Fancy Cross-referencing

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Abstract

`fancyref.sty` is a package for fancy cross-referencing. See the files README and COPYING for additional information.

Contents

1 Introduction

Besides the notorious FAQ problem "I get a section number when refering to a figure!"[1], cross-referencing with LaTeX is simple: You set a `\label` and refer to it with `\ref` and `\pageref`. These commands just work.

Some lazy people soon had the idea to write a `\fullref` command to save some keystrokes:

```
\newcommand*{\fullref}[1]{\ref{#1} on page~\pageref{#1}}
```

After that, people sometimes got page references to the current page which cluttered the text with redundant information.

Perhaps one of these people was FRANK MITTELBACH, who was so annoyed that he wrote the `varioref` package [7]. It provides a `\vref` command which generates output dependent on the difference between the page number of the label and the page number of the cross-reference, e.g. like "on the next page" or "on page 27". No output will be generated if label and cross-reference fall onto the same page. This is really great, especially as the package supports lots of *languages*.

If you write larger documents with lots of sections and figures, you probably will find out that it is important to keep track of your labels. If you have a section labeled `britain` and a figure labeled `england`, it is only a question of time until you mix them up. To avoid this, most people *prefix* the label with an abbreviation for the type of the referenced object, e.g. `fig` is widely used for figure labels. Also it is common practice to separate this classifying prefix from the label by a *delimitor* character, normally : is used by convention [4, p. 41]. If your labels look like `sec:britain` or `fig:england` a mix-up will belong to the past.

In almost all cases when you are referencing to a figure, you will add a descriptive *string* like "Figure", because the counter only is not very helpful to the reader. Hence, some people write macros for this purpose:

```
\newcommand*{\figref}[1]{\figurename~\ref{#1}}
```

`\figurename` is much better than hard-coding "Figure" into the macro, because in this way the command not only works in other languages, but also if you redefine the string:

```
\renewcommand*{\figurename}{Picture}
```

---

[1] Just put `\label` *after* `\caption`.

Both captions of figures and cross-references will now happily use the new string.

In many journals cross-references to figures are emphasized by usage of bold face or (much worse) underlining. This enables the reader (who is normally quickly browsing through an article) to find the description of an interesting figure. Of course you can add a `\textbf` to the definition above, however, you will run into trouble, if you want to use the `varioref` package. Neither

```
\newcommand*{\figref}[1]{\textbf{\figurename~\vref{#1}}}
```

nor

```
\newcommand*{\figref}[1]{\textbf{\figurename}~\vref{#1}}
```

will produce the desired output: You will get "**Figure 1 on page 2**" or "**Figure** 1 on page 2" instead of "**Figure 1** on page 2". What you can do in this case is to hack the strings used by `varioref.sty`, e. g. like:

```
\renewcommand*{\reftextfaraway}[1]{%
  \normalfont on page~\pageref{#1}%
}
```

But this is dependent on the language and does not work within italic text.

Also, you will not want bold face for every cross-reference to a figure, only for the "main" cross-reference. And you will not want the page number to appear in every cross-reference when explaining a picture consisting of subfigures: "The left part of Figure 1 on the following page shows England. The right part of Figure 1 on the next page shows Great Britain." So your set of macros will grow further by `\mainfigref` and `\shortfigref`. And of course the same applies to tables as well. Slowly, cross-referencing starts to get messy . . .

Ok, you got the idea. I felt the need for a more general solution. The `fancyref` package supports different *languages* (at the moment only english and german) and allows customization of the classifying *prefixes*, the *delimitor* character and the *strings* used in cross-references. Most important, it provides user-definable *formats*. Enough advocacy, here we go!

2   Loading

You will need:

1. LaTeX 2$_\varepsilon$ (at least the 1995/06/01 release)

2. The `varioref` package (part of the standard LaTeX tools, normally included in every distribution)

3. The `german` or `babel` package [8, 2] (if you want to write not only in english)

The loading is simple:

```
\usepackage{fancyref}
```

English is used as the default language.

2.1   Language Options

At the moment only english and german are supported languages, others might follow.

german   If you write a german text:

```
\usepackage{german} % \usepackage[german]{babel}
\usepackage[german]{fancyref}
```

english If you write a mixed english/german text:

```
\usepackage{german} % \usepackage[english,german]{babel}
\usepackage[english,german]{fancyref}
```

As with `babel.sty` the last language given in the optional argument is the current language. For `german.sty` you will have to use the `\selectlanguage` command [8, p. 7] for english as current language.

