

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

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

L<sup>A</sup>T<sub>E</sub>X Project\*

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     [\lftlabkerneldate\space v\lftlabkernelversion\space
4     General kernel and class changes]
```

### 2.2 Providing the counter representation \theHxx generally

This has been moved to base.

We still suppress the patches from hyperref:

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

---

\*Initial implementation done by Ulrike Fischer

## 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.

```
6 \def\toclevel@document{-10}
7 \def\toclevel@part{-1}
8 \def\toclevel@chapter{0}
9 \def\toclevel@section{1}
10 \def\toclevel@subsection{2}
11 \def\toclevel@subsubsection{3}
12 \def\toclevel@paragraph{4}
13 \def\toclevel@subparagraph{5}
14 \def\toclevel@figure{1}
15 \def\toclevel@table{1}
```

## 2.4 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. TODO: remove

```
16 \ExplSyntaxOn
17 \str_if_exist:cF { l__socket_tagsupport/recordtarget_str }
18 {
19   \AddToHookWithArguments{cmd/MakeLinkTarget/after}
20   {
21     \tag_if_active:T
22     {
23       \tl_if_blank:VF \@currentHref
24       {
25         \prop_gput:Nee \g__tag_struct_dest_num_prop {\@currentHref}{\tag_get:n{struct_n}}
26       }
27     }
28   }
29 }
30 \ExplSyntaxOff
31 </kernelchange>
```

## 2.5 load kernel changes

```
32 <*package>
33 \RequirePackage{latex-lab-kernel-changes}
```

## 2.6 \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.

```

34 \socket_if_exist:nF {tagsupport/toc/contentsline/before}
35 {
36     \NewTaggingSocket{toc/contentsline/before}{1}
37     \NewTaggingSocket{toc/contentsline/after}{1}
38 }

```

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 too many problems we should pass the destination through a command name ...

```

39 \def\contentsline#1#2#3#4%
40 {%
41     \UseTaggingSocket{toc/contentsline/before}{#{1}{#2}{#3}{#4}}%
42     \gdef\@contentsline@destination{#4}%
43     \csname l@#1\endcsname{#2}{#3}%
44     \UseTaggingSocket{toc/contentsline/after}{#{1}{#2}{#3}{#4}}%
45 }

```

## 2.7 \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.

```

46 \def\addcontentsline#1#2#3{% #1=toc extension, #2= heading type, tag
47     \addtocontents{#1}{%
48         \protect\contentsline{#2}{#3}{\thepage}{\@currentHref}\protected@file@percent
49     }}

```

## 2.8 \@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.

```

50 \socket_if_exist:nF {tagsupport/toc/starttoc/before}
51 {
52     \NewTaggingSocket{toc/starttoc/before}{1}
53     \NewTaggingSocket{toc/starttoc/after}{1}
54 }

```

```

55 \def\@starttoc#1{%
56   \begingroup
57   \makeatletter
58   \UseTaggingSocket{toc/starttoc/before}{#1}%
59   \@input{\jobname.#1}%
60   \UseTaggingSocket{toc/starttoc/after}{#1}%
61   \if@files
62     \expandafter\newwrite\csname tf@#1\endcsname
63     \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
64   \fi
65   \@nobreakfalse
66   \endgroup}

```

## 2.9 Formatting of the toc entries

### 2.9.1 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`

```

67 \NewMirroredHookPairWithArguments{contentsline/number/before}{contentsline/number/after}{1}%
68 \NewMirroredHookPairWithArguments{contentsline/text/before}{contentsline/text/after}{4}%
69 \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.

```

70 \socket_if_exist:nF {tagssupport/toc/leaders/before}
71 {
72   \NewTaggingSocket{toc/leaders/before}{0}
73   \NewTaggingSocket{toc/leaders/after}{0}
74 }

