First aid for external files and packages that need updating

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Abstract

This file contains some first aid for packages or classes that require updates because of internal changes to LaTeX but that aren't yet reflected in the package/class code.

Contents

1 Introduction

Over the years package writers have hooked into various parts of internal LaTeX commands (largely because proper interfaces were missing in important places) and if we are now gradually adding such interfaces these internal commands do change and as a result patching into them stops working.

As part of making such internal changes the LaTeX Project team attempts to check for such usage in packages, alert the package maintainers and ensures that the packages get updated alongside the core LaTeX system. However it is not always possible to get packages that will fail with a new kernel updated in time and if that is the case we try to provide a temporary fix in this file for them. Once the package gets updated the fix will then be removed again.

For that reason, it is put into a separate bundle so that we can update it easily without requiring the CTAN maintainers to install a new full LaTeX system just because we take out (or add) a fix for a package here.

In the best case scenario the file documented here should be empty. In practice it will probably always contain one or the other fix while we are waiting for the package to get updated.

> **Important notice:** The fixes provided here are not meant to be a permanent solution, but are only provided to support the transition period. They are (usually) neither complete nor necessarily the best solution! Furthermore, as they are done from the "outside", they usually add some burden and slow down LaTeX processing, even if the package/class is not used in the document.
>
> We will therefore remove such code as soon as possible again. In practice this means that if some package never gets updated/corrected, then it will eventually fail to work, because after one or at most two LaTeX releases we will take out the transition code to ensure that this "first aid patching" doesn't get out of bounds.

1.1 Minor kernel fixes

If we encounter issues with the kernel code that should get fixed before the next main release we normally generate a patch release for LaTeX. However, depending on the complexity of the fix we might first add the fix here and generate a full patch release only when a number of such issues have accumulated. This way we lessen the impact on CTAN maintainers because for each tach release we have to make and distribute also a matching development release.

2 The Implementation

This file is meant to be loaded during format generation which is why we give it the extension `.ltx`.

```
1 ⟨*kernel⟩
2 \def\LaTeXFirstAidDate{2025/03/10}
3 \def\LaTeXFirstAidVersion{v1.1n}
4 \ProvidesFile{latex2e-first-aid-for-external-files.ltx}
5               [\LaTeXFirstAidDate\space \LaTeXFirstAidVersion\space
6                 LaTeX kernel fixes to external files and packages]
```

`\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.

```
\ExplSyntaxOn
\cs_new:Npn\FirstAidNeededT#1#2#3{
  \exp_args:Ncx\str_if_eq:onTF{ver@#1.#2}{#3}
      { \typeout{==>~ First~ Aid~ for~ #1.#2~ applied! } }
      { \typeout{==>~ First~ Aid~ for~ #1.#2~ no~ longer~ applied!^^J
          \@spaces Expected:^^J
          \@spaces\@spaces #3^^J
          \@spaces but~ found:^^J
          \@spaces\@spaces \use:c{ver@#1.#2}^^J
          \@spaces so~ I'm~ assuming~ it~ got~ fixed.
      } }
  \exp_args:Ncx\str_if_eq:onT{ver@#1.#2}{#3}
}
\ExplSyntaxOff
```

⟨/kernel⟩

2.1 The filehook package first aid

The filehook package implements hooks into file loading commands. These days this is already provided by the kernel albeit not with the same user interface. Until that package gets updated (to use the kernel interfaces) we provide a substitution. This does not offer all hooks from filehook but all that have been used in packages available in TEX Live.

Note that this doesn't fix currfile because that package uses filehook but relies on the internals of the old implementation.

The package has now got an update so we aren't activating the first aid. However, at the moment it basically bypasses the new hook mechanism and puts the old hooks in thereby disabling, for example, the possibility to re-order code through rules.

We therefore keep `filehook-ltx.sty` around as a guideline for further updates.

