

# The `latex-lab-tikz` package

## Support for the tagging of `TikZ` pictures

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### Abstract

## 1 Introduction

This implements the tagging of `TikZ` picture along the ideas described in `latex-lab-graphic`, please check its documentation for the background!

Resulting structures and contents should be checked!

The code doesn't use the generic sockets documented in `latex-lab-graphic` but instead sets up sockets and keys that are `TikZ`-specific. One reason for this approach is to avoid that the tagging `TikZ` pictures has side effect on pictures but more importantly because as this implementation patches into `tikz` internals special code in the plugs is required.

The module is automatically loaded if `tagging=on` or `testphase=latest` is used. The patches of `TikZ` commands can be suppressed by removing the code with the label `latex-lab-testphase-tikz` from the hook `package/tikz/after` before loading `TikZ`.

## 2 Implementation

```
1 <*package>
2 <@@=tag>
3 \ProvidesExplPackage {latex-lab-testphase-tikz} {\ltlabtikzdate} {\ltlabtikzversion}
4 {Code related to the tagging of tikz pictures}
```

### 2.1 Sockets

`support/tikz/picture/init` (*socket*) Sockets at the begin and the end of a `tikzpicture`. The argument in the `init` should process the keys of the picture and switch the plugs if needed. Unlike the generic sockets `support/tikz/picture/begin` (*socket*) the begin and end sockets here do not need arguments.

```
5 \NewTaggingSocket{tikz/picture/init}{1}
6 \NewTaggingSocket{tikz/picture/begin}{0}
7 \NewTaggingSocket{tikz/picture/end}{0}
8 \NewSocket{tagsupport/tikz/picture/text/begin}{0}
9 \NewSocket{tagsupport/tikz/picture/text/end}{0}
```

---

\*Initial implementation done by Ulrike Fischer

## 2.2 Plugs

`\support/tikz/picture/init`) (*plug*) The init socket takes a list of keys, processes the known keys to setup tagging options and then assigns the plugs. TODO: correct module name? TODO: tikz should probably use pgfkeys, but as l3keys are easier for me ...

```

10 \NewTaggingSocketPlug{tikz/picture/init}{default}
11 {
12   \keys_set_known:nn { tikz / tagging } {#1}
13 }
14 \AssignTaggingSocketPlug{tikz/picture/init}{default}

```

`\support/tikz/picture/begin`) (*plug*) This plug handles the TikZ picture as a text object. So the graphical parts are tagged as artifact, but when we encounter a node we activate tagging there. There is no BBox. A TikZ picture does not necessarily starts with a `\leavevmode` so we test for vmode.

```

15 \NewTaggingSocketPlug{tikz/picture/begin}{text}
16 {
17   \ifvmode
18   {
19     \if@inlabel \leavevmode \else \tag_socket_use:n{para/begin}\fi
20   }
21   \fi
22   \tag_mc_end_push:
23   \tagmcbegin{artifact}

```

We hook into two pgf commands to add the tagging code. They are only used for postscript and svg so it should be safe inside a tagging socket for now. TODO: ask for an interface.

```

24 \def\pgfsys@begin@text
25 {
26   \tag_resume:n{\tikz/picture}
27   \tag_socket_use:n{tikz/picture/text/begin}
28 }
29 \def\pgfsys@end@text
30 {
31   \tag_socket_use:n{tikz/picture/text/end}
32   \tag_suspend:n{\tikzpicture}
33 }
34 }
35 \NewTaggingSocketPlug{tikz/picture/end}{text}
36 {
37   \tagmccend
38   \tag_mc_begin_pop:n{
39 }

```

`\support/tikz/picture/begin`) (*plug*) This plug handles the TikZ picture as a figure. Around the graphic is a **Figure** environment which will use an alt text given in the optional argument and internally tagging is suspended. The Bbox will be set (after the second compilation) to the size of the bounding box.

```

40 \NewTaggingSocketPlug{tikz/picture/begin}{alt}

```

```

41 {
42   \ifvmode
43   {
44     \if@inlabel \leavevmode \else \tag_socket_use:n{para/begin}\fi
45   }
46   \fi
47   \tag_mc_end_push:

```

TODO: The structure name should be adaptable, similar to the generic implementation

```

48   \tag_struct_begin:n
49   {
50     tag=Figure,
51     alt=\l__tikz_tagging_alt_tl
52   }
53   \pgfrememberpicturepositiononpagetrue
54   \tag_mc_begin:n{tag=Figure}
55 }
56
57 \NewTaggingSocketPlug{tikz/picture/end}{alt}
58 {
59   \tag_mc_end:

