

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

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2010/04/30

## 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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<sup>\*</sup>This file has version number v2.40, last revised 2010/04/30.

## 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]
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).

```
5 \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.

```

6 \newif\ifNR@showkeys
7 \NR@showkeysfalse
8 \@ifpackageloaded{showkeys}{%
9   \begingroup
10    \@ifundefined{SK@@label}{%
11      {%
12        \global\NR@showkeystrue
13      }%
14    \endgroup
15 }{}

16 \def\label#1{%
17   \@bsphack
18   \begingroup
19     \@onelevel@sanitize\@currentlabelname
20     \edef\@currentlabelname{%
21       \expandafter\strip@period\@currentlabelname\relax.\relax\@@@%
22     }%
23     \protected@write\@auxout{}{%
24       \string\newlabel{#1}{%
25         {\@currentlabel}%
26         {\thepage}%
27         {\@currentlabelname}%
28         {\@currentHref}{}%
29       }%
30     }%
31   \endgroup
32   \@esphack
33 }%
34 \ifNR@showkeys
35   \def\label#1{%
36     \@bsphack
37     \SK@\SK@@label{#1}%
38     \begingroup
39       \@onelevel@sanitize\@currentlabelname
40       \edef\@currentlabelname{%
41         \expandafter\strip@period\@currentlabelname\relax.\relax\@@@%
42       }%
43       \protected@write\@auxout{}{%
44         \string\newlabel{#1}{%
45           {\@currentlabel}%
46           {\thepage}%
47           {\@currentlabelname}%
48           {\@currentHref}{}%
49         }%
50       }%
51     \endgroup
52     \@esphack
53   }%
54 \fi

55 \let\ltx@label\label

```

Needed for the *subeqnarray* package.

```

56 \@ifundefined{slabel}{}{%
57   \def\slabel#1{%
58     \@bsphack
59     \if@filesw
60       {%

```

```

61      \@onelevel@sanitize\@currentlabelname
62      \edef\@currentlabelname{%
63        \expandafter\strip@period\@currentlabelname\relax.\relax\@@@%
64      }%
65      \let\thepage\relax
66      \def\protect{\noexpand\noexpand\noexpand}%
67      \edef\@tempa{%
68        \write\@auxout{%
69          \string\newlabel{#1}{%
70            {\thesubequation}%
71            {\thepage}%
72            {\@currentlabelname}%
73            {\@currentHref}{}%
74          }%
75        }%
76      }%
77      \expandafter
78    }%
79    \@tempa
80    \if@nobreak\ifvmode\nobreak\fi\fi
81  \fi
82  \esphack
83 }%
84 }

```

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

```

85 \def\@writetocindents@{%
86   \begingroup
87   \@for\@tempa:=-1,0,1,2,3\do{%
88     \immediate\write\@auxout{%
89       \string\newlabel{tocindent\@tempa}{%
90         \csname r@tocindent\@tempa\endcsname}{-}{-}{-}%
91       }%
92     }%
93   }%
94   \endgroup
95 }

```

## 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.

```

96 \def\NR@getttitle#1{%
97   \GetTitleString{#1}%
98   \let\@currentlabelname\GetTitleStringResult
99 }

```

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

```

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

```

```

106 }
and now the unnumbered ones
107 \let\NR@ssect\@ssect
108 \def\@ssect#1#2#3#4#5{%
109   \NR@getttitle{#5}%
110   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
111 }

Support for class memoir.
112 \ltx@ifundefined{ifheadnameref}{%
113 }{%
114   \ltx@ifundefined{M@ssect}{%
115   }{%
116     \let\NRorgM@ssect\M@ssect
117     \def\M@ssect#1#2#3#4#5#6[#7][#8]{%
118       \ifheadnameref
119         \NR@getttitle{#8}%
120       \else
121         \NR@getttitle{#7}%
122       \fi
123       \NRorgM@ssect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}][{#8}]%
124     }%
125   }%
126 }

```

Parts and chapters are treated differently. sigh. \@part and \@spart are \long because of class memoir.

