

The pdftexcmds package

Heiko Oberdiek*

<heiko.oberdiek at gmail.com>

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Abstract

LuaTeX provides most of the commands of pdfTeX 1.40. However a number of utility functions are removed. This package tries to fill the gap and implements some of the missing primitive using Lua.

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*Please report any issues at <https://github.com/ho-tex/oberdiek/issues>

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1 Documentation

Some primitives of pdfTeX [**pdfTeX-manual**] are not defined by LuaTeX [**luatex-manual**]. This package implements macro based solutions using Lua code for the following missing pdfTeX primitives;

- `\pdfstrcmp`
- `\pdfunescapehex`
- `\pdfescapehex`
- `\pdfescapename`
- `\pdfescapestring`

- `\pdffilesize`
- `\pdffilemoddate`
- `\pdffiledump`
- `\pdfmdfivesum`
- `\pdfresettimer`
- `\pdfelapsedtime`
- `\immediate\write18`

The original names of the primitives cannot be used:

- The syntax for their arguments cannot easily simulated by macros. The primitives using key words such as `file` (`\pdfmdfivesum`) or `offset` and `length` (`\pdffiledump`) and uses $\langle general\ text \rangle$ for the other arguments. Using token registers assignments, $\langle general\ text \rangle$ could be caught. However, the simulated primitives are expandable and register assignments would destroy this important property. ($\langle general\ text \rangle$ allows something like `\expandafter\bgroup ...`.)
- The original primitives can be expanded using one expansion step. The new macros need two expansion steps because of the additional macro expansion. Example:

```
\expandafter\foo\pdffilemoddate{file}
vs.
\expandafter\expandafter\expandafter
\foo\pdf@filemoddate{file}
```

LuaTeX isn't stable yet and thus the status of this package is *experimental*. Feedback is welcome.

1.1 General principles

Naming convention: Usually this package defines a macro `\pdf@ $\langle cmd \rangle$` if pdfTeX provides `\pdf $\langle cmd \rangle$` .

Arguments: The order of arguments in `\pdf@ $\langle cmd \rangle$` is the same as for the corresponding primitive of pdfTeX. The arguments are ordinary undelimited TeX arguments, no $\langle general\ text \rangle$ and without additional keywords.

Expandibility: The macro `\pdf@ $\langle cmd \rangle$` is expandable if the corresponding pdfTeX primitive has this property. Exact two expansion steps are necessary (first is the macro expansion) except for `\pdf@primitive` and `\pdf@ifprimitive`. The latter ones are not macros, but have the direct meaning of the primitive.

Without LuaTeX: The macros `\pdf@ $\langle cmd \rangle$` are mapped to the commands of pdfTeX if they are available. Otherwise they are undefined.

Availability: The macros that the packages provides are undefined, if the necessary primitives are not found and cannot be implemented by Lua.

1.2 Macros

1.2.1 Strings [pdfTeX-manual]

<code>\pdf@strcmp {$\langle stringA \rangle$} {$\langle stringB \rangle$}</code>
--

Same as `\pdfstrcmp{ $\langle stringA \rangle$ }{ $\langle stringB \rangle$ }`.

`\pdf@unescapehex {⟨string⟩}`

Same as `\pdfunescapehex{⟨string⟩}`. The argument is a byte string given in hexadecimal notation. The result are character tokens from 0 until 255 with catcode 12 and the space with catcode 10.

`\pdf@escapehex {⟨string⟩}`
`\pdf@escapestring {⟨string⟩}`
`\pdf@escapename {⟨string⟩}`

Same as the primitives of pdfTeX. However pdfTeX does not know about characters with codes 256 and larger. Thus the string is treated as byte string, characters with more than eight bits are ignored.

1.2.2 Files [pdftex-manual]

`\pdf@filesize {⟨filename⟩}`

Same as `\pdffilesize{⟨filename⟩}`.

`\pdf@filemoddate {⟨filename⟩}`

Same as `\pdffilemoddate{⟨filename⟩}`.

`\pdf@filedump {⟨offset⟩} {⟨length⟩} {⟨filename⟩}`

Same as `\pdffiledump offset ⟨offset⟩ length ⟨length⟩ {⟨filename⟩}`. Both `⟨offset⟩` and `⟨length⟩` must not be empty, but must be a valid TeX number.

`\pdf@mdfivesum {⟨string⟩}`

Same as `\pdfmdfivesum{⟨string⟩}`. Keyword `file` is supported by macro `\pdf@filemdfivesum`.

`\pdf@filemdfivesum {⟨filename⟩}`

Same as `\pdfmdfivesum file{⟨filename⟩}`.

1.2.3 Timekeeping [pdftex-manual]

The timekeeping macros are based on Andy Thomas' work [**AndyThomas:Analog**].

`\pdf@resettimer`

Same as `\pdfresettimer`, it resets the internal timer.

`\pdf@elapsedtime`

Same as `\pdfelapsedtime`. It behaves like a read-only integer. For printing purposes it can be prefixed by `\the` or `\number`. It measures the time in scaled seconds (seconds multiplied with 65536) since the latest call of `\pdf@resettimer` or start of program/package. The resolution, the shortest time interval that can be measured, depends on the program and system.

- pdfTeX with `gettimeofday`: $\geq 1/65536$ s

- pdfTeX with `ftime`: ≥ 1 ms
- pdfTeX with `time`: ≥ 1 s
- LuaTeX: ≥ 10 ms
(`os.clock()` returns a float number with two decimal digits in LuaTeX beta-0.70.1-2011061416 (rev 4277)).

1.2.4 Miscellaneous [pdfTeX-manual]

`\pdf@draftmode`

If the TeX compiler knows `\pdfdraftmode` or `\draftmode` (pdfTeX, LuaTeX), then `\pdf@draftmode` returns, whether this mode is enabled. The result is an implicit number: one means the draft mode is available and enabled. If the value is zero, then the mode is not active or `\pdfdraftmode` is not available. An explicit number is yielded by `\number\pdf@draftmode`. The macro cannot be used to change the mode, see `\pdf@setdraftmode`.

`\pdf@ifdraftmode {<true>} {<false>}`

If `\pdfdraftmode` is available and enabled, `<true>` is called, otherwise `<false>` is executed.

`\pdf@setdraftmode {<value>}`

Macro `\pdf@setdraftmode` expects the number zero or one as `<value>`. Zero deactivates the mode and one enables the draft mode. The macro does not have an effect, if the feature `\pdfdraftmode` is not available.

`\pdf@shellescape`

Same as `\pdfshellescape`. It is or expands to 1 if external commands can be executed and 0 otherwise. In pdfTeX external commands must be enabled first by command line option or configuration option. In LuaTeX option `--safer` disables the execution of external commands.

In LuaTeX before 0.68.0 `\pdf@shellescape` is not available due to a bug in `os.execute()`. The argumentless form crashes in some circumstances with segmentation fault. (It is fixed in version 0.68.0 or revision 4167 of LuaTeX. and packported to some version of 0.67.0).

Hints for usage:

- Before its use `\pdf@shellescape` should be tested, whether it is available. Example with package `ltxcmds` (loaded by package `pdftexcmds`):

```
\ltx@ifundefined{pdf@shellescape}{%
  % \pdf@shellescape is undefined
}{%
  % \pdf@shellescape is available
}
```

Use `\ltx@ifundefined` in expandable contexts.

- `\pdf@shellescape` might be a numerical constant, expands to the primitive, or expands to a plain number. Therefore use it in contexts where these differences does not matter.
- Use in comparisons, e.g.:

`\ifnum\pdf@shellescape=0 ...`

- Print the number: `\number\pdf@shellescape`

`\pdf@system {<cmdline>}`

It is a wrapper for `\immediate\write18` in pdfTeX or `os.execute` in LuaTeX.

In theory `os.execute` returns a status number. But its meaning is quite undefined. Are there some reliable properties? Does it make sense to provide an user interface to this status exit code?

`\pdf@primitive \cmd`

Same as `\pdfprimitive` in pdfTeX or LuaTeX. In XeTeX the primitive is called `\primitive`. Despite the current definition of the command `\cmd`, it's meaning as primitive is used.

`\pdf@ifprimitive \cmd`

Same as `\ifpdfprimitive` in pdfTeX or LuaTeX. XeTeX calls it `\ifprimitive`. It is a switch that checks if the command `\cmd` has it's primitive meaning.

1.2.5 Additional macro: `\pdf@isprimitive`

`\pdf@isprimitive \cmd1 \cmd2 {<true>} {<false>}`

If `\cmd1` has the primitive meaning given by the primitive name of `\cmd2`, then the argument `<true>` is executed, otherwise `<false>`. The macro `\pdf@isprimitive` is expandable. Internally it checks the result of `\meaning` and is therefore available for all TeX variants, even the original TeX. Example with L^ATeX:

```
\makeatletter
\pdf@isprimitive{@@input}{input}{%
  \typeout{\string\@@input\space is original\string\input}%
}{%
  \typeout{Oops, \string\@@input\space is not the %
    original\string\input}%
}
```

1.2.6 Experimental

`\pdf@unescapehexnative {<string>}`
`\pdf@escapehexnative {<string>}`
`\pdf@escapenamenative {<string>}`
`\pdf@mdfivesumnative {<string>}`

The variants without **native** in the macro name are supposed to be compatible with pdfTeX. However characters with more than eight bits are not supported and are ignored. If LuaTeX is running, then its UTF-8 coded strings are used. Thus the full unicode character range is supported. However the result differs from pdfTeX for characters with eight or more bits.

