

What's New in Auto Layout

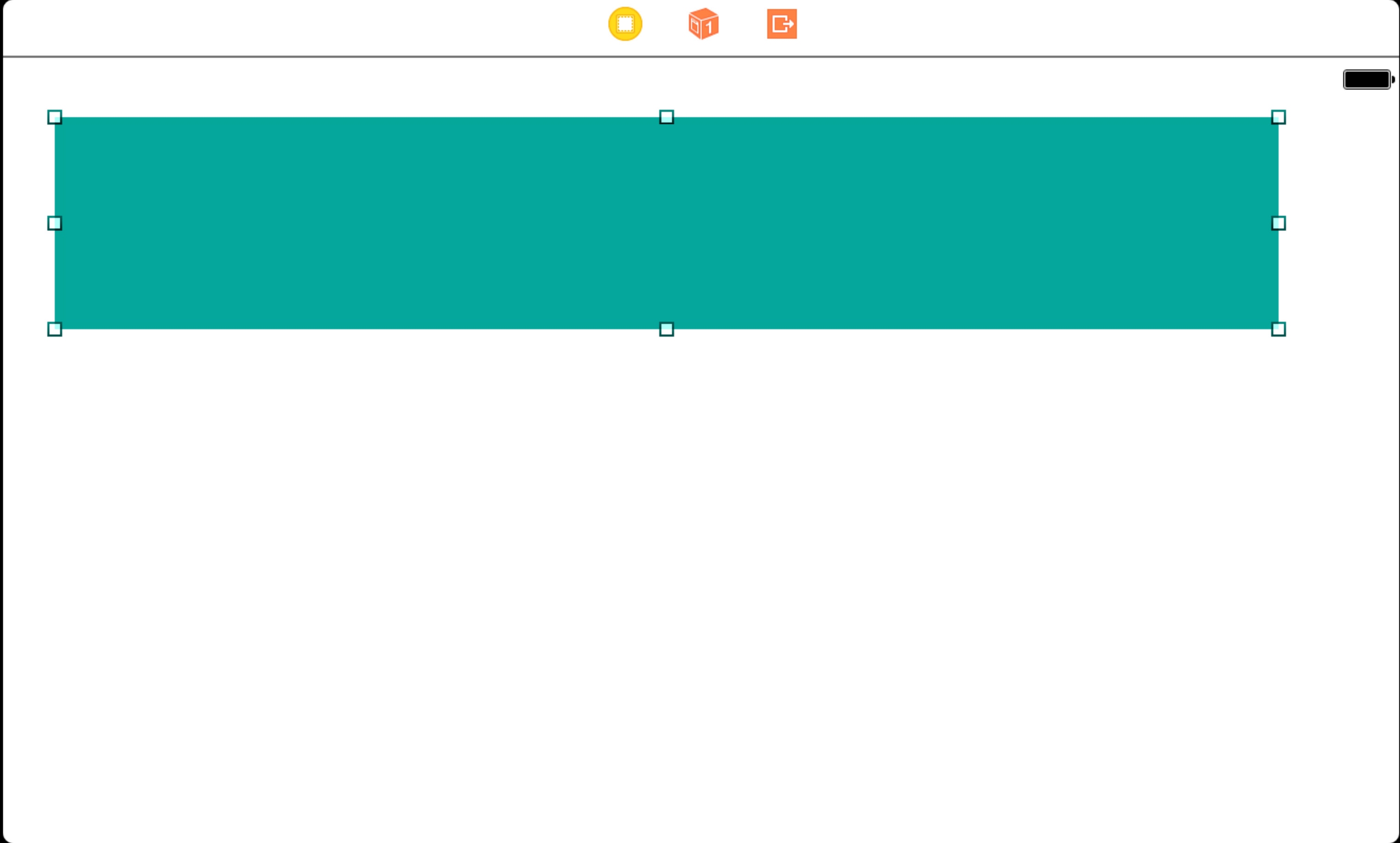
Session 236

Jason Yao Interface Builder Engineer

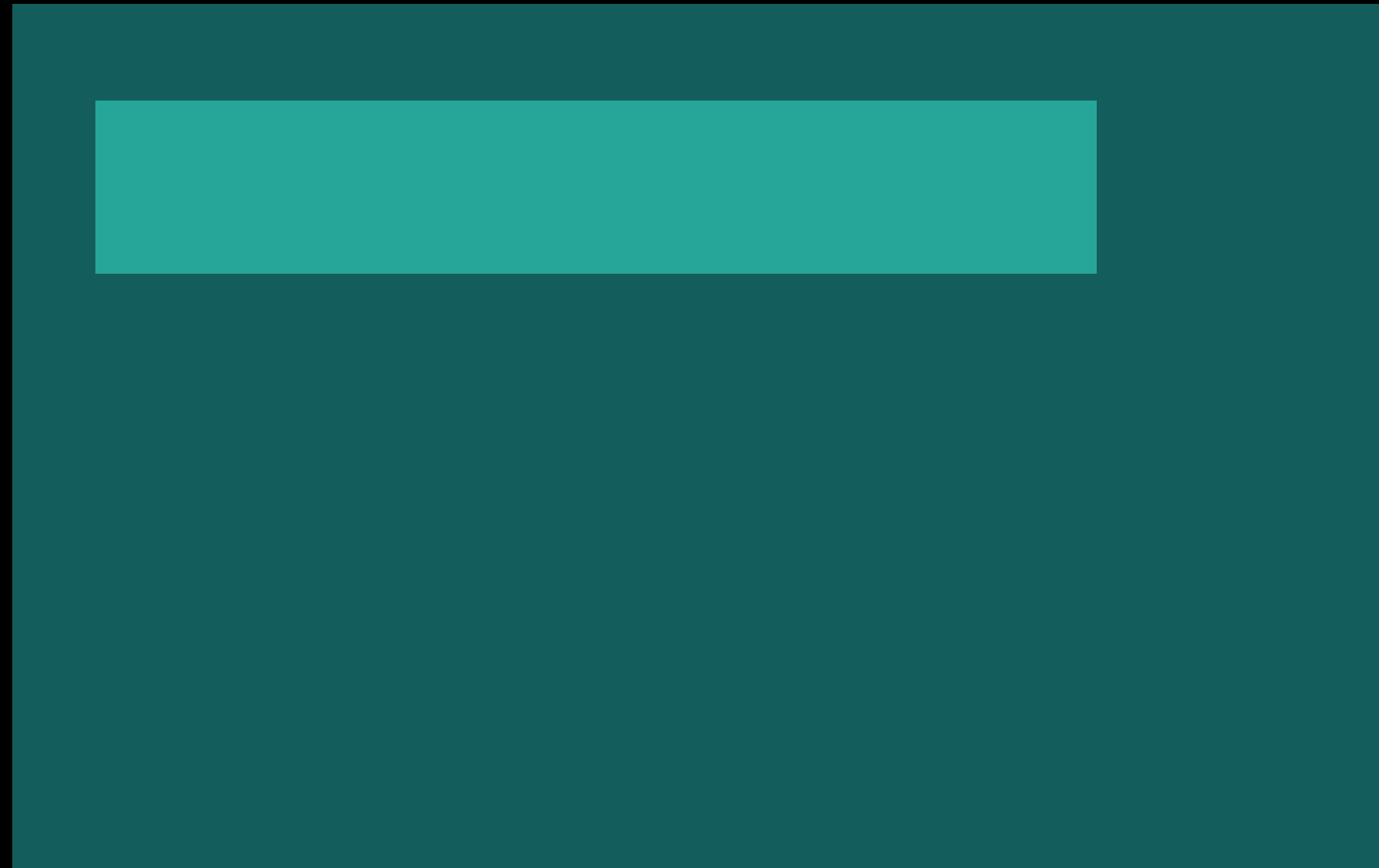
Jesse Donaldson AppKit Engineer

Marian Goldeen UIKit Engineer

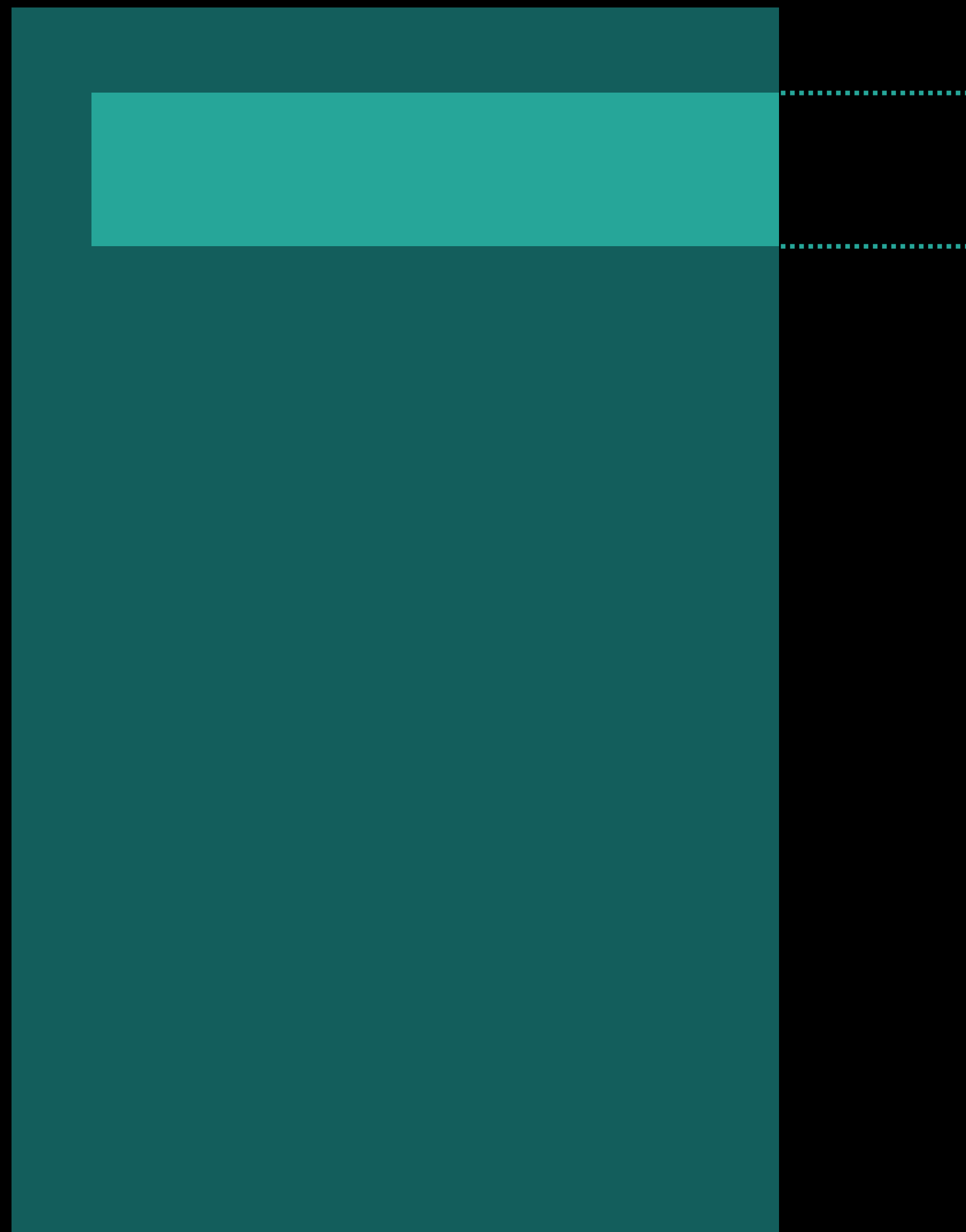
Incrementally Adopting Auto Layout



Views with No Constraints



Views with No Constraints



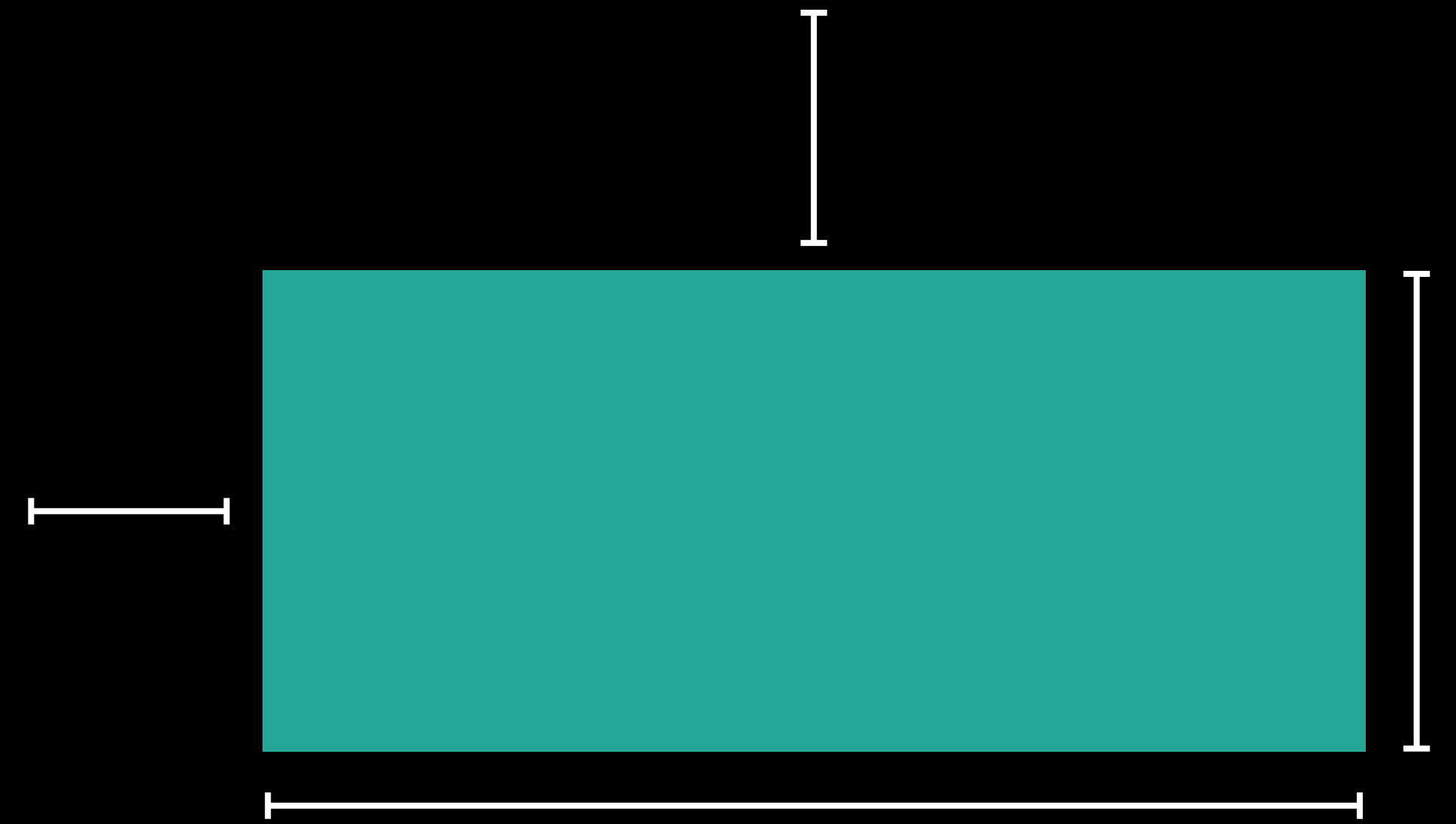
