Section name references in LaTeX*

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https://github.com/latex3/hyperref/issues

2022-05-17

Documentation overview for hyperref

The documentation for package hyperref consists of several files:

Manual The **USER MANUAL** (also available as HTML).

ChangeLog This file records the version history.

Bookmark talk, slides Slides for the talk "PDF information and navigation elements with hyperref, pdfTeX and thumbpdf" at EuroTeX 1999.

Bookmark talk, paper The paper version of the talk.

Source code documentation:

hyperref.dtx This is the source code documentation for hyperref.

backref.dtx "Back referencing from bibliographical citations"

☞ **nameref.dtx** "Section name references in LaTeX" (this file)

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*This file has version number v2.50, last revised 2022-05-17.

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1 Introduction

Cross-referencing to include the *name* of the section, rather than just the number or page. This works by redefining some of the inside LaTeX macros, so it is vulnerable to future changes.

2 Background and advice for package and class authors

The package redefines the `\label` command to write additionally `\@currentlabelname` to the `.aux` file. This can then be referenced with `\nameref`. Package authors who want to support nameref should define this command (locally) in a suitable way. The content should be so that it can be safely written to the `.aux` file. nameref itself uses the package gettitlestring but this is not required.

nameref patches a number of commands (mostly sectioning commands) and environments so that they store `\@currentlabelname`. A class or a package that want to provide native support instead can suppress this patches by defining commands described below. The commands must be defined before the patch is made, in most cases before nameref is loaded, sometimes only before begin document.

sectioning commands Redefined are

- `\@sect`: beside adding a command that stores the title of a sectioning command (if present the optional argument is used) nameref also stores the level number in a counter `section@level` (reason is unknown, only two packages, e-french and pdfscreen seem to use it), and surrounds the text with `\Sectionformat` (only used by acmart, memoir, pdfscreen, pdfslide), a command which takes two argument: the first the text, the second the level.
- `\@ssect`: command to store the title added, `\Sectionformat` is added.
- `\M@sect` (memoir class): command to store the title added
- `\@part`, `\@spart`, `\@chapter`, `\@schapter`: command to store the title added
- `\ttl@sect@i` (from the titlesec package): command to store the title added

All the patches excepted the last are disabled if the command `\NR@nopatch@sectioning` is defined (the actual definition is irrelevant, only existence is tested. The titlesec patch is disabled if `\NR@nopatch@titlesec` is defined. This currently only suppress the actual patches, the counter, `\Sectionformat` and also the internal copies `\NR@sect` etc are still defined.

captions The following commands are patched

- `\@caption`: command to store the title added. This is done at begin document, but only if hyperref is not detected. With hyperref the patch is done there (and must be disabled in hyperref).

  This patch can be disabled by defining `\NR@nopatch@caption`
- `\LT@c@ption` (from the longtable package): command to store the title added.

  This patch can be disabled by defining `\NR@nopatch@longtable`
- `\lst@MakeCaption` (from the listings package)

  This patch can be disabled by defining `\NR@nopatch@listings`

lists The following command is patched

- `\descriptionlabel`: command to store the label text added. To reference this text the `\label` must be put *inside* the label. This is not compatible with the enumitem package as internal formatting commands are written to the `.aux` file too.

  This patch can be disabled by defining `\NR@nopatch@lists`

theorems

- `\@opargbegintheorem`: command to store the title added.

  This patch can be disabled by defining `\NR@nopatch@theorem`
- `\@begintheorem` (if amsthm is loaded and if the command has a tested meaning): command to store the title added.

  This patch can be disabled by defining `\NR@nopatch@amsthm`

beamer In the beamer class the following commands are patched: `\beamer@section`, `\beamer@subsection`, `\beamer@subsubsection`, `\beamer@descriptionitem` and the template `theorem begin`. If `\NR@nopatch@beamer` is defined nothing is done.

