



Toplo, Bloc & Spec

A Graphic Layer for the Future



Pablo Tesone & Martín Dias - ESUG 2024 - Lille



It's us!

Pablo Tesone
Pharo Consortium
Engineer



@tesonep  

Martín Dias
Pharo Consortium
Engineer



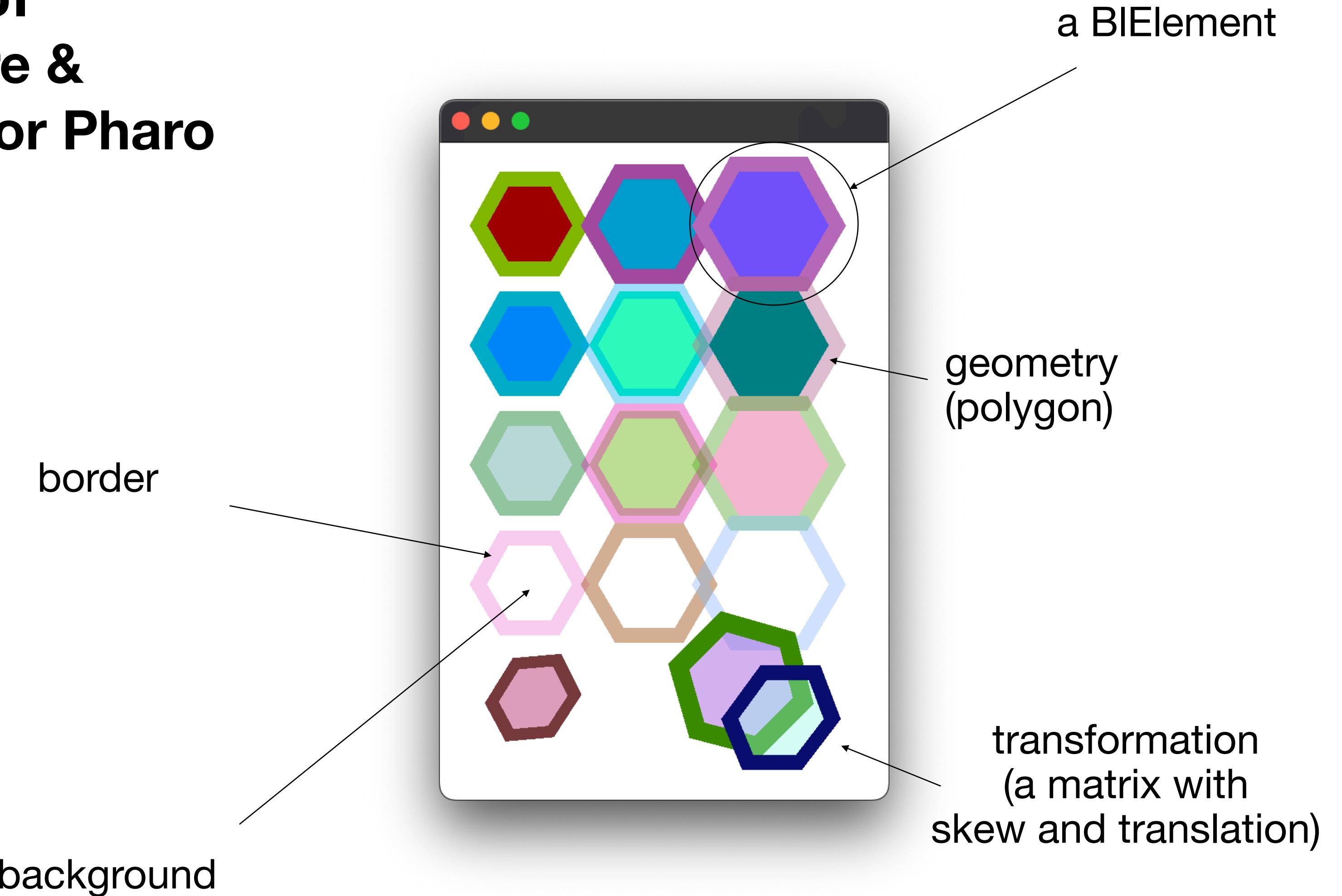
@tinchodias  

Just in the
presentation effort...
a lot of development
behind



What is Bloc?

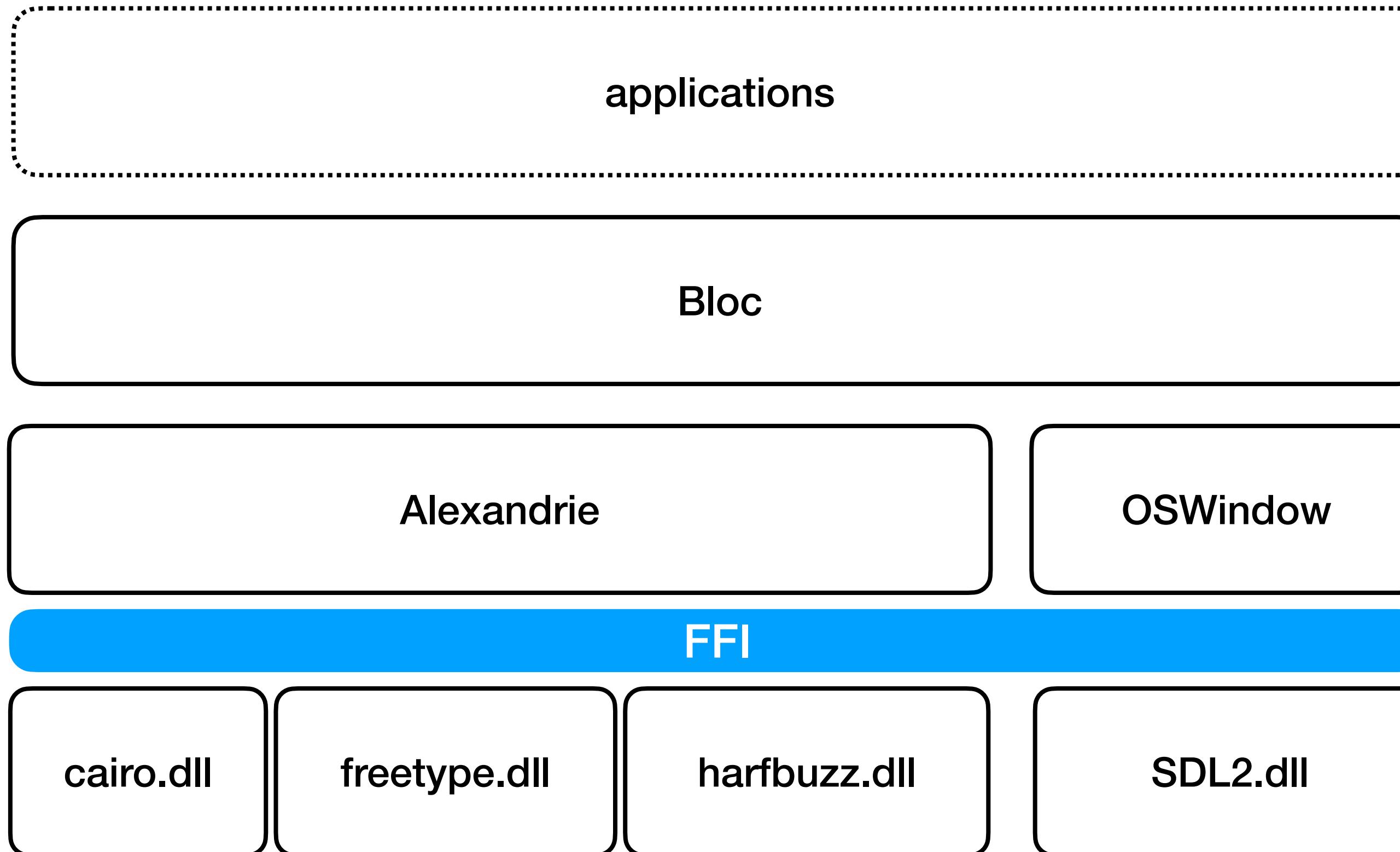
a low-level UI
infrastructure &
framework for Pharo





What is Bloc?

Architecture



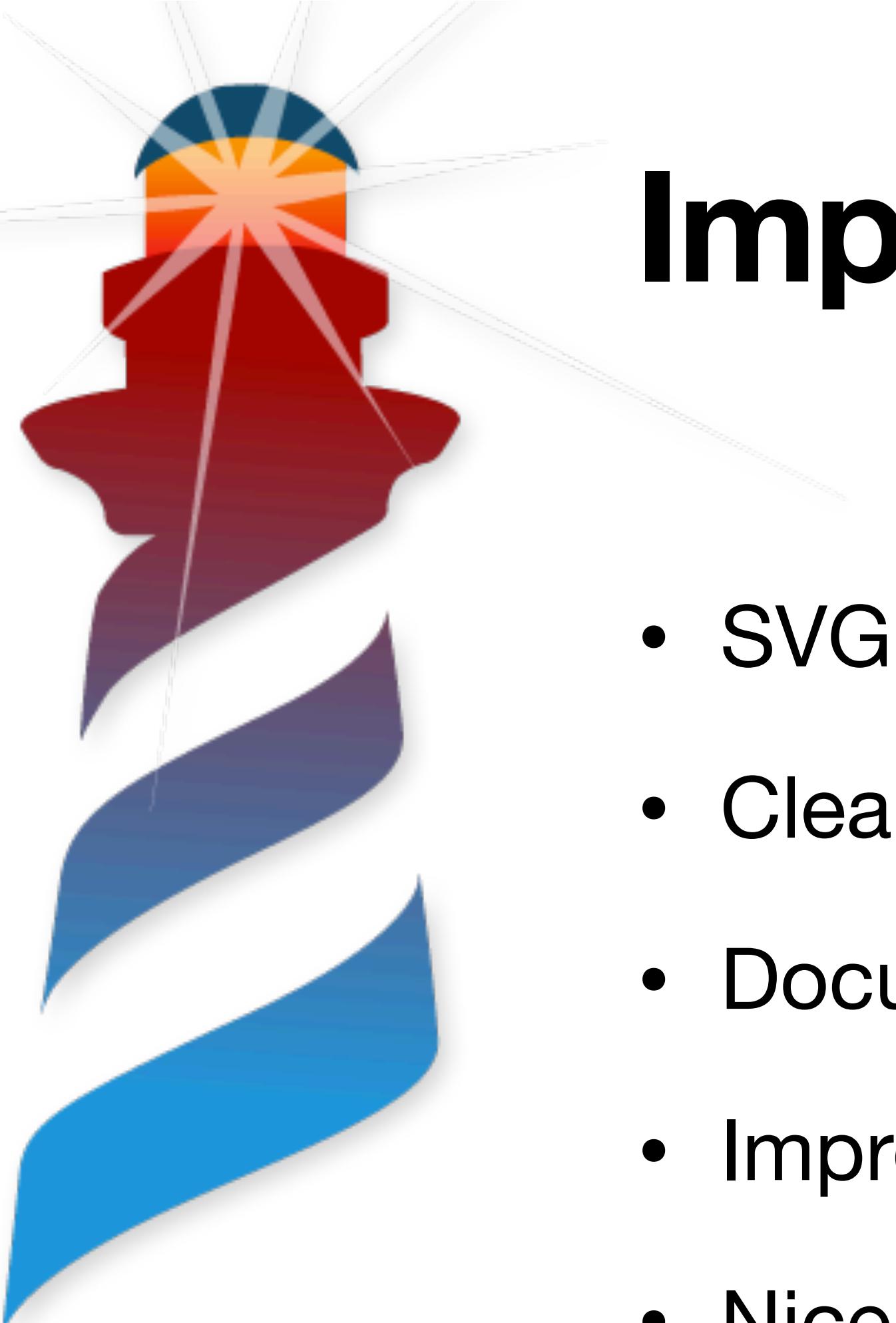


Why Cairo and SDL2?

Stay with simple FFI bindings to C libraries



- Works on all Pharo's platforms
- GPU acceleration
- Active gamer community
- Stable with active development. Support by gnome community (it's the way to draw custom widgets in gtk 3 and 4).
- Not GPU-optimized but we can use buffering, layer composition and other techniques to mitigate.



