

The pdfmanagement-firstaid package – temporary patches and package replacements L^AT_EX PDF management testphase bundle

The L^AT_EX Project*

Version 0.95d, released 2021-05-14

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}{2021-05-14}{0.95d}
3   {LaTeX PDF management testphase bundle / firstaid-patches}
4
5 <@@=pdfmanagement>
6 \clist_map_inline:nn {pgf,transparent,hyperxmp,pdflscape,xcolor,color,beamer}
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 beamer

beamer makes use of the now unsupported syntax `linkbordercolor={.5 .5 .5}`. To avoid an error we define this color as a name.

```
20 \bool_if:NT \g__pdfmanagement_firstaid_beamer_bool
```

*E-mail: latex-team@latex-project.org

```

21 {
22   \color_set:nnn{.5~.5~.5}{rgb}{0.5,0.5,0.5}
23 }

```

1.2 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 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.

```

24 \@ifundefined{color_set:nn}{
25   \RequirePackage{l3color}}{}
26 \bool_if:NT \g__pdfmanagement_firstaid_color_bool
27 {
28   \declare@file@substitution{color.sty}{color-ltx.sty}
29 }

```

1.3 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`.

```

30 \@ifundefined{color_set:nn}{
31   \RequirePackage{l3color}}{}
32 \bool_if:NT \g__pdfmanagement_firstaid_xcolor_bool
33 {
34   \AddToHook{package/after/xcolor}
35     {\RequirePackage{xcolor-patches-tmp-ltx}\XC@@names}
36 }

```

1.4 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.

```

37
38 \bool_if:NT \g__pdfmanagement_firstaid_pgf_bool
39 {
40   \msg_info:nnn{pdfmanagement }{firstaid}{pgf}
41   \AddToHook{file/after/pgfrcs.sty}
42   {
43     \cs_set_eq:NN
44     \__pdfmanagement_pgfori_pgfulil@setuppdfresources
45     \pgfutil@setuppdfresources
46     \def\pgfutil@setuppdfresources
47     {
48       \pdfmanagement_if_active:TF
49       {
50         \__pdfmanagement_pgf_sys_setuppdfresources_plain:
51       }
52       {
53         \__pdfmanagement_pgfori_pgfulil@setuppdfresources
54       }
55     }
56   }
57 }
58 %\def\pgfutil@addpdfresource@extgs#1{\pgf@sys@addpdfresource@extgs@plain{#1}}
59 %\def\pgfutil@addpdfresource@colorspaces#1{\pgf@sys@addpdfresource@colorspaces@plain{#1}}
60 %\def\pgfutil@addpdfresource@patterns#1{\pgf@sys@addpdfresource@patterns@plain{#1}}
61 %\def\pgfutil@setuppdfresources{\pgf@sys@setuppdfresources@plain}
62 % \pgf@sys@pdf@possible@resources %used in xform
63 %Trying to patch pgf ..
64 \cs_new_protected:Npn \__pdfmanagement_pgf_sys_setuppdfresources_plain:
65 {
66   %objects are already created ...
67   \def\pgf@sys@pdf@possible@resources
68   {
69     /ColorSpace~\pdf_object_ref:n {__pdf/Page/Resources/ColorSpace}
70     /Pattern ~\pdf_object_ref:n {__pdf/Page/Resources/Pattern}
71     /ExtGState ~\pdf_object_ref:n {__pdf/Page/Resources/ExtGState}
72   }
73   \let\pgf@sys@pdf@check@resources=\relax%
74   %not sure if needed, but perhaps the lists are used somewhere else ...
75   \let\pgf@sys@pgf@resource@list@extgs=\pgfutil@empty%
76   \let\pgf@sys@pgf@resource@list@patterns=\pgfutil@empty%
77   \let\pgf@sys@pgf@resource@list@colorspaces=\pgfutil@empty%
78   % the commands to add page resources
79   \def\pgf@sys@addpdfresource@extgs@plain##1
80   {
81     %\exp_after:wN %for transparent which passes a command
82     \__pdfmanagement_patch_pgftextgs:w ##1\q_stop
83   }
84   \def\pgf@sys@addpdfresource@patterns@plain##1
85   {
86     \__pdfmanagement_patch_pgfpatterns:w ##1\q_stop