`\pdf@pipe {<cmdline>}`

It calls `<cmdline>` and returns the output of the external program in the usual manner as byte string (catcode 12, space with catcode 10). The Lua documen-

tation says, that the used `io.popen` may not be available on all platforms. Then macro `\pdf@pipe` is undefined.

2 Implementation

```
1 \<package>
```

2.1 Reload check and package identification

Reload check, especially if the package is not used with L^AT_EX.

```
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
3 \catcode13=5 % ^^M
4 \endlinechar=13 %
5 \catcode35=6 % #
6 \catcode39=12 % '
7 \catcode44=12 % ,
8 \catcode45=12 % -
9 \catcode46=12 % .
10 \catcode58=12 % :
11 \catcode64=11 % @
12 \catcode123=1 % {
13 \catcode125=2 % }
14 \expandafter\let\expandafter\x\csname ver@pdftexcmds.sty\endcsname
15 \ifx\x\relax % plain-TeX, first loading
16 \else
17 \def\empty{}%
18 \ifx\x\empty % LaTeX, first loading,
19 % variable is initialized, but \ProvidesPackage not yet seen
20 \else
21 \expandafter\ifx\csname PackageInfo\endcsname\relax
22 \def\x#1#2{%
23 \immediate\write-1{Package #1 Info: #2.}%
24 }%
25 \else
26 \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
27 \fi
28 \x{pdftexcmds}{The package is already loaded}%
29 \aftergroup\endinput
30 \fi
31 \fi
32 \endgroup%
```

Package identification:

```
33 \begingroup\catcode61\catcode48\catcode32=10\relax%
34 \catcode13=5 % ^^M
35 \endlinechar=13 %
36 \catcode35=6 % #
37 \catcode39=12 % '
38 \catcode40=12 % (
39 \catcode41=12 % )
40 \catcode44=12 % ,
41 \catcode45=12 % -
42 \catcode46=12 % .
43 \catcode47=12 % /
44 \catcode58=12 % :
45 \catcode64=11 % @
46 \catcode91=12 % [
47 \catcode93=12 % ]
48 \catcode123=1 % {
49 \catcode125=2 % }
50 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
51 \def\x#1#2#3[#4]{\endgroup
```

```

52 \immediate\write-1{Package: #3 #4}%
53 \xdef#1{#4}%
54 }%
55 \else
56 \def\x#1#2[#3]{\endgroup
57 #2[#3]}%
58 \ifx#1\@undefined
59 \xdef#1{#3}%
60 \fi
61 \ifx#1\relax
62 \xdef#1{#3}%
63 \fi
64 }%
65 \fi
66 \expandafter\x\csname ver@pdftexcmds.sty\endcsname
67 \ProvidesPackage{pdftexcmds}%
68 [2018/09/07 v0.28 Utility functions of pdfTeX for LuaTeX (HO)]%

```

2.2 Catcodes

```

69 \begingroup\catcode61\catcode48\catcode32=10\relax%
70 \catcode13=5 % ^^M
71 \endlinechar=13 %
72 \catcode123=1 % {
73 \catcode125=2 % }
74 \catcode64=11 % @
75 \def\x{\endgroup
76 \expandafter\edef\csname pdftexcmds@AtEnd\endcsname{%
77 \endlinechar=\the\endlinechar\relax
78 \catcode13=\the\catcode13\relax
79 \catcode32=\the\catcode32\relax
80 \catcode35=\the\catcode35\relax
81 \catcode61=\the\catcode61\relax
82 \catcode64=\the\catcode64\relax
83 \catcode123=\the\catcode123\relax
84 \catcode125=\the\catcode125\relax
85 }%
86 }%
87 \x\catcode61\catcode48\catcode32=10\relax%
88 \catcode13=5 % ^^M
89 \endlinechar=13 %
90 \catcode35=6 % #
91 \catcode64=11 % @
92 \catcode123=1 % {
93 \catcode125=2 % }
94 \def\TMP@EnsureCode#1#2{%
95 \edef\pdftexcmds@AtEnd{%
96 \pdftexcmds@AtEnd
97 \catcode#1=\the\catcode#1\relax
98 }%
99 \catcode#1=#2\relax
100 }
101 \TMP@EnsureCode{0}{12}%
102 \TMP@EnsureCode{1}{12}%
103 \TMP@EnsureCode{2}{12}%
104 \TMP@EnsureCode{10}{12}% ^^J
105 \TMP@EnsureCode{33}{12}% !
106 \TMP@EnsureCode{34}{12}% "
107 \TMP@EnsureCode{38}{4}% &
108 \TMP@EnsureCode{39}{12}% '
109 \TMP@EnsureCode{40}{12}% (
110 \TMP@EnsureCode{41}{12}% )

```



```

111 \TMP@EnsureCode{42}{12}% *
112 \TMP@EnsureCode{43}{12}% +
113 \TMP@EnsureCode{44}{12}% ,
114 \TMP@EnsureCode{45}{12}% -
115 \TMP@EnsureCode{46}{12}% .
116 \TMP@EnsureCode{47}{12}% /
117 \TMP@EnsureCode{58}{12}% :
118 \TMP@EnsureCode{60}{12}% <
119 \TMP@EnsureCode{62}{12}% >
120 \TMP@EnsureCode{91}{12}% [
121 \TMP@EnsureCode{93}{12}% ]
122 \TMP@EnsureCode{94}{7}% ^ (superscript)
123 \TMP@EnsureCode{95}{12}% _ (other)
124 \TMP@EnsureCode{96}{12}% `
125 \TMP@EnsureCode{126}{12}% ~ (other)
126 \edef\pdf texcmds@AtEnd{%
127   \pdf texcmds@AtEnd
128   \escapechar=\number\escapechar\relax
129   \noexpand\endinput
130 }
131 \escapechar=92 %

```

2.3 Load packages

```

132 \begingroup\expandafter\expandafter\expandafter\endgroup
133 \expandafter\ifx\csname RequirePackage\endcsname\relax
134   \def\TMP@RequirePackage#1[#2]{%
135     \begingroup\expandafter\expandafter\expandafter\endgroup
136     \expandafter\ifx\csname ver@#1.sty\endcsname\relax
137       \input #1.sty\relax
138     \fi
139   }%
140   \TMP@RequirePackage{infwarerr}[2007/09/09]%
141   \TMP@RequirePackage{ifluatex}[2010/03/01]%
142   \TMP@RequirePackage{ltxcmds}[2010/12/02]%
143   \TMP@RequirePackage{ifpdf}[2010/09/13]%
144 \else
145   \RequirePackage{infwarerr}[2007/09/09]%
146   \RequirePackage{ifluatex}[2010/03/01]%
147   \RequirePackage{ltxcmds}[2010/12/02]%
148   \RequirePackage{ifpdf}[2010/09/13]%
149 \fi

```

2.4 Without LuaTeX

```

150 \ifluatex
151 \else
152   \@PackageInfoNoLine{pdf texcmds}{LuaTeX not detected}%
153   \def\pdf texcmds@nopdftex{%
154     \@PackageInfoNoLine{pdf texcmds}{pdfTeX >= 1.30 not detected}%
155     \let\pdf texcmds@nopdftex\relax
156   }%
157   \def\pdf texcmds@temp#1{%
158     \begingroup\expandafter\expandafter\expandafter\endgroup
159     \expandafter\ifx\csname pdf#1\endcsname\relax
160       \pdf texcmds@nopdftex
161     \else
162       \expandafter\def\csname pdf@#1\endcsname
163       \expandafter##\expandafter{%
164         \csname pdf#1\endcsname
165       }%
166     \fi
167   }%
168   \pdf texcmds@temp{strcmp}%

```

```

169 \pdfTexcmds@temp{escapehex}%
170 \let\pdf@escapehexnative\pdf@escapehex
171 \pdfTexcmds@temp{unescapehex}%
172 \let\pdf@unescapehexnative\pdf@unescapehex
173 \pdfTexcmds@temp{escapestring}%
174 \pdfTexcmds@temp{escapename}%
175 \pdfTexcmds@temp{filesize}%
176 \pdfTexcmds@temp{filemoddate}%
177 \begingroup\expandafter\expandafter\expandafter\endgroup
178 \expandafter\ifx\csname pdfshellescape\endcsname\relax
179 \pdfTexcmds@nopdftex
180 \ltx@ifundefined{pdftexversion}{%
181 }{%
182 \ifnum\pdftexversion>120 % 1.21a supports \ifeof18
183 \ifeof18 %
184 \chardef\pdf@shellescape=0 %
185 \else
186 \chardef\pdf@shellescape=1 %
187 \fi
188 \fi
189 }%
190 \else
191 \def\pdf@shellescape{%
192 \pdfshellescape
193 }%
194 \fi
195 \begingroup\expandafter\expandafter\expandafter\endgroup
196 \expandafter\ifx\csname pdffiledump\endcsname\relax
197 \pdfTexcmds@nopdftex
198 \else
199 \def\pdf@filedump#1#2#3{%
200 \pdffiledump offset#1 length#2{#3}%
201 }%
202 \fi
203 \begingroup\expandafter\expandafter\expandafter\endgroup
204 \expandafter\ifx\csname pdfmdfivesum\endcsname\relax
205 \begingroup\expandafter\expandafter\expandafter\endgroup
206 \expandafter\ifx\csname mdfivesum\endcsname\relax
207 \pdfTexcmds@nopdftex
208 \else
209 \def\pdf@mdfivesum#{\mdfivesum}%
210 \let\pdf@mdfivesumnative\pdf@mdfivesum
211 \def\pdf@filemdfivesum#{\mdfivesum file}%
212 \fi
213 \else
214 \def\pdf@mdfivesum#{\pdfmdfivesum}%
215 \let\pdf@mdfivesumnative\pdf@mdfivesum
216 \def\pdf@filemdfivesum#{\pdfmdfivesum file}%
217 \fi
218 \def\pdf@system#{%
219 \immediate\write18%
220 }%
221 \def\pdfTexcmds@temp#1{%
222 \begingroup\expandafter\expandafter\expandafter\endgroup
223 \expandafter\ifx\csname pdf#1\endcsname\relax
224 \pdfTexcmds@nopdftex
225 \else
226 \expandafter\let\csname pdf@#1\endcsname
227 \csname pdf#1\endcsname
228 \fi
229 }%
230 \pdfTexcmds@temp{resettimer}%

```

```

231 \pdf texcmds@temp{elapsedtime}%
232 \fi

```

2.5 \pdf@primitive, \pdf@ifprimitive

Since version 1.40.0 pdfTeX has \pdfprimitive and \ifpdfprimitive. And \pdfprimitive was fixed in version 1.40.4.

