

# Section name references in L<sup>A</sup>T<sub>E</sub>X\*

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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 EuroT<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X” (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 L<sup>A</sup>T<sub>E</sub>X 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 `getttitlestring` 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 `getttitlestring` how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

```
\usepackage{getttitlestring}
\GetTitleStringDisableCommands{%
  \let\mylabel\@gobble
  \renewcommand\myindex[2]{}%
}
```

## 3 Implementation

```
1 (*package)
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{getttitlestring}[2009/12/18]
```

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).

```
4 \def\strip@period#1.\relax#2\@@@{#1}
```

### 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.

```
5 \newif\ifNR@showkeys
```

```

6 \NR@showkeysfalse
7 \@ifpackageloaded{showkeys}{%
8   \begingroup
9     \ifundefined{SK@@label}{%
10    }{%
11      \global\NR@showkeystrue
12    }%
13  \endgroup
14 }{}

15 \def\label#1{%
16   \bsphack
17   \begingroup
18     \@onelevel@sanitize\@currentlabelname
19     \edef\@currentlabelname{%
20       \expandafter\strip@period\@currentlabelname\relax.\relax\@@%
21     }%
22     \protected@write\@auxout{}{%
23       \string\newlabel{#1}{%
24         {\@currentlabel}%
25         {\thepage}%
26         {\@currentlabelname}%
27         {\@currentHref}{}%
28       }%
29     }%
30   \endgroup
31   \esphack
32 }%

33 \ifNR@showkeys
34   \def\label#1{%
35     \bsphack
36     \SK@\SK@@label{#1}%
37     \begingroup
38       \@onelevel@sanitize\@currentlabelname
39       \edef\@currentlabelname{%
40         \expandafter\strip@period\@currentlabelname\relax.\relax\@@%
41       }%
42       \protected@write\@auxout{}{%
43         \string\newlabel{#1}{%
44           {\@currentlabel}%
45           {\thepage}%
46           {\@currentlabelname}%
47           {\@currentHref}{}%
48         }%
49       }%
50     \endgroup
51     \esphack
52   }%
53 \fi

54 \let\ltx@label\label

```

Needed for the *subeqnarray* package.

```

55 \ifundefined{slabel}{%
56   \def\slabel#1{%
57     \bsphack
58     \if@files
59       {%
60         \@onelevel@sanitize\@currentlabelname

```

```

61      \edef\@currentlabelname{%
62        \expandafter\strip@period\@currentlabelname\relax.\relax\@@@%
63      }%
64      \let\thepage\relax
65      \def\protect{\noexpand\noexpand\noexpand}%
66      \edef\@tempa{%
67        \write\@auxout{%
68          \string\newlabel{#1}{%
69            {\thesubequation}%
70            {\thepage}%
71            {\@currentlabelname}%
72            {\@currentHref}{}}%
73        }%
74      }%
75    }%
76    \expandafter
77  }%
78  \@tempa
79  \if@nobreak\ifvmode\nobreak\fi\fi
80  \fi
81  \@esphack
82  }%
83 }

```

Overload an AMS L<sup>A</sup>T<sub>E</sub>X command, which uses `\newlabel`. Sigh!

```

84 \def\@writetocindent@{%
85   \begingroup
86   \@for\@tempa:=-1,0,1,2,3\do{%
87     \immediate\write\@auxout{%
88       \string\newlabel{tocindent\@tempa}{%
89         \csname r@tocindent\@tempa\endcsname}{ }{ }{ }%
90       }%
91     }%
92   }%
93   \endgroup
94 }

```

## 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.

```

95 \def\NR@getttitle#1{%
96   \GetTitleString{#1}%
97   \let\@currentlabelname\GetTitleStringResult
98 }

```

First the numbered sections. While we are about it, put in a useful section formatting macro.

```

99 \let\NR@sect\@sect
100 \newcounter{section@level}
101 \def\@sect#1#2#3#4#5#6[#7]#8{%
102   \setcounter{section@level}{#2}%
103   \NR@getttitle{#7}%
104   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]{\Sectionformat{#8}{#2}}%
105 }

```

and now the unnumbered ones

```

106 \let\NR@ssect\@ssect
107 \def\@ssect#1#2#3#4#5{%
108   \NR@getttitle{#5}%
109   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
110 }

```

Parts and chapters are treated differently. sigh.

```

111 \let\NR@part\@part
112 \def\@part[#1]#2{%
113   \NR@getttitle{#1}%
114   \NR@part[{#1}]{#2}%
115 }
116 \let\NR@chapter\@chapter
117 \def\@chapter[#1]#2{%
118   \NR@getttitle{#1}%
119   \NR@chapter[{#1}]{#2}%
120 }
121 \let\NR@schapter\@schapter
122 \def\@schapter#1{%
123   \NR@getttitle{#1}%
124   \NR@schapter{#1}%
125 }

