

# The pdfmanagement-firstaid package – temporary patches and package replacements L<sup>A</sup>T<sub>E</sub>X PDF management testphase bundle

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

Version 0.95a, released 2021-02-22

## 1 pdfmanagement-firstaid documentation

This code is temporary! It tries to patch commands of other packages or even replace package which are incompatible with the pdfmanagement, to remove clashes and test if everything works as expected. This code should disappear when packages adapt to the central interfaces.

The package contains an number of sections for various packages. Every section can be disabled in (the first) `\DeclareDocumentMetadata` with `firstaidoff={name1,name2,...}`.

```
1 <*package>
2 \ProvidesExplPackage {pdfmanagement-firstaid} {2021-02-22} {0.95a}
3   {LaTeX PDF management testphase bundle / firstaid-patches}
4
5 <@@=pdfmanagement>
6 \clist_map_inline:nn {pgf,transparent,hyperxmp,pdflscape,xcolor,color}
7   {
8     \bool_new:c          { g__pdfmanagement_firstaid_#1_bool }
9     \bool_gset_true:c { g__pdfmanagement_firstaid_#1_bool }
10  }
11 \clist_map_inline:Nn \g__pdfmanagement_firstaidoff_clist
12   {
13     \bool_if_exist:cT { g__pdfmanagement_firstaid_#1_bool }
14     {
15       \bool_gset_false:c { g__pdfmanagement_firstaid_#1_bool }
16     }
17  }
18 \msg_new:nnn { pdfmanagement } { firstaid }
19             { loading~pdfmanagement~firstaid~code~for~#1 }
```

### 1.1 color

`color` is not incompatible, but the new `hyperref` driver makes use of `l3color` to set the colors. It is therefore necessary to patch some internal `color` commands, so that colors defined with its `\definecolor` command are known to `l3color` and so `hyperref`. This only

---

\*E-mail: [latex-team@latex-project.org](mailto:latex-team@latex-project.org)

supports the color models from `l3color` (which covers all standard model of the `color` package). The `named` model is mapped to `\color_set:nn`.

This patch serves also as test to check if this change can be safely added to `color` later.

```

20 \@ifundefined{color_set:nn}{
21 \RequirePackage{l3color}}{}
22 \bool_if:NT \g__pdfmanagement_firstaid_color_bool
23 {
24   \declare@file@substitution{color.sty}{color-ltx.sty}
25 }

```

## 1.2 xcolor

`xcolor` is not incompatible, but the new `hyperref` driver makes use of `l3color` to set the colors. It is therefore necessary to patch `xcolor`, so that colors defined with its `\definecolor` command are known to `l3color` and so `hyperref`. This only supports the color model from `l3color`. Colors defined with the models `cm` and `tHsb` are silently ignored.

The `named` model is mapped to `\color_set:nn`.

```

26 \@ifundefined{color_set:nn}{
27 \RequirePackage{l3color}}{}
28 \bool_if:NT \g__pdfmanagement_firstaid_xcolor_bool
29 {
30   \AddToHook{package/after/xcolor}
31     {\RequirePackage{xcolor-patches-tmp-ltx}\XC@@names}
32 }

```

## 1.3 pgf

In `pgf`, resource management is set up in the file `pgfutil-common.tex`. This then provides three functions for adding to the resources, all of which are objects:

- `\pgfutil@addpdfresource@extgs`: Extended graphics state
- `\pgfutil@addpdfresource@colorspaces`: Color spaces
- `\pgfutil@addpdfresource@patterns`: Patterns

These resource dictionaries are used by adding entries in a cumulative sense; the macro layer deals with ensuring that each entry is only given once. Note that the objects themselves must be given only once for each page.

To support these functions, there are a series of set-up macros which install these resources. That has to take place for every page: the exact route therefore depends on the driver.