Do *not* pass the language as a global option to the document class! Due to a feature of the LaTeX option handler

```
\documentclass[english,danish]{article}
\usepackage{babel,fancyref}
```

will result in danish headings ("Figur") and english strings for the cross-references ("Figure"), without a warning or an error [6, p. 20]. The correct usage

```
\documentclass{article}
\usepackage[english,danish]{babel,fancyref}
```

gives a package error, as expected, because danish is not (yet) supported (see section 4.4 on page 8).

2.2 Spacing Options

The spacing between the string and the counter can be adjusted, see also section 4.3 on page 8.

loose   Loose spacing, like in "Figure 1", which is the default, can be turned on explicitly by:

```
\usepackage[loose]{fancyref}
```

tight   Tight spacing, like in "Figure 1" will be obtained with:

```
\usepackage[tight]{fancyref}
```

Most textbooks on typography recommend loose spacing (i.e. a normal word space) in this context, but tight spacing (half a word space) is recommended in abbreviated formats like "Fig. 1" [9, p. 220].

2.3 Format Options

The usage of page numbers for the cross-references can be controlled by using different `fancyref` formats, see section 4.5 on page 11. The two most common variants are provided also as package options.

plain   Output without a page number, like "Figure 1", is used if the `plain` option is specified:

```
\usepackage[plain]{fancyref}
```

vario   Output like from the `varioref` package ("Figure 1 on the following page") is used by default, but you could give the `vario` option explicitly:

```
\usepackage[vario]{fancyref}
```

2.4 Hook Options

The appearance of a cross-reference can not only be controlled by individual formats which depend on the type of the referenced object, but also by a *hook* which is executed for *every* cross-reference, see section 4.6 on page 12. Two variants of this hook can be activated by package options (but only one at a time).

margin   You can place all cross-references into the margin, like above. This is achieved by:

```
\usepackage[margin]{fancyref}
```

If you want to do this, you should be aware of the limited space in the margin and use abbreviated formats. In my opinion marginal cross-references are sensible only for floats, for which I already defined the `margin` formats (see section 4.5 on page 11), so this option should better be considered as an example of a hook. The above example was indeed done manually. (-;

paren   You can put all cross-references into parentheses, like this: (section 3). This is achieved by:

    `\usepackage[paren]{fancyref}`

Neither use this option in combination with the `margin` option nor with the `margin` formats!

3   Usage

The cross-referencing is done by two almost identical macros.

\fref   `\fref` is used within a sentence and gives lower-case output, like "figure 1".

\Fref   `\Fref` is used at the beginning of a sentence and gives output with normal capitalization, like "Figure 1". For german users the macros make no difference, "Abbildung 1" remains "Abbildung 1" even within a sentence. How sensible! (-;

There seems to be no reliable heuristic to determine the start of a sentence, so you either have to cope with two macros or accept "Figure 1" even within a sentence.

Both macros take one optional argument, the format of the cross-reference, and one mandatory argument, consisting of the classifying prefix, the delimitor character and the label itself:

    `\fref[`⟨*format*⟩`]{`⟨*prefix*⟩⟨*delim*⟩⟨*label*⟩`}`
    `\Fref[`⟨*format*⟩`]{`⟨*prefix*⟩⟨*delim*⟩⟨*label*⟩`}`

A typical cross-reference will thus look like this,

    `\fref{fig:england}`

with `fig` as the prefix, `:` as the delimiter and `britain` as the label, using the default format. The formats, the prefixes and the delimitor character are described in detail in the following section.

4 Customization

4.1 Prefixes

`\...labelprefix` The following table shows the defaults of the various prefixes I already defined for you.

Object	Macro	Prefix
Chapter	\fancyrefchaplabelprefix	chap
Section	\fancyrefseclabelprefix	sec
Equation	\fancyrefeqlabelprefix	eq
Figure	\fancyreffiglabelprefix	fig
Table	\fancyreftablabelprefix	tab
Enumeration	\fancyrefenumlabelprefix	enum
Footnote	\fancyreffnlabelprefix	fn

If you need to add a prefix, use the following syntax:

`\newcommand*{`⟨*macro*⟩`}{`⟨*prefix*⟩`}`

For example, if you need theorems in your document, you could use:

`\newcommand*{\fancyrefthmlabelprefix}{thm}`

Note that the name of the macro does not matter, but names fitting into the scheme are highly recommended. Be consistent. After that, you will need to define your own `fancyref` formats for the new prefixes. Read section 4.5 on page 11. And let me know of objects for which I should supply prefixes.