Improvements

- SVG importer bugfixing
- Cleanup (#Classes / Methods, Lines of code)
- Documentation improvements
- Improved Text Rendering
- Nicer Shadows, Polygons and Rounded figures



Performance & Stability

Running Faster and Reliable

- Performance Improvement
- Regression Testing
- CI Integration
- Correct Versioning & Repeatable Builds



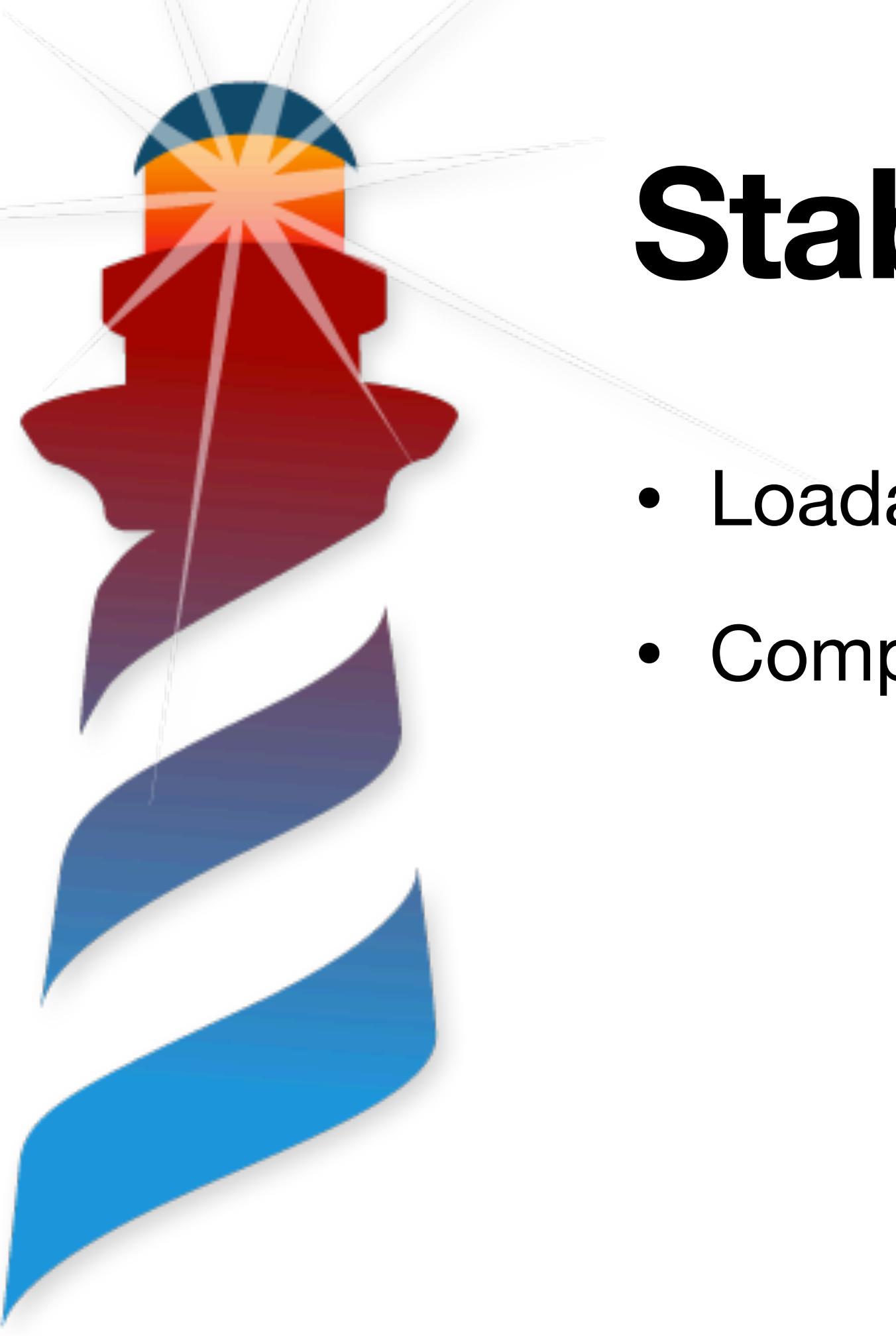
How you see
the test fixture



Mouse events were only
dispatched on the colored
regions

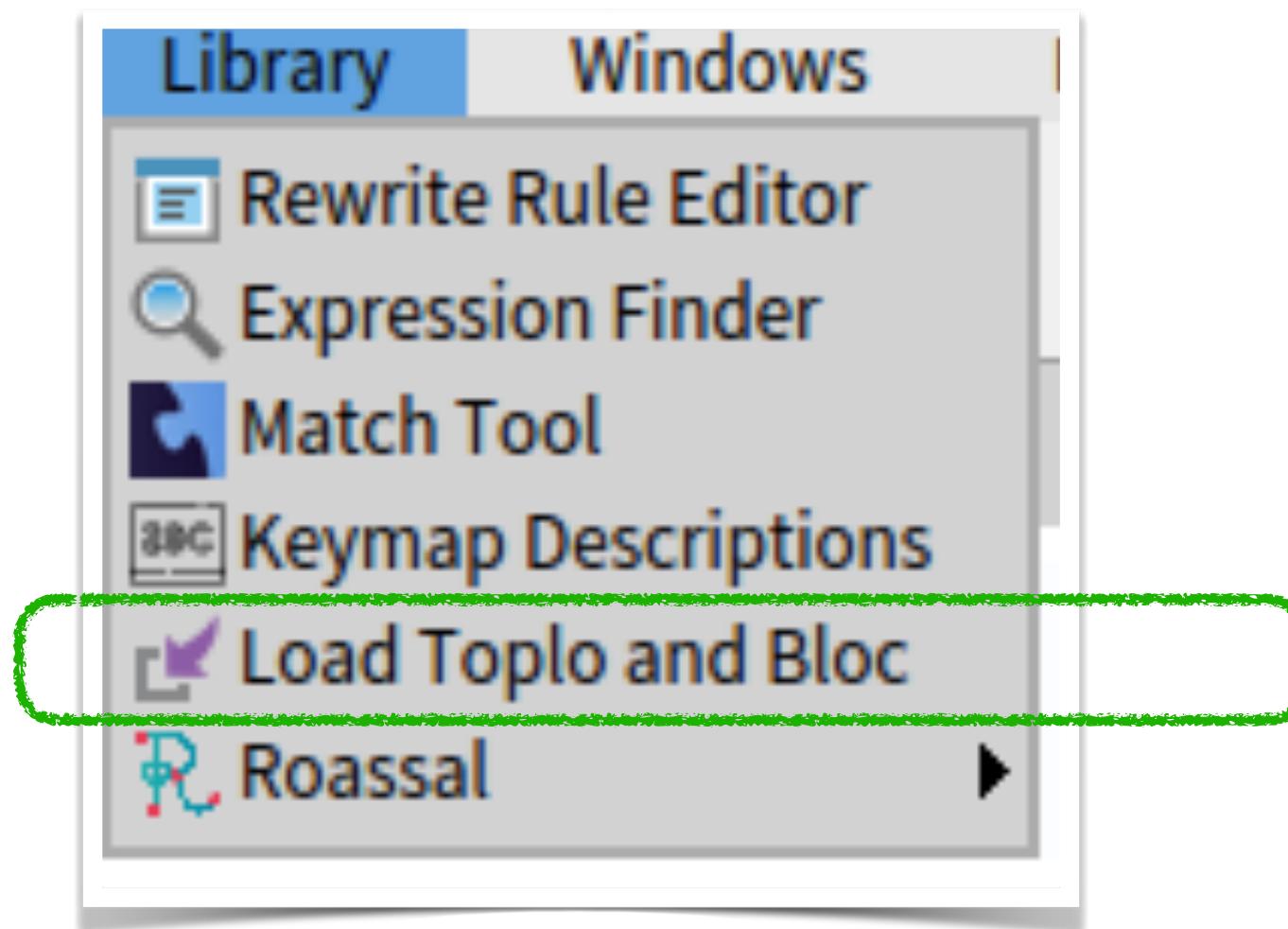


After the fix



Stable and Ready to Use

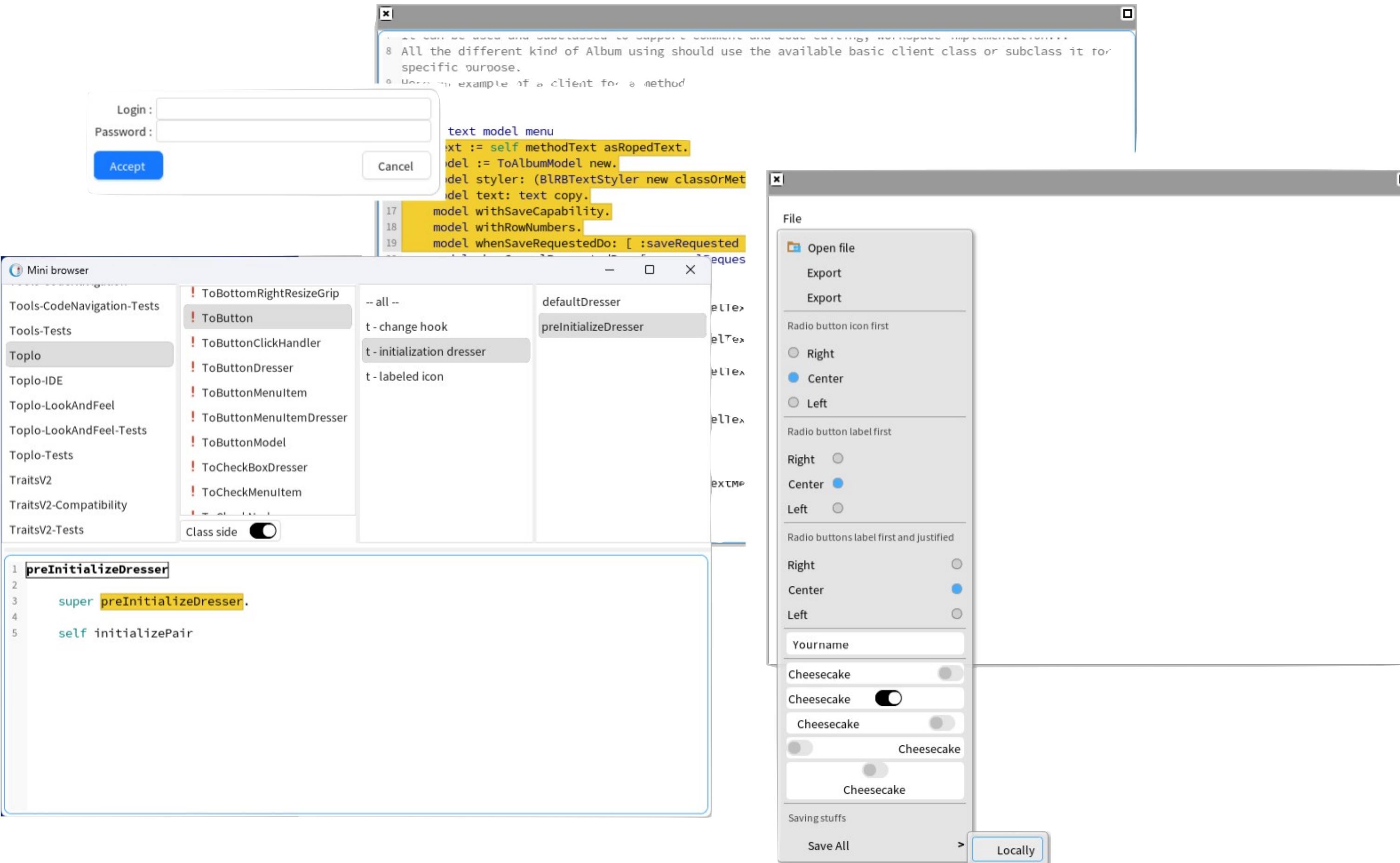
- Loadable from the menu in P12 & P13
- Compatible Versions for P11 / P12 / P13





Toplo

Widget Framework on Top of Bloc





Toplo

Widget Framework on Top of Bloc

- No New Revolutionary Concepts
 - Keep it Simple
 - Bloc has many of the features
 - Bloc + Element States and Skins
 - + 18 Widgets ready to use
 - Collaboration with

THALES



UBO

Université de Bretagne Occidentale



Toplo

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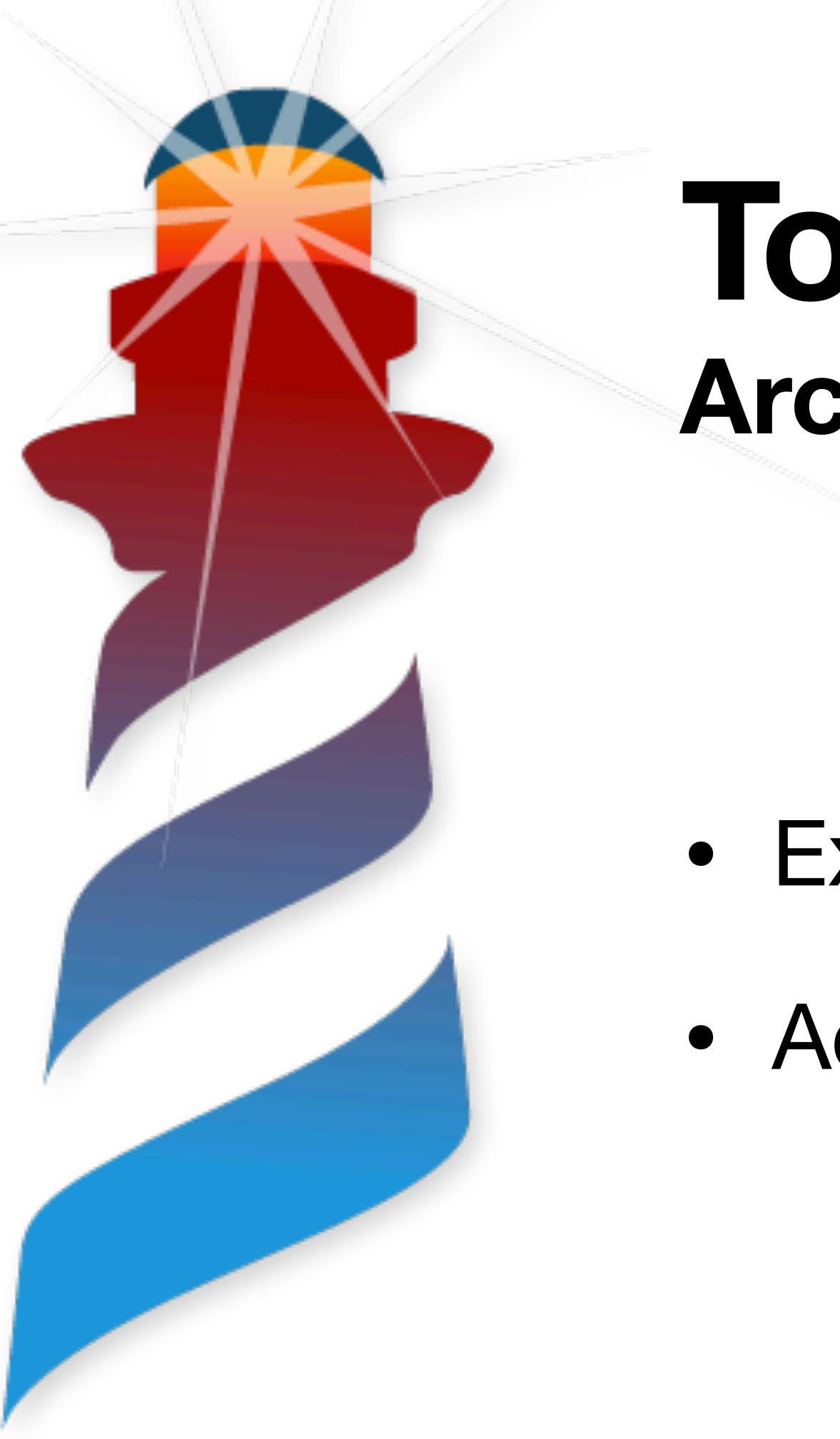
Widgets: 600 Classes
~ 3000 Methods
Core: 200 Classes ~
2000 Methods
Tests: +1000

