The \texttt{scrlayer} interface \texttt{scrlayer-fancyhdr}\footnote{This is version v0.2 of file \texttt{scrlayer-fancyhdr.dtx}.}

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2021-03-17

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1 The Purpose of this Package

This package has been made to give users a chance to combine the features of Piet van Oostrum’s \texttt{fancyhdr} \cite{fancyhdr} with the features of \texttt{scrlayer} \cite{scrlayer}. In other words: It has been made to combine the page layers of \texttt{scrlayer} with the page styles of \texttt{fancyhdr}.

In this combination compatibility with \texttt{fancyhdr} is the first aim! Usability and the freedom provided by \texttt{scrlayer} is only the second one. Compatibility with other packages or classes of KOMA-Script \cite{koma} is not a primary aim. Perhaps it will become an optional feature in future. Abolishing any real or virtual limitations of \texttt{fancyhdr} other than make it possible to use layers is not an aim and will not be an aim in future.

If you need a better combination of page styles and layers, you should either use the low level interface of \texttt{scrlayer} to define your page styles or — and this is the recommendation of the author — use \texttt{scrlayer-scrpage} instead of \texttt{scrlayer-fancyhdr} or \texttt{fancyhdr}. If you need more compatibility with other parts of KOMA-Script, i.e. with the KOMA-Script classes, you should use \texttt{scrlayer-scrpage} instead of \texttt{scrlayer-fancyhdr} or \texttt{fancyhdr}.
2 How it works

To combine fancyhdr and scrlayer, scrlayer-scrpage loads both packages. After loading fancyhdr it redefines page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4) to make it a layer page style of scrlayer using the newly defined layers fancy.head.even, fancy.head.odd, fancy.foot.even and fancy.foot.odd. The ...head... layers are background layers like the page head of fancyhdr’s page styles (or other usual page styles). The ...foot... layers are foreground layers like the page footer of fancyhdr’s page styles (or other usual page styles). The ...even layers are restricted to even pages, that means left side pages in two-sided documents. The ...odd layers are restricted to odd pages, that means right side pages in two-sided documents or all pages in single-sided documents.

Note: Page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4) is an internal basic page style of package fancyhdr. It is used for the user page style fancy. The user page style fancy is also used for fancyhdr’s deprecated page style fancyplain, that also redefines page style plain to be fancyhdr’s internal page style plain@fancy, that also uses fancy but with \if@fancyplain set to \iftrue. There is also a deprecated command \fancyplain{⟨plain code⟩}{⟨fancy code⟩}, that uses the ⟨plain code⟩ if \if@fancyplain is \iftrue and ⟨fancy code⟩ if \if@fancyplain is \iffalse.

Note: Page styles defined using fancyhdr’s command \fancypagestyle also always use page style fancy and so the internal basic page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4).

As a result of the two notes above, every page style of fancyhdr always uses the same internal basic page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4). As a result of redefining page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4) to be a layer page style, users can add layers to or remove layers from all fancyhdr page styles by adding layers to or remove layers from page style @fancy (up to fancyhdr version 3.10) resp. f@nch@fancycore (from fancyhdr version 4). You cannot add layers to or remove layers from fancyhdr’s single page styles fancy, fancyplain, plain@fancy or the page styles defined using \fancypagestyle directly. So using layers is a all or nothing feature with scrlayer-scrpage. However, you can use the second argument of \fancypagestyle to add or remove layers whenever one of the fancyhdr page styles is activated. So this is a move from the scrlayer interface of adding or removing layers to single page styles to the fancyhdr interface.
of defining modifications of page style \texttt{fancy}.

