The latex-lab-firstaid package
Temporary patches to external packages needed for the tagging project

LaTeX Project[*]

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Abstract

1 Introduction

The followings contains small temporary changes to external packages to avoid errors with the new tagging code.

Similar to the main firstaid package the goal is to remove the patches once the packages have been updated.

2 Implementation

```
1 ⟨*package⟩
2 ⟨@@=tag⟩

3 \ProvidesPackage {latex-lab-testphase-firstaid} [%
4     \ltlabfirstaiddate\space v\ltlabfirstaiddate\space
5     Temporary patches to external packages needed for the tagging project]
```

\FirstAidNeededT This is a very simple help to ensure that we only apply first aid to an unmodified package or class. It only works in the case the file has already been loaded and the csname `\ver@#1.#2` got defined (holding the current date, version, and short description info). We then compare its content to a frozen string and make the modification `#3` only if both agree. If they differ we assume that the package/class in question got updated by its maintainer.

```
6 \ExplSyntaxOn
7 \providecommand\FirstAidNeededT[3]{
8   \exp_args:Ncx\str_if_eq:onF{ver@#1.#2}{#3}
9     { \typeout{==>~ First~ Aid~ for~ #1.#2~ no~ longer~ applied!^^J
10          \@spaces Expected:^^J
11          \@spaces\@spaces #3^^J
12          \@spaces but~ found:^^J
13          \@spaces\@spaces \use:c{ver@#1.#2}^^J
14          \@spaces so~ I'm~ assuming~ it~ got~ fixed.
```

```
15      } }
16   \exp_args:Ncx\str_if_eq:onT{ver@#1.#2}{#3}
17 }
```

(*End of definition for* `\FirstAidNeededT`*. This function is documented on page* **??**.)

2.1 ams classes

The amsart, amsbook and amsproc classes do not use `\@author` to store the author list but a command `\authors`. To be able to nevertheless use the authors in the xmp-metadata we map `\@author` to this new command.

```
18  \AddToHook{class/amsart/after}
19   {\def\@author{\authors}}
20  \AddToHook{class/amsbook/after}
21   {\def\@author{\authors}}
22  \AddToHook{class/amsproc/after}
23   {\def\@author{\authors}}
```

2.2 ams classes and amsthm

The amsart, amsbook and amsproc classes redefine the theorem code and this breaks the tagging added by the block code. The following reenables tagging. It does *not* give a completly identical output (similar to the new theorem code, see https://github.com/latex3/tagging-project/issues/715). The code also does not try to use sockets yet, as the theorem definitions in the block code don't do that yet either.

```
24  \AddToHook{class/amsart/after}[latex-lab-testphase-firstaid/amsthm]
25   {\tag_if_active:T{\__tag_firstaid_amsthm:}\__tag_firstaid_ams_abstract:}
26  \AddToHook{class/amsbook/after}[latex-lab-testphase-firstaid/amsthm]
27   {\tag_if_active:T{\__tag_firstaid_amsthm:}\__tag_firstaid_ams_abstract:}
28  \AddToHook{class/amsproc/after}[latex-lab-testphase-firstaid/amsthm]
29   {\tag_if_active:T{\__tag_firstaid_amsthm:}}
30  \AddToHook{package/amsthm/after}[latex-lab-testphase-firstaid/amsthm]
31   {\tag_if_active:T{\__tag_firstaid_amsthm:}}

32  \cs_new_protected:Npn \__tag_firstaid_ams_abstract:
33    {
34  \renewenvironment{abstract}{%
35    \ifx\maketitle\relax
36      \ClassWarning{\@classname}{Abstract~ should~ precede~
37        \protect\maketitle\space in~ AMS~ document~ classes;~ reported}%
38    \fi
39    \global\setbox\abstractbox=\vtop \bgroup
40      \normalfont\Small
41      \list{}{\labelwidth\z@
42        \leftmargin3pc \rightmargin\leftmargin
43        \listparindent\normalparindent \itemindent\z@
44        \parsep\z@ \@plus\p@
45        \let\fullwidthdisplay\relax
46      }%
47      \item[\hskip\labelsep\scshape\abstractname.]%
48  }{%
49    \endlist
50    \par                % <--- added
```

```
51    \egroup
52    \ifx\@setabstract\relax \@setabstracta \fi
53  }
54    }
```

```
55  \cs_new_protected:Npn \__tag_firstaid_amsthm:
56    {
```

