

# The latex-lab-firstaid package

## Temporary patches to external packages needed for the tagging project

L<sup>A</sup>T<sub>E</sub>X 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   \lftlabfirstaiddate\space v\lftlabfirstaiddate\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 `\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.
```

---

\*Initial implementation done by Ulrike Fischer

```

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 completely 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 \mode_leave_vertical:

```

The anchor for links. amsthm allows for unnumbered theorems so we have to test for an empty counter.

```

85 \tl_if_empty:nTF \l__block_thm_current_counter_tl
86 {\MakeLinkTarget[theorem]}
87 {\MakeLinkTarget{\l__block_thm_current_counter_tl}}
88 \group_begin:

```

```

89     \normalfont
90     \the\thm@headfont \thm@indent
91     \@ifempty{##1}
92     {\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.

```

93     {\def\thmname####1{\tag_mc_begin:n {}####1\tag_mc_end:}}%
94     \@ifempty{##2}
95     {\let\thmnumber@gobble}
96     {\def\thmnumber####1
97     {\tag_struct_begin:n{tag=Lbl}\tag_mc_begin:n {}
98     ####1
99     \tag_mc_end:\tag_struct_end:}}%
100    \@ifempty{##3}
101    {\let\thmnote@gobble}
102    {\def\thmnote####1{\tag_mc_begin:n{}####1\tag_mc_end:}}%
103    \tag_struct_begin:n{tag=Caption}
104    \thm@swap\swappedhead\thmhead{##1}{##2}{##3}%
105    \tag_mc_begin:n{\the\thm@headpunct}\tag_mc_end:
106    \tag_struct_end:
107    \thmheadnl % possibly a newline.
108    \hskip\thm@headsep
109    \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!

```

110    \tagpdfpara0n
111    \UseTaggingSocket{para/begin} %
112    \ignorespaces}

```

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

```

113    \def\thmhead@plain##1##2##3{%
114    \thmname{##1}
115    \thmnumber{
116    \@ifnotempty{##1}{~}\@upn{##2}
117    }%
118    \thmnote{\pdfspacespace\space{\the\thm@notefont(##3)}}
119    }
120    \let\thmhead\thmhead@plain
121    \def\swappedhead##1##2##3{%
122    \thmnumber{##2}
123    \thmname{\@ifnotempty{##2}{\nobreakspace}##1}
124    \thmnote{\pdfspacespace\space{\the\thm@notefont(##3)}}
125    }
126    \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`.

```

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

```

And redefine proof to no longer use a trivlist.

```

132   \renewenvironment{proof}[1][\proofname]{\par
133     \pushQED{\qed}%
134     \UseInstance{blockenv}{theorem}{beginsep=6\p@\@plus6\p@}
135     \normalfont
136     \tagpdfparaOff
137     \AddToHookNext{para/begin}
138     {\tag_struct_begin:n{tag=Caption}
139     \tag_mc_begin:n{}}%
140     \textit{##1\@addpunct{.}}%
141     \tag_mc_end:
142     \tag_struct_end:
143     \tagpdfparaOn
144     \UseTaggingSocket{para/begin}
145     \pdfspaces\hspace{\labelsep}}
146   \ignorespaces
147 }{%
148   \popQED\endblockenv\par
149 }
150 }
151 \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.

```

152 \AddToHook{package/verse/after}[latex-lab-firstaid]{%
153   \FirstAidNeededT{verse}{sty}{2014/05/10 v2.4b verse typesetting}%
154   {%
155     \AtBeginDocument{%
156       \renewenvironment{verse}[1][\linewidth]{%
157         \stepcounter{verse@envctr}%
158         \setcounter{poemline}{0}\refstepcounter{poemline}%
159         \setcounter{vslineno}{1}%
160         \let\@vscentercr
161         \list{}{\itemsep \z@
162           \itemindent -\vindent
163           \listparindent\itemindent
164           \parsep \stanzaskip
165           \ifdim #1 < \linewidth
166             \rightmargin \z@
167             \setlength{\leftmargin}{\linewidth}%
168             \addtolength{\leftmargin}{-#1}%
169             \addtolength{\leftmargin}{-0.5\leftmargin}%
170           \else
171             \rightmargin \leftmargin
172           \fi
173           \addtolength{\leftmargin}{\vindent}}%
174         \item[]%
175       }%
176     {\endlist}%

```

```

177     }%
178   }%
179 }

```

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 elaborate 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}!0{\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 `\@makefnctext` and this means that the patches in the new footnote code fails. We use a hook instead.