For the `pdfmanagement` project we need to avoid that `pgf` interferes in `ExtGState`, `ColorSpace` and `Pattern` (Shadings are added to the `xform` resources and so probably unproblematic for now). The actual patch is in a file hook guarded by the boolean, the rest of the code is always defined.

```

33
34 \bool_if:NT \g__pdfmanagement_firstaid_pgf_bool
35 {
36   \msg_info:nnn{pdfmanagement }{firstaid}{pgf}
37   \AddToHook{file/after/pgfrcs.sty}

```

```

38     {
39         \cs_set_eq:NN
40         \__pdfmanagement_pgfori_pgfulil@setuppdfresources
41         \pgfulil@setuppdfresources
42         \def\pgfulil@setuppdfresources
43         {
44             \pdfmanagement_if_active:TF
45             {
46                 \__pdfmanagement_pgf_sys_setuppdfresources_plain:
47             }
48             {
49                 \__pdfmanagement_pgfori_pgfulil@setuppdfresources
50             }
51         }
52     }
53 }
54 %\def\pgfulil@addpdfresource@extgs#1{\pgf@sys@addpdfresource@extgs@plain{#1}}
55 %\def\pgfulil@addpdfresource@colorspaces#1{\pgf@sys@addpdfresource@colorspaces@plain{#1}}
56 %\def\pgfulil@addpdfresource@patterns#1{\pgf@sys@addpdfresource@patterns@plain{#1}}
57 %\def\pgfulil@setuppdfresources{\pgf@sys@setuppdfresources@plain}
58 % \pgf@sys@pdf@possible@resources %used in xform
59 %Trying to patch pgf ..
60 \cs_new_protected:Npn \__pdfmanagement_pgf_sys_setuppdfresources_plain:
61 {
62     %objects are already created ...
63     \def\pgf@sys@pdf@possible@resources
64     {
65         /ColorSpace~\pdf_object_ref:n {Page/Resources/ColorSpace}
66         /Pattern ~\pdf_object_ref:n {Page/Resources/Pattern}
67         /ExtGState ~\pdf_object_ref:n {Page/Resources/ExtGState}
68     }
69     \let\pgf@sys@pdf@check@resources=\relax%
70     %not sure if needed, but perhaps the lists are used somewhere else ...
71     \let\pgf@sys@pgf@resource@list@extgs=\pgfulil@empty%
72     \let\pgf@sys@pgf@resource@list@patterns=\pgfulil@empty%
73     \let\pgf@sys@pgf@resource@list@colorspaces=\pgfulil@empty%
74     % the commands to add page resources
75     \def\pgf@sys@addpdfresource@extgs@plain##1
76     {
77         \exp_after:wN %for transparent which passes a command
78         \__pdfmanagement_patch_pgfextgs:w ##1\q_stop
79     }
80     \def\pgf@sys@addpdfresource@patterns@plain##1
81     {
82         \__pdfmanagement_patch_pgfpatterns:w ##1\q_stop
83     }
84     \def\pgf@sys@addpdfresource@colorspaces@plain##1
85     {
86         \__pdfmanagement_patch_pgfcolorspaces:w ##1\q_stop
87     }
88 }
89
90 %\AtEndPreamble{\pgfulil@setuppdfresources}
91 % helper commands as pgf doesn't pass resources as two arguments

```

```

92 % code to add to the resources existing stuff in the format "/name value":
93 \cs_new:Npn \__pdfmanagement_split_dict_entry_aux:NNw #1 #2 /#3~#4\q_stop
94 {
95     \tl_set:Nn #1 {#3}
96     \tl_set:Nn #2 {#4}
97 }
98
99 \cs_new:Npn \__pdfmanagement_patch_pgftexts:w #1/#2<<#3>>#4\q_stop
100 {
101     \exp_args:Nne
102     \__pdf_backend_PageResources_gput:nnn
103     {ExtGState}{\tl_trim_spaces:n{#2}}{<<#3>>}
104 }
105 \cs_new:Npn \__pdfmanagement_patch_pgfpatterns:w #1/#2\space#3\q_stop
106 {
107     \exp_args:Nnxx
108     \__pdf_backend_PageResources_gput:nnn
109     {Pattern}{\tl_trim_spaces:n{#2}}{#3}
110 }
111 \cs_new:Npn \__pdfmanagement_patch_pgfcolorspaces:w #1/#2[#3]#4\q_stop
112 {
113     \exp_args:Nne
114     \__pdf_backend_PageResources_gput:nnn
115     {ColorSpace}{\tl_trim_spaces:n{#2}}{[#3]}
116 }
117