```

```

87     }
88     \def\pgf@sys@addpdfresource@colorspaces@plain##1
89     {
90         \__pdfmanagement_patch_pgfcOLORSPACES:w ##1\q_stop
91     }
92 }
93
94 %\AtEndPreamble{\pgfutil@setuppdfresources}
95 % helper commands as pgf doesn't pass resources as two arguments
96 % code to add to the resources existing stuff in the format "/name value":
97 \cs_new:Npn \__pdfmanagement_split_dict_entry_aux:NNw #1 #2 /#3~#4\q_stop
98 {
99     \tl_set:Nn #1 {#3}
100     \tl_set:Nn #2 {#4}
101 }
102
103 \cs_generate_variant:Nn \tl_trim_spaces:n{V}
104 \cs_generate_variant:Nn \pdfmanagement_add:nnn {nex}
105 \cs_new:Npn \__pdfmanagement_patch_pgfgextgs:w #1/#2<<#3>>#4\q_stop
106 {
107     \tl_set:Nx\l_tmpa_tl{#2}
108     \pdfmanagement_add:nex
109         {Page/Resources/ExtGState}{\tl_trim_spaces:V\l_tmpa_tl}{<<#3 #4>>}
110 }
111 \cs_new:Npn \__pdfmanagement_patch_pgfpatterns:w #1/#2\space#3\q_stop
112 {
113     \pdfmanagement_add:nex
114         {Page/Resources/Pattern}{\tl_trim_spaces:n{#2}}{#3}
115 }
116 \cs_new:Npn \__pdfmanagement_patch_pgfcOLORSPACES:w #1/#2[#3]#4\q_stop
117 {
118     \pdfmanagement_add:nex
119         {Page/Resources/ColorSpace}{\tl_trim_spaces:n{#2}}{[#3]}
120 }
121

```

1.5 transparent

We simply replace by the new version.

```

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

```

1.6 pdfscape

We simply replace by the new version.

```

126 \bool_if:NT \g__pdfmanagement_firstaid_pdfscape_bool
127 {
128     \declare@file@substitution{pdfscape.sty}{pdfscape-ltx.sty}
129 }

```

1.7 hyperxmp

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

```
130 \bool_if:NT \g__pdfmanagement_firstaid_hyperxmp_bool
131 {
132   \AddToHook
133     {file/after/hyperxmp.sty}
134     {\RequirePackage{hyperxmp-patches-tmp-ltx}}
135 }
136 \end{package}
```

1.8 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.

