOENCODING(
              type,
              rep,
              rtype )
```

Value:

```
  template<> struct VRToEncoding<VR::type>    \
  { enum:long long { Mode = VR::rep }; };                \
  template<> struct VRToType<VR::type>        \
  { typedef rtype Type; };
```

11.289.1.2 VRTypeTemplateCase

```
#define VRTypeTemplateCase(
              type )
```

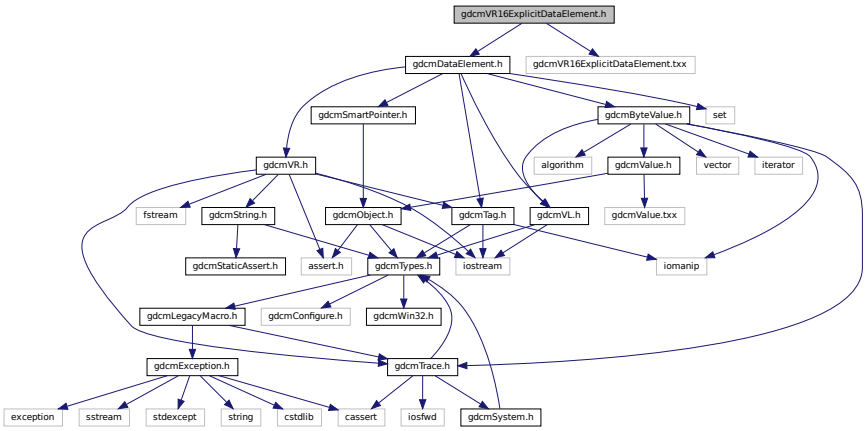
Value:

```
  case VR::type: \
    return sizeof ( VRToType<VR::type>::Type );
```

11.290 gdcmVR16ExplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmVR16ExplicitDataElement.txx"
```

Include dependency graph for gdcmVR16ExplicitDataElement.h:



Classes

- class gdcm::VR16ExplicitDataElement

  Class to read/write a DataElement as Explicit Data Element.

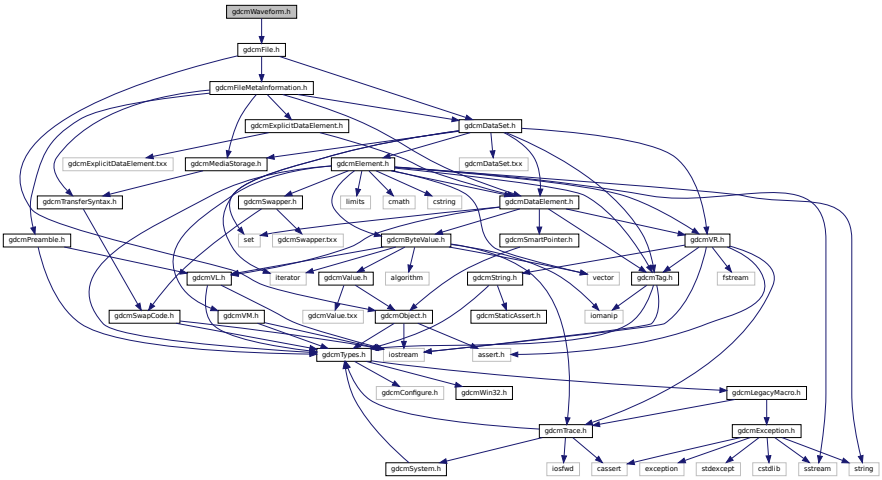
Namespaces

- gdcm

11.291 gdcmWaveform.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmWaveform.h:



Classes

- class gdcm::Waveform

  Waveform class.

Namespaces

- gdcm

11.292 gdcmWin32.h File Reference

This graph shows which files directly or indirectly include this file:

Macros

- #define GDCM_EXPORT

11.292.1 Macro Definition Documentation

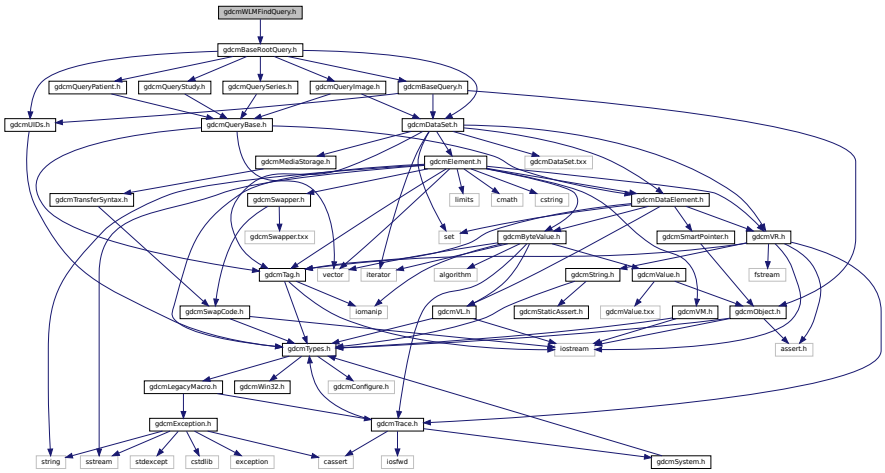
11.292.1.1 GDCM_EXPORT

```
#define GDCM_EXPORT
```

11.293 gdcmWLMFindQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmWLMFindQuery.h:



Classes

- class gdcm::WLMFindQuery

  PatientRootQuery.

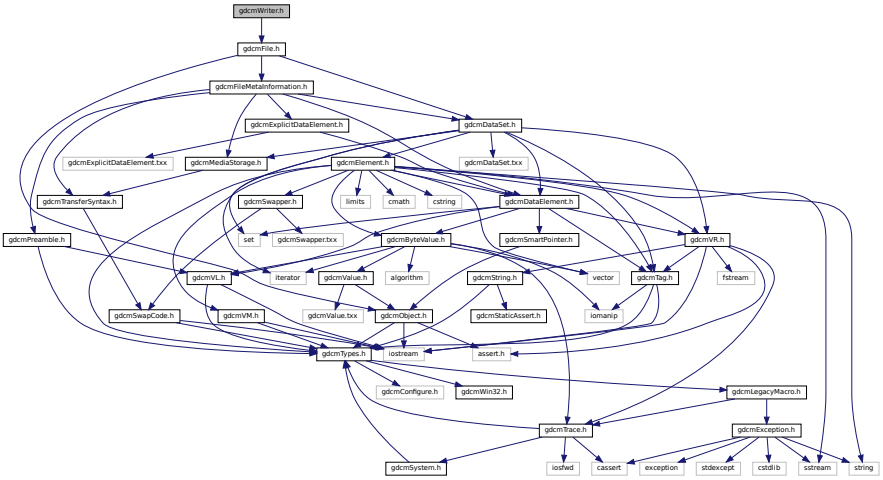
Namespaces

- gdcm

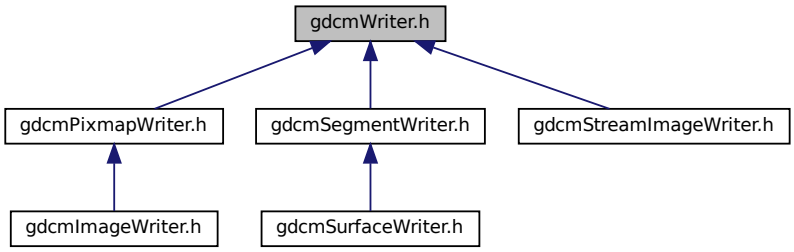
11.294 gdcmWriter.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmWriter.h:



This graph shows which files directly or indirectly include this file:



Classes

- class gdcm::Writer

  Writer ala DOM (Document Object Model)

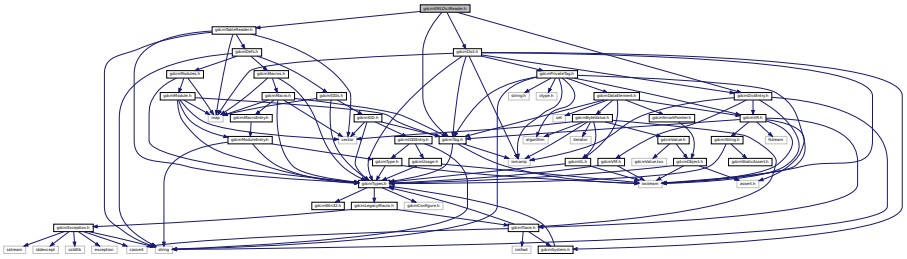
Namespaces

- gdcm

11.295 gdcmXMLDictReader.h File Reference

```
#include "gdcmTableReader.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmXMLDictReader.h:



Classes

- class gdcm::XMLDictReader

  Class for representing a XMLDictReader.

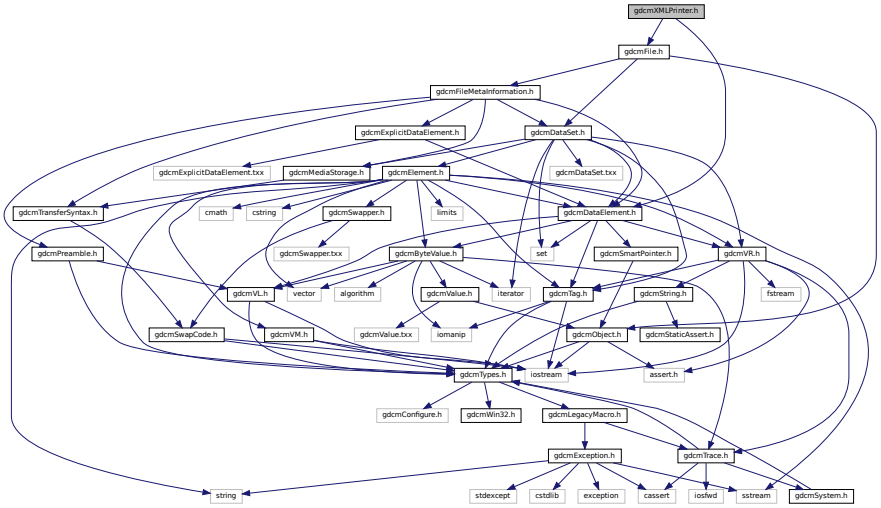
Namespaces

- gdcm

11.296 gdcmXMLPrinter.h File Reference

```
#include "gdcmFile.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmXMLPrinter.h:



Classes

- class gdcm::XMLPrinter

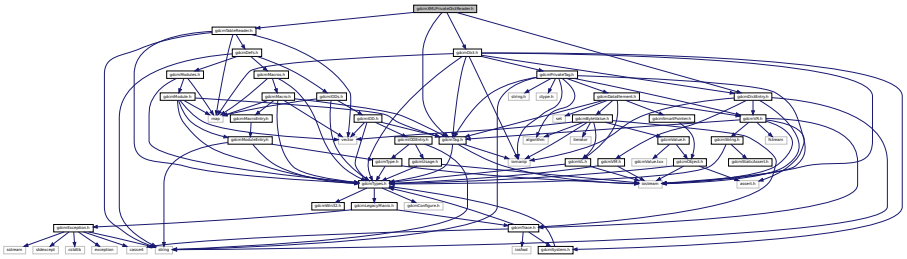
Namespaces

- gdcm

11.297 gdcmXMLPrivateDictReader.h File Reference

```
#include "gdcmTableReader.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmXMLPrivateDictReader.h:



Classes

- class gdcm::XMLPrivateDictReader

  Class for representing a XMLPrivateDictReader.

Namespaces

- gdcm

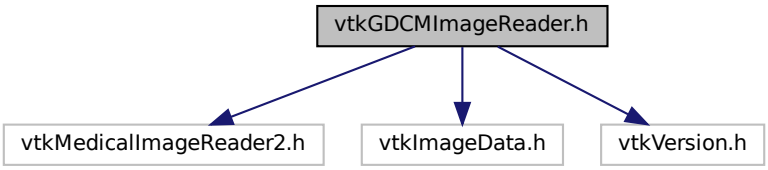
11.298 README.txt File Reference

11.299 TestsList.txt File Reference

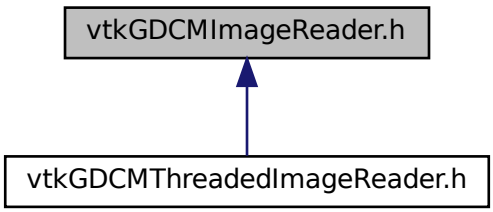
11.300 vtkGDCMImageReader.h File Reference

```
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"
#include "vtkVersion.h"
```

Include dependency graph for vtkGDCMImageReader.h:



This graph shows which files directly or indirectly include this file:



Classes

- class vtkGDCMImageReader

Namespaces

- gdcm

Macros

- #define VTK_CMYK 8
- #define VTK_INVERSE_LUMINANCE 5
- #define VTK_LOOKUP_TABLE 6
- #define VTK_YBR 7

11.300.1 Macro Definition Documentation

11.300.1.1 VTK_CMYK

```
#define VTK_CMYK 8
```

11.300.1.2 VTK_INVERSE_LUMINANCE

```
#define VTK_INVERSE_LUMINANCE 5
```

11.300.1.3 VTK_LOOKUP_TABLE

```
#define VTK_LOOKUP_TABLE 6
```

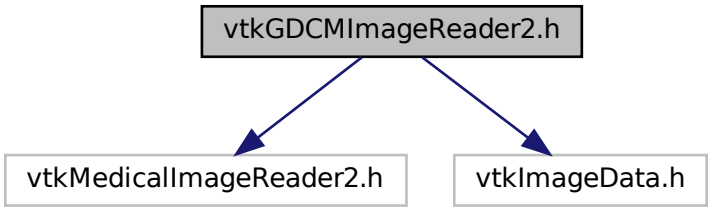
11.300.1.4 VTK_YBR

```
#define VTK_YBR 7
```

11.301 vtkGDCMImageReader2.h File Reference

```
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"
```

Include dependency graph for vtkGDCMImageReader2.h:



Classes

- class vtkGDCMImageReader2

Namespaces

- gdcm

Macros

- #define VTK_CMYK 8
- #define VTK_INVERSE_LUMINANCE 5
- #define VTK_LOOKUP_TABLE 6
- #define VTK_YBR 7

11.301.1 Macro Definition Documentation

11.301.1.1 VTK_CMYK

```
#define VTK_CMYK 8
```

11.301.1.2 VTK_INVERSE_LUMINANCE

```
#define VTK_INVERSE_LUMINANCE 5
```

11.301.1.3 VTK_LOOKUP_TABLE

```
#define VTK_LOOKUP_TABLE 6
```

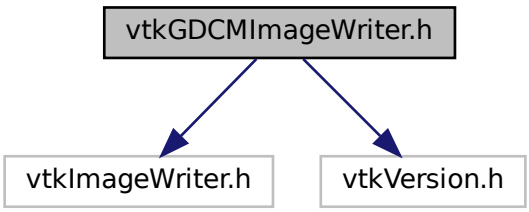
11.301.1.4 VTK_YBR

```
#define VTK_YBR 7
```

11.302 vtkGDCMImageWriter.h File Reference

```
#include "vtkImageWriter.h"
#include "vtkVersion.h"
```

Include dependency graph for vtkGDCMImageWriter.h:

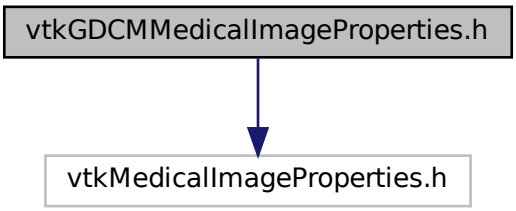


Classes

- class vtkGDCMImageWriter

11.303 vtkGDCMMedicalImageProperties.h File Reference

```
#include "vtkMedicalImageProperties.h"
```
Include dependency graph for vtkGDCMMedicalImageProperties.h:



Classes

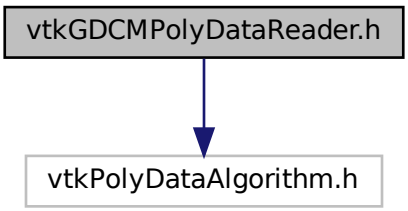
- class vtkGDCMMedicalImageProperties

Namespaces

- gdcm

11.304 vtkGDCMPolyDataReader.h File Reference

```
#include "vtkPolyDataAlgorithm.h"
```
Include dependency graph for vtkGDCMPolyDataReader.h:



Classes

- class vtkGDCMPolyDataReader

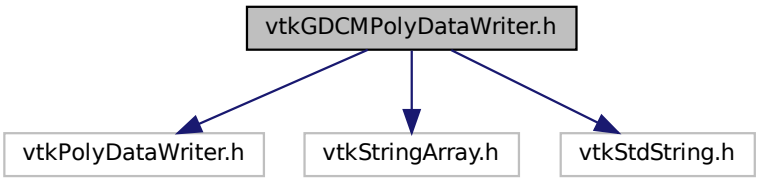
Namespaces

- gdcm

11.305 vtkGDCMPolyDataWriter.h File Reference

```
#include "vtkPolyDataWriter.h"
#include "vtkStringArray.h"
#include "vtkStdString.h"
```

Include dependency graph for vtkGDCMPolyDataWriter.h:



Classes

- class vtkGDCMPolyDataWriter

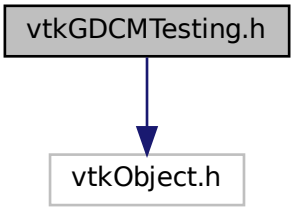
Namespaces

- gdcm

11.306 vtkGDCMTesting.h File Reference

```
#include "vtkObject.h"
```

Include dependency graph for vtkGDCMTesting.h:



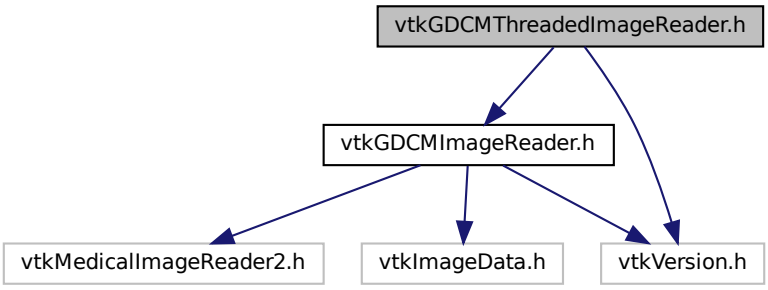
Classes

- class vtkGDCMTesting

11.307 vtkGDCMThreadedImageReader.h File Reference

```
#include "vtkGDCMImageReader.h"
#include "vtkVersion.h"
```

Include dependency graph for vtkGDCMThreadedImageReader.h:

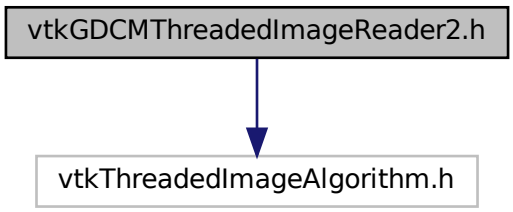


Classes

- class vtkGDCMThreadedImageReader

11.308 vtkGDCMThreadedImageReader2.h File Reference

```
#include "vtkThreadedImageAlgorithm.h"
```
Include dependency graph for vtkGDCMThreadedImageReader2.h:

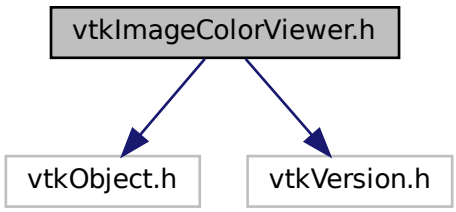


Classes

- class vtkGDCMThreadedImageReader2

11.309 vtkImageColorViewer.h File Reference

```
#include "vtkObject.h"
#include "vtkVersion.h"
```
Include dependency graph for vtkImageColorViewer.h:

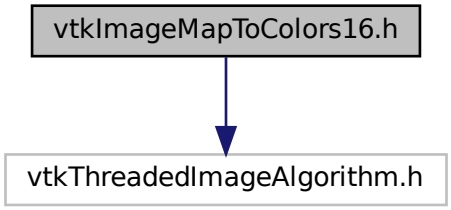


Classes

- class vtkImageColorViewer

11.310 vtkImageMapToColors16.h File Reference

```
#include "vtkThreadedImageAlgorithm.h"
```
Include dependency graph for vtkImageMapToColors16.h:

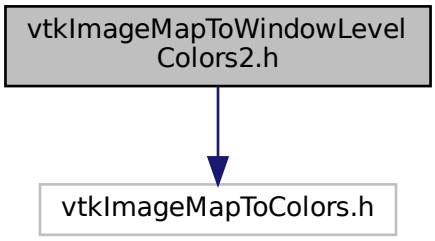


Classes

- class vtkImageMapToColors16

11.311 vtkImageMapToWindowLevelColors2.h File Reference

```
#include "vtkImageMapToColors.h"
```
Include dependency graph for vtkImageMapToWindowLevelColors2.h:

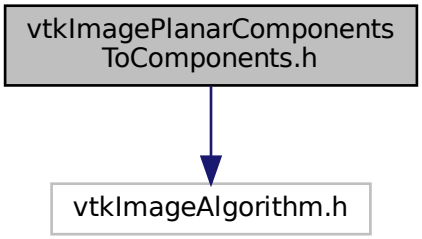


Classes

- class vtkImageMapToWindowLevelColors2

11.312 vtkImagePlanarComponentsToComponents.h File Reference

```
#include "vtkImageAlgorithm.h"
```
Include dependency graph for vtkImagePlanarComponentsToComponents.h:

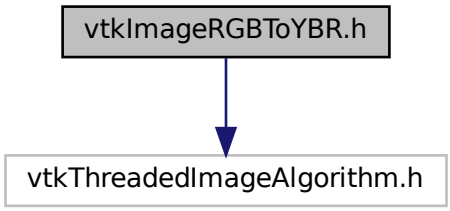


Classes

- class vtkImagePlanarComponentsToComponents

11.313 vtkImageRGBToYBR.h File Reference

```
#include "vtkThreadedImageAlgorithm.h"
```
Include dependency graph for vtkImageRGBToYBR.h:

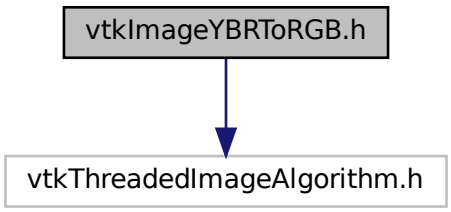


Classes

- class vtkImageRGBToYBR

11.314 vtkImageYBRToRGB.h File Reference

```
#include "vtkThreadedImageAlgorithm.h"
```
Include dependency graph for vtkImageYBRToRGB.h:

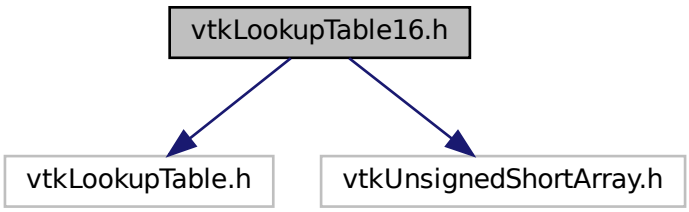


Classes

- class vtkImageYBRToRGB

11.315 vtkLookupTable16.h File Reference

```
#include "vtkLookupTable.h"
#include "vtkUnsignedShortArray.h"
```
Include dependency graph for vtkLookupTable16.h:



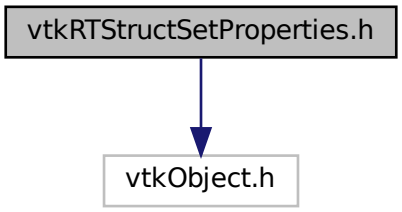
Classes

- class vtkLookupTable16

11.316 vtkRTStructSetProperties.h File Reference

```
#include "vtkObject.h"
```

Include dependency graph for vtkRTStructSetProperties.h:



Classes

- class vtkRTStructSetProperties

Chapter 12

Example Documentation

12.1 TestByteSwap.cxx

This is a C++ example on how to use gdcm::ByteSwap

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmTypes.h"
#include "gdcmSwapCode.h"
#include "gdcmByteSwap.h"
#include <string.h> // memcpy
int myfunc()
{
  char vl_str[4];
  const char raw[] = "\000\000\000\004";
  memcpy(vl_str, raw, 4);
  uint32_t vl;
  gdcm::ByteSwap<uint32_t>::SwapRangeFromSwapCodeIntoSystem((uint32_t*)(&vl_str), gdcm::SwapCode::BigEndian, 1);
  memcpy(&vl, vl_str, 4);
  if( vl != 0x00000004 )
    {
    std::cerr « std::hex « "vl: " « vl « std::endl;
    return 1;
    }
  gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::LittleEndian);
  if( vl != 0x00000004 )
    {
    std::cerr « std::hex « "vl: " « vl « std::endl;
    return 1;
    }
  gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::BigEndian);
  if( vl != 0x4000000 )
    {
    std::cerr « std::hex « "vl: " « vl « std::endl;
    return 1;
    }
  return 0;
}
int TestByteSwap(int , char *[])
{
  gdcm::SwapCode sc = gdcm::SwapCode::Unknown;
  if ( gdcm::ByteSwap<uint16_t>::SystemIsBigEndian() )
```

```
  {
  sc = gdcm::SwapCode::BigEndian;
  }
else if ( gdcm::ByteSwap<uint16_t>::SystemIsLittleEndian() )
  {
  sc = gdcm::SwapCode::LittleEndian;
  }
if( sc == gdcm::SwapCode::Unknown )
  {
  std::cerr « "unk" « std::endl;
  return 1;
  }
//std::cout « "sc: " « sc « std::endl;
uint16_t t = 0x1234;
gdcm::ByteSwap<uint16_t>::SwapFromSwapCodeIntoSystem(t, sc);
if( sc == gdcm::SwapCode::BigEndian )
  {
  if( t != 0x3412 )
    {
    std::cerr « std::hex « "t: " « t « std::endl;
    return 1;
    }
  // ok test pass rest value to old one
  t = 0x1234;
  }
else if ( sc == gdcm::SwapCode::LittleEndian )
  {
  if( t != 0x1234 )
    {
    std::cerr « std::hex « "t: " « t « std::endl;
    return 1;
    }
  }
union { char n[2]; uint16_t tn; } u16;
memcpy(u16.n, &t, 2 );
gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&u16.tn, sc, 1);
uint16_t tn = u16.tn;
if( sc == gdcm::SwapCode::BigEndian )
  {
  if( tn != 0x3412 )
    {
    std::cerr « std::hex « "tn: " « tn « std::endl;
    return 1;
    }
  // ok test pass rest value to old one
  t = 0x1234;
  }
else if ( sc == gdcm::SwapCode::LittleEndian )
  {
  if( tn != 0x1234 )
    {
    std::cerr « std::hex « "tn: " « tn « std::endl;
    return 1;
    }
  }
gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&u16.tn, gdcm::SwapCode::BigEndian, 1);
tn = u16.tn;
if( sc == gdcm::SwapCode::LittleEndian )
  {
  if( tn != 0x3412 )
    {
    std::cerr « std::hex « "tn: " « tn « std::endl;
    return 1;
    }
  }
else if ( sc == gdcm::SwapCode::BigEndian )
  {
  if( tn != 0x1234 )
    {
    std::cerr « std::hex « "tn: " « tn « std::endl;
    return 1;
    }
  }
if( myfunc() )
  {
  return 1;
  }
uint16_t array[] = { 0x1234 };
gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(array,
  gdcm::SwapCode::BigEndian,1);
 if ( array[0] != 0x3412 )
```

```
    {
    std::cerr « std::hex « "array: " « array[0] « std::endl;
    return 1;
    }
  return 0;
}
```

12.2 PatchFile.cxx

This is a C++ example on how to use gdcm::Attribute

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * The image was a broken file where the Pixel Data element was 8 times too big
 * Apparently multiplying the BitsAllocated to 4 and multiplying the number of
 * frames by 2 would solve the problem
 *
 * This C++ code can be used to patch the header.
 */
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    return 1;
    }
  const char *f = argv[1];
  const char *out = argv[2];
  gdcm::Reader r;
  r.SetFileName( f );
  if( !r.Read() )
    {
    return 1;
    }
  gdcm::File &file = r.GetFile();
  gdcm::DataSet& ds = file.GetDataSet();
  // (0028,0100) US 16                                       #   2, 1 BitsAllocated
  // (0028,0101) US 16                                       #   2, 1 BitsStored
  // (0028,0102) US 15                                       #   2, 1 HighBit
  //
    {
    gdcm::Attribute<0x28,0x100> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    if( at.GetValue() != 8 )
      {
      return 1;
      }
    at.SetValue( 32 );
    ds.Replace( at.GetAsDataElement() );
    }
    {
    gdcm::Attribute<0x28,0x101> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    if( at.GetValue() != 8 )
      {
      return 1;
      }
    at.SetValue( 32 );
    ds.Replace( at.GetAsDataElement() );
    }
```

```
    {
    gdcm::Attribute<0x28,0x102> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    if( at.GetValue() != 7 )
      {
      return 1;
      }
    at.SetValue( 31 );
    ds.Replace( at.GetAsDataElement() );
    }
  // (0028,0008) IS [56]                                    #   2, 1 NumberOfFrames
    {
    gdcm::Attribute<0x28,0x8> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    at.SetValue( at.GetValue() * 2 );
    ds.Replace( at.GetAsDataElement() );
    }
  gdcm::Writer w;
  w.SetFile( file );
  w.SetCheckFileMetaInformation( false );
  w.SetFileName( out );
  if( !w.Write() )
    {
    return 1;
    }
  // Now let's see if we can read it as an image:
  gdcm::ImageReader ir;
  ir.SetFileName( out );
  if(!ir.Read())
    {
    return 1;
    }
  gdcm::Image &image = ir.GetImage();
  unsigned long len = image.GetBufferLength();
  const gdcm::ByteValue *bv = ir.GetFile().GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010)
      ).GetByteValue();
  if( !bv || len != bv->GetLength() )
    {
    return 1;
    }
  std::cout « bv->GetLength() « " " « len « std::endl;
  std::cout « "Sucess to rewrite image !" « std::endl;
  image.Print( std::cout );
  return 0;
}
```

12.3 SimplePrint.cs

This is a C# example on how to use gdcm::SWIGDataSet

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
  Convertor convertor = new Convertor();
  int a = convertor.Convert<int>( some_int_blob );
  double b = convertor.Convert<double>( some_double_blob );
*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/SimplePrint.exe gdcmData/012345.002.050.dcm
 */
using System;
using gdcm;
public class SimplePrint
```

```
{
  public static void RecurseDataSet(File f, DataSet ds, string indent)
    {
    CSharpDataSet cds = new CSharpDataSet(ds);
    while(!cds.IsAtEnd())
      {
      DataElement de = cds.GetCurrent();
      // Compute VR from the toplevel file, and the currently processed dataset:
      VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );
      if( vr.Compatible( new VR(VR.VRType.SQ) ) )
        {
        uint uvl = (uint)de.GetVL(); // Test cast is ok
        System.Console.WriteLine( indent + de.GetTag().toString() + ":" + uvl ); // why not ?
        //SequenceOfItems sq = de.GetSequenceOfItems();
        // GetValueAsSQ handle more cases than GetSequenceOfItems
        SmartPtrSQ sq = de.GetValueAsSQ();
        uint n = sq.GetNumberOfItems();
        for( uint i = 1; i <= n; i++) // item starts at 1, not 0
          {
          Item item = sq.GetItem( i );
          DataSet nested = item.GetNestedDataSet();
          RecurseDataSet( f, nested, indent + "  " );
          }
        }
      else
        {
        System.Console.WriteLine( indent + de.toString() );
        }
      cds.Next();
      }
    }
  public static int Main(string[] args)
    {
    string filename = args[0];
    Reader reader = new Reader();
    reader.SetFileName( filename );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    File f = reader.GetFile();
    DataSet ds = f.GetDataSet();
    RecurseDataSet( f, ds, "" );
    return 0;
    }
}
```

12.4 TestReader.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmFileMetaInformation.h"
#include "gdcmFile.h"
#include "gdcmTesting.h"
#include "gdcmMediaStorage.h"
int TestRead(const char* filename, bool verbose = false)
{
  if( verbose )
  std::cout « "TestRead: " « filename « std::endl;
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if ( !reader.Read() )
    {
    std::cerr « "TestReadError: Failed to read: " « filename « std::endl;
```

```
    return 1;
    }
//commenting out the fmi and ds to avoid warnings
  //const gdcm::FileMetaInformation &h = reader.GetFile().GetHeader();
  //std::cout « h « std::endl;
  //const gdcm::DataSet &ds = reader.GetFile().GetDataSet();
  //std::cout « ds « std::endl;
  const char *ref = gdcm::Testing::GetMediaStorageFromFile(filename);
  gdcm::MediaStorage ms;
  ms.SetFromFile( reader.GetFile() );
  if( !ref )
    {
    std::cerr « "TestReadError: Missing MediaStorage: " « filename « std::endl;
    std::cerr « "It should be: " « ms « std::endl;
    return 1;
    }
  if( ms.IsUndefined() && ref && *ref != 0 )
    {
    std::cerr « "TestReadError: MediaStorage: " « filename « std::endl;
    std::cerr « "It should be instead: " « ref « std::endl;
    return 1;
    }
  // Make sure it is the right one:
  if( ref && *ref != 0 && ms != gdcm::MediaStorage::GetMSType(ref) )
    {
    std::cerr « "Error: Found MediaStorage: " « ms « " for " « filename « std::endl;
    std::cerr « "It should be instead: " « ref « std::endl;
    return 1;
    }
  return 0;
}
int TestReader(int argc, char *argv[])
{
  if( argc == 2 )
    {
    const char *filename = argv[1];
    return TestRead(filename, true);
    }
  // else
  gdcm::Trace::DebugOff();
  gdcm::Trace::WarningOff();
  int r = 0, i = 0;
  const char *filename;
  const char * const *filenames = gdcm::Testing::GetFileNames();
  while( (filename = filenames[i]) )
    {
    r += TestRead( filename );
    ++i;
    }
  return r;
}
```

12.5 TestReader.py

This is a C++ example on how to use gdcm::Reader

```
1
14
15 import os,sys
16 import gdcm
17
18 def TestRead(filename, verbose = False):
19   r = gdcm.Reader()
20   r.SetFileName( filename )
21   success = r.Read()
22   #if verbose: print r.GetFile()
23   if verbose: print(r.GetFile().GetDataSet())
24   return success
25
26 if __name__ == "__main__":
27   success = 0
28   try:
29     filename = os.sys.argv[1]
30     success += TestRead( filename, True )
31   except:
32     # loop over all files:
```

```
33      gdcm.Trace.DebugOff()
34      gdcm.Trace.WarningOff()
35      t = gdcm.Testing()
36      nfiles = t.GetNumberOfFileNames()
37      for i in range(0,nfiles):
38        filename = t.GetFileName(i)
39        success += TestRead( filename )
40
41
42    # Test succeed ?
43    sys.exit(success == 0)
```

12.6 DecompressJPEGFile.cs

This is a C# example on how to use gdcm::SequenceOfFragments

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressJPEGFile.exe somejpegfile.jpg
 */
using System;
using gdcm;
public class DecompressJPEGFile
{
  public static int Main(string[] args)
    {
    string file1 = args[0];
    System.IO.FileStream infile =
      new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
    uint fsize = gdcm.PosixEmulation.FileSize(file1);
    byte[] jstream  = new byte[fsize];
    infile.Read(jstream, 0 , jstream.Length);
    Trace.DebugOn();
    Image image = new Image();
    image.SetNumberOfDimensions( 2 ); // important for now
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    // DO NOT set a ByteValue here, JPEG is a particular kind of encapsulated syntax
    // in which can one cannot use a simple byte array for storage. Instead, see
    // gdcm.SequenceOfFragments
    //pixeldata.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length ) );
    // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
    SmartPtrFrag sq = SequenceOfFragments.New();
    Fragment frag = new Fragment();
    frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
    // Single file => single fragment
    sq.AddFragment( frag );
    // Pass by reference:
    pixeldata.SetValue( sq.__ref__() );
    // insert:
    image.SetDataElement( pixeldata );
    // JPEG use YBR to achieve better compression ratio by default (not RGB)
    // FIXME hardcoded:
    PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.YBR_FULL );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(3,8,8,7);
    image.SetPixelFormat( pixeltype );
    // FIXME hardcoded:
    image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
    image.SetDimension(0, 692);
    image.SetDimension(1, 721);
    // Decompress !
```

```
    byte[] decompressedData = new byte[(int)image.GetBufferLength()];
    image.GetBuffer(decompressedData);
    // Write out the decompressed bytes
    System.Console.WriteLine(image.toString());
    using (System.IO.Stream stream =
      System.IO.File.Open(@"/tmp/dd.raw",
        System.IO.FileMode.Create))
      {
      System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
      writer.Write(decompressedData);
      }
    return 0;
    }
}
```

12.7 ManipulateFile.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ManipulateFile.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class ManipulateFile
{
  public static int Main(string[] args)
    {
    string file1 = args[0];
    string file2 = args[1];
    Reader reader = new Reader();
    reader.SetFileName( file1 );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    Anonymizer ano = new Anonymizer();
    ano.SetFile( reader.GetFile() );
    ano.RemovePrivateTags();
    ano.RemoveGroupLength();
    Tag t = new Tag(0x10,0x10);
    ano.Replace( t, "GDCM^Csharp^Test^Hello^World" );
    UIDGenerator g = new UIDGenerator();
    ano.Replace( new Tag(0x0008,0x0018), g.Generate() );
    ano.Replace( new Tag(0x0020,0x000d), g.Generate() );
    ano.Replace( new Tag(0x0020,0x000e), g.Generate() );
    ano.Replace( new Tag(0x0020,0x0052), g.Generate() );
    Writer writer = new Writer();
    writer.SetFileName( file2 );
    writer.SetFile( ano.GetFile() );
    ret = writer.Write();
    if( !ret )
      {
      return 1;
      }
    return 0;
    }
}
```

12.8 ClinicalTrialIdentificationWorkflow.cs

This is a C# example on how to use Anonymizer

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Typical usage on UNIX:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ClinicalTrialIdentificationWorkflow.exe input_dir output_dir
 */
using System;
using gdcm;
public class MyWatcher : SimpleSubjectWatcher
{
  public MyWatcher(Subject s):base(s,"Override String"){}
  protected override void StartFilter() {
    System.Console.WriteLine( "This is my start" );
  }
  protected override void EndFilter(){
    System.Console.WriteLine( "This is my end" );
  }
  protected override void ShowProgress(Subject caller, Event evt){
    ProgressEvent pe = ProgressEvent.Cast(evt);
    System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
  }
  protected override void ShowIteration(){
    System.Console.WriteLine( "This is my iteration" );
  }
  protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 *  http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 *  System.Console.WriteLine( "This is my Anonymization. Type: " + evt.GetEventName() );
 *  System.Type type = evt.GetType();
 *  System.Console.WriteLine( "This is my Anonymization. System.Type: " + type.ToString() );
 *  System.Console.WriteLine( "This is my Anonymization. CheckEvent: " + ae.CheckEvent( evt ) );
 *  System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + ae.GetTag().toString() );
 */
    AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
    if( ae != null )
      {
      Tag t = ae.GetTag();
      System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + t.toString() );
      }
    else
      {
      System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
      }
  }
  protected override void ShowAbort(){
    System.Console.WriteLine( "This is my abort" );
  }
}
public class ClinicalTrialIdentificationWorkflow
{
  public static bool ProcessOneFile( gdcm.Anonymizer ano , string filename, string outfilename )
    {
    Reader reader = new Reader();
    reader.SetFileName( filename );
    bool ret = reader.Read();
    if( !ret )
      {
      return false;
      }
    // Pass in the file:
    ano.SetFile( reader.GetFile() );
    // First step, let's protect all Patient information as per
```

```
  // PS 3.15 / E.1 / Basic Application Level Confidentiality Profile
  if( !ano.BasicApplicationLevelConfidentialityProfile() )
    {
    return false;
    }
  // Now let's pass in all Clinical Trial fields
  // PS 3.3 - 2008 / C.7.1.3 Clinical Trial Subject Module
  /*
  Clinical Trial Sponsor Name (0012,0010) 1 The name of the clinical trial sponsor. See C.7.1.3.1.1.
  Clinical Trial Protocol ID (0012,0020) 1 Identifier for the noted protocol. See C.7.1.3.1.2.
  Clinical Trial Protocol Name (0012,0021) 2 The name of the clinical trial protocol. See C.7.1.3.1.3.
  Clinical Trial Site ID (0012,0030) 2 The identifier of the site responsible for submitting clinical trial
     data. See C.7.1.3.1.4.
  Clinical Trial Site Name (0012,0031) 2 Name of the site responsible for submitting clinical trial data. See
     C.7.1.3.1.5
  Clinical Trial Subject ID (0012,0040) 1C The assigned identifier for the clinical trial subject. See
     C.7.1.3.1.6. Shall be present if Clinical Trial Subject Reading ID (0012,0042) is absent. May be present
     otherwise.
  Clinical Trial Subject Reading ID (0012,0042) 1C Identifies the subject for blinded evaluations. Shall be
     present if Clinical Trial Subject ID (0012,0040) is absent.  May be present otherwise. See C.7.1.3.1.7.
   */
  ano.Replace( new gdcm.Tag(0x0012,0x0010), "MySponsorName");
  ano.Replace( new gdcm.Tag(0x0012,0x0020), "MyProtocolID");
  ano.Replace( new gdcm.Tag(0x0012,0x0021), "MyProtocolName");
  ano.Replace( new gdcm.Tag(0x0012,0x0030), "MySiteId");
  ano.Replace( new gdcm.Tag(0x0012,0x0031), "MySiteName");
  ano.Replace( new gdcm.Tag(0x0012,0x0040), "MySponsorId");
  ano.Replace( new gdcm.Tag(0x0012,0x0050), "MyTPId");
  ano.Replace( new gdcm.Tag(0x0012,0x0051), "MyTPDescription");
  // The following two are not required as they are guaranteed to be filled in by the
  // Basic Application Level Confidentiality Profile. Only override if you understand what
  // you are doing
  //ano.Replace( new gdcm.Tag(0x0012,0x0062), "YES");
  //ano.Replace( new gdcm.Tag(0x0012,0x0063), "My Super Duper Anonymization Overload");
  // We might be generating a subdirectory. Let's make sure the subdir exist:
  gdcm.Filename fn = new gdcm.Filename( outfilename );
  string subdir = fn.GetPath();
  if( !gdcm.PosixEmulation.MakeDirectory( subdir ) )
    {
    return false;
    }
  gdcm.FileMetaInformation fmi = ano.GetFile().GetHeader();
  // The following three lines make sure to regenerate any value:
  fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
  fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
  fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
  Writer writer = new Writer();
  writer.SetFileName( outfilename );
  writer.SetFile( ano.GetFile() );
  ret = writer.Write();
  if( !ret )
    {
    return false;
    }
  return true;
  }
public static int Main(string[] args)
  {
  gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My ClinicalTrial App" );
  // http://www.oid-info.com/get/1.3.6.1.4.17434
  string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
  gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
  System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );
  gdcm.Global global = gdcm.Global.GetInstance();
  if( !global.LoadResourcesFiles() )
    {
    System.Console.WriteLine( "Could not LoadResourcesFiles" );
    return 1;
    }
  if( args.Length != 2 )
    {
    System.Console.WriteLine( "Usage:" );
    System.Console.WriteLine( "ClinicalTrialIdentificationWorkflow input_dir output_dir" );
    return 1;
    }
  string dir1 = args[0];
  string dir2 = args[1];
  // Check input is valid:
  if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
    {
    System.Console.WriteLine( "Input directory: " + dir1 + " does not exist. Sorry" );
```

```
      return 1;
      }
    if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )
      {
      System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
      return 1;
      }
    // Recursively search all file within this toplevel directory:
    Directory d = new Directory();
    uint nfiles = d.Load( dir1, true );
    if(nfiles == 0) return 1;
    // Let's use the pre-shipped certificate of GDCM.
    string certpath = gdcm.Filename.Join(gdcm.Testing.GetSourceDirectory(),
       "/Testing/Source/Data/certificate.pem" );
    gdcm.CryptoFactory fact = gdcm.CryptoFactory.GetFactoryInstance();
    gdcm.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
    if( !cms.ParseCertificateFile( certpath ) )
      {
      System.Console.WriteLine( "PEM Certificate : " + certpath + " could not be read. Sorry" );
      return 1;
      }
    //Anonymizer ano = new Anonymizer();
    // A reference to an actual C++ instance is required here:
    SmartPtrAno sano = Anonymizer.New();
    Anonymizer ano = sano.__ref__();
    //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
    MyWatcher watcher = new MyWatcher(ano);
    // Explicitly specify the Cryptographic Message Syntax to use:
    ano.SetCryptographicMessageSyntax( cms );
    // Process all filenames:
    FilenamesType filenames = d.GetFilenames();
    for( uint i = 0; i < nfiles; ++i )
      {
      string filename = filenames[ (int)i ];
      string outfilename = filename.Replace( dir1, dir2 );
      System.Console.WriteLine( "Filename: " + filename );
      System.Console.WriteLine( "Out Filename: " + outfilename );
      if( !ProcessOneFile( ano , filename, outfilename ) )
        {
        System.Console.WriteLine( "Could not process filename: " + filename );
        return 1;
        }
      }
    return 0;
    }
}
```

12.9 GenerateDICOMDIR.cs

This is a C# example on how to use DICOMDIRGenerator

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Simple C# example to show how to use DICOMDIRGenerator
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/GenerateDICOMDIR.exe path output_filename
 */
using System;
using gdcm;
public class GenerateDICOMDIR
{
  public static int Main(string[] args)
```

```
    {
    string directory = args[0];
    string outfilename = args[1];
    Directory d = new Directory();
    uint nfiles = d.Load( directory, true );
    if(nfiles == 0) return 1;
    //System.Console.WriteLine( "Files:\n" + d.toString() );
    // Implement fast path ?
    // Scanner s = new Scanner();
    string descriptor = "My_Descriptor";
    FilenamesType filenames = d.GetFilenames();
    gdcm.DICOMDIRGenerator gen = new DICOMDIRGenerator();
    gen.SetFilenames( filenames );
    gen.SetDescriptor( descriptor );
    if( !gen.Generate() )
      {
      return 1;
      }
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "GenerateDICOMDIR" );
    gdcm.Writer writer = new Writer();
    writer.SetFile( gen.GetFile() );
    writer.SetFileName( outfilename );
    if( !writer.Write() )
      {
      return 1;
      }
    return 0;
    }
}
```

12.10 GenFakeImage.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmFileDerivation.h"
#include "gdcmUIDGenerator.h"
//#include "gdcmImageChangePhotometricInterpretation.h"
/*
 * This example shows two things:
 * 1. How to create an image ex-nihilo
 * 2. How to use the gdcm.FileDerivation filter. This filter is meant to create "DERIVED" image
 * object. FileDerivation has a simple API where you can reference *all* the input image that have been
 * used to generate the image. The API also allows user to specify the purpose of reference (see CID 7202,
 * PS 3.16 - 2008), and the image derivation type (CID 7203, PS 3.16 - 2008).
 */
int main(int, char *[])
{
  // Step 1: Fake Image
  gdcm::SmartPointer<gdcm::Image> im = new gdcm::Image;
  char * buffer = new char[ 256 * 256 * 3];
  char * p = buffer;
  int b = 128;
  //int ybr[3];
  int ybr2[3];
  //int rgb[3];
  for(int r = 0; r < 256; ++r)
    for(int g = 0; g < 256; ++g)
      //for(int b = 0; b < 256; ++b)
      {
      //rgb[0] = r;
      //rgb[1] = g;
      //rgb[1] = 128;
      //rgb[2] = b;
      //ybr[0] = r;
```

```
      //ybr[1] = g;
      //ybr[1] = 128;
      //ybr[2] = b;
      ybr2[0] = r;
      ybr2[1] = g;
      ybr2[1] = 128;
      ybr2[2] = b;
      //gdcm::ImageChangePhotometricInterpretation::YBR2RGB(rgb, ybr);
      //gdcm::ImageChangePhotometricInterpretation::RGB2YBR(ybr2, rgb);
      *p++ = (char)ybr2[0];
      *p++ = (char)ybr2[1];
      *p++ = (char)ybr2[2];
      }
  im->SetNumberOfDimensions( 2 );
  im->SetDimension(0, 256 );
  im->SetDimension(1, 256 );
  im->GetPixelFormat().SetSamplesPerPixel(3);
  //im->SetPhotometricInterpretation( gdcm::PhotometricInterpretation::RGB );
  im->SetPhotometricInterpretation( gdcm::PhotometricInterpretation::YBR_FULL );
  unsigned long l = im->GetBufferLength();
  if( l != 256 * 256 * 3 )
    {
    return 1;
    }
  gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
  pixeldata.SetByteValue( buffer, (uint32_t)l );
  delete[] buffer;
  im->SetDataElement( pixeldata );
  gdcm::UIDGenerator uid; // helper for uid generation
  gdcm::SmartPointer<gdcm::File> file = new gdcm::File; // empty file
  // Step 2: DERIVED object
  gdcm::FileDerivation fd;
  // For the pupose of this execise we will pretend that this image is referencing
  // two source image (we need to generate fake UID for that).
  const char ReferencedSOPClassUID[] = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
  fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
  fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
  // Again for the purpose of the exercise we will pretend that the image is a
  // multiplanar reformat (MPR):
  // CID 7202 Source Image Purposes of Reference
  // {"DCM",121322,"Source image for image processing operation"},
  fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
  // CID 7203 Image Derivation
  // { "DCM",113072,"Multiplanar reformatting" },
  fd.SetDerivationCodeSequenceCodeValue( 113072 );
  fd.SetFile( *file );
  // If all Code Value are ok the filter will execute properly
  if( !fd.Derive() )
    {
    std::cerr « "Sorry could not derive using input info" « std::endl;
    return 1;
    }
  // We pass both :
  // 1. the fake generated image
  // 2. the 'DERIVED' dataset object
  // to the writer.
  gdcm::ImageWriter w;
  w.SetImage( *im );
  w.SetFile( fd.GetFile() );
  // Set the filename:
  w.SetFileName( "ybr2.dcm" );
  if( !w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.11 ReformatFile.cs

This is a C++ example on how to use FileDerivation

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library
```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Simple C# example
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ReformatFile.exe input.dcm output.dcm
 */
using System;
using gdcm;
public class ReformatFile
{
  public static int Main(string[] args)
    {
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Reformat App" );
    // http://www.oid-info.com/get/1.3.6.1.4.17434
    string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
    gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
    System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );
    string filename = args[0];
    string outfilename = args[1];
    Reader reader = new Reader();
    reader.SetFileName( filename );
    if( !reader.Read() )
      {
      System.Console.WriteLine( "Could not read: " + filename );
      return 1;
      }
    UIDGenerator uid = new UIDGenerator(); // helper for uid generation
    FileDerivation fd = new FileDerivation();
    // For the pupose of this execise we will pretend that this image is referencing
    // two source image (we need to generate fake UID for that).
    string ReferencedSOPClassUID = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
    fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
    fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
    // Again for the purpose of the exercise we will pretend that the image is a
    // multiplanar reformat (MPR):
    // CID 7202 Source Image Purposes of Reference
    // {"DCM",121322,"Source image for image processing operation"},
    fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
    // CID 7203 Image Derivation
    // { "DCM",113072,"Multiplanar reformatting" },
    fd.SetDerivationCodeSequenceCodeValue( 113072 );
    fd.SetFile( reader.GetFile() );
    // If all Code Value are ok the filter will execute properly
    if( !fd.Derive() )
      {
      return 1;
      }
    gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
    // The following three lines make sure to regenerate any value:
    fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
    fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
    fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
    Writer writer = new Writer();
    writer.SetFileName( outfilename );
    writer.SetFile( fd.GetFile() );
    if( !writer.Write() )
      {
      System.Console.WriteLine( "Could not write: " + outfilename );
      return 1;
      }
    return 0;
    }
}
```

12.12 DecompressImage.cs

This is a C# example on how to use Image

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm decompress.dcm
 */
using System;
using gdcm;
public class DecompressImage
{
  public static int Main(string[] args)
    {
    string file1 = args[0];
    string file2 = args[1];
    ImageReader reader = new ImageReader();
    reader.SetFileName( file1 );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    // check that one can access a Fragment from C#:
    var de = reader.GetFile().GetDataSet().GetDataElement(new Tag(0x7fe0, 0x0010));
    var sq = de.GetSequenceOfFragments();
    sq.GetFragment(0);
    Image image = new Image();
    Image ir = reader.GetImage();
    image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );
    //Just for fun:
    //int dircos =  ir.GetDirectionCosines();
    //t = gdcm.Orientation.GetType(dircos);
    //int l = gdcm.Orientation.GetLabel(t);
    //System.Console.WriteLine( "Orientation label:" + l );
    // Set the dimensions,
    // 1. either one at a time
    //image.SetDimension(0, ir.GetDimension(0) );
    //image.SetDimension(1, ir.GetDimension(1) );
    // 2. the array at once
    uint[] dims = {0, 0};
    // Just for fun let's invert the dimensions:
    dims[0] = ir.GetDimension(1);
    dims[1] = ir.GetDimension(0);
    ir.SetDimensions( dims );
    PixelFormat pixeltype = ir.GetPixelFormat();
    image.SetPixelFormat( pixeltype );
    PhotometricInterpretation pi = ir.GetPhotometricInterpretation();
    image.SetPhotometricInterpretation( pi );
    DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
    byte[] str1 = new byte[ ir.GetBufferLength()];
    ir.GetBuffer( str1 );
    //System.Console.WriteLine( ir.GetBufferLength() );
    pixeldata.SetByteValue( str1, new VL( (uint)str1.Length ) );
    //image.SetDataElement( pixeldata );
    ir.SetDataElement( pixeldata );
    ImageWriter writer = new ImageWriter();
    writer.SetFileName( file2 );
    writer.SetFile( reader.GetFile() );
    writer.SetImage( ir );
    ret = writer.Write();
    if( !ret )
      {
      return 1;
      }
    return 0;
    }
}
```

12.13 StandardizeFiles.cs

This is a C++ example on how to use ImageChangeTransferSyntax

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Simple C# example to show how one would 'Standardize' a DICOM File-Set
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/StandardizeFiles.exe input_path output_path
 */
using System;
using gdcm;
public class StandardizeFiles
{
  public static bool ProcessOneFile( string filename, string outfilename )
    {
    PixmapReader reader = new PixmapReader();
    reader.SetFileName( filename );
    if( !reader.Read() )
      {
      System.Console.WriteLine( "Could not read: " + filename );
      return false;
      }
    ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
    change.SetForce( false ); // do we really want to recompress when input is alread compressed in same alg ?
    change.SetCompressIconImage( false ); // Keep it simple
    change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEG2000Lossless ) );
    change.SetInput( reader.GetPixmap() );
    if( !change.Change() )
      {
      System.Console.WriteLine( "Could not change: " + filename );
      return false;
      }
    gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
    // The following three lines make sure to regenerate any value:
    fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
    fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
    fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
    PixmapWriter writer = new PixmapWriter();
    writer.SetFileName( outfilename );
    writer.SetFile( reader.GetFile() );
    gdcm.Pixmap pixout = ((PixmapToPixmapFilter)change).GetOutput();
    writer.SetPixmap( pixout );
    if( !writer.Write() )
      {
      System.Console.WriteLine( "Could not write: " + outfilename );
      return false;
      }
    return true;
    }
  public static int Main(string[] args)
    {
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Standardize App" );
    // http://www.oid-info.com/get/1.3.6.1.4.17434
    string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
    gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
    System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );
    string dir1 = args[0];
    string dir2 = args[1];
    // Check input is valid:
    if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
      {
      System.Console.WriteLine( "Input directory: " + dir1 + " does not exist. Sorry" );
      return 1;
      }
    if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )
```

```
      {
      System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
      return 1;
      }
    Directory d = new Directory();
    uint nfiles = d.Load( dir1, true );
    if(nfiles == 0) return 1;
    // Process all filenames:
    FilenamesType filenames = d.GetFilenames();
    for( uint i = 0; i < nfiles; ++i )
      {
      string filename = filenames[ (int)i ];
      string outfilename = filename.Replace( dir1, dir2 );
      System.Console.WriteLine( "Filename: " + filename );
      System.Console.WriteLine( "Out Filename: " + outfilename );
      if( !ProcessOneFile( filename, outfilename ) )
        {
        System.Console.WriteLine( "Could not process filename: " + filename );
        //return 1;
        }
      }
    return 0;
    }
}
```

12.14 ScanDirectory.cs

This is a C# example on how to use Scanner

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Usage:
 * $ bin/ScanDirectory.exe /path/to/gdcmData/
 */
using System;
using gdcm;
// We will print each filename being processed
public class MyWatcher : SimpleSubjectWatcher
{
  public MyWatcher(Subject s):base(s,"Override String"){}
  protected override void ShowFileName(Subject caller, Event evt){
    FileNameEvent fne = FileNameEvent.Cast(evt);
    if( fne != null )
      {
      string fn = fne.GetFileName();
      System.Console.WriteLine( "This is my Scanner. Processing FileName: " + fn );
      }
    else
      {
      System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
      }
  }
}
public class ScanDirectory
{
  public static int Main(string[] args)
    {
    string directory = args[0];
    Tag t = new Tag(0x8,0x80);
    Directory d = new Directory();
    uint nfiles = d.Load( directory );
    if(nfiles == 0) return 1;
    //System.Console.WriteLine( "Files:\n" + d.toString() );
    // Use a StrictScanner, need to use a reference to pass the C++ pointer to
```

```
    // MyWatcher implementation
    SmartPtrStrictScan sscan = StrictScanner.New();
    StrictScanner s = sscan.__ref__();
    MyWatcher watcher = new MyWatcher(s);
    s.AddTag( t );
    bool b = s.Scan( d.GetFilenames() );
    if(!b) return 1;
    for(int i = 0; i < (int)nfiles; ++i)
      {
      if( !s.IsKey( d.GetFilenames()[i] ) )
        {
        System.Console.WriteLine( "File is not DICOM or could not be read: " + d.GetFilenames()[i] );
        }
      }
    System.Console.WriteLine( "Scan:\n" + s.toString() );
    System.Console.WriteLine( "success" );
    return 0;
    }
}
```

12.15 BasicAnonymizer.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/BasicAnonymizer.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class MyWatcher : SimpleSubjectWatcher
{
  public MyWatcher(Subject s):base(s,"Override String"){}
  protected override void StartFilter() {
    System.Console.WriteLine( "This is my start" );
  }
  protected override void EndFilter(){
    System.Console.WriteLine( "This is my end" );
  }
  protected override void ShowProgress(Subject caller, Event evt){
    ProgressEvent pe = ProgressEvent.Cast(evt);
    System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
  }
  protected override void ShowIteration(){
    System.Console.WriteLine( "This is my iteration" );
  }
  protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 *  http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 *  System.Console.WriteLine( "This is my Anonymization. Type: " + evt.GetEventName() );
 *  System.Type type = evt.GetType();
 *  System.Console.WriteLine( "This is my Anonymization. System.Type: " + type.ToString() );
 *  System.Console.WriteLine( "This is my Anonymization. CheckEvent: " + ae.CheckEvent( evt ) );
 *  System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + ae.GetTag().toString() );
 */
    AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
    if( ae != null )
      {
      Tag t = ae.GetTag();
      System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + t.toString() );
      }
    else
      {
```

```
      System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
      }
  }
  protected override void ShowAbort(){
    System.Console.WriteLine( "This is my abort" );
  }
}
public class BasicAnonymizer
{
  public static int Main(string[] args)
    {
    gdcm.Global global = gdcm.Global.GetInstance();
    if( !global.LoadResourcesFiles() )
      {
      System.Console.WriteLine( "Could not LoadResourcesFiles" );
      return 1;
      }
    string file1 = args[0];
    string file2 = args[1];
    Reader reader = new Reader();
    reader.SetFileName( file1 );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    string certpath = gdcm.Filename.Join(gdcm.Testing.GetSourceDirectory(),
       "/Testing/Source/Data/certificate.pem" );
    gdcm.CryptoFactory fact = gdcm.CryptoFactory.GetFactoryInstance();
    gdcm.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
    if( !cms.ParseCertificateFile( certpath ) )
      {
      return 1;
      }
    //Anonymizer ano = new Anonymizer();
    SmartPtrAno sano = Anonymizer.New();
    Anonymizer ano = sano.__ref__();
    //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
    MyWatcher watcher = new MyWatcher(ano);
    ano.SetFile( reader.GetFile() );
    ano.SetCryptographicMessageSyntax( cms );
    if( !ano.BasicApplicationLevelConfidentialityProfile() )
      {
      return 1;
      }
    Writer writer = new Writer();
    writer.SetFileName( file2 );
    writer.SetFile( ano.GetFile() );
    ret = writer.Write();
    if( !ret )
      {
      return 1;
      }
    return 0;
    }
}
```

12.16 BasicImageAnonymizer.cs

```
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=========================================================================*/
/*
 */
using System;
using gdcm;
public class BasicImageAnonymizer
```

```
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    // instanciate the reader:
    gdcm.ImageReader reader = new gdcm.ImageReader();
    reader.SetFileName( filename );
    if (!reader.Read()) return 1;
    Image ir = reader.GetImage();
    uint[] dims = {0, 0, 0};
    dims[0] = ir.GetDimension(0);
    dims[1] = ir.GetDimension(1);
    dims[2] = ir.GetDimension(2);
    System.Console.WriteLine( "Dim:" + dims[0] );
    System.Console.WriteLine( "Dim:" + dims[1] );
    System.Console.WriteLine( "Dim:" + dims[2] );
    // buffer to get the pixels
    byte[] buffer = new byte[ ir.GetBufferLength()];
    System.Console.WriteLine( "Dim:" + ir.GetBufferLength() );
    ir.GetBuffer( buffer );
    for (uint z = 0; z < dims[2]; z++)
      {
      for (uint y = 0; y < dims[1] / 2; y++) // only half Y
        {
        for (uint x = 0; x < dims[0] / 2; x++) // only half X
          {
          buffer[ (z * dims[1] + y) * dims[0] + x ] = 0; // works when pixel type == UINT8
          }
        }
      }
    DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buffer, new VL( (uint)buffer.Length ) );
    ir.SetDataElement( pixeldata );
    ir.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.ExplicitVRLittleEndian ) );
    ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
    change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLSLossless ) );
    change.SetInput( ir );
    if( !change.Change() )
      {
      System.Console.WriteLine( "Could not change: " + filename );
      return 1;
      }
    ImageWriter writer = new ImageWriter();
    writer.SetFileName( "out.dcm" );
    writer.SetFile( reader.GetFile() );
    writer.SetImage( change.GetOutput() );
    bool ret = writer.Write();
    if( !ret )
      {
      return 1;
      }
    return 0;
    }
}
```

12.17 CompressLossyJPEG.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm/debug-gcc/bin
 * $ mono bin/CompressLossyJPEG.exe input.dcm output.dcm
 */
using System;
using gdcm;
```

```
public class CompressLossyJPEG
{
  public static int Main(string[] args)
    {
    if( args.Length < 2 )
      {
      System.Console.WriteLine( " input.dcm output.dcm" );
      return 1;
      }
    string filename = args[0];
    string outfilename = args[1];
    ImageReader reader = new ImageReader();
    reader.SetFileName( filename );
    if( !reader.Read() )
      {
      System.Console.WriteLine( "Could not read: " + filename );
      return 1;
      }
    // The output of gdcm::Reader is a gdcm::File
    File file = reader.GetFile();
    // the dataset is the the set of element we are interested in:
    DataSet ds = file.GetDataSet();
    Image image = reader.GetImage();
    //image.Print( cout );
    ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
    TransferSyntax targetts =  new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
    change.SetTransferSyntax( targetts );
    // Setup our JPEGCodec, warning it should be compatible with JPEGBaselineProcess1
    JPEGCodec jpegcodec = new JPEGCodec();
    if( !jpegcodec.CanCode( targetts ) )
      {
      System.Console.WriteLine( "Something went really wrong, JPEGCodec cannot handle JPEGBaselineProcess1" );
      return 1;
      }
    jpegcodec.SetLossless( false );
    jpegcodec.SetQuality( 50 ); // poor quality !
    change.SetUserCodec( jpegcodec ); // specify the codec to use to the ImageChangeTransferSyntax
    change.SetInput( image );
    bool b = change.Change();
    if( !b )
      {
      System.Console.WriteLine( "Could not change the Transfer Syntax" );
      return 1;
      }
    ImageWriter writer = new ImageWriter();
    writer.SetImage( (gdcm.Image)change.GetOutput() );
    writer.SetFile( reader.GetFile() );
    writer.SetFileName( outfilename );
    if( !writer.Write() )
      {
      System.Console.WriteLine( "Could not write: " + outfilename );
      return 1;
      }
    return 0;
    }
}
```

12.18 DecompressImageMultiframe.cs

```
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=========================================================================*/
/*
$ gdcminfo ~/Desktop/angiogram-06.dcm
MediaStorage is 1.2.840.10008.5.1.4.1.1.12.1 [X-Ray Angiographic Image Storage]
TransferSyntax is 1.2.840.10008.1.2.4.50 [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8
       Bit Image Compression]
```

```
NumberOfDimensions: 3
Dimensions: (512,512,355)
Origin: (0,0,0)
Spacing: (1,1,40)
DirectionCosines: (1,0,0,0,1,0)
Rescale Intercept/Slope: (0,1)
SamplesPerPixel    :1
BitsAllocated      :8
BitsStored         :8
HighBit            :7
PixelRepresentation:0
ScalarType found   :UINT8
PhotometricInterpretation: MONOCHROME2
PlanarConfiguration: 0
TransferSyntax: 1.2.840.10008.1.2.4.50
Orientation Label: AXIAL
*/
/*
 * Description:
 *
 * Assume we have a file angiogram-06.dcm as described above.
 * the following program will decompress directly from the extracted jpeg stream.
 *
 * First step extract the jpeg stream (but not the Basic Offset Table):
 *
 * $ gdcmraw -i angiogram-06.dcm -o /tmp/output/chris --split-frags --pattern %d.jpg
 *
 * Check that indeed there are 355 files, while there are 356 fragments in the original DICOM file, since
 * gdcmraw always skip the first fragment (Basic Offset Table).
 *
 * Now from those individual jpeg stream, recreate a fake gdcm.DataElement...
 *
 * Usage:
 *
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono ./bin/DecompressImageMultiframe.exe /tmp/output
 */
using System;
using gdcm;
public class DecompressImageMultiframe
{
  public static int Main(string[] args)
    {
    string directory = args[0];
    gdcm.Directory dir = new gdcm.Directory();
    uint nfiles = dir.Load(directory);
    //System.Console.WriteLine(dir.toString());
    gdcm.FilenamesType filenames = dir.GetFilenames();
    Image image = new Image();
    image.SetNumberOfDimensions( 3 ); // important for now
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
    SmartPtrFrag sq = SequenceOfFragments.New();
    // Yeah, the file are not garantee to be in order, please adapt...
    for(uint i = 0; i < nfiles; ++i)
      {
      System.Console.WriteLine( filenames[(int)i] );
      string file = filenames[(int)i];
      System.IO.FileStream infile =
        new System.IO.FileStream(file, System.IO.FileMode.Open, System.IO.FileAccess.Read);
      uint fsize = gdcm.PosixEmulation.FileSize(file);
      byte[] jstream  = new byte[fsize];
      infile.Read(jstream, 0 , jstream.Length);
      Fragment frag = new Fragment();
      frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
      sq.AddFragment( frag );
      }
    // Pass by reference:
    pixeldata.SetValue( sq.__ref__() );
    // insert:
    image.SetDataElement( pixeldata );
    // JPEG use YBR to achieve better compression ratio by default (not RGB)
    // FIXME hardcoded:
    PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
       );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(1,8,8,7);
    image.SetPixelFormat( pixeltype );
    // FIXME hardcoded:
    image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
```

```
    image.SetDimension(0, 512);
    image.SetDimension(1, 512);
    image.SetDimension(2, 355);
    // Decompress !
    byte[] decompressedData = new byte[(int)image.GetBufferLength()];
    image.GetBuffer(decompressedData);
    // Write out the decompressed bytes
    System.Console.WriteLine(image.toString());
    using (System.IO.Stream stream =
      System.IO.File.Open(@"/tmp/dd.raw",
        System.IO.FileMode.Create))
      {
      System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
      writer.Write(decompressedData);
      }
    return 0;
    }
}
```

12.19 DumpCSA.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ bin/DumpCSA.exe input.dcm
 */
using System;
using gdcm;
public class DumpCSA
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    gdcm.Reader reader = new gdcm.Reader();
    reader.SetFileName( filename );
    if (!reader.Read()) return 1;
    gdcm.File f = reader.GetFile();
    gdcm.DataSet ds = f.GetDataSet();
    string[] expectedSiemensTags = new string[] { "B_value" , "AcquisitionMatrixText" };
    using (PrivateTag gtag = CSAHeader.GetCSAImageHeaderInfoTag())
    {
        if (ds.FindDataElement(gtag))
        {
            using (DataElement de = ds.GetDataElement(gtag))
            {
                if (de != null && !de.IsEmpty())
                {
                    using (CSAHeader csa = new CSAHeader())
                    {
                        if (csa.LoadFromDataElement(de))
                        {
                            foreach (string str in expectedSiemensTags)
                            {
                                if (csa.FindCSAElementByName(str))
                                {
                                    using (CSAElement elem = csa.GetCSAElementByName(str))
                                    {
                                        if (elem != null)
                                        {
                                            System.Console.WriteLine( elem.toString() );
                                        }
                                    }
                                }
                            }
                        }
```

```
                    }
                }
            }
        }
    }
    return 0;
    }
}
```

12.20 ExtractEncapsulatedFile.cs

```
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=========================================================================*/
/*
 * This example shows how one from C# context can extract a binary blob
 * and write out as a file.
 * This example is meant for pdf encapsulated file, but can be adapted for other type
 * of binary blob.
 *
 * DICOM file is:
 * ...
 * (0042,0010) ST (no value available)                     #   0, 0 DocumentTitle
 * (0042,0011) OB 25\50\44\46\2d\31\2e\32\20\0d\25\e2\e3\cf\d3\20\0d\31\30\20\30\20... # 40718, 1
      EncapsulatedDocument
 * (0042,0012) LO [application/pdf]                        #  16, 1 MIMETypeOfEncapsulatedDocument
 * ...
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ExtractEncapsulatedFile.exe some_pdf_encapsulated.dcm
 */
using System;
using gdcm;
public class ExtractEncapsulatedFile
{
  public static int Main(string[] args)
    {
    string file = args[0];
    Reader reader = new Reader();
    reader.SetFileName( file );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    File f = reader.GetFile();
    DataSet ds = f.GetDataSet();
    Tag tencapsulated_stream = new Tag(0x0042,0x0011); // Encapsulated Document
    if( !ds.FindDataElement( tencapsulated_stream ) )
      {
      return 1;
      }
    // else
    DataElement de = ds.GetDataElement( tencapsulated_stream );
    ByteValue bv = de.GetByteValue();
    uint len = bv.GetLength();
    byte[] encapsulated_stream = new byte[len];
    bv.GetBuffer( encapsulated_stream, len );
    // Write out the decompressed bytes
    //System.Console.WriteLine(image.toString());
    using (System.IO.Stream stream =
      System.IO.File.Open(@"/tmp/dd.pdf",
        System.IO.FileMode.Create))
      {
      System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
      writer.Write( encapsulated_stream );
```

```
      }
    return 0;
    }
}
```

12.21 ExtractImageRegion.cs

```
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=========================================================================*/
/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 *
 * Usage:
 * $ bin/ExtractImageRegion.exe input.dcm
 *
 * Example:
 * $ bin/ExtractImageRegion.exe gdcmData/012345.002.050.dcm
 * $ md5sum /tmp/frame.raw
 * d594a5e2fde12f32b6633ca859b4d4a6  /tmp/frame.raw
 * $ gdcminfo --md5sum gdcmData/012345.002.050.dcm
 * [...]
 * md5sum: d594a5e2fde12f32b6633ca859b4d4a6
 */
using System;
using gdcm;
public class ExtractImageRegion
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    uint file_size = gdcm.PosixEmulation.FileSize(filename);
    // instantiate the reader:
    gdcm.ImageRegionReader reader = new gdcm.ImageRegionReader();
    reader.SetFileName( filename );
    // pull DICOM info:
    if (!reader.ReadInformation()) return 1;
    // store current offset:
    uint cur_pos = reader.GetStreamCurrentPosition();
    uint remaining = file_size - cur_pos;
    Console.WriteLine("Remaining bytes to read (Pixel Data): " + remaining.ToString() );
    // Get file infos
    gdcm.File f = reader.GetFile();
    // get some info about image
    UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
    PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
    int pixelsize = pf.GetPixelSize();
    PhotometricInterpretation pi = ImageHelper.GetPhotometricInterpretationValue(f);
    Console.WriteLine( pi.toString() );
    // buffer to get the pixels
    byte[] buffer = new byte[ dims[0] * dims[1] * pixelsize ];
    // define a simple box region.
    BoxRegion box = new BoxRegion();
    for (uint z = 0; z < dims[2]; z++)
      {
      // Define that I want the image 0, full size (dimx x dimy pixels)
      // and do that for each z:
      box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
      //System.Console.WriteLine( box.toString() );
      reader.SetRegion( box );
      // reader will try to load the uncompressed image region into buffer.
      // the call returns an error when buffer.Length is too small. For instance
      // one can call:
      // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
      // to get the exact size of minimum buffer
```

```
      if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))
        {
        using (System.IO.Stream stream =
          System.IO.File.Open(@"/tmp/frame.raw",
            System.IO.FileMode.Create))
          {
          System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
          writer.Write(buffer);
          }
        }
      else
        {
        throw new Exception("can't read pixels error");
        }
      }
    return 0;
    }
}
```

12.22 ExtractImageRegionWithLUT.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 * Furthermore we are applying the LUT on this image.
 * Special care should be taken in case the image is not PALETTE COLOR
 *
 * Usage:
 * $ bin/ExtractImageRegionWithLUT.exe input.dcm
 *
 * Example:
 * $ bin/ExtractImageRegionWithLUT.exe gdcmData/rle16loo.dcm
 * $ md5sum /tmp/frame_rgb.raw
 * 73bf61325fdb6e2830244a2b7b0c4ae2  /tmp/frame_rgb.raw
 * $ gdcmimg --depth 16 --spp 3 --size 600,430 /tmp/frame_rgb.raw rgb.dcm
 * $ gdcmviewer rgb.dcm
 */
using System;
using gdcm;
public class ExtractImageRegion
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    // instantiate the reader:
    gdcm.ImageRegionReader reader = new gdcm.ImageRegionReader();
    reader.SetFileName( filename );
    // pull DICOM info:
    if (!reader.ReadInformation()) return 1;
    // Get file infos
    gdcm.File f = reader.GetFile();
    gdcm.LookupTable lut = reader.GetImage().GetLUT();
    // get some info about image
    UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
    PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
    int pixelsize = pf.GetPixelSize();
    // buffer to get the pixels
    byte[] buffer = new byte[ dims[0] * dims[1] * pixelsize ];
    // output buffer for the RGB decoded image:
    byte[] buffer2 = new byte[ dims[0] * dims[1] * pixelsize * 3 ];
    // define a simple box region.
    BoxRegion box = new BoxRegion();
    for (uint z = 0; z < dims[2]; z++)
```

```
      {
      // Define that I want the image 0, full size (dimx x dimy pixels)
      // and do that for each z:
      box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
      //System.Console.WriteLine( box.toString() );
      reader.SetRegion( box );
      // reader will try to load the uncompressed image region into buffer.
      // the call returns an error when buffer.Length is too small. For instance
      // one can call:
      // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
      // to get the exact size of minimum buffer
      if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))
        {
        if( !lut.Decode( buffer2, (uint)buffer2.Length, buffer, (uint)buffer.Length ) )
          {
          throw new Exception("can't decode");
          }
        using (System.IO.Stream stream =
          System.IO.File.Open(@"/tmp/frame_rgb.raw",
            System.IO.FileMode.Create))
          {
          System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
          writer.Write(buffer2);
          }
        }
      else
        {
        throw new Exception("can't read pixels error");
        }
      }
    return 0;
    }
}
```

12.23 ExtractOneFrame.cs

```
/*=========================================================================

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=========================================================================*/
/*
 * This small code shows how to use the gdcm.StreamImageReader API
 * to read a single (whole) frame at a time
 * The API allow extracting a smaller extent of the frame of course.
 * It will write out the extracted frame in /tmp/frame.raw
 *
 * Usage:
 * $ bin/ExtractOneFrame.exe input.dcm
 */
using System;
using gdcm;
public class ExtractOneFrame
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    gdcm.StreamImageReader reader = new gdcm.StreamImageReader();
    reader.SetFileName( filename );
    if (!reader.ReadImageInformation()) return 1;
    // Get file infos
    gdcm.File f = reader.GetFile();
    // get some info about image
    UIntArrayType extent = ImageHelper.GetDimensionsValue(f);
    //System.Console.WriteLine( extent[0] );
    uint dimx = extent[0];
    //System.Console.WriteLine( extent[1] );
    uint dimy = extent[1];
    //System.Console.WriteLine( extent[2] );
```

```
    uint dimz = extent[2];
    PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
    int pixelsize = pf.GetPixelSize();
    //System.Console.WriteLine( pixelsize );
    // buffer to get the pixels
    byte[] buffer = new byte[ dimx * dimy * pixelsize ];
    for (int i = 0; i < dimz; i++)
      {
      // Define that I want the image 0, full size (dimx x dimy pixels)
      reader.DefinePixelExtent(0, (ushort)dimx, 0, (ushort)dimy, (ushort)i, (ushort)(i+1));
      uint buf_len = reader.DefineProperBufferLength(); // take into account pixel size
      //System.Console.WriteLine( buf_len );
      if( buf_len > buffer.Length )
        {
        throw new Exception("buffer is too small for target");
        }
      if (reader.Read(buffer, (uint)buffer.Length))
        {
        using (System.IO.Stream stream =
          System.IO.File.Open(@"/tmp/frame.raw",
            System.IO.FileMode.Create))
          {
          System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
          writer.Write(buffer);
          }
        }
      else
        {
        throw new Exception("can't read pixels error");
        }
      }
    return 0;
    }
}
```

12.24 FileAnonymize.cs

```
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=========================================================================*/
/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileAnonymize.exe input.dcm output.dcm
 */
using System;
using gdcm;
public class FileAnonymize
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    gdcm.FileAnonymizer fa = new gdcm.FileAnonymizer();
    fa.SetInputFileName( filename );
    fa.SetOutputFileName( outfilename );
    // Empty Operations
    // It will create elements, since those tags are non-registered public elements (2011):
    fa.Empty( new Tag(0x0008,0x1313) );
    fa.Empty( new Tag(0x0008,0x1317) );
    // Remove Operations
    // The following Tag are actually carefully chosen, since they refer to SQ:
    fa.Remove( new Tag(0x0008,0x2112) );
    fa.Remove( new Tag(0x0008,0x9215) );
    // Replace Operations
    // do not call replace operation on SQ attribute !
```

```
    fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
    fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );
    if( !fa.Write() )
      {
      System.Console.WriteLine( "Could not write" );
      return 1;
      }
    return 0;
    }
}
```

12.25 FileChangeTS.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.
 * Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
 * image to be able to create the volume in memory Of course you can use any
 * existing DICOM instead
 *
 * Step 2.
 * Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
 * At this point in time this makes the DICOM file invalid (truncated). But the
 * next step will fix this.
 *
 * Step 3.
 * Use C# to create a binary data which will represent our source object for
 * image.
 *
 * Step 4.
 * We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
 * the binary data from Step 3. We decide to read a scanline at a time, but
 * this can be read with any number of bytes. AppendToDataElement() will always
 * do the proper computation.
 *
 * Step 5.
 * We compress this gigantic file, into [JPEG Lossless, Non-Hierarchical,
 * First-Order Prediction (Process 14 [Selection Value 1])]
 *
 * Usage:
 * $ mono bin/FileChangeTS.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
 */
using System;
using System.IO;
using gdcm;
public class FileChangeTS
{
  public static byte[] StrToByteArray(string str)
    {
    System.Text.ASCIIEncoding  encoding=new System.Text.ASCIIEncoding();
    return encoding.GetBytes(str);
    }
  // Create a 256 x 256 Secondary Capture Image Storage
  static private void CreateSmallDICOM(string fileName)
    {
    using( var writer = new gdcm.PixmapWriter() )
      {
      gdcm.Pixmap img = writer.GetImage();
      img.SetNumberOfDimensions( 3 );
      img.SetDimension(0, 512 );
      img.SetDimension(1, 512 );
      img.SetDimension(2, 2 ); // fake a 3d volume
```

```
    PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
     );
    img.SetPhotometricInterpretation( pi );
    gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    byte[] buffer = new byte[ 512 * 512 * 2 ];
    pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
    img.SetDataElement( pixeldata );
    gdcm.File file = writer.GetFile();
    gdcm.DataSet ds = file.GetDataSet();
    gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
    string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
     Storage
    byte[] val = StrToByteArray(mediastorage);
    ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );
    ds.Insert( ms );
    writer.SetFileName( fileName );
    writer.Write();
    }
  }
static private void CreateBigDICOM(string fileName, string outfilename)
  {
  using( var ano = new gdcm.FileAnonymizer() )
    {
    // The following is somewhat dangerous, do not try at home:
    string nframes = "1000";
    ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
    ano.SetInputFileName(fileName);
    ano.SetOutputFileName(outfilename);
    ano.Write(); // at this point the DICOM is invalid !
    }
  }
static private void CreateDummyFile(string fileName, long length)
  {
  using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
    {
    // Looks like C# always init to 0 (fallocate ?)
    // For the purpose of the test we could add some random noise
    fileStream.SetLength(length);
    }
  }
static private void ReadBytesIntoArray( byte[] array, FileStream source )
  {
  int numBytesToRead = array.Length;
  int numBytesRead = 0;
  while (numBytesToRead > 0)
    {
    // According to spec: Read() may return anything from 0 to numBytesToRead.
    int n = source.Read(array, numBytesRead, numBytesToRead);
    // Break when the end of the file is reached.
    if (n == 0)
      break;
    numBytesRead += n;
    numBytesToRead -= n;
    }
  }
static private void AssembleDICOMAndRaw(string dicomfn, string rawdata, string outfn)
  {
  using ( var fs = new gdcm.FileStreamer() )
    {
    fs.SetTemplateFileName(dicomfn);
    fs.SetOutputFileName(outfn);
    gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
    // FileStreamer support automatic checking of pixel data length
    // based on DICOM attributes, only if we say so:
    fs.CheckDataElement( pixeldata );
    // Declare we are working on Pixel Data attribute:
    fs.StartDataElement( pixeldata );
    using (FileStream rawSource = new FileStream(rawdata,
        FileMode.Open, FileAccess.Read))
      {
      byte[] bytes = new byte[512];
      // Only read one scanline at a time
      // We could have been reading more at once, if this is more efficient,
      // AppendToDataElement will do the logic in all cases.
      for( int i = 0; i < 512 * 1000; ++i )
        {
        // Read the source file into a byte array.
        ReadBytesIntoArray( bytes, rawSource );
        fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
        }
      }
```

