The \texttt{tabularht} package

Heiko Oberdiek\footnote{Please report any issues at \url{https://github.com/ho-tex/oberdiek/issues}}

2019/12/29 v2.7

Abstract

This package defines some environments that adds a height specification to \texttt{tabular} and \texttt{array}.

Contents

1 Usage 2
  1.1 Option \texttt{vlines} 2
  1.2 Limitations 3
  1.3 Compatibility 3
  1.4 Examples 3
    1.4.1 Example 1 3
    1.4.2 Example 2 4

2 Implementation 4
  2.1 Environments 4
  2.2 Options 7
  2.3 Option \texttt{vlines}, driver independent stuff 7
  2.4 Driver \texttt{pdftex} 8
  2.5 DVI drivers 11

3 Installation 14
  3.1 Download 14
  3.2 Bundle installation 14
  3.3 Package installation 14
  3.4 Refresh file name databases 15
  3.5 Some details for the interested 15

4 History 15
  [2005/09/22 v1.0] 15
  [2005/10/16 v2.0] 16
  [2005/10/18 v2.1] 16
  [2006/02/20 v2.2] 16
  [2006/12/22 v2.3] 16
  [2007/03/21 v2.4] 16
  [2007/04/11 v2.5] 16
  [2016/05/16 v2.6] 16
  [2019/12/29 v2.7] 16

5 Index 16
1 Usage

\usepackage{tabularht}

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

- \texttt{tabularht}, \texttt{tabularht*}
- \texttt{arrayht}
- \texttt{tabularhtx} (if package \texttt{tabularx} is loaded)

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

Examples:

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

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

\begin{verbatim}
interrowspace {...}
\end{verbatim}

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

\begin{verbatim}
interrowfill
\end{verbatim}

Short for \texttt{interrowspace{\fill}}

\begin{verbatim}
interrowstart... interrowstop
\end{verbatim}

Marker commands, useful for option \texttt{vlines}.

1.1 Option \texttt{vlines}

Warning: This stuff is experimental.

Vertical lines are interrupted, if space is inserted in \texttt{\noalign}, \texttt{interrowspace}, \texttt{addlinespace} (\texttt{booktabs}), between double \texttt{\hlines}. This option tries to detect and add the vertical lines. The lines in a tabular with \texttt{tabularht} support (environments of this package) are numbered from left to right. The gap that is controlled by \texttt{interrowspace} or inbetween \texttt{interrowstart} and \texttt{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{verbatim}
\begin{tabularht}{50mm}{|l|l|}
Hello & World\\
\interrowfill[1,3]
Foo & Bar
\end{tabularht}
\end{verbatim}
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 \texttt{\langle list\rangle}. \texttt{\langle list\rangle} is a comma separated list of numbers, \texttt{\langle height\rangle} means the height specification described above with the optional prefixes \texttt{to=} or \texttt{spread=}.

\interrowspace \texttt{\langle list\rangle} \{\texttt{\langle height\rangle}\}
\interrowfill \texttt{\langle list\rangle}
\interrowstart \texttt{\langle list\rangle} \ldots \texttt{\interrowstop}

Option \texttt{vlines} is driver dependent and uses \LaTeX\ features.

**pdftex**: pdf\TeX\ in PDF mode. Here the positions of the lines are written with the help of the \texttt{\pdfsavepos} feature into the \texttt{.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.

V\TeX: 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 \texttt{\noalign{\vfill}}.

### 1.3 Compatibility

- \texttt{array}, \texttt{delarray}, \texttt{tabularx} are supported.

- There can be problems with packages that redefine \texttt{\@array} (or \texttt{\@@array}, \texttt{\@tabarray}) and \texttt{\@arrayrule} (for option \texttt{vlines}).