`\@endtheorem` must use the endblock code

```
57        \def\@endtheorem{\endblockenv}
```

In `\@thm` we have to remove the `\trivlist`

```
58        \RenewDocumentCommand\@thm{mmmO{}}{%
59          \ifhmode\unskip\unskip\par\fi
60          \normalfont
61          \let\thmheadnl\relax
62          \let\thm@swap\@gobble
63          \thm@notefont{\fontseries\mddefault\upshape}%
64          \thm@headpunct{.}% add period after heading
65          \thm@headsep 5\p@ plus\p@ minus\p@\relax
66          \thm@space@setup
67          ##1% style overrides
68          \@topsep \thm@preskip              % used by thm head
69          \@topsepadd \thm@postskip          % used by \@endparenv
```

We store the counter name so that the anchor can make use of it.

```
70          \tl_set:Nn \l__block_thm_current_counter_tl{##2}
71          \tl_if_empty:nTF{##2}
72           {
73            \@begintheorem{##3}{}[##4]
74           }
75           {
76            \@kernel@refstepcounter{##2}
77            \@begintheorem{##3}{\csname the##2\endcsname}[##4]
78           }
79          }
```

`\@begintheorem` has a larger number of changes

```
80        \def\@begintheorem##1##2[##3]{%
```

We use the theorem instance.

```
81          \UseInstance{blockenv}{theorem}{beginsep=\thm@preskip}
```

There is no working key to set the endskip, so we set the skip directly similar to what amsthm is doing after the `\trivlist`.

```
82          \skip_set:Nn\l__block_topsepadd_skip { \thm@postskip }
```

While create the caption/label we disable para-tagging.

```
83          \tagpdfparaOff
84          \group_begin:
85            \normalfont
86            \the\thm@headfont \thm@indent
```

The anchor for links. It must be inserted when we have started hmode (which happens with `\thm@indent`). amsthm allows for unnumbered theorems so we have to test for an empty counter.

```
87          \tl_if_empty:NTF \l__block_thm_current_counter_tl
88            {\MakeLinkTarget[theorem]{}}
89            {\MakeLinkTarget{\l__block_thm_current_counter_tl}}
90          \@ifempty{##1}
91            {\let\thmname\@gobble}
```

we insert the MC and the Lbl structure into `\thmname`, `\thmnumber` and `\thmnote`. This will also work with new theorem style as long as they use these command.

```
92            {\def\thmname####1{\tag_mc_begin:n {}####1\tag_mc_end:}}%
93          \@ifempty{##2}
94            {\let\thmnumber\@gobble}
95            {\def\thmnumber####1
96              {\tag_struct_begin:n{tag=Lbl}\tag_mc_begin:n {}
97                ####1
98              \tag_mc_end:\tag_struct_end:}}%
99          \@ifempty{##3}
100            {\let\thmnote\@gobble}
101            {\def\thmnote####1{\tag_mc_begin:n{}####1\tag_mc_end:}}%
102          \tag_struct_begin:n{tag=Caption}
103          \thm@swap\swappedhead\thmhead{##1}{##2}{##3}%
104          \tag_mc_begin:n{}\the\thm@headpunct\tag_mc_end:
105          \tag_struct_end:
106          \thmheadnl % possibly a newline.
107          \hskip\thm@headsep
108        \group_end:
```

Now we restart para tagging and start a paragraph. The socket is currently defined in tagpdf, so the code should only be used if tagging is active!

```
109          \tagpdfparaOn
110          \UseTaggingSocket{para/begin}
111        \ignorespaces}
```

This redefines the standard styles for the theorem heads. `\thm@headpunct` has been moved into the head code to make tagging more easier.

```
112      \def\thmhead@plain##1##2##3{%
113        \thmname{##1}
114        \thmnumber{
115          \@ifnotempty{##1}{~}\@upn{##2}
116        }%
117        \thmnote{\pdffakespace\space{\the\thm@notefont(##3)}}
118      }
119      \let\thmhead\thmhead@plain
120      \def\swappedhead##1##2##3{%
121        \thmnumber{##2}
122        \thmname{\@ifnotempty{##2}{\nobreakspace}##1}
123        \thmnote{\pdffakespace\space{\the\thm@notefont(##3)}}
124      }
125      \let\swappedhead@plain=\swappedhead
```

