

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

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<https://github.com/latex3/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).

[ChangeLog](#) This file records the version history.

[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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\*This file has version number v2.56, last revised 2023-11-26.

## 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 Background and advice for package and class authors

The package redefines the `\label` command to write additionally `\@currentlabelname` to the `.aux` file. This can then be referenced with `\nameref`. Package authors who want to support `nameref` should define this command (locally) in a suitable way. The content should be so that it can be safely written to the `.aux` file. `nameref` itself uses the package `getttitlestring` but this is not required.

`nameref` patches a number of commands (mostly sectioning commands) and environments so that they store `\@currentlabelname`. A class or a package that want to provide native support instead can suppress this patches by defining commands described below. The commands must be defined before the patch is made, in most cases before `nameref` is loaded, sometimes only before `begin document`.

**sectioning commands** Redefined are

- `\@sect`: beside adding a command that stores the title of a sectioning command (if present the optional argument is used) `nameref` also stores the level number in a counter `section@level` (reason is unknown, only two packages, `e-french` and `pdfscreen` seem to use it), and surrounds the text with `\Sectionformat` (only used by `acmart`, `memoir`, `pdfscreen`, `pdfslide`), a command which takes two argument: the first the text, the second the level.
- `\@ssect`: command to store the title added, `\Sectionformat` is added.
- `\@part`, `\@spart`, `\@chapter`, `\@schapter`: command to store the title added

All the patches excepted the last are disabled if the command `\NR@nopatch@sectioning` is defined (the actual definition is irrelevant, only existence is tested). This currently only suppress the actual patches, the counter, `\Sectionformat` and also the internal copies `\NR@sect` etc are still defined.

**captions** The following commands are patched

- `\@caption`: command to store the title added. This is done at `begin document`, but only if `hyperref` is not detected. With `hyperref` the patch is done there (and must be disabled in `hyperref`).  
This patch can be disabled by defining `\NR@nopatch@caption`
- `\LT@c@ption` (from the `longtable` package): command to store the title added.  
This patch can be disabled by defining `\NR@nopatch@longtable`

- `\lst@MakeCaption` (from the listings package)  
This patch can be disabled by defining `\NR@nopatch@listings`

**lists** The following command is patched

- `\descriptionlabel`: command to store the label text added. To reference this text the `\label` must be put *inside* the label. This is not compatible with the `enumitem` package as internal formatting commands are written to the `.aux` file too.  
This patch can be disabled by defining `\NR@nopatch@lists`

**theorems** • `\@opargbegintheorem`: command to store the title added.  
This patch can be disabled by defining `\NR@nopatch@theorem`

- `\@begintheorem` (if `amsthm` is loaded and if the command has a tested meaning): command to store the title added.  
This patch can be disabled by defining `\NR@nopatch@amsthm`

**beamer** In the beamer class the following commands are patched: `\beamer@section`, `\beamer@subsection`, `\beamer@subsubsection`, `\beamer@descriptionitem` and the template `theorem begin`. If `\NR@nopatch@beamer` is defined nothing is done.

### 3 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]{}%
}
```

## 4 Implementation

```
1 (*package)
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{getttitlestring}[2009/12/18]
4 \ExplSyntaxOn
5 \let\NR@GlobalAppendToMacro\tl_gput_right:Nn
6 \ExplSyntaxOff
7
```

In formats older than 2023-06-01 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`

```
8 \def\NR@strip@period#1.\@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`.

```
9 \def\strip@period#1.\relax#2\@@@{#1}
10 \def\NR@sanitize@labelname{%
11   \@onelevel@sanitize\@currentlabelname
12   \edef\@currentlabelname{%
13     \expandafter\NR@strip@period\@currentlabelname
14     \@empty.\@empty\@nil
15   }%
16 }
```