THALES



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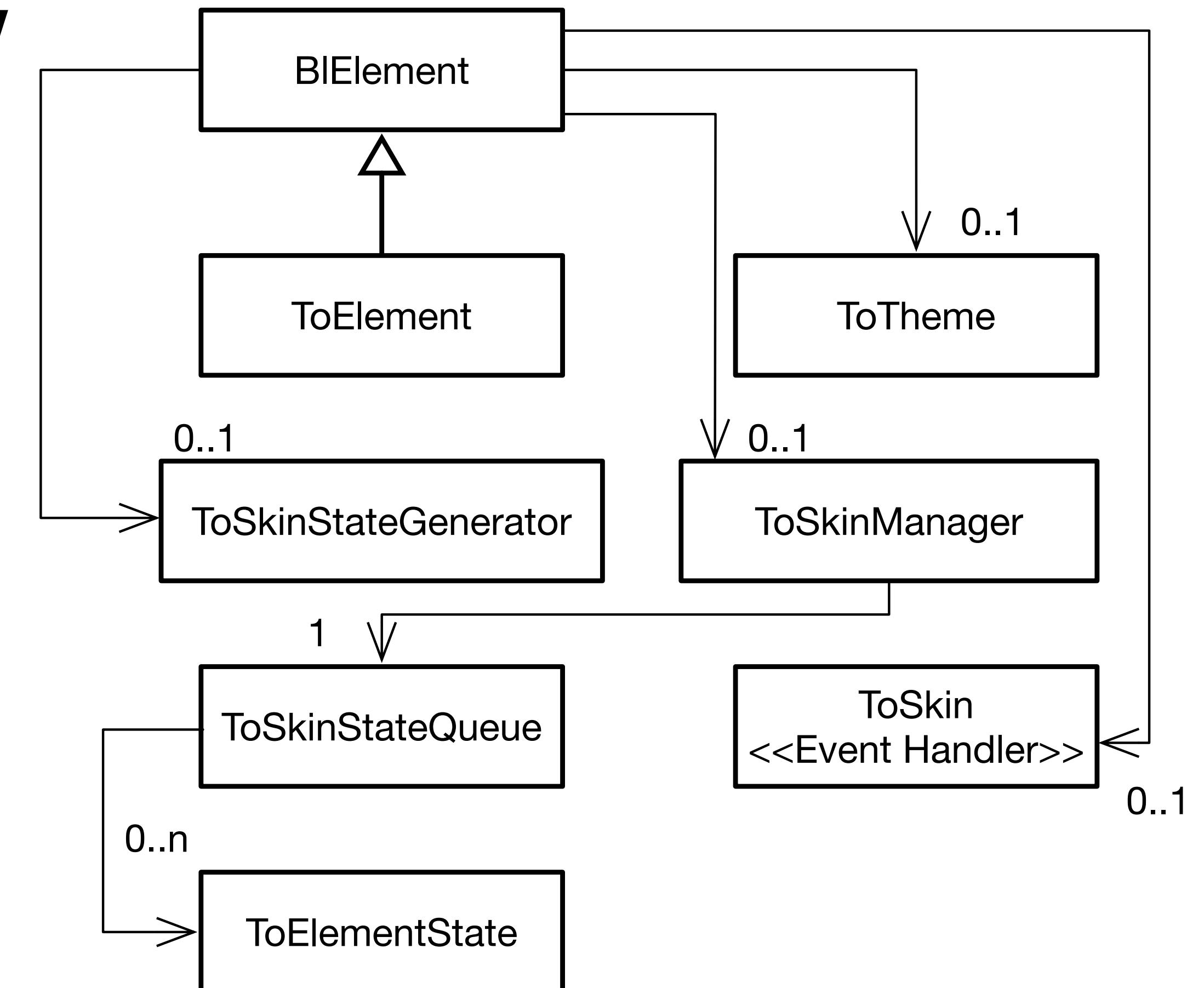
Université de Bretagne Occidentale

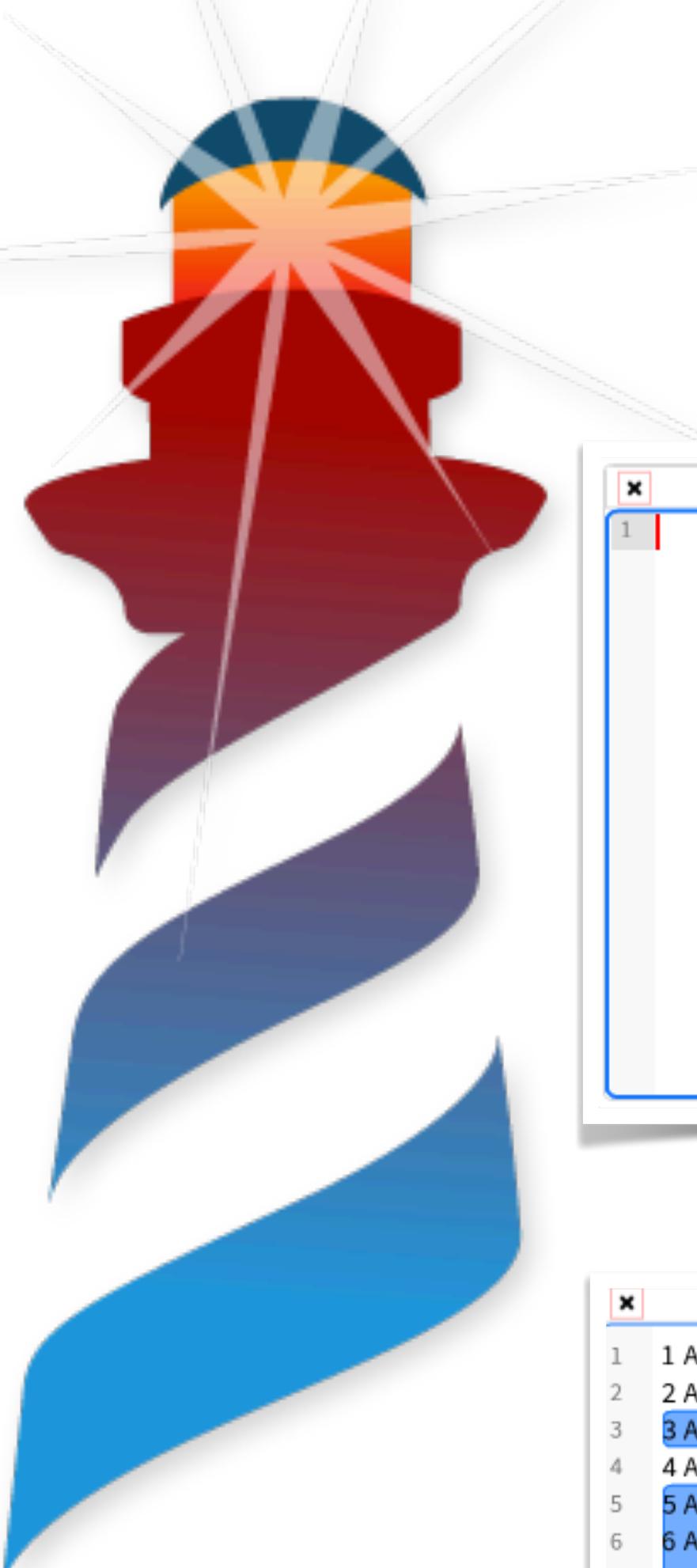


Toplo

Architecture Overview

- Extending Bloc
- Adding Skin & States





Beautiful and Powerful

Monday
Tuesday
Wednesday
Thursday
Friday

Here is a placeholder text visible only if the text is empty

1 AAAAAAAA
2 AAAAAAAA
3 AAAAAAAA
4 AAAAAAAA
5 AAAAAAAA
6 AAAAAAAA
7 AAAAAAAA
8 AAAAAAAA
9 AAAAAAAA
10 AAAAAAAA
11 AAAAAAAA
12 AAAAAAAA
13 AAAAAAAA
14 AAAAAAAA
15 AAAAAAAA