Another such movement from an \texttt{scrlayer} user interface to a \texttt{fancyhdr} user interface is the decision whether or not automatic running heads are used. \texttt{scrlayer} provides the options \texttt{automark} and \texttt{manualmark} and commands \texttt{\automark} and \texttt{\manualmark} to do this decision and also to configure commands like \texttt{\partmark}, \texttt{\chaptermark}, \texttt{\sectionmark} etc. With \texttt{scrlayer-fancyhdr} also using page style \texttt{@fancy} (up to fancyhdr version 3.10) resp. \texttt{\_f@mch\@f@ncy\_co@re} (from fancyhdr version 4) does switch to automatic running heads. The first activation of page style \texttt{fancy} still redefines \texttt{\chaptermark} and \texttt{\sectionmark}, if a class with \texttt{\chapter} is used, or \texttt{\sectionmark} and \texttt{\subsectionmark}, if a class without \texttt{\chapter} is used. However, you still can use \texttt{\manualmark} and \texttt{\automark} after switching to a \texttt{fancyhdr} page style to configure the running heads. So this movement is only partial.

\begin{itemize}
  \item \texttt{\ps@headings} \texttt{\ps@myheadings} \texttt{\ps@plain}
  
  \texttt{\ps@empty} \texttt{\ps@empty}
\end{itemize}

Note: Currently, neither \texttt{scrlayer} nor \texttt{fancyhdr} nor \texttt{scrlayer-fancyhdr} do redefine page styles \texttt{headings} or \texttt{myheadings} by default. And neither \texttt{scrlayer} nor \texttt{fancyhdr} nor \texttt{scrlayer-fancyhdr} do redefine page style \texttt{plain} unless you are activating the deprecated \texttt{fancyhdr} page style \texttt{fancyplain}. So if you like to use layers on \texttt{plain} pages, i.e. usually the first page of a chapter or part or the page with a title head, you have to either use \texttt{fancyhdr}’s deprecated page style \texttt{fancyplain} or redefine page style \texttt{plain} either using \texttt{\fancypagestyle} as documented in the \texttt{fancyhdr} manual or using \texttt{\DeclareNewPageStyleByLayers}, documented in the \texttt{KOMA-Script} manual. However from version 4.0 \texttt{fancyhdr} provides options \texttt{myheadings} and \texttt{headings} to redefine the corresponding page style. \texttt{scrlayer-fancyhdr} also provides these options and passes them to \texttt{fancyhdr}.

\begin{itemize}
  \item \texttt{\ps@headings} \texttt{\ps@myheadings} \texttt{\ps@plain}
  
  \texttt{\ps@empty} \texttt{\ps@empty}
\end{itemize}

Note: Pagestyle \texttt{empty} is somehow special. \texttt{scrlayer} redefines it to be a layer page style. And \texttt{fancyhdr}’s internal page style \texttt{@empty} is the same like \texttt{empty}. So \texttt{@empty} also uses the layers of \texttt{empty} but you should not try to modify it directly using the interface of \texttt{scrlayer}. Moreover, if \texttt{fancyhdr} is loaded before \texttt{scrlayer-scrpage}, \texttt{fancyhdr}’s internal page style \texttt{@empty} is not a copy of \texttt{scrlayer}’s layer page style \texttt{empty} but the original standard page style \texttt{empty}. However, with \texttt{scrlayer-fancyhdr} package \texttt{fancyhdr} does not longer use the internal page style \texttt{@empty}. So you would not need to know this.

\section*{3 How to use the Package}

To use the package you have to load it, e.g., using:

\begin{verbatim}
\usepackage{scrlayer-fancyhdr}
\end{verbatim}
instead of loading \texttt{scrlayer} and \texttt{fancyhdr} or before or after loading one of these packages. However it is recommended to replace loading \texttt{scrlayer} and \texttt{fancyhdr} by loading \texttt{scrlayer-fancyhdr} because this avoids option clashes. \texttt{scrlayer-fancyhdr} provides all options of \texttt{scrlayer} and \texttt{fancyhdr} and passes them to \texttt{scrlayer} resp. \texttt{fancyhdr}. Nevertheless sometimes it may be useful to be able to additionally load \texttt{scrlayer} or \texttt{fancyhdr}.

\begin{verbatim}
\ps@@fancy
\ps@f@nch@fancycore
\ps@fancy
\ps@plain@fancy
\fancypagestyle
\ps@plain
\ps@headings
\ps@myheadings
\ps@empty
\end{verbatim}

After this you should be able to use the page styles and commands of \texttt{fancyhdr} and to add layers to or remove layers from the \texttt{fancyhdr}’s internal basic page style @fancy (up to \texttt{fancyhdr} version 3.10) resp. f@nch@fancycore (from \texttt{fancyhdr} version 4). Note, you are not able to add layers to or remove layers from \texttt{fancyhdr}’s page styles fancy, fancyplain, plain@fancy or page styles defined by \texttt{\fancypagestyle}. However adding layers to or removing layers from @fancy (up to \texttt{fancyhdr} version 3.10) resp. f@nch@fancycore (from \texttt{fancyhdr} version 4) will always change all these page styles!

