

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

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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 L<sup>A</sup>T<sub>E</sub>X” (this file)

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<sup>\*</sup>This file has version number v2.42, last revised 2012/07/31.

## 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).

`\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 compatibility reasons with package `subfig`.

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

```

7 \def\NR@sanitize@labelname{%
8   \@onelevel@sanitize\@currentlabelname
9   \edef\@currentlabelname{%
10    \expandafter\NR@strip@period\@currentlabelname
11    \ltx@empty.\ltx@empty\@nil
12   }%
13 }

```

### 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

```

14 \newif\ifNR@showkeys
15 \NR@showkeysfalse
16 \@ifpackageloaded{showkeys}{%
17   \begingroup
18   \@ifundefined{SK@@label}{%
19     }{%
20     \global\NR@showkeystrue
21   }%
22   \endgroup
23 }{}

```

\label@hook

```

24 \providecommand*{\label@hook}{}
25 \ltx@GlobalAppendToMacro{\label@hook}{%
26   \NR@sanitize@labelname
27 }

```

\label

```

28 \def\label#1{%
29   \@bsphack
30   \begingroup
31   \def\label@name{#1}%
32   \label@hook
33   \protected@write\@auxout{}{%
34     \string\newlabel{#1}{%
35       {\@currentlabel}%
36       {\thepage}%
37       {\@currentlabelname}%
38       {\@currentHref}{}%
39     }%
40   }%
41   \endgroup
42   \@esphack
43 }%
44 \ifNR@showkeys
45   \def\label#1{%
46     \@bsphack
47     \SK@\SK@@label{#1}%
48     \begingroup
49     \def\label@name{#1}%
50     \label@hook
51     \protected@write\@auxout{}{%
52       \string\newlabel{#1}{%

```

```

53      {\@currentlabel}%
54      {\thepage}%
55      {\@currentlabelname}%
56      {\@currentHref}{}%
57    }%
58  }%
59  \endgroup
60  \@esphack
61 }%
62 \fi

```

`\ltx@label`

```

63 \let\ltx@label\label

```

Needed for the *subeqnarray* package.

`\slabel`

```

64 \ifundefined{slabel}{%
65   \def\slabel#1{%
66     \@bsphack
67     \if@filesw
68       \begingroup
69       \def\label@name{#1}%
70       \label@hook
71       \let\thepage\relax
72       \def\protect{\noexpand\noexpand\noexpand}%
73       \edef\@tempa{%
74         \write\@auxout{%
75           \string\newlabel{#1}{%
76             {\thesubequation}%
77             {\thepage}%
78             {\@currentlabelname}%
79             {\@currentHref}{}%
80           }%
81         }%
82       }%
83       \expandafter\endgroup
84       \@tempa
85       \if@nobreak\ifvmode\nobreak\fi\fi
86     \fi
87     \@esphack
88   }%
89 }

```

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

`\@writetocindents@`

```

90 \def\@writetocindents@{%
91   \begingroup
92   \@for\@tempa:=-1,0,1,2,3\do{%
93     \immediate\write\@auxout{%
94       \string\newlabel{tocindent\@tempa}{%
95         \csname r@tocindent\@tempa\endcsname}{-}{-}{-}%
96       }%
97     }%
98   }%
99   \endgroup
100 }

```

## 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`

```
101 \def\NR@gettitle#1{%
102   \GetTitleString{#1}%
103   \let\@currentlabelname\GetTitleStringResult
104 }
```

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

`\NR@sect`

```
105 \let\NR@sect\@sect
106 \newcounter{section@level}
```

`\@sect`

```
107 \def\@sect#1#2#3#4#5#6[#7]#8{%
108   \setcounter{section@level}{#2}%
109   \NR@gettitle{#7}%
110   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[#7]{\Sectionformat{#8}{#2}}%
111 }
```

and now the unnumbered ones

`\NR@ssect`

```
112 \let\NR@ssect\@ssect
```

`\NR@ssect`

```
113 \def\@ssect#1#2#3#4#5{%
114   \NR@gettitle{#5}%
115   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
116 }
```

Support for class memoir.

```
117 \ltx@ifundefined{ifheadnameref}{%
118 }{%
119   \ltx@ifundefined{M@sect}{%
120   }{%
121     \let\NRorg@M@sect\M@sect
122     \def\M@sect#1#2#3#4#5#6[#7][#8]{%
123       \ifheadnameref
124         \NR@gettitle{#8}%
125       \else
126         \NR@gettitle{#7}%
127       \fi
128       \NRorg@M@sect{#1}{#2}{#3}{#4}{#5}{#6}[#7][#8]%
129     }%
130   }%
131 }
```