```

127 \let\NR@part\@part
128 \long\def\@part[#1]#2{%
129   \NR@getttitle{#1}%
130   \NR@part[{#1}]{#2}%
131 }
132 \let\NR@spart\@spart
133 \long\def\@spart#1{%
134   \NR@getttitle{#1}%
135   \NR@spart{#1}%
136 }
137 \let\NR@chapter\@chapter
138 \def\@chapter[#1]#2{%
139   \NR@getttitle{#1}%
140   \NR@chapter[{#1}]{#2}%
141 }
142 \ifclassloaded{memoir}{%
143   \ltx@ifundefined{ifheadnameref}{%
144   }{%
145     \def\@chapter[#1]#2{%
146       \ltx@ifundefined{ch@pt@c}{%
147         \NR@getttitle{#1}%
148       }{%
149         \ifx\ch@pt@c\ltx@empty
150           \NR@getttitle{#2}%
151         \else
152           \def\NR@temp{#1}%
153           \ifx\NR@temp\ltx@empty
154             \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
155           \else
156             \ifheadnameref

```

```

157         \NR@getttitle{#1}%
158     \else
159         \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
160     \fi
161 \fi
162 \fi
163 }%
164 \NR@chapter[{#1}]{#2}%
165 }%
166 }%
167 }{}
168 \let\NR@schapter\@schapter
169 \def\@schapter#1{%
170     \NR@getttitle{#1}%
171     \NR@schapter{#1}%
172 }

```

#### Captions

```

173 \AtBeginDocument{%
174     \@ifpackageloaded{hyperref}{%
175         \@ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
176     }\@firstofone
177     {%
178         \let\NR@@caption\@caption
179         \long\def\@caption#1[#2]{%
180             \NR@getttitle{#2}%
181             \NR@@caption{#1}[{#2}]%
182         }%
183     }%
184     \@ifpackageloaded{longtable}{%
185         \let\NRorg@LT@c@ption\LT@c@ption
186         \def\LT@c@ption#1[#2]#3{%
187             \NRorg@LT@c@ption{#1}[{#2}]{#3}%
188             \def\@tempa{#2}%
189             \ifx\@tempa\@empty
190                 \else
191                     \NR@getttitle{#2}%
192                 \fi
193             }%
194         }{}%

```

#### Environment ‘description’.

```

195     \ltx@ifundefined{descriptionlabel}{%
196     }{%
197         \let\NRorg@descriptionlabel\descriptionlabel
198         \def\descriptionlabel#1{%
199             \NR@getttitle{#1}%
200             \NRorg@descriptionlabel{#1}%
201         }%
202     }%
203 }

```

#### Compatibility for package titlesec.

```

204 \AtBeginDocument{%
205     \@ifpackageloaded{titlesec}{%
206         \let\NRorg@ttl@sect@i\ttl@sect@i
207         \def\ttl@sect@i#1#2[#3]#4{%
208             \NR@getttitle{#4}%

```

```

209 \NRorg@ttl@sect@i{#1}{#2} [{#3}] {#4}%
210 }%
211 {}%
212 }

```

### 3.2.1 Class beamer

```

213 \@ifclassloaded{beamer}{%
214 \def\NR@PatchBeamer#1{%
215 \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
216 \csname beamer@#1\endcsname
217 \begingroup
218 \edef\x{\endgroup
219 \long\def\expandafter\noexpand\csname beamer@#1\endcsname
220 [####1]{% hash-ok
221 \noexpand\NR@getttitle{####1}%
222 \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
223 [{####1]}%
224 }%
225 }%
226 \x
227 }%
228 \NR@PatchBeamer{section}%
229 \NR@PatchBeamer{subsection}%
230 \NR@PatchBeamer{subsubsection}%
231 }{}

```

### 3.2.2 Theorems

```

232 \ltx@ifundefined{@opargbegintheorem}{}{%
233 \let\NRorg@opargbegintheorem\@opargbegintheorem
234 \def\@opargbegintheorem#1#2#3{%
235 \NR@getttitle{#3}%
236 \NRorg@opargbegintheorem{#1}{#2}{#3}%
237 }%
238 }
239 \AtBeginDocument{%
240 \@ifpackageloaded{amsthm}{%
241 \let\NRorg@begintheorem\@begintheorem
242 \begingroup
243 \edef\x{\macro:\string#1\string#2[\string#3]}%
244 \@onelevel@sanitize\x
245 \def\y#1->#2\@nil{#1}%
246 \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
247 \@onelevel@sanitize\z
248 \expandafter\endgroup
249 \ifx\x\z
250 \def\@begintheorem#1#2[#3]{%
251 \NR@getttitle{#3}%
252 \NRorg@begintheorem{#1}{#2} [{#3}]%
253 }%
254 \fi
255 }{}%
256 }

```

## 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

257 \providecommand*{\@currentlabelname}{}

```

```
258 \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:

