

# 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 EuroTeX 1999.

**Bookmark talk, paper** The paper version of the talk.

Source code documentation:

**hyperref.dtx** This is the source code documentation for hyperref (this file).

**backref.dtx** “Back referencing from bibliographical citations”

**nameref.dtx** “Section name references in L<sup>A</sup>T<sub>E</sub>X”

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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 variorref hacks by Corey Minyard;  
 September 28th changes by David Carlisle.  
 More recent changes are recorded in ChangeLog.

## 3 Implementation

```
1 <*package>
2 \RequirePackage{refcount}[2006/02/12]
```

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).

```
3 \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.

```
4 \newif\ifNR@showkeys
5 \NR@showkeysfalse
6 \ifpackageloaded{showkeys}{%
7   \begingroup
8     \ifundefined{SK@label}{%
9       }{%
10      \global\NR@showkeystrue
11    }%
12  \endgroup
13 }{%
14 \def\label#1{%
15   \@bsphack
16   \begingroup
17     \onelevel@sanitize@\currentlabelname
18     \edef@\currentlabelname{%
19       \expandafter\strip@period@\currentlabelname\relax.\relax\@%
20     }%
}
```

```

21   \protected@write\@auxout{}{%
22     \string\newlabel{\#1}{%
23       {@currentlabel}%
24       {\thepage}%
25       {@currentlabelname}%
26       {@currentHref}{}}%
27     }%
28   }%
29   \endgroup
30   \esphack
31 }%
32 \ifNR@showkeys
33   \def\label#1{%
34     \bsphack
35     \SK@\SK@\label{\#1}%
36     \begingroup
37       @onelvel@sanitize@currentlabelname
38       \edef@currentlabelname{%
39         \expandafter\strip@period@currentlabelname\relax.\relax\@@@%
40       }%
41     \protected@write\@auxout{}{%
42       \string\newlabel{\#1}{%
43         {@currentlabel}%
44         {\thepage}%
45         {@currentlabelname}%
46         {@currentHref}{}}%
47       }%
48     }%
49   \endgroup
50   \esphack
51 }%
52 \fi
53 \let\ltx@label\label

```

Needed for the *subeqnarray* package.

```

54 \ifundefined{slabel}{%
55   \def\slabel#1{%
56     \bsphack
57     \if@filesw
58       {%
59         @onelvel@sanitize@currentlabelname
60         \edef@currentlabelname{%
61           \expandafter\strip@period@currentlabelname\relax.\relax\@@@%
62         }%
63         \let\thepage\relax
64         \def\protect{\noexpand\noexpand\noexpand}%
65         \edef@tempa{%
66           \write\@auxout{%
67             \string\newlabel{\#1}{%
68               @thesubequation}%
69               {\thepage}%
70               {@currentlabelname}%
71               {@currentHref}{}}%
72           }%
73         }%
74       }%
75     \expandafter

```

```

76      }%
77      \atempa
78      \if@nobreak\ifvmode\nobreak\fi\fi
79      \fi
80      \esphack
81  }%
82 }

```

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

```

83 \def\@writetocindents{%
84   \begingroup
85   \for\@tempa:=-1,0,1,2,3\do{%
86     \immediate\write\auxout{%
87       \string\newlabel{tocindent\@tempa}{%
88         \csname r@tocindent\@tempa\endcsname{}{}{}{}}%
89     }%
90   }%
91 }%
92 \endgroup
93 }

```

### 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. This is done by the label-writing routine.

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

```

94 \let\NR@sect\@sect
95 \newcounter{section@level}
96 \def\@sect#1#2#3#4#5#6[#7]{#8}{%
97   \setcounter{section@level}{#2}%
98   \def\@currentlabelname{#7}%
99   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]{\Sectionformat{#8}{#2}}%
100 }

```

and now the unnumbered ones

```

101 \let\NR@ssect\@ssect
102 \def\@ssect#1#2#3#4#5{%
103   \def\@currentlabelname{#5}%
104   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
105 }

```

Parts and chapters are treated differently. sigh.

```

106 \let\NR@part\@part
107 \def\@part[#1]{#2}{%
108   \def\@currentlabelname{#1}%
109   \NR@part[{#1}]{#2}%
110 }
111 \let\NR@chapter\@chapter
112 \def\@chapter[#1]{#2}{%
113   \def\@currentlabelname{#1}%
114   \NR@chapter[{#1}]{#2}%
115 }
116 \let\NR@schapter\@schapter
117 \def\@schapter#1{%
118   \def\@currentlabelname{#1}%

```

```

119  \NR@schapter{#1}%
120 }

    Captions

121 \let\NR@@caption\@caption
122 \long\def\@caption#1[#2]{%
123   \def\@currentlabelname{#2}%
124   \NR@@caption{#1}[{#2}]%
125 }

126 \AtBeginDocument{%
127   \@ifpackageloaded{longtable}{%
128     \let\NRorg@LT@c@option\LT@c@option
129     \def\LT@c@option#1[#2]#3{%
130       \NRorg@LT@c@option{#1}[{#2}]{#3}%
131       \def\@tempa{#2}%
132       \ifx\@tempa\@empty
133       \else
134         \def\@currentlabelname{#2}%
135       \fi
136     }%
137   }{}%
138 }

```

Compatibility for package titlesec.