Replacing filehook with a leaner version would then work like this:

⟨*kernel⟩

```
%\declare@file@substitution{filehook.sty}{filehook-ltx.sty}
```

⟨/kernel⟩

What follows is a simplified (partial) implementation of the filehook interfaces. Not implemented are:

```
\AtBeginOfFiles      \AtEndOfFiles
\AtBeginOfInputs     \AtEndOfInputs
\AtBeginOfInputFile  \AtEndOfInputFile
```

⟨*filehook-ltx⟩

```
\newcommand\AtBeginOfEveryFile [1]
  {\AddToHook{file/before}{#1}}
\newcommand\AtEndOfEveryFile [1]
  {\AddToHook{file/after}{#1}}
\newcommand\AtBeginOfIncludes [1]
  {\AddToHook{include/before}{#1}}
```

```
\newcommand\AtEndOfIncludes [1]
  {\AddToHook{include/end}{#1}}
\newcommand\AfterIncludes [1]
  {\AddToHook{include/after}{#1}}

\newcommand\AtBeginOfPackages [1]
  {\AddToHook{package/before}{#1}}
\newcommand\AtEndOfPackages [1]
  {\AddToHook{package/after}{#1}}

\newcommand\AtBeginOfClasses [1]
  {\AddToHook{class/before}{#1}}
\newcommand\AtEndOfClasses [1]
  {\AddToHook{class/after}{#1}}

\newcommand\AtBeginOfFile [2]
  {\AddToHook{file/#1/before}{#2}}
\newcommand\AtEndOfFile [2]
  {\AddToHook{file/#1/after}{#2}}
```

Some commands offered a starred form

```
\DeclareDocumentCommand \AtBeginOfPackageFile {smm}
   {\IfBooleanTF{#1}%
     {\@ifpackageloaded{#2}%
         {#3}%
         {\AddToHook{package/#2/before}{#3}}}%
     {\AddToHook{package/#2/before}{#3}}%
   }

\DeclareDocumentCommand \AtEndOfPackageFile {smm}
   {\IfBooleanTF{#1}%
     {\@ifpackageloaded{#2}%
         {#3}%
         {\AddToHook{package/#2/after}{#3}}}%
     {\AddToHook{package/#2/after}{#3}}%
   }
```

Are the * forms here of any use? I know they are use 3–4 times on CTAN but I wonder if those are real or mistaken usages.

```
\DeclareDocumentCommand \AtBeginOfClassFile {smm}
   {\IfBooleanTF{#1}%
     {\@ifclassloaded{#2}%
         {#3}%
         {\AddToHook{class/#2/before}{#3}}}%
     {\AddToHook{class/#2/before}{#3}}%
   }
\DeclareDocumentCommand \AtEndOfClassFile {smm}
   {\IfBooleanTF{#1}%
     {\@ifclassloaded{#2}%
         {#3}%
         {\AddToHook{class/#2/after}{#3}}}%
     {\AddToHook{class/#2/after}{#3}}%
   }

\newcommand\AtBeginOfIncludeFile [2]
  {\AddToHook{include/#1/before}{#2}}
\newcommand\AtEndOfIncludeFile [2]
```

```
  {\AddToHook{include/#1/end}{#2}}
\newcommand\AfterIncludeFile [2]
  {\AddToHook{include/#1/after}{#2}}
```

⟨/filehook-ltx⟩

⟨∗kernel⟩

2.2 The dinbrief class first aid

Again a case of a no longer correct `\endgroup` in document. Here the fix is simply though.

```
\AddToHook{file/dinbrief.cls/after}[firstaid]{%
  \FirstAidNeededT{dinbrief}{cls}{2000/03/02 LaTeX2e class}%
                   {\AddToHook{env/document/begin}{\begingroup}}%
}
```

2.3 The unicode-math package first aid

If unicode-math is used together with doc there is a problem because it changes the mathcodes without adjusting the use in doc that assume standard settings. Could be fixed on either side, but as unicode-math is derivating from the standard, the right place is probably a fix in this package. For now we do it here. See github/820.

```
\AddToHook{package/unicode-math/after}{%
  \AddToHook{cmd/mod@math@codes/after}{\mathcode`\|=28796 }}
```