`\...changeprefix` If you need to change a prefix (either one I already provided or one you added later), use the following syntax:

`\fancyrefchangeprefix{`⟨*macro*⟩`}{`⟨*prefix*⟩`}`

For example, if you are labeling your equations with `eqn` instead of `eq` (I guess this will be the most common change):

`\fancyrefchangeprefix{\fancyrefeqlabelprefix}{eqn}`

4.2 Delimitors

`\fancyrefargdelim` The default delimitor character is the colon (`:`). If you need to change it, for example to `-`, use the following syntax:

`\renewcommand*{\fancyrefargdelim}{-}`

There is no restriction to one character, you could also use `too-long`, but you definitely should use a delimitor that never, ever occurs within the real label. A single *letter* would be a very bad idea.

4.3 Spacing

Quite unlikely that someone is not happy with at least one of the package options for this purpose, but one never knows ...

The following table shows the definition of the spacing macros.

Macro	Definition	Example
\fancyrefloosespacing	~	Figure 1
\fancyreftightspacing	\,	Figure 1
\fancyrefdefaultspacing	\fancyrefloosespacing	Figure 1

You could switch from loose to tight spacing and vice versa even after the package is loaded:

```
\renewcommand*{\fancyrefdefaultspacing}{%
  \fancyreftightspacing
}
```

You could loosen the tight spacing or tighten the loose spacing by using for example

```
\renewcommand*{\fancyrefloosespacing}{\kern.25em}
```

but you should not change \fancyrefdefaultspacing in this way, because you would lose flexibility: Almost all fancyref formats (except the margin formats) use \fancyrefdefaultspacing, so it is clever to adjust \fancyreftightspacing and \fancyrefloosespacing and then to switch between the two variants. But I doubt that this will ever be necessary.

4.4 Names

The following table shows some strings that are already provided by many document classes. If they do not exist, I will define them, otherwise I will not touch their values (in case you have changed them already).

Macro	English string	German string
\chaptername	Chapter	Kapitel
\figurename	Figure	Abbildung
\pagename	Page	Seite
\tablename	Table	Tabelle

The next table shows the strings used for cross-references at the beginning of a sentence.

Macro	English string	German string
\Frefchapname	\chaptername	\chaptername
\Frefenumname	Item	Punkt
\Frefeqname	Equation	Gleichung
\Freffigname	\figurename	\figurename
\Freffnname	Footnote	Fußnote
\Frefonname	On	Auf
\Frefpgname	\pagename	\pagename
\Frefsecname	Section	Abschnitt
\Frefseename	See	Siehe
\Freftabname	\tablename	\tablename

The `fancyref` package uss own macros to achieve maximum flexibility: If you redefine `\figurename` to "Picture", both the caption and the cross-references will use this string. If brevity is more important to you than consistency, you could also use "Picture" within the caption and "Pic." for the cross-references. The necessary code is:

```
\renewcommand*{\figurename}{Picture}
\renewcommand*{\Freffigname}{Pic.}
```

\fref...name Within a sentence you should use "picture" instead of "Picture". The `fancyref` package takes care of this for you and defines the corresponding macros (`\fref...name`) with automatically generated lower-case strings.

\Frefonname `\Frefonname` and `\Frefseename` are not used by any `fancyref`
\Frefseename formats, but you could use them for your additional formats. An interesting idea would be to use an arrow ($\rightarrow$) for `\Frefseename`:

```
\renewcommand*{\Frefseename}{%
  \ensuremath{\mathsurround 0pt\rightarrow}%
}
```

If do this, there will be no need to redefine `\frefseename` manually, because the `\MakeLowercase` command [6, p. 26] used internally to generate the lower-case strings can cope even with such strange things. (-:

\Fref...shortname The table shows some abbreviated strings used for cross-references with the `margin` formats. I do not like abbreviations very much,[2] because they need to be introduced carefully (written out at the first occurrence) and even then make a document less readable. Also, at the

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[2]I am stubborn, DIRK, am I not? (-;

beginning of a sentence, abbreviations should be written out, so you run into inconsistencies (also known as trouble). In my opinion they are reasonable for the `margin` formats, so only the strings necessary for these formats are defined. If you are a big fan of PCMCIA[3] or abbreviations or simply do not bear my propaganda, you are on your own.