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

```

132 \let\NR@part\@part
133 \long\def\@part[#1]#2{%
134   \NR@gettitle{#1}%
135   \NR@part[{#1}]{#2}%
136 }
137 \let\NR@spart\@spart
138 \long\def\@spart#1{%
139   \NR@gettitle{#1}%
140   \NR@spart{#1}%
141 }
142 \let\NR@chapter\@chapter
143 \def\@chapter[#1]#2{%
144   \NR@gettitle{#1}%
145   \NR@chapter[{#1}]{#2}%
146 }
147 \ifclassloaded{memoir}{%
148   \ltx@ifundefined{ifheadnameref}{%
149     {%
150       \def\@chapter[#1]#2{%
151         \ltx@ifundefined{ch@pt@c}{%
152           \NR@gettitle{#1}%
153         }{%
154           \ifx\ch@pt@c\ltx@empty
155             \NR@gettitle{#2}%
156           \else
157             \def\NR@temp{#1}%
158             \ifx\NR@temp\ltx@empty
159               \expandafter\NR@gettitle\expandafter{\ch@pt@c}%
160             \else
161               \ifheadnameref
162                 \NR@gettitle{#1}%
163               \else
164                 \expandafter\NR@gettitle\expandafter{\ch@pt@c}%
165             \fi
166           \fi
167         \fi
168       }%
169       \NR@chapter[{#1}]{#2}%
170     }%
171   }%
172 }{}
173 \let\NR@schapter\@schapter
174 \def\@schapter#1{%
175   \NR@gettitle{#1}%
176   \NR@schapter{#1}%
177 }

```

#### Captions

```

178 \AtBeginDocument{%
179   \ifpackageloaded{hyperref}{%
180     \ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
181   }\@firstofone
182   {%
183     \let\NR@@caption\@caption
184     \long\def\@caption#1[#2]{%

```

```

185 \NR@gettitle{#2}%
186 \NR@@caption{#1}{#2}%
187 }%
188 }%

189 \ifpackageloaded{longtable}{%
190 \let\NRorg@LT@c@ption\LT@c@ption
191 \def\LT@c@ption#1[#2]#3{%
192 \NRorg@LT@c@ption{#1}{#2}{#3}%
193 \def\@tempa{#2}%
194 \ifx\@tempa\@empty
195 \else
196 \NR@gettitle{#2}%
197 \fi
198 }%
199 }{}%

Environment ‘description’.
200 \ltx@ifundefined{descriptionlabel}{%
201 }{%
202 \let\NRorg@descriptionlabel\descriptionlabel
203 \def\descriptionlabel#1{%
204 \NR@gettitle{#1}%
205 \NRorg@descriptionlabel{#1}%
206 }%
207 }%
208 }

Compatibility for package titlesec.
209 \AtBeginDocument{%
210 \ifpackageloaded{titlesec}{%
211 \let\NRorg@ttl@sect@i\ttl@sect@i
212 \def\ttl@sect@i#1#2[#3]#4{%
213 \NR@gettitle{#4}%
214 \NRorg@ttl@sect@i{#1}{#2}{#3}{#4}%
215 }%
216 }{}%
217 }

```

### 3.2.1 Class beamer

```

218 \ifclassloaded{beamer}{%
219 \def\NR@PatchBeamer#1{%
220 \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
221 \csname beamer@#1\endcsname
222 \begingroup
223 \edef\x{\endgroup
224 \long\def\expandafter\noexpand\csname beamer@#1\endcsname
225 [####1]{% hash-ok
226 \noexpand\NR@gettitle{####1}%
227 \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
228 [{####1]}%
229 }%
230 }%
231 \x
232 }%
233 \NR@PatchBeamer{section}%
234 \NR@PatchBeamer{subsection}%
235 \NR@PatchBeamer{subsubsection}%

