The tabularht package

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Abstract

This package defines some environments that adds a height specification to tabular and array.

Contents

[*] Please report any issues at https://github.com/ho-tex/oberdiek/issues

1 Usage

```
\usepackage{tabularht}
```

The package provides the following environments that extend the tabular/array environment by a height specification as first argument:

- `tabularht`, `tabularht*`
- `arrayht`
- `tabularhtx` (if package tabularx is loaded)

The height argument allows a length specification, package calc is supported if used. This means, the tabular will have the specified height. You can also use the prefixes `to=` and `spread=`. `to=` is the default, `spread=` means, the natural height of the tabular box is changed by the length after `spread=`.

Examples:

```
\begin{tabularht}{1in}          → height is 1in
\begin{tabularht}{to=1in}       → height is 1in
\begin{tabularht}{spread=0pt}  → natural height, same as \begin{tabular}
\begin{tabularht}{spread=1in}  → natural height increased by 1in
```

Hint: See also package tabularkv, it provides an interface, where most parameters for the environments can be given by key-value pairs.

`\interrowspace{...}`

Adds space between table rows. It is essentially the same as `\noalign{\vspace{...}}`.

`\interrowfill`

Short for `\interrowspace{\fill}`

`\interrowstart ... \interrowstop`

Marker commands, useful for option vlines.

1.1 Option vlines

Warning: This stuff is experimental.

Vertical lines are interrupted, if space is inserted in `\noalign`, `\interrowspace`, `\addlinespace` (booktabs), between double `\hline`s. This option tries to detect and add the vertical lines. The lines in a tabular with tabularht support (environments of this package) are numbered from left to right. The gap that is controlled by `\interrowspace` or inbetween `\interrowstart` and `\interrowstop` is then filled with the detected vertical lines.

If only a limited selection of the lines should be drawn, the commands know an optional argument with a list of line numbers, e.g.

```
\begin{tabularht}{50mm}{|l|l|}
  Hello & World\\
  \interrowfill[1,3]
  Foo & Bar
\end{tabularht}
```

There are three lines, but the middle line is not drawn in the gap between the first and second row. Zero can be used to suppress all lines:

```
\interrowspace[0]{10mm}
```

The syntax of the commands with the optional argument with the line number list ⟨*list*⟩. ⟨*list*⟩ is a comma separated list of numbers, ⟨*height*⟩ means the height specification described above with the optional prefixes `to=` or `spread=`.

```
\interrowspace [⟨list⟩] {⟨height⟩}
\interrowfill [⟨list⟩]
\interrowstart [⟨list⟩] ... \interrowstop
```

Option vlines is driver dependent and uses ε-TEX features.

pdftex: pdfTEX in PDF mode. Here the positions of the lines are written with the help of the `\pdfsavepos` feature into the `.aux` file(s). Therefore you need two LaTeX runs to get the lines.

dvips: Here, PostScript's currentpoint it used to get the line positions. The lines are then drawn at the end of the page. Thus one LATEX/dvips run is sufficient for this option.

Other drivers:

PostScript drivers: probably possible, an end of page hook would be nice.

VTEX: with GeX (PostScript interpreter) probably possible.

dvipdfm: no idea. The big problem is, how to get the current position?

1.2 Limitations

- Vertical lines are interrupted by `\noalign{\vfill}`.

1.3 Compatibility

- array, delarray, tabularx are supported.
- There can be problems with packages that redefine `\@array` (or `\@@array`, `\@tabarray`) and `\@arrayrule` (for option vlines).
- colortbl: it should at least work, but there isn't support for filling the gaps with color, neither the rules nor the backgrounds.