2.4 The pgfpages and pgfmorepages first aid

pgfpages alters the `\shipout` primitive to support multiple page up scenarios. If used together with atbegshi that worked because the alterations done by atbegshi came later and so used the new definition provide by pgfpages. Now that the code from atbegshi is already in the kernel this further redefinition doesn't happen with the result that the change to `\shipout` comes to late and breaks the kernel processes.

```
\ExplSyntaxOn
\AddToHook{file/pgfpages.sty/after}[firstaid]{
```

Undo overwriting `\shipout`:

```
  \cs_gset_eq:NN \shipout \pgfpages@originalshipout
```

Instead overwrite the L3 programming layer name of the primitive. This is really an absolute no-go, but for now the simplest solution to keep the original code running.

It will be replaced when the "configuration points" interface for LaTeX becomes available. At that point the package will be able to set up a different strategy for doing shipouts and without the need to overwrite a primitive (which it did in the past and which we do below) and then this code here can be taken out again.

```
  \cs_set_eq:NN \pgfpages@originalshipout \tex_shipout:D
  \cs_set_eq:NN \tex_shipout:D \pgfpages@interceptshipout
}
\ExplSyntaxOff
```

Same issue with pgfmorepages but slightly different implementation (sigh).

```
\ExplSyntaxOn
\AddToHook{file/pgfmorepages.sty/after}[firstaid]{
  \cs_set_nopar:Npn \pgfhookintoshipout {
    \cs_set_eq:NN \pgfpages@originalshipout \tex_shipout:D
    \cs_set_eq:NN \tex_shipout:D \pgfpages@interceptshipout
  }
}
\ExplSyntaxOff
```

2.5 The babel package

Turn off the babel hack.

```
\AddToHook{file/babel.sty/before}[firstaid]{\def\BabelCaseHack{}}
```

2.6 The songs package first aid

The songs package uses `\obeylines` and redefines `\par` for special effect. this no longer works in LaTeX 2022-06-01 (gh issue 367). The following fixes at least one failure.

```
\AddToHook{file/songs.sty/after}[firstaid]{%
  \FirstAidNeededT{songs}{sty}{2018/09/12 v3.1 Songs package}%
                  {%
     \renewcommand\SB@obeylines{%
         \let\obeyedline\SB@par%
         \obeylines%
         \let\@par\SB@@par%
       }}%
}
```

2.7 The crop package first aid

The crop packages fails currently due to two LaTeX changes: It doesn't know that `\stockheight` and `\stockwidth` are now defined, and doesn't take into account that `\rlap` is robust (https://github.com/rrthomas/crop/issues/2). The first is addressed by setting the dimension if they are zero or negative. For the second we locally change the meaning of `\protect`

```
\AddToHook{file/crop.sty/after}[firstaid]{%
  \FirstAidNeededT{crop}{sty}{2017/11/19 1.10 crop marks (mf)}%
                  {%
  \ifdim\stockwidth  > 0pt \else \stockwidth\paperwidth \fi
  \ifdim\stockheight > 0pt \else \stockheight\paperheight \fi
  \renewcommand*\CROP@genreflect[1]{%
    \leavevmode
    \dimen0\CROP@horigin
    \kern2\dimen0
    \begingroup
    \set@typeset@protect %change protect
    \reflectbox{%
        \hb@xt@\paperwidth{%
            \vbox to\paperheight{%
                #1%
```

```
                \vss
              }%
              \hss
          }%
     }%
    \endgroup
    }
   }%
}
```

⟨/kernel⟩

⟨*kernel⟩

2.8 The bigfoot first aid

The bigfoot packages makes the assumption that two `\newinsert` allocations have a recognisable order in their numbers, the second one has a lower number. This was correct in the classic TEX implementation but with the extended allocation possibilities of all modern engines is no longer the case and there is a point where the allocations take a "jump" breaking the ordering assumption. These days we are fairly close to that point and depending on how many packages are loaded before bigfoot the package breaks.