```

## 1.4 transparent

We simply replace by the new version.

```

118 \bool_if:NT \g__pdfmanagement_firstaid_transparent_bool
119 {
120     \declare@file@substitution{transparent.sty}{transparent-ltx.sty}
121 }

```

## 1.5 pdflscape

We simply replace by the new version.

```

122 \bool_if:NT \g__pdfmanagement_firstaid_pdflscape_bool
123 {
124     \declare@file@substitution{pdflscape.sty}{pdflscape-ltx.sty}
125 }

```

## 1.6 hyperxmp

We add some code at the end of hyperxmp.sty.

```

126 \bool_if:NT \g__pdfmanagement_firstaid_hyperxmp_bool
127 {
128     \AddToHook
129     {file/after/hyperxmp.sty}
130     {\RequirePackage{hyperxmp-patches-tmp-ltx}}
131 }
132 \</package>

```

## 1.7 colorspace

This is rather difficult as no real places to inject patches at first a try to avoid that its ExtGState is missing: it can not be avoided to recreate the objects (and so to get duplicates) as colorspace uses temporary macros whose contents is lost.

```
133 \*package)
134 \<@@=pdf>
135 % this must be earlier, to avoid problems with luatex which has two pageresources
136 % lua/tex
137 \hook_gput_code:nnn {begindocument} {pdf}
138 {
139   \tl_if_exist:NT \spc@op
140   {
141     \def\spc@Pageresources#1{}
142   }
143
144 }
145
146 \hook_gput_code:nnn {begindocument/end} {pdf}
147 {
148   \tl_if_exist:NT \spc@op
149   {
150     \__pdf_backend_object_new:nn {__spc_extgstate_op_false}{dict}
151     \__pdf_backend_object_write:nn
152       {__spc_extgstate_op_false}
153       {/Type /ExtGState~/op~false~/OP~false}
154     \pdfmanagement_add:nnn
155       {Page/Resources/ExtGState}
156       {SPCko}
157       {\__pdf_backend_object_ref:n {__spc_extgstate_op_false}}
158     \__pdf_backend_object_new:nn {__spc_extgstate_op_true0}{dict}
159     \__pdf_backend_object_write:nn
160       {__spc_extgstate_op_true0}
161       {/Type /ExtGState~/op~true~/OP~true~/OPM~0}%
162     \pdfmanagement_add:nnn
163       {Page/Resources/ExtGState}
164       {SPCmz}
165       {\__pdf_backend_object_ref:n {__spc_extgstate_op_true0}}
166     \__pdf_backend_object_new:nn {__spc_extgstate_op_true1}{dict}
167     \__pdf_backend_object_write:nn
168       {__spc_extgstate_op_true1}
169       {/Type /ExtGState~/op~true~/OP~true~/OPM~1}%
170     \pdfmanagement_add:nnn
171       {Page/Resources/ExtGState}
172       {SPCop}
173     {\__pdf_backend_object_ref:n {__spc_extgstate_op_true1}}
174   }
175 }
176 \</package>
```

