

# The pdftextcmds package

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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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# 1 Documentation

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

- `\pdfstrcmp`
- `\pdfunescapehex`
- `\pdfescapehex`
- `\pdfescapename`
- `\pdfescapestring`
- `\pdffilesize`
- `\pdffilemoddate`
- `\pdffiledump`
- `\pdfmdfivesum`
- `\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 *general text* for the other arguments. Using token registers assignments, *general text* could be caught. However, the simulated primitives are expandable and register assignments would destroy this important property. (*general text* 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@<cmd>` if pdfTeX provides `\pdf<cmd>`.

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

**Expandibility:** The macro `\pdf@<cmd>` 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@<cmd>` 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

`\pdf@strcmp {<stringA>} {<stringB>}`

Same as `\pdfstrcmp{<stringA>}{<stringB>}`.

`\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 pdf<sub>TEX</sub>. However pdf<sub>TEX</sub> 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.

`\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 <sub>TEX</sub> number.

`\pdf@mdfivesum {<string>}`

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

`\pdf@filemdfivesum {<filename>}`

Same as `\pdfmdfivesum file{<filename>}`.

`\pdf@shellescape`

Same as `\pdfshellescape`. It expands to 1 if external commands can be executed and 0 otherwise. In pdf<sub>TEX</sub> external commands must be enabled first by command line option or configuration option. In Lua<sub>TEX</sub> option `--safer` disables the execution of external commands.

`\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.

### 1.2.1 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<sup>A</sup>T<sub>E</sub>X:

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

### 1.2.2 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 documentation 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<sup>A</sup>T<sub>E</sub>X.

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

Package identification:

```
30 \begingroup
31 \catcode35 6 % #
32 \catcode40 12 % (
33 \catcode41 12 % )
34 \catcode44 12 % ,
35 \catcode45 12 % -
36 \catcode46 12 % .
37 \catcode47 12 % /
38 \catcode58 12 % :
39 \catcode64 11 % @
40 \catcode91 12 % [
41 \catcode93 12 % ]
42 \catcode123 1 % {
43 \catcode125 2 % }
44 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
45 \def\x#1#2#3[#4]{\endgroup
46 \immediate\write-1{Package: #3 #4}%
47 \xdef#1{#4}%
48 }%
49 \else
50 \def\x#1#2[#3]{\endgroup
51 #2[#3]}%
52 \ifx#1\@undefined
53 \xdef#1{#3}%
54 \fi
55 \ifx#1\relax
56 \xdef#1{#3}%
57 \fi
58 \endgroup
```

```

57      \fi
58    }%
59  \fi
60 \expandafter\x\csname ver@pdftexcmds.sty\endcsname
61 \ProvidesPackage{pdftexcmds}%
62 [2010/04/01 v0.9 Utility functions of pdfTeX for LuaTeX (H0)]

```

## 2.2 Catcodes

```

63 \begingroup
64   \catcode123 1 % {
65   \catcode125 2 % }
66   \def\x{\endgroup
67     \expandafter\edef\csname pdftexcmds@AtEnd\endcsname{%
68       \catcode35 \the\catcode35\relax
69       \catcode64 \the\catcode64\relax
70       \catcode123 \the\catcode123\relax
71       \catcode125 \the\catcode125\relax
72     }%
73   }%
74 \x
75 \catcode35 6 % #
76 \catcode64 11 % @
77 \catcode123 1 % {
78 \catcode125 2 % }
79 \def\TMP@EnsureCode#1#2{%
80   \edef\pdftexcmds@AtEnd{%
81     \pdftexcmds@AtEnd
82     \catcode#1 \the\catcode#1\relax
83   }%
84   \catcode#1 #2\relax
85 }
86 \TMP@EnsureCode{10}{12}% ^^J
87 \TMP@EnsureCode{33}{12}% !
88 \TMP@EnsureCode{34}{12}% "
89 \TMP@EnsureCode{39}{12}% '
90 \TMP@EnsureCode{40}{12}% (
91 \TMP@EnsureCode{41}{12}% )
92 \TMP@EnsureCode{42}{12}% *
93 \TMP@EnsureCode{43}{12}% +
94 \TMP@EnsureCode{44}{12}% ,
95 \TMP@EnsureCode{45}{12}% -
96 \TMP@EnsureCode{46}{12}% .
97 \TMP@EnsureCode{47}{12}% /
98 \TMP@EnsureCode{58}{12}% :
99 \TMP@EnsureCode{60}{12}% <
100 \TMP@EnsureCode{61}{12}% =
101 \TMP@EnsureCode{62}{12}% >
102 \TMP@EnsureCode{94}{7}% ^ (superscript)
103 \TMP@EnsureCode{95}{12}% _ (other)
104 \TMP@EnsureCode{96}{12}% `
105 \TMP@EnsureCode{126}{12}% ~ (other)
106 \edef\pdftexcmds@AtEnd{%
107   \pdftexcmds@AtEnd
108   \escapechar=\number\escapechar\relax
109 }
110 \escapechar=92 %