This firstaid therefore jumps over the problematical point by pushing the count allocation to a safe value if necessary.

```
\AddToHook{file/bigfoot.sty/after}{%
   \ifnum\count10<\insc@unt
     \global\count10=\insc@unt
   \fi
```

We also correct a bug that bigfoot tries to shift mark registers, but in LATEX (at least since 2015) the allocation number is not 266, so it does that to a random number of mark registers (which sometimes blows up depending on the value in 266).

```
    \def\FN@allmarks#1{\@elt{#1}%
      \ifnum#1<\count256 %<--- problem: 266 isn't the counter for marks
        \expandafter\FN@allmarks\expandafter{\number\numexpr#1+\@ne}%
        \fi}%
}
```

2.9 marginfix first aid

The marginfix package tries to patch `\@combinefloats` but with 2025-06 the kernel doesn't use this any longer but uses `\@outputbox@attachfloats` instead.

```
\AddToHook{file/marginfix.sty/after}[firstaid]{%
  \FirstAidNeededT{marginfix}{sty}%
       {2020/05/06 v1.2 Fix Margin Paragraphs}%
     {\let \@outputbox@attachfloats \@combinefloats}%
}
```

2.10 ulem first aid

In 2020 we fixed various kernel commands to accept calc syntax. The ulem package redefines some internals and that now conflicts with the new definitions as they

involve an extra group. So we alter the definition of \@hspace if ulem was loaded. This is not perfect, obviously, so it will go out the moment ulem gets adjusted.

```
\AddToHook{file/ulem.sty/after}[firstaid]{%
  \def\@hspace#1{\begingroup\setlength\skip@{#1}%
                 \edef\x{\endgroup\hskip\the\skip@\relax}\x}%
  }
```

2.11 varwidth first aid

The varwidth package does a lot of low-level paragraph manipulation assuming traditional TEX paragraphs. However, with the paragraph hooks we end up with one extra glue 0pt item on the vertical list and if that isn't removed then the package doesn't find its penalties.

So this needs to be removed as well by adding an additional \unskip.

```
\AddToHook{file/varwidth.sty/after}[firstaid]{%
  \FirstAidNeededT{varwidth}{sty}%
       {2009/03/30 ver 0.92; \space Variable-width minipages}%
     {%
\def\@vwid@sift{%
  \skip@\lastskip\unskip
  \ifdim\lastskip=\z@\unskip\fi   % <---- the first aid here (not just unskip)
  \dimen@\lastkern\unkern
  \count@\lastpenalty\unpenalty
  \setbox\z@\lastbox
  \ifvoid\z@ \advance\sift@deathcycles\@ne \else \sift@deathcycles\z@ \fi
  \ifnum\sift@deathcycles>33
    \let\@vwid@sift\relax
    \PackageWarning{varwidth}{Failed to reprocess entire contents}%
  \fi
  \ifnum\count@=\@vwid@preeqp \@vwid@eqmodefalse\fi
  \ifnum\count@=\@vwid@posteqp \@vwid@eqmodetrue\fi
  \ifnum\count@=\@vwid@toppen % finished
    \let\@vwid@sift\relax
  \else\ifnum\count@=\@vwid@offsets
    \@vwid@setoffsets
  \else
    \ifnum\count@=\@vwid@postw
    \else
      \@vwid@resetb % reset box \z@ or measure it
    \fi
    \@vwid@append
  \fi\fi
  \@vwid@sift}%
     }%
  }
```

2.12 The german class first aid

Handling of \protected UTF-8

```
\AddToHook{file/german.sty/after}[firstaid]{%
  \FirstAidNeededT{german}{sty}{1998/07/08 v2.5e Support for writing german texts (br)}
                  {%
```

```
\let\grmn@active@dq@\@active@dq
\def\@active@dq{\protect\grmn@active@dq@}%
\germanTeX
}%
}
\AddToHook{file/ngerman.sty/after}[firstaid]{%
  \FirstAidNeededT{ngerman}{sty}{1998/07/08 v2.5e Support for writing german texts (br)}
                   {%
\let\grmn@active@dq@\@active@dq
\def\@active@dq{\protect\grmn@active@dq@}%
\ngermanTeX
}%
}
```

⟨/kernel⟩

2.13 The underscore first aid

The underscore package makes the underscore active. This means that the underscore can not be used in label and references unless the package option `strings` is used (which patches a selection of problematic commands like `\label` and `\ref`) or babel is used which redefines[1] a selection of problematic commands like `\@testdef` or `\@newl@bel`.