```

The destination is accessed through \@contentsline@destination.

```

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     \UseTaggingSocket{toc/leaders/before}\SuspendTagging{toc/leaders}%
89     \leaders\hbox{$\m@th
90       \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
91       mu$}\hfill
92     \ResumeTagging{toc/leaders}\UseTaggingSocket{toc/leaders/after}%
93     \nobreak
94     \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor
95     \UseHookWithArguments{contentsline/page/before}{4}{#1}{#4}{#5}{\@contentsline@destination}
96     #5%
97     \UseHookWithArguments{contentsline/page/after}{4}{#1}{#4}{#5}{\@contentsline@destination}
98     \kern-\p@\kern\p@}%
99   \par}%
100 \fi}

```

## 2.9.2 \numberline

[kernel?] Inside or outside the box?

```

101 \def\numberline#1{\hb@xt@\@tempdima{%
102   \UseHookWithArguments{contentsline/number/before}{1}{#1}%
103   #1\hfil
104   \UseHookWithArguments{contentsline/number/after}{1}{#1}%
105   }}

```

## 2.9.3 \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.

```

106 \AddToHook{class/article/after}
107 {
108   \renewcommand*\l@part[2]{% as in contentsline: content, page
109   \ifnum \c@tocdepth >-2\relax
110     \addpenalty\@secpenalty
111     \addvspace{2.25em \@plus\p@}%
112     \setlength\@tempdima{3em}%
113     \begingroup
114       \parindent \z@ \rightskip \@pnumwidth
115       \parfillskip -\@pnumwidth
116     {\leavevmode

```

```

117 \large \bfseries
118 \UseHookWithArguments{contentsline/text/before}{4}
119 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
120 \csname contentsline@text@-1@format\endcsname{#1}%
121 \UseHookWithArguments{contentsline/text/after}{4}
122 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
123 \hfil
124 \hb@xt@{\pnumwidth}{\hss
125 \UseHookWithArguments{contentsline/page/before}{4}
126 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
127 #2%
128 \UseHookWithArguments{contentsline/page/after}{4}
129 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
130 \kern-\p@\kern\p@}\par
131 \nobreak
132 \endgroup
133 \fi}
134 \renewcommand*\l@section[2]{%
135 \ifnum \c@tocdepth >\z@
136 \addpenalty\@secpenalty
137 \addvspace{1.0em \@plus\p@}%
138 \setlength\@tempdima{1.5em}%
139 \begingroup
140 \parindent \z@ \rightskip \@pnumwidth
141 \parfillskip -\@pnumwidth
142 \leavevmode \bfseries
143 \advance\leftskip\@tempdima
144 \hskip -\leftskip
145 \UseHookWithArguments{contentsline/text/before}{4}
146 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
147 \csname contentsline@text@1@format\endcsname{#1}%
148 \UseHookWithArguments{contentsline/text/after}{4}
149 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
150 \nobreak\hfil
151 \nobreak\hb@xt@{\pnumwidth}{\hss
152 \UseHookWithArguments{contentsline/page/before}{4}
153 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
154 #2%
155 \UseHookWithArguments{contentsline/page/after}{4}
156 {\toclevel@section}{#1}{#2}{\@contentsline@destination}%
157 \kern-\p@\kern\p@}\par
158 \endgroup
159 \fi}
160 }
161 \AddToHook{class/report/after}
162 {
163 \renewcommand*\l@part[2]{%
164 \ifnum \c@tocdepth >-2\relax
165 \addpenalty{-\@highpenalty}%
166 \addvspace{2.25em \@plus\p@}%
167 \setlength\@tempdima{3em}%
168 \begingroup
169 \parindent \z@ \rightskip \@pnumwidth
170 \parfillskip -\@pnumwidth