X_YTeX provides them under the name \primitive and \ifprimitive. LuaTeX knows both name variants, but they have possibly to be enabled first (tex.enableprimitives).

Depending on the format TeX Live uses a prefix luatex.

Caution: \let must be used for the definition of the macros, especially because of \ifpdfprimitive.

2.5.1 Using LuaTeX's tex.enableprimitives

```

233 \ifluatex

\pdf texcmds@directlua

234 \ifnum\luatexversion<36 %
235   \def\pdf texcmds@directlua{\directlua0 }%
236 \else
237   \let\pdf texcmds@directlua\directlua
238 \fi

239 \begingroup
240   \newlinechar=10 %
241   \endlinechar=\newlinechar
242   \pdf texcmds@directlua{%
243     if tex.enableprimitives then
244       tex.enableprimitives(
245         'pdf@',
246         {'primitive', 'ifprimitive', 'pdfdraftmode','draftmode'}
247       )
248       tex.enableprimitives('',{luaescapestring'})
249     end
250   }%
251 \endgroup %

252 \fi

```

2.5.2 Trying various names to find the primitives

```

\pdf texcmds@strip@prefix

253 \def\pdf texcmds@strip@prefix#1>{}

254 \def\pdf texcmds@temp#1#2#3{%
255   \begingroup\expandafter\expandafter\expandafter\endgroup
256   \expandafter\ifx\csname pdf@#1\endcsname\relax
257     \begingroup
258       \def\x{#3}%
259       \edef\x{\expandafter\pdf texcmds@strip@prefix\meaning\x}%
260       \escapechar=-1 %
261       \edef\y{\expandafter\meaning\csname#2\endcsname}%
262       \expandafter\endgroup
263       \ifx\x\y
264         \expandafter\let\csname pdf@#1\endcsname\expandafter\endcsname
265         \csname #2\endcsname
266       \fi
267     \fi
268 }

```

\pdf@primitive

```

269 \pdf texcmds@temp{primitive}{pdfprimitive}{pdfprimitive}% pdfTeX, oldLuaTeX
270 \pdf texcmds@temp{primitive}{primitive}{primitive}% XeTeX, luatex
271 \pdf texcmds@temp{primitive}{luatexprimitive}{pdfprimitive}% oldLuaTeX
272 \pdf texcmds@temp{primitive}{luatexpdfprimitive}{pdfprimitive}% oldLuaTeX

```

`\pdf@ifprimitive`

```

273 \pdf texcmds@temp{ifprimitive}{ifpdfprimitive}{ifpdfprimitive}% pdfTeX, oldLu-
    aTeX
274 \pdf texcmds@temp{ifprimitive}{ifprimitive}{ifprimitive}% XeTeX, luatex
275 \pdf texcmds@temp{ifprimitive}{luatexifprimitive}{ifpdfprimitive}% oldLuaTeX
276 \pdf texcmds@temp{ifprimitive}{luatexpdfprimitive}{ifpdfprimitive}% oldLuaTeX

```

Disable broken `\pdfprimitive`.

```

277 \ifluatex\else
278 \begingroup
279 \expandafter\ifx\csname pdf@primitive\endcsname\relax
280 \else
281 \expandafter\ifx\csname pdftexversion\endcsname\relax
282 \else
283 \ifnum\pdftexversion=140 %
284 \expandafter\ifx\csname pdftexrevision\endcsname\relax
285 \else
286 \ifnum\pdftexrevision<4 %
287 \endgroup
288 \let\pdf@primitive\@undefined
289 \@PackageInfoNoLine{pdftexcmds}{%
290 \string\pdf@primitive\space disabled, %
291 because\MessageBreak
292 \string\pdfprimitive\space is broken until pdfTeX 1.40.4%
293 }%
294 \begingroup
295 \fi
296 \fi
297 \fi
298 \fi
299 \fi
300 \endgroup
301 \fi

```

2.5.3 Result

```

302 \begingroup
303 \@PackageInfoNoLine{pdftexcmds}{%
304 \string\pdf@primitive\space is %
305 \expandafter\ifx\csname pdf@primitive\endcsname\relax not \fi
306 available%
307 }%
308 \@PackageInfoNoLine{pdftexcmds}{%
309 \string\pdf@ifprimitive\space is %
310 \expandafter\ifx\csname pdf@ifprimitive\endcsname\relax not \fi
311 available%
312 }%
313 \endgroup

```

2.6 X_YTeX

Look for primitives `\shellescape`, `\stricmp`.

```

314 \def\pdftexcmds@temp#1{%
315 \begingroup\expandafter\expandafter\expandafter\endgroup
316 \expandafter\ifx\csname pdf@#1\endcsname\relax
317 \begingroup
318 \escapechar=-1 %
319 \edef\x{\expandafter\meaning\csname#1\endcsname}%

```

```

320 \def\y{#1}%
321 \def\z##1->{}%
322 \edef\y{\expandafter\z\meaning\y}%
323 \expandafter\endgroup
324 \ifx\x\y
325 \expandafter\def\csname pdf@#1\expandafter\endcsname
326 \expandafter{%
327 \csname#1\endcsname
328 }%
329 \fi
330 \fi
331 }%
332 \pdfTexcmds@temp{shellescape}%
333 \pdfTexcmds@temp{strcmp}%

```

2.7 \pdf@isprimitive

```

334 \def\pdf@isprimitive{%
335 \begingroup\expandafter\expandafter\expandafter\endgroup
336 \expandafter\ifx\csname pdf@strcmp\endcsname\relax
337 \long\def\pdf@isprimitive##1{%
338 \expandafter\pdfTexcmds@isprimitive\expandafter{\meaning##1}%
339 }%
340 \long\def\pdfTexcmds@isprimitive##1##2{%
341 \expandafter\pdfTexcmds@@isprimitive\expandafter{\string##2}{##1}%
342 }%
343 \def\pdfTexcmds@@isprimitive##1##2{%
344 \ifnum0\pdfTexcmds@equal##1\delimiter##2\delimiter=1 %
345 \expandafter\ltx@firstoftwo
346 \else
347 \expandafter\ltx@secondoftwo
348 \fi
349 }%
350 \def\pdfTexcmds@equal##1##2\delimiter##3##4\delimiter{%
351 \ifx##1##3%
352 \ifx\relax##2##4\relax
353 1%
354 \else
355 \ifx\relax##2\relax
356 \else
357 \ifx\relax##4\relax
358 \else
359 \pdfTexcmds@equalcont{##2}{##4}%
360 \fi
361 \fi
362 \fi
363 \fi
364 }%
365 \def\pdfTexcmds@equalcont##1{%
366 \def\pdfTexcmds@equalcont####1####2##1##1##1##1{%
367 ##1##1##1##1%
368 \pdfTexcmds@equal####1\delimiter####2\delimiter
369 }%
370 }%
371 \expandafter\pdfTexcmds@equalcont\csname fi\endcsname
372 \else
373 \long\def\pdf@isprimitive##1##2{%
374 \ifnum\pdf@strcmp{\meaning##1}{\string##2}=0 %
375 \expandafter\ltx@firstoftwo
376 \else
377 \expandafter\ltx@secondoftwo
378 \fi

```

```

379 }%
380 \fi
381 }
382 \ifluatex
383 \ifx\pdfdraftmode\@undefined
384 \let\pdfdraftmode\draftmode
385 \fi
386 \else
387 \pdf@isprimitive
388 \fi

```

2.8 \pdf@draftmode

```

389 \let\pdf texcmds@temp\ltx@zero %
390 \ltx@ifundefined{pdfdraftmode}{%
391 \@PackageInfoNoLine{pdf texcmds}{\ltx@backslashchar pdfdraftmode not found}%
392 }{%
393 \ifpdf
394 \let\pdf texcmds@temp\ltx@one
395 \@PackageInfoNoLine{pdf texcmds}{\ltx@backslashchar pdfdraftmode found}%
396 \else
397 \@PackageInfoNoLine{pdf texcmds}{%
398 \ltx@backslashchar pdfdraftmode is ignored in DVI mode%
399 }%
400 \fi
401 }
402 \ifcase\pdf texcmds@temp

