

# 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).

```
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 }

185 \AtBeginDocument{%
186     \@ifpackageloaded{longtable}{%
187         \let\NRorg@LT@caption\LT@caption
188         \def\LT@caption#1[#2]#3{%
189             \NRorg@LT@caption{#1}[{#2}]{#3}%
190             \def\@tempa{#2}%
191             \ifx\@tempa\@empty
192             \else
193                 \NR@getttitle{#2}%
194             \fi
195         }%
196     }{}%
197 }

```

### Compatibility for package titlesec.

```

198 \AtBeginDocument{%
199     \@ifpackageloaded{titlesec}{%
200         \let\NRorg@ttl@sect@i\ttl@sect@i
201         \def\ttl@sect@i#1#2[#3]#4{%
202             \NR@getttitle{#4}%
203             \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
204         }%
205     }{}%
206 }

```

### 3.2.1 Class beamer

```

207 \@ifclassloaded{beamer}{%
208   \def\NR@PatchBeamer#1{%
209     \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
210       \csname beamer@#1\endcsname
211     \begingroup
212       \edef\x{\endgroup
213         \long\def\expandafter\noexpand\csname beamer@#1\endcsname
214           [####1]{% hash-ok
215             \noexpand\NR@getttitle{####1}%
216             \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
217               [{####1]}%
218             }%
219           }%
220     \x
221   }%
222   \NR@PatchBeamer{section}%
223   \NR@PatchBeamer{subsection}%
224   \NR@PatchBeamer{subsubsection}%
225 }{}

```

### 3.2.2 Theorems

```

226 \ltx@ifundefined{@opargbegintheorem}{}{%
227   \let\NRorg@opargbegintheorem\@opargbegintheorem
228   \def\@opargbegintheorem#1#2#3{%
229     \NR@getttitle{#3}%
230     \NRorg@opargbegintheorem{#1}{#2}{#3}%
231   }%
232 }
233 \AtBeginDocument{%
234   \@ifpackageloaded{amsthm}{%
235     \let\NRorg@begintheorem\@begintheorem
236     \begingroup
237       \edef\x{macro:\string#1\string#2[\string#3]}%
238       \@onelevel@sanitize\x
239       \def\y#1->#2\@nil{#1}%
240       \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
241       \@onelevel@sanitize\z
242     \expandafter\endgroup
243     \ifx\x\z
244       \def\@begintheorem#1#2[#3]{%
245         \NR@getttitle{#3}%
246         \NRorg@begintheorem{#1}{#2} [{#3}]%
247       }%
248     \fi
249   }{}%
250 }

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

251 \providecommand*{\@currentlabelname}{}
252 \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:

```

253 \long\def\@firstoffive#1#2#3#4#5{#1}
254 \long\def\@secondoffive#1#2#3#4#5{#2}
255 \long\def\@thirdoffive#1#2#3#4#5{#3}

```

```

256 \long\def\@fourthoffive#1#2#3#4#5{#4}
257 \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`.

```

258 \providecommand*\@safe@activetrue{%
259 \providecommand*\@safe@activesfalse{%
260 \def\NR@setref#1{%
261   \begingroup
262     \@safe@activetrue
263     \expandafter
264   \endgroup
265   \expandafter\NR@@setref\csname r@#1\endcsname
266 }
267 \def\NR@@setref#1{%
268   \ifx\@undefined#1%
269     \let#1\relax
270   \fi
271   \@setref#1%
272 }
273 \def\T@ref#1{%
274   \NR@setref{#1}\@firstoffive{#1}%
275 }%
276 \def\T@pageref#1{%
277   \NR@setref{#1}\@secondoffive{#1}%
278 }%
279 \ifNR@showkeys
280   \ifx\SK@ref\@empty
281   \else
282     \def\T@ref#1{%
283       \@safe@activetrue
284       \SK@\SK@@ref{#1}%
285       \@safe@activesfalse
286       \NR@setref{#1}\@firstoffive{#1}%
287     }%
288     \def\T@pageref#1{%
289       \@safe@activetrue
290       \SK@\SK@@ref{#1}%
291       \@safe@activesfalse
292       \NR@setref{#1}\@secondoffive{#1}%
293     }%
294   \fi
295 \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`.

```

296 \@ifpackageloaded{hyperref}{%
297 }{%
298   \DeclareRobustCommand{\ref}{\T@ref}%
299   \DeclareRobustCommand{\pageref}{\T@pageref}%
300 }

```



### 3.4 Usage and frontend

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

```

301 \def\T@nameref#1{%
302   \begingroup
303     \let\label\@gobble
304     \NR@setref{#1}\@thirdoffive{#1}%
305   \endgroup
306 }%
307 \ifNR@showkeys
308   \ifx\SK@ref\@empty
309   \else
310     \def\T@nameref#1{%
311       \@safe@activestrue
312       \SK@\SK@@ref{#1}%
313       \@safe@activesfalse
314       \begingroup
315         \let\label\@gobble
316         \NR@setref{#1}\@thirdoffive{#1}%
317       \endgroup
318     }%
319   \fi
320 \fi
321 %\@ifclassloaded{memoir}{%
322 %  \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
323 %    \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
324 %  }%
325 %}\ltx@secondoftwo
326 %{%
327 %  \DeclareRobustCommand*\nameref{%
328 %    \@ifstar\@mem@titlerefno link\@mem@titleref
329 %  }%
330 %}{%
331   \DeclareRobustCommand*\nameref{%
332     \@ifstar\T@nameref\T@nameref
333   }%
334 %}

```

An extended form which gives title and page number.