Views with No Constraints

Pins top, left, width and height



Views with No Constraints

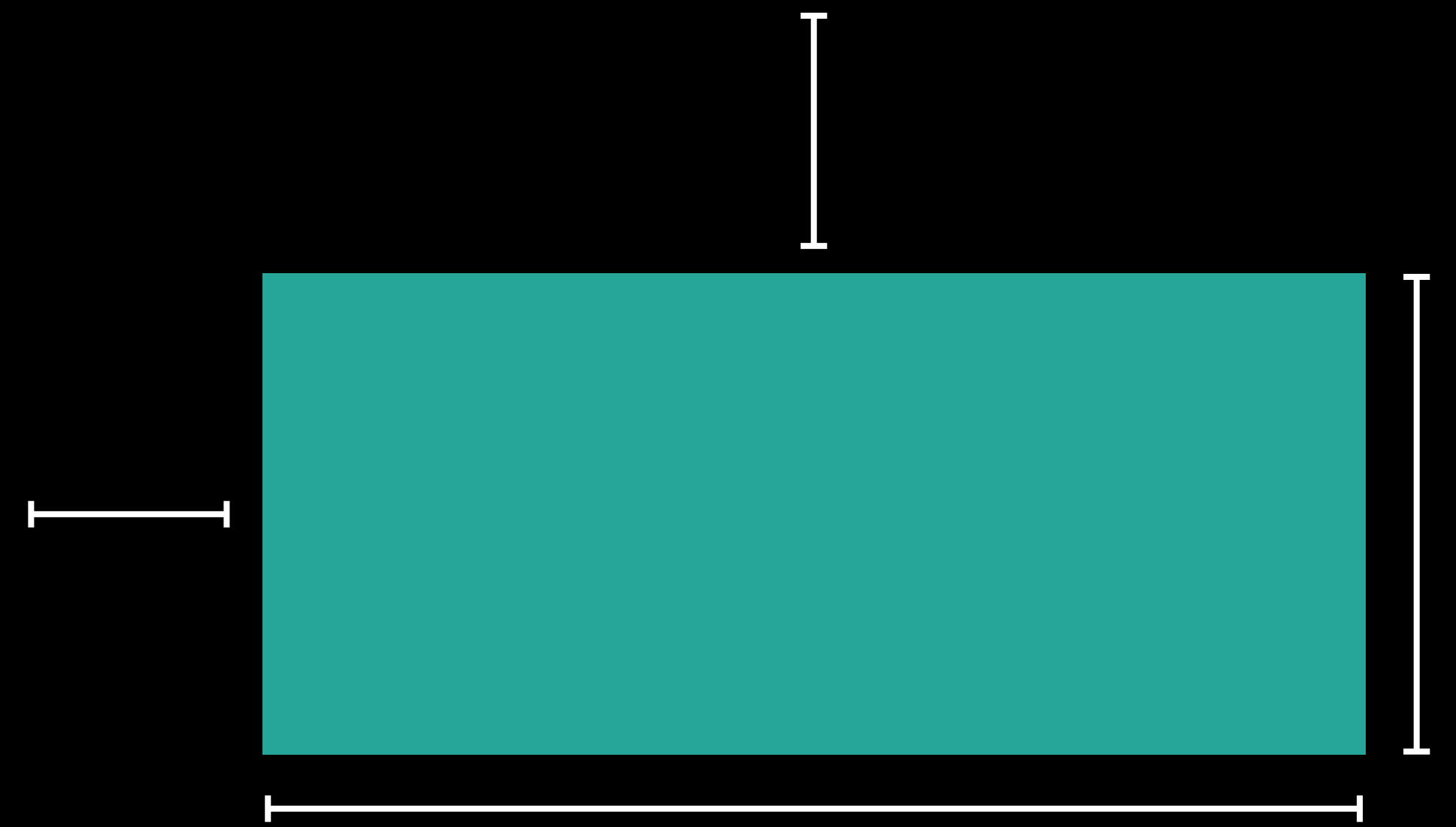
Pins top, left, width and height



Views with No Constraints

Pins top, left, width and height

For dynamic resize behavior

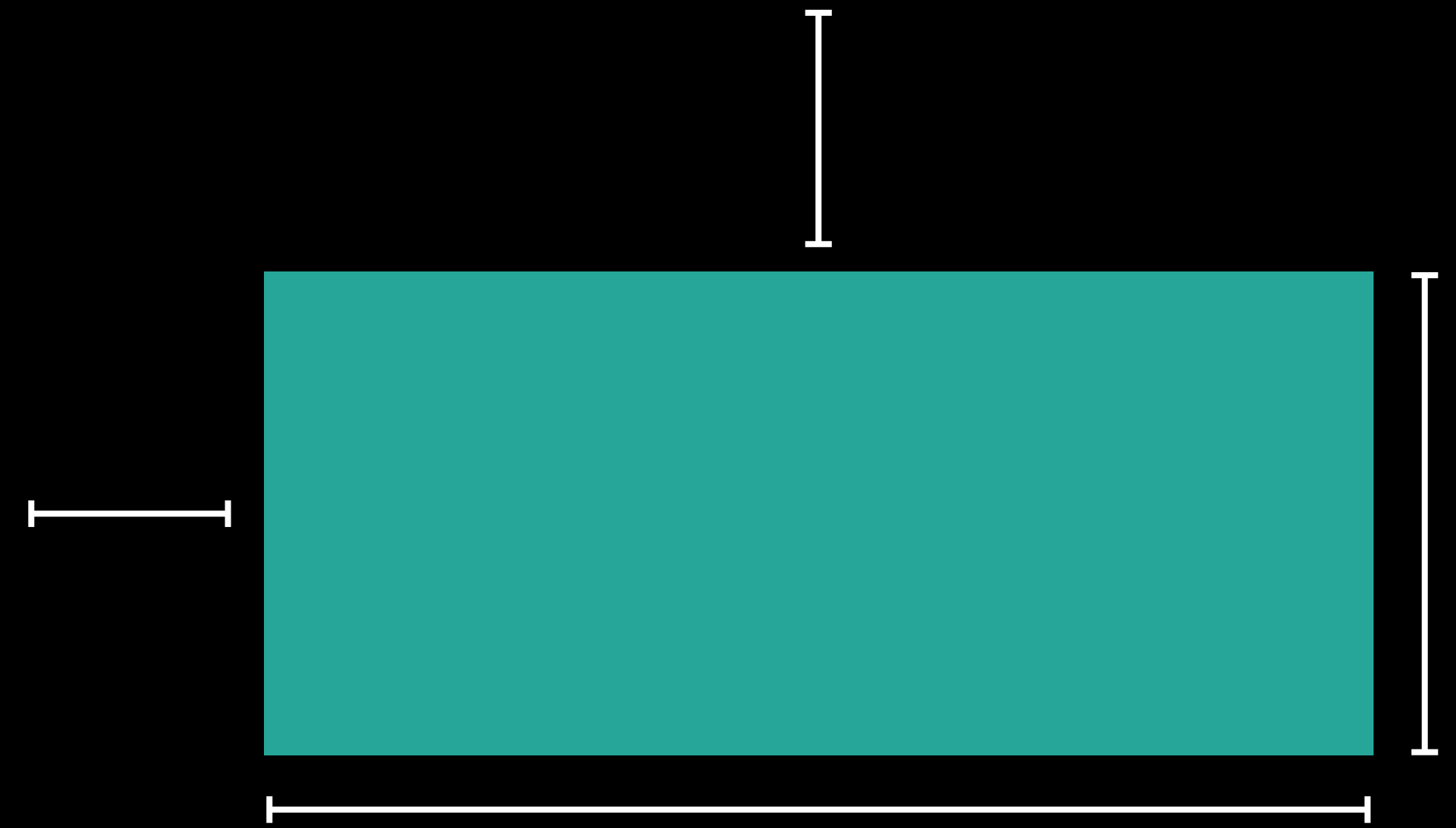


Views with No Constraints

Pins top, left, width and height