```
      if( !fs.StopDataElement( pixeldata ) )
        {
        // Most likely an issue with Pixel Data Length computation:
        throw new Exception("StopDataElement failed");
        }
      }
    }
  static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
    {
    using( var sfcts = FileChangeTransferSyntax.New() )
      {
      // Need to retrieve the actual C++ reference, to pass to
      // SimpleSubjectWatcher:
      FileChangeTransferSyntax fcts = sfcts.__ref__();
      SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
      gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 );
      fcts.SetTransferSyntax( ts );
      fcts.SetInputFileName( rawdicom );
      fcts.SetOutputFileName( jpegdicom );
      fcts.Change();
      }
    }
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];
    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);
    return 0;
    }
}
```

12.26 FileChangeTSLossy.cs

```
/*=========================================================================

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.
 * Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
 * image to be able to create the volume in memory Of course you can use any
 * existing DICOM instead
 *
 * Step 2.
 * Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
 * At this point in time this makes the DICOM file invalid (truncated). But the
 * next step will fix this.
 *
 * Step 3.
 * Use C# to create a binary data which will represent our source object for
 * image.
 *
 * Step 4.
 * We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
 * the binary data from Step 3. We decide to read a scanline at a time, but
 * this can be read with any number of bytes. AppendToDataElement() will always
 * do the proper computation.
 *
```

```
 * Step 5.
 * We compress this gigantic file, into [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit
      Image Compression]
 *
 * Usage:
 * $ bin/FileChangeTSLossy.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
 */
using System;
using System.IO;
using gdcm;
public class FileChangeTS
{
  public static byte[] StrToByteArray(string str)
    {
    System.Text.ASCIIEncoding  encoding=new System.Text.ASCIIEncoding();
    return encoding.GetBytes(str);
    }
  // Create a 256 x 256 Secondary Capture Image Storage
  static private void CreateSmallDICOM(string fileName)
    {
    using( var writer = new gdcm.PixmapWriter() )
      {
      gdcm.Pixmap img = writer.GetImage();
      img.SetNumberOfDimensions( 3 );
      img.SetDimension(0, 512 );
      img.SetDimension(1, 512 );
      img.SetDimension(2, 2 ); // fake a 3d volume
      PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
       );
      img.SetPhotometricInterpretation( pi );
      gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
      byte[] buffer = new byte[ 512 * 512 * 2 ];
      pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
      img.SetDataElement( pixeldata );
      gdcm.File file = writer.GetFile();
      gdcm.DataSet ds = file.GetDataSet();
      gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
      string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
       Storage
      byte[] val = StrToByteArray(mediastorage);
      ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );
      ds.Insert( ms );
      writer.SetFileName( fileName );
      writer.Write();
      }
    }
  static private void CreateBigDICOM(string fileName, string outfilename)
    {
    using( var ano = new gdcm.FileAnonymizer() )
      {
      // The following is somewhat dangerous, do not try at home:
      string nframes = "1000";
      ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
      ano.SetInputFileName(fileName);
      ano.SetOutputFileName(outfilename);
      ano.Write(); // at this point the DICOM is invalid !
      }
    }
  static private void CreateDummyFile(string fileName, long length)
    {
    using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
      {
      // Looks like C# always init to 0 (fallocate ?)
      // For the purpose of the test we could add some random noise
      fileStream.SetLength(length);
      }
    }
  static private void ReadBytesIntoArray( byte[] array, FileStream source )
    {
    int numBytesToRead = array.Length;
    int numBytesRead = 0;
    while (numBytesToRead > 0)
      {
      // According to spec: Read() may return anything from 0 to numBytesToRead.
      int n = source.Read(array, numBytesRead, numBytesToRead);
      // Break when the end of the file is reached.
      if (n == 0)
        break;
      numBytesRead += n;
      numBytesToRead -= n;
      }
```

```
    }
  static private void AssembleDICOMAndRaw(string dicomfn, string rawdata, string outfn)
    {
    using ( var fs = new gdcm.FileStreamer() )
      {
      fs.SetTemplateFileName(dicomfn);
      fs.SetOutputFileName(outfn);
      gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
      // FileStreamer support automatic checking of pixel data length
      // based on DICOM attributes, only if we say so:
      fs.CheckDataElement( pixeldata );
      // Declare we are working on Pixel Data attribute:
      fs.StartDataElement( pixeldata );
      using (FileStream rawSource = new FileStream(rawdata,
          FileMode.Open, FileAccess.Read))
        {
        byte[] bytes = new byte[512];
        // Only read one scanline at a time
        // We could have been reading more at once, if this is more efficient,
        // AppendToDataElement will do the logic in all cases.
        for( int i = 0; i < 512 * 1000; ++i )
          {
          // Read the source file into a byte array.
          ReadBytesIntoArray( bytes, rawSource );
          fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
          }
        }
      if( !fs.StopDataElement( pixeldata ) )
        {
        // Most likely an issue with Pixel Data Length computation:
        throw new Exception("StopDataElement failed");
        }
      }
    }
  static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
    {
    using( var sfcts = FileChangeTransferSyntax.New() )
      {
      // Need to retrieve the actual C++ reference, to pass to
      // SimpleSubjectWatcher:
      FileChangeTransferSyntax fcts = sfcts.__ref__();
      SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
      gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
      fcts.SetTransferSyntax( ts );
      ImageCodec ic = fcts.GetCodec();
      JPEGCodec jpeg = JPEGCodec.Cast( ic );
      jpeg.SetLossless( false );
      jpeg.SetQuality( 50 ); // poor quality !
      fcts.SetInputFileName( rawdicom );
      fcts.SetOutputFileName( jpegdicom );
      fcts.Change();
      }
    }
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];
    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);
    return 0;
    }
}
```

12.27 FileStreaming.cs

```
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```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileStreaming.exe gdcmData/CT_16b_signed-UsedBits13.dcm output.dcm
 *
 * The class will take care of group handling and will use the first available group:
 * (0009,0012) ?? (LO) [MYTEST]                            # 6,1 Private Creator
 */
using System;
using gdcm;
public class FileStreaming
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    gdcm.PrivateTag pt = new gdcm.PrivateTag( new gdcm.Tag(0x9,0x10), "MYTEST" );
    gdcm.FileStreamer fs = new gdcm.FileStreamer();
    fs.SetTemplateFileName( filename );
    fs.SetOutputFileName( outfilename );
    byte[] buffer = new byte[ 8192 ];
    uint len = (uint)buffer.Length;
    // In this example, we want that each newly created Private Attribute
    // contains at most 1000 bytes of incoming dataset.
    // We are also calling the function twice to check that appending mode is
    // working from one call to the other. The last element will have a length
    // of (2 * 8192) % 1000 = 384
    if( !fs.StartGroupDataElement( pt, 1000, 1 )
      || !fs.AppendToGroupDataElement( pt, buffer, len )
      || !fs.AppendToGroupDataElement( pt, buffer, len )
      || !fs.StopGroupDataElement( pt ) )
      {
      System.Console.WriteLine( "Could not change private group" );
      return 1;
      }
    return 0;
    }
}
```

12.28 GetArray.cs

```
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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/GetArray.exe gdcmData/012345.002.050.dcm
 */
using System;
using gdcm;
public class GetArray
{
  public static int Main(string[] args)
    {
    string file1 = args[0];
    ImageReader reader = new ImageReader();
    reader.SetFileName( file1 );
    bool ret = reader.Read();
```

```
    if( !ret )
      {
      return 1;
      }
    Image image = reader.GetImage();
    PixelFormat pixeltype = image.GetPixelFormat();
    if( image.GetNumberOfDimensions() != 2 )
      {
      // For the purpose of the test, exit early on
      return 1;
      }
    uint dimx = image.GetDimension(0);
    uint dimy = image.GetDimension(1);
    uint npixels = dimx * dimy;
    //LookupTable lut = image.GetLUT();
    //uint rl = lut.GetLUTLength( LookupTable.LookupTableType.RED );
    //byte[] rbuf = new byte[ rl ];
    //uint rl2 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
    //assert rl == rl2;
    //byte[] str1 = new byte[ image.GetBufferLength()];
    //image.GetBuffer( str1 );
    if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT8 )
      {
      System.Console.WriteLine( "Processing UINT8 image type" );
      byte[] str1 = new byte[ npixels ];
      image.GetArray( str1 );
      }
    else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.INT16 )
      {
      System.Console.WriteLine( "Processing INT16 image type" );
      short[] str1 = new short[ npixels ];
      image.GetArray( str1 );
      }
    else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT16 )
      {
      System.Console.WriteLine( "Processing UINT16 image type" );
      ushort[] str1 = new ushort[ npixels ];
      image.GetArray( str1 );
      }
    else
      {
      //System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.toString() );
      System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.GetScalarTypeAsString() );
      // Get bytes
      byte[] str1 = new byte[ image.GetBufferLength()];
      image.GetBuffer( str1 );
      }
    return 0;
    }
}
```

12.29 MpegVideoInfo.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * This examples takes in a MPEG2 and write out a Video Endoscopic Imagae Storage
 * encoded using MPEG2 @ Main Profile
 * ref: http://chrisa.wordpress.com/2007/11/21/decoding-mpeg2-information/
 * See also:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 * http://cvs.linux.hr/cgi-bin/viewcvs.cgi/mpeg_mod/README.infompeg?view=markup
 * http://www.guru-group.fi/~too/sw/m2vmp2cut/mpeg2info.c
 */
/*
 * Provides information about an MPEG2 file, including the duration, frame rate, aspect
```

```
 * ratio, and resolution.  Good information about the MPEG2 file structure that helps
 * explain parts of the code can be found here:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 *
 * Copyright (c) 2007 Chris Anderson (chrisa@wordpress.com)
 *
 * This library is free software; you can redistribute it and/or
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 * version 2 of the License, or (at your option) any later version.
 *
 * This library is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the GNU
 * Lesser General Public License for more details.
 */
using System;
using System.IO;
using gdcm;
public class Mpeg2VideoInfo
{
    #region Member Variables
    private TimeSpan        m_startTime     = TimeSpan.Zero;
    private TimeSpan        m_endTime       = TimeSpan.Zero;
    private TimeSpan        m_duration      = TimeSpan.Zero;
    private eAspectRatios   m_aspectRatio   = eAspectRatios.Invalid;
    private eFrameRates     m_frameRate     = 0;
    private int             m_pictureWidth  = 0;
    private int             m_pictureHeight = 0;
    #endregion
    #region Constants
    private const byte PADDING_PACKET = 0xBE;
    private const byte VIDEO_PACKET = 0xE0;
    private const byte AUDIO_PACKET = 0xC0;
    private const byte SYSTEM_PACKET = 0xBB;
    private const byte TIMESTAMP_PACKET = 0xB8;
    private const byte HEADER_PACKET = 0xB3;
    private const int BUFFER_SIZE = 8162; // 8K buffer
    private readonly static TimeSpan EMPTY_TIMESPAN = new TimeSpan(0, 0, -1);
    #endregion
    #region Enumerations
    public enum eFrameRates
    {
        Invalid,
        PulldownNTSC,           // 24000d/1001d = 23.976 Hz
        Film,                   // 24 Hz
        PAL,                    // 25 Hz
        NTSC,                   // 30000d/1001d = 29.97 Hz
        DropFrameNTSC,          // 30 Hz
        DoubleRatePAL,          // 50 Hz
        DoubleRateNTSC,         // 59.97 Hz
        DoubleRateDropFrameNTSC // 60 Hz
    }
    public enum eAspectRatios
    {
        Invalid,
        VGA,        // 1/1
        StandardTV, // 4/3
        LargeTV,    // 16/9
        Cinema      // 2.21/1
    }
    #endregion
    #region Constructor
    public Mpeg2VideoInfo(string file)
    {
        ParseMpeg(file);
    }
    #endregion
    #region Public Properties
    public TimeSpan StartTime
    {
        get { return m_startTime; }
    }
    public TimeSpan EndTime
    {
        get { return m_endTime; }
    }
    public TimeSpan Duration
    {
        get { return m_duration; }
    }
```

```
public eAspectRatios AspectRatio
{
    get { return m_aspectRatio; }
}
public eFrameRates FrameRate
{
    get { return m_frameRate; }
}
public int PictureWidth
{
    get { return m_pictureWidth; }
}
public int PictureHeight
{
    get { return m_pictureHeight; }
}
#endregion
#region Private Functions
private void ParseMpeg(string file)
{
    FileStream fs = new FileStream(file, FileMode.Open, FileAccess.Read, FileShare.ReadWrite);
    BinaryReader br = new BinaryReader(fs);
    m_startTime = GetStartTimeStampInfo(br);
    m_endTime = GetEndTimeStampInfo(br);
    m_duration = m_endTime.Subtract(m_startTime);
    GetHeaderInfo(br);
    br.Close();
    fs.Close();
}
private TimeSpan GetStartTimeStampInfo(BinaryReader br)
{
    TimeSpan startTime = EMPTY_TIMESPAN;
    byte[] buffer = new byte[BUFFER_SIZE];
    br.BaseStream.Seek(0, SeekOrigin.Begin);
    while (startTime == EMPTY_TIMESPAN && br.BaseStream.Position < br.BaseStream.Length)
    {
        int readBytes = br.Read(buffer, 0, BUFFER_SIZE);
        for (int offset = 0; offset < readBytes - 8; offset++)
        {
            if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
            {
                offset += 4; // Move to the data position which follows the stream header
                uint timeStampEncoded = GetData(ref buffer, offset);
                startTime = DecodeTimeStamp(timeStampEncoded);
                if (startTime != EMPTY_TIMESPAN)
                    break;
            }
        }
    }
    return startTime;
}
private TimeSpan GetEndTimeStampInfo(BinaryReader br)
{
    TimeSpan endTime = EMPTY_TIMESPAN;
    byte[] buffer = new byte[BUFFER_SIZE];
    br.BaseStream.Seek(-BUFFER_SIZE, SeekOrigin.End);
    while (endTime == EMPTY_TIMESPAN && br.BaseStream.Position > BUFFER_SIZE)
    {
        int readBytes = br.Read(buffer, 0, BUFFER_SIZE);
        for (int offset = readBytes - 8; offset >= 0; offset--)
        {
            if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
            {
                offset += 4; // Move to the data position which follows the stream header
                uint timeStampEncoded = GetData(ref buffer, offset);
                endTime = DecodeTimeStamp(timeStampEncoded);
                if (endTime != EMPTY_TIMESPAN)
                    break;
            }
        }
        br.BaseStream.Seek(-BUFFER_SIZE * 2, SeekOrigin.Current);
    }
    return endTime;
}
private TimeSpan DecodeTimeStamp(uint timeStampEncoded)
{
    TimeSpan timeStamp = EMPTY_TIMESPAN;
    // Mask out the bits containing the property we are after, then
    // shift the data to the right to get its value
    int hour = (int)(timeStampEncoded & 0x7C000000) » 26;   // Bits 31 -> 27
    int minute = (int)(timeStampEncoded & 0x03F00000) » 20; // Bits 26 -> 21
```

```
        int second = (int)(timeStampEncoded & 0x0007E000) » 13; // Bits 19 -> 14
        int frame = (int)(timeStampEncoded & 0x00001F80) » 7;   // Bits 13 -> 8 - not used, but included for
       completeness
        timeStamp = new TimeSpan(hour, minute, second);
        return timeStamp;
    }
    private void GetHeaderInfo(BinaryReader br)
    {
        byte[] buffer = new byte[BUFFER_SIZE];
        br.BaseStream.Seek(0, SeekOrigin.Begin);
        br.Read(buffer, 0, BUFFER_SIZE);
        for (int offset = 0; offset < buffer.Length - 4; offset++)
        {
            if (IsStreamMarker(ref buffer, offset, HEADER_PACKET))
            {
                offset += 4; // Move to the data position which follows the stream header
                uint headerData = GetData(ref buffer, offset);
                // Mask out the bits containing the property we are after, then
                // shift the data to the right to get its value
                m_pictureWidth = (int)(headerData & 0xFFF00000) » 20;
                m_pictureHeight = (int)(headerData & 0x000FFF00) » 8;
                uint aspectRatioIndex = (headerData & 0x000000F0) » 4;
                uint fpsIndex = headerData & 0x0000000F;
                m_aspectRatio = (eAspectRatios)fpsIndex;
                m_frameRate = (eFrameRates)fpsIndex;
                break;
            }
        }
    }
    private uint GetData(ref byte[] buffer, int offset)
    {
        return (uint)  ((buffer[offset] « 24) |
                        (buffer[offset + 1] « 16) |
                        (buffer[offset + 2] « 8) |
                        (buffer[offset + 3]));
    }
    private bool IsStreamMarker(ref byte[] buffer, int offset, byte markerType)
    {
        return (buffer[offset] == 0x00 &&
                buffer[offset + 1] == 0x00 &&
                buffer[offset + 2] == 0x01 &&
                buffer[offset + 3] == markerType);
    }
    #endregion
  public static int Main(string[] args)
    {
    string file1 = args[0];
    Mpeg2VideoInfo info = new Mpeg2VideoInfo(file1);
    System.Console.WriteLine( info.StartTime );
    System.Console.WriteLine( info.EndTime );
    System.Console.WriteLine( info.Duration );
    System.Console.WriteLine( info.AspectRatio );
    System.Console.WriteLine( info.FrameRate );
    System.Console.WriteLine( info.PictureWidth );
    System.Console.WriteLine( info.PictureHeight );
    ImageReader r = new ImageReader();
    //Image image = new Image();
    Image image = r.GetImage();
    image.SetNumberOfDimensions( 3 );
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    System.IO.FileStream infile =
      new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
    uint fsize = gdcm.PosixEmulation.FileSize(file1);
    byte[] jstream  = new byte[fsize];
    infile.Read(jstream, 0 , jstream.Length);
    SmartPtrFrag sq = SequenceOfFragments.New();
    Fragment frag = new Fragment();
    frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
    sq.AddFragment( frag );
    pixeldata.SetValue( sq.__ref__() );
    // insert:
    image.SetDataElement( pixeldata );
    PhotometricInterpretation pi = new PhotometricInterpretation(
       PhotometricInterpretation.PIType.YBR_PARTIAL_420 );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(3,8,8,7);
    image.SetPixelFormat( pixeltype );
    // FIXME hardcoded:
    TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.MPEG2MainProfile);
    image.SetTransferSyntax( ts );
```

```
    image.SetDimension(0, (uint)info.PictureWidth);
    image.SetDimension(1, (uint)info.PictureHeight);
    image.SetDimension(2, 721);
    ImageWriter writer = new ImageWriter();
    gdcm.File file = writer.GetFile();
    file.GetHeader().SetDataSetTransferSyntax( ts );
    Anonymizer anon = new Anonymizer();
    anon.SetFile( file );
    MediaStorage ms = new MediaStorage( MediaStorage.MSType.VideoEndoscopicImageStorage);
    UIDGenerator gen = new UIDGenerator();
    anon.Replace( new Tag(0x0008,0x16), ms.GetString() );
    anon.Replace( new Tag(0x0018,0x40), "25" );
    anon.Replace( new Tag(0x0018,0x1063), "40.000000" );
    anon.Replace( new Tag(0x0028,0x34), "4\\3" );
    anon.Replace( new Tag(0x0028,0x2110), "01" );
    writer.SetImage( image );
    writer.SetFileName( "dummy.dcm" );
    if( !writer.Write() )
      {
      System.Console.WriteLine( "Could not write" );
      return 1;
      }
    return 0;
    }
}
```

12.30 NewSequence.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/NewSequence.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
//using gdcm;
public class NewSequence
{
  public static byte[] StrToByteArray(string str)
    {
    System.Text.ASCIIEncoding  encoding=new System.Text.ASCIIEncoding();
    return encoding.GetBytes(str);
    }
  public static int Main(string[] argv)
    {
    string file1 = argv[0];
    string file2 = argv[1];
    gdcm.Reader r = new gdcm.Reader();
    r.SetFileName( file1 );
    if ( ! r.Read() )
      {
      return 1;
      }
    gdcm.File f = r.GetFile();
    gdcm.DataSet ds = f.GetDataSet();
    // tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
    // Create a dataelement
    gdcm.DataElement de = new gdcm.DataElement(new gdcm.Tag(0x0010, 0x2180));
    string occ = "Occupation";
    de.SetByteValue( StrToByteArray(occ), new gdcm.VL((uint)occ.Length));
    de.SetVR(new gdcm.VR(gdcm.VR.VRType.SH));
    // Create an item
    gdcm.Item it = new gdcm.Item();
    it.SetVLToUndefined();      // Needed to not popup error message
    //it.InsertDataElement(de)
```

```
    gdcm.DataSet nds = it.GetNestedDataSet();
    nds.Insert(de);
    // Create a Sequence
    gdcm.SmartPtrSQ sq = gdcm.SequenceOfItems.New();
    sq.SetLengthToUndefined();
    sq.AddItem(it);
    // Insert sequence into data set
    gdcm.DataElement des = new gdcm.DataElement(new gdcm.Tag(0x0400,0x0550));
    des.SetVR(new gdcm.VR(gdcm.VR.VRType.SQ));
    des.SetValue(sq.__ref__());
    des.SetVLToUndefined();
    ds.Insert(des);
    gdcm.Writer w = new gdcm.Writer();
    w.SetFile( f );
    w.SetFileName( file2 );
    if ( !w.Write() )
      return 1;
    return 0;
    }
}
```

12.31 RescaleImage.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm rescaled.dcm
 */
using System;
using gdcm;
public class DecompressImage
{
  public static int Main(string[] args)
    {
    string file1 = args[0];
    ImageReader reader = new ImageReader();
    reader.SetFileName( file1 );
    bool ret = reader.Read();
    if( !ret )
      {
      return 1;
      }
    Image image = reader.GetImage();
    PixelFormat pixeltype = image.GetPixelFormat();
    Rescaler r = new Rescaler();
    r.SetIntercept( 0 );
    r.SetSlope( 1.2 );
    r.SetPixelFormat( pixeltype );
    PixelFormat outputpt = new PixelFormat( r.ComputeInterceptSlopePixelType() );
    System.Console.WriteLine( "pixeltype" );
    System.Console.WriteLine( pixeltype.toString() );
    System.Console.WriteLine( "outputpt" );
    System.Console.WriteLine( outputpt.toString() );
    uint len = image.GetBufferLength();
    short[] input = new short[ len / 2 ]; // sizeof(short) == 2
    image.GetArray( input );
    double[] output = new double[ len / 2 ];
    r.Rescale( output, input, len );
    // First Pixel is:
    System.Console.WriteLine( "Input:" );
    System.Console.WriteLine( input[0] );
    System.Console.WriteLine( "Output:" );
    System.Console.WriteLine( output[0] );
    return 0;
```

```
    }
}
```

12.32 SendFileSCU.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm-gcc/bin
 * $ mono bin/SendFileSCU.exe server port input.dcm
 */
using System;
using gdcm;
public class SendFileSCU
{
  public static int Main(string[] args)
    {
    string server = args[0];
    ushort port = ushort.Parse(args[1]);
    string filename = args[2];
    bool b = CompositeNetworkFunctions.CEcho( server, port );
    if( !b ) return 1;
    FilenamesType files = new FilenamesType();
    files.Add( filename );
    b = CompositeNetworkFunctions.CStore( server, port, files );
    if( !b ) return 1;
    return 0;
    }
}
```

12.33 SimplePrintPatientName.cs

```
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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm/debug-gcc/bin
 * $ mono bin/SimplePrintPatientName.exe gdcmData/012345.002.050.dcm
 */
/*
 This example was provided by Jonathan Morra /jonmorra gmail com/
 on the gdcm mailing list (Fri, 28 May 2010)
*/
using System;
using gdcm;
namespace GDCMTest
{
  class SimplePrintPatientName
    {
    static int Main(string[] args)
```

```
      {
      if (args.Length != 1)
        {
        Console.WriteLine("This program prints the patient name of a dicom file with gdcm");
        Console.WriteLine("Usage: [input.dcm]");
        return 1;
        }
      gdcm.Reader reader = new gdcm.Reader();
      reader.SetFileName(args[0]);
      bool ret = reader.Read();
      //TagSetType tst = new TagSetType();
      //tst.Add( new Tag(0x7fe0,0x10) );
      //bool ret = reader.ReadUpToTag( new Tag(0x88,0x200), tst );
      if( !ret )
        {
        return 1;
        }
      gdcm.File file = reader.GetFile();
      gdcm.StringFilter filter = new gdcm.StringFilter();
      filter.SetFile(file);
      string value = filter.ToString(new gdcm.Tag(0x0010, 0x0010));
      Console.WriteLine("Patient Name: " + value);
      return 0;
      }
    }
}
```

12.34 SortImage2.cs

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/SortImage.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class SortImage2
{
  bool mysort(DataSet ds1, DataSet ds2)
    {
    return false;
    }
  public static int Main(string[] args)
    {
    Sorter sorter = new Sorter();
    sorter.SetSortFunction( mysort );
    return 0;
    }
}
```

12.35 CStoreQtProgress.cxx

```
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```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This small example show how one can use the virtual function
 * mechanism of the SimpleSubjectWatcher class to redirect progress
 * report to a custom Qt classes
 *
 * http://doc.qt.nokia.com/latest/qprogressdialog.html
 *
 * Usage:
 * CStoreQtProgress dicom.example.com 11112 gdcmData/MR_Spectroscopy_SIEMENS_OF.dcm
 *
 */
#include "gdcmServiceClassUser.h"
#include "gdcmSimpleSubjectWatcher.h"
#include "gdcmProgressEvent.h"
#include "gdcmDirectory.h"
#include "gdcmPresentationContextGenerator.h"
#include <QApplication>
#include <QProgressDialog>
#include <QVBoxLayout>
namespace gdcm {
/*
 * This class is a little more complicated than what this example demonstrate
 * This watcher is capable of handling nested progress. Since the Progress
 * grows from [0 to 1] on a per file basis and we only have one instance of a
 * watcher per association, we need some calculation to compute the global
 * (total) progress
 * In fact we simply divide the per-file progress by the number of files.
 *
 * This QtWatcher class will then update the progress bar according to the
 * progress.
 */
class MyQtWatcher : public SimpleSubjectWatcher
{
  size_t nfiles;
  double progress;
  size_t index;
  double refprogress;
  QWidget* win;
  QProgressDialog* qtprogress;
public:
  MyQtWatcher(Subject * s, const char *comment = "", QWidget *w = NULL, QProgressDialog* p = NULL, size_t n =
      1):
    SimpleSubjectWatcher(s,comment),nfiles(n),progress(0),index(0),refprogress(0),win(w),qtprogress(p){}
  void ShowIteration()
    {
    index++;
    assert( index <= nfiles );
    // update refprogess (we are moving to the next file)
    refprogress = progress;
    }
  void ShowProgress(Subject *, const Event &evt)
    {
    // Retrieve the ProgressEvent:
    const ProgressEvent &pe = dynamic_cast<const ProgressEvent&>(evt);
    // compute global progress:
    progress = refprogress + (1. / (double)nfiles ) * pe.GetProgress();
    // Print Global and local progress to stdout:
    std::cout « "Global Progress: " « progress « " per file progress " « pe.GetProgress() « std::endl;
    //set progress value in the QtProgress bar
    int i = (int)(progress * 100 + 0.5); // round to next int
    qtprogress->setValue(i);
    win->show();
    }
  virtual void ShowDataSet(Subject *caller, const Event &evt)
    {
    (void)caller;
    (void)evt;
    }
};
} // end namespace gdcm
int main(int argc, char *argv[])
{
  if( argc < 4 )
    {
    std::cerr « argv[0] « " remote_server port filename" « std::endl;
    return 1;
```

```
    }
  QApplication a(argc, argv);
  std::ostringstream error_log;
  gdcm::Trace::SetErrorStream( error_log );
  const char *remote = argv[1];
  int portno = atoi(argv[2]);
  const char *filename = argv[3];
  QVBoxLayout* layout = new QVBoxLayout;
  QWidget*  win = new QWidget;
  QProgressDialog* progress = new QProgressDialog("Sending data...", "Cancel", 0, 100);
  progress->setWindowModality(Qt::WindowModal);
  layout->addWidget(progress,Qt::AlignCenter);
  win->setLayout(layout);
  gdcm::SmartPointer<gdcm::ServiceClassUser> scup = new gdcm::ServiceClassUser;
  gdcm::ServiceClassUser &scu = *scup;
  //gdcm::SimpleSubjectWatcher w( &scu, "TestServiceClassUser" );
  // let's use a more complicated progress reported in this example
  gdcm::MyQtWatcher w( &scu, "QtWatcher", win, progress );
  scu.SetHostname( remote );
  scu.SetPort( (uint16_t)portno );
  scu.SetTimeout( 1000 );
  scu.SetCalledAETitle( "GDCM_STORE" );
  if( !scu.InitializeConnection() )
    {
    std::cerr << "Could not InitializeConnection" << std::endl;
    return 1;
    }
  gdcm::Directory::FilenamesType filenames;
  filenames.push_back( filename );
  // setup the PC(s) based on the filenames:
  gdcm::PresentationContextGenerator generator;
  if( !generator.GenerateFromFilenames(filenames) )
    {
    std::cerr << "Could not GenerateFromFilenames" << std::endl;
    return 1;
    }
  // Setup PresentationContext(s)
  scu.SetPresentationContexts( generator.GetPresentationContexts() );
  // Start ASSOCIATION
  if( !scu.StartAssociation() )
    {
    std::cerr << "Could not Start" << std::endl;
    return 1;
    }
  // Send C-STORE
  if( !scu.SendStore( filename ) )
    {
    std::cerr << "Could not Store" << std::endl;
    std::cerr << "Error log is:" << std::endl;
    std::cerr << error_log.str() << std::endl;
    return 1;
    }
  // Stop ASSOCIATION
  if( !scu.StopAssociation() )
    {
    std::cerr << "Could not Stop" << std::endl;
    return 1;
    }
  win->show();
  return a.exec();
}
```

12.36 ChangePrivateTags.cxx

```
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=========================================================================*/
```

```
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmPrivateTag.h"
int main(int argc, char* argv[] )
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " path/to/05148044-mr-siemens-avanto-syngo.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if (! reader.Read() )
    {
    return 1;
    }
  // (0029,0010) LO [SIEMENS CSA HEADER]                                  # 18,1 Private Creator
  // (0029,0011) LO [SIEMENS MEDCOM HEADER ]                              # 22,1 Private Creator
  // (0029,0012) LO [SIEMENS MEDCOM HEADER2]                              # 22,1 Private Creator
  // [...]
  // (0029,1018) CS [MR]                                                  # 2,1 CSA Series Header Type
  // (0029,1134) CS [DB TO DICOM ]                                        # 12,1 PMTF Information 4
  // (0029,1260) LO [com ]                                                # 4,1 Series Workflow Status
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  // Declare private tag we need to find:
  gdcm::PrivateTag pt1( 0x29,0x18, "SIEMENS CSA HEADER" );
  gdcm::PrivateTag pt2( 0x29,0x34, "SIEMENS MEDCOM HEADER" );
  gdcm::PrivateTag pt3( 0x29,0x60, "SIEMENS MEDCOM HEADER2" );
  const char str1[] = "GDCM was here 3!";
  if( !ds.FindDataElement( pt1 ) ) return 1;
  gdcm::DataElement de1 = ds.GetDataElement( pt1 ); // Convert Private tag, into actual DataElement
  std::cout « de1 « std::endl;
  de1.SetByteValue( str1, (uint32_t)strlen(str1) );
  ds.Replace( de1 );
  const char str2[] = "GDCM was here 2!";
  if( !ds.FindDataElement( pt2 ) ) return 1;
  gdcm::DataElement de2 = ds.GetDataElement( pt2 );
  std::cout « de2 « std::endl;
  de2.SetByteValue( str2, (uint32_t)strlen(str2) );
  ds.Replace( de2 );
  const char str3[] = "GDCM was here 3!";
  if( !ds.FindDataElement( pt3 ) ) return 1;
  gdcm::DataElement de3 = ds.GetDataElement( pt3 );
  std::cout « de3 « std::endl;
  de3.SetByteValue( str3, (uint32_t)strlen(str3) );
  ds.Replace( de3 );
  gdcm::Writer writer;
  writer.SetFile( file );
  writer.SetFileName( outfilename );
  if ( !writer.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.37 ChangeSequenceUltrasound.cxx

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmSmartPointer.h"
```

```
#include "gdcmDataSetHelper.h"
/*
 ./ChangeSequenceUltrasound gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm

 This is the exact C++ translation of the original python example: ManipulateSequence.py
 */
int main(int argc, char* argv[] )
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if (! reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  gdcm::Tag tsis(0x0008,0x2112); // SourceImageSequence
  if ( ds.FindDataElement( tsis ) )
    {
    const gdcm::DataElement &sis = ds.GetDataElement( tsis );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqsis = sis.GetValueAsSQ();
    if ( sqsis && sqsis->GetNumberOfItems() )
      {
      gdcm::Item &item1 = sqsis->GetItem(1);
      gdcm::DataSet &nestedds = item1.GetNestedDataSet();
      gdcm::Tag tprcs(0x0040,0xa170); // PurposeOfReferenceCodeSequence
      if( nestedds.FindDataElement( tprcs ) )
        {
        const gdcm::DataElement &prcs = nestedds.GetDataElement( tprcs );
        gdcm::SmartPointer<gdcm::SequenceOfItems> sqprcs = prcs.GetValueAsSQ();
        if ( sqprcs && sqprcs->GetNumberOfItems() )
          {
          gdcm::Item &item2 = sqprcs->GetItem(1);
          gdcm::DataSet &nestedds2 = item2.GetNestedDataSet();
          // (0008,0104) LO [Uncompressed predecessor]               #  24, 1 CodeMeaning
          gdcm::Tag tcm(0x0008,0x0104);
          if( nestedds2.FindDataElement( tcm ) )
            {
            gdcm::DataElement cm = nestedds2.GetDataElement( tcm );
            std::string mystr = "GDCM was here";
            cm.SetByteValue( mystr.c_str(), (uint32_t)mystr.size() );
            nestedds2.Replace( cm );
            }
          }
        }
      }
    }
  gdcm::Writer writer;
  writer.SetFile( file );
  writer.SetFileName( outfilename );
  if ( !writer.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.38 CheckBigEndianBug.cxx

```
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```

```
=========================================================================*/
/*
 * WARNING: This is a dev tool, do not use !
 *
 * Usage: after a gdcmconv, you would like to know if the conversion process is acceptable
 * sometime a vbindiff is acceptable, sometime it is not. In the case of the famous Philips
 * Little/Big Endian Explicit Transfer Syntax it is not easy to compare two files. However
 * this only impact byte ordering, thus we can compute byte-indenpendant information to still
 * compare the files.
 */
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmSystem.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input1.dcm input2.dcm" « std::endl;
    return 1;
    }
  const char *filename1 = argv[1];
  const char *filename2 = argv[2];
  gdcm::ImageReader reader1;
  reader1.SetFileName( filename1 );
  if( !reader1.Read() )
    {
    std::cerr « "Could not read: " « filename1 « std::endl;
    return 1;
    }
  gdcm::ImageReader reader2;
  reader2.SetFileName( filename2 );
  if( !reader2.Read() )
    {
    std::cerr « "Could not read: " « filename2 « std::endl;
    return 1;
    }
  // TODO: need a DataSet== operator implementation
  std::cout « "Both files can be read and looks like DICOM" « std::endl;
  size_t s1 = gdcm::System::FileSize(filename1);
  size_t s2 = gdcm::System::FileSize(filename2);
  if( s1 != s2 )
    {
    std::cout « "Size mismatch: " « s1 « " != " « s2 « std::endl;
    return 1;
    }
  else
    {
    std::cout « "Size match: " « s1 « " = " « s2 « std::endl;
    }
  std::ifstream is1( filename1, std::ios::binary );
  char *buffer1 = new char[s1];
  is1.read(buffer1, s1);
  std::ifstream is2( filename2, std::ios::binary );
  char *buffer2 = new char[s2];
  is2.read(buffer2, s2);
  assert( s1 == s2 );
  if( memcmp(buffer1, buffer2, s1 ) == 0 )
    {
    std::cout « "memcmp succeed ! File are bit identical" « std::endl;
    }
  else
    {
    std::cout « "memcmp failed!" « std::endl;
    }
  // Hum...memcmp failed, for big endian/ little endian inversion the histogram of bytes
  // should still be the same. So let's compute it
  // buffer2[0] = 1; // let's make the test fail
  std::multiset<char> set1( buffer1, buffer1 + s1 );
  std::multiset<char> set2( buffer2, buffer2 + s2 );
  if( set1 == set2 )
    {
    std::cout « "set1 == set2. Byte histogram seems valid" « std::endl;
    }
  else
    {
    std::cout « "set1 != set2" « std::endl;
```

```
    }
  delete[] buffer1;
  delete[] buffer2;
  return 0;
}
```

12.39 ClinicalTrialAnnotate.cxx

```
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=========================================================================*/
/*
 * Dummy implementation of C.7.1.3 Clinical Trial Subject Module
 *
 * Usage:
 *  ClinicalTrialAnnotate gdcmData/012345.002.050.dcm out.dcm
 */
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAnonymizer.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // The output of gdcm::Reader is a gdcm::File
  //gdcm::File &file = reader.GetFile();
  // the dataset is the the set of element we are interested in:
  //gdcm::DataSet &ds = file.GetDataSet();
  gdcm::Anonymizer ano;
  ano.SetFile( reader.GetFile() );
  ano.RemoveGroupLength();
  ano.RemovePrivateTags();
  // PS 3.3 - 2008
  // C.7.1.3 Clinical Trial Subject Module
  // <entry group="0012" element="0010" vr="LO" vm="1" name="Clinical Trial Sponsor Name"/>
  ano.Replace( gdcm::Tag(0x12,0x10), "BigCompany name" );
  // <entry group="0012" element="0020" vr="LO" vm="1" name="Clinical Trial Protocol ID"/>
  ano.Replace( gdcm::Tag(0x12,0x20), "My Clinical Trial Protocol ID" );
  // <entry group="0012" element="0021" vr="LO" vm="1" name="Clinical Trial Protocol Name"/>
  ano.Replace( gdcm::Tag(0x12,0x21), "My Clinical Trial Protocol Name" );
  // <entry group="0012" element="0030" vr="LO" vm="1" name="Clinical Trial Site ID"/>
  ano.Replace( gdcm::Tag(0x12,0x30), "My Clinical Trial Site ID" );
  // <entry group="0012" element="0031" vr="LO" vm="1" name="Clinical Trial Site Name"/>
  ano.Replace( gdcm::Tag(0x12,0x31), "My Clinical Trial Site Name" );
  // <entry group="0012" element="0040" vr="LO" vm="1" name="Clinical Trial Subject ID"/>
  ano.Replace( gdcm::Tag(0x12,0x40), "My Clinical Trial Subject ID" );
  // <entry group="0012" element="0042" vr="LO" vm="1" name="Clinical Trial Subject Reading ID"/>
  ano.Replace( gdcm::Tag(0x12,0x42), "My Clinical Trial Subject Reading ID" );
  gdcm::Writer writer;
  writer.SetFile( reader.GetFile() );
  writer.SetFileName( outfilename );
  if( !writer.Write() )
    {
    return 1;
    }
```

```
  return 0;
}
```

12.40 CompressImage.cxx

```
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=========================================================================*/
/*
 *
 */
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include "gdcmImageChangeTransferSyntax.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // The output of gdcm::Reader is a gdcm::File
  //gdcm::File &file = reader.GetFile();
  // the dataset is the the set of element we are interested in:
  //gdcm::DataSet &ds = file.GetDataSet();
  gdcm::Image &image = reader.GetImage();
  // image.SetSpacing(0, 0.1);
  // image.SetSpacing(1, 0.2);
  image.Print( std::cout );
  gdcm::ImageChangeTransferSyntax change;
  change.SetTransferSyntax( gdcm::TransferSyntax::JPEG2000Lossless );
  change.SetTransferSyntax( gdcm::TransferSyntax::JPEGLosslessProcess14_1 );
  //change.SetTransferSyntax( gdcm::TransferSyntax::JPEGBaselineProcess1 );
  //change.SetTransferSyntax( image.GetTransferSyntax() );
  change.SetInput( image );
  bool b = change.Change();
  if( !b )
    {
    std::cerr « "Could not change the Transfer Syntax" « std::endl;
    return 1;
    }
  //std::ofstream out( outfilename, std::ios::binary );
  //image.GetBuffer2(out);
  //out.close();
  gdcm::ImageWriter writer;
  writer.SetImage( change.GetOutput() );
  writer.SetFile( reader.GetFile() );
  writer.SetFileName( outfilename );
  if( !writer.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.41 ConvertToQImage.cxx

```
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=========================================================================*/
/*
 * This example shows how to setup the pipeline from a gdcm::ImageReader into a
 * Qt QImage data structure.
 * It only handles 2D image.
 *
 * Ref:
 * http://doc.trolltech.com/4.5/qimage.html
 *
 * Usage:
 *  ConvertToQImage gdcmData/012345.002.050.dcm output.png

 * Thanks:
 *   Sylvain ADAM (sylvain51 hotmail com) for contributing this example
 */
#include "gdcmImageReader.h"
#include <QImage>
#include <QImageWriter>
bool ConvertToFormat_RGB888(gdcm::Image const & gimage, char *buffer, QImage* &imageQt)
{
  const unsigned int* dimension = gimage.GetDimensions();
  unsigned int dimX = dimension[0];
  unsigned int dimY = dimension[1];
  gimage.GetBuffer(buffer);
  // Let's start with the easy case:
  if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::RGB )
    {
    if( gimage.GetPixelFormat() != gdcm::PixelFormat::UINT8 )
      {
      return false;
      }
    unsigned char *ubuffer = (unsigned char*)buffer;
    // QImage::Format_RGB888  13  The image is stored using a 24-bit RGB format (8-8-8).
    imageQt = new QImage((unsigned char *)ubuffer, dimX, dimY, 3*dimX, QImage::Format_RGB888);
    }
  else if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::MONOCHROME2 )
    {
    if( gimage.GetPixelFormat() == gdcm::PixelFormat::UINT8 )
      {
      // We need to copy each individual 8bits into R / G and B:
      unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
      unsigned char *pubuffer = ubuffer;
      for(unsigned int i = 0; i < dimX*dimY; i++)
        {
        *pubuffer++ = *buffer;
        *pubuffer++ = *buffer;
        *pubuffer++ = *buffer++;
        }
      imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
      }
    else if( gimage.GetPixelFormat() == gdcm::PixelFormat::INT16 )
      {
      // We need to copy each individual 16bits into R / G and B (truncate value)
      short *buffer16 = (short*)buffer;
      unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
      unsigned char *pubuffer = ubuffer;
      for(unsigned int i = 0; i < dimX*dimY; i++)
        {
        // Scalar Range of gdcmData/012345.002.050.dcm is [0,192], we could simply do:
        // *pubuffer++ = *buffer16;
        // *pubuffer++ = *buffer16;
        // *pubuffer++ = *buffer16;
        // instead do it right:
        *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
        *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
        *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
```

```
        buffer16++;
        }
      imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
      }
    else
      {
      std::cerr « "Pixel Format is: " « gimage.GetPixelFormat() « std::endl;
      return false;
      }
    }
  else
    {
    std::cerr « "Unhandled PhotometricInterpretation: " « gimage.GetPhotometricInterpretation() « std::endl;
    return false;
    }
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::ImageReader ir;
  ir.SetFileName( filename );
  if(!ir.Read())
    {
    //Read failed
    return 1;
    }
  std::cout«"Getting image from ImageReader..."«std::endl;
  const gdcm::Image &gimage = ir.GetImage();
  std::vector<char> vbuffer;
  vbuffer.resize( gimage.GetBufferLength() );
  char *buffer = &vbuffer[0];
  QImage *imageQt = NULL;
  if( !ConvertToFormat_RGB888( gimage, buffer, imageQt ) )
    {
    return 1;
    }
  QImageWriter writer;
  writer.setFormat("png");
  writer.setFileName( outfilename );
  if( !writer.write( *imageQt ) )
    {
    return 1;
    }
  return 0;
}
```

12.42 CreateARGBImage.cxx

```
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=========================================================================*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png: PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.rgba
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmSystem.h"
#include "gdcmImageWriter.h"
```

```
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.rgba output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  size_t len = gdcm::System::FileSize(filename);
  std::ifstream is(filename, std::ios::binary);
  char * buf = new char[len];
  is.read(buf, len);
  gdcm::ImageWriter writer;
  gdcm::Image &image = writer.GetImage();
  image.SetNumberOfDimensions( 2 );
  unsigned int dims[3] = {};
  dims[0] = 380;
  dims[1] = 287;
  image.SetDimensions( dims );
  gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
  pf.SetSamplesPerPixel( 4 );
  image.SetPixelFormat( pf );
  gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::ARGB;
  image.SetPhotometricInterpretation( pi );
  image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
  pixeldata.SetByteValue( buf, (uint32_t)len );
  image.SetDataElement( pixeldata );
  writer.SetFileName( outfilename );
  if( !writer.Write() )
    {
    return 1;
    }
  delete[] buf;
  return 0;
}
```

12.43 CreateCMYKImage.cxx

```
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=========================================================================*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png: PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.cmyk
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmSystem.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.cmyk output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  size_t len = gdcm::System::FileSize(filename);
```

```
  std::ifstream is(filename, std::ios::binary);
  char * buf = new char[len];
  is.read(buf, len);
  gdcm::ImageWriter writer;
  gdcm::Image &image = writer.GetImage();
  image.SetNumberOfDimensions( 2 );
  unsigned int dims[3] = {};
  dims[0] = 380;
  dims[1] = 287;
  image.SetDimensions( dims );
  gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
  pf.SetSamplesPerPixel( 4 );
  image.SetPixelFormat( pf );
  gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::CMYK;
  image.SetPhotometricInterpretation( pi );
  image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
  pixeldata.SetByteValue( buf, (uint32_t)len );
  image.SetDataElement( pixeldata );
  writer.SetFileName( outfilename );
  if( !writer.Write() )
    {
    return 1;
    }
  delete[] buf;
  return 0;
}
```

12.44 CreateJPIPDataSet.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This example was created during the GSOC 2011 project for
 * JPIP
 */
#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " output.dcm" « std::endl;
    return 1;
    }
  const char *outfilename = argv[1];
  gdcm::Writer w;
  gdcm::File &file = w.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  //w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::JPIPReferenced );
  gdcm::Anonymizer anon;
  anon.SetFile( file );
  gdcm::MediaStorage ms = gdcm::MediaStorage::SecondaryCaptureImageStorage;
  gdcm::UIDGenerator gen;
  anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
  std::cout « ms.GetString() « std::endl;
  anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );
  //
  anon.Replace( gdcm::Tag(0x0010,0x10), "JPIP^EXAMPLE" );
```

```
  anon.Replace( gdcm::Tag(0x0010,0x20), "012345" );
  anon.Empty( gdcm::Tag(0x0010,0x30) );
  anon.Empty( gdcm::Tag(0x0010,0x40) );
  anon.Empty( gdcm::Tag(0x0008,0x20) );
  anon.Empty( gdcm::Tag(0x0008,0x30) );
  anon.Empty( gdcm::Tag(0x0008,0x90) );
  anon.Empty( gdcm::Tag(0x0020,0x10) );
  anon.Empty( gdcm::Tag(0x0020,0x11) );
  anon.Empty( gdcm::Tag(0x0008,0x50) );
  anon.Empty( gdcm::Tag(0x0020,0x0013) );
  anon.Replace( gdcm::Tag(0x0020,0xd), gen.Generate() );
  anon.Replace( gdcm::Tag(0x0020,0xe), gen.Generate() );
  anon.Replace( gdcm::Tag(0x0008,0x64), "WSD " );
  anon.Replace( gdcm::Tag(0x0008,0x60), "OT" );
  gdcm::Attribute<0x0028,0x7FE0> at;
  at.SetValue( "http://dicom.example.com/jpipserver.cgi?target=img.jp2" );
  ds.Insert( at.GetAsDataElement() );
  // Need to retrieve the PixelFormat information from the given file
  if (!w.Write() )
    {
    std::cerr « "Could not write: " « outfilename « std::endl;
    return 1;
    }
  return 0;
}
```

12.45 DeriveSeries.cxx

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileDerivation.h"
#include "gdcmUIDGenerator.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
  {
    return 1;
  }
  const char * ref = argv[1];
  const char * in  = argv[2];
  gdcm::Reader r1;
  r1.SetFileName( ref );
  if( !r1.Read() ) return 1;
  gdcm::Reader r2;
  r2.SetFileName( in );
  if( !r2.Read() ) return 1;
  // Fix Spatial info:
  gdcm::DataSet & ds1 = r1.GetFile().GetDataSet();
  gdcm::File & file2 = r2.GetFile();
  gdcm::DataSet & ds2 = file2.GetDataSet();
  //gdcm::Attribute<0x8,0x8> img_type = { "ORIGINAL", "PRIMARY" };
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0008) ));
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0032) ));
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0037) ));
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0088) )); // Spacing between slices
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0013) )); // Instance Number
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x5100) )); // Patient Position
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0050) )); // Slice Thickness
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0070) )); // Manufacturer
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0081) )); // Echo Time
  ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x1041) )); // Slice Location
  gdcm::Attribute<0x8,0x16> sopclassuid;
  sopclassuid.SetFromDataSet( ds1 );
```

```
  gdcm::Attribute<0x8,0x18> sopinstanceuid;
  sopinstanceuid.SetFromDataSet( ds1 );
  // Step 2: DERIVED object
  gdcm::FileDerivation fd;
  fd.AddReference( sopclassuid.GetValue(), sopinstanceuid.GetValue() );
  // http://dicom.nema.org/MEDICAL/dicom/current/output/chtml/part16/chapter_D.html#DCM_121321
  // CID 7202 "Source Image Purposes of Reference"
  // DCM 121321 "Mask image for image processing operation"
  fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121321 );
  // CID 7203 "Image Derivation"
  // DCM 113047 "Pixel by pixel mask"
  fd.SetDerivationCodeSequenceCodeValue( 113047 );
  fd.SetFile( file2 );
  // If all Code Value are ok the filter will execute properly
  if( !fd.Derive() )
    {
    std::cerr « "Sorry could not derive using input info" « std::endl;
    return 1;
    }
  gdcm::Writer w;
  w.SetFile( r2.GetFile() );
  w.SetFileName( "derived.dcm" );
  if( !w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.46 DiffFile.cxx

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input1.dcm input2.dcm" « std::endl;
    return 1;
    }
  const char *filename1 = argv[1];
  const char *filename2 = argv[2];
  gdcm::Reader reader1;
  reader1.SetFileName( filename1 );
  if( !reader1.Read() )
    {
    return 1;
    }
  gdcm::Reader reader2;
  reader2.SetFileName( filename2 );
  if( !reader2.Read() )
    {
    return 1;
    }
  const gdcm::File &file1 = reader1.GetFile();
  const gdcm::File &file2 = reader2.GetFile();
  const gdcm::DataSet &ds1 = file1.GetDataSet();
  const gdcm::DataSet &ds2 = file2.GetDataSet();
  gdcm::DataSet::ConstIterator it1 = ds1.Begin();
  gdcm::DataSet::ConstIterator it2 = ds2.Begin();
  const gdcm::DataElement &de1 = *it1;
  const gdcm::DataElement &de2 = *it2;
  if( de1 == de2 )
    {
    }
```

```
  while( it1 != ds1.End() && it2 != ds2.End() && *it1 == *it2 )
    {
    ++it1;
    ++it2;
    }
  if( it1 != ds1.End() || it2 != ds2.End() )
    {
    std::cerr « "Problem with:" « std::endl;
    if( it1 != ds1.End() )
      {
      std::cerr « "ds1: " « *it1 « std::endl;
      }
    if( it2 != ds2.End() )
      {
      std::cerr « "ds2: " « *it2 « std::endl;
      }
    return 1;
    }
  return 0;
}
```

12.47 DiscriminateVolume.cxx

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmScanner.h"
#include "gdcmTesting.h"
#include "gdcmIPPSorter.h"
#include "gdcmDirectionCosines.h"
#include <cmath>
/*
 * The following example is a basic sorted which should work in generic cases.
 * It sort files based on:
 * Study Instance UID
 *   Series Instance UID
 *     Frame of Reference UID
 *       Image Orientation (Patient)
 *         Image Position (Patient) (Sorting based on IPP + IOP)
 */
namespace gdcm {
  const Tag t1(0x0020,0x000d); // Study Instance UID
  const Tag t2(0x0020,0x000e); // Series Instance UID
  const Tag t3(0x0020,0x0052); // Frame of Reference UID
  const Tag t4(0x0020,0x0037); // Image Orientation (Patient)
class DiscriminateVolume
{
private:
  std::vector< Directory::FilenamesType > SortedFiles;
  std::vector< Directory::FilenamesType > UnsortedFiles;
  Directory::FilenamesType GetAllFilenamesFromTagToValue(
    Scanner const & s, Directory::FilenamesType const &filesubset, Tag const &t, const char *valueref)
{
  Directory::FilenamesType theReturn;
  if( valueref )
    {
    size_t len = strlen( valueref );
    Directory::FilenamesType::const_iterator file = filesubset.begin();
    for(; file != filesubset.end(); ++file)
      {
      const char *filename = file->c_str();
      const char * value = s.GetValue(filename, t);
      if( value && strncmp(value, valueref, len ) == 0 )
        {
        theReturn.push_back( filename );
        }
      }
```

```
    }
  return theReturn;
}
void ProcessAIOP(Scanner const & , Directory::FilenamesType const & subset, const char *iopval)
{
  std::cout « "IOP: " « iopval « std::endl;
  IPPSorter ipp;
  ipp.SetComputeZSpacing( true );
  ipp.SetZSpacingTolerance( 1e-3 ); // ??
  bool b = ipp.Sort( subset );
  if( !b )
    {
    // If you reach here this means you need one more parameter to discriminiat this
    // series. Eg. T1 / T2 intertwinted. Multiple Echo (0018,0081)
    std::cerr « "Failed to sort: " « subset.begin()->c_str() « std::endl;
    for(
      Directory::FilenamesType::const_iterator file = subset.begin();
      file != subset.end(); ++file)
      {
      std::cerr « *file « std::endl;
      }
    UnsortedFiles.push_back( subset );
    return ;
    }
  ipp.Print( std::cout );
  SortedFiles.push_back( ipp.GetFilenames() );
}
void ProcessAFrameOfRef(Scanner const & s, Directory::FilenamesType const & subset, const char * frameuid)
{
  // In this subset of files (belonging to same series), let's find those
  // belonging to the same Frame ref UID:
  Directory::FilenamesType files = GetAllFilenamesFromTagToValue(
    s, subset, t3, frameuid);
  std::set< std::string > iopset;
  for(
    Directory::FilenamesType::const_iterator file = files.begin();
    file != files.end(); ++file)
    {
    //std::cout « *file « std::endl;
    const char * value = s.GetValue(file->c_str(), gdcm::t4 );
    assert( value );
    iopset.insert( value );
    }
  size_t n = iopset.size();
  if ( n == 0 )
    {
    assert( files.empty() );
    return;
    }
  std::cout « "Frame of Ref: " « frameuid « std::endl;
  if ( n == 1 )
    {
    ProcessAIOP(s, files, iopset.begin()->c_str() );
    }
  else
    {
    const char *f = files.begin()->c_str();
    std::cerr « "More than one IOP: " « f « std::endl;
    // Make sure that there is actually 'n' different IOP
    gdcm::DirectionCosines ref;
    gdcm::DirectionCosines dc;
    for(
      std::set< std::string >::const_iterator it = iopset.begin();
      it != iopset.end(); ++it )
      {
      ref.SetFromString( it->c_str() );
      for(
        Directory::FilenamesType::const_iterator file = files.begin();
        file != files.end(); ++file)
        {
        std::string value = s.GetValue(file->c_str(), gdcm::t4 );
        if( value != it->c_str() )
          {
          dc.SetFromString( value.c_str() );
          const double crossdot = ref.CrossDot(dc);
          const double eps = std::fabs( 1. - crossdot );
          if( eps < 1e-6 )
            {
            std::cerr « "Problem with IOP discrimination: " « file->c_str()
              « " " « it->c_str() « std::endl;
            return;
```

```
            }
          }
        }
      }
      // If we reach here this means there is actually 'n' different IOP
    for(
      std::set< std::string >::const_iterator it = iopset.begin();
      it != iopset.end(); ++it )
      {
      const char *iopvalue = it->c_str();
      Directory::FilenamesType iopfiles = GetAllFilenamesFromTagToValue(
        s, files, t4, iopvalue );
      ProcessAIOP(s, iopfiles, iopvalue );
      }
    }
}
void ProcessASeries(Scanner const & s, const char * seriesuid)
{
  std::cout « "Series: " « seriesuid « std::endl;
  // let's find all files belonging to this series:
  Directory::FilenamesType seriesfiles = GetAllFilenamesFromTagToValue(
    s, s.GetFilenames(), t2, seriesuid);
  gdcm::Scanner::ValuesType vt3 = s.GetValues(t3);
  for(
    gdcm::Scanner::ValuesType::const_iterator it = vt3.begin()
    ; it != vt3.end(); ++it )
    {
    ProcessAFrameOfRef(s, seriesfiles, it->c_str());
    }
}
void ProcessAStudy(Scanner const & s, const char * studyuid)
{
  std::cout « "Study: " « studyuid « std::endl;
  gdcm::Scanner::ValuesType vt2 = s.GetValues(t2);
  for(
    gdcm::Scanner::ValuesType::const_iterator it = vt2.begin()
    ; it != vt2.end(); ++it )
    {
    ProcessASeries(s, it->c_str());
    }
}
public:
void Print( std::ostream & os )
{
  os « "Sorted Files: " « std::endl;
  for(
    std::vector< Directory::FilenamesType >::const_iterator it = SortedFiles.begin();
    it != SortedFiles.end(); ++it )
    {
    os « "Group: " « std::endl;
    for(
      Directory::FilenamesType::const_iterator file = it->begin();
      file != it->end(); ++file)
      {
      os « *file « std::endl;
      }
    }
  os « "Unsorted Files: " « std::endl;
  for(
    std::vector< Directory::FilenamesType >::const_iterator it = UnsortedFiles.begin();
    it != UnsortedFiles.end(); ++it )
    {
    os « "Group: " « std::endl;
    for(
      Directory::FilenamesType::const_iterator file = it->begin();
      file != it->end(); ++file)
      {
      os « *file « std::endl;
      }
    }
}
  std::vector< Directory::FilenamesType > const & GetSortedFiles() const { return SortedFiles; }
  std::vector< Directory::FilenamesType > const & GetUnsortedFiles() const { return UnsortedFiles; }
void ProcessIntoVolume( Scanner const & s )
{
  gdcm::Scanner::ValuesType vt1 = s.GetValues( gdcm::t1 );
  for(
    gdcm::Scanner::ValuesType::const_iterator it = vt1.begin()
    ; it != vt1.end(); ++it )
    {
    ProcessAStudy( s, it->c_str() );
```

```
    }
}
};
} // namespace gdcm
int main(int argc, char *argv[])
{
  std::string dir1;
  if( argc < 2 )
    {
    const char *extradataroot = nullptr;
#ifdef GDCM_BUILD_TESTING
    extradataroot = gdcm::Testing::GetDataExtraRoot();
#endif
    if( !extradataroot )
      {
      return 1;
      }
    dir1 = extradataroot;
    dir1 += "/gdcmSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
  else
    {
    dir1 = argv[1];
    }
  gdcm::Directory d;
  d.Load( dir1.c_str(), true ); // recursive !
  gdcm::Scanner s;
  s.AddTag( gdcm::t1 );
  s.AddTag( gdcm::t2 );
  s.AddTag( gdcm::t3 );
  s.AddTag( gdcm::t4 );
  bool b = s.Scan( d.GetFilenames() );
  if( !b )
    {
    std::cerr « "Scanner failed" « std::endl;
    return 1;
    }
  gdcm::DiscriminateVolume dv;
  dv.ProcessIntoVolume( s );
  dv.Print( std::cout );
  return 0;
}
```

12.48 DumpADAC.cxx

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * the goal of this example is to mimic the behavior of disp_img_header
 * see http://www.gmecorp-usa.com/IM/NM/GC/ADAC/SV/adactechtips/Released_01Q3.pdf
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <string.h>
#include <assert.h>
#include <stdint.h>
struct dict
{
  uint16_t key;
  const char *name;
};
```

```
dict Array[] = {
  { 0x01, "Patient name" },
  { 0x02, "Patient ID" },
  { 0x03, "Patient sex" },
  { 0x04, "Patient age" },
  { 0x05, "Patient height" },
  { 0x06, "Patient weight" },
  { 0x07, "Exam date" },
  { 0x08, "Dose admin. time" },
  { 0x09, "Unique exam key" },
  { 0x0a, "Exam procedure" },
  { 0x0b, "Referring physician" },
  { 0x0c, "Attending physician" },
  { 0x0d, "Imaging modality" },
  { 0x0e, "Hospital ID" },
  { 0x0f, "Histogram crv file" },
  { 0x10, "Acq. start time" },
  { 0x11, "Object data type" },
  { 0x12, "Image viewid" },
  { 0x13, "Imaging device name" },
  { 0x14, "Device serial number" },
  { 0x15, "Collimator" },
  { 0x16, "Software version" },
  { 0x17, "Radiopharmaceutical #1" },
  { 0x18, "Energy window #1 center" },
  { 0x19, "Radiopharmaceutical #2" },
  { 0x1a, "Energy window #1 width" },
  { 0x1b, "Isotope imaging mode" },
  { 0x1c, "Energy window #2 center" },
  { 0x1d, "Energy window #2 width" },
  { 0x1e, "Energy window #3 center" },
  { 0x1f, "Energy window #3 width" },
  { 0x20, "Energy window #4 center" },
  { 0x21, "Energy window #4 width" },
  { 0x22, "??Energy window #5 center" },
  { 0x23, "??Energy window #5 width" },
  { 0x24, "Patient orientation" },
  { 0x25, "Spatial resolution" },
  { 0x26, "Slice thickness" },
  { 0x27, "Image X dimension" },
  { 0x28, "Image Y dimension" },
  { 0x29, "Image Z dimension" },
  { 0x2a, "Image pixel width" },
  { 0x2b, "Uniformity corr. file" },
  { 0x2c, "Acquisition zoom factor" },
  { 0x2d, "Total counts in set" },
  { 0x2e, "Time / frame" },
  { 0x2f, "Total acq. time" },
  { 0x30, "Maximum pixel value" },
  { 0x31, "Minimum pixel value" },
  { 0x32, "R-R interval time" },
  { 0x33, "Percent of cycle imaged" },
  { 0x34, "# of cycles accepted" },
  { 0x35, "# of cycles rejected" },
  { 0x36, "Approximate ED frame" },
  { 0x37, "Approximate ES frame" },
  { 0x38, "Approximate EF" },
  { 0x39, "Starting angle" },
  { 0x3a, "Degrees of rotation" },
  { 0x3b, "Direction of rotation" },
  { 0x3c, "Cont. or step/shoot" },
  { 0x3d, "Lim recon start frame" },
  { 0x3e, "Upper window grey shade" },
  { 0x3f, "Lower lvl grey shade" },
  { 0x40, "Associated color map" },
  { 0x41, "Custom color map file" },
  { 0x42, "Manipulated image" },
  { 0x43, "Axis of rotation corr." },
  { 0x44, "Reorientation azimuth" },
  { 0x45, "Reorientation elevation" },
  { 0x46, "Filter type" },
  { 0x47, "Filter order" },
  { 0x48, "Filter cutoff frequency" },
  { 0x49, "Reconstruction type" },
  { 0x4a, "Attenuation coefficient" },
  { 0x4b, "Associated parent file" },
  { 0x4c, "Unique patient key" },
  { 0x52, "Normalization crv file" },
  { 0x53, "Unique object key" },
  { 0x54, "This phase of VFR is" },
  { 0x55, "True color value" },
```

```
  { 0x56, "# of sets of x,y,z grps" },
  { 0x57, "Scale factor of set" },
  { 0x6d, "Date of birth" },
  { 0x6e, "Directional orientation" },
  { 0x6f, "Number of VFR studies" },
  { 0x70, "R-R low tolerance" },
  { 0x71, "R-R high tolerance" },
  { 0x72, "Prog specific results:" },
  { 0x99, nullptr }
};
void printname( int , int , uint16_t v )
{
  if( v == 0x1 )
    {
    std::cout « "DATABASE PARAMETERS" « std::endl;
    std::cout « "____________________" « std::endl;
    }
  else if( v == 0x27 )
    {
    std::cout « "IMAGE PARAMETERS" « std::endl;
    std::cout « "_________________" « std::endl;
    }
  else if( v == 0x13 )
    {
    std::cout « "EXTRA PARAMETERS" « std::endl;
    std::cout « "_________________" « std::endl;
    }
  else if( v == 0x2e )
    {
    std::cout « "*** NOT CURRENTLY USED :" « std::endl;
    }
  static const unsigned int n = sizeof( Array ) / sizeof( *Array ) - 1;
  for( unsigned int i = 0; i < n; ++i )
    {
    if( v == Array[i].key )
      {
      std::cout « /*"" « std::dec « len « "," « mult « " " « */ Array[i].name;
      std::cout « " : ";
      return;
      }
    }
  std::cout « /*"\t# " « std::dec « len « "," « mult « */ std::hex « v « "\t: ";
}
uint16_t readint16(std::istream &is )
{
  uint16_t val;
  is.read( (char*)&val, sizeof( val ));
  return (uint16_t)((val»8) | (val«8));
}
uint32_t readint32(std::istream &is )
{
  uint32_t val;
  is.read( (char*)&val, sizeof( val ));
  val= ((val«8)&0xFF00FF00) | ((val»8)&0x00FF00FF);
  return (val»16) | (val«16);
}
float readfloat32(std::istream &is )
{
  union { uint32_t val; float f;} dual;
  dual.val = readint32(is);
  return dual.f;
}
struct el
{
  uint16_t v1;
  uint16_t v2;
  uint16_t v3;
  void read( std::istream & is )
    {
    v1 = readint16(is);
    v2 = readint16(is);
    v3 = readint16(is);
    }
  void print( std::ostream & os )
    {
    os « std::hex « v1 « "\t" « v2 « "\t" « v3 « std::endl;
    }
};
std::vector<el> Vel;
void readelement( std::istream & is )
{
```

```
  el e;
  e.read( is );
  Vel.push_back( e );
}
void printascii( uint16_t tag, const char *buffer, size_t len )
{
  std::ostream & os = std::cout;
  if( tag == 0x72 )
    {
    os « "\n  ";
    for(size_t i = 0; i < len; ++i)
      {
      const char &c = buffer[i];
      if( c == 0x0 ) os « "!";
      else if( c == 0x0f ) os « " ";
      else if( c == 0x17 ) os « ":";
      else if( c == 0x14 ) os « ":";
      else if( c == 0x10 ) os « ":";
      else if( c == 0x16 ) os « ":";
      else if( c == 0x08 ) os « ":";
      else if( c == 0x0b ) os « ":";
      else if( c == 0x0e ) os « ":";
      else if( c == 0x07 ) os « ":";
      else os « c;
      }
    os « "";
    }
  else
    {
    (void)len;
    os « "" « buffer « "";
    }
}
bool DumpADAC( std::istream & is )
{
  std::ostream &os = std::cout;
  char magic[6 + 1];
  magic[6] = 0;
  is.read( magic, 6);
//  std::cout « magic « " ";
  assert( strcmp( magic, "adac01" ) == 0 );
  int c = is.get();
  assert( c == 0 ); (void)c;
  c = is.get();
  assert( c == 'X' );
  uint16_t v;
  v = readint16(is);
//  std::cout « v « std::endl;
  assert( v == 512 ); (void)v; // ??
  int nel = 87;
  for (int i = 0; i <= nel; ++i )
    {
    readelement( is );
    }
  char buffer[512];
  for( int i = 0; i <= nel; ++i )
    {
    const el &e = Vel[i];
    int diff;
    if( i == nel )
      {
      diff = 2048 - e.v3;
      if( diff > 512 ) diff = 512;
      }
    else
      {
      const el &enext = Vel[i+1];
      diff = enext.v3 - e.v3;
      }
    is.seekg( e.v3, std::ios::beg );
    //std::cout « "(" « std::hex « std::setw( 2 ) « std::setfill( '0' ) « e.v1 « ") " « std::hex « std::setw( 3
      ) « std::setfill( '0' ) « e.v2 « " ";
    printname( diff, 0, e.v1 );
    int mult = 1;
    if( e.v2 == 0 )
      {
      is.read( buffer, diff);
      buffer[ diff ] = 0;
      printascii( e.v1, buffer, diff);
      }
    else if( e.v2 == 0x100 )
```

```
      {
      mult = diff / 2;
      assert( diff == 2 * mult );
      for ( int ii = 0; ii < mult; ++ii )
        {
        if ( ii ) os « "\\";
        uint16_t val = readint16(is);
        os « "" « std::dec « val « "";
        }
      }
    else if( e.v2 == 0x200 )
      {
      assert( diff == 4 );
      uint32_t val = readint32(is);
      os « "" « std::dec « val « "";
      }
    else if( e.v2 == 0x300 )
      {
      assert( diff == 4 );
      float val = readfloat32(is);
      os « "" « std::dec « val « "";
      }
     else
      {
      assert( 0 );
      }
    os « std::endl;
    }
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  // (0019,1061) UN (OB) 61\64\61\63\30         # 2048,1 Ver200 ADAC Pegasys Headers
  const gdcm::PrivateTag tver200adacpegasysheaders(0x0019,0x61,"ADAC_IMG");
  if( !ds.FindDataElement( tver200adacpegasysheaders ) ) return 1;
  const gdcm::DataElement& ver200adacpegasysheaders = ds.GetDataElement( tver200adacpegasysheaders );
  if ( ver200adacpegasysheaders.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv = ver200adacpegasysheaders.GetByteValue();
  // (0019,1021) US 1               # 2,1 Ver200 Number of ADAC Headers
  // TODO
  // (0019,1041) IS [2048\221184 ]  # 12,1-n Ver200 ADAC Header/Image Size
  if( bv->GetLength() != 2048 ) return 1;
  gdcm::Element<gdcm::VR::IS,gdcm::VM::VM2> el;
  const gdcm::PrivateTag tver200adacheaderimagesize(0x0019,0x41,"ADAC_IMG");
  if( !ds.FindDataElement( tver200adacheaderimagesize ) ) return 1;
  const gdcm::DataElement& ver200adacheaderimagesize = ds.GetDataElement( tver200adacheaderimagesize );
  el.SetFromDataElement( ver200adacheaderimagesize );
  if( el.GetValue(0) != 2048 ) return 1;
  std::istringstream is;
  std::string dup( bv->GetPointer(), bv->GetLength() );
  is.str( dup );
  bool b = DumpADAC( is );
  if( !b ) return 1;
  return 0;
}
```

12.49 DumpExamCard.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     This software is distributed WITHOUT ANY WARRANTY; without even
```

```
     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*

  Try to extract contents of Philips RAW storage class:

(0002,0002) UI [1.2.840.10008.5.1.4.1.1.66]                       # 26,1 Media Storage SOP Class UID
(0002,0003) UI [1.3.46.670589.11.17240.5.23.4.1.3012.20100324094825680 18]         # 56,1 Media Storage SOP
      Instance UID
(0002,0010) UI [1.2.840.10008.1.2.1]                              # 20,1 Transfer Syntax UID
(0002,0012) UI [1.3.46.670589.11.0.0.51.4.4.1]                    # 30,1 Implementation Class UID
(0002,0013) SH [MR DICOM 4.1]                                     # 12,1 Implementation Version Name

 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Triplett,William T for bringing to your attention on this ExamCard stuff
 */
#include "gdcmReader.h"
#include "gdcmDataSet.h"
#include "gdcmPrivateTag.h"
#include "gdcmBase64.h"
#include <iomanip>
static bool compfn(const char *s1, const char *s2)
{
  return strcmp(s1,s2) < 0 ? true : false;
}
static const char *PDFStrings[] = { // Keep me ordered please
  "COILSTATE", // series of string ?
  "HARDWARE_CONFIG", // series of number ?
  "PDF_CONTROL_GEN_PARS",
  "PDF_CONTROL_PREP_PARS",
  "PDF_CONTROL_RECON_PARS",
  "PDF_CONTROL_SCAN_PARS",
  "PDF_EXAM_PARS",
  "PDF_HARDWARE_PARS",
  "PDF_PREP_PARS",
  "PDF_PRESCAN_COIL_PARS",
  "PDF_SPT_PARS",
};
static bool isvalidpdfstring( const char *pdfstring )
{
  assert( pdfstring );
  static const size_t n = sizeof( PDFStrings ) / sizeof( *PDFStrings );
  static const char **begin = PDFStrings;
  static const char **end = begin + n;
  return std::binary_search(begin, end, pdfstring, compfn);
}
typedef enum
{
  param_float = 0,
  param_integer = 1, // 1 « 0
  param_string = 2, // 1 « 1
  param_3, // ??
  param_enum = 4  // 1 « 2
} param_type;
static const char *gettypenamefromtype( int i)
{
  const char *ret = nullptr;
  param_type e = (param_type)i;
  switch( e )
    {
  case param_float:
    ret = "float";
    break;
  case param_integer:
    ret = "int";
    break;
  case param_string:
    ret = "string";
    break;
  case param_3:
```

```
    ret = "??";
    break;
  case param_enum:
    ret = "enum";
    break;
    }
  assert( ret );
  return ret;
}
struct header
{
/*
 * TODO:
 * Looks as if we could read all int*, float* and string* at once...
 */
  int32_t v1; // offset to int pointer array ?
  uint16_t nints; // number of ints (max number?)
  uint16_t v3; // always 0 ?
  int32_t v4; // offset to float pointer array ?
  uint32_t nfloats;
  int32_t v6; // offset to string pointer array ?
  uint32_t nstrings;
  int32_t v8; // always 8 ??
  uint32_t numparams;
  uint32_t getnints() const { return nints; }
  uint32_t getnfloats() const { return nfloats; }
  uint32_t getnstrings() const { return nstrings; }
  uint32_t getnparams() const { return numparams; }
  void read( std::istream & is )
    {
    is.read( (char*)&v1,sizeof(v1));
    if( v1 == 0x01 ) {
      // direct (FIXME how should we detect this, much like TIFF ???)
      nints = 0;
      v3 = 0;
      v4 = 0;
      nfloats = 0;
      v6 = 0;
      nstrings = 0;
      v8 = 0;
      numparams = 0;
      uint32_t bla;
      is.read( (char*)&bla, sizeof(bla) );
      assert( bla == 0x2 || bla == 0x3 );
      nstrings = 1;
      numparams = 1;
    } else {
      // indirect
      is.read( (char*)&nints,sizeof(nints));
      is.read( (char*)&v3,sizeof(v3));
      assert( v3 == 0 ); // looks like this is always 0
      is.read( (char*)&v4,sizeof(v4));
      is.read( (char*)&nfloats,sizeof(nfloats));
      is.read( (char*)&v6,sizeof(v6));
      is.read( (char*)&nstrings,sizeof(nstrings));
      is.read( (char*)&v8,sizeof(v8));
      assert( v8 == 8 );
      is.read( (char*)&numparams,sizeof(numparams));
    }
    }
  void print( std::ostream & os )
    {
    os « v1 « ",";
    os « nints « ",";
    os « v3 « ",";
    os « v4 « ",";
    os « nfloats « ",";
    os « v6 « ",";
    os « nstrings « ",";
    os « v8 « ",";
    os « numparams « std::endl;
    }
};
struct param
{
  char name[32+1];
  uint8_t boolean;
  int32_t type;
  uint32_t dim;
  union {
  uint32_t val;
```

```
  char * ptr; } v4;
  int32_t /*std::streamoff*/ offset;
  param_type gettype() const { return (param_type)type; }
  uint32_t getdim() const { return dim; }
  void read_direct_int( std::istream & is ) {
    uint32_t bla;
    int max = 9;
    std::vector<uint32_t> v;
    for( int i = 0; i < max; ++i ) {
      is.read( (char*)&bla, sizeof(bla) );
      v.push_back( bla );
    }
    is.read( (char*)&bla, sizeof(bla) );
    char name0[32];
    memset(name0,0,sizeof(name0));
    assert( bla < sizeof(name0) );
    is.read( name0, bla);
    size_t l = strlen(name0);
    assert( l == bla ); (void)l;
    char * ptr = strdup( name0 );
    v4.ptr = ptr;
    type = param_string;
    dim = 1;
    offset = 0; // important !
  }
  void read_direct_string( std::istream & is ) {
    uint32_t bla;
    is.read( (char*)&bla, sizeof(bla) );
    char name0[32];
    memset(name0,0,sizeof(name0));
    assert( bla < sizeof(name0) );
    is.read( name0, bla);
    size_t l = strlen(name0);
    assert( l == bla ); (void)l;
    memcpy( this->name, name0, bla );
    is.read( (char*)&bla, sizeof(bla) );
    assert( bla == 0x1 );
    is.read( (char*)&bla, sizeof(bla) );
    char value[32];
    memset(value,0,sizeof(value));
    assert( bla < sizeof(value) );
    is.read( value, bla);
    is.read( (char*)&bla, sizeof(bla) );
    assert( bla == 0 ); // trailing stuff ?
    is.read( (char*)&bla, sizeof(bla) );
    assert( bla == 0 ); // trailing stuff ?
    const uint32_t cur = (uint32_t)is.tellg();
    std::cerr « "offset:" « cur « std::endl;
    if( cur == 65 )
      is.read( (char*)&bla, 1 );
    else if( cur == 66 )
      is.read( (char*)&bla, 1 );
    else if( cur == 122 )
      is.read( (char*)&bla, 2 );
    else
      assert(0);
    type = param_string;
    dim = 1;
    // FIXME: store the value in v4 for now:
    char * ptr = strdup( value );
    v4.ptr = ptr;
    offset = 0; // important !
  }
  void read( std::istream & is )
    {
    is.read( name, 32 + 1);
    // This is always the same issue the string can contains garbarge from previous run,
    // we need to print only until the first \0 character:
    assert( strlen( name ) <= 32 );
    is.read( (char*)&boolean,1);
    assert( boolean == 0 || boolean == 1 || boolean == 0x69 ); // some kind of bool, or digital trash ?
    is.read( (char*)&type, sizeof( type ) );
    assert( gettypenamefromtype( type ) );
    is.read( (char*)&dim, sizeof( dim ) ); // number of elements
    is.read( (char*)&v4.val, sizeof( v4.val ) );
    //assert( v4.val == 0 ); // always 0 ? sometimes not...
    const uint32_t cur = (uint32_t)is.tellg();
    is.read( (char*)&offset, sizeof( offset ) );
    assert( offset != 0 );
    offset += cur;
    }
```

```
  void print( std::ostream & os ) const
    {
    os « name « ",";
    os « (int)boolean « ",";
    os « type « ",";
    os « dim « ",";
    os « v4.val « ",";
    os « offset « std::endl;
    }
  void printvalue( std::ostream & os, std::istream & is ) const
    {
    if( offset ) {
    is.seekg( offset );
    switch( type )
      {
    case param_float:
        {
        os.precision(2);
        os « std::fixed;
        for( uint32_t idx = 0; idx < dim; ++idx )
          {
          if( idx ) os « ",";
          float v;
          is.read( (char*)&v, sizeof(v) );
          os « v; // what if the string contains \0 ?
          }
        }
      break;
    case param_integer:
        {
        int32_t v;
        for( uint32_t idx = 0; idx < dim; ++idx )
          {
          if( idx ) os « ",";
          is.read( (char*)&v, sizeof(v) );
          os « v;
          }
        }
      break;
    case param_string:
        {
        int size = 81;
        std::string v;
        v.resize( size );
        for( uint32_t idx = 0; idx < dim; ++idx )
          {
          if( idx ) os « ";";
          is.read( &v[0], size );
          os « v.c_str();
          }
        }
      break;
    case param_enum:
        {
        int32_t v;
        for( uint32_t idx = 0; idx < dim; ++idx )
          {
          if( idx ) os « ",";
          is.read( (char*)&v, sizeof(v) );
          os « v;
          }
        }
      break;
      }
    } else {
#if 1
      // direct
      assert ( type == param_string );
      char * ptr = v4.ptr;
        //std::string v;
        //v.resize( dim );
        //is.read( &v[0], dim );
        os « ptr;
#endif
    }
    }
  void printxml( std::ostream & os, std::istream & is ) const
    {
    // <Attribute Name="CGEN_force_par_mode" Type="enum">0</Attribute>
    os « "  <Attribute";
    os « " Name=\"" « name « "\"";
```

```
    os « " Type=\"" « gettypenamefromtype(type) « "\"";
    if( dim != 1 )
      {
      os « " ArraySize=\"" « dim « "\"";
      }
    os « ">";
    printvalue( os, is );
    os « "</Attribute>\n";
    }
  void printcsv( std::ostream & os, std::istream & is ) const
    {
    os « std::setw(32) « std::left « name « ",";
    os « std::setw(7) « std::right « gettypenamefromtype(type) « ",";
    os « std::setw(4) « dim « ",";
    os « " ";
    printvalue( os, is );
    os « ",\n";
    }
};
static bool ProcessNested( gdcm::DataSet & ds )
{
  /*
  TODO:
   Looks like the real length of the blob is stored here:
(2005,1132) SQ                                                  # u/l,1 ?
  (fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ]                 # 26,1 Private Creator
    (2005,1143) SL 3103                                         # 4,1 ?

Wotsit ?
(2005,1132) SQ                                                  # u/l,1 ?
  (fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ]                 # 26,1 Private Creator
    (2005,1147) CS [Y ]                                         # 2,1 ?
  */
  bool ret = false;
  //  (2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS]                  # 20,1 Protocol Data Name
  const gdcm::PrivateTag pt0(0x2005,0x37,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt0 ) ) return false;
  const gdcm::DataElement &de0 = ds.GetDataElement( pt0 );
  if( de0.IsEmpty() ) return false;
  const gdcm::ByteValue * bv0 = de0.GetByteValue();
  std::string s0( bv0->GetPointer() , bv0->GetLength() );
  // (2005,1139) LO [IEEE_PDF]                                  # 8,1 Protocol Data Type
  const gdcm::PrivateTag pt1(0x2005,0x39,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt1 ) ) return false;
  const gdcm::DataElement &de1 = ds.GetDataElement( pt1 );
  // (2005,1143) SL 53                                          # 4,1 Protocol Data Block Length (non-padded)
  const gdcm::PrivateTag pt2(0x2005,0x43,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt2 ) ) return false;
  const gdcm::DataElement &de2 = ds.GetDataElement( pt2 );
  // (2005,1147) CS [Y ]                                        # 2,1 Protocol Data Boolean
  const gdcm::PrivateTag pt3(0x2005,0x47,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt3 ) ) return false;
  const gdcm::DataElement &de3 = ds.GetDataElement( pt3 );
  (void)de3;
  // (2005,1144) OW 00\00\00\00\05\00\00\00\35\2e\31\2e\37\00     # 54,1 Protocol Data Block
  const gdcm::PrivateTag pt(0x2005,0x44,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt ) ) return false;
  const gdcm::DataElement &de = ds.GetDataElement( pt );
  if( de.IsEmpty() ) return false;
  const gdcm::ByteValue * bv = de.GetByteValue();
  if( s0 == "ExamCardBlob" )
    {
    assert( de1.IsEmpty() );
    std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".xml";
    std::ofstream out( fn.c_str() );
    // remove trailing \0
    size_t len = strlen( bv->GetPointer() );
    out.write( bv->GetPointer() , len );
    out.close();
    // Extract binary64 thingy (this is a ugly hack, better use an XML parser)
    std::string dup( bv->GetPointer(), len );
    std::string::size_type pos1 = dup.find( "<ExamCardBlob>" );
    std::string::size_type pos2 = dup.find( "</ExamCardBlob>" );
    std::string b64( bv->GetPointer() + pos1 + 14, pos2 - (pos1 + 14) );
    // ulgy hack to remove \r\n from input base64:
    std::string::iterator r_pos = std::remove(b64.begin(), b64.end(), '\r');
    b64.erase(r_pos, b64.end());
    std::string::iterator n_pos = std::remove(b64.begin(), b64.end(), '\n');
```

```
    b64.erase(n_pos, b64.end());
#if 0
    std::ofstream out2( "debug" );
    out2.write( b64.c_str(), b64.size() );
    out2.close();
#endif
    const size_t dlen = gdcm::Base64::GetDecodeLength(b64.c_str(), b64.size() );
    std::string decoded;
    decoded.resize( dlen );
    gdcm::Base64::Decode( &decoded[0], decoded.size(), b64.c_str(), b64.size() );
    std::ofstream f64( "soap.xml" );
    f64.write( decoded.c_str(), decoded.size() );
    f64.close();
    ret = true;
    }
  else
    {
    if( de1.IsEmpty() ) return false;
    const gdcm::ByteValue * bv1 = de1.GetByteValue();
    gdcm::Element<gdcm::VR::SL,gdcm::VM::VM1> dlen = {{0l}};
    dlen.SetFromDataElement( de2 );
    std::string s1( bv1->GetPointer() , bv1->GetLength() );
    if( s1 == "IEEE_PDF" )
      {
      std::istringstream is;
      assert( bv->GetLength() == (size_t)dlen.GetValue() || bv->GetLength() == (size_t)(dlen.GetValue() + 1) );
      std::string dup( bv->GetPointer(), dlen.GetValue() /*bv->GetLength()*/ );
      is.str( dup );
      header h;
      h.read( is );
      //assert( is.peek() && is.eof() );
#if 1
      static int c = 0;
      std::string fn0 = gdcm::LOComp::Trim( s1.c_str() ); // remove trailing space
      std::stringstream ss;
      ss « fn0 « "_" « c++;
      if( h.v1 == 0x01 )
        ss « ".direct";
      else
        ss « ".indirect";
      std::cout « "fn0=" « ss.str() « " Len= " « bv->GetLength() « std::endl;
      std::ofstream out( ss.str().c_str() );
      out.write( bv->GetPointer(), bv->GetLength() );
      out.close();
#endif
#if 1
      std::cout « dup.c_str() « std::endl;
      h.print( std::cout );
#endif
      std::vector< param > params;
      if( h.v1 == 0x01 ) {
        for( uint32_t i = 0; i < 1 /* h.getnparams()*/; ++i ) {
          param p;
          if( s0 == "HARDWARE_CONFIG " )
            {
            p.read_direct_int( is );
            }
          else if( s0 == "COILSTATE " )
            {
            p.read_direct_string( is );
            }
          else
            {
            assert(0);
            }
          params.push_back( p );
        }
      } else {
        assert( is.tellg() == std::streampos(0x20) );
        is.seekg( 0x20 );
        param p;
        for( uint32_t i = 0; i < h.getnparams(); ++i )
          {
          p.read( is );
          //p.print( std::cout );
          params.push_back( p );
          }
      }
      std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
      bool b1 = isvalidpdfstring( fn.c_str() );
      assert( b1 ); (void)b1;
```

```
      fn += ".csv";
      //fn += ".xml";
      std::ofstream csv( fn.c_str() );
      // let's do some bookeeping:
      uint32_t nfloats = 0;
      uint32_t nints = 0;
      uint32_t nstrings = 0;
      for( std::vector<param>::const_iterator it = params.begin();
        it != params.end(); ++it )
        {
        param_type type = it->gettype();
        switch( type )
          {
        case param_float:
          nfloats += it->getdim();
          break;
        case param_integer:
          nints += it->getdim();
          break;
        case param_string:
          nstrings += it->getdim();
          break;
        default:
          ;
          }
        }
#if 0
      std::cout « "Stats:" « std::endl;
      std::cout « "nfloats:" « nfloats « std::endl;
      std::cout « "nints:" « nints « std::endl;
      std::cout « "nstrings:" « nstrings « std::endl;
#endif
      assert( h.getnints() >= nints );
      assert( h.getnfloats() >= nfloats );
      assert( h.getnstrings() >= nstrings);
      for( uint32_t i = 0; i < h.getnparams(); ++i )
        {
        params[i].printcsv( csv, is );
        //params[i].printxml( csv, is );
        }
      csv.close();
      ret = true;
      }
    else if( s1 == "ASCII " )
      {
#if 0
      std::cerr « "ASCII is not handled" « std::endl;
      std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
      fn += ".asc";
      std::ofstream out( fn.c_str() );
      out.write( bv->GetPointer() , bv->GetLength() );
      out.close();
#endif
      std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
      fn += ".sin";
      std::ofstream sin( fn.c_str() );
      const char *beg = bv->GetPointer();
      const char *end = beg + bv->GetLength();
      assert( *beg == 0 );
      const char *p = beg + 1; // skip first \0
      size_t prev = 0;
      for( ; p != end; ++p )
        {
        if( *p == 0 )
          {
          const char *s = beg + prev + 1;
          if( *s )
            {
            sin « s « std::endl;
            }
          else
            {
            sin « std::endl;
            }
          prev = p - beg;
          }
        }
      sin.close();
      ret = true;
      }
    else if( s1 == "BINARY" )
```

```
      {
      std::cerr « "BINARY is not handled" « std::endl;
      std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
      fn += ".bin";
      std::ofstream out( fn.c_str() );
      //out.write( bv->GetPointer() + 512, bv->GetLength() - 512);
      out.write( bv->GetPointer() , bv->GetLength() );
      out.close();
#if 0
      int array[ 128 ];
      memcpy( array, bv->GetPointer(), 512 );
      for( int i = 0; i < 14; ++i )
        {
        std::cout « array[i] « std::endl;
        }
#endif
      ret = true;
      }
    }
  // else -> ret == false
  assert( ret );
  return ret;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
/*
(2005,1132) SQ                                          # u/l,1 ?
  (fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ]         # 26,1 Private Creator
    (2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS]          # 20,1 ?
    (2005,1138) PN (LO) (no value)                      # 0,1 ?
    (2005,1139) PN (LO) [IEEE_PDF]                      # 8,1 ?
    (2005,1140) PN (LO) (no value)                      # 0,1 ?
    (2005,1141) PN (LO) (no value)                      # 0,1 ?
    (2005,1143) SL 3103                                 # 4,1 ?
    (2005,1144) OW
       66\05\00\00\3b\01\00\00\4a\0a\00\00\0e\00\00\00\7a\0a\00\00\95\01\00\00\08\00\00\00\1b\00\00\00\43\47\45\4e\5f\75\73\65\72\5
              # 3104,1 ?
    (2005,1147) CS [Y ]                                 # 2,1 ?
  (fffe,e00d)
*/
  const gdcm::PrivateTag pt(0x2005,0x32,"Philips MR Imaging DD 002");
  if( !ds.FindDataElement( pt ) ) return 1;
  const gdcm::DataElement &de = ds.GetDataElement( pt );
  if( de.IsEmpty() ) return 1;
  gdcm::SequenceOfItems *sqi = de.GetValueAsSQ();
  if ( !sqi ) return 1;
  gdcm::SequenceOfItems::SizeType s = sqi->GetNumberOfItems();
  for( gdcm::SequenceOfItems::SizeType i = 1; i <= s; ++i )
    {
    gdcm::Item &item = sqi->GetItem(i);
    gdcm::DataSet &nestedds = item.GetNestedDataSet();
    if( !ProcessNested( nestedds ) ) {
      std::cerr « "Error processing Item #" « i « std::endl;
    }
    }
  return 0;
}
```