Note: Loading \texttt{scrlayer-fancyhdr} will not make page style plain nor headings nor myheadings or any other page style but empty to automatically be a layer page style! But if you are using option headings or myheadings package \texttt{fancyhdr} redefines the corresponding page styles to be \texttt{fancyhdr} page styles — and so become layer page styles.

4 Known Issues

Please note, the follow issues are either notes to the package author or notes to the user to avoid them reporting the same issues again and again. Listing these issues does not say they are bugs or features.

\begin{verbatim}
\ps@fancy
\ps@f@nch@fancycore
\ps@fancyplain
\fancypagestyle
\ps@@fancy
\ps@empty
\end{verbatim}

- You are not able to add layers to the user level page style fancy or fancyplain or any page style defined by \texttt{\fancypagestyle} but only to the internal page style @fancy (if you are using \texttt{fancyhdr} up to version 3.10) resp. f@nch@fancycore (if you are using \texttt{fancyhdr} from version 4). This is intended as explained in this manual.

\begin{verbatim}
\ps@empty
\end{verbatim}

- Using \texttt{fancyhdr}’s internal page style @empty could have strange results. However, there is a simple solution for this: Don’t use the internal @empty but always the user level page style empty!

\begin{verbatim}
\ps@fancy
\ps@f@nch@fancycore
\end{verbatim}

- The vertical position of the page header does differ a little bit, if \texttt{scrlayer-fancyhdr} is used instead of \texttt{fancyhdr}. This could be fixed by a modification of the layers fancy.head.odd and fancy.head.even using addvoffset. More tests are needed.
5 Implementation of scrlayer-fancyhdr

This section if for developers only.

We need scrlayer at least version 2021/02/15,

\begin{verbatim}
\RequirePackage{scrlayer}[2021/02/15]
\end{verbatim}

Because before \texttt{\textbackslash scrlayer\textbackslash do\textbackslash inherited\textbackslash options} would not be defined. And we need it, to inherit all options of scrlayer.

\begin{verbatim}
\scrlayer{do}{inherited}{options}{\scrlayer{inherit}{option}}
\end{verbatim}

And the very first thing at the body, after definition of the options is to process the options.

\begin{verbatim}
\KOMAProcessOptions
\end{verbatim}

Note: The main problem of this interface is, that it tries to implement the user interface of package fancyhdr by Piet van Oostrum, that is completely different from scrlayer and not really compatible with scrlayer, using scrlayer. This means, that scrlayer-fancyhdr never can be a drop-in replacement of fancyhdr. Nevertheless it can help to let scrlayer and fancyhdr coexist. To do so

- the lowest level of fancyhdr should not be the page style but a layer
- the page styles of fancyhdr should be layer page styles
- \texttt{init} code of the page styles of fancyhdr should use the layer page \texttt{init} code

Currently it is unsure whether it would be best to do a new implementation or to load original fancyhdr and to only modify some things. First I’ll try the second method. Currently we explicitly provide the options of fancyhdr.

\begin{verbatim}
\DeclareOption{nocheck}{\PassOptionsToPackage{nocheck}{fancyhdr}}
\DeclareOption{compatV3}{\PassOptionsToPackage{compatV3}{fancyhdr}}
\DeclareOption{myheadings}{\PassOptionsToPackage{myheadings}{fancyhdr}}
\DeclareOption{headings}{\PassOptionsToPackage{headings}{fancyhdr}}
\end{verbatim}

\begin{verbatim}
\RequirePackage{fancyhdr}
\end{verbatim}
We need at least one new layer for the new layer page style `fancy`. However, it could be useful to have not only one but four layers (even side head, odd side head, even side foot, odd side foot).