1.4 Examples

1.4.1 Example 1

```
⟨*example1⟩
\documentclass{article}
\usepackage{tabularht}

\begin{document}
\fbox{%
  \begin{tabularht*}{1in}{4in}{@{}l@{\extracolsep{\fill}}r@{}}%
    upper left corner & upper right corner\\%
    \noalign{\vfill}%
    \multicolumn{2}{@{}c@{}}{bounding box}\\%
    \noalign{\vfill}%
    lower left corner & lower right corner\\%
  \end{tabularht*}%
}
\end{document}
⟨/example1⟩
```

1.4.2 Example 2

```
⟨*example2⟩
\documentclass{article}
\usepackage{booktabs}
\usepackage[dvips,vlines]{tabularht}

\begin{document}

\begin{tabularht}{spread=0pt}{|l|l|}
  \hline
  First&Line\\%
  \hline
\interrowstart
  \addlinespace[10mm]%
\interrowstop
  \hline
  Second&Line\\%
\interrowstart
  \hline
  \hline
\interrowstop
  Third&Line\\%
  \hline
\interrowspace{10mm}
  \hline
  Fourth&Line\\%
  \hline
\end{tabularht}

\end{document}
⟨/example2⟩
```

2 Implementation

```
⟨*package⟩
```

Package identification.

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{tabularht}%
  [2019/12/29 v2.7 Tabular with height specified (HO)]
```

2.1 Environments

```
\let\@toarrayheight\@empty
\let\tabH@array@init\@empty

\toks@={%
  \begingroup
    \long\def\x#1\vcenter\fi\fi\bgroup#2\@sharp#3#4\@nil{%
      \endgroup
      \gdef\@array[##1]##2{%
        \tabH@array@init
        #1%
        \vcenter\fi\fi
        \@toarrayheight
        \bgroup
        \let\@toarrayheight\@empty
        #2\@sharp###3#4%
      }%
    }%
  \expandafter\x\@array[#1]{#2}\@nil % hash-ok
}
\edef\tabH@patch@array{\the\toks@}
\def\tabH@patch@@array{%
  \ifx\@array\@@array
    \def\reserved@a{\let\@@array\@array}%
  \else
    \let\reserved@a\relax
  \fi
  \tabH@patch@array
  \reserved@a
}
\tabH@patch@@array

\@ifpackageloaded{array}{}{%
  \AtBeginDocument{%
    \@ifpackageloaded{array}{%
      \tabH@patch@@array
    }{}%
  }%
}

\def\tabH@setheight#1{%
  \tabH@@setheight#1==\@nil
}
\def\tabH@@setheight#1=#2=#3\@nil{%
  \ifx\\#2#3\\%
    \setlength{\dimen@}{#1}%
    \edef\@toarrayheight{to\the\dimen@}%
  \else
    \edef\tabH@temp{\zap@space#1 \@empty}%
    \ifx\tabH@temp\tabH@to
    \else
      \ifx\tabH@temp\tabH@spread
      \else
        \PackageError{tabularht}{%
          Unknown height specifier %
          ‘\expandafter\strip@prefix\meaning\tabH@temp’%
        }{%
          The height dimension for tabular height can be prefixed%
          \MessageBreak
          with ‘to=’ or ‘spread=’, default is ‘to=’.%
        }%
        \let\tabH@temp\tabH@to
      \fi
    \fi
    \setlength{\dimen@}{#2}%
    \edef\@toarrayheight{\tabH@temp\the\dimen@}%
  \fi
}
\def\tabH@to{to}
\def\tabH@spread{spread}
```

First argument is the height of the table, then the orignal arguments for tabular follow.

```
\newenvironment{tabularht}[1]{%
  \tabH@setheight{#1}%
  \tabular
}{%
  \endtabular
}

\newenvironment{tabularht*}[1]{%
  \tabH@setheight{#1}%
  \@nameuse{tabular*}%
}{%
  \@nameuse{endtabular*}%
}

\newenvironment{tabularhtx}[1]{%
  \tabH@setheight{#1}%
  \tabularx
}{%
  \endtabularx
}

\newenvironment{arrayht}[1]{%
  \tabH@setheight{#1}%
  \array
}{%
  \endarray
}

\def\interrowspace{%
  \noalign\bgroup
    \tabH@interrowspace
}
\newcommand*{\tabH@interrowspace}[2][]{%
    \tabH@vspace{#1}{#2}%
  \egroup
}
\def\interrowfill{%
  \noalign\bgroup
    \tabH@interrowfill
}
\newcommand*{\tabH@interrowfill}[1][]{%
    \tabH@vspace{#1}{\fill}%
  \egroup
}
\def\tabH@vspace#1#2{%
  \tabH@vspace@start{#1}%
  \vspace{#2}%
  \tabH@vspace@stop
}
\let\tabH@vspace@start\@gobble
\let\tabH@vspace@stop\@empty