```

\pdf@draftmode

```
403 \let\pdf@draftmode\ltx@zero
```

\pdf@ifdraftmode

```
404 \let\pdf@ifdraftmode\ltx@secondoftwo
```

\pdf texcmds@setdraftmode

```
405 \def\pdf texcmds@setdraftmode#1{%

```

```
406 \else

```

\pdf texcmds@draftmode

```
407 \let\pdf texcmds@draftmode\pdfdraftmode
```

\pdf@ifdraftmode

```

408 \def\pdf@ifdraftmode{%
409 \ifnum\pdf texcmds@draftmode=\ltx@one
410 \expandafter\ltx@firstoftwo
411 \else
412 \expandafter\ltx@secondoftwo
413 \fi
414 }%

```

\pdf@draftmode

```

415 \def\pdf@draftmode{%
416 \ifnum\pdf texcmds@draftmode=\ltx@one
417 \expandafter\ltx@one
418 \else
419 \expandafter\ltx@zero
420 \fi
421 }%

```

\pdf texcmds@setdraftmode

```

422 \def\pdf texcmds@setdraftmode#1{%
423 \pdf texcmds@draftmode=#1\relax
424 }%

```

425 \fi

\pdf@setdraftmode

```
426 \def\pdf@setdraftmode#1{%
427   \begingroup
428     \count\ltx@cclv=#1\relax
429   \edef\x{\endgroup
430     \noexpand\pdf@texcmds@@setdraftmode{\the\count\ltx@cclv}%
431   }%
432   \x
433 }
```

\pdf@texcmds@@setdraftmode

```
434 \def\pdf@texcmds@@setdraftmode#1{%
435   \ifcase#1 %
436     \pdf@texcmds@setdraftmode{#1}%
437   \or
438     \pdf@texcmds@setdraftmode{#1}%
439   \else
440     \@PackageWarning{pdf@texcmds}{%
441       \string\pdf@setdraftmode: Ignoring\MessageBreak
442       invalid value `#1'%
443     }%
444   \fi
445 }
```

2.9 Load Lua module

```
446 \ifluatex
447 \else
448   \expandafter\pdf@texcmds@AtEnd
449 \fi%

450 \ifnum\luatexversion<80
451   \begingroup\expandafter\expandafter\expandafter\endgroup
452   \expandafter\ifx\csname RequirePackage\endcsname\relax
453     \def\TMP@RequirePackage#1[#2]{%
454       \begingroup\expandafter\expandafter\expandafter\endgroup
455       \expandafter\ifx\csname ver@#1.sty\endcsname\relax
456         \input #1.sty\relax
457       \fi
458     }%
459     \TMP@RequirePackage{luatex-loader}[2009/04/10]%
460   \else
461     \RequirePackage{luatex-loader}[2009/04/10]%
462   \fi
463 \fi

464 \pdf@texcmds@directlua{%
465   require("pdf@texcmds")%
466 }

467 \ifnum\luatexversion>37 %
468   \ifnum0%
469     \pdf@texcmds@directlua{%
470       if status.ini_version then %
471         tex.write("1")%
472       end%
473     }>0 %
474   \everyjob\expandafter{%
475     \the\everyjob
476     \pdf@texcmds@directlua{%
477       require("pdf@texcmds")%
478     }%
479   }%
```

```

480 \fi
481 \fi
482 \begingroup
483 \def\x{2018/09/07 v0.28}%
484 \ltx@onelevel@sanitize\x
485 \edef\y{%
486   \pdfTexcmds@directlua{%
487     if oberdiek.pdfTexcmds.getVersion then %
488       oberdiek.pdfTexcmds.getVersion()%
489     end%
490   }%
491 }%
492 \ifx\x\y
493 \else
494   \@PackageError{pdfTexcmds}{%
495     Wrong version of lua module.\MessageBreak
496     Package version: \x\MessageBreak
497     Lua module: \y
498   }\@ehc
499 \fi
500 \endgroup

```

2.10 Lua functions

2.10.1 Helper macros

\pdfTexcmds@toks

```

501 \begingroup\expandafter\expandafter\expandafter\endgroup
502 \expandafter\ifx\csname newtoks\endcsname\relax
503   \toksdef\pdfTexcmds@toks=0 %
504 \else
505   \csname newtoks\endcsname\pdfTexcmds@toks
506 \fi

```

\pdfTexcmds@Patch

```

507 \def\pdfTexcmds@Patch{0}
508 \ifnum\luaTeXversion>40 %
509   \ifnum\luaTeXversion<66 %
510     \def\pdfTexcmds@Patch{1}%
511   \fi
512 \fi

513 \ifcase\pdfTexcmds@Patch
514   \catcode`\&=14 %
515 \else
516   \catcode`\&=9 %

```

\pdfTexcmds@PatchDecode

```

517 \def\pdfTexcmds@PatchDecode#1\@nil{%
518   \pdfTexcmds@DecodeA#1^^A^^A\@nil{%
519   }%

```

\pdfTexcmds@DecodeA

```

520 \def\pdfTexcmds@DecodeA#1^^A^^A#2\@nil#3{%
521   \ifx\relax#2\relax
522     \ltx@ReturnAfterElseFi{%
523       \pdfTexcmds@DecodeB#3#1^^A^^B\@nil{%
524       }%
525     \else
526       \ltx@ReturnAfterFi{%
527         \pdfTexcmds@DecodeA#2\@nil{#3#1^^@}%
528       }%
529     \fi
530   }%

```


\pdftexcmds@DecodeB

```
531 \def\pdftexcmds@DecodeB#1^^A^^B#2\@nil#3{%
532   \ifx\relax#2\relax%
533     \ltx@ReturnAfterElseFi{%
534       \ltx@zero
535       #3#1%
536     }%
537   \else
538     \ltx@ReturnAfterFi{%
539       \pdftexcmds@DecodeB#2\@nil{#3#1^^A}%
540     }%
541   \fi
542 }%

543 \fi

544 \ifnum\luatexversion<36 %
545 \else
546   \catcode`\0=9 %
547 \fi
```

2.10.2 Strings [pdfTeX-manual]

\pdf@strcmp

```
548 \long\def\pdf@strcmp#1#2{%
549   \directlua0{%
550     oberdiek.pdfTexcmds strcmp("\luaescapestring{#1}",%
551       "\luaescapestring{#2}")%
552   }%
553 }%

554 \pdf@isprimitive
```

\pdf@escapehex

```
555 \long\def\pdf@escapehex#1{%
556   \directlua0{%
557     oberdiek.pdfTexcmds.escapehex("\luaescapestring{#1}", "byte")%
558   }%
559 }%
```

\pdf@escapehexnative

```
560 \long\def\pdf@escapehexnative#1{%
561   \directlua0{%
562     oberdiek.pdfTexcmds.escapehex("\luaescapestring{#1}")%
563   }%
564 }%
```

\pdf@unescapehex

```
565 \def\pdf@unescapehex#1{%
566   & \romannumeral\expandafter\pdfTexcmds@PatchDecode
567   \the\expandafter\pdfTexcmds@toks
568   \directlua0{%
569     oberdiek.pdfTexcmds.toks="pdfTexcmds@toks"%
570     oberdiek.pdfTexcmds.unescapehex("\luaescapestring{#1}", "byte", \pdfTex-
571       cmds@Patch)%
572   }%
573   & \@nil
574 }%
```

\pdf@unescapehexnative

```
574 \def\pdf@unescapehexnative#1{%
575   & \romannumeral\expandafter\pdfTexcmds@PatchDecode
576   \the\expandafter\pdfTexcmds@toks
```

```

577 \directlua0{%
578   oberdiek.pdfdocmds.toks="pdfdocmds@toks"%
579   oberdiek.pdfdocmds.unescapehex("\luaescapestring{#1}", \pdfdocmds@Patch)%
580 }%
581 & \@nil
582 }%

```

\pdf@escapestring

```

583 \long\def\pdf@escapestring#1{%
584   \directlua0{%
585     oberdiek.pdfdocmds.escapestring("\luaescapestring{#1}", "byte")%
586   }%
587 }

```

\pdf@escapename

```

588 \long\def\pdf@escapename#1{%
589   \directlua0{%
590     oberdiek.pdfdocmds.escapename("\luaescapestring{#1}", "byte")%
591   }%
592 }

```

\pdf@escapenamenative

```

593 \long\def\pdf@escapenamenative#1{%
594   \directlua0{%
595     oberdiek.pdfdocmds.escapename("\luaescapestring{#1}")%
596   }%
597 }

```

2.10.3 Files [pdfdoc-manual]

\pdf@filesize

```

598 \def\pdf@filesize#1{%
599   \directlua0{%
600     oberdiek.pdfdocmds.filesize("\luaescapestring{#1}")%
601   }%
602 }

```

\pdf@filemoddate

```

603 \def\pdf@filemoddate#1{%
604   \directlua0{%
605     oberdiek.pdfdocmds.filemoddate("\luaescapestring{#1}")%
606   }%
607 }

```

\pdf@filedump

```

608 \def\pdf@filedump#1#2#3{%
609   \directlua0{%
610     oberdiek.pdfdocmds.filedump("\luaescapestring{\number#1}",%
611       "\luaescapestring{\number#2}",%
612       "\luaescapestring{#3}")%
613   }%
614 }%