For dynamic resize behavior

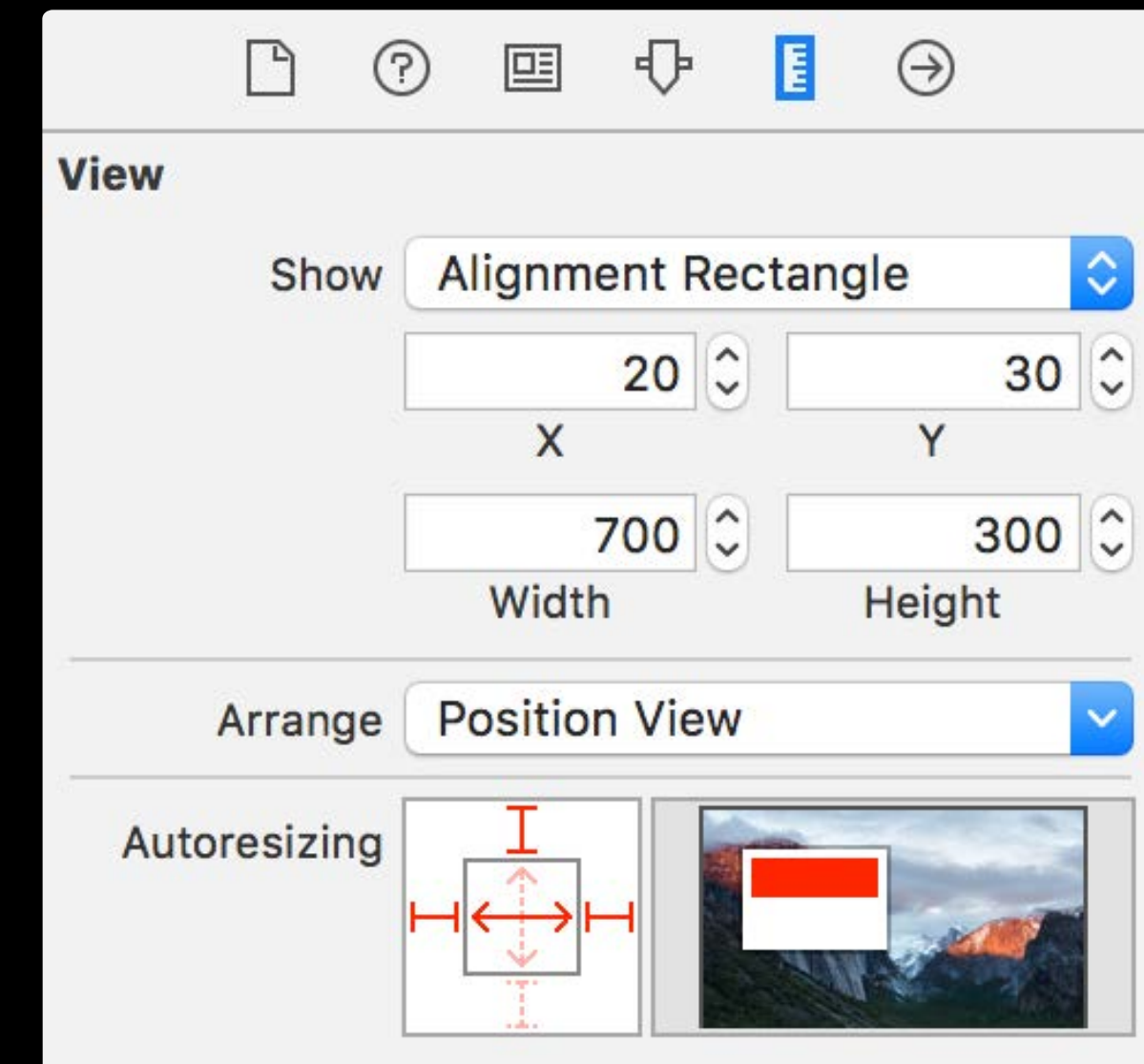
- Must add your own constraints



Views with No Constraints

NEW

Can specify autoresizing masks

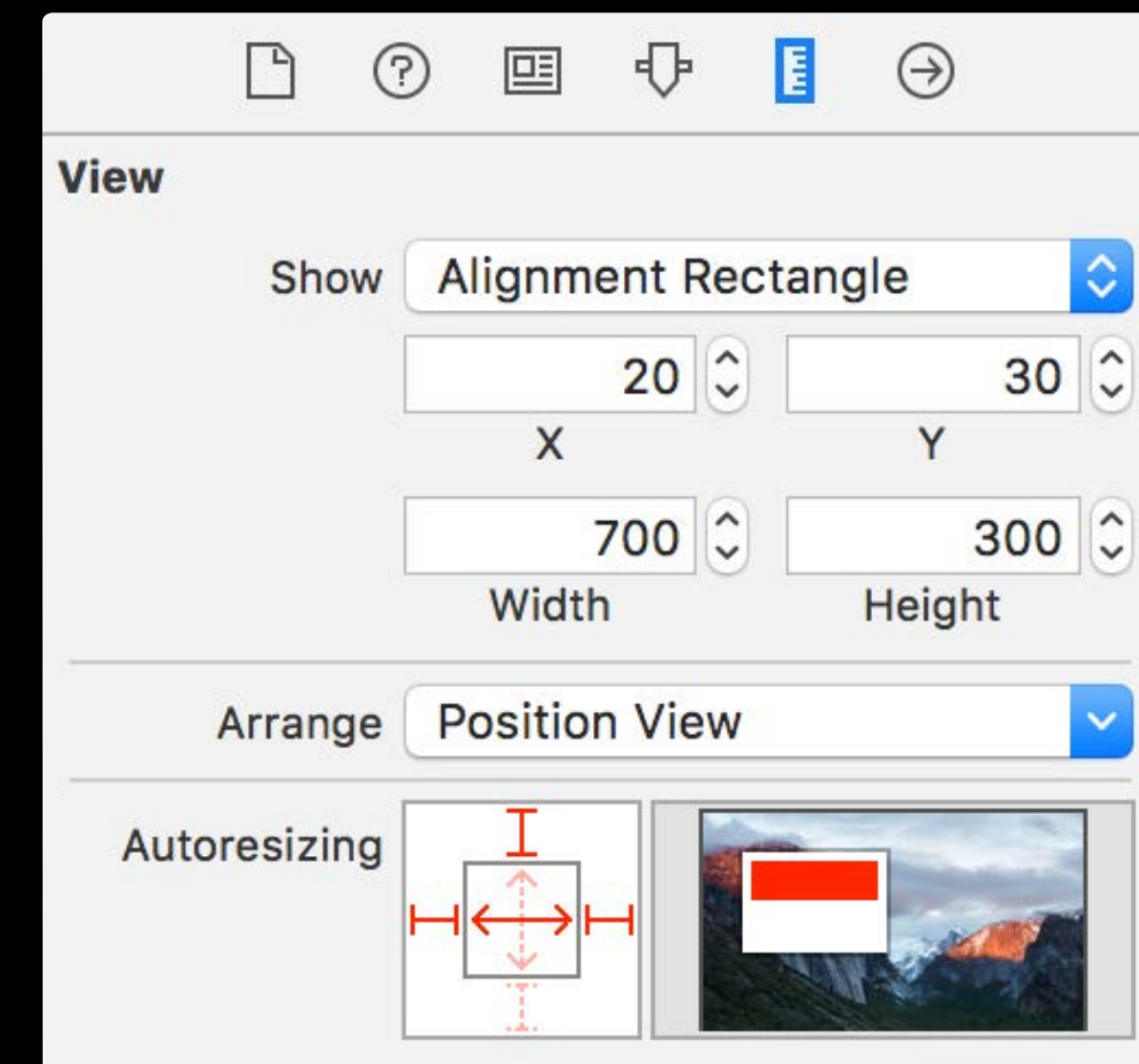


Views with No Constraints

NEW

Can specify autoresizing masks

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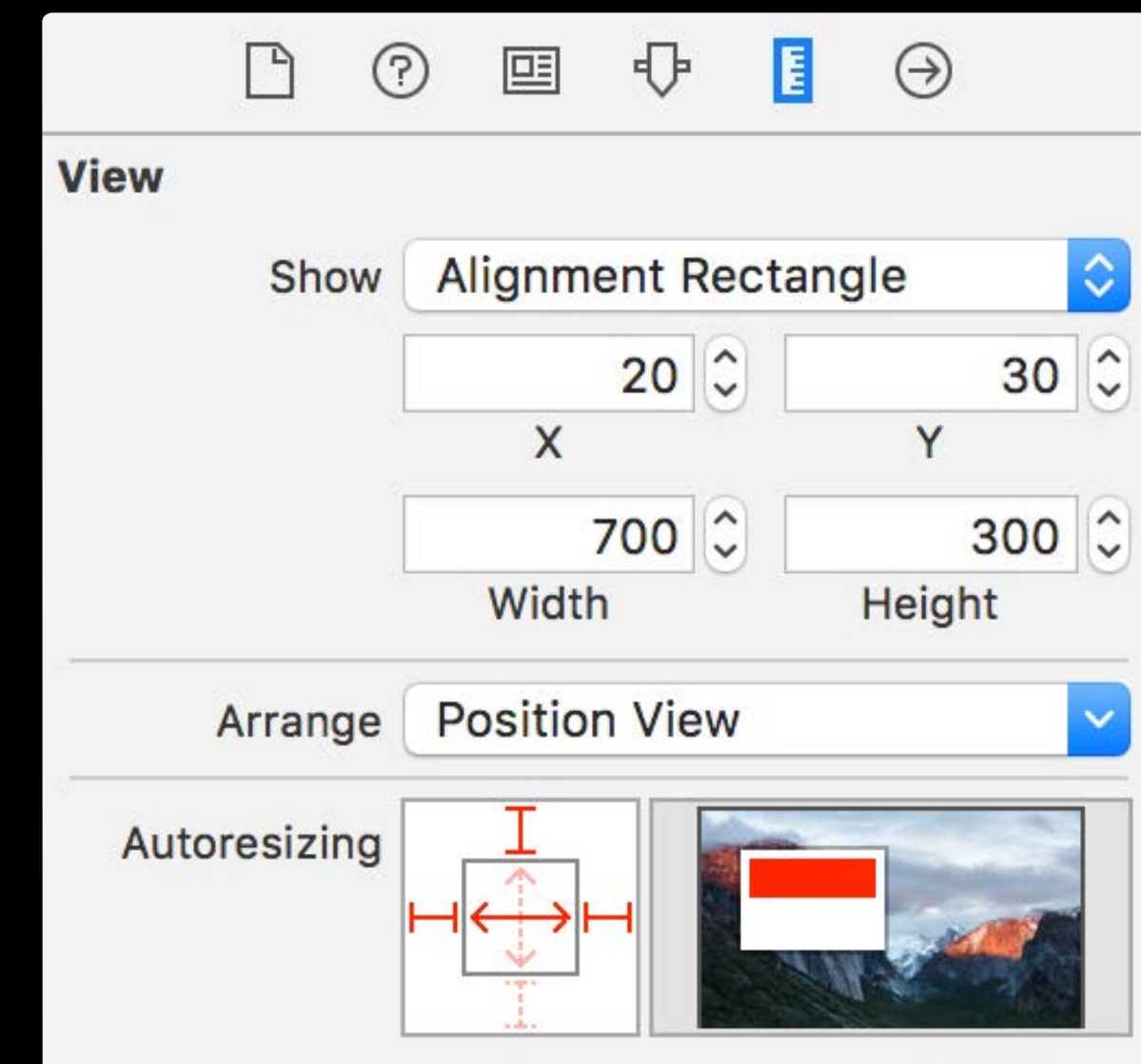
Views with No Constraints