- \texttt{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

```latex
\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}%
\end{tabularht*}}%
\end{document}
```
1.4.2 Example 2

\begin{example}
\begin{verbatim}
\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
Third&Line\
\interrowspace{10mm}\hline
Fourth&Line\
\end{tabularht}
\end{document}
\end{verbatim}
\end{example}

2 Implementation

\begin{package}
Package identification.
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{tabularht}[]
[2019/12/29 v2.7 Tabular with height specified (HO)]
\end{package}

2.1 Environments

\begin{verbatim}
\let\@toarrayheight\@empty
\let\tabH@array@init\@empty
\toks@={%\begingroup\longdef\x#1\vcenter\fi\bgroup\sharp#2\@nil{%\endgroup\tabH@array@init\x\vcenter\fi\fi}
\endgroup
\gdef\@array[##1]##2{\tabH@array@init\@sharp##1\@nil{##2}}
\end{verbatim}
First argument is the height of the table, then the original arguments for tabular follow.
\newenvironment{tabularht}{\%\tabH@setheight{#1}\%\tabular}{\%\endtabular\%}
\newenvironment{tabularht*}{\%\tabH@setheight{#1}\%\@nameuse{tabular*}}{\%\@nameuse{endtabular*}\
\newenvironment{tabularhtx}{\%\tabH@setheight{#1}\%\tabularx}{\%\endtabularx\%}
\newenvironment{arrayht}{\%\tabH@setheight{#1}\%\array}{\%\endarray\%}
\def\interrowspace{\%\noalign\bgroup\tabH@interrowspace\%\egroup\%}
\newcommand*{\tabH@interrowspace}[2]{\%\tabH@vspace{#1}{#2}\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\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\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\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\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\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\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\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\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\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\%\egroup\%}
\def\interrowfill{\%\noalign\bgroup\tabH@interrowfill\%\egroup\%}
\newcommand*{\tabH@interrowfill}[1]{\%\tabH@vspace{#1}{\fill}\%\egroup\%}
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}
\PackageError{tabularht}{
Use of eTeX is recommended for LaTeX, see \TeX{}news16.}
}\endgroup
\endinput
\endgroup
2.3 Option vlines, driver independent stuff
\begingroup
\let@addtoreset@\gobbletwo
\newcounter{tabH@unique}
\let\tabH@currenttab@\empty
\def\tabH@array@init{\if\@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
\if\tabH@currenttab@\empty
%
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
\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}%
}{%
\tabH@lastxpos{	he\pdflastxpos}%
\tabH@lastypos{\the\pdflastypos}%
\%}
\fi
\def\tabH@lastxpos{\the\pdflastxpos}%
\%}
\def\tabH@lastypos{\the\pdflastypos}%
\%
\% The .aux file contains three commands:
\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%}
\if@filesw
\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@<tabcount>rule#1#2{%\
%\@ifundefined{tabH@<tabcount>rule#1\@secondoftwo\@firstofone
{%
}{\%\noexpand\do{#2}\
\fi
}}
{\%
\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{(#2)}\
\fi
}"
2.5 DVI drivers

