Section name references in LaTeX*

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Documentation overview for hyperref

The documentation for package `hyperref` consists of several files:

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

README The **README** file (also available as text file). Here information is collected that is not yet in the manual: new features, package compatibility, limitations, known problems, ...

ChangeLog This file records the version history (also available as text file).

Options This file provides a short option summary.

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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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 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]{}%
}
```

3 Implementation

```
1 ⟨*package⟩
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{gettitlestring}[2009/12/18]
4 \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`

```
5 \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.

```
6 \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
  }%
}
```

3.1 \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
}
```

3.2 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`

```
\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
```

`\NR@ssect`

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

Support for class memoir.

```
\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
\long\def\@part[#1]#2{%
  \NR@gettitle{#1}%
  \NR@part[{#1}]{#2}%
}
\let\NR@spart\@spart
\long\def\@spart#1{%
  \NR@gettitle{#1}%
  \NR@spart{#1}%
}
\let\NR@chapter\@chapter
\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}%
    }%
  }%
}{}
\let\NR@schapter\@schapter
\def\@schapter#1{%
  \NR@gettitle{#1}%
  \NR@schapter{#1}%
}
```

Captions

```
\AtBeginDocument{%
  \@ifpackageloaded{hyperref}{%
    \@ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
  }\@firstofone
  {%
    \let\NR@@caption\@caption
    \long\def\@caption#1[#2]{%
```

```
    \NR@gettitle{#2}%
    \NR@@caption{#1}[{#2}]%
  }%
 }%
 \@ifpackageloaded{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}{%
 }{%
  \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
  \def\ttl@sect@i#1#2[#3]#4{%
    \NR@gettitle{#4}%
    \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
  }%
 }{}%
}
```

3.2.1 Class beamer

```
\@ifclassloaded{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
 }%
 \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}%
    }%
  }%
}{}
```

3.2.2 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
  }{}%
}
```

3.3 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}
```

\@offive

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

We have to redefine \ref and \pageref to know about extra reference elements. Make them robust, and compatible with Babel. 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@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@setref{#1}\@firstoffive{#1}%
}%
```

\T@pageref

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

\ifNR@showkeys
  \ifx\SK@ref\@empty
  \else
```

\T@ref

```
    \def\T@ref#1{%
      \@safe@activestrue
      \SK@\SK@@ref{#1}%
      \@safe@activesfalse
      \NR@setref{#1}\@firstoffive{#1}%
    }%
```

\T@pageref

```
    \def\T@pageref#1{%
      \@safe@activestrue
      \SK@\SK@@ref{#1}%
      \@safe@activesfalse
      \NR@setref{#1}\@secondoffive{#1}%
    }%

  \fi
\fi
```

Package hyperref uses its own definitions of \ref and \pageref because it extends the syntax by the star form. \DeclareRobustCommand is used by hyperref. Package nameref can be loaded before, after hyperref or after hyperref's definitions in \AtBeginDocument.

```
\@ifpackageloaded{hyperref}{%
}{%
```

\ref

```
  \DeclareRobustCommand{\ref}{\T@ref}%
```

\pageref

```
  \DeclareRobustCommand{\pageref}{\T@pageref}%

}
```

3.4 Usage and frontend

Access the (third) name part with \nameref;

\T@nameref

```
\def\T@nameref#1{%
  \begingroup
    \let\label\@gobble
    \NR@setref{#1}\@thirdoffive{#1}%
  \endgroup
}%
\ifNR@showkeys
  \ifx\SK@ref\@empty
  \else
    \def\T@nameref#1{%
      \@safe@activestrue
      \SK@\SK@@ref{#1}%
      \@safe@activesfalse
      \begingroup
        \let\label\@gobble
        \NR@setref{#1}\@thirdoffive{#1}%
      \endgroup
    }%
  \fi
\fi

%\@ifclassloaded{memoir}{%
%  \ltx@IfUndefined{@mem@titlerefnolink}\ltx@secondoftwo{%
%    \ltx@IfUndefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
%  }%
%}\ltx@secondoftwo
```

```
%{%
%  \DeclareRobustCommand*{\nameref}{%
%    \@ifstar\@mem@titlerefnolink\@mem@titleref
%  }%
%}{%
```

\nameref

```
  \DeclareRobustCommand*{\nameref}{%
    \@ifstar\T@nameref\T@nameref
  }%
%}
```

\Nameref An extended form which gives title and page number.