\begin{verbatim}
\DeclareNewLayer[%
  background, oddpage,
  head,
  contents={\hb@xt@ \layerwidth{%
    \f@nch@head\f@nch@Oolh\f@nch@och\f@nch@orh\f@nch@Oorh}}
]{fancy.head.odd}
\DeclareNewLayer[%
  background, evenpage,
  head,
  contents={\hb@xt@ \layerwidth{%
    \f@nch@head\f@nch@Oelh\f@nch@elh\f@nch@ech\f@nch@erh}}
]{fancy.head.even}
\DeclareNewLayer[%
  foreground, oddpage,
  foot,
  contents={\hb@xt@ \layerwidth{%
    \f@nch@foot\f@nch@Oolf\f@nch@olf\f@nch@ocf\f@nch@orf}}
]{fancy.foot.odd}
\DeclareNewLayer[%
  foreground, evenpage,
  foot,
  contents={\hb@xt@ \layerwidth{%
    \f@nch@foot\f@nch@Oelf\f@nch@elf\f@nch@ecf\f@nch@erf}}
]{fancy.foot.even}
\end{verbatim}

And have to create a layer page style from this new layers, but we do not redefine page style `fancy` but the low level page style @fancy (up to `fancyhdr` version 3.10) resp. f@nch@fancycore (from `fancyhdr` version 4.0).

`fancyhdr` does some initialization at the very first call of \pagemstyle{fancy}. To do so `fancyhdr` first uses a different page style definition, that does the initialization and redefines the page style afterwards. This is still active with `scrlayer-fancyhdr`. Additionally, `fancyhdr` redefines \@mkboth at every selection of the internal page style \@fancy resp. f@nch@fancycore. This can be adapted using the onselect feature of the new layer page style \@fancy resp. f@nch@fancycore. In my opinion, the \let@mkboth\markboth used by page style headings of, e.g., the standard classes or the KOMA-Script classes would be best here. However, `fancyhdr` uses the uncommon \def{\markboth{\protect\markboth}}; which would fail if a class or package tests \@mkboth using \ifx@mkboth\markboth. However, KOMA-Script's \IfActiveMkBoth (see the scrbase chapter in the KOMA-Script manual) does also recognize the `fancyhdr` definition and copying this is.
more compatible with fancyhdr.

\ifpackagelater{fancyhdr}{2019/03/21}{%
\DeclarePageStyleByLayers[
onselect={\def\@mkboth{\protect\markboth}},
]{f@nch@fancycore}{%
ofancy.head.odd,fancy.head.even,fancy.foot.odd,fancy.foot.even
}%
}{%
\DeclarePageStyleByLayers[
onselect={\def\@mkboth{\protect\markboth}},
]{@fancy}{%
ofancy.head.odd,fancy.head.even,fancy.foot.odd,fancy.foot.even
}%
}
⟨/body⟩

Note: Redefining page style @fancy resp. f@nch@fancycore instead of fancy does also mean, that features like options automark and manualmark resp. \automark and \manualmark are not fully supported by scrlayer-fancyhdr. Also currently the font features of the KOMA-Script classes are not supported by scrlayer-fancyhdr. However you are now able to combine other features of scrlayer with features of fancyhdr and you can, e.g., use scrlayer-notecolumn with scrlayer-fancyhdr.

A future release of scrlayer-fancyhdr may even provide the font features of the KOMA-Script classes and a working markcase. However, in this case I would have to redefine the initial page style fancy and the layers above.

References


Change History

0.1.3558
\ps@f@nch@fancycore: support for fancyhdr 4 .... 6

v0.2
General: package is no longer part of KOMA-Script .... 1

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

Symbols
\@mkboth .................. 44 \ps@empty .................. 3, 4
\ps@f@nch@fancycore ... 2, 4, 44 \ps@fancy .................. 4
\ps@fancypagestyle .......... 4 \ps@fancyplain ............ 2, 4
\ps@headings .............. 3, 4 \ps@myheadings .......... 3, 4
\ps@@empty ............... 3, 4 \ps@plain ............... 3, 4
\ps@@fancy .............. 2, 4, 44 \ps@plain@fancy ........ 2, 4

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