3 History

Sebastian Rahtz, for Lou Burnard, March 15th 1994;
SPQR CERN July 1994;
Last mod. Sept. 3th MG;
Sept. 19th SPQR;
April 11th 1995 SPQR (added section formatting hook);
April 14th 1995 SPQR (compatibility with hyperref);
June 22 1995 SPQR (removed typeout from Sectionformat);
September 22 1997 added varioref hacks by Corey Minyard;
September 28th changes by David Carlisle.
More recent changes are recorded in ChangeLog.

The versions before 2009/11/27 v2.32 did not expand the title strings (of `\section`, `\caption`, …). Then the behaviour switched to expanding, because this allows to remove unwanted macros (`\label`, …). Despite this method is used in package titleref and class memoir, the first feedbacks let me conclude that this is not robust enough. Therefore I wrote package gettitlestring that uses the non-expanding method as default. It also allows me to use this package in package zref-titleref. See the package documentation of package gettitlestring how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

```
\usepackage{gettitlestring}
\GetTitleStringDisableCommands{%
  \let\mylabel\@gobble
  \renewcommand\myindex[2]{}%
}
```

4 Implementation

```
⟨*package⟩
\RequirePackage{refcount}[2006/02/12]
\RequirePackage{gettitlestring}[2009/12/18]
\RequirePackage{ltxcmds}[2009/12/12]
```

We redefine `\label` so that it also writes the name of the current section to the .aux file; if the name ends in a dot, we zap it. To allow for the hyperref package, also write fourth and fifth fields (empty by default; used for cross-ref name, and file).

`\NR@strip@period`

```
\def\NR@strip@period#1.\ltx@empty#2\@nil{#1}
```

`\strip@period` Macro `\strip@period` was removed in nameref 2012/07/28 v2.41 and reinserted in 2012/07/31 v2.42 for compatibilty reasons with package subfig.

```
\def\strip@period#1.\relax#2\@@@{#1}

\def\NR@sanitize@labelname{%
  \@onelevel@sanitize\@currentlabelname
  \edef\@currentlabelname{%
    \expandafter\NR@strip@period\@currentlabelname
    \ltx@empty.\ltx@empty\@nil
  }%
}
```

4.1 `\label` stuff

Here is tested, whether package showkeys is loaded. But if option final is used, the macros of showkeys are not defined, so we have to check an additional test.

`\ifNR@showkeys`

```
\newif\ifNR@showkeys
\NR@showkeysfalse
\@ifpackageloaded{showkeys}{%
  \begingroup
```

```
    \@ifundefined{SK@@label}{%
    }{%
      \global\NR@showkeystrue
    }%
  \endgroup
}{}
```

`\label@hook`

```
\providecommand*{\label@hook}{}
\ltx@GlobalAppendToMacro{\label@hook}{%
  \NR@sanitize@labelname
}
```

`\label`

```
\def\label#1{%
  \@bsphack
  \begingroup
    \def\label@name{#1}%
    \label@hook
    \protected@write\@auxout{}{%
      \string\newlabel{#1}{%
        {\@currentlabel}%
        {\thepage}%
        {\@currentlabelname}%
        {\@currentHref}{}%
      }%
    }%
  \endgroup
  \@esphack
}%
\ifNR@showkeys
  \def\label#1{%
    \@bsphack
    \SK@\SK@@label{#1}%
    \begingroup
      \def\label@name{#1}%
      \label@hook
      \protected@write\@auxout{}{%
        \string\newlabel{#1}{%
          {\@currentlabel}%
          {\thepage}%
          {\@currentlabelname}%
          {\@currentHref}{}%
        }%
      }%
    \endgroup
    \@esphack
  }%
\fi
```

`\ltx@label`

```
\let\ltx@label\label
```

Needed for the *subeqnarray* package.

\slabel

```
\@ifundefined{slabel}{}{%
  \def\slabel#1{%
    \@bsphack
    \if@filesw
      \begingroup
        \def\label@name{#1}%
        \label@hook
        \let\thepage\relax
        \def\protect{\noexpand\noexpand\noexpand}%
        \edef\@tempa{%
          \write\@auxout{%
            \string\newlabel{#1}{%
              {\thesubequation}%
              {\thepage}%
              {\@currentlabelname}%
              {\@currentHref}{}%
            }%
          }%
        }%
      \expandafter\endgroup
      \@tempa
      \if@nobreak\ifvmode\nobreak\fi\fi
    \fi
    \@esphack
  }%
}
```

Overload an AMS LaTeX command, which uses `\newlabel`. Sigh!

