

# The latex-lab-toc-kernel-changes package

## Changes and additions to the kernel related to tagging and links in toc entries

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**Abstract**

## 1 Introduction

The followings contains various changes to kernel commands needed for the tagging of table of contents and similar lists.

## 2 General kernel and class changes

Some of the changes can probably could go into the kernel. This are marked with [kernel?], the other are marked with [latex-lab]. A few changes must be done in the classes. They are marked as [class]. They are inserted with hooks here: this will break if a non-standard class is used.

### 2.1 Providing the counter representation `\theHxx` generally

[kernel?]

The `\theHxx` representation allows to create a unique representation of a counter that is for example used to create destination names. It will also be needed to add `/Ref` keys to various tagging structures. It makes therefore sense to provide it by default as soon as a counter is created. The `\@addtoreset` change (taken also from `hyperref`) tries to ensure the counter stays unique if it is reset.

At first we suppress the patches from `hyperref`:

```
1 <*kernelchange>
2 \def\hyper@nopatch@counter{}
3 \def\@definecounter#1{\expandafter\newcount\csname c@#1\endcsname
4   \setcounter{#1}\z@
5   \global\expandafter\let\csname cl@#1\endcsname\@empty
6   \@addtoreset{#1}{@ckpt}%
7   \global\expandafter\let\csname p@#1\endcsname\@empty
8   \expandafter\gdef\csname theH#1\endcsname{\the\value{#1}}%new
```

---

\*Initial implementation done by Ulrike Fischer

```

9     \expandafter
10    \gdef\csname the#1\expandafter\endcsname\expandafter
11        {\expandafter\@arabic\csname c@#1\endcsname}}
12 \def\@addtoreset#1#2{\expandafter\@cons\csname c1@#2\endcsname {#1}}%
13 \expandafter\gdef\csname theH#1\endcsname{\csname theH#2\endcsname.\the\value{#1}}%
14 }

```

The following counters are defined in the kernel

```

15 \gdef\theHenumi{\the\value{enumi}}
16 \gdef\theHenumii{\the\value{enumii}}
17 \gdef\theHenumiii{\the\value{enumiii}}
18 \gdef\theHenumiv{\the\value{enumiv}}
19 \gdef\theHequation{\the\value{equation}}
20 \gdef\theHfootnote{\the\value{footnote}}
21 \gdef\theHmpfootnote{\the\value{mpfootnote}}

```

## 2.2 Providing and updating \@currentHref

[kernel?]

\@currentHref contains the current unique representation of a counter. It is useful also without hyperref as it allows to connect with a /Ref key a toc entry with the heading it refers too. So \refstepcounter is extended to update the command. This is done at the begin so that the hyperref code can still adapt it later (using the cmd/refstepcounter/after hook would be too late, and could also break with cleverref.)

We also provide a kernel version that hyperref doesn't touch and so will never set a target.

```

22 \def\@currentHref{}
23 \def\refstepcounter#1{\stepcounter{#1}%
24     \edef\@currentcounter{#1}%
25     \xdef\@currentHref {#1.\csname theH#1\endcsname}%
26     \protected@edef\@currentlabel
27         {\csname p@#1\expandafter\endcsname\csname the#1\endcsname}%
28 }
29 \let\@kernel@refstepcounter\refstepcounter

```

## 2.3 Assigning the headings level numbers

[kernel?]

The code for the toc must be able to compare the level of subsection against section. So some numbers are needed. It uses for now the commands used by hyperref for the bookmark levels. While headings are more a class thing, it could make sense to provide a standard set already in the kernel. The numbers are a bit different to the one in hyperref, but imho sensible.