# Index

The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

<b>A</b>	
<code>\AddToHook</code> .....	30, 37, 128
<code>\AtEndPreamble</code> .....	90
<b>B</b>	
bool commands:	
<code>\bool_gset_false:N</code> .....	15
<code>\bool_gset_true:N</code> .....	9
<code>\bool_if:NTF</code> .	22, 28, 34, 118, 122, 126
<code>\bool_if_exist:NTF</code> .....	13
<code>\bool_new:N</code> .....	8
<b>C</b>	
clist commands:	
<code>\clist_map_inline:Nn</code> .....	11
<code>\clist_map_inline:nn</code> .....	6
color commands:	
<code>\color_set:nn</code> .....	2, 2
cs commands:	
<code>\cs_new:Npn</code> .....	93, 99, 105, 111
<code>\cs_new_protected:Npn</code> .....	60
<code>\cs_set_eq:NN</code> .....	39
<b>D</b>	
<code>\DeclareDocumentMetadata</code> .....	1
<code>\def</code> ..	42, 54, 55, 56, 57, 63, 75, 80, 84, 141
<code>\definecolor</code> .....	1, 2
<b>E</b>	
exp commands:	
<code>\exp_after:wN</code> .....	77
<code>\exp_args:Nne</code> .....	101, 113
<code>\exp_args:Nnxx</code> .....	107
<b>H</b>	
hook commands:	
<code>\hook_gput_code:nnn</code> .....	137, 146
<b>L</b>	
<code>\let</code> .....	69, 71, 72, 73
<b>M</b>	
msg commands:	
<code>\msg_info:nnn</code> .....	36
<code>\msg_new:nnn</code> .....	18
<b>P</b>	
pdf commands:	
<code>\pdf_object_ref:n</code> .....	65, 66, 67
pdf internal commands:	
<code>\__pdf_backend_object_new:nn</code> ...	150, 158, 166
<code>\__pdf_backend_object_ref:n</code> ...	157, 165, 173
<code>\__pdf_backend_object_write:nn</code> ..	151, 159, 167
<code>\__pdf_backend_PageResources_gput:nnn</code> .....	102, 108, 114
pdfmanagement commands:	
<code>\pdfmanagement_add:nnn</code> .	154, 162, 170
<code>\pdfmanagement_if_active:TF</code> ....	44
pdfmanagement internal commands:	
<code>\g__pdfmanagement_firstaid_color_bool</code> .....	22
<code>\g__pdfmanagement_firstaid_hyperxmp_bool</code> .....	126
<code>\g__pdfmanagement_firstaid_pdflscape_bool</code> .....	122
<code>\g__pdfmanagement_firstaid_pgf_bool</code> .....	34
<code>\g__pdfmanagement_firstaid_transparent_bool</code> .....	118
<code>\g__pdfmanagement_firstaid_xcolor_bool</code> .....	28
<code>\g__pdfmanagement_firstaidoff_clist</code> .....	11
<code>\__pdfmanagement_patch_pgfcolorspaces:w</code> .....	86, 111
<code>\__pdfmanagement_patch_pgfextgs:w</code> .....	78, 99
<code>\__pdfmanagement_patch_pgfpatterns:w</code> .....	82, 105
<code>\__pdfmanagement_pgf_sys_setuppdfresources_plain:</code> ..	46, 60
<code>\__pdfmanagement_pgfori_pgful@setuppdfresources</code> .....	40, 49
<code>\__pdfmanagement_split_dict_entry_aux:NNw</code> .....	93
<code>\ProvidesExplPackage</code> .....	2
<b>Q</b>	
quark commands:	
<code>\q_stop</code> ...	78, 82, 86, 93, 99, 105, 111
<b>R</b>	
<code>\relax</code> .....	69
<code>\RequirePackage</code> .....	21, 27, 31, 130

S	
\space	105
T	
T <sub>E</sub> X and L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> commands:	
\@ifundefined	20, 26
\declare@file@substitution	24, 120, 124
\pgf@sys@addpdfresource@colorspaces@plain	55, 84
\pgf@sys@addpdfresource@extgs@plain	54, 75
\pgf@sys@addpdfresource@patterns@plain	56, 80
\pgf@sys@pdf@check@resources	69
\pgf@sys@pdf@possible@resources	58, 63
\pgf@sys@pgf@resource@list@colorspaces	73
\pgf@sys@pgf@resource@list@extgs	71
\pgf@sys@pgf@resource@list@patterns	72
\pgf@sys@setuppdfresources@plain	57
\pgfutil@addpdfresource@colorspaces	2, 55
\pgfutil@addpdfresource@extgs	2, 54
\pgfutil@addpdfresource@patterns	2, 56
\pgfutil@empty	71, 72, 73
\pgfutil@setuppdfresources	41, 42, 57, 90
\spc@op	139, 148
\spc@Pageresources	141
\XC@names	31
tl commands:	
\tl_if_exist:NTF	139, 148
\tl_set:Nn	95, 96
\tl_trim_spaces:n	103, 109, 115