```

139 \AtBeginDocument{%
140   \@ifpackageloaded{titlesec}{%
141     \let\NRorg@ttl@sect@i\ttl@sect@i
142     \def\ttl@sect@i#1#2[#3]#4{%
143       \def\@currentlabelname{#4}%
144       \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
145     }%
146   }{}%
147 }

```

### 3.2.1 Class beamer

```

148 \@ifclassloaded{beamer}{%
149   \def\NR@PatchBeamer#1{%
150     \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
151     \csname beamer@#1\endcsname
152     \begingroup
153       \edef\x{\endgroup
154         \long\def\expandafter\noexpand\csname beamer@#1\endcsname
155         [####1]{% hash-ok
156           \def\noexpand\@currentlabelname{####1}%
157           \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
158           [{####1}]%
159         }%
160       }%
161       \x
162     }%
163   \NR@PatchBeamer{section}%
164   \NR@PatchBeamer{subsection}%
165   \NR@PatchBeamer{subsubsection}%
166 }{}%

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```
167 \def\@currentlabelname{}  
168 \def\@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:

```
169 \long\def\@firstoffive#1#2#3#4#5{#1}  
170 \long\def\@secondoffive#1#2#3#4#5{#2}  
171 \long\def\@thirdoffive#1#2#3#4#5{#3}  
172 \long\def\@fourthoffive#1#2#3#4#5{#4}  
173 \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`.

```
174 \providecommand*\@safe@activestrue{}%  
175 \providecommand*\@safe@activesfalse{}%  
176 \def\NR@setref#1{  
177   \begingroup  
178     \@safe@activestrue  
179     \expandafter  
180   \endgroup  
181   \expandafter\NR@@setref\csname r#1\endcsname  
182 }  
183 \def\NR@@setref#1{  
184   \ifx\@undefined#1%  
185     \let#1\relax  
186   \fi  
187   \@setref#1%  
188 }  
189 \def\T@ref#1{  
190   \NR@setref{#1}\@firstoffive{#1}%  
191 }%  
192 \def\T@pageref#1{  
193   \NR@setref{#1}\@secondoffive{#1}%  
194 }%  
195 \ifNR@showkeys  
196   \ifx\SK@ref\empty  
197   \else  
198     \def\T@ref#1{  
199       \@safe@activestrue  
200       \SK@\SK@@ref{#1}%  
201       \@safe@activesfalse  
202       \NR@setref{#1}\@firstoffive{#1}%  
203     }%  
204     \def\T@pageref#1{  
205       \@safe@activestrue  
206       \SK@\SK@@ref{#1}%  
207       \@safe@activesfalse  
208       \NR@setref{#1}\@secondoffive{#1}%  
209     }%  
210   \fi  
211 }
```

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`.

```
212 \@ifpackageloaded{hyperref}{%
213 }{%
214   \DeclareRobustCommand{\ref}{\T@ref}%
215   \DeclareRobustCommand{\pageref}{\T@pageref}%
216 }
```

### 3.4 Usage and frontend

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

```
217 \def\T@nameref#1{%
218   \begingroup
219   \let\label\gobble
220   \NR@setref{\#1}\@thirdoffive{\#1}%
221   \endgroup
222 }%
223 \ifNR@showkeys
224   \ifx\SK@ref\empty
225   \else
226     \def\T@nameref#1{%
227       \csname\activestrue\endcsname
228       \SK@\SK@ref{\#1}%
229       \csname\activesfalse\endcsname
230       \begingroup
231       \let\label\gobble
232       \NR@setref{\#1}\@thirdoffive{\#1}%
233       \endgroup
234     }%
235   \fi
236 \fi
237 \def\nameref{\protect\T@nameref}
```

An extended form which gives title and page number.

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

The default for `\Sectionformat`

```
239 \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`:

```
240 \@ifpackageloaded{ifthen}{%
241   \let\NROrg@ifthenelse\ifthenelse
242   \def\ifthenelse{%
243     \let\begingroup\NR@TE@begingroup
244     \NROrg@ifthenelse
245   }%
246   \let\NROrg@begingroup\begingroup
247   \def\NR@TE@begingroup{%
248     \let\begingroup\NROrg@begingroup
249     \begingroup
250     \def\ref##1{\getrefbykeydefault{\#1}{}{??}}%
```

```

251     \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
252   }%
253 }{}%
```