12.50 DumpGEMSMovieGroup.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmUIDGenerator.h"
#include <iostream>
#include <string>
#include <map>
bool PrintNameValueMapping( gdcm::SequenceOfItems *sqi_values,
gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
  using namespace gdcm;
  // prepare names mapping:
  typedef VRToType<VR::UL>::Type UL;
  std::map< UL, std::string > names;
  assert( sqi_names );
  assert( sqi_values );
  SequenceOfItems::SizeType s = sqi_names->GetNumberOfItems();
  PrivateTag tindex(0x7fe1,0x71,"GEMS_Ultrasound_MovieGroup_001");
  PrivateTag tname (0x7fe1,0x72,"GEMS_Ultrasound_MovieGroup_001");
  // First sequence contains all possible names (this is a dict)
  for( SequenceOfItems::SizeType i = 1; i <= s; ++i )
    {
    const Item & item = sqi_names->GetItem( i );
    const DataSet & ds = item.GetNestedDataSet();
    if( !ds.FindDataElement( tindex )
      || !ds.FindDataElement( tname ) )
      {
      assert( 0 );
      return false;
      }
    const DataElement & index = ds.GetDataElement( tindex );
    const DataElement & name = ds.GetDataElement( tname );
    if( index.IsEmpty() || name.IsEmpty() )
      {
      assert( 0 );
      return false;
      }
    gdcm::Element<VR::UL, VM::VM1> el1;
    el1.SetFromDataElement( index );
    gdcm::Element<VR::LO, VM::VM1> el2;
    el2.SetFromDataElement( name );
//    std::cout « el1.GetValue() « " " « el2.GetValue() « std::endl;
    names.insert( std::make_pair( el1.GetValue(), el2.GetValue() ) );
    }
  SequenceOfItems::SizeType s2 = sqi_values->GetNumberOfItems();
  assert( s2 <= s );
  PrivateTag tindex2(0x7fe1,0x48,"GEMS_Ultrasound_MovieGroup_001");
  for( SequenceOfItems::SizeType i = 1; i <= s2; ++i )
    {
    const Item & item = sqi_values->GetItem( i );
    const DataSet & ds = item.GetNestedDataSet();
    if( !ds.FindDataElement( tindex2 ) )
      {
      assert( 0 );
      return false;
      }
    const DataElement & index2 = ds.GetDataElement( tindex2 );
    if( index2.IsEmpty() )
      {
      assert( 0 );
      return false;
      }
    gdcm::Element<VR::FD, VM::VM1_2> el1;
    el1.SetFromDataElement( index2 );
    UL copy = (UL)el1.GetValue();
#if 1
    std::cout « indent;
    std::cout « "( " « names[ copy ];
#endif
    // (7fe1,1052) FD 1560                                     # 8,1 ?
    // (7fe1,1057) LT [MscSkelSup]                             # 10,1 ?
    //PrivateTag tvalue(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001");
```

```
    PrivateTag tvalueint(0x7fe1,0x49,"GEMS_Ultrasound_MovieGroup_001"); // UL
    PrivateTag tvaluefloat1(0x7fe1,0x51,"GEMS_Ultrasound_MovieGroup_001"); // FL
    PrivateTag tvaluefloat(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001"); // FD
    PrivateTag tvalueul(0x7fe1,0x53,"GEMS_Ultrasound_MovieGroup_001"); // UL
    PrivateTag tvaluesl(0x7fe1,0x54,"GEMS_Ultrasound_MovieGroup_001"); // SL
    PrivateTag tvalueob(0x7fe1,0x55,"GEMS_Ultrasound_MovieGroup_001"); // OB
    PrivateTag tvaluetext(0x7fe1,0x57,"GEMS_Ultrasound_MovieGroup_001");  // LT
    PrivateTag tvaluefd(0x7fe1,0x77,"GEMS_Ultrasound_MovieGroup_001");  // FD / 1-N
    PrivateTag tvaluesl3(0x7fe1,0x79,"GEMS_Ultrasound_MovieGroup_001");  // SL / 1-N
    PrivateTag tvaluesl2(0x7fe1,0x86,"GEMS_Ultrasound_MovieGroup_001");  // SL ??
    PrivateTag tvaluefd1(0x7fe1,0x87,"GEMS_Ultrasound_MovieGroup_001");  // FD / 1-N
    PrivateTag tvaluefloat2(0x7fe1,0x88,"GEMS_Ultrasound_MovieGroup_001");  // FD ??
#if 1
    std::cout « " ) = ";
#endif
    if( ds.FindDataElement( tvalueint ) )
      {
      const DataElement & value = ds.GetDataElement( tvalueint );
      gdcm::Element<VR::UL,VM::VM1> el2;
      el2.SetFromDataElement( value );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvaluefloat1 ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluefloat1 );
      gdcm::Element<VR::FL,VM::VM1> el2;
      el2.SetFromDataElement( value );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvaluefloat ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluefloat );
      gdcm::Element<VR::FD,VM::VM1> el2;
      el2.SetFromDataElement( value );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvaluesl ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluesl );
      gdcm::Element<VR::SL,VM::VM1> el2;
      el2.SetFromDataElement( value );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvalueul ) )
      {
      const DataElement & value = ds.GetDataElement( tvalueul );
      gdcm::Element<VR::UL,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      assert( el2.GetLength() == 1 );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvalueob ) )
      {
      const DataElement & value = ds.GetDataElement( tvalueob );
//      gdcm::Element<VR::SL,VM::VM1> el2;
//      el2.SetFromDataElement( value );
//      std::cout « el2.GetValue() « std::endl;
      std::cout « value « std::endl;
      }
    else if( ds.FindDataElement( tvaluetext ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluetext );
      gdcm::Element<VR::LT,VM::VM1> el2;
      el2.SetFromDataElement( value );
      std::cout « el2.GetValue() « std::endl;
      }
    else if( ds.FindDataElement( tvaluesl2 ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluesl2 );
      gdcm::Element<VR::SL,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      el2.Print( std::cout );
      assert( el2.GetLength() == 4 );
      std::cout « std::endl;
      }
    else if( ds.FindDataElement( tvaluesl3 ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluesl3 );
      gdcm::Element<VR::SL,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      el2.Print( std::cout );
```

```
//      assert( el2.GetLength() == 4 );
      std::cout « std::endl;
      }
    else if( ds.FindDataElement( tvaluefd ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluefd );
      gdcm::Element<VR::FD,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      el2.Print( std::cout );
//      assert( el2.GetLength() == 4 || el2.GetLength() == 3 || el2.GetLength() == 8 );
      std::cout « std::endl;
      }
    else if( ds.FindDataElement( tvaluefloat2 ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluefloat2 );
      gdcm::Element<VR::FD,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      el2.Print( std::cout );
      assert( el2.GetLength() == 2 );
      std::cout « std::endl;
      }
    else if( ds.FindDataElement( tvaluefd1 ) )
      {
      const DataElement & value = ds.GetDataElement( tvaluefd1 );
      gdcm::Element<VR::FD,VM::VM1_n> el2;
      el2.SetFromDataElement( value );
      el2.Print( std::cout );
      assert( el2.GetLength() == 4 );
      std::cout « std::endl;
      }
    else
      {
      std::cout « "(no value)" « std::endl;
//      std::cout « ds « std::endl;
      assert( ds.Size() == 2 );
      }
    }
  return true;
}
bool PrintNameValueMapping2( gdcm::PrivateTag const & privtag, const gdcm::DataSet & ds ,
  gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
  if( !ds.FindDataElement( privtag ) ) return false;
  const gdcm::DataElement& seq_values = ds.GetDataElement( privtag );
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = seq_values.GetValueAsSQ();
  return PrintNameValueMapping( sqi, sqi_names, indent);
}
bool PrintNameValueMapping3( gdcm::PrivateTag const & privtag1, gdcm::PrivateTag const & privtag2, const
       gdcm::DataSet & ds ,
gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
  if( !ds.FindDataElement( privtag1 ) )
    {
    assert( 0 );
    return false;
    }
  const gdcm::DataElement& values10name = ds.GetDataElement( privtag1 );
  gdcm::Element<gdcm::VR::LO,gdcm::VM::VM1> el;
  el.SetFromDataElement( values10name );
  std::cout « std::endl;
  std::cout « " <" « el.GetValue().c_str() « ">" « std::endl;
  return PrintNameValueMapping2( privtag2, ds, sqi_names, indent);
}
bool print73( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
  const gdcm::PrivateTag tseq_values73(0x7fe1,0x73,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds10.FindDataElement( tseq_values73 ) )
    {
    std::cout « indent « "No group 73" « std::endl;
    return false;
    }
  const gdcm::DataElement& seq_values73 = ds10.GetDataElement( tseq_values73 );
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values73 = seq_values73.GetValueAsSQ();
  size_t ni3 = sqi_values73->GetNumberOfItems();
  for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
    gdcm::Item &item_73 = sqi_values73->GetItem(i3);
    gdcm::DataSet &ds73 = item_73.GetNestedDataSet();
    assert( ds73.Size() == 3 );
    const gdcm::PrivateTag tseq_values74name(0x7fe1,0x74,"GEMS_Ultrasound_MovieGroup_001");
    const gdcm::PrivateTag tseq_values75(0x7fe1,0x75,"GEMS_Ultrasound_MovieGroup_001");
```

```
    PrintNameValueMapping3( tseq_values74name, tseq_values75, ds73, sqi_dict, indent);
    std::cout « std::endl;
    }
  return true;
}
bool print36( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
  (void)sqi_dict;
  const gdcm::PrivateTag tseq_values36(0x7fe1,0x36,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds10.FindDataElement( tseq_values36 ) )
    {
    std::cout « indent « "No group 36" « std::endl;
    return false;
    }
  const gdcm::DataElement& seq_values36 = ds10.GetDataElement( tseq_values36 );
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values36 = seq_values36.GetValueAsSQ();
  size_t ni3 = sqi_values36->GetNumberOfItems();
  assert( ni3 >= 1 );
  for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
    gdcm::Item &item_36 = sqi_values36->GetItem(i3);
    gdcm::DataSet &ds36 = item_36.GetNestedDataSet();
    assert( ds36.Size() == 4 );
    // (7fe1,1037) UL 47  # 4,1 US MovieGroup Number of Frames
    // (7fe1,1043) OB 40\00\1c\c4\67\2f\0b\11\40         # 376,1 ?
    // (7fe1,1060) OB 4e\4e\49\4f\4e\47\46\43\2a         # 4562714,1 US MovieGroup Image Data
    //
    const gdcm::PrivateTag timagedata(0x7fe1,0x60,"GEMS_Ultrasound_MovieGroup_001");
    assert( ds36.FindDataElement( timagedata ) );
    gdcm::DataElement const & imagedata = ds36.GetDataElement( timagedata );
      const gdcm::ByteValue * bv = imagedata.GetByteValue();
  assert( bv );
      static int c = 0;
      std::stringstream ss;
      ss « "/tmp/debug";
      ss « c++;
      std::ofstream os( ss.str().c_str(), std::ios::binary );
      os.write( bv->GetPointer(), bv->GetLength() );
      os.close();
    //const gdcm::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
    //PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
    //std::cout « std::endl;
    }
  return true;
}
bool print83( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
  const gdcm::PrivateTag tseq_values83(0x7fe1,0x83,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds10.FindDataElement( tseq_values83 ) )
    {
    std::cout « indent « "No group 83" « std::endl;
    return false;
    }
  const gdcm::DataElement& seq_values83 = ds10.GetDataElement( tseq_values83 );
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values83 = seq_values83.GetValueAsSQ();
  size_t ni3 = sqi_values83->GetNumberOfItems();
  for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
    gdcm::Item &item_83 = sqi_values83->GetItem(i3);
    gdcm::DataSet &ds83 = item_83.GetNestedDataSet();
    assert( ds83.Size() == 3 );
    const gdcm::PrivateTag tseq_values84name(0x7fe1,0x84,"GEMS_Ultrasound_MovieGroup_001");
    const gdcm::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
    PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
    std::cout « std::endl;
    }
  return true;
}
bool PrintNameValueMapping4( gdcm::PrivateTag const & privtag0, const gdcm::DataSet & subds, gdcm::PrivateTag
      const & privtag1, gdcm::PrivateTag const & privtag2,
gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
  (void)indent;
  if( !subds.FindDataElement( privtag0 ) )
    {
    assert( 0 );
    return false;
    }
  const gdcm::DataElement& seq_values10 = subds.GetDataElement( privtag0 );
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values10 = seq_values10.GetValueAsSQ();
  size_t ni1 = sqi_values10->GetNumberOfItems();
```

```
//  assert( ni1 == 1 );
  for( size_t i1 = 1; i1 <= ni1; ++i1 )
    {
    gdcm::Item &item_10 = sqi_values10->GetItem(i1);
    gdcm::DataSet &ds10 = item_10.GetNestedDataSet();
    assert( ds10.Size() == 2 + 3 );
    // (7fe1,0010)
    // (7fe1,1012)
    // (7fe1,1018)
    // (7fe1,1020)
    // (7fe1,1083)
    PrintNameValueMapping3( privtag1, privtag2, ds10, sqi_dict, "  " );
    std::cout « std::endl;
    const gdcm::PrivateTag tseq_values20(0x7fe1,0x20,"GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values20 ) )
      {
      assert( 0 );
      return false;
      }
    const gdcm::DataElement& seq_values20 = ds10.GetDataElement( tseq_values20 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values20 = seq_values20.GetValueAsSQ();
    size_t ni2 = sqi_values20->GetNumberOfItems();
    //assert( ni == 1 );
    for( size_t i2 = 1; i2 <= ni2; ++i2 )
      {
      gdcm::Item &item_20 = sqi_values20->GetItem(i2);
      gdcm::DataSet &ds20 = item_20.GetNestedDataSet();
      size_t count = ds20.Size(); (void)count;
      assert( ds20.Size() == 2 + 3 || ds20.Size() == 2 + 2 );
      // (7fe1,0010)
      // (7fe1,1024)
      // (7fe1,1026)
      // (7fe1,1036)
      // (7fe1,103a)
      // (7fe1,1083) (*)
      const gdcm::PrivateTag tseq_values20name(0x7fe1,0x24,"GEMS_Ultrasound_MovieGroup_001");
      const gdcm::PrivateTag tseq_values26(0x7fe1,0x26,"GEMS_Ultrasound_MovieGroup_001");
      PrintNameValueMapping3( tseq_values20name, tseq_values26, ds20, sqi_dict, "   ");
      std::cout « std::endl;
      print36(ds20, sqi_dict, "    ");
      print83(ds20, sqi_dict, "    ");
      }
    print83(ds10, sqi_dict, "   ");
    }
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() ) return 1;
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  const PrivateTag tseq(0x7fe1,0x1,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds.FindDataElement( tseq ) ) return 1;
  const DataElement& seq = ds.GetDataElement( tseq );
  SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
  assert( sqi->GetNumberOfItems() == 1 );
  Item &item = sqi->GetItem(1);
  DataSet &subds = item.GetNestedDataSet();
  const PrivateTag tseq_dict(0x7fe1,0x70,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_dict ) ) return 1;
  const DataElement& seq_dict = subds.GetDataElement( tseq_dict );
  SmartPointer<SequenceOfItems> sqi_dict = seq_dict.GetValueAsSQ();
  const PrivateTag tseq_values8(0x7fe1,0x8,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_values8 ) ) return 1;
  const DataElement& seq_values8 = subds.GetDataElement( tseq_values8 );
  SmartPointer<SequenceOfItems> sqi_values8 = seq_values8.GetValueAsSQ();
  const PrivateTag tseq_values8name(0x7fe1,0x2,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_values8name ) ) return 1;
  const DataElement& values8name = subds.GetDataElement( tseq_values8name );
{
  Element<VR::LO,VM::VM1> el;
  el.SetFromDataElement( values8name );
  std::cout « el.GetValue() « std::endl;
}
  size_t count = subds.Size(); (void)count;
  assert( subds.Size() == 3 + 2 + 1 || subds.Size() == 3 + 2 + 2);
```

```
//  (7fe1,0010) # 30,1 Private Creator
//  (7fe1,1002) # 8,1 US MovieGroup Value 0008 Name
//  (7fe1,1003) # 4,1 ?
//  (7fe1,1008) # 8140,1 US MovieGroup Value 0008 Sequence
//  (7fe1,1010) # 1372196,1 ?
//  (7fe1,1070) # 33684,1 US MovieGroup Dict
//  (7fe1,1073) (*)
  PrintNameValueMapping( sqi_values8, sqi_dict, " ");
  const PrivateTag tseq_values10(0x7fe1,0x10,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq_values10name(0x7fe1,0x12,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq_values18(0x7fe1,0x18,"GEMS_Ultrasound_MovieGroup_001");
  PrintNameValueMapping4( tseq_values10, subds, tseq_values10name, tseq_values18, sqi_dict,"  ");
  print73( subds, sqi_dict, "  " );
#if 0
  gdcm::DataSet::ConstIterator it = subds.Begin();
  for( ; it != subds.End(); ++it )
    {
  const gdcm::DataElement &de = *it;
    std::cout « de.GetTag() « std::endl;
    }
#endif
  return 0;
}
```

12.51 DumpImageHeaderInfo.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Dump TOSHIBA MDW HEADER / Image Header Info
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <string.h>
#include <assert.h>
#include <stdint.h>
struct element
{
  std::istream & read( std::istream & is );
};
std::istream & element::read( std::istream & is )
{
  static const uint32_t ref = 0xe000fffe;
  std::ostream &os = std::cout;
  if( is.eof() )
    {
    return is;
    }
  uint32_t magic;
  if( !is.read( (char*)&magic, sizeof(magic) ) )
    {
    return is;
    }
  //os « magic « std::endl;
  assert( magic == ref ); (void)ref;
  uint32_t l;
  is.read( (char*)&l, sizeof(l) );
  //os « l « std::endl;
  char str[17];
  str[16] = 0;
  is.read( str, 16 );
```

```
  os « str « " (" « l « ")" « std::endl;
  std::vector<char> bytes;
  bytes.resize( l - 16 );
  if( !bytes.empty() )
    {
    is.read( &bytes[0], l - 16 );
    }
  //os « "pos:" « is.tellg() « std::endl;
  if( strcmp(str, "TUSREMEASUREMENT" ) == 0 )
    {
    const char *p = &bytes[0];
    uint32_t val;
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
#if 0
    float f;
    memcpy( (char*)&f, p, sizeof(f) );
    os « " " « f « std::endl;
    p += sizeof(f);
#else
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
#endif
    memcpy( (char*)&val, p, sizeof(val) );
    os « " " « val « std::endl;
    p += sizeof(val);
    char str2[17];
    memcpy( str2, p, 16 );
    str2[16] = 0;
    os « " " « str2 « std::endl;
    }
#if 0
  std::ofstream out( str, std::ios::binary );
  out.write( (char*)&magic, sizeof( magic ) );
  out.write( (char*)&l, sizeof( l ) );
  out.write( str, 16 );
  out.write( &bytes[0], bytes.size() );
#endif
  return is;
}
static bool DumpImageHeaderInfo( std::istream & is, size_t reflen )
{
  // TUSNONIMAGESTAM (5176)
  // TUSREMEASUREMEN (1352)
  // TUSBSINGLELAYOU (16)
  // TUSCLIPPARAMETE (104)
  element el;
  while( el.read( is ) )
    {
    }
  //size_t pos = is.tellg();
  //assert( pos == reflen );
  (void)reflen;
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
```

```
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  const gdcm::PrivateTag timageheaderinfo(0x0029,0x10,"TOSHIBA MDW HEADER");
  if( !ds.FindDataElement( timageheaderinfo) ) return 1;
  const gdcm::DataElement& imageheaderinfo = ds.GetDataElement( timageheaderinfo );
  if ( imageheaderinfo.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv = imageheaderinfo.GetByteValue();
  std::istringstream is;
  std::string dup( bv->GetPointer(), bv->GetLength() );
  is.str( dup );
  bool b = DumpImageHeaderInfo( is, bv->GetLength() );
  if( !b ) return 1;
#if 0
  const float d1 = 0.0041666668839752674; // 89 88 88 3B // 0x44c
  //const float d1 = 0.053231674455417881;
  const float d2 = 0.10828025639057159; // 0A C2 DD 3D // 0x1ac
  //const float d1 = 0.17869562069272813;
  //const unsigned int d2 = 4294967280;
  const float d3 = 0.10828025639057159; // 0A C2 DD 3D // 0x15c
  const int32_t d4 = 134;
  const uint32_t d5 = 1153476;
  std::ofstream t("/tmp/debug", std::ios::binary );
  //t.write( (char*)&d0, sizeof( d0 ) );
  t.write( (char*)&d1, sizeof( d1 ) );
  t.write( (char*)&d2, sizeof( d2 ) );
  t.write( (char*)&d3, sizeof( d3 ) );
  t.write( (char*)&d4, sizeof( d4 ) );
  t.write( (char*)&d5, sizeof( d5 ) );
  t.close();
#endif
  return 0;
}
```

12.52 DumpPhilipsECHO.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmDeflateStream.h"
#include "gdcm_zlib.h"
/*
 * This example extract the ZLIB compressed US image from a Philips private tag
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Usage:
 *
 * $ DumpPhilipsECHO private_us.dcm raw_us_img.raw
 * $ gdcmimg --sop-class-uid 1.2.840.10008.5.1.4.1.1.3.1 --size 608,427,88 raw_us_img.raw raw_us_img.dcm
 */
// header:
struct hframe
{
  uint32_t val0; // 800 increment ?
  uint16_t val1[2];
  uint16_t val2[2];
  uint32_t imgsize;
  bool operator==(const hframe &h) const
```

```
    {
    return val0 == h.val0 &&
      val1[0] == h.val1[0] &&
      val1[1] == h.val1[1] &&
      val2[0] == h.val2[0] &&
      val2[1] == h.val2[1] &&
      imgsize == h.imgsize;
    }
};
static bool ProcessDeflate( const char *outfilename, const int nslices, const
  int buf_size, const char *buf, const std::streampos len,
  const char *crcbuf, const size_t crclen )
{
  std::vector< hframe > crcheaders;
  crcheaders.reserve( nslices );
    {
    std::istringstream is;
    is.str( std::string( crcbuf, crclen ) );
    hframe header;
    for( int r = 0; r < nslices; ++r )
      {
      is.read( (char*)&header, sizeof( header ));
#if 0
      std::cout « header.val0
         « " " « header.val1[0]
         « " " « header.val1[1]
         « " " « header.val2[0]
         « " " « header.val2[1]
         « " " « header.imgsize « std::endl;
#endif
      crcheaders.push_back( header );
      }
    }
  std::istringstream is;
  is.str( std::string( buf, (size_t)len ) );
  std::streamoff totalsize;
  is.read( (char*)&totalsize, sizeof( totalsize ));
  assert( totalsize == len );
  uint32_t nframes;
  is.read( (char*)&nframes, sizeof( nframes ));
  assert( nframes == (uint32_t)nslices );
  std::vector< std::streamoff > offsets;
  offsets.reserve( nframes );
  for( uint32_t frame = 0; frame < nframes ; ++frame )
    {
    uint32_t offset;
    is.read( (char*)&offset, sizeof( offset ));
    offsets.push_back( offset );
    }
  std::vector<char> outbuf;
  const int size[2] = { 608, 427 }; // FIXME: where does it comes from ?
  std::stringstream ss;
  ss « outfilename;
  ss « '_';
  //ss « crcheaders[0].imgsize; // FIXME: Assume all header are identical !
  ss « size[0];
  ss « '_';
  ss « size[1];
  ss « '_';
  ss « nframes;
  ss « ".raw";
  std::ofstream os( ss.str().c_str(), std::ios::binary );
  assert( buf_size >= size[0] * size[1] );
  outbuf.resize( buf_size );
  hframe header;
  //uint32_t prev = 0;
  for( unsigned int r = 0; r < nframes; ++r )
    {
    is.read( (char*)&header, sizeof( header ));
    assert( header == crcheaders[r] );
    assert( header.val1[0] == 2000 );
    assert( header.val1[1] == 3 );
    assert( header.val2[0] == 1 );
    assert( header.val2[1] == 1280 );
    uLongf destLen = buf_size; // >= 608,427
    Bytef *dest = (Bytef*)&outbuf[0];
    assert( is.tellg() == offsets[r] + 16 );
    const Bytef *source = (const Bytef*)buf + offsets[r] + 16;
    uLong sourceLen;
    if( r + 1 == nframes )
      sourceLen = (uLong)totalsize - (uLong)offsets[r] - 16;
```

```
    else
      sourceLen = (uLong)offsets[r+1] - (uLong)offsets[r] - 16;
    // FIXME: in-memory decompression:
    int ret = uncompress (dest, &destLen, source, sourceLen);
    assert( ret == Z_OK ); (void)ret;
    assert( destLen >= (uLongf)size[0] * size[1] ); // 16bytes padding ?
    assert( header.imgsize == (uint32_t)size[0] * size[1] );
    //os.write( &outbuf[0], outbuf.size() );
    os.write( &outbuf[0], size[0] * size[1] );
    // skip data:
    is.seekg( sourceLen, std::ios::cur );
    }
  os.close();
  assert( is.tellg() == totalsize );
  return true;
}
static bool ProcessNone( const char *outfilename, const int nslices, const
  int buf_size, const char *buf, const std::streampos len,
  const char *crcbuf, const size_t crclen )
{
  std::vector< hframe > crcheaders;
  crcheaders.reserve( nslices );
    {
    std::istringstream is;
    is.str( std::string( crcbuf, crclen ) );
    hframe header;
    for( int r = 0; r < nslices; ++r )
      {
      is.read( (char*)&header, sizeof( header ));
#if 0
      std::cout « header.val0
         « " " « header.val1[0]
         « " " « header.val1[1]
         « " " « header.val2[0]
         « " " « header.val2[1]
         « " " « header.imgsize « std::endl;
#endif
      crcheaders.push_back( header );
      }
    }
  std::istringstream is;
  is.str( std::string( buf, (size_t)len ) );
  std::streampos totalsize;
  is.read( (char*)&totalsize, sizeof( totalsize ));
  assert( totalsize == len );
  uint32_t nframes;
  is.read( (char*)&nframes, sizeof( nframes ));
  assert( nframes == (uint32_t)nslices );
  std::vector< uint32_t > offsets;
  offsets.reserve( nframes );
  for( uint32_t frame = 0; frame < nframes ; ++frame )
    {
    uint32_t offset;
    is.read( (char*)&offset, sizeof( offset ));
    offsets.push_back( offset );
    //std::cout « offset « std::endl;
    }
  std::vector<char> outbuf;
  // No idea how to present the data, I'll just append everything, and present it as 2D
  std::stringstream ss;
  ss « outfilename;
  ss « '_';
  ss « crcheaders[0].imgsize; // FIXME: Assume all header are identical !
  ss « '_';
  ss « nframes;
  ss « ".raw";
  std::ofstream os( ss.str().c_str(), std::ios::binary );
  outbuf.resize( buf_size ); // overallocated + 16
  char *buffer = &outbuf[0];
  hframe header;
  for( unsigned int r = 0; r < nframes; ++r )
    {
    is.read( (char*)&header, sizeof( header ));
#if 0
      std::cout « header.val0
         « " " « header.val1[0]
         « " " « header.val1[1]
         « " " « header.val2[0]
         « " " « header.val2[1]
         « " " « header.imgsize « std::endl;
#endif
```

```
    assert( header == crcheaders[r] );
    is.read( buffer, buf_size - 16 );
    os.write( buffer, header.imgsize );
    }
  assert( is.tellg() == totalsize );
  os.close();
  return true;
}
#ifndef NDEBUG
static const char * const UDM_USD_DATATYPE_STRINGS[] = {
  "UDM_USD_DATATYPE_DIN_2D_ECHO",
  "UDM_USD_DATATYPE_DIN_2D_ECHO_CONTRAST",
  "UDM_USD_DATATYPE_DIN_DOPPLER_CW",
  "UDM_USD_DATATYPE_DIN_DOPPLER_PW",
  "UDM_USD_DATATYPE_DIN_DOPPLER_PW_TDI",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_FLOW",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_PMI",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_CPA",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_TDI",
  "UDM_USD_DATATYPE_DIN_MMODE_ECHO",
  "UDM_USD_DATATYPE_DIN_MMODE_COLOR",
  "UDM_USD_DATATYPE_DIN_MMODE_COLOR_TDI",
  "UDM_USD_DATATYPE_DIN_PARAM_BLOCK",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_VELOCITY",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_POWER",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_VARIANCE",
  "UDM_USD_DATATYPE_DIN_DOPPLER_AUDIO",
  "UDM_USD_DATATYPE_DIN_DOPPLER_HIGHQ",
  "UDM_USD_DATATYPE_DIN_PHYSIO",
  "UDM_USD_DATATYPE_DIN_2D_COLOR_STRAIN",
  "UDM_USD_DATATYPE_DIN_COMPOSITE_RGB",
  "UDM_USD_DATATYPE_DIN_XFOV_REALTIME_GRAPHICS",
  "UDM_USD_DATATYPE_DIN_XFOV_MOSAIC",
  "UDM_USD_DATATYPE_DIN_COMPOSITE_R",
  "UDM_USD_DATATYPE_DIN_COMPOSITE_G",
  "UDM_USD_DATATYPE_DIN_COMPOSITE_B",
  "UDM_USD_DATATYPE_DIN_MMODE_COLOR_VELOCITY",
  "UDM_USD_DATATYPE_DIN_MMODE_COLOR_POWER",
  "UDM_USD_DATATYPE_DIN_MMODE_COLOR_VARIANCE",
  "UDM_USD_DATATYPE_DIN_2D_ELASTO",
};
static inline bool is_valid( const char * datatype_str )
{
  static const int n = sizeof( UDM_USD_DATATYPE_STRINGS ) / sizeof( *UDM_USD_DATATYPE_STRINGS );
  bool found = false;
  if( datatype_str )
    {
    for( int i = 0; !found && i < n; ++i )
      {
      found = strcmp( datatype_str, UDM_USD_DATATYPE_STRINGS[i] ) == 0;
      }
    }
  return found;
}
#endif
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() ) return 1;
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds1 = file.GetDataSet();
  const PrivateTag tseq1(0x200d,0x3cf8,"Philips US Imaging DD 045");
  if( !ds1.FindDataElement( tseq1 ) ) return 1;
  const DataElement& seq1 = ds1.GetDataElement( tseq1 );
  SmartPointer<SequenceOfItems> sqi1 = seq1.GetValueAsSQ();
  assert( sqi1->GetNumberOfItems() >= 1 );
  const size_t nitems = sqi1->GetNumberOfItems();
  for( size_t item = 1; item < nitems; ++item )
    {
    Item &item1 = sqi1->GetItem(item);
    DataSet &ds2 = item1.GetNestedDataSet();
    // (200d,300d)  LO  28  UDM_USD_DATATYPE_DIN_2D_ECHO
    const PrivateTag tdatatype(0x200d,0x300d,"Philips US Imaging DD 033");
    if( !ds2.FindDataElement( tdatatype ) ) return 1;
    const DataElement& datatype = ds2.GetDataElement( tdatatype );
    const ByteValue *bvdatatype = datatype.GetByteValue();
    if( !bvdatatype ) return 1;
```

```
const PrivateTag tseq2(0x200d,0x3cf1,"Philips US Imaging DD 045");
if( !ds2.FindDataElement( tseq2 ) ) return 1;
const DataElement& seq2 = ds2.GetDataElement( tseq2 );
SmartPointer<SequenceOfItems> sqi2 = seq2.GetValueAsSQ();
assert( sqi2->GetNumberOfItems() >= 1 );
// FIXME: what if not in first Item ?
assert( sqi2->GetNumberOfItems() == 1 );
Item &item2 = sqi2->GetItem(1);
DataSet &ds3 = item2.GetNestedDataSet();
const PrivateTag tzlib(0x200d,0x3cfa,"Philips US Imaging DD 045");
if( !ds3.FindDataElement( tzlib ) ) return 1;
const DataElement& zlib = ds3.GetDataElement( tzlib );
const ByteValue *bv = zlib.GetByteValue();
if( !bv ) return 1;
if( bv->GetLength() != 4 ) return 1;
// (200d,3010)  IS  2  88
const PrivateTag tnslices(0x200d,0x3010,"Philips US Imaging DD 033");
if( !ds3.FindDataElement( tnslices ) ) return 1;
const DataElement& nslices = ds3.GetDataElement( tnslices );
Element<VR::IS,VM::VM1> elnslices;
elnslices.SetFromDataElement( nslices );
const int nslicesref = elnslices.GetValue();
assert( nslicesref >= 0 );
// (200d,3011)  IS  6  259648
const PrivateTag tzalloc(0x200d,0x3011,"Philips US Imaging DD 033");
if( !ds3.FindDataElement( tzalloc ) ) return 1;
const DataElement& zalloc = ds3.GetDataElement( tzalloc );
Element<VR::IS,VM::VM1> elzalloc;
elzalloc.SetFromDataElement( zalloc );
const int zallocref = elzalloc.GetValue();
assert( zallocref >= 0 );
// (200d,3021)  IS  2  0
const PrivateTag tzero(0x200d,0x3021,"Philips US Imaging DD 033");
if( !ds3.FindDataElement( tzero ) ) return 1;
const DataElement& zero = ds3.GetDataElement( tzero );
Element<VR::IS,VM::VM1> elzero;
elzero.SetFromDataElement( zero );
const int zerocref = elzero.GetValue();
assert( zerocref == 0 ); (void)zerocref;
// (200d,3cf3) OB
const PrivateTag tdeflate(0x200d,0x3cf3,"Philips US Imaging DD 045");
if( !ds3.FindDataElement( tdeflate) ) return 1;
const DataElement& deflate = ds3.GetDataElement( tdeflate );
const ByteValue *bv2 = deflate.GetByteValue();
// (200d,3cfb) OB
const PrivateTag tcrc(0x200d,0x3cfb,"Philips US Imaging DD 045");
if( !ds3.FindDataElement( tcrc ) ) return 1;
const DataElement& crc = ds3.GetDataElement( tcrc );
const ByteValue *bv3 = crc.GetByteValue();
std::string outfile = std::string( bvdatatype->GetPointer(), bvdatatype->GetLength() );
outfile = LOComp::Trim( outfile.c_str() );
const char *outfilename = outfile.c_str();
assert( is_valid(outfilename) );
if( bv2 )
  {
  assert( bv3 );
  assert( zallocref > 0 );
  assert( nslicesref > 0 );
  std::cout « ds2 « std::endl;
  if( strncmp(bv->GetPointer(), "ZLib", 4) == 0 )
    {
    if( !ProcessDeflate( outfilename, nslicesref, zallocref, bv2->GetPointer(),
        std::streampos(bv2->GetLength()), bv3->GetPointer(), bv3->GetLength() ) )
      {
      return 1;
      }
    }
  else if( strncmp(bv->GetPointer(), "None", 4) == 0 )
    {
    if( !ProcessNone( outfilename, nslicesref, zallocref, bv2->GetPointer(),
        std::streampos(bv2->GetLength()), bv3->GetPointer(), bv3->GetLength() ) )
      {
      return 1;
      }
    }
  else
    {
    std::string str( bv->GetPointer(), bv->GetLength() );
    std::cerr « "Unhandled: " « str « std::endl;
    return 1;
    }
```

```
      }
    }
  return 0;
}
```

12.53 DumpSiemensBase64.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * https://groups.google.com/forum/#!msg/comp.protocols.dicom/2kZ2lLP8EcM/WzjFrtjnAgAJ
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include "gdcmCSAHeader.h"
#include "gdcmBase64.h"
#include "gdcmExplicitDataElement.h"
#include "gdcmSwapper.h"
#include "gdcmPrinter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <assert.h>
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
  {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
  }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  gdcm::CSAHeader csa;
  const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
  if( !ds.FindDataElement( t1 ) ) return 1;
  csa.LoadFromDataElement( ds.GetDataElement( t1 ) );
  //const char name[] = "MRDiffusion";
  const char name[] = "MR_ASL";
  if( csa.FindCSAElementByName(name) )
  {
    const gdcm::CSAElement & el = csa.GetCSAElementByName(name);
    const gdcm::ByteValue* bv = el.GetByteValue();
    std::string str( bv->GetPointer(), bv->GetLength() );
    str.erase(std::remove(str.begin(), str.end(), '\n'), str.end());
    size_t dl = gdcm::Base64::GetDecodeLength( str.c_str(), str.size() );
    std::vector<char> buf;
    buf.resize( dl );
    size_t dl2 = gdcm::Base64::Decode( &buf[0], buf.size(), str.c_str(), str.size() );
    (void)dl2;
    std::stringstream ss;
    ss.str( std::string(&buf[0], buf.size()) );
    gdcm::File file;
    gdcm::DataSet &ds2 = file.GetDataSet();
    gdcm::DataElement xde;
    try
    {
      while( xde.Read<gdcm::ExplicitDataElement,gdcm::SwapperNoOp>( ss ) )
      {
        ds2.Insert( xde );
      }
      assert( ss.eof() );
```

```
    }
    catch(std::exception &)
    {
      return 1;
    }
    gdcm::Printer p;
    p.SetFile( file );
    p.Print(std::cout);
  }
  return 0;
}
```

12.54 DumpToSQLITE3.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Ref:
 * http://massmail.spl.harvard.edu/public-archives/slicer-devel/2010/004408.html
 *
 * Implementation details:
 * http://www.sqlite.org/c3ref/bind_blob.html
 * http://www.adp-gmbh.ch/sqlite/bind_insert.html
 */
#include "gdcmScanner.h"
#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "sqlite3.h"
#include <stdio.h>
#include <time.h>
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    return 1;
    }
  time_t time_start = time(nullptr);
  gdcm::Trace::SetDebug( false );
  gdcm::Trace::SetWarning( false );
  const char *inputdirectory = argv[1];
  gdcm::Directory d;
  unsigned int nfiles = d.Load( inputdirectory, true);
  gdcm::Scanner s;
  using gdcm::Tag;
  s.AddTag( Tag(0x20,0xd) ); // Study Instance UID
  s.AddTag( Tag(0x20,0xe) ); // Series Instance UID
  bool b0 = s.Scan( d.GetFilenames() );
  if( !b0 ) return 1;
  time_t time_scanner = time(nullptr);
  std::cout « "Finished loading data from : " « nfiles « " files" « std::endl;
//  MappingType const &mappings = s.GetMappings();
  sqlite3* db;
  sqlite3_open("./dicom.db", &db);
  if(db == nullptr)
    {
    std::cerr « "Could not open database." « std::endl;
    return 1;
    }
  const char sql_stmt[] = "create table browser (seriesuid, studyuid)";
  int   ret;
  char *errmsg;
  ret = sqlite3_exec(db, sql_stmt, nullptr, nullptr, &errmsg);
  if(ret != SQLITE_OK)
    {
    printf("Error in statement: %s [%s].\n", sql_stmt, errmsg);
```

```
    return 1;
    }
  using gdcm::Directory;
  using gdcm::Scanner;
  const Directory::FilenamesType& files = d.GetFilenames();
  Directory::FilenamesType::const_iterator file = files.begin();
  sqlite3_stmt *stmt;
  if ( sqlite3_prepare(
      db,
      "insert into browser values (?,?)",  // stmt
      -1, // If than zero, then stmt is read up to the first nul terminator
      &stmt,
      nullptr  // Pointer to unused portion of stmt
  )
    != SQLITE_OK)
    {
    printf("\nCould not prepare statement.");
    return 1;
    }
  //printf("\nThe statement has %d wildcards\n", sqlite3_bind_parameter_count(stmt));
  for(; file != files.end(); ++file)
    {
    const char *filename = file->c_str();
    bool b = s.IsKey(filename);
    if( b )
      {
      const Scanner::TagToValue &mapping = s.GetMapping(filename);
      Scanner::TagToValue::const_iterator it = mapping.begin();
      sqlite3_reset(stmt);
      for( int index = 1; it != mapping.end(); ++it, ++index)
        {
        //const Tag & tag = it->first;
        const char *value = it->second;
        if (sqlite3_bind_text (
            stmt,
            index,  // Index of wildcard
            value,
            (int)strlen(value),  // length of text
            SQLITE_STATIC // SQLite assumes that the information is in static
        )
          != SQLITE_OK)
          {
          printf("\nCould not bind int.\n");
          return 1;
          }
        }
      if (sqlite3_step(stmt) != SQLITE_DONE)
        {
        printf("\nCould not step (execute) stmt.\n");
        return 1;
        }
      }
    }
  sqlite3_close(db);
  time_t time_sqlite = time(nullptr);
  std::cout « "Time to scan DICOM files: " « (time_scanner - time_start) « std::endl;
  std::cout « "Time to build SQLITE3: " « (time_sqlite - time_scanner) « std::endl;
  return 0;
}
```

12.55 DumpToshibaDTI.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * https://groups.google.com/d/msg/comp.protocols.dicom/7IaIkT0ZG5U/k7LPu81VvAMJ
```

```
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <assert.h>
static bool DumpToshibaDTI( const char * input, size_t len )
{
  static int i = 0;
  ++i;
  if( len % 2 ) return false;
  std::vector<char> copy( input, input + len );
  std::reverse( copy.begin(), copy.end() );
#if 0
  std::ostringstream f;
  f « "debug" « i;
  std::ofstream of( f.str().c_str(), std::ios::binary );
  of.write( &copy[0], copy.size() );
  of.close();
#else
  std::istringstream is;
  std::string dup( &copy[0], copy.size() );
  is.str( dup );
  gdcm::File file;
  gdcm::FileMetaInformation & fmi = file.GetHeader();
  fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::DataSet & ds = file.GetDataSet();
  ds.Read<gdcm::ExplicitDataElement,gdcm::SwapperNoOp>( is );
  //gdcm::DictPrinter p;
  gdcm::Printer p;
  p.SetFile( file );
  p.SetColor( true );
  p.Print( std::cout );
#endif
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ]                      # 22,1 Private Creator
  // (0029,1001) ?? (SQ) (Sequence with undefined length)              # u/l,1 ?
  const gdcm::PrivateTag tpmtf(0x0029,0x1,"PMTF INFORMATION DATA");
  if( !ds.FindDataElement( tpmtf) ) return 1;
  const gdcm::DataElement& pmtf = ds.GetDataElement( tpmtf );
  if ( pmtf.IsEmpty() ) return 1;
  gdcm::SmartPointer<gdcm::SequenceOfItems> seq = pmtf.GetValueAsSQ();
  if ( !seq || !seq->GetNumberOfItems() ) return 1;
  size_t n = seq->GetNumberOfItems();
  for( size_t i = 1; i <= n; ++i )
    {
    gdcm::Item &item = seq->GetItem(i);
    gdcm::DataSet &subds = item.GetNestedDataSet();
    // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ]                  # 22,1 Private Creator
    // (0029,1090) ?? (OB) 00\05\00\13\00\12\00\22\                  # 202,1 ?
    const gdcm::PrivateTag tseq(0x0029,0x90,"PMTF INFORMATION DATA");
    if( subds.FindDataElement( tseq ) )
      {
      const gdcm::DataElement & de = subds.GetDataElement( tseq );
      const gdcm::ByteValue * bv = de.GetByteValue();
      if( !bv ) return 1;
      bool b = DumpToshibaDTI( bv->GetPointer(), bv->GetLength() );
      if( !b ) return 1;
      }
    }
  return 0;
}
```

12.56 DumpToshibaDTI2.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 *
       https://gazelle.ihe.net/EVSClient/dicomResult.seam;jsessionid=x+Rf9Zs+ip49P+jC3L8SLZb8?&oid=1.3.6.1.4.1.12559.11.1.2.1.4.1
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <assert.h>
static bool DumpToshibaDTI2( const char * input, size_t len )
{
  static int i = 0;
  ++i;
  if( len % 2 ) return false;
  std::vector<char> copy( input, input + len );
  std::reverse( copy.begin(), copy.end() );
#if 0
  std::ostringstream f;
  f << "debug" << i;
  std::ofstream of( f.str().c_str(), std::ios::binary );
  of.write( &copy[0], copy.size() );
  of.close();
#else
  std::istringstream is;
  std::string dup( &copy[0], copy.size() );
  is.str( dup );
  gdcm::File file;
  gdcm::FileMetaInformation & fmi = file.GetHeader();
  fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::DataSet & ds = file.GetDataSet();
  ds.Read<gdcm::ExplicitDataElement,gdcm::SwapperNoOp>( is );
  //gdcm::DictPrinter p;
  gdcm::Printer p;
  p.SetFile( file );
  p.SetColor( true );
  p.Print( std::cout );
#endif
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr << "Failed to read: " << filename << std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  /*
  (0029,1001) SQ (Sequence with explicit length #=6)      # 18746, 1 Unknown Tag & Data
    (fffe,e000) na (Item with explicit length #=2)          # 206, 1 Item
      (0029,0010) LO [TOSHIBA_MEC_MR3]                        #  16, 1 PrivateCreator
      (0029,1090) OB 00\07\00\06\00\05\00\04\00\03\00\02\00\0c\00\01\00\00\00\00\00\12... # 170, 1 Unknown Tag &
       Data
    (fffe,e00d) na (ItemDelimitationItem for re-encoding)   #   0, 0 ItemDelimitationItem
    (fffe,e000) na (Item with explicit length #=2)          # 866, 1 Item
      (0029,0010) LO [TOSHIBA_MEC_MR3]                        #  16, 1 PrivateCreator
      (0029,1090) OB 45\4e\49\50\53\4c\20\52\41\5c\45\4e\49\50\53\4c\54\5c\52\45\53\55... # 830, 1 Unknown Tag &
       Data
```

```
  [...]
  (0029,1002) SQ (Sequence with explicit length #=1)      # 120, 1 Unknown Tag & Data
    (fffe,e000) na (Item with explicit length #=2)          # 112, 1 Item
      (0029,0010) LO [TOSHIBA_MEC_MR3]                        #  16, 1 PrivateCreator
      (0029,1090) OB 00\10\00\02\53\55\10\80\70\0d\30\31\5e\33\52\4d\5f\43\45\4d\5f\41... #  76, 1 Unknown Tag &
       Data
    (fffe,e00d) na (ItemDelimitationItem for re-encoding)   #   0, 0 ItemDelimitationItem
  */
  const gdcm::PrivateTag tmecmr3(0x0029,0x1,"TOSHIBA_MEC_MR3");
  if( !ds.FindDataElement( tmecmr3) ) return 1;
  const gdcm::DataElement& mecmr3 = ds.GetDataElement( tmecmr3 );
  if ( mecmr3.IsEmpty() ) return 1;
  gdcm::SmartPointer<gdcm::SequenceOfItems> seq = mecmr3.GetValueAsSQ();
  if ( !seq || !seq->GetNumberOfItems() ) return 1;
  size_t n = seq->GetNumberOfItems();
  for( size_t i = 1; i <= n; ++i )
    {
    gdcm::Item &item = seq->GetItem(i);
    gdcm::DataSet &subds = item.GetNestedDataSet();
    const gdcm::PrivateTag tseq(0x0029,0x90,"TOSHIBA_MEC_MR3");
    if( subds.FindDataElement( tseq ) )
      {
      const gdcm::DataElement & de = subds.GetDataElement( tseq );
      const gdcm::ByteValue * bv = de.GetByteValue();
      if( !bv ) return 1;
      bool b = DumpToshibaDTI2( bv->GetPointer(), bv->GetLength() );
      if( !b ) return 1;
      }
    }
  return 0;
}
```

12.57 DumpVisusChange.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmDirectory.h"
#include "gdcmStringFilter.h"
#include <vector>
#include <algorithm>
/*
 */
static bool process( std::vector<gdcm::DataElement> & ms, const char * filename)
{
  using namespace gdcm;
  Tag pd(0x7fe0,0x0000);
  std::set<gdcm::Tag> skiptags;
  skiptags.insert( pd );
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.ReadUpToTag( pd, skiptags ) )
  {
    std::cerr « "Failure to read: " « filename « std::endl;
    return false;
  }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds1 = file.GetDataSet();
  const gdcm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
  if( !ds1.FindDataElement( tseq1 ) ) return true;
  const gdcm::DataElement& seq1 = ds1.GetDataElement( tseq1 );
  SmartPointer<SequenceOfItems> sqi1 = seq1.GetValueAsSQ();
  const size_t nitems = sqi1->GetNumberOfItems();
  for( size_t item = 1; item < nitems; ++item )
    {
    Item &item1 = sqi1->GetItem(item);
```

```
    DataSet &ds2 = item1.GetNestedDataSet();
    for(DataSet::ConstIterator it = ds2.Begin(); it != ds2.End(); ++it )
      {
      DataElement const & de = *it;
      // cannot simply use std::set here, see there is a discrepancy in between
      // operator== and operator<.
      // So only use operator== here:
      std::vector<DataElement>::iterator vit = std::find(ms.begin(), ms.end(), de);
      if( vit == ms.end() )
        ms.push_back(de);
      }
    }
  return true;
}
int main(int argc, char *argv[])
{
  bool usefastpath = true;
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Directory::FilenamesType filenames;
  if( !gdcm::System::FileExists(filename) )
    {
    std::cerr « "Could not find file: " « filename « std::endl;
    return 1;
    }
  gdcm::Directory dir;
  if( gdcm::System::FileIsDirectory(filename) )
  {
    unsigned int nfiles = dir.Load(filename, false);
    if( nfiles == 0 )
      {
      std::cerr « "Could not find files: " « filename « std::endl;
      return 1;
      }
    filenames = dir.GetFilenames();
  }
  else
  {
    filenames.push_back( filename );
  }
  gdcm::StringFilter sf;
  Tag pd(0x7fe0,0x0000);
  std::set<gdcm::Tag> skiptags;
  skiptags.insert( pd );
  gdcm::Reader reader;
  reader.SetFileName( filenames[0].c_str() );
  if( !reader.ReadUpToTag( pd, skiptags ) )
  {
    std::cerr « "Could not read file: " « filename « std::endl;
    return 1;
  }
  gdcm::File &file = reader.GetFile();
  sf.SetFile(file);
  if( usefastpath ) {
    // Heuristic, assume if private tag cannot be found in first file, skip the directory
    gdcm::DataSet &ds1 = file.GetDataSet();
    const gdcm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
    if( !ds1.FindDataElement( tseq1 ) ){
      std::cerr « "Could not find private tag in first file skipping whole directory: " « filename « std::endl;
      return 0;
    }
  }

  std::vector<DataElement> ms;
  for(gdcm::Directory::FilenamesType::const_iterator cit = filenames.begin(); cit != filenames.end(); ++cit )
  {
    if( !process(ms, cit->c_str()) ) {
      return 1;
    }
  }
  if( !ms.empty() ) {
    std::sort(ms.begin(), ms.end());
    std::cout « filename « ",\"";
    for(std::vector<DataElement>::const_iterator it = ms.begin(); it != ms.end(); ++it )
    {
      DataElement const & de = *it;
      std::string const & s = sf.ToString( de );
      std::cout « de.GetTag() « " " « s « std::endl;
    }
    std::cout « "\"" « std::endl;
```

```
  }
  return 0;
}
```

12.58 DuplicatePCDE.cxx

```
/*=========================================================================

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
/*
  Usage:
  DuplicatePCDE gdcmData/D_CLUNIE_CT1_J2KI.dcm out.dcm

aka:
medical.nema.org/medical/dicom/DataSets/WG04/IMAGES/J2KI/CT1_J2KI

See:
  gdcmConformanceTests/CT1_J2KI_DuplicatePCDE.dcm

Original thread can be found at:

http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/82f28c4db28963af


Question:
1.
  There is no restriction for a specific Private Creator Data Element
(PCDE) to be unique within the same group, right ?
  Decoders of Private Data would have to handle the case where a PCDE
would be repeated and should NOT stop on the first instance of a
particular PCDE, right ?

  Eg. when searching for the tag associated with
(0x0029,0x0010,"SIEMENS CSA HEADER") in the following (pseudo)
dataset:

(0029,0010) LO [SIEMENS CSA HEADER]                     #  18, 1
PrivateCreator
(0029,0011) LO [SIEMENS MEDCOM HEADER]                  #  22, 1
PrivateCreator
(0029,0012) LO [SIEMENS MEDCOM HEADER2]                 #  22, 1
PrivateCreator
(0029,0013) LO [SIEMENS CSA HEADER]                     #  18, 1
PrivateCreator
(0029,1008) CS [IMAGE NUM 4]                            #  12, 1
CSAImageHeaderType
(0029,1009) LO [20050723]                               #   8, 1
CSAImageHeaderVersion
(0029,1010) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo
(0029,1018) CS [MR]                                     #   2, 1
CSASeriesHeaderType
(0029,1019) LO [20050723]                               #   8, 1
CSASeriesHeaderVersion
(0029,1020) OB 53\56\31\30\04\03\02\01\2c\00\00\00\4d
\00\00\00\55\73\65\64\50\61... # 51520, 1 CSASeriesHeaderInfo
(0029,1131) LO [4.0.163088300]                          #  14, 1
PMTFInformation1
(0029,1132) UL 32768                                    #   4, 1
PMTFInformation2
```

```
(0029,1133) UL 0                                        #   4, 1
PMTFInformation3
(0029,1134) CS [DB TO DICOM]                            #  12, 1
PMTFInformation4
(0029,1260) ?? 63\6f\6d\20                              #   4, 1
Unknown Tag & Data
(0029,1310) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo

  one should return two instances, correct ?

Answer:
I would say that this is covered in principle by the PS 3.5 7.1
"The Data Elements ... shall occur at most once in a Data Set"
rule, since the data element is defined by the tuple
(private creator,gggg,ee) where xxee is the element
number and xx is arbitrary and has no inherent meaning and
does not serve to disambiguate the data element.

E.g.:

(0019,0030) Private Creator ID = "Smith"
...
(0019,0032) Private Creator ID = "Smith"
...
(0019,3015) Fractal Index = "32"
...
(0019,3215) Fractal Index = "32"

would be illegal because even though they are assigned different
(completely arbitrary) blocks, with the same group, element
number and private creator, (0019,3015) and (0019,3215) are the
"same" data element.

*/
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  // Let's get all private element from group 0x9:
/*
(0009,0010) LO [GEMS_IDEN_01]                                   # 12,1 Private Creator
(0009,1001) LO [GE_GENESIS_FF ]                                 # 14,1 Full fidelity
(0009,1002) SH [CT01]                                           # 4,1 Suite id
(0009,1004) SH [HiSpeed CT/i]                                   # 12,1 Product id
(0009,1027) SL 862399669                                        # 4,1 Image actual date
(0009,1030) SH (no value)                                       # 0,1 Service id
(0009,1031) SH (no value)                                       # 0,1 Mobile location number
(0009,10e6) SH [05]                                             # 2,1 Genesis Version - now
(0009,10e7) UL 973283917                                        # 4,1 Exam Record checksum
(0009,10e9) SL 862399669                                        # 4,1 Actual series data time stamp
*/
  gdcm::Tag start(0x0009,0x0);
  // Create a temporary duplicate dataset, since we cannot insert data element as we go over them (std::set
  // would reorganize itself as we go over it ...)
  gdcm::DataSet dup;
  gdcm::Tag new_private(0x0009,0x0);
  while (start.GetGroup() == 0x9 )
    {
    const gdcm::DataElement& de = ds.FindNextDataElement(start);
    const gdcm::Tag &t = de.GetTag();
    if( t.IsPrivateCreator() )
      {
      std::cout « t « std::endl;
      // Ok let's duplicate into the next available attribute:
      gdcm::DataElement duplicate = de;
      duplicate.GetTag().SetElement( (uint16_t)(t.GetElement() + 1) );
      dup.Insert( duplicate );
```

```
      new_private = duplicate.GetTag();
      }
    else if( t.IsPrivate() && !t.IsPrivateCreator() )
      {
      //std::cout « de « std::endl;
      std::string owner = ds.GetPrivateCreator( de.GetTag() );
      //std::cout « owner « std::endl;
      gdcm::DataElement duplicate = de;
      duplicate.GetTag().SetPrivateCreator( new_private );
      if( const gdcm::ByteValue *bv = duplicate.GetByteValue() )
        {
        // Warning: when doing : duplicate = de, only the pointer to the ByteValue is passed
        // (to avoid large memory duplicate). We need to explicitly duplicate the bytevalue ourselves:
        gdcm::ByteValue *dupbv = new gdcm::ByteValue( bv->GetPointer(),
          bv->GetLength() );
        // Let's recognize the duplicated ASCII-type elements:
        if( duplicate.GetVR() & gdcm::VR::VRASCII )
          dupbv->Fill( 'X' );
        duplicate.SetValue( *dupbv );
        }
      dup.Insert( duplicate );
      }
    start = t;
    // move to next possible 'public' element
    start.SetElement( (uint16_t)(start.GetElement() + 1) );
    }
  gdcm::DataSet::ConstIterator it = dup.Begin();
  for( ; it != dup.End(); ++it )
    {
    ds.Insert( *it );
    }
  gdcm::Writer w;
  w.SetFile( file );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.59 ELSCINT1WaveToText.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
/*
 * This example shows how to read a Wave Information tag from ELSCINT1
 * The wave information is stored in Tag (01e1,18,ELSCINT1) hidden in a
 * Secondary Capture Image Storage (usually a 'N' Symbol is shown)
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Gauthier Bouilhol
 */
template <typename T>
bool dumpargs(std::ostream & os, T c1, T c2, T c3, T c4, T c5, T c6, T c7, T c8)
```

```
{
  static const char sep = '\t';
  os « c1 « sep « c2 « sep « c3 « sep « c4 « sep « c5 « sep « c6 « sep « c7 « sep « c8;
  os « std::endl;
  return true;
}
bool wave2stream( std::ostream &text_file, const char *in, size_t len )
{
  const short * buffer = (const short*)in;
  size_t length = len / sizeof( short );
  text_file « "COMPLETE_WAVE" « '\t' « "MASK"       « '\t' « "AQUISITION_PROFIL" « '\t' « "END-INHALE" « '\t' «
       "END-EXHALE" « '\t' « "AQUISITION_WAVE" « '\t' « "WAVE_STATISTICS" « '\t' « "MASK"        « std::endl;
  for (size_t i=0;i<length-76;i+=2)
    {
    if ( i < 74 )
      {
      if (buffer[i+75] == 0)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « "  "         «
       '\t' « "  "         « '\t' « "  "              « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      if (buffer[i+75] == 16384)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « buffer[i+74] «
       '\t' « "  "         « '\t' « "  "              « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      if (buffer[i+75] == 256)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « "  "         «
       '\t' « buffer[i+74] « '\t' « "  "              « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      if (buffer[i+75] == -32768)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « "  "         «
       '\t' « "  "         « '\t' « buffer[i+74]      « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      if (buffer[i+75] == -16384)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « buffer[i+74] «
       '\t' « "  "         « '\t' « buffer[i+74]      « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      if (buffer[i+75] == -32512)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « "  "         «
       '\t' « buffer[i+74] « '\t' « buffer[i+74]      « '\t' « buffer[i]         « '\t' « buffer[i+1] «
        std::endl;
      }
    else
      {
      if (buffer[i+75] == 0)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « "  "         «
       '\t' « "  "         « '\t' « "  "              « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      if (buffer[i+75] == 16384)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « buffer[i+74] «
       '\t' « "  "         « '\t' « "  "              « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      if (buffer[i+75] == 256)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 0                « '\t' « "  "         «
       '\t' « buffer[i+74] « '\t' « "  "              « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      if (buffer[i+75] == -32768)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « "  "         «
       '\t' « "  "         « '\t' « buffer[i+74]      « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      if (buffer[i+75] == -16384)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « buffer[i+74] «
       '\t' « "  "         « '\t' « buffer[i+74]      « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      if (buffer[i+75] == -32512)
        text_file « buffer[i+74]    « '\t' « buffer[i+75] « '\t' « 1                « '\t' « "  "         «
       '\t' « buffer[i+74] « '\t' « buffer[i+74]      « '\t' « "  "              « '\t' « "  "         «
        std::endl;
      }
    }
  return true;
}
int main(int argc, char *argv [])
{
  if( argc < 3 ) return 1;
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
```

```
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  const gdcm::PrivateTag twave(0x01e1,0x18,"ELSCINT1");
  if( !ds.FindDataElement( twave ) ) return 1;
  const gdcm::DataElement& wave = ds.GetDataElement( twave );
  if ( wave.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv = wave.GetByteValue();
  assert( bv );
  std::ofstream os( outfilename, std::ios::binary );
  // Dump that to a CSV file:
  wave2stream( os, bv->GetPointer(), bv->GetLength() );
  os.close();
  return 0;
}
```

12.60 EmptyMask.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmEmptyMaskGenerator.h"
#include <string>
#include <cstring>
int main( int argc, char *argv[] )
{
  std::string inputdir;
  std::string outputdir;
  bool input_sopclassuid = true;
  bool grayscale_secondary_sopclassuid = false;
  if( argc < 3 ) return 1;
  inputdir = argv[1];
  outputdir = argv[2];
  // input_sopclassuid -> Use original SOP Class UID from input DICOM (Default).
  // grayscale_secondary_sopclassuid -> Use Grayscale Secondary Image Storage SOP Class UID.
  if( argc >= 3 )
  {
    input_sopclassuid = false;
    if( strcmp("input_sopclassuid", argv[3]) == 0 )
      input_sopclassuid = true;
    else if (strcmp("grayscale_secondary_sopclassuid", argv[3]) == 0 ) {
      grayscale_secondary_sopclassuid = true;
    }
  }
  //
  gdcm::EmptyMaskGenerator emg;
  if( input_sopclassuid )
    emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseOriginalSOPClassUID );
  else if( grayscale_secondary_sopclassuid )
    emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseGrayscaleSecondaryImageStorage );
  emg.SetInputDirectory( inputdir.c_str() );
  emg.SetOutputDirectory( outputdir.c_str() );
  if( !emg.Execute() )
  {
    return 1;
  }
  return 0;
}
```

12.61 EncapsulateFileInRawData.cxx

```
/*=========================================================================
```

```
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=========================================================================*/
#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"
#include "magic.h" // libmagic, API to file command line tool
/*
 * Let say you want to encapsulate a file type that is not defined in DICOM (exe, zip, png)
 * PNG is a bad example, unless it contains transparency (which has been deprecated).
 * It will take care of dispatching each chunk to an appropriate data item (pretty much like
 * WaveformData)
 *
 * Usage:
 * ./EncapsulateFileInRawData large_input_file.exe large_input_file.dcm
 */
// TODO:
// $ file -bi /tmp/gdcm-2.1.0.pdf
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " inputfile output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  if( !gdcm::System::FileExists( filename ) ) return 1;
  size_t s = gdcm::System::FileSize(filename);
  if( !s ) return 1;
  magic_t cookie = magic_open(MAGIC_NONE);
  const char * file_type = magic_file(cookie, filename);
  if( !file_type ) return 1;
  magic_close(cookie);
  gdcm::Writer w;
  gdcm::File &file = w.GetFile();
  //gdcm::DataSet &ds = file.GetDataSet();
  //w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
  gdcm::Anonymizer anon;
  anon.SetFile( file );
  gdcm::MediaStorage ms = gdcm::MediaStorage::RawDataStorage;
  gdcm::UIDGenerator gen;
  anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
  std::cout « ms.GetString() « std::endl;
  anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );
  if (!w.Write() )
    {
    std::cerr « "Could not write: " « outfilename « std::endl;
    return 1;
    }
  return 0;
}
```

12.62 ExtractEncryptedContent.cxx

```
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```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include <fstream>
/*

openssl smime -encrypt -binary -aes256 -in outputfile.dcm -inform DER -out outputfile.der -outform DER
       ../trunk/Testing/Source/Data/certificate.pem

openssl smime -decrypt -binary -in out.der -inform DER -out outputfile.dcm -outform DER -inkey
       ../trunk/Testing/Source/Data/privatekey.pem ../trunk/Testing/Source/Data/certificate.pem

 */
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.der" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  const gdcm::DataElement &EncryptedAttributesSequence = ds.GetDataElement( gdcm::Tag( 0x0400,0x0500 ) );
  gdcm::SequenceOfItems *sqi = EncryptedAttributesSequence.GetValueAsSQ();
  if ( !sqi || sqi->GetNumberOfItems() != 1 ) return 1;
  gdcm::Item &item = sqi->GetItem(1);
  gdcm::DataSet &nestedds = item.GetNestedDataSet();
  if( ! nestedds.FindDataElement( gdcm::Tag( 0x0400,0x0520) ) ) return 1;
  const gdcm::DataElement &EncryptedContent = nestedds.GetDataElement( gdcm::Tag( 0x0400,0x0520) );
  const gdcm::ByteValue *bv = EncryptedContent.GetByteValue();
  std::ofstream of( outfilename, std::ios::binary );
  of.write( bv->GetPointer(), bv->GetLength() );
  of.close();
  return 0;
}
```

12.63 ExtractIconFromFile.cxx

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * This example shows how to either retrieve an Icon if present somewhere
 * in the file, or else generate one.
 */
#include "gdcmImageReader.h"
#include "gdcmPNMCodec.h"
#include "gdcmIconImageFilter.h"
#include "gdcmIconImageGenerator.h"
bool WriteIconAsPNM(const char* filename, const gdcm::IconImage& icon)
{
  gdcm::PNMCodec pnm;
  pnm.SetDimensions( icon.GetDimensions() );
  pnm.SetPixelFormat( icon.GetPixelFormat() );
  pnm.SetPhotometricInterpretation( icon.GetPhotometricInterpretation() );
  pnm.SetLUT( icon.GetLUT() );
  const gdcm::DataElement& in = icon.GetDataElement();
```

```
  bool b = pnm.Write( filename, in );
  assert( b );
  return b;
}
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read (or not image): " « filename « std::endl;
    return 1;
    }
  gdcm::IconImageFilter iif;
  iif.SetFile( reader.GetFile() );
  bool b = iif.Extract();
  if( b )
    {
    const gdcm::IconImage &icon = iif.GetIconImage(0);
    icon.Print( std::cout );
    if( !icon.GetTransferSyntax().IsEncapsulated() )
      {
      // Let's write out this icon as PNM file
      WriteIconAsPNM("icon.ppm", icon);
      }
    else if( icon.GetTransferSyntax() == gdcm::TransferSyntax::JPEGBaselineProcess1
      || icon.GetTransferSyntax() == gdcm::TransferSyntax::JPEGExtendedProcess2_4
    )
      {
      const gdcm::DataElement& in = icon.GetDataElement();
      const gdcm::ByteValue *bv = in.GetByteValue();
      assert( bv );
      std::ofstream out( "icon.jpg", std::ios::binary );
      out.write( bv->GetPointer(), bv->GetLength() );
      out.close();
      }
    }
  else
    {
    assert( iif.GetNumberOfIconImages() == 0 );
    std::cerr « "No Icon Found anywhere in file" « std::endl;
    const gdcm::Image &img = reader.GetImage();
    gdcm::IconImageGenerator iig;
    iig.AutoPixelMinMax(true);
    iig.SetPixmap( img );
    const unsigned int idims[2] = { 64, 64 };
    iig.SetOutputDimensions( idims );
    //iig.SetPixelMinMax(60, 868);
    if( !iig.Generate() ) return 1;
    const gdcm::IconImage & icon = iig.GetIconImage();
    WriteIconAsPNM("icon.ppm", icon);
    }
  return 0;
}
```