Note for the future: once that heading stuff is turned into template instances the template should set that number.

```

30 \def\toclevel@document{-10}
31 \def\toclevel@part{-1}
32 \def\toclevel@chapter{0}
33 \def\toclevel@section{1}
34 \def\toclevel@subsection{2}
35 \def\toclevel@subsubsection{3}
36 \def\toclevel@paragraph{4}

```

```

37 \def\toclevel@subparagraph{5}
38 \def\toclevel@figure{1}
39 \def\toclevel@table{1}
40 \kernelchange

```

## 2.4 load kernel changes

```

41 <*package>
42 \RequirePackage{latex-lab-kernel-changes}

```

## 2.5 \contentsline extension

[latex-lab] The tagging code must add code at the begin and end of `\contentsline`. This code must have access to the arguments. We set it up as config point for now.

```

43 \def\@contentsline@cfgpoint@before#1#2#3#4{}
44 \def\@contentsline@cfgpoint@after#1#2#3#4{}

```

for the hooks we need that the `\l@XX` pass also the destination and that `\l@XX` takes three arguments. TODO: test that, if there are two many problems we should pass the destination through a command name ...

```

45 \def\contentsline#1#2#3#4%
46   {%
47     \@contentsline@cfgpoint@before{#1}{#2}{#3}{#4}%
48     \gdef\@contentsline@destination{#4}%
49     \csname l@#1\endcsname{#2}{#3}%
50     \@contentsline@cfgpoint@after{#1}{#2}{#3}{#4}%
51   }

```

## 2.6 \addcontentsline changes

[latex-lab]

`\addcontentsline` should always write the unique counter representation `\@currentHref` so that we can create the `/Ref` key. At the same time we need a hook, so that `hyperref` can add its bookmarks code, the generic hook with arguments is ok.

```

52 \def\addcontentsline#1#2#3{% #1= toc extension, #2= heading type, tag
53   \addtocontents{#1}{%
54     \protect\contentsline{#2}{#3}{\thepage}{\@currentHref}\protected@file@percent
55   }}

```

## 2.7 \@starttoc

[kernel?]

We add a configuration point before and after reading the file for the tagging.

```

56 \def\@starttoc@cfgpoint@before#1{}
57 \def\@starttoc@cfgpoint@after#1{}
58 \def\@starttoc#1{%
59   \begingroup
60     \makeatletter
61     \@starttoc@cfgpoint@before{#1}%
62     \@input{jobname.#1}%
63     \@starttoc@cfgpoint@after{#1}
64   \if@filesw
65     \expandafter\newwrite\csname tf@#1\endcsname

```

```

66     \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
67     \fi
68     \nobreakfalse
69 \endgroup}

```

## 2.8 Formatting of the toc entries

### 2.8.1 Kernel commands

[latex-lab] or [kernel?]?

We need hooks before and after the content and before and after the page number. The number needs some thing so that it can be tagged as label. The text and the page hooks are used in manual `\l@xx` commands and in `\l@xx` defined by `\@dottedtocline` or by other means. The arguments of the following hooks are:

`#1` level as a *number* (integer expression), see above for the standard numbering. The standard first argument of `\contentsline` is not used, as `\@dottedtocline` knows only a number.

`#2` content (the second argument of a `\contentsline`

`#3` page (the third argument of a `\contentsline`

`#3` target (the fourth argument of a `\contentsline`

```

70 \NewMirroredHookPairWithArguments{contentsline/number/before}{contentsline/number/after}{1}%
71 \NewMirroredHookPairWithArguments{contentsline/text/before}{contentsline/text/after}{4}%
72 \NewMirroredHookPairWithArguments{contentsline/page/before}{contentsline/page/after}{4}%

```

The dot in the leader must be set as artifact. But luatex requires that the mc are set outside the leaders. So we need a config point.

`\@dottedtocline` needs hooks and formatting commands. We add a sixth argument so that it can grab the destination too.

```

73 \def\@dottedtocline@cfgpoint@leaders#1{#1}
74
75 \def\@dottedtocline#1#2#3#4#5{%
76   \ifnum #1>\c@tocdepth \else
77     \vskip \z@ \@plus.2\p@
78     {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
79     \parindent #2\relax\@afterindenttrue
80     \interlinepenalty\@M
81     \leavevmode
82     \@tempdima #3\relax
83     \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
84     \UseHookWithArguments{contentsline/text/before}{4}{#1}{#4}{#5}{\@contentsline@destination}
85     \csname contentsline@text@#1@format\endcsname{#4}%
86     \UseHookWithArguments{contentsline/text/after}{4}{#1}{#4}{#5}{\@contentsline@destination}
87     \nobreak
88     \@dottedtocline@cfgpoint@leaders{%
89       \leaders\hbox{${\m@th
90         \mkern \dotsep mu\hbox{.}\mkern \dotsep
91         mu$}\hfill}%
92     \nobreak
93     \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor
94     \UseHookWithArguments{contentsline/page/before}{4}{#1}{#4}{#5}{\@contentsline@destination}