\@writetocindents@

```
\def\@writetocindents@{%
  \begingroup
  \@for\@tempa:=-1,0,1,2,3\do{%
    \immediate\write\@auxout{%
      \string\newlabel{tocindent\@tempa}{%
        \csname r@tocindent\@tempa\endcsname{}{}{}{}%
      }%
    }%
  }%
  \endgroup
}
```

4.2 Changes of section macros

Add to the underlying section heading macros so that they note the section name for use by label.

If a section heading or the like has a `\label` in it, we need to extract it, or subsequent processing breaks.

\NR@gettitle

```
\def\NR@gettitle#1{%
  \GetTitleString{#1}%
  \let\@currentlabelname\GetTitleStringResult
```

```
}
```

First the numbered sections. While we are about it, put in a useful section formatting macro.

\NR@sect

```
\let\NR@sect\@sect
\newcounter{section@level}
```

\@sect

```
\@ifundefined{NR@nopatch@sectioning}
 {\def\@sect#1#2#3#4#5#6[#7]#8{%
   \setcounter{section@level}{#2}%
   \NR@gettitle{#7}%
   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]{\Sectionformat{#8}{#2}}%
 }}{}
```

and now the unnumbered ones

\NR@ssect

```
\let\NR@ssect\@ssect
```

\@ssect

```
\@ifundefined{NR@nopatch@sectioning}
 {\def\@ssect#1#2#3#4#5{%
   \NR@gettitle{#5}%
   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
 }}{}
```

Support for class memoir.

```
\@ifundefined{NR@nopatch@sectioning}
 {\ltx@IfUndefined{ifheadnameref}{%
  }{%
    \ltx@IfUndefined{M@sect}{%
    }{%
      \let\NRorg@M@sect\M@sect
      \def\M@sect#1#2#3#4#5#6[#7][#8]{%
        \ifheadnameref
          \NR@gettitle{#8}%
        \else
          \NR@gettitle{#7}%
        \fi
        \NRorg@M@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}][{#8}]%
      }%
    }%
  }}{}
```

Parts and chapters are treated differently. sigh. `\@part` and `\@spart` are `\long` because of class memoir.

```
\let\NR@part\@part
\let\NR@spart\@spart
\let\NR@chapter\@chapter
\let\NR@schapter\@schapter
```

```
\@ifundefined{NR@nopatch@sectioning}
 {%
  \long\def\@part[#1]#2{%
    \NR@gettitle{#1}%
    \NR@part[{#1}]{#2}%
  }
  \long\def\@spart#1{%
    \NR@gettitle{#1}%
    \NR@spart{#1}%
  }
  \def\@chapter[#1]#2{%
    \NR@gettitle{#1}%
    \NR@chapter[{#1}]{#2}%
  }
  \@ifclassloaded{memoir}{%
    \ltx@IfUndefined{ifheadnameref}{%
    }{%
      \def\@chapter[#1]#2{%
        \ltx@IfUndefined{ch@pt@c}{%
          \NR@gettitle{#1}%
        }{%
          \ifx\ch@pt@c\ltx@empty
            \NR@gettitle{#2}%
          \else
            \def\NR@temp{#1}%
            \ifx\NR@temp\ltx@empty
              \expandafter\NR@gettitle\expandafter{\ch@pt@c}%
            \else
              \ifheadnameref
                \NR@gettitle{#1}%
              \else
                \expandafter\NR@gettitle\expandafter{\ch@pt@c}%
              \fi
            \fi
          \fi
        }%
        \NR@chapter[{#1}]{#2}%
      }%
    }%
  }{}
  \def\@schapter#1{%
    \NR@gettitle{#1}%
    \NR@schapter{#1}%
  }}{}
```