\newcommand*{\interrowstart}{%
  \noalign\bgroup
    \tabH@interrowstart
}
```

```
\newcommand*{\tabH@interrowstart}[1][]{%
    \tabH@vspace@start{#1}%
  \egroup
}
\newcommand*{\interrowstop}{%
  \noalign{\tabH@vspace@stop}%
}
```

2.2 Options

```
\providecommand*{\tabH@driver}{}

\DeclareOption{vlines}{%
  \let\tabH@temp\relax
}
\DeclareOption{pdftex}{}
\DeclareOption{dvips}{%
  \def\tabH@driver{dvips}%
}
\ProcessOptions*\relax

\ifx\tabH@temp\relax
\else
  \expandafter\endinput
\fi

\begingroup
  \@ifundefined{eTeXversion}{%
    \PackageError{tabularht}{%
      Option ‘vlines’ requires eTeX%
    }{%
      Use of eTeX is recommended for LaTeX, see ltnews16.%
    }%
    \endgroup
    \endinput
  }{}%
\endgroup
```

2.3 Option vlines, driver independent stuff

```
\begingroup
  \let\@addtoreset\@gobbletwo
  \newcounter{tabH@unique}%
\endgroup
\let\tabH@currenttab\@empty

\def\tabH@array@init{%
  \ifx\@toarrayheight\@empty
    % ignore vertical lines of nested tabular environments
    \let\tabH@currenttab\@empty
  \else
    \stepcounter{tabH@unique}%
    \edef\tabH@currenttab{\the\c@tabH@unique}%
  \fi
}

\renewcommand*{\@arrayrule}{%
  \@addtopreamble{%
    \hskip -.5\arrayrulewidth
    \ifx\tabH@currenttab\@empty
    \else
      \tabH@vrule{\tabH@currenttab}%
    \fi
    \begingroup
      \expandafter\ifx\csname CT@arc@\endcsname\relax
      \else
        \expandafter\CT@arc@
      \fi
      \vline
    \endgroup
    \hskip -.5\arrayrulewidth
  }%
}
\let\tabH@arrayrule\@arrayrule
\AtBeginDocument{%
  \@ifpackageloaded{colortbl}{%
    \let\@arrayrule\tabH@arrayrule
  }{}%
}

\let\tabH@vrule\@gobble
```

2.4 Driver pdftex

```
\RequirePackage{iftex}[2019/11/07]
\ifpdf
  \begingroup
    \@ifundefined{pdfsavepos}{%
      \PackageError{tabularht}{%
        Your pdfTeX is too old%
      }{%
        \string\pdfsavepos\space is missing.%
      }%
      \endgroup
      \csname fi\endcsname
      \endinput
    }{}%

    \let\on@line\@empty
    \PackageInfo{tabularht}{%
      Using driver ‘pdftex’ because of pdfTeX in PDF mode%
    }%
  \endgroup

  \protected\def\tabH@vrule#1{%
    \if@filesw
      \pdfsavepos
      \protected@write\@auxout{%
        \let\tabH@lastxpos\relax
      }{%
        \tabH@aux@vrule{#1}{\tabH@lastxpos}%
      }%
    \fi
  }%