```

## 2.3 Load package infwarerr

```

111 \begingroup\expandafter\expandafter\expandafter\endgroup
112 \expandafter\ifx\csname RequirePackage\endcsname\relax
113   \input infwarerr.sty\relax

```

```

114 \input ifluatex.sty\relax
115 \input ltxcmds.sty\relax
116 \else
117 \RequirePackage{infwarerr}[2007/09/09]%
118 \RequirePackage{ifluatex}[2010/03/01]%
119 \RequirePackage{ltxcmds}[2009/12/12]%
120 \fi

```

## 2.4 Without LuaTeX

```

121 \ifluatex
122 \else
123 \@PackageInfoNoLine{pdftexcmds}{LuaTeX not detected}%
124 \def\pdftexcmds@nopdftex{%
125   \@PackageInfoNoLine{pdftexcmds}{pdfTeX >= 1.30 not detected}%
126   \let\pdftexcmds@nopdftex\relax
127 }%
128 \def\pdftexcmds@temp#1{%
129   \begingroup\expandafter\expandafter\expandafter\endgroup
130   \expandafter\ifx\csname pdf#1\endcsname\relax
131     \pdftexcmds@nopdftex
132   \else
133     \expandafter\def\csname pdf@#1\endcsname\expandafter\endcsname
134     \expandafter##\expandafter{%
135       \csname pdf#1\endcsname
136     }%
137   \fi
138 }%
139 \pdftexcmds@temp{strcmp}%
140 \pdftexcmds@temp{escapehex}%
141 \let\pdf@escapehexnative\pdf@escapehex
142 \pdftexcmds@temp{unescapehex}%
143 \let\pdf@unescapehexnative\pdf@unescapehex
144 \pdftexcmds@temp{escapestring}%
145 \pdftexcmds@temp{escapename}%
146 \pdftexcmds@temp{filesize}%
147 \pdftexcmds@temp{filemoddate}%
148 \begingroup\expandafter\expandafter\expandafter\endgroup
149 \expandafter\ifx\csname pdfshellescape\endcsname\relax
150   \pdftexcmds@nopdftex
151   \ltx@ifundefined{pdftexversion}{%
152     {%
153       \ifnum\pdftexversion>120 % 1.21a supports \ifeof18
154       \ifeof18 %
155         \chardef\pdf@shellescape=0 %
156       \else
157         \chardef\pdf@shellescape=1 %
158       \fi
159     }%
160   }%
161 \else
162   \def\pdf@shellescape{%
163     \pdfshellescape
164   }%
165 \fi
166 \begingroup\expandafter\expandafter\expandafter\endgroup
167 \expandafter\ifx\csname pdffiledump\endcsname\relax
168   \pdftexcmds@nopdftex
169 \else
170   \def\pdf@filedump#1#2#3{%
171     \pdffiledump offset#1 length#2{#3}%
172   }%
173 \fi

```

```

174 \begingroup\expandafter\expandafter\expandafter\endgroup
175 \expandafter\ifx\csname pdfmdfivesum\endcsname\relax
176   \pdftexcmds@nopdfTeX
177 \else
178   \def\pdf@mdfivesum#\pdfmdfivesum}%
179   \let\pdf@mdfivesumnative\pdf@mdfivesum
180   \def\pdf@filemdfivesum#\pdfmdfivesum file}%
181 \fi
182 \def\pdf@system#{%
183   \immediate\write18%
184   }%
185 \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.

XeTeX 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

```

186 \ifluatex

\pdftexcmds@directlua

187 \ifnum\luatexversion<36 %
188   \def\pdftexcmds@directlua{\directlua0 }%
189 \else
190   \let\pdftexcmds@directlua\directlua
191 \fi

192 \begingroup
193   \newlinechar=10 %
194   \endlinechar=\newlinechar
195   \pdftexcmds@directlua{%
196     if tex.enableprimitives then
197       tex.enableprimitives('pdf',{ 'primitive', 'ifprimitive'})
198       tex.enableprimitives('', { 'luaescapestring'})
199     end
200   }%
201 \endgroup %