At last some adjustments for the proof environment. The qed symbols use a drawn box by default. We add an actualtext.

```
126      \renewcommand{\openbox}{\leavevmode
```

```
127        \hbox to.77778em{\pdf_bdc:nn{Span}{/ActualText<FEFF220E>}%
128        \pdffakespace\hfil\vrule
129        \vbox to.675em{\hrule width.6em\vfil\hrule}%
130        \vrule\hfil\pdf_emc:}}
```

And redefine proof to no longer use a trivlist.

```
131        \renewenvironment{proof}[1][\proofname]{\par
132          \pushQED{\qed}%
133          \UseInstance{blockenv}{theorem}{beginsep=6\p@\@plus6\p@}
134          \normalfont
135          \tagpdfparaOff
136          \AddToHookNext{para/begin}
137           {\tag_struct_begin:n{tag=Caption}
138            \tag_mc_begin:n{}%
139             \textit{##1\@addpunct{.}}%
140            \tag_mc_end:
141            \tag_struct_end:
142            \tagpdfparaOn
143            \UseTaggingSocket{para/begin}
144            \pdffakespace\hspace{\labelsep}}
145          \ignorespaces
146        }{%
147          \popQED\endblockenv\par
148        }
149    }
150 \ExplSyntaxOff
```

2.3   verse

The verse package has its own definition of the verse environment, which would tag correctly, except that it is overwritten by the block code in the hook begindocument/before. So the simplest way to make tagging work is to reinstall the package version afterwards, which is what we are doing here.

```
151 \AddToHook{package/verse/after}[latex-lab-firstaid]{%
152  \FirstAidNeededT{verse}{sty}{2014/05/10 v2.4b verse typesetting}%
153    {%
154      \AtBeginDocument{%
155        \renewenvironment{verse}[1][\linewidth]{%
156          \stepcounter{verse@envctr}%
157          \setcounter{poemline}{0}\refstepcounter{poemline}%
158          \setcounter{vslineno}{1}%
159          \let\\=\@vscentercr
160          \list{}{\itemsep \z@
161                  \itemindent  -\vindent
162                  \listparindent\itemindent
163                  \parsep        \stanzaskip
164                  \ifdim #1 < \linewidth
165                    \rightmargin        \z@
166                    \setlength{\leftmargin}{\linewidth}%
167                    \addtolength{\leftmargin}{-#1}%
168                    \addtolength{\leftmargin}{-0.5\leftmargin}%
169                  \else
170                    \rightmargin         \leftmargin
171                  \fi
```

```
172              \addtolength{\leftmargin}{\vindent}}%
173          \item[]%
174        }%
175        {\endlist}%
176      }%
177    }%
178 }
```

Of course, this means that the optional argument of the environment then only accepts a length value and not any more a key value list for altering the environment settings.