```

```

95     #5%
96     \UseHookWithArguments{contentsline/page/after}{4}{#1}{#4}{#5}{\@contentsline@destination}%
97         \kern-\p@\kern\p@}%
98     \par}%
99 \fi}

```

### 2.8.2 \numberline

[kernel?] Inside or outside the box?

```

100 \def\numberline#1{\hb@xt@\@tempdima{%
101     \UseHookWithArguments{contentsline/number/before}{1}{#1}%
102     #1\hfil
103     \UseHookWithArguments{contentsline/number/after}{1}{#1}%
104     }}

```

### 2.8.3 \l@xx in the classes

Depending on the class we have to redefine also more commands. For other classes it should be documented what is needed. Let the commands grab also the third arguments. If a class redefines them again it will break tagging anyway.

```

105 \AddToHook{class/article/after}
106 {
107     \renewcommand*\l@part[2]{% as in contentsline: content, page
108     \ifnum \c@tocdepth >-2\relax
109         \addpenalty\@secpenalty
110         \addvspace{2.25em \@plus\p@}%
111         \setlength\@tempdima{3em}%
112         \begingroup
113             \parindent \z@ \rightskip \@pnumwidth
114             \parfillskip -\@pnumwidth
115             {\leavevmode
116             \large \bfseries
117             \UseHookWithArguments{contentsline/text/before}{4}
118                 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
119             \csname contentsline@text@-1@format\endcsname{#1}%
120             \UseHookWithArguments{contentsline/text/after}{4}
121                 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
122             \hfil
123             \hb@xt@\@pnumwidth{\hss
124             \UseHookWithArguments{contentsline/page/before}{4}
125                 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
126             #2%
127             \UseHookWithArguments{contentsline/page/after}{4}
128                 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
129                 \kern-\p@\kern\p@}}\par
130         \nobreak
131     \endgroup
132 \fi}
133 \renewcommand*\l@section[2]{%
134     \ifnum \c@tocdepth >\z@
135         \addpenalty\@secpenalty
136         \addvspace{1.0em \@plus\p@}%
137         \setlength\@tempdima{1.5em}%

```

```

138 \begingroup
139 \parindent \z@ \rightskip \@pnumwidth
140 \parfillskip -\@pnumwidth
141 \leavevmode \bfseries
142 \advance\leftskip\@tempdima
143 \hskip -\leftskip
144 \UseHookWithArguments{contentsline/text/before}{4}
145 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
146 \csname contentsline@text@1@format\endcsname{#1}%
147 \UseHookWithArguments{contentsline/text/after}{4}
148 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
149 \nobreak\hfil
150 \nobreak\hb@xt@\@pnumwidth{\hss
151 \UseHookWithArguments{contentsline/page/before}{4}
152 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
153 #2%
154 \UseHookWithArguments{contentsline/page/after}{4}
155 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
156 \kern-\p@\kern\p@}\par
157 \endgroup
158 \fi}
159 }
160 \AddToHook{class/report/after}
161 {
162 \renewcommand*\l@part[2]{%
163 \ifnum \c@tocdepth >-2\relax
164 \addpenalty{-\@highpenalty}%
165 \addvspace{2.25em \@plus\p@}%
166 \setlength\@tempdima{3em}%
167 \begingroup
168 \parindent \z@ \rightskip \@pnumwidth
169 \parfillskip -\@pnumwidth
170 {\leavevmode
171 \large \bfseries
172 \UseHookWithArguments{contentsline/text/before}{4}
173 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
174 \csname contentsline@text@-1@format\endcsname{#1}%
175 \UseHookWithArguments{contentsline/text/after}{4}
176 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
177 \hfil
178 \hb@xt@\@pnumwidth{\hss
179 \UseHookWithArguments{contentsline/page/before}{4}
180 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
181 #2%
182 \UseHookWithArguments{contentsline/page/after}{4}
183 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
184 \kern-\p@\kern\p@}}\par
185 \nobreak
186 \endgroup
187 \fi}
188 \renewcommand*\l@chapter[2]{%
189 \ifnum \c@tocdepth >\m@ne
190 \addpenalty{-\@highpenalty}%
191 \vskip 1.0em \@plus\p@