```

335 \def\Nameref#1{'\nameref{#1}' on page~\pageref{#1}}

```

The default for `\Sectionformat`

```

336 \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`:

```

337 \@ifpackageloaded{ifthen}{%
338   \let\NR@org@ifthenelse\ifthenelse
339   \def\ifthenelse{%
340     \let\begingroup\NR@TE@begingroup
341     \NR@org@ifthenelse
342   }%

```

```

343 \let\NROrg@begingroup\begingroup
344 \def\NR@TE@begingroup{%
345   \let\begin@group\NROrg@begingroup
346   \begin@group
347   \def\ref##1{\getrefbykeydefault{##1}{}}{??}}%
348   \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
349 }%
350 }{}

```

### 3.6 Compatibility with varioref

[This section was derived by Corey Minyard minyard@acm.org from the varioref package]

```

351 \AtBeginDocument{%
352   \ifx\csname @vpageref\endcsname\relax
353   \else
354     \def\@vpageref#1[#2]#3{%
355       \begin@group
356       \csname @safe@activestrue\endcsname
357       \edef\x{#3}%
358       \@onelevel@sanitize\x
359       \toks@{%
360         \NR@vpageref{#1}[{#2}]}%
361       }%
362       \edef\x{\endgroup
363         \the\toks@{\x}}%
364       }%
365     \x
366   }%
367   \def\NR@vpageref#1[#2]#3{%
368     \leavevmode\unskip
369     \global\advance\c@vrcnt\@ne
370     \@ifundefined{r@\the\c@vrcnt @vr}%
371     {\@namedef{r@\the\c@vrcnt @vr}{??}{?}{-}{-}}{}%
372     \edef\@tempa{%
373       \expandafter\expandafter\expandafter
374       \@secondoffive\csname r@\the\c@vrcnt @vr\endcsname
375     }%
376     \@ifundefined{r@\the\c@vrcnt @xvr}%
377     {\@namedef{r@\the\c@vrcnt @xvr}{??}{?}{-}{-}}{}%
378     \edef\@tempb{%
379       \expandafter\expandafter\expandafter
380       \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
381     }%
382     {%
383       \let\@currentlabel\@empty
384       \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
385     }%
386     \ifx\@tempa\@tempb
387     \else
388       \vref@err{%
389         \noexpand\vref at page boundary %
390         \@tempb-\@tempa\space (may loop)%
391       }%
392     \fi
393     \@ifundefined{r@#3}{\@namedef{r@#3}{??}{?}{-}{-}}{}%
394     \edef\thevpagerefnum{%

```

```

395     \expandafter\expandafter\expandafter
396     \@secondoffive\csname r@#3\endcsname
397 }%
398 \ifx\vref@space\@undefined
399     \space
400 \else
401     \vref@space
402 \fi
403 \ifx\@tempa\thevpagerefnum
404     #1%
405 \else
406     #2%
407     \is@pos@number\thevpagerefnum{%
408         \is@pos@number\@tempa{%
409             \@tempcnta\@tempa
410             \advance\@tempcnta\@ne
411         }{%
412             \@tempcnta\maxdimen
413         }%
414     \ifnum \thevpagerefnum =\@tempcnta
415         \ifodd\@tempcnta
416             \if@twoside
417                 \reftextfaceafter
418             \else
419                 \reftextafter
420             \fi
421         \else
422             \reftextafter
423         \fi
424     \else
425         \advance\@tempcnta-2 %
426         \ifnum \thevpagerefnum =\@tempcnta
427             \ifodd\@tempcnta
428                 \reftextbefore
429             \else
430                 \if@twoside
431                     \reftextfacebefore
432                 \else
433                     \reftextbefore
434                 \fi
435             \fi
436         \else
437             \reftextfaraway{#3}%
438         \fi
439     \fi
440 }{%
441     \reftextfaraway{#3}%
442 }%
443 \fi
444 {%
445     \let\@currentlabel\@empty
446     \expandafter\label\expandafter{\the\c@vrcnt @vr}%
447 }%
448 }%
449 \DeclareRobustCommand\vnameref[1]{%
450     \unskip~\nameref{#1}%
451     \@vpageref[\unskip]{#1}%

```

```

452 }%
453 \fi
454 }

455 \ifundefined{@Refstar}{%
456   \def\T@Ref#1{%
457     \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
458   }%
459   \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
460     \MakeUppercase#1%
461   }%
462 }{}%
463 \AtBeginDocument{%
464   \ifpackageloaded{varioref}{%
465     \ifundefined{@Refstar}{%
466       \DeclareRobustCommand*\Ref}[1]{%
467         \T@Ref{#1}%
468       }%
469     }{}%
470   }{}%
471 }%

```

### 3.7 Support for listings

```

472 \AtBeginDocument{%
473   \ifpackageloaded{listings}{%
474     \let\NR@Org@lst@MakeCaption\lst@MakeCaption
475     \def\lst@MakeCaption{%
476       \ifx\lst@label\@empty
477       \else
478         \let\@currentlabelname\lst@@caption
479       \fi
480       \NR@Org@lst@MakeCaption
481     }%
482   }{}%
483 }

484 \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.

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