Inspect

Vertical Wrapping

Uniform element width

Scrolling

Auto-distribution

Animate selection transition

Select on mouse down

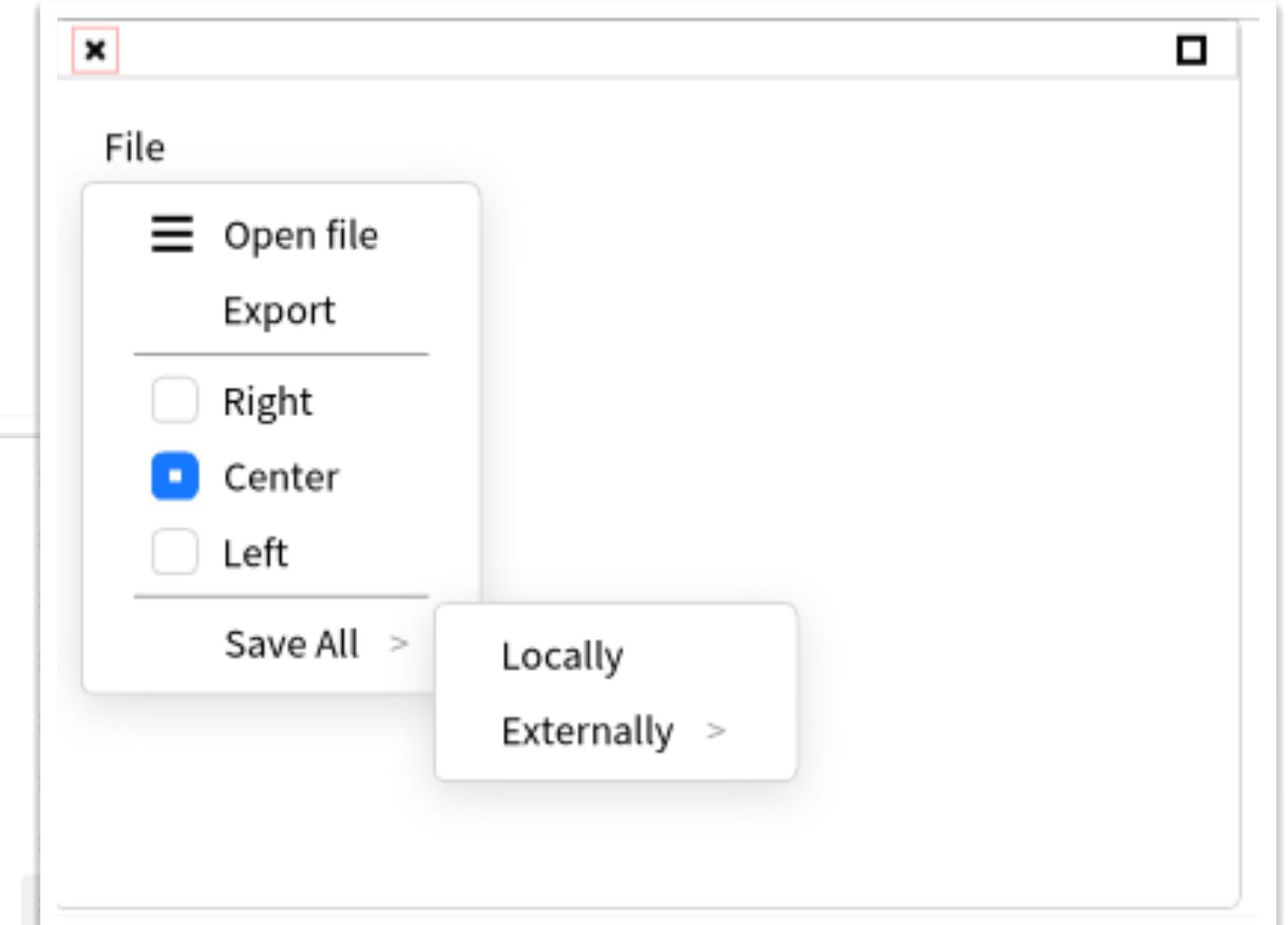
Selection mode

Multiple

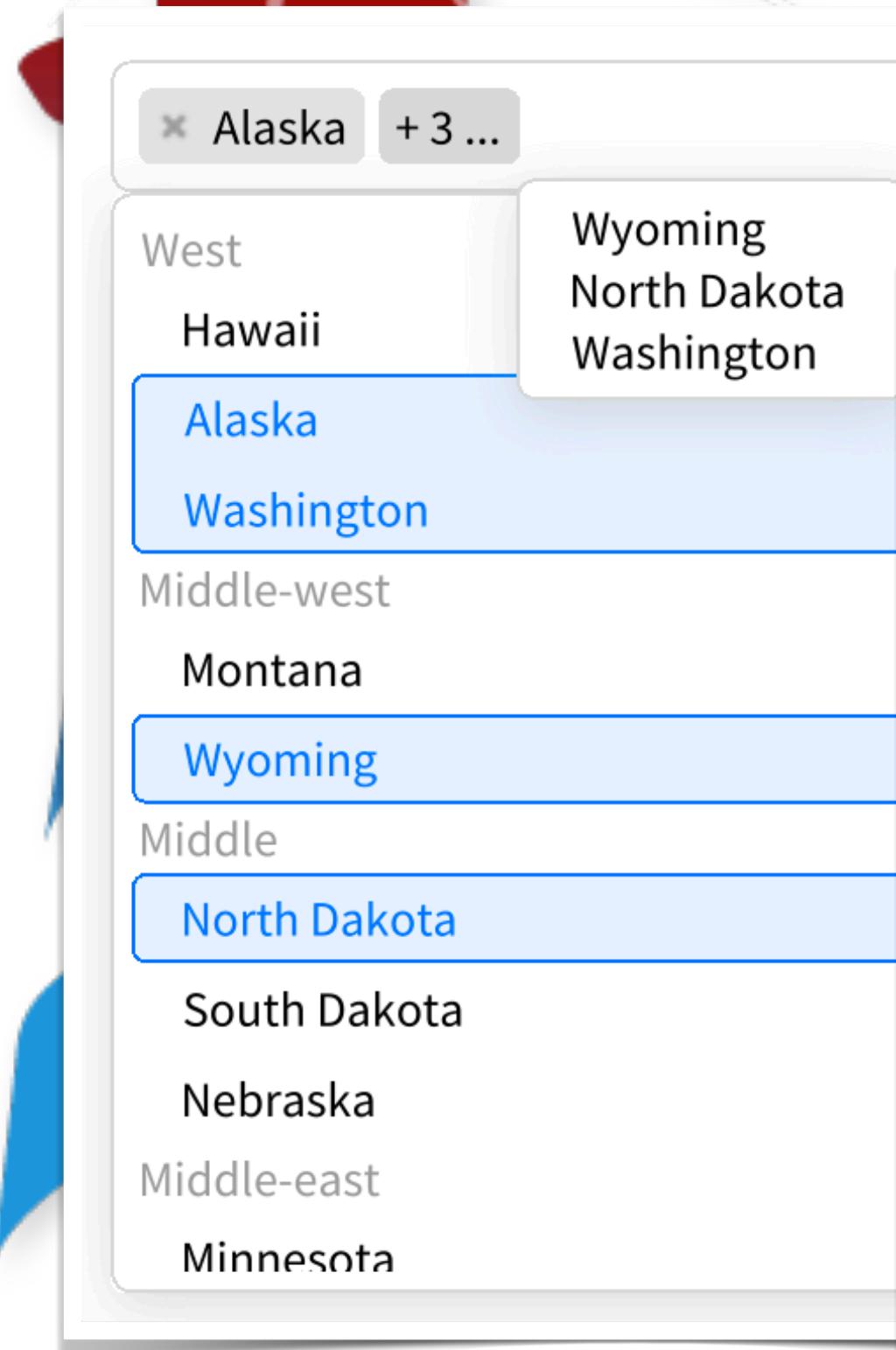
Single

Disabled

- * 1: Alabama
- * 3: Arizona
- * 5: California
- * 7: Connecticut
- * 9: Florida
- * 11: Hawaii
- * 13: Illinois Indiana
- * 15: Kansas
- * 17: Louisiana
- * 19: Maryland
- * 21: Michigan
- * 23: Mississippi
- * 25: Montana
- * 27: Nevada
- * 29: New Jersey
- * 31: New York
- * 33: North Dakota
- * 35: Oklahoma
- * 37: Pennsylvania Rhode Island
- * 38: South Carolina
- * 39: South Dakota
- * 40: Tennessee
- * 41: Texas
- * 42: Utah



Beautiful and Powerful (2)



```

1 example_CodeEditor
2
3 | text album menuBuilder |
4 text := self methodText asRopedText fontName: 'Source Code Pro'.
5 album := ToAlbum new.
6 album inspect.
7 album styler: (BlPharoCodeStyler new
8   classOrMetaClass: self class;
9   yourself).
10 album text: text copy.
11 album withSaveCapability.
12 album withRowNumbers.
13 album whenSaveRequestedDo: [ :saveRequested ]
14   saveRequested accepted: true ].
15 album whenCancelRequestedDo: [ :cancelRequested ]
16   cancelRequested client text: text copy ].
17
18 menuBuilder := [ :menu :request |
19   | element |
20   element := request currentTarget.
21   menu addItem: (ToMenuItem new
22     labelText: 'Select all';
23     whenClickedDo: [ :event |
24       element selector
25         all;
26         apply ];
27         yourself).
28   menu addItem: (ToMenuItem new
29     labelText: 'Copy';
30     whenClickedDo: [ :event |
31       element editor copySelected ];
32         yourself).
33   menu addItem: (ToMenuItem new
34     labelText: 'Cut';

```

Mini browser

```

1 BaselineOfToplo
2 Toplo
3 Toplo-Demo
4 Toplo-Examples
Imported-Icons-
Imported-Icons-
Incubator
Tests
Theme
Theme-Bee
Theme-Bee-Test

```

idePlaceholder

```

e ph |
ph := ToElementWithPlaceholderForTest new size: 100 asPoint.
rawPlaceholderBuilder: [ :thePlaceholder :theElement |
thePlaceholder addChild: (BlElement new id: #child) ].
showPlaceholder.
ph := e currentPlaceholderLayer.
self assert: ph notNil.
self assert: ph parent identicalTo: e.
hidePlaceholder.
self assert: e currentPlaceholderLayer isNil.
self assert: ph parent isNil.

```

```

1 ManifestToploDem
2 TToElementWithCo
3 TToElementWithLa
4 TToElementWithPl
5 TToElementWithTc
6 TToEnableableTes
7 TToLookEventListe
8 TToOrientableTest
9 TToStyleRulesHol
10 ToAdjacentRectangl
11 ToAnchorEventHar

```

```

1 -- all --
2 tests

```

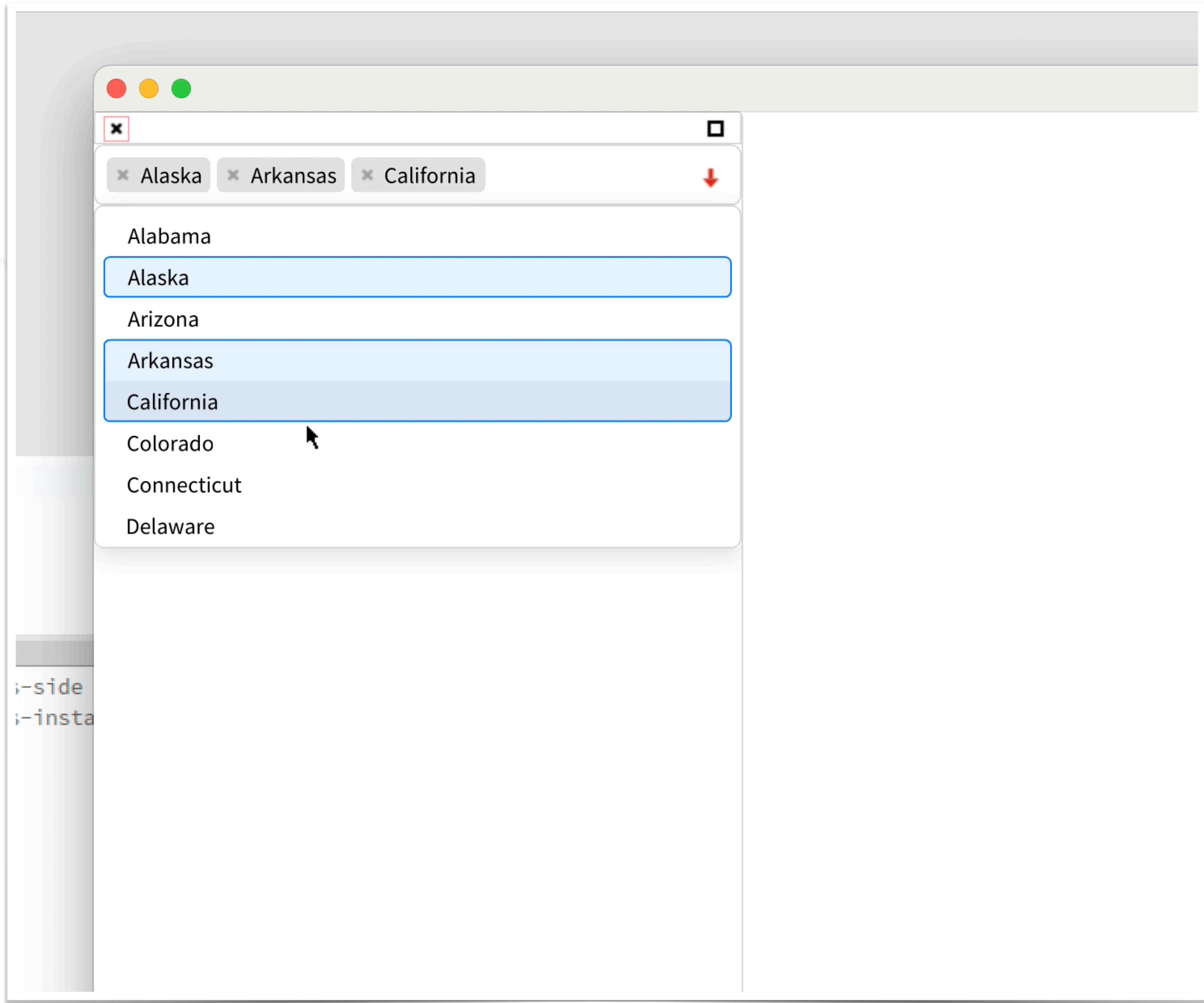
```

1 testCurrentPlaceholder
2 testHidePlaceholder
3 testIsShowingPlaceholder
4 testNewPlaceholder
5 testPlaceholderBuilder
6 testPlaceholderClass
7 testPlaceholderElevation
8 testPlaceholderText
9 testPlaceholderText2
10 testRawPlaceholderBui
11 testShowPlaceholder

```

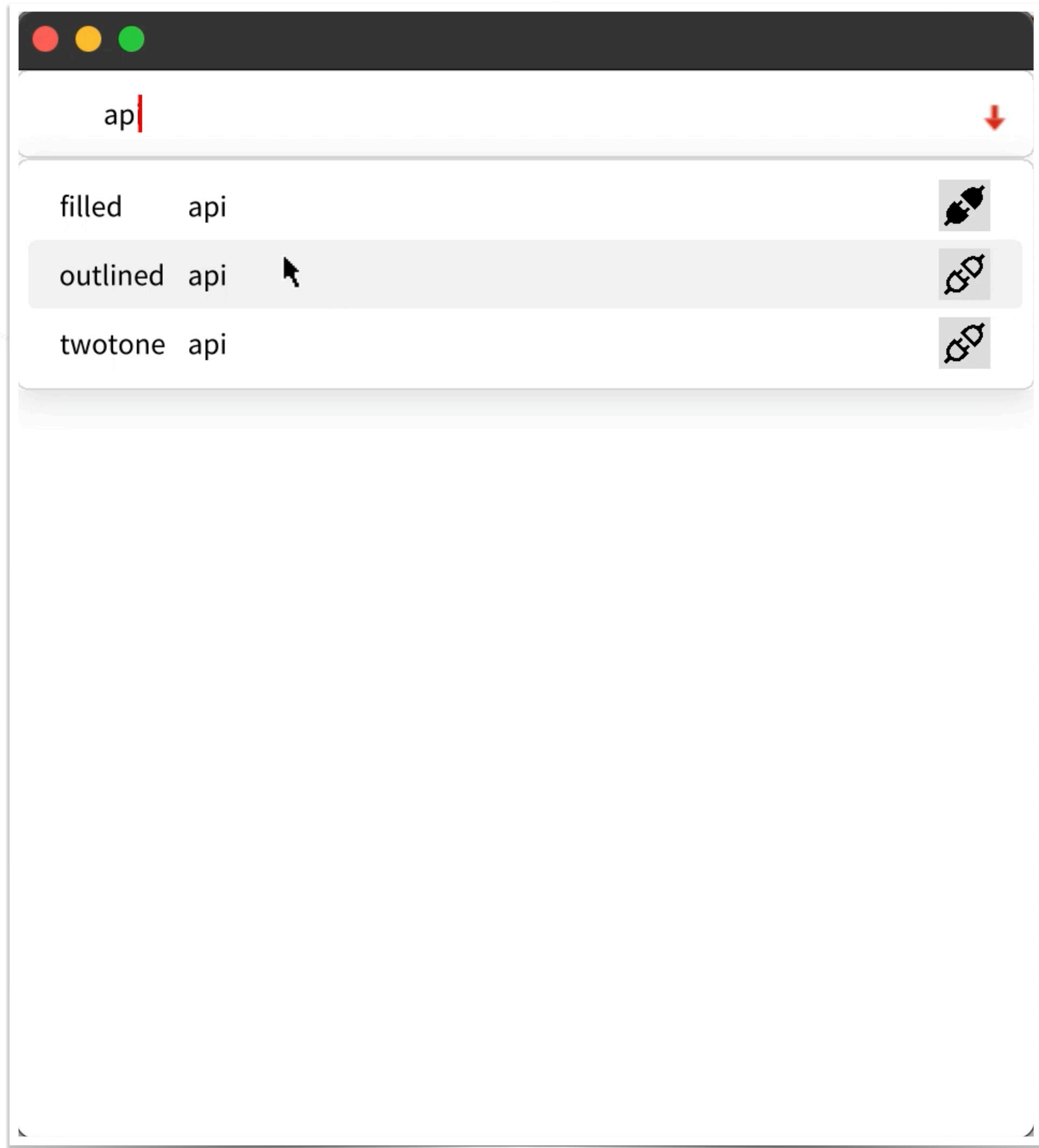


Toplo





Toplo





Toplo

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Multiple

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- * 1: Alabama * 2: Alaska * 3: Arizona * 4: Arkansas * 5: California * 6: Colorado
- * 7: Delaware * 8: Florida * 9: Georgia * 10: Hawaii * 11: Idaho
- * 12: Illinois Indiana * 13: Kansas * 14: Kentucky * 15: Louisiana * 16: Maine
- * 17: Maryland * 18: Massachusetts * 19: Michigan * 20: Minnesota
- * 21: Mississippi * 22: Missouri * 23: Montana * 24: Nebraska * 25: Nevada
- * 26: New Hampshire * 27: New Jersey * 28: New Mexico * 29: New York
- * 30: North Carolina * 31: North Dakota * 32: Ohio * 33: Oklahoma * 34: Oregon
- * 35: Pennsylvania Rhode Island * 36: South Carolina * 37: South Dakota
- * 38: Tennessee * 39: Texas * 40: Utah * 41: Vermont * 42: Virginia
- * 43: Washington * 44: West Virginia * 45: Wisconsin * 46: Wyoming