12.64 Extracting_All_Resolution.cxx

```
/*=========================================================================

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
// This work was realised during the GSOC 2011 by Manoj Alwani
#include <fstream>
#include <stdint.h>
#include <string.h>
#include <assert.h>
```

```
#include <gdcm_j2k.h>
#include <gdcm_jp2.h>
#include<iostream>
#include <cstring>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <math.h>
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmSystem.h"
#include <fstream>
#include "gdcm_openjpeg.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"
void error_callback(const char *msg, void *) {
  (void)msg;
}
void warning_callback(const char *msg, void *) {
  (void)msg;
}
void info_callback(const char *msg, void *) {
  (void)msg;
}
bool Write_Resolution(gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res, std::ostream&
      of, int flag,  gdcm::SequenceOfItems *sq, int No_Of_Resolutions)
{
  std::ifstream is;
  is.open( filename, std::ios::binary );
  opj_dparameters_t parameters;  /* decompression parameters */
  opj_event_mgr_t event_mgr;    /* event manager */
  opj_dinfo_t* dinfo;  /* handle to a decompressor */
  opj_cio_t *cio;
  opj_image_t *image = NULL;
  // FIXME: Do some stupid work:
  is.seekg( 0, std::ios::end);
  std::streampos buf_size = is.tellg();
  char *dummy_buffer = new char[(unsigned int)buf_size];
  is.seekg(0, std::ios::beg);
  is.read( dummy_buffer, buf_size);
  unsigned char *src = (unsigned char*)dummy_buffer;
  uint32_t file_length = (uint32_t)buf_size; // 32bits truncation should be ok since DICOM cannot have larger
       than 2Gb image
  /* configure the event callbacks (not required) */
  memset(&event_mgr, 0, sizeof(opj_event_mgr_t));
  event_mgr.error_handler = error_callback;
  event_mgr.warning_handler = warning_callback;
  event_mgr.info_handler = info_callback;
  /* set decoding parameters to default values */
  opj_set_default_decoder_parameters(&parameters);
  // default blindly copied
  parameters.cp_layer=0;
  parameters.cp_reduce= res;
  //   parameters.decod_format=-1;
  //   parameters.cod_format=-1;
  const char jp2magic[] = "\x00\x00\x00\x0C\x6A\x50\x20\x20\x0D\x0A\x87\x0A";
  if( memcmp( src, jp2magic, sizeof(jp2magic) ) == 0 )
    {
    /* JPEG-2000 compressed image data ... sigh */
    // gdcmData/ELSCINT1_JP2vsJ2K.dcm
    // gdcmData/MAROTECH_CT_JP2Lossy.dcm
    //gdcmWarningMacro( "J2K start like JPEG-2000 compressed image data instead of codestream" );
    parameters.decod_format = 1; //JP2_CFMT;
    //assert(parameters.decod_format == JP2_CFMT);
    }
  else
    {
    /* JPEG-2000 codestream */
    //parameters.decod_format = J2K_CFMT;
    //assert(parameters.decod_format == J2K_CFMT);
```

```
    assert( 0 );
    }
  parameters.cod_format = 11; // PGX_DFMT;
  //assert(parameters.cod_format == PGX_DFMT);
  /* get a decoder handle */
    dinfo = opj_create_decompress(CODEC_JP2);
  /* catch events using our callbacks and give a local context */
  opj_set_event_mgr((opj_common_ptr)dinfo, &event_mgr, NULL);
  /* setup the decoder decoding parameters using user parameters */
  opj_setup_decoder(dinfo, &parameters);
  /* open a byte stream */
  cio = opj_cio_open((opj_common_ptr)dinfo, src, file_length);
  /* decode the stream and fill the image structure */
  image = opj_decode(dinfo, cio);
  if(!image) {
    opj_destroy_decompress(dinfo);
    opj_cio_close(cio);
    //gdcmErrorMacro( "opj_decode failed" );
    return 1;
  }
       opj_cp_t * cp = ((opj_jp2_t*)dinfo->jp2_handle)->j2k->cp;
       opj_tcp_t *tcp = &cp->tcps[0];
       opj_tccp_t *tccp = &tcp->tccps[0];
    /*   std::cout « "\n No of Cols In Image" « image->x1;
       std::cout « "\n No of Rows In Image" « image->y1;
       std::cout « "\n No of Components in Image" « image->numcomps;
       std::cout « "\n No of Resolutions"« tccp->numresolutions « "\n";
*/
        opj_j2k_t* j2k = NULL;
        opj_jp2_t* jp2 = NULL;
        jp2 = (opj_jp2_t*)dinfo->jp2_handle;
        int reversible = jp2->j2k->cp->tcps->tccps->qmfbid;
        //std:: cout « reversible;
       int compno = 0;
       opj_image_comp_t *comp = &image->comps[compno];
       int Dimensions[2];
       Dimensions[0]= comp->w;
       Dimensions[1] = comp->h;
       opj_cio_close(cio);
       unsigned long len = Dimensions[0]*Dimensions[1] * image->numcomps;
       //std::cout « "\nTest" «image->comps[0].factor;
       char *raw = new char[len];
  for (unsigned int compno = 0; compno < (unsigned int)image->numcomps; compno++)
    {
    opj_image_comp_t *comp = &image->comps[compno];
    int w = image->comps[compno].w;
    int h = image->comps[compno].h;
      uint8_t *data8 = (uint8_t*)raw + compno;
      for (int i = 0; i < w * h ; i++)
        {
        int v = image->comps[compno].data[i];
        *data8 = (uint8_t)v;
        data8 += image->numcomps;
        }
    }
  gdcm::Writer w;
  gdcm::File &file = w.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( gdcm::VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, strlen(u) );
  ds.Insert( de );
  gdcm::DataElement de1( gdcm::Tag(0x8,0x16) );
  de1.SetVR( gdcm::VR::UI );
  gdcm::MediaStorage ms( gdcm::MediaStorage::CTImageStorage );
  de1.SetByteValue( ms.GetString(), strlen(ms.GetString()));
  ds.Insert( de1 );
  const char mystr[] = "MONOCHROME2 ";
  gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
  //de.SetTag(gdcm::Tag(0x28,0x04));
  de2.SetVR( gdcm::VR::CS );
  de2.SetByteValue(mystr, strlen(mystr));
  ds.Insert( de2 );
   gdcm::Attribute<0x0028,0x0010> row = {image->comps[0].w};
   //row.SetValue(512);
   ds.Insert( row.GetAsDataElement() );
 //  w.SetCheckFileMetaInformation( true );
   gdcm::Attribute<0x0028,0x0011> col = {image->comps[0].h};
```

```
  ds.Insert( col.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
  ds.Insert( Number_Of_Frames.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0100> at = {8};
  ds.Insert( at.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0002> at1 = {image->numcomps};
  ds.Insert( at1.GetAsDataElement() );
 gdcm::Attribute<0x0028,0x0101> at2 = {8};
  ds.Insert( at2.GetAsDataElement() );
 gdcm::Attribute<0x0028,0x0102> at3 = {7};
 ds.Insert( at3.GetAsDataElement() );
 if (flag == 1)
 {
   for (int i=0; i < No_Of_Resolutions; i++)
   {
    int a = 1;
    int b =1;
    while(a!=((No_Of_Resolutions)-i))
       {
         b = b*2;
         a = a+1;
       }
    uint16_t row = (image->y1)/b;
    uint16_t col = (image->x1)/b;
    //std::cout « row;
    gdcm::Element<gdcm::VR::IS,gdcm::VM::VM1> el2;
    el2.SetValue(i+1);
    gdcm::DataElement rfn = el2.GetAsDataElement();     //ulr --> upper left row
    rfn.SetTag( gdcm::Tag(0x0008,0x1160) );
    gdcm::Element<gdcm::VR::US,gdcm::VM::VM2> el;
    el.SetValue(1,0);
    el.SetValue(1,1);
    gdcm::DataElement ulr = el.GetAsDataElement();     //ulr --> upper left col/row
    ulr.SetTag( gdcm::Tag(0x0048,0x0201) );
    gdcm::Element<gdcm::VR::US,gdcm::VM::VM2> el1;
    el1.SetValue(col,0);
    el1.SetValue(row,1);
    gdcm::DataElement brr = el1.GetAsDataElement();
    brr.SetTag( gdcm::Tag(0x0048,0x0202) );            //brr --> bottom right col/row
   gdcm::Item it;
   gdcm::DataSet &nds = it.GetNestedDataSet();
   nds.Insert( rfn );
   nds.Insert(ulr);
   nds.Insert(brr);
   sq->AddItem(it);
 }
 gdcm::Writer w1;
 gdcm::File &file1 = w1.GetFile();
 gdcm::DataSet &ds1 = file1.GetDataSet();
 file1.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
 gdcm::UIDGenerator uid1;
 gdcm::DataElement dea( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
 dea.SetVR( gdcm::VR::UI );
 const char *u1 = uid1.Generate();
 dea.SetByteValue( u1, strlen(u1) );
 ds1.Insert( dea );
 gdcm::DataElement deb( gdcm::Tag(0x8,0x16) );
 deb.SetVR( gdcm::VR::UI );
 gdcm::MediaStorage ms1( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
 deb.SetByteValue( ms1.GetString(), strlen(ms1.GetString()));
 ds1.Insert( deb );
 const char mystr1[] = "MONOCHROME2 ";
 gdcm::DataElement dec( gdcm::Tag(0x28,0x04) );
 //de.SetTag(gdcm::Tag(0x28,0x04));
 dec.SetVR( gdcm::VR::CS );
 dec.SetByteValue(mystr, strlen(mystr1));
 ds1.Insert( dec );
  gdcm::Attribute<0x0028,0x0010> row1 = {image->y1};
  //row.SetValue(512);
  ds1.Insert( row1.GetAsDataElement() );
//  w.SetCheckFileMetaInformation( true );
  gdcm::Attribute<0x0028,0x0011> col1 = {image->x1};
  ds1.Insert( col1.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0008> Number_Of_Frames1 = {tccp->numresolutions};
  ds1.Insert( Number_Of_Frames1.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0100> ata = {8};
  ds1.Insert( ata.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0002> atb = {image->numcomps};
  ds1.Insert( atb.GetAsDataElement() );
 gdcm::Attribute<0x0028,0x0101> atc = {8};
  ds1.Insert( atc.GetAsDataElement() );
```

```
  gdcm::Attribute<0x0028,0x0102> atd = {7};
  ds1.Insert( atd.GetAsDataElement() );
   theStreamWriter.SetFile(file1);
  gdcm::DataElement des( gdcm::Tag(0x0048,0x0200) );
  des.SetVR(gdcm::VR::SQ);
  //des.SetVR(gdcm::VM::VM1);
  des.SetValue(*sq);
  des.SetVLToUndefined();
  ds1.Insert(des);
  if (!theStreamWriter.WriteImageInformation()){
      std::cerr « "unable to write image information" « std::endl;
      return 1; //the CanWrite function should prevent getting here, else,
      //that's a test failure
    }
 }
   theStreamWriter.SetFile(file);
  if (!theStreamWriter.CanWriteFile()){
      delete [] raw;
      std::cout « "Not able to write";
      return 0;//this means that the file was unwritable, period.
      //very similar to a ReadImageInformation failure
    }
else
   std::cout«"\nabletoread";
 // Important to write here
 std::vector<unsigned int> extent = gdcm::ImageHelper::GetDimensionsValue(file);
    unsigned short xmax = extent[0];
    unsigned short ymax = extent[1];
    unsigned short theChunkSize = 4;
    unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
    unsigned short zmax = extent[2];
    std::cout « "\n"«xmax « "\n" « ymax«"\n"«zmax«"\n" « image->numcomps«"\n";
    if (xmax == 0 || ymax == 0)
      {
      std::cerr « "Image has no size, unable to write zero-sized image." « std::endl;
      return 0;
      }
    int z, y, nexty;
    unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
    //the bytes sequentially.  So, store how far you got in the buffer with each iteration.
    for (z = 0; z < zmax; ++z){
      for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout « "\n" «len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(raw[prevLen]), len);
        std::cout « "\nable to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
          std::cerr « "writing failure:" « "output.dcm" « " at y = " « y « " and z= " « z « std::endl;
          delete [] raw;
          delete [] finalBuffer;
          return 1;
        }
        delete [] finalBuffer;
        prevLen += len;
      }
    }
    delete raw;
  delete[] src;  //FIXME
if(dinfo) {
    opj_destroy_decompress(dinfo);
  }
 opj_image_destroy(image);
 return true;
}
bool Different_Resolution( gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res,
       std::ostream& of)
{
  //std::vector<std::string>::const_iterator it = filenames.begin();
  bool b = true;
  int flag = 1;
 gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
 sq->SetLengthToUndefined();
  for(int i = res-1 ; i>=0; --i)
  {
    b = b && Write_Resolution( theStreamWriter, filename, i, of ,flag,sq,res);
   // b = b && Get_Resolution( theStreamWriter, filename, i, of ,0);
    flag = 0;
```

```
  }
  //b = b && Get_Lowest_Resolution( writer, sq, filename, res-1 );
  //b = b && PopulateSingeFile( writer, sq, jpeg, filename2 );
  //image.SetDimension(2,  res )
  return b;
}
int main(int argc, char *argv[])
{
   if( argc < 4 )
    {
    std::cerr « argv[0] « " input.jp2 output.dcm No. Of Resolutions " « std::endl;
    return 1;
    }
   const char *filename = argv[1];
  const char *outfilename = argv[2];
  char *resolutions = argv[3];
   int res = int((*resolutions)-48);
    //std:: cout « "\nres"« res;
   gdcm::StreamImageWriter theStreamWriter;
   std::ofstream of;
   of.open( outfilename, std::ios::out | std::ios::binary );
   theStreamWriter.SetStream(of);
   if( !Different_Resolution( theStreamWriter, filename,res,of ) ) return 1;
 uint16_t firstTag1 =  0xfffe;
 uint16_t secondTag1 = 0xe0dd;
 uint32_t thirdTag1 =  0x00000000;
 //uint16_t fourthTag1 = 0xffff;
 const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
 char* tmpBuffer2 = new char[theBufferSize1];
 memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
 memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
 memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
 //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
 assert( of && !of.eof() && of.good() );
 of.write(tmpBuffer2, theBufferSize1);
 of.flush();
 assert( of );
return 0;
}
```

12.65 Fake_Image_Using_Stream_Image_Writer.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
// This work was realised during the GSOC 2011 by Manoj Alwani
#include "gdcmReader.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"
int main(int, char *[])
{
  char * buffer = new char[ 256 * 256 *3 ];
  // *p = (uint8_t*)buffer;
  char * p = buffer;
  gdcm::Trace::DebugOn();
  gdcm::Trace::WarningOn();
```

```
  for(int row = 0; row < 256; ++row)
  {
    for(int col = 0; col < 256; ++col)
      //for(int b = 0; b < 256; ++b)
      {
        *p++ = 255;
        *p++ = 0;
        *p++ = 0;
       }
  }
  gdcm::Writer w;
  gdcm::File &file = w.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( gdcm::VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, strlen(u) );
  ds.Insert( de );
  gdcm::DataElement de1( gdcm::Tag(0x8,0x16) );
  de1.SetVR( gdcm::VR::UI );
  gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
  de1.SetByteValue( ms.GetString(), strlen(ms.GetString()));
  ds.Insert( de1 );
  const char mystr[] = "RGB";
  gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
  //de.SetTag(gdcm::Tag(0x28,0x04));
  de2.SetVR( gdcm::VR::CS );
  de2.SetByteValue(mystr, strlen(mystr));
  ds.Insert( de2 );
   gdcm::Attribute<0x0028,0x0010> row = {256};
   //row.SetValue(512);
   ds.Insert( row.GetAsDataElement() );
//  w.SetCheckFileMetaInformation( true );
   gdcm::Attribute<0x0028,0x0011> col = {256};
   ds.Insert( col.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
   ds.Insert( Number_Of_Frames.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0100> at = {8};
   ds.Insert( at.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0002> at1 = {3}; //bits per pixel
   ds.Insert( at1.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0101> at2 = {8};
   ds.Insert( at2.GetAsDataElement() );
  gdcm::Attribute<0x0028,0x0102> at3 = {7};
   ds.Insert( at3.GetAsDataElement() );
 gdcm::Attribute<0x0028,0x006> at4 = {0};
 ds.Insert( at4.GetAsDataElement() );
 gdcm::Attribute<0x0028,0x0103> at5 = {0};
 ds.Insert( at5.GetAsDataElement() );
 //de.SetTag(gdcm::Tag(0x7fe0,0x0010));
 //ds.Insert(de);
  gdcm::StreamImageWriter theStreamWriter;
gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
 sq->SetLengthToUndefined();
     uint16_t row1 = 256;
     uint16_t col1 = 256;
     //std::cout « row;
     gdcm::Element<gdcm::VR::IS,gdcm::VM::VM1> el2;
     el2.SetValue(1);
     gdcm::DataElement rfn = el2.GetAsDataElement();     //rfn ---> reference frame number
     rfn.SetTag( gdcm::Tag(0x0008,0x1160) );
     gdcm::Element<gdcm::VR::US,gdcm::VM::VM2> el;
     el.SetValue(1,0);
     el.SetValue(1,1);
     gdcm::DataElement ulr = el.GetAsDataElement();     //ulr --> upper left col/row
     ulr.SetTag( gdcm::Tag(0x0048,0x0201) );
     gdcm::Element<gdcm::VR::US,gdcm::VM::VM2> el1;
     el1.SetValue(col1,0);
     el1.SetValue(row1,1);
     gdcm::DataElement brr = el1.GetAsDataElement();
     brr.SetTag( gdcm::Tag(0x0048,0x0202) );            //brr --> bottom right col/row
    gdcm::Item it;
    gdcm::DataSet &nds = it.GetNestedDataSet();
    nds.Insert( rfn );
    nds.Insert(ulr);
    nds.Insert(brr);
    sq->AddItem(it);
  gdcm::DataElement des( gdcm::Tag(0x0048,0x0200) );
  des.SetVR(gdcm::VR::SQ);
```

```
  des.SetValue(*sq);
  des.SetVLToUndefined();
  ds.Insert(des);
 theStreamWriter.SetFile(file);
  std::ofstream of;
  of.open( "output.dcm", std::ios::out | std::ios::binary );
  theStreamWriter.SetStream(of);
if (!theStreamWriter.CanWriteFile()){
      delete [] buffer;
      std::cout « "Not able to write";
      return 0;//this means that the file was unwritable, period.
      //very similar to a ReadImageInformation failure
    }
else
   std::cout«"\nabletoread";
if (!theStreamWriter.WriteImageInformation()){
      std::cerr « "unable to write image information" « std::endl;
      delete [] buffer;
      return 1; //the CanWrite function should prevent getting here, else,
      //that's a test failure
    }
 std::vector<unsigned int> extent =
      gdcm::ImageHelper::GetDimensionsValue(file);
    unsigned short xmax = extent[0];
    unsigned short ymax = extent[1];
    unsigned short theChunkSize = 1;
    unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
    unsigned short zmax = extent[2];
    std::cout « xmax « ymax « zmax;
    if (xmax == 0 || ymax == 0)
      {
      std::cerr « "Image has no size, unable to write zero-sized image." « std::endl;
      return 0;
      }
    int z, y, nexty;
    unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
    //the bytes sequentially.  So, store how far you got in the buffer with each iteration.
    for (z = 0; z < zmax; ++z){
      for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout « "\n" «len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(buffer[prevLen]), len);
        std::cout « "\nable to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
          std::cerr « "writing failure:" « "output.dcm" « " at y = " « y « " and z= " « z « std::endl;
          delete [] buffer;
          delete [] finalBuffer;
          return 1;
        }
        delete [] finalBuffer;
        prevLen += len;
      }
    }
    delete buffer;
 uint16_t firstTag1 =  0xfffe;
 uint16_t secondTag1 = 0xe0dd;
 uint32_t thirdTag1 =  0x00000000;
 //uint16_t fourthTag1 = 0xffff;
 const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
 char* tmpBuffer2 = new char[theBufferSize1];
 memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
 memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
 memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
 //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
 assert( of && !of.eof() && of.good() );
 of.write(tmpBuffer2, theBufferSize1);
 of.flush();
 assert( of );
  return 0;
}
```

12.66 FixBrokenJ2K.cxx

```
/*=========================================================================
```

```
  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmFile.h"
// http://www.lost.in.ua/dicom/c.dcm
//
// -> BuggyJ2Kvvvua-fixed2-j2k.dcm
/*
 * This program attemps to fix a broken J2K/DICOM:
 * It contains 2 bugs:
 * 1. The first 8 bytes seems to be random bytes: remove them
 * 2. YCC is set to 1, while image is grayscale need to set it back to 0
 *
 * Ref:
 * It's a software from http://rentgenprom.ru/ , shipped with universal digital radiographic units
 * "ProScan-2000". The Ukrainian manufacturer developed own digital radiographic unit and it is
 * compatible with software from "ProScan-2000".
 * Information found in DICOM file is:
 *
 * (0008,0070) LO [ZAO "Renthenprom" (JSC Rentgenprom) ]             # 36,1 Manufacturer
 * (0018,1020) LO [2.13.1.7]                                         # 8,1-n Software Version(s)
 *
 */
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  const gdcm::DataElement &pixeldata0 = file.GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010) );
  const gdcm::SequenceOfFragments *sqf = pixeldata0.GetSequenceOfFragments();
  if( !sqf )
    {
    return 1;
    }
  const gdcm::Fragment &frag0 = sqf->GetFragment(0);
  gdcm::ByteValue *bv = const_cast<gdcm::ByteValue*>(frag0.GetByteValue());
  char *ptr = (char*)bv->GetVoidPointer();
  size_t len = bv->GetLength();
  static const unsigned char sig[] = {0,0,0,0,0x6A,0x70,0x32,0x63};
  if( memcmp(ptr, sig, sizeof(sig)) != 0 )
    {
    std::cerr « "magic random signature not found" « std::endl;
    return 1;
    }
  // Apparently the flag to enable a color transform on 3 color components is set in
  // the COD marker. (YCC is byte[6] in the COD marker)
  // we need to disable this flag;
  char *cod_marker = ptr + 0x35; /* 0x2d + 0x8 */ // FIXME
  if( cod_marker[0] == (char)0xff && cod_marker[1] == 0x52 )
    {
    // found start of COD
    if( cod_marker[6+2] == 1 )
      {
      // Change in place:
      *((char*)cod_marker + 6+2) = 0;
      // Prepare a new DataElement:
      gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
```

```
      pixeldata.SetVR( gdcm::VR::OB );
      gdcm::SmartPointer<gdcm::SequenceOfFragments> sq = new gdcm::SequenceOfFragments;
      gdcm::Fragment frag;
      // remove 8 first bytes:
      frag.SetByteValue( ptr + 8, (uint32_t)(len - 8) );
      sq->AddFragment( frag );
      pixeldata.SetValue( *sq );
      file.GetDataSet().Replace( pixeldata );
      }
    else
      {
      return 1;
      }
    }
  else
    {
    std::cerr « "COD not found" « (int)cod_marker[0] « std::endl;
    return 1;
    }
  gdcm::Writer writer;
  writer.SetFile( reader.GetFile() );
  writer.SetFileName( outfilename );
  writer.CheckFileMetaInformationOff();
  if( !writer.Write() )
    {
    std::cerr « "Could not write" « std::endl;
    }
  // paranoid check:
  gdcm::ImageReader ireader;
  ireader.SetFileName( outfilename );
  if( !ireader.Read() )
    {
    std::cerr « "file written is still not valid, please report" « std::endl;
    return 1;
    }
  return 0;
}
```

12.67 FixJAIBugJPEGLS.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"
#include <fstream>
#include "gdcm_charls.h"
/*
 * This small example should show how one can handle the famous JAI-JPEGLS bug
 * It will take in as invalid DICOM/JAI-JPEG-LS and write out as Explicit Little
 * Endian. One can use `gdcmconv --jpegls` to recompress properly
 *
 * References:
 * http://charls.codeplex.com/discussions/230307?ProjectName=charls
 * http://charls.codeplex.com/workitem/7297
 * http://www.dcm4che.org/jira/browse/DCM-442
 * http://www.dcm4che.org/jira/browse/DCMEE-1144
 * http://java.net/jira/browse/JAI_IMAGEIO_CORE-183
 *
 * Explanation of the issue:
 *
 * Seems, the error is in the calculation of the default values for thresholds T1,
 * T2, T3, in particular min(MAXVAL, 4095) is not applied in
 *
 * FACTOR = (min(MAXVAL, 4095) + 128)/256
 *
```

```
 * as specified in http://www.itu.int/rec/T-REC-T.87-199806-I/en .
 *
 */
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::FileMetaInformation::SetSourceApplicationEntityTitle( "FixJAIBugJPEGLS" );
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::Image &image = reader.GetImage();
  //unsigned long len = image.GetBufferLength();
  const gdcm::DataElement & in =
    reader.GetFile().GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010) );
  const gdcm::SequenceOfFragments *sf = in.GetSequenceOfFragments();
  if( !sf )
    {
    std::cerr « "No pixel data (or not encapsulated)" « std::endl;
    return 1;
    }
  const unsigned int *dims = image.GetDimensions();
  if ( sf->GetNumberOfFragments() != dims[2] )
    {
    std::cerr « "Unsupported" « std::endl;
    return 1;
    }
//  unsigned long totalLen = sf->ComputeByteLength();
  std::vector<unsigned char> rgbyteOutall;
  for(unsigned int i = 0; i < sf->GetNumberOfFragments(); ++i)
    {
    const gdcm::Fragment &frag = sf->GetFragment(i);
    if( frag.IsEmpty() ) return 1;
    const gdcm::ByteValue *bv = frag.GetByteValue();
    if( !bv ) return 1;
    unsigned long totalLen = bv->GetLength();
    std::vector<char> vbuffer;
    vbuffer.resize( totalLen );
    char *buffer = &vbuffer[0];
    bv->GetBuffer(buffer, totalLen);
    const unsigned char* pbyteCompressed0 = (const unsigned char*)buffer;
    while( totalLen > 0 && pbyteCompressed0[totalLen-1] != 0xd9 )
      {
      totalLen--;
      }
    JlsParameters metadata;
    char errorMsg[256+1]={'\0'};
    if (JpegLsReadHeader(buffer, totalLen, &metadata, errorMsg) != charls::ApiResult::OK)
      {
      std::cerr « "Cant parse jpegls: " « errorMsg « std::endl;
      return 1;
      }
    std::cout « metadata.width « std::endl;
    std::cout « metadata.height « std::endl;
    std::cout « metadata.bitsPerSample « std::endl;
    gdcm::PixelFormat const & pf = image.GetPixelFormat();
    std::cout « pf « std::endl;
    // http://charls.codeplex.com/discussions/230307?ProjectName=charls
    unsigned char marker_lse_13[] = {
      0xFF, 0xF8, 0x00, 0x0D,
      0x01,
      0x1F, 0xFF,
      0x00, 0x22,  // T1 = 34
      0x00, 0x83,  // T2 = 131
      0x02, 0x24,  // T3 = 548
      0x00, 0x40
    };
    unsigned char marker_lse_14[] = {
      0xFF, 0xF8, 0x00, 0x0D,
      0x01,
      0x3F, 0xFF,
      0x00, 0x42, // T1 = 66
      0x01, 0x03, // T2 = 259
```

```
      0x04, 0x44, // T3 = 1092
      0x00, 0x40
    };
    unsigned char marker_lse_15[] = {
      0xFF, 0xF8, 0x00, 0x0D,
      0x01,
      0x7F, 0xFF,
      0x00, 0x82, // T1 = 130
      0x02, 0x03, // T2 = 515
      0x08, 0x84, // T3 = 2180
      0x00, 0x40
    };
    unsigned char marker_lse_16[] = {
      0xFF, 0xF8, 0x00, 0x0D,
      0x01,
      0xFF, 0xFF,
      0x01, 0x02, // T1 = 258
      0x04, 0x03, // T2 = 1027
      0x11, 0x04, // T3 = 4356
      0x00, 0x40
    };
    const unsigned char *marker_lse = nullptr;
    switch( metadata.bitsPerSample )
      {
    case 13:
      marker_lse = marker_lse_13;
      break;
    case 14:
      marker_lse = marker_lse_14;
      break;
    case 15:
      marker_lse = marker_lse_15;
      break;
    case 16:
      marker_lse = marker_lse_16;
      break;
      }
    if( !marker_lse )
      {
      std::cerr « "Cant handle: " « metadata.bitsPerSample « std::endl;
      return 1;
      }
    // FIXME: One should recompute the value for 0x0F
    vbuffer.insert (vbuffer.begin() + 0x0F, marker_lse, marker_lse+15);
#if 0
    std::ofstream of( "/tmp/d.jls", std::ios::binary );
    of.write( &vbuffer[0], vbuffer.size() );
    of.close();
#endif
    const char *pbyteCompressed = &vbuffer[0];
    size_t cbyteCompressed = vbuffer.size(); // updated legnth
    JlsParameters params;
    JpegLsReadHeader(pbyteCompressed, cbyteCompressed, &params, nullptr);
    std::vector<unsigned char> rgbyteOut;
    //rgbyteOut.resize( image.GetBufferLength() );
    rgbyteOut.resize(params.height *params.width * ((params.bitsPerSample + 7)
        / 8) * params.components);
    CharlsApiResultType result =
      JpegLsDecode(&rgbyteOut[0], rgbyteOut.size(), pbyteCompressed, cbyteCompressed, &params, errorMsg );
    if (result != charls::ApiResult::OK)
      {
      std::cerr « "Could not patch JAI-JPEGLS: " « errorMsg « std::endl;
      return 1;
      }
    rgbyteOutall.insert( rgbyteOutall.end(), rgbyteOut.begin(), rgbyteOut.end() );
    }
  gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
  pixeldata.SetVR( gdcm::VR::OW );
  pixeldata.SetByteValue( (char*)&rgbyteOutall[0], (uint32_t)rgbyteOutall.size() );
  // Add the pixel data element
  reader.GetFile().GetDataSet().Replace( pixeldata );
  reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
  gdcm::Writer writer;
  writer.SetFileName( outfilename );
  writer.SetFile( reader.GetFile() );
  writer.Write();
  std::cout « "Success !" « std::endl;
  return 0;
}
```

12.68 FixOrientation.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmFile.h"
#include "gdcmOrientation.h"
#include "gdcmAttribute.h"
// Very simple orientation changer, fix invalid dataset
int main(int argc, char* argv[] )
{
  // assume AXIAL input for now
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if (! reader.Read() )
    {
    return 1;
    }
  const double axial[] = { 1,0,0, 0,1,0 };
  (void)axial;
  const double coronal[] = { 0,0,1, 1,0,0 };
  (void)coronal;
  const double sagittal[] = { 0,1,0, 0,0,1 };
  (void)sagittal;
  gdcm::Attribute<0x0020,0x0032> at1; // IPP
  (void)at1;
  gdcm::Attribute<0x0020,0x0037> at2; // IOP
  (void)at2;
  gdcm::File & f = reader.GetFile();
  gdcm::DataSet & ds = f.GetDataSet();
  at1.SetFromDataSet( ds );
#if 0
  at2.SetFromDataSet( ds );
  const double * iop = at2.GetValues();
  if( !std::equal(iop, iop + 6, axial ) )
  {
    gdcm::Orientation::OrientationType type = gdcm::Orientation::GetType ( iop );
    std::cerr « "Wrong orientation: " « gdcm::Orientation::GetLabel( type ) « std::endl;
    return 1;
  }
  at2.SetValues( sagittal );
  ds.Replace( at2.GetAsDataElement() );
#endif
  // for sagittal: swap element 0 & 2
  const double tmp0 = at1.GetValue(0);
  const double tmp2 = at1.GetValue(2);
  (void)tmp2;
  //at1.SetValue(tmp2, 0);
  //at1.SetValue(tmp0, 2);
  at1.SetValue( - tmp0 );
  ds.Replace( at1.GetAsDataElement() );
  gdcm::Writer writer;
  writer.SetFile( f );
  writer.SetFileName( outfilename );
  if ( !writer.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.69 GenAllVR.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDummyValueGenerator.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmDicts.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFileExplicitFilter.h"
#include <cstdlib>
#include <cstring>
gdcm::Tag FindTagFromVR(gdcm::Dict const &dict, gdcm::VR const &vr)
{
  using gdcm::Dict;
  Dict::ConstIterator beg = dict.Begin();
  Dict::ConstIterator end = dict.End();
  Dict::ConstIterator it;
  for( it = beg; it != end; ++it)
    {
    const gdcm::Tag &t = it->first;
    const gdcm::DictEntry &de = it->second;
    const gdcm::VR &vr_de = de.GetVR();
    if( vr == vr_de && !de.GetRetired() && t.GetGroup() >= 0x8 )
      {
      return t;
      }
    }
  return gdcm::Tag(0xffff,0xffff);
}
struct rnd_gen {
  rnd_gen(char const* r = "abcdefghijklmnopqrstuvwxyz0123456789")
    : range(r), len(std::strlen(r)) { }
  char operator ()() const {
    return range[static_cast<std::size_t>(std::rand() * (1.0 / ((double)RAND_MAX + 1.0 )) * (double)len)];
  }
private:
  char const* range;
  std::size_t len;
};
/*
 */
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " output.dcm" « std::endl;
    return 1;
    }
  const char *outfilename = argv[1];
  static const gdcm::Global &g = gdcm::Global::GetInstance();
  static const gdcm::Dicts &dicts = g.GetDicts();
  static const gdcm::Dict &pubdict = dicts.GetPublicDict();
  using gdcm::VR;
  using gdcm::Tag;
  gdcm::Writer w;
  gdcm::File &f = w.GetFile();
  gdcm::DataSet &ds = f.GetDataSet();
  gdcm::FileExplicitFilter fef;
```

```
  //fef.SetChangePrivateTags( true );
  fef.SetFile( w.GetFile() );
  if( !fef.Change() )
    {
    std::cerr « "Failed to change" « std::endl;
    return 1;
    }
  gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
  sq->SetLengthToUndefined();
//  gdcm::DummyValueGenerator dvg;
  const std::size_t len = 10;
  char ss[len+1];
  ss[len] = '\0';
  const char owner_str[] = "GDCM CONFORMANCE TESTS";
  gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
  owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
  owner.SetVR( gdcm::VR::LO );
  // Create an item
  gdcm::Item it;
  it.SetVLToUndefined();
  gdcm::DataSet &nds = it.GetNestedDataSet();
  //    nds.Insert(owner);
  //    nds.Insert(de);
  // Insert sequence into data set
  gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
  des.SetVR(gdcm::VR::SQ);
  des.SetValue(*sq);
  des.SetVLToUndefined();
  ds.Insert(owner);
  ds.Insert(des);
  // avoid INVALID = 0
  for(int i = 1; i < 27; ++i)
    {
    VR vr = (VR::VRType)(1LL « i);
    Tag t = FindTagFromVR( pubdict, vr );
    if( vr != VR::UN && vr != VR::SQ )
      {
      assert( t != Tag(0xffff,0xffff) );
      gdcm::DataElement de( t );
      std::generate_n(ss, len, rnd_gen());
      de.SetVR( vr );
      de.SetByteValue( ss, (uint32_t)std::strlen( ss ) );
      nds.Insert( de );
      }
    }
  sq->AddItem(it);
  // Make sure to override any UID stuff
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, (uint32_t)strlen(u) );
  ds.Insert( de );
  de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
  de.SetVR( VR::UI );
  gdcm::MediaStorage ms( gdcm::MediaStorage::RawDataStorage );
  de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()));
  ds.Insert( de );
  gdcm::FileMetaInformation &fmi = f.GetHeader();
  //fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
  fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.70 GenFakeIdentifyFile.cxx

```
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```

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDummyValueGenerator.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmDicts.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include <cstdlib>
#include <cstring>
gdcm::DataElement CreateFakeElement(gdcm::Tag const &tag, bool toremove)
{
  static const gdcm::Global &g = gdcm::Global::GetInstance();
  static const gdcm::Dicts &dicts = g.GetDicts();
  static const gdcm::Dict &pubdict = dicts.GetPublicDict();
  static size_t countglobal = 0;
  static std::vector<gdcm::Tag> balcptags =
    gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
  size_t count = countglobal % balcptags.size();
  const gdcm::DictEntry &dictentry = pubdict.GetDictEntry(tag);
  gdcm::DataElement de;
  de.SetTag( tag );
  using gdcm::VR;
  const VR &vr = dictentry.GetVR();
  //if( vr != VR::INVALID )
  if( vr.IsDual() )
    {
    if( vr == VR::US_SS )
      {
      de.SetVR( VR::US );
      }
    else if( vr == VR::US_SS_OW )
      {
      de.SetVR( VR::OW );
      }
    else if( vr == VR::OB_OW )
      {
      de.SetVR( VR::OB );
      }
    }
  else
    {
    de.SetVR( vr );
    }
  const char str[] = "BasicApplicationLevelConfidentialityProfileAttributes";
  const char safe[] = "This is safe to keep";
  if( de.GetVR() != VR::SQ )
    {
    if( toremove )
      de.SetByteValue( str, (uint32_t)strlen(str) );
    else
      de.SetByteValue( safe, (uint32_t)strlen(safe) );
    }
  else
    {
    // Create an item
    gdcm::Item it;
    it.SetVLToUndefined();
    gdcm::DataSet &nds = it.GetNestedDataSet();
    // Insert sequence into data set
    assert(de.GetVR() == gdcm::VR::SQ );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();
    de.SetValue(*sq);
```

```
    de.SetVLToUndefined();
    //ds.Insert(de);
    if( !toremove )
      {
      nds.Insert( CreateFakeElement( balcptags[count], true ) );
      countglobal++;
      }
    else
      {
      gdcm::Attribute<0x0008,0x0000> at1 = { 0 }; // This element has no reason to be 'anonymized'...
      nds.Insert( at1.GetAsDataElement() );
      gdcm::Attribute<0x000a,0x0000> at2 = { 0 };
      nds.Insert( at2.GetAsDataElement() );
      }
    sq->AddItem(it);
    }
  return de;
}
/*
 */
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " output.dcm" « std::endl;
    return 1;
    }
  using gdcm::Tag;
  using gdcm::VR;
  const char *outfilename = argv[1];
  std::vector<gdcm::Tag> balcptags =
    gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
  gdcm::Writer w;
  gdcm::File &f = w.GetFile();
  gdcm::DataSet &ds = f.GetDataSet();
  // Add attribute that need to be anonymized:
  std::vector<gdcm::Tag>::const_iterator it = balcptags.begin();
  for(; it != balcptags.end(); ++it)
    {
    ds.Insert( CreateFakeElement( *it, true ) );
    }
  // Add attribute that do NOT need to be anonymized:
  static const gdcm::Global &g = gdcm::Global::GetInstance();
  static const gdcm::Dicts &dicts = g.GetDicts();
  static const gdcm::Dict &pubdict = dicts.GetPublicDict();
  using gdcm::Dict;
  Dict::ConstIterator dictit = pubdict.Begin();
  for(; dictit != pubdict.End(); ++dictit)
    {
    const gdcm::Tag &dicttag = dictit->first;
    if( dicttag == Tag(0x6e65,0x6146) ) break;
    //const gdcm::DictEntry &dictentry = dictit->second;
    ds.Insert( CreateFakeElement( dicttag, false ) );
    }
  ds.Remove( gdcm::Tag(0x400,0x500) );
  ds.Remove( gdcm::Tag(0x12,0x62) );
  ds.Remove( gdcm::Tag(0x12,0x63) );
  // Make sure to override any UID stuff
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, (uint32_t)strlen(u) );
  //ds.Insert( de );
  ds.Replace( de );
  de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
  de.SetVR( VR::UI );
  gdcm::MediaStorage ms( gdcm::MediaStorage::RawDataStorage );
  de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()));
  ds.Replace( de ); // replace !
  gdcm::FileMetaInformation &fmi = f.GetHeader();
  //fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
  fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.71 GenLongSeqs.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
/*
 * This example is used to generate the file:
 *
 *
 * There is a flaw in the DICOM design were it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * We need to make sure that we can store numerous Item in a SQ
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  // Create a Sequence
  gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
  sq->SetLengthToUndefined();
  const char owner_str[] = "GDCM CONFORMANCE TESTS";
  gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
  owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
  owner.SetVR( gdcm::VR::LO );
  size_t nitems = 1000;
  nitems += std::numeric_limits<uint32_t>::max();
  for(unsigned int idx = 0; idx < nitems; ++idx)
    {
    // Create a dataelement
    //gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
    //de.SetByteValue(ptr, ptr_len);
    //de.SetVR( gdcm::VR::OB );
    // Create an item
    gdcm::Item it;
    it.SetVLToUndefined();
    //gdcm::DataSet &nds = it.GetNestedDataSet();
    //nds.Insert(owner);
    //nds.Insert(de);
    sq->AddItem(it);
    }
  // Insert sequence into data set
  gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
  des.SetVR(gdcm::VR::SQ);
  des.SetValue(*sq);
  des.SetVLToUndefined();
```

```
  ds.Insert(owner);
  ds.Insert(des);
  gdcm::Writer w;
  w.SetFile( file );
  //w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.72 GenSeqs.cxx

```
/*=========================================================================

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
/*
 * This example is used to generate the file:
 *
 * gdcmConformanceTests/SequenceWithUndefinedLengthNotConvertibleToDefinedLength.dcm
 *
 * There is a flaw in the DICOM design were it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * Deflated syntax was used in this case since this synthetic example can be
 * nicely compressed using this transfer syntax.
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  //const unsigned int nitems = 1000;
  const unsigned int ptr_len = 42; /*94967296 / nitems; */
  //assert( ptr_len == 42949672 );
  char *ptr = new char[ptr_len];
  memset(ptr,0,ptr_len);
  // Create a Sequence
  gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
  sq->SetLengthToUndefined();
  const char owner_str[] = "GDCM CONFORMANCE TESTS";
  gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
```

```
  owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
  owner.SetVR( gdcm::VR::LO );
  for(unsigned int idx = 0; idx < 10/* nitems*/; ++idx)
    {
    // Create a dataelement
    gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
    de.SetByteValue(ptr, ptr_len);
    de.SetVR( gdcm::VR::OB );
    // Create an item
    gdcm::Item it;
    it.SetVLToUndefined();
    gdcm::DataSet &nds = it.GetNestedDataSet();
    nds.Insert(owner);
    nds.Insert(de);
    sq->AddItem(it);
    }
  // Insert sequence into data set
  gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
  des.SetVR(gdcm::VR::SQ);
  des.SetValue(*sq);
  des.SetVLToUndefined();
  ds.Insert(owner);
  ds.Insert(des);
  gdcm::Writer w;
  w.SetFile( file );
  //w.SetCheckFileMetaInformation( true );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.73 GenerateStandardSOPClasses.cxx

```
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=========================================================================*/
/*
 */
#include "gdcmDefs.h"
#include "gdcmUIDs.h"
#include "gdcmGlobal.h"
#include "gdcmMediaStorage.h"
#include "gdcmSOPClassUIDToIOD.h"
int main(int , char *[])
{
  using gdcm::MediaStorage;
  gdcm::Global& g = gdcm::Global::GetInstance();
  if( !g.LoadResourcesFiles() )
    {
    std::cerr << "Could not LoadResourcesFiles" << std::endl;
    return 1;
    }
  const gdcm::Defs &defs = g.GetDefs();
  int ret = 0;
  //std::cout << "Table B.5-1 STANDARD SOP CLASSES" << std::endl;
  std::cout << "SOP Class Name,SOP Class UID,IOD Specification (defined in PS 3.3)" << std::endl;
  gdcm::MediaStorage::MSType mst;
  for ( mst = gdcm::MediaStorage::MediaStorageDirectoryStorage; mst < gdcm::MediaStorage::MS_END;
    mst = (gdcm::MediaStorage::MSType)(mst + 1) )
    {
    const char *iod = defs.GetIODNameFromMediaStorage(mst);
    gdcm::UIDs uid;
    uid.SetFromUID( gdcm::MediaStorage::GetMSString(mst) /*mst.GetString()*/ );
    if( iod )
```

```
      {
      const char *iod_ref = gdcm::SOPClassUIDToIOD::GetIOD(uid);
      if( iod_ref )
        {
        std::string iod_ref_str = iod_ref;
        //iod_ref_str += " IOD Modules";
        //if( iod_ref_str != iod )
          {
          //std::cout « "UID: " « uid « "    ";
          std::cout « '"' « uid.GetName() « '"' «"," « '"' «uid.GetString() « '"' «"," « '"' «iod « '"' «
       std::endl;
          //std::cout « "Incompatible IODs: [" « iod « "] versus ref= [" « iod_ref_str « "]" « std::endl;
          ++ret;
          }
        }
      }
    }
  return 0;
}
```

12.74 GetJPEGSamplePrecision.cxx

```
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=========================================================================*/
/*
 * This example is a little helper to detect the famous SIEMENS JPEG lossless compressed image
 * where DICOM is declared as:
 *
 *  (0028,0100) US 16                                       # 2,1 Bits Allocated
 *  (0028,0101) US 12                                       # 2,1 Bits Stored
 *  (0028,0102) US 11                                       # 2,1 High Bit
 *  (0028,0103) US 0                                        # 2,1 Pixel Representation
 *
 * But where JPEG is:
 *
 *        JPEG_SOF_Parameters:
 *                SamplePrecision = 16
 *                nLines = 192
 *                nSamplesPerLine = 192
 *                nComponentsInFrame = 1
 *                component 0
 *                        ComponentIdentifier = 1
 *                        HorizontalSamplingFactor = 1
 *                        VerticalSamplingFactor = 1
 *                        QuantizationTableDestinationSelector = 0
 *
 *
 * This case is valid. One simply has to use the 16bits jpeg decoder to decode the 12bits stored image.
 * This used to be an issue in GDCM 1.2.x (fixed in GDCM 1.2.5)
 *
 * The main return 0 (no error) when the file read is actually a potential problem. At the end of the main
 * function, the jpeg stream is stored in the filename specified as second argument
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmJPEGCodec.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.jpg" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
```

```
  const char *outfilename = argv[2];
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // The output of gdcm::Reader is a gdcm::File
  const gdcm::File &file = reader.GetFile();
  const gdcm::Image &image = reader.GetImage();
  const gdcm::TransferSyntax &ts = file.GetHeader().GetDataSetTransferSyntax();
  if( ts != gdcm::TransferSyntax::JPEGLosslessProcess14 && ts != gdcm::TransferSyntax::JPEGLosslessProcess14_1 )
    {
    std::cerr « "Input is not a lossless JPEG" « std::endl;
    return 1;
    }
  // the dataset is the the set of element we are interested in:
  const gdcm::DataSet &ds = file.GetDataSet();
  const gdcm::Tag rawTag(0x7fe0, 0x0010); // Default to Pixel Data
  const gdcm::DataElement& pdde = ds.GetDataElement( rawTag );
  const gdcm::SequenceOfFragments *sf = pdde.GetSequenceOfFragments();
  if( sf )
    {
    std::ofstream output(outfilename, std::ios::binary);
    sf->WriteBuffer(output);
    }
  else
    {
    std::cerr « "Error" « std::endl;
    return 1;
    }
  gdcm::JPEGCodec jpeg;
  std::ifstream is(outfilename, std::ios::binary);
  gdcm::PixelFormat pf ( gdcm::PixelFormat::UINT8 ); // let's pretend it's a 8bits jpeg
  jpeg.SetPixelFormat( pf );
  gdcm::TransferSyntax ts_jpg;
  bool b = jpeg.GetHeaderInfo( is, ts_jpg );
  if( !b )
    {
    return 1;
    }
  //jpeg.Print( std::cout );
  if( jpeg.GetPixelFormat().GetBitsAllocated() != image.GetPixelFormat().GetBitsAllocated()
   || jpeg.GetPixelFormat().GetBitsStored() != image.GetPixelFormat().GetBitsStored() )
    {
    std::cerr « "There is a mismatch in between DICOM declared Pixel Format and Sample Precision used in the
       JPEG stream" « std::endl;
    return 0;
    }
  std::cout « jpeg.GetPixelFormat() « std::endl;
  std::cout « image.GetPixelFormat() « std::endl;
  return 1;
}
```

12.75 GetSequenceUltrasound.cxx

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmAttribute.h"
bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max
       );
int main(int argc, char* argv[] )
{
  // Controllo del numero di argomenti introdotti da riga di comando
```

```
  if( argc < 2 )
    {
    std::cerr « "Usage: " « std::endl;
    std::cerr « argv[0] « " inputImageFile  " « std::endl;
    return EXIT_FAILURE;
    }
  unsigned int x_min = 1;
  unsigned int y_min = 1;
  unsigned int x_max = 1;
  unsigned int y_max = 1;
  if( Region ( argv[1], &x_min, &y_min, &x_max, &y_max ) )
    {
    std::cout « "x_min = " « x_min « std::endl;
    std::cout « "y_min = " « y_min « std::endl;
    std::cout « "x_max = " « x_max « std::endl;
    std::cout « "y_max = " « y_max « std::endl;
    }
  else
    {
    std::cout « "no\n";
    }
}
bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max
      )
{
  gdcm::Reader reader;
  reader.SetFileName( nomefile );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « nomefile « std::endl;
    return false;
    }
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  gdcm::Tag tsqur(0x0018,0x6011);
  if( !ds.FindDataElement( tsqur ) )
    {
    return false;
    }
  const gdcm::DataElement &squr= ds.GetDataElement( tsqur );
  //std::cout « squr « std::endl;
  const gdcm::SequenceOfItems *sqi = squr.GetValueAsSQ();
  if( !sqi || !sqi->GetNumberOfItems() )
    {
    return false;
    }
  //std::cout « sqi « std::endl;
  const gdcm::Item & item = sqi->GetItem(1);
  //std::cout « item « std::endl;
  const gdcm::DataSet& nestedds = item.GetNestedDataSet();
  //std::cout « nestedds « std::endl;
  gdcm::Tag tX0(0x0018,0x6018);
  gdcm::Tag tY0(0x0018,0x601a);
  gdcm::Tag tX1(0x0018,0x601c);
  gdcm::Tag tY1(0x0018,0x601e);
  if( (!nestedds.FindDataElement( tX0 ))||(!nestedds.FindDataElement( tY0 ))||(!nestedds.FindDataElement( tX1
       ))||(!nestedds.FindDataElement( tY1 )) )
    {
    return false;
    }
  const gdcm::DataElement& deX0 = nestedds.GetDataElement( tX0 );
  const gdcm::DataElement& deY0 = nestedds.GetDataElement( tY0 );
  const gdcm::DataElement& deX1 = nestedds.GetDataElement( tX1 );
  const gdcm::DataElement& deY1 = nestedds.GetDataElement( tY1 );
  //std::cout « deX0 « std::endl « deY0 « std::endl « deX1 « std::endl « deY1 « std::endl;
  //const gdcm::ByteValue *bvX0 = deX0.GetByteValue();
  //const gdcm::ByteValue *bvY0 = deY0.GetByteValue();
  //const gdcm::ByteValue *bvX1 = deX1.GetByteValue();
  //const gdcm::ByteValue *bvY1 = deY1.GetByteValue();
  //std::cout « bvX0 « std::endl « bvY0 « std::endl « bvX1 « std::endl « bvY1 « std::endl;
  gdcm::Attribute<0x0018,0x6018> atX0;
  gdcm::Attribute<0x0018,0x601a> atY0;
  gdcm::Attribute<0x0018,0x601c> atX1;
  gdcm::Attribute<0x0018,0x601e> atY1;
  atX0.SetFromDataElement( deX0 );
  atY0.SetFromDataElement( deY0 );
  atX1.SetFromDataElement( deX1 );
  atY1.SetFromDataElement( deY1 );
  uint32_t X0 = atX0.GetValue();
  uint32_t Y0 = atY0.GetValue();
  uint32_t X1 = atX1.GetValue();
```

```
  uint32_t Y1 = atY1.GetValue();
  std::cout « X0 « std::endl « Y0 « std::endl « X1 « std::endl « Y1 « std::endl;
  *X_min = static_cast<unsigned int>(X0);
  *Y_min = static_cast<unsigned int>(Y0);
  *X_max = static_cast<unsigned int>(X1);
  *Y_max = static_cast<unsigned int>(Y1);
  //std::cout « "X_min = " « *X_min « std::endl;
  //std::cout « "Y_min = " « *Y_min « std::endl;
  //std::cout « "X_max = " « *X_max « std::endl;
  //std::cout « "Y_max = " « *Y_max « std::endl;
  return true;
}
```

12.76 GetSubSequenceData.cxx

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmUIDGenerator.h"
#include <iostream>
#include <string>
#include <map>
/*
 * This example will extract the Movie from the private group of
 * GEMS_Ultrasound_MovieGroup_001 See Attribute
 * (7fe1,60,GEMS_Ultrasound_MovieGroup_001)
 *
 * The output file will be stored in `outvid.dcm` as
 * MultiframeGrayscaleByteSecondaryCaptureImageStorage
 */
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  reader.Read();
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  const PrivateTag tseq(0x7fe1,0x1,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds.FindDataElement( tseq ) ) return 1;
  const DataElement& seq = ds.GetDataElement( tseq );
  SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
  assert( sqi->GetNumberOfItems() == 1 );
  Item &item = sqi->GetItem(1);
  DataSet &subds = item.GetNestedDataSet();
  const PrivateTag tseq1(0x7fe1,0x10,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq1 ) ) return 1;
  const DataElement& seq1 = subds.GetDataElement( tseq1 );
  SmartPointer<SequenceOfItems> sqi2 = seq1.GetValueAsSQ();
  //int n = sqi2->GetNumberOfItems();
  int index = 1;
  Item &item2 = sqi2->GetItem(index);
  DataSet &subds2 = item2.GetNestedDataSet();
  const PrivateTag tseq2(0x7fe1,0x20,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds2.FindDataElement( tseq2 ) ) return 1;
  const DataElement& seq2 = subds2.GetDataElement( tseq2 );
//    std::cout « seq2 « std::endl;
  SmartPointer<SequenceOfItems> sqi3 = seq2.GetValueAsSQ();
  size_t ni3 = sqi3->GetNumberOfItems(); (void)ni3;
  assert( sqi3->GetNumberOfItems() >= 1 );
```

```
  Item &item3 = sqi3->GetItem(1);
  DataSet &subds3 = item3.GetNestedDataSet();
  const PrivateTag tseq6(0x7fe1,0x26,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds3.FindDataElement( tseq6 ) ) return 1;
  const DataElement& seq6 = subds3.GetDataElement( tseq6 );
  SmartPointer<SequenceOfItems> sqi6 = seq6.GetValueAsSQ();
  size_t ni6= sqi6->GetNumberOfItems();
  assert( sqi6->GetNumberOfItems() >= 1 );
  const PrivateTag tseq7(0x7fe1,0x86,"GEMS_Ultrasound_MovieGroup_001");
  int dimx = 0, dimy = 0;
  for( size_t i6 = 1; i6 <= ni6; ++i6 )
    {
    Item &item6 = sqi6->GetItem(i6);
    DataSet &subds6 = item6.GetNestedDataSet();
    if( subds6.FindDataElement( tseq7 ) )
      {
      Element<VR::SL, VM::VM4> el;
      el.SetFromDataElement( subds6.GetDataElement( tseq7 ) );
      std::cout « "El= " « el.GetValue() « std::endl;
      dimx = el.GetValue(0);
      dimy = el.GetValue(1);
      }
    }
  const PrivateTag tseq3(0x7fe1,0x36,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds3.FindDataElement( tseq3 ) ) return 1;
  const DataElement& seq3 = subds3.GetDataElement( tseq3 );
//    std::cout « seq3 « std::endl;
  SmartPointer<SequenceOfItems> sqi4 = seq3.GetValueAsSQ();
  size_t ni4= sqi4->GetNumberOfItems();
  assert( sqi4->GetNumberOfItems() >= 1 );
  const PrivateTag tseq8(0x7fe1,0x37,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq4(0x7fe1,0x43,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq5(0x7fe1,0x60,"GEMS_Ultrasound_MovieGroup_001");
  std::vector<char> imbuffer;
  int dimz = 0;
  for( size_t i4 = 1; i4 <= ni4; ++i4 )
    {
    Item &item4 = sqi4->GetItem(i4);
    DataSet &subds4 = item4.GetNestedDataSet();
    if( !subds4.FindDataElement( tseq8 ) ) return 1;
    const DataElement& de8 = subds4.GetDataElement( tseq8 );
    Element<VR::UL,VM::VM1> ldimz;
    ldimz.SetFromDataElement( de8 );
    dimz += ldimz.GetValue();
    if( !subds4.FindDataElement( tseq4 ) ) return 1;
    const DataElement& seq4 = subds4.GetDataElement( tseq4 );
    if( !subds4.FindDataElement( tseq5 ) ) return 1;
    const DataElement& seq5 = subds4.GetDataElement( tseq5 );
    //    std::cout « seq4 « std::endl;
    //    std::cout « seq5 « std::endl;
    const ByteValue *bv4 = seq4.GetByteValue();
    (void)bv4;
#if 0
      {
      std::ofstream out( "/tmp/mo4", std::ios::binary );
      out.write( bv4->GetPointer(), bv4->GetLength());
      out.close();
      }
#endif
  const ByteValue *bv5 = seq5.GetByteValue();
#if 0
    {
    std::ofstream out( "/tmp/mo5", std::ios::binary );
    out.write( bv5->GetPointer(), bv5->GetLength());
    out.close();
    }
#endif
    std::cout « bv5->GetLength() « std::endl;
    imbuffer.insert( imbuffer.begin(), bv5->GetPointer(), bv5->GetPointer() + bv5->GetLength() );
    }
  DataElement fakedata;
  fakedata.SetByteValue( &imbuffer[0], (uint32_t)imbuffer.size() );
  gdcm::SmartPointer<gdcm::Image> im = new gdcm::Image;
  im->SetNumberOfDimensions( 3 );
  im->SetDimension(0, dimx );
  im->SetDimension(1, dimy );
  im->SetDimension(2, dimz );
  size_t l1 = imbuffer.size();
  (void)l1;
  size_t l2 = im->GetBufferLength();
  (void)l2;
```

```
  assert( im->GetBufferLength() == imbuffer.size() );
  im->SetPhotometricInterpretation( gdcm::PhotometricInterpretation::MONOCHROME2 );
  im->SetDataElement( fakedata );
  gdcm::ImageWriter w;
  w.SetImage( *im );
  DataSet &dataset = w.GetFile().GetDataSet();
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, (uint32_t)strlen(u) );
  //ds.Insert( de );
  dataset.Replace( de );
  de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
  de.SetVR( VR::UI );
  gdcm::MediaStorage ms(
    gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
  de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()));
  dataset.Replace( de ); // replace !
  w.SetFileName( "outvid.dcm" );
  if( !w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.77 HelloVizWorld.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Basic example for dealing with a DICOM file that contains an Image
 * (read: Pixel Data element)
 */
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"
#include <iostream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  // Instanciate the image reader:
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // If we reach here, we know for sure 2 things:
  // 1. It is a valid DICOM
  // 2. And it contains an Image !
  // The output of superclass gdcm::Reader is a gdcm::File
  //gdcm::File &file = reader.GetFile();
  // The other output of gdcm::ImageReader is a gdcm::Image
  const gdcm::Image &image = reader.GetImage();
  // Let's get some property from the image:
  unsigned int ndim = image.GetNumberOfDimensions();
```

```
  // Dimensions of the image:
  const unsigned int *dims = image.GetDimensions();
  // Origin
  const double *origin = image.GetOrigin();
  const gdcm::PhotometricInterpretation &pi = image.GetPhotometricInterpretation();
  for(unsigned int i = 0; i < ndim; ++i)
    {
    std::cout « "Dim(" « i « "): " « dims[i] « std::endl;
    }
  for(unsigned int i = 0; i < ndim; ++i)
    {
    std::cout « "Origin(" « i « "): " « origin[i] « std::endl;
    }
  std::cout « "PhotometricInterpretation: " « pi « std::endl;
  // Write the modified DataSet back to disk
  gdcm::ImageWriter writer;
  writer.SetImage( image );
  writer.SetFileName( outfilename );
  //writer.SetFile( file ); // We purposely NOT copy the meta information from the input
                            // file, and instead only pass the image
  if( !writer.Write() )
    {
    std::cerr « "Could not write: " « outfilename « std::endl;
    return 1;
    }
  return 0;
}
```

12.78 HelloWorld.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * This example is ... guess what this is for :)
 */
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include <iostream>
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  // Instanciate the reader:
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // If we reach here, we know for sure only 1 thing:
  // It is a valid DICOM file (potentially an old ACR-NEMA 1.0/2.0 file)
  // (Maybe, it's NOT a Dicom image -could be a DICOMDIR, a RTSTRUCT, etc-)
  // The output of gdcm::Reader is a gdcm::File
  gdcm::File &file = reader.GetFile();
  // the dataset is the the set of element we are interested in:
  gdcm::DataSet &ds = file.GetDataSet();
  // Contruct a static(*) type for Image Comments :
  gdcm::Attribute<0x0020,0x4000> imagecomments;
  imagecomments.SetValue( "Hello, World !" );
```

```
  // Now replace the Image Comments from the dataset with our:
  ds.Replace( imagecomments.GetAsDataElement() );
  // Write the modified DataSet back to disk
  gdcm::Writer writer;
  writer.CheckFileMetaInformationOff(); // Do not attempt to reconstruct the file meta to preserve the file
                                        // as close to the original as possible.
  writer.SetFileName( outfilename );
  writer.SetFile( file );
  if( !writer.Write() )
    {
    std::cerr « "Could not write: " « outfilename « std::endl;
    return 1;
    }
  return 0;
}
/*
 * (*) static type, means that extra DICOM information VR & VM are computed at compilation time.
 * The compiler is deducing those values from the template arguments of the class.
 */
```

12.79 LargeVRDSExplicit.cxx

```
/*=========================================================================

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileExplicitFilter.h"
#include "gdcmSequenceOfItems.h"
bool interpolate(const double * pts, size_t npts, std::vector<double> &out )
{
  out.clear();
  for(size_t i = 0; i < 2*npts; ++i )
    {
    const size_t j = i / 2;
    if( i % 2 )
      {
      if( j != npts - 1 )
        {
        assert( 3*j+5 < 3*npts );
        const double midpointx = (pts[3*j+0] + pts[3*j+3]) / 2;
        const double midpointy = (pts[3*j+1] + pts[3*j+4]) / 2;
        const double midpointz = (pts[3*j+2] + pts[3*j+5]) / 2;
        out.push_back( midpointx );
        out.push_back( midpointy );
        out.push_back( midpointz );
        }
      }
    else
      {
      assert( j < npts );
      out.push_back( pts[3*j+0] );
      out.push_back( pts[3*j+1] );
      out.push_back( pts[3*j+2] );
      }
    }
  assert( out.size() == 2 * npts * 3 - 3 );
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm" « std::endl;
    return 1;
    }
```

```
const char *filename = argv[1];
const char *outfilename = argv[2];
gdcm::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
  {
  return 1;
  }
gdcm::File &file = reader.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
gdcm::FileExplicitFilter fef;
//fef.SetChangePrivateTags( changeprivatetags );
fef.SetFile( reader.GetFile() );
if( !fef.Change() )
  {
  std::cerr « "Failed to change: " « filename « std::endl;
  return 1;
  }
// (3006,0039) SQ (Sequence with undefined length #=4)     # u/l, 1 ROIContourSequence
gdcm::Tag tag(0x3006,0x0039);
const gdcm::DataElement &roicsq = ds.GetDataElement( tag );
gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = roicsq.GetValueAsSQ();
//sqi->SetNumberOfItems( 1 );
const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
const gdcm::DataSet& nestedds = item.GetNestedDataSet();
gdcm::Tag tcsq(0x3006,0x0040);
if( !nestedds.FindDataElement( tcsq ) )
  {
  return 0;
  }
const gdcm::DataElement& csq = nestedds.GetDataElement( tcsq );
gdcm::SmartPointer<gdcm::SequenceOfItems> sqi2 = csq.GetValueAsSQ();
if( !sqi2 || !sqi2->GetNumberOfItems() )
  {
  return 0;
  }
//unsigned int nitems = sqi2->GetNumberOfItems();
gdcm::Item & item2 = sqi2->GetItem(1); // Item start at #1
gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
//item2.SetVLToUndefined();
//std::cout « nestedds2 « std::endl;
// (3006,0050) DS [43.57636\65.52504\-10.0\46.043102\62.564945\-10.0\49.126537\60.714... # 398,48 ContourData
gdcm::Tag tcontourdata(0x3006,0x0050);
const gdcm::DataElement & contourdata = nestedds2.GetDataElement( tcontourdata );
//std::cout « contourdata « std::endl;
//const gdcm::ByteValue *bv = contourdata.GetByteValue();
gdcm::Attribute<0x3006,0x0046> ncontourpoints;
ncontourpoints.Set( nestedds2 );
gdcm::Attribute<0x3006,0x0050> at;
at.SetFromDataElement( contourdata );
const double* pts = at.GetValues();
unsigned int npts = at.GetNumberOfValues() / 3;
std::vector<double> out( pts, pts + npts * 3 );
std::vector<double> out2;
//const unsigned int niter = 7;
const unsigned int niter = 8;
for( unsigned int i = 0; i < niter; ++i)
  {
  //bool b =
  interpolate(&out[0], out.size() / 3, out2);
  //const double *pout = &out[0];
  out = out2;
  out2.clear();
  }
assert( out.size() % 3 == 0 );
gdcm::Attribute<0x3006,0x0050> at_interpolate;
at_interpolate.SetNumberOfValues( (unsigned int)(out.size() / 3) );
at_interpolate.SetValues( &out[0], (uint32_t)out.size() );
ncontourpoints.SetValue( at_interpolate.GetNumberOfValues() / 3 );
nestedds2.Replace( at_interpolate.GetAsDataElement() );
nestedds2.Replace( ncontourpoints.GetAsDataElement() );
//assert(0);
// Let's take item one and subdivide it
gdcm::TransferSyntax ts = gdcm::TransferSyntax::ImplicitVRLittleEndian;
ts = gdcm::TransferSyntax::ExplicitVRLittleEndian;
gdcm::FileMetaInformation &fmi = file.GetHeader();
const char *tsuid = gdcm::TransferSyntax::GetTSString( ts );
// const char * is ok since padding is \0 anyway...
gdcm::DataElement de( gdcm::Tag(0x0002,0x0010) );
de.SetByteValue( tsuid, (uint32_t)strlen(tsuid) );
de.SetVR( gdcm::Attribute<0x0002, 0x0010>::GetVR() );
```

```
  fmi.Replace( de );
  fmi.Remove( gdcm::Tag(0x0002,0x0012) ); // will be regenerated
  fmi.Remove( gdcm::Tag(0x0002,0x0013) ); //  '   '    '
  fmi.SetDataSetTransferSyntax(ts);
  gdcm::Writer w;
  w.SetFile( file );
  w.SetFileName( outfilename );
  if (!w.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.80 MakeTemplate.cxx

```
/*=========================================================================

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=========================================================================*/
#include "gdcmFileAnonymizer.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
int main(int argc, char *argv[])
{
  if( argc < 3 ) return 1;
  const char* filename = argv[1];
  const char* outfilename = argv[2];
  //gdcm::Trace::DebugOn();
  // Remove Pixel Data element:
  gdcm::FileAnonymizer fa;
  fa.SetInputFileName( filename );
  fa.SetOutputFileName( outfilename );
  fa.Empty( gdcm::Tag(0x7fe0,0x10) );
  // cannot replace in-place DICOM header:
  //fa.Replace( gdcm::Tag(0x2,0x2), "1.2.840.10008.5.1.4.1.1.7" );
  if( !fa.Write() )
    {
    std::cerr « "impossible to remove Pixel Data attribute" « std::endl;
    return 1;
    }
  // Update the DICOM Header:
  gdcm::Reader reader;
  reader.SetFileName( outfilename );
  if( !reader.Read() )
    {
    std::cerr « "could not read back" « std::endl;
    return 1;
    }
  gdcm::File & file = reader.GetFile();
  gdcm::FileMetaInformation &fmi = file.GetHeader();
  gdcm::TransferSyntax ts = gdcm::TransferSyntax::ImplicitVRLittleEndian;
  ts = gdcm::TransferSyntax::ExplicitVRLittleEndian;
  fmi.SetDataSetTransferSyntax(ts);
  gdcm::Writer writer;
  writer.SetFile( file );
  writer.SetFileName( outfilename ); // warning overwrite file !
  if( !writer.Write() )
    {
    std::cerr « "could not write back" « std::endl;
    return 1;
    }
  return 0;
}
```

12.81 MergeTwoFiles.cxx

```
/*=========================================================================

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This example will show how one can read in two DICOM files, use the dataset
 * from file1 and use image from file2  to save it in a 3rd file.
 *
 * Eg:
 * MergeTwoFiles gdcmData/012345.002.050.dcm gdcmData/test.acr merge.dcm
 */
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    return 1;
    }
  const char *file1 = argv[1];
  const char *file2 = argv[2];
  const char *file3 = argv[3];
  // Read file1
  gdcm::ImageReader reader1;
  reader1.SetFileName( file1 );
  if( !reader1.Read() )
    {
    return 1;
    }
  // Read file2
  gdcm::ImageReader reader2;
  reader2.SetFileName( file2 );
  if( !reader2.Read() )
    {
    return 1;
    }
  // Ok now let's take the DataSet from file1 and the Image from file2
  // Warning: if file2 is -for example- a Secondary Capture Storage, then it has no
  // Image Orientation (Patient) thus any Image Orientation (Patient) from file1
  // will be discarded...
  // let's be fancy. In case reader2 contains explicit, but reader1 is implicit
  // we would rather see an implicit output
  if( reader1.GetFile().GetHeader().GetDataSetTransferSyntax() == gdcm::TransferSyntax::ImplicitVRLittleEndian )
    {
    reader2.GetImage().SetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
    }
  gdcm::ImageWriter writer;
  writer.SetFileName( file3 );
  writer.SetFile( reader1.GetFile() );
  // ImageWriter will always use all of gdcm::Image information an override anything wrong from
  // reader1.GetFile(), including the Transfer Syntax
  writer.SetImage( reader2.GetImage() );
  gdcm::DataSet &ds = reader1.GetFile().GetDataSet();
  // Make sure that SOPInstanceUID are different
  // Simply removing it is sufficient as gdcm::ImageWriter will generate one by default
  // if not found.
  ds.Remove( gdcm::Tag(0x0008,0x0018) );
  if( !writer.Write() )
    {
    return 1;
    }
  return 0;
}
```

12.82 MrProtocol.cxx

```
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  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 *
 */
/*
28 - 'MrProtocol' VM 1, VR UN, SyngoDT 0, NoOfItems 6, Data '### ASCCONV BEGIN ###
ulVersion                              = 0xbee332
tSequenceFileName                      = "%SiemensSeq%\fl_fq_shphs"
tProtocolName                          = "flash+AF8-100+AF8-through-plane+AF8-V"
tReferenceImage0                       = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004658"
tReferenceImage1                       = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004635"
tReferenceImage2                       = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004683"
ucScanRegionPosValid                   = 0x1
sProtConsistencyInfo.tBaselineString   = "N4_VB11A_LATEST_20031004"
sProtConsistencyInfo.flNominalB0       = 1.494
sProtConsistencyInfo.flGMax            = 22
sProtConsistencyInfo.flRiseTime        = 10
sGRADSPEC.sEddyCompensationX.aflAmplitude[0] = 0.0141111
sGRADSPEC.sEddyCompensationX.aflAmplitude[1] = 0.057038
sGRADSPEC.sEddyCompensationX.aflAmplitude[2] = -0.00986504
sGRADSPEC.sEddyCompensationX.aflAmplitude[3] = 0.00247627
sGRADSPEC.sEddyCompensationX.aflAmplitude[4] = 0.0026377
sGRADSPEC.sEddyCompensationX.aflTimeConstant[0] = 1.53826
sGRADSPEC.sEddyCompensationX.aflTimeConstant[1] = 0.746617
sGRADSPEC.sEddyCompensationX.aflTimeConstant[2] = 0.339236
sGRADSPEC.sEddyCompensationX.aflTimeConstant[3] = 0.0309809
sGRADSPEC.sEddyCompensationX.aflTimeConstant[4] = 0.00067694
sGRADSPEC.sEddyCompensationY.aflAmplitude[0] = 0.0156411
sGRADSPEC.sEddyCompensationY.aflAmplitude[1] = 0.0440623
sGRADSPEC.sEddyCompensationY.aflAmplitude[2] = -0.00782663
sGRADSPEC.sEddyCompensationY.aflAmplitude[3] = 0.00186828
sGRADSPEC.sEddyCompensationY.aflAmplitude[4] = 0.00154504
sGRADSPEC.sEddyCompensationY.aflTimeConstant[0] = 1.47145
sGRADSPEC.sEddyCompensationY.aflTimeConstant[1] = 0.750538
sGRADSPEC.sEddyCompensationY.aflTimeConstant[2] = 0.339397
sGRADSPEC.sEddyCompensationY.aflTimeConstant[3] = 0.0312962
sGRADSPEC.sEddyCompensationY.aflTimeConstant[4] = 0.000895133
sGRADSPEC.sEddyCompensationZ.aflAmplitude[0] = 0.00618504
sGRADSPEC.sEddyCompensationZ.aflAmplitude[1] = 0.00313121
sGRADSPEC.sEddyCompensationZ.aflAmplitude[2] = 0.000289346
sGRADSPEC.sEddyCompensationZ.aflAmplitude[3] = -0.00019677
sGRADSPEC.sEddyCompensationZ.aflAmplitude[4] = 7.66445e-005
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[0] = 3.37462
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[1] = 0.999351
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[2] = 0.0174646
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[3] = 0.0110094
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[4] = 0.00199922
sGRADSPEC.bEddyCompensationValid       = 1
sGRADSPEC.sB0CompensationX.aflAmplitude[0] = 0.307474
sGRADSPEC.sB0CompensationX.aflAmplitude[1] = 0.029337
sGRADSPEC.sB0CompensationX.aflAmplitude[2] = -0.187118
sGRADSPEC.sB0CompensationX.aflTimeConstant[0] = 0.98583
sGRADSPEC.sB0CompensationX.aflTimeConstant[1] = 0.0308443
sGRADSPEC.sB0CompensationX.aflTimeConstant[2] = 0.000466792
sGRADSPEC.sB0CompensationY.aflAmplitude[0] = 0.365257
sGRADSPEC.sB0CompensationY.aflAmplitude[1] = -0.318647
sGRADSPEC.sB0CompensationY.aflAmplitude[2] = -0.0118978
sGRADSPEC.sB0CompensationY.aflTimeConstant[0] = 0.61535
sGRADSPEC.sB0CompensationY.aflTimeConstant[1] = 0.488831
sGRADSPEC.sB0CompensationY.aflTimeConstant[2] = 0.00199991
sGRADSPEC.sB0CompensationZ.aflAmplitude[0] = -0.44647
sGRADSPEC.sB0CompensationZ.aflAmplitude[1] = -0.0455154
sGRADSPEC.sB0CompensationZ.aflAmplitude[2] = -0.0304901
sGRADSPEC.sB0CompensationZ.aflTimeConstant[0] = 0.959231
sGRADSPEC.sB0CompensationZ.aflTimeConstant[1] = 0.0720189
sGRADSPEC.sB0CompensationZ.aflTimeConstant[2] = 0.00190141
```

```
sGRADSPEC.bB0CompensationValid          = 1
sGRADSPEC.sCrossTermCompensationXY.aflAmplitude[0] = 0.00105046
sGRADSPEC.sCrossTermCompensationXY.aflTimeConstant[0] = 0.842014
sGRADSPEC.sCrossTermCompensationXZ.aflAmplitude[0] = -0.00150189
sGRADSPEC.sCrossTermCompensationXZ.aflTimeConstant[0] = 0.736169
sGRADSPEC.sCrossTermCompensationYX.aflAmplitude[0] = -5.5278e-005
sGRADSPEC.sCrossTermCompensationYX.aflTimeConstant[0] = 0.228697
sGRADSPEC.sCrossTermCompensationYZ.aflAmplitude[0] = 0.000307999
sGRADSPEC.sCrossTermCompensationYZ.aflTimeConstant[0] = 1.19431
sGRADSPEC.sCrossTermCompensationZX.aflAmplitude[0] = -0.000286868
sGRADSPEC.sCrossTermCompensationZX.aflTimeConstant[0] = 0.665979
sGRADSPEC.sCrossTermCompensationZY.aflAmplitude[0] = 0.000355175
sGRADSPEC.sCrossTermCompensationZY.aflTimeConstant[0] = 0.844189
sGRADSPEC.bCrossTermCompensationValid    = 1
sGRADSPEC.lOffsetX                      = 25
sGRADSPEC.lOffsetY                      = 84
sGRADSPEC.lOffsetZ                      = 47
sGRADSPEC.bOffsetValid                  = 1
sGRADSPEC.lDelayX                       = 12
sGRADSPEC.lDelayY                       = 11
sGRADSPEC.lDelayZ                       = 9
sGRADSPEC.bDelayValid                   = 1
sGRADSPEC.flSensitivityX                = 0.000264087
sGRADSPEC.flSensitivityY                = 0.000272009
sGRADSPEC.flSensitivityZ                = 0.000272677
sGRADSPEC.bSensitivityValid             = 1
sGRADSPEC.alShimCurrent[0]              = 183
sGRADSPEC.alShimCurrent[1]              = -25
sGRADSPEC.alShimCurrent[2]              = -85
sGRADSPEC.alShimCurrent[3]              = 378
sGRADSPEC.alShimCurrent[4]              = 82
sGRADSPEC.bShimCurrentValid             = 1
sGRADSPEC.ucMode                        = 0x2
sTXSPEC.asNucleusInfo[0].tNucleus       = "1H"
sTXSPEC.asNucleusInfo[0].lFrequency     = 63684693
sTXSPEC.asNucleusInfo[0].bFrequencyValid = 1
sTXSPEC.asNucleusInfo[0].flReferenceAmplitude = 359.734
sTXSPEC.asNucleusInfo[0].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[0].flAmplitudeCorrection = 1
sTXSPEC.asNucleusInfo[0].bAmplitudeCorrectionValid = 1
sTXSPEC.asNucleusInfo[1].bFrequencyValid = 1
sTXSPEC.asNucleusInfo[1].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[1].bAmplitudeCorrectionValid = 1
sTXSPEC.aRFPULSE[0].tName               = "03GreFCE"
sTXSPEC.aRFPULSE[0].bAmplitudeValid     = 0x1
sTXSPEC.aRFPULSE[0].flAmplitude         = 147.095
sTXSPEC.aRFPULSE[1].tName               = "02GreFCE"
sTXSPEC.aRFPULSE[1].bAmplitudeValid     = 0x1
sTXSPEC.aRFPULSE[1].flAmplitude         = 147.095
sTXSPEC.aRFPULSE[2].tName               = "01GreFCE"
sTXSPEC.aRFPULSE[2].bAmplitudeValid     = 0x1
sTXSPEC.aRFPULSE[2].flAmplitude         = 147.095
sTXSPEC.lNoOfTraPulses                  = 3
sTXSPEC.lBTB1ParallelCapacity           = 2
sTXSPEC.lBTB1SerialCapacity             = 24
sTXSPEC.lBTB2ParallelCapacity           = 2
sTXSPEC.lBTB2SerialCapacity             = 26
sTXSPEC.bBTBValid                       = 1
sTXSPEC.flKDynMagnitudeMin              = 0.5
sTXSPEC.flKDynMagnitudeMax              = 1.5
sTXSPEC.flKDynMagnitudeClipLow          = 0.96
sTXSPEC.flKDynMagnitudeClipHigh         = 1.04
sTXSPEC.flKDynPhaseMax                  = 0.698132
sTXSPEC.flKDynPhaseClip                 = 0.174533
sTXSPEC.bKDynValid                      = 1
sTXSPEC.ucRFPulseType                   = 0x1
sTXSPEC.ucExcitMode                     = 0x1
sTXSPEC.ucSimultaneousExcitation        = 0x1
sRXSPEC.lGain                           = 1
sRXSPEC.bGainValid                      = 1
sRXSPEC.aFFT_SCALE[0].lRxChannel        = 1
sRXSPEC.aFFT_SCALE[0].flFactor          = 1.06857
sRXSPEC.aFFT_SCALE[0].bValid            = 1
sRXSPEC.aFFT_SCALE[1].lRxChannel        = 2
sRXSPEC.aFFT_SCALE[1].flFactor          = 1.07454
sRXSPEC.aFFT_SCALE[1].bValid            = 1
sRXSPEC.aFFT_SCALE[2].lRxChannel        = 3
sRXSPEC.aFFT_SCALE[2].flFactor          = 1.06622
sRXSPEC.aFFT_SCALE[2].bValid            = 1
sRXSPEC.aFFT_SCALE[3].lRxChannel        = 4
sRXSPEC.aFFT_SCALE[3].flFactor          = 1.06524
```

```
sRXSPEC.aFFT_SCALE[3].bValid             = 1
sRXSPEC.aFFT_SCALE[4].lRxChannel         = 5
sRXSPEC.aFFT_SCALE[4].flFactor           = 0.982692
sRXSPEC.aFFT_SCALE[4].bValid             = 1
sRXSPEC.aFFT_SCALE[5].lRxChannel         = 6
sRXSPEC.aFFT_SCALE[5].flFactor           = 0.988603
sRXSPEC.aFFT_SCALE[5].bValid             = 1
sRXSPEC.aFFT_SCALE[6].lRxChannel         = 7
sRXSPEC.aFFT_SCALE[6].flFactor           = 0.981538
sRXSPEC.aFFT_SCALE[6].bValid             = 1
sRXSPEC.aFFT_SCALE[7].lRxChannel         = 8
sRXSPEC.aFFT_SCALE[7].flFactor           = 1.00856
sRXSPEC.aFFT_SCALE[7].bValid             = 1
sRXSPEC.bVariCapVoltagesValid            = 1
sRXSPEC.alDwellTime[0]                   = 8500
sAdjFreSpec.ulMode                       = 0x1
sAdjFreSpec.ucAdjWithBC                  = 0x1
sAdjTraSpec.ucAdjWithBC                  = 0x1
sAdjShimSpec.ulMode                      = 0x1
sAdjShimSpec.ucAdjWithBC                 = 0x1
sAdjWatSupSpec.ulMode                    = 0x1
sAdjWatSupSpec.ucAdjWithBC               = 0x1
alTR[0]                                  = 37000
lContrasts                               = 1
alTE[0]                                  = 4000
acFlowComp[0]                            = 1
lCombinedEchoes                          = 1
sSliceArray.asSlice[0].sPosition.dSag    = 35.31199581
sSliceArray.asSlice[0].sPosition.dCor    = -8.387765754
sSliceArray.asSlice[0].sPosition.dTra    = -23.13178296
sSliceArray.asSlice[0].sNormal.dSag      = 0.771051253
sSliceArray.asSlice[0].sNormal.dCor      = 0.5863890019
sSliceArray.asSlice[0].sNormal.dTra      = -0.2482496801
sSliceArray.asSlice[0].dThickness        = 6
sSliceArray.asSlice[0].dPhaseFOV         = 187.5
sSliceArray.asSlice[0].dReadoutFOV       = 250
sSliceArray.lSize                        = 1
sSliceArray.lSag                         = 1
sSliceArray.lConc                        = 1
sSliceArray.ucMode                       = 0x1
sSliceArray.sTSat.dThickness             = 40
sSliceArray.sTSat.dGap                   = 10
sGroupArray.asGroup[0].nSize             = 1
sGroupArray.asGroup[0].dDistFact         = 0.2
sGroupArray.anMember[1]                  = -1
sGroupArray.lSize                        = 1
sGroupArray.sPSat.dThickness             = 50
sGroupArray.sPSat.dGap                   = 10
sAutoAlign.dAAMatrix[0]                  = 1
sAutoAlign.dAAMatrix[5]                  = 1
sAutoAlign.dAAMatrix[10]                 = 1
sAutoAlign.dAAMatrix[15]                 = 1
sNavigatorPara.ucRespComp                = 0x4
sPrepPulses.ucFatSat                     = 0x4
sPrepPulses.ucWaterSat                   = 0x4
sPrepPulses.ucInversion                  = 0x4
sPrepPulses.ucSatRecovery                = 0x1
sPrepPulses.ucFatSatMode                 = 0x2
sKSpace.lBaseResolution                  = 256
sKSpace.lPhaseEncodingLines              = 192
sKSpace.dPhaseResolution                 = 1
sKSpace.lPartitions                      = 32
sKSpace.lImagesPerSlab                   = 32
sKSpace.dSliceResolution                 = 1
sKSpace.ucPhasePartialFourier            = 0x10
sKSpace.ucSlicePartialFourier            = 0x10
sKSpace.ucAveragingMode                  = 0x2
sKSpace.ucMultiSliceMode                 = 0x1
sKSpace.ucDimension                      = 0x2
sKSpace.ucAsymmetricEchoAllowed          = 0x1
sKSpace.unReordering                     = 0x1
sFastImaging.lEPIFactor                  = 1
sFastImaging.lTurboFactor                = 1
sFastImaging.lSegments                   = 3
sFastImaging.ulEnableRFSpoiling          = 0x1
sPhysioImaging.lSignal1                  = 2
sPhysioImaging.lMethod1                  = 2
sPhysioImaging.lSignal2                  = 1
sPhysioImaging.lMethod2                  = 1
sPhysioImaging.lPhases                   = 21
sPhysioImaging.lRetroGatedImages         = 16
```

```
sPhysioImaging.sPhysioECG.lScanWindow    = 805
sPhysioImaging.sPhysioECG.lTriggerPulses = 1
sPhysioImaging.sPhysioECG.lTriggerWindow = 5
sPhysioImaging.sPhysioECG.lArrhythmiaDetection = 1
sPhysioImaging.sPhysioECG.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioECG.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioPulse.lTriggerPulses = 1
sPhysioImaging.sPhysioPulse.lTriggerWindow = 5
sPhysioImaging.sPhysioPulse.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioPulse.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioExt.lTriggerPulses = 1
sPhysioImaging.sPhysioExt.lTriggerWindow = 5
sPhysioImaging.sPhysioExt.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioExt.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioResp.lRespGateThreshold = 20
sPhysioImaging.sPhysioResp.lRespGatePhase = 2
sPhysioImaging.sPhysioResp.dGatingRatio  = 0.3
sSpecPara.lPhaseCyclingType              = 1
sSpecPara.lPhaseEncodingType             = 1
sSpecPara.lRFExcitationBandwidth         = 1
sSpecPara.ucRemoveOversampling           = 0x1
sSpecPara.lDecouplingType                = 1
sSpecPara.lNOEType                       = 1
sSpecPara.lExcitationType                = 1
sSpecPara.lSpectralSuppression           = 1
sDiffusion.ulMode                        = 0x1
sAngio.sFlowArray.asElm[0].nVelocity     = 100
sAngio.sFlowArray.asElm[0].nDir          = 0x4
sAngio.sFlowArray.lSize                  = 1
sAngio.ucPCFlowMode                      = 0x2
sAngio.ucTOFInflow                       = 0x4
sAngio.ucRephasedImage                   = 0x1
sAngio.ucPhaseImage                      = 0x1
sEllipticalFilter.ucMode                 = 0x1
sPat.lAccelFactPE                        = 1
sPat.lAccelFact3D                        = 1
sPat.ucPATMode                           = 0x1
sPat.ucRefScanMode                       = 0x1
ucAutoMovie                              = 0x1
ucDisableChangeStoreImages               = 0x1
ucReconstructionMode                     = 0x1
ucPHAPSMode                              = 0x1
ucDixon                                  = 0x1
lAverages                                = 2
adFlipAngleDegree[0]                     = 30
lScanTimeSec                             = 103
lTotalScanTimeSec                        = 112
dRefSNR                                  = 165404.1473
dRefSNR_VOI                              = 165404.1473
tdefaultEVAProt                          = "%SiemensEvaDefProt%\Inline\Inline.evp"
tcurrentEVAProt                          = "%CURRENTEVAPROT%\EVA2A5.tmp"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tElement = "PP6"
sCOIL_SELECT_MEAS.asList[0].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[0].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tElement = "PP5"
sCOIL_SELECT_MEAS.asList[1].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[1].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tElement = "PP3"
sCOIL_SELECT_MEAS.asList[2].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[2].lRxChannelConnected = 2
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tElement = "PP4"
sCOIL_SELECT_MEAS.asList[3].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[3].lRxChannelConnected = 3
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tElement = "PP2"
sCOIL_SELECT_MEAS.asList[4].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[4].lRxChannelConnected = 4
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tElement = "PP1"
sCOIL_SELECT_MEAS.asList[5].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[5].lRxChannelConnected = 4
```

```
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tElement = "PA6"
sCOIL_SELECT_MEAS.asList[6].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[6].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tElement = "PA5"
sCOIL_SELECT_MEAS.asList[7].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[7].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tElement = "PA3"
sCOIL_SELECT_MEAS.asList[8].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[8].lRxChannelConnected = 6
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tElement = "PA4"
sCOIL_SELECT_MEAS.asList[9].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[9].lRxChannelConnected = 7
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tElement = "PA2"
sCOIL_SELECT_MEAS.asList[10].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[10].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tElement = "PA1"
sCOIL_SELECT_MEAS.asList[11].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[11].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[0] = 0xff
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[1] = 0x76
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[2] = 0x78
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[3] = 0x87
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[4] = 0x67
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[0] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[1] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[2] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[3] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[4] = 0x2
sEFISPEC.bEFIDataValid                   = 1
### ASCCONV END ###
'
*/
/*
 * Table of equivalence:
 *
ulVersion                                = 0xbee332
<=>
27 - 'MrProtocolVersion' VM 1, VR IS, SyngoDT 6, NoOfItems 6, Data '12510002'
*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include <map>
#include <math.h>
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  gdcm::CSAHeader csa;
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  //const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
  const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();
  if( ds.FindDataElement( t2 ) )
    {
    csa.LoadFromDataElement( ds.GetDataElement( t2 ) );
    //csa.Print( std::cout );
    }
  if( !csa.FindCSAElementByName( "MrProtocol" ) )
```

```
    {
    return 1;
    }
  const gdcm::CSAElement &csael = csa.GetCSAElementByName( "MrProtocol" );
  //std::cout « csael « std::endl;
  const gdcm::ByteValue *bv = csael.GetByteValue();
  if( !bv )
    {
    return 1;
    }
  std::string str(bv->GetPointer(), bv->GetLength());
  std::istringstream is(str);
  std::string s;
  typedef std::map< std::string, std::string > MyMapType;
  MyMapType mymap;
  while( std::getline(is, s ) )
    {
    std::string::size_type pos = s.find( '=' );
    if( pos != std::string::npos )
      {
      std::string sub1 = s.substr(0, pos);
      sub1.erase( sub1.find_last_not_of(' ') + 1);
      std::string sub2 = s.substr(pos+1); // skip the '=' char
      sub2.erase( 0, sub2.find_first_not_of(' '));
      //std::cout « sub1 « std::endl;
      mymap.insert( MyMapType::value_type(sub1, sub2) );
      }
    else
      {
      // ### ASCCONV BEGIN ###
      // ### ASCCONV END ###
      }
    }
  const char fourierstr[] = "sKSpace.ucSlicePartialFourier";
  const gdcm::CSAHeaderDict &csadict = gdcm::Global::GetInstance().GetDicts().GetCSAHeaderDict();
  const gdcm::CSAHeaderDictEntry &fourier = csadict.GetCSAHeaderDictEntry( fourierstr );
  std::cout « fourier « std::endl;
  MyMapType::const_iterator it = mymap.find ( fourierstr );
  if( it == mymap.end() ) return 1;
  //std::cout « it->second « std::endl;
  const std::string &partial_fourier = it->second;
  if( partial_fourier == "0x1" )
    {
    std::cout « "partial fourier is 4/8" « std::endl;
    }
  else if( partial_fourier == "0x2" )
    {
    std::cout « "partial fourier is 5/8" « std::endl;
    }
  else if( partial_fourier == "0x4" )
    {
    std::cout « "partial fourier is 6/8" « std::endl;
    }
  else if( partial_fourier == "0x8" )
    {
    std::cout « "partial fourier is 7/8" « std::endl;
    }
  else if( partial_fourier == "0x10" )
    {
    std::cout « "partial fourier is 8/8" « std::endl;
    }
  else
    {
    std::cerr « "Impossible: " « partial_fourier « std::endl;
    return 1;
    }
/*
This is the Flip Angle:
adFlipAngleDegree[0]                    = 30

One can find it also in the protocol:

...
      <ParamFunctor.""T1mapFunctor"">
      {
        <Class> ""T1mapFunctor@IceImagePostProcFunctors""

        <ParamBool.""EXECUTE""> { }
        <ParamDouble.""Flip1_deg""> { <Precision> 16  14.7378520000000000  }
...
```

```
*/
  // Below is an attemp to play with the CSAHeader dict:
#if 0
  const char gspec[] = "sGRADSPEC.flSensitivityX";
  it = mymap.find( gspec );
  if( it == mymap.end() ) return 1;
  const std::string &dummy = it->second;
  std::cout « dummy « std::endl;
  const gdcm::CSAHeaderDictEntry &csaentry = csadict.GetCSAHeaderDictEntry( gspec );
  std::cout « csaentry  « std::endl;
#endif
/*
    sSliceArray.ucMode -- should be in (1, 2, 4)
    enum SeriesMode
    {
      ASCENDING   = 0x01,
      DESCENDING  = 0x02,
      INTERLEAVED = 0x04
    };
*/
  const char sliceorderstr[] = "sSliceArray.ucMode";
  const gdcm::CSAHeaderDictEntry &sliceorder = csadict.GetCSAHeaderDictEntry( sliceorderstr );
  std::cout « sliceorder « std::endl;
  it = mymap.find ( sliceorderstr );
  if( it == mymap.end() ) return 1;
  const std::string &slice_order = it->second;
  if( slice_order == "0x1" )
    {
    std::cout « "slice_order: ASCENDING" « std::endl;
    }
  else if( slice_order == "0x2" )
    {
    std::cout « "slice_order: DESCENDING" « std::endl;
    }
  else if( slice_order == "0x4" )
    {
    std::cout « "slice_order: INTERLEAVED" « std::endl;
    }
  else
    {
    std::cerr « "Impossible: " « slice_order « std::endl;
    return 1;
    }
  gdcm::MrProtocol mrprot;
  if(  csa.GetMrProtocol(ds, mrprot) )
  {
    std::cout « mrprot « std::endl;
  }
  return 0;
}
```