```

\pdf@mdfivesum

```

615 \long\def\pdf@mdfivesum#1{%
616   \directlua0{%
617     oberdiek.pdfdocmds.mdfivesum("\luaescapestring{#1}", "byte")%
618   }%
619 }%

```

\pdf@mdfivesumnative

```
620 \long\def\pdf@mdfivesumnative#1{%
621   \directlua0{%
622     oberdiek.pdf_texcmds.mdfivesum("\luaescapestring{#1}")%
623   }%
624 }%
```

\pdf@filemdfivesum

```
625 \def\pdf@filemdfivesum#1{%
626   \directlua0{%
627     oberdiek.pdf_texcmds.filemdfivesum("\luaescapestring{#1}")%
628   }%
629 }%
```

2.10.4 Timekeeping [pdfTeX-manual]

\protected

```
630 \let\pdf_texcmds@temp=Y%
631 \begingroup\expandafter\expandafter\expandafter\endgroup
632 \expandafter\ifx\csname protected\endcsname\relax
633   \pdf_texcmds@directlua0{%
634     if tex.enableprimitives then %
635       tex.enableprimitives('', {'protected'})%
636     end%
637   }%
638 \fi
639 \begingroup\expandafter\expandafter\expandafter\endgroup
640 \expandafter\ifx\csname protected\endcsname\relax
641   \let\pdf_texcmds@temp=N%
642 \fi
```

\numexpr

```
643 \begingroup\expandafter\expandafter\expandafter\endgroup
644 \expandafter\ifx\csname numexpr\endcsname\relax
645   \pdf_texcmds@directlua0{%
646     if tex.enableprimitives then %
647       tex.enableprimitives('', {'numexpr'})%
648     end%
649   }%
650 \fi
651 \begingroup\expandafter\expandafter\expandafter\endgroup
652 \expandafter\ifx\csname numexpr\endcsname\relax
653   \let\pdf_texcmds@temp=N%
654 \fi

655 \ifx\pdf_texcmds@temp N%
656   \@PackageWarningNoLine{pdfTeX}{%
657     Definitions of \ltx@backslashchar pdf@resettimer and%
658     \MessageBreak
659     \ltx@backslashchar pdf@elapsed time are skipped, because%
660     \MessageBreak
661     e-TeX's \ltx@backslashchar protected or %
662     \ltx@backslashchar numexpr are missing%
663   }%
664 \else
```

\pdf@resettimer

```
665 \protected\def\pdf@resettimer{%
666   \pdf_texcmds@directlua0{%
667     oberdiek.pdf_texcmds.resettimer()%
668   }%
669 }%
```

\pdf@elapsedtime

```
670 \protected\def\pdf@elapsedtime{%
671   \numexpr
672   \pdftexcmds@directlua{%
673     oberdiek.pdf texcmds.elapsedtime()}%
674   }%
675   \relax
676 }%

677 \fi
```

2.10.5 Shell escape

\pdf@shellescape

```
678 \ifnum\luatexversion<68 %
679 \else
680 \protected\edef\pdf@shellescape{%
681   \numexpr\directlua{tex.sprint(status.shell_escape)}\relax}
682 \fi
```

\pdf@system

```
683 \def\pdf@system#1{%
684   \directlua0{%
685     oberdiek.pdf texcmds.system("\luaescapestring{#1}")%
686   }%
687 }
```

\pdf@lastsystemstatus

```
688 \def\pdf@lastsystemstatus{%
689   \directlua0{%
690     oberdiek.pdf texcmds.lastsystemstatus}%
691   }%
692 }
```

\pdf@lastsystemexit

```
693 \def\pdf@lastsystemexit{%
694   \directlua0{%
695     oberdiek.pdf texcmds.lastsystemexit}%
696   }%
697 }
```

```
698 \catcode`\0=12 %
```

\pdf@pipe Check availability of io.popen first.

```
699 \ifnum0%
700   \pdftexcmds@directlua{%
701     if io.popen then %
702       tex.write("1")%
703     end%
704   }%
705   =1 %
706 \def\pdf@pipe#1{%
707 & \romannumeral\expandafter\pdf texcmds@PatchDecode
708 \the\expandafter\pdf texcmds@toks
709 \pdf texcmds@directlua{%
710   oberdiek.pdf texcmds.toks="pdf texcmds@toks"%
711   oberdiek.pdf texcmds.pipe("\luaescapestring{#1}", \pdf texcmds@Patch)%
712 }%
713 & \@nil
714 }%
715 \fi

716 \pdf texcmds@AtEnd%
717 \</package>
```

2.11 Lua module

```
718  $\langle$ *lua $\rangle$ 
719 module("oberdiek.pdfTeXcmds", package.seeall)
720 local systemexitstatus
721 function getversion()
722   tex.write("2018/09/07 v0.28")
723 end
```

2.11.1 Strings [pdfTeX-manual]

```
724 function strcmp(A, B)
725   if A == B then
726     tex.write("0")
727   elseif A < B then
728     tex.write("-1")
729   else
730     tex.write("1")
731   end
732 end
733 local function utf8_to_byte(str)
734   local i = 0
735   local n = string.len(str)
736   local t = {}
737   while i < n do
738     i = i + 1
739     local a = string.byte(str, i)
740     if a < 128 then
741       table.insert(t, string.char(a))
742     else
743       if a >= 192 and i < n then
744         i = i + 1
745         local b = string.byte(str, i)
746         if b < 128 or b >= 192 then
747           i = i - 1
748           elseif a == 194 then
749             table.insert(t, string.char(b))
750           elseif a == 195 then
751             table.insert(t, string.char(b + 64))
752           end
753         end
754       end
755     end
756   return table.concat(t)
757 end
758 function escapehex(str, mode)
759   if mode == "byte" then
760     str = utf8_to_byte(str)
761   end
762   tex.write((string.gsub(str, ".",
763     function (ch)
764       return string.format("%02X", string.byte(ch))
765     end
766   )))
767 end
```

See procedure `unescapehex` in file `utils.c` of pdfTeX. Caution: `tex.write` ignores leading spaces.

```
768 function unescapehex(str, mode, patch)
769   local a = 0
770   local first = true
771   local result = {}
772   for i = 1, string.len(str), 1 do
773     local ch = string.byte(str, i)
```

```

774 if ch >= 48 and ch <= 57 then
775   ch = ch - 48
776 elseif ch >= 65 and ch <= 70 then
777   ch = ch - 55
778 elseif ch >= 97 and ch <= 102 then
779   ch = ch - 87
780 else
781   ch = nil
782 end
783 if ch then
784   if first then
785     a = ch * 16
786     first = false
787   else
788     table.insert(result, a + ch)
789     first = true
790   end
791 end
792 end
793 if not first then
794   table.insert(result, a)
795 end
796 if patch == 1 then
797   local temp = {}
798   for i, a in ipairs(result) do
799     if a == 0 then
800       table.insert(temp, 1)
801       table.insert(temp, 1)
802     else
803       if a == 1 then
804         table.insert(temp, 1)
805         table.insert(temp, 2)
806       else
807         table.insert(temp, a)
808       end
809     end
810   end
811   result = temp
812 end
813 if mode == "byte" then
814   local utf8 = {}
815   for i, a in ipairs(result) do
816     if a < 128 then
817       table.insert(utf8, a)
818     else
819       if a < 192 then
820         table.insert(utf8, 194)
821         a = a - 128
822       else
823         table.insert(utf8, 195)
824         a = a - 192
825       end
826       table.insert(utf8, a + 128)
827     end
828   end
829   result = utf8
830 end

```

this next line added for current luatex; this is the only change in the file. eroux,
28apr13. (v 0.21)

```

831 local unpack = _G["unpack"] or table.unpack
832 tex.settoks(toks, string.char(unpack(result)))
833 end

```

See procedure `escapestring` in file `utils.c` of `pdfTeX`.

```
834 function escapestring(str, mode)
835   if mode == "byte" then
836     str = utf8_to_byte(str)
837   end
838   tex.write((string.gsub(str, ".",
839     function (ch)
840       local b = string.byte(ch)
841       if b < 33 or b > 126 then
842         return string.format("\\%.3o", b)
843       end
844       if b == 40 or b == 41 or b == 92 then
845         return "\\" .. ch
846       end
847     end
848   end
849 )))
850 end
```

Lua 5.1 returns the match in case of return value `nil`.

```
847   return nil
848 end
849 )))
850 end
```

See procedure `escapename` in file `utils.c` of `pdfTeX`.

```
851 function escapename(str, mode)
852   if mode == "byte" then
853     str = utf8_to_byte(str)
854   end
855   tex.write((string.gsub(str, ".",
856     function (ch)
857       local b = string.byte(ch)
858       if b == 0 then
```

In Lua 5.0 `nil` could be used for the empty string, But `nil` returns the match in Lua 5.1, thus we use the empty string explicitly.

```
859     return ""
860   end
861   if b <= 32 or b >= 127
862     or b == 35 or b == 37 or b == 40 or b == 41
863     or b == 47 or b == 60 or b == 62 or b == 91
864     or b == 93 or b == 123 or b == 125 then
865     return string.format("#%.2X", b)
866   else
```

Lua 5.1 returns the match in case of return value `nil`.

```
867   return nil
868 end
869 end
870 )))
871 end
```