  \def\tabH@lastxpos{\the\pdflastxpos}%
  \def\tabH@lastypos{\the\pdflastypos}%

  % The .aux file contains three commands:
```

```
% \tabH@aux@vrule{tabular id}{x position}
% \tabH@aux@vstart{tabular id}{row id}{x position}{y position}
% \tabH@aux@vstop{y position}
%
\AtBeginDocument{%
  % The .aux files are read the first time before
  % \AtBeginDocument and later at \end{document}.
  % \tabH@aux@done is a marker to distinguish
  % between these two readings. Only in the first
  % case we need the \tabH@aux@... commands.
  \let\tabH@aux@done\@empty
  \if@filesw
    \immediate\write\@mainaux{%
      \@percentchar\@percentchar BeginProlog: tabularht%
    }%
    % items in the aux file are executed,
    % if tabularht is loaded
    % and during the aux file read at \begin{document} only
    \immediate\write\@mainaux{%
      \detokenize{%
        % the \tabH@aux@... commands are needed only if
        % tabularht is loaded with driver pdftex.
        \@ifundefined{tabH@aux@vrule}\@secondoftwo\@firstofone
        {%
          % disable commands except for the first .aux files reading
          \@ifundefined{tabH@aux@done}\@gobble\@firstofone
        }%
        {%
          \let\tabH@aux@vrule\@gobbletwo
          \let\tabH@aux@vstart\@gobblefour
          \let\tabH@aux@vstop\@gobble
        }%
      }%
    }%
    \immediate\write\@mainaux{%
      \@percentchar\@percentchar EndProlog: tabularht%
    }%
  \fi
}%

% the x positions of vrules are stored in
% \tabH@<tabcount>list with distinct values
\protected\def\tabH@aux@vrule#1#2{%
  \@ifundefined{tabH@#1list}{%
    \expandafter\xdef\csname tabH@#1list\endcsname{%
      \noexpand\do{#2}%
    }%
  }{%
    \begingroup
      \def\x{#2}%
      \let\y\@undefined
      \let\do\tabH@do@add
      \expandafter\xdef\csname tabH@#1list\endcsname{%
        \csname tabH@#1list\endcsname\@empty
        \ifx\y\@undefined
          \noexpand\do{\x}%
        \fi
      }%
    \endgroup
  }%
}%
\def\tabH@do@add#1{%
  \ifx\y\@undefined
    \ifnum#1<\x\space
    \else
      \expandafter\ifx\csname y\endcsname\relax\fi
      \ifnum#1>\x\space
        \noexpand\do{\x}%
      \fi
    \fi
  \fi
  \noexpand\do{#1}%
}%

\def\tabH@vspace@start#1{%
  \if@filesw
    \stepcounter{tabH@unique}%
    \edef\tabH@currentrow{\the\c@tabH@unique}%
    \pdfsavepos
    \protected@write\@auxout{%
      \let\tabH@lastxpos\relax
      \let\tabH@lastypos\relax
    }{%
      \tabH@aux@vstart{\tabH@currenttab}{\tabH@currentrow}%
                      {\tabH@lastxpos}{\tabH@lastypos}%
    }%
  \fi
  \begingroup
    \edef\a{tabH@\tabH@currenttab row\tabH@currentrow}%
    \expandafter\let\expandafter\x\csname\a x\endcsname
    \ifx\x\relax
    \else
      \expandafter\let\expandafter\y\csname\a y\endcsname
      \expandafter\let\expandafter\l
          \csname tabH@\tabH@currenttab list\endcsname
      \ifx\l\relax
      \else
        \def\f{#1}%
        \ifx\f\@empty
          \let\do\tabH@do@set
        \else
          \count@=\z@
          \let\do\tabH@do@filter
        \fi
        \setbox\z@=\hbox{\l}%
        \wd\z@=\z@
        \dp\z@=\z@
        \copy\z@
      \fi
    \fi
  \endgroup
}%
\def\tabH@vspace@stop{%
  \if@filesw
    \pdfsavepos
    \protected@write\@auxout{%
```

```
        \let\tabH@lastypos\relax
      }{%
        \tabH@aux@vstop{\tabH@lastypos}%
      }%
    \fi
  }%
  \def\tabH@do@set#1{%
    \hbox to \z@{%
      \hskip \dimexpr #1sp - \x sp\relax
      \vrule \@width\arrayrulewidth
             \@depth\dimexpr \y sp\relax
      \hss
    }%
  }%
  \def\tabH@do@filter{%
    \@tempswafalse
    \advance\count@\@ne
    \@for\e:=\f\do{%
      \ifnum\e=\count@
        \@tempswatrue
      \fi
    }%
    \if@tempswa
      \expandafter\tabH@do@set
    \else
      \expandafter\@gobble
    \fi
  }%