NEW

Can specify autoresizing masks

- For simple resize behavior

Works alongside views with constraints



Views with No Constraints

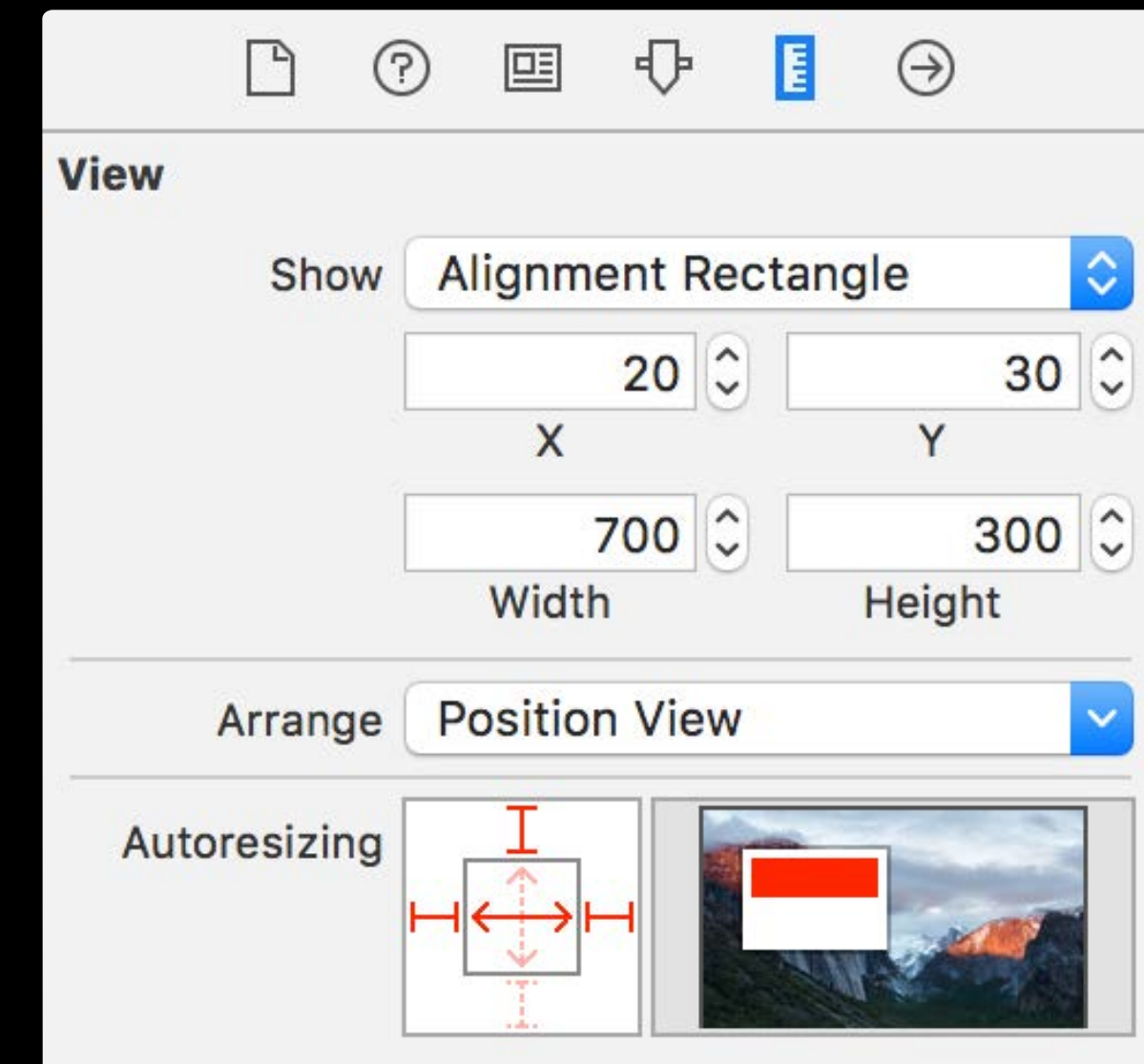
NEW

Can specify autoresizing masks

- For simple resize behavior

Works alongside views with constraints

Autoresizing masks will translate into constraints at runtime



Views with No Constraints

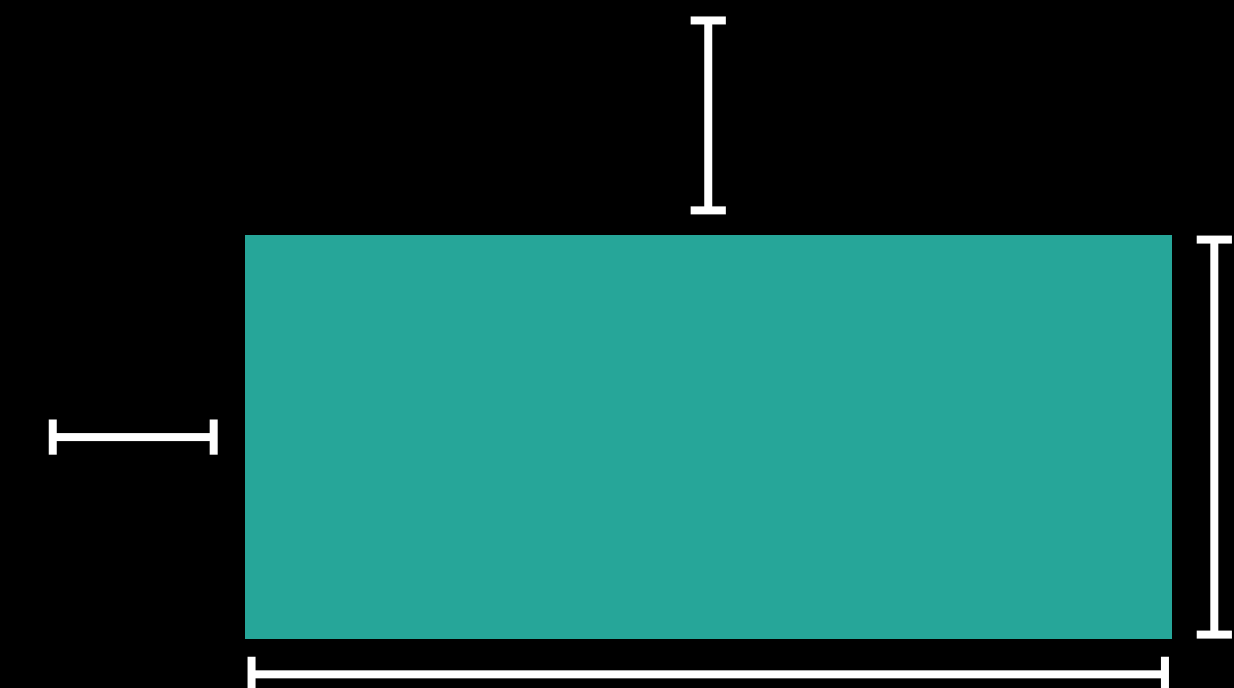
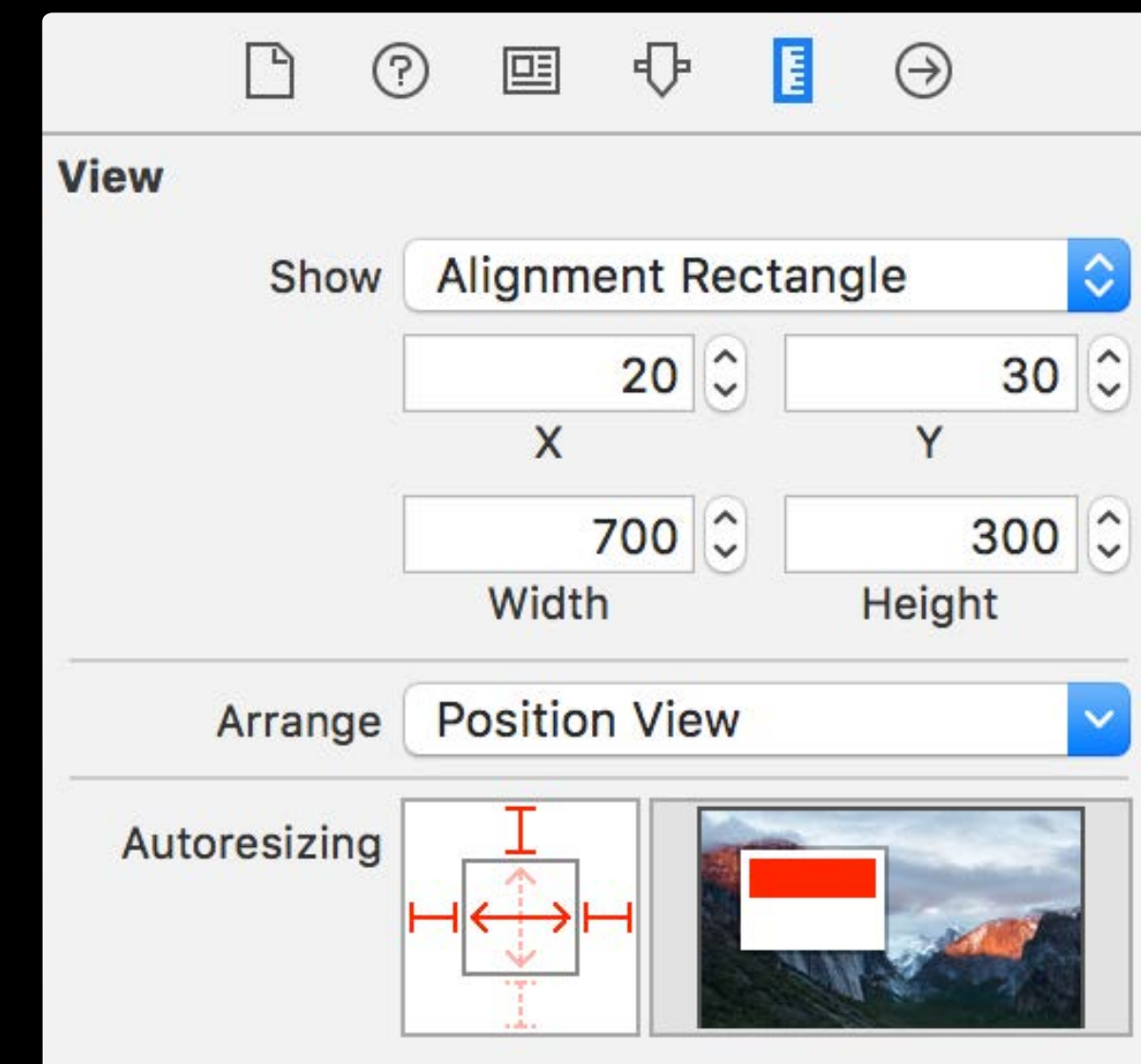
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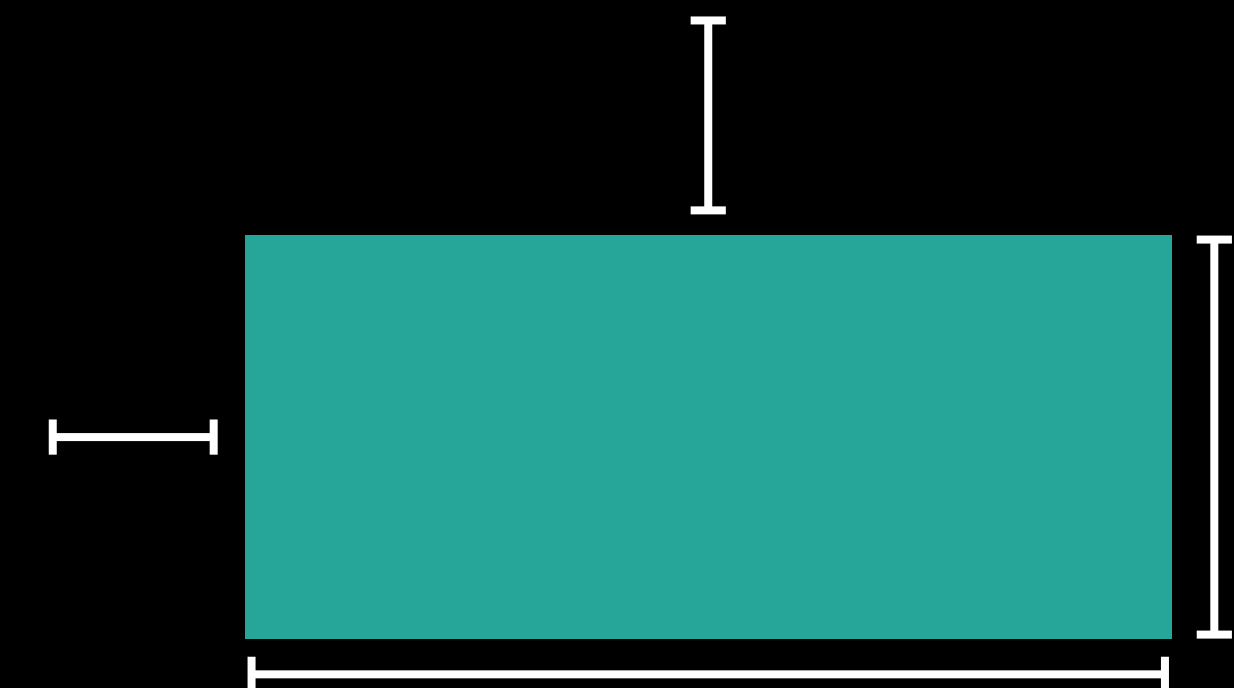
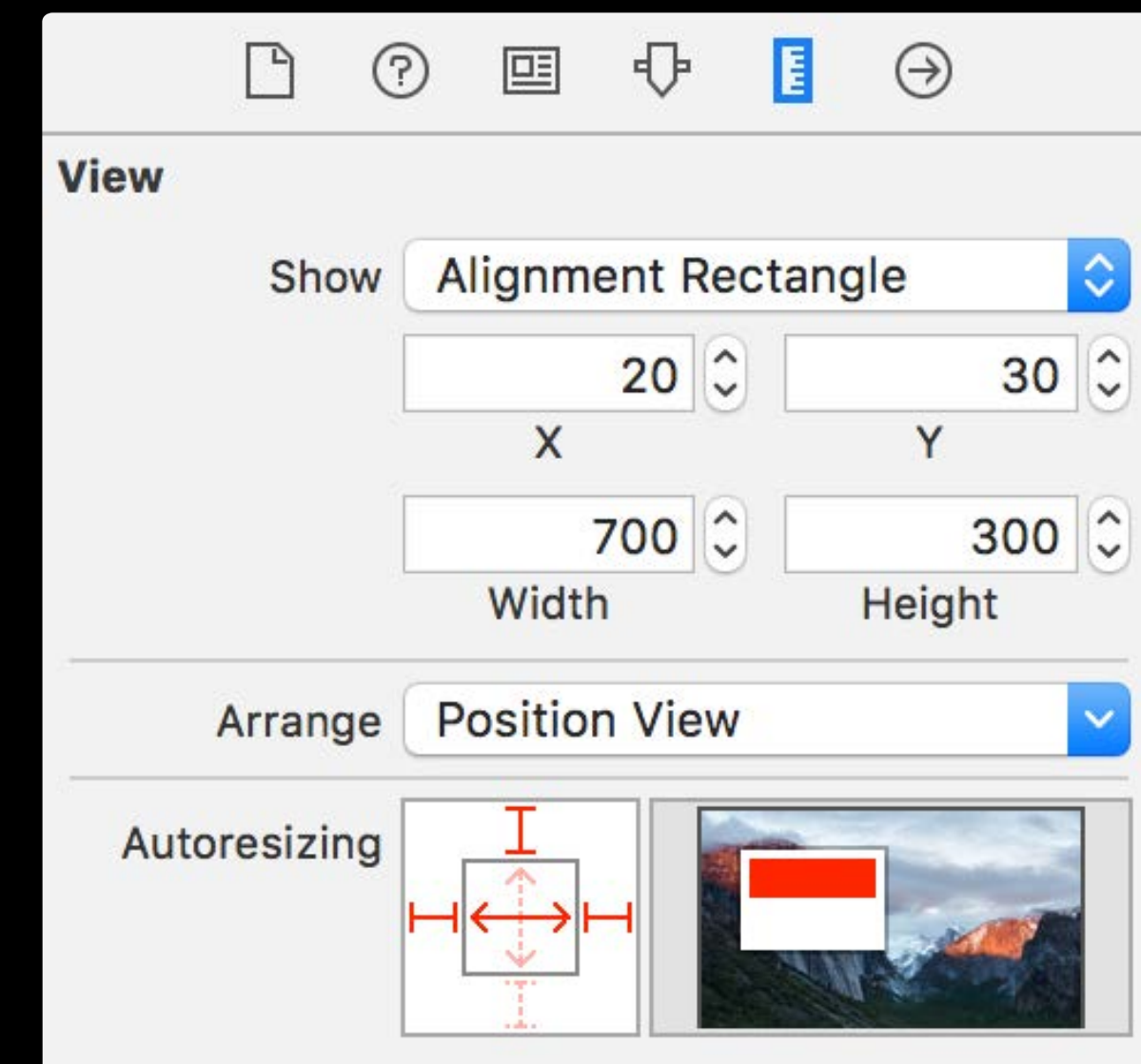
Can specify autoresizing masks

