

# 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]
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}
6 \def\NR@sanitize@labelname{%
7   \@onelevel@sanitize\@currentlabelname
8   \edef\@currentlabelname{%
```

```

9   \expandafter\NR@strip@period\@currentlabelname
10  \ltx@empty.\ltx@empty\@nil
11  }%
12 }

```

### 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

```

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

```

\label@hook

```

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

```

\label

```

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

```

```

55      {\@currentHref}{}%
56    }%
57  }%
58  \endgroup
59  \@esphack
60 }%
61 \fi

```

`\ltx@label`

```
62 \let\ltx@label\label
```

Needed for the *subeqnarray* package.

`\slabel`

```

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

```

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

`\@writetocindents@`

```

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

```

## 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`

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

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

`\NR@sect`

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

`\@sect`

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

and now the unnumbered ones

`\NR@ssect`

```
111 \let\NR@ssect\@ssect
```

`\NR@ssect`

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

Support for class memoir.

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

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

```

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

```

#### Captions

```

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

```

```

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

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

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

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

```

### 3.2.1 Class beamer

```

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

```

235 }{}

### 3.2.2 Theorems

```

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

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

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

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

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

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

\@offive
267 \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
268 \providecommand*\@safe@activetrue{}%

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

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

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

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

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

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

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

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

304   \fi
305   \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`.

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

`\ref`

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

`\pageref`

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

```
310 }
```

### 3.4 Usage and frontend

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

`\T@nameref`

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

331 %\@ifclassloaded{memoir}{%
332 % \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
333 % \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
334 % }%
335 %}\ltx@secondoftwo
336 %}%
337 % \DeclareRobustCommand*{\nameref}{%
338 % \ifstar\@mem@titlerefno link\@mem@titleref
339 % }%
340 %}{%
```

`\nameref`

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

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

`\Sectionformat` The default for `\Sectionformat`  
346 `\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`:

```

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

### 3.6 Compatibility with varioref

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

```

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

```

385 }%
386 \@ifundefined{r@\the\c@vrcnt @xvr}%
387   {\@namedef{r@\the\c@vrcnt @xvr}{\{??\}{??\}{\}{\}}}%
388 \edef\@tempb{%
389   \expandafter\expandafter\expandafter
390   \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
391 }%
392 {%
393   \let\@currentlabel\@empty
394   \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
395 }%
396 \ifx\@tempa\@tempb
397 \else
398   \vref@err{%
399     \noexpand\vref at page boundary %
400     \@tempb-\@tempa\space (may loop)%
401   }%
402 \fi
403 \@ifundefined{r@#3}{\@namedef{r@#3}{\{??\}{??\}{\}{\}}}%
404 \edef\thevpagerefnum{%
405   \expandafter\expandafter\expandafter
406   \@secondoffive\csname r@#3\endcsname
407 }%
408 \ifx\vref@space\@undefined
409   \space
410 \else
411   \vref@space
412 \fi
413 \ifx\@tempa\thevpagerefnum
414   #1%
415 \else
416   #2%
417   \is@pos@number\thevpagerefnum{%
418     \is@pos@number\@tempa{%
419       \@tempcnta\@tempa
420       \advance\@tempcnta\@ne
421     }{%
422       \@tempcnta\maxdimen
423     }%
424     \ifnum \thevpagerefnum =\@tempcnta
425       \ifodd\@tempcnta
426         \if@twoside
427           \reftextfaceafter
428         \else
429           \reftextafter
430         \fi
431       \else
432         \reftextafter
433       \fi
434     \else
435       \advance\@tempcnta-2 %
436       \ifnum \thevpagerefnum =\@tempcnta
437         \ifodd\@tempcnta
438           \reftextbefore
439         \else
440           \if@twoside
441             \reftextfacebefore

```

```

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

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

```

### 3.7 Support for listings

```

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

494 </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.

<b>Symbols</b>	<code>\@schapter</code> . . . . .	172, 173	121, 132, 137,
<code>\@vppageref</code> . . . . .	<code>\@secondoffive</code> . . . . .		142, 149, 156,
<code>\@auxout</code> . . . . .	32, 50, 73, 92	264, 287,	173, 183, 190,
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