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

\Sectionformat The default for \Sectionformat

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

3.5 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:

```
\@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}}%
  }%
}{}
```

3.6 Compatibility with varioref

[This section was derived by Corey Minyard minyard@acm.org from the varioref package]

```
\AtBeginDocument{%
  \ifx\csname @@vpageref\endcsname\relax
  \else
    \def\@@vpageref#1[#2]#3{%
      \begingroup
        \csname @safe@activestrue\endcsname
        \edef\x{#3}%
        \@onelevel@sanitize\x
        \toks@{%
          \NR@@vpageref{#1}[{#2}]%
        }%
        \edef\x{\endgroup
```

```
      \the\toks@{\x}%
    }%
  \x
}%
\def\NR@@vpageref#1[#2]#3{%
  \leavevmode\unskip
  \global\advance\c@vrcnt\@ne
  \@ifundefined{r@\the\c@vrcnt @vr}%
    {\@namedef{r@\the\c@vrcnt @vr}{{??}{??}{}{}{}}}{}%
  \edef\@tempa{%
    \expandafter\expandafter\expandafter
    \@secondoffive\csname r@\the\c@vrcnt @vr\endcsname
  }%
  \@ifundefined{r@\the\c@vrcnt @xvr}%
    {\@namedef{r@\the\c@vrcnt @xvr}{{??}{??}{}{}{}}}{}%
  \edef\@tempb{%
    \expandafter\expandafter\expandafter
    \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
  }%
  {%
    \let\@currentlabel\@empty
    \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
  }%
  \ifx\@tempa\@tempb
  \else
    \vref@err{%
      \noexpand\vref at page boundary %
      \@tempb-\@tempa\space (may loop)%
    }%
  \fi
  \@ifundefined{r@#3}{\@namedef{r@#3}{{??}{??}{}{}{}}}{}%
  \edef\thevpagerefnum{%
    \expandafter\expandafter\expandafter
    \@secondoffive\csname r@#3\endcsname
  }%
  \ifx\vref@space\@undefined
    \space
  \else
    \vref@space
  \fi
  \ifx\@tempa\thevpagerefnum
    #1%
  \else
    #2%
    \is@pos@number\thevpagerefnum{%
      \is@pos@number\@tempa{%
        \@tempcnta\@tempa
        \advance\@tempcnta\@ne
      }{%
        \@tempcnta\maxdimen
      }%
      \ifnum \thevpagerefnum =\@tempcnta
        \ifodd\@tempcnta
          \if@twoside
            \reftextfaceafter
          \else
            \reftextafter
```

```
            \fi
          \else
            \reftextafter
          \fi
        \else
          \advance\@tempcnta-2 %
          \ifnum \thevpagerefnum =\@tempcnta
            \ifodd\@tempcnta
              \reftextbefore
            \else
              \if@twoside
                \reftextfacebefore
              \else
                \reftextbefore
              \fi
            \fi
          \else
            \reftextfaraway{#3}%
          \fi
        \fi
      }{%
        \reftextfaraway{#3}%
      }%
    \fi
    {%
      \let\@currentlabel\@empty
      \expandafter\label\expandafter{\the\c@vrcnt @vr}%
    }%
  }%
  \DeclareRobustCommand\vnameref[1]{%
    \unskip~\nameref{#1}%
    \@vpageref[\unskip]{#1}%
  }%
 \fi
}
\@ifundefined{@Refstar}{%
 \def\T@Ref#1{%
  \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
 }%
 \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
  \MakeUppercase#1%
 }%
}{}%
\AtBeginDocument{%
 \@ifpackageloaded{varioref}{%
  \@ifundefined{@Refstar}{%
   \DeclareRobustCommand*{\Ref}[1]{%
    \T@Ref{#1}%
   }%
  }{}%
 }{}%
}%
```

3.7 Support for package **listings**

```
\AtBeginDocument{%
 \@ifpackageloaded{listings}{%
```

```
    \let\NROrg@lst@MakeCaption\lst@MakeCaption
    \def\lst@MakeCaption{%
      \ifx\lst@label\@empty
      \else
        \let\@currentlabelname\lst@@caption
      \fi
      \NROrg@lst@MakeCaption
    }%
  }{}%
}
```

⟨/package⟩

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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.

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