12.83 PrintLUT.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 */
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"
#include <iostream>
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
```

```
    std::cerr « argv[0] « " input.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  // Instanciate the image reader:
  gdcm::ImageReader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  const gdcm::Image &image = reader.GetImage();
  const gdcm::LookupTable & lut = image.GetLUT();
  lut.Print( std::cout );
  return 0;
}
```

12.84 PublicDict.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Dummy example to show GDCM Dict(s) API (Part 6) + Collected Private Attributes:
 */
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmCSAHeader.h"
#include "gdcmPrivateTag.h"
int main(int , char *[])
{
  const gdcm::Global& g = gdcm::Global::GetInstance(); // sum of all knowledge !
  const gdcm::Dicts &dicts = g.GetDicts();
  const gdcm::Dict &pub = dicts.GetPublicDict(); // Part 6
  //std::cout « pub « std::endl;
  // 3 differents way to access the same information
  // 1. From the public dict only:
  gdcm::Tag patient_name(0x10,0x10);
  const gdcm::DictEntry &entry1 = pub.GetDictEntry(patient_name);
  std::cout « entry1 « std::endl;
  // 2. From all dicts:
  const gdcm::DictEntry &entry2 = dicts.GetDictEntry(patient_name);
  std::cout « entry2 « std::endl;
  // 3. This solution is the most flexible solution as you can request using the same
  // API either a public tag or a private tag
  const char *strowner = nullptr;
  const gdcm::DictEntry &entry3 = dicts.GetDictEntry(patient_name,strowner);
  std::cout « entry3 « std::endl;
  // Private attributes:
  // try with a private tag now:
  const gdcm::PrivateTag &private_tag = gdcm::CSAHeader::GetCSAImageHeaderInfoTag();
  //std::cout « private_tag « std::endl;
  const gdcm::DictEntry &entry4 = dicts.GetDictEntry(private_tag,private_tag.GetOwner());
  std::cout « entry4 « std::endl;
  // Let's pretend that private lookup is on 0x10xx elements:
  gdcm::PrivateTag dummy = private_tag;
  dummy.SetElement( (uint16_t)(0x1000 + dummy.GetElement()) );
  const gdcm::DictEntry &entry5 = dicts.GetDictEntry(dummy,dummy.GetOwner());
  std::cout « entry5 « std::endl;
  return 0;
}
```

12.85 QIDO-RS.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmJSON.h"
/*
 * Simple QIDO-RS round-trip to test implementation of gdcm::JSON
 * See Sup166 for details
 */
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() ) return 1;
  gdcm::JSON json;
  json.PrettyPrintOn();
  std::stringstream ss;
  const gdcm::File & f = reader.GetFile();
  json.Code( f.GetDataSet(), ss);
  std::cout « ss.str() « std::endl;
  gdcm::Writer w;
  gdcm::File & ff = w.GetFile();
  ff.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  if( !json.Decode(ss, ff.GetDataSet() ) )
    {
    std::cerr « "Could not decode" « std::endl;
    return 1;
    }
  w.SetFileName( "/tmp/debug.dcm" );
  if( !w.Write() ) return 1;
  return 0;
}
```

12.86 ReadAndDumpDICOMDIR.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 *   Tom Marynowski (lordglub gmail) for contributing this example
 */
#include "gdcmReader.h"
#include "gdcmMediaStorage.h"
typedef std::set<gdcm::DataElement> DataElementSet;
typedef DataElementSet::const_iterator ConstIterator;
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
```

```
const char *filename = argv[1];
gdcm::Reader reader;
reader.SetFileName( filename);
if( !reader.Read() )
  {
  std::cerr « "Could not read: " « filename « std::endl;
  return 1;
  }
std::stringstream strm;
gdcm::File &file = reader.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
gdcm::FileMetaInformation &fmi = file.GetHeader();
gdcm::MediaStorage ms;
ms.SetFromFile(file);
if( ms != gdcm::MediaStorage::MediaStorageDirectoryStorage )
  {
  std::cout « "This file is not a DICOMDIR" « std::endl;
  return 1;
  }
if (fmi.FindDataElement( gdcm::Tag (0x0002, 0x0002)))
  {   strm.str("");
  fmi.GetDataElement( gdcm::Tag (0x0002, 0x0002) ).GetValue().Print(strm);
  }
else
  {
  std::cerr « " Media Storage Sop Class UID not present" « std::endl;
  }
//TODO il faut trimer strm.str() avant la comparaison au cas ou...
if ("1.2.840.10008.1.3.10"!=strm.str())
  {
  std::cout « "This file is not a DICOMDIR" « std::endl;
  return 1;
  }
ConstIterator it = ds.GetDES().begin();
for( ; it != ds.GetDES().end(); ++it)
  {
  if (it->GetTag()==gdcm::Tag (0x0004, 0x1220))
    {
    const gdcm::DataElement &de = (*it);
    // ne pas utiliser GetSequenceOfItems pour extraire les items
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi =de.GetValueAsSQ();
    unsigned int itemused = 1;
    while (itemused<=sqi->GetNumberOfItems())
      {
      strm.str("");
      if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
      //TODO il faut trimer strm.str() avant la comparaison
      while((strm.str()=="PATIENT")||((strm.str()=="PATIENT ")))
        {
        std::cout « strm.str() « std::endl;
        strm.str("");
        if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0010)))
          sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0010)).GetValue().Print(strm);
        std::cout « "PATIENT NAME : " « strm.str() « std::endl;
        //PATIENT ID
        strm.str("");
        if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0020)))
          sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0020)).GetValue().Print(strm);
        std::cout « "PATIENT ID : " « strm.str() « std::endl;
        /*ADD TAG TO READ HERE*/
        std::cout « "============================ "  « std::endl;
        itemused++;
        strm.str("");
        if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
          sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
        //TODO il faut trimer strm.str() avant la comparaison
        while((strm.str()=="STUDY")||((strm.str()=="STUDY ")))
          {
          std::cout « "   " « strm.str() « std::endl;
          //UID
          strm.str("");
          if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000d)))
            sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000d)).GetValue().Print(strm);
          std::cout « "       STUDY UID : " « strm.str() « std::endl;
          //STUDY DATE
          strm.str("");
          if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0020)))
            sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0020)).GetValue().Print(strm);
          std::cout « "       STUDY DATE : " « strm.str() « std::endl;
          //STUDY DESCRIPTION
```

```
            strm.str("");
            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x1030)))
              sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x1030)).GetValue().Print(strm);
            std::cout « "      STUDY DESCRIPTION : " « strm.str() « std::endl;
            /*ADD TAG TO READ HERE*/
            std::cout « "      " « "========================== "  « std::endl;
            itemused++;
            strm.str("");
            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
              sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
            //TODO il faut trimer strm.str() avant la comparaison
            while((strm.str()=="SERIES")||((strm.str()=="SERIES ")))
              {
              std::cout « "      " « strm.str() « std::endl;
              strm.str("");
              if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000e)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000e)).GetValue().Print(strm);
              std::cout « "          SERIE UID" « strm.str() « std::endl;
              //SERIE MODALITY
              strm.str("");
              if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0060)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0060)).GetValue().Print(strm);
              std::cout « "          SERIE MODALITY" « strm.str() « std::endl;
              //SERIE DESCRIPTION
              strm.str("");
              if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x103e)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x103e)).GetValue().Print(strm);
              std::cout « "          SERIE DESCRIPTION" « strm.str() « std::endl;
              /*ADD TAG TO READ HERE*/
              std::cout « "          " « "========================== "  « std::endl;
              itemused++;
              strm.str("");
              if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
              //TODO il faut trimer strm.str() avant la comparaison
              while ((strm.str()=="IMAGE")||((strm.str()=="IMAGE ")))
                // if(tmp=="IMAGE")
                {
                std::cout « "          " « strm.str() « std::endl;
                //UID
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1511)))
                  sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1511)).GetValue().Print(strm);
                std::cout « "              IMAGE UID : " « strm.str() « std::endl;
                //PATH de l'image
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1500)))
                  sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1500)).GetValue().Print(strm);
                std::cout « "              IMAGE PATH : " « strm.str() « std::endl;
                /*ADD TAG TO READ HERE*/
                if(itemused < sqi->GetNumberOfItems())
                  {itemused++;
                  }else{break;}
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
                  sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
                }
              }
            }
          }
        itemused++;
        }
      }
    }
  return 0;
}
```

12.87 ReadAndDumpDICOMDIR2.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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```

```
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=========================================================================*/
/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 *   Tom Marynowski (lordglub gmail) for contributing the original
 *    ReadAndDumpDICOMDIR.cxx example
 *   Mihail Isakov for contributing offset calculation code here:
 *    https://sourceforge.net/p/gdcm/mailman/gdcm-developers/?viewmonth=201707&viewday=15
 *   Tod Baudais for combining the above and cleaning up this example
 */
#include <string>
#include <unordered_map>
#include <iostream>
#include <memory>
#include "gdcmReader.h"
#include "gdcmAttribute.h"
#include "gdcmDirectory.h"
//============================================================================
//============================================================================
#define TAG_MEDIA_STORAGE_SOP_CLASS_UID 0x0002,0x0002
#define TAG_DIRECTORY_RECORD_SEQUENCE 0x0004,0x1220
#define TAG_DIRECTORY_RECORD_TYPE 0x0004,0x1430
#define TAG_PATIENTS_NAME 0x0010,0x0010
#define TAG_PATIENT_ID 0x0010,0x0020
#define TAG_STUDY_DATE 0x0008,0x0020
#define TAG_STUDY_DESCRIPTION 0x0008,0x1030
#define TAG_MODALITY 0x0008,0x0060
#define TAG_SERIES_DESCRIPTION 0x0008,0x103E
#define TAG_REFERENCED_FILE_ID 0x0004,0x1500
#define TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET 0x0004,0x1420
#define TAG_NEXT_DIRECTORY_RECORD_OFFSET 0x0004,0x1400
//============================================================================
// Some handy utility functions
//============================================================================
std::string left_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(ss.begin(), std::find_if(ss.begin(), ss.end(), std::not1(std::ptr_fun<int, int>(std::isspace))));
    return ss;
}
std::string right_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(std::find_if(ss.rbegin(), ss.rend(), std::not1(std::ptr_fun<int, int>(std::isspace))).base(),
       ss.end());
    return ss;
}
std::string trim(const std::string &s) {
    return left_trim(right_trim(s));
}
//============================================================================
// This code could be put in a header file somewhere
//============================================================================
class DICOMDIRReader {
    public:
                                DICOMDIRReader      (void) {}
                                DICOMDIRReader      (const DICOMDIRReader &rhs) = delete;
                                DICOMDIRReader      (DICOMDIRReader &&rhs) = delete;
        DICOMDIRReader &        operator =          (const DICOMDIRReader &rhs) = delete;
        DICOMDIRReader &        operator =          (DICOMDIRReader &&rhs) = delete;
        virtual                 ~DICOMDIRReader     (void) {}
    public:
        struct Common {
            int64_t child_offset;
            int64_t sibling_offset;
        };
        struct Image: public Common {
            std::string path;
        };
        struct Series: public Common {
            std::string modality;
            std::string description;
            std::vector<std::shared_ptr<Image>> children;
        };
        struct Study: public Common {
            std::string date;
            std::string description;
            std::vector<std::shared_ptr<Series>> children;
```

```
        };
        struct Patient: public Common {
            std::string name;
            std::string id;
            std::vector<std::shared_ptr<Study» children;
        };
        struct Other: public Common {
        };
        const std::vector<std::shared_ptr<Patient»&    load        (const std::string &path);
        const std::vector<std::shared_ptr<Patient»&    patients    (void)  {   return _patients;   }
    private:
        template <class T>
        std::string     get_string              (const T &ds, const gdcm::Tag &tag)
        {
            std::stringstream strm;
            if (ds.FindDataElement(tag)) {
                auto &de = ds.GetDataElement(tag);
                if (!de.IsEmpty() && !de.IsUndefinedLength())
                    de.GetValue().Print(strm);
            }
            return trim(strm.str());
        }
        template <class P, class C, class O>
        void            reassemble_hierarchy    (P &parent_offsets, C &child_offsets, O &other_offsets)
        {
            for (auto &parent : parent_offsets) {
                int64_t sibling_offset;
                auto c = child_offsets[parent.second->child_offset];
                if (!c) {
                    auto o = other_offsets[parent.second->child_offset];
                    if (!o) {
                        continue;
                    } else {
                        sibling_offset = o->sibling_offset;
                    }
                } else {
                    parent.second->children.push_back(c);
                    sibling_offset = c->sibling_offset;
                }
                // Get all siblings
                while (sibling_offset) {
                    c = child_offsets[sibling_offset];
                    if (!c) {
                        auto o = other_offsets[sibling_offset];
                        if (!o) {
                            break;
                        } else {
                            sibling_offset = o->sibling_offset;
                        }
                    } else {
                        parent.second->children.push_back(c);
                        sibling_offset = c->sibling_offset;
                    }
                }
            }
        }
        std::vector<std::shared_ptr<Patient» _patients;
};
//================================================================================
// This code could be put in an implementation file somewhere
//================================================================================
const std::vector<std::shared_ptr<DICOMDIRReader::Patient»& DICOMDIRReader::load (const std::string &path)
{
    _patients.clear();
    //
    // Read the dataset from the DICOMDIR file
    //
    gdcm::Reader reader;
    reader.SetFileName(path.c_str());
    if(!reader.Read()) {
        throw std::runtime_error("Unable to read file");
    }
    // Retrieve information from file
    auto &file = reader.GetFile();
    auto &data_set = file.GetDataSet();
    auto &file_meta_information = file.GetHeader();
    // Retrieve and check the Media Storage class from file
    gdcm::MediaStorage media_storage;
    media_storage.SetFromFile(file);
    if(media_storage != gdcm::MediaStorage::MediaStorageDirectoryStorage) {
        throw std::runtime_error("This file is not a DICOMDIR");
```

```
}
auto media_storage_sop_class_uid = get_string(file_meta_information,
   gdcm::Tag(TAG_MEDIA_STORAGE_SOP_CLASS_UID));
// Make sure we have a DICOMDIR file
if (media_storage_sop_class_uid != "1.2.840.10008.1.3.10") {
    throw std::runtime_error("This file is not a DICOMDIR");
}
//
// Offset to first item courtesy of Mihail Isakov
//
gdcm::VL first_item_offset = 0;
auto it = data_set.Begin();
for(; it != data_set.End() && it->GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE); ++it) {
    first_item_offset += it->GetLength<gdcm::ExplicitDataElement>();
}
// Tag (4 bytes)
first_item_offset += it->GetTag().GetLength();
// VR field
first_item_offset += it->GetVR().GetLength();
// VL field
// For Explicit VR: adventitiously VL field lenght = VR field lenght,
// for SQ 4 bytes:
// http://dicom.nema.org/medical/dicom/current/output/html/part05.html#table_7.1-1
first_item_offset += it->GetVR().GetLength();
//
// Iterate all data elements
//
// For each item in data set
for(auto data_element : data_set.GetDES()) {
    // Only look at Directory sequence
    if (data_element.GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE))
        continue;
    auto item_sequence = data_element.GetValueAsSQ();
    auto num_items = item_sequence->GetNumberOfItems();
    //
    // Compute an offset table
    //
    // Start calculation of offset to each item courtesy of Mihail Isakov
    std::vector<int64_t> item_offsets(num_items+1);
    item_offsets[0] = file_meta_information.GetFullLength() + static_cast<int64_t>(first_item_offset);
    //
    // Extract out all of the items
    //
    std::unordered_map<int64_t, std::shared_ptr<Patient» patient_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Study» study_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Series» series_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Image» image_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Other» other_offsets;
    for (uint32_t item_index = 1; item_index <= num_items; ++item_index) {
        auto &item = item_sequence->GetItem(item_index);
        // Add offset for item to offset table
        item_offsets[item_index] = item_offsets[item_index-1] + item.GetLength<gdcm::ExplicitDataElement>();
        // Child offset
        gdcm::Attribute<TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET> child_offset;
        child_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
   (TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET)));
        // Sibling offset
        gdcm::Attribute<TAG_NEXT_DIRECTORY_RECORD_OFFSET> sibling_offset;
        sibling_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
   (TAG_NEXT_DIRECTORY_RECORD_OFFSET)));
        // Record Type
        auto record_type = trim(get_string(item, gdcm::Tag (TAG_DIRECTORY_RECORD_TYPE)));
        // std::cout « "record_type " « record_type « " at " « item_offsets[item_index-1] « std::endl;
        // std::cout « " child_offset " « child_offset.GetValue() « std::endl;
        // std::cout « " sibling_offset " « sibling_offset.GetValue() « std::endl;
        // Extract patient information
        if (record_type == "PATIENT") {
            auto patient = std::make_shared<Patient>();
            patient->name = get_string(item, gdcm::Tag (TAG_PATIENTS_NAME));
            patient->id = get_string(item, gdcm::Tag (TAG_PATIENT_ID));
            patient->child_offset = child_offset.GetValue();
            patient->sibling_offset = sibling_offset.GetValue();
            patient_offsets[item_offsets[item_index-1]] = patient;
        // Extract study information
        } else if (record_type == "STUDY") {
            auto study = std::make_shared<Study>();
            study->date = get_string(item, gdcm::Tag (TAG_STUDY_DATE));
            study->description = get_string(item, gdcm::Tag (TAG_STUDY_DESCRIPTION));
            study->child_offset = child_offset.GetValue();
            study->sibling_offset = sibling_offset.GetValue();
            study_offsets[item_offsets[item_index-1]] = study;
```

```
            // Extract series information
            } else if (record_type == "SERIES") {
                auto series = std::make_shared<Series>();
                series->modality = get_string(item, gdcm::Tag (TAG_MODALITY));
                series->description = get_string(item, gdcm::Tag (TAG_SERIES_DESCRIPTION));
                series->child_offset = child_offset.GetValue();
                series->sibling_offset = sibling_offset.GetValue();
                series_offsets[item_offsets[item_index-1]] = series;
            // Extract image information
            } else if (record_type == "IMAGE") {
                auto image = std::make_shared<Image>();
                image->path = get_string(item, gdcm::Tag (TAG_REFERENCED_FILE_ID));
                image->child_offset = child_offset.GetValue();
                image->sibling_offset = sibling_offset.GetValue();
                image_offsets[item_offsets[item_index-1]] = image;
            } else {
                auto other = std::make_shared<Other>();
                other->child_offset = child_offset.GetValue();
                other->sibling_offset = sibling_offset.GetValue();
                other_offsets[item_offsets[item_index-1]] = other;
            }
        }
        // Check validity
        if (patient_offsets.size() == 0)
            throw std::runtime_error("Unable to find patient record");
        reassemble_hierarchy(series_offsets, image_offsets, other_offsets);
        reassemble_hierarchy(study_offsets, series_offsets, other_offsets);
        reassemble_hierarchy(patient_offsets, study_offsets, other_offsets);
        // Set the new root
        for (auto &patient : patient_offsets) {
            _patients.push_back(patient.second);
        }
    }
    return _patients;
}
//=============================================================================
// Quick test
//=============================================================================
int main(int argc, const char *argv[]) {
    DICOMDIRReader reader;
    try {
        if (argc != 2)
            throw std::runtime_error("Wrong number of arguments");
        auto &patients = reader.load(argv[1]);
        for (auto &patient : patients) {
            std::cout « "PATIENT" « std::endl;
            std::cout « "NAME: " « patient->name « std::endl;
            std::cout « "ID: " « patient->id « std::endl;
            int x = 0;
            for (auto &study : patient->children) {
                std::cout « "    STUDY" « std::endl;
                std::cout « "    DESCRIPTION: " « study->description « std::endl;
                std::cout « "    DATE: " « study->date « std::endl;
                for (auto &series : study->children) {
                    x+=1;
                    std::cout « "        SERIES " « x « std::endl;
                    std::cout « "        DESCRIPTION: " « series->description « std::endl;
                    std::cout « "        MODALITY: " « series->modality « std::endl;
                    for (auto &image : series->children) {
                        std::cout « "            IMAGE PATH: " « image->path « std::endl;
                    }
                }
            }
        }
    }
    catch (...) {
        // TODO handle this
        return EXIT_FAILURE;
    }
    return EXIT_SUCCESS;
}
```

12.88 ReadAndPrintAttributes.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library
```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This small example will show how one can read and print
 * a DICOM Attribute using different technique (by tag or by name)
 */
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmAttribute.h"
#include "gdcmStringFilter.h"
#include <iostream>
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " input.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  // Instanciate the reader:
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Could not read: " « filename « std::endl;
    return 1;
    }
  // The output of gdcm::Reader is a gdcm::File
  gdcm::File &file = reader.GetFile();
  // the dataset is the the set of element we are interested in:
  gdcm::DataSet &ds = file.GetDataSet();
  const gdcm::Global& g = gdcm::Global::GetInstance();
  const gdcm::Dicts &dicts = g.GetDicts();
  const gdcm::Dict &pubdict = dicts.GetPublicDict();
  using namespace gdcm;
  // In this example we will show why using name to lookup attribute can be
  // dangerous.
  Tag tPatientName(0x0,0x0);
  //const DictEntry &de1 =
  pubdict.GetDictEntryByName("Patient Name", tPatientName);
  std::cout « "Found: " « tPatientName « std::endl;
  // Indeed the attribute could not be found. Since DICOM 2003, Patient Name
  // has become Patient's Name.
  Tag tPatientsName;
  //const DictEntry &de2 =
  pubdict.GetDictEntryByName("Patient's Name", tPatientsName);
  std::cout « "Found: " « tPatientsName « std::endl;
  // Let's try to read an arbitrary DICOM Attribute:
  Tag tDoseGridScaling;
  //const DictEntry &de3 =
  pubdict.GetDictEntryByName("Dose Grid Scaling", tDoseGridScaling);
  std::cout « "Found: " « tDoseGridScaling « std::endl;
  if( ds.FindDataElement( tDoseGridScaling ) )
    {
    gdcm::StringFilter sf;
    sf.SetFile(file);
    std::cout « "Attribute Value as String: " « sf.ToString( tDoseGridScaling ) « std::endl;
    // Let's check the name again:
    std::pair<std::string, std::string> pss
      = sf.ToStringPair( tDoseGridScaling );
    std::cout « "Attribute Name Checked: " « pss.first « std::endl;
    std::cout « "Attribute Value (string): " « pss.second « std::endl;
    //const DataElement &dgs = ds.GetDataElement( tDoseGridScaling );
    // Let's assume for a moment we knew the tag number:
    Attribute<0x3004,0x000e> at;
    assert( at.GetTag() == tDoseGridScaling );
    at.SetFromDataSet( ds );
    // For the sake of long term maintenance, we will not write
    // that this particular attribute is stored as a double. What if
    // a user made a mistake. It is much safer to rely on GDCM internal
    // mechanism to deduce the VR::DS type (represented as a ieee double)
```

```
    Attribute<0x3004,0x000e>::ArrayType v = at.GetValue();
    std::cout « "DoseGridScaling=" « v « std::endl;
    }
  return 0;
}
```

12.89 ReadExplicitLengthSQIVR.cxx

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmImplicitDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmByteValue.h"
#include "gdcmSequenceOfItems.h"
using namespace gdcm;
int main(int argc, char *argv[])
{
  if ( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader r;
  r.SetFileName( filename );
  r.Read();
  //gdcm::PrivateTag pt(0xe1,0x42,"ELSCINT1");
  //gdcm::Tag pt(0x88,0x200);
  gdcm::Tag pt(0x8,0x1140);
  DataSet &ds = r.GetFile().GetDataSet();
  const DataElement &de = ds.GetDataElement( pt );
  std::cout « de « std::endl;
  const ByteValue *bv = de.GetByteValue();
  SmartPointer<SequenceOfItems> sqi = new SequenceOfItems;
  sqi->SetLength( bv->GetLength() );
  std::stringstream ss;
  ss.str( std::string( bv->GetPointer(), bv->GetLength() ) );
  sqi->Read<ImplicitDataElement,SwapperNoOp>( ss );
  std::cout « *sqi « std::endl;
  return 0;
}
```

12.90 ReadGEMSSDO.cxx

```
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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include <iostream>
#include <string>
using namespace gdcm;
```

```
struct SDOElement
{
  typedef std::vector<std::string>::size_type SizeType;
  const char *GetData(SizeType index) const {
    return Data[index].c_str();
  }
  SizeType GetNumberOfData() const {
    return Data.size();
  }
  void SetData(SizeType index, const char *data) {
    Data[index] = data;
  }
  const char *GetDataFormat() const {
    return DataFormat.c_str();
  }
  void SetDataFormat(const char *dataformat, SizeType num) {
    DataFormat = dataformat;
    Data.resize( num );
  }
  void Print( std::ostream &os ) const {
    os « DataFormat « ":" « std::endl;
    std::vector<std::string>::const_iterator it = Data.begin();
    size_t s = 0;
    for( ; it != Data.end(); ++it )
      {
      os « "  (" « s++ « ") " « *it « std::endl;
      }
  }
private:
  std::string DataFormat;
  std::vector<std::string> Data;
};
class SDOHeader
{
public:
  typedef std::vector<SDOElement> SDOElements;
  typedef SDOElements::size_type SizeType;
  SizeType GetNumberOfSDOElements() const {
  return InternalSDODataSet.size();
  }
  void AddSDOElement(SDOElement const &sdoelement) {
  InternalSDODataSet.push_back( sdoelement );
  }
  const SDOElement &GetSDOElement(SizeType index) const {
  return InternalSDODataSet[index];
  }
  const SDOElement &GetSDOElementByName(const char *) const {
    return InternalSDODataSet[0];
  }
  void LoadFromAttributes(std::string const &s1, std::string const &s2)
    {
  std::string tok;
  std::string tok2;
  std::stringstream strstr(s1);
  std::stringstream strstr2(s2);
  SDOElement element;
  // Do format
  size_t count = 0;
  while ( std::getline ( strstr2, tok, '\\' ) )
    {
    //std::cout « tok « " ";
    std::getline ( strstr2, tok2, '\\' );
    //std::cout « tok2 « std::endl;
    count += atoi( tok2.c_str() );
    element.SetDataFormat( tok.c_str(), atoi( tok2.c_str() ) );
    for( size_t t = 0; t < element.GetNumberOfData(); ++t )
      {
      std::getline ( strstr, tok, '\\' );
      element.SetData(t, tok.c_str() );
      }
    AddSDOElement( element );
    }
  //while ( std::getline ( strstr, tok, '^' ) )
//  while ( std::getline ( strstr, tok, '\\' ) )
//    {
//    std::cout « tok « std::endl;
//    count++;
//    }
//  std::cout « "Count: " « count « std::endl;
//  count = 0;
//  std::cout « "Count: " « count « std::endl;
```

```
    }
  void Print( std::ostream &os ) const {
    SDOElements::const_iterator it = InternalSDODataSet.begin();
    for( ; it != InternalSDODataSet.end(); ++it )
      {
      it->Print ( os );
      }
  }
private:
  SDOElements InternalSDODataSet;
};
bool sdo_decode( DataElement const &stringdata, DataElement const &stringdataformat )
{
  const char *sd = stringdata.GetByteValue()->GetPointer();
  const size_t len_sd = stringdata.GetByteValue()->GetLength();
  std::string s1 = std::string( sd, len_sd );
  const char *sdf = stringdataformat.GetByteValue()->GetPointer();
  const size_t len_sdf = stringdataformat.GetByteValue()->GetLength();
  std::string s2 = std::string( sdf, len_sdf );
//  std::cout « s1 « std::endl;
//  std::cout « s2 « std::endl;
  SDOHeader header;
  header.LoadFromAttributes( s1, s2 );
  header.Print( std::cout );
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " input.dcm" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  File &file = reader.GetFile();
  DataSet &ds = file.GetDataSet();
  // StringData (0033,xx1F) 3 "GEMS_GENIE_1" List of SDO parameters stored as
  // list of strings
  const PrivateTag tstringdata(0x33,0x1f,"GEMS_GENIE_1");
  // StringDataFormat (0033,xx23) 3 "GEMS_GENIE_1" Format of string parameters;
  // contains information about name and number of strings in list
  const PrivateTag tstringdataformat(0x33,0x23,"GEMS_GENIE_1");
  if( !ds.FindDataElement( tstringdata ) ) return 1;
  const DataElement& stringdata = ds.GetDataElement( tstringdata );
  if( !ds.FindDataElement( tstringdataformat ) ) return 1;
  const DataElement& stringdataformat = ds.GetDataElement( tstringdataformat );
  sdo_decode( stringdata, stringdataformat );
  return 0;
}
```

12.91 ReadMultiTimesException.cxx

```
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=========================================================================*/
// The intention of this sample program is to provoke bad_alloc exceptions in gdcm code
#include "gdcmImageReader.h"
int main(int argc, char* argv[])
{
  // We pre-allocate some memory (about 1Gb) to help the issue to show up earlier
  char *dummyBuffer = new char[1024*1024*1100]; (void)dummyBuffer;
```

```
  // Check the number of parameters given
  if (argc < 3)
    {
    std::cerr « "Usage: " « argv[0] « " Filename numberOfTries" « std::endl;
    return 1;
    }
  std::cout « "We are going to read the file: " « argv[1] « " " « argv[2] « " times" « std::endl;
  // We hold the pointers in an array to avoid the memory to be released
  // We read the input file n-times
  for (int i = 0; i < atoi(argv[2]); ++i)
    {
    gdcm::ImageReader reader;
    std::cout « "Reading try: " « i « std::endl;
    // Read files
    reader.SetFileName(argv[1]);
    try
      {
      reader.Read();
      gdcm::Image & img = reader.GetImage();
      unsigned long len = img.GetBufferLength();
      char *buffer = new char[ len ];
      img.GetBuffer( buffer ); // do NOT de-allocate buffer !
      }
    catch (std::bad_alloc &ba)
      {
      (void)ba;
      std::cerr « "BAD ALLOC Exception caught!" « std::endl;
      }
    catch (...)
      {
      std::cerr « "Exception caught!" « std::endl;
      }
    }
  return 0;
}
```

12.92 ReadUTF8QtDir.cxx

```
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=========================================================================*/
/*
 * GDCM API expect a const char * as input for SetFileName
 * In order to use this API from Qt, here is a simple test that
 * shows how to do it in a portable manner:
 *
 * http://doc.qt.nokia.com/latest/qdir.html#navigation-and-directory-operations
 */
#include "gdcmReader.h"
#include "gdcmDirectory.h"
#include <QDir>
#include <QString>
#include <QCoreApplication>
#include <string>
#include <fstream>
#include <stdio.h> // fopen
static int TestBothFuncs(const char *info , const char *ba_str)
{
  int res = 0;
  FILE *f = fopen( ba_str, "r" );
  if( f )
    {
    std::cout « info « " fopen: " « ba_str « std::endl;
    fclose(f);
    ++res;
    }
  gdcm::Reader reader;
```

```
  std::ifstream is( ba_str, std::ios::binary );
  if( is.is_open() )
    {
    std::cout « info « " is_open: " « ba_str « std::endl;
    ++res;
    }
  reader.SetStream( is );
  if( reader.CanRead() == true )
    {
    std::cout « info « " SetStream/CanRead:" « ba_str « std::endl;
    ++res;
    }
  is.close();
  reader.SetFileName( ba_str );
  if( reader.CanRead() == true )
    {
    std::cout « info « " SetFileName/CanRead:" « ba_str « std::endl;
    ++res;
    }
  return 4 - res;
}
static int scanFolder(const char dirname[])
{
  int res = 0;
  gdcm::Directory dir;
  unsigned int nfiles = dir.Load( dirname, true );
  const gdcm::Directory::FilenamesType &filenames = dir.GetFilenames();
  for( unsigned int i = 0; i < nfiles; ++i )
    {
    const char *ba_str = filenames[i].c_str();
    res += TestBothFuncs("GDCM",ba_str);
    }
  return res;
}
static int scanFolderQt(QDir const &dir, QStringList& files)
{
  int res = 0;
  QFileInfoList children = dir.entryInfoList(QDir::AllEntries|QDir::NoDotAndDotDot);
  for ( int i=0; i<children.count(); i++ ) {
    QFileInfo file = children.at(i);
    if ( file.isDir() == true ) {
      res += scanFolderQt(QDir(file.absoluteFilePath()), files);
      continue;
    }
    // Convert back from the internal representation to 8bits
    // toLocal8Bit() returns by copy. Need to store explicitly the QByteArray
    QByteArray str = file.absoluteFilePath().toLocal8Bit();
    const char *ba_str1 = str.constData();
    res += TestBothFuncs("QString", ba_str1);
    }
  return res;
}
int main(int argc, char *argv[])
{
  // very important:
  QCoreApplication qCoreApp( argc , argv );
  if( argc < 2 )
    {
    std::cerr « argv[0] « " dir " « std::endl;
    return 1;
    }
  int res = 0;
  const char *dirname = argv[1];
  res += scanFolder( dirname );
  QDir dir( QString::fromLocal8Bit(dirname) );
  QStringList files;
  res += scanFolderQt( dir, files);
  if( res )
    std::cerr « "Problem with UTF-8" « std::endl;
  else
    std::cerr « "Success with UTF-8" « std::endl;
  return res;
}
```

12.93 SimpleScanner.cxx

```
/*=========================================================================
```

```
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=========================================================================*/
/*
 * Simple example to show how to use Scanner API.
 * It exposes the three different cases:
 *  - DICOM Attribute is present and has a value
 *  - DICOM Attribute is present and has no value
 *  - DICOM Attribute is not present at all
 * It also shows the purpose of the function 'IsKey' to detect whether or
 * not the file has been read by the gdcm::Scanner. Technically most of the time
 * if a file is not a 'Key' this is because it is not a DICOM file. You need to use
 * gdcm::System::FileExists to decide whether or not the file actually exist on the disk.
 *
 * It was tested on this particular image:
 * ./SimpleScanner gdcmData/012345.002.050.dcm
 */
#include "gdcmStrictScanner.h"
#include "gdcmSimpleSubjectWatcher.h"
#include "gdcmFileNameEvent.h"
class MyFileWatcher : public gdcm::SimpleSubjectWatcher
{
public:
  MyFileWatcher(gdcm::Subject * s, const char *comment = ""):
    gdcm::SimpleSubjectWatcher(s,comment){}
  void ShowFileName(gdcm::Subject *, const gdcm::Event &evt) override
    {
    const gdcm::FileNameEvent &pe = dynamic_cast<const gdcm::FileNameEvent&>(evt);
    const char *fn = pe.GetFileName();
    std::cout « "FileName: " « fn « " FileSize: " « gdcm::System::FileSize( fn ) « std::endl;
    }
};
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    return 1;
    }
  const char *filename = argv[1];
  const char filename_invalid[] = "this is a file that may not exist on this disk.dcm";
  gdcm::SmartPointer<gdcm::StrictScanner> sp = new gdcm::StrictScanner;
  gdcm::StrictScanner &s = *sp;
  //gdcm::SimpleSubjectWatcher w(&s, "TestFileName" );
  MyFileWatcher w(&s, "TestFileName" );
  const gdcm::Tag tag_array[] = {
    gdcm::Tag(0x8,0x50),
    gdcm::Tag(0x8,0x51),
    gdcm::Tag(0x8,0x60),
    gdcm::Tag(0x8,0x80),
  };
  s.AddTag( tag_array[0] );
  s.AddTag( tag_array[1] );
  s.AddTag( tag_array[2] );
  s.AddTag( tag_array[3] );
  gdcm::Directory::FilenamesType filenames;
  filenames.push_back( filename );
  filenames.push_back( filename_invalid );
  if( !s.Scan( filenames ) )
    {
    return 1;
    }
  //s.Print( std::cout );
  for(gdcm::Directory::FilenamesType::const_iterator it = filenames.begin();
    it != filenames.end(); ++it )
    {
    if( s.IsKey( it->c_str() ) )
      {
      std::cout « "INFO:" « it->c_str() « " is a proper Key for the Scanner (this is a DICOM file)" « std::endl;
      }
    else
      {
      std::cout « "INFO:" « it->c_str() « " is not a proper Key for the Scanner (this is either not a DICOM file
```

```
       or file does not exist)" << std::endl;
      }
    }
  gdcm::StrictScanner::TagToValue const &ttv = s.GetMapping(filename);
  const gdcm::Tag *ptag = tag_array;
  for( ; ptag != tag_array + 3; ++ptag )
    {
    gdcm::StrictScanner::TagToValue::const_iterator it = ttv.find( *ptag );
    if( it != ttv.end() )
      {
      std::cout << *ptag << " was properly found in this file" << std::endl;
      // it contains a pair of value. the first one is the actual tag, so the following is always true:
      //  *ptag == it->first
      // The second part is the actual value (stored as RAW strings). You will have to reinterpret this string
      // if VR for *ptag is not VR::VRASCII !
      const char *value = it->second;
      if( *value )
        {
        std::cout << "  It has the value: " << value << std::endl;
        }
      else
        {
        std::cout << "  It has no value (empty)" << std::endl;
        }
      }
    else
      {
      std::cout << "Sorry " << *ptag << " could not be found in this file" << std::endl;
      }
    }
  return 0;
}
```

12.94 SortImage.cxx

```
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=========================================================================*/
/*
 */
#include "gdcmSorter.h"
#include "gdcmScanner.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
bool mysort(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  //gdcm::Attribute<0x0020,0x0013> at1; // Instance Number
  gdcm::Attribute<0x0018,0x1060> at1; // Trigger Time
  gdcm::Attribute<0x0020,0x0032> at11; // Image Position (Patient)
  at1.Set( ds1 );
  at11.Set( ds1 );
  //gdcm::Attribute<0x0020,0x0013> at2;
  gdcm::Attribute<0x0018,0x1060> at2;
  gdcm::Attribute<0x0020,0x0032> at22;
  at2.Set( ds2 );
  at22.Set( ds2 );
  if( at11 == at22 )
    {
    return at1 < at2;
    }
  return at11 < at22;
}
bool mysort_part1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  gdcm::Attribute<0x0018,0x1060> at1;
  at1.Set( ds1 );
  gdcm::Attribute<0x0018,0x1060> at2;
```

```
  at2.Set( ds2 );
  return at1 < at2;
}
bool mysort_part2(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  gdcm::Attribute<0x0020,0x0032> at1;
  at1.Set( ds1 );
  gdcm::Attribute<0x0020,0x0032> at2;
  at2.Set( ds2 );
  return at1 < at2;
}
// technically all files are in the same Frame of Reference, so this function
// should be a no-op
bool mysort_dummy(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  gdcm::Attribute<0x0020,0x0052> at1; // FrameOfReferenceUID
  at1.Set( ds1 );
  gdcm::Attribute<0x0020,0x0052> at2;
  at2.Set( ds2 );
  return at1 < at2;
}
int main(int argc, char *argv[])
{
  if (argc < 2 ) return 1;
  const char *dirname = argv[1];
  gdcm::Directory dir;
  unsigned int nfiles = dir.Load( dirname );
  dir.Print( std::cout );
  gdcm::Sorter sorter;
  sorter.SetSortFunction( mysort );
  sorter.Sort( dir.GetFilenames() );
  std::cout « "Sorter:" « std::endl;
  sorter.Print( std::cout );
  gdcm::Sorter sorter2;
  sorter2.SetSortFunction( mysort_part1 );
  sorter2.StableSort( dir.GetFilenames() );
  sorter2.SetSortFunction( mysort_part2 );
  sorter2.StableSort( sorter2.GetFilenames() ); // IMPORTANT
  sorter2.SetSortFunction( mysort_dummy );
  sorter2.StableSort( sorter2.GetFilenames() ); // IMPORTANT
  std::cout « "Sorter2:" « std::endl;
  sorter2.Print( std::cout );
  gdcm::Scanner s;
  s.AddTag( gdcm::Tag(0x20,0x32) ); // Image Position (Patient)
  //s.AddTag( gdcm::Tag(0x20,0x37) ); // Image Orientation (Patient)
  s.Scan( dir.GetFilenames() );
  //s.Print( std::cout );
  // Count how many different IPP there are:
  const gdcm::Scanner::ValuesType &values = s.GetValues();
  size_t nvalues = values.size();
  std::cout « "There are " « nvalues « " different type of values" « std::endl;
  //std::cout « "nfiles=" « nfiles « std::endl;
  if( nfiles % nvalues != 0 )
    {
    std::cerr « "Impossible: this is a not a proper series" « std::endl;
    return 1;
    }
  std::cout « "Series is composed of " « (nfiles/nvalues) « " different 3D volumes" « std::endl;
  return 0;
}
```

12.95 StreamImageReaderTest.cxx

```
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=========================================================================*/
// This work was realised during the GSOC 2011 by Manoj Alwani
```

```
#include "gdcmStreamImageReader.h"
#include "gdcmFileMetaInformation.h"
#include "gdcmSystem.h"
#include "gdcmFilename.h"
#include "gdcmByteSwap.h"
#include "gdcmTrace.h"
#include "gdcmTesting.h"
#include "gdcmImageHelper.h"
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmMediaStorage.h"
#include "gdcmRAWCodec.h"
#include "gdcmJPEGLSCodec.h"
#include "gdcmUIDGenerator.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
bool StreamImageRead(gdcm::StreamImageWriter & theStreamWriter,
  const char* filename, const char* outfilename, int resolution)
{
  gdcm::StreamImageReader reader;
  reader.SetFileName( filename );
  if (!reader.ReadImageInformation())
    {
    std::cerr « "unable to read image information" « std::endl;
    return 1; //unable to read tags as expected.
    }
  //let's be tricky; each image will be read in portions, first the top half, then the bottom
  //that way, we can test how the stream handles fragmentation of the data
  //we could also loop this to get various different size combinations, but I'm not sure
  //that's useful, yet.
  std::vector<unsigned int> extent =
    gdcm::ImageHelper::GetDimensionsValue(reader.GetFile());
  // std::cout « extent[0];
  //at this point, these values aren't used, but may be in the future
  //unsigned short xmin = 0;
  //unsigned short xmax = extent[0];
  //unsigned short ymin = 0;
  //unsigned short ymax = extent[1];
  //unsigned short zmin = 0;
  //unsigned short zmax = extent[2];
  std::cout« "\n Row: "«extent[0] «"\n Col :"« extent[1]« "\n Resolution :"« extent[2] « std::endl;
  int a =1;
  for (int i=1; i<=(extent[2]-resolution);++i)
    a = a*2;
  reader.DefinePixelExtent(0, extent[0]/a, 0, extent[1]/a, resolution-1, resolution);
  unsigned long len = reader.DefineProperBufferLength();
  char* finalBuffer = new char[len];
  memset(finalBuffer, 0, sizeof(char)*len);
  if (reader.CanReadImage())
    {
    bool result = reader.Read(finalBuffer, len);
    if( !result )
      {
      std::cout « "res2 failure:" « filename « std::endl;
      delete [] finalBuffer;
      return 1;
      }
    else
      {
      std::cout« "Able to read";
      }
    }
  else
    {
    std::cerr« "Not able to put in buffer"« std::endl;
    }
/*
    //now, read in smaller buffer extents
    reader.DefinePixelExtent(xmin, xmax, ymin, ymax);
    len = reader.DefineProperBufferLength();

    char* buffer = new char[len];
    bool res2 = reader.Read(buffer, len);
    if( !res2 ){
      std::cerr « "res2 failure:" « filename « std::endl;
      return 1;
    }
    //copy the result into finalBuffer
    memcpy(finalBuffer, buffer, len);
```

```
    //now read the next half of the image
    ymin = ymax;
    ymax = extent[1];

    reader.DefinePixelExtent(xmin, xmax, ymin, ymax);

    //std::cerr « "Success to read image from file: " « filename « std::endl;
    unsigned long len2 = reader.DefineProperBufferLength();

    char* buffer2 = new char[len2];
    bool res3 = reader.Read(buffer2, len2);
    if( !res3 ){
      std::cerr « "res3 failure:" « filename « std::endl;
      return 1;
    }
    //copy the result into finalBuffer
    memcpy(&(finalBuffer[len]), buffer2, len2);

    delete [] buffer;
    delete [] buffer2;
*/
  gdcm::Writer w;
  gdcm::File &file = w.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
  gdcm::UIDGenerator uid;
  gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
  de.SetVR( gdcm::VR::UI );
  const char *u = uid.Generate();
  de.SetByteValue( u, strlen(u) );
  ds.Insert( de );
  gdcm::DataElement de1( gdcm::Tag(0x8,0x16) );
  de1.SetVR( gdcm::VR::UI );
  gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
  de1.SetByteValue( ms.GetString(), strlen(ms.GetString()));
  ds.Insert( de1 );
  const char mystr[] = "MONOCHROME2 ";
  gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
  //de.SetTag(gdcm::Tag(0x28,0x04));
  de2.SetVR( gdcm::VR::CS );
  de2.SetByteValue(mystr, strlen(mystr));
  ds.Insert( de2 );
   gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
   ds.Insert( Number_Of_Frames.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0010> row = {extent[0]/a};//
   ds.Insert( row.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0011> col = {extent[1]/a};//
   ds.Insert( col.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0100> at = {8};
   ds.Insert( at.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0002> at1 = {1};//
   ds.Insert( at1.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0101> at2 = {8};
   ds.Insert( at2.GetAsDataElement() );
   gdcm::Attribute<0x0028,0x0102> at3 = {7};
   ds.Insert( at3.GetAsDataElement() );
    /*
   ds1.Remove( gdcm::Tag(0x0028,0x0008) );

   gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
   ds1.Insert( Number_Of_Frames.GetAsDataElement() );
*/
   theStreamWriter.SetFile(file);
   if (!theStreamWriter.WriteImageInformation())
     {
     std::cerr « "unable to write image information" « std::endl;
     return 1; //the CanWrite function should prevent getting here, else,
     //that's a test failure
     }
    std::vector<unsigned int> extent1 = gdcm::ImageHelper::GetDimensionsValue(file);
    unsigned short xmax = extent1[0];
    unsigned short ymax = extent1[1];
    unsigned short theChunkSize = 1;
    unsigned short ychunk = extent1[1]/theChunkSize; //go in chunk sizes of theChunkSize
    unsigned short zmax = 1;
    std::cout« "\n Row: "«extent1[0] «"\n Col :"« extent1[1]« "\n Resolution :"« extent1[2] « std::endl;
    if (xmax == 0 || ymax == 0)
      {
      std::cerr « "Image has no size, unable to write zero-sized image." « std::endl;
      return 0;
```

```
      }
    int z, y, nexty;
    unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
    //the bytes sequentially.  So, store how far you got in the buffer with each iteration.
    for (z = 0; z < zmax; ++z){
      for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout « "\n" «len;
        char* finalBuffer1 = new char[len];
        memcpy(finalBuffer1, &(finalBuffer[prevLen]), len);
        std::cout « "\nable to write";
        if (!theStreamWriter.Write(finalBuffer1, len)){
          std::cerr « "writing failure:" « "output.dcm" « " at y = " « y « " and z= " « z « std::endl;
          delete [] finalBuffer1;
          delete [] finalBuffer;
          return 1;
        }
        delete [] finalBuffer1;
        prevLen += len;
      }
    }
   delete [] finalBuffer;
   std::cout « "all is set";
  return true;
}
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm Resolution" « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  char *res = argv[3];
  int resolution = atoi(res);
  gdcm::StreamImageWriter theStreamWriter;
  std::ofstream of;
  of.open( outfilename, std::ios::out | std::ios::binary );
  theStreamWriter.SetStream(of);
  // else
  // First of get rid of warning/debug message
  gdcm::Trace::DebugOn();
  gdcm::Trace::WarningOn();
  if(!StreamImageRead( theStreamWriter, filename, outfilename, resolution))
    return 1;
  uint16_t firstTag1 =  0xfffe;
  uint16_t secondTag1 = 0xe0dd;
  uint32_t thirdTag1 =  0x00000000;
  //uint16_t fourthTag1 = 0xffff;
  const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
  char* tmpBuffer2 = new char[theBufferSize1];
  memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
  memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
  memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
  //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
  assert( of && !of.eof() && of.good() );
  of.write(tmpBuffer2, theBufferSize1);
  of.flush();
  assert( of );
  return 0;
}
```

12.96 TemplateEmptyImage.cxx

```
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=========================================================================*/
#include "gdcmFileStreamer.h"
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmImageRegionReader.h"
#include "gdcmImageHelper.h"
#include "gdcmWriter.h"
#include "gdcmImageWriter.h"
#include "gdcmTagKeywords.h"
#include "gdcmUIDGenerator.h"
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  const char * filename = argv[1];
  gdcm::ImageRegionReader irr;
  irr.SetFileName( filename );
  const bool b3 = irr.ReadInformation();
  std::cout << b3 << std::endl;
  gdcm::Image & img = irr.GetImage();
  std::cout << img << std::endl;
  //  const gdcm::Region & r = irr.GetRegion();
  //  std::cout << r << std::endl;
  gdcm::ImageWriter w;
  gdcm::File & file = w.GetFile();
  gdcm::DataSet & ds = file.GetDataSet();
  gdcm::UIDGenerator uid;
  namespace kwd = gdcm::Keywords;
  kwd::FrameOfReferenceUID frameref;
  frameref.SetValue( uid.Generate() );
  // ContentDate
  char date[22];
  const size_t datelen = 8;
  int res = gdcm::System::GetCurrentDateTime(date);
  (void)res;
  kwd::ContentDate contentdate;
  // Do not copy the whole cstring:
  contentdate.SetValue( gdcm::DAComp( date, datelen ) );
  ds.Insert( contentdate.GetAsDataElement() );
  // ContentTime
  const size_t timelen = 6 + 1 + 6; // time + milliseconds
  kwd::ContentTime contenttime;
  // Do not copy the whole cstring:
  contenttime.SetValue( gdcm::TMComp(date+datelen, timelen) );
  ds.Insert( contenttime.GetAsDataElement() );

  gdcm::MediaStorage ms0 = w.ComputeTargetMediaStorage();
  std::cout << ms0 << std::endl;
  kwd::SeriesNumber seriesnumber = { 1 };
  kwd::InstanceNumber instancenum = { 1 };
  kwd::StudyID studyid = { "St1" };
  kwd::PatientID patientid = { "P1" };
  kwd::SOPClassUID sopclassuid;
  kwd::PositionReferenceIndicator pri;
  //kwd::Laterality lat;
  //kwd::BodyPartExamined bodypartex = { "HEAD" };
  kwd::BodyPartExamined bodypartex = { "ANKLE" };
  kwd::PatientOrientation pator;
  kwd::BurnedInAnnotation bia = { "NO" };
  kwd::ConversionType convtype = { "SYN" };
  kwd::PresentationLUTShape plutshape = { "IDENTITY" }; // MONOCHROME2
  // gdcm will pick the Word in case Byte class is not compatible:
  gdcm::MediaStorage ms = gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage;
  sopclassuid.SetValue( ms.GetString() );
  ds.Insert( instancenum.GetAsDataElement() );
  ds.Insert( sopclassuid.GetAsDataElement() );
  ds.Insert( seriesnumber.GetAsDataElement() );
  ds.Insert( patientid.GetAsDataElement() );
  ds.Insert( studyid.GetAsDataElement() );
  ds.Insert( frameref.GetAsDataElement() );
  ds.Insert( pri.GetAsDataElement() );
  //ds.Insert( lat.GetAsDataElement() );
  ds.Insert( bodypartex.GetAsDataElement() );
  ds.Insert( pator.GetAsDataElement() );
  ds.Insert( bia.GetAsDataElement() );
  ds.Insert( convtype.GetAsDataElement() );
  ds.Insert( plutshape.GetAsDataElement() );
  //    gdcm::MediaStorage ms1 = w.ComputeTargetMediaStorage();
  //    std::cout << ms1 << std::endl;
```

```
  std::cout « ds « std::endl;
  gdcm::PixelFormat & pf = img.GetPixelFormat();
  pf.SetPixelRepresentation(0); // always overwrite
  img.SetSlope(1);
  img.SetIntercept(0);
  w.SetImage( img );
  w.SetFileName( "TemplateImage.dcm" );
  if( !w.Write() )
  {
    return 1;
  }
  return 0;
}
```

12.97 TraverseModules.cxx

```
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=========================================================================*/
/*
 */
#include "gdcmDefs.h"
#include "gdcmGlobal.h"
#include "gdcmIODs.h"
#include "gdcmIOD.h"
#include "gdcmMacros.h"
#include "gdcmIODEntry.h"
#include "gdcmModules.h"
#include "gdcmModule.h"
#include "gdcmAnonymizer.h"
#include "gdcmDicts.h"
int main(int , char *[])
{
  using namespace gdcm;
  static Global &g = Global::GetInstance();
  if( !g.LoadResourcesFiles() )
    {
    return 1;
    }
  static const Defs &defs = g.GetDefs();
  static const Modules &modules = defs.GetModules();
  static const IODs &iods = defs.GetIODs();
  static const Macros &macros = defs.GetMacros();
  static const Dicts &dicts = g.GetDicts();
  std::vector<Tag> tags = gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
  for( std::vector<Tag>::const_iterator tit = tags.begin(); tit != tags.end(); ++tit )
    {
    const Tag &tag = *tit;
    const DictEntry &dictentry = dicts.GetDictEntry(tag);
    std::cout « "Processing Attribute: " « tag « " " « dictentry « std::endl;
    IODs::IODMapTypeConstIterator it = iods.Begin();
    for( ; it != iods.End(); ++it )
      {
      const IODs::IODName &name = it->first;
      const IOD &iod = it->second;
      const size_t niods = iod.GetNumberOfIODs();
      // Iterate over each iod entry in order:
      for(unsigned int idx = 0; idx < niods; ++idx)
        {
        const IODEntry &iodentry = iod.GetIODEntry(idx);
        const char *ref = iodentry.GetRef();
        //Usage::UsageType ut = iodentry.GetUsageType();
        const Module &module = modules.GetModule( ref );
        if( module.FindModuleEntryInMacros(macros, tag ) )
          {
          const ModuleEntry &module_entry = module.GetModuleEntryInMacros(macros,tag);
```

```
          Type type = module_entry.GetType();
          std::cout « "IOD Name: " « name « std::endl;
          std::cout « "Type: " « type « std::endl;
          }
        }
      }
    }
  return 0;
}
```

12.98 VolumeSorter.cxx

```
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=========================================================================*/
/*
 */
#include "gdcmSorter.h"
#include "gdcmIPPSorter.h"
#include "gdcmScanner.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
#include "gdcmTesting.h"
bool mysort1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  gdcm::Attribute<0x0020,0x000d> at1;
  at1.Set( ds1 );
  gdcm::Attribute<0x0020,0x000d> at2;
  at2.Set( ds2 );
  return at1 < at2;
}
bool mysort2(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  gdcm::Attribute<0x0020,0x000e> at1;
  at1.Set( ds1 );
  gdcm::Attribute<0x0020,0x000e> at2;
  at2.Set( ds2 );
  return at1 < at2;
}
bool mysort3(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  // This is a floating point number is the comparison ok ?
  gdcm::Attribute<0x0020,0x0037> at1;
  at1.Set( ds1 );
  gdcm::Attribute<0x0020,0x0037> at2;
  at2.Set( ds2 );
  return at1 < at2;
}
bool mysort4(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
  // Do the IPP sorting here
  gdcm::Attribute<0x0020,0x0032> ipp1;
  gdcm::Attribute<0x0020,0x0037> iop1;
  ipp1.Set( ds1 );
  iop1.Set( ds1 );
  gdcm::Attribute<0x0020,0x0032> ipp2;
  gdcm::Attribute<0x0020,0x0037> iop2;
  ipp2.Set( ds2 );
  iop2.Set( ds2 );
  if( iop1 != iop2 )
    {
    return false;
    }
  // else
  double normal[3];
  normal[0] = iop1[1]*iop1[5] - iop1[2]*iop1[4];
  normal[1] = iop1[2]*iop1[3] - iop1[0]*iop1[5];
```

```
  normal[2] = iop1[0]*iop1[4] - iop1[1]*iop1[3];
  double dist1 = 0;
  for (int i = 0; i < 3; ++i) dist1 += normal[i]*ipp1[i];
  double dist2 = 0;
  for (int i = 0; i < 3; ++i) dist2 += normal[i]*ipp2[i];
  std::cout « dist1 « "," « dist2 « std::endl;
  return dist1 < dist2;
}
int main(int argc, char *argv[])
{
  const char *extradataroot = gdcm::Testing::GetDataExtraRoot();
  std::string dir1;
  if( argc < 2 )
    {
    if( !extradataroot )
      {
      return 1;
      }
    dir1 = extradataroot;
    dir1 += "/gdcmSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
  else
    {
    dir1 = argv[1];
    }
  gdcm::Directory d;
  d.Load( dir1.c_str(), true ); // recursive !
  const gdcm::Directory::FilenamesType &l1 = d.GetFilenames();
  const size_t nfiles = l1.size();
  std::cout « nfiles « std::endl;
  //if( nfiles != 280 )
  //  {
  //  return 1;
  //  }
  //d.Print( std::cout );
  gdcm::Scanner s0;
  const gdcm::Tag t1(0x0020,0x000d); // Study Instance UID
  const gdcm::Tag t2(0x0020,0x000e); // Series Instance UID
  //const gdcm::Tag t3(0x0010,0x0010); // Patient's Name
  s0.AddTag( t1 );
  s0.AddTag( t2 );
  //s0.AddTag( t3 );
  //s0.AddTag( t4 );
  //s0.AddTag( t5 );
  //s0.AddTag( t6 );
  bool b = s0.Scan( d.GetFilenames() );
  if( !b )
    {
    std::cerr « "Scanner failed" « std::endl;
    return 1;
    }
  //s0.Print( std::cout );
  // Only get the DICOM files:
  gdcm::Directory::FilenamesType l2 = s0.GetKeys();
  const size_t nfiles2 = l2.size();
  std::cout « nfiles2 « std::endl;
  if ( nfiles2 > nfiles )
    {
    return 1;
    }
  gdcm::Sorter sorter;
  sorter.SetSortFunction( mysort1 );
  sorter.StableSort( l2 );
  sorter.SetSortFunction( mysort2 );
  sorter.StableSort( sorter.GetFilenames() );
  sorter.SetSortFunction( mysort3 );
  sorter.StableSort( sorter.GetFilenames() );
  sorter.SetSortFunction( mysort4 );
  sorter.StableSort( sorter.GetFilenames() );
  //sorter.Print( std::cout );
  // Let's try to check our result:
  // assume that IPP is precise enough so that we can test floating point equality:
  size_t nvalues = 0;
{
  gdcm::Scanner s;
  s.AddTag( gdcm::Tag(0x20,0x32) ); // Image Position (Patient)
  //s.AddTag( gdcm::Tag(0x20,0x37) ); // Image Orientation (Patient)
  s.Scan( d.GetFilenames() );
  //s.Print( std::cout );
  const gdcm::Scanner::ValuesType &values = s.GetValues();
  nvalues = values.size();
```

```
  std::cout « "There are " « nvalues « " different type of values" « std::endl;
  assert( nfiles2 % nvalues == 0 );
  std::cout « "Series is composed of " « (nfiles/nvalues) « " different 3D volumes" « std::endl;
}
  gdcm::Directory::FilenamesType sorted_files = sorter.GetFilenames();
  // Which means we can take nvalues files at a time and execute gdcm::IPPSorter on it:
  gdcm::IPPSorter ippsorter;
  gdcm::Directory::FilenamesType sub( sorted_files.begin(), sorted_files.begin() + nvalues);
  std::cout « sub.size() « std::endl;
  std::cout « sub[0] « std::endl;
  std::cout « sub[nvalues-1] « std::endl;
  ippsorter.SetComputeZSpacing( false );
  if( !ippsorter.Sort( sub ) )
    {
    std::cerr « "Could not sort" « std::endl;
    return 1;
    }
  std::cout « "IPPSorter:" « std::endl;
  ippsorter.Print( std::cout );
  return 0;
}
```

12.99 csa2img.cxx

```
/*=========================================================================

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * I do not know what the format is, just guessing from info found on the net:
 *
 * http://atonal.ucdavis.edu/matlab/fmri/spm5/spm_dicom_convert.m
 *
 * This example is an attempt at understanding the format used by SIEMENS
 * their "SIEMENS CSA NON-IMAGE" DICOM file (1.3.12.2.1107.5.9.1)
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 */
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"
#include <math.h>
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
  // gdcmDataExtra/gdcmNonImageData/exCSA_Non-Image_Storage.dcm
  // PHANTOM.MR.CARDIO_COEUR_S_QUENCE_DE_REP_RAGE.9.257.2008.03.20.14.53.25.578125.43151705.IMA
  const char *filename = argv[1];
  gdcm::Reader reader; // Do not use ImageReader
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  gdcm::CSAHeader csa;
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
  //std::cout « t1 « std::endl;
  //const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();
```

```
if( ds.FindDataElement( t1 ) )
  {
  csa.LoadFromDataElement( ds.GetDataElement( t1 ) );
  csa.Print( std::cout );
  }
int dims[2] = {};
if( csa.FindCSAElementByName( "Columns" ) )
  {
  const gdcm::CSAElement &csael = csa.GetCSAElementByName( "Columns" );
  std::cout << csael << std::endl;
  //const gdcm::ByteValue *bv = csael.GetByteValue();
  gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el;
  el.Set( csael.GetValue() );
  dims[0] = el.GetValue();
  std::cout << "Columns:" << el.GetValue() << std::endl;
  }
if( csa.FindCSAElementByName( "Rows" ) )
  {
  const gdcm::CSAElement &csael2 = csa.GetCSAElementByName( "Rows" );
  std::cout << csael2 << std::endl;
  gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
  el2.Set( csael2.GetValue() );
  dims[1] = el2.GetValue();
  std::cout << "Rows:" << el2.GetValue() << std::endl;
  }
double spacing[2] = { 1. , 1. };
bool spacingfound = false;
if( csa.FindCSAElementByName( "PixelSpacing" ) )
  {
  const gdcm::CSAElement &csael3 = csa.GetCSAElementByName( "PixelSpacing" );
  if( !csael3.IsEmpty() )
    {
    std::cout << csael3 << std::endl;
    gdcm::Element<gdcm::VR::DS, gdcm::VM::VM2> el3;
    el3.Set( csael3.GetValue() );
    spacing[0] = el3.GetValue(0);
    spacing[1] = el3.GetValue(1);
    std::cout << "PixelSpacing:" << el3.GetValue() << "," << el3.GetValue(1) << std::endl;
    spacingfound = true;
    }
  }
if( !spacingfound )
  {
  std::cerr << "Problem with PixelSpacing" << std::endl;
  //return 1;
  }
if( !dims[0] || !dims[1] )
  {
  std::cerr << "Problem with dims" << std::endl;
  return 1;
  }
gdcm::ImageWriter writer;
gdcm::Image &image = writer.GetImage();
image.SetNumberOfDimensions( 2 ); // good default
image.SetDimension(0, dims[0] );
image.SetDimension(1, dims[1] );
image.SetSpacing(0, spacing[0] );
image.SetSpacing(1, spacing[1] );
gdcm::PixelFormat pixeltype = gdcm::PixelFormat::INT16; // bytepix = spm_type('int16','bits')/8;
//unsigned long l = image.GetBufferLength();
//const int p =  l / (dims[0] * dims[1]);
//image.SetNumberOfDimensions( 3 );
//image.SetDimension(2, p / pixeltype.GetPixelSize() );
gdcm::PhotometricInterpretation pi;
pi = gdcm::PhotometricInterpretation::MONOCHROME2;
//pixeltype.SetSamplesPerPixel(  );
image.SetPhotometricInterpretation( pi );
image.SetPixelFormat( pixeltype );
//image.SetIntercept( inputimage.GetIntercept() );
//image.SetSlope( inputimage.GetSlope() );
//gdcm::DataElement pixeldata( gdcm::Tag(0x7fe1,0x1010) );
//pixeldata.SetByteValue( &outbuf[0], outbuf.size() );
gdcm::PrivateTag csanonimaget(0x7fe1,0x10,"SIEMENS CSA NON-IMAGE");
const gdcm::DataElement &pixeldata = ds.GetDataElement( csanonimaget );
image.SetDataElement( pixeldata );
std::string outfilename = "outcsa.dcm";
//writer.SetFile( reader.GetFile() );
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
  {
  std::cerr << "could not write: " << outfilename << std::endl;
```

```
    return 1;
    }
  return 0;
}
```

12.100 iU22tomultisc.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * iU22 Raw Data extractor
 */
#include "gdcmReader.h"
#include "gdcmImageWriter.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"
#include <math.h>
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
  // IM_001
  const char *filename = argv[1];
  gdcm::Reader reader; // Do not use ImageReader
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
 // * The data is simply 8-bit unsigned in the obvious x/y/z order
 // * 200D,300B contains the data
 // * 200D,3001 contains the no. of voxels (416,412,256 in this case)
 // * 200D,3003 contains the voxel sizes (0.156184527398215 /
 // 0.1223749613981957 / 0.328479990704639 in this case)
  const gdcm::File &file = reader.GetFile();
  const gdcm::DataSet &ds = file.GetDataSet();
  const gdcm::PrivateTag trawdataus( 0x200d, 0x0b, "Philips US Imaging DD 033" );
  const gdcm::DataElement &rawdataus = ds.GetDataElement( trawdataus );
  const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x01, "Philips US Imaging DD 036" );
  const gdcm::DataElement &colsrowsframes = ds.GetDataElement( tcolsrowsframes );
  // const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x02, "Philips US Imaging DD 036" );
  // this is just a duplicate previous tag.
  const gdcm::PrivateTag tvoxelspacing( 0x200d, 0x03, "Philips US Imaging DD 036" );
  const gdcm::DataElement &voxelspacing = ds.GetDataElement( tvoxelspacing );
  gdcm::Element<gdcm::VR::DS,gdcm::VM::VM3> dims; // Use DS to interpret value stored in LO
  dims.SetFromDataElement( colsrowsframes );
  gdcm::Element<gdcm::VR::DS,gdcm::VM::VM3> spacing;
  spacing.SetFromDataElement( voxelspacing );
  gdcm::ImageWriter writer;
  gdcm::Image &image = writer.GetImage();
  image.SetNumberOfDimensions( 3 ); // good default
  image.SetDimension(0, (unsigned int)dims[0] );
  image.SetDimension(1, (unsigned int)dims[1] );
  image.SetDimension(2, (unsigned int)dims[2] );
  image.SetSpacing(0, spacing[0] );
  image.SetSpacing(1, spacing[1] );
  image.SetSpacing(2, spacing[2] );
  gdcm::PixelFormat pixeltype = gdcm::PixelFormat::UINT8;
  gdcm::PhotometricInterpretation pi;
  pi = gdcm::PhotometricInterpretation::MONOCHROME2;
  image.SetPhotometricInterpretation( pi );
  image.SetPixelFormat( pixeltype );
  image.SetDataElement( rawdataus );
  std::string outfilename = "outiu22.dcm";
  gdcm::DataElement de( gdcm::Tag(0x8,0x16) ); // SOP Class UID
  de.SetVR( gdcm::VR::UI );
```

```
  gdcm::MediaStorage ms(
    gdcm::MediaStorage::UltrasoundMultiFrameImageStorage );
//    gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
  de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()));
  writer.GetFile().GetDataSet().Replace( de );
  writer.SetFileName( outfilename.c_str() );
  if( !writer.Write() )
    {
    std::cerr « "could not write: " « outfilename « std::endl;
    return 1;
    }
  return 0;
}
```

12.101 pmsct_rgb1.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * This example shows how to rewrite a ELSCINT1/PMSCT_RGB1 compressed
 * image so that it is readable by most 3rd party software (DICOM does
 * not specify this particular encoding).
 * This is required for the sake of interoperability with any standard
 * conforming DICOM system.
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Jean-Pierre Roux for providing the sample datasets
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
void delta_decode(const unsigned char *data_in, size_t data_size,
  std::vector<unsigned char> &new_stream, unsigned short pc, size_t w, size_t h)
{
  const size_t plane_size = h * w;
  const size_t outputlen = 3 * plane_size;
  new_stream.resize( outputlen );
  assert( data_size != outputlen );
  if( data_size == outputlen )
    {
    return;
    }
  typedef unsigned char byte;
  enum {
    COLORMODE  = 0x81,
    ESCMODE    = 0x82,
    REPEATMODE = 0x83
  };
  const byte* src = (const byte*)data_in;
  byte* dest = (byte*)&new_stream[0];
  union { byte gray; byte rgb[3]; } pixel;
  pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
  // always start in grayscale mode
  bool graymode = true;
  size_t dx = 1;
  size_t dy = 3;
```

```
// algorithm works with both planar configuration
// It does produce surprising greenish background color for planar
// configuration is 0, while the nested Icon SQ display a nice black
// background
if (pc)
  {
  dx = plane_size;
  dy = 1;
  }
size_t ps = plane_size;
// The following is highly unoptimized as we have nested if statement in a while loop
// we need to switch from one algorithm to ther other (RGB <-> GRAY)
while (ps)
  {
  // next byte:
  byte b = *src++;
  assert( src < data_in + data_size );
  // mode selection:
  switch ( b )
    {
  case ESCMODE:
    // Used to treat a byte 81/82/83 as a normal byte
    if (graymode)
      {
      pixel.gray += *src++;
      dest[0*dx] = pixel.gray;
      dest[1*dx] = pixel.gray;
      dest[2*dx] = pixel.gray;
      }
    else
      {
      pixel.rgb[0] += *src++;
      pixel.rgb[1] += *src++;
      pixel.rgb[2] += *src++;
      dest[0*dx] = pixel.rgb[0];
      dest[1*dx] = pixel.rgb[1];
      dest[2*dx] = pixel.rgb[2];
      }
    dest += dy;
    ps--;
    break;
  case REPEATMODE:
    // repeat mode (RLE)
    b = *src++;
    ps -= b;
    if (graymode)
      {
      while (b-- > 0)
        {
        dest[0*dx] = pixel.gray;
        dest[1*dx] = pixel.gray;
        dest[2*dx] = pixel.gray;
        dest += dy;
        }
      }
    else
      {
      while (b-- > 0)
        {
        dest[0*dx] = pixel.rgb[0];
        dest[1*dx] = pixel.rgb[1];
        dest[2*dx] = pixel.rgb[2];
        dest += dy;
        }
      }
    break;
  case COLORMODE:
    // We are swithing from one mode to the other. The stream contains an intermixed
    // compression of RGB codec and GRAY codec. Each one not knowing of the other
    // reset old value to 0.
    if (graymode)
      {
      graymode = false;
      pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
      }
    else
      {
      graymode = true;
      pixel.gray = 0;
      }
    break;
```

```
    default:
      // This is identical to ESCMODE, it would be nicer to use fall-through
      if (graymode)
        {
        pixel.gray += b;
        dest[0*dx] = pixel.gray;
        dest[1*dx] = pixel.gray;
        dest[2*dx] = pixel.gray;
        }
      else
        {
        pixel.rgb[0] += b;
        pixel.rgb[1] += *src++;
        pixel.rgb[2] += *src++;
        dest[0*dx] = pixel.rgb[0];
        dest[1*dx] = pixel.rgb[1];
        dest[2*dx] = pixel.rgb[2];
        }
      dest += dy;
      ps--;
      break;
      } // end switch
    } // end while
}
int main(int argc, char *argv [])
{
  if( argc < 2 ) return 1;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  // (07a1,1011) CS [PMSCT_RGB1]                                      # 10,1 Tamar Compression Type
  const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
  if( !ds.FindDataElement( tcompressiontype ) ) return 1;
  const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );
  if ( compressiontype.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv = compressiontype.GetByteValue();
  std::string comprle = "PMSCT_RLE1";
  std::string comprgb = "PMSCT_RGB1";
  bool isrle = false;
  bool isrgb = false;
  if( strncmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
    {
    isrle = true;
    return 1;
    }
  if( strncmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
    {
    isrgb = true;
    }
  if( !isrgb && !isrle ) return 1;
  const gdcm::PrivateTag tcompressedpixeldata(0x07a1,0x000a,"ELSCINT1");
  if( !ds.FindDataElement( tcompressedpixeldata) ) return 1;
  const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tcompressedpixeldata);
  if ( compressionpixeldata.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();
  gdcm::Attribute<0x0028,0x0006> at0;
  at0.SetFromDataSet( ds );
  gdcm::Attribute<0x0028,0x0010> at1;
  at1.SetFromDataSet( ds );
  gdcm::Attribute<0x0028,0x0011> at2;
  at2.SetFromDataSet( ds );
  std::vector<unsigned char> buffer;
  delta_decode((const unsigned char*)bv2->GetPointer(), bv2->GetLength(), buffer,
    at0.GetValue(), at1.GetValue(), at2.GetValue() );
  gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
  pixeldata.SetVR( gdcm::VR::OW );
  pixeldata.SetByteValue( (char*)&buffer[0], (uint32_t)buffer.size() );
  // TODO we should check that decompress byte buffer match the expected size (row*col*...)
  // Add the pixel data element
  reader.GetFile().GetDataSet().Replace( pixeldata );
  reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
  gdcm::Writer writer;
  writer.SetFile( reader.GetFile() );
  // Cleanup stuff:
```