Captions

```
\AtBeginDocument{%
  \@ifpackageloaded{hyperref}{}
  {%
    \@ifundefined{NR@nopatch@caption}
     {\let\NR@@caption\@caption
      \long\def\@caption#1[#2]{%
      \NR@gettitle{#2}%
      \NR@@caption{#1}[{#2}]%
```

```
      }}%
    {}%
}%
\@ifpackageloaded{longtable}{%
 \@ifundefined{NR@nopatch@longtable}
  {%
    \let\NRorg@LT@c@ption\LT@c@ption
    \def\LT@c@ption#1[#2]#3{%
     \NRorg@LT@c@ption{#1}[{#2}]{#3}%
     \def\@tempa{#2}%
     \ifx\@tempa\@empty
     \else
      \NR@gettitle{#2}%
     \fi
    }%
  }{}%
}{}%
```

Environment ‘description’.

```
\ltx@IfUndefined{descriptionlabel}{%
}{%
  \@ifundefined{NR@nopatch@longtable}
   {\let\NRorg@descriptionlabel\descriptionlabel
    \def\descriptionlabel#1{%
     \NR@gettitle{#1}%
     \NRorg@descriptionlabel{#1}%
     }%
   }{}%
}%
}
```

Compatibility for package titlesec.

```
\AtBeginDocument{%
  \@ifpackageloaded{titlesec}{%
    \let\NRorg@ttl@sect@i\ttl@sect@i
    \@ifundefined{NR@nopatch@titlesec}
     {%
       \def\ttl@sect@i#1#2[#3]#4{%
         \NR@gettitle{#4}%
         \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
         }%
      }{}%
  }{}%
}
```

4.2.1 Class beamer

```
\@ifclassloaded{beamer}{%
 \@ifclasslater{beamer}{2022-05-17}
  {}%do nothing
  {%
    \@ifundefined{NR@nopatch@beamer}
    {%
      \def\NR@PatchBeamer#1{%
```

```
        \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
                        \csname beamer@#1\endcsname
        \begingroup
          \edef\x{\endgroup
            \long\def\expandafter\noexpand\csname beamer@#1\endcsname
                [####1]{% hash-ok
              \noexpand\NR@gettitle{####1}%
              \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
              [{####1}]%
            }%
          }%
          \x
      }%
      \AddToHook{class/beamer/after}{%
      \NR@PatchBeamer{section}%
      \NR@PatchBeamer{subsection}%
      \NR@PatchBeamer{subsubsection}%
```

Theorem names.

```
      \addtobeamertemplate{theorem begin}{%
       \expandafter\NR@gettitle\expandafter{\inserttheoremaddition}%
      }{}%
      \@ifdefinable{\NRorg@beamer@descriptionitem}{%
        \let\NRorg@beamer@descriptionitem\beamer@descriptionitem
        \renewcommand{\beamer@descriptionitem}[1]{%
          \NR@gettitle{#1}%
          \NRorg@beamer@descriptionitem{#1}%
        }%
      }%
     }%Hook
   }{}%@ifundefined
  }%class later
 }{}
```

4.2.2 Theorems

```
\ltx@IfUndefined{@opargbegintheorem}{}{%
  \let\NRorg@opargbegintheorem\@opargbegintheorem
  \def\@opargbegintheorem#1#2#3{%
    \NR@gettitle{#3}%
    \NRorg@opargbegintheorem{#1}{#2}{#3}%
  }%
}
\AtBeginDocument{%
  \@ifpackageloaded{amsthm}{%
    \let\NRorg@begintheorem\@begintheorem
    \begingroup
      \edef\x{macro:\string#1\string#2[\string#3]}%
      \@onelevel@sanitize\x
      \def\y#1->#2\@nil{#1}%
      \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
      \@onelevel@sanitize\z
    \expandafter\endgroup
    \ifx\x\z
      \def\@begintheorem#1#2[#3]{%
```

```
        \NR@gettitle{#3}%
        \NRorg@begintheorem{#1}{#2}[{#3}]%
      }%
    \fi
  }{}%
}
```