```

Captions

```

126 \AtBeginDocument{%
127   \@ifpackageloaded{hyperref}{%
128     \ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
129   }\@firstofone
130   {%
131     \let\NR@@caption\@caption
132     \long\def\@caption#1[#2]{%
133       \NR@getttitle{#2}%
134       \NR@@caption{#1}[{#2}]]%
135     }%
136   }%
137 }
138 \AtBeginDocument{%
139   \@ifpackageloaded{longtable}{%
140     \let\NRorg@LT@c@ption\LT@c@ption
141     \def\LT@c@ption#1[#2]#3{%
142       \NRorg@LT@c@ption{#1}[{#2}]{#3}%
143       \def\@tempa{#2}%
144       \ifx\@tempa\@empty
145         \else
146           \NR@getttitle{#2}%
147         \fi
148       }%
149     }{}%
150 }

```

Compatibility for package titlesec.

```

151 \AtBeginDocument{%
152   \@ifpackageloaded{titlesec}{%
153     \let\NRorg@ttl@sect@i\ttl@sect@i
154     \def\ttl@sect@i#1#2[#3]#4{%
155       \NR@getttitle{#4}%

```

```

156 \NRorg@ttl@sect@i{#1}{#2}[#{3}]{#4}%
157 }%
158 }{}%
159 }

```

### 3.2.1 Class beamer

```

160 \@ifclassloaded{beamer}{%
161 \def\NR@PatchBeamer#1{%
162 \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
163 \csname beamer@#1\endcsname
164 \begingroup
165 \edef\x{\endgroup
166 \long\def\expandafter\noexpand\csname beamer@#1\endcsname
167 [####1]{% hash-ok
168 \noexpand\NR@getttitle{####1}%
169 \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
170 [####1]}%
171 }%
172 }%
173 \x
174 }%
175 \NR@PatchBeamer{section}%
176 \NR@PatchBeamer{subsection}%
177 \NR@PatchBeamer{subsubsection}%
178 }{}

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

179 \def\@currentlabelname{}
180 \def\@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:

```

181 \long\def\@firstoffive#1#2#3#4#5{#1}
182 \long\def\@secondoffive#1#2#3#4#5{#2}
183 \long\def\@thirdoffive#1#2#3#4#5{#3}
184 \long\def\@fourthoffive#1#2#3#4#5{#4}
185 \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`.

```

186 \providecommand*\@safe@activestruer{}%
187 \providecommand*\@safe@activesfalse{}%
188 \def\NR@setref#1{%
189 \begingroup
190 \@safe@activestruer
191 \expandafter
192 \endgroup
193 \expandafter\NR@@setref\csname r@#1\endcsname
194 }
195 \def\NR@@setref#1{%
196 \ifx\@undefined#1%
197 \let#1\relax
198 \fi

```

```

199 \setref#1%
200 }
201 \def\T@ref#1{%
202   \NR@setref{#1}\@firstoffive{#1}%
203 }%
204 \def\T@pageref#1{%
205   \NR@setref{#1}\@secondoffive{#1}%
206 }%
207 \ifNR@showkeys
208   \ifx\SK@ref\@empty
209   \else
210     \def\T@ref#1{%
211       \@safe@activetrue
212       \SK@\SK@@ref{#1}%
213       \@safe@activesfalse
214       \NR@setref{#1}\@firstoffive{#1}%
215     }%
216     \def\T@pageref#1{%
217       \@safe@activetrue
218       \SK@\SK@@ref{#1}%
219       \@safe@activesfalse
220       \NR@setref{#1}\@secondoffive{#1}%
221     }%
222   \fi
223 \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`.

```

224 \@ifpackageloaded{hyperref}{%
225 }{%
226   \DeclareRobustCommand{\ref}{\T@ref}%
227   \DeclareRobustCommand{\pageref}{\T@pageref}%
228 }

```

### 3.4 Usage and frontend

Access the (third) name part with `\nameref`;

```

229 \def\T@nameref#1{%
230   \begingroup
231     \let\label\@gobble
232     \NR@setref{#1}\@thirdoffive{#1}%
233   \endgroup
234 }%
235 \ifNR@showkeys
236   \ifx\SK@ref\@empty
237   \else
238     \def\T@nameref#1{%
239       \@safe@activetrue
240       \SK@\SK@@ref{#1}%
241       \@safe@activesfalse
242       \begingroup
243         \let\label\@gobble
244         \NR@setref{#1}\@thirdoffive{#1}%
245       \endgroup
246     }%

```

```

247 \fi
248 \fi
249 \def\nameref{\protect\T@nameref}

```

An extended form which gives title and page number.