```
  // remove the compressed pixel data:
  // FIXME: should I remove more private tags ? all of them ?
  // oh well this is just an example
  // use gdcm::Anonymizer::RemovePrivateTags if needed...
  writer.GetFile().GetDataSet().Remove( compressionpixeldata.GetTag() );
  std::string outfilename;
  if (argc > 2)
     outfilename = argv[2];
  else
     outfilename = "outrgb.dcm";
  writer.SetFileName( outfilename.c_str() );
  if( !writer.Write() )
    {
    std::cerr « "Failed to write" « std::endl;
    return 1;
    }
  std::cout « "success !" « std::endl;
  return 0;
}
```

12.102 rle2img.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
/*
 * This example shows how to rewrite a ELSCINT1/PMSCT_RLE1 compressed
 * image so that it is readable by most 3rd party software (DICOM does
 * not specify this particular encoding).
 * This is required for the sake of interoperability with any standard
 * conforming DICOM system.
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Mauro Maiorca for bringing to our attention on this new ELSCINT1
 * compression algorithm : PMSCT_RLE1 (different from the 'LOSSLESS RICE')
 * See post at:
 * http://groups.google.com/group/comp.protocols.dicom/msg/f2b99bf706a7f8ca
 *
 * Thanks to Jesus Spinola, for more datasets,
 * http://www.itk.org/pipermail/insight-users/2008-April/025571.html
 *
 * And last but not least, a very big thank to Ivo van Poorten, without
 * whom we would still be looking at this compressed byte stream as if
 * it was RLE compressed.
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
/* FIXME: Why is PhilipsLosslessRice.dcm a 512x512 image ... */
void delta_decode(const char *inbuffer, size_t length, std::vector<unsigned short> &output)
{
  // RLE pass
  std::vector<char> temp;
  for(size_t i = 0; i < length; ++i)
    {
    if( inbuffer[i] == (char)0xa5 )
      {
```

```
      //unsigned char repeat = (unsigned char)inbuffer[i+1] + 1;
      //assert( (unsigned char)inbuffer[i+1] != 255 );
      int repeat = (unsigned char)inbuffer[i+1] + 1;
      char value = inbuffer[i+2];
      while(repeat)
        {
        temp.push_back( value );
        --repeat;
        }
      i+=2;
      }
    else
      {
      temp.push_back( inbuffer[i] );
      }
    }
  // Delta encoding pass
  unsigned short delta = 0;
  for(size_t i = 0; i < temp.size(); ++i)
    {
    if( temp[i] == 0x5a )
      {
      unsigned char v1 = (unsigned char)temp[i+1];
      unsigned char v2 = (unsigned char)temp[i+2];
      unsigned short value = (unsigned short)(v2 * 256 + v1);
      output.push_back( value );
      delta = value;
      i+=2;
      }
    else
      {
      unsigned short value = (unsigned short)(temp[i] + delta);
      output.push_back( value );
      delta = value;
      }
    //assert( output[output.size()-1] == ref[output.size()-1] );
    }
  if ( output.size() % 2 )
    {
    output.resize( output.size() - 1 );
    }
  std::cout « length « " -> " « output.size() * 2 « std::endl;
}
int main(int argc, char *argv [])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « "input.dcm [output.dcm]" « std::endl;
    std::cerr « "will default to 'outrle.dcm' unless output.dcm is specified."
      « std::endl;
    return 1;
    }
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    std::cerr « "Failed to read: " « filename « std::endl;
    return 1;
    }
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  // (07a1,1011) CS [PMSCT_RLE1]                                      # 10,1 Tamar Compression Type
  const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
  if( !ds.FindDataElement( tcompressiontype ) ) return 1;
  const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );
  if ( compressiontype.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv = compressiontype.GetByteValue();
  std::string comprle = "PMSCT_RLE1";
  std::string comprgb = "PMSCT_RGB1";
  bool isrle = false;
  bool isrgb = false;
  if( strncmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
    {
    isrle = true;
    }
  if( strncmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
    {
    isrgb = true;
    std::cerr « "See: pmsct_rgb1.cxx instead" « std::endl;
    return 1;
    }
```

```
  if( !isrgb && !isrle ) return 1;
  // check if compressed pixel data reside in private or standard tag
  const gdcm::PrivateTag tprivatepixeldata(0x07a1,0x100a,"ELSCINT1");
  const gdcm::Tag tstandardpixeldata(0x7fe0, 0x0010);
  gdcm::Tag tpixeldata;
  if(ds.FindDataElement(tprivatepixeldata)) tpixeldata = tprivatepixeldata;
  else if(ds.FindDataElement(tstandardpixeldata)) tpixeldata = tstandardpixeldata;
  if(!ds.FindDataElement(tpixeldata)) return 1;
  const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tpixeldata);
  if ( compressionpixeldata.IsEmpty() ) return 1;
  const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();
  gdcm::Attribute<0x0028,0x0010> at1;
  at1.SetFromDataSet( ds );
  gdcm::Attribute<0x0028,0x0011> at2;
  at2.SetFromDataSet( ds );
  gdcm::DataElement pixeldata;
  // if standard voxel data element does not exist, create it
  if( !reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )
  {
    pixeldata = gdcm::DataElement( tpixeldata, 0, gdcm::VR::OW );
  }
  else{
    pixeldata = reader.GetFile().GetDataSet().GetDataElement( tpixeldata );
  }
  pixeldata.SetVR( gdcm::VR::OW );
  gdcm::VL bv2l = bv2->GetLength();
  gdcm::VL at1l = at1.GetValue() * at2.GetValue() * 2; /* sizeof(unsigned short) == 2 */
  // Handle special case that is not compressed:
  if( bv2l == at1l )
    {
    pixeldata.SetByteValue( bv2->GetPointer(), bv2->GetLength() );
    }
  else
    {
    std::vector<unsigned short> buffer;
    delta_decode(bv2->GetPointer(), bv2->GetLength(), buffer);
    pixeldata.SetByteValue( (char*)&buffer[0], (uint32_t)(buffer.size() * sizeof( unsigned short )) );
    }
  // TODO we should check that decompress byte buffer match the expected size (row*col*...)
  // Add the pixel data element
  if( reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )
  {
    reader.GetFile().GetDataSet().Replace( pixeldata );
  }
  else
  {
    reader.GetFile().GetDataSet().ReplaceEmpty( pixeldata );
  }
  reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
  gdcm::Writer writer;
  writer.SetFile( reader.GetFile() );
  // Cleanup stuff:
  // This makes the code equivalent to Philips workstation IntelliSpace Portal
  if( writer.GetFile().GetDataSet().FindDataElement( tcompressiontype ) )
  {
    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x1011) );
  }
  if( writer.GetFile().GetDataSet().FindDataElement( tprivatepixeldata ) )
  {
    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x100a) );
  }
  std::string outfilename;
  if (argc > 2)
     outfilename = argv[2];
  else
     outfilename = "outrle.dcm";
  writer.SetFileName( outfilename.c_str() );
  if( !writer.Write() )
    {
    std::cerr « "Failed to write" « std::endl;
    return 1;
    }
  std::cout « "success !" « std::endl;
  return 0;
}
```

12.103 uid_unique.cxx

```
/*=========================================================================

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=========================================================================*/
#include "gdcmUIDGenerator.h"
#include <iostream>
#include <string>
#include <set>
int main()
{
  gdcm::UIDGenerator uid;
  //const char myroot[] = "9876543210.9876543210.9876543210.9876543210.9876543210"; // fails in ~40000 tries
  const char myroot[] = "9876543210.9876543210.9876543210";
  uid.SetRoot( myroot );
  std::set<std::string> uids;
  uint64_t wrap = 0;
  uint64_t c = 0;
  while(true)
    {
    const char *unique = uid.Generate();
    //std::cout << unique << std::endl;
    if( c % 10000 == 0 )
      {
      std::cout << "wrap=" << wrap << ",c=" << c << std::endl;
      }
    ++c;
    if( c == 0 )
      {
      wrap++;
      }
    if ( uids.count(unique) == 1 )
      {
      std::cerr << "Failed with: " << unique << std::endl;
      return 1;
      }
    uids.insert( unique );
    }
}
```

12.104 DecompressImage.java

```
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=========================================================================*/
/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressImage.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressImage gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;
public class DecompressImage
```

```
{
  public static void main(String[] args) throws Exception
    {
    String file1 = args[0];
    String file2 = args[1];
    ImageReader reader = new ImageReader();
    reader.SetFileName( file1 );
    boolean ret = reader.Read();
    if( !ret )
      {
      throw new Exception("Could not read: " + file1 );
      }
    ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
    change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TSType.ImplicitVRLittleEndian) );
    change.SetInput( reader.GetImage() );
    if( !change.Change() )
      {
      throw new Exception("Could not change: " + file1 );
      }
    Image out = change.GetOutput();
    System.out.println( out.toString() );
    // Set the Source Application Entity Title
    FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );
    ImageWriter writer = new ImageWriter();
    writer.SetFileName( file2 );
    writer.SetFile( reader.GetFile() );
    writer.SetImage( out );
    ret = writer.Write();
    if( !ret )
      {
      throw new Exception("Could not write: " + file2 );
      }
    }
}
```

12.105 DecompressPixmap.java

```
/*=========================================================================

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=========================================================================*/
/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressPixmap.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressPixmap gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;
public class DecompressPixmap
{
  public static void main(String[] args) throws Exception
    {
    String file1 = args[0];
    String file2 = args[1];
    PixmapReader reader = new PixmapReader();
    reader.SetFileName( file1 );
    boolean ret = reader.Read();
    if( !ret )
      {
      throw new Exception("Could not read: " + file1 );
      }
    ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
    change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TSType.ImplicitVRLittleEndian) );
    PixmapToPixmapFilter filter = (PixmapToPixmapFilter)change;
```

```
    filter.SetInput( reader.GetPixmap() );
    if( !change.Change() )
      {
      throw new Exception("Could not change: " + file1 );
      }
    // The following does not work in Java/swig 2.0.7
    //Pixmap p = ((PixmapToPixmapFilter)change).GetOutput();
    Pixmap p = change.GetOutputAsPixmap();  // be explicit
    //System.out.println( p.toString() );
    // Set the Source Application Entity Title
    FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );
    PixmapWriter writer = new PixmapWriter();
    writer.SetFileName( file2 );
    writer.SetFile( reader.GetFile() );
    writer.SetImage( p );
    ret = writer.Write();
    if( !ret )
      {
      throw new Exception("Could not write: " + file2 );
      }
    }
}
```

12.106 ExtractImageRegion.java

```
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=========================================================================*/
/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java ExtractImageRegion input.dcm
 */
import gdcm.*;
import java.io.FileOutputStream;
public class ExtractImageRegion
{
  public static void main(String[] args) throws Exception
    {
    String filename = args[0];
    // instantiate the reader:
    ImageRegionReader reader = new ImageRegionReader();
    reader.SetFileName( filename );
    // pull DICOM info:
    if (!reader.ReadInformation()) return;
    // Get file infos
    File f = reader.GetFile();
    // get some info about image
    UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
    PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
    int pixelsize = pf.GetPixelSize();
    // buffer to get the pixels
    long buffer_length = dims.get(0) * dims.get(1) * pixelsize;
    byte[] buffer = new byte[ (int)buffer_length ];
    // define a simple box region.
    BoxRegion box = new BoxRegion();
    for (int z = 0; z < dims.get(2); z++)
      {
      // Define that I want the image 0, full size (dimx x dimy pixels)
      // and do that for each z:
      box.SetDomain(0, dims.get(0) - 1, 0, dims.get(1) - 1, z, z);
      //System.Console.WriteLine( box.toString() );
      reader.SetRegion( box );
      // reader will try to load the uncompressed image region into buffer.
```

```
      // the call returns an error when buffer.Length is too small. For instance
      // one can call:
      // long buf_len = reader.ComputeBufferLength(); // take into account pixel size
      // to get the exact size of minimum buffer
      if (reader.ReadIntoBuffer(buffer, buffer_length))
        {
        FileOutputStream fos = new FileOutputStream("/tmp/frame.raw");
        fos.write(buffer);
        fos.close();
        }
      else
        {
        throw new Exception("can't read pixels error");
        }
      }
    }
}
```

12.107 FileAnonymize.java

```
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=========================================================================*/
import gdcm.*;
public class FileAnonymize
{
  public static class MyWatcher extends SimpleSubjectWatcher
    {
    public MyWatcher(Subject s) { super(s,"Override String"); }
    protected void ShowProgress(Subject caller, Event evt)
      {
      ProgressEvent pe = ProgressEvent.Cast(evt);
      System.out.println( "This is my progress: " + pe.GetProgress() );
      }
    }
  public static void main(String[] args) throws Exception
    {
    String input = args[0];
    String output = args[1];
    FileAnonymizer fa = new FileAnonymizer();
    fa.SetInputFileName( input );
    fa.SetOutputFileName( output );
    // Empty Operations
    // It will create elements, since those tags are non-registered public elements (2011):
    fa.Empty( new Tag(0x0008,0x1313) );
    fa.Empty( new Tag(0x0008,0x1317) );
    // Remove Operations
    // The following Tag are actually carefully chosen, since they refer to SQ:
    fa.Remove( new Tag(0x0008,0x2112) );
    fa.Remove( new Tag(0x0008,0x9215) );
    // Replace Operations
    // do not call replace operation on SQ attribute !
    fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
    fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );
    if( !fa.Write() )
      {
      System.out.println( "Could not write" );
      return;
      }
    System.out.println( "success" );
    }
}
```

12.108 HelloSimple.java

```
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=========================================================================*/
/*
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/HelloSimple.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java HelloSimple gdcmData/012345.002.050.dcm
 */
import gdcm.*;
public class HelloSimple
{
  public static void main(String[] args) throws Exception
    {
    String filename = args[0];
    Reader reader = new Reader();
    reader.SetFileName( filename );
    boolean ret = reader.Read();
    if( !ret )
      {
      throw new Exception("Could not read: " + filename );
      }
    File f = reader.GetFile();
    DataSet ds = f.GetDataSet();
    System.out.println( ds.toString() );
    System.out.println("Success reading: " + filename );
    }
}
```

12.109 ReadFiles.java

```
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=========================================================================*/
import gdcm.*;
import java.io.File;
public class ReadFiles
{
  static int i = 0;
  public static void process(String path)
    {
    //String path = file.getPath();
    assert PosixEmulation.FileExists(path) : "Problem converting to 8bits";
    System.out.println("Reading: " + path );
    System.out.println("File: " + i++);
    Reader r = new Reader();
    try
      {
      r.SetFileName( path );
      TagSetType skip = new TagSetType();
      skip.insert( new Tag(0x7fe0,0x10) );
      boolean b = r.ReadUpToTag( new Tag(0x88,0x200), skip );
      //System.out.println("DS:\n" + r.GetFile().GetDataSet().toString() );
      }
```

```
    finally
      {
      r.delete(); // will properly call C++ destructor and close file descriptor
      }
    }
  // Process only files under dir
  public static void visitAllFiles(File dir)
    {
    if (dir.isDirectory())
      {
      String[] children = dir.list();
      for (int i=0; i<children.length; i++)
        {
        visitAllFiles(new File(dir, children[i]));
        }
      }
    else
      {
      process(dir.getPath());
      }
    }
  public static void waiting (int n)
    {
    long t0, t1;
    t0 =  System.currentTimeMillis();
    do
      {
      t1 = System.currentTimeMillis();
      }
    while ((t1 - t0) < (n * 1000));
    }
  public static void main(String[] args) throws Exception
    {
    String directory = args[0];
    Directory gdir = new Directory();
    long n = gdir.Load( directory, true );
    System.out.println( gdir.toString() );
    FilenamesType files = gdir.GetFilenames();
    for( long i = 0; i < n; ++i )
      {
      String path = files.get( (int)i );
      process( path );
      }
    System.out.println( "Java API" );
    //waiting( 10 );
    for( int i = 0; i < 2; ++i )
      {
      File dir = new File(directory);
      visitAllFiles(dir);
      }
    }
}
```

12.110 ScanDirectory.java

```
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=========================================================================*/
import gdcm.*;
import gdcm.Reader;
import gdcm.LookupTable;
import java.io.File;
import java.io.*;
import java.awt.image.*;
import javax.imageio.ImageIO;
public class ScanDirectory
{
```

```
  public static class MyWatcher extends SimpleSubjectWatcher
    {
    public MyWatcher(Subject s) { super(s,"Override String"); }
    protected void ShowProgress(Subject caller, Event evt)
      {
      ProgressEvent pe = ProgressEvent.Cast(evt);
      System.out.println( "This is my progress: " + pe.GetProgress() );
      }
    }
  public static byte[] GetAsByte(Bitmap input)
    {
    long len = input.GetBufferLength();
    byte[] buffer = new byte[ (int)len ];
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
      {
      ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
      icpi.SetInput( input );
      icpi.SetPhotometricInterpretation(
        new PhotometricInterpretation(
          PhotometricInterpretation.PIType.MONOCHROME2 ) );
      if( icpi.Change() )
        {
        Bitmap output = icpi.GetOutput();
        output.GetArray( buffer );
        }
      return buffer;
      }
    else
      {
      input.GetArray( buffer );
      return buffer;
      }
    }
  public static short[] GetAsShort(Bitmap input)
    {
    long len = input.GetBufferLength(); // length in bytes
    short[] buffer = new short[ (int)len / 2 ];
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
      {
      ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
      icpi.SetInput( input );
      icpi.SetPhotometricInterpretation(
        new PhotometricInterpretation(
          PhotometricInterpretation.PIType.MONOCHROME2 ) );
      if( icpi.Change() )
        {
        Bitmap output = icpi.GetOutput();
        output.GetArray( buffer );
        }
      return buffer;
      }
    else
      {
      input.GetArray( buffer );
      return buffer;
      }
    }
  public static boolean WritePNG(Bitmap input, String outfilename )
    {
    int imageType = BufferedImage.TYPE_CUSTOM;
    PixelFormat pf = input.GetPixelFormat();
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    // We need to handle both public and private icon
    // It could well be that we are getting an RGB Icon or 16 bits Icon:
    ColorModel colorModel = null;
    if( pf.GetSamplesPerPixel() == 1 )
      {
      if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1
         || pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME2 )
        {
        if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
          {
          imageType = BufferedImage.TYPE_BYTE_GRAY;
          }
        else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT12 )
          {
          imageType = BufferedImage.TYPE_USHORT_GRAY;
          }
        else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT16 )
```

```
          {
          imageType = BufferedImage.TYPE_USHORT_GRAY;
          }
        }
      else if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
        {
        LookupTable lut = input.GetLUT();
        long rl = lut.GetLUTLength( LookupTable.LookupTableType.RED );
        byte[] rbuf = new byte[ (int)rl ];
        long rl2 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
        assert rl == rl2;
        long gl = lut.GetLUTLength( LookupTable.LookupTableType.GREEN );
        byte[] gbuf = new byte[ (int)gl ];
        long gl2 = lut.GetLUT( LookupTable.LookupTableType.GREEN, gbuf );
        assert gl == gl2;
        long bl = lut.GetLUTLength( LookupTable.LookupTableType.BLUE );
        byte[] bbuf = new byte[ (int)bl ];
        long bl2 = lut.GetLUT( LookupTable.LookupTableType.BLUE, bbuf );
        assert bl == bl2;
        colorModel = new IndexColorModel(8, (int)rl, rbuf, gbuf, bbuf);
        // For code below
        imageType = BufferedImage.TYPE_BYTE_GRAY;
        }
      }
    else if( pf.GetSamplesPerPixel() == 3 )
      {
      if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
        {
        // FIXME should be TYPE_3BYTE_RGB
        imageType = BufferedImage.TYPE_3BYTE_BGR;
        }
      }
    //System.out.println( "pf: " + pf.toString() );
    //System.out.println( "pi: " + pi.toString() );
    long width  = input.GetDimension(0);
    long height = input.GetDimension(0);
    BufferedImage bi;
    if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
      {
      bi = new BufferedImage(colorModel,
        colorModel.createCompatibleWritableRaster((int)width, (int)height),
        false, null);
      }
    else
      {
      bi = new BufferedImage((int)width,(int)height,imageType);
      }
    WritableRaster wr = bi.getRaster();
    //System.out.println( "imagetype: " + imageType );
    if( imageType == BufferedImage.TYPE_BYTE_GRAY
      || imageType == BufferedImage.TYPE_3BYTE_BGR )
      {
      byte[] buffer = GetAsByte( input );
      wr.setDataElements (0, 0, (int)width, (int)height, buffer);
      }
    else if( imageType == BufferedImage.TYPE_USHORT_GRAY )
      {
      short[] buffer = GetAsShort( input );
      wr.setDataElements (0, 0, (int)width, (int)height, buffer);
      }
    File outputfile = new File( outfilename );
    try {
      ImageIO.write(bi, "png", outputfile);
    } catch (IOException e) {
      return false;
    }
    return true;
    }
  public static void main(String[] args) throws Exception
    {
    String directory = args[0];
    Directory d = new Directory();
    long nfiles = d.Load( directory, true );
    if(nfiles == 0)
      {
      throw new Exception("No files found");
      }
//    System.out.println( "Files:\n" + d.toString() );
    FilenamesType fns = d.GetFilenames();
    //Scanner s = new Scanner();
    SmartPtrScan sscan = Scanner.New();
```

```
Scanner s = sscan.__ref__();
//SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(s, "MySimple");
MyWatcher watcher = new MyWatcher(s);
Tag[] tagarray = {
  new Tag(0x0010, 0x0010),    // PatientName
  new Tag(0x0010, 0x0020),    // PatientID
  new Tag(0x0010, 0x0030),    // PatientBirthDate
  new Tag(0x0010, 0x0040),    // PatientSex
  new Tag(0x0010, 0x1010),    // PatientAge
  new Tag(0x0020, 0x000d),    // StudyInstanceUID
  new Tag(0x0020, 0x0010),    // StudyID
  new Tag(0x0008, 0x0020),    // StudyDate
  new Tag(0x0008, 0x1030),    // StudyDescription
  new Tag(0x0020, 0x000e),    // SeriesInstanceUID
  new Tag(0x0020, 0x0011),    // SeriesNumber
  new Tag(0x0008, 0x0021),    // SeriesDate
  new Tag(0x0008, 0x103e),    // SeriesDescription
  new Tag(0x0008, 0x0090),    // ReferringPhysicianName
  new Tag(0x0008, 0x0060),    // Modality
  new Tag(0x0054, 0x0400),    // ImageID ?? Should be Instance number ??
  new Tag(0x0008, 0x0018),    // SOPInstanceUID
  new Tag(0x0008, 0x0032),    // AcquisitionTime
  new Tag(0x0008, 0x0033),    // ContentTime
  new Tag(0x0020, 0x0013),    // InstanceNumber
  new Tag(0x0020, 0x1041),    // SliceLocation
  new Tag(0x0018, 0x0050),    // SliceThickness ?? Eg. Enhanced MR Image Storage
  new Tag(0x0008, 0x0080),    // InstitutionName
  new Tag(0x0028, 0x1050),    // WindowCenter
  new Tag(0x0028, 0x1051),    // WindowWidth
};
for( Tag t : tagarray ) {
  //System.out.println( "Tag: " + t.toString() );
  s.AddTag( t );
}
boolean b = s.Scan( fns );
if(!b)
  {
  throw new Exception("Could not scan");
  }
String fn0 = fns.get(0);
TagToValue mappings = s.GetMapping( fn0 );
System.out.println( "mappings size: " + mappings.size() );
for( Tag tag : tagarray ) {
  if( mappings.has_key( tag ) ) {
    String val = mappings.get( tag );
    System.out.println( "tag/val: " + tag + "->" + val );
  }
}
for( long idx = 0; idx < fns.size(); ++idx )
  {
  Reader r = new Reader();
  String fn = fns.get( (int)idx );
  String outfn = fn + ".png";
  r.SetFileName( fn );
  TagSetType tst = new TagSetType();
  tst.insert( new Tag(0x7fe0,0x10) );
  b = r.ReadUpToTag( new Tag(0x88,0x200), tst );
  UIntArrayType dims = ImageHelper.GetDimensionsValue( r.GetFile() );
  if( b )
    {
    IconImageFilter iif = new IconImageFilter();
    System.out.println( "Processing: " + fn );
    iif.SetFile( r.GetFile() );
    b = iif.Extract();
    if( b )
      {
      Bitmap icon = iif.GetIconImage(0);
      WritePNG(icon, outfn);
      }
    else
      {
      ImageReader ir = new ImageReader();
      ir.SetFileName( fn );
      if( ir.Read() )
        {
        Image img = ir.GetImage();
        StringFilter sf = new StringFilter();
        sf.SetFile( r.GetFile() );
        String strval = sf.ToString( new Tag(0x0028,0x0120) );
        IconImageGenerator iig = new IconImageGenerator();
        iig.SetPixmap( img );
```

```
            iig.AutoPixelMinMax( true );
            try {
              double val = Double.parseDouble( strval );
              iig.SetOutsideValuePixel( val );
            }
            catch ( NumberFormatException e) {
              }
            iig.ConvertRGBToPaletteColor( false );
            long idims[] = { 128, 128};
            iig.SetOutputDimensions( idims );
            iig.Generate();
            Bitmap icon = iig.GetIconImage();
            WritePNG(icon, outfn);
            }
          }
        }
      }
    System.out.println( "Scan:\n" + s.toString() );
    System.out.println( "success" );
    }
}
```

12.111 SimplePrint.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
/*
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/SimplePrint.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java SimplePrint gdcmData/012345.002.050.dcm
 */
import gdcm.*;
public class SimplePrint
{
  public static void RecurseDataSet(File f, DataSet ds, String indent)
    {
    JavaDataSet cds = new JavaDataSet(ds);
    while(!cds.IsAtEnd())
      {
      DataElement de = cds.GetCurrent();
      // Compute VR from the toplevel file, and the currently processed dataset:
      VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );
      if( vr.Compatible( new VR(VR.VRType.SQ) ) )
        {
        long uvl = de.GetVL().GetValueLength(); // Test cast is ok
        System.out.println(  indent + de.GetTag().toString() + ":" + uvl ); // why not ?
        //SequenceOfItems sq = de.GetSequenceOfItems();
        // GetValueAsSQ handle more cases than GetSequenceOfItems
        SmartPtrSQ sq = de.GetValueAsSQ();
        long n = sq.GetNumberOfItems();
        for( long i = 1; i <= n; i++) // item starts at 1, not 0
          {
          Item item = sq.GetItem( i );
          DataSet nested = item.GetNestedDataSet();
          RecurseDataSet( f, nested, indent + "  " );
          }
        }
      else
        {
        System.out.println( indent + de.toString() );
        }
      cds.Next();
      }
    }
```

```
  public static void main(String[] args) throws Exception
    {
    String filename = args[0];
    Reader reader = new Reader();
    reader.SetFileName( filename );
    boolean ret = reader.Read();
    if( !ret )
      {
      throw new Exception("Could not read: " + filename );
      }
    File f = reader.GetFile();
    DataSet ds = f.GetDataSet();
    RecurseDataSet( f, ds, "" );
    }
}
```

12.112 AddPrivateAttribute.py

```
1
14
15 """
16 Usage:
17
18   python AddPrivateAttribute.py input.dcm output.dcm
19
20
21 """
22
23 import sys
24 import gdcm
25
26 if __name__ == "__main__":
27
28   file1 = sys.argv[1]
29   file2 = sys.argv[2]
30
31   r = gdcm.Reader()
32   r.SetFileName( file1 )
33   if not r.Read():
34     sys.exit(1)
35
36   f = r.GetFile()
37   ds = f.GetDataSet()
38
39   # Create a dataelement
40   de = gdcm.DataElement(gdcm.Tag(0x0051, 0x1011))
41   de.SetByteStringValue("p2")
42   de.SetVR(gdcm.VR(gdcm.VR.SH))
43
44   ds.Insert(de)
45
46   w = gdcm.Writer()
47   w.SetFile( f )
48   w.SetFileName( file2 )
49   if not w.Write():
50     sys.exit(1)
```

12.113 ConvertMPL.py

```
1
14
15 """
16 display a DICOM image with matPlotLib via numpy
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Usage:
22
23  python ConvertNumpy.py "IM000000"
24
25 Thanks:
26   plotting example - Ray Schumacher 2009
```

```
27 """
28
29 import gdcm
30 import numpy
31 from pylab import *
32
33
34 def get_gdcm_to_numpy_typemap():
35     """Returns the GDCM Pixel Format to numpy array type mapping."""
36     _gdcm_np = {gdcm.PixelFormat.UINT8  :numpy.int8,
37                 gdcm.PixelFormat.INT8   :numpy.uint8,
38                 gdcm.PixelFormat.UINT16 :numpy.uint16,
39                 gdcm.PixelFormat.INT16  :numpy.int16,
40                 gdcm.PixelFormat.UINT32 :numpy.uint32,
41                 gdcm.PixelFormat.INT32  :numpy.int32,
42                 gdcm.PixelFormat.FLOAT32:numpy.float32,
43                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
44     return _gdcm_np
45
46 def get_numpy_array_type(gdcm_pixel_format):
47     """Returns a numpy array typecode given a GDCM Pixel Format."""
48     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
49
50 def gdcm_to_numpy(image):
51     """Converts a GDCM image to a numpy array.
52     """
53     pf = image.GetPixelFormat().GetScalarType()
54     print 'pf', pf
55     print image.GetPixelFormat().GetScalarTypeAsString()
56     assert pf in get_gdcm_to_numpy_typemap().keys(), \
57            "Unsupported array type %s"%pf
58     d = image.GetDimension(0), image.GetDimension(1)
59     print 'Image Size: %d x %d' % (d[0], d[1])
60     dtype = get_numpy_array_type(pf)
61     gdcm_array = image.GetBuffer()
62
63     result = numpy.frombuffer(gdcm_array, dtype=dtype).astype(float)
64
65     result.shape = d
66     return result
67
68 if __name__ == "__main__":
69   import sys
70   r = gdcm.ImageReader()
71   filename = sys.argv[1]
72   r.SetFileName( filename )
73   if not r.Read():  sys.exit(1)
74   numpy_array = gdcm_to_numpy( r.GetImage() )
75
76   subplot(111)# one plot, on left
77   title(filename)
78
79   imshow(numpy_array, interpolation='bilinear', cmap=cm.jet)
80
81   subplots_adjust(bottom=0.1, right=0.8, top=0.9)
82   cax = axes([0.85, 0.1, 0.075, 0.8])
83   colorbar(cax=cax)
84   title('values')
85   get_current_fig_manager().window.title('plot')
86   show()
```

12.114 ConvertNumpy.py

```
1
14
15 """
16 This module add support for converting a gdcm.Image to a numpy array.
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Removed:
22 - float16 is defined in GDCM API but no implementation exist for it ...
23 """
24
25 import gdcm
26 import numpy
```

```
27
28 def get_gdcm_to_numpy_typemap():
29     """Returns the GDCM Pixel Format to numpy array type mapping."""
30     _gdcm_np = {gdcm.PixelFormat.UINT8  :numpy.uint8,
31                 gdcm.PixelFormat.INT8   :numpy.int8,
32                 #gdcm.PixelFormat.UINT12 :numpy.uint12,
33                 #gdcm.PixelFormat.INT12  :numpy.int12,
34                 gdcm.PixelFormat.UINT16 :numpy.uint16,
35                 gdcm.PixelFormat.INT16  :numpy.int16,
36                 gdcm.PixelFormat.UINT32 :numpy.uint32,
37                 gdcm.PixelFormat.INT32  :numpy.int32,
38                 #gdcm.PixelFormat.FLOAT16:numpy.float16,
39                 gdcm.PixelFormat.FLOAT32:numpy.float32,
40                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
41     return _gdcm_np
42
43 def get_numpy_array_type(gdcm_pixel_format):
44     """Returns a numpy array typecode given a GDCM Pixel Format."""
45     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
46
47 def gdcm_to_numpy(image):
48     """Converts a GDCM image to a numpy array.
49     """
50     pf = image.GetPixelFormat()
51
52     assert pf.GetScalarType() in get_gdcm_to_numpy_typemap().keys(), \
53            "Unsupported array type %s"%pf
54
55     shape = image.GetDimension(0) * image.GetDimension(1), pf.GetSamplesPerPixel()
56     if image.GetNumberOfDimensions() == 3:
57       shape = shape[0] * image.GetDimension(2), shape[1]
58
59     dtype = get_numpy_array_type(pf.GetScalarType())
60     gdcm_array = image.GetBuffer()
61     result = numpy.frombuffer(gdcm_array, dtype=dtype)
62     result.shape = shape
63     return result
64
65 if __name__ == "__main__":
66   import sys
67   r = gdcm.ImageReader()
68   filename = sys.argv[1]
69   r.SetFileName( filename )
70   if not r.Read():
71     sys.exit(1)
72
73   numpy_array = gdcm_to_numpy( r.GetImage() )
74   print numpy_array
```

12.115 ConvertPIL.py

```
1
14
15 """
16 save a DICOM image with PIL via numpy
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Usage:
22
23  python ConvertNumpy.py "IM000000"
24
25 Thanks:
26   plotting example - Ray Schumacher 2009
27 """
28
29 import gdcm
30 import numpy
31 from PIL import Image, ImageOps
32
33
34 def get_gdcm_to_numpy_typemap():
35     """Returns the GDCM Pixel Format to numpy array type mapping."""
36     _gdcm_np = {gdcm.PixelFormat.UINT8  :numpy.int8,
37                 gdcm.PixelFormat.INT8   :numpy.uint8,
38                 gdcm.PixelFormat.UINT16 :numpy.uint16,
```

```
39                 gdcm.PixelFormat.INT16  :numpy.int16,
40                 gdcm.PixelFormat.UINT32 :numpy.uint32,
41                 gdcm.PixelFormat.INT32  :numpy.int32,
42                 gdcm.PixelFormat.FLOAT32:numpy.float32,
43                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
44     return _gdcm_np
45
46 def get_numpy_array_type(gdcm_pixel_format):
47     """Returns a numpy array typecode given a GDCM Pixel Format."""
48     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
49
50 def gdcm_to_numpy(image):
51     """Converts a GDCM image to a numpy array.
52     """
53     pf = image.GetPixelFormat().GetScalarType()
54     print 'pf', pf
55     print image.GetPixelFormat().GetScalarTypeAsString()
56     assert pf in get_gdcm_to_numpy_typemap().keys(), \
57            "Unsupported array type %s"%pf
58     d = image.GetDimension(0), image.GetDimension(1)
59     print 'Image Size: %d x %d' % (d[0], d[1])
60     dtype = get_numpy_array_type(pf)
61     gdcm_array = image.GetBuffer()
62     result = numpy.frombuffer(gdcm_array, dtype=dtype)
63     maxV = float(result[result.argmax()])
64
67     result = numpy.log(result+50)
68     maxV = float(result[result.argmax()])
69     result = result*(2.**8/maxV)
70     result.shape = d
71     return result
72
73 if __name__ == "__main__":
74   import sys
75   r = gdcm.ImageReader()
76   filename = sys.argv[1]
77   r.SetFileName( filename )
78   if not r.Read():  sys.exit(1)
79   numpy_array = gdcm_to_numpy( r.GetImage() )
80
82   pilImage = Image.frombuffer('L',
83                               numpy_array.shape,
84                               numpy_array.astype(numpy.uint8),
85                               'raw','L',0,1)
86
87   pilImage = ImageOps.autocontrast(pilImage, cutoff=.1)
88   pilImage.save(sys.argv[1]+'.jpg')
```

12.116 CreateRAWStorage.py

```
1
14
15 """
16     <uid value="1.2.840.10008.5.1.4.1.1.66" name="Raw Data Storage" type="SOP Class" part="PS 3.4"
       retired="false"/>
17 """
18
19 import gdcm
20 import sys,os
21
22 if __name__ == "__main__":
23   r = gdcm.Reader()
24   # Will require Testing...
25   dataroot = gdcm.Testing.GetDataRoot()
26   filename = os.path.join( dataroot, '012345.002.050.dcm' )
27   r.SetFileName( filename )
28   r.Read()
29   f = r.GetFile()
30   ds = f.GetDataSet()
31
32   uid = "1.2.840.10008.5.1.4.1.1.66"
33 #  f = gdcm.File()
34 #  ds = f.GetDataSet()
35   de = gdcm.DataElement( gdcm.Tag(0x0008,0x0016) )
36   de.SetByteStringValue( uid )
37   vr = gdcm.VR( gdcm.VR.UI )
38   de.SetVR( vr )
```

```
39   ds.Replace( de )
40
41   ano = gdcm.Anonymizer()
42   ano.SetFile( r.GetFile() )
43   ano.RemovePrivateTags()
44   ano.RemoveGroupLength()
45   taglist = [
46   gdcm.Tag(0x0008,0x0008),
47   gdcm.Tag(0x0008,0x0022),
48   gdcm.Tag(0x0008,0x0032),
49   gdcm.Tag(0x0008,0x2111),
50   gdcm.Tag(0x0008,0x1150),
51   gdcm.Tag(0x0008,0x1155),
52   gdcm.Tag(0x0008,0x0100),
53   gdcm.Tag(0x0008,0x0102),
54   gdcm.Tag(0x0008,0x0104),
55   gdcm.Tag(0x0040,0xa170),
56   gdcm.Tag(0x0008,0x2112),
57   gdcm.Tag(0x0008,0x0100),
58   gdcm.Tag(0x0008,0x0102),
59   gdcm.Tag(0x0008,0x0104),
60   gdcm.Tag(0x0008,0x9215),
61   gdcm.Tag(0x0018,0x0010),
62   gdcm.Tag(0x0018,0x0022),
63   gdcm.Tag(0x0018,0x0050),
64   gdcm.Tag(0x0018,0x0060),
65   gdcm.Tag(0x0018,0x0088),
66   gdcm.Tag(0x0018,0x0090),
67   gdcm.Tag(0x0018,0x1040),
68   gdcm.Tag(0x0018,0x1100),
69   gdcm.Tag(0x0018,0x1110),
70   gdcm.Tag(0x0018,0x1111),
71   gdcm.Tag(0x0018,0x1120),
72   gdcm.Tag(0x0018,0x1130),
73   gdcm.Tag(0x0018,0x1150),
74   gdcm.Tag(0x0018,0x1151),
75   gdcm.Tag(0x0018,0x1152),
76   gdcm.Tag(0x0018,0x1160),
77   gdcm.Tag(0x0018,0x1190),
78   gdcm.Tag(0x0018,0x1210),
79   gdcm.Tag(0x0020,0x0012),
80   gdcm.Tag(0x0020,0x0032),
81   gdcm.Tag(0x0020,0x0037),
82   gdcm.Tag(0x0020,0x1041),
83   gdcm.Tag(0x0020,0x4000),
84   gdcm.Tag(0x0028,0x0002),
85   gdcm.Tag(0x0028,0x0004),
86   gdcm.Tag(0x0028,0x0010),
87   gdcm.Tag(0x0028,0x0011),
88   gdcm.Tag(0x0028,0x0030),
89   gdcm.Tag(0x0028,0x0100),
90   gdcm.Tag(0x0028,0x0101),
91   gdcm.Tag(0x0028,0x0102),
92   gdcm.Tag(0x0028,0x0103),
93   gdcm.Tag(0x0028,0x1052),
94   gdcm.Tag(0x0028,0x1053),
95   gdcm.Tag(0x0028,0x2110),
96   gdcm.Tag(0x0028,0x2112),
97   gdcm.Tag(0x7fe0,0x0010),
98   gdcm.Tag(0x0018,0x0020),
99   gdcm.Tag(0x0018,0x0021),
100   gdcm.Tag(0x0018,0x0023),
101   gdcm.Tag(0x0018,0x0025),
102   gdcm.Tag(0x0018,0x0080),
103   gdcm.Tag(0x0018,0x0081),
104   gdcm.Tag(0x0018,0x0083),
105   gdcm.Tag(0x0018,0x0084),
106   gdcm.Tag(0x0018,0x0085),
107   gdcm.Tag(0x0018,0x0086),
108   gdcm.Tag(0x0018,0x0087),
109   gdcm.Tag(0x0018,0x0091),
110   gdcm.Tag(0x0018,0x0093),
111   gdcm.Tag(0x0018,0x0094),
112   gdcm.Tag(0x0018,0x0095),
113   gdcm.Tag(0x0018,0x1088),
114   gdcm.Tag(0x0018,0x1090),
115   gdcm.Tag(0x0018,0x1094),
116   gdcm.Tag(0x0018,0x1250),
117   gdcm.Tag(0x0018,0x1251),
118   gdcm.Tag(0x0018,0x1310),
119   gdcm.Tag(0x0018,0x1312),
```

```
120   gdcm.Tag(0x0018,0x1314),
121   gdcm.Tag(0x0018,0x1315),
122   gdcm.Tag(0x0018,0x1316),
123   gdcm.Tag(0x0020,0x0110),
124   gdcm.Tag(0x0028,0x0120),
125   gdcm.Tag(0x0028,0x1050),
126   gdcm.Tag(0x0028,0x1051)
127   ]
128   for tag in taglist:
129     #print tag
130     ano.Remove( tag )
131
132   # special handling
133   gen = gdcm.UIDGenerator()
134   ano.Replace( gdcm.Tag(0x0008,0x9123), gen.Generate() )
135   #ano.Empty( gdcm.Tag(0x0040,0x0555) )
136
137
138 #
139 #  uid = gen.Generate()
140 #  de.SetTag( gdcm.Tag(0x0008,0x0018) )
141 #  de.SetByteStringValue( uid )
142 #  ds.Insert( de )
143
144   # init FMI now:
145   #fmi = f.GetHeader()
146   #ts = gdcm.TransferSyntax()
147   #print ts
148   #fmi.SetDataSetTransferSyntax( ts ) # default
149   #print fmi.GetDataSetTransferSyntax()
150   #de.SetTag( gdcm.Tag(0x0002,0x0010) )
151   #uid = "1.2.840.10008.1.2"
152   #de.SetByteStringValue( uid )
153   #fmi.Insert( de )
154 #  f.SetHeader( r.GetFile().GetHeader() )
155
156   writer = gdcm.Writer()
157   writer.SetFile( ano.GetFile() )
158   writer.SetFileName( "rawstorage.dcm" );
159   writer.Write()
```

12.117 DecompressImage.py

```
1
14
15 """
16 Usage:
17
18  python DecompressImage.py gdcmData/012345.002.050.dcm decompress.dcm
19 """
20
21 import gdcm
22 import sys
23
24 if __name__ == "__main__":
25
26   file1 = sys.argv[1]
27   file2 = sys.argv[2]
28
29   r = gdcm.ImageReader()
30   r.SetFileName( file1 )
31   if not r.Read():
32     sys.exit(1)
33
34   # check GetFragment API:
35   pd = r.GetFile().GetDataSet().GetDataElement(gdcm.Tag(0x7fe0, 0x0010))
36   frags = pd.GetSequenceOfFragments();
37   frags.GetFragment(0);
38
39   ir = r.GetImage()
40   w = gdcm.ImageWriter()
41   image = w.GetImage()
42
43   image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );
44   dims = ir.GetDimensions();
45   print ir.GetDimension(0);
46   print ir.GetDimension(1);
```

```
47   print "Dims:",dims
48
49   #  Just for fun:
50   dircos =  ir.GetDirectionCosines()
51   t = gdcm.Orientation.GetType(tuple(dircos))
52   l = gdcm.Orientation.GetLabel(t)
53   print "Orientation label:",l
54
55   image.SetDimension(0, ir.GetDimension(0) );
56   image.SetDimension(1, ir.GetDimension(1) );
57
58   pixeltype = ir.GetPixelFormat();
59   image.SetPixelFormat( pixeltype );
60
61   pi = ir.GetPhotometricInterpretation();
62   image.SetPhotometricInterpretation( pi );
63
64   pixeldata = gdcm.DataElement( gdcm.Tag(0x7fe0,0x0010) )
65   str1 = ir.GetBuffer()
66   #print ir.GetBufferLength()
67   pixeldata.SetByteStringValue( str1 )
68   image.SetDataElement( pixeldata )
69
70   w.SetFileName( file2 )
71   w.SetFile( r.GetFile() )
72   w.SetImage( image )
73   if not w.Write():
74     sys.exit(1)
```

12.118 DumbAnonymizer.py

```
1
14
15 """
16 This example shows how one can use the gdcm.Anonymizer in 'dumb' mode.
17 This class becomes really handy when one knows which particular tag to fill in.
18
19 Usage:
20
21  python DumbAnonymizer.py gdcmData/012345.002.050.dcm out.dcm
22
23 """
24
25 import gdcm
26
27 # http://www.oid-info.com/get/1.3.6.1.4.17434
28 THERALYS_ORG_ROOT = "1.3.6.1.4.17434"
29
30 tag_rules={
31   # Value
32   (0x0012,0x0010):("Value","MySponsorName"),
33   (0x0012,0x0020):("Value","MyProtocolID"),
34   (0x0012,0x0021):("Value","MyProtocolName"),
35   (0x0012,0x0062):("Value","YES"),
36   (0x0012,0x0063):("Value","MyDeidentificationMethod"),
37
38   # Method
39   #(0x0002,0x0003):("Method","GenerateMSOPId"),
40   #(0x0008,0x1155):("Method","GenerateMSOPId"),
41   (0x0008,0x0018):("Method","GenerateMSOPId"),
42   (0x0010,0x0010):("Method","GetSponsorInitials"),
43   (0x0010,0x0020):("Method","GetSponsorId"),
44   (0x0012,0x0030):("Method","GetSiteId"),
45   (0x0012,0x0031):("Method","GetSiteName"),
46   (0x0012,0x0040):("Method","GetSponsorId"),
47   (0x0012,0x0050):("Method","GetTPId"),
48   (0x0018,0x0022):("Method","KeepIfExist"),
49   (0x0018,0x1315):("Method","KeepIfExist"),
50   (0x0020,0x000d):("Method","GenerateStudyId"),
51   (0x0020,0x000e):("Method","GenerateSeriesId"),
52   (0x0020,0x1002):("Method","GetNumberOfFrames"),
53   (0x0020,0x0020):("Method","GetPatientOrientation"),
54   # Other:
55   (0x0012,0x0051):("Patient Field","Type Examen"),
56   (0x0018,0x1250):("Sequence Field","Receive Coil"),
57   (0x0018,0x0088):("Sequence Field","Spacing Between Slice"),
58   (0x0018,0x0095):("Sequence Field","Pixel Bandwidth"),
```

```
59   (0x0018,0x0082):("Sequence Field","Invertion Time"),
60 }
61
62 class MyAnon:
63   def __init__(self):
64     self.studyuid = None
65     self.seriesuid = None
66     generator = gdcm.UIDGenerator()
67     if not self.studyuid:
68       self.studyuid = generator.Generate()
69     if not self.seriesuid:
70       self.seriesuid = generator.Generate()
71   def GetSponsorInitials(self):
72     return "dummy^foobar"
73   def GenerateStudyId(self):
74     return self.studyuid
75   def GenerateSeriesId(self):
76     return self.seriesuid
77   #def GenerateMSOPId(self):
78   def GenerateMSOPId(self):
79     generator = gdcm.UIDGenerator()
80     return generator.Generate()
81   def GetSiteId(self):
82     return "MySiteId"
83   def GetSiteName(self):
84     return "MySiteName"
85   def GetSponsorId(self):
86     return "MySponsorId"
87   def GetTPId(self):
88     return "MyTP"
89
90 if __name__ == "__main__":
91   import sys
92   gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "DumbAnonymizer" )
93   gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT )
94
95   r = gdcm.Reader()
96   filename = sys.argv[1]
97   r.SetFileName( filename )
98   if not r.Read(): sys.exit(1)
99
100   obj = MyAnon()
101
102   w = gdcm.Writer()
103   ano = gdcm.Anonymizer()
104   ano.SetFile( r.GetFile() )
105   ano.RemoveGroupLength()
106   for tag,rule in tag_rules.items():
107     if rule[0] == 'Value':
108       print tag,rule
109       ano.Replace( gdcm.Tag( tag[0], tag[1] ), rule[1] )
110     elif rule[0] == 'Method':
111       print tag,rule
112       # result = locals()[rule[1]]()
113       methodname = rule[1]
114       if hasattr(obj, methodname):
115         _member = getattr(obj, methodname)
116         result = _member()
117         ano.Replace( gdcm.Tag( tag[0], tag[1] ), result )
118       else:
119         print "Problem with: ", methodname
120
121   outfilename = sys.argv[2]
122   w.SetFileName( outfilename )
123   w.SetFile( ano.GetFile() )
124   if not w.Write(): sys.exit(1)
```

12.119 ExtractImageRegion.py

```
1
14
15 """
16
17  This small code shows how to use the gdcm.ImageRegionReader API
18  In this example we are taking each frame by frame and dump them to
19  /tmp/frame.raw.
20
```

```
21  Usage:
22  $ ExtractImageRegion.py input.dcm
23
24  Example:
25  $ ExtractImageRegion.py gdcmData/012345.002.050.dcm
26  $ md5sum /tmp/frame.raw
27  d594a5e2fde12f32b6633ca859b4d4a6  /tmp/frame.raw
28  $ gdcminfo --md5sum gdcmData/012345.002.050.dcm
29  [...]
30  md5sum: d594a5e2fde12f32b6633ca859b4d4a6
31 """
32
33 import gdcm
34
35 if __name__ == "__main__":
36   import sys
37   filename = sys.argv[1]
38
39   file_size = gdcm.System.FileSize(filename);
40
41   # instantiate the reader:
42   reader = gdcm.ImageRegionReader();
43   reader.SetFileName( filename );
44
45   # pull DICOM info:
46   if not reader.ReadInformation():
47     sys.exit(1)
48
49   # store current offset:
50   cur_pos = reader.GetStreamCurrentPosition();
51
52   remaining = file_size - cur_pos;
53
54   print("Remaining bytes to read (Pixel Data): %d" % remaining );
55
56   # Get file infos
57   f = reader.GetFile();
58
59   # get some info about image
60   dims = gdcm.ImageHelper.GetDimensionsValue(f);
61   print(dims)
62   pf = gdcm.ImageHelper.GetPixelFormatValue (f);
63   pixelsize = pf.GetPixelSize();
64   pi = gdcm.ImageHelper.GetPhotometricInterpretationValue(f);
65   print( pi );
66
67   # buffer to get the pixels
68   buffer = bytearray( dims[0] * dims[1] * pixelsize )
69
70   # define a simple box region.
71   box = gdcm.BoxRegion();
72   for z in range(0, dims[2]):
73     # Define that I want the image 0, full size (dimx x dimy pixels)
74     # and do that for each z:
75     box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
76     #print( box.toString() );
77     reader.SetRegion( box );
78
79     # reader will try to load the uncompressed image region into buffer.
80     # the call returns an error when buffer.Length is too small. For instance
81     # one can call:
82     # uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
83     # to get the exact size of minimum buffer
84     if reader.ReadIntoBuffer(buffer):
85       open('/tmp/frame.raw', 'wb').write(buffer)
86     else:
87       #throw new Exception("can't read pixels error");
88       sys.exit(1)
```

12.120 FindAllPatientName.py

```
1
14 """
15 This example shows how one can use the gdcm.CompositeNetworkFunctions class
16 for executing a C-FIND query
17 It will print the list of patient name found
18
```

```
Usage:

 python FindAllPatientName.py

"""

import gdcm

# Patient Name
tag = gdcm.Tag(0x10,0x10)
de = gdcm.DataElement(tag)

# Search all patient name where string match 'F*'
de.SetByteStringValue('F*')

ds = gdcm.DataSet()
ds.Insert(de)

cnf = gdcm.CompositeNetworkFunctions()
theQuery = cnf.ConstructQuery (gdcm.ePatientRootType,gdcm.ePatient,ds)

#print theQuery.ValidateQuery()

# prepare the variable for output
ret = gdcm.DataSetArrayType()

# Execute the C-FIND query
cnf.CFind('dicom.example.com',11112,theQuery,ret,'GDCM_PYTHON','ANY-SCP')

for i in range(0,ret.size()):
  print "Patient #",i
  print ret[i]
```

12.121 FixCommaBug.py

```

"""
Using LC_NUMERIC set to something not compatible with "C" it is possible to write out "," instead of
"." as required by the DICOM standard
Issue is still current (IMHO) with gdcm 2.0.9
"""

import gdcm
import sys

filename = sys.argv[1]
outname = sys.argv[2]

# read
r = gdcm.Reader()
r.SetFileName( filename )
if not r.Read():
  print "not valid"
  sys.exit(1)

file = r.GetFile()
dataset = file.GetDataSet()

ano = gdcm.Anonymizer()
ano.SetFile( file )

tags = [
gdcm.Tag(0x0018,0x1164),
gdcm.Tag(0x0018,0x0088),
gdcm.Tag(0x0018,0x0050),
gdcm.Tag(0x0028,0x0030),
]

for tag in tags:
  print tag
  if dataset.FindDataElement( tag ):
    pixelspacing = dataset.GetDataElement( tag )
    #print pixelspacing
    bv = pixelspacing.GetByteValue()
    str = bv.GetBuffer()
    #print bv.GetLength()
```

```
55     #print len(str)
56     new_str = str.replace(",",".")
57     # Need to explicitly pass bv.GetLength() to remove any trailing garbage
58     ano.Replace( tag, new_str, bv.GetLength() )
59
60 #print dataset
61
62 w = gdcm.Writer()
63 w.SetFile( file )
64 w.SetFileName( outname )
65 if not w.Write():
66   print "Cannot write"
67   sys.exit(1)
68
69 # paranoid:
70 image_reader = gdcm.ImageReader()
71 image_reader.SetFileName( outname )
72 if not image_reader.Read():
73   print "there is still a comma"
74   sys.exit(1)
75
76 print "Sucess!"
77 sys.exit(0) # success
```

12.122 GetPortionCSAHeader.py

```
1
14
15 """
16 Usage:
17
18  python GetPortionCSAHeader.py input.dcm
19
20 Footnote:
21   SIEMENS is not publishing any information on the CSA header. So any info extracted
22   is at your own risk.
23 """
24
25 import sys
26 import gdcm
27
28 if __name__ == "__main__":
29
30   file = sys.argv[1]
31
32   r = gdcm.Reader()
33   r.SetFileName( file )
34   if not r.Read():
35     sys.exit(1)
36
37   ds = r.GetFile().GetDataSet()
38   csa_t1 = gdcm.CSAHeader()
39   csa_t2 = gdcm.CSAHeader()
40   #print csa
41   t1 = csa_t1.GetCSAImageHeaderInfoTag();
42   print t1
43   t2 = csa_t2.GetCSASeriesHeaderInfoTag();
44   print t2
45   # Let's do it for t1:
46   if ds.FindDataElement( t1 ):
47     csa_t1.LoadFromDataElement( ds.GetDataElement( t1 ) )
48     print csa_t1
49
50   # Now let's pretend we are only interested in B_value and DiffusionGradientDirection entries:
51   bvalues = csa_t1.GetCSAElementByName( "B_value" ) # WARNING: it is case sensitive !
52   print bvalues
53
54   diffgraddir = csa_t1.GetCSAElementByName( "DiffusionGradientDirection" ) # WARNING: it is case sensitive !
55   print diffgraddir
56
57   # repeat for t2 if you like it:
58   if ds.FindDataElement( t2 ):
59     csa_t2.LoadFromDataElement( ds.GetDataElement( t2 ) )
60     # print csa_t2
61
62   gdt = csa_t2.GetCSAElementByName( "GradientDelayTime" )
63   print gdt
```

```
64
65   bv = gdt.GetByteValue();
66   #print bv
67   str = bv.GetPointer()
68   print str.split("\\")
```

12.123 HelloWorld.py

```
1
14
15 """
16 Hello World !
17 """
18
19 import gdcm
20 import sys
21
22 if __name__ == "__main__":
23
24   # verbosity:
25   #gdcm.Trace.DebugOn()
26   #gdcm.Trace.WarningOn()
27   #gdcm.Trace.ErrorOn()
28
29   # Get the filename from the command line
30   filename = sys.argv[1]
31
32   # Instanciate a gdcm.Reader
33   # This is the main class to handle any type of DICOM object
34   # You should check for gdcm.ImageReader for reading specifically DICOM Image file
35   r = gdcm.Reader()
36   r.SetFileName( filename )
37   # If the reader fails to read the file, we should stop !
38   if not r.Read():
39     print "Not a valid DICOM file"
40     sys.exit(1)
41
42   # Get the DICOM File structure
43   file = r.GetFile()
44
45   # Get the DataSet part of the file
46   dataset = file.GetDataSet()
47
48   # Ok let's print it !
49   print dataset
50
51   # Use StringFilter to print a particular Tag:
52   sf = gdcm.StringFilter()
53   sf.SetFile(r.GetFile())
54
55   # Check if Attribute exist
56   print dataset.FindDataElement( gdcm.Tag(0x0028,0x0010))
57
58   # Let's print it as string pair:
59   print sf.ToStringPair(gdcm.Tag(0x0028,0x0010))
```

12.124 ManipulateFile.py

```
1
14
15 """
16 Usage:
17
18  python ManipulateFile.py input.dcm output.dcm
19
20 Footnote:
21   GDCM 1.2.x would create incorrect Multiframes MR Image Storage file. Try to recover from
22   the issues to recreate a MultiframeGrayscaleByteSecondaryCaptureImageStorage file.
23   e.g:
24
25   python ManipulateFile.py Insight/Testing/Temporary/itkGDCMImageIOTest5-j2k.dcm manipulated.dcm
26 """
27
```

```
28 import sys
29 import gdcm
30
31 if __name__ == "__main__":
32
33   file1 = sys.argv[1]
34   file2 = sys.argv[2]
35
36   r = gdcm.Reader()
37   r.SetFileName( file1 )
38   if not r.Read():
39     sys.exit(1)
40
41   ano = gdcm.Anonymizer()
42   ano.SetFile( r.GetFile() )
43   ano.RemovePrivateTags()
44   ano.Remove( gdcm.Tag(0x0032,0x1030) )
45   ano.Remove( gdcm.Tag(0x008,0x14) )
46   ano.Remove( gdcm.Tag(0x008,0x1111) )
47   ano.Remove( gdcm.Tag(0x008,0x1120) )
48   ano.Remove( gdcm.Tag(0x008,0x1140) )
49   ano.Remove( gdcm.Tag(0x10,0x21b0) )
50   ano.Empty( gdcm.Tag(0x10,0x10) )
51   ano.Empty( gdcm.Tag(0x10,0x20) )
52   ano.Empty( gdcm.Tag(0x10,0x30) )
53   ano.Empty( gdcm.Tag(0x20,0x10) )
54   ano.Empty( gdcm.Tag(0x32,0x1032) )
55   ano.Empty( gdcm.Tag(0x32,0x1033) )
56   ano.Empty( gdcm.Tag(0x40,0x241) )
57   ano.Empty( gdcm.Tag(0x40,0x254) )
58   ano.Empty( gdcm.Tag(0x40,0x253) )
59   ano.Empty( gdcm.Tag(0x40,0x1001) )
60   ano.Empty( gdcm.Tag(0x8,0x80) )
61   ano.Empty( gdcm.Tag(0x8,0x50) )
62   ano.Empty( gdcm.Tag(0x8,0x1030) )
63   ano.Empty( gdcm.Tag(0x8,0x103e) )
64   ano.Empty( gdcm.Tag(0x18,0x1030) )
65   ano.Empty( gdcm.Tag(0x38,0x300) )
66   g = gdcm.UIDGenerator()
67   ano.Replace( gdcm.Tag(0x0008,0x0018), g.Generate() )
68   ano.Replace( gdcm.Tag(0x0020,0x00d), g.Generate() )
69   ano.Replace( gdcm.Tag(0x0020,0x00e), g.Generate() )
70   ano.Replace( gdcm.Tag(0x0020,0x052), g.Generate() )
71   #ano.Replace( gdcm.Tag(0x0008,0x0016), "1.2.840.10008.5.1.4.1.1.7.2" )
72   """
73   ano.Remove( gdcm.Tag(0x0018,0x0020) ) # ScanningSequence
74   ano.Remove( gdcm.Tag(0x0018,0x0021) ) # SequenceVariant
75   ano.Remove( gdcm.Tag(0x0018,0x0022) ) # ScanOptions
76   ano.Remove( gdcm.Tag(0x0018,0x0023) ) # MRAcquisitionType
77   ano.Remove( gdcm.Tag(0x0018,0x0050) ) # SliceThickness
78   ano.Remove( gdcm.Tag(0x0018,0x0080) ) # RepetitionTime
79   ano.Remove( gdcm.Tag(0x0018,0x0081) ) # EchoTime
80   ano.Remove( gdcm.Tag(0x0018,0x0088) ) # SpacingBetweenSlices
81   ano.Remove( gdcm.Tag(0x0018,0x0091) ) # EchoTrainLength
82   ano.Remove( gdcm.Tag(0x0018,0x1164) ) # ImagerPixelSpacing
83
84   ano.Remove( gdcm.Tag(0x0020,0x0032) ) # Image Position (Patient)
85   ano.Remove( gdcm.Tag(0x0020,0x0037) ) # Image Orientation (Patient)
86   ano.Remove( gdcm.Tag(0x0020,0x0052) ) # Frame of Reference UID
87   ano.Remove( gdcm.Tag(0x0020,0x1040) ) # Position Reference Indicator
88
89   ano.Replace( gdcm.Tag(0x0028,0x0301), "NO" ) # Burned In Annotation
90
91   ano.Empty( gdcm.Tag(0x0020,0x0020) )
92
93   ano.Remove( gdcm.Tag(0x7fe0,0x0000) )
94
95   #ano.Empty( gdcm.Tag(0x0028,0x0009) ) # Frame Increment Pointer
96
97   #ano.Empty( gdcm.Tag(0x0028,0x1052) )  #<entry group="0028" element="1052" vr="DS" vm="1" name="Rescale
       Intercept"/>
98   #ano.Empty( gdcm.Tag(0x0028,0x1053) )  #<entry group="0028" element="1053" vr="DS" vm="1" name="Rescale
       Slope"/>
99   #ano.Replace( gdcm.Tag(0x0028,0x1054), "US" )  #<entry group="0028" element="1054" vr="LO" vm="1"
       name="Rescale Type"/>
100
101   ano.Replace( gdcm.Tag(0x2050, 0x0020), "IDENTITY")
102   """
103
104   w = gdcm.Writer()
105   w.SetFile( ano.GetFile() )
```

```
106   w.SetFileName( file2 )
107   if not w.Write():
108     sys.exit(1)
```

12.125 ManipulateSequence.py

```
1
14
15 """
16 Usage:
17
18  python ManipulateSequence.py input.dcm output.dcm
19
20 This was tested using:
21
22  python ManipulateSequence.py gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm
23
24 This is a dummy example on how to modify a value set in a nested-nested dataset
25
26 WARNING:
27 Do not use as-is in production, this is just an example
28 This example works in an undefined length Item only (you need to explicitly recompute the length otherwise)
29 """
30
31 import sys
32 import gdcm
33
34 if __name__ == "__main__":
35
36   file1 = sys.argv[1]
37   file2 = sys.argv[2]
38
39   r = gdcm.Reader()
40   r.SetFileName( file1 )
41   if not r.Read():
42     sys.exit(1)
43
44   f = r.GetFile()
45   ds = f.GetDataSet()
46   tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
47   if ds.FindDataElement( tsis ):
48     sis = ds.GetDataElement( tsis )
49     #sqsis = sis.GetSequenceOfItems()
50     # GetValueAsSQ handle more cases
51     sqsis = sis.GetValueAsSQ()
52     if sqsis.GetNumberOfItems():
53       item1 = sqsis.GetItem(1)
54       nestedds = item1.GetNestedDataSet()
55       tprcs = gdcm.Tag(0x0040,0xa170) # PurposeOfReferenceCodeSequence
56       if nestedds.FindDataElement( tprcs ):
57         prcs = nestedds.GetDataElement( tprcs )
58         sqprcs = prcs.GetSequenceOfItems()
59         if sqprcs.GetNumberOfItems():
60           item2 = sqprcs.GetItem(1)
61           nestedds2 = item2.GetNestedDataSet()
62           # (0008,0104) LO [Uncompressed predecessor]               #  24, 1 CodeMeaning
63           tcm = gdcm.Tag(0x0008,0x0104)
64           if nestedds2.FindDataElement( tcm ):
65             cm = nestedds2.GetDataElement( tcm )
66             mystr = "GDCM was here"
67             cm.SetByteStringValue( mystr )
68
69   w = gdcm.Writer()
70   w.SetFile( f )
71   w.SetFileName( file2 )
72   if not w.Write():
73     sys.exit(1)
```

12.126 MergeFile.py

```
1
14
15 """
```

```
16 Usage:
17
18  python MergeFile.py input1.dcm input2.dcm
19
20   It will produce a 'merge.dcm' output file, which contains all meta information from input1.dcm
21   and copy the Stored Pixel values from input2.dcm
22   This script even works when input2.dcm is a Secondary Capture and does not contains information
23   such as IOP and IPP...
24 """
25
26 import sys
27 import gdcm
28
29 if __name__ == "__main__":
30
31   file1 = sys.argv[1]
32   file2 = sys.argv[2]
33
34   r1 = gdcm.ImageReader()
35   r1.SetFileName( file1 )
36   if not r1.Read():
37     sys.exit(1)
38
39   r2 = gdcm.ImageReader()
40   r2.SetFileName( file2 )
41   if not r2.Read():
42     sys.exit(1)
43
44   # Image from r2 could be Secondary Capture and thus would not contains neither IPP nor IOP
45   # Instead always prefer to only copy the Raw Data Element.
46   # Warning ! Image need to be identical ! Only the value of Stored Pixel can be different.
47   r1.GetImage().SetDataElement( r2.GetImage().GetDataElement() )
48
49   w = gdcm.ImageWriter()
50   w.SetFile( r1.GetFile() )
51   #w.SetImage( r2.GetImage() )  # See comment above
52   w.SetImage( r1.GetImage() )
53
54   w.SetFileName( "merge.dcm" )
55   if not w.Write():
56     sys.exit(1)
57
58   sys.exit(0)
```

12.127 NewSequence.py

```
1
14
15 """
16 Usage:
17
18   python NewSequence.py input.dcm output.dcm
19
20
21 Thanks to Robert Irie for code
22 """
23
24 import sys
25 import gdcm
26
27 if __name__ == "__main__":
28
29   file1 = sys.argv[1]
30   file2 = sys.argv[2]
31
32   r = gdcm.Reader()
33   r.SetFileName( file1 )
34   if not r.Read():
35     sys.exit(1)
36
37   f = r.GetFile()
38   ds = f.GetDataSet()
39   #tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
40
41   # Create a dataelement
42   de = gdcm.DataElement(gdcm.Tag(0x0010, 0x2180))
43   de.SetByteStringValue("Occupation")
```

```
44   de.SetVR(gdcm.VR(gdcm.VR.SH))
45
46   # Create an item
47   it=gdcm.Item()
48   it.SetVLToUndefined()      # Needed to not popup error message
49   #it.InsertDataElement(de)
50   nds=it.GetNestedDataSet()
51   nds.Insert(de)
52
53   # Create a Sequence
54   sq=gdcm.SequenceOfItems().New()
55   sq.SetLengthToUndefined()
56   sq.AddItem(it)
57
58   # Insert sequence into data set
59   des=gdcm.DataElement(gdcm.Tag(0x0400,0x0550))
60   des.SetVR(gdcm.VR(gdcm.VR.SQ))
61   des.SetValue(sq.__ref__())
62   des.SetVLToUndefined()
63
64   ds.Insert(des)
65
66   w = gdcm.Writer()
67   w.SetFile( f )
68   w.SetFileName( file2 )
69   if not w.Write():
70     sys.exit(1)
```

12.128 PhilipsPrivateRescaleInterceptSlope.py

```
1
14
15 """
16 Usage:
17
18  python
19 """
20
21 import gdcm
22 import sys
23
24 filename = sys.argv[1]
25 tmpfile = "/tmp/philips_rescaled.dcm"
26
27
28 # Need to access some private tags, read the file :
29 reader = gdcm.Reader()
30 reader.SetFileName( filename )
31 if not reader.Read():
32   sys.exit(1)
33
34 ds = reader.GetFile().GetDataSet()
35
36 #print ds
37 # (2005,1409)     DS      4       0.0
38 # (2005,140a)     DS      16      1.52283272283272
39
40 # (2005,0014)     LO      26      Philips MR Imaging DD 005
41 tag1 = gdcm.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
42 tag2 = gdcm.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
43 print tag1
44 print tag2
45
46 # make sure to do a copy, we want the private tag to remain
47 # otherwise gdcm gives us a reference
48 el1 = gdcm.DataElement( ds.GetDataElement( tag1 ) )
49 print el1
50 el2 = gdcm.DataElement( ds.GetDataElement( tag2 ) )
51 print el2
52
53 # (0028,1052) DS [-1000]                                  #   6, 1 RescaleIntercept
54 # (0028,1053) DS [1]                                      #   2, 1 RescaleSlope
55
56 el1.SetTag( gdcm.Tag(0x0028,0x1052) )
57 el2.SetTag( gdcm.Tag(0x0028,0x1053) )
58
59 ds.Insert( el1 )
```

```
60 ds.Insert( el2 )
61
62 w = gdcm.Writer()
63 w.SetCheckFileMetaInformation( False )
64 w.SetFileName( tmpfile )
65 w.SetFile( reader.GetFile() )
66 if not w.Write():
67   sys.exit(1)
68
69 print "success"
```

12.129 PlaySound.py

```
1
14
15 """
16 Usage:
17
18  python PlaySound.py input.dcm
19 """
20
21 import gdcm
22 import sys
23
24 #filename = "/home/mmalaterre/Creatis/gdcmDataExtra/gdcmNonImageData/audio_from_rafael_sanguinetti.dcm"
25 filename = sys.argv[1]
26 print filename
27
28 r = gdcm.Reader()
29 r.SetFileName( filename )
30 if not r.Read():
31   sys.exit(1)
32
33 ds = r.GetFile().GetDataSet()
34
35 waveformtag = gdcm.Tag(0x5400,0x0100)
36 waveformsq = ds.GetDataElement( waveformtag )
37 #print waveformsq
38
39 #print dir(waveformsq)
40
41 items = waveformsq.GetSequenceOfItems()
42
43 if not items.GetNumberOfItems():
44   sys.exit(1)
45
46 item = items.GetItem(1)
47 #print item
48
49 waveformds = item.GetNestedDataSet()
50 #print waveformds
51
52 waveformdatatag = gdcm.Tag(0x5400,0x1010)
53 waveformdata = waveformds.GetDataElement( waveformdatatag )
54
55 #print waveformdata.GetPointer()
56 bv = waveformdata.GetByteValue()
57 print dir(bv)
58
59 #print bv.GetPointer()
60 print bv.GetLength()
61 l = 116838
62
63 file='test.wav'
64 myfile = open(file, "wb")
65 s = bv.GetPointer()
66 for i in range(0, l):
67   myfile.write(s[i])
68 myfile.close()
69
70 # http://mail.python.org/pipermail/python-list/2004-October/288905.html
71 if sys.platform.startswith('win'):
72    from winsound import PlaySound, SND_FILENAME, SND_ASYNC
73    PlaySound(file, SND_FILENAME|SND_ASYNC)
74 elif sys.platform.find('linux')>-1:
75    from wave import open as waveOpen
76    from ossaudiodev import open as ossOpen
```

```
77    s = waveOpen(file,'rb')
78    (nc,sw,fr,nf,comptype, compname) = s.getparams( )
79    dsp = ossOpen('/dev/dsp','w')
80    try:
81      from ossaudiodev import AFMT_S16_NE
82    except ImportError:
83      if byteorder == "little":
84        AFMT_S16_NE = ossaudiodev.AFMT_S16_LE
85      else:
86        AFMT_S16_NE = ossaudiodev.AFMT_S16_BE
87    dsp.setparameters(AFMT_S16_NE, nc, fr)
88    data = s.readframes(nf)
89    s.close()
90    dsp.write(data)
91    dsp.close()
```

12.130 PrivateDict.py

```
1
14
15 """
16 """
17
18 import gdcm
19 import sys,os
20
21 if __name__ == "__main__":
22   #gdcm.Trace.DebugOn()
23   globInst = gdcm.Global.GetInstance()
24   # Try to load Part3.xml file
25   # This fils is too big for being accessible directly at runtime.
26   globInst.LoadResourcesFiles()
27
28
29   # Get a private tag from the runtime dicts. LoadResourcesFiles could
30   # have failed but this has no impact on the private dict
31
32   d = globInst.GetDicts()
33   print d.GetDictEntry( gdcm.Tag(0x0029,0x0010) ,"SIEMENS CSA HEADER" )
34   pd = d.GetPrivateDict()
35   print pd.GetDictEntry( gdcm.PrivateTag(0x0029,0x0010,"SIEMENS CSA HEADER") )
```

12.131 ReWriteSCAsMR.py

```
1
14
15 """
16 GDCM 1.x would write out MR Image Storage as Secondary Capture Object while still setting Rescale
       Slope/Intercept
17 and saving the Pixel Spacing in (0028,0030)
18 """
19
20 import gdcm
21 import sys,os
22
23 def CheckSecondaryCaptureObjectIsMRImageStorage(r):
24   ds = r.GetFile().GetDataSet()
25   # Check Source Image Sequence
26   if ds.FindDataElement( gdcm.Tag(0x0008,0x2112) ):
27     sis = ds.GetDataElement( gdcm.Tag(0x0008,0x2112) )
28     sqsis = sis.GetSequenceOfItems()
29     if sqsis.GetNumberOfItems():
30       item1 = sqsis.GetItem(1)
31       nestedds = item1.GetNestedDataSet()
32       if nestedds.FindDataElement( gdcm.Tag(0x0008,0x1150) ):
33         ReferencedSOPClassUID = nestedds.GetDataElement( gdcm.Tag(0x0008,0x1150) )
34         raw = ReferencedSOPClassUID.GetByteValue().GetPointer()
35         uids = gdcm.UIDs()
36         # what is the actual object we are looking at ?
37         ms = gdcm.MediaStorage()
38         ms.SetFromDataSet(ds)
39         msuid = ms.GetString()
40         uids.SetFromUID( msuid )
```

```
41          msuidname = uids.GetName() # real Media Storage Name
42          uids.SetFromUID( raw )
43          sqmsuidname = uids.GetName() # Source Image Sequence Media Storage Name
44          # If object is SC and Source derivation is MRImageStorage then we can assume 'Pixel Spacing' is
      correct
45          if( sqmsuidname == 'MR Image Storage' and msuidname == 'Secondary Capture Image Storage' ):
46            return True
47    # in all other case simply return the currentspacing:
48    return False
49
50  if __name__ == "__main__":
51    r = gdcm.ImageReader()
52    filename = sys.argv[1]
53    r.SetFileName( filename )
54    if not r.Read():
55      sys.exit(1)
56    f = r.GetFile()
57
58    if( CheckSecondaryCaptureObjectIsMRImageStorage(r) ):
59      # Special handling of the spacing:
60      # GDCM 1.2.0 would not rewrite correcly DICOM Object and would always set them as 'Secondary Capture
      Image Storage'
61      # while we would rather have 'MR Image Storage'
62      gdcm.ImageHelper.SetForcePixelSpacing( True )
63      mrspacing = gdcm.ImageHelper.GetSpacingValue( r.GetFile() )
64      # TODO: I cannot do simply the following:
65      #image.SetSpacing( mrspacing )
66      image.SetSpacing(0, mrspacing[0] )
67      image.SetSpacing(1, mrspacing[1] )
68      image.SetSpacing(2, mrspacing[2] )
69      gdcm.ImageHelper.SetForceRescaleInterceptSlope( True )
70      ris = gdcm.ImageHelper.GetRescaleInterceptSlopeValue( r.GetFile() )
71      image.SetIntercept( ris[0] )
72      image.SetSlope( ris[1] )
73
74    outfilename = sys.argv[2]
75    w = gdcm.ImageWriter()
76    w.SetFileName( outfilename )
77    w.SetFile( r.GetFile() )
78    w.SetImage( image )
79    if not w.Write():
80      sys.exit(1)
81
82    sys.exit(0)
```

12.132 ReadAndDumpDICOMDIR.py

```
1
23
24
25
26  import sys
27  import gdcm
28
29  if __name__ == "__main__":
30      # Check arguments
31      if (len(sys.argv) < 2):
32          # No filename passed
33          print "No input filename found"
34          quit()
35
36      filename = sys.argv[1]
37
38
39      # Read file
40      reader = gdcm.Reader()
41      reader.SetFileName(filename)
42      if (not reader.Read()):
43          print "Unable to read %s" % (filename)
44          quit()
45
46      file = reader.GetFile()
47
48      # Retrieve header information
49      fileMetaInformation = file.GetHeader()
50      print fileMetaInformation
51
```

```
52      # Retrieve data set
53      dataSet = file.GetDataSet()
54      #print dataSet
55
56      # Check media storage
57      mediaStorage = gdcm.MediaStorage()
58      mediaStorage.SetFromFile(file)
59      if (gdcm.MediaStorage.GetMSType(str(mediaStorage)) != gdcm.MediaStorage.MediaStorageDirectoryStorage):
60          # File is not a DICOMDIR
61          print "This file is not a DICOMDIR (Media storage type: %s)" % (str(mediaStorage))
62          quit()
63
64      # Check Media Storage SOP Class
65      if (fileMetaInformation.FindDataElement(gdcm.Tag(0x0002, 0x0002))):
66          sopClassUid = str(fileMetaInformation.GetDataElement(gdcm.Tag(0x0002, 0x0002)).GetValue())
67          # Check SOP UID
68          if (sopClassUid != "1.2.840.10008.1.3.10"):
69              # File is not a DICOMDIR
70              print "This file is not a DICOMDIR"
71      else:
72          # Not present
73          print "Media Storage SOP Class not present"
74          quit()
75
76      # Iterate through the DICOMDIR data set
77      iterator = dataSet.GetDES().begin()
78      while (not iterator.equal(dataSet.GetDES().end())):
79          dataElement = iterator.next()
80
81          # Check the element tag
82          if (dataElement.GetTag() == gdcm.Tag(0x004, 0x1220)):
83              # The 'Directory Record Sequence' element
84              sequence = dataElement.GetValueAsSQ()
85
86              # Loop through the sequence items
87              itemNr = 1
88              while (itemNr < sequence.GetNumberOfItems()):
89                  item = sequence.GetItem(itemNr)
90
91                  # Check the element tag
92                  if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
93                      # The 'Directory Record Type' element
94                      value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
95
96                      # PATIENT
97                      while (value.strip() == "PATIENT"):
98                          print value.strip()
99                          # Print patient name
100                         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0010))):
101                             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0010)).GetValue())
102                             print value
103
104                         # Print patient ID
105                         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0020))):
106                             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0020)).GetValue())
107                             print value
108
109                         # Next
110                         itemNr = itemNr + 1
111                         item = sequence.GetItem(itemNr)
112                         if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
113                             value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
114
115                         # STUDY
116                         while (value.strip() == "STUDY"):
117                             print value.strip()
118
119                             # Print study UID
120                             if (item.FindDataElement(gdcm.Tag(0x0020, 0x000d))):
121                                 value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000d)).GetValue())
122                                 print value
123
124                             # Print study date
125                             if (item.FindDataElement(gdcm.Tag(0x0008, 0x0020))):
126                                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0020)).GetValue())
127                                 print value
128
129                             # Print study description
130                             if (item.FindDataElement(gdcm.Tag(0x0008, 0x1030))):
131                                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x1030)).GetValue())
132                                 print value
```

```
133
134                             # Next
135                             itemNr = itemNr + 1
136                             item = sequence.GetItem(itemNr)
137                             if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
138                                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
139
140                             # SERIES
141                             while (value.strip() == "SERIES"):
142                                 print value.strip()
143
144                                 # Print series UID
145                                 if (item.FindDataElement(gdcm.Tag(0x0020, 0x000e))):
146                                     value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000e)).GetValue())
147                                     print value
148
149                                 # Print series modality
150                                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x0060))):
151                                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0060)).GetValue())
152                                     print "Modality"
153                                     print value
154
155                                 # Print series description
156                                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x103e))):
157                                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x103e)).GetValue())
158                                     print "Description"
159                                     print value
160
161                                 # Next
162                                 itemNr = itemNr + 1
163                                 item = sequence.GetItem(itemNr)
164                                 if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
165                                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
166
167                                 # IMAGE
168                                 while (value.strip() == "IMAGE"):
169                                     print value.strip()
170
171                                     # Print image UID
172                                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1511))):
173                                         value = str(item.GetDataElement(gdcm.Tag(0x0004,
        0x1511)).GetValue())
174                                         print value
175
176                                     # Next
177                                     if (itemNr < sequence.GetNumberOfItems()):
178                                         itemNr = itemNr + 1
179                                     else:
180                                         break
181
182                                     item = sequence.GetItem(itemNr)
183                                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
184                                             value = str(item.GetDataElement(gdcm.Tag(0x0004,
        0x1430)).GetValue())
185
186                 # Next
187                 itemNr = itemNr + 1
```

12.133 RemovePrivateTags.py

```
1
14
15 """
16 Usage:
17
18  python RemovePrivateTags.py input.dcm output.dcm
19 """
20
21 import sys
22 import gdcm
23
24
25 if __name__ == "__main__":
26
27   file1 = sys.argv[1]
28   file2 = sys.argv[2]
29
```

```
30   # Instanciate the reader.
31   r = gdcm.Reader()
32   r.SetFileName( file1 )
33   if not r.Read():
34     sys.exit(1)
35
36   # Remove private tags
37   ano = gdcm.Anonymizer()
38   ano.SetFile( r.GetFile() )
39   if not ano.RemovePrivateTags():
40     sys.exit(1)
41
42   # Write DICOM file
43   w = gdcm.Writer()
44   w.SetFile( ano.GetFile() )
45   #w.CheckFileMetaInformationOff() # Do not attempt to check meta header
46   w.SetFileName( file2 )
47   if not w.Write():
48     sys.exit(1)
49
50   # It is usually a good idea to exit the script with an error, as gdcm does not remove partial (incorrect)
       DICOM file
51   # (application level)
```

12.134 ScanDirectory.py

```
1
14
15 import gdcm
16 import sys,os
17
18 class ProgressWatcher(gdcm.SimpleSubjectWatcher):
19   def ShowProgress(self, sender, event):
20     pe = gdcm.ProgressEvent.Cast(event)
21     print pe.GetProgress()
22   def EndFilter(self):
23     print "Yay ! I am done"
24
25 if __name__ == "__main__":
26   directory = sys.argv[1]
27
28   # Define the set of tags we are interested in
29   t1 = gdcm.Tag(0x8,0x8);
30   t2 = gdcm.Tag(0x10,0x10);
31
32   # Iterate over directory
33   d = gdcm.Directory();
34   nfiles = d.Load( directory );
35   if(nfiles == 0): sys.exit(1);
36   # System.Console.WriteLine( "Files:\n" + d.toString() );
37
38   filenames = d.GetFilenames()
39
40   #  Get rid of any Warning while parsing the DICOM files
41   gdcm.Trace.WarningOff()
42
43   # instanciate Scanner:
44   sp = gdcm.Scanner.New();
45   s = sp.__ref__()
46   w = ProgressWatcher(s, 'Watcher')
47
48   s.AddTag( t1 );
49   s.AddTag( t2 );
50   b = s.Scan( filenames );
51   if(not b): sys.exit(1);
52
53   print "success" ;
54   #print s
55
56   pttv = gdcm.PythonTagToValue( s.GetMapping( filenames[1] ) )
57   pttv.Start()
58   # iterate until the end:
59   while( not pttv.IsAtEnd() ):
60     # get current value for tag and associated value:
61     # if tag was not found, then it was simply not added to the internal std::map
62     # Warning value can be None
63     tag = pttv.GetCurrentTag()
```

```
64     value = pttv.GetCurrentValue()
65     print tag,"->",value
66     # increment iterator
67     pttv.Next()
68
69   sys.exit(0)
```

12.135 SortImage.py

```
1
14
15 """
16 Usage:
17
18  python SortImage.py dirname
19 """
20
21 import gdcm
22 import sys
23
24 def PrintProgress(object, event):
25   assert event == "ProgressEvent"
26   print "Progress:", object.GetProgress()
27
28 def MySort(ds1, ds2):
29   # compare ds1
30   return False
31
32 if __name__ == "__main__":
33
34   dirname = sys.argv[1]
35   d = gdcm.Directory()
36   d.Load( dirname )
37
38   print d
39
40   sorter = gdcm.Sorter()
41   sorter.SetSortFunction( MySort )
42   #sorter.AddObserver( "ProgressEvent", PrintProgress )
43   sorter.Sort( d.GetFilenames() )
44
45   print "Sorter:"
46   print sorter
```

12.136 WriteBuffer.py