Based in ANT Design



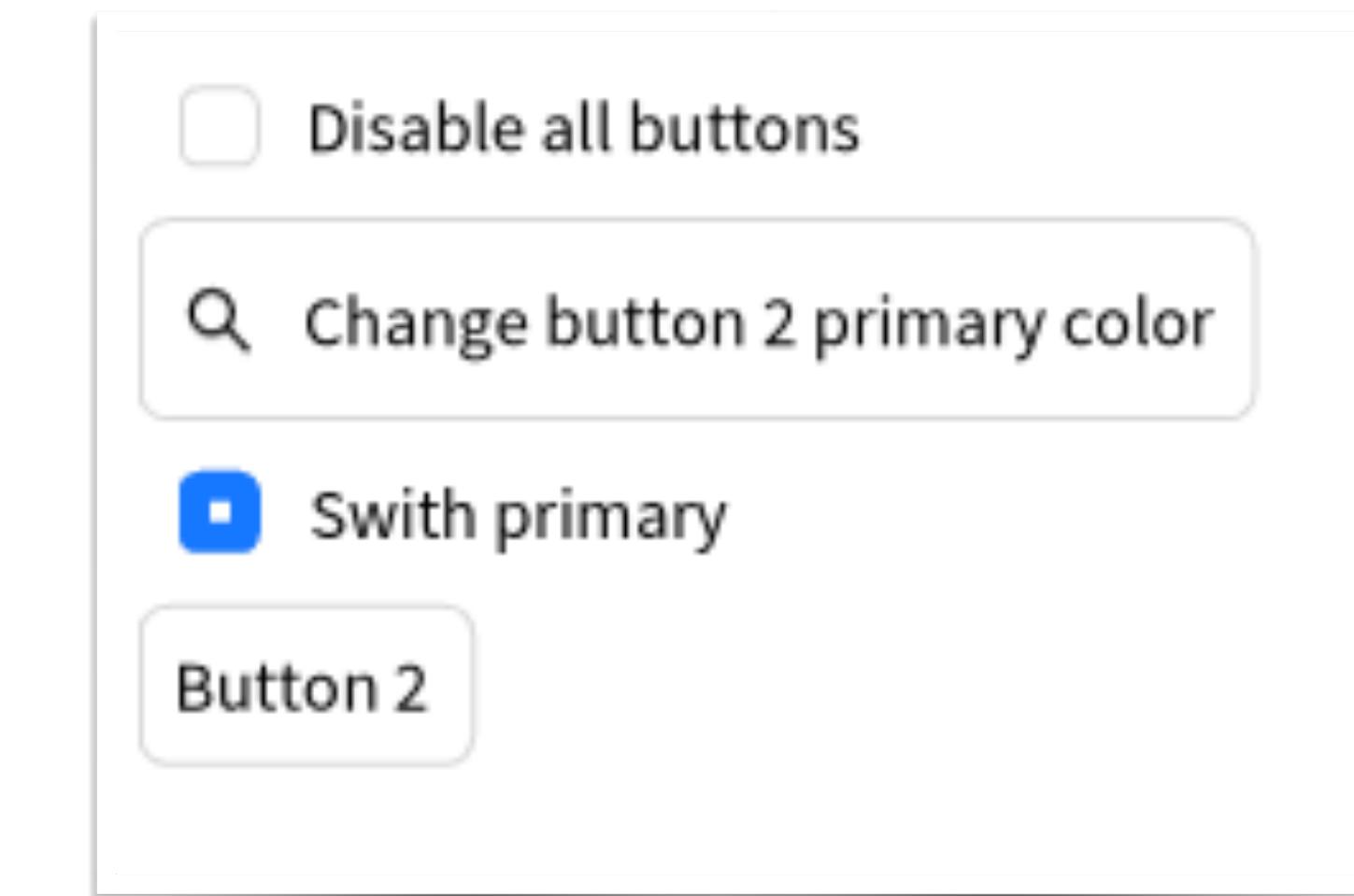
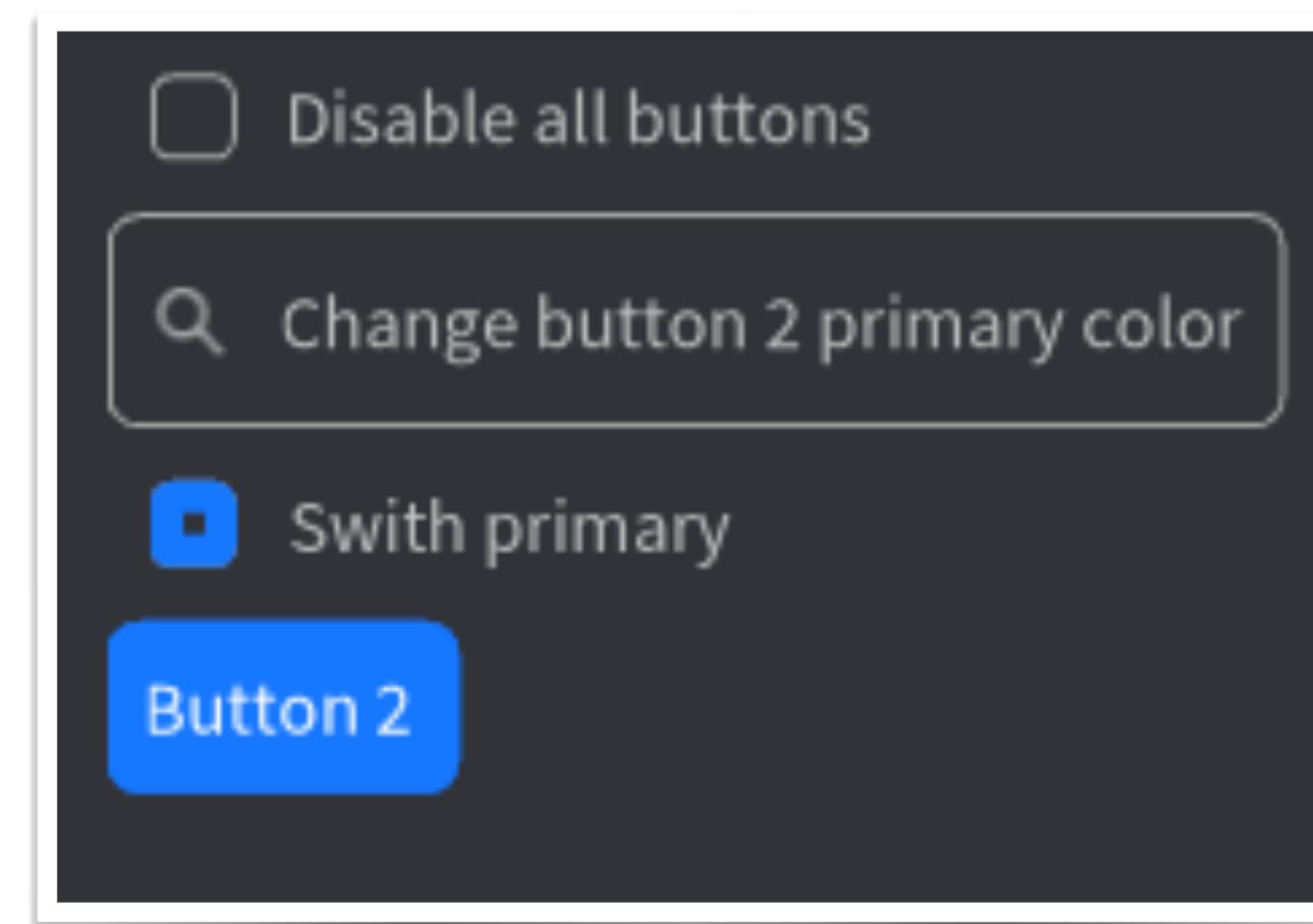
<https://ant.design/>

- Rich Components
- UI / UX Designed
- Validated design values & guidelines
- Intended for Theming and Customization



What is a Skin in Toplo?

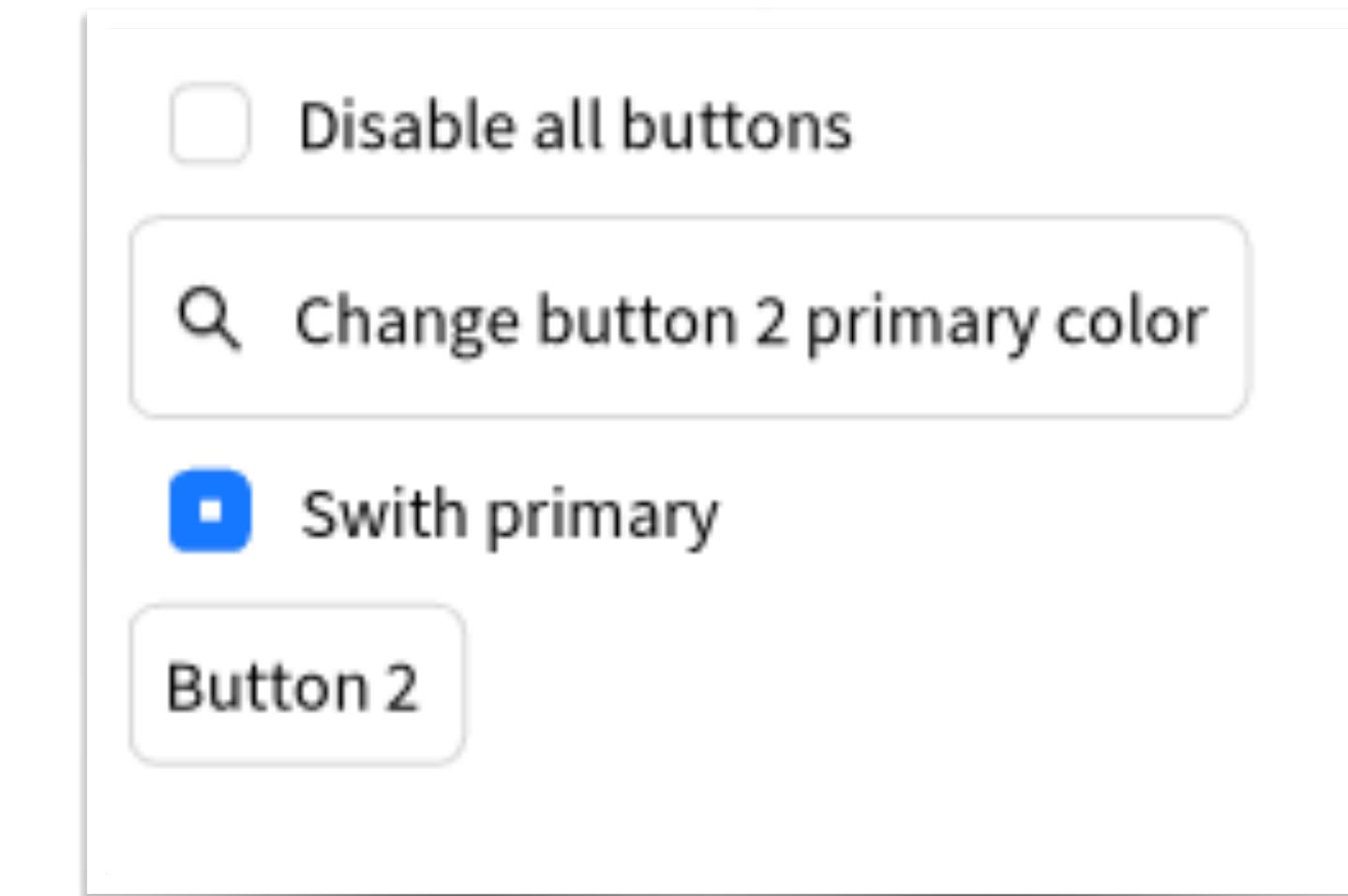
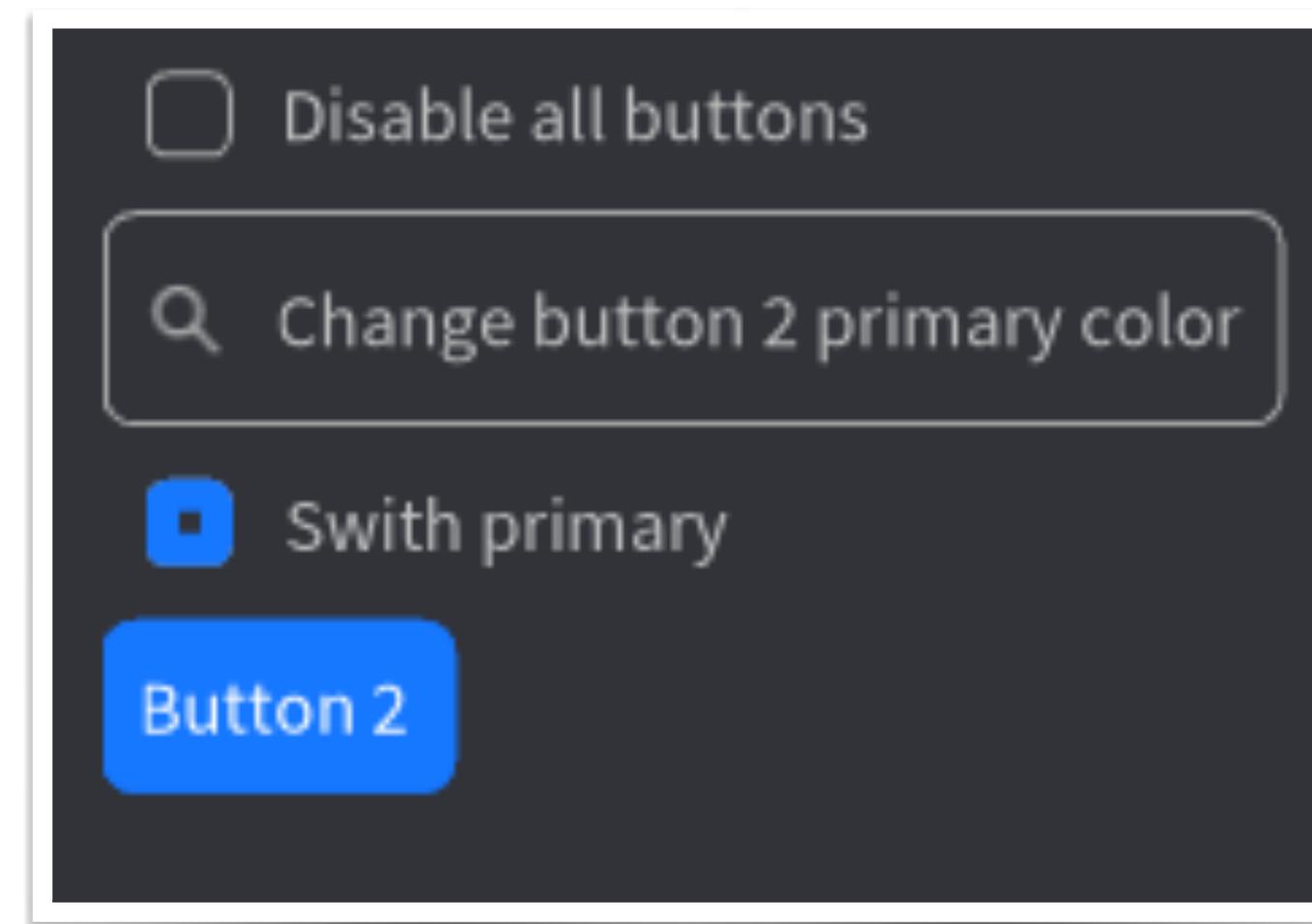
- Adapt properties of BIElements
 - Visual (background, border, font, ...)
 - Structural (Layout, alignment, margin, padding)
 - Composition (Adding / Removing Children)





When adaptations occur?