2.11.2 Files [pdfTeX-manual]

```
872 function filesize(filename)
873   local foundfile = kpse.find_file(filename, "tex", true)
874   if foundfile then
875     local size = lfs.attributes(foundfile, "size")
876     if size then
877       tex.write(size)
878     end
879   end
880 end
```

See procedure `makepdftime` in file `utils.c` of `pdfTeX`.

```
881 function filemoddate(filename)
882   local foundfile = kpse.find_file(filename, "tex", true)
883   if foundfile then
884     local date = lfs.attributes(foundfile, "modification")
885     if date then
```

```

886     local d = os.date("!*t", date)
887     if d.sec >= 60 then
888         d.sec = 59
889     end
890     local u = os.date("!*t", date)
891     local off = 60 * (d.hour - u.hour) + d.min - u.min
892     if d.year ~= u.year then
893         if d.year > u.year then
894             off = off + 1440
895         else
896             off = off - 1440
897         end
898     elseif d.yday ~= u.yday then
899         if d.yday > u.yday then
900             off = off + 1440
901         else
902             off = off - 1440
903         end
904     end
905     local timezone
906     if off == 0 then
907         timezone = "Z"
908     else
909         local hours = math.floor(off / 60)
910         local mins = math.abs(off - hours * 60)
911         timezone = string.format("%+03d'%02d'", hours, mins)
912     end
913     tex.write(string.format("D:%04d%02d%02d%02d%02d%02d%s",
914         d.year, d.month, d.day, d.hour, d.min, d.sec, timezone))
915     end
916 end
917 end
918 function filedump(offset, length, filename)
919     length = tonumber(length)
920     if length and length > 0 then
921         local foundfile = kpse.find__file(filename, "tex", true)
922         if foundfile then
923             offset = tonumber(offset)
924             if not offset then
925                 offset = 0
926             end
927             local filehandle = io.open(foundfile, "rb")
928             if filehandle then
929                 if offset > 0 then
930                     filehandle:seek("set", offset)
931                 end
932                 local dump = filehandle:read(length)
933                 escapehex(dump)
934                 filehandle:close()
935             end
936         end
937     end
938 end
939 function md5sum(str, mode)
940     if mode == "byte" then
941         str = utf8_to_byte(str)
942     end
943     escapehex(md5.sum(str))
944 end
945 function filemd5sum(filename)
946     local foundfile = kpse.find__file(filename, "tex", true)
947     if foundfile then

```



```

948 local filehandle = io.open(foundfile, "rb")
949 if filehandle then
950     local contents = filehandle:read("*a")
951     escapehex(md5.sum(contents))
952     filehandle:close()
953 end
954 end
955 end

```

2.11.3 Timekeeping [pdftex-manual]

The functions for timekeeping are based on Andy Thomas' work [[AndyThomas:Analog](#)]. Changes:

- Overflow check is added.
- `string.format` is used to avoid exponential number representation for sure.
- `tex.write` is used instead of `tex.print` to get tokens with catcode 12 and without appended `\endlinechar`.

```

956 local basetime = 0
957 function resettimer()
958     basetime = os.clock()
959 end
960 function elapsedtime()
961     local val = (os.clock() - basetime) * 65536 + .5
962     if val > 2147483647 then
963         val = 2147483647
964     end
965     tex.write(string.format("%d", val))
966 end

```

2.11.4 Miscellaneous [pdftex-manual]

```

967 function shellescape()
968     if os.execute then
969         if status
970             and status.luatex_version
971             and status.luatex_version >= 68 then
972             tex.write(os.execute())
973         else
974             local result = os.execute()
975             if result == 0 then
976                 tex.write("0")
977             else
978                 if result == nil then
979                     tex.write("0")
980                 else
981                     tex.write("1")
982                 end
983             end
984         end
985     else
986         tex.write("0")
987     end
988 end
989 function system(cmdline)
990     systemexitstatus = nil
991     texio.write_nl("log", "system(" .. cmdline .. ")")
992     if os.execute then
993         texio.write("log", "executed.")
994         systemexitstatus = os.execute(cmdline)
995     else
996         texio.write("log", "disabled.")

```

```

997 end
998 end
999 function lastsystmstatus()
1000 local result = tonumber(systemexitstatus)
1001 if result then
1002   local x = math.floor(result / 256)
1003   tex.write(result - 256 * math.floor(result / 256))
1004 end
1005 end
1006 function lastsystmexit()
1007 local result = tonumber(systemexitstatus)
1008 if result then
1009   tex.write(math.floor(result / 256))
1010 end
1011 end
1012 function pipe(cmdline, patch)
1013 local result
1014 systemexitstatus = nil
1015 texio.write_nl("log", "pipe(" .. cmdline .. ") ")
1016 if io.popen then
1017   texio.write("log", "executed.")
1018   local handle = io.popen(cmdline, "r")
1019   if handle then
1020     result = handle:read("*a")
1021     handle:close()
1022   end
1023 else
1024   texio.write("log", "disabled.")
1025 end
1026 if result then
1027   if patch == 1 then
1028     local temp = {}
1029     for i, a in ipairs(result) do
1030       if a == 0 then
1031         table.insert(temp, 1)
1032         table.insert(temp, 1)
1033       else
1034         if a == 1 then
1035           table.insert(temp, 1)
1036           table.insert(temp, 2)
1037         else
1038           table.insert(temp, a)
1039         end
1040       end
1041     end
1042     result = temp
1043   end
1044   tex.settoks(toks, result)
1045 else
1046   tex.settoks(toks, "")
1047 end
1048 end
1049 

```

3 Test

3.1 Catcode checks for loading

```

1050 <*test1>
1051 \catcode`\{=1 %
1052 \catcode`\}=2 %
1053 \catcode`\#=6 %

```

```

1054 \catcode`\@=11 %
1055 \expandafter\ifx\csname count@\endcsname\relax
1056 \countdef\count@=255 %
1057 \fi
1058 \expandafter\ifx\csname @gobble\endcsname\relax
1059 \long\def\@gobble#1{%
1060 \fi
1061 \expandafter\ifx\csname @firstofone\endcsname\relax
1062 \long\def\@firstofone#1{#1}%
1063 \fi
1064 \expandafter\ifx\csname loop\endcsname\relax
1065 \expandafter\@firstofone
1066 \else
1067 \expandafter\@gobble
1068 \fi
1069 {%
1070 \def\loop#1\repeat{%
1071 \def\body{#1}%
1072 \iterate
1073 }%
1074 \def\iterate{%
1075 \body
1076 \let\next\iterate
1077 \else
1078 \let\next\relax
1079 \fi
1080 \next
1081 }%
1082 \let\repeat=\fi
1083 }%
1084 \def\RestoreCatcodes{
1085 \count@=0 %
1086 \loop
1087 \edef\RestoreCatcodes{%
1088 \RestoreCatcodes
1089 \catcode\the\count@=\the\catcode\count@\relax
1090 }%
1091 \ifnum\count@<255 %
1092 \advance\count@ 1 %
1093 \repeat
1094
1095 \def\RangeCatcodeInvalid#1#2{%
1096 \count@=#1\relax
1097 \loop
1098 \catcode\count@=15 %
1099 \ifnum\count@<#2\relax
1100 \advance\count@ 1 %
1101 \repeat
1102 }
1103 \def\RangeCatcodeCheck#1#2#3{%
1104 \count@=#1\relax
1105 \loop
1106 \ifnum#3=\catcode\count@
1107 \else
1108 \errmessage{%
1109 Character \the\count@\space
1110 with wrong catcode \the\catcode\count@\space
1111 instead of \number#3%
1112 }%
1113 \fi
1114 \ifnum\count@<#2\relax
1115 \advance\count@ 1 %

```

```

1116 \repeat
1117 }
1118 \def\space{ }
1119 \expandafter\ifx\csname LoadCommand\endcsname\relax
1120 \def\LoadCommand{\input pdftexcmds.sty\relax}%
1121 \fi
1122 \def\Test{%
1123 \RangeCatcodeInvalid{0}{47}%
1124 \RangeCatcodeInvalid{58}{64}%
1125 \RangeCatcodeInvalid{91}{96}%
1126 \RangeCatcodeInvalid{123}{255}%
1127 \catcode`\@=12 %
1128 \catcode`\=0 %
1129 \catcode`\%=14 %
1130 \LoadCommand
1131 \RangeCatcodeCheck{0}{36}{15}%
1132 \RangeCatcodeCheck{37}{37}{14}%
1133 \RangeCatcodeCheck{38}{47}{15}%
1134 \RangeCatcodeCheck{48}{57}{12}%
1135 \RangeCatcodeCheck{58}{63}{15}%
1136 \RangeCatcodeCheck{64}{64}{12}%
1137 \RangeCatcodeCheck{65}{90}{11}%
1138 \RangeCatcodeCheck{91}{91}{15}%
1139 \RangeCatcodeCheck{92}{92}{0}%
1140 \RangeCatcodeCheck{93}{96}{15}%
1141 \RangeCatcodeCheck{97}{122}{11}%
1142 \RangeCatcodeCheck{123}{255}{15}%
1143 \RestoreCatcodes
1144 }
1145 \Test
1146 \csname @@end\endcsname
1147 \end
1148 </test1>