Macro	English string	German string
\Freffigshortname	Fig.	Abb.
\Frefpgshortname	P.	S.
\Freftabshortname	Tab.	Tab.

Lower-case versions of these strings (`\fref...shortname`) are generated automatically again.

`\...addcaptions`   If you add new prefixes (section 4.1 on page 7), you will probably also need further strings, e. g. `\frefthmname`. If you write a multilingual document, they should automatically be changed with the active language. For this case the `fancyref` package offers the following command,

    \fancyrefaddcaptions{⟨language⟩}{⟨stringdefs⟩}

which can be used only in the preamble of the document. In the above example you would use:

```
\fancyrefaddcaptions{english}{%
  \newcommand*{\Frefthmname}{Theorem}%
  \newcommand*{\frefthmname}{%
    \MakeLowercase{\Frefthmname}%
  }%
}
\fancyrefaddcaptions{german}{%
  \newcommand*{\Frefthmname}{Satz}%
  \newcommand*{\frefthmname}{\Frefthmname}%
}
```

If you can supply such additional strings or further languages, please do and send me a mail.

---

[3]People Cannot Memorize Computer Industry's Acronyms.

4.5   Formats

The output of the `\fref` and `\Fref` commands depends on the used `fancyref` format. For all the different objects that can be cross-referenced, two `fancyref` formats, `plain` and `vario`, are already defined. In addition, for the floating objects (`figure` or `table` environments) two other `fancyref` format called `margin` and `main` are available. The following table shows sample output of these `fancyref` formats.

Object	Format	Output
Chapter	`vario`	chapter 1 on the following page
	`plain`	Chapter 1
Equation	`vario`	Equation (1) on the previous page
	`plain`	equation (1)
Figure	`margin`	→ Fig. 1, p. 1
	`main`	**figure 1** on the facing page
	`vario`	Figure 1 on the page before
	`plain`	figure 1

The `fancyref` formats for sections, enumerations and footnotes give output similar to those for chapters, whereas the formats for tables correspond to the `fancyref` formats for figures.

`\...defaultformat`   If no optional argument is specified for the `\fref` or `\Fref` command, the `vario` format will be used. You can change this default `fancyref` format to `plain`:

```
\renewcommand{\fancyrefdefaultformat}{plain}
```

If you do not like some of these `fancyref` formats or you need some more, e. g. for theorems, algorithms etc., you will have to define them yourself. If you define some nice formats, please let me know, perhaps I will add them in a future version of this package.

`\frefformat`   The definition is done by means of two almost identical macros.
`\Frefformat`   `\frefformat` declares (or changes) the formats used within a sentence, whereas `\Frefformat` does the same for the formats used at the beginning of a sentence. Unfortunately this means that you need to do the work twice.)-:

Both macros take three mandatory arguments, the name of the `fancyref` format, the prefix macro and the description of the format itself:

```
\frefformat{⟨format⟩}{⟨prefix macro⟩⟨output⟩}
\Frefformat{⟨format⟩}{⟨prefix macro⟩⟨output⟩}
```

Within the third argument `#1` will be replaced by the counter of the referenced object (i. e. the output of a `\ref` command), `#2` will be replaced by the page number (i. e. the output of a `\pageref` command) and `#3` will be replaced by the output of a `\vpageref` command ("on the facing page", "on page 1").

As an example, I will modify the output foss-references to figures done with the `main` format:

```
\frefformat{main}{\fancyreffiglabelprefix}{%
  \MakeUppercase{\freffigname}\fancyrefdefaultspacing#1#2%
}%
\Frefformat{main}{\fancyreffiglabelprefix}{%
  \MakeUppercase{\Freffigname}\fancyrefdefaultspacing#1#2%
}%
```

These redefinitions will make `\fref[main]{fig:foo}` come out as "FIGURE 1 on page 1". The page number will always be printed explicitly, not like `varioref.sty` output. By use of the `\freffigname`, `\Freffigname` and `\fancyrefdefaultspacing` commands it is ensured that further modifications of the string as well as the spacing and language options of the package will work. A quick and dirty hack would have been:

```
\frefformat{main}{\fancyreffiglabelprefix}{FIGURE~#1#2}
\Frefformat{main}{\fancyreffiglabelprefix}{FIGURE~#1#2}
```

The usage of the defined macros for spacing and naming like in the first example is of course highly recommended. Do not blame me, if your lazyness leads to inconsistencies. (-;

Note that in either case you *must* use the prefix *macro*, not the string itself!