202 \fi

```

### 2.5.2 Trying various names to find the primitives

```

\pdftexcmds@strip@prefix

203 \def\pdftexcmds@strip@prefix#1>{}

204 \def\pdftexcmds@temp#1#2#3{%
205   \begingroup\expandafter\expandafter\expandafter\endgroup
206   \expandafter\ifx\csname pdf@#1\endcsname\relax
207     \begingroup
208       \def\x{#3}%
209       \edef\x{\expandafter\pdftexcmds@strip@prefix\meaning\x}%
210       \escapechar=-1 %
211       \edef\y{\expandafter\meaning\csname#2\endcsname}%
212     \expandafter\endgroup
213     \ifx\x\y
214       \expandafter\let\csname pdf@#1\endcsname

```



```

215     \csname #2\endcsname
216     \fi
217 \fi
218 }

```

`\pdf@primitive`

```

219 \pdftexcmds@temp{primitive}{pdfprimitive}{pdfprimitive}% pdfTeX, LuaTeX
220 \pdftexcmds@temp{primitive}{primitive}{primitive}% XeTeX
221 \pdftexcmds@temp{primitive}{luatexpprimitive}{pdfprimitive}% LuaTeX
222 \pdftexcmds@temp{primitive}{luatexpdfprimitive}{pdfprimitive}% LuaTeX

```

`\pdf@ifprimitive`

```

223 \pdftexcmds@temp{ifprimitive}{ifpdfprimitive}{ifpdfprimitive}% pdfTeX, LuaTeX
224 \pdftexcmds@temp{ifprimitive}{ifprimitive}{ifprimitive}% XeTeX
225 \pdftexcmds@temp{ifprimitive}{luatexpifprimitive}{ifpdfprimitive}% LuaTeX
226 \pdftexcmds@temp{ifprimitive}{luatexpdfprimitive}{ifpdfprimitive}% LuaTeX

```

Disable broken `\pdfprimitive`.

```

227 \begingroup
228   \expandafter\ifx\csname pdf@primitive\endcsname\relax
229   \else
230     \expandafter\ifx\csname pdftexversion\endcsname\relax
231     \else
232       \ifnum\pdftexversion=140 %
233         \expandafter\ifx\csname pdftexrevision\endcsname\relax
234         \else
235           \ifnum\pdftexrevision<4 %
236           \endgroup
237           \let\pdf@primitive\undefined
238           \@PackageInfoNoLine{pdftexcmds}{%
239             \string\pdf@primitive disabled, because\MessageBreak
240             \string\pdfprimitive\space is broken until pdfTeX 1.40.4%
241           }%
242           \begingroup
243           \fi
244         \fi
245       \fi
246     \fi
247   \fi
248 \endgroup

```

### 2.5.3 Result

```

249 \begingroup
250   \@PackageInfoNoLine{pdftexcmds}{%
251     \string\pdf@primitive\space is %
252     \expandafter\ifx\csname pdf@primitive\endcsname\relax not \fi
253     available%
254   }%
255   \@PackageInfoNoLine{pdftexcmds}{%
256     \string\pdf@ifprimitive\space is %
257     \expandafter\ifx\csname pdf@ifprimitive\endcsname\relax not \fi
258     available%
259   }%
260 \endgroup

```

## 2.6 XeTeX

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

```

261 \def\pdftexcmds@temp#1{%
262   \begingroup\expandafter\expandafter\expandafter\endgroup
263   \expandafter\ifx\csname pdf@#1\endcsname\relax

```

```

264 \begingroup
265 \escapechar=-1 %
266 \edef\x{\expandafter\meaning\csname#1\endcsname}%
267 \def\y{#1}%
268 \def\z##1->{}%
269 \edef\y{\expandafter\z\meaning\y}%
270 \expandafter\endgroup
271 \ifx\x\y
272 \expandafter\def\csname pdf@#1\expandafter\endcsname
273 \expandafter{%
274 \csname#1\endcsname
275 }%
276 \fi
277 \fi
278 }%
279 \pdfTexcmds@temp{shellescape}%
280 \pdfTexcmds@temp{strcmp}%

```

## 2.7 \pdf@isprimitive