A more elabroate version could be something like this that allows key/val and legacy interface. Or one could extend the list template to support a `list-width` key.

```
\ExplSyntaxOn
\cs_new_protected:Npn \ExtractAndDropKey #1#2#3#4#5 {
  \tl_set_eq:NN #4 \c_novalue_tl      % or empty?
  \keys_define:nn { #1 } { #2 .code:n = \tl_set:Nn #4{##1} }
  \keys_set_known:nnN { #1 } { #3 } #5
}
\ExplSyntaxOff

% Change the env definition for verse matching verse.sty
% This keeps the verse.sty interface as it is and only adjusts the
% main environment to use the basic list env with the verse.sty
% specific settings.
\makeatletter

\AddToHook{package/verse/after}{%
  \AtBeginDocument{%
  \RenewDocumentEnvironment{verse}{={verse-width}!O\linewidth}}%
    {%
      \stepcounter{verse@envctr}%
      \setcounter{poemline}{0}\refstepcounter{poemline}%
      \setcounter{vslineno}{1}%
      \let\\=\@vscentercr
%
      \ExtractAndDropKey{verse}{verse-width}{#1}\@vswidth\@vsremainingkvlist
% If other keys have been specified but not verse-width we have no
% default for \@vswidth and need to set it again
      \ExpandArgs{o}\IfNoValueT \@vswidth
                       {\def\@vswidth{\linewidth}}%
%
% This is a bit ugly but we can't stick \cs{@vsremainingkvlist} into
% the instance argument as keys are expected to be visible on
% top-level not hidden inside a macro.  The alternative is to push
% in \verb=#1= but then the key/value \verb/verse-width=.../ is
% passed into the instance which is not known there (not harmful as
% it will get ignored but noticeably more and unnecessary
% processing).
%
      \def\next##1{%
```

```
      \UseInstance{blockenv}{list}%
        {%
          item-indent =-\vindent,%
          parindent   =-\vindent,%
          par-skip    =\stanzaskip,%
          item-skip   =0pt,%
          leftmargin  = (\linewidth-\@vswidth)/2+\vindent,%
          rightmargin = \ifdim\@vswidth<\linewidth 0pt
                        \else (\linewidth-\@vswidth)/2\fi,%
          ##1%
        }}%
      \ExpandArgs{o}\next\@vsremainingkvlist
      \item\relax
    }{\endblockenv}%
  }%
}
\makeatother
```

2.4 cleveref

The cleveref package redefines `\@makefntext` and this means that the patches in the new footnote code fails. We use a hook instead.

```
179 \AddToHook{package/cleveref/after}
180 {
181   \let\@makefntext\cref@old@makefntext
182   \AddToHook{cmd/@makefntext/before}{%
183    \cref@constructprefix{footnote}{\cref@result}%
184    \protected@edef\cref@currentlabel{%
185     [footnote][\arabic{footnote}][\cref@result]%
186    \p@footnote\@thefnmark}}
187 }
```

2.5 booktabs

In some cases booktabs inserts a `\multispan` into the table (through the commands `\@cmidruleb` and `\@cmidrulea` and this then errors with the tagging code. This affects both tabular and longtable (but longtable more as booktabs handles lines in longtable differently). See also issue https://github.com/latex3/tagging-project/issues/69

```
188 \ExplSyntaxOn
189 \AddToHook{package/booktabs/after}
190 {
191  \def\@cmidrulea{
192   \multispan\@cmidla
193   &\multispan\@cmidlb
194   \unskip\hskip\cmrkern@l
195  {
196   \tag_mc_begin:n{artifact}
197   \CT@arc@\leaders\hrule \@height\@thisrulewidth\hfill\kern\z@}
198   \hskip\cmrkern@r
199   \tag_mc_end: \int_gdecr:N \g__tbl_row_int
200   \cr}
```

```
201
202  \def\@cmidruleb{%
203    \multispan\@cmidlb
204    \unskip\hskip \cmrkern@l%
205  {
206    \tag_mc_begin:n{artifact}
207    \CT@arc@\leaders\hrule \@height\@thisrulewidth\hfill\kern\z@}
208    \hskip\cmrkern@r
209    \tag_mc_end: \int_gdecr:N \g__tbl_row_int
210    \cr}
211  }
212 \ExplSyntaxOff
```

2.6 fancyvrb

The firstaid adds first partial tagging support to the environments of fancyvrb (inline verbatim is untested). This supports then also packages like minted which internally uses fancyvrb and classes like l3doc (where currently the verbatim environment based on fancyvrb is overwritten by the block code). The environments are surrounded by a `verbatim` structure, every line by a `codeline` structure (this requires the block code, but firstaid should be used only with phase-III anyway). Line numbers are tagged as Lbl, inside of the `codeline` structure. The frame lines are marked as artifact.