### 4.1 `\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`

```
17 \newif\ifNR@showkeys
18 \NR@showkeysfalse
19 \@ifpackageloaded{showkeys}{%
20   \begingroup
21   \@ifundefined{SK@@label}{%
22     }{%
23     \global\NR@showkeystrue
24   }%
25   \endgroup
26 }{}
```

`\label@hook` Starting with LaTeX 2023-06-01 it is not longer needed to redefine `\label` as the kernel provides a hook and stores `\@currentlabelname`. But as there are packages like `ntheorem` and `revtex` which overwrites the kernel definition and then break `nameref` and `hyperref` we add a guard. We still support `\label@hook` for now as it is used below in `\slabel` and also in `hyperref`.

```
27 \providecommand*\label@hook{}
```

```

28 \NR@GlobalAppendToMacro{\label@hook}{%
29   \NR@sanitize@labelname
30 }
31 \@ifl@t@r\fmtversion{2023-06-01}
32 {
33   \def\NR@label@copy#1{\@bsphack
34     \begingroup
35     \UseHookWithArguments{label}{1}{#1}%
36     \protected@write\@auxout{%
37       {\string\newlabel{#1}{\@currentlabel}{\thepage}%
38       {\@currentlabelname}{\@currentHref}{\@kernel@reserved@label@data}}}%
39   \endgroup
40   \@esphack}
41   \ifx\label\NR@label@copy
42   \else
43     \PackageWarning{nameref}{The definition of \string\label\space has changed!
44                                   \MessageBreak Check your packages!
45                                   \MessageBreak Replacing it with the kernel definition}
46     \let\label\NR@label@copy
47     \let\ltx@label\label %for amsmath
48   \fi
49   \AddToHookWithArguments{label}{\def\label@name{#1}\label@hook}
50 }
51 {
52

```

\label

```

53   \def\label#1{%
54     \@bsphack
55     \begingroup
56     \def\label@name{#1}%
57     \label@hook
58     \protected@write\@auxout{%
59       {\string\newlabel{#1}{%
60         {\@currentlabel}%
61         {\thepage}%
62         {\@currentlabelname}%
63         {\@currentHref}{}}%
64       }%
65     }%
66   \endgroup
67   \@esphack
68 }%
69 \ifNR@showkeys
70   \def\label#1{%
71     \@bsphack
72     \SK@\SK@\label{#1}%
73     \begingroup
74     \def\label@name{#1}%
75     \label@hook
76     \protected@write\@auxout{%
77       {\string\newlabel{#1}{%
78         {\@currentlabel}%
79         {\thepage}%

```

```

80         {\@currentlabelname}%
81         {\@currentHref}{}%
82     }%
83 }%
84 \endgroup
85 \@esphack
86 }%
87 \fi
88 }

```

`\ltx@label` Starting with LaTeX 2023-06-01 it is not longer needed to update the `amsmath` command `\ltx@label` as `nameref` no longer changes `\label`

```

89 \@ifl@t@r\fmtversion{2023-06-01}
90 {}{\let\ltx@label\label}

```

Needed for the `subeqnarray` package.

`\slabel`

```

91 \@ifundefined{slabel}{}{%
92   \def\slabel#1{%
93     \@bsphack
94     \if@filesw
95       \begingroup
96         \def\label@name{#1}%
97         \label@hook
98         \let\thepage\relax
99         \def\protect{\noexpand\noexpand\noexpand}%
100        \edef\@tempa{%
101          \write\@auxout{%
102            \string\newlabel{#1}{%
103              {\thesubequation}%
104              {\thepage}%
105              {\@currentlabelname}%
106              {\@currentHref}{}}%
107          }%
108        }%
109      }%
110    \expandafter\endgroup
111    \@tempa
112    \if@nobreak\ifvmode\nobreak\fi\fi
113  \fi
114  \@esphack
115 }%
116 }