```

this is the code that calculates and sets the BBox attribute

```

60   \cs_set:Npn\pgfqpoint##1##2
61   {
62     \tl_set:N\l_tmpa_tl
63     {
64       \dim_to_decimal_in_bp:n {##1+ \pgf@picminx}
65       \c_space_tl
66       \dim_to_decimal_in_bp:n {##2+ \pgf@picminy}
67       \c_space_tl
68       \dim_to_decimal_in_bp:n {##1+ \pgf@picmaxx}
69       \c_space_tl
70       \dim_to_decimal_in_bp:n {##2+ \pgf@picmaxx}
71     }
72   }

```

The following command executes a `\pgfqpoint` command with the origin coordinates, and so set the `\l_tmpa_tl` used then in the `BBox` command. With `pgfplots` the command is not expandable. So we execute it before the structure command.

```

73   \cs_if_exist:cT { pgf@sys@pdf@mark@pos@pgfid\the\pgf@picture@serial@count }
74   {
75     \use:c { pgf@sys@pdf@mark@pos@pgfid\the\pgf@picture@serial@count }
76     \tag_struct_gput:ene
77     {\tag_get:n{struct_num}}
78     {attribute}
79     {
80       /O /Layout /BBox~
81       [
82         \l_tmpa_tl
83       ]

```

```

84     }
85   }
86   \tag_struct_end:
87   \tag_mc_begin_pop:n{}
88 }

```

`\port/tikz/picture/begin`) (*plug*) This plug handles the TikZ picture as a symbol with an `actualtext`. It tags the content `\support/tikz/picture/end`) (*plug*) as a `Span` and expects an `actualtext`. Internally tagging is suspended.

```

89 \NewTaggingSocketPlug{tikz/picture/begin}{actualtext}
90 {
91   \ifvmode
92   {
93     \if@inlabel \leavevmode \else \tag_socket_use:n{para/begin}\fi
94   }
95   \fi
96   \tag_mc_end_push:
97   \tag_struct_begin:n{tag=Span,actualtext=\l__tikz_tagging_actualtext_tl}
98   \tag_mc_begin:n{}
99 }
100
101 \NewTaggingSocketPlug{tikz/picture/end}{actualtext}
102 {
103   \tag_mc_end:
104   \tag_struct_end:
105   \tag_mc_begin_pop:n{}
106 }

```

`\port/tikz/picture/begin`) (*plug*) This plug handles the TikZ picture as an artifact, as decoration. So it is surrounded by `\support/tikz/picture/end`) (*plug*) an artifact MC and internal text does not restart tagging.

```

107 \NewTaggingSocketPlug{tikz/picture/begin}{artifact}
108 {
109   \ifvmode
110   {
111     \if@inlabel \leavevmode \else \tag_socket_use:n{para/begin}\fi
112   }
113   \fi
114   \tag_mc_end_push:
115   \tag_mc_begin:n{artifact}
116 }
117
118 \NewTaggingSocketPlug{tikz/picture/end}{artifact}
119 {
120   \tag_mc_end:
121   \tag_mc_begin_pop:n{}
122 }

```

By default we use the text plugs. This allow packages like `todonotes` to get a sensible tagging without changes.

```

123 \AssignTaggingSocketPlug{tikz/picture/begin}{text}
124 \AssignTaggingSocketPlug{tikz/picture/end}{text}

```

`tikz/picture/text/begin`) (*plug*) These sockets are used inside the text plugs and ends the previous mc and restarts it  
`t/tikz/picture/text/end`) (*plug*) after the text.

```

125 \NewTaggingSocketPlug{tikz/picture/text/begin}{default}
126 {
127   \tag_mc_end:
128   \tag_mc_begin:n{ }
129 }
130 \NewTaggingSocketPlug{tikz/picture/text/end}{default}
131 {
132   \tag_mc_end:
133   \tag_mc_begin:n{artifact}
134 }
135 \AssignTaggingSocketPlug{tikz/picture/text/begin}{default}
136 \AssignTaggingSocketPlug{tikz/picture/text/end}{default}

```

## 2.3 Patching tagging into tikz

We add the begin socket to the `\tikz@picture` command (it is also used by `\tikz`). This allows us to process the keys of the picture, assign the plugs and then to suspend tagging.

```

137 \AddToHook{package/tikz/after}
138 {
139   \AddToHookWithArguments{cmd/tikz@picture/before}
140   {
141     \tag_socket_use:nn{tikz/picture/init}{#1}
142     \tag_socket_use:n {tikz/picture/begin}
143     \tag_suspend:n{\tikzpicture}
144   }

```

The end socket is in the `\endpgfpicture` command.

```

145   \AddToHook{cmd/endpgfpicture/after}
146   {
147     \tag_resume:n{\tikzpicture}
148     \tag_socket_use:n{tikz/picture/end}
149   }
150 }

```

## 2.4 User interface: Keys to change the tagging behaviour

These keys will be processed directly at the begin of the picture commands to change the tagging behaviour. They are specific to tikz and should probably better be implemented with pgfkeys ....

```

151 \tl_new:N \l__tikz_tagging_alt_tl
152 \tl_set:Nn \l__tikz_tagging_alt_tl {Alternative-text-missing!}
153 \tl_new:N \l__tikz_tagging_actualtext_tl
154
155 \keys_define:nn { tikz / tagging }
156 {
157   alt .code:n =
158   {