### 3.6 Compatibility with varioref

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

```

254 \AtBeginDocument{%
255   \ifx\csname @@vpageref\endcsname\relax
256   \else
257     \def\@@vpageref#1[#2]#3{%
258       \begingroup
259         \csname @safe@activestru\endcsname
260         \edef\x{#3}%
261         \onelevel@sanitize\x
262         \toks@{%
263           \NR@@vpageref{#1}[{#2}]%
264         }%
265         \edef\x{\endgroup
266           \the\toks@{\x}%
267         }%
268         \x
269     }%
270     \def\NR@@vpageref#1[#2]#3{%
271       \leavevmode\unskip
272       \global\advance\c@vrcnt\@ne
273       \@ifundefined{r@\the\c@vrcnt @vr}%
274         {\@namedef{r@\the\c@vrcnt @vr}{{?}{?}{?}{?}{?}}{}}%
275       \edef@\tempa{%
276         \expandafter\expandafter\expandafter
277         \secondoffive\csname r@\the\c@vrcnt @vr\endcsname
278       }%
279       \@ifundefined{r@\the\c@vrcnt @xvr}%
280         {\@namedef{r@\the\c@vrcnt @xvr}{{?}{?}{?}{?}{?}}{}}%
281       \edef@\tempb{%
282         \expandafter\expandafter\expandafter
283         \secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
284       }%
285     }%
286     \let@\currentlabel\empty
287     \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
288   }%
289   \ifx@\tempa@\tempb
290   \else
291     \vref@err{%
292       \noexpand\vref at page boundary %
293       \tempb-\tempa\space (may loop)%
294     }%
295   \fi
296   \ifundefined{r@#3}{\@namedef{r@#3}{{?}{?}{?}{?}{?}}{}}%
297   \edef\thevpagerefnum{%
298     \expandafter\expandafter\expandafter
299     \secondoffive\csname r@#3\endcsname
300   }%
301   \ifx\vref@space\undefined
302     \space
```

```

303      \else
304          \vref@space
305      \fi
306      \ifx\@tempa\thevpagerefnum
307          #1%
308      \else
309          #2%
310      \is@pos@number\thevpagerefnum{%
311          \is@pos@number\@tempa{%
312              \tempcnta\@tempa
313              \advance\tempcnta\@ne
314          }{%
315              \tempcnta\maxdimen
316          }%
317          \ifnum \thevpagerefnum =\tempcnta
318              \ifodd\tempcnta
319                  \if@twoside
320                      \reftextfaceafter
321                  \else
322                      \reftextafter
323                  \fi
324              \else
325                  \reftextafter
326              \fi
327          \else
328              \advance\tempcnta- 2 %
329              \ifnum \thevpagerefnum =\tempcnta
330                  \ifodd\tempcnta
331                      \reftextbefore
332                  \else
333                      \if@twoside
334                          \reftextfacebefore
335                      \else
336                          \reftextbefore
337                      \fi
338                  \fi
339              \else
340                  \reftextfaraway{#3}%
341              \fi
342          \fi
343      }{%
344          \reftextfaraway{#3}%
345      }%
346      \fi
347  {%
348      \let\@currentlabel\empty
349      \expandafter\label\expandafter{\the\c@vrcnt @vr}%
350  }%
351 }%
352 \DeclareRobustCommand\vnameref[1]{%
353     \unskip\@nameref{#1}%
354     \vpageref[\unskip]{#1}%
355 }%
356 \fi
357 }

358 \Qifundefined{@Refstar}{%
359     \def\T@Ref#1{%

```

```

360      \NR@setref{\#1}\NR@MakeUppercaseFirstOfFive{\#1}%
361  }%
362  \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
363      \MakeUppercase#1%
364  }%
365 }{ }%
366 \AtBeginDocument{%
367   \@ifpackageloaded{variorref}{%
368     \@ifundefined{@Refstar}{%
369       \DeclareRobustCommand*{\Ref}[1]{%
370         \T@Ref{\#1}%
371       }%
372     }{ }%
373   }{ }%
374 }%

```

### 3.7 Support for listings

```

375 \AtBeginDocument{%
376   \@ifpackageloaded{listings}{%
377     \let\NROrg@lst@MakeCaption\lst@MakeCaption
378     \def\lst@MakeCaption{%
379       \ifx\lst@label\empty
380       \else
381         \let\@currentlabelname\lst@caption
382       \fi
383     \NROrg@lst@MakeCaption
384   }%
385 }{ }%
386 }%
387 </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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