```

236 }{}

### 3.2.2 Theorems

```
237 \ltx@ifundefined{@opargbegintheorem}{}{%
238   \let\NRorg@opargbegintheorem\@opargbegintheorem
239   \def\@opargbegintheorem#1#2#3{%
240     \NR@getttitle{#3}%
241     \NRorg@opargbegintheorem{#1}{#2}{#3}%
242   }%
243 }
244 \AtBeginDocument{%
245   \ifpackageloaded{amsthm}{%
246     \let\NRorg@begintheorem\@begintheorem
247     \begingroup
248     \edef\x{\macro:\string#1\string#2[\string#3]}%
249     \@onelevel@sanitize\x
250     \def\y#1->#2\@nil{#1}%
251     \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
252     \@onelevel@sanitize\z
253     \expandafter\endgroup
254     \ifx\x\z
255       \def\@begintheorem#1#2[#3]{%
256         \NR@getttitle{#3}%
257         \NRorg@begintheorem{#1}{#2}[#3]}%
258     }%
259   \fi
260 }{ }%
261 }
```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```
262 \providecommand*{\@currentlabelname}{}
263 \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
264 \long\def\@firstoffive#1#2#3#4#5{#1}

\@secondoffive
265 \long\def\@secondoffive#1#2#3#4#5{#2}

\@thirdoffive
266 \long\def\@thirdoffive#1#2#3#4#5{#3}

\@fourthoffive
267 \long\def\@fourthoffive#1#2#3#4#5{#4}

\@offive
268 \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@activetrue
269 \providecommand*\@safe@activetrue{}%

\@safe@activesfalse
270 \providecommand*\@safe@activesfalse{}%

\NR@setref
271 \def\NR@setref#1{%
272   \begingroup
273   \@safe@activetrue
274   \expandafter
275   \endgroup
276   \expandafter\NR@@setref\csname r@#1\endcsname
277 }

\NR@@setref
278 \def\NR@@setref#1{%
279   \ifx\@undefined#1%
280     \let#1\relax
281   \fi
282   \@setref#1%
283 }

\T@ref
284 \def\T@ref#1{%
285   \NR@setref{#1}\@firstoffive{#1}%
286 }%

\T@pageref
287 \def\T@pageref#1{%
288   \NR@setref{#1}\@secondoffive{#1}%
289 }%

290 \ifNR@showkeys
291   \ifx\SK@ref\@empty
292     \else

\T@ref
293   \def\T@ref#1{%
294     \@safe@activetrue
295     \SK@\SK@@ref{#1}%
296     \@safe@activesfalse
297     \NR@setref{#1}\@firstoffive{#1}%
298   }%

\T@pageref
299   \def\T@pageref#1{%
300     \@safe@activetrue
301     \SK@\SK@@ref{#1}%
302     \@safe@activesfalse
303     \NR@setref{#1}\@secondoffive{#1}%
304   }%

305   \fi
306   \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`.

```
307 \ifpackageloaded{hyperref}{%
308 }{%
```

`\ref`

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

`\pageref`

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

```
311 }
```

### 3.4 Usage and frontend

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

`\T@nameref`

```
312 \def\T@nameref#1{%
313 \begingroup
314 \let\label\@gobble
315 \NR@setref{#1}\@thirdoffive{#1}%
316 \endgroup
317 }%
318 \ifNR@showkeys
319 \ifx\SK@ref\@empty
320 \else
321 \def\T@nameref#1{%
322 \@safe@activestrue
323 \SK@\SK@@ref{#1}%
324 \@safe@activesfalse
325 \begingroup
326 \let\label\@gobble
327 \NR@setref{#1}\@thirdoffive{#1}%
328 \endgroup
329 }%
330 \fi
331 \fi

332 %\@ifclassloaded{memoir}{%
333 % \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
334 % \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
335 % }%
336 %}\ltx@secondoftwo
337 %}%
338 % \DeclareRobustCommand*{\nameref}{%
339 % \@ifstar\@mem@titlerefno link\@mem@titleref
340 % }%
341 %}{%}
```

`\nameref`

```
342 \DeclareRobustCommand*{\nameref}{%
343 \@ifstar\T@nameref\T@nameref
344 }%
345 %}
```

`\Nameref` An extended form which gives title and page number.  
346 `\def\Nameref#1{'\nameref{#1}' on page~\pageref{#1}}`

`\Sectionformat` The default for `\Sectionformat`  
347 `\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`:

```

348 \ifpackageloaded{ifthen}{%
349   \let\NROrg@ifthenelse@ifthenelse
350   \def@ifthenelse{%
351     \let\begingroup\NR@TE@begingroup
352     \NROrg@ifthenelse
353   }%
354   \let\NROrg@begingroup\begingroup
355   \def\NR@TE@begingroup{%
356     \let\begingroup\NROrg@begingroup
357     \begingroup
358     \def\ref##1{\getrefbykeydefault{##1}{}{??}}%
359     \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
360   }%
361 }
```