4.6   Hooks

`\fancyrefhook` After all the work of the `fancyref` formats has been done, the result is passed as an argument to a hook command called `\fancyrefhook`. Normally, this hook does nothing but simply passing on the output. If you want to change this hook, use the following syntax:

```
\renewcommand{\fancyrefhook}[1]{⟨definition⟩}
```

Within ⟨*definition*⟩, `#1` will be replaced by the output of the `fancyref` format.

You can use this hook for all kinds of weird stuff, e. g. if you want to have huge cross-references, use the following code:

```
\renewcommand*{\fancyrefhook}[1]{{\huge #1}}
```

In this simple example the *-form of \renewcommand may be used, because the hook does not contain whole paragraphs [5, p. 14]. This makes debugging of your code easier.

A more complex (and totally brain-dead) example does not work with the *-form:

```
\renewcommand{\fancyrefhook}[1]{%
  \begin{itemize}%
    \item #1%
  \end{itemize}%
}
```

If you define really *useful* and "typographically correct" hooks, please send me a mail, so I can include your work in future versions of this package. (-;

5 Examples

See the example file `freftest.tex` and its output, `freftest.dvi`.

6 Bugs

None, as my beta testers, DIRK KUYPERS and ROBIN S. SOCHA, told me. (-;

If you encounter problems after having changed all your cross-references to the macros provided by `fancyref.sty`, please go through the following checklist:

1. Make sure that you either use : as a delimitor or that have changed it as described in section 4.2 on page 7.

2. Make sure that you either use the default prefixes or that you have changed them as described in section 4.1 on page 7. Especially do *not* try to modify the prefixes with the \renewcommand command.

3. Make sure that you have defined all necessary formats in addition to those provided by me. The definition of `fancyref` formats is described in section 4.5 on page 11.

4. Make sure that you have eliminated all old superfluous strings like `Figure` or `\figurename` in your source code. Just replacing all `\ref` commands with `\fref` will *not* be sufficient.

As far as I know, there is only one *real* problem: If you are working on a multi-author document where each author is used to a different set of prefixes and prefers a different delimitor, be *extremely cautious* when redefining the prefixes and the delimitor. You will get really funny errors, if the current delimitor is `-`, the prefix for equations is `eqn` and you try to make a cross-reference to an equation in a part written by another author who used : and `eq` in his `\label` commands.

With the current implementation the only solution is to temporarily redefine the prefix and the deliminator, do the cross-reference and switch back to the original definitions again. This is annoying, of course. `)-:`

As a consequence, I would recommend either to drop this cross-reference or to try to convince your co-authors that your prefixes and delimitor are the best. Sorry.

7 Implementation

7.1 Documentation Driver

```
1 ⟨∗driver⟩
2 \documentclass[12pt,a4paper]{ltxdoc} \usepackage{fancyref}
3 \begin{document}
4   \DocInput{fancyref.dtx}
5 \end{document}
6 ⟨/driver⟩
```

References

[1] American Mathematical Society. *AMS-LATEX Version 1.2 User's Guide*, Nov. 1996. Version 1.02.

[2] BRAAMS, J.: *Babel, a multilingual package for use with LATEX's standard document classes*. Zoetermeer, Jan. 1997.

[3] FRANZ, M.: *The `soul` package*, Dec. 1998. Version 1.1a.

[4] GOOSSENS, M.; MITTELBACH, F.; SAMARIN, A.: *Der LaTeX-Begleiter.* Addison-Wesley, Bonn, 1st edn., 1994.

[5] LaTeX3 Project Team. *LaTeX 2ε for authors*, Jun. 1997.

[6] LaTeX3 Project Team. *LaTeX 2ε for class and package writers*, Jun. 1998.

[7] MITTELBACH, F.: *The `varioref` package.* Mainz, May 1998. Version 1.1g.

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[9] WILLBERG, H. P.; FORSSMAN, F.: *Lesetypographie.* Hermann Schmidt, Mainz, 1997.