Section name references in LaTeX*

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The LaTeX3 Project
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 EuroTeX 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 LaTeX" (this file)

Contents

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*This file has version number v2.46, last revised 2019/09/16.

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 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 gettitlestring 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 gettitlestring how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

```
\usepackage{gettitlestring}
\GetTitleStringDisableCommands{%
 \let\mylabel\@gobble
 \renewcommand\myindex[2]{}%
}
```

3 Implementation

1 ⟨*package⟩

2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{gettitlestring}[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@filesw
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 LaTeX 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 }
```

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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@activestrue

```
279 \providecommand*\@safe@activestrue{}%
```

\@safe@activesfalse

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

\NR@setref

```
281 \def\NR@setref#1{%
282   \begingroup
283     \@safe@activestrue
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@activestrue
305     \SK@\SK@@ref{#1}%
306     \@safe@activesfalse
307     \NR@setref{#1}\@firstoffive{#1}%
308   }%
```

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```
309    \def\T@pageref#1{%
310      \@safe@activestrue
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. Package nameref can be loaded before, after hyperref or after hyperref's definitions in \AtBeginDocument.

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

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

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

321 }
```

3.4 Usage and frontend

Access the (third) name part with \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@activestrue
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@titlerefnolink}\ltx@secondoftwo{%
344 %   \ltx@IfUndefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
345 % }%
346 %}\ltx@secondoftwo
```

```
347 %{%
348 %  \DeclareRobustCommand*{\nameref}{%
349 %    \@ifstar\@mem@titlerefnolink\@mem@titleref
350 %  }%
351 %}{%
```

\nameref

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

\Nameref   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\NROrg@ifthenelse\ifthenelse
360   \def\ifthenelse{%
361     \let\begingroup\NR@TE@begingroup
362     \NROrg@ifthenelse
363   }%
364   \let\NROrg@begingroup\begingroup
365   \def\NR@TE@begingroup{%
366     \let\begingroup\NROrg@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 from the varioref package] Changed in 2019-09-12 by Frank Mittelbach to adapt to changes in varioref

```
372 \AtBeginDocument{%
373   \ifx\csname @@vpageref\endcsname\relax
374   \else
375 %FMi
```

Test if we are using the new varioref ...

```
376     \ifdefined\vp@gerefstar
377       \let\NR@@vpageref\@@vpageref
```

if not then old patching code

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

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```
434            \reftextafter
435          \fi
436        \else
437          \advance\@tempcnta-2 %
438          \ifnum \thevpagerefnum =\@tempcnta
439            \ifodd\@tempcnta
440              \reftextbefore
441            \else
442              \if@twoside
443                \reftextfacebefore
444              \else
445                \reftextbefore
446              \fi
447            \fi
448          \else
449            \reftextfaraway{#3}%
450          \fi
451        \fi
452      }{%
453        \reftextfaraway{#3}%
454      }%
455      \fi
456      {%
457        \let\@currentlabel\@empty
458        \expandafter\label\expandafter{\the\c@vrcnt @vr}%
459      }%
460    }%
461    \fi
462 %FM - end mod
463    \def\@@vpageref#1[#2]#3{%
464      \begingroup
465      \csname @safe@activestrue\endcsname
466      \edef\x{#3}%
467      \@onelevel@sanitize\x
468      \toks@{%
469        \NR@@vpageref{#1}[{#2}]%
470      }%
471      \edef\x{\endgroup
472        \the\toks@{\x}%
473      }%
474      \x
475    }%
476    \DeclareRobustCommand\vnameref[1]{%
477      \unskip~\nameref{#1}%
478      \@vpageref[\unskip]{#1}%
479    }%
480    \fi
481 }

482 \@ifundefined{@Refstar}{%
483    \def\T@Ref#1{%
484      \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
485    }%
486    \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
487      \MakeUppercase#1%
488    }%
489 }{}%
490 \AtBeginDocument{%
```

```
491  \@ifpackageloaded{varioref}{%
492    \@ifundefined{@Refstar}{%
493      \DeclareRobustCommand*{\Ref}[1]{%
494        \T@Ref{#1}%
495      }%
496    }{}%
497  }{}%
498  }%
```

3.7 Support for package **listings**

```
499  \AtBeginDocument{%
500   \@ifpackageloaded{listings}{%
501    \let\NROrg@lst@MakeCaption\lst@MakeCaption
502    \def\lst@MakeCaption{%
503      \ifx\lst@label\@empty
504      \else
505        \let\@currentlabelname\lst@@caption
506      \fi
507      \NROrg@lst@MakeCaption
508    }%
509   }{}%
510  }
```

511 ⟨/package⟩