- On Skin Installation / Uninstallation
- On state changes
 - Hovered, pressed, leave, ...
 - Checked, enabled, selected, ...

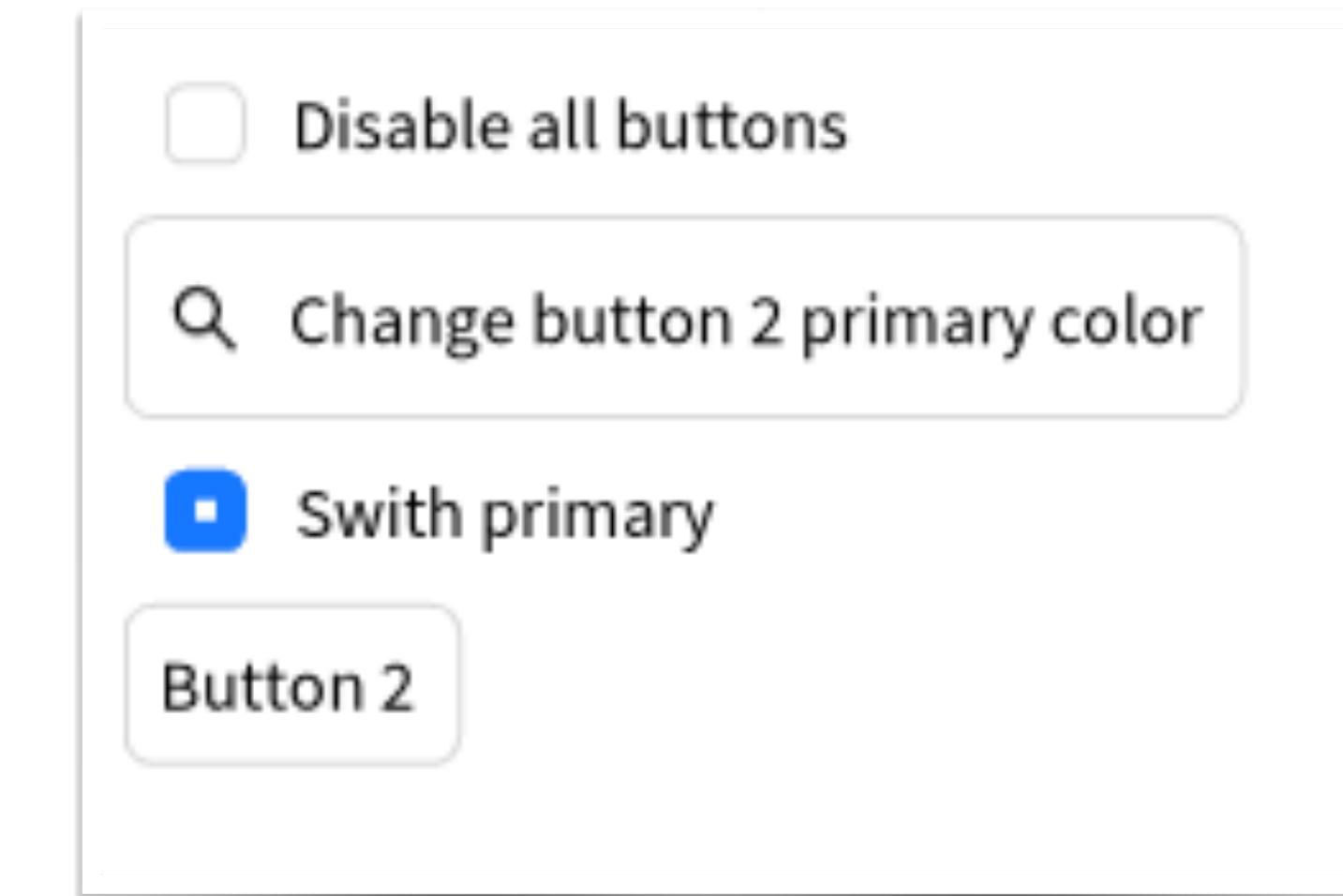
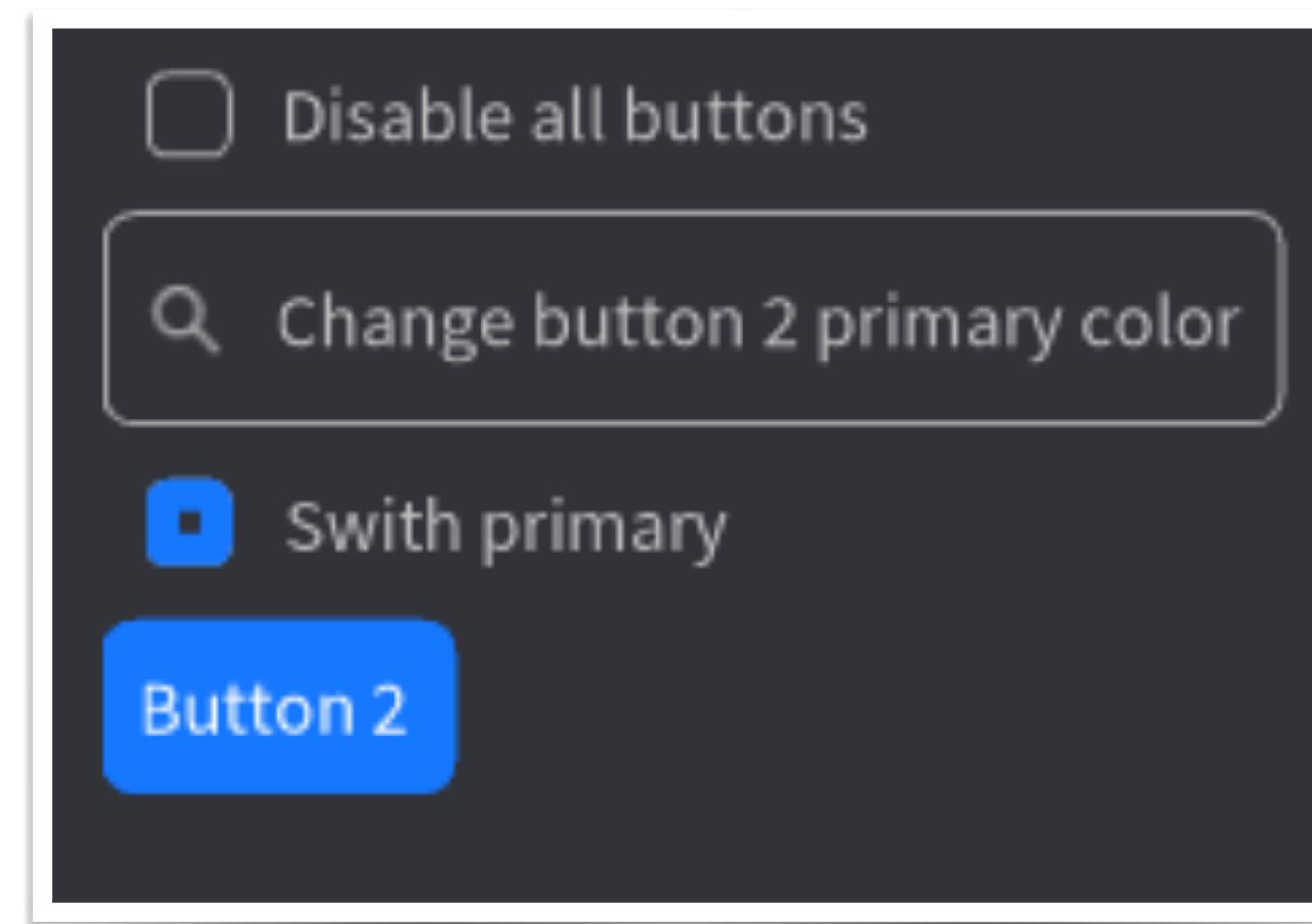




When adaptations occur?

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**Driven by Events.
A skin is a event
handler**



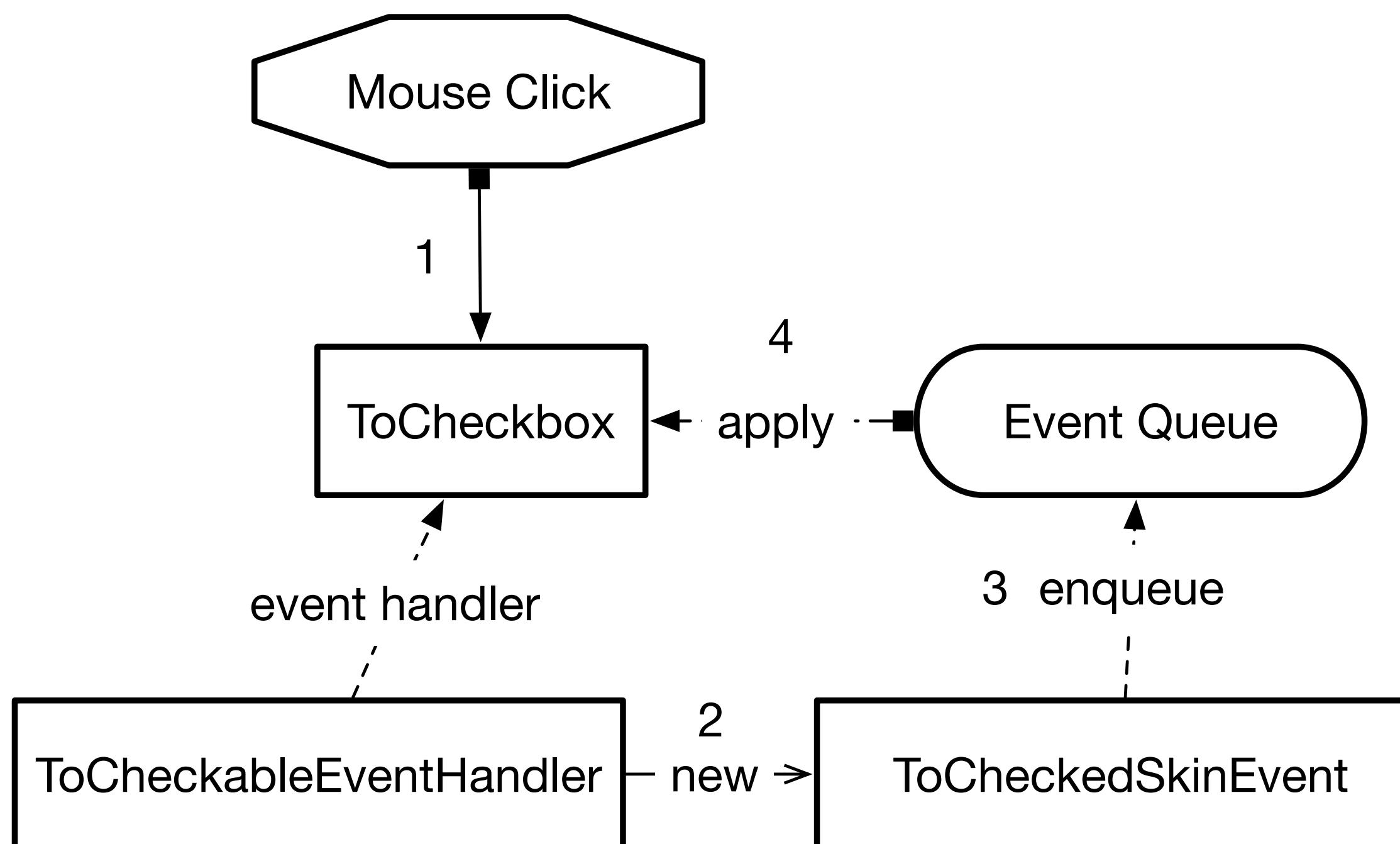


Element State

- Dynamically created
- 3 Kinds of States
 - Skin Management (Install / Uninstall)
 - Intrinsic States (checked, selected, focused, ...)
 - Transient States (Hovered, leave, enter, ...)
- Skin contributes new states (ToSkinStateGenerator)



Element State Generation



- Extends Bloc Events
- Events are handled in the correct rendering stage



Toplo StyleSheets

Declarative Skins

- A nice script version
- CSS Like rules

script = rule*

rule = selector property*

property = event_class property value

```
self
select: ToPane asTypeSelector || (self id: #'space-root')
style: [
  self
    write: (self property: #background)
    with: Color blue ]
```

Still in
Development



Toplo - Spec

The power of Toplo, the ease of Spec

Rewrite Basic Editor

Search for:

```
(`@receiver collect: `@arg) flattened
```

Replace with:

```
`@receiver flatCollect: `@arg
```

Help:

- The rule is for a method?
- [? More help](#)

Definitions:

- ` = meta var
- @ = list
- ` = recurse into
- . = statement
- # = literal

Actions:

- Transform all classes
- Transform selected classes
- Find occurrences
- Open Match Tool
- Load an example rule