```

281 \def\pdf@isprimitive{%
282 \begingroup\expandafter\expandafter\expandafter\endgroup
283 \expandafter\ifx\csname pdf@strcmp\endcsname\relax
284 \long\def\pdf@isprimitive##1{%
285 \expandafter\pdfTexcmds@isprimitive\expandafter{\meaning##1}%
286 }%
287 \long\def\pdfTexcmds@isprimitive##1##2{%
288 \expandafter\pdfTexcmds@isprimitive\expandafter{\string##2}{##1}%
289 }%
290 \def\pdfTexcmds@isprimitive##1##2{%
291 \ifnum0\pdfTexcmds@equal##1\delimiter##2\delimiter=1 %
292 \expandafter\ltx@firstoftwo
293 \else
294 \expandafter\ltx@secondoftwo
295 \fi
296 }%
297 \def\pdfTexcmds@equal##1##2\delimiter##3##4\delimiter{%
298 \ifx##1##3%
299 \ifx\relax##2##4\relax
300 1%
301 \else
302 \ifx\relax##2\relax
303 \else
304 \ifx\relax##4\relax
305 \else
306 \pdfTexcmds@equalcont{##2}{##4}%
307 \fi
308 \fi
309 \fi
310 \fi
311 }%
312 \def\pdfTexcmds@equalcont##1{%
313 \def\pdfTexcmds@equalcont####1####2##1##1##1##1{%
314 ##1##1##1##1%
315 \pdfTexcmds@equal####1\delimiter####2\delimiter
316 }%
317 }%
318 \expandafter\pdfTexcmds@equalcont\csname fi\endcsname
319 \else
320 \long\def\pdf@isprimitive##1##2{%
321 \ifnum\pdf@strcmp{\meaning##1}{\string##2}=0 %
322 \expandafter\ltx@firstoftwo

```

```

323     \else
324     \expandafter\ltx@secondoftwo
325     \fi
326   }%
327 \fi
328 }
329 \ifluatex
330 \else
331   \pdf@isprimitive
332   \pdftexcmds@AtEnd
333   \expandafter\endinput
334 \fi

```

## 2.8 Load Lua module

```

335 \begingroup\expandafter\expandafter\expandafter\endgroup
336 \expandafter\ifx\csname RequirePackage\endcsname\relax
337   \input luatex-loader.sty\relax
338 \else
339   \RequirePackage{luatex-loader}[2009/04/10]%
340 \fi
341 \pdftexcmds@directlua{%
342   require("oberdiek.pdftexcmds")%
343 }

```

## 2.9 Lua functions

\pdftexcmds@toks

```

344 \begingroup\expandafter\expandafter\expandafter\endgroup
345 \expandafter\ifx\csname newtoks\endcsname\relax
346   \toksdef\pdftexcmds@toks=0 %
347 \else
348   \csname newtoks\endcsname\pdftexcmds@toks
349 \fi

350 \ifnum\luatexversion<36 %
351 \else
352   \catcode'\0=9 %
353 \fi

```

\pdf@strcmp

```

354 \long\def\pdf@strcmp#1#2{%
355   \directlua0{%
356     oberdiek.pdftexcmds.strptime("\luaescapestring{#1}",%
357     "\luaescapestring{#2}")%
358   }%
359 }%

360 \pdf@isprimitive

```

\pdf@escapehex

```

361 \long\def\pdf@escapehex#1{%
362   \directlua0{%
363     oberdiek.pdftexcmds.escapehex("\luaescapestring{#1}", "byte")%
364   }%
365 }%

```

\pdf@escapehexnative

```

366 \long\def\pdf@escapehexnative#1{%
367   \directlua0{%
368     oberdiek.pdftexcmds.escapehex("\luaescapestring{#1}")%
369   }%
370 }%

```

\pdf@unescapehex

```
371 \def\pdf@unescapehex#1{%
372   \the\expandafter\pdftexcmds@toks
373   \directlua0{%
374     oberdiek.pdftexcmds.toks="pdftexcmds@toks"%
375     oberdiek.pdftexcmds.unescapehex("\luaescapestring{#1}", "byte")%
376   }%
377 }%
```

\pdf@unescapehexnative

```
378 \def\pdf@unescapehexnative#1{%
379   \the\expandafter\pdftexcmds@toks
380   \directlua0{%
381     oberdiek.pdftexcmds.toks="pdftexcmds@toks"%
382     oberdiek.pdftexcmds.unescapehex("\luaescapestring{#1}")%
383   }%
384 }%
```

\pdf@escapestring

```
385 \long\def\pdf@escapestring#1{%
386   \directlua0{%
387     oberdiek.pdftexcmds.escapestring("\luaescapestring{#1}", "byte")%
388   }%
389 }
```

\pdf@escapename