  \protected\def\tabH@aux@vstart#1#2#3#4{%
    \def\tabH@current@vstart{{#1}{#2}{#3}{#4}}%
  }%
  \protected\def\tabH@aux@vstop{%
    \expandafter\tabH@aux@v\tabH@current@vstart
  }%
  \def\tabH@aux@v#1#2#3#4#5{%
    \expandafter\gdef\csname tabH@#1row#2x\endcsname{#3}%
    \expandafter\xdef\csname tabH@#1row#2y\endcsname{%
      \the\numexpr #4 - #5\relax
    }%
  }%

  \csname fi\endcsname
  \endinput

\fi
```

2.5 DVI drivers

```
\ifx\tabH@driver\@empty
  \PackageError{tabularht}{%
    Missing DVI driver, option ‘vlines’ disabled%
  }{%
    Supported DVI drivers: dvips.%
  }%
  \expandafter\endinput
\fi

\def\tabH@driver@dvips{%
```

```
  \def\tabH@literalps##1{\special{ps:SDict begin ##1 end}}%
  \def\tabH@headerps##1{\special{! ##1}}%
}

\@onelevel@sanitize\tabH@driver
\@ifundefined{tabH@driver@\tabH@driver}{%
  \PackageError{tabularht}{%
    Unsupported driver ‘\tabH@driver’%
  }{%
    Supported DVI drivers: dvips.%
  }%
  \endinput
}{}

\begingroup
  \let\on@line\@empty
  \PackageInfo{tabularht}{%
    Using driver ‘\tabH@driver’%
  }%
\endgroup
\csname tabH@driver@\tabH@driver\endcsname

\protected\def\tabH@vrule#1#2\vrule#3\arrayrulewidth{%
  #2% \fi or empty
  % hack to get rid of maxdrift rounding of dvips,
  % thus simulate a large motion
  \kern1in\relax
  \tabH@literalps{%
    #1 tabH.vrule %
    Resolution neg 0 translate%
  }%
  \vrule#3\arrayrulewidth
  \tabH@literalps{Resolution 0 translate}%
  \kern-1in\relax
}

\def\tabH@vspace@start#1{%
  \begingroup
    \let\y\@empty
    \@for\x:=#1\do{%
      \ifx\y\@empty
        \edef\y{\x}%
      \else
        \edef\y{\y\space\x}%
      \fi
    }%
    \tabH@literalps{\tabH@currenttab[\y]currentpoint exch pop}%
  \endgroup
}
\def\tabH@vspace@stop{%
  \tabH@literalps{%
    currentpoint exch pop %
    \number\dimexpr\arrayrulewidth\relax\space
    tabH.vspace%
  }%
}