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Works alongside views with constraints

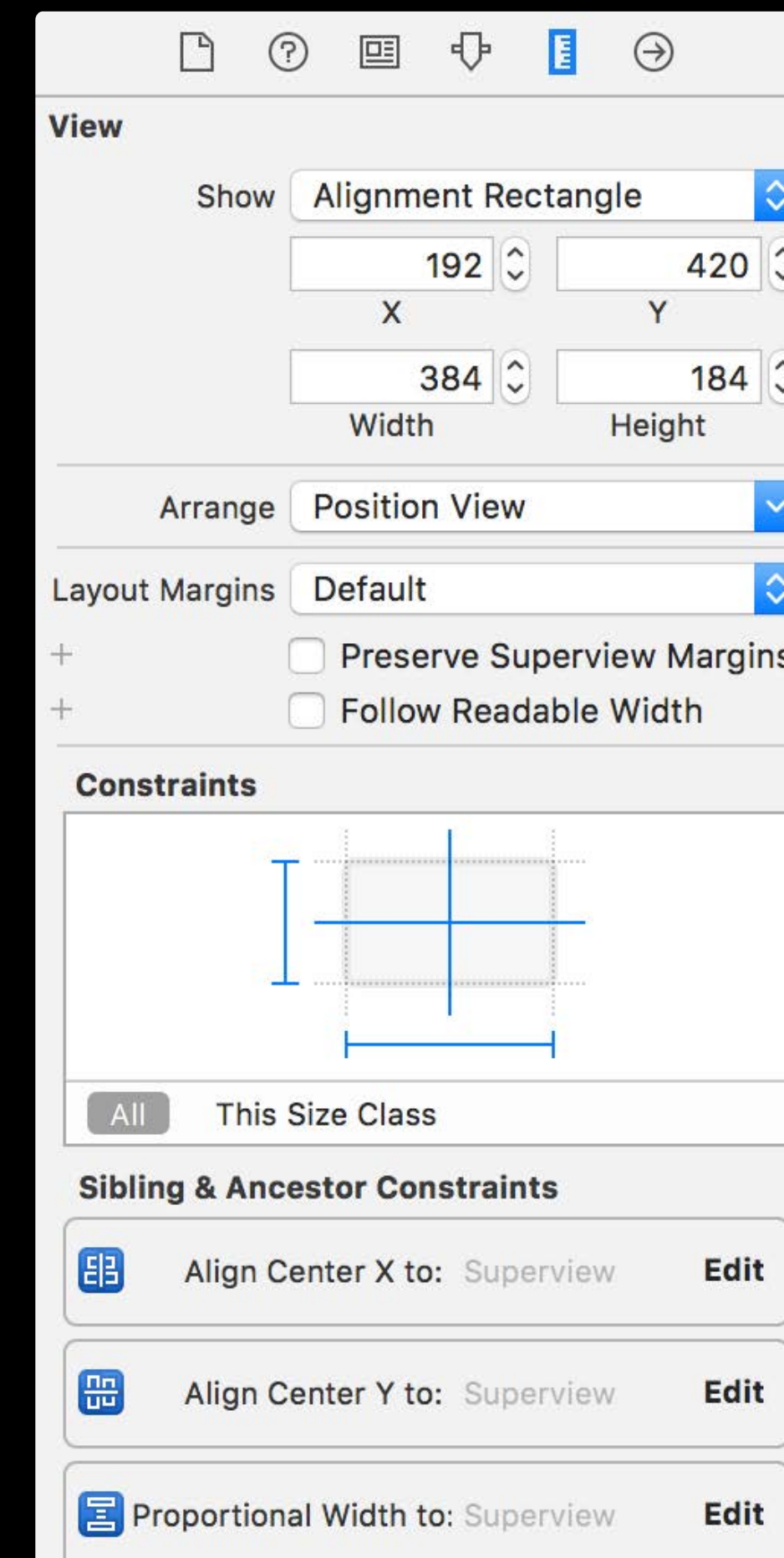
Autoresizing masks will translate into constraints at runtime

```
translatesAutoresizingMaskIntoConstraints == true
```



