

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

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<https://github.com/ho-tex/hyperref/issues>

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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  $\text{\LaTeX}$  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 compatibilty 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@files
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}%

Theorem names.
236      \addtobeamertemplate{theorem begin}{%
237      \expandafter\NR@gettitle\expandafter{\inserttheoremaddition}%
238      }{%
239      \@ifdefinable{\NRorg@beamer@descriptionitem}{%
240      \let\NRorg@beamer@descriptionitem\beamer@descriptionitem
241      \renewcommand{\beamer@descriptionitem}[1]{%
242      \NR@gettitle{#1}%
243      \NRorg@beamer@descriptionitem{#1}%
244      }%
245      }%
246      }%

```

### 3.2.2 Theorems

```

247      \ltx@ifundefined{@opargbegintheorem}{%
248      \let\NRorg@opargbegintheorem\@opargbegintheorem
249      \def\@opargbegintheorem#1#2#3{%
250      \NR@gettitle{#3}%
251      \NRorg@opargbegintheorem{#1}{#2}{#3}%
252      }%
253      }
254      \AtBeginDocument{%
255      \@ifpackageloaded{amsthm}{%
256      \let\NRorg@begintheorem\@begintheorem
257      \begingroup
258      \edef\x{\macro:\string#1\string#2[\string#3]}%
259      \@onelevel@sanitize\x
260      \def\y#1->#2\@nil{#1}%
261      \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
262      \@onelevel@sanitize\z
263      \expandafter\endgroup
264      \ifx\x\z
265      \def\@begintheorem#1#2[#3]{%
266      \NR@gettitle{#3}%
267      \NRorg@begintheorem{#1}{#2}{#3}%
268      }%
269      \fi
270      }{%
271      }

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

272      \providecommand*{\@currentlabelname}{}
273      \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
274 \long\def\@firstoffive#1#2#3#4#5{#1}

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

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

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

\@offive
278 \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
279 \providecommand*\@safe@activetrue{}%

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

\NR@setref
281 \def\NR@setref#1{%
282   \begingroup
283   \@safe@activetrue
284   \expandafter
285   \endgroup
286   \expandafter\NR@@setref\csname r@#1\endcsname
287 }

\NR@@setref
288 \def\NR@@setref#1{%
289   \ifx\@undefined#1%
290     \let#1\relax
291   \fi
292   \@setref#1%
293 }

\T@ref
294 \def\T@ref#1{%
295   \NR@setref{#1}\@firstoffive{#1}%
296 }%

\T@pageref
297 \def\T@pageref#1{%
298   \NR@setref{#1}\@secondoffive{#1}%
299 }%
```

```

300 \ifNR@showkeys
301 \ifx\SK@ref\@empty
302 \else

\T@ref
303 \def\T@ref#1{%
304 \@safe@activestru
305 \SK@\SK@@ref{#1}%
306 \@safe@activesfalse
307 \NR@setref{#1}\@firstoffive{#1}%
308 }%

\T@pageref
309 \def\T@pageref#1{%
310 \@safe@activestru
311 \SK@\SK@@ref{#1}%
312 \@safe@activesfalse
313 \NR@setref{#1}\@secondoffive{#1}%
314 }%

315 \fi
316 \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. Pack-
age nameref can be loaded before, after hyperref or after hyperref's definitions in
\AtBeginDocument.

317 \@ifpackageloaded{hyperref}{%
318 }{%

\ref
319 \DeclareRobustCommand{\ref}{\T@ref}%

\pageref
320 \DeclareRobustCommand{\pageref}{\T@pageref}%

321 }

```

### 3.4 Usage and frontend

Access the (third) name part with \nameref;

```

\T@nameref
322 \def\T@nameref#1{%
323 \begingroup
324 \let\label\@gobble
325 \NR@setref{#1}\@thirdoffive{#1}%
326 \endgroup
327 }%
328 \ifNR@showkeys
329 \ifx\SK@ref\@empty
330 \else
331 \def\T@nameref#1{%
332 \@safe@activestru
333 \SK@\SK@@ref{#1}%
334 \@safe@activesfalse
335 \begingroup

```

```

336      \let\label\@gobble
337      \NR@setref{#1}\@thirdoffive{#1}%
338      \endgroup
339    }%
340  \fi
341 \fi

342 %\@ifclassloaded{memoir}{%
343 %  \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
344 %    \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
345 %  }%
346 %}\ltx@secondoftwo
347 %}%
348 % \DeclareRobustCommand*{\nameref}{%
349 %   \@ifstar{@mem@titlerefno link}@mem@titleref
350 % }%
351 %}{%

\Nameref
352 \DeclareRobustCommand*{\nameref}{%
353   \@ifstar{T@nameref{T@nameref
354   }%
355   %}