```
1
14
15 """
16 Usage:
17
18 http://chuckhahm.com/Ischem/Zurich/XX_0134
19
20 (2005,1132) SQ (Sequence with undefined length #=8)     # u/l, 1 Unknown Tag & Data
21   (fffe,e000) na (Item with undefined length #=9)        # u/l, 1 Item
22     (2005,0011) LO [Philips MR Imaging DD 002]             #  26, 1 PrivateCreator
23     (2005,1137) PN [PDF_CONTROL_GEN_PARS]                  #  20, 1 Unknown Tag & Data
24     (2005,1138) PN (no value available)                    #   0, 0 Unknown Tag & Data
25     (2005,1139) PN [IEEE_PDF]                              #   8, 1 Unknown Tag & Data
26     (2005,1140) PN (no value available)                    #   0, 0 Unknown Tag & Data
27     (2005,1141) PN (no value available)                    #   0, 0 Unknown Tag & Data
28     (2005,1143) SL 3103                                    #   4, 1 Unknown Tag & Data
29     (2005,1144) OW 0566\0000\013b\0000\0a4a\0000\000e\0000\0a7a\0000\0195\0000\0008... # 3104, 1 Unknown Tag
       & Data
30     (2005,1147) CS [Y]                                     #   2, 1 Unknown Tag & Data
31   (fffe,e00d) na (ItemDelimitationItem)                  #   0, 0 ItemDelimitationItem
32   (fffe,e000) na (Item with undefined length #=9)        # u/l, 1 Item
33     (2005,0011) LO [Philips MR Imaging DD 002]             #  26, 1 PrivateCreator
34     (2005,1137) PN [PDF_CONTROL_PREP_PARS]                 #  22, 1 Unknown Tag & Data
35     (2005,1138) PN (no value available)                    #   0, 0 Unknown Tag & Data
36     (2005,1139) PN [IEEE_PDF]                              #   8, 1 Unknown Tag & Data
37     (2005,1140) PN (no value available)                    #   0, 0 Unknown Tag & Data
38     (2005,1141) PN (no value available)                    #   0, 0 Unknown Tag & Data
```

```
39     (2005,1143) SL 7934                                      #   4, 1 Unknown Tag & Data
40     (2005,1144) OW 19b6\0000\005f\0000\1b2a\0000\00f3\0000\1eee\0000\0000\0000\0008... # 7934, 1 Unknown Tag
       & Data
41     (2005,1147) CS [Y]                                       #   2, 1 Unknown Tag & Data
42   (fffe,e00d) na (ItemDelimitationItem)                    #   0, 0 ItemDelimitationItem
43 ...
44 """
45
46 import sys
47 import gdcm
48
49 if __name__ == "__main__":
50
51   file1 = sys.argv[1]
52   file2 = sys.argv[2]
53
54   r = gdcm.Reader()
55   r.SetFileName( file1 )
56   if not r.Read():
57     sys.exit(1)
58
59   fg = gdcm.FilenameGenerator()
60   f = r.GetFile()
61   ds = f.GetDataSet()
62   tsis = gdcm.Tag(0x2005,0x1132) #
63   if ds.FindDataElement( tsis ):
64     sis = ds.GetDataElement( tsis )
65     #sqsis = sis.GetSequenceOfItems()
66     # GetValueAsSQ handle more cases
67     sqsis = sis.GetValueAsSQ()
68     if sqsis.GetNumberOfItems():
69       nitems = sqsis.GetNumberOfItems();
70       fg.SetNumberOfFilenames( nitems )
71       fg.SetPrefix( file2 )
72       if not fg.Generate():
73         print "problem"
74         sys.exit(1)
75       for i in range(0,nitems):
76         item1 = sqsis.GetItem(i+1) # Item start at 1
77         nestedds = item1.GetNestedDataSet()
78         tprcs = gdcm.Tag(0x2005,0x1144) #
79         if nestedds.FindDataElement( tprcs ):
80           prcs = nestedds.GetDataElement( tprcs )
81           bv = prcs.GetByteValue()
82           print bv
83           f = open( fg.GetFilename(i) , "w" )
84           f.write( bv.WriteBuffer() )
```

12.137 HelloActiviz.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     This software is distributed WITHOUT ANY WARRANTY; without even
     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
using vtkgdcm;
using Kitware.VTK;
using System;
using System.Runtime.InteropServices;
/*
 * This example shows how vtkgdcm can be connected to Kitware.VTK Activiz product.
 * Three (3) arguments are required:
 * 1. Input DICOM file                    (SWIG)
 * 2. Temporary PNG (intermediate) file   (Activiz)
 * 3. Final DICOM file                    (SWIG)
 *
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz.exe ~/Creatis/gdcmData/test.acr out.png toto.dcm
 *
```

```
 * Footnote:
 * this test originally used vtkBMPWriter / vtkBMPReader combination to store intermediate
 * image file, but BMP file are 24bits by default. Instead use PNG format which supports seems
 * to be closer to what was expected in this simple test.
 */
public class HelloActiviz
{
  // Does not work with ActiViz.NET-5.4.0.455-Linux-x86_64-Personal
/*
  static void ConnectSWIGToActiviz(Kitware.VTK.vtkImageExport imgin, Kitware.VTK.vtkImageImport imgout)
    {
    imgout.SetUpdateInformationCallback(imgin.GetUpdateInformationCallback());
    imgout.SetPipelineModifiedCallback(imgin.GetPipelineModifiedCallback());
    imgout.SetWholeExtentCallback(imgin.GetWholeExtentCallback());
    imgout.SetSpacingCallback(imgin.GetSpacingCallback());
    imgout.SetOriginCallback(imgin.GetOriginCallback());
    imgout.SetScalarTypeCallback(imgin.GetScalarTypeCallback());
    imgout.SetNumberOfComponentsCallback(imgin.GetNumberOfComponentsCallback());
    imgout.SetPropagateUpdateExtentCallback(imgin.GetPropagateUpdateExtentCallback());
    imgout.SetUpdateDataCallback(imgin.GetUpdateDataCallback());
    imgout.SetDataExtentCallback(imgin.GetDataExtentCallback());
    imgout.SetBufferPointerCallback(imgin.GetBufferPointerCallback());
    imgout.SetCallbackUserData(imgin.GetCallbackUserData());
    }
*/
  static Kitware.VTK.vtkImageData ConnectSWIGToActiviz(vtkgdcm.vtkImageData imgin)
    {
    HandleRef rawCppThis = imgin.GetCppThis();
    Kitware.VTK.vtkImageData imgout = new Kitware.VTK.vtkImageData( rawCppThis.Handle, false, false);
    return imgout;
    }
  static vtkgdcm.vtkImageData ConnectActivizToSWIG(Kitware.VTK.vtkImageData imgin)
    {
    HandleRef rawCppThis = imgin.GetCppThis();
    vtkgdcm.vtkImageData imgout = new vtkgdcm.vtkImageData( rawCppThis );
    return imgout;
    }
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    // Step 1. Test SWIG -> Activiz
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    reader.SetFileName( filename );
    //reader.Update(); // DO NOT call Update to check pipeline execution
    Kitware.VTK.vtkImageData imgout = ConnectSWIGToActiviz(reader.GetOutput());
    System.Console.WriteLine( imgout.ToString() ); // not initialized as expected
    vtkPNGWriter writer = new vtkPNGWriter();
    writer.SetInput( imgout );
    writer.SetFileName( outfilename );
    writer.Write();
    // Step 2. Test Activiz -> SWIG
    vtkPNGReader bmpreader = new vtkPNGReader();
    bmpreader.SetFileName( outfilename );
    //bmpreader.Update(); // DO NOT update to check pipeline execution
    System.Console.WriteLine( bmpreader.GetOutput().ToString() ); // not initialized as expected
    vtkgdcm.vtkImageData imgout2 = ConnectActivizToSWIG(bmpreader.GetOutput());
    System.Console.WriteLine( imgout2.ToString() ); // not initialized as expected
    Kitware.VTK.vtkMedicalImageProperties prop = new Kitware.VTK.vtkMedicalImageProperties();
    prop.SetModality( "MR" );
    string outfilename2 = args[2];
    vtkGDCMImageWriter writer2 = vtkGDCMImageWriter.New();
    writer2.SetMedicalImageProperties( prop.CastToActiviz() );
    writer2.SetFileName( outfilename2 );
    writer2.SetInput( imgout2 );
    writer2.Write();
    return 0;
    }
}
```

12.138 HelloActiviz2.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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```

```
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     This software is distributed WITHOUT ANY WARRANTY; without even
     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * Usage:
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz2.exe gdcmData/test.acr bla.png bla2.dcm
 */
/*
 * From the outside view, no-one can detect that object pass to/from
 * vtkGDCMImageWriter/vtkGDCMImageReader are not Activiz object.
 *
 * TODO: Test Command/Observer
 */
public class HelloActiviz2
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    string outfilename = args[1];
    string outfilename2 = args[2];
    vtkGDCMImageReader reader = new Kitware.VTK.GDCM.vtkGDCMImageReader();
    reader.SetFileName( filename );
    // When calling multiple times creation of C# object from the same C++ object it triggers a:
//error: potential refcounting error: Duplicate rawCppThis - weak reference that is still alive. Attempting to
       add '0x00b2dc10' again.
//       Allowing new wrapped object to take over table key...
//       Original object should *not* have been destroyed while we still had it in our table without notifying
       us...
    //reader.GetOutput();
    //reader.GetOutput();
    System.Console.WriteLine( reader.ToString() ); // Test the ToString compat with Activiz
    vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
    writer.SetInput( reader.GetOutput() );
    writer.SetFileName( outfilename2 );
    writer.Write();
    System.Console.WriteLine( reader.GetOutput().ToString() ); // Test the ToString compat with Activiz
    System.Console.WriteLine( writer.ToString() ); // Test the ToString compat with Activiz
    vtkPNGWriter pngwriter = new vtkPNGWriter();
    pngwriter.SetInput( reader.GetOutput() );
    pngwriter.SetFileName( outfilename );
    pngwriter.Write();
    // at that point the .Write() should have triggered an Update() on the reader:
    if( reader.GetImageFormat() == vtkgdcm.VTK_LUMINANCE ) // MONOCHROME2
      {
      System.Console.WriteLine( "Image is MONOCHROME2" ); //
      }
    vtkPNGReader bmpreader = new vtkPNGReader();
    bmpreader.SetFileName( outfilename );
    vtkMedicalImageProperties prop = new vtkMedicalImageProperties();
    prop.SetModality( "MR" );
    vtkMatrix4x4 dircos = reader.GetDirectionCosines();
    dircos.Invert();
    vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();
    writer2.SetFileName( outfilename2 );
    writer2.SetDirectionCosines( dircos );
    writer2.SetMedicalImageProperties( prop );
    writer2.SetInput( bmpreader.GetOutput() );
    writer2.Write();
    return 0;
    }
}
```

12.139 HelloActiviz3.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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```

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz3.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz3
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    vtkStringArray array = vtkStringArray.New();
    array.InsertNextValue(filename);
    reader.SetFileNames(array);
    reader.Update();
    //System.Console.Write(reader.GetOutput());
    vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
    vtkImageViewer2 viewer = vtkImageViewer2.New();
    viewer.SetInput(reader.GetOutput());
    viewer.SetupInteractor(iren);
    viewer.SetSize(600, 600);
    viewer.Render();
    iren.Initialize();
    iren.Start();
    return 0;
    }
}
```

12.140 HelloActiviz4.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz4.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz4
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    vtkStringArray array = vtkStringArray.New();
    array.InsertNextValue(filename);
    reader.SetFileNames(array);
    reader.Update();
    //System.Console.Write(reader.GetOutput());
    vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
    vtkImageViewer viewer = vtkImageViewer.New();
    viewer.SetInput(reader.GetOutput());
    viewer.SetupInteractor(iren);
    viewer.SetSize(600, 600);
    viewer.Render();
    iren.Initialize();
    iren.Start();
```

```
    return 0;
    }
}
```

12.141 HelloActiviz5.cs

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
// The command line arguments are:
// -I        => run in interactive mode; unless this is used, the program will
//              not allow interaction and exit
// -D <path> => path to the data; the data should be in <path>/Data/
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz5.exe -I
 */
public class HelloActiviz5
{
  public static int Main(string[] args)
    {
    vtkTesting testHelper = vtkTesting.New();
    for ( int cc = 0; cc < args.Length; cc++ )
      {
      //testHelper.AddArguments(argc,const_cast<const char **>(argv));
      //System.Console.Write( "args: " + args[cc] + "\n" );
      testHelper.AddArgument( args[cc] );
      }
    if ( testHelper.IsFlagSpecified("-D") != 0 )
      {
      string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();
      if( VTK_DATA_ROOT != null )
        {
        //System.Console.Write( "VTK_DATA_ROOT: " + VTK_DATA_ROOT  + "\n" );
        testHelper.SetDataRoot(VTK_DATA_ROOT);
        testHelper.AddArgument("-D");
        testHelper.AddArgument(VTK_DATA_ROOT);
        }
      }
    string dataRoot = testHelper.GetDataRoot();
    string filename = dataRoot;
    filename += "/Data/mr.001";
    vtkDirectory dir = vtkDirectory.New();
    if( dir.FileIsDirectory( dataRoot ) == 0 )
      {
      filename = vtkGDCMTesting.GetGDCMDataRoot() + "/test.acr";
      }
    //System.Console.Write( "dataRoot: " + dataRoot + "\n" );
    System.Console.Write( "filename being used is: " + filename + "\n" );
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    vtkStringArray array = vtkStringArray.New();
    array.InsertNextValue(filename);
    reader.SetFileNames(array);
    reader.Update();
    System.Console.Write(reader.GetOutput());
    vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
    vtkRenderer ren1 = vtkRenderer.New();
    vtkRenderWindow renWin = vtkRenderWindow.New();
    renWin.AddRenderer(ren1);
    vtkImageActor actor = vtkImageActor.New();
    vtkImageMapToWindowLevelColors coronalColors = vtkImageMapToWindowLevelColors.New();
    coronalColors.SetInput(reader.GetOutput());
    actor.SetInput(coronalColors.GetOutput());
    ren1.AddActor(actor);
    iren.SetRenderWindow(renWin);
```

```
    iren.Initialize();
    renWin.Render();
    int retVal = testHelper.IsInteractiveModeSpecified();
    if( retVal != 0 )
      {
      iren.Start();
      }
    return 0;
    }
}
```

12.142 HelloVTKWorld.cs

```
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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
using vtkgdcm;
/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld
{
  public static int Main(string[] args)
    {
    string filename = args[0];
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    reader.SetFileName( filename );
    reader.Update();
    vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
    System.Console.WriteLine( prop.GetPatientName() ); //
    if( reader.GetImageFormat() == vtkgdcm.vtkgdcm.VTK_LUMINANCE ) // MONOCHROME2
      {
      System.Console.WriteLine( "Image is MONOCHROME2" ); //
      }
    // Just for fun, invert the direction cosines, output should reflect that:
    vtkMatrix4x4 dircos = reader.GetDirectionCosines();
    dircos.Invert();
    string outfilename = args[1];
    vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
    writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
    writer.SetDirectionCosines( dircos );
    writer.SetShift( reader.GetShift() );
    writer.SetScale( reader.GetScale() );
    writer.SetImageFormat( reader.GetImageFormat() );
    writer.SetFileName( outfilename );
    writer.SetInputConnection( reader.GetOutputPort() );
    writer.Write();
    return 0;
    }
}
```

12.143 HelloVTKWorld2.cs

```
/*=========================================================================

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```

```
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
using vtkgdcm;
/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld2
{
  public static int Main(string[] args)
    {
    string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();
    vtkVolume16Reader reader = vtkVolume16Reader.New();
    reader.SetDataDimensions(64, 64);
    reader.SetDataByteOrderToLittleEndian();
    reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter");
    reader.SetImageRange(1, 93);
    reader.SetDataSpacing(3.2, 3.2, 1.5);
    vtkImageCast cast = vtkImageCast.New();
    cast.SetInputConnection( reader.GetOutputPort() );
    cast.SetOutputScalarTypeToUnsignedChar();
    // By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
    vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
    writer.SetFileName( "headsq.dcm" );
    writer.SetInputConnection( reader.GetOutputPort() );
    // cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
    // writer.SetInputConnection( cast.GetOutputPort() );
    writer.SetFileDimensionality( 3 );
    writer.Write();
    return 0;
    }
}
```

12.144 MetaImageMD5Activiz.cs

```
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=========================================================================*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
using gdcm;
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET/:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/MetaImageMD5Activiz.exe gdcmData/012345.002.050.dcm
 */
public class MetaImageMD5Activiz
{
  public static int ProcessOneMHDMD5(string filename)
    {
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    reader.FileLowerLeftOn();
    reader.DebugOff();
    int canread = reader.CanReadFile( filename );
    if( canread == 0 )
      {
      string refms = gdcm.Testing.GetMediaStorageFromFile(filename);
      if( gdcm.MediaStorage.IsImage( gdcm.MediaStorage.GetMSType(refms) ) )
        {
        System.Console.Write( "Problem with file: " + filename + "\n" );
        return 1;
        }
      // not an image
      return 0;
      }
    reader.SetFileName( filename );
    reader.Update();
    // System.Console.Write(reader.GetOutput());
```

```
    vtkMetaImageWriter writer = vtkMetaImageWriter.New();
    writer.SetCompression( false );
    writer.SetInput( reader.GetOutput() );
    string subdir = "MetaImageMD5Activiz";
    string tmpdir = gdcm.Testing.GetTempDirectory( subdir );
    if( !gdcm.PosixEmulation.FileIsDirectory( tmpdir ) )
      {
      gdcm.PosixEmulation.MakeDirectory( tmpdir );
      }
    string mhdfile = gdcm.Testing.GetTempFilename( filename, subdir );
    string rawfile = mhdfile;
    mhdfile += ".mhd";
    rawfile += ".raw";
    writer.SetFileName( mhdfile );
    writer.Write();
    string digestmhd = gdcm.Testing.ComputeFileMD5( mhdfile );
    string digestraw = gdcm.Testing.ComputeFileMD5( rawfile );
    string mhdref = vtkGDCMTesting.GetMHDMD5FromFile(filename);
    string rawref = vtkGDCMTesting.GetRAWMD5FromFile(filename);
    if( mhdref != digestmhd )
      {
      System.Console.Write( "Problem with mhd file: " + filename + "\n" );
      System.Console.Write( digestmhd );
      System.Console.Write( "\n" );
      System.Console.Write( mhdref );
      System.Console.Write( "\n" );
      return 1;
      }
    if( rawref != digestraw )
      {
      System.Console.Write( "Problem with raw file: " + filename + "\n" );
      System.Console.Write( digestraw );
      System.Console.Write( "\n" );
      System.Console.Write( rawref );
      System.Console.Write( "\n" );
      return 1;
      }
    return 0;
    }
  public static int Main(string[] args)
    {
    if ( args.Length  == 1 )
      {
      string filename = args[0];
      return ProcessOneMHDMD5( filename );
      }
    // Loop over all gdcmData
    gdcm.Trace.DebugOff();
    gdcm.Trace.WarningOff();
    gdcm.Trace.ErrorOff();
    uint n = gdcm.Testing.GetNumberOfFileNames();
    int ret = 0;
    for( uint i = 0; i < n; ++i )
      {
      string filename = gdcm.Testing.GetFileName( i );
      ret += ProcessOneMHDMD5( filename );
      }
    return ret;
    }
}
```

12.145 RefCounting.cs

```
/*=========================================================================

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=========================================================================*/
using Kitware.VTK;
```

```
using Kitware.VTK.GDCM;
/*
 * this is not so much an example but simply a test to make sure cstor / dstor work as expected
 * and call the ::New and ->Delete() of VTK style.
 */
public class RefCounting
{
  public static int Main(string[] args)
    {
    vtkGDCMTesting testing1 = vtkGDCMTesting.New();
    vtkGDCMTesting testing2 = new vtkGDCMTesting(); // just in case people do not read STYLE documentation
    vtkGDCMImageReader reader1 = vtkGDCMImageReader.New();
    vtkGDCMImageReader reader2 = new vtkGDCMImageReader();
    vtkGDCMImageWriter writer1 = vtkGDCMImageWriter.New();
    vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();
    using (vtkGDCMTesting testing3 = new vtkGDCMTesting())
      {
      System.Console.Write( "GetReferenceCount: " + testing1.GetReferenceCount() + "\n");
      System.Console.Write( "GetReferenceCount: " + testing2.GetReferenceCount() + "\n");
      System.Console.Write( "GetReferenceCount: " + testing3.GetReferenceCount() + "\n");
      }
    using (vtkGDCMImageReader reader3 = new vtkGDCMImageReader())
      {
      System.Console.Write( "GetReferenceCount: " + reader3.GetReferenceCount() + "\n");
      }
    using (vtkGDCMImageWriter writer3 = vtkGDCMImageWriter.New())
      {
      System.Console.Write( "GetReferenceCount: " + writer3.GetReferenceCount() + "\n");
      }
    // C# destructor will call ->Delete on all C++ object as expected.
    return 0;
    }
}
```

12.146 Compute3DSpacing.cxx

```
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=========================================================================*/
#include "vtkGDCMImageReader2.h"
#include "vtkImageChangeInformation.h"
#include "vtkStringArray.h"
#include "gdcmIPPSorter.h"
#ifndef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
/*
 * Simple example to check computation of spacing within vtkGDCMImageReader2
 * This is a direct implementation of:
 *
 *
 *       http://gdcm.sourceforge.net/wiki/index.php/Using_GDCM_API#Automatic_ordering_of_slices_for_vtkGDCMImageReader.SetFileNames
 *
 * For more advanced information on how 3D spacing is being computed see:
 *
 *  - http://gdcm.sourceforge.net/html/classgdcm_1_1IPPSorter.html
 *
 * Usage:
 *
 * $ Compute3DSpacing SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm \
 *     SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm \
 *     SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm \
 *     SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm
 */
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
```

```
  std::vector<std::string> filenames;
  for( int  i = 1; i < argc; ++i )
    {
    filenames.push_back( argv[i] );
    }
  gdcm::IPPSorter s;
  s.SetComputeZSpacing( true );
  s.SetZSpacingTolerance( 1e-3 );
  bool b = s.Sort( filenames );
  if( !b )
    {
    std::cerr « "Failed to sort files" « std::endl;
    return 1;
    }
  std::cout « "Sorting succeeded:" « std::endl;
  //s.Print( std::cout );
  std::cout « "Found z-spacing:" « std::endl;
  std::cout « s.GetZSpacing() « std::endl;
  const double ippzspacing = s.GetZSpacing();
  const std::vector<std::string> & sorted = s.GetFilenames();
  vtkGDCMImageReader2 * reader = vtkGDCMImageReader2::New();
  vtkStringArray *files = vtkStringArray::New();
  std::vector< std::string >::const_iterator it = sorted.begin();
  for( ; it != sorted.end(); ++it)
    {
    const std::string &f = *it;
    files->InsertNextValue( f.c_str() );
    }
  reader->SetFileNames( files );
  reader->Update();
  const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();
  vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
#if (VTK_MAJOR_VERSION >= 6)
  v16->SetInputConnection( reader->GetOutputPort() );
#else
  v16->SetInput( reader->GetOutput() );
#endif
  v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
  v16->Update();
  v16->GetOutput()->Print( std::cout );
  return 0;
}
```

12.147 Convert16BitsTo8Bits.cxx

```
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=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "gdcmTesting.h"
// The following file is 16/16/15 but the scalar range of the image is [0,192]
// it could be safely stored as 8bits instead:
// gdcmData/012345.002.050.dcm
int main(int, char *[])
{
  const char *directory = gdcm::Testing::GetDataRoot();
  if(!directory) return 1;
  std::string file = std::string(directory) + "/012345.002.050.dcm";
  std::cout « file « std::endl;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( file.c_str() );
  reader->Update();
  //reader->GetOutput()->Print( std::cout );
  vtkImageCast *cast = vtkImageCast::New();
```

```
#if (VTK_MAJOR_VERSION >= 6)
  cast->SetInputConnection( reader->GetOutputPort() );
#else
  cast->SetInput( reader->GetOutput() );
#endif
  cast->SetOutputScalarTypeToUnsignedChar();
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileName( "/tmp/cast.dcm" );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputConnection( cast->GetOutputPort() );
#else
  writer->SetInput( cast->GetOutput() );
#endif
  writer->SetImageFormat( reader->GetImageFormat() );
  writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
  writer->SetDirectionCosines( reader->GetDirectionCosines() );
  writer->SetShift( reader->GetShift() );
  writer->SetScale( reader->GetScale() );
  writer->Write();
  reader->Delete();
  cast->Delete();
  writer->Delete();
  return 0;
}
```

12.148 ConvertMultiFrameToSingleFrame.cxx

```
/*=========================================================================

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=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkStringArray.h"
#include "gdcmTesting.h"
#include "gdcmFilenameGenerator.h"
int main(int argc, char *argv[])
{
  std::string filename;
  if( argc <= 1 )
    {
    const char *directory = gdcm::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/US-PAL-8-10x-echo.dcm";
    filename = file;
    }
  else
    {
    filename = argv[1];
    }
  std::cout « "file: " « filename « std::endl;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( filename.c_str() );
  reader->Update();
  //reader->GetOutput()->Print( std::cout );
  int dims[3];
  reader->GetOutput()->GetDimensions( dims );
  std::ostringstream os;
  os « "singleframe";
  os « "%04d.dcm";
  gdcm::FilenameGenerator fg;
  fg.SetPattern( os.str().c_str() );
  unsigned int nfiles = dims[2];
  fg.SetNumberOfFilenames( nfiles );
  bool b = fg.Generate();
  if( !b )
    {
```

```
    std::cerr « "FilenameGenerator::Generate() failed" « std::endl;
    return 1;
    }
  if( !fg.GetNumberOfFilenames() )
    {
    std::cerr « "FilenameGenerator::Generate() failed somehow..." « std::endl;
    return 1;
    }
  // By default write them as Secondary Capture (for portability)
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  vtkStringArray *filenames = vtkStringArray::New();
  for(unsigned int i = 0; i < fg.GetNumberOfFilenames(); ++i)
    {
    filenames->InsertNextValue( fg.GetFilename(i) );
    }
  assert( filenames->GetNumberOfValues() == (int)fg.GetNumberOfFilenames() );
  writer->SetFileNames( filenames );
  filenames->Delete();
  writer->SetFileDimensionality( 2 );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputConnection( reader->GetOutputPort() );
#else
  writer->SetInput( reader->GetOutput() );
#endif
  writer->SetImageFormat( reader->GetImageFormat() );
  writer->Write();
  reader->Delete();
  writer->Delete();
  return 0;
}
```

12.149 ConvertRGBToLuminance.cxx

```
/*=========================================================================

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=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageLuminance.h"
#include "gdcmTesting.h"
// There is no such thing as MR Image Storage + Photometric Interpretation = RGB
// let's rewrite that into a proper single component image:
int main(int, char *[])
{
  const char *directory = gdcm::Testing::GetDataRoot();
  if(!directory) return 1;
  std::string file = std::string(directory) + "/SIEMENS-MR-RGB-16Bits.dcm";
  std::cout « file « std::endl;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( file.c_str() );
  reader->Update();
  //reader->GetOutput()->Print( std::cout );
  vtkImageLuminance *luminance = vtkImageLuminance::New();
#if (VTK_MAJOR_VERSION >= 6)
  luminance->SetInputConnection( reader->GetOutputPort() );
#else
  luminance->SetInput( reader->GetOutput() );
#endif
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileName( "/tmp/bla.dcm" );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputConnection( luminance->GetOutputPort() );
#else
  writer->SetInput( luminance->GetOutput() );
#endif
  //writer->SetImageFormat( reader->GetImageFormat() ); // Do NOT pass image format
```

```
  writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
  writer->SetDirectionCosines( reader->GetDirectionCosines() );
  writer->SetShift( reader->GetShift() );
  writer->SetScale( reader->GetScale() );
  writer->Write();
  // TODO:
  //vtkImageAppendComponents.h
  reader->Delete();
  luminance->Delete();
  writer->Delete();
  return 0;
}
```

12.150 ConvertSingleBitTo8Bits.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "vtkPointData.h"
#include "vtkBitArray.h"
#include "vtkUnsignedCharArray.h"
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    return 1;
    }
  const char *filename = argv[1];
  const char *outfilename = argv[2];
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( filename );
  reader->Update();
  //reader->GetOutput()->Print( std::cout );
  vtkDataArray* array = reader->GetOutput()->GetPointData()->GetScalars();
  vtkBitArray *barray = vtkBitArray::SafeDownCast( array );
  if( !barray ) return false;
  vtkIdType nvalues = array->GetNumberOfTuples();
  vtkUnsignedCharArray *uarray = vtkUnsignedCharArray::New();
  uarray->SetNumberOfTuples( nvalues );
  for(vtkIdType i = 0; i < nvalues; ++i)
    {
    uarray->SetValue( i, (unsigned char)barray->GetValue(i) );
    }
  vtkImageData *copy = vtkImageData::New();
  // http://www.vtk.org/Wiki/VTK/VTK_6_Migration/Changes_to_Scalars_Manipulation_Functions#AllocateScalars.28.29
  copy->SetExtent( reader->GetOutput()->GetExtent() );
#if (VTK_MAJOR_VERSION >= 6)
  copy->AllocateScalars(VTK_UNSIGNED_CHAR, 3);
#else
  copy->SetScalarType( VTK_UNSIGNED_CHAR );
  copy->AllocateScalars();
#endif
  //uarray->Print( std::cout );
  //copy->GetPointData()->GetScalars()->Print( std::cout );
  copy->GetPointData()->SetScalars( uarray );
  uarray->Delete();
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileName( outfilename );
  //writer->SetInput( cast->GetOutput() );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputData( copy );
#else
  writer->SetInput( copy );
```

```
#endif
  writer->SetImageFormat( reader->GetImageFormat() );
  writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
  writer->SetDirectionCosines( reader->GetDirectionCosines() );
  writer->SetShift( reader->GetShift() );
  writer->SetScale( reader->GetScale() );
  writer->SetFileDimensionality( reader->GetFileDimensionality( ) );
  writer->Write();
  reader->Delete();
  copy->Delete();
  writer->Delete();
  return 0;
}
```

12.151 CreateFakePET.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "vtkStringArray.h"
#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFilenameGenerator.h"
/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
  gdcm::Trace::DebugOn();
  const vtkIdType xSize = 512;
  const vtkIdType ySize = 512;
  const vtkIdType zSize = 512;
  // Create the filenames in advance to supply to the vtkGDCMImageWriter
  std::ostringstream os;
  os « "PT";
  os « "%03d.dcm";
  gdcm::FilenameGenerator fg;
  fg.SetPattern( os.str().c_str() );
  unsigned int nfiles = zSize;
  fg.SetNumberOfFilenames( nfiles );
  bool b = fg.Generate();
  if( !b )
    {
    std::cerr « "FilenameGenerator::Generate() failed" « std::endl;
    return 1;
    }
  if( !fg.GetNumberOfFilenames() )
    {
    std::cerr « "FilenameGenerator::Generate() failed somehow..." « std::endl;
    return 1;
    }
  vtkStringArray *filenames = vtkStringArray::New();
  for(unsigned int i = 0; i < fg.GetNumberOfFilenames(); ++i)
    {
    filenames->InsertNextValue( fg.GetFilename(i) );
```

```
    }
  vtkImageData *image = vtkImageData::New();
  image->SetDimensions(xSize,ySize,zSize);
  image->SetOrigin(-350.684,350.0,890.76);
  image->SetSpacing(5.4688,-5.4688,-3.27);
#if VTK_MAJOR_VERSION <= 5
  image->SetNumberOfScalarComponents(1);
  image->SetScalarTypeToDouble();
#else
  image->AllocateScalars(VTK_DOUBLE ,1);
#endif
  double pt[3];
  for( int z = 0; z < zSize; ++z )
    for( int y = 0; y < ySize; ++y )
      for( int x = 0; x < xSize; ++x )
        {
        pt[0] = x;
        pt[1] = y;
        pt[2] = z;
        pt[0] -= xSize / 2;
        pt[1] -= ySize / 2;
        pt[2] -= zSize / 2;
        pt[0] /= xSize / 2;
        pt[1] /= ySize / 2;
        pt[2] /= zSize / 2;
        const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
        const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
        double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
        pixel[0] = inval;
        }
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileDimensionality( 2 );
  writer->SetFileNames(filenames);
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputData( image );
#else
  writer->SetInput( image );
#endif
  writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
  writer->GetMedicalImageProperties()->SetModality( "PT" );
  writer->SetScale( 0.0042 ); // why not
  writer->Write();
  image->Delete();
  writer->Delete();
  return 0;
}
```

12.152 CreateFakeRTDOSE.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
```

```
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
  //gdcm::Trace::DebugOn();
  const vtkIdType xSize = 512;
  const vtkIdType ySize = 512;
  const vtkIdType zSize = 512;
  vtkImageData *image = vtkImageData::New();
  image->SetDimensions(xSize,ySize,zSize);
  image->SetOrigin(-350.684,350.0,890.76);
  image->SetSpacing(5.4688,-5.4688,-3.27);
#if VTK_MAJOR_VERSION <= 5
  image->SetNumberOfScalarComponents(1);
  image->SetScalarTypeToDouble();
#else
  image->AllocateScalars(VTK_DOUBLE ,1);
#endif
  double pt[3];
  for( int z = 0; z < zSize; ++z )
    for( int y = 0; y < ySize; ++y )
      for( int x = 0; x < xSize; ++x )
        {
        pt[0] = x;
        pt[1] = y;
        pt[2] = z;
        pt[0] -= xSize / 2;
        pt[1] -= ySize / 2;
        pt[2] -= zSize / 2;
        pt[0] /= xSize / 2;
        pt[1] /= ySize / 2;
        pt[2] /= zSize / 2;
        const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
        const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
        double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
        pixel[0] = inval;
        }
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileDimensionality( 3 );
  writer->SetFileName( "rtdose.dcm" );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputData( image );
#else
  writer->SetInput( image );
#endif
  writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
  writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Units", "GY");
  writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Summation Type", "PLAN");
  writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Type", "PHYSICAL");
  writer->GetMedicalImageProperties()->AddUserDefinedValue( "Frame of Reference UID",
       "1.3.12.2.1107.5.6.1.68100.30270111041215391275000000001");
  writer->GetMedicalImageProperties()->SetModality( "RTDOSE" );
  //writer->GetMedicalImageProperties()->SetModality( "PT" ); // debug
  writer->SetScale( 0.0042 ); // why not
  writer->Write();
  image->Delete();
  writer->Delete();
  // BEGIN HACK
  // In GDCM version 2.4.3 and before, the following tag was missing which caused issue with some RTDose
       software:
  // Open the DICOM file that was temporarily created. This will allows me to used
  // GDCM to append specific tags that allows the RTDOSE to be associated with the
  // relevant CT images.
  gdcm::Reader reader2;
  reader2.SetFileName("rtdose.dcm" );
  reader2.Read();
  gdcm::File &file = reader2.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  // Required by some software and not automagically added by GDCM in old version
  gdcm::Attribute<0x0028,0x0009> framePointer;
  framePointer.SetNumberOfValues(1);
  framePointer.SetValue( gdcm::Tag(0x3004,0x000C) );
  ds.Replace( framePointer.GetAsDataElement() );
  gdcm::Writer writer2;
  writer2.CheckFileMetaInformationOff();
  writer2.SetFileName("rtdose2.dcm");
  writer2.SetFile( file );
  writer2.Write();
  // END HACK
  return 0;
}
```

12.153 GenerateRTSTRUCT.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMPolyDataWriter.h"
#include "vtkGDCMPolyDataReader.h"
#include "vtkPolyData.h"
#include "vtkPolyDataReader.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRTStructSetProperties.h"
#include "vtkStringArray.h"
#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkImageData.h"
#include <algorithm> //for std::find
#include "gdcmDirectoryHelper.h"
using namespace gdcm;
//view each organ independently of the others, to make sure that
//organ names correspond to actual segmentations.
void ShowOrgan(vtkPolyData* inData)
{
  // Now we'll look at it.
  vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
  cubeMapper->SetInputData( inData );
#else
  cubeMapper->SetInput( inData );
#endif
  cubeMapper->SetScalarRange(0,7);
  vtkActor *cubeActor = vtkActor::New();
  cubeActor->SetMapper(cubeMapper);
  vtkProperty * property = cubeActor->GetProperty();
  property->SetRepresentationToWireframe();
  vtkRenderer *renderer = vtkRenderer::New();
  vtkRenderWindow *renWin = vtkRenderWindow::New();
  renWin->AddRenderer(renderer);
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
  iren->SetRenderWindow(renWin);
  renderer->AddActor(cubeActor);
  renderer->ResetCamera();
  renderer->SetBackground(1,1,1);
  renWin->SetSize(300,300);
  renWin->Render();
  iren->Start();
  cubeMapper->Delete();
  cubeActor->Delete();
  renderer->Delete();
  renWin->Delete();
  iren->Delete();
}
/*
 * Full application which ... RTSTUCT
 */
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " directory-with-rtstruct-and-ct-images\n";
    return 1;
```

```
    }
  std::string theDirName(argv[1]);
  Directory::FilenamesType theRTSeries =
    DirectoryHelper::GetRTStructSeriesUIDs(theDirName);
  gdcm::Directory theDir;
  theDir.Load(argv[1]);
  if (theRTSeries.empty())
    {
    std::cerr « "No RTStructs found for the test, ending." « std::endl;
    return 1;
    }
  for (size_t q = 0; q < theRTSeries.size(); q++)
    {
    Directory::FilenamesType theRTNames =
      DirectoryHelper::GetFilenamesFromSeriesUIDs(theDirName, theRTSeries[q]);
    if (theRTNames.empty()){
      std::cerr « "Unable to load RT Series " « theRTSeries[q] « ", continuing. " « std::endl;
      continue;
    }
    vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
    reader->SetFileName( theRTNames[0].c_str() );
    reader->Update();
    //std::cout « reader->GetMedicalImageProperties()->GetStudyDate() « std::endl;
    vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
    int numMasks = reader->GetNumberOfOutputPorts() + 1;//add a blank one in
    writer->SetNumberOfInputPorts( numMasks );
    std::string thePotentialName = theDirName + "/" + "GDCMTestRTStruct." +  theRTSeries[q] + ".dcm";
    gdcm::Directory::FilenamesType theFileNames = theDir.GetFilenames();
    //keep renaming the output until we get something that doesn't overwrite what was there already
    int count = 0;
    while (std::find(theFileNames.begin(), theFileNames.end(), thePotentialName) != theFileNames.end())
      {
        char buff[255];
        sprintf(buff,"%d",count);
        thePotentialName = theDirName + "/" + "GDCMTestRTStruct." + buff + "." + theRTSeries[q] + ".dcm";
      }
    writer->SetFileName( thePotentialName.c_str());
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    //this line is cheating, we won't have the same stuff, and may not have a struct
    //to start with.
    //have to go back to the original data to reconstruct the RTStructureSetProperties
    //writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
    //writer->Write();
    //loop through the outputs in order to write them out as if they had been created and appended
    vtkStringArray* roiNames = vtkStringArray::New();
    vtkStringArray* roiAlgorithms = vtkStringArray::New();
    vtkStringArray* roiTypes = vtkStringArray::New();
    roiNames->SetNumberOfValues(numMasks);
    roiAlgorithms->SetNumberOfValues(numMasks);
    roiTypes->SetNumberOfValues(numMasks);
    vtkAppendPolyData* append = vtkAppendPolyData::New();
    //ok, now we'll add a blank organ
    //the blank organ is to test to ensure that blank organs work; there have been crash reports
    //this code is added at the beginning to ensure that the blank organs are read
    //and preserved as individual organs.
    vtkPolyData* blank = vtkPolyData::New();
#if (VTK_MAJOR_VERSION >= 6)
    writer->SetInputData(0, blank);
#else
    writer->SetInput(0, blank);
#endif
    roiNames->InsertValue(0, "blank");
    roiAlgorithms->InsertValue(0, "blank");
    roiTypes->InsertValue(0, "ORGAN");
    //note the offsets used to place the blank rtstruct at the beginning of the newly generated RT.
    //the idea is to run the program twice; first to generate an rtstruct with a blank mask (making
    //sure that that functionality works), and then a second time to make sure that everything is
    //being read properly.  Multiple organs with the same name could cause some strangenesses.
    for (int i = 1; i < numMasks; ++i)
      {
#if (VTK_MAJOR_VERSION >= 6)
      writer->SetInputConnection(i, reader->GetOutputPort(i-1));
      append->AddInputConnection(reader->GetOutputPort(i-1));
#else
      writer->SetInput(i, reader->GetOutput(i-1));
      append->AddInput(reader->GetOutput(i-1));
#endif
      std::string theString = reader->GetRTStructSetProperties()->GetStructureSetROIName(i-1);
      roiNames->InsertValue(i, theString);
      theString = reader->GetRTStructSetProperties()->GetStructureSetROIGenerationAlgorithm(i-1);
      roiAlgorithms->InsertValue(i, theString);
```

```
      theString = reader->GetRTStructSetProperties()->GetStructureSetRTROIInterpretedType(i-1);
      roiTypes->InsertValue(i, theString);
      ShowOrgan(reader->GetOutput(i-1));
      }
    vtkRTStructSetProperties* theProperties = vtkRTStructSetProperties::New();
    writer->SetRTStructSetProperties(theProperties);
    writer->InitializeRTStructSet(theDirName,
      reader->GetRTStructSetProperties()->GetStructureSetLabel(),
      reader->GetRTStructSetProperties()->GetStructureSetName(),
      roiNames, roiAlgorithms, roiTypes);
    writer->SetRTStructSetProperties(theProperties);
    writer->Write();
    // print reader output:
    reader->Print( std::cout );
    // print first output:
    reader->GetOutput()->Print( std::cout );
    reader->Delete();
    append->Delete();
    roiNames->Delete();
    roiTypes->Delete();
    theProperties->Delete();
    roiAlgorithms->Delete();
    blank->Delete();
    writer->Delete();
  }
  return 0;
}
```

12.154 MagnifyFile.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageMagnify.h"
#include "vtkImageCast.h"
#include "gdcmTesting.h"
#include "gdcmSystem.h"
// This is a simple test to magnify an image that is known to give excellent
// compression ratio. This will be our test for those large image
int main(int, char *[])
{
  const char *directory = gdcm::Testing::GetDataRoot();
  if(!directory) return 1;
  std::string file = std::string(directory) + "/test.acr";
  std::cout << file << std::endl;
  if( !gdcm::System::FileExists( file.c_str() ) ) return 1;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( file.c_str() );
  reader->Update();
  //reader->GetOutput()->Print( std::cout );
  vtkImageCast *cast = vtkImageCast::New();
#if (VTK_MAJOR_VERSION >= 6)
  cast->SetInputConnection( reader->GetOutputPort() );
#else
  cast->SetInput( reader->GetOutput() );
#endif
  cast->SetOutputScalarTypeToUnsignedShort();
  vtkImageMagnify *magnify = vtkImageMagnify::New();
#if (VTK_MAJOR_VERSION >= 6)
  magnify->SetInputConnection( cast->GetOutputPort() );
#else
  magnify->SetInput( cast->GetOutput() );
#endif
  magnify->SetInterpolate( 1 );
```

```
  magnify->SetInterpolate( 0 );
  int factor = 100;
  magnify->SetMagnificationFactors (factor, factor, 1);
  vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
  writer->SetFileName( "/tmp/bla.dcm" );
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputConnection( magnify->GetOutputPort() );
#else
  writer->SetInput( magnify->GetOutput() );
#endif
  writer->SetImageFormat( reader->GetImageFormat() );
  writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
  writer->SetDirectionCosines( reader->GetDirectionCosines() );
  writer->SetShift( reader->GetShift() );
  writer->SetScale( reader->GetScale() );
  writer->Write();
  // TODO:
  //vtkImageAppendComponents.h
  reader->Delete();
  magnify->Delete();
  writer->Delete();
  return 0;
}
```

12.155 gdcmorthoplanes.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkActor.h"
#include "vtkCamera.h"
#include "vtkMatrix4x4.h"
#include "vtkTransform.h"
#include "vtkAssembly.h"
#include "vtkCellPicker.h"
#include "vtkCommand.h"
#include "vtkImageActor.h"
#include "vtkImageMapToColors.h"
#include "vtkImageOrthoPlanes.h"
#include "vtkImagePlaneWidget.h"
#include "vtkImageReader.h"
#include "vtkInteractorEventRecorder.h"
#include "vtkLookupTable.h"
#include "vtkOutlineFilter.h"
#include "vtkPolyDataMapper.h"
#include "vtkProperty.h"
#include "vtkRenderWindow.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderer.h"
#include "vtkVolume16Reader.h"
#include "vtkImageData.h"
#include "vtkImageChangeInformation.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkAxesActor.h"
#include "vtkCaptionActor2D.h"
#include "vtkTextProperty.h"
#include "vtkPropAssembly.h"
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkStringArray.h"
#include "gdcmSystem.h"
#include "gdcmDirectory.h"
#include "gdcmIPPSorter.h"
#ifndef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
```

```
//----------------------------------------------------------------------------
class vtkOrthoPlanesCallback : public vtkCommand
{
public:
  static vtkOrthoPlanesCallback *New()
  { return new vtkOrthoPlanesCallback; }
  void Execute( vtkObject *caller, unsigned long vtkNotUsed( event ),
                void *callData )
  {
    vtkImagePlaneWidget* self =
      reinterpret_cast< vtkImagePlaneWidget* >( caller );
    if(!self) return;
    double* wl = static_cast<double*>( callData );
    if ( self == this->WidgetX )
      {
      this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
      this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
      }
    else if( self == this->WidgetY )
      {
      this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
      this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
      }
    else if (self == this->WidgetZ)
      {
      this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
      this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
      }
  }
  vtkOrthoPlanesCallback():WidgetX( 0 ), WidgetY( 0 ), WidgetZ ( 0 ) {}
  vtkImagePlaneWidget* WidgetX;
  vtkImagePlaneWidget* WidgetY;
  vtkImagePlaneWidget* WidgetZ;
};
int main( int argc, char *argv[] )
{
  //char* fname = vtkTestUtilities::ExpandDataFileName(argc, argv, "Data/headsq/quarter");
  //vtkVolume16Reader* v16 =  vtkVolume16Reader::New();
  //  v16->SetDataDimensions( 64, 64);
  //  v16->SetDataByteOrderToLittleEndian();
  //  v16->SetImageRange( 1, 93);
  //  v16->SetDataSpacing( 3.2, 3.2, 1.5);
  //  v16->SetFilePrefix( fname );
  //  v16->SetDataMask( 0x7fff);
  //  v16->Update();
  std::vector<std::string> filenames;
  if( argc < 2 )
    {
    std::cerr « argv[0] « " filename1.dcm [filename2.dcm ...]\n";
    return 1;
    }
  else
    {
    // Is it a single directory ? If so loop over all files contained in it:
    const char *filename = argv[1];
    if( argc == 2 && gdcm::System::FileIsDirectory( filename ) )
      {
      std::cout « "Loading directory: " « filename « std::endl;
      bool recursive = false;
      gdcm::Directory d;
      d.Load(filename, recursive);
      gdcm::Directory::FilenamesType const &files = d.GetFilenames();
      for( gdcm::Directory::FilenamesType::const_iterator it = files.begin(); it != files.end(); ++it )
        {
        filenames.push_back( it->c_str() );
        }
      }
    else // list of files passed directly on the cmd line:
        // discard non-existing or directory
      {
      for(int i=1; i < argc; ++i)
        {
        filename = argv[i];
        if( gdcm::System::FileExists( filename ) )
          {
          if( gdcm::System::FileIsDirectory( filename ) )
            {
            std::cerr « "Discarding directory: " « filename « std::endl;
            }
          else
            {
```

```
            filenames.push_back( filename );
            }
          }
        else
          {
          std::cerr « "Discarding non existing file: " « filename « std::endl;
          }
        }
      }
    //names->Print( std::cout );
    }
  vtkGDCMImageReader * reader = vtkGDCMImageReader::New();
  double ippzspacing;
  if( filenames.size() > 1 )
    {
    //gdcm::Trace::DebugOn();
    //gdcm::Trace::WarningOn();
    gdcm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( filenames );
    if( !b )
      {
      std::cerr « "Failed to sort files" « std::endl;
      return 1;
      }
    std::cout « "Sorting succeeded:" « std::endl;
    s.Print( std::cout );
    std::cout « "Found z-spacing:" « std::endl;
    std::cout « s.GetZSpacing() « std::endl;
    ippzspacing = s.GetZSpacing();
    const std::vector<std::string> & sorted = s.GetFilenames();
    vtkStringArray *files = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it)
      {
      const std::string &f = *it;
      files->InsertNextValue( f.c_str() );
      }
    reader->SetFileNames( files );
    //reader->SetFileLowerLeft( 1 );
    reader->Update(); // important
    files->Delete();
    }
  else
    {
    reader->SetFileName( argv[1] );
    reader->Update(); // important
    ippzspacing = reader->GetOutput()->GetSpacing()[2];
    ippzspacing = 4;
    }
  //reader->GetOutput()->Print( std::cout );
  //vtkFloatingPointType range[2];
  //reader->GetOutput()->GetScalarRange(range);
  //std::cout « "Range: " « range[0] « " " « range[1] « std::endl;
  const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();
  vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
#if (VTK_MAJOR_VERSION >= 6)
  v16->SetInputConnection( reader->GetOutputPort() );
#else
  v16->SetInput( reader->GetOutput() );
#endif
  v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
  v16->Update();
#if 0
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetInput( v16->GetOutput() );
    writer->SetFileLowerLeft( reader->GetFileLowerLeft() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetFileDimensionality( 3); //reader->GetFileDimensionality() );
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->SetFileName( "out.dcm" );
    writer->Write();
#endif
  vtkOutlineFilter* outline = vtkOutlineFilter::New();
    outline->SetInputConnection(v16->GetOutputPort());
  vtkPolyDataMapper* outlineMapper = vtkPolyDataMapper::New();
    outlineMapper->SetInputConnection(outline->GetOutputPort());
```

```
  vtkActor* outlineActor =  vtkActor::New();
    outlineActor->SetMapper( outlineMapper);
  vtkRenderer* ren1 = vtkRenderer::New();
  vtkRenderer* ren2 = vtkRenderer::New();
  vtkRenderWindow* renWin = vtkRenderWindow::New();
    renWin->AddRenderer(ren2);
    renWin->AddRenderer(ren1);
  vtkRenderWindowInteractor* iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
  vtkCellPicker* picker = vtkCellPicker::New();
    picker->SetTolerance(0.005);
  vtkProperty* ipwProp = vtkProperty::New();
   //assign default props to the ipw's texture plane actor
  vtkImagePlaneWidget* planeWidgetX = vtkImagePlaneWidget::New();
    planeWidgetX->SetInteractor( iren);
    planeWidgetX->SetKeyPressActivationValue('x');
    planeWidgetX->SetPicker(picker);
    planeWidgetX->RestrictPlaneToVolumeOn();
    planeWidgetX->GetPlaneProperty()->SetColor(1,0,0);
    planeWidgetX->SetTexturePlaneProperty(ipwProp);
    planeWidgetX->TextureInterpolateOff();
    planeWidgetX->SetResliceInterpolateToNearestNeighbour();
#if (VTK_MAJOR_VERSION >= 6)
    planeWidgetX->SetInputConnection(v16->GetOutputPort());
#else
    planeWidgetX->SetInput(v16->GetOutput());
#endif
    planeWidgetX->SetPlaneOrientationToXAxes();
    //planeWidgetX->SetSliceIndex(32);
    planeWidgetX->DisplayTextOn();
    planeWidgetX->On();
    planeWidgetX->InteractionOff();
    planeWidgetX->InteractionOn();
  vtkImagePlaneWidget* planeWidgetY = vtkImagePlaneWidget::New();
    planeWidgetY->SetInteractor( iren);
    planeWidgetY->SetKeyPressActivationValue('y');
    planeWidgetY->SetPicker(picker);
    planeWidgetY->GetPlaneProperty()->SetColor(1,1,0);
    planeWidgetY->SetTexturePlaneProperty(ipwProp);
    planeWidgetY->TextureInterpolateOn();
    planeWidgetY->SetResliceInterpolateToLinear();
#if (VTK_MAJOR_VERSION >= 6)
    planeWidgetY->SetInputConnection(v16->GetOutputPort());
#else
    planeWidgetY->SetInput(v16->GetOutput());
#endif
    planeWidgetY->SetPlaneOrientationToYAxes();
    //planeWidgetY->SetSlicePosition(102.4);
    planeWidgetY->SetLookupTable( planeWidgetX->GetLookupTable());
    planeWidgetY->DisplayTextOn();
    planeWidgetY->UpdatePlacement();
    planeWidgetY->On();
  vtkImagePlaneWidget* planeWidgetZ = vtkImagePlaneWidget::New();
    planeWidgetZ->SetInteractor( iren);
    planeWidgetZ->SetKeyPressActivationValue('z');
    planeWidgetZ->SetPicker(picker);
    planeWidgetZ->GetPlaneProperty()->SetColor(0,0,1);
    planeWidgetZ->SetTexturePlaneProperty(ipwProp);
    planeWidgetZ->TextureInterpolateOn();
    planeWidgetZ->SetResliceInterpolateToCubic();
#if (VTK_MAJOR_VERSION >= 6)
    planeWidgetZ->SetInputConnection(v16->GetOutputPort());
#else
    planeWidgetZ->SetInput(v16->GetOutput());
#endif
    planeWidgetZ->SetPlaneOrientationToZAxes();
    //planeWidgetZ->SetSliceIndex(25);
    planeWidgetZ->SetLookupTable( planeWidgetX->GetLookupTable());
    planeWidgetZ->DisplayTextOn();
    planeWidgetZ->On();
  vtkImageOrthoPlanes *orthoPlanes = vtkImageOrthoPlanes::New();
    orthoPlanes->SetPlane(0, planeWidgetX);
    orthoPlanes->SetPlane(1, planeWidgetY);
    orthoPlanes->SetPlane(2, planeWidgetZ);
    orthoPlanes->ResetPlanes();
   vtkOrthoPlanesCallback* cbk = vtkOrthoPlanesCallback::New();
   cbk->WidgetX = planeWidgetX;
   cbk->WidgetY = planeWidgetY;
   cbk->WidgetZ = planeWidgetZ;
   planeWidgetX->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
   planeWidgetY->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
```

```
   planeWidgetZ->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
   cbk->Delete();
  double wl[2];
  planeWidgetZ->GetWindowLevel(wl);
  // Add a 2D image to test the GetReslice method
  //
  vtkImageMapToColors* colorMap = vtkImageMapToColors::New();
    colorMap->PassAlphaToOutputOff();
    colorMap->SetActiveComponent(0);
    colorMap->SetOutputFormatToLuminance();
#if (VTK_MAJOR_VERSION >= 6)
    colorMap->SetInputData(planeWidgetZ->GetResliceOutput());
#else
    colorMap->SetInput(planeWidgetZ->GetResliceOutput());
#endif
    colorMap->SetLookupTable(planeWidgetX->GetLookupTable());
  vtkImageActor* imageActor = vtkImageActor::New();
    imageActor->PickableOff();
#if (VTK_MAJOR_VERSION >= 6)
    imageActor->SetInputData(colorMap->GetOutput());
#else
    imageActor->SetInput(colorMap->GetOutput());
#endif
  // Add the actors
  //
  ren1->AddActor( outlineActor);
  ren2->AddActor( imageActor);
  ren1->SetBackground( 0.1, 0.1, 0.2);
  ren2->SetBackground( 0.2, 0.1, 0.2);
  renWin->SetSize( 600, 350);
  ren1->SetViewport(0,0,0.58333,1);
  ren2->SetViewport(0.58333,0,1,1);
  // Set the actors' postions
  //
  renWin->Render();
  //iren->SetEventPosition( 175,175);
  //iren->SetKeyCode('r');
  //iren->InvokeEvent(vtkCommand::CharEvent,NULL);
  //iren->SetEventPosition( 475,175);
  //iren->SetKeyCode('r');
  //iren->InvokeEvent(vtkCommand::CharEvent,NULL);
  //renWin->Render();
  //ren1->GetActiveCamera()->Elevation(110);
  //ren1->GetActiveCamera()->SetViewUp(0, 0, -1);
  //ren1->GetActiveCamera()->Azimuth(45);
  //ren1->GetActiveCamera()->Dolly(1.15);
  ren1->ResetCameraClippingRange();
  vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
  cube->SetXPlusFaceText ( "R" );
  cube->SetXMinusFaceText( "L" );
  cube->SetYPlusFaceText ( "A" );
  cube->SetYMinusFaceText( "P" );
  cube->SetZPlusFaceText ( "H" );
  cube->SetZMinusFaceText( "F" );
  cube->SetFaceTextScale( 0.666667 );
  vtkAxesActor* axes2 = vtkAxesActor::New();
  vtkMatrix4x4 *invert = vtkMatrix4x4::New();
  invert->DeepCopy( reader->GetDirectionCosines() );
  invert->Invert();
  // simulate a left-handed coordinate system
  //
  vtkTransform *transform = vtkTransform::New();
  transform->Identity();
  //transform->RotateY(90);
  transform->Concatenate(invert);
  axes2->SetShaftTypeToCylinder();
  axes2->SetUserTransform( transform );
  cube->GetAssembly()->SetUserTransform( transform );
  axes2->SetTotalLength( 1.5, 1.5, 1.5 );
  axes2->SetCylinderRadius( 0.500 * axes2->GetCylinderRadius() );
  axes2->SetConeRadius    ( 1.025 * axes2->GetConeRadius() );
  axes2->SetSphereRadius  ( 1.500 * axes2->GetSphereRadius() );
  vtkTextProperty* tprop = axes2->GetXAxisCaptionActor2D()->
    GetCaptionTextProperty();
  tprop->ItalicOn();
  tprop->ShadowOn();
  tprop->SetFontFamilyToTimes();
  axes2->GetYAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );
  axes2->GetZAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );
  vtkPropAssembly* assembly = vtkPropAssembly::New();
  assembly->AddPart( axes2 );
```

```
  assembly->AddPart( cube );
  vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
  widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
  widget->SetOrientationMarker( assembly );
  widget->SetInteractor( iren );
  widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
  widget->SetEnabled( 1 );
  widget->InteractiveOff();
  widget->InteractiveOn();
  // Playback recorded events
  //
  //vtkInteractorEventRecorder *recorder = vtkInteractorEventRecorder::New();
  //recorder->SetInteractor(iren);
  //recorder->ReadFromInputStringOn();
  //recorder->SetInputString(IOPeventLog);
  // Interact with data
  // Render the image
  //
  iren->Initialize();
  renWin->Render();
  // Test SetKeyPressActivationValue for one of the widgets
  //
  //iren->SetKeyCode('z');
  //iren->InvokeEvent(vtkCommand::CharEvent,NULL);
  //iren->SetKeyCode('z');
  //iren->InvokeEvent(vtkCommand::CharEvent,NULL);
  //int retVal = vtkRegressionTestImage( renWin );
  //
  //if ( retVal == vtkRegressionTester::DO_INTERACTOR)
    {
    iren->Start();
    }
  // Clean up
  //
  //recorder->Off();
  //recorder->Delete();
  ipwProp->Delete();
  orthoPlanes->Delete();
  planeWidgetX->Delete();
  planeWidgetY->Delete();
  planeWidgetZ->Delete();
  colorMap->Delete();
  imageActor->Delete();
  picker->Delete();
  outlineActor->Delete();
  outlineMapper->Delete();
  outline->Delete();
  iren->Delete();
  renWin->Delete();
  ren1->Delete();
  ren2->Delete();
  v16->Delete();
  reader->Delete();
  return 0;
}
```

12.156 gdcmreslice.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkImageFlip.h"
#include "vtkImageReslice.h"
#include "vtkRenderWindow.h"
```

```
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
int main( int argc, char *argv[] )
{
  if( argc < 2 ) return 1;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( argv[1] );
  //reader->FileLowerLeftOn();
  reader->Update();
  vtkImageFlip *flip = vtkImageFlip::New();
#if (VTK_MAJOR_VERSION >= 6)
  flip->SetInputConnection(reader->GetOutputPort());
#else
  flip->SetInput(reader->GetOutput());
#endif
  flip->SetFilteredAxis(0);
  flip->Update();
  vtkImageReslice *reslice = vtkImageReslice::New();
  //reslice->SetInput(reader->GetOutput());
#if (VTK_MAJOR_VERSION >= 6)
  reslice->SetInputConnection(flip->GetOutputPort());
#else
  reslice->SetInput(flip->GetOutput());
#endif
  //reslice->SetResliceAxesDirectionCosines()
  reader->GetDirectionCosines()->Print(std::cout);
  vtkMatrix4x4 *invert = vtkMatrix4x4::New();
  invert->DeepCopy( reader->GetDirectionCosines() );
  invert->Invert();
  //reslice->SetResliceAxes( reader->GetDirectionCosines() );
  reslice->SetResliceAxes( invert );
  reslice->Update();
  vtkImageData* ima = reslice->GetOutput();
  vtkLookupTable* table = vtkLookupTable::New();
  table->SetNumberOfColors(1000);
  table->SetTableRange(0,1000);
  table->SetSaturationRange(0,0);
  table->SetHueRange(0,1);
  table->SetValueRange(0,1);
  table->SetAlphaRange(1,1);
  table->Build();
  // Texture
  vtkTexture* texture = vtkTexture::New();
#if (VTK_MAJOR_VERSION >= 6)
  texture->SetInputData(ima);
#else
  texture->SetInput(ima);
#endif
  texture->InterpolateOn();
  texture->SetLookupTable(table);
  // PlaneSource
  vtkPlaneSource* plane = vtkPlaneSource::New();
  // PolyDataMapper
  vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
  planeMapper->SetInputConnection(plane->GetOutputPort());
#else
  planeMapper->SetInput(plane->GetOutput());
#endif
  // Actor
  vtkActor* planeActor = vtkActor::New();
  planeActor->SetTexture(texture);
  planeActor->SetMapper(planeMapper);
  planeActor->PickableOn();
  // Final rendering with simple interactor:
  vtkRenderer        *ren = vtkRenderer::New();
  vtkRenderWindow *renwin = vtkRenderWindow::New();
  renwin->AddRenderer(ren);
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
```

```
  iren->SetRenderWindow(renwin);
  ren->AddActor(planeActor);
  ren->SetBackground(0,0,0.5);
  // DICOM is RAH:
  vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
  cube->SetXPlusFaceText ( "R" );
  cube->SetXMinusFaceText( "L" );
  cube->SetYPlusFaceText ( "A" );
  cube->SetYMinusFaceText( "P" );
  cube->SetZPlusFaceText ( "H" );
  cube->SetZMinusFaceText( "F" );
  vtkAxesActor* axes2 = vtkAxesActor::New();
  vtkTransform *transform = vtkTransform::New();
  transform->Identity();
  //reader->GetDirectionCosines()->Print(std::cout);
  transform->Concatenate(invert);
  //axes2->SetShaftTypeToCylinder();
  axes2->SetUserTransform( transform );
  cube->GetAssembly()->SetUserTransform( transform ); // cant get it to work
  vtkPropAssembly* assembly = vtkPropAssembly::New();
  assembly->AddPart( axes2 );
  assembly->AddPart( cube );
  vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
  widget->SetOrientationMarker( assembly );
  widget->SetInteractor( iren );
  widget->SetEnabled( 1 );
  widget->InteractiveOff();
  widget->InteractiveOn();
  renwin->Render();
  iren->Start();
  // Clean up:
  reader->Delete();
  table->Delete();
  texture->Delete();
  plane->Delete();
  planeMapper->Delete();
  planeActor->Delete();
  ren->Delete();
  renwin->Delete();
  iren->Delete();
  return 0;
}
```

12.157 gdcmrtionplan.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"
#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkXMLPolyDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "gdcmReader.h"
#include "gdcmAttribute.h"
/*
 This example is just for fun. We found a RT Ion Plan Storage and simply extracted the viz stuff for VTK
```

```
    RTIonPlanStorage, // 1.2.840.10008.5.1.4.1.1.481.8
*/
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " filename.dcm outfile.vti\n";
    return 1;
    }
  const char * filename = argv[1];
  const char * outfilename = argv[2];
  const char * outfilename2 = argv[3];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::MediaStorage ms;
  ms.SetFromFile( reader.GetFile() );
  if( ms != gdcm::MediaStorage::RTIonPlanStorage )
    {
    return 1;
    }
/*
(300a,03a2) SQ                                                  # u/l,1 Ion Beam Sequence
  (fffe,e000) na (Item with undefined length)
    (0008,1040) LO [Test]                                       # 4,1 Institutional Department Name
    (300a,00b2) SH (no value)                                   # 0,1 Treatment Machine Name
    (300a,00b3) CS [MU]                                         # 2,1 Primary Dosimeter Unit
    (300a,00c0) IS [1 ]                                         # 2,1 Beam Number
    (300a,00c2) LO [1 ]                                         # 2,1 Beam Name
    (300a,00c4) CS [STATIC]                                     # 6,1 Beam Type
    (300a,00c6) CS [PROTON]                                     # 6,1 Radiation Type
    (300a,00ce) CS [TREATMENT ]                                 # 10,1 Treatment Delivery Type
    (300a,00d0) IS [0 ]                                         # 2,1 Number of Wedges
    (300a,00e0) IS [1 ]                                         # 2,1 Number of Compensators
    (300a,00ed) IS [0 ]                                         # 2,1 Number of Boli
    (300a,00f0) IS [1 ]                                         # 2,1 Number of Blocks
    (300a,0110) IS [2 ]                                         # 2,1 Number of Control Points
    (300a,02ea) SQ                                              # u/l,1 Ion Range Compensator Sequence
      (fffe,e000) na (Item with undefined length)
        (300a,00e1) SH [lucite]                                 # 6,1 Material ID
        (300a,00e4) IS [1 ]                                     # 2,1 Compensator Number
        (300a,00e5) SH [75hdhe5 ]                               # 8,1 Compensator ID
        (300a,00e7) IS [35]                                     # 2,1 Compensator Rows
        (300a,00e8) IS [37]                                     # 2,1 Compensator Columns
        (300a,00e9) DS [3.679991\4.249288 ]                     # 18,2 Compensator Pixel Spacing
        (300a,00ea) DS [-76.00\62.50]                           # 12,2 Compensator Position
        (300a,00ec) DS
       [52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36
              # 7618,1-n Compensator Thickness Data
        (300a,02e0) CS [ABSENT]                                 # 6,1 Compensator Divergence
        (300a,02e1) CS [SOURCE_SIDE ]                           # 12,1 Compensator Mounting Position
        (300a,02e4) FL 39.2                                     # 4,1 Isocenter to Compensator Tray Distance
        (300a,02e5) FL 2.12                                     # 4,1 Compensator Column Offset
        (300a,02e8) FL 4.76                                     # 4,1 Compensator Milling Tool Diameter
      (fffe,e00d)
*/
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  gdcm::Tag tbeamsq(0x300a,0x03a2);
  if( !ds.FindDataElement( tbeamsq ) )
    {
    return 1;
    }
  const gdcm::DataElement &beamsq = ds.GetDataElement( tbeamsq );
  //std::cout « beamsq « std::endl;
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = beamsq.GetValueAsSQ();
  if( !sqi || !sqi->GetNumberOfItems() )
    {
    return 1;
    }
  //for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
  //  {
    //const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
    const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();
    //std::cout « nestedds « std::endl;
    gdcm::Tag tcompensatorsq(0x300a,0x02ea);
    if( !nestedds.FindDataElement( tcompensatorsq ) )
      {
```

```
      return 1;
      }
    const gdcm::DataElement &compensatorsq = nestedds.GetDataElement( tcompensatorsq );
    //std::cout « compensatorsq « std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
    const gdcm::Item & item2 = ssqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
    //std::cout « nestedds2 « std::endl;
    gdcm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
    if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
      {
      return 1;
      }
    const gdcm::DataElement &compensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
    //  std::cout « compensatorthicknessdata « std::endl;
    gdcm::Attribute<0x300a,0x00ec> at;
    at.SetFromDataElement( compensatorthicknessdata );
    const double* pts = at.GetValues();
    //        (300a,00e7) IS [35]                                     # 2,1 Compensator Rows
    gdcm::Attribute<0x300a,0x00e7> at1;
    const gdcm::DataElement &compensatorrows = nestedds2.GetDataElement( at1.GetTag() );
    at1.SetFromDataElement( compensatorrows );
    std::cout « at1.GetValue() « std::endl;
    //        (300a,00e8) IS [37]                                     # 2,1 Compensator Columns
    gdcm::Attribute<0x300a,0x00e8> at2;
    const gdcm::DataElement &compensatorcols = nestedds2.GetDataElement( at2.GetTag() );
    at2.SetFromDataElement( compensatorcols );
    std::cout « at2.GetValue() « std::endl;
        // (300a,00e9) DS [3.679991\4.249288 ]                      # 18,2 Compensator Pixel Spacing
    gdcm::Attribute<0x300a,0x00e9> at3;
    const gdcm::DataElement &compensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
    at3.SetFromDataElement( compensatorpixelspacing );
    std::cout « at3.GetValue(0) « std::endl;
        // (300a,00ea) DS [-76.00\62.50]                            # 12,2 Compensator Position
    gdcm::Attribute<0x300a,0x00ea> at4;
    const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
    at4.SetFromDataElement( compensatorposition );
    std::cout « at4.GetValue(0) « std::endl;
    vtkDoubleArray *d = vtkDoubleArray::New();
    d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );
    vtkImageData *img = vtkImageData::New();
    img->Initialize();
    img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
    //imgb->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
    img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
    img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
    img->GetPointData()->SetScalars(d);
#if (VTK_MAJOR_VERSION >= 6)
#else
    img->Update();
#endif
    img->Print(std::cout);
    vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writeb->SetInputData( img );
#else
    writeb->SetInput( img );
#endif
    writeb->SetFileName( outfilename );
    writeb->Write( );
/*
    (300a,03a6) SQ                                          # u/l,1 Ion Block Sequence
      (fffe,e000) na (Item with undefined length)
        (300a,00e1) SH [brass ]                             # 6,1 Material ID
        (300a,00f7) FL 95.03                                # 4,1 Isocenter to Block Tray Distance
        (300a,00f8) CS [APERTURE]                           # 8,1 Block Type
        (300a,00fa) CS [ABSENT]                             # 6,1 Block Divergence
        (300a,00fb) CS [SOURCE_SIDE ]                       # 12,1 Block Mounting Position
        (300a,00fc) IS [1 ]                                 # 2,1 Block Number
        (300a,0100) DS [50.00 ]                             # 6,1 Block Thickness
        (300a,0104) IS [179 ]                               # 4,1 Block Number of Points
```

```
       (300a,0106) DS
      [1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.
2\37.4\43.0\37.1\44.7\36] # 1934,2-2n Block Data
      (fffe,e00d)
    (fffe,e0dd)

*/
    gdcm::Tag tblocksq(0x300a,0x03a6);
    if( !nestedds.FindDataElement( tblocksq ) )
      {
      return 1;
      }
    const gdcm::DataElement &blocksq = nestedds.GetDataElement( tblocksq );
    //std::cout « blocksq « std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sssqi = blocksq.GetValueAsSQ();
    const gdcm::Item & item3 = sssqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds3 = item3.GetNestedDataSet();
    gdcm::Tag tblockdata(0x300a,0x0106);
    if( !nestedds3.FindDataElement( tblockdata ) )
      {
      return 1;
      }
    const gdcm::DataElement &blockdata = nestedds3.GetDataElement( tblockdata );
    //  std::cout « blockdata « std::endl;
    gdcm::Attribute<0x300a,0x0106> at_;
    at_.SetFromDataElement( blockdata );
    vtkDoubleArray *scalars = vtkDoubleArray::New();
    scalars->SetNumberOfComponents(3);
    gdcm::Attribute<0x300a,0x0104> bnpts; //  IS [179 ]                                          # 4,1 Block Number
       of Points
    if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
      {
      return 1;
      }
    const gdcm::DataElement &blocknpts = nestedds3.GetDataElement( bnpts.GetTag() );
    bnpts.SetFromDataElement(  blocknpts );
    //std::cout « bnpts.GetValue() « std::endl;
    vtkPolyData *output = vtkPolyData::New();
    vtkPoints *newPts = vtkPoints::New();
    vtkCellArray *polys = vtkCellArray::New();
    const double *ptr = at_.GetValues();
    //unsigned int npts = bnpts.GetNumberOfValues() / 2;
    unsigned int npts = bnpts.GetValue();
    vtkIdType *ptIds =  new vtkIdType[npts];
    for(unsigned int i = 0; i < npts; ++i)
      {
      float x[3] = {};
      x[0] = (float)ptr[2*i+0];
      x[1] = (float)ptr[2*i+1];
      //x[2] = pts[i+2];
      vtkIdType ptId = newPts->InsertNextPoint( x );
      //std::cout « x[0] « "," « x[1] « "," « x[2] « std::endl;
      ptIds[i ] = ptId;
      }
    vtkIdType cellId = polys->InsertNextCell(npts , ptIds);
    (void)cellId;
    delete[] ptIds;
    output->SetPoints(newPts);
    newPts->Delete();
    output->SetPolys(polys);
    polys->Delete();
    //output->GetCellData()->SetScalars(scalars);
    //scalars->Delete();
#if (VTK_MAJOR_VERSION >= 6)
#else
    output->Update();
#endif
    output->Print( std::cout );
  //  }
   vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
   vtkImageColorViewer *viewer = vtkImageColorViewer::New();
#if (VTK_MAJOR_VERSION >= 6)
   viewer->SetInputData(img);
#else
   viewer->SetInput(img);
#endif
   viewer->SetupInteractor(iren);
   viewer->SetSize(600, 600);
   viewer->GetRenderer()->ResetCameraClippingRange();
   viewer->Render();
   viewer->GetRenderer()->ResetCameraClippingRange();
```

```
  vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
  //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
#if (VTK_MAJOR_VERSION >= 6)
      cubeMapper->SetInputData( output );
#else
      cubeMapper->SetInput( output );
#endif
      cubeMapper->SetScalarRange(0,7);
  vtkActor *cubeActor = vtkActor::New();
  //vtkActor2D* cubeActor = vtkActor2D::New();
      cubeActor->SetMapper(cubeMapper);
  vtkProperty * property = cubeActor->GetProperty();
  property->SetRepresentationToWireframe();
viewer->GetRenderer()->AddActor( cubeActor );
    vtkXMLPolyDataWriter *writec= vtkXMLPolyDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writec->SetInputData( output );
#else
    writec->SetInput( output );
#endif
    writec->SetFileName( outfilename2 );
    writec->Write( );
   iren->Initialize();
   iren->Start();
  return 0;
}
```

12.158 gdcmrtplan.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"
#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "gdcmReader.h"
#include "gdcmAttribute.h"
/*
 This example is just for fun. We found a fake RT Ion Plan Storage and simply extracted the viz stuff for VTK
 but this is rather a RT Plan storage
*/
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " filename.dcm outfile.vti\n";
    return 1;
    }
  const char * filename = argv[1];
  const char * outfilename = argv[2];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() )
    {
    return 1;
    }
  gdcm::MediaStorage ms;
```

```
  ms.SetFromFile( reader.GetFile() );
  if( ms != gdcm::MediaStorage::RTIonPlanStorage )
    {
    return 1;
    }
/*
(300a,00b0) SQ                                          # u/l,1 Beam Sequence
  (fffe,e000) na (Item with undefined length)
    (300a,00b2) SH (no value)                           # 0,1 Treatment Machine Name
    (300a,00c0) IS [1 ]                                 # 2,1 Beam Number
    (300a,00c2) LO [1 ]                                 # 2,1 Beam Name
    (300a,00c4) CS [STATIC]                             # 6,1 Beam Type
    (300a,00c6) CS [PROTON]                             # 6,1 Radiation Type
    (300a,00ce) CS [TREATMENT ]                         # 10,1 Treatment Delivery Type
    (300a,00e0) IS [1 ]                                 # 2,1 Number of Compensators
    (300a,00e3) SQ                                      # u/l,1 Compensator Sequence
      (fffe,e000) na (Item with undefined length)
        (300a,00e1) SH [lucite]                         # 6,1 Material ID
        (300a,00e4) IS [1 ]                             # 2,1 Compensator Number
        (300a,00e5) SH [75hdhe5 ]                       # 8,1 Compensator ID
        (300a,00e7) IS [35]                             # 2,1 Compensator Rows
        (300a,00e8) IS [37]                             # 2,1 Compensator Columns
        (300a,00e9) DS [3.679991\4.249288 ]             # 18,2 Compensator Pixel Spacing
        (300a,00ea) DS [-76.00\62.50]                   # 12,2 Compensator Position
        (300a,00ec) DS
       [52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36
              # 7618,1-n Compensator Thickness Data
        (300a,02e0) CS [ABSENT]                         # 6,1 Compensator Divergence
        (300a,02e1) CS [SOURCE_SIDE ]                   # 12,1 Compensator Mounting Position
      (fffe,e00d)
      (fffe,e000) na (Item with undefined length)
      (fffe,e00d)
    (fffe,e0dd)
*/
  const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
  gdcm::Tag tbeamsq(0x300a,0x00b0);
  if( !ds.FindDataElement( tbeamsq ) )
    {
    return 1;
    }
  const gdcm::DataElement &beamsq = ds.GetDataElement( tbeamsq );
  //std::cout « beamsq « std::endl;
  gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = beamsq.GetValueAsSQ();
  if( !sqi || !sqi->GetNumberOfItems() )
    {
    return 1;
    }
  //for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
  //  {
    //const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
    const gdcm::Item & item = sqi->GetItem(2); // Item start at #1
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();
    //std::cout « nestedds « std::endl;
    gdcm::Tag tcompensatorsq(0x300a,0x00e3);
    if( !nestedds.FindDataElement( tcompensatorsq ) )
      {
      return 1;
      }
    const gdcm::DataElement &compensatorsq = nestedds.GetDataElement( tcompensatorsq );
    //std::cout « compensatorsq « std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
    const gdcm::Item & item2 = ssqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
    //std::cout « nestedds2 « std::endl;
    gdcm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
    if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
      {
      return 1;
      }
    const gdcm::DataElement &compensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
    //  std::cout « compensatorthicknessdata « std::endl;
    gdcm::Attribute<0x300a,0x00ec> at;
    at.SetFromDataElement( compensatorthicknessdata );
    const double* pts = at.GetValues();
    //        (300a,00e7) IS [35]                                   # 2,1 Compensator Rows
    gdcm::Attribute<0x300a,0x00e7> at1;
    const gdcm::DataElement &compensatorrows = nestedds2.GetDataElement( at1.GetTag() );
    at1.SetFromDataElement( compensatorrows );
    std::cout « at1.GetValue() « std::endl;
    //        (300a,00e8) IS [37]                                   # 2,1 Compensator Columns
    gdcm::Attribute<0x300a,0x00e8> at2;
```

```
    const gdcm::DataElement &compensatorcols = nestedds2.GetDataElement( at2.GetTag() );
    at2.SetFromDataElement( compensatorcols );
    std::cout « at2.GetValue() « std::endl;
        // (300a,00e9) DS [3.679991\4.249288 ]                      # 18,2 Compensator Pixel Spacing
    gdcm::Attribute<0x300a,0x00e9> at3;
    const gdcm::DataElement &compensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
    at3.SetFromDataElement( compensatorpixelspacing );
    std::cout « at3.GetValue(0) « std::endl;
        // (300a,00ea) DS [-76.00\62.50]                            # 12,2 Compensator Position
    gdcm::Attribute<0x300a,0x00ea> at4;
    const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
    at4.SetFromDataElement( compensatorposition );
    std::cout « at4.GetValue(0) « std::endl;
    vtkDoubleArray *d = vtkDoubleArray::New();
    d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );
    vtkImageData *img = vtkImageData::New();
    img->Initialize();
    img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
    //imgb->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
    img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
    img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
    img->GetPointData()->SetScalars(d);
    vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writeb->SetInputData( img );
#else
    writeb->SetInput( img );
#endif
    writeb->SetFileName( outfilename );
    writeb->Write( );
/*
 (300a,00f4) SQ                                          # u/1,1 Block Sequence
      (fffe,e000) na (Item with undefined length)
        (300a,00e1) SH [brass ]                             # 6,1 Material ID
        (300a,00f8) CS [APERTURE]                           # 8,1 Block Type
        (300a,00fa) CS [ABSENT]                             # 6,1 Block Divergence
        (300a,00fb) CS [SOURCE_SIDE ]                       # 12,1 Block Mounting Position
        (300a,00fc) IS [1 ]                                 # 2,1 Block Number
        (300a,0100) DS [50.00 ]                             # 6,1 Block Thickness
        (300a,0104) IS [179 ]                               # 4,1 Block Number of Points
        (300a,0106) DS
       [1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.
              # 1934,2-2n Block Data
      (fffe,e00d)
      (fffe,e000) na (Item with undefined length)
      (fffe,e00d)
    (fffe,e0dd)
*/
    gdcm::Tag tblocksq(0x300a,0x00f4);
    if( !nestedds.FindDataElement( tblocksq ) )
      {
      return 1;
      }
    const gdcm::DataElement &blocksq = nestedds.GetDataElement( tblocksq );
    //std::cout « blocksq « std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sssqi = blocksq.GetValueAsSQ();
    const gdcm::Item & item3 = sssqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds3 = item3.GetNestedDataSet();
    gdcm::Tag tblockdata(0x300a,0x0106);
    if( !nestedds3.FindDataElement( tblockdata ) )
      {
      return 1;
      }
    const gdcm::DataElement &blockdata = nestedds3.GetDataElement( tblockdata );
    //  std::cout « blockdata « std::endl;
    gdcm::Attribute<0x300a,0x0106> at_;
    at_.SetFromDataElement( blockdata );
    vtkDoubleArray *scalars = vtkDoubleArray::New();
    scalars->SetNumberOfComponents(3);
    gdcm::Attribute<0x300a,0x0104> bnpts; //  IS [179 ] # 4,1 Block Number of Points
    if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
```