Views with Constraints

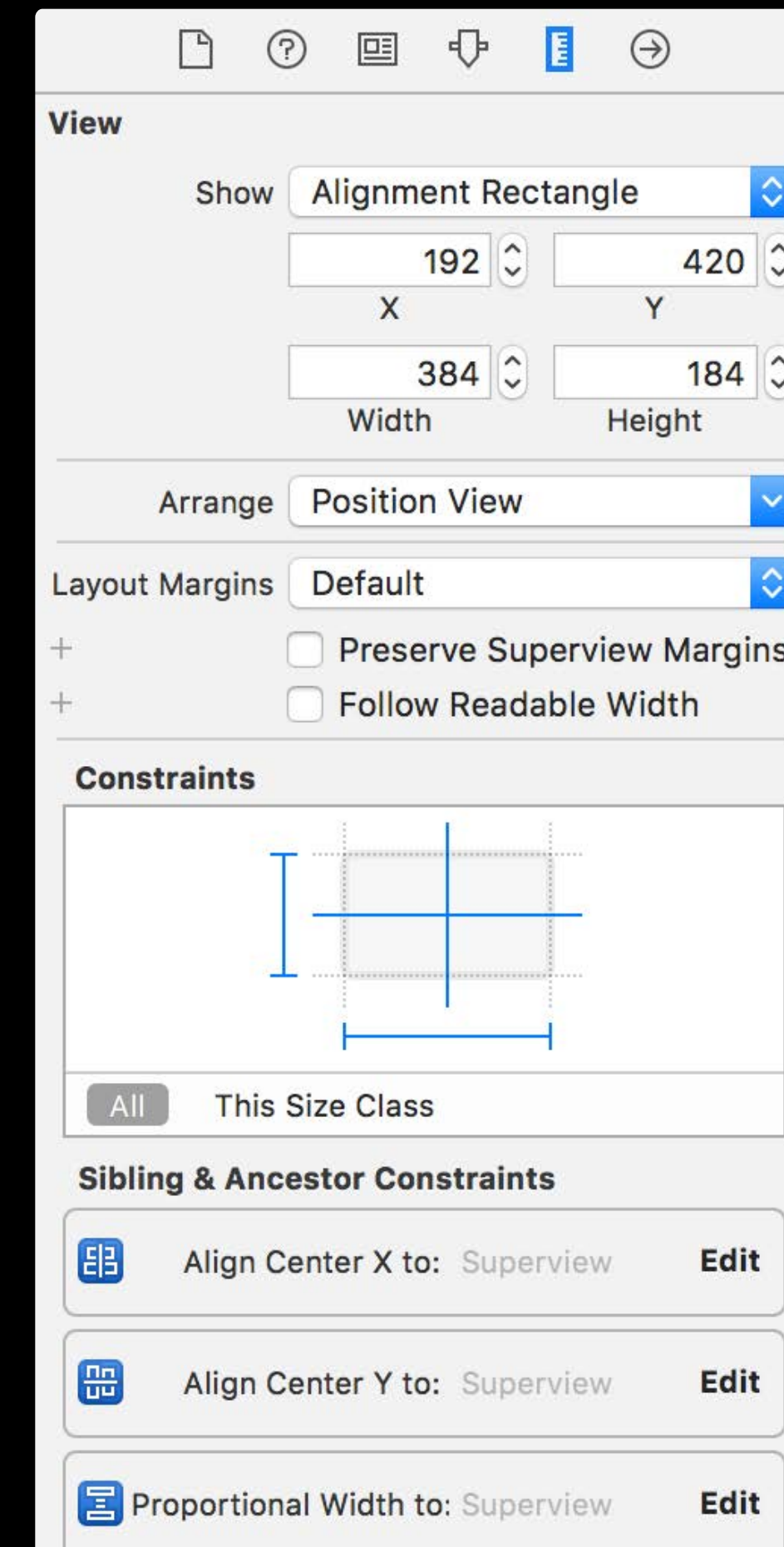
Show constraints in the size inspector



Views with Constraints

Show constraints in the size inspector

Autoresizing masks are ignored

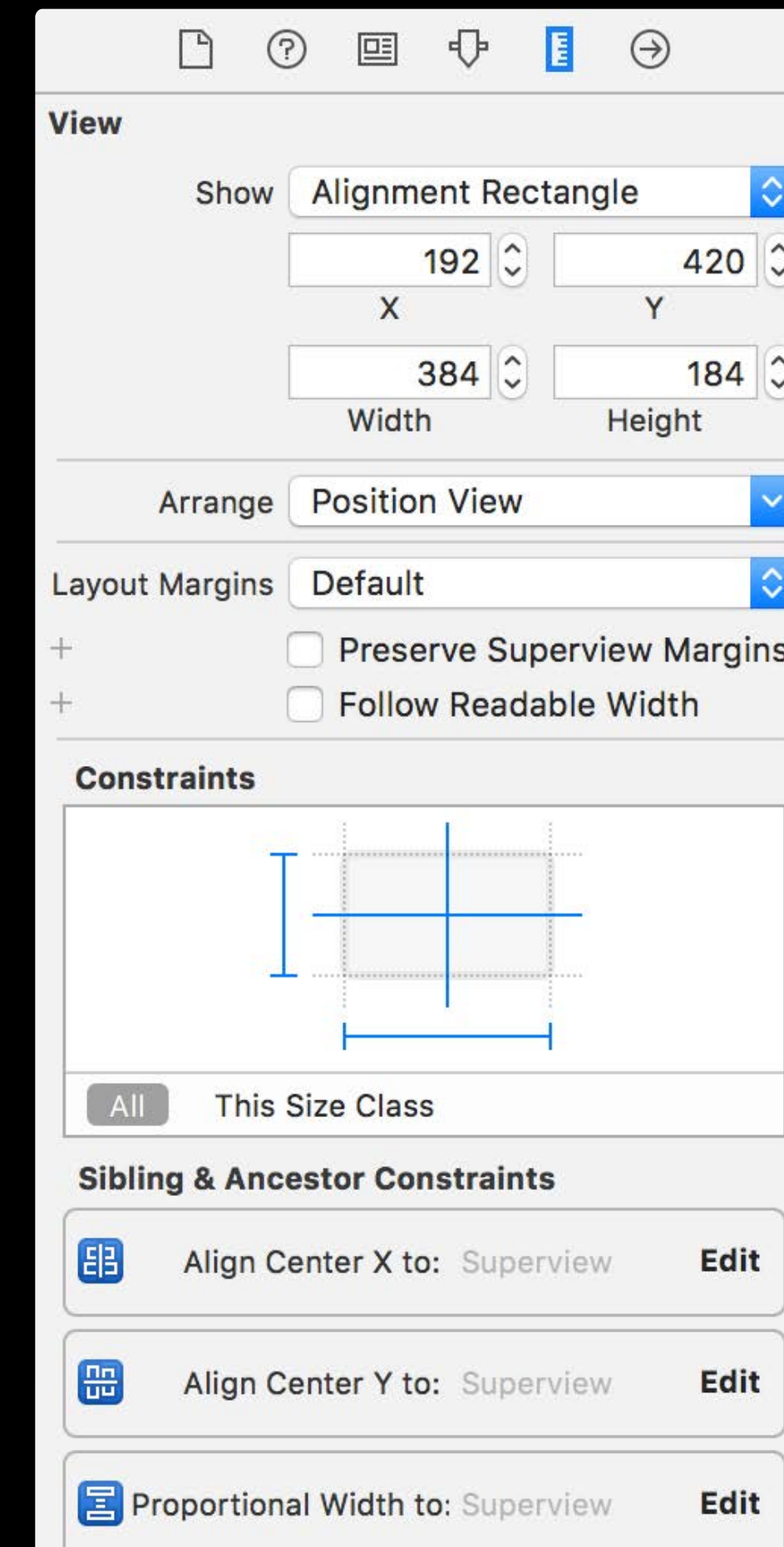


Views with Constraints

Show constraints in the size inspector

Autoresizing masks are ignored

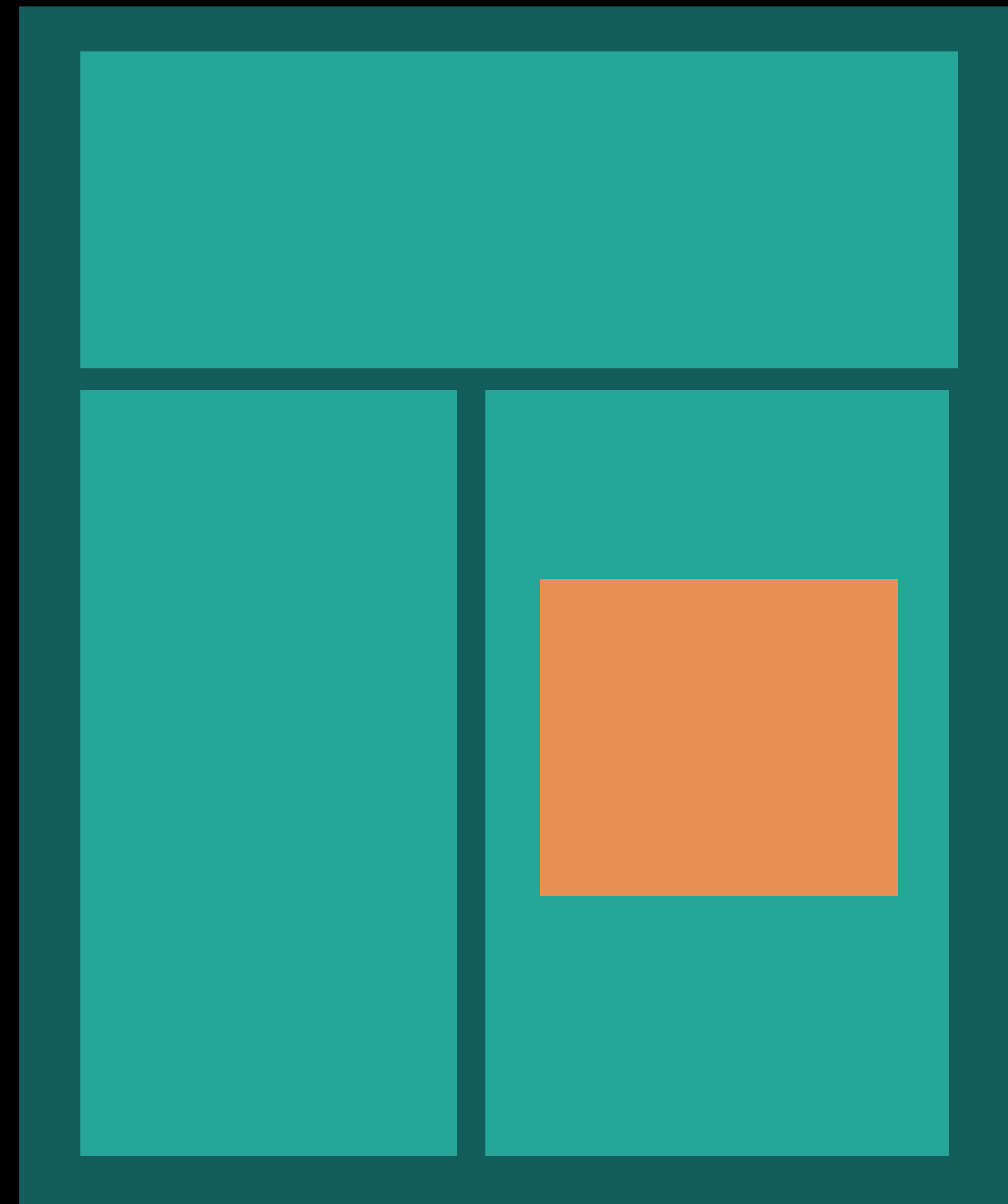
```
translatesAutoresizingMaskIntoConstraints == false
```



Incremental Adoption

NEW

Use autoresizing masks until ready
for constraints

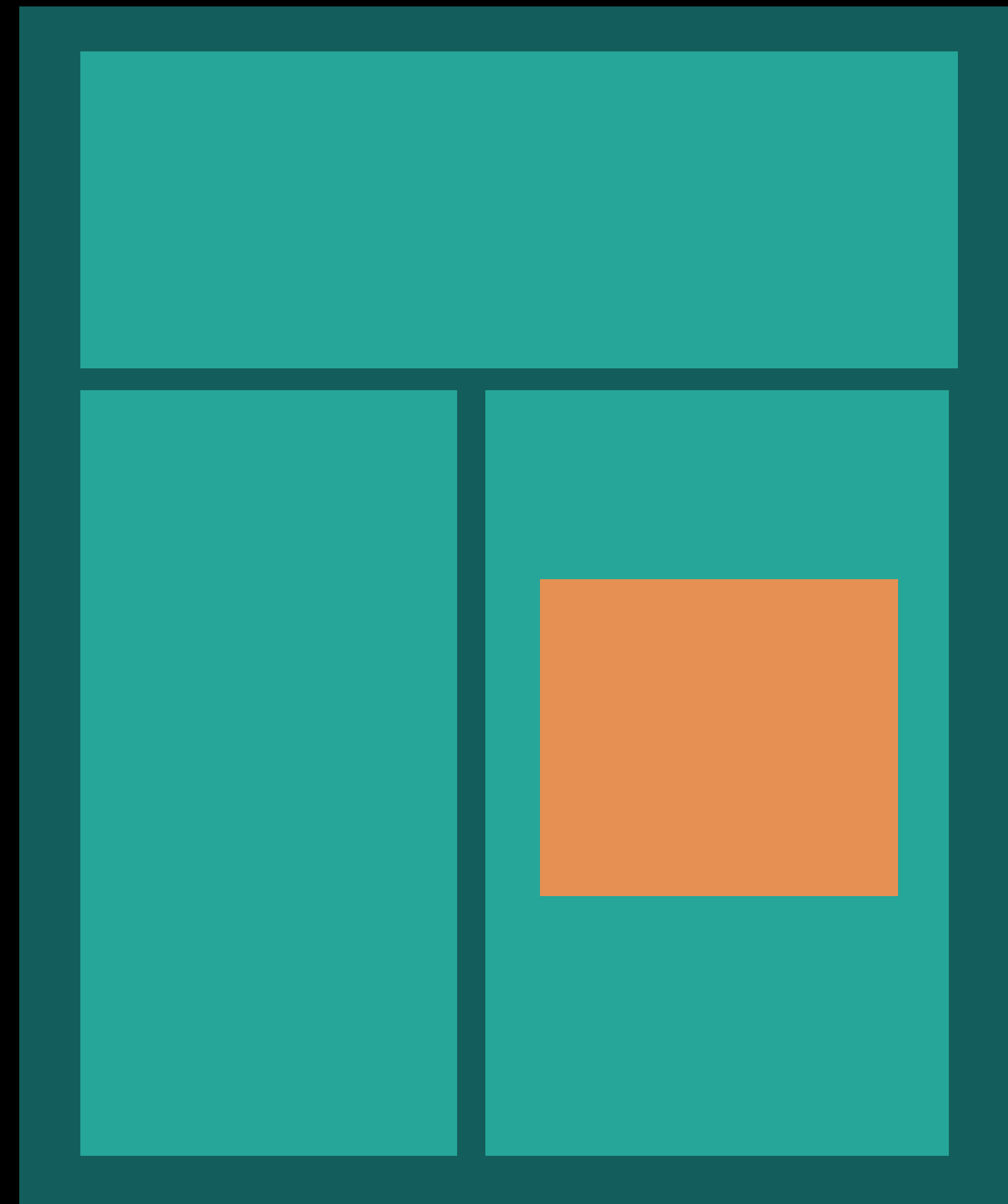


Incremental Adoption

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Constrain views by subtree



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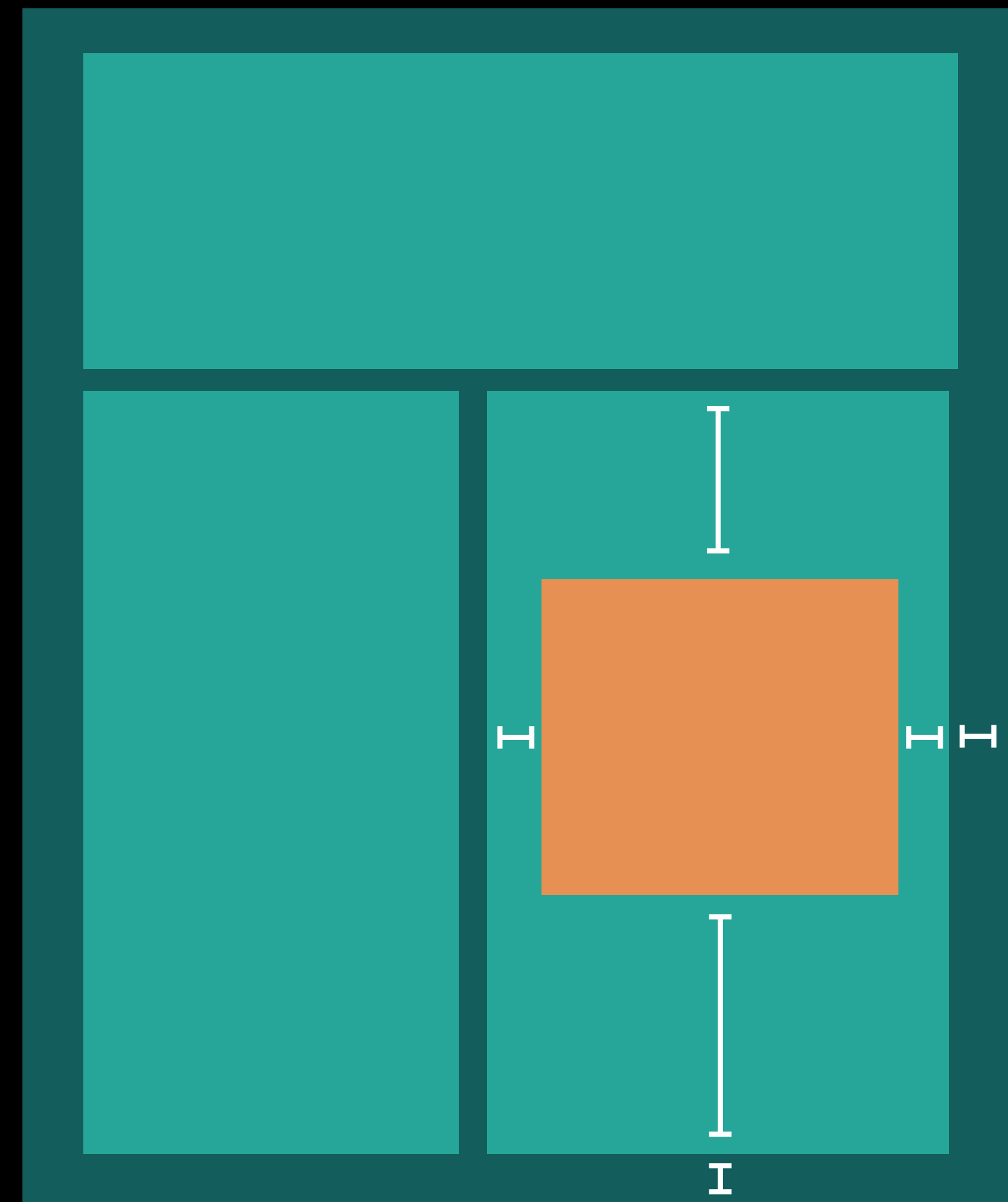