### 3.6 Compatibility with varioref

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

```

362 \AtBeginDocument{%
363   \ifx\csname @@vpageref\endcsname\relax
364   \else
365     \def\@@vpageref#1[#2]#3{%
366       \begingroup
367       \csname @safe@activetrue\endcsname
368       \edef\x{#3}%
369       \@onelevel@sanitize\x
370       \toks@{%
371         \NR@@vpageref{#1}{#2}}%
372       }%
373       \edef\x{\endgroup
374         \the\toks@{\x}}%
375       }%
376       \x
377     }%
378     \def\NR@@vpageref#1[#2]#3{%
379       \leavevmode\unskip
380       \global\advance\c@vrcnt\@ne
381       \@ifundefined{r@the\c@vrcnt @vr}%
382       {\@namedef{r@the\c@vrcnt @vr}{??}{??}{}}{}%
383       \edef\@tempa{%
384         \expandafter\expandafter\expandafter
385         \@secondoffive\csname r@the\c@vrcnt @vr\endcsname
```

```

386 }%
387 \@ifundefined{r@\the\c@vrcnt @xvr}%
388   {\@namedef{r@\the\c@vrcnt @xvr}{\{??\}{??\}{\}{\}}}%
389 \edef\@tempb{%
390   \expandafter\expandafter\expandafter
391   \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
392 }%
393 {%
394   \let\@currentlabel\@empty
395   \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
396 }%
397 \ifx\@tempa\@tempb
398 \else
399   \vref@err{%
400     \noexpand\vref at page boundary %
401     \@tempb-\@tempa\space (may loop)%
402   }%
403 \fi
404 \@ifundefined{r@#3}{\@namedef{r@#3}{\{??\}{??\}{\}{\}}}%
405 \edef\thevpagerefnum{%
406   \expandafter\expandafter\expandafter
407   \@secondoffive\csname r@#3\endcsname
408 }%
409 \ifx\vref@space\@undefined
410   \space
411 \else
412   \vref@space
413 \fi
414 \ifx\@tempa\thevpagerefnum
415   #1%
416 \else
417   #2%
418   \is@pos@number\thevpagerefnum{%
419     \is@pos@number\@tempa{%
420       \@tempcnta\@tempa
421       \advance\@tempcnta\@ne
422     }{%
423       \@tempcnta\maxdimen
424     }%
425     \ifnum \thevpagerefnum =\@tempcnta
426       \ifodd\@tempcnta
427         \if@twoside
428           \reftextfaceafter
429         \else
430           \reftextafter
431         \fi
432       \else
433         \reftextafter
434       \fi
435     \else
436       \advance\@tempcnta-2 %
437       \ifnum \thevpagerefnum =\@tempcnta
438         \ifodd\@tempcnta
439           \reftextbefore
440         \else
441           \if@twoside
442             \reftextfacebefore

```

```

443         \else
444         \reftextbefore
445         \fi
446     \fi
447     \else
448     \reftextfaraway{#3}%
449     \fi
450 \fi
451 }{%
452     \reftextfaraway{#3}%
453 }%
454 \fi
455 {%
456     \let\@currentlabel\@empty
457     \expandafter\label\expandafter{\the\c@vrcnt \@vr}%
458 }%
459 }%
460 \DeclareRobustCommand\vnameref[1]{%
461     \unskip~\nameref{#1}%
462     \@vpageref[\unskip]{#1}%
463 }%
464 \fi
465 }

466 \ifundefined{@Refstar}{%
467     \def\T@Ref#1{%
468         \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
469     }%
470     \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
471         \MakeUppercase#1%
472     }%
473 }{}%
474 \AtBeginDocument{%
475     \ifpackageloaded{varioref}{%
476         \ifundefined{@Refstar}{%
477             \DeclareRobustCommand*\Ref}[1]{%
478                 \T@Ref{#1}%
479             }%
480         }{}%
481     }{}%
482 }%

```

### 3.7 Support for package listings

```

483 \AtBeginDocument{%
484     \ifpackageloaded{listings}{%
485         \let\NR@Org@lst@MakeCaption\lst@MakeCaption
486         \def\lst@MakeCaption{%
487             \ifx\lst@label\@empty
488             \else
489                 \let\@currentlabelname\lst@@caption
490             \fi
491             \NR@Org@lst@MakeCaption
492         }%
493     }{}%
494 }

495 \end{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		
\@@@ . . . . . 6	\@safe@activetrue . . . . . 269,	\def . . . . . 5, 6,
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