4.3 Referencing stuff

We default the label and hypertext reference to be empty.

```
\providecommand*{\@currentlabelname}{}
\providecommand*{\@currentHref}{}
```

Since the second part of the preserved reference now has five parts (number, page, name, hypertext reference and file), we need extra utility macros:

`\@firstoffive`

```
\long\def\@firstoffive#1#2#3#4#5{#1}
```

`\@secondoffive`

```
\long\def\@secondoffive#1#2#3#4#5{#2}
```

`\@thirdoffive`

```
\long\def\@thirdoffive#1#2#3#4#5{#3}
```

`\@fourthoffive`

```
\long\def\@fourthoffive#1#2#3#4#5{#4}
```

`\@fifthoffive`

```
\long\def\@fifthoffive#1#2#3#4#5{#5}
```

We have to redefine `\ref`, `\Ref` and `\pageref` to know about extra reference elements. Make them robust, and compatible with Babel. We also define starred versions so that it doesn't depend on hyperref if they are defined or not. We use the same internal names as hyperref. The Babel switch is mimicked if not already defined. Some support for package showkeys is implemented. If option `notref` of that package is set, `\SK@ref` has the meaning of `\@empty`.

`\@safe@activestrue`

```
\providecommand*\@safe@activestrue{}%
```

`\@safe@activesfalse`

```
\providecommand*\@safe@activesfalse{}%
```

`\NR@ref@showkeys`

```
\newcommand\NR@ref@showkeys[1]{}%
```

`\NR@setref`

```
\def\NR@setref#1{%
  \begingroup
    \@safe@activestrue
    \expandafter
  \endgroup
  \expandafter\NR@@setref\csname r@#1\endcsname
}
```

\NR@@setref

```
\def\NR@@setref#1{%
  \ifx\@undefined#1%
    \let#1\relax
  \fi
  \@setref#1%
}
```

\T@ref

```
\def\T@ref#1{%
  \NR@ref@showkeys{#1}%
  \NR@setref{#1}\@firstoffive{#1}%
}%
```

\@refstar

```
\def\@refstar#1{%
  \NR@ref@showkeys{#1}%
  \NR@setref{#1}\@firstoffive{#1}%
}%
```

\T@pageref

```
\def\T@pageref#1{%
  \NR@ref@showkeys{#1}%
  \NR@setref{#1}\@secondoffive{#1}%
}%
```

\@pagerefstar

```
\def\@pagerefstar#1{%
  \NR@ref@showkeys{#1}%
  \NR@setref{#1}\@secondoffive{#1}%
}%
```

\T@Ref

```
\def\T@Ref#1{%
    \NR@ref@showkeys{#1}%
    \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
  }%
\def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
    \MakeUppercase#1%
  }%
```

\@Refstar

```
\def\@Refstar#1{%
    \NR@ref@showkeys{#1}%
    \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
  }%

\ifNR@showkeys
  \ifx\SK@ref\@empty
  \else
  \renewcommand\NR@ref@showkeys[1]{%
    \@safe@activestrue
    \SK@\SK@@ref{#1}%
```

```
    \@safe@activesfalse}
  \fi
\fi
```

Package hyperref uses the same definitions of `\ref`, `\Ref` and `\pageref` but has to redefine the non-starred command to add the hyperlink support. `\DeclareRobustCommand` is used by hyperref. Package `nameref` can be loaded before, after hyperref or after hyperref's definitions in `\AtBeginDocument`. We have to postpone the definition to `\AtBeginDocument` to avoid that showkeys overwrites them again.

```
\AddToHook{begindocument}{%
```

`\ref`

```
  \DeclareDocumentCommand\ref{s}
   {\IfBooleanTF{#1}{\@refstar}{\T@ref}}%
```

`\pageref`

```
  \DeclareDocumentCommand\pageref{s}
   {\IfBooleanTF{#1}{\@pagerefstar}{\T@pageref}}%
```