\FV@LeaveVMode   If we are in vmode we have to open a text-unit structure, if we are in hmode we have to set para mode to flattened before the fancyhdr code issues the\par. The closing of the text-unit structure is handled by the doendpe code in the block code.

```
213 \ExplSyntaxOn
214 \AddToHook{package/fancyvrb/after}
215 {
216   \def\FV@LeaveVMode{%
217     \if@noskipsec
218       \leavevmode
219     \else
220       \if@FV@ResetMargins\if@inlabel\leavevmode\fi\fi
221     \fi
222     \ifvmode
223       \@noparlisttrue
224       \__tag_gincr_para_main_begin_int:
225       \tag_struct_begin:n{tag=\l__tag_para_main_tag_tl}
226     \else
227       \bool_set_true:N\l__tag_para_flattened_bool
228       \@noparlistfalse
229       \unskip\par
230     \fi
231     }
```

(*End of definition for* `\FV@LeaveVMode`. *This function is documented on page* **??**.)

\FV@List   At the begin of the list code we have to tag the frame as artifact and start the `verbatim` structure

```
232     \def\FV@List#1{%
233       \begingroup
234       \FV@UseKeyValues
```

```
235        \FV@LeaveVMode
236        \if@inlabel\else\setbox\@labels=\box\voidb@x\fi
237        \FV@ListNesting{#1}%
238        \FV@ListParameterHook
239        \FV@ListVSpace
240        \FV@SetLineWidth
241        \FV@InterLinePenalty
242        \let\FV@ProcessLine\FV@ListProcessLine@i
243        \FV@CatCodes
244        \FV@FormattingPrep
245        \FV@ObeyTabsInit
246        \cs_if_exist:NT \FV@BeginListFrame
247          {
248           \tag_mc_begin:n{artifact}
249           \FV@BeginListFrame
250           \tag_mc_end:
251          }
252        \tag_struct_begin:n{tag=verbatim}
253          }
```

(*End of definition for* `\FV@List`*. This function is documented on page* **??***.*)

\FV@EndList   At the end of the list code we close the `verbatim` structure and tag the frame as artifact.

```
254        \def\FV@EndList{%
255        \FV@ListProcessLastLine
256        \tag_struct_end:
257        \cs_if_exist:NT \FV@EndListFrame
258          {
259           \tag_mc_begin:n{artifact}
260           \FV@EndListFrame
261           \tag_mc_end:
262          }
263        \@endparenv
264        \endgroup
265        \@endpetrue
266          }
```

(*End of definition for* `\FV@EndList`*. This function is documented on page* **??***.*)

\FV@ListProcessLine   At last the tagging of the code lines. Here we have to tag also numbers and frame parts if they exist.

```
267        \def\FV@ListProcessLine#1{%
268        \hbox to \hsize{%
269          \kern\leftmargin
270          \hbox to \linewidth{%
271           \tag_struct_begin:n{tag=codeline}
272            \cs_if_exist:NT \FV@LeftListNumber
273              {
274               \tag_struct_begin:n{tag=Lbl}
275               \tag_mc_begin:n{}
276               \FV@LeftListNumber
277               \tag_mc_end:
278               \tag_struct_end:
279              }
```

```
280        \cs_if_exist:NT \FV@LeftListFrame
281         {
282            \tag_mc_begin:n{artifact}
283            \FV@LeftListFrame
284            \tag_mc_end:
285         }
286       \tag_mc_begin:n{}%
287       \FancyVerbFormatLine{#1}%
288       \tag_mc_end:
289       \tag_struct_end:\hss
290       \cs_if_exist:NT \FV@RightListFrame
291         {
292            \tag_mc_begin:n{artifact}
293            \FV@RightListFrame
294            \tag_mc_end:
295         }
296       \cs_if_exist:NT \FV@RightListNumber
297         {
298            \tag_struct_begin:n{tag=Lbl}
299            \tag_mc_begin:n{}
300            \FV@RightListNumber
301            \tag_mc_begin:n{}
302            \tag_struct_end:
303         }
304       }
305       \hss}}
306   }
307 \ExplSyntaxOff
```

(*End of definition for* `\FV@ListProcessLine`*. This function is documented on page* **??**.)

```
308 ⟨/package⟩

309 ⟨∗latex-lab⟩
310 \ProvidesFile{firstaid-latex-lab-testphase.ltx}
311        [\ltlabfirstaiddate\space v\ltlabfirstaidversion\space
312         latex-lab wrapper firstaid]
313
314 \RequirePackage{latex-lab-testphase-firstaid}
315
316 ⟨/latex-lab⟩
```