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

```

174         \pdfmanagement_add:nnn
175         {Page/Resources/ExtGState}
176         {SPCop}
177         {\_pdf_backend_object_ref:n {\_spc_extgstate_op_true1}}
178     }
179 }
180 </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.

A		M	
\AddToHook	34, 41, 132	msg commands:	
\AtEndPreamble	94	\msg_info:nnn	40
		\msg_new:nnn	18
B		P	
bool commands:		pdf commands:	
\bool_gset_false:N	15	\pdf_object_ref:n	69, 70, 71
\bool_gset_true:N	9	pdf internal commands:	
\bool_if:NTF	20, 26, 32, 38, 122, 126, 130	_pdf_backend_object_new:nn	154, 162, 170
\bool_if_exist:NTF	13	_pdf_backend_object_ref:n	161, 169, 177
\bool_new:N	8	_pdf_backend_object_write:nn	155, 163, 171
C		pdfmanagement commands:	
clist commands:		\pdfmanagement_add:nnn	104, 108, 113, 118, 158, 166, 174
\clist_map_inline:Nn	11	\pdfmanagement_if_active:TF	48
\clist_map_inline:nn	6	pdfmanagement internal commands:	
color commands:		\g_pdfmanagement_firstaid_-	
\color_set:nn	2	beamer_bool	20
\color_set:nnn	22	\g_pdfmanagement_firstaid_-	
cs commands:		color_bool	26
\cs_generate_variant:Nn	103, 104	\g_pdfmanagement_firstaid_-	
\cs_new:Npn	97, 105, 111, 116	hyperxmp_bool	130
\cs_new_protected:Npn	64	\g_pdfmanagement_firstaid_-	
\cs_set_eq:NN	43	pdflscape_bool	126
D		\g_pdfmanagement_firstaid_pgf_-	
\DeclareDocumentMetadata	1	bool	38
\def	46, 58, 59, 60, 61, 67, 79, 84, 88, 145	\g_pdfmanagement_firstaid_-	
\definecolor	2	transparent_bool	122
E		\g_pdfmanagement_firstaid_-	
exp commands:		xcolor_bool	32
\exp_after:wN	81	\g_pdfmanagement_firstaidoff_-	
H		clist	11
hook commands:		_pdfmanagement_patch_pgfcOLORSPACES:w	90, 116
\hook_gput_code:nnn	141, 150		
L			
\let	73, 75, 76, 77		

<code>__pdfmanagement_patch_pgftextgs:w</code>	<code>\pgf@sys@addpdfresource@extgs@plain</code>
..... 82, 105 58, 79
<code>__pdfmanagement_patch_pgfpatterns:w</code>	<code>\pgf@sys@addpdfresource@patterns@plain</code>
..... 86, 111 60, 84
<code>__pdfmanagement_pgf_sys_-</code>	<code>\pgf@sys@pdf@check@resources</code> ... 73
<code>setuppdfresources_plain:</code> .. 50, 64	<code>\pgf@sys@pdf@possible@resources</code> .
<code>__pdfmanagement_pgfori_pgful@setuppdfresources.</code> .. 62, 67	<code>\pgf@sys@pgf@resource@list@colorspaces</code>
..... 44, 53 77
<code>__pdfmanagement_split_dict_-</code>	<code>\pgf@sys@pgf@resource@list@extgs</code> 75
<code>entry_aux:NNw</code> 97	<code>\pgf@sys@pgf@resource@list@patterns</code>
<code>\ProvidesExplPackage</code> 2 76
Q	
quark commands:	<code>\pgf@sys@setuppdfresources@plain</code> 61
<code>\q_stop</code> .. 82, 86, 90, 97, 105, 111, 116	<code>\pgfutil@addpdfresource@colorspaces</code>
R	
<code>\relax</code> 73 2, 59
<code>\RequirePackage</code> 25, 31, 35, 134	<code>\pgfutil@addpdfresource@extgs</code> . 2, 58
S	
<code>\space</code> 111	<code>\pgfutil@addpdfresource@patterns</code>
T	
$\mathrm{T}_{\mathrm{E}}\mathrm{X}$ and $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}_{2\epsilon}$ commands: 2, 60
<code>\@ifundefined</code> 24, 30	<code>\pgfutil@empty</code> 75, 76, 77
<code>\declare@file@substitution</code>	<code>\pgfutil@setuppdfresources</code>
..... 28, 124, 128 45, 46, 61, 94
<code>\pgf@sys@addpdfresource@colorspaces@plain</code>	<code>\spc@op</code> 143, 152
..... 59, 88	<code>\spc@Pageresources</code> 145
	<code>\XC@@names</code> 35
	tl commands:
	<code>\tl_if_exist:NTF</code> 143, 152
	<code>\tl_set:Nn</code> 99, 100, 107
	<code>\tl_trim_spaces:n</code> .. 103, 109, 114, 119
	<code>\l_tmpa_tl</code> 107, 109