

# 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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Version 0.83 2023-06-07

**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 Package declaration

```
1 <*kernelchange>
2 \ProvidesPackage{latex-lab-kernel-changes}
3     [\ltmlabkerneldate\space v\ltmlabkernelversion\space
4     General kernel and class changes]
```

### 2.2 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`:

```
5 \def\hyper@nopatch@counter{}
```

---

\*Initial implementation done by Ulrike Fischer

```

6 \def\@definecounter#1{\expandafter\newcount\csname c@#1\endcsname
7   \setcounter{#1}\z@
8   \global\expandafter\let\csname cl@#1\endcsname\@empty
9   \@addtoreset{#1}{\ckpt}%
10  \global\expandafter\let\csname p@#1\endcsname\@empty
11  \expandafter\gdef\csname theH#1\endcsname{\the\value{#1}}%new
12  \expandafter
13  \gdef\csname the#1\expandafter\endcsname\expandafter
14    {\expandafter\@arabic\csname c@#1\endcsname}}
15 \def\@addtoreset#1#2{\expandafter\@cons\csname cl@#2\endcsname {{#1}}%
16  \expandafter\gdef\csname theH#1\endcsname{\csname theH#2\endcsname.\the\value{#1}}%
17 }

```

The following counters are defined in the kernel

```

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

```

## 2.3 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.

```

25 \def\@currentHref{}
26 \def\refstepcounter#1{\stepcounter{#1}%
27   \edef\@currentcounter{#1}%
28   \xdef\@currentHref {#1.\csname theH#1\endcsname}%
29   \protected@edef\@currentlabel
30     {\csname p@#1\expandafter\endcsname\csname the#1\endcsname}%
31 }
32 \let\@kernel@refstepcounter\refstepcounter

```

## 2.4 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.

```

33 \def\toclevel@document{-10}

```

```

34 \def\toclevel@part{-1}
35 \def\toclevel@chapter{0}
36 \def\toclevel@section{1}
37 \def\toclevel@subsection{2}
38 \def\toclevel@subsubsection{3}
39 \def\toclevel@paragraph{4}
40 \def\toclevel@subparagraph{5}
41 \def\toclevel@figure{1}
42 \def\toclevel@table{1}

```

## 2.5 Storing the relation between target names and structure numbers

To be able to add a /Ref key to structures the tagging makes use of target names and stores the relationship in a property. We add a hook to `\MakeLinkTarget` to catch as much as possible, see also tagging issue #20. This should work also without hyperref. The property is defined in tagpdf-base, so the code would work also without tagging but we add a test anyway, this is probably faster.

```

43 \ExplSyntaxOn
44 \AddToHookWithArguments{cmd/MakeLinkTarget/after}
45 {
46   \tag_if_active:T
47   {
48     \tl_if_blank:VF \@currentHref
49     {
50       \prop_gput:Nee \g__tag_struct_dest_num_prop {\@currentHref}{\tag_get:n{struct_num}}
51     }
52   }
53 }
54 \ExplSyntaxOff
55 </kernelchange>

```

## 2.6 load kernel changes

```

56 <*package>
57 \RequirePackage{latex-lab-kernel-changes}

```

## 2.7 \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. They are passed together in tagging socket.

`/toc/contentsline/before (socket)` Tagging sockets at the begin and end of contentsline. They receive *all* contentsline arguments as one argument in four brace groups. The socket code should then use the parts it needs. The sockets will be in ltagging.dtx, but that may only happen in the next main release, so for now we test if they are in the format and if not define them now.

```

58 \str_if_exist:cF { l__socket_tagsupport/toc/contentsline/before_plug_str }
59 {
60   \NewSocket{tagsupport/toc/contentsline/before}{1}
61   \NewSocket{tagsupport/toc/contentsline/after}{1}
62 }

```

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 ...

```

63 \def\contentsline#1#2#3#4%
64   {%
65     \UseTaggingSocket{toc/contentsline/before}{#1}{#2}{#3}{#4}}%
66     \gdef\@contentsline@destination{#4}%
67     \csname l@#1\endcsname{#2}{#3}%
68     \UseTaggingSocket{toc/contentsline/after}{#1}{#2}{#3}{#4}}%
69   }

```

## 2.8 `\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.

```

70 \def\addcontentsline#1#2#3{% #1=toc extension, #2= heading type, tag
71   \addtocontents{#1}{%
72     \protect\contentsline{#2}{#3}{\thepage}{\@currentHref}\protected@file@percent
73   }}

```

## 2.9 `\@starttoc`

[kernel?]