```
      {
      return 1;
      }
    const gdcm::DataElement &blocknpts = nestedds3.GetDataElement( bnpts.GetTag() );
    bnpts.SetFromDataElement(  blocknpts );
    std::cout « bnpts.GetValue() « std::endl;
    vtkPolyData *output = vtkPolyData::New();
    vtkPoints *newPts = vtkPoints::New();
    vtkCellArray *polys = vtkCellArray::New();
    const double *ptr = at_.GetValues();
    //unsigned int npts = bnpts.GetNumberOfValues() / 2;
    unsigned int npts = bnpts.GetValue();
    vtkIdType *ptIds =  new vtkIdType[npts];
    for(unsigned int i = 0; i < npts; ++i)
      {
      float x[3] = {};
      x[0] = (float)ptr[2*i+0];
      x[1] = (float)ptr[2*i+1];
      //x[2] = pts[i+2];
      vtkIdType ptId = newPts->InsertNextPoint( x );
      //std::cout « x[0] « "," « x[1] « "," « x[2] « std::endl;
      ptIds[i ] = ptId;
      }
    vtkIdType cellId = polys->InsertNextCell(npts , ptIds);
    (void)cellId;
    delete[] ptIds;
    output->SetPoints(newPts);
    newPts->Delete();
    output->SetPolys(polys);
    polys->Delete();
    //output->GetCellData()->SetScalars(scalars);
    //scalars->Delete();
#if (VTK_MAJOR_VERSION >= 6)
#else
    output->Update();
#endif
    output->Print( std::cout );
  //  }
   vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
   vtkImageColorViewer *viewer = vtkImageColorViewer::New();
#if (VTK_MAJOR_VERSION >= 6)
   viewer->SetInputData(img);
#else
   viewer->SetInput(img);
#endif
   viewer->SetupInteractor(iren);
   viewer->SetSize(600, 600);
   viewer->Render();
  vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
  //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
#if (VTK_MAJOR_VERSION >= 6)
      cubeMapper->SetInputData( output );
#else
      cubeMapper->SetInput( output );
#endif
      cubeMapper->SetScalarRange(0,7);
  vtkActor *cubeActor = vtkActor::New();
  //vtkActor2D* cubeActor = vtkActor2D::New();
      cubeActor->SetMapper(cubeMapper);
  vtkProperty * property = cubeActor->GetProperty();
  property->SetRepresentationToWireframe();
  viewer->GetRenderer()->AddActor( cubeActor );
   iren->Initialize();
   iren->Start();
  return 0;
}
```

12.159 gdcmscene.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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  All rights reserved.
  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
```

```
     This software is distributed WITHOUT ANY WARRANTY; without even
     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMPolyDataReader.h"
//#include "vtkGDCMPolyDataWriter.h"
#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm
// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr « argv[0] « " filename1.dcm\n";
    return 1;
    }
  const char * filename = argv[1];
  vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
  reader->SetFileName( filename );
  reader->Update();
//  vtkGDCMPolyDataWriter * writer2 = vtkGDCMPolyDataWriter::New();
//  for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
//    writer2->SetInput( num, reader->GetOutput(num) );
//  writer2->SetFileName( "rtstruct.dcm" );
//  writer2->Write();
  // print reader output:
  reader->Print( std::cout );
  // print first output:
  reader->GetOutput()->Print( std::cout );
  vtkAppendPolyData *append = vtkAppendPolyData::New();
  int n = reader->GetNumberOfOutputPorts();
  for(int i = 0; i < n; ++i)
    {
#if (VTK_MAJOR_VERSION >= 6)
    append->AddInputConnection( reader->GetOutputPort(i) );
#else
    append->AddInput( reader->GetOutput(i) );
#endif
    }
  vtkPolyDataWriter * writer = vtkPolyDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputConnection( reader->GetOutputPort() );
#else
  writer->SetInput( reader->GetOutput() );
#endif
  writer->SetFileName( "rtstruct.vtk" );
  //writer->Write();
  // Now we'll look at it.
  vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
  //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
      //cubeMapper->SetInput( reader->GetOutput() );
#if (VTK_MAJOR_VERSION >= 6)
      cubeMapper->SetInputConnection( append->GetOutputPort() );
#else
      cubeMapper->SetInput( append->GetOutput() );
#endif
      cubeMapper->SetScalarRange(0,7);
  vtkActor *cubeActor = vtkActor::New();
  //vtkActor2D* cubeActor = vtkActor2D::New();
      cubeActor->SetMapper(cubeMapper);
  vtkProperty * property = cubeActor->GetProperty();
  property->SetRepresentationToWireframe();
  //cubeActor->GetProperty()->SetColor(1, 0, 0);
  // The usual rendering stuff.
//  vtkCamera *camera = vtkCamera::New();
//      camera->SetPosition(1,1,1);
//      camera->SetFocalPoint(0,0,0);
  vtkRenderer *renderer = vtkRenderer::New();
  vtkRenderWindow *renWin = vtkRenderWindow::New();
```

```
    renWin->AddRenderer(renderer);
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
  renderer->AddActor(cubeActor);
  //renderer->AddActor2D(cubeActor);
      //renderer->SetActiveCamera(camera);
      renderer->ResetCamera();
      renderer->SetBackground(1,1,1);
  renWin->SetSize(300,300);
  // interact with data
  renWin->Render();
  iren->Start();
  reader->Delete();
  append->Delete();
  cubeMapper->Delete();
  cubeActor->Delete();
//  camera->Delete();
  renderer->Delete();
  renWin->Delete();
  iren->Delete();
  writer->Delete();
  return 0;
}
```

12.160 gdcmtexture.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkRenderWindow.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
int main( int argc, char *argv[] )
{
  if( argc < 2 ) return 1;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( argv[1] );
  reader->Update();
  vtkImageData* ima = reader->GetOutput();
  vtkLookupTable* table = vtkLookupTable::New();
  table->SetNumberOfColors(1000);
  table->SetTableRange(0,1000);
  table->SetSaturationRange(0,0);
  table->SetHueRange(0,1);
  table->SetValueRange(0,1);
  table->SetAlphaRange(1,1);
  table->Build();
  // Texture
  vtkTexture* texture = vtkTexture::New();
#if (VTK_MAJOR_VERSION >= 6)
  texture->SetInputData(ima);
#else
```

```
  texture->SetInput(ima);
#endif
  texture->InterpolateOn();
  texture->SetLookupTable(table);
  // PlaneSource
  vtkPlaneSource* plane = vtkPlaneSource::New();
  plane->SetOrigin( -0.5, -0.5, 0.0);
  plane->SetPoint1(  0.5, -0.5, 0.0);
  plane->SetPoint2( -0.5,  0.5, 0.0);
  // PolyDataMapper
  vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
  planeMapper->SetInputConnection(plane->GetOutputPort());
#else
  planeMapper->SetInput(plane->GetOutput());
#endif
  // Actor
  vtkActor* planeActor = vtkActor::New();
  planeActor->SetTexture(texture);
  planeActor->SetMapper(planeMapper);
  planeActor->PickableOn();
  // Final rendering with simple interactor:
  vtkRenderer        *ren = vtkRenderer::New();
  vtkRenderWindow *renwin = vtkRenderWindow::New();
  renwin->AddRenderer(ren);
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
  iren->SetRenderWindow(renwin);
  ren->AddActor(planeActor);
  ren->SetBackground(0,0,0.5);
  vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
  cube->SetXPlusFaceText ( "L" );
  cube->SetXMinusFaceText( "R" );
  cube->SetYPlusFaceText ( "A" );
  cube->SetYMinusFaceText( "P" );
  cube->SetZPlusFaceText ( "H" );
  cube->SetZMinusFaceText( "F" );
  vtkAxesActor* axes2 = vtkAxesActor::New();
  // simulate a left-handed coordinate system
  //
  vtkTransform *transform = vtkTransform::New();
  transform->Identity();
  //transform->RotateY(180);
  reader->GetDirectionCosines()->Print(std::cout);
  transform->Concatenate(reader->GetDirectionCosines());
  //axes2->SetShaftTypeToCylinder();
  axes2->SetUserTransform( transform );
  //cube->SetUserTransform( transform ); // cant get it to work
  cube->GetAssembly()->SetUserTransform( transform ); // cant get it to work
  vtkPropAssembly* assembly = vtkPropAssembly::New();
  assembly->AddPart( axes2 );
  assembly->AddPart( cube );
  vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
  //widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
  widget->SetOrientationMarker( assembly );
  widget->SetInteractor( iren );
  //widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
  widget->SetEnabled( 1 );
  widget->InteractiveOff();
  widget->InteractiveOn();
  renwin->Render();
  iren->Start();
  // Clean up:
  reader->Delete();
  table->Delete();
  texture->Delete();
  plane->Delete();
  planeMapper->Delete();
  planeActor->Delete();
  ren->Delete();
  renwin->Delete();
  iren->Delete();
  return 0;
}
```

12.161 gdcmvolume.cxx

```
/*=========================================================================
```

```
  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "vtkVersion.h"
#include "vtkGDCMImageReader.h"
#include "vtkPiecewiseFunction.h"
#include "vtkColorTransferFunction.h"
#include "vtkVolume.h"
#include "vtkVolumeProperty.h"
#if VTK_MAJOR_VERSION < 7
#include "vtkVolumeTextureMapper3D.h"
#endif
#include "vtkFixedPointVolumeRayCastMapper.h"
#include "vtkInteractorStyleTrackballCamera.h"
#include "vtkRenderer.h"
#include "vtkRenderWindow.h"
#include "vtkImageClip.h"
#include "vtkRenderWindowInteractor.h"
// gdcmvolume gdcmData/GE_DLX-8-MONO2-Multiframe-Jpeg_Lossless.dcm
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( argv[1] );
  reader->Update();
  // Create the renderers, render window, and interactor
  vtkRenderWindow *renWin = vtkRenderWindow::New();
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
  iren->SetRenderWindow(renWin);
  vtkRenderer *ren = vtkRenderer::New();
  renWin->AddRenderer(ren);
  // Create a transfer function mapping scalar value to opacity
  vtkPiecewiseFunction *oTFun = vtkPiecewiseFunction::New();
  //oTFun->AddSegment(0, 1.0, 256, 0.1);
  oTFun->AddSegment(0, 1.0, 240, 0.1);
  vtkColorTransferFunction *cTFun = vtkColorTransferFunction::New();
  cTFun->AddRGBPoint(   0, 1.0, 1.0, 1.0 );
  //cTFun->AddRGBPoint( 255, 1.0, 1.0, 1.0 );
  cTFun->AddRGBPoint( 240, 1.0, 1.0, 1.0 );
  // Need to crop to actually see minimum intensity
  vtkImageClip *clip = vtkImageClip::New();
  clip->SetInputConnection( reader->GetOutputPort() );
  clip->SetOutputWholeExtent(0,66,0,66,30,37);
  clip->ClipDataOn();
  vtkVolumeProperty *property = vtkVolumeProperty::New();
  property->SetScalarOpacity(oTFun);
  property->SetColor(cTFun);
  property->SetInterpolationTypeToLinear();
  vtkFixedPointVolumeRayCastMapper *mapper = vtkFixedPointVolumeRayCastMapper::New();
  mapper->SetBlendModeToMinimumIntensity();
  mapper->SetInputConnection( reader->GetOutputPort() );
  vtkVolume *volume = vtkVolume::New();
  volume->SetMapper(mapper);
  volume->SetProperty(property);
  ren->AddViewProp(volume);
  renWin->Render();
    {
    iren->Start();
    }
  volume->Delete();
  mapper->Delete();
  property->Delete();
  clip->Delete();
  cTFun->Delete();
  oTFun->Delete();
  reader->Delete();
  renWin->Delete();
  iren->Delete();
  ren->Delete();
 return 0;
}
```

12.162 offscreenimage.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkImageMapToWindowLevelColors.h"
#include "vtkImageActor.h"
#include "vtkPNGWriter.h"
#include "vtkWindowToImageFilter.h"
#include "vtkMedicalImageProperties.h"
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    return 1;
    }
  const char *filename = argv[1];
  vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
  reader->SetFileName( filename );
  reader->Update(); // important to read the window/level info
  vtkMedicalImageProperties *prop = reader->GetMedicalImageProperties();
  vtkRenderWindow *renWin = vtkRenderWindow::New();
  renWin->OffScreenRenderingOn();
  vtkRenderer *renderer = vtkRenderer::New();
  renWin->AddRenderer(renderer);
  vtkImageMapToWindowLevelColors *windowlevel = vtkImageMapToWindowLevelColors::New();
#if (VTK_MAJOR_VERSION >= 6)
  windowlevel->SetInputConnection( reader->GetOutputPort() );
#else
  windowlevel->SetInput( reader->GetOutput() );
#endif
  unsigned int n = prop->GetNumberOfWindowLevelPresets();
  if( n )
    {
    // Take the first one by default:
    const double *wl = prop->GetNthWindowLevelPreset(0);
    windowlevel->SetWindow( wl[0] );
    windowlevel->SetLevel( wl[1] );
    }
  vtkImageActor *actor = vtkImageActor::New();
#if (VTK_MAJOR_VERSION >= 6)
  actor->SetInputData( windowlevel->GetOutput() );
#else
  actor->SetInput( windowlevel->GetOutput() );
#endif
  renderer->AddActor( actor );
  renWin->Render();
  vtkWindowToImageFilter *w2if = vtkWindowToImageFilter::New();
  w2if->SetInput ( renWin );
  vtkPNGWriter *wr = vtkPNGWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
  wr->SetInputConnection( w2if->GetOutputPort() );
#else
  wr->SetInput( w2if->GetOutput() );
#endif
  wr->SetFileName ( "offscreenimage.png" );
  wr->Write();
  reader->Delete();
  renWin->Delete();
  renderer->Delete();
  windowlevel->Delete();
  actor->Delete();
  w2if->Delete();
  wr->Delete();
  return 0;
}
```

12.163 reslicesphere.cxx

```
/*=========================================================================

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=========================================================================*/
//
// Load a DICOM series.
// Position a sphere within the volume.
// Allow the user to change between Axial, Sagittal, Coronal, and
//     Oblique view of the images and move through the slices.
// The display should show the resliced image and the cross section
// of the sphere intersecting that plane.
//
/*
from  Scott Johnson /Scott Johnson neuwave com/
to  VTK /vtkusers vtk.org/
date  Tue, May 11, 2010 at 7:01 PM
*/
#include <strstream>
#include <string>
#include <vtkDICOMImageReader.h>
#include <vtkStringArray.h>
#include <vtkDirectory.h>
#include <vtkImageThreshold.h>
#include <vtkImageShiftScale.h>
#include <vtkImageReslice.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageViewer2.h>
#include <vtkSphereSource.h>
#include <vtkPolyDataMapper.h>
#include <vtkPlane.h>
#include <vtkCutter.h>
#include <vtkActor.h>
#include <vtkCommand.h>
#include <vtkSmartPointer.h>
#include <vtkMatrix4x4.h>
#include <vtkInteractorObserver.h>
#include <vtkProperty.h>
#include <vtkRenderer.h>
#include <vtkImageData.h>
#include <vtkImageActor.h>
#include "vtkTransformPolyDataFilter.h"
#include <vtkCamera.h>
#include <vtkMath.h>
#include <vtkTransform.h>
#include <vtkTextActor.h>
#include <vtkActor2D.h>
#include <vtkPolyDataMapper2D.h>
#include <vtkProperty2D.h>
#include <vtkGDCMImageReader.h>
#include <vtkImageChangeInformation.h>
#include "gdcmDirectory.h"
#include "gdcmTesting.h"
#include "gdcmIPPSorter.h"
// Change to match the path to find Raw_0.vti or provide
// the parameter when starting ResliceSphere.
const double sphereCenter[3]={74, 219, 70};
// Angles (0, 0, 0)
const double AxialMatrix[]    = { 1.0,  0.0,  0.0,  0.0,
                                  0.0,  1.0,  0.0,  0.0,
                                  0.0,  0.0,  1.0,  0.0,
                                  0.0,  0.0,  0.0,  1.0 };
// Angles (0, 90, 0)
const double SagittalMatrix[] = { 0.0,  0.0,  1.0,  0.0,
                                  0.0,  1.0,  0.0,  0.0,
                                 -1.0,  0.0,  0.0,  0.0,
                                  0.0,  0.0,  0.0,  1.0 };
// Angles (-90, 0, 0)
const double CoronalMatrix[]  = { 1.0,  0.0,  0.0,  0.0,
                                  0.0,  0.0,  1.0,  0.0,
```

```
                                  0.0, -1.0,  0.0,  0.0,
                                  0.0,  0.0,  0.0,  1.0 };
// Angles (0, 90, 31)
const double ObliqueMatrix[] =  { 0.0, -0.515038, 0.857167, 0.0,
                                  0.0,  0.857167, 0.515038, 0.0,
                                 -1.0,  0.0,      0.0,      0.0,
                                  0.0,  0.0,      0.0,      1.0 };
class ResliceRender;
// Class to handle key press events.
class KeyCallback : public vtkCommand
{
public:
    static KeyCallback* New()
    {
        return new KeyCallback();
    }
    void Execute(vtkObject* caller, unsigned long eventId, void *calldata);
    void SetCallbackData(ResliceRender* reslice);
protected:
    ResliceRender* _reslice;
};
class ResliceRender
{
public:
    typedef enum _ORIENTATION
    {
        AXIAL = 0,
        SAGITTAL = 1,
        CORONAL = 2,
        OBLIQUE = 3
    } ORIENTATION;
    ResliceRender()
    {
        _orientation=AXIAL;
    }
    ~ResliceRender()
    {
        _transform->Delete();
        _reader->Delete();
        _reslice->Delete();
        _interactor->Delete();
        _imageViewer->Delete();
        _sphere->Delete();
        _sphereMapper->Delete();
        _sphereActor->Delete();
        _plane->Delete();
        _cutter->Delete();
        _polyTransform->Delete();
        _ROIMapper->Delete();
        _ROIActor->Delete();
        _annotation->Delete();
    }
    void CreatePipeline(const char* fileName)
    {
        vtkProperty2D* props;
        //_reader=vtkXMLImageDataReader::New();
        //_reader->SetFileName(fileName);
        //_reader->Update();
        //_reader=qzDICOMImageReader::New();
        _reader=vtkGDCMImageReader::New();
      //vtkDirectory *d = vtkDirectory::New();
      //d->Open(fileName);
      //d->Print( std::cout );
      gdcm::Directory d;
      d.Load(fileName);
      gdcm::Directory::FilenamesType const &files = d.GetFilenames();
  gdcm::IPPSorter s;
  s.SetComputeZSpacing( true );
  s.SetZSpacingTolerance( 1e-3 );
  bool b = s.Sort( files );
  if( !b )
    {
    std::cerr « "Failed to sort:" « fileName « std::endl;
    //return ;
    }
  //std::cout « "Sorting succeeded:" « std::endl;
  //s.Print( std::cout );
  //std::cout « "Found z-spacing:" « std::endl;
  //std::cout « s.GetZSpacing() « std::endl;
  double ippzspacing = s.GetZSpacing();
  const std::vector<std::string> & sorted = s.GetFilenames();
```

```
  vtkStringArray *vtkfiles = vtkStringArray::New();
  std::vector< std::string >::const_iterator it = sorted.begin();
  for( ; it != sorted.end(); ++it)
    {
    const std::string &f = *it;
    vtkfiles->InsertNextValue( f.c_str() );
    }
        //_reader->SetDirectoryName(fileName);
        //_reader->SetFileNames( d->GetFiles() );
        _reader->SetFileNames( vtkfiles );
        _reader->Update();
  const vtkFloatingPointType *spacing = _reader->GetOutput()->GetSpacing();
  vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
#if (VTK_MAJOR_VERSION >= 6)
  v16->SetInputConnection( _reader->GetOutputPort() );
#else
  v16->SetInput( _reader->GetOutput() );
#endif
  v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
  v16->Update();
        _threshold=vtkImageThreshold::New();
        _threshold->ThresholdByUpper(-3024.0);
        _threshold->ReplaceOutOn();
        _threshold->SetOutValue(0.0);
        _threshold->SetInputConnection(v16->GetOutputPort());
        _shift=vtkImageShiftScale::New();
        _shift->SetShift(0);
        _shift->SetScale(1);
        _shift->SetInputConnection(_threshold->GetOutputPort());
        // Initialize the reslice with an axial orientation.
        vtkSmartPointer<vtkMatrix4x4> matrix =
            vtkSmartPointer<vtkMatrix4x4>::New();
        matrix->Identity();
        _transform = vtkTransform::New();
        _transform->SetMatrix(matrix);
        _reslice = vtkImageReslice::New();
        _reslice->SetOutputDimensionality(3);
        // PROBLEM:
        // The original intent was to connect the same transform
        // to the vtkImageReslice and vtkTransformPolyDataFilter,
        // but the resulting reslices appear different using the
        // vtkTransform as opposed to explicitly setting the
        // reslice axes via SetResliceAxes.  Also, if the vtkTransform
        // is connected and orientated other than axial, the extents
        // don't seem to update resulting in VTK believing the slice
        // is out of range.
        //_reslice->SetResliceTransform(_transform);
        _reslice->SetResliceAxes(matrix);
        //_reslice->SetInputConnection(_reader->GetOutputPort());
        _reslice->SetInputConnection(_shift->GetOutputPort());
        // Create the sphere target shape.
        _sphere=vtkSphereSource::New();
        _sphere->SetRadius(7.0);
        _sphere->SetThetaResolution(16);
        _sphere->SetPhiResolution(16);
        _sphere->SetCenter(sphereCenter[0], sphereCenter[1], sphereCenter[2]);
        _sphereMapper=vtkPolyDataMapper::New();
        _sphereMapper->SetInputConnection(_sphere->GetOutputPort());
        _sphereActor=vtkActor::New();
        _sphereActor->SetMapper(_sphereMapper);
        _sphereActor->PickableOff();
        _sphereActor->GetProperty()->SetColor(1.0, 0.0, 0.0);
        _sphereActor->GetProperty()->SetEdgeColor(1.0, 0.0, 0.0);
        _sphereActor->GetProperty()->SetDiffuseColor(1.0, 0.0, 0.0);
        _sphereActor->SetVisibility(true);
        // Create the cutting pipeline.
        // This plane will be positioned in the original image coordinate system.
        _plane = vtkPlane::New();
        _plane->SetNormal(0.0, 0.0, 1.0);
        _cutter = vtkCutter::New();
        _cutter->SetInputConnection(_sphere->GetOutputPort());
        _cutter->SetCutFunction(_plane);
        _cutter->GenerateCutScalarsOn();
        _cutter->SetValue(0, 0.5);
        // The transform attached to _polyTransform should move the cut
        // ROI into the resliced coordinate system, which should be the
        // same as the coordinate system of the resliced images.
        // PROBLEM:  It doesn't.
        _polyTransform = vtkTransformPolyDataFilter::New();
        _polyTransform->SetTransform(_transform);
        _polyTransform->SetInputConnection(_cutter->GetOutputPort());
```

```
        _ROIMapper = vtkPolyDataMapper2D::New();
        _ROIMapper->SetInputConnection(_polyTransform->GetOutputPort());
    vtkCoordinate* coordinate = vtkCoordinate::New();
    coordinate->SetCoordinateSystemToWorld();
    _ROIMapper->SetTransformCoordinate(coordinate);
        _ROIActor = vtkActor2D::New();
        _ROIActor->SetMapper(_ROIMapper);
        // Make sure the cut can be seen, especially the edges.
        props=_ROIActor->GetProperty();
        props->SetLineWidth(2);
        props->SetOpacity(1.0);
//        props->EdgeVisibilityOn();
//        props->SetDiffuse(0.8);
//        props->SetSpecular(0.3);
//        props->SetSpecularPower(20);
//        props->SetRepresentationToSurface();
//        props->SetDiffuseColor(1.0, 0.0, 0.0);
//        props->SetEdgeColor(1.0, 0.0, 0.0);
        props->SetColor(1.0, 0.0, 0.0);
        _interactor = vtkRenderWindowInteractor::New();
        // Create the image viewer and add the actor with the cut ROI.
        _imageViewer = vtkImageViewer2::New();
        _imageViewer->SetupInteractor(_interactor);
        _imageViewer->SetSize(400, 400);
        _imageViewer->SetColorWindow(1024);
        _imageViewer->SetColorLevel(800);
        _imageViewer->SetInputConnection(_reslice->GetOutputPort());
        _imageViewer->GetImageActor()->SetOpacity(0.5);
        _annotation = vtkTextActor::New();
        _annotation->SetTextScaleModeToViewport();
        _imageViewer->GetRenderer()->AddActor(_annotation);
        // Add the cut shape actor to the renderer.
        _imageViewer->GetRenderer()->AddActor(_ROIActor);
        // Set up the key handler.
        vtkSmartPointer<KeyCallback> callback = vtkSmartPointer<KeyCallback>::New();
        callback->SetCallbackData(this);
        _interactor->AddObserver(vtkCommand::KeyPressEvent, callback);
        _interactor->Initialize();
    }
    void Start()
    {
        _interactor->Start();
    }
    void ResetOrientation()
    {
        vtkSmartPointer<vtkMatrix4x4> matrix =
            vtkSmartPointer<vtkMatrix4x4>::New();
        matrix->Identity();
        SetOrientation(matrix);
    }
    // Make sure the orientation of the vtkImageReslice and
    // vtkTransform are in sync.
    void SetOrientation(vtkMatrix4x4* matrix)
    {
        _reslice->SetResliceAxes(matrix);
        _reslice->Update();
    vtkMatrix4x4* inverse = vtkMatrix4x4::New();
    vtkMatrix4x4::Invert(matrix, inverse);
        _transform->SetMatrix(inverse);
        _transform->Update();
    }
    // Set the current slice of the current view.
    void SetSlice(int slice)
    {
        std::strstream posString;
        double    center[3];
        double    spacing[3];
        double    origin[3];
        double    point[4];
        double    newPoint[4];
        vtkImageData* imageData;
        int newSlice;
        // Try to make sure the extents of the reslice are updated.
        // PROBLEM:  It doesn't seem to work when changing the orientation.
        imageData=vtkImageData::SafeDownCast(_reslice->GetOutput());
#if (VTK_MAJOR_VERSION >= 6)
        assert(0);
#else
        imageData->UpdateInformation();
#endif
        // Let vtkImageViewer2 handle the slice limits.
```

```
        _imageViewer->SetSlice(slice);
        newSlice=GetSlice();
        imageData->GetCenter(center);
        imageData->GetSpacing(spacing);
        imageData->GetOrigin(origin);
        // Compute the position of the center of the slice based on the
        // spacing of the slices.  The resliced axis will always
        // be the "Z" axis.
        point[0]=center[0];
        point[1]=center[1];
        point[2]=(newSlice * spacing[2]) + origin[2];
        point[3]=1.0;
        // Convert the coordinate from the reslice coordinate system to the
        // original image coordinate system.
        // PROBLEM:  Logically this seems like it should have been multiplied
        // by the inverse to translate from the resliced coordinate system to
        // the original coordinate system.  However, multiplying by the inverse
        // sticks the plane in the wrong place completely.  Using the original
        // matrix at least gets the Z coordinate right.
        vtkMatrix4x4* matrix=_reslice->GetResliceAxes();
        vtkSmartPointer<vtkMatrix4x4> inverse =
            vtkSmartPointer<vtkMatrix4x4>::New();
        vtkMatrix4x4::Invert(matrix, inverse);
        matrix->MultiplyPoint(point, newPoint);
        _plane->SetOrigin(newPoint[0], newPoint[1], newPoint[2]);
        // Annotate the image.
        posString << "Position: (" << newPoint[0] << ", " << newPoint[1]
                  << ", " << newPoint[2] << ")  Slice: " << newSlice;
        _annotation->SetInput(posString.str());
        _imageViewer->Render();
    }
    int GetSlice()
    {
        return _imageViewer->GetSlice();
    }
    // Set the orientation of the view.
    void SetOrientation(ResliceRender::ORIENTATION orientation)
    {
        vtkCamera* camera=_imageViewer->GetRenderer()->GetActiveCamera();
        double spacing[3];
        double origin[3];
        double point[4];
        double newPoint[4];
        double initialPosition;
        double xDirCosine[3];
        double yDirCosine[3];
        double zDirCosine[3];
        double normal[3];
        vtkImageData* imageData;
        vtkSmartPointer<vtkMatrix4x4> matrix =
            vtkSmartPointer<vtkMatrix4x4>::New();
        _orientation=orientation;
        // Reset ViewUp
        camera->SetViewUp(0.0, 1.0, 0.0);
        // Compute the cut plane position to the input coordinate system.
        imageData=vtkImageData::SafeDownCast(_reslice->GetInput());
#if (VTK_MAJOR_VERSION >= 6)
        assert(0);
#else
        imageData->UpdateInformation();
#endif
        imageData->GetSpacing(spacing);
        imageData->GetOrigin(origin);
        point[0]=origin[0];
        point[1]=origin[1];
        point[2]=origin[2];
        point[3]=1.0;
        switch (_orientation)
        {
        case AXIAL:
            matrix->DeepCopy(AxialMatrix);
            initialPosition=sphereCenter[2];
            break;
        case CORONAL:
            matrix->DeepCopy(CoronalMatrix);
            initialPosition=sphereCenter[1];
            break;
        case SAGITTAL:
            matrix->DeepCopy(SagittalMatrix);
            initialPosition=sphereCenter[0];
            break;
```

```
        case OBLIQUE:
            matrix->DeepCopy(ObliqueMatrix);
            initialPosition=sphereCenter[2];
            break;
        }
        // Move the origin from the original image coordinate system to the
        // resliced image coordinate system.
        matrix->MultiplyPoint(point, newPoint);
        matrix->SetElement(0, 3, newPoint[0]);
        matrix->SetElement(1, 3, newPoint[1]);
        matrix->SetElement(2, 3, newPoint[2]);
        ResetOrientation();
        SetOrientation(matrix);
        // Compute the cutting plane normal and set it.
        // PROBLEM:  If the transformation is connected rather than
        // using SetResliceAxes, the Direction Cosines do not reflect
        // the orientation of the vtkImageReslice.
        _reslice->GetResliceAxesDirectionCosines(xDirCosine, yDirCosine,
                                                 zDirCosine);
        vtkMath::Cross(xDirCosine, yDirCosine, normal);
        _plane->SetNormal(normal);
        // Set the extents and spacing of the reslice to account for
        // all of the data.
        _reslice->SetOutputExtentToDefault();
        _reslice->SetOutputSpacing(spacing[0], spacing[0], spacing[0]);
        // Force the vtkImageViewer2 to update.
        // PROBLEM:  The whole extent does not seem to be set in time
        // for the first render.  This results in an error because the
        // slice is positioned outside the old bounds.
#if (VTK_MAJOR_VERSION >= 6)
        _imageViewer->SetInputData(NULL);
#else
        _imageViewer->SetInput(NULL);
#endif
        _imageViewer->SetInputConnection(_reslice->GetOutputPort());
        _imageViewer->GetRenderer()->ResetCameraClippingRange();
        _imageViewer->GetRenderer()->ResetCamera();
        // Set the initial slice to be at the center of the sphere.
        // Divide by the spacing because this will be undone in SetSlice.
        SetSlice( (int)(initialPosition / spacing[0]));
    }
    vtkRenderWindowInteractor* GetInteractor()
    {
        return _interactor;
    }
protected:
    ORIENTATION                 _orientation;
    //qzDICOMImageReader*        _reader;
    vtkGDCMImageReader*        _reader;
    vtkImageThreshold*          _threshold;
    vtkImageShiftScale*         _shift;
    vtkImageReslice*            _reslice;
    vtkRenderWindowInteractor*  _interactor;
    vtkImageViewer2*            _imageViewer;
    vtkSphereSource*            _sphere;
    vtkPolyDataMapper*          _sphereMapper;
    vtkActor*                   _sphereActor;
    vtkPlane*                   _plane;
    vtkCutter*                  _cutter;
    vtkTransform*               _transform;
    vtkTransformPolyDataFilter* _polyTransform;
    vtkPolyDataMapper2D*          _ROIMapper;
    vtkActor2D*                   _ROIActor;
    vtkTextActor*               _annotation;
};
// Catch KeyPress events.
// Up Arrow   - increases the slice
// Down Arrow - decreases the slice
// 'A'        - sets the view to Axial
// 'S'        - sets the view to Sagittal
// 'C'        - sets the view to Coronal
// 'O'        - set the view to Oblique
void KeyCallback::Execute(vtkObject* caller, unsigned long eventId, void *calldata)
{
  (void)caller;
  (void)eventId;
  (void)calldata;
    std::string sym=_reslice->GetInteractor()->GetKeySym();
    if (!sym.compare("Up"))
    {
        _reslice->SetSlice(_reslice->GetSlice() + 1);
```

```
    }
    else if (!sym.compare("Down"))
    {
        _reslice->SetSlice(_reslice->GetSlice() - 1);
    }
    else if ((!sym.compare("A")) || (!sym.compare("a")))
    {
        _reslice->SetOrientation(ResliceRender::AXIAL);
    }
    else if ((!sym.compare("C")) || (!sym.compare("c")))
    {
        _reslice->SetOrientation(ResliceRender::CORONAL);
    }
    else if ((!sym.compare("S")) || (!sym.compare("s")))
    {
        _reslice->SetOrientation(ResliceRender::SAGITTAL);
    }
    else if ((!sym.compare("O")) || (!sym.compare("o")))
    {
        _reslice->SetOrientation(ResliceRender::OBLIQUE);
    }
}
void KeyCallback::SetCallbackData(ResliceRender* reslice)
{
    _reslice=reslice;
}
// Usage:  ResliceSphere [fileName]
int main(int argc, char *argv[])
{
    ResliceRender render;
    if (argc == 1)
      {
      const char *root = gdcm::Testing::GetDataExtraRoot();
      std::string dir3 = root;
      dir3 += "/gdcmSampleData/ForSeriesTesting/Dentist/images/";
      render.CreatePipeline(dir3.c_str());
      }
    else
      {
      render.CreatePipeline(argv[1]);
      }
    render.SetOrientation(ResliceRender::AXIAL);
    render.Start();
    return EXIT_SUCCESS;
}
```

12.164 rtstructapp.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
#include "vtkGDCMPolyDataReader.h"
#include "vtkGDCMPolyDataWriter.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkAppendPolyData.h"
#include "vtkImageData.h"
/*
```

```
 * Small example to read in a RTSTUCT and write it out (displays it too).
 */
// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm
// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm
int main(int argc, char *argv[])
{
  if( argc < 3 )
    {
    std::cerr « argv[0] « " input.dcm output.dcm\n";
    return 1;
    }
  const char * filename = argv[1];
  const char * outfilename = argv[2];
  vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
  reader->SetFileName( filename );
  reader->Update();
  //std::cout « reader->GetMedicalImageProperties()->GetStudyDate() « std::endl;
  vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
  writer->SetNumberOfInputPorts( reader->GetNumberOfOutputPorts() );
  writer->SetFileName( outfilename );
  for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
#if (VTK_MAJOR_VERSION >= 6)
    writer->SetInputConnection( num, reader->GetOutputPort(num) );
#else
    writer->SetInput( num, reader->GetOutput(num) );
#endif
  //doesn't look like the medical properties are actually written out
  writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
  writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
  writer->Write();
  // print reader output:
  reader->Print( std::cout );
  // print first output:
  reader->GetOutput()->Print( std::cout );
 vtkAppendPolyData *append = vtkAppendPolyData::New();
 int n = reader->GetNumberOfOutputPorts();
 for(int i = 0; i < n; ++i)
   {
#if (VTK_MAJOR_VERSION >= 6)
   append->AddInputConnection( reader->GetOutputPort(i) );
#else
   append->AddInput( reader->GetOutput(i) );
#endif
   }
  // Now we'll look at it.
  vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
  cubeMapper->SetInputConnection( append->GetOutputPort());
#else
  cubeMapper->SetInput( append->GetOutput());
#endif
  cubeMapper->SetScalarRange(0,7);
  vtkActor *cubeActor = vtkActor::New();
  cubeActor->SetMapper(cubeMapper);
  vtkProperty * property = cubeActor->GetProperty();
  property->SetRepresentationToWireframe();
  vtkRenderer *renderer = vtkRenderer::New();
  vtkRenderWindow *renWin = vtkRenderWindow::New();
  renWin->AddRenderer(renderer);
  vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
  iren->SetRenderWindow(renWin);
  renderer->AddActor(cubeActor);
  renderer->ResetCamera();
  renderer->SetBackground(1,1,1);
  renWin->SetSize(300,300);
  renWin->Render();
  iren->Start();
  reader->Delete();
  append->Delete();
  cubeMapper->Delete();
  cubeActor->Delete();
  renderer->Delete();
  renWin->Delete();
  iren->Delete();
  writer->Delete();
  return 0;
}
```

12.165 threadgdcm.cxx

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmDirectory.h"
#include "gdcmSystem.h"
#include "vtkImageData.h"
#include "vtkStructuredPointsWriter.h"
#include <pthread.h>
struct threadparams
{
  const char **filenames;
  size_t nfiles;
  char *scalarpointer;
// TODO I should also pass in the dim of the reference image just in case
};
void *ReadFilesThread(void *voidparams)
{
  const threadparams *params = static_cast<const threadparams *> (voidparams);
  const size_t nfiles = params->nfiles;
  for(unsigned int file = 0; file < nfiles; ++file)
    {
    /*
    // TODO: update progress
    pthread_mutex_lock(&params->lock);
    //section critique
    ReadingProgress+=params->stepProgress;
    pthread_mutex_unlock(&params->lock);
    */
    const char *filename = params->filenames[file];
    //std::cerr « filename « std::endl;
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    try
      {
      if( !reader.Read() )
        {
        std::cerr « "Failed to read: " « filename « std::endl;
        break;
        }
      }
    catch( ... )
      {
      std::cerr « "Failed to read: " « filename « std::endl;
      break;
      }
    const gdcm::Image &image = reader.GetImage();
    unsigned long len = image.GetBufferLength();
    char * pointer = params->scalarpointer;
#if 0
    char *tempimage = new char[len];
    image.GetBuffer(tempimage);
    memcpy(pointer + file*len, tempimage, len);
    delete[] tempimage;
#else
    char *tempimage = pointer + file * len;
    image.GetBuffer(tempimage);
#endif
    }
  return voidparams;
}
void ShowFilenames(const threadparams &params)
{
  std::cout « "start" « std::endl;
  for(unsigned int i = 0; i < params.nfiles; ++i)
    {
    const char *filename = params.filenames[i];
```

```
    std::cout « filename « std::endl;
    }
  std::cout « "end" « std::endl;
}
void ReadFiles(size_t nfiles, const char *filenames[])
{
  // \precondition: nfiles > 0
  assert( nfiles > 0 );
  const char *reference= filenames[0]; // take the first image as reference
  gdcm::ImageReader reader;
  reader.SetFileName( reference );
  if( !reader.Read() )
    {
    // That would be very bad...
    assert(0);
    }
  const gdcm::Image &image = reader.GetImage();
  gdcm::PixelFormat pixeltype = image.GetPixelFormat();
  unsigned long len = image.GetBufferLength();
  const unsigned int *dims = image.GetDimensions();
  unsigned short pixelsize = pixeltype.GetPixelSize();
  (void)pixelsize;
  assert( image.GetNumberOfDimensions() == 2 );
  vtkImageData *output = vtkImageData::New();
  output->SetDimensions(dims[0], dims[1], (int)nfiles);
#if (VTK_MAJOR_VERSION >= 6)
  int numscal = pixeltype.GetSamplesPerPixel();
  switch( pixeltype )
    {
  case gdcm::PixelFormat::INT8:
    output->AllocateScalars( VTK_SIGNED_CHAR, numscal );
    break;
  case gdcm::PixelFormat::UINT8:
    output->AllocateScalars( VTK_UNSIGNED_CHAR, numscal );
    break;
  case gdcm::PixelFormat::INT16:
    output->AllocateScalars( VTK_SHORT, numscal );
    break;
  case gdcm::PixelFormat::UINT16:
    output->AllocateScalars( VTK_UNSIGNED_SHORT, numscal );
    break;
  case gdcm::PixelFormat::INT32:
    output->AllocateScalars( VTK_INT, numscal );
    break;
  case gdcm::PixelFormat::UINT32:
    output->AllocateScalars( VTK_UNSIGNED_INT, numscal );
    break;
  default:
    assert(0);
    }
#else
  switch( pixeltype )
    {
  case gdcm::PixelFormat::INT8:
#if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
    output->SetScalarType ( VTK_SIGNED_CHAR );
#else
    output->SetScalarType ( VTK_CHAR );
#endif
    break;
  case gdcm::PixelFormat::UINT8:
    output->SetScalarType ( VTK_UNSIGNED_CHAR );
    break;
  case gdcm::PixelFormat::INT16:
    output->SetScalarType ( VTK_SHORT );
    break;
  case gdcm::PixelFormat::UINT16:
    output->SetScalarType ( VTK_UNSIGNED_SHORT );
    break;
  case gdcm::PixelFormat::INT32:
    output->SetScalarType ( VTK_INT );
    break;
  case gdcm::PixelFormat::UINT32:
    output->SetScalarType ( VTK_UNSIGNED_INT );
    break;
  default:
    assert(0);
    }
  output->SetNumberOfScalarComponents ( pixeltype.GetSamplesPerPixel() );
  output->AllocateScalars();
#endif
```

```
  char * scalarpointer = static_cast<char*>(output->GetScalarPointer());
  const unsigned int nthreads = 4;
  threadparams params[nthreads];
  //pthread_mutex_t lock;
  //pthread_mutex_init(&lock, NULL);
  pthread_t *pthread = new pthread_t[nthreads];
  // There is nfiles, and nThreads
  assert( nfiles > nthreads );
  const size_t partition = nfiles / nthreads;
  for (unsigned int thread=0; thread < nthreads; ++thread)
    {
    params[thread].filenames = filenames + thread * partition;
    params[thread].nfiles = partition;
    if( thread == nthreads - 1 )
      {
      // There is slightly more files to process in this thread:
      params[thread].nfiles += nfiles % nthreads;
      }
    assert( thread * partition < nfiles );
    params[thread].scalarpointer = scalarpointer + thread * partition * len;
    //assert( params[thread].scalarpointer < scalarpointer + 2 * dims[0] * dims[1] * dims[2] );
    // start thread:
    int res = pthread_create( &pthread[thread], NULL, ReadFilesThread, &params[thread]);
    if( res )
      {
      std::cerr << "Unable to start a new thread, pthread returned: " << res << std::endl;
      assert(0);
      }
    //ShowFilenames(params[thread]);
    }
// DEBUG
  size_t total = 0;
  for (unsigned int thread=0; thread < nthreads; ++thread)
    {
    total += params[thread].nfiles;
    }
  assert( total == nfiles );
// END DEBUG
  for (unsigned int thread=0;thread<nthreads;thread++)
    {
    pthread_join( pthread[thread], NULL);
    }
  delete[] pthread;
  //pthread_mutex_destroy(&lock);
  // For some reason writing down the file is painfully slow...
  vtkStructuredPointsWriter *writer = vtkStructuredPointsWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
  writer->SetInputData( output );
#else
  writer->SetInput( output );
#endif
  writer->SetFileName( "/tmp/threadgdcm.vtk" );
  writer->SetFileTypeToBinary();
  //writer->Write();
  writer->Delete();
  //output->Print( std::cout );
  output->Delete();
}
int main(int argc, char *argv[])
{
  if( argc < 2 )
    {
    std::cerr << argv[0] << " [directory|list of filenames]\n";
    return 1;
    }
  // Check if user pass in a single directory
  if( argc == 2 && gdcm::System::FileIsDirectory( argv[1] ) )
    {
    gdcm::Directory d;
    d.Load( argv[1] );
    gdcm::Directory::FilenamesType l = d.GetFilenames();
    const size_t nfiles = l.size();
    const char **filenames = new const char* [ nfiles ];
    for(unsigned int i = 0; i < nfiles; ++i)
      {
      filenames[i] = l[i].c_str();
      }
    ReadFiles(nfiles, filenames);
    delete[] filenames;
    }
  else
```

```
    {
    // Simply copy all filenames into the vector:
    const char **filenames = const_cast<const char**>(argv+1);
    const size_t nfiles = argc - 1;
    ReadFiles(nfiles, filenames);
    }
  return 0;
}
```

12.166 AWTMedical3.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
package examples;
import vtk.*;
//import gdcm.*;
import vtk.util.VtkPanelContainer;
import vtk.util.VtkPanelUtil;
import vtk.util.VtkUtil;
import java.util.ArrayList;
import javax.swing.*;
import java.awt.*;
import java.io.File;
public class AWTMedical3  extends JComponent implements VtkPanelContainer {
  private vtkPanel renWin;
    vtkImageData ReadDataFile(File inSelectedFile){
        vtkImageData outImageData = null;
        Directory theDir = new Directory();
        String theInputDirectory = inSelectedFile.getPath();
        theDir.Load(theInputDirectory);
        Scanner theScanner = new Scanner();
        Tag theStudyTag = new Tag(0x0020,0x000d);
        Tag theSeriesTag = new Tag(0x0020,0x000e);
        theScanner.AddTag(theStudyTag);//get studies,
        theScanner.AddTag(theSeriesTag);//get studies,
        theScanner.Scan(theDir.GetFilenames());
        FilenamesType theStudyValues = theScanner.GetOrderedValues(theStudyTag);
        long theNumStudies = theStudyValues.size();
        //for now, take the first study, and nothing else.
        //and the return is actually not FilenamesType, just a
        //vector of strings
        if (theNumStudies != 1)
            return outImageData;
        String theStudyVal = theStudyValues.get(0);
        //now, get all the values from the scanner that are in that
        //study, then from that get their different series
        FilenamesType theFilenames =
                theScanner.GetAllFilenamesFromTagToValue(theStudyTag, theStudyVal);
        //from that set of filenames, isolate individual series
        //conclude that singleton series = RT struct (can do further
        //checking for things like MIPs and the like)
        //and multiple series entries = volumetric data
        theScanner.Scan(theFilenames);
        FilenamesType theSeriesValues = theScanner.GetOrderedValues(theSeriesTag);
        String studyUID = theScanner.GetValue(theScanner.GetFilenames().get(0), theStudyTag);
        long theNumSeries = theSeriesValues.size();
        for (int i = 0; i < theNumSeries; i++) {
            FilenamesType theSeriesFiles =
                theScanner.GetAllFilenamesFromTagToValue(theSeriesTag, theSeriesValues.get(i));
            long theNumFilesInSeries = theSeriesFiles.size();
            if (theNumFilesInSeries > 1) {//assume it's CT or volumetric data
                //for now, assume a single volume
                //could have multiples, like PET and CT
                IPPSorter sorter = new IPPSorter();
                sorter.SetComputeZSpacing(true);
                sorter.SetZSpacingTolerance(0.001);
```

```
                Boolean sorted = sorter.Sort(theSeriesFiles);
                if (!sorted){
                    //need some better way to handle failures here
                    return outImageData;
                }
                FilenamesType sortedFT = sorter.GetFilenames();
                long theSize = sortedFT.size();
                vtkStringArray sa = new vtkStringArray();
                ArrayList<String> theStrings = new ArrayList<String>();
                vtkGDCMImageReader gdcmReader = new vtkGDCMImageReader();
                for (int j = 0; j < theSize; j++) {
                    String theFileName = sortedFT.get(j);
                    if (gdcmReader.CanReadFile(theFileName) > 0){
                        theStrings.add(theFileName);
                        sa.InsertNextValue(theFileName);
                    } else {
                        //this is a busted series
                        //need some more appropriate error here
                        return outImageData;
                    }
                }
                gdcmReader.SetFileNames(sa);
                gdcmReader.Update();
                outImageData = gdcmReader.GetOutput();//the zeroth output should be the image
            }
        }
        String theImageInfo = "";
        if (outImageData != null){
            theImageInfo = outImageData.Print();
        }
        return outImageData;
    }
    //this function is a rewrite of Medical3 to see if data can
    //be loaded via gdcm easily
  public AWTMedical3(File inFile) {
    // Create the buttons.
    renWin = new vtkPanel();
    vtkImageData theImageData = ReadDataFile(inFile);
    // An isosurface, or contour value of 500 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter skinExtractor = new vtkContourFilter();
    skinExtractor.SetInput(theImageData);
    skinExtractor.SetValue(0, 500);
    vtkPolyDataNormals skinNormals = new vtkPolyDataNormals();
    skinNormals.SetInput(skinExtractor.GetOutput());
    skinNormals.SetFeatureAngle(60.0);
//        vtkStripper skinStripper = new vtkStripper();
//        skinStripper.SetInput(skinNormals.GetOutput());
    vtkPolyDataMapper skinMapper = new vtkPolyDataMapper();
    skinMapper.SetInput(skinNormals.GetOutput());
    skinMapper.ScalarVisibilityOff();
    vtkActor skin = new vtkActor();
    skin.SetMapper(skinMapper);
    skin.GetProperty().SetDiffuseColor(1, .49, .25);
    skin.GetProperty().SetSpecular(.3);
    skin.GetProperty().SetSpecularPower(20);
    // An isosurface, or contour value of 1150 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter boneExtractor = new vtkContourFilter();
    boneExtractor.SetInput(theImageData);
    boneExtractor.SetValue(0, 1150);
    vtkPolyDataNormals boneNormals = new vtkPolyDataNormals();
    boneNormals.SetInput(boneExtractor.GetOutput());
    boneNormals.SetFeatureAngle(60.0);
    vtkStripper boneStripper = new vtkStripper();
    boneStripper.SetInput(boneNormals.GetOutput());
    vtkPolyDataMapper boneMapper = new vtkPolyDataMapper();
    boneMapper.SetInput(boneStripper.GetOutput());
    boneMapper.ScalarVisibilityOff();
    vtkActor bone = new vtkActor();
    bone.SetMapper(boneMapper);
    bone.GetProperty().SetDiffuseColor(1, 1, .9412);
    // An outline provides context around the data.
    vtkOutlineFilter outlineData = new vtkOutlineFilter();
    outlineData.SetInput(theImageData);
```

```
vtkPolyDataMapper mapOutline = new vtkPolyDataMapper();
mapOutline.SetInput(outlineData.GetOutput());
vtkActor outline = new vtkActor();
outline.SetMapper(mapOutline);
outline.GetProperty().SetColor(0, 0, 0);
// Now we are creating three orthogonal planes passing through the
// volume. Each plane uses a different texture map and therefore has
// diferent coloration.
// Start by creatin a black/white lookup table.
vtkLookupTable bwLut = new vtkLookupTable();
bwLut.SetTableRange(0, 2000);
bwLut.SetSaturationRange(0, 0);
bwLut.SetHueRange(0, 0);
bwLut.SetValueRange(0, 1);
bwLut.Build();
// Now create a lookup table that consists of the full hue circle (from
// HSV);.
vtkLookupTable hueLut = new vtkLookupTable();
hueLut.SetTableRange(0, 2000);
hueLut.SetHueRange(0, 1);
hueLut.SetSaturationRange(1, 1);
hueLut.SetValueRange(1, 1);
hueLut.Build();
// Finally, create a lookup table with a single hue but having a range
// in the saturation of the hue.
vtkLookupTable satLut = new vtkLookupTable();
satLut.SetTableRange(0, 2000);
satLut.SetHueRange(.6, .6);
satLut.SetSaturationRange(0, 1);
satLut.SetValueRange(1, 1);
satLut.Build();
// Create the first of the three planes. The filter vtkImageMapToColors
// maps the data through the corresponding lookup table created above.
// The vtkImageActor is a type of vtkProp and conveniently displays an
// image on a single quadrilateral plane. It does this using texture
// mapping and as a result is quite fast. (Note: the input image has to
// be unsigned char values, which the vtkImageMapToColors produces.);
// Note also that by specifying the DisplayExtent, the pipeline
// requests data of this extent and the vtkImageMapToColors only
// processes a slice of data.
vtkImageMapToColors saggitalColors = new vtkImageMapToColors();
saggitalColors.SetInput(theImageData);
saggitalColors.SetLookupTable(bwLut);
vtkImageActor saggital = new vtkImageActor();
saggital.SetInput(saggitalColors.GetOutput());
saggital.SetDisplayExtent(32, 32, 0, 63, 0, 92);
// Create the second (axial); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors axialColors = new vtkImageMapToColors();
axialColors.SetInput(theImageData);
axialColors.SetLookupTable(hueLut);
vtkImageActor axial = new vtkImageActor();
axial.SetInput(axialColors.GetOutput());
axial.SetDisplayExtent(0, 63, 0, 63, 46, 46);
// Create the third (coronal); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors coronalColors = new vtkImageMapToColors();
coronalColors.SetInput(theImageData);
coronalColors.SetLookupTable(satLut);
vtkImageActor coronal = new vtkImageActor();
coronal.SetInput(coronalColors.GetOutput());
coronal.SetDisplayExtent(0, 63, 32, 32, 0, 92);
// It is convenient to create an initial view of the data. The FocalPoint
// and Position form a vector direction. Later on (ResetCamera() method)
// this vector is used to position the camera to look at the data in
// this direction.
vtkCamera aCamera = new vtkCamera();
aCamera.SetViewUp(0, 0, -1);
aCamera.SetPosition(0, 1, 0);
aCamera.SetFocalPoint(0, 0, 0);
aCamera.ComputeViewPlaneNormal();
// Actors are added to the renderer. An initial camera view is created.
// The Dolly() method moves the camera towards the FocalPoint,
// thereby enlarging the image.
renWin.GetRenderer().AddActor(saggital);
renWin.GetRenderer().AddActor(axial);
renWin.GetRenderer().AddActor(coronal);
renWin.GetRenderer().AddActor(outline);
renWin.GetRenderer().AddActor(skin);
renWin.GetRenderer().AddActor(bone);
// Turn off bone for this example.
```

```
    bone.VisibilityOff();
    // Set skin to semi-transparent.
    skin.GetProperty().SetOpacity(0.5);
    // An initial camera view is created.  The Dolly() method moves
    // the camera towards the FocalPoint, thereby enlarging the image.
    renWin.GetRenderer().SetActiveCamera(aCamera);
    renWin.GetRenderer().ResetCamera();
    aCamera.Dolly(1.5);
    // Set a background color for the renderer and set the size of the
    // render window (expressed in pixels).
    renWin.GetRenderer().SetBackground(1, 1, 1);
    VtkPanelUtil.setSize(renWin, 640, 480);
    // Note that when camera movement occurs (as it does in the Dolly()
    // method), the clipping planes often need adjusting. Clipping planes
    // consist of two planes: near and far along the view direction. The
    // near plane clips out objects in front of the plane the far plane
    // clips out objects behind the plane. This way only what is drawn
    // between the planes is actually rendered.
    renWin.GetRenderer().ResetCameraClippingRange();
    // Setup panel
    setLayout(new BorderLayout());
    add(renWin, BorderLayout.CENTER);
  }
  public vtkPanel getRenWin() {
    return renWin;
  }
  public static void main(String s[]) {
    if (s.length == 0){
      return; //need a filename here
    }
    File theFile = new File(s[0]);
    //File theFile = new
       File("/Users/mmroden/Documents/MVSDownloadDirectory/Documents/1.2.840.113704.1.111.3384.1271766367.5/");
    AWTMedical3 panel = new AWTMedical3(theFile);
    JFrame frame = new JFrame("AWTMedical3");
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    frame.getContentPane().add("Center", panel);
    frame.pack();
    frame.setVisible(true);
  }
}
```

12.167 HelloVTKWorld.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
// We are required to call the package 'vtk' eventhough I (MM) would have prefered
// an import statement along the line of:
// import vtkgdcm.*;
import vtk.*;
/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac HelloVTKWorld.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
       CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java HelloVTKWorld gdcmData/012345.002.050.dcm
       bla.dcm
 *
 */
public class HelloVTKWorld
{
  static {
    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
    System.loadLibrary("vtkIOJava");
```

```
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkgdcmJava");
    try {
      System.loadLibrary("vtkRenderingJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkHybrid, skipping...");
    }
    try {
      System.loadLibrary("vtkHybridJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkHybrid, skipping...");
    }
    try {
      System.loadLibrary("vtkVolumeRenderingJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkVolumeRendering, skipping...");
    }
  }
  public static void main(String[] args)
    {
    String filename = args[0];
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileName( filename );
    reader.Update();
    vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
    System.out.println( prop.GetPatientName() ); //
//    if( reader.GetImageFormat() == vtkgdcm.vtkgdcm.VTK_LUMINANCE ) // MONOCHROME2
//      {
//      System.out.println( "Image is MONOCHROME2" ); //
//      }
    // Just for fun, invert the direction cosines, output should reflect that:
    vtkMatrix4x4 dircos = reader.GetDirectionCosines();
    dircos.Invert();
    // We need to maintain in sync information stored in vtkMedicalImageProperties:
    double[] cosines = new double[6];
    cosines[0] = dircos.GetElement(0,0);
    cosines[1] = dircos.GetElement(1,0);
    cosines[2] = dircos.GetElement(2,0);
    cosines[3] = dircos.GetElement(0,1);
    cosines[4] = dircos.GetElement(1,1);
    cosines[5] = dircos.GetElement(2,1);
    reader.GetMedicalImageProperties().SetDirectionCosine( cosines );
    String outfilename = args[1];
    vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
    writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
    writer.SetDirectionCosines( dircos );
    writer.SetShift( reader.GetShift() );
    writer.SetScale( reader.GetScale() );
    writer.SetImageFormat( reader.GetImageFormat() );
    writer.SetFileName( outfilename );
    writer.SetInputConnection( reader.GetOutputPort() ); // new
    //writer.SetInput( reader.GetOutput() ); // old
    writer.Write();
    System.out.println("Success reading: " + filename );
    }
}
```

12.168 MIPViewer.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
import vtk.*;
import gdcm.*;
import java.io.File;
import java.awt.Canvas;
```

```
/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MIPViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
      CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MIPViewer BRAINX
 *
 */
public class MIPViewer extends Canvas
{
  static {
    // VTK
    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
    System.loadLibrary("vtkIOJava");
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkRenderingJava");
    System.loadLibrary("vtkVolumeRenderingJava"); // vtkSmartVolumeMapper
    System.loadLibrary("vtkWidgetsJava"); // vtkBoxWidget
    // VTK-GDCM
    System.loadLibrary("vtkgdcmJava");
  }
  static FilenamesType fns = new FilenamesType();
  protected native int Lock();
  protected native int UnLock();
  public static void process(String path)
    {
    fns.add( path );
    }
  // Process only files under dir
  public static void visitAllFiles(File dir)
    {
    if (dir.isDirectory())
      {
      String[] children = dir.list();
      for (int i=0; i<children.length; i++)
        {
        visitAllFiles(new File(dir, children[i]));
        }
      }
    else
      {
      process(dir.getPath());
      }
    }
  public static void main(String[] args) throws Exception
    {
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
      {
      return;
      }
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
      {
      throw new Exception("Could not scan");
      }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
      String f = sorted.get(i);
      files.InsertNextValue( f );
      }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value
    double[] spacing = reader.GetOutput().GetSpacing();
    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    // Create our volume and mapper
```

```
    vtkVolume volume = new vtkVolume();
    vtkSmartVolumeMapper mapper = new vtkSmartVolumeMapper();
    vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
    // Add a box widget if the clip option was selected
    vtkBoxWidget box = new vtkBoxWidget();
    box.SetInteractor(iren);
    box.SetPlaceFactor(1.01);
    box.SetInputConnection(change.GetOutputPort());
    //box.SetDefaultRenderer(renderer);
    box.InsideOutOn();
    box.PlaceWidget();
    //vtkBoxWidgetCallback callback = vtkBoxWidgetCallback::New();
    //callback.SetMapper(mapper);
    //box.AddObserver(vtkCommand::InteractionEvent, callback);
    //callback.Delete();
//    Lock();
//    box.EnabledOn();
//    UnLock();
    box.GetSelectedFaceProperty().SetOpacity(0.0);
    mapper.SetInputConnection( change.GetOutputPort() );
    // Create our transfer function
    vtkColorTransferFunction colorFun = new vtkColorTransferFunction();
    vtkPiecewiseFunction opacityFun = new vtkPiecewiseFunction();
    // Create the property and attach the transfer functions
    vtkVolumeProperty property = new vtkVolumeProperty();
    property.IndependentComponentsOn();
    property.SetColor( colorFun );
    property.SetScalarOpacity( opacityFun );
    property.SetInterpolationTypeToLinear();
    // connect up the volume to the property and the mapper
    volume.SetProperty( property );
    volume.SetMapper( mapper );
    vtkMedicalImageProperties medprop = reader.GetMedicalImageProperties();
    int n = medprop.GetNumberOfWindowLevelPresets();
    double opacityWindow = 4096;
    double opacityLevel = 2048;
    // Override default with value from DICOM files:
    for( int i = 0; i < n; ++i )
      {
      double wl[] = medprop.GetNthWindowLevelPreset(i);
      //System.out.println( "W/L: " + wl[0] + " " + wl[1] );
      opacityWindow = wl[0];
      opacityLevel  = wl[1];
      }
    colorFun.AddRGBSegment(0.0, 1.0, 1.0, 1.0, 255.0, 1.0, 1.0, 1.0 );
    opacityFun.AddSegment( opacityLevel - 0.5*opacityWindow, 0.0,
      opacityLevel + 0.5*opacityWindow, 1.0 );
    mapper.SetBlendModeToMaximumIntensity();
    // Create the RenderWindow, Renderer
    vtkRenderer ren1 = new vtkRenderer();
    vtkRenderWindow renWin = new vtkRenderWindow();
    renWin.AddRenderer(ren1);
    // Set the default window size
    renWin.SetSize(600,600);
    // Add the volume to the scene
    ren1.AddVolume( volume );
    ren1.ResetCamera();
    iren.SetRenderWindow( renWin );
    // interact with data
    renWin.Render();
    iren.Start();
    }
}
```

12.169 MPRViewer.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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```

```
=========================================================================*/
import vtk.*;
import gdcm.*;
import java.io.File;
/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MPRViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
      CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MPRViewer BRAINX
 *
 */
public class MPRViewer
{
  static {
    // VTK
    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
    System.loadLibrary("vtkIOJava");
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkRenderingJava");
    // VTK-GDCM
    System.loadLibrary("vtkgdcmJava");
  }
  static FilenamesType fns = new FilenamesType();
  public static void process(String path)
    {
    fns.add( path );
    }
  // Process only files under dir
  public static void visitAllFiles(File dir)
    {
    if (dir.isDirectory())
      {
      String[] children = dir.list();
      for (int i=0; i<children.length; i++)
        {
        visitAllFiles(new File(dir, children[i]));
        }
      }
    else
      {
      process(dir.getPath());
      }
    }
  public static void main(String[] args) throws Exception
    {
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
      {
      return;
      }
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
      {
      throw new Exception("Could not scan");
      }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
      String f = sorted.get(i);
      files.InsertNextValue( f );
      }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value
    double[] spacing = reader.GetOutput().GetSpacing();
    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
```

```
    // A simple vtkInteractorStyleImage example for
    // 3D image viewing with the vtkImageResliceMapper.
    //
    // Drag Left mouse button to window/level
    // Shift-Left drag to rotate (oblique slice)
    // Shift-Middle drag to slice through image
    // OR Ctrl-Right drag to slice through image
    // Create the RenderWindow, Renderer
    vtkRenderer ren1 = new vtkRenderer();
    vtkRenderWindow renWin = new vtkRenderWindow();
    renWin.AddRenderer(ren1);
    vtkImageResliceMapper im = new vtkImageResliceMapper();
    im.SetInputConnection(change.GetOutputPort());
    im.SliceFacesCameraOn();
    im.SliceAtFocalPointOn();
    im.BorderOff();
    vtkImageProperty ip = new vtkImageProperty();
    ip.SetColorWindow(2000);
    ip.SetColorLevel(1000);
    ip.SetAmbient(0.0);
    ip.SetDiffuse(1.0);
    ip.SetOpacity(1.0);
    ip.SetInterpolationTypeToLinear();
    vtkImageSlice ia = new vtkImageSlice();
    ia.SetMapper(im);
    ia.SetProperty(ip);
    ren1.AddViewProp(ia);
    ren1.SetBackground(0.1,0.2,0.4);
    renWin.SetSize(300,300);
    vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
    vtkInteractorStyleImage style = new vtkInteractorStyleImage();
    style.SetInteractionModeToImage3D();
    iren.SetInteractorStyle(style);
    renWin.SetInteractor(iren);
    // render the image
    renWin.Render();
    vtkCamera cam1 = ren1.GetActiveCamera();
    cam1.ParallelProjectionOn();
    ren1.ResetCameraClippingRange();
    renWin.Render();
    iren.Start();
    }
}
```

12.170 MPRViewer2.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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=========================================================================*/
import vtk.*;
import gdcm.*;
import java.io.File;
/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MPRViewer2.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
       CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MPRViewer2 BRAINX
 *
 */
public class MPRViewer2
{
  static {
    // VTK
    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
```

```
    System.loadLibrary("vtkIOJava");
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkRenderingJava");
    System.loadLibrary("vtkHybridJava");
    System.loadLibrary("vtkWidgetsJava");
    // VTK-GDCM
    System.loadLibrary("vtkgdcmJava");
  }
  static FilenamesType fns = new FilenamesType();
  public static void process(String path)
    {
    fns.add( path );
    }
  // Process only files under dir
  public static void visitAllFiles(File dir)
    {
    if (dir.isDirectory())
      {
      String[] children = dir.list();
      for (int i=0; i<children.length; i++)
        {
        visitAllFiles(new File(dir, children[i]));
        }
      }
    else
      {
      process(dir.getPath());
      }
    }
  public void dointer(vtkImagePlaneWidget  current_widget)
    {
    int cstat = current_widget.GetCursorDataStatus();
    double[] v = current_widget.GetCurrentCursorPosition();
    //System.out.println( cstat );
    //System.out.println( v[0] );
    //System.out.println( v[1] );
    //System.out.println( v[2] );
    planeWidgetX.SetSliceIndex( (int)v[0] );
    planeWidgetY.SetSliceIndex( (int)v[1] );
    planeWidgetZ.SetSliceIndex( (int)v[2] );
    planeWidgetX.GetCurrentRenderer().ResetCameraClippingRange();
    planeWidgetY.GetCurrentRenderer().ResetCameraClippingRange();
    planeWidgetZ.GetCurrentRenderer().ResetCameraClippingRange();
    }
  public void startinterX()
    {
    dointer( planeWidgetX );
    }
  public void interX()
    {
    dointer( planeWidgetX );
    }
  public void endinterX()
    {
    }
  public void startinterY()
    {
    dointer( planeWidgetY );
    }
  public void interY()
    {
    dointer( planeWidgetY );
    }
  public void endinterY()
    {
    }
  public void startinterZ()
    {
    dointer( planeWidgetZ );
    }
  public void interZ()
    {
    dointer( planeWidgetZ );
    }
  public void endinterZ()
    {
    //System.out.println( "endinter" );
    }
  public static void AlignCamera(int slice_number, vtkImagePlaneWidget current_widget)
    {
```

```
    vtkImageData image = (vtkImageData)current_widget.GetInput();
    vtkRenderer ren = current_widget.GetCurrentRenderer();
    double[] origin = image.GetOrigin();
    double ox = origin[0];
    double oy = origin[1];
    double oz = origin[2];
    int dims[] = image.GetDimensions();
    int xMin = 0;
    int xMax = 1;
    int yMin = 2;
    int yMax = dims[0]-1;
    int zMin = dims[1]-1;
    int zMax = dims[2]-1;
    double[] spacing = image.GetSpacing();
    double sx = spacing[0];
    double sy = spacing[1];
    double sz = spacing[2];
    double cx = ox+(0.5*(xMax-xMin))*sx;
    double cy = oy+(0.5*(yMax-yMin))*sy;
    double cz = oy+(0.5*(zMax-zMin))*sz;
    double vx = 0, vy = 0, vz = 0;
    double nx = 0, ny = 0, nz = 0;
    int iaxis = current_widget.GetPlaneOrientation();
    if ( iaxis == 0 ) {
      vz = -1;
      nx = ox + xMax*sx;
      cx = ox + slice_number*sx;
      }
    else if ( iaxis == 1 ) {
      vz = -1;
      ny = oy+yMax*sy;
      cy = oy+slice_number*sy;
      }
    else {
      vy = 1;
      nz = oz+zMax*sz;
      cz = oz+slice_number*sz;
    }
    double px = cx+nx*2;
    double py = cy+ny*2;
    double pz = cz+nz*3;
    vtkCamera camera = ren.GetActiveCamera();
    camera.SetViewUp(vx, vy, vz);
    camera.SetFocalPoint(cx, cy, cz);
    camera.SetPosition(px, py, pz);
    camera.OrthogonalizeViewUp();
    ren.ResetCameraClippingRange();
    }
  private vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
  private vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
  private vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();
  public void config()
    {
    //System.out.println( "config" );
    planeWidgetX.GetCurrentRenderer().ResetCamera();
    planeWidgetY.GetCurrentRenderer().ResetCamera();
    planeWidgetZ.GetCurrentRenderer().ResetCamera();
    }
  public void Run(String dirname)
    {
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
      {
      //throw new Exception("Could not scan");
      }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
      String f = sorted.get(i);
      files.InsertNextValue( f );
      }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
```

```
reader.Update(); // get spacing value
double[] spacing = reader.GetOutput().GetSpacing();
vtkImageChangeInformation change = new vtkImageChangeInformation();
change.SetInputConnection( reader.GetOutputPort() );
change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
change.Update();
System.out.println( change.GetOutput().toString() );
vtkRenderer ren1 = new vtkRenderer();
ren1.SetViewport(0., 0., 0.333, 1);
ren1.SetBackground(0.1,0.2,0.4);
vtkRenderer ren2 = new vtkRenderer();
ren2.SetViewport(0.333, 0., 0.667, 1);
ren2.SetBackground(0.1,0.2,0.4);
vtkRenderer ren3 = new vtkRenderer();
ren3.SetViewport(0.667, 0., 1., 1.);
ren3.SetBackground(0.1,0.2,0.4);
vtkRenderWindow renWin = new vtkRenderWindow();
renWin.AddRenderer(ren1);
renWin.AddRenderer(ren2);
renWin.AddRenderer(ren3);
vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
iren.SetRenderWindow(renWin);
vtkInteractorStyleImage style = new vtkInteractorStyleImage();
iren.SetInteractorStyle( style );
vtkCellPicker picker = new vtkCellPicker();
picker.SetTolerance(0.005);
vtkProperty ipwProp = new vtkProperty();
//vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
planeWidgetX.SetInteractor(iren);
planeWidgetX.SetCurrentRenderer(ren1);
planeWidgetX.SetDefaultRenderer(ren1);
planeWidgetX.RestrictPlaneToVolumeOn();
planeWidgetX.SetTexturePlaneProperty(ipwProp);
//planeWidgetX.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetX.TextureInterpolateOff();
//planeWidgetX.SetResliceInterpolateToNearestNeighbour();
planeWidgetX.SetInputConnection(change.GetOutputPort());
planeWidgetX.SetPlaneOrientationToXAxes();
planeWidgetX.SetSliceIndex(62);
planeWidgetX.SetPicker(picker);
planeWidgetX.SetKeyPressActivationValue('x');
planeWidgetX.On();
planeWidgetX.InteractionOn();
//vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
planeWidgetY.SetInteractor(iren);
planeWidgetY.SetCurrentRenderer(ren2);
planeWidgetY.SetDefaultRenderer(ren2);
planeWidgetY.RestrictPlaneToVolumeOn();
planeWidgetY.SetTexturePlaneProperty(ipwProp);
//planeWidgetY.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetY.TextureInterpolateOff();
//planeWidgetY.SetResliceInterpolateToNearestNeighbour();
planeWidgetY.SetInputConnection(change.GetOutputPort());
planeWidgetY.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetY.SetPlaneOrientationToYAxes();
planeWidgetY.SetSliceIndex(32);
planeWidgetY.SetPicker(picker);
planeWidgetY.SetKeyPressActivationValue('y');
planeWidgetY.On();
//vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();
planeWidgetZ.SetInteractor(iren);
planeWidgetZ.SetCurrentRenderer(ren3);
planeWidgetZ.SetDefaultRenderer(ren3);
planeWidgetZ.RestrictPlaneToVolumeOn();
planeWidgetZ.SetTexturePlaneProperty(ipwProp);
//planeWidgetZ.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetZ.TextureInterpolateOff();
//planeWidgetZ.SetResliceInterpolateToNearestNeighbour();
planeWidgetZ.SetInputConnection(change.GetOutputPort());
planeWidgetZ.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetZ.SetPlaneOrientationToZAxes();
planeWidgetZ.SetSliceIndex(32);
planeWidgetZ.SetPicker(picker);
planeWidgetZ.SetKeyPressActivationValue('z');
planeWidgetZ.On();
iren.Initialize();
renWin.Render();
AlignCamera(52, planeWidgetX);
AlignCamera(32, planeWidgetY);
AlignCamera(32, planeWidgetZ);
planeWidgetX.GetCurrentRenderer().ResetCamera();
```

```
    planeWidgetY.GetCurrentRenderer().ResetCamera();
    planeWidgetZ.GetCurrentRenderer().ResetCamera();
    renWin.Render();
    planeWidgetX.AddObserver("StartInteractionEvent", this,"startinterX");
    planeWidgetX.AddObserver("InteractionEvent", this,"interX");
    planeWidgetX.AddObserver("EndInteractionEvent", this,"endinterX");
    planeWidgetY.AddObserver("StartInteractionEvent", this,"startinterY");
    planeWidgetY.AddObserver("InteractionEvent", this,"interY");
    planeWidgetY.AddObserver("EndInteractionEvent", this,"endinterY");
    planeWidgetZ.AddObserver("StartInteractionEvent", this,"startinterZ");
    planeWidgetZ.AddObserver("InteractionEvent", this,"interZ");
    planeWidgetZ.AddObserver("EndInteractionEvent", this,"endinterZ");
    iren.AddObserver("ConfigureEvent", this,"config");
    iren.Start();
    }
  public static void main(String[] args) throws Exception
    {
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
      {
      return;
      }
    MPRViewer2 me = new MPRViewer2();
    me.Run( dirname );
    }
}
```

12.171 ReadSeriesIntoVTK.java

```
/*=========================================================================

  Program: GDCM (Grassroots DICOM). A DICOM library

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     This software is distributed WITHOUT ANY WARRANTY; without even
     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
     PURPOSE.  See the above copyright notice for more information.

=========================================================================*/
// We are required to call the package 'vtk' eventhough I (MM) would have prefered
// an import statement along the line of:
// import vtkgdcm.*;
import vtk.*;
/*
 * Usage:
 * export LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:.
 * java -classpath `pwd`/vtkgdcm.jar:/usr/share/java/vtk.jar:. ReadSeriesIntoVTK
 */
public class ReadSeriesIntoVTK
{
  static {
    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
    System.loadLibrary("vtkIOJava");
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkgdcmJava");
    try {
      System.loadLibrary("vtkRenderingJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkHybrid, skipping...");
    }
    try {
      System.loadLibrary("vtkHybridJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkHybrid, skipping...");
    }
    try {
      System.loadLibrary("vtkVolumeRenderingJava");
    } catch (Throwable e) {
      System.out.println("cannot load vtkVolumeRendering, skipping...");
    }
  }
  public static void main(String[] args)
```

```
    {
    vtkFileOutputWindow outWin = new vtkFileOutputWindow();
    outWin.SetInstance(outWin);
    outWin.SetFileName("MVSVTKViewer.log");
    // See: http://review.source.kitware.com/#change,888
    // vtkWrapJava does not handle static keyword
    // String directory = vtkGDCMTesting.GetGDCMDataRoot();
    vtkGDCMTesting t = new vtkGDCMTesting();
    String directory = t.GetGDCMDataRoot();
    String file0 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm";
    String file1 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm";
    String file2 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm";
    String file3 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm";
    vtkStringArray s = new vtkStringArray();
    System.out.println("adding : " + file0 );
    s.InsertNextValue( file0 );
    s.InsertNextValue( file1 );
    s.InsertNextValue( file2 );
    s.InsertNextValue( file3 );
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( s );
    reader.Update();
    System.out.println("Success reading: " + file0 );
    vtkMetaImageWriter writer = new vtkMetaImageWriter();
    writer.DebugOn();
    writer.SetCompression( false );
    writer.SetInputConnection( reader.GetOutputPort() );
    writer.SetFileName( "ReadSeriesIntoVTK.mhd" );
    writer.Write();
    System.out.println("Success writing: " + writer.GetFileName() );
    }
}
```

12.172 CastConvertPhilips.py

```
1
14
15 """
16 Usage:
17
18  python --public /path/to/directory/
19 or
20  python --private /path/to/directory/
21
22  python --public --extension bak /path/to/directory/
23
24 rename -f 's/\.bak$//' *.bak
25
26 TODO:
27 http://docs.python.org/library/optparse.html#module-optparse
28 """
29
30 import vtkgdcm
31 import vtk
32 import sys
33 import gdcm
34
35 def ProcessOneFilePublic(filename, outfilename, tmpfile):
36   gdcm.ImageHelper.SetForceRescaleInterceptSlope(True)
37   vtkreader = vtkgdcm.vtkGDCMImageReader()
38   vtkreader.SetFileName( filename )
39   vtkreader.Update()
40
41   cast = vtk.vtkImageCast()
42   cast.SetInput( vtkreader.GetOutput() )
43   cast.SetOutputScalarTypeToUnsignedShort()
44
45   # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
46   # Some operation will actually be discarded (we simply need a temp storage)
47   vtkwriter = vtkgdcm.vtkGDCMImageWriter()
48   vtkwriter.SetFileName( tmpfile )
49   vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
50   vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
51   print "Format:",vtkreader.GetImageFormat()
52   vtkwriter.SetImageFormat( vtkreader.GetImageFormat() )
53   vtkwriter.SetInput( cast.GetOutput() )
54   #vtkwriter.Update()
```

```
55   vtkwriter.Write()
56
57   # ok now rewrite the exact same file as the original (keep all info)
58   # but use the Pixel Data Element from the written file
59   tmpreader = gdcm.ImageReader()
60   tmpreader.SetFileName( tmpfile )
61   if not tmpreader.Read():
62     sys.exit(1)
63
64   reader = gdcm.Reader()
65   reader.SetFileName( filename )
66   if not reader.Read():
67     sys.exit(1)
68
69   # Make sure to remove Slope/Rescale to avoid re-execution
70   ds = reader.GetFile().GetDataSet()
71   tags = [
72     gdcm.Tag(0x0028,0x1052),
73     gdcm.Tag(0x0028,0x1053),
74     gdcm.Tag(0x0028,0x1053),
75   ]
76   for tag in tags:
77     ds.Remove( tag )
78
79   writer = gdcm.ImageWriter()
80   writer.SetFileName( outfilename )
81   # Pass image from vtk written file
82   writer.SetImage( tmpreader.GetImage() )
83   # pass dataset from initial 'reader'
84   writer.SetFile( reader.GetFile() )
85   if not writer.Write():
86     sys.exit(1)
87
88 def ProcessOneFilePrivate(filename, outfilename, tmpfile):
89   vtkreader = vtkgdcm.vtkGDCMImageReader()
90   vtkreader.SetFileName( filename )
91   vtkreader.Update()
92
93
94   # (2005,1409)     DS      4       0.0
95   # (2005,140a)     DS      16      1.52283272283272
96
97   # (2005,0014)     LO      26      Philips MR Imaging DD 005
98   tag1 = gdcm.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
99   tag2 = gdcm.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
100
101
102
103    # Need to access some private tags, reread the file (for now):
104    reader = gdcm.Reader()
105    reader.SetFileName( filename )
106    if not reader.Read():
107      sys.exit(1)
108
109    ds = reader.GetFile().GetDataSet()
110
111    el1 = ds.GetDataElement( tag1 )
112    el2 = ds.GetDataElement( tag2 )
113
114
115    #pf = gdcm.PythonFilter()
116    #pf.SetFile( reader.GetFile() )
117    #print el1.GetTag()
118
119    print el1.GetByteValue()
120    v1 = eval(el1.GetByteValue().GetBuffer())
121    print el2.GetByteValue()
122    v2 = eval(el2.GetByteValue().GetBuffer())
123
124    print v1
125    shift = v1
126    print v2
127    scale = v2
128
129    ss = vtk.vtkImageShiftScale()
130    ss.SetInput( vtkreader.GetOutput() )
131    # because VTK image shift / scale convention is inverted from DICOM make sure shift is 0
132    assert shift == 0
133    ss.SetShift( shift )
134    ss.SetScale( scale )
135    ss.SetOutputScalarTypeToUnsignedShort ()
```

```
136   ss.Update()
137
138   # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
139   # Some operation will actually be discarded (we simply need a temp storage)
140   vtkwriter = vtkgdcm.vtkGDCMImageWriter()
141   vtkwriter.SetFileName( tmpfile )
142   vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
143   vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
144   vtkwriter.SetImageFormat( reader.GetImageFormat() )
145   # do not pass shift/scale again
146   vtkwriter.SetInput( ss.GetOutput() )
147   #vtkwriter.Update()
148   vtkwriter.Write()
149
150   # ok now rewrite the exact same file as the original (keep all info)
151   # but use the Pixel Data Element from the written file
152   tmpreader = gdcm.ImageReader()
153   tmpreader.SetFileName( tmpfile )
154   if not tmpreader.Read():
155     sys.exit(1)
156
157   writer = gdcm.ImageWriter()
158   writer.SetFileName( outfilename )
159   # Pass image from vtk written file
160   writer.SetImage( tmpreader.GetImage() )
161   # pass dataset from initial 'reader'
162   writer.SetFile( reader.GetFile() )
163   if not writer.Write():
164     sys.exit(1)
165
166 if __name__ == "__main__":
167
168   gdcm.Trace.DebugOff()
169   gdcm.Trace.WarningOff()
170   #filename = sys.argv[1]
171   #outfilename = sys.argv[2]
172   tmpfile = "/tmp/philips_rescaled.dcm"
173   #ProcessOneFile( filename, outfilename, tmpfile )
174   rescaletype = sys.argv[1]
175   assert rescaletype == "--public" or rescaletype == "--private"
176   dirname = sys.argv[2]
177   d = gdcm.Directory()
178   d.Load( dirname )
179
180   for f in d.GetFilenames():
181     #print f
182     ProcessOneFilePublic( f, f + ".bak", tmpfile )
183
184
185 print "success"
```

12.173 headsq2dcm.py

```
1
14
15 """
16 Usage:
17  python headsq2dcm.py -D /path/to/VTKData
18 """
19
20 import vtk
21 import vtkgdcm
22 from vtk.util.misc import vtkGetDataRoot
23 VTK_DATA_ROOT = vtkGetDataRoot()
24
25 reader = vtk.vtkVolume16Reader()
26 reader.SetDataDimensions(64, 64)
27 reader.SetDataByteOrderToLittleEndian()
28 reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter")
29 reader.SetImageRange(1, 93)
30 reader.SetDataSpacing(3.2, 3.2, 1.5)
31
32 cast = vtk.vtkImageCast()
33 cast.SetInput( reader.GetOutput() )
34 cast.SetOutputScalarTypeToUnsignedChar()
35
36 # By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
```

```
writer = vtkgdcm.vtkGDCMImageWriter()
writer.SetFileName( "headsq.dcm" )
writer.SetInput( reader.GetOutput() )
# cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
#writer.SetInput( cast.GetOutput() )
writer.SetFileDimensionality( 3 )
writer.Write()
```

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