```

3.2 Test for \pdf@isprimitive

```

1149 <*test2>
1150 \catcode`\{=1 %
1151 \catcode`\}=2 %
1152 \catcode`\#=6 %
1153 \catcode`\@=11 %
1154 \input pdftexcmds.sty\relax
1155 \def\msg#1{%
1156 \begingroup
1157 \escapechar=92 %
1158 \immediate\write16{#1}%
1159 \endgroup
1160 }
1161 \long\def\test#1#2#3#4{%
1162 \begingroup
1163 #4%
1164 \def\str{%
1165 Test \string\pdf@isprimitive
1166 {\string #1}{\string #2}{...}: %
1167 }%
1168 \pdf@isprimitive{#1}{#2}{%
1169 \ifx#3Y%
1170 \msg{\str true ==> OK.}%
1171 \else
1172 \errmessage{\str false ==> FAILED}%
1173 \fi
1174 }{%
1175 \ifx#3Y%

```

```

1176     \errmessage{\str true ==> FAILED}%
1177     \else
1178     \msg{\str false ==> OK.}%
1179     \fi
1180 }%
1181 \endgroup
1182 }
1183 \test\relax\relax Y{}
1184 \test\foobar\relax Y{\let\foobar\relax}
1185 \test\foobar\relax N{}
1186 \test\hbox\hbox Y{}
1187 \test\foobar@hbox\hbox Y{\let\foobar@hbox\hbox}
1188 \test\if\if Y{}
1189 \test\if\ifx N{}
1190 \test\ifx\if N{}
1191 \test\par\par Y{}
1192 \test\hbox\par N{}
1193 \test\par\hbox N{}
1194 \csname @@end\endcsname\end
1195 </test2>

```

3.3 Test for \pdf@shellescape

```

1196 <*test-shell>
1197 \catcode`\{=1 %
1198 \catcode`\}=2 %
1199 \catcode`\#=6 %
1200 \catcode`\@=11 %
1201 \input pdftexcmds.sty\relax
1202 \def\msg##{\immediate\write16}
1203 \def\MaybeEnd{}
1204 \ifx\luatexversion\UnDeFiNeD
1205 \else
1206   \ifnum\luatexversion<68 %
1207     \ifx\pdf@shellescape\@undefined
1208       \msg{SHELL=U}%
1209       \msg{OK (LuaTeX < 0.68)}%
1210     \else
1211       \msg{SHELL=defined}%
1212       \errmessage{Failed (LuaTeX < 0.68)}%
1213     \fi
1214     \def\MaybeEnd{\csname @@end\endcsname\end}%
1215   \fi
1216 \fi
1217 \MaybeEnd
1218 \ifx\pdf@shellescape\@undefined
1219   \msg{SHELL=U}%
1220 \else
1221   \msg{SHELL=\number\pdf@shellescape}%
1222 \fi
1223 \ifx\expected\@undefined
1224 \else
1225   \ifx\expected\relax
1226     \msg{EXPECTED=U}%
1227     \ifx\pdf@shellescape\@undefined
1228       \msg{OK}%
1229     \else
1230       \errmessage{Failed}%
1231     \fi
1232   \else
1233     \msg{EXPECTED=\number\expected}%
1234     \ifnum\pdf@shellescape=\expected\relax
1235       \msg{OK}%

```

```

1236 \else
1237 \errmessage{Failed}%
1238 \fi
1239 \fi
1240 \fi
1241 \csname @@end\endcsname\end
1242 </test-shell>

```

3.4 Test for escape functions

```

1243 <*test-escape>
1244 \catcode`\{=1 %
1245 \catcode`\}=2 %
1246 \catcode`\#=6 %
1247 \catcode`\^=7 %
1248 \catcode`\@=11 %
1249 \errorcontextlines=1000 %
1250 \input pdftexcmds.sty\relax
1251 \def\msg#1{%
1252 \begingroup
1253 \escapechar=92 %
1254 \immediate\write16{#1}%
1255 \endgroup
1256 }

1257 \begingroup
1258 \catcode`\@=11 %
1259 \countdef\count@=255 %
1260 \def\space{ }%
1261 \long\def\@whilenum#1\do #2{%
1262 \ifnum #1\relax
1263 #2\relax
1264 \@iwhilenum{#1\relax#2\relax}%
1265 \fi
1266 }%
1267 \long\def\@iwhilenum#1{%
1268 \ifnum #1%
1269 \expandafter\@iwhilenum
1270 \else
1271 \expandafter\ltx@gobble
1272 \fi
1273 {#1}%
1274 }%
1275 \gdef\AllBytes{%
1276 \count@=0 %
1277 \catcode0=12 %
1278 \@whilenum\count@<256 \do{%
1279 \lcode0=\count@
1280 \ifnum\count@=32 %
1281 \xdef\AllBytes{\AllBytes\space}%
1282 \else
1283 \lowercase{%
1284 \xdef\AllBytes{\AllBytes^^@}%
1285 }%
1286 \fi
1287 \advance\count@ by 1 %
1288 }%
1289 \endgroup

1290 \def\AllBytesHex{%
1291 000102030405060708090A0B0C0D0E0F%
1292 101112131415161718191A1B1C1D1E1F%
1293 202122232425262728292A2B2C2D2E2F%
1294 303132333435363738393A3B3C3D3E3F%
1295 404142434445464748494A4B4C4D4E4F%

```

```

1296 505152535455565758595A5B5C5D5E5F%
1297 606162636465666768696A6B6C6D6E6F%
1298 707172737475767778797A7B7C7D7E7F%
1299 808182838485868788898A8B8C8D8E8F%
1300 909192939495969798999A9B9C9D9E9F%
1301 A0A1A2A3A4A5A6A7A8A9AAABACADAEAF%
1302 B0B1B2B3B4B5B6B7B8B9ABBBBCBDBEBF%
1303 C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF%
1304 D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF%
1305 E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF%
1306 F0F1F2F3F4F5F6F7F8F9FAFBFCFDFF%
1307 }
1308 \ltx@onelevel@sanitize\AllBytesHex
1309 \expandafter\lowercase\expandafter{%
1310 \expandafter\def\expandafter\AllBytesHexLC
1311 \expandafter{\AllBytesHex}%
1312 }
1313 \begingroup
1314 \catcode`\#=12 %
1315 \xdef\AllBytesName{%
1316 #01#02#03#04#05#06#07#08#09#0A#0B#0C#0D#0E#0F%
1317 #10#11#12#13#14#15#16#17#18#19#1A#1B#1C#1D#1E#1F%
1318 #20!"#23$#25&'#28#29*+,-.#2F%
1319 0123456789:;#3C=#3E?%
1320 @ABCDEFGHIJKLMNO%
1321 PQRSTUVWXYZ#5B\ltx@backslashchar#5D^_%
1322 `abcdefghijklmno%
1323 pqrstuvwxyz#7B|#7D|string~#7F%
1324 #80#81#82#83#84#85#86#87#88#89#8A#8B#8C#8D#8E#8F%
1325 #90#91#92#93#94#95#96#97#98#99#9A#9B#9C#9D#9E#9F%
1326 #A0#A1#A2#A3#A4#A5#A6#A7#A8#A9#AA#AB#AC#AD#AE#AF%
1327 #B0#B1#B2#B3#B4#B5#B6#B7#B8#B9#BA#BB#BC#BD#BE#BF%
1328 #C0#C1#C2#C3#C4#C5#C6#C7#C8#C9#CA#CB#CC#CD#CE#CF%
1329 #D0#D1#D2#D3#D4#D5#D6#D7#D8#D9#DA#DB#DC#DD#DE#DF%
1330 #E0#E1#E2#E3#E4#E5#E6#E7#E8#E9#EA#EB#EC#ED#EE#EF%
1331 #F0#F1#F2#F3#F4#F5#F6#F7#F8#F9#FA#FB#FC#FD#FE#FF%
1332 }%
1333 \endgroup
1334 \ltx@onelevel@sanitize\AllBytesName
1335 \edef\AllBytesFromName{\expandafter\ltx@gobble\AllBytes}
1336 \begingroup
1337 \def\|{|}%
1338 \edef%\{\ltx@percentchar}%
1339 \catcode`\|=0 %
1340 \catcode`\#=12 %
1341 \catcode`\~=12 %
1342 \catcode`\=12 %
1343 |xdef| AllBytesString{%
1344 \000\001\002\003\004\005\006\007\010\011\012\013\014\015\016\017%
1345 \020\021\022\023\024\025\026\027\030\031\032\033\034\035\036\037%
1346 \040!"#$%&'(\)*+,-./%
1347 0123456789:;<=>?%
1348 @ABCDEFGHIJKLMNO%
1349 PQRSTUVWXYZ[\]^_%
1350 `abcdefghijklmno%
1351 pqrstuvwxyz{|}~\177%
1352 \200\201\202\203\204\205\206\207\210\211\212\213\214\215\216\217%
1353 \220\221\222\223\224\225\226\227\230\231\232\233\234\235\236\237%
1354 \240\241\242\243\244\245\246\247\250\251\252\253\254\255\256\257%
1355 \260\261\262\263\264\265\266\267\270\271\272\273\274\275\276\277%
1356 \300\301\302\303\304\305\306\307\310\311\312\313\314\315\316\317%
1357 \320\321\322\323\324\325\326\327\330\331\332\333\334\335\336\337%