```
390 \long\def\pdf@escapename#1{%
391   \directlua0{%
392     oberdiek.pdftexcmds.escapename("\luaescapestring{#1}", "byte")%
393   }%
394 }
```

\pdf@escapenamenative

```
395 \long\def\pdf@escapenamenative#1{%
396   \directlua0{%
397     oberdiek.pdftexcmds.escapename("\luaescapestring{#1}")%
398   }%
399 }
```

\pdf@filesize

```
400 \def\pdf@filesize#1{%
401   \directlua0{%
402     oberdiek.pdftexcmds.filesize("\luaescapestring{#1}")%
403   }%
404 }
```

\pdf@filemoddate

```
405 \def\pdf@filemoddate#1{%
406   \directlua0{%
407     oberdiek.pdftexcmds.filemoddate("\luaescapestring{#1}")%
408   }%
409 }
```

\pdf@filedump

```
410 \def\pdf@filedump#1#2#3{%
411   \directlua0{%
412     oberdiek.pdftexcmds.filedump("\luaescapestring{\number#1}",%
413     "\luaescapestring{\number#2}",%
414     "\luaescapestring{#3}")%
415   }%
416 }%
```

```

\pdf@mdfivesum
417 \long\def\pdf@mdfivesum#1{%
418   \directlua0{%
419     oberdiek.pdfcmds.mdfivesum("\luaescapestring{#1}", "byte")%
420   }%
421 }%

\pdf@mdfivesumnative
422 \long\def\pdf@mdfivesumnative#1{%
423   \directlua0{%
424     oberdiek.pdfcmds.mdfivesum("\luaescapestring{#1}")%
425   }%
426 }%

\pdf@filemdfivesum
427 \def\pdf@filemdfivesum#1{%
428   \directlua0{%
429     oberdiek.pdfcmds.filemdfivesum("\luaescapestring{#1}")%
430   }%
431 }%

\pdf@shellescape
432 \def\pdf@shellescape{%
433   \directlua0{%
434     oberdiek.pdfcmds.shellescape()%
435   }%
436 }

\pdf@system
437 \def\pdf@system#1{%
438   \directlua0{%
439     oberdiek.pdfcmds.system("\luaescapestring{#1}")%
440   }%
441 }

\pdf@lastsystemstatus
442 \def\pdf@lastsystemstatus{%
443   \directlua0{%
444     oberdiek.pdfcmds.lastsystemstatus()%
445   }%
446 }

\pdf@lastsystemexit
447 \def\pdf@lastsystemexit{%
448   \directlua0{%
449     oberdiek.pdfcmds.lastsystemexit()%
450   }%
451 }

452 \catcode'\0=12 %

\pdf@pipe Check availability of io.popen first.
453 \ifnum0%
454   \pdfcmds@directlua{%
455     if io.popen then %
456       tex.write("1")%
457     end%
458   }%
459   =1 %
460 \def\pdf@pipe#1{%
461   \the\expandafter\pdfcmds@toks

```

```

462 \pdfdocmds@directlua{%
463     oberdiek.pdfdocmds.toks="pdfdocmds@toks"%
464     oberdiek.pdfdocmds.pipe("\luaescapestring{#1}")%
465 }%
466 }%
467 \fi

468 \pdfdocmds@AtEnd
469 \end{package}

```

## 2.10 Lua module

```

470 \lua

471 module("oberdiek.pdfdocmds", package.seeall)
472 local systemexitstatus
473 function strcmp(A, B)
474     if A == B then
475         tex.write("0")
476     elseif A < B then
477         tex.write("-1")
478     else
479         tex.write("1")
480     end
481 end
482 local function utf8_to_byte(str)
483     local i = 0
484     local n = string.len(str)
485     local t = {}
486     while i < n do
487         i = i + 1
488         local a = string.byte(str, i)
489         if a < 128 then
490             table.insert(t, string.char(a))
491         else
492             if a >= 192 and i < n then
493                 i = i + 1
494                 local b = string.byte(str, i)
495                 if b < 128 or b >= 192 then
496                     i = i - 1
497                 elseif a == 194 then
498                     table.insert(t, string.char(b))
499                 elseif a == 195 then
500                     table.insert(t, string.char(b + 64))
501                 end
502             end
503         end
504     end
505     return table.concat(t)
506 end
507 function escapehex(str, mode)
508     if mode == "byte" then
509         str = utf8_to_byte(str)
510     end
511     tex.write((string.gsub(str, ".",
512         function (ch)
513             return string.format("%02X", string.byte(ch))
514         end
515     )))
516 end

```

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