```

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

`\@writetocindent@`

```

117 \def\@writetocindent@{%
118   \begingroup
119   \@for\@tempa:=-1,0,1,2,3\do{%
120     \immediate\write\@auxout{%
121       \string\newlabel{tocindent\@tempa}{%
122         \csname r@tocindent\@tempa\endcsname}{-}{-}{-}}%

```

```

123     }%
124   }%
125 }%
126 \endgroup
127 }

```

## 4.2 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@getttitle
128 \def\NR@getttitle#1{%
129   \GetTitleString{#1}%
130   \let\@currentlabelname\GetTitleStringResult
131 }

```

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

```

\NR@sect
132 \let\NR@sect\@sect

133 \newcounter{section@level}

\@sect
134 \@ifundefined{NR@nopatch@sectioning}
135  {\def\@sect#1#2#3#4#5#6[#7]#8{%
136   \setcounter{section@level}{#2}%
137   \NR@getttitle{#7}%
138   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[\@sect]{\Sectionformat{#8}{#2}}%
139  }}{}

```

and now the unnumbered ones

```

\NR@ssect
140 \let\NR@ssect\@ssect

\@ssect
141 \@ifundefined{NR@nopatch@sectioning}
142  {\def\@ssect#1#2#3#4#5{%
143   \NR@getttitle{#5}%
144   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
145  }}{}

```

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

```

146 \let\NR@part\@part
147 \let\NR@spart\@spart
148 \let\NR@chapter\@chapter
149 \let\NR@schapter\@schapter

```

```

150 \@ifundefined{NR@nopatch@sectioning}
151 {%
152   \long\def\@part[#1]#2{%
153     \NR@getttitle{#1}%
154     \NR@part[{#1}]{#2}%
155   }
156   \long\def\@spart#1{%
157     \NR@getttitle{#1}%
158     \NR@spart{#1}%
159   }
160   \def\@chapter[#1]#2{%
161     \NR@getttitle{#1}%
162     \NR@chapter[{#1}]{#2}%
163   }
164   \def\@schapter#1{%
165     \NR@getttitle{#1}%
166     \NR@schapter{#1}%
167   }}

```

#### Captions

```

168 \AtBeginDocument{%
169   \@ifpackageloaded{hyperref}{%
170     {%
171       \@ifundefined{NR@nopatch@caption}
172       {\let\NR@@caption\@caption
173        \long\def\@caption#1[#2]{%
174          \NR@getttitle{#2}%
175          \NR@@caption{#1}[{#2}]%
176          }}%
177       {}%
178     }%
179   \@ifpackageloaded{longtable}{%
180     \@ifundefined{NR@nopatch@longtable}
181     {%
182       \let\NRorg@LT@caption\LT@caption
183       \def\LT@caption#1[#2]#3{%
184         \NRorg@LT@caption{#1}[{#2}]{#3}%
185         \def\@tempa{#2}%
186         \ifx\@tempa\@empty
187           \else
188             \NR@getttitle{#2}%
189           \fi
190       }%
191     }{}%
192   }{}%

```

#### Environment ‘description’

```

193   \@ifundefined{descriptionlabel}{%
194     }{%
195     \@ifundefined{NR@nopatch@lists}
196     {\let\NRorg@descriptionlabel\descriptionlabel
197      \def\descriptionlabel#1{%
198        \NR@getttitle{#1}%
199        \NRorg@descriptionlabel{#1}%

```