```
259 \long\def\@firstoffive#1#2#3#4#5{#1}
260 \long\def\@secondoffive#1#2#3#4#5{#2}
261 \long\def\@thirdoffive#1#2#3#4#5{#3}
262 \long\def\@fourthoffive#1#2#3#4#5{#4}
263 \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`.

```
264 \providecommand*\@safe@activestruetrue{}%
265 \providecommand*\@safe@activesfalse{}%
266 \def\NR@setref#1{%
267   \begingroup
268     \@safe@activestruetrue
269     \expandafter
270     \endgroup
271     \expandafter\NR@@setref\csname r@#1\endcsname
272 }
273 \def\NR@@setref#1{%
274   \ifx\@undefined#1%
275     \let#1\relax
276   \fi
277   \@setref#1%
278 }
279 \def\T@ref#1{%
280   \NR@setref{#1}\@firstoffive{#1}%
281 }%
282 \def\T@pageref#1{%
283   \NR@setref{#1}\@secondoffive{#1}%
284 }%
285 \ifNR@showkeys
286   \ifx\SK@ref\@empty
287     \else
288       \def\T@ref#1{%
289         \@safe@activestruetrue
290         \SK@\SK@@ref{#1}%
291         \@safe@activesfalse
292         \NR@setref{#1}\@firstoffive{#1}%
293       }%
294       \def\T@pageref#1{%
295         \@safe@activestruetrue
296         \SK@\SK@@ref{#1}%
297         \@safe@activesfalse
298         \NR@setref{#1}\@secondoffive{#1}%
299       }%
300     \fi
301   \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`.

```
302 \ifpackageloaded{hyperref}{}%

```



```

303 }{%
304   \DeclareRobustCommand{\ref}{\T@ref}%
305   \DeclareRobustCommand{\pageref}{\T@pageref}%
306 }

```

### 3.4 Usage and frontend

Access the (third) name part with \nameref;

```

307 \def\T@nameref#1{%
308   \begingroup
309     \let\label\@gobble
310     \NR@setref{#1}\@thirdoffive{#1}%
311   \endgroup
312 }%
313 \ifNR@showkeys
314   \ifx\SK@ref\@empty
315   \else
316     \def\T@nameref#1{%
317       \@safe@activetrue
318       \SK@\SK@@ref{#1}%
319       \@safe@activesfalse
320       \begingroup
321         \let\label\@gobble
322         \NR@setref{#1}\@thirdoffive{#1}%
323       \endgroup
324     }%
325   \fi
326 \fi
327 %\@ifclassloaded{memoir}{%
328 %  \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
329 %    \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
330 %  }%
331 %}\ltx@secondoftwo
332 %{%
333 %  \DeclareRobustCommand*{\nameref}{%
334 %    \@ifstar\@mem@titlerefno link\@mem@titleref
335 %  }%
336 %}%
337 \DeclareRobustCommand*{\nameref}{%
338   \@ifstar\T@nameref\T@nameref
339 }%
340 %}

```

An extended form which gives title and page number.

```

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

```

The default for \Sectionformat

```

342 \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:

```

343 \@ifpackageloaded{ifthen}{%

```

```

344 \let\NROrg@ifthenelse\ifthenelse
345 \def\ifthenelse{%
346   \let\begin\NR@TE@begin\group
347   \NROrg@ifthenelse
348 }%
349 \let\NROrg@begin\begin\group
350 \def\NR@TE@begin\group{%
351   \let\begin\NROrg@begin\group
352   \begin\group
353   \def\ref##1{\getrefbykeydefault{##1}{-}{??}}%
354   \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
355 }%
356 }{}

```

### 3.6 Compatibility with varioref

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

```

357 \AtBeginDocument{%
358   \ifx\csname @v\pageref\endcsname\relax
359   \else
360     \def\@v\pageref#1[#2]#3{%
361       \begin\group
362       \csname @safe@activetrue\endcsname
363       \edef\x{#3}%
364       \@onelevel@sanitize\x
365       \toks@{%
366         \NR@@v\pageref{#1}[#2]}%
367       }%
368       \edef\x{\endgroup
369         \the\toks@}%
370     }%
371   \x
372 }%
373 \def\NR@@v\pageref#1[#2]#3{%
374   \leavevmode\unskip
375   \global\advance\c@vrcnt\@ne
376   \@ifundefined{r@the\c@vrcnt @vr}%
377   {\@namedef{r@the\c@vrcnt @vr}{??}{??}{-}{-}}{}%
378   \edef\@tempa{%
379     \expandafter\expandafter\expandafter
380     \@secondoffive\csname r@the\c@vrcnt @vr\endcsname
381   }%
382   \@ifundefined{r@the\c@vrcnt @xvr}%
383   {\@namedef{r@the\c@vrcnt @xvr}{??}{??}{-}{-}}{}%
384   \edef\@tempb{%
385     \expandafter\expandafter\expandafter
386     \@secondoffive\csname r@the\c@vrcnt @xvr\endcsname
387   }%
388   {%
389     \let\@currentlabel\@empty
390     \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
391   }%
392   \ifx\@tempa\@tempb
393   \else
394     \vref@err{%
395       \noexpand\vref at page boundary %