With the new property commands the work-around do not work. We therefore make the underscore protected and use `\ifincsname` to allow its use in csnames.

⟨*underscore-ltx⟩

```
\ProvidesPackage{underscore-ltx}[2023/09/20 LaTeX firstaid to make underscore protected ]
\begingroup
 \catcode`\_=\active
 \protected\gdef _{%
   \ifincsname %
      \string_%
   \else
      \ifx\protect\@typeset@protect
         \ifmmode \sb \else \BreakableUnderscore \fi
      \else
         \ifx\protect\@unexpandable@protect \noexpand_%
         \else \protect_%
      \fi\fi
    \fi
    }
  \global\let\ActiveUnderscore=_
\endgroup
```

⟨/underscore-ltx⟩

⟨*kernel⟩

```
\AddToHook{file/underscore.sty/after}[firstaid]{%
  \FirstAidNeededT{underscore}{sty}{2006/09/13}{\RequirePackage{underscore-ltx}}}
```

⟨/kernel⟩

⟨*kernel⟩

[1] unless the recommended option `safe=none` is used

2.14 The acro package first aid

The package does not declare a prop, which causes an issue with newer routines in expl3.

```
\AddToHook{package/acro/after}[firstaid]{%
  \FirstAidNeededT{acro}{sty}{2022/04/01 v3.8 typeset acronyms
                              and other abbreviations (CN)}
    {\UseName{prop_new:c}{l__acro_tmpa_prop}%
```

With the 2024 June release of LaTeX it will also fail to patch \endlongtable and therefore errors when loading. However, the patch it tries never worked (because it was setting a local boolean at a point where it was more or less immediately reset). Thus, rather than fixing the patch approach (which requires to surround the patch with \ExplSyntaxOn \catcode`\␣=10␣ and \ExplSyntaxOff) we simply disable the patch for now.

```
      \acsetup{patch/longtable=false}%
    }%
}
```

2.15 The chemformula package first aid

Package chemformula uses l3keys2e for option processing. This used to be made available as chemformula also loads xfrac, which loaded l3keys2e. However, xfrac has now been updated to use the newer kernel method if available, so loading chemformula fails.

```
\AddToHook{package/chemformula/before}[firstaid]{%
  \RequirePackage{l3keys2e}%
}
```

2.16 The chemnum package first aid

The package does not declare a prop, which causes an issue with newer routines in expl3.

```
\AddToHook{package/chemnum/after}[firstaid]{%
  \FirstAidNeededT{chemnum}{sty}{2021/01/21 v1.3a a comprehensive
             approach for the numbering of chemical compounds (CN)}
    {\UseName{prop_new:c}{l__chemnum_tmpa_prop}}%
}
```

2.17 The cleveref package first aid

The cleveref package expects only two data containers for its internal \newlabel command. This fails if xr-hyper is used which expands every \newlabel to five data container and puts the file name into the last one.

```
\AddToHook{package/cleveref/after}[firstaid]{%
  \FirstAidNeededT{cleveref}{sty}{2018/03/27 v0.21.4 Intelligent cross-referencing}
    {%
```

This are the two commands which retrieve the data from the label info. We change them to expect five arguments.

```
      \def\cref@getref#1#2{%
        \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
```

```
      \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter#2%
        \expandafter\expandafter\expandafter{%
          \expandafter\@firstoffive#2}}% <-------- five
    \def\cpageref@getref#1#2{%
      \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
      \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter#2%
        \expandafter\expandafter\expandafter{%
          \expandafter\@secondoffive#2}}% <----------- five
```