```

200     }%
201   }{}%
202 }%
203 }

```

#### 4.2.1 Theorems

```

204 \@ifundefined{NR@nopatch@theorem}{%
205   \@ifundefined{@opargbegintheorem}{}%
206   \let\NRorg@opargbegintheorem\@opargbegintheorem
207   \def\@opargbegintheorem#1#2#3{%
208     \NR@getttitle{#3}%
209     \NRorg@opargbegintheorem{#1}{#2}{#3}%
210   }%
211 }
212 }{}
213 \@ifundefined{NR@nopatch@amsthm}{%
214 \AtBeginDocument{%
215   \@ifpackageloaded{amsthm}{%
216     \let\NRorg@begintheorem\@begintheorem
217     \begingroup
218       \edef\x{macro:\string#1\string#2[\string#3]}%
219       \@onelevel@sanitize\x
220       \def\y#1->#2\@nil{#1}%
221       \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
222       \@onelevel@sanitize\z
223     \expandafter\endgroup
224     \ifx\x\z
225       \def\@begintheorem#1#2[#3]{%
226         \NR@getttitle{#3}%
227         \NRorg@begintheorem{#1}{#2}[#3]}%
228     }%
229     \fi
230   }{}%
231 }}{}

```

#### 4.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

232 \providecommand*{\@currentlabelname}{}
233 \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
234 \long\def\@firstoffive#1#2#3#4#5{#1}

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

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

```

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

```
\@fifthoffive
238 \long\def\@fifthoffive#1#2#3#4#5{#5}
```

We have to redefine `\ref`, `\Ref` and `\pageref` to know about extra reference elements. Make them robust, and compatible with Babel. We also define starred versions so that it doesn't depend on `hyperref` if they are defined or not. We use the same internal names as `hyperref`. 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@activestruerue
239 \providecommand*\@safe@activestruerue{}%
```

```
\@safe@activesfalse
240 \providecommand*\@safe@activesfalse{}%
```

```
\NR@ref@showkeys
241 \newcommand\NR@ref@showkeys[1]{}%
```

```
\NR@setref
242 \def\NR@setref#1{%
243   \begingroup
244     \@safe@activestruerue
245     \expandafter
246     \endgroup
247   \expandafter\NR@@setref\csname r@#1\endcsname
248 }
```

```
\NR@@setref
249 \def\NR@@setref#1{%
250   \ifx\undefined#1%
251     \let#1\relax
252   \fi
253   \@setref#1%
254 }
```

```
\T@ref
255 \def\T@ref#1{%
256   \NR@ref@showkeys{#1}%
257   \NR@setref{#1}\@firstoffive{#1}%
258 }%
```

```
\@refstar
259 \def\@refstar#1{%
260   \NR@ref@showkeys{#1}%
261   \NR@setref{#1}\@firstoffive{#1}%
262 }%
```

```

\T@pageref
263 \def\T@pageref#1{%
264 \NR@ref@showkeys{#1}%
265 \NR@setref{#1}\@secondoffive{#1}%
266 }%

\@pagerefstar
267 \def\@pagerefstar#1{%
268 \NR@ref@showkeys{#1}%
269 \NR@setref{#1}\@secondoffive{#1}%
270 }%

\T@Ref
271 \def\T@Ref#1{%
272 \NR@ref@showkeys{#1}%
273 \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
274 }%
275 \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
276 \MakeUppercase#1%
277 }%

\@Refstar
278 \def\@Refstar#1{%
279 \NR@ref@showkeys{#1}%
280 \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
281 }%

282 \ifNR@showkeys
283 \ifx\SK@ref\@empty
284 \else
285 \renewcommand\NR@ref@showkeys[1]{%
286 \@safe@activestru
287 \SK@\SK@\@ref{#1}%
288 \@safe@activesfalse}
289 \fi
290 \fi

Package hyperref uses the same definitions of \ref, \Ref and \pageref but has to
redefine the non-starred command to add the hyperlink support. \DeclareRobustCommand
is used by hyperref. Package nameref can be loaded before, after hyperref or after
hyperref's definitions in \AtBeginDocument. We have to postpone the definition
to \AtBeginDocument to avoid that showkeys overwrites them again.
291 \AddToHook{begindocument}{%

\ref
292 \DeclareDocumentCommand\ref{s}
293 {\IfBooleanTF{#1}{\@refstar}{\T@ref}}%