Incremental Adoption

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Constrain views by subtree



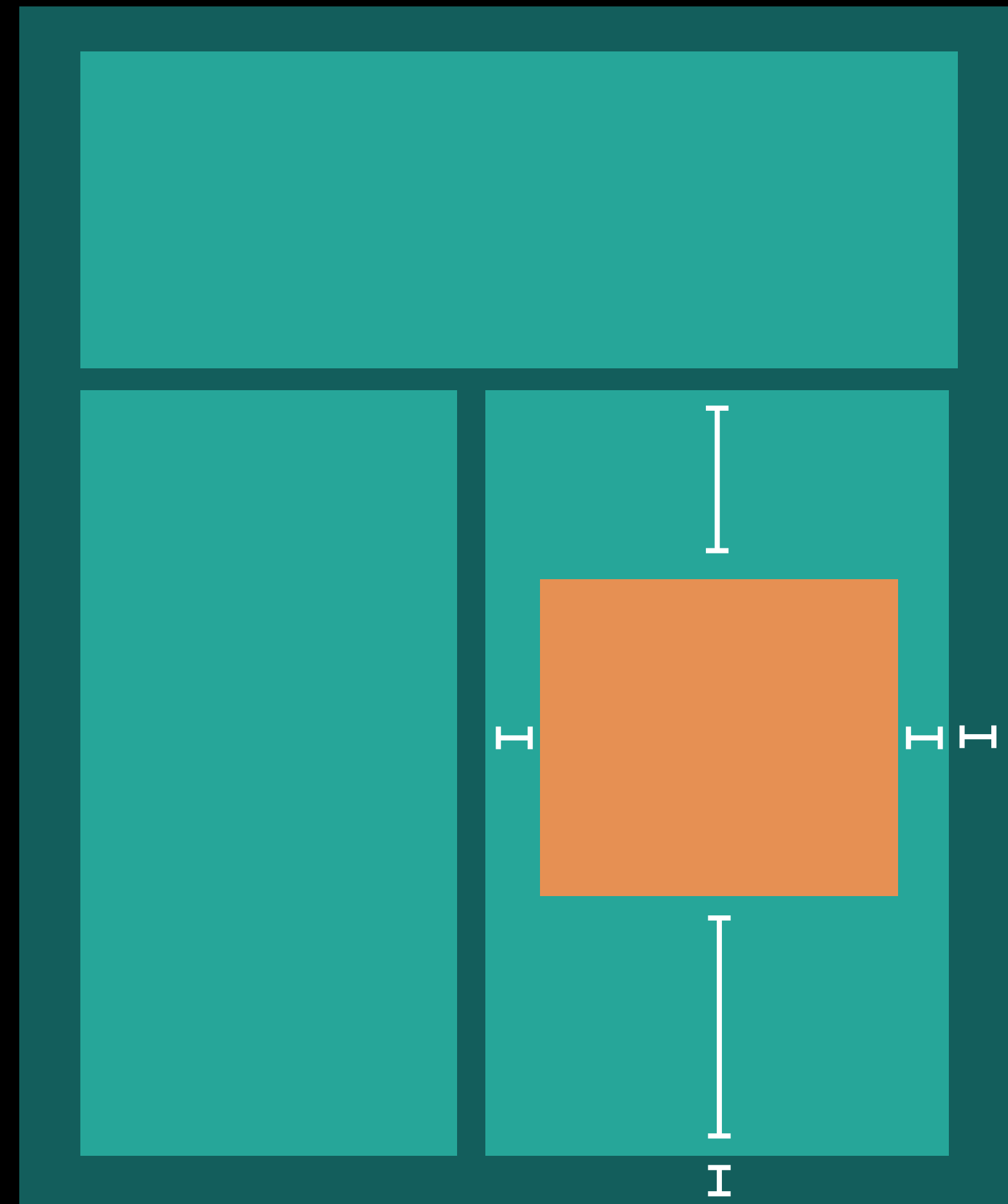
Incremental Adoption

NEW

Use autoresizing masks until ready
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Constrain views by subtree

Adopt Auto Layout on your terms



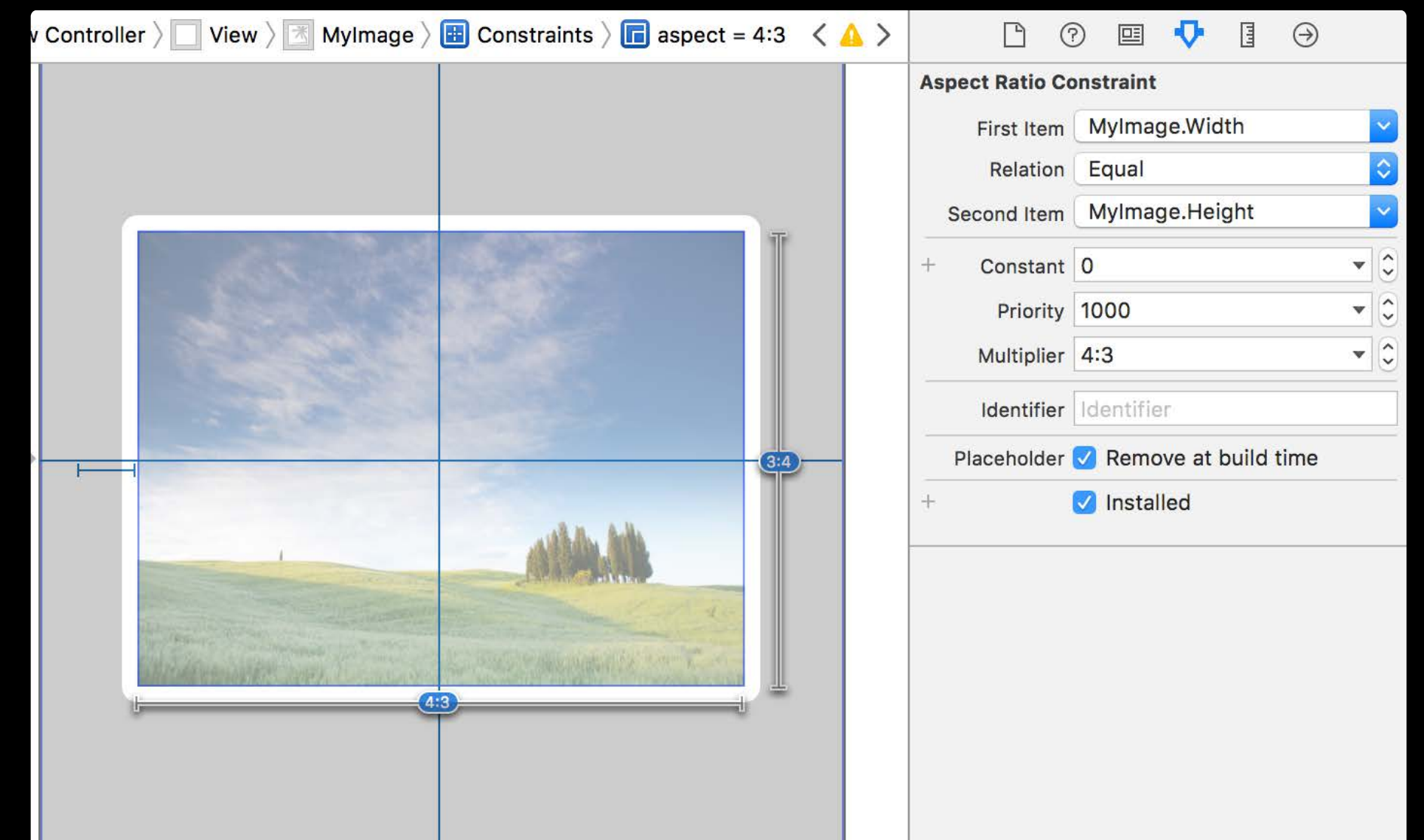
Demo

Incremental adoption

Design and Runtime Constraints

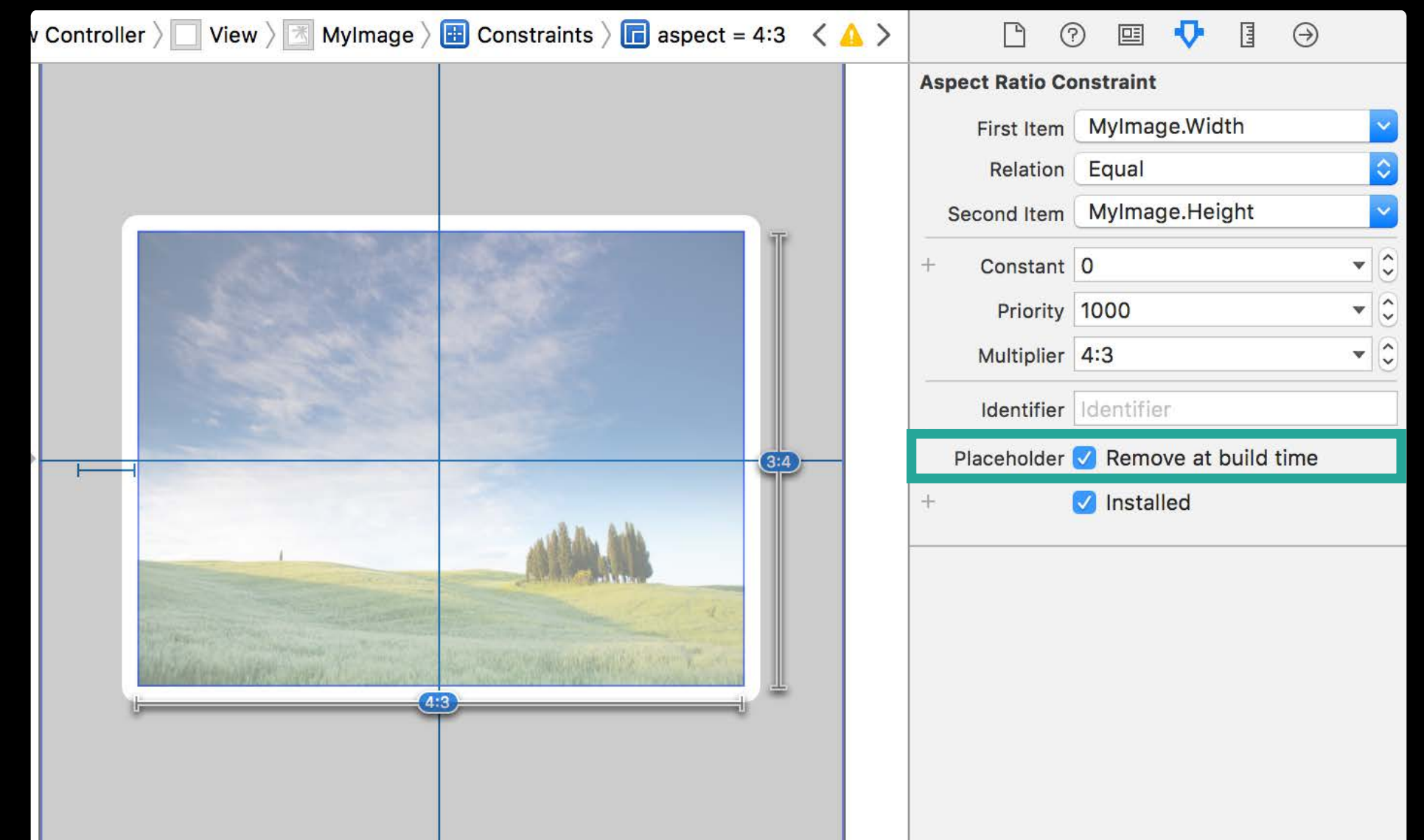
Placeholder Constraints

Simulate constraint behavior at design time



Placeholder Constraints

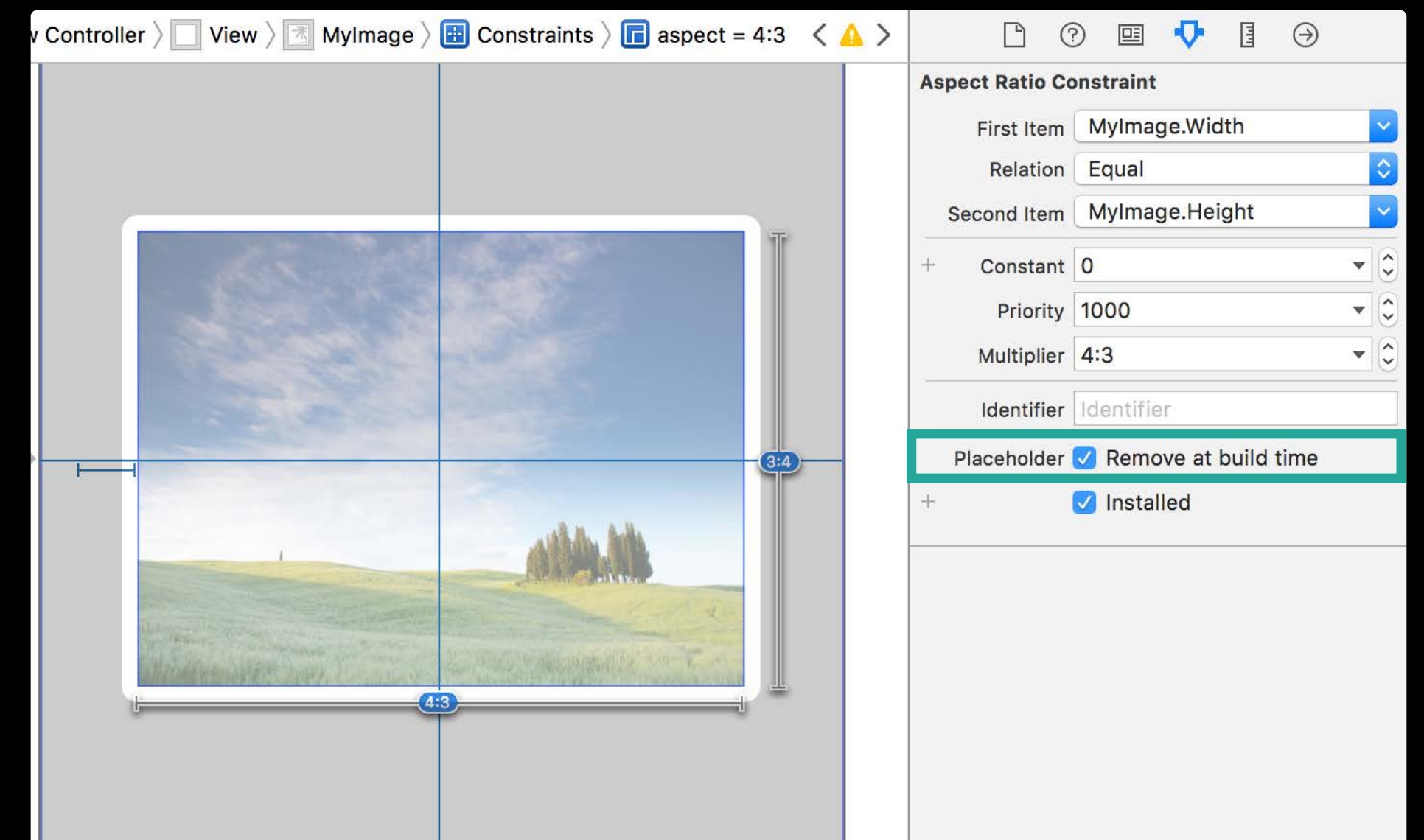
Simulate constraint behavior at design time