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

`ort/toc/starttoc/before (socket)` Tagging sockets for the begin and end of start of `\@starttoc`. They take one argument, the extension. The sockets will be in `ltagging.dtx`, but that may only happen in the next main release, so for now we test if they are in the format and if not define them now.

```

74 \str_if_exist:cF { l__socket_tagsupport/toc/starttoc/before_plug_str }
75   {
76     \NewSocket{tagsupport/toc/starttoc/before}{1}
77     \NewSocket{tagsupport/toc/starttoc/after}{1}
78   }

```

```

79 \def\@starttoc#1{%
80   \begingroup
81     \makeatletter
82     \UseTaggingSocket{toc/starttoc/before}{#1}%
83     \@input{\jobname.#1}%
84     \UseTaggingSocket{toc/starttoc/after}{#1}%
85     \if@filesw
86       \expandafter\newwrite\csname tf@#1\endcsname
87       \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
88     \fi
89     \@nobreakfalse
90   \endgroup}

```

## 2.10 Formatting of the toc entries

### 2.10.1 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`)

```
91 \NewMirroredHookPairWithArguments{contentsline/number/before}{contentsline/number/after}{1}%
92 \NewMirroredHookPairWithArguments{contentsline/text/before}{contentsline/text/after}{4}%
93 \NewMirroredHookPairWithArguments{contentsline/page/before}{contentsline/page/after}{4}%
```

The dots in the leader must be set as artifact. But luatex requires that the mc are set outside the leaders. So we need sockets.

`\@dottedtocline` needs hooks and formatting commands. To make the leaders into artifact we use tagging sockets. The declaration should perhaps be moved into `ltagging` so that it can be used also by external packages even if the tagging code is not loaded?

`port/toc/leaders/before (socket)` Tagging sockets to make the dot leaders an artifact. They do not take an argument. The  
`port/toc/leaders/after (socket)` sockets will be in `ltagging.dtx`, but that may only happen in the next main release, so for now we test if they are in the format and if not define them now.

```
94 \str_if_exist:cF { l__socket_tagsupport/toc/leaders/before_plug_str }
95   {
96     \NewSocket{tagsupport/toc/leaders/before}{0}
97     \NewSocket{tagsupport/toc/leaders/after}{0}
98   }
```

The destination is accessed through `\@contentsline@destination`.

```
99 \def\@dottedtocline#1#2#3#4#5{%
100   \ifnum #1>\c@tocdepth \else
101     \vskip \z@ \@plus.2\p@
102     {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
103     \parindent #2\relax\@afterindenttrue
104     \interlinepenalty\@M
105     \leavevmode
106     \@tempdima #3\relax
107     \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
108     \UseHookWithArguments{contentsline/text/before}{4}{#1}{#4}{#5}{\@contentsline@destination}
109     \csname contentsline@text@#1@format\endcsname{#4}%
110     \UseHookWithArguments{contentsline/text/after}{4}{#1}{#4}{#5}{\@contentsline@destination}
111     \nobreak
112     \UseTaggingSocket{toc/leaders/before}\SuspendTagging{toc/leaders}%
113     \leaders\hbox{$\m@th
114     \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
```

```

115         mu$}\hfill
116     \ResumeTagging{toc/leaders}\UseTaggingSocket{toc/leaders/after}%
117     \nobreak
118     \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor
119     \UseHookWithArguments{contentsline/page/before}{4}{#1}{#4}{#5}{\@contentsline@destination}%
120     #5%
121     \UseHookWithArguments{contentsline/page/after}{4}{#1}{#4}{#5}{\@contentsline@destination}%
122         \kern-\p@\kern\p@}%
123     \par}%
124 \fi}

```

### 2.10.2 \numberline

[kernel?] Inside or outside the box?

```

125 \def\numberline#1{\hb@xt@\@tempdima{%
126     \UseHookWithArguments{contentsline/number/before}{1}{#1}%
127     #1\hfil
128     \UseHookWithArguments{contentsline/number/after}{1}{#1}%
129     }}

```

### 2.10.3 \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.

```

130 \AddToHook{class/article/after}
131 {
132     \renewcommand*\l@part[2]{% as in contentsline: content, page
133     \ifnum \c@tocdepth >-2\relax
134         \addpenalty\@secpenalty
135         \addvspace{2.25em \@plus\p@}%
136         \setlength\@tempdima{3em}%
137         \begingroup
138             \parindent \z@ \rightskip \@pnumwidth
139             \parfillskip -\@pnumwidth
140             {\leavevmode
141             \large \bfseries
142             \UseHookWithArguments{contentsline/text/before}{4}
143             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
144             \csname contentsline@text@-1@format\endcsname{#1}%
145             \UseHookWithArguments{contentsline/text/after}{4}
146             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
147             \hfil
148             \hb@xt@\@pnumwidth{\hss
149             \UseHookWithArguments{contentsline/page/before}{4}
150             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
151             #2%
152             \UseHookWithArguments{contentsline/page/after}{4}
153             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
154             \kern-\p@\kern\p@}}\par
155         \nobreak
156     \endgroup
157 \fi}