```

```

171         {\leavevmode
172         \large \bfseries
173         \UseHookWithArguments{contentsline/text/before}{4}
174         {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
175         \csname contentsline@text@-1@format\endcsname{#1}%
176         \UseHookWithArguments{contentsline/text/after}{4}
177         {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
178         \hfil
179         \hb@xt@{\@pnumwidth}{\hss
180         \UseHookWithArguments{contentsline/page/before}{4}
181         {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
182         #2%
183         \UseHookWithArguments{contentsline/page/after}{4}
184         {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
185         \kern-\p@\kern\p@}}\par
186     \nobreak
187 \endgroup
188 \fi}
189 \renewcommand*\l@chapter[2]{%
190 \ifnum \c@tocdepth >\m@ne
191 \addpenalty{-\@highpenalty}%
192 \vskip 1.0em \@plus\p@
193 \setlength\@tempdima{1.5em}%
194 \begingroup
195 \parindent \z@ \rightskip \@pnumwidth
196 \parfillskip -\@pnumwidth
197 \leavevmode \bfseries
198 \advance\leftskip\@tempdima
199 \hskip -\leftskip
200 \UseHookWithArguments{contentsline/text/before}{4}
201 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
202 \csname contentsline@text@0@format\endcsname
203 {#1}%
204 \UseHookWithArguments{contentsline/text/after}{4}
205 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
206 \nobreak\hfil
207 \nobreak\hb@xt@{\@pnumwidth}{\hss
208 \UseHookWithArguments{contentsline/page/before}{4}
209 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
210 #2%
211 \UseHookWithArguments{contentsline/page/after}{4}
212 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}}%
213 \kern-\p@\kern\p@}\par
214 \penalty\@highpenalty
215 \endgroup
216 \fi}
217 }
218 \AddToHook{class/book/after}
219 {
220 \renewcommand*\l@part[2]{%
221 \ifnum \c@tocdepth >-2\relax
222 \addpenalty{-\@highpenalty}%
223 \addvspace{2.25em \@plus\p@}%
224 \setlength\@tempdima{3em}%

```

```

225 \begingroup
226 \parindent \z@ \rightskip \@pnumwidth
227 \parfillskip -\@pnumwidth
228 {\leavevmode
229 \large \bfseries
230 \UseHookWithArguments{contentsline/text/before}{4}
231 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
232 \csname contentsline@text@-1@format\endcsname{#1}%
233 \UseHookWithArguments{contentsline/text/after}{4}
234 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
235 \hfil
236 \hb@xt@ \@pnumwidth{\hss
237 \UseHookWithArguments{contentsline/page/before}{4}
238 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
239 #2%
240 \UseHookWithArguments{contentsline/page/after}{4}
241 {\toclevel@part}{#1}{#2}{\@contentsline@destination}%
242 \kern-\p@\kern\p@}}\par
243 \nobreak
244 \endgroup
245 \fi}
246 \renewcommand*\l@chapter[2]{%
247 \ifnum \c@tocdepth >\m@ne
248 \addpenalty{-\@highpenalty}%
249 \vskip 1.0em \@plus\p@
250 \setlength\@tempdima{1.5em}%
251 \begingroup
252 \parindent \z@ \rightskip \@pnumwidth
253 \parfillskip -\@pnumwidth
254 \leavevmode \bfseries
255 \advance\leftskip\@tempdima
256 \hskip -\leftskip
257 \UseHookWithArguments{contentsline/text/before}{4}
258 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
259 \csname contentsline@text@0@format\endcsname
260 {#1}%
261 \UseHookWithArguments{contentsline/text/after}{4}
262 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
263 \nobreak\hfil
264 \nobreak\hb@xt@ \@pnumwidth{\hss
265 \UseHookWithArguments{contentsline/page/before}{4}
266 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
267 #2%
268 \UseHookWithArguments{contentsline/page/after}{4}
269 {\toclevel@chapter}{#1}{#2}{\@contentsline@destination}%
270 \kern-\p@\kern\p@}\par
271 \penalty\@highpenalty
272 \endgroup
273 \fi}
274 }
275 \end{package}

```