We also need to redefine the internal label commands of cleveref. This must be done after cleveref has made its changes in `begindocument` so we add it to the same hook using the hook label used by cleveref. This way it is guaranteed to overwrite the definitions.

```
  \AddToHook{begindocument}[cleveref]{%
     \def\label@noarg#1{%
      \cref@old@label{#1}%
      \@bsphack%
      \protected@edef\@tempa{{page}{\the\c@page}}%   <--- should be protected
      \setcounter{page}{1}%
      \protected@edef\@tempb{\thepage}%              <--- should be protected
      \expandafter\setcounter\@tempa%
      \cref@constructprefix{page}{\cref@result}%
      \protected@write\@auxout{}%
        {\string\newlabel{#1@cref}{{\cref@currentlabel}%
        {[\@tempb][\arabic{page}][\cref@result]\thepage}{}{}{}}}% <----- five
      \@esphack}%
    \def\label@optarg[#1]#2{%
      \cref@old@label{#2}%
      \@bsphack%
      \protected@edef\@tempa{{page}{\the\c@page}}%    <--- should be protected
      \setcounter{page}{1}%
      \protected@edef\@tempb{\thepage}%               <--- should be protected
      \expandafter\setcounter\@tempa%
      \cref@constructprefix{page}{\cref@result}%
      \protected@edef\cref@currentlabel{%
        \expandafter\cref@override@label@type%
          \cref@currentlabel\@nil{#1}}%
      \protected@write\@auxout{}%
        {\string\newlabel{#2@cref}{{\cref@currentlabel}%
        {[\@tempb][\arabic{page}][\cref@result]\thepage}{}{}{}}}% <------- five
      \@esphack}%
      }
```

cleveref patches and redefines `\refstepcounter` so that a call updates its data. This fails if like e.g. in longtable the counter is stepped with `\@kernel@refstepcounter`. We therefore move the data setup into the label hook. As the hook is in a group we have to smuggle the data out of it. https://tex.stackexchange.com/a/722909/2388 and issue #1393

```
  \newcommand\firstaid@cref@smugglelabel{\let\cref@currentlabel\cref@gcurrentlabel@temp}
  \newcommand\firstaid@cref@updatelabeldata[1]{%
   \cref@constructprefix{#1}{\cref@result}%
    \@ifundefined{cref@#1@alias}%
```

```
            {\def\@tempa{#1}}%
            {\def\@tempa{\csname cref@#1@alias\endcsname}}%
          \protected@xdef\cref@gcurrentlabel@temp{%
            [\@tempa][\arabic{#1}][\cref@result]%
            \csname p@#1\expandafter\endcsname\csname the#1\endcsname}%
          \aftergroup\firstaid@cref@smugglelabel
            }
```

we test if `\@currentcounter` is empty for unnumbered sections

```
        \newif\iftag@
        \AddToHook{label}[firstaid/cleveref]
          {\ifx
            \@currentcounter\@empty
           \else
            \iftag@\else
            \firstaid@cref@updatelabeldata{\@currentcounter}%
            \fi
           \fi}
       }%
}
```

2.18 The arydshln package first aid

Making two internal commands robust to avoid expansion while constructing the array preamble.

```
\AddToHook{package/arydshln/after}[firstaid]{%
  \FirstAidNeededT{arydshln}{sty}{2019/02/21 v1.76 }
  {%
% add \protected
\protected\def\adl@@vlineL#1#2#3#4{\adl@ivline#4\@nil{#1}{#2}%
        \xdef\adl@colsL{\adl@colsL
                \@elt{#3}{\number\@tempcnta}{\number\@tempcntb}%
                        {\adl@dashcolor}{\adl@gapcolor}}}%
\protected\def\adl@@vlineR#1#2#3#4{\adl@ivline#4\@nil{#1}{#2}%
        \xdef\adl@colsR{%
                \@elt{#3}{\number\@tempcnta}{\number\@tempcntb}%
                        {\adl@dashcolor}{\adl@gapcolor}%
                \adl@colsR}}%
\let\adl@act@@vlineL\adl@@vlineL
\let\adl@act@@vlineR\adl@@vlineR
  }%
}
```

⟨/kernel⟩

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