```

```

192     \setlength\@tempdima{1.5em}%
193     \begingroup
194     \parindent \z@ \rightskip \@pnumwidth
195     \parfillskip -\@pnumwidth
196     \leavevmode \bfseries
197     \advance\leftskip\@tempdima
198     \hskip -\leftskip
199     \UseHookWithArguments{contentsline/text/before}{4}
200     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
201     \csname contentsline@text@0@format\endcsname
202     {#1}%
203     \UseHookWithArguments{contentsline/text/after}{4}
204     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
205     \nobreak\hfil
206     \nobreak\hb@xt@\@pnumwidth{\hss
207     \UseHookWithArguments{contentsline/page/before}{4}
208     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
209     #2%
210     \UseHookWithArguments{contentsline/page/after}{4}
211     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
212     \kern-\p@\kern\p@}\par
213     \penalty\@highpenalty
214     \endgroup
215     \fi}
216 }
217 \AddToHook{class/book/after}
218 {
219     \renewcommand*\l@part[2]{%
220     \ifnum \c@tocdepth >-2\relax
221     \addpenalty{-\@highpenalty}%
222     \addvspace{2.25em \@plus\p@}%
223     \setlength\@tempdima{3em}%
224     \begingroup
225     \parindent \z@ \rightskip \@pnumwidth
226     \parfillskip -\@pnumwidth
227     {\leavevmode
228     \large \bfseries
229     \UseHookWithArguments{contentsline/text/before}{4}
230     {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
231     \csname contentsline@text@-1@format\endcsname{#1}%
232     \UseHookWithArguments{contentsline/text/after}{4}
233     {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
234     \hfil
235     \hb@xt@\@pnumwidth{\hss
236     \UseHookWithArguments{contentsline/page/before}{4}
237     {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
238     #2%
239     \UseHookWithArguments{contentsline/page/after}{4}
240     {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
241     \kern-\p@\kern\p@}}\par
242     \nobreak
243     \endgroup
244     \fi}
245     \renewcommand*\l@chapter[2]{%

```

```

246 \ifnum \c@tocdepth >\m@ne
247 \addpenalty{-\@highpenalty}%
248 \vskip 1.0em \@plus\p@
249 \setlength\@tempdima{1.5em}%
250 \begingroup
251 \parindent \z@ \rightskip \@pnumwidth
252 \parfillskip -\@pnumwidth
253 \leavevmode \bfseries
254 \advance\leftskip\@tempdima
255 \hskip -\leftskip
256 \UseHookWithArguments{contentsline/text/before}{4}
257 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
258 \csname contentsline@text@0@format\endcsname
259 {#1}%
260 \UseHookWithArguments{contentsline/text/after}{4}
261 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
262 \nobreak\hfil
263 \nobreak\hb@xt@\@pnumwidth{\hss
264 \UseHookWithArguments{contentsline/page/before}{4}
265 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
266 #2%
267 \UseHookWithArguments{contentsline/page/after}{4}
268 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
269 \kern-\p@\kern\p@}\par
270 \penalty\@highpenalty
271 \endgroup
272 \fi}
273 }
274 </package>
275 <*latex-lab>
276 \ProvidesFile{toc-tagging-latex-lab-testphase.ltx}
277 [2023-05-20 v0.81 code related to the tagging of toc and similar lists]
278
279 \RequirePackage{latex-lab-testphase-toc}
280
281 </latex-lab>

```