```

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

```

The default for \Sectionformat

```

251 \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`:

```

252 \@ifpackageloaded{ifthen}{%
253   \let\NROrg@ifthenelse\ifthenelse
254   \def\ifthenelse{%
255     \let\begin@group\NR@TE@begin@group
256     \NROrg@ifthenelse
257   }%
258   \let\NROrg@begin@group\begin@group
259   \def\NR@TE@begin@group{%
260     \let\begin@group\NROrg@begin@group
261     \begin@group
262     \def\ref##1{\getrefbykeydefault{##1}{}{??}}%
263     \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
264   }%
265 }{}

```

### 3.6 Compatibility with varioref

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

```

266 \AtBeginDocument{%
267   \ifx\csname @@vppageref\endcsname\relax
268   \else
269     \def\@@vppageref#1[#2]#3{%
270       \begingroup
271         \csname @safe@activetrue\endcsname
272         \edef\x{#3}%
273         \@onelevel@sanitize\x
274         \toks@{%
275           \NR\@@vppageref{#1}[{#2}]%
276         }%
277         \edef\x{\endgroup
278           \the\toks@{\x}%
279         }%
280       \x
281     }%
282     \def\NR\@@vppageref#1[#2]#3{%
283       \leavevmode\unskip
284       \global\advance\c@vrcnt\@ne
285       \ifundefined{r@\the\c@vrcnt @vr}%
286         {\@namedef{r@\the\c@vrcnt @vr}{\{?\}\{?\}\{\}\{\}\}\{?\}}%

```



```

287 \edef\@tempa{%
288   \expandafter\expandafter\expandafter
289   \@secondoffive\csname r@\the\c@vrcnt @vr\endcsname
290 }%
291 \@ifundefined{r@\the\c@vrcnt @xvr}%
292   {\@namedef{r@\the\c@vrcnt @xvr}{\{?\}\{?\}\{\}\{\}\}\{}}%
293 \edef\@tempb{%
294   \expandafter\expandafter\expandafter
295   \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
296 }%
297 {%
298   \let\@currentlabel\@empty
299   \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
300 }%
301 \ifx\@tempa\@tempb
302 \else
303   \vref@err{%
304     \noexpand\vref at page boundary %
305     \@tempb-\@tempa\space (may loop)%
306   }%
307 \fi
308 \@ifundefined{r@#3}{\@namedef{r@#3}{\{?\}\{?\}\{\}\{\}\}\{}}%
309 \edef\thevpagerefnum{%
310   \expandafter\expandafter\expandafter
311   \@secondoffive\csname r@#3\endcsname
312 }%
313 \ifx\vref@space\@undefined
314   \space
315 \else
316   \vref@space
317 \fi
318 \ifx\@tempa\thevpagerefnum
319   #1%
320 \else
321   #2%
322   \is@pos@number\thevpagerefnum{%
323     \is@pos@number\@tempa{%
324       \@tempcnta\@tempa
325       \advance\@tempcnta\@ne
326     }{%
327       \@tempcnta\maxdimen
328     }%
329     \ifnum \thevpagerefnum =\@tempcnta
330       \ifodd\@tempcnta
331         \if@twoside
332           \reftextfaceafter
333         \else
334           \reftextafter
335         \fi
336       \else
337         \reftextafter
338       \fi
339     \else
340       \advance\@tempcnta-2 %
341       \ifnum \thevpagerefnum =\@tempcnta
342         \ifodd\@tempcnta
343           \reftextbefore

```

```

344         \else
345         \if@twoside
346         \reftextfacebefore
347         \else
348         \reftextbefore
349         \fi
350     \fi
351     \else
352     \reftextfaraway{#3}%
353     \fi
354     \fi
355     }{%
356     \reftextfaraway{#3}%
357     }%
358     \fi
359     {%
360     \let\@currentlabel\@empty
361     \expandafter\label\expandafter{\the\c@vrcnt @vr}%
362     }%
363     }%
364     \DeclareRobustCommand\vnameref[1]{%
365     \unskip~\nameref{#1}%
366     \vpageref[\unskip]{#1}%
367     }%
368     \fi
369 }

370 \@ifundefined{@Refstar}{%
371     \def\T@Ref#1{%
372         \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
373     }%
374     \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
375         \MakeUppercase#1%
376     }%
377 }{}%
378 \AtBeginDocument{%
379     \@ifpackageloaded{varioref}{%
380         \@ifundefined{@Refstar}{%
381             \DeclareRobustCommand*\{Ref}[1]{%
382                 \T@Ref{#1}%
383             }%
384         }{}%
385     }{}%
386 }%

```

### 3.7 Support for listings

```

387 \AtBeginDocument{%
388     \@ifpackageloaded{listings}{%
389         \let\NR@Org@lst@MakeCaption\lst@MakeCaption
390         \def\lst@MakeCaption{%
391             \ifx\lst@label\@empty
392             \else
393                 \let\@currentlabelname\lst@@caption
394             \fi
395             \NR@Org@lst@MakeCaption
396         }%
397     }{}%

```

398 }  
 399 </package>

## 4 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; numbers in roman refer to the code lines where the entry is used.

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