\pageref
294 \DeclareDocumentCommand\pageref{s}
295 {\IfBooleanTF{#1}{\@pagerefstar}{\T@pageref}}%

```

```

\Ref
296 \DeclareDocumentCommand\Ref{s}
297   {\IfBooleanTF{#1}{\@Refstar}{\T@Ref}}%
298 }
299 \DeclareHookRule{begindocument}{showkeys}{before}{nameref}

```

## 4.4 Usage and frontend

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

```

\T@nameref
300 \def\T@nameref#1{%
301   \NR@ref@showkeys{#1}%
302   \begingroup
303     \let\label@gobble
304     \NR@setref{#1}\@thirdoffive{#1}%
305   \endgroup
306 }%

```

```

\@namerefstar
307 \def\@namerefstar#1{%
308   \NR@ref@showkeys{#1}%
309   \begingroup
310     \let\label@gobble
311     \NR@setref{#1}\@thirdoffive{#1}%
312   \endgroup
313 }%

```

```

\nameref
314 \@ifundefined{nameref}
315   {
316     \NewDocumentCommand\nameref{s}
317       {\IfBooleanTF{#1}{\@namerefstar}{\T@nameref}}
318   }
319   {
320     \PackageWarning{nameref}{Redefining \string\nameref}
321     \RenewDocumentCommand\nameref{s}
322       {\IfBooleanTF{#1}{\@namerefstar}{\T@nameref}}
323   }

```

`\Nameref` An extended form which gives title and page number. Not really useful, quotes are english, and no starred version. `varioref` can do that better. Remove??

```

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

```

```

\Sectionformat The default for \Sectionformat
325 \providecommand\Sectionformat[2]{#1}

```

## 4.5 Compatibility with varioref

[This section was derived by Corey Minyard [minyard@acm.org](mailto:minyard@acm.org) from the `varioref` package] Changed in 2019-09-12 by Frank Mittelbach to adapt to changes in `varioref`

```
326 \AtBeginDocument{%
327   \ifx\csname @@vpageref\endcsname\relax
328   \else
This requires a varioref newer than 2019-09-12
329   \let\NR@@vpageref\@@vpageref
330   \def\@@vpageref#1[#2]#3{%
331     \begingroup
332       \csname @safe@activetrue\endcsname
333       \edef\x{#3}%
334       \@onelevel@sanitize\x
335       \toks@{%
336         \NR@@vpageref{#1}[{#2}]%
337       }%
338       \edef\x{\endgroup
339         \the\toks@\x}%
340     }%
341   \x
342 }%
343 \DeclareRobustCommand\vnameref[1]{%
344   \unskip~\nameref{#1} %
345   \@vpageref[\unskip]{#1}%
346 }%
347 \fi
348 }
```

## 4.6 Support for package listings

```
349 \AtBeginDocument{%
350   \@ifpackageloaded{listings}{%
351     \@ifundefined{NR@nopatch@listings}
352     {%
353       \let\NR@Org@lst@MakeCaption\lst@MakeCaption
354       \def\lst@MakeCaption{%
355         \ifx\lst@label\@empty
356         \else
357           \let\@currentlabelname\lst@@caption
358         \fi
359       \NR@Org@lst@MakeCaption
360     }%
361   }{}%
362 }{}%
363 }
364 </package>
```

## 5 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>\@@@</code>                         | ..... 9  | <code>\@safe@activesfalse</code>     | 234, 235, 236,<br>237, 238, 242,  |
| <code>\@vpageref</code>                   | .. 329, 330  | <code>\@safe@activetrue</code>       | 249, 255, 259,<br>263, 267, 271,  |
| <code>\@Refstar</code>                    | .... <u>278</u> , 297  | .... <u>239</u> , 244, 286           | 275, 278, 300,<br>307, 324, 330, 354  |
| <code>\@auxout</code>                     | .....<br>36, 58, 76, 101, 120  | <code>\@schapter</code>              | ... 149, 164  |
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