```

517 function unescapehex(str, mode)

```

```

518 local a = 0
519 local first = true
520 local result = {}
521 for i = 1, string.len(str), 1 do
522     local ch = string.byte(str, i)
523     if ch >= 48 and ch <= 57 then
524         ch = ch - 48
525     elseif ch >= 65 and ch <= 70 then
526         ch = ch - 55
527     elseif ch >= 97 and ch <= 102 then
528         ch = ch - 87
529     else
530         ch = nil
531     end
532     if ch then
533         if first then
534             a = ch * 16
535             first = false
536         else
537             table.insert(result, a + ch)
538             first = true
539         end
540     end
541 end
542 if not first then
543     table.insert(result, a)
544 end
545 if mode == "byte" then
546     local utf8 = {}
547     for i, a in ipairs(result) do
548         if a < 128 then
549             table.insert(utf8, a)
550         else
551             if a < 192 then
552                 table.insert(utf8, 194)
553                 a = a - 128
554             else
555                 table.insert(utf8, 195)
556                 a = a - 192
557             end
558             table.insert(utf8, a + 128)
559         end
560     end
561     result = utf8
562 end
563 tex.settoks(toks, string.char(unpack(result)))
564 end

```

See procedure `escapestring` in file `utils.c` of pdf<sub>T</sub>E<sub>X</sub>.

```

565 function escapestring(str, mode)
566     if mode == "byte" then
567         str = utf8_to_byte(str)
568     end
569     tex.write((string.gsub(str, ".",
570         function (ch)
571             local b = string.byte(ch)
572             if b < 33 or b > 126 then
573                 return string.format("\\%.3o", b)
574             end
575             if b == 40 or b == 41 or b == 92 then
576                 return "\\" .. ch
577             end

```

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

```

578     return nil
579 end
580 )))
581 end

```

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

```

582 function escapename(str, mode)
583   if mode == "byte" then
584     str = utf8_to_byte(str)
585   end
586   tex.write((string.gsub(str, ".",
587     function (ch)
588       local b = string.byte(ch)
589       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.

```

590     return ""
591   end
592   if b <= 32 or b >= 127
593     or b == 35 or b == 37 or b == 40 or b == 41
594     or b == 47 or b == 60 or b == 62 or b == 91
595     or b == 93 or b == 123 or b == 125 then
596     return string.format("#%.2X", b)
597   else

```

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

```

598     return nil
599   end
600 end
601 )))
602 end
603 function filesize(filename)
604   local foundfile = kpse.find_file(filename, "tex", true)
605   if foundfile then
606     local size = lfs.attributes(foundfile, "size")
607     if size then
608       tex.write(size)
609     end
610   end
611 end

```

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

```

612 function filemoddate(filename)
613   local foundfile = kpse.find_file(filename, "tex", true)
614   if foundfile then
615     local date = lfs.attributes(foundfile, "modification")
616     if date then
617       local d = os.date("*t", date)
618       if d.sec >= 60 then
619         d.sec = 59
620       end
621       local u = os.date("!*t", date)
622       local off = 60 * (d.hour - u.hour) + d.min - u.min
623       if d.year ~= u.year then
624         if d.year > u.year then
625           off = off + 1440
626         else
627           off = off - 1440
628         end
629       elseif d.yday ~= u.yday then
630         if d.yday > u.yday then
631           off = off + 1440
632         else
633           off = off - 1440

```



```

634         end
635     end
636     local timezone
637     if off == 0 then
638         timezone = "Z"
639     else
640         local hours = math.floor(off / 60)
641         local mins = math.abs(off - hours * 60)
642         timezone = string.format("%+03d'%02d'", hours, mins)
643     end
644     tex.write(string.format("D:%04d%02d%02d%02d%02d%s",
645         d.year, d.month, d.day, d.hour, d.min, d.sec, timezone))
646     end
647 end
648 end
649 function filedump(offset, length, filename)
650     length = tonumber(length)
651     if length and length > 0 then
652         local foundfile = kpse.find_file(filename, "tex", true)
653         if foundfile then
654             offset = tonumber(offset)
655             if not offset then
656                 offset = 0
657             end
658             local filehandle = io.open(foundfile, "r")
659             if filehandle then
660                 if offset > 0 then
661                     filehandle:seek("set", offset)
662                 end
663                 local dump = filehandle:read(length)
664                 escapehex(dump)
665             end
666         end
667     end
668 end
669 function md5sum(str, mode)
670     if mode == "byte" then
671         str = utf8_to_byte(str)
672     end
673     escapehex(md5.sum(str))
674 end
675 function filemd5sum(filename)
676     local foundfile = kpse.find_file(filename, "tex", true)
677     if foundfile then
678         local filehandle = io.open(foundfile, "r")
679         if filehandle then
680             local contents = filehandle:read("*a")
681             escapehex(md5.sum(contents))
682         end
683     end
684 end
685 function shellescape()
686     if os.execute then
687         tex.write("1")
688     else
689         tex.write("0")
690     end
691 end
692 function system(cmdline)
693     systemexitstatus = nil
694     texio.write_nl("log", "system(" .. cmdline .. ") ")
695     if os.execute then