\tabH@headerps{%
```

```
userdict begin%
  /tabH.list 10 dict def%
  /tabH.job [] def %
end%
/tabH.vrule{%
  10 string cvs cvn dup tabH.list exch known{%
    tabH.list exch dup [ exch tabH.list exch get %
    currentpoint pop round exch true exch{%
      % tabH.list key [ ... x true i
      % tabH.list key [ ... false i
      exch{%
        % ... [ ... x i
        2 copy lt{false}{%
          2 copy eq{pop false}{exch true}ifelse%
        }ifelse%
      }{false}ifelse%
    }forall %
    pop%
    ]put%
  }{%
    tabH.list exch[currentpoint pop round]put%
  }ifelse%
}bind def%
% <tab num> <cols array> <ytop> <ybottom> <rulewidth[sp]>
/tabH.vspace{%
  userdict begin %
    10 dict dup begin %
      exch 65536 div Resolution mul 72.27 div %
      % dvips uses a poor man's ceil function
      % see dopage.c before "drawrule": (int)(... + 0.9999999)
      0.9999999 add truncate%
      /rulewidth exch def %
      exch/ybottom exch def %
      exch/ytop exch def %
      exch/cols exch def %
      exch/tabkey exch 10 string cvs cvn def %
    end%
    /tabH.job exch[exch userdict/tabH.job get aload pop]def %
  end%
}bind def %
% Now we do the work at the end of the page.
% Unhappily "eop-hook" cannot be used, because "eop"
% executes "restore" before, so that all data are lost.
TeXDict begin%
  /eop%
  [%
    {%
      tabH.job{%
        begin%
         /colarray %
           tabH.list tabkey known{tabH.list tabkey get}{[]}ifelse %
         def %
         cols length 0 eq not{%
           /colarray[%
             cols{1 sub %
               dup 0 lt{pop}{%
                 dup colarray length ge{pop}{%
                   colarray exch get%
                   }ifelse%
                 }ifelse%
               }forall%
             ]def%
           }if %
           colarray{%
             % (rulewidth) == rulewidth == % debug
             Resolution sub %
             ytop rulewidth ytop ybottom sub v%
           }forall %
          end%
        }forall%
        % tabH.list{== ==}forall % debug
      }bind aload pop %
      TeXDict /eop get aload pop%
    ]cvx def %
  end%
}
⟨/package⟩
```

3 Installation

3.1 Download

Package. This package is available on CTAN[1]:

CTAN:macros/latex/contrib/oberdiek/tabularht.dtx The source file.

CTAN:macros/latex/contrib/oberdiek/tabularht.pdf Documentation.

Bundle. All the packages of the bundle 'oberdiek' are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

CTAN:install/macros/latex/contrib/oberdiek.tds.zip

TDS refers to the standard "A Directory Structure for TEX Files" (CTAN:pkg/tds). Directories with `texmf` in their name are usually organized this way.

3.2 Bundle installation

Unpacking. Unpack the `oberdiek.tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

3.3 Package installation

Unpacking. The `.dtx` file is a self-extracting docstrip archive. The files are extracted by running the `.dtx` through plain TEX:

```
tex tabularht.dtx
```

[1] CTAN:pkg/tabularht

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

```
tabularht.sty          → tex/latex/oberdiek/tabularht.sty
tabularht.pdf          → doc/latex/oberdiek/tabularht.pdf
tabularht-example1.tex → doc/latex/oberdiek/tabularht-example1.tex
tabularht-example2.tex → doc/latex/oberdiek/tabularht-example2.tex
tabularht.dtx          → source/latex/oberdiek/tabularht.dtx
```

If you have a `docstrip.cfg` that configures and enables docstrip's TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

3.4 Refresh file name databases

If your TeX distribution (TeX Live, MiKTeX, ...) relies on file name databases, you must refresh these. For example, TeX Live users run `texhash` or `mktexlsr`.

3.5 Some details for the interested

Unpacking with LaTeX. The `.dtx` chooses its action depending on the format:

plain TeX: Run docstrip and extract the files.

LaTeX: Generate the documentation.

If you insist on using LaTeX for docstrip (really, docstrip does not need LaTeX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{tabularht.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfLaTeX:

```
pdflatex tabularht.dtx
makeindex -s gind.ist tabularht.idx
pdflatex tabularht.dtx
makeindex -s gind.ist tabularht.idx
pdflatex tabularht.dtx
```

4 History

[2005/09/22 v1.0]

- First public version.

[2005/10/16 v2.0]

- Height specification allows `to=...` or `spread=...`, default is `to=`.
- Option vlines added, drivers pdftex and dvips.
- `\interrowspace`, `\interrowfil`, and `\interrowstart`...`\interrowstop` added.

[2005/10/18 v2.1]

- Fix for package colortbl, but the colors of colortbl remain unsupported.

[2006/02/20 v2.2]

- Code is not changed.
- DTX framework.

[2006/12/22 v2.3]

- Documentation fix.
- Fix in code of option vlines.

[2007/03/21 v2.4]

- Fix: Counter `tabh@unique` must not be changed by `\include`.

[2007/04/11 v2.5]

- Line ends sanitized.

[2016/05/16 v2.6]

- Documentation updates.

[2019/12/29 v2.7]

- Use `\iftex` package.

5 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.