```

```

396         \@tempb-\@tempa\space (may loop)%
397     }%
398 \fi
399 \@ifundefined{r@#3}{\@namedef{r@#3}{\{??\}{??\}{-}{-}{-}{-}}}%
400 \edef\thevpagerefnum{%
401     \expandafter\expandafter\expandafter
402     \@secondoffive\csname r@#3\endcsname
403 }%
404 \ifx\vref@space\@undefined
405     \space
406 \else
407     \vref@space
408 \fi
409 \ifx\@tempa\thevpagerefnum
410     #1%
411 \else
412     #2%
413     \is@pos@number\thevpagerefnum{%
414         \is@pos@number\@tempa{%
415             \@tempcnta\@tempa
416             \advance\@tempcnta\@ne
417         }{%
418             \@tempcnta\maxdimen
419         }%
420         \ifnum \thevpagerefnum =\@tempcnta
421             \ifodd\@tempcnta
422                 \if@twoside
423                     \reftextfaceafter
424                 \else
425                     \reftextafter
426                 \fi
427             \else
428                 \reftextafter
429             \fi
430         \else
431             \advance\@tempcnta-2 %
432             \ifnum \thevpagerefnum =\@tempcnta
433                 \ifodd\@tempcnta
434                     \reftextbefore
435                 \else
436                     \if@twoside
437                         \reftextfacebefore
438                     \else
439                         \reftextbefore
440                     \fi
441                 \fi
442             \else
443                 \reftextfaraway{#3}%
444             \fi
445         \fi
446     }{%
447         \reftextfaraway{#3}%
448     }%
449 \fi
450 {%
451     \let\@currentlabel\@empty
452     \expandafter\label\expandafter{\the\c@vrcnt @vr}%

```

```

453     }%
454   }%
455   \DeclareRobustCommand\vnameref[1]{%
456     \unskip~\nameref{#1}%
457     \@vpageref[\unskip]{#1}%
458   }%
459 \fi
460 }

461 \ifundefined{@Refstar}{%
462   \def\T@Ref#1{%
463     \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
464   }%
465   \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
466     \MakeUppercase#1%
467   }%
468 }{}%
469 \AtBeginDocument{%
470   \@ifpackageloaded{varioref}{%
471     \ifundefined{@Refstar}{%
472       \DeclareRobustCommand*\Ref}[1]{%
473         \T@Ref{#1}%
474       }%
475     }{}%
476   }{}%
477 }%

```

### 3.7 Support for listings

```

478 \AtBeginDocument{%
479   \@ifpackageloaded{listings}{%
480     \let\NR@Org@lst@MakeCaption\lst@MakeCaption
481     \def\lst@MakeCaption{%
482       \ifx\lst@label\@empty
483       \else
484         \let\@currentlabelname\lst@@caption
485       \fi
486       \NR@Org@lst@MakeCaption
487     }%
488   }{}%
489 }
490 </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.

Symbols			
\@@@ . . . . .	5, 21, 41, 63	\@caption . . . . .	178, 179
\@vpageref . . . . .	360	\@chapter . . . . .	137, 138, 145
\@auxout . . . . .	23, 43, 68, 88	\@currentHref . . . . .	41, 47, 61, 62,
\@begintheorem . . . . .	241, 246, 250	. . . . .	63, 72, 98, 257, 484
. . . . .	17, 36, 58	\@currentlabel . . . . .	\@empty . . . . .
\@bspack . . . . .	17, 36, 58	\@currentlabelname . . . . .	189, 286,
			314, 389, 451, 482
			\@espack . . . . .
			32, 52, 82

<code>\@fifthoffive</code> . . . . .	263	<b>A</b>	<code>\endcsname</code> . . . . .	90,
<code>\@firstoffive</code> . . . . .		<code>\advance</code> . .	375, 416, 431	215, 216, 219,
. . . . .	259, 280, 292	<code>\AtBeginDocument</code> . .		222, 271, 358,
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