```

```

1358 \340\341\342\343\344\345\346\347\350\351\352\353\354\355\356\357%
1359 \360\361\362\363\364\365\366\367\370\371\372\373\374\375\376\377%
1360 }%
1361 \endgroup
1362 \ltx@onelevel@sanitize\AllBytesString

1363 \def\Test#1#2#3{%
1364 \begingroup
1365 \expandafter\expandafter\expandafter\def
1366 \expandafter\expandafter\expandafter\TestResult
1367 \expandafter\expandafter\expandafter{%
1368 #1{#2}%
1369 }%
1370 \ifx\TestResult#3%
1371 \else
1372 \newlinechar=10 %
1373 \msg{Expect:^^J#3}%
1374 \msg{Result:^^J\TestResult}%
1375 \errmessage{\string#2 -\string#1-> \string#3}%
1376 \fi
1377 \endgroup
1378 }

1379 \def\test#1#2#3{%
1380 \edef\TestFrom{#2}%
1381 \edef\TestExpect{#3}%
1382 \ltx@onelevel@sanitize\TestExpect
1383 \Test#1\TestFrom\TestExpect
1384 }

1385 \test\pdf@unescapehex{74657374}{test}
1386 \begingroup
1387 \catcode0=12 %
1388 \catcode1=12 %
1389 \test\pdf@unescapehex{740074017400740174}{t^^@t^^At^^@t^^At}%
1390 \endgroup
1391 \Test\pdf@escapehex\AllBytes\AllBytesHex
1392 \Test\pdf@unescapehex\AllBytesHex\AllBytes
1393 \Test\pdf@escapename\AllBytes\AllBytesName
1394 \Test\pdf@escapestring\AllBytes\AllBytesString

1395 \csname @@end\endcsname\end
1396 </test-escape>

```

4 Installation

4.1 Download

Package. This package is available on CTAN¹:

[CTAN:macros/latex/contrib/oberdiek/pdftexcmds.dtx](http://ctan.org/macros/latex/contrib/oberdiek/pdftexcmds.dtx) The source file.

[CTAN:macros/latex/contrib/oberdiek/pdftexcmds.pdf](http://ctan.org/macros/latex/contrib/oberdiek/pdftexcmds.pdf) Documentation.

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](http://ctan.org/install/macros/latex/contrib/oberdiek.tds.zip)

TDS refers to the standard “A Directory Structure for T_EX Files” ([CTAN:tds/tds.pdf](http://ctan.org/tds/tds.pdf)). Directories with `texmf` in their name are usually organized this way.

¹<http://ctan.org/pkg/pdftexcmds>

4.2 Bundle installation

Unpacking. Unpack the oberdiek.tds.zip in the TDS tree (also known as **texmf** tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package **attachfile2** comes with the Perl script **pdfatfi.pl** that should be installed in such a way that it can be called as **pdfatfi**. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

Unpacking. The .dtx file is a self-extracting **docstrip** archive. The files are extracted by running the .dtx through plain **T_EX**:

```
tex pdftexcmds.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as **texmf** tree):

pdftexcmds.sty	→ tex/generic/oberdiek/pdftexcmds.sty
oberdiek.pdftexcmds.lua	→ scripts/oberdiek/oberdiek.pdftexcmds.lua
pdftexcmds.lua	→ scripts/oberdiek/pdftexcmds.lua
pdftexcmds.pdf	→ doc/latex/oberdiek/pdftexcmds.pdf
test/pdftexcmds-test1.tex	→ doc/latex/oberdiek/test/pdftexcmds-test1.tex
test/pdftexcmds-test2.tex	→ doc/latex/oberdiek/test/pdftexcmds-test2.tex
test/pdftexcmds-test-shell.tex	→ doc/latex/oberdiek/test/pdftexcmds-test-shell.tex
test/pdftexcmds-test-escape.tex	→ doc/latex/oberdiek/test/pdftexcmds-test-escape.tex
pdftexcmds.dtx	→ source/latex/oberdiek/pdftexcmds.dtx

If you have a **docstrip.cfg** that configures and enables **docstrip**'s TDS installing feature, then some files can already be in the right place, see the documentation of **docstrip**.

4.4 Refresh file name databases

If your **T_EX** distribution (te**T_EX**, mik**T_EX**, ...) relies on file name databases, you must refresh these. For example, te**T_EX** users run **texhash** or **mktextlsr**.

4.5 Some details for the interested

Unpacking with L^AT_EX. The .dtx chooses its action depending on the format:

plain T_EX: Run **docstrip** and extract the files.

L^AT_EX: Generate the documentation.

If you insist on using L^AT_EX for **docstrip** (really, **docstrip** does not need L^AT_EX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{pdftexcmds.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfL^AT_EX:

```
pdflatex pdftexcmts.dtx
bibtex pdftexcmts.aux
makeindex -s gind.ist pdftexcmts.idx
pdflatex pdftexcmts.dtx
makeindex -s gind.ist pdftexcmts.idx
pdflatex pdftexcmts.dtx
```

5 Catalogue

The following XML file can be used as source for the [T_EX Catalogue](#). The elements `caption` and `description` are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is `pdftexcmts.xml`.

```
1397 <*catalogue>
1398 <?xml version='1.0' encoding='us-ascii'?>
1399 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
1400 <entry datestamp='$Date$' modifier='$Author$' id='pdftexcmts'>
1401   <name>pdftexcmts</name>
1402   <caption>LuaTeX support for pdfTeX utility functions.</caption>
1403   <authorref id='auth:oberdiek' />
1404   <copyright owner='Heiko Oberdiek' year='2007,2009-2011' />
1405   <license type='lppl1.3' />
1406   <version number='0.20' />
1407   <description>
1408     LuaTeX provides most of the commands of
1409     <xref refid='pdfTeX'>pdfTeX</xref> 1.40. However, a number of
1410     utility functions are not available. This package tries to fill
1411     the gap and implements some of the missing primitives using Lua.
1412     <p/>
1413     The package is part of the <xref refid='oberdiek'>oberdiek</xref>
1414     bundle.
1415   </description>
1416   <documentation details='Package documentation'
1417     href='ctan:/macros/latex/contrib/oberdiek/pdftexcmts.pdf' />
1418   <ctan file='true' path='/macros/latex/contrib/oberdiek/pdftexcmts.dtx' />
1419   <miktex location='oberdiek' />
1420   <texlive location='oberdiek' />
1421   <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip' />
1422 </entry>
1423 </catalogue>
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6 History

[2007/11/11 v0.1]

- First version.

[2007/11/12 v0.2]

- Short description fixed.

[2007/12/12 v0.3]

- Organization of Lua code as module.

[2009/04/10 v0.4]

- Adaptation for syntax change of `\directlua` in LuaTeX 0.36.

[2009/09/22 v0.5]

- `\pdf@primitive`, `\pdf@ifprimitive` added.
- XeTeX's variants are detected for `\pdf@shellescape`, `\pdf@strcmp`, `\pdf@primitive`, `\pdf@ifprimitive`.

[2009/09/23 v0.6]

- Macro `\pdf@isprimitive` added.

[2009/12/12 v0.7]

- Short info shortened.

[2010/03/01 v0.8]

- Required date for package `ifluatex` updated.

[2010/04/01 v0.9]

- Use `\ifeof18` for defining `\pdf@shellescape` between pdfTeX 1.21a (inclusive) and 1.30.0 (exclusive).

[2010/11/04 v0.10]

- `\pdf@draftmode`, `\pdf@ifdraftmode` and `\pdf@setdraftmode` added.

[2010/11/11 v0.11]

- Missing `\RequirePackage` for package `ifpdf` added.

[2011/01/30 v0.12]

- Already loaded package files are not input in plain TeX.

[2011/03/04 v0.13]

- Improved Lua function `shellescape` that also uses the result of `os.execute()` (thanks to Philipp Stephani).

[2011/04/10 v0.14]

- Version check of loaded module added.
- Patch for bug in LuaTeX between 0.40.6 and 0.65 that is fixed in revision 4096.

[2011/04/16 v0.15]

- LuaTeX: `\pdf@shellescape` is only supported for version 0.70.0 and higher due to a bug, `os.execute()` crashes in some circumstances. Fixed in LuaTeX beta-0.70.0, revision 4167.

[2011/04/22 v0.16]

- Previous fix was not working due to a wrong catcode of digit zero (due to easily support the old `\directlua0`). The version border is lowered to 0.68, because some beta-0.67.0 seems also to work.

[2011/06/29 v0.17]

- Documentation addition to `\pdf@shellescape`.

[2011/07/01 v0.18]

- Add Lua module loading in `\everyjob` for `iniTeX` (LuaTeX only).

[2011/07/28 v0.19]

- Missing space in an info message added (Martin Münch).

[2011/11/29 v0.20]

- `\pdf@resettimer` and `\pdf@elapsedtime` added (thanks Andy Thomas).

[2016/05/10 v0.21]

- local unpack added (thanks Élie Roux).

[2016/05/21 v0.22]

- adjust `\textbackslash` usage in bib file for biber bug.

[2016/10/02 v0.23]

- add `file.close` to lua filehandles (github pull request).

[2017/01/29 v0.24]

- Avoid loading `luatex-loader` for current `luatex`. (Use `pdftexcmds.lua` not `oberdiek.pdftexcmds.lua` to simplify file search with standard require)

[2017/03/19 v0.25]

- New `\pdf@shellescape` for LuaTeX, see github issue 20.

[2018/01/21 v0.26]

- use `rb` not `r` mode for file open github issue 34.

[2018/01/30 v0.27]

- `\pdf@mdfivesum` for `XYTeX`

[2018/09/07 v0.28]

- Fix catcode regime in `luatex sprint` for `\pdf@shellescape` GH issue 45

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