```

```

696     texio.write("log", "executed.")
697     systemexitstatus = os.execute(cmdline)
698   else
699     texio.write("log", "disabled.")
700   end
701 end
702 function lastsystemstatus()
703   local result = tonumber(systemexitstatus)
704   if result then
705     local x = math.floor(result / 256)
706     tex.write(result - 256 * math.floor(result / 256))
707   end
708 end
709 function lastsystemexit()
710   local result = tonumber(systemexitstatus)
711   if result then
712     tex.write(math.floor(result / 256))
713   end
714 end
715 function pipe(cmdline)
716   local result
717   systemexitstatus = nil
718   texio.write_nl("log", "pipe(" .. cmdline .. ") ")
719   if io.popen then
720     texio.write("log", "executed.")
721     local handle = io.popen(cmdline, "r")
722     if handle then
723       result = handle:read("*a")
724       handle:close()
725     end
726   else
727     texio.write("log", "disabled.")
728   end
729   if result then
730     tex.settoks(toks, result)
731   else
732     tex.settoks(toks, "")
733   end
734 end
735 

```

### 3 Test

#### 3.1 Catcode checks for loading

```

736 (*test1)
737 \catcode'\{=1 %
738 \catcode'\}=2 %
739 \catcode'\#=6 %
740 \catcode'\@=11 %
741 \expandafter\ifx\csname count@\endcsname\relax
742   \countdef\count@=255 %
743 \fi
744 \expandafter\ifx\csname @gobble\endcsname\relax
745   \long\def\@gobble#1{}%
746 \fi
747 \expandafter\ifx\csname @firstofone\endcsname\relax
748   \long\def\@firstofone#1{#1}%
749 \fi
750 \expandafter\ifx\csname loop\endcsname\relax
751   \expandafter\@firstofone
752 \else

```

```

753 \expandafter\@gobble
754 \fi
755 {%
756 \def\loop#1\repeat{%
757 \def\body{#1}%
758 \iterate
759 }%
760 \def\iterate{%
761 \body
762 \let\next\iterate
763 \else
764 \let\next\relax
765 \fi
766 \next
767 }%
768 \let\repeat=\fi
769 }%
770 \def\RestoreCatcodes{}
771 \count@=0 %
772 \loop
773 \edef\RestoreCatcodes{%
774 \RestoreCatcodes
775 \catcode\the\count@=\the\catcode\count@\relax
776 }%
777 \ifnum\count@<255 %
778 \advance\count@ 1 %
779 \repeat
780
781 \def\RangeCatcodeInvalid#1#2{%
782 \count@=#1\relax
783 \loop
784 \catcode\count@=15 %
785 \ifnum\count@<#2\relax
786 \advance\count@ 1 %
787 \repeat
788 }
789 \expandafter\ifx\csname LoadCommand\endcsname\relax
790 \def\LoadCommand{\input pdftexcmds.sty\relax}%
791 \fi
792 \def\Test{%
793 \RangeCatcodeInvalid{0}{47}%
794 \RangeCatcodeInvalid{58}{64}%
795 \RangeCatcodeInvalid{91}{96}%
796 \RangeCatcodeInvalid{123}{255}%
797 \catcode'\@=12 %
798 \catcode'\=0 %
799 \catcode'\{=1 %
800 \catcode'\}=2 %
801 \catcode'\#=6 %
802 \catcode'\[=12 %
803 \catcode'\]=12 %
804 \catcode'\%=14 %
805 \catcode'\ =10 %
806 \catcode13=5 %
807 \LoadCommand
808 \RestoreCatcodes
809 }
810 \Test
811 \csname @@end\endcsname
812 \end
813 </test1>