```

```

159     \tl_set:N\l__tikz_tagging_alt_tl {\text_purify:n{#1}}
160     \AssignTaggingSocketPlug{tikz/picture/begin}{alt}
161     \AssignTaggingSocketPlug{tikz/picture/end}{alt}
162     \def\pgfsys@begin@text{}
163     \def\pgfsys@end@text{}
164   },
165   actualtext .code:n =
166   {
167     \tl_set:N\l__tikz_tagging_actualtext_tl {\text_purify:n{#1}}
168     \AssignTaggingSocketPlug{tikz/picture/begin}{actualtext}
169     \AssignTaggingSocketPlug{tikz/picture/end}{actualtext}
170     \def\pgfsys@begin@text{}
171     \def\pgfsys@end@text{}
172   },
173   artifact .code:n =
174   {
175     \AssignTaggingSocketPlug{tikz/picture/begin}{artifact}
176     \AssignTaggingSocketPlug{tikz/picture/end}{artifact}
177     \def\pgfsys@begin@text{}
178     \def\pgfsys@end@text{}
179   },
180   tagging-setup .multichoice:,
181   tagging-setup / text .code:n =
182   {
183     \AssignTaggingSocketPlug{tikz/picture/begin}{text}
184     \AssignTaggingSocketPlug{tikz/picture/end}{text}
185   },
186   tagging-setup / unknown .code:n=
187   {
188     \keys_set:nn { tag/graphic }{#1}
189   }
190 }

```

## 2.5 Key definitions for TikZ

```

191 \AddToHook{package/tikz/after}
192 {

```

we add a dummy definition for alt, actualtext and artifact key to avoid errors, and to allow to set the variables outside the tikzpicture.

```

193   \tikzset
194   {
195     alt/.code=
196     {
197       \tl_set:N\l__tikz_tagging_alt_tl {\text_purify:n{#1}}
198       \AssignTaggingSocketPlug{tikz/picture/begin}{alt}
199       \AssignTaggingSocketPlug{tikz/picture/end}{alt}
200       \def\pgfsys@begin@text{}
201       \def\pgfsys@end@text{}
202     },
203     actualtext/.code=
204     {
205       \tl_set:N\l__tikz_tagging_actualtext_tl {\text_purify:n{#1}}
206       \AssignTaggingSocketPlug{tikz/picture/begin}{actualtext}

```

```

207     \AssignTaggingSocketPlug{tikz/picture/end}{actualtext}
208     \def\pgfsys@begin@text{}
209     \def\pgfsys@end@text{}
210 },
211 artifact/.code=
212 {
213     \AssignTaggingSocketPlug{tikz/picture/begin}{artifact}
214     \AssignTaggingSocketPlug{tikz/picture/end}{artifact}
215     \def\pgfsys@begin@text{}
216     \def\pgfsys@end@text{}
217 }
218 }

```

## 2.6 TikZ keys to switch the recipes

Todo: alt and actualtext should be able to handle a value, but how is that done in pgfkeys??

```

219 \tikzset
220 {
221     tagging-setup/.is~choice,
222     tagging-setup/text/.code =
223     {
224         \AssignTaggingSocketPlug{tikz/picture/begin}{text}
225         \AssignTaggingSocketPlug{tikz/picture/end}{text}
226     },
227     tagging-setup/alt/.code =
228     {
229         \AssignTaggingSocketPlug{tikz/picture/begin}{alt}
230         \AssignTaggingSocketPlug{tikz/picture/end}{alt}
231         \def\pgfsys@begin@text{}
232         \def\pgfsys@end@text{}
233     },
234     tagging-setup/actualtext/.code =
235     {
236         \AssignTaggingSocketPlug{tikz/picture/begin}{actualtext}
237         \AssignTaggingSocketPlug{tikz/picture/end}{actualtext}
238         \def\pgfsys@begin@text{}
239         \def\pgfsys@end@text{}
240     },
241     tagging-setup/artifact/.code =
242     {
243         \AssignTaggingSocketPlug{tikz/picture/begin}{artifact}
244         \AssignTaggingSocketPlug{tikz/picture/end}{artifact}
245         \def\pgfsys@begin@text{}
246         \def\pgfsys@end@text{}
247     },
248 }
249 }

```

Todonotes works with the default text recipe quite ok, details can be handled later.

```

250 \end{package}

```

```

251 \end{*latex-lab}

```

```
252 \ProvidesFile{tikz-latex-lab-testphase.ltx}
253     [\ltmlabtikzdate\space v\ltmlabtikzversion\space
254       latex-lab wrapper tikz]
255
256 \RequirePackage{latex-lab-testphase-tikz}
257
258 \</latex-lab>
```