```

```

158 \renewcommand*\l@section[2]{%
159   \ifnum \c@tocdepth >\z@
160     \addpenalty\@secpenalty
161     \advspace{1.0em \@plus\p@}%
162     \setlength\@tempdima{1.5em}%
163     \begingroup
164       \parindent \z@ \rightskip \@pnumwidth
165       \parfillskip -\@pnumwidth
166       \leavevmode \bfseries
167       \advance\leftskip\@tempdima
168       \hskip -\leftskip
169       \UseHookWithArguments{contentsline/text/before}{4}
170         {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
171       \csname contentsline@text@1@format\endcsname{#1}%
172       \UseHookWithArguments{contentsline/text/after}{4}
173         {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
174       \nobreak\hfil
175       \nobreak\hb@xt@\@pnumwidth{\hss
176       \UseHookWithArguments{contentsline/page/before}{4}
177         {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
178       #2%
179       \UseHookWithArguments{contentsline/page/after}{4}
180         {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
181       \kern-\p@\kern\p@}\par
182     \endgroup
183   \fi}
184 }
185 \AddToHook{class/report/after}
186 {
187   \renewcommand*\l@part[2]{%
188     \ifnum \c@tocdepth >-2\relax
189       \addpenalty{-\@highpenalty}%
190       \advspace{2.25em \@plus\p@}%
191       \setlength\@tempdima{3em}%
192       \begingroup
193         \parindent \z@ \rightskip \@pnumwidth
194         \parfillskip -\@pnumwidth
195         {\leavevmode
196           \large \bfseries
197           \UseHookWithArguments{contentsline/text/before}{4}
198             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
199           \csname contentsline@text@-1@format\endcsname{#1}%
200           \UseHookWithArguments{contentsline/text/after}{4}
201             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
202           \hfil
203           \hb@xt@\@pnumwidth{\hss
204           \UseHookWithArguments{contentsline/page/before}{4}
205             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
206           #2%
207           \UseHookWithArguments{contentsline/page/after}{4}
208             {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
209           \kern-\p@\kern\p@}}\par
210         \nobreak
211       \endgroup

```

```

212     \fi}
213 \renewcommand*\l@chapter[2]{%
214   \ifnum \c@tocdepth >\m@ne
215     \addpenalty{-\@highpenalty}%
216     \vskip 1.0em \@plus\p@
217     \setlength\@tempdima{1.5em}%
218     \begingroup
219       \parindent \z@ \rightskip \@pnumwidth
220       \parfillskip -\@pnumwidth
221       \leavevmode \bfseries
222       \advance\leftskip\@tempdima
223       \hskip -\leftskip
224       \UseHookWithArguments{contentsline/text/before}{4}
225         {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
226       \csname contentsline@text@0@format\endcsname
227         {#1}%
228       \UseHookWithArguments{contentsline/text/after}{4}
229         {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
230       \nobreak\hfil
231       \nobreak\hb@xt@\@pnumwidth{\hss
232         \UseHookWithArguments{contentsline/page/before}{4}
233           {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
234       #2%
235       \UseHookWithArguments{contentsline/page/after}{4}
236         {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
237         \kern-\p@\kern\p@}\par
238     \penalty\@highpenalty
239   \endgroup
240 \fi}
241 }
242 \AddToHook{class/book/after}
243 {
244   \renewcommand*\l@part[2]{%
245     \ifnum \c@tocdepth >-2\relax
246       \addpenalty{-\@highpenalty}%
247       \advvspace{2.25em \@plus\p@}%
248       \setlength\@tempdima{3em}%
249       \begingroup
250         \parindent \z@ \rightskip \@pnumwidth
251         \parfillskip -\@pnumwidth
252         {\leavevmode
253           \large \bfseries
254           \UseHookWithArguments{contentsline/text/before}{4}
255             {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
256         \csname contentsline@text@-1@format\endcsname{#1}%
257         \UseHookWithArguments{contentsline/text/after}{4}
258           {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
259         \hfil
260         \hb@xt@\@pnumwidth{\hss
261           \UseHookWithArguments{contentsline/page/before}{4}
262             {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%
263         #2%
264         \UseHookWithArguments{contentsline/page/after}{4}
265           {\toclevel@part}{#1}{#2}{\@contentsline@destination}}%

```



```

266             \kern-\p@\kern\p@}\par
267         \nobreak
268     \endgroup
269 \fi}
270 \renewcommand*\l@chapter[2]{%
271     \ifnum \c@tocdepth >\m@ne
272         \addpenalty{-\@highpenalty}%
273         \vskip 1.0em \@plus\p@
274         \setlength\@tempdima{1.5em}%
275         \begingroup
276             \parindent \z@ \rightskip \@pnumwidth
277             \parfillskip -\@pnumwidth
278             \leavevmode \bfseries
279             \advance\leftskip\@tempdima
280             \hskip -\leftskip
281             \UseHookWithArguments{contentsline/text/before}{4}
282                 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
283             \csname contentsline@text@0@format\endcsname
284                 {#1}%
285             \UseHookWithArguments{contentsline/text/after}{4}
286                 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
287             \nobreak\hfil
288             \nobreak\hb@xt@\@pnumwidth{\hss
289                 \UseHookWithArguments{contentsline/page/before}{4}
290                     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
291                     #2%
292                 \UseHookWithArguments{contentsline/page/after}{4}
293                     {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
294                     \kern-\p@\kern\p@}\par
295             \penalty\@highpenalty
296         \endgroup
297     \fi}
298 }
299 \end{package}

```