

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

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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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\*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@activestruet{}%
265 \providecommand*\@safe@activesfalse{}%
266 \def\NR@setref#1{%
267   \begingroup
268     \@safe@activestruet
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@activestruet
290         \SK@\SK@@ref{#1}%
291         \@safe@activesfalse
292         \NR@setref{#1}\@firstoffive{#1}%
293       }%
294       \def\T@pageref#1{%
295         \@safe@activestruet
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\group\NR@TE@begin\group
347   \NROrg@ifthenelse
348 }%
349 \let\NROrg@begin\group\begin\group
350 \def\NR@TE@begin\group{%
351   \let\begin\group\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 @vppageref\endcsname\relax
359   \else
360     \def\@vppageref#1[#2]#3{%
361       \begin\group
362         \csname @safe@activetrue\endcsname
363         \edef\x{#3}%
364         \@onelevel@sanitize\x
365         \toks@{%
366           \NR@@vppageref{#1}[{#2}]%
367         }%
368         \edef\x{\endgroup
369           \the\toks@{\x}%
370         }%
371       \x
372     }%
373     \def\NR@@vppageref#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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