

# 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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