```

180 \AddToHook{package/cleveref/after}
181 {
182   \let\@makefnctext\cref@old@makefnctext
183   \AddToHook{cmd/@makefnctext/before}{%
184     \cref@constructprefix{footnote}{\cref@result}%
185     \protected@edef\cref@currentlabel{%
186       [footnote] [\arabic{footnote}] [\cref@result]%
187     \p@footnote\@thefnmark}}
188 }

```

## 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>

```

189 \ExplSyntaxOn
190 \AddToHook{package/booktabs/after}
191 {
192   \def\@cmidrulea{
193     \multispan\@cmidla
194     &\multispan\@cmidlb
195     \unskip\hskip\cmrkern@l
196   {
197     \tag_mc_begin:n{artifact}
198     \CT@arc@\leaders\hrule \@height\@thisrulewidth\hfill\kern\z@}
199     \hskip\cmrkern@r
200     \tag_mc_end: \int_gdecr:N \g__tbl_row_int
201     \cr}
202
203   \def\@cmidruleb{%
204     \multispan\@cmidlb
205     \unskip\hskip \cmrkern@l%

```

```

206 {
207   \tag_mc_begin:n{artifact}
208   \CT@arc@\leaders\hrule \@height\@thisrulewidth\hfill\kern\z@}
209   \hskip\cmrkern@r
210   \tag_mc_end: \int_gdecr:N \g__tbl_row_int
211   \cr}
212 }
213 \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`, currently outside 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.

```

214 \ExplSyntaxOn
215 \AddToHook{package/fancyvrb/after}
216 {
217   \def\FV@LeaveVMode{%
218     \if@noskipsec
219       \leavevmode
220     \else
221       \if@FV@ResetMargins\if@inlabel\leavevmode\fi\fi
222     \fi
223     \ifvmode
224       \@nolisttrue
225       \__tag_gincr_para_main_begin_int:
226       \tag_struct_begin:n{tag=\l__tag_para_main_tag_tl}
227     \else
228       \bool_set_true:N\l__tag_para_flattened_bool
229       \@nolistfalse
230       \unskip\par
231     \fi
232   }

```

*(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

```

233   \def\FV@List#1{%
234     \begingroup
235     \FV@UseKeyValues
236     \FV@LeaveVMode
237     \if@inlabel\else\setbox\@labels=\box\voidb@x\fi
238     \FV@ListNesting{#1}%
239     \FV@ListParameterHook

```



```

240 \FV@ListVSpace
241 \FV@SetLineWidth
242 \FV@InterLinePenalty
243 \let\FV@ProcessLine\FV@ListProcessLine@i
244 \FV@CatCodes
245 \FV@FormattingPrep
246 \FV@ObeyTabsInit
247 \cs_if_exist:NT \FV@BeginListFrame
248 {
249   \tag_mc_begin:n{artifact}
250   \FV@BeginListFrame
251   \tag_mc_end:
252 }
253 \tag_struct_begin:n{tag=verbatim}
254 }

```

*(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.

```

255 \def\FV@EndList{%
256   \FV@ListProcessLastLine
257   \tag_struct_end:
258   \cs_if_exist:NT \FV@EndListFrame
259   {
260     \tag_mc_begin:n{artifact}
261     \FV@EndListFrame
262     \tag_mc_end:
263   }
264   \@endparenv
265   \endgroup
266   \@endpetrue
267 }

```

*(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.

```

268 \def\FV@ListProcessLine#1{%
269   \hbox to \hsize{%
270     \kern\leftmargin
271     \hbox to \linewidth{%
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_struct_begin:n{tag=codeline}
287     \tag_mc_begin:n{}%
288     \FancyVerbFormatLine{#1}%
289     \tag_mc_end:
290     \tag_struct_end:\hss
291     \cs_if_exist:NT \FV@RightListFrame
292     {
293         \tag_mc_begin:n{artifact}
294         \FV@RightListFrame
295         \tag_mc_end:
296     }
297     \cs_if_exist:NT \FV@RightListNumber
298     {
299         \tag_struct_begin:n{tag=Lbl}
300         \tag_mc_begin:n{}
301         \FV@RightListNumber
302         \tag_mc_begin:n{}
303         \tag_struct_end:
304     }
305     }
306     \hss}}
307 }
308 \ExplSyntaxOff

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

309 \</package>
310 \<*/latex-lab>
311 \ProvidesFile{firstaid-latex-lab-testphase.ltx}
312     [\l\tlabfirstaiddate\space v\l\tlabfirstaidversion\space
313     latex-lab wrapper firstaid]
314
315 \RequirePackage{latex-lab-testphase-firstaid}
316
317 \</latex-lab>

```