```

## 3.2 Test for \pdf@isprimitive

```
814 (*test2)
815 \catcode'\{=1 %
816 \catcode'\}=2 %
817 \catcode'\#=6 %
818 \catcode'\@=11 %
819 \input pdftexcmds.sty\relax
820 \def\msg#1{%
821   \begingroup
822     \escapechar=92 %
823     \immediate\write16{#1}%
824   \endgroup
825 }
826 \long\def\test#1#2#3#4{%
827   \begingroup
828     #4%
829     \def\str{%
830       Test \string\pdf@isprimitive
831       {\string #1}{\string #2}{...}: %
832     }%
833     \pdf@isprimitive{#1}{#2}{%
834       \ifx#3Y%
835         \msg{\str true ==> OK.}%
836       \else
837         \errmessage{\str false ==> FAILED}%
838       \fi
839     }{%
840       \ifx#3Y%
841         \errmessage{\str true ==> FAILED}%
842       \else
843         \msg{\str false ==> OK.}%
844       \fi
845     }%
846   \endgroup
847 }
848 \test\relax\relax Y{}
849 \test\foobar\relax Y{\let\foobar\relax}
850 \test\foobar\relax N{}
851 \test\hbox\hbox Y{}
852 \test\foobar@hbox\hbox Y{\let\foobar@hbox\hbox}
853 \test\if\if Y{}
854 \test\if\ifx N{}
855 \test\ifx\if N{}
856 \test\par\par Y{}
857 \test\hbox\par N{}
858 \test\par\hbox N{}
859 \csname @@end\endcsname\end
860 </test2>
```

## 4 Installation

### 4.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

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

[CTAN:macros/latex/contrib/oberdiek/pdftexcmds.pdf](#) Documentation.

---

<sup>1</sup>[ftp://ftp.ctan.org/tex-archive/](http://ftp.ctan.org/tex-archive/)

**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](#)

TDS refers to the standard “A Directory Structure for T<sub>E</sub>X Files” ([CTAN:tds/tds.pdf](#)). Directories with `texmf` in their name are usually organized this way.

## 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<sub>E</sub>X:

```
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):

<code>pdftexcmds.sty</code>	→ <code>tex/generic/oberdiek/pdftexcmds.sty</code>
<code>oberdiek.pdftexcmds.lua</code>	→ <code>scripts/oberdiek/oberdiek.pdftexcmds.lua</code>
<code>pdftexcmds.lua</code>	→ <code>scripts/oberdiek/pdftexcmds.lua</code>
<code>pdftexcmds.pdf</code>	→ <code>doc/latex/oberdiek/pdftexcmds.pdf</code>
<code>test/pdftexcmds-test1.tex</code>	→ <code>doc/latex/oberdiek/test/pdftexcmds-test1.tex</code>
<code>test/pdftexcmds-test2.tex</code>	→ <code>doc/latex/oberdiek/test/pdftexcmds-test2.tex</code>
<code>pdftexcmds.dtx</code>	→ <code>source/latex/oberdiek/pdftexcmds.dtx</code>

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<sub>E</sub>X distribution (teT<sub>E</sub>X, mikT<sub>E</sub>X, ...) relies on file name databases, you must refresh these. For example, teT<sub>E</sub>X users run `texhash` or `mktextlsr`.

## 4.5 Some details for the interested

**Attached source.** The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk pdftexcmds.pdf unpack_files output .
```

**Unpacking with L<sup>A</sup>T<sub>E</sub>X.** The .dtx chooses its action depending on the format:

**plain-T<sub>E</sub>X:** Run docstrip and extract the files.

**L<sup>A</sup>T<sub>E</sub>X:** Generate the documentation.

If you insist on using L<sup>A</sup>T<sub>E</sub>X for docstrip (really, docstrip does not need L<sup>A</sup>T<sub>E</sub>X), 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<sup>A</sup>T<sub>E</sub>X:

```
pdflatex pdftexcmds.dtx
makeindex -s gind.ist pdftexcmds.idx
pdflatex pdftexcmds.dtx
makeindex -s gind.ist pdftexcmds.idx
pdflatex pdftexcmds.dtx
```

## 5 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 LuaL<sup>A</sup>T<sub>E</sub>X 0.36.

[2009/09/22 v0.5]

- \pdf@primitive, \pdf@ifprimitive added.
- XeL<sup>A</sup>T<sub>E</sub>X'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 `\pdfshellescape` between pdfTeX 1.21a (inclusive) and 1.30.0 (exclusive).

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