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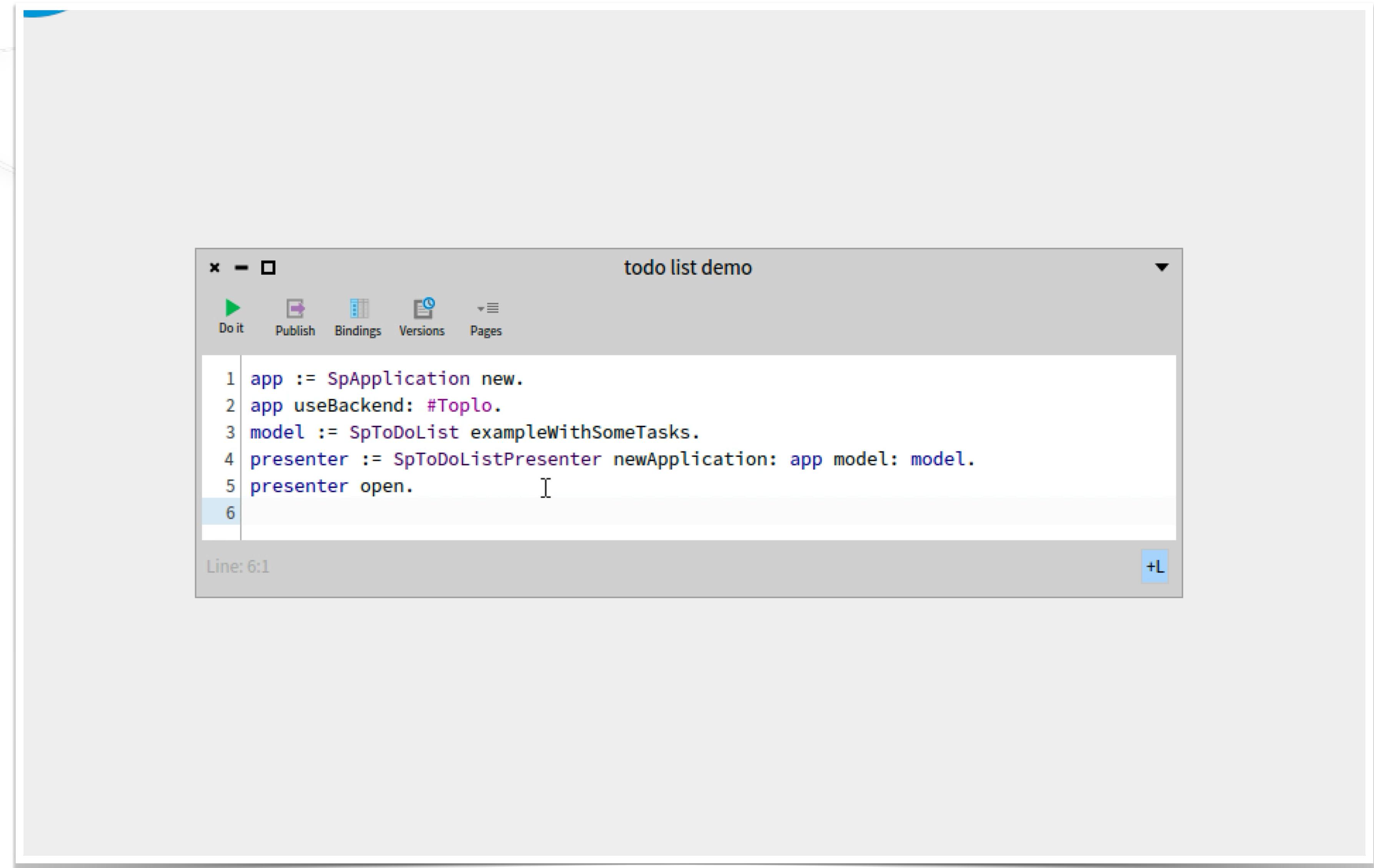
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Toplo & Spec



The screenshot shows a software interface titled "todo list demo". At the top, there is a toolbar with icons for "Do it", "Publish", "Bindings", "Versions", and "Pages". Below the toolbar is a code editor window containing the following Groovy code:

```
1 app := SpApplication new.  
2 app useBackend: #Toplo.  
3 model := SpToDoList exampleWithSomeTasks.  
4 presenter := SpToDoListPresenter newApplication: app model: model.  
5 presenter open.  
6
```

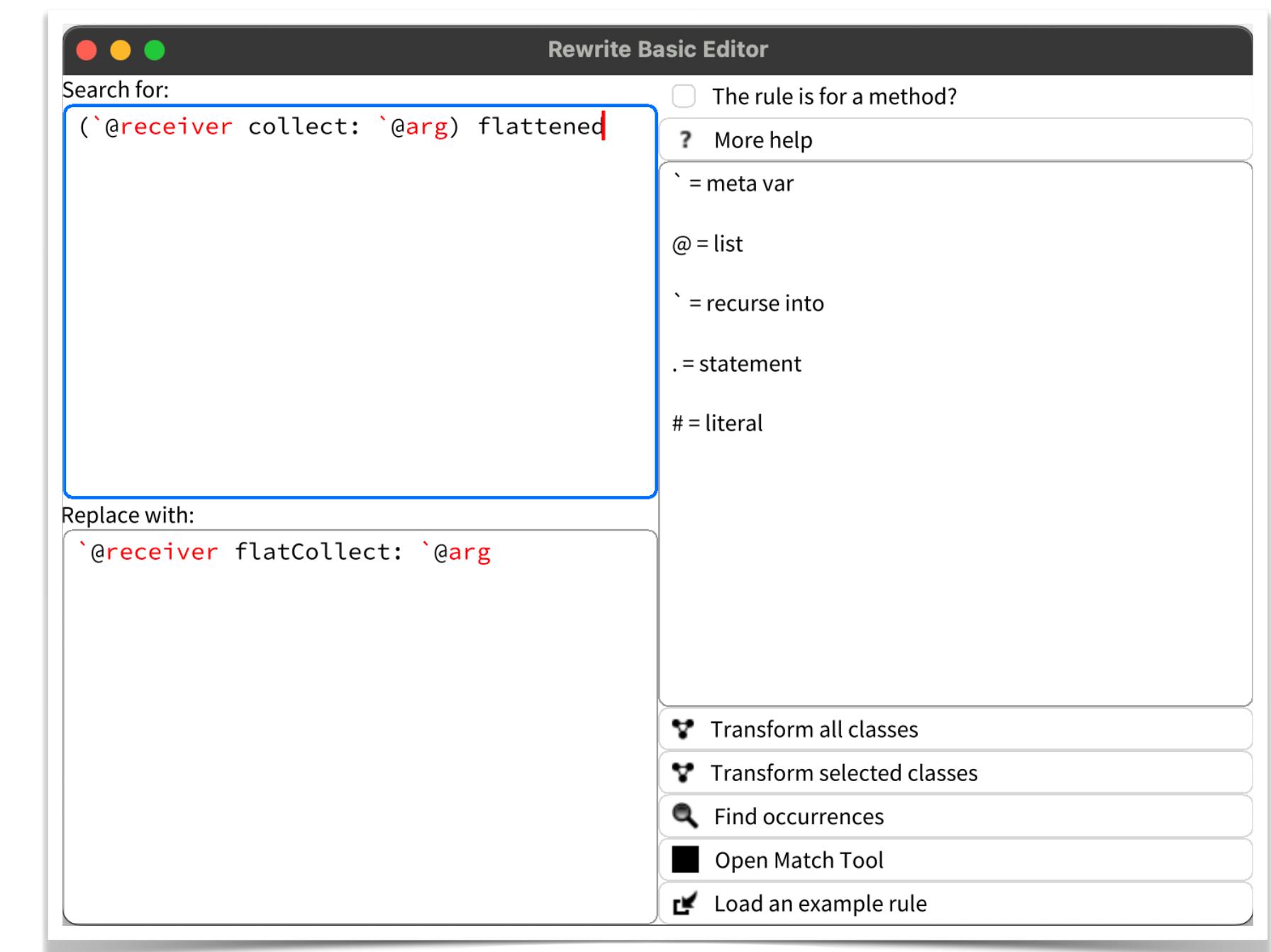
The status bar at the bottom of the code editor displays "Line: 6:1".