`\Ref`

```
  \DeclareDocumentCommand\Ref{s}
   {\IfBooleanTF{#1}{\@Refstar}{\T@Ref}}%

}
\DeclareHookRule{begindocument}{showkeys}{before}{nameref}
```

4.4 Usage and frontend

Access the (third) name part with `\nameref`;

`\T@nameref`

```
\def\T@nameref#1{%
  \NR@ref@showkeys{#1}%
  \begingroup
    \let\label\@gobble
    \NR@setref{#1}\@thirdoffive{#1}%
  \endgroup
}%
```

`\@namerefstar`

```
\def\@namerefstar#1{%
  \NR@ref@showkeys{#1}%
  \begingroup
    \let\label\@gobble
    \NR@setref{#1}\@thirdoffive{#1}%
  \endgroup
}%
```

`\nameref`

```
\@ifundefined{nameref}
  {
   \NewDocumentCommand\nameref{s}
```

```
    {\IfBooleanTF{#1}{\@namerefstar}{\T@nameref}}
  }
  {
    \PackageWarning{nameref}{Redefining \string\nameref}
    \RenewDocumentCommand\nameref{s}
    {\IfBooleanTF{#1}{\@namerefstar}{\T@nameref}}
  }
```

`\Nameref` An extended form which gives title and page number. Not really useful, quotes are english, and no starred version. varioref can do that better. Remove??

```
\def\Nameref#1{`\nameref{#1}' on page~\pageref{#1}}
```

`\Sectionformat` The default for `\Sectionformat`

```
\providecommand\Sectionformat[2]{#1}
```

4.5 Package ifthen support

Package ifthen's `\isodd` does not work with `\pageref` because of the extra link and the star form. Therefore we need an expandable variant.

Unfortunately there is no hook in `\ifthenelse` in order to provide expandable versions without link of `\ref` and `\pageref`. As possible target I could only find `\begingroup`: Changed/disabled 2022-04-13: ifthen takes care itself to change `\pageref` to an expandable version.

```
\@ifundefined{@kernel@pageref@exp}
   {\@ifpackageloaded{ifthen}{%
     \let\NROrg@ifthenelse\ifthenelse
     \def\ifthenelse{%
       \let\begingroup\NR@TE@begingroup
       \NROrg@ifthenelse
     }%
     \let\NROrg@begingroup\begingroup
     \def\NR@TE@begingroup{%
       \let\begingroup\NROrg@begingroup
       \begingroup
       \def\ref##1{\getrefbykeydefault{##1}{}{??}}%
       \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
     }%
   }{}}{}
```

4.6 Compatibility with varioref

[This section was derived by Corey Minyard `minyard@acm.org` from the varioref package] Changed in 2019-09-12 by Frank Mittelbach to adapt to changes in varioref

```
\AtBeginDocument{%
  \ifx\csname @@vpageref\endcsname\relax
  \else
```

This requires a varioref newer than 2019-09-12

```
    \let\NR@@vpageref\@@vpageref
    \def\@@vpageref#1[#2]#3{%
       \begingroup
         \csname @safe@activestrue\endcsname
```

```
410         \edef\x{#3}%
411         \@onelevel@sanitize\x
412         \toks@{%
413           \NR@@vpageref{#1}[{#2}]%
414         }%
415         \edef\x{\endgroup
416           \the\toks@{\x}%
417         }%
418       \x
419     }%
420     \DeclareRobustCommand\vnameref[1]{%
421       \unskip~\nameref{#1} %
422       \@vpageref[\unskip]{#1}%
423     }%
424   \fi
425 }
```

4.7 Support for package listings

```
426 \AtBeginDocument{%
427   \@ifpackageloaded{listings}{%
428     \@ifundefined{NR@nopatch@listings}
429      {%
430        \let\NROrg@lst@MakeCaption\lst@MakeCaption
431        \def\lst@MakeCaption{%
432          \ifx\lst@label\@empty
433          \else
434            \let\@currentlabelname\lst@@caption
435          \fi
436          \NROrg@lst@MakeCaption
437        }%
438       }{}%
439   }{}%
440 }
```

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