\ifx\tabH@driver\@empty
\PackageError{tabularht}{Missing DVI driver, option \texttt{vlines} disabled}{Supported DVI drivers: dvips, \texttt{dvips}}
\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 \string\tabH@driver}{Supported DVI drivers: dvips.}}%
\endinput
\begingroup
\let\on@line\@empty
\PackageInfo{tabularht}{Using driver \string\tabH@driver}\
\endgroup
\csname tabH@driver@\tabH@driver\endcsname
\protected\def\tabH@vrule#1#2\vrule#3\arrayrulewidth{%
  \if\fi or empty
  \% hack to get rid of maxdrift rounding of dvips,
  \% thus simulate a large motion
  \kern1in\relax
  \tabH@literalps{\tabH.vrule %
    Resolution neg 0 translate%}
  \vrule#3\arrayrulewidth
  \kern-1in\relax}
\def\tabH@vspace@start#1{%
  \begingroup
    \let\y\@empty
    \@for\x:=#1\do{%
      \if\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%}
\def\tabH@vspace@start#1{%
  \begingroup
\def\tabH@vspace@stop{%
  \tabH@literalps{currentpoint exch pop %
    \number\dimexpr\arrayrulewidth\relax\space
    \tabH.vspace%}
  \endgroup
}
\def\tabH@headerps{\%
516  /tabH.list 10 dict def
517  /tabH.job [] def
518  end
519  /tabH.vrule{
520   10 string cvs cvn dup tabH.list exch known{
521      tabH.list exch dup [ exch tabH.list exch get ]
522      currentpoint pop round exch true exch{
523         tabH.list key [ ... x true i
524         tabH.list key [ ... false i
525         exch{
526            ... [ ... x i
527            2 copy lt{false}{%}
528            2 copy eq{pop false}{exch true}ifelse%
529         }ifelse%
530      )}forall
531      pop%
532      ]put%
533  )bind def
534  }bind def
535  % <tab num> <cols array> <ytop> <ybottom> <rulewidth[sp]>
536  /tabH.vspace{
537    userdict begin
538    10 dict dup begin
539    exch 65536 div Resolution mul 72.27 div %
540    % dvips uses a poor man's ceil function
541    % see dopage.c before "drawrule": (int)(... + 0.9999999)
542    0.9999999 add truncate%
543    /rulewidth exch def %
544    exch/ybottom exch def %
545    exch/ytop exch def %
546    exch/cols exch def %
547    exch/tabkey exch 10 string cvs cvn def %
548    end
549  /tabH.job exch[exch userdict/tabH.job get aload pop]def %
550  end
551  )bind def
552  % Now we do the work at the end of the page.
553  % Unhappily "eop-hook" cannot be used, because "eop"
554  % executes "restore" before, so that all data are lost.
555  TeXDdict begin
556  /eop%
557  [%
558  tabH.job{
559    begin
560    /colarray %
561    tabH.list tabkey known{tabH.list tabkey get}{[]}ifelse %
562    def %
563    cols length 0 eq not{%
564    /colarray[%
565    cols{1 sub %
566    dup 0 lt{pop}{%}
567    dup colarray length ge{pop}{%}
568    colarray exch get%
3 Installation

3.1 Download

Package. This package is available on CTAN\textsuperscript{1}:

\url{CTAN:macros/latex/contrib/oberdiek/tabularht.dtx} The source file.
\url{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.

\url{CTAN:install/macros/latex/contrib/oberdiek.tds.zip}

TDS refers to the standard “A Directory Structure for \LaTeX\ Files” (\url{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 \LaTeX:

```
tex tabularht.dtx
```
\textsuperscript{1}\url{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, MiK\TeX, ...) 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:

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

An example follows how to generate the documentation with pdf\LaTeX:\n
```latex
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.
• Height specification allows \texttt{to=...} or \texttt{spread=...}, default is \texttt{to=}.

• Option \texttt{vlines} added, drivers \texttt{pdftex} and \texttt{dvips}.

• \texttt{\interrowspace}, \texttt{\interrowfil}, and \texttt{\interrowstart...\interrowstop} added.

• Fix for package \texttt{colortbl}, but the colors of \texttt{colortbl} remain unsupported.

• Code is not changed.

• DTX framework.

• Documentation fix.

• Fix in code of option \texttt{vlines}.

• Fix: Counter \texttt{tabh@unique} must not be changed by \texttt{\include}.

• Line ends sanitized.

• Documentation updates.

• Use \texttt{\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.

<table>
<thead>
<tr>
<th>Symbols</th>
<th>98, 170, 214, 217, 219, 229, 265, 296, 339, 384, 448, 473, 496, 498</th>
</tr>
</thead>
<tbody>
<tr>
<td>\texttt{@array}</td>
<td>72, 73</td>
</tr>
<tr>
<td>\texttt{@addtopreamble}</td>
<td>227 \texttt{@firstofone}</td>
</tr>
<tr>
<td>\texttt{@addtoreset}</td>
<td>211 \texttt{@for}</td>
</tr>
<tr>
<td>\texttt{@array}</td>
<td>58, 68, 72, 73 \texttt{@gobble}</td>
</tr>
<tr>
<td>\texttt{@arrayrule}</td>
<td>226, 243, 246 \texttt{@gobblefour}</td>
</tr>
<tr>
<td>\texttt{@auxout}</td>
<td>274, 365, 401 \texttt{@gobbletwo}</td>
</tr>
<tr>
<td>\texttt{@depth}</td>
<td>412 \texttt{@ifpackageloaded}</td>
</tr>
<tr>
<td>\texttt{@empty}</td>
<td>51, 52, 64, \texttt{@ifundefined}</td>
</tr>
</tbody>
</table>