Toplo - Spec

The power of Toplo, the ease of Spec

- A new Backend for Spec
- Transparent
- Full support

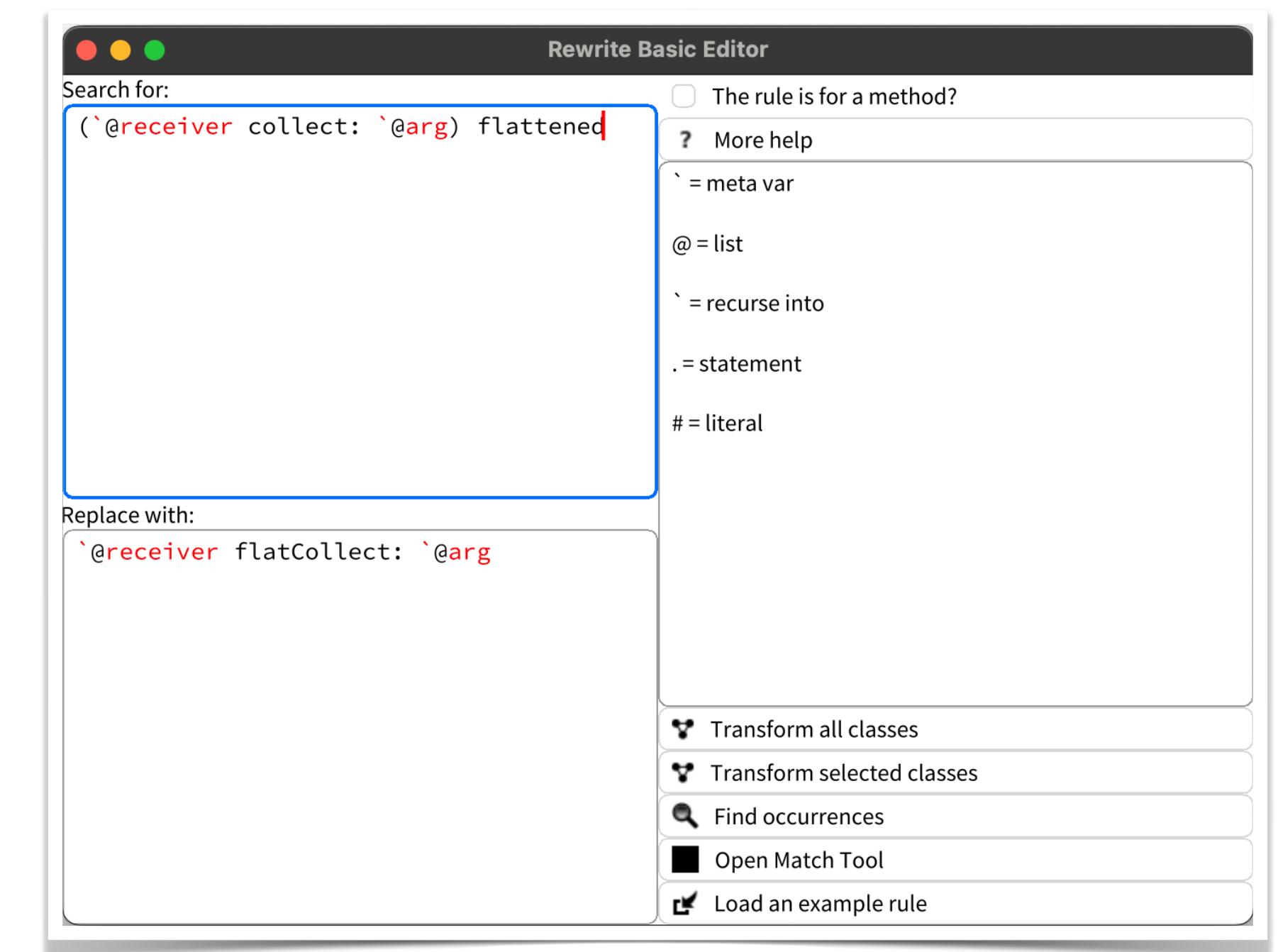




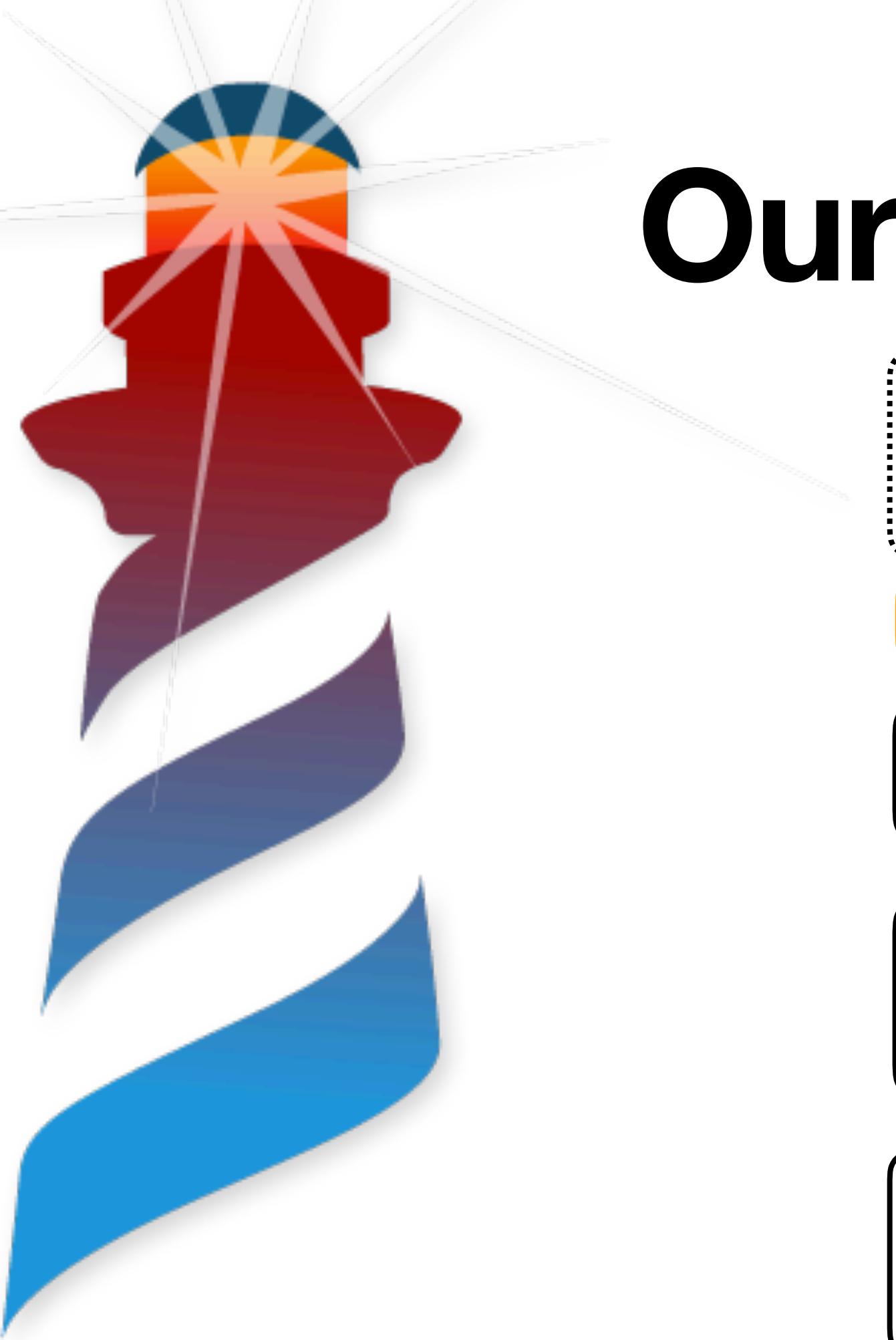
Toplo - Spec

The power of Toplo, the ease of Spec

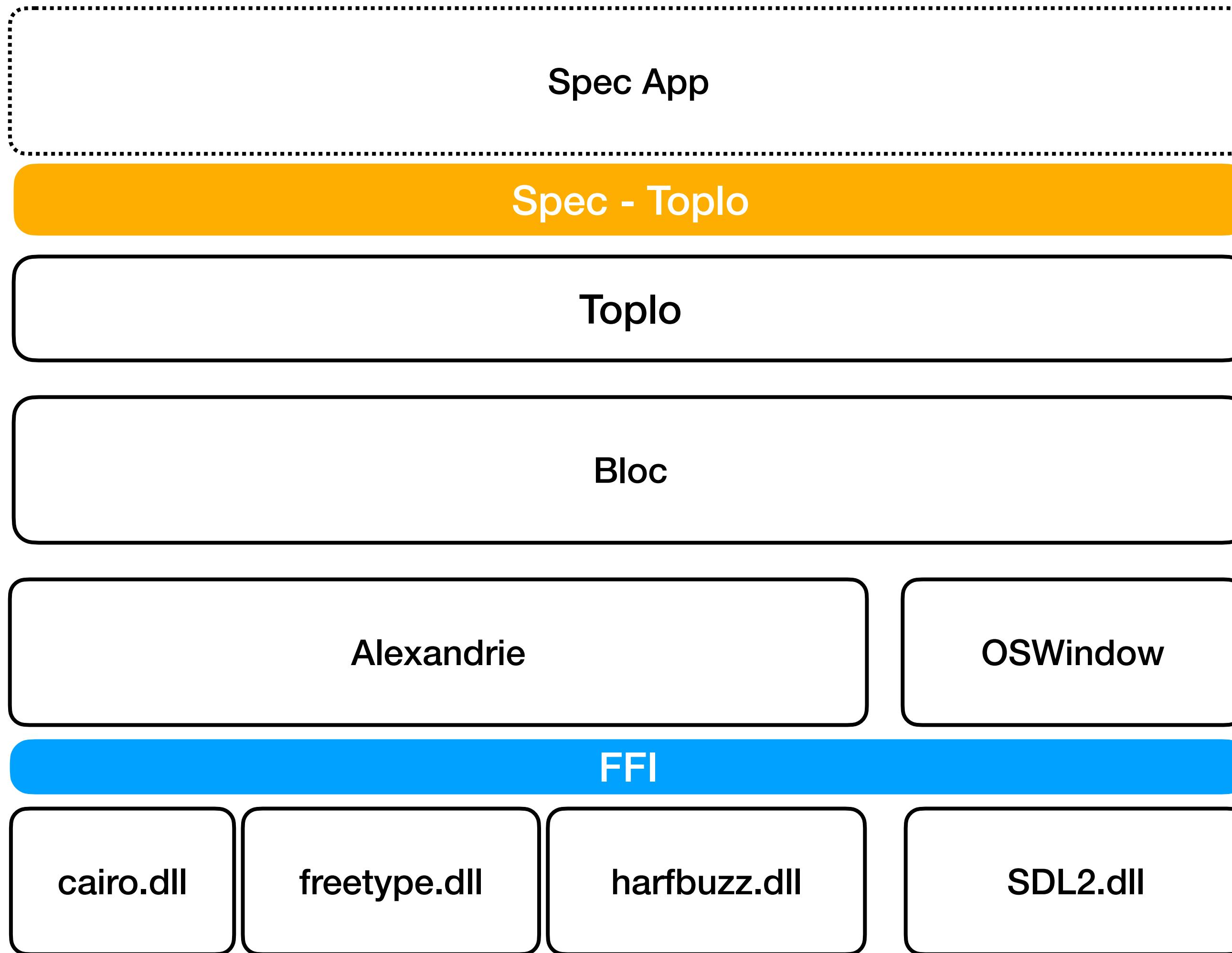
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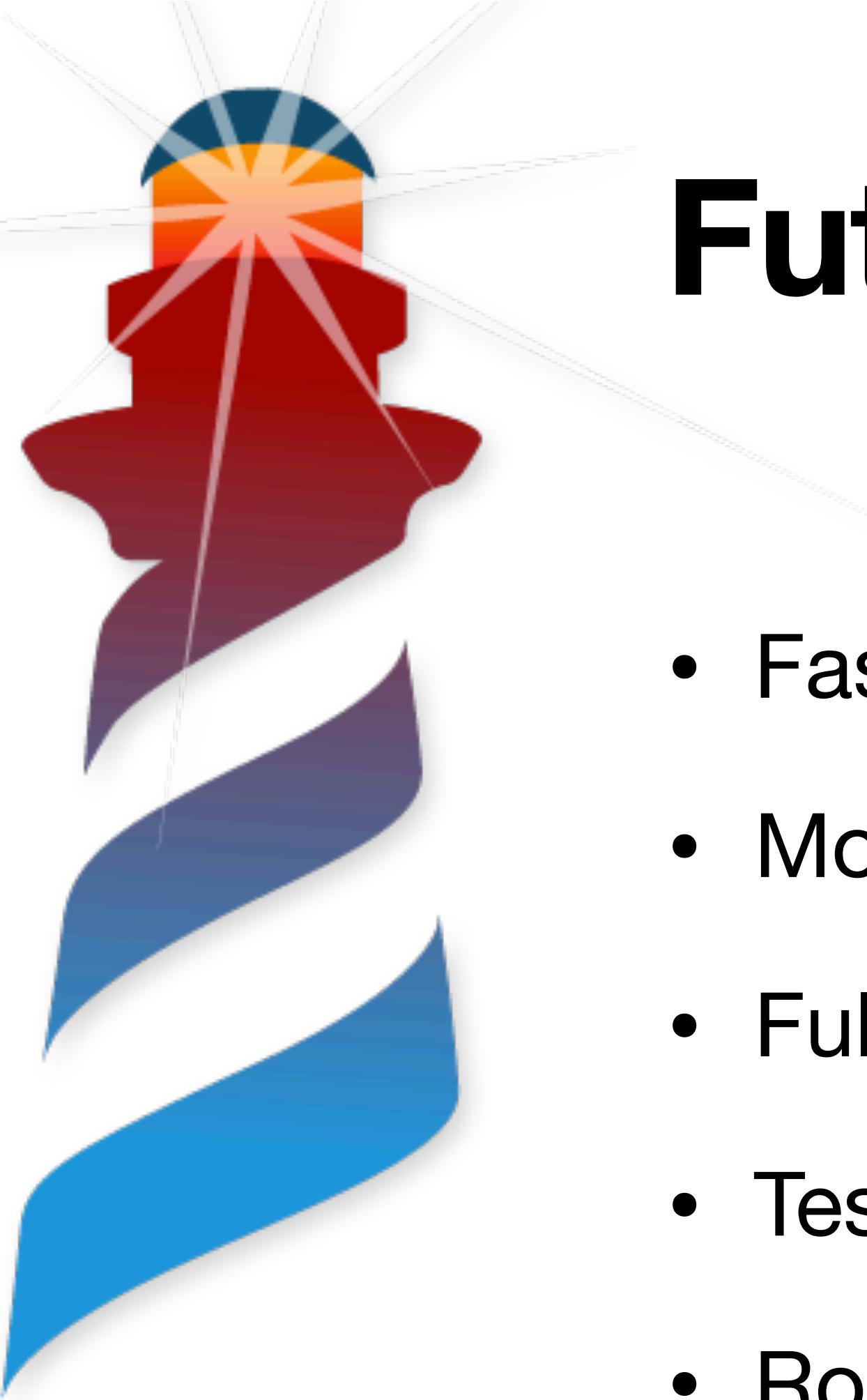


Still in
Development



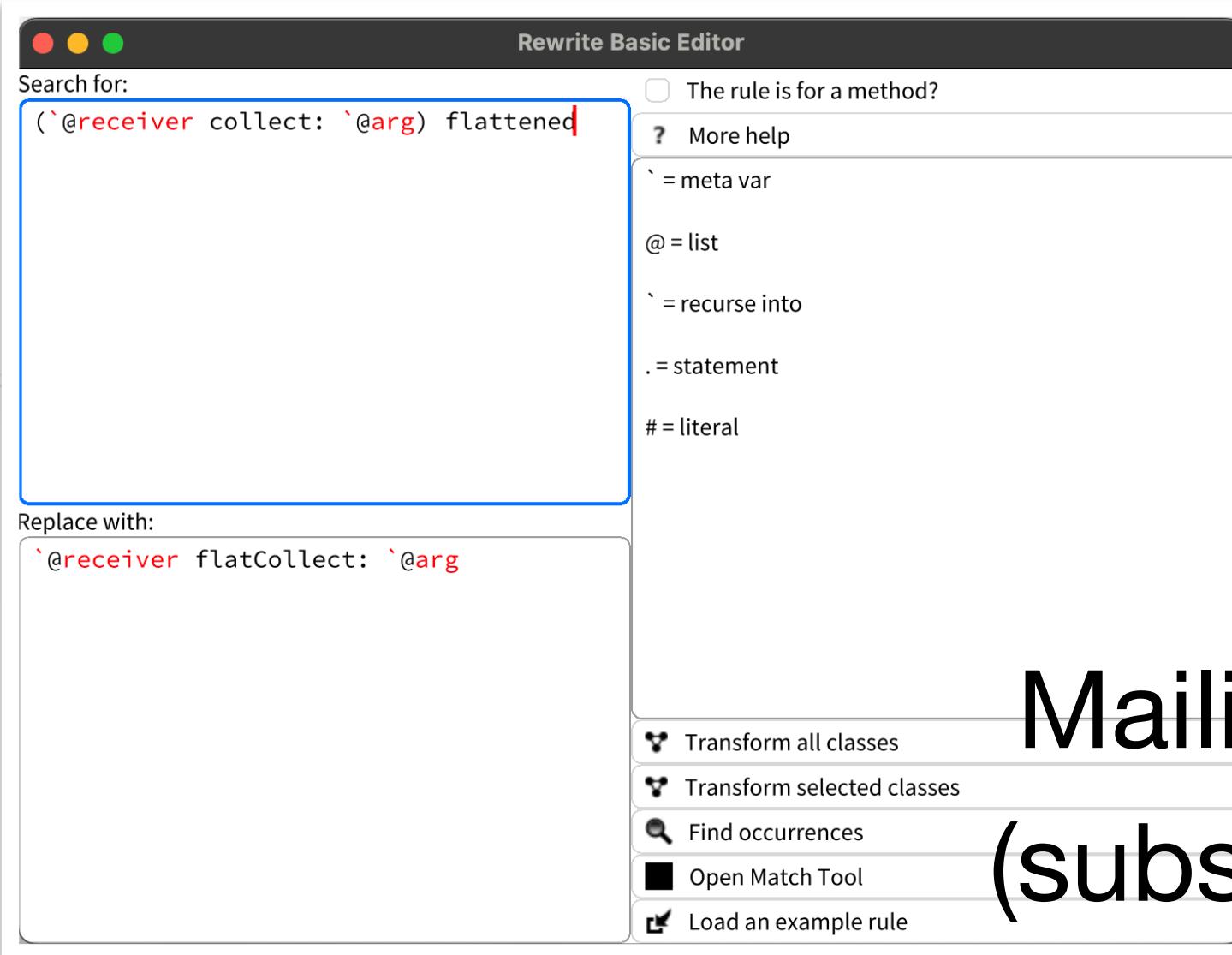
Our Application Stack





Future

- Faster & More Stable Bloc
- More Widgets in Toplo (Tables / Trees)
- Full Implementation of Spec-Toplo
- Tests & Documentation
- Roassal in Bloc



STAY
TUNED!

Mailing-list: lse-openbloc@inria.fr
(subscribe at: <http://sympa.inria.fr>)

Discord: Pharo server / #bloc channel

Bloc: <https://github.com/pharo-graphics/Bloc>

Toplo: <https://github.com/pharo-graphics/Toplo>

Spec-Toplo: <https://github.com/pharo-graphics/Spec-Toplo>

The screenshot shows the Mini browser with a list of classes on the left and a list of tests on the right. The class `TToElementWithPlaceholder` is selected. On the right, the test `testHidePlaceholder` is selected, showing its source code:

```

1 testHidePlaceholder
2
3 | e ph |
4 e := TToElementWithPlaceholderForTest new size: 100 asPoint.
5 e rawPlaceholderBuilder: [ :thePlaceholder :theElement |
6   thePlaceholder addChild: (BlElement new id: #child) ].
7 e showPlaceholder.
8 ph := e currentPlaceholderLayer.
9 self assert: ph notNil.
10 self assert: ph parent identicalTo: e.
11 e hidePlaceholder.
12 self assert: e currentPlaceholderLayer isNil.
13 self assert: ph parent isNil.

```



THALES

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