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

\Sectionformat The default for \Sectionformat
357 \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`:

```

358 \@ifpackageloaded{ifthen}{%
359   \let\NR@Org@ifthenelse@ifthenelse
360   \def@ifthenelse{%
361     \let\begingroup\NR@TE@begingroup
362     \NR@Org@ifthenelse
363   }%
364   \let\NR@Org@begingroup\begingroup
365   \def\NR@TE@begingroup{%
366     \let\begingroup\NR@Org@begingroup
367     \begingroup
368     \def\ref###1{\getrefbykeydefault{##1}{-}{??}}%
369     \def\pageref###1{\getrefbykeydefault{##1}{page}{0}}%
370   }%
371 }{}

```

### 3.6 Compatibility with varioref

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

```

372 \AtBeginDocument{%
373   \ifx\csname @@vpageref\endcsname\relax
374   \else
375     \def\@@vpageref#1[#2]#3{%
376       \begingroup
377         \csname @safe@activetrue\endcsname
378         \edef\x{#3}%
379         \@onelevel@sanitize\x
380         \toks@{%
381           \NR\@@vpageref{#1}[{#2}]%
382         }%
383         \edef\x{\endgroup
384           \the\toks@{\x}%
385         }%
386       \x
387     }%
388   \def\NR\@@vpageref#1[#2]#3{%
389     \leavevmode\unskip
390     \global\advance\c@vrcnt\@ne
391     \@ifundefined{r@\the\c@vrcnt @vr}%
392       {\@namedef{r@\the\c@vrcnt @vr}{\{??\}{??\}{\}{\}}}%
393     \edef\@tempa{%
394       \expandafter\expandafter\expandafter
395       \@secondoffive\csname r@\the\c@vrcnt @vr\endcsname
396     }%
397     \@ifundefined{r@\the\c@vrcnt @xvr}%
398       {\@namedef{r@\the\c@vrcnt @xvr}{\{??\}{??\}{\}{\}}}%
399     \edef\@tempb{%
400       \expandafter\expandafter\expandafter
401       \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
402     }%
403     {%
404       \let\@currentlabel\@empty
405       \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
406     }%
407     \ifx\@tempa\@tempb
408     \else
409       \vref@err{%
410         \noexpand\vref at page boundary %
411         \@tempb-\@tempa\space (may loop)%
412       }%
413     \fi
414     \@ifundefined{r@#3}{\@namedef{r@#3}{\{??\}{??\}{\}{\}}}%
415     \edef\thepagerefnum{%
416       \expandafter\expandafter\expandafter
417       \@secondoffive\csname r@#3\endcsname
418     }%
419     \ifx\vref@space\@undefined
420       \space
421     \else
422       \vref@space
423     \fi
424     \ifx\@tempa\thepagerefnum
425       #1%
426     \else
427       #2%
428     \is@pos@number\thepagerefnum{%

```

```

429 \is@pos@number\@tempa{%
430 \@tempcnta\@tempa
431 \advance\@tempcnta\@ne
432 }{%
433 \@tempcnta\maxdimen
434 }%
435 \ifnum \thevpagerefnum =\@tempcnta
436 \ifodd\@tempcnta
437 \if@twoside
438 \reftextfaceafter
439 \else
440 \reftextafter
441 \fi
442 \else
443 \reftextafter
444 \fi
445 \else
446 \advance\@tempcnta-2 %
447 \ifnum \thevpagerefnum =\@tempcnta
448 \ifodd\@tempcnta
449 \reftextbefore
450 \else
451 \if@twoside
452 \reftextfacebefore
453 \else
454 \reftextbefore
455 \fi
456 \fi
457 \else
458 \reftextfaraway{#3}%
459 \fi
460 \fi
461 }{%
462 \reftextfaraway{#3}%
463 }%
464 \fi
465 {%
466 \let\@currentlabel\@empty
467 \expandafter\label\expandafter{\the\c@vrcnt @vr}%
468 }%
469 }%
470 \DeclareRobustCommand\vnameref[1]{%
471 \unskip~\nameref{#1}%
472 \@vpageref[\unskip]{#1}%
473 }%
474 \fi
475 }

476 \@ifundefined{@Refstar}{%
477 \def\T@Ref#1{%
478 \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
479 }%
480 \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
481 \MakeUppercase#1%
482 }%
483 }{}%
484 \AtBeginDocument{%
485 \@ifpackageloaded{varioref}{%

```

```

486 \ifundefined{@Refstar}{%
487   \DeclareRobustCommand*{\Ref}[1]{%
488     \T@Ref{#1}%
489   }%
490 }{}%
491 }{}%
492 }%

```

### 3.7 Support for package listings

```

493 \AtBeginDocument{%
494   \ifpackageloaded{listings}{%
495     \let\NROrg@lst@MakeCaption\lst@MakeCaption
496     \def\lst@MakeCaption{%
497       \ifx\lst@label\@empty
498         \else
499           \let\@currentlabelname\lst@@caption
500         \fi
501       \NROrg@lst@MakeCaption
502     }%
503   }{}%
504 }
505 \end{package}

```