Placeholder Constraints

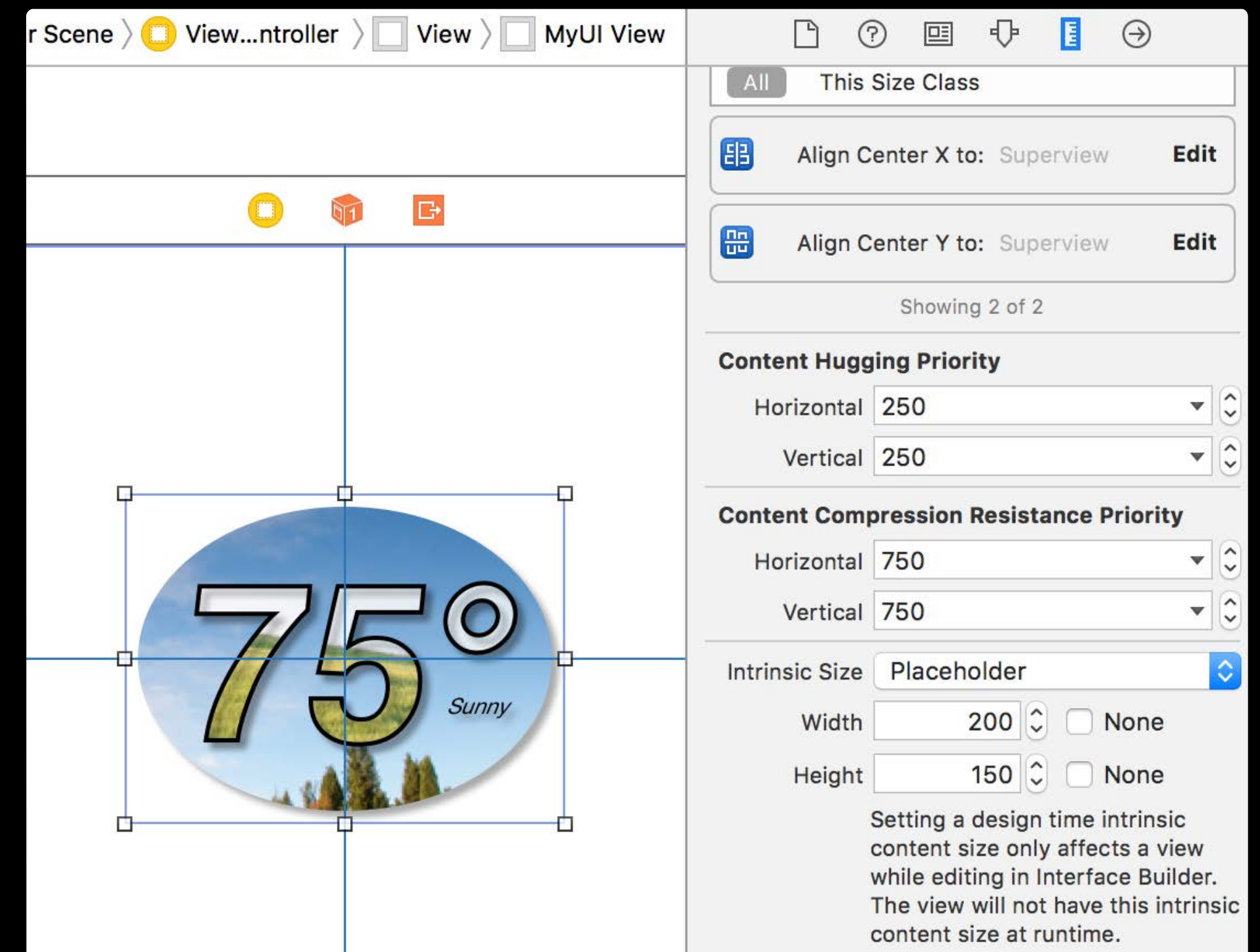
Simulate constraint behavior at design time

Add constraint at runtime



Design Time Intrinsic Size

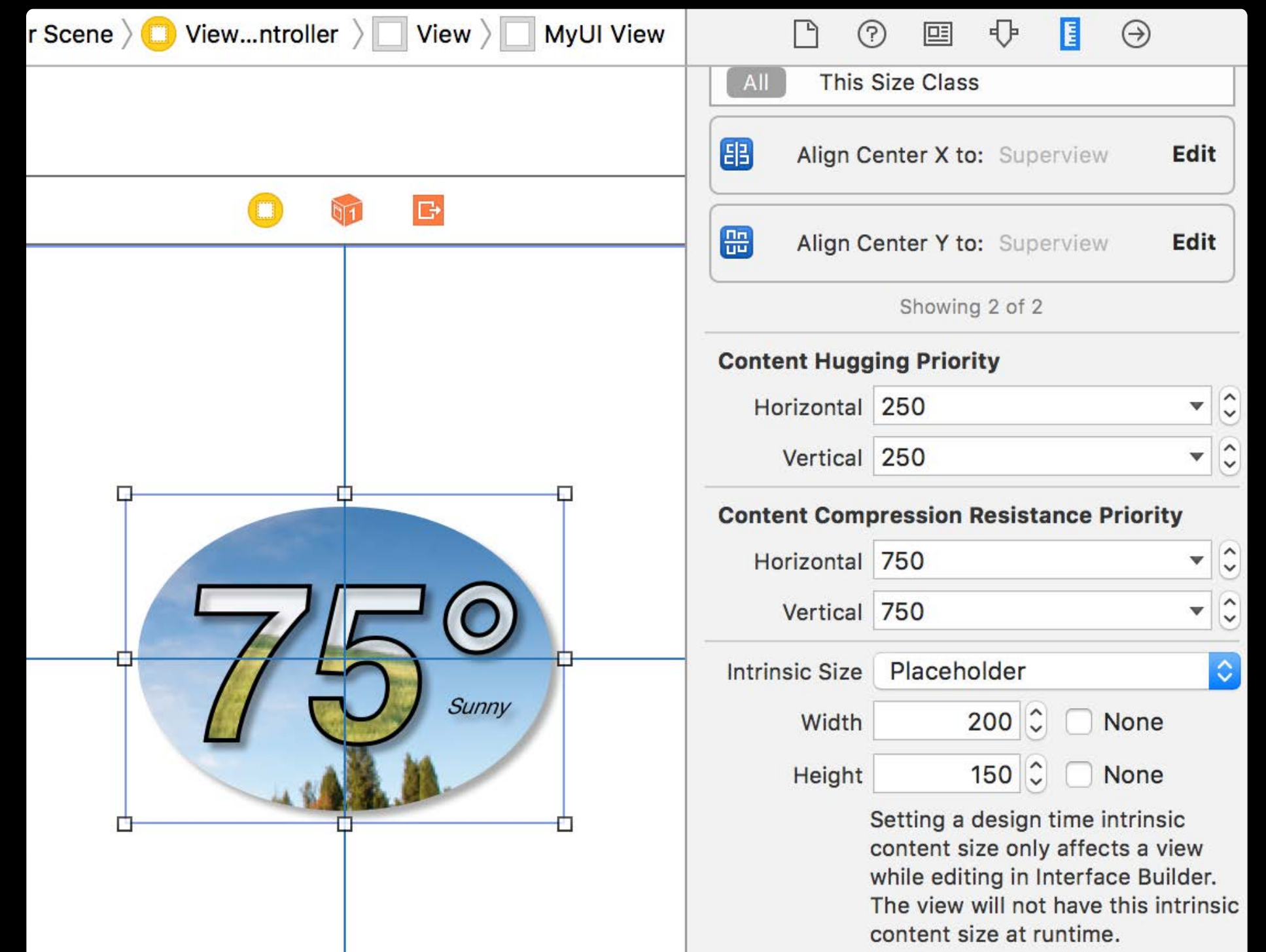
Good for custom controls



Design Time Intrinsic Size

Good for custom controls

Intrinsic content size

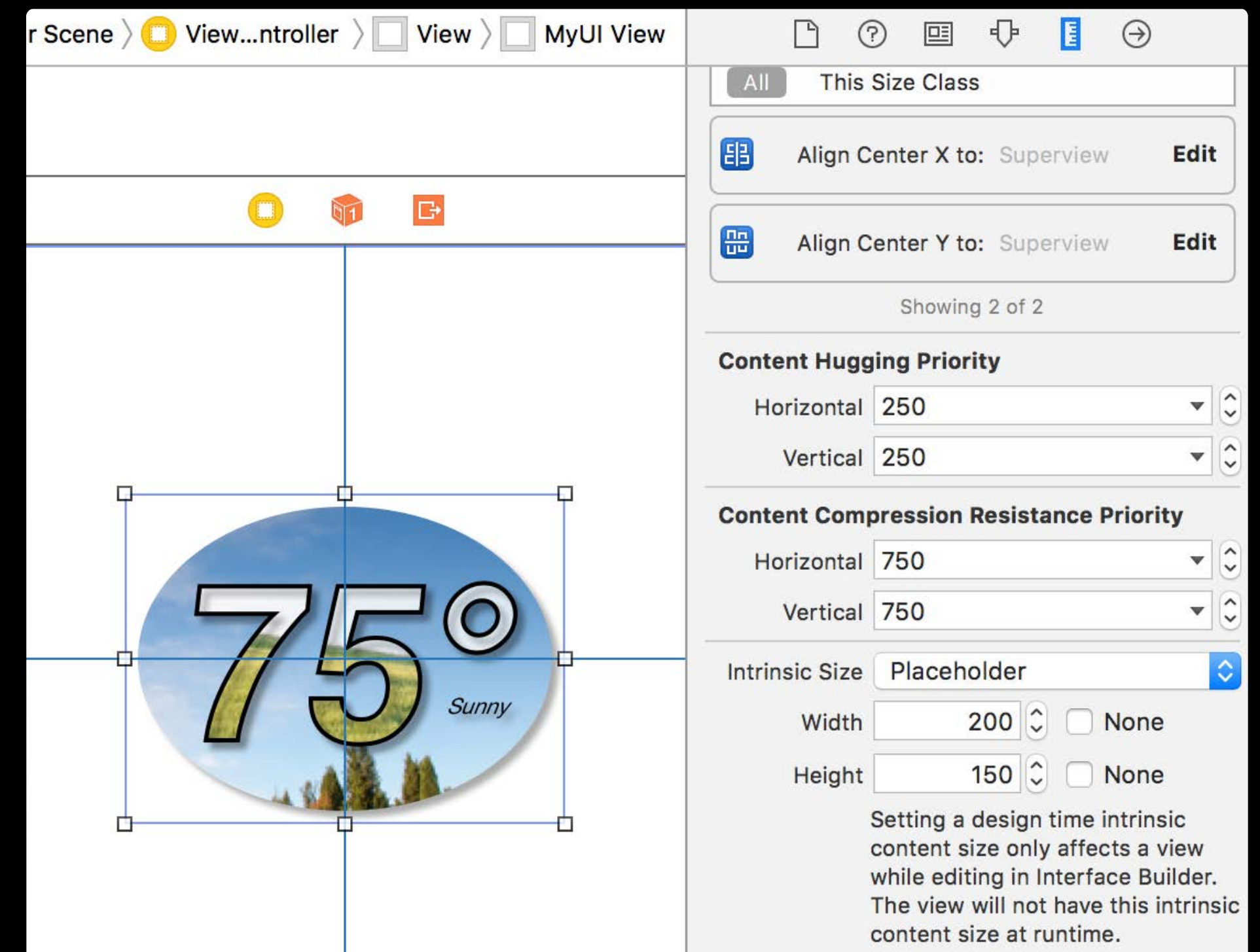


Design Time Intrinsic Size

Good for custom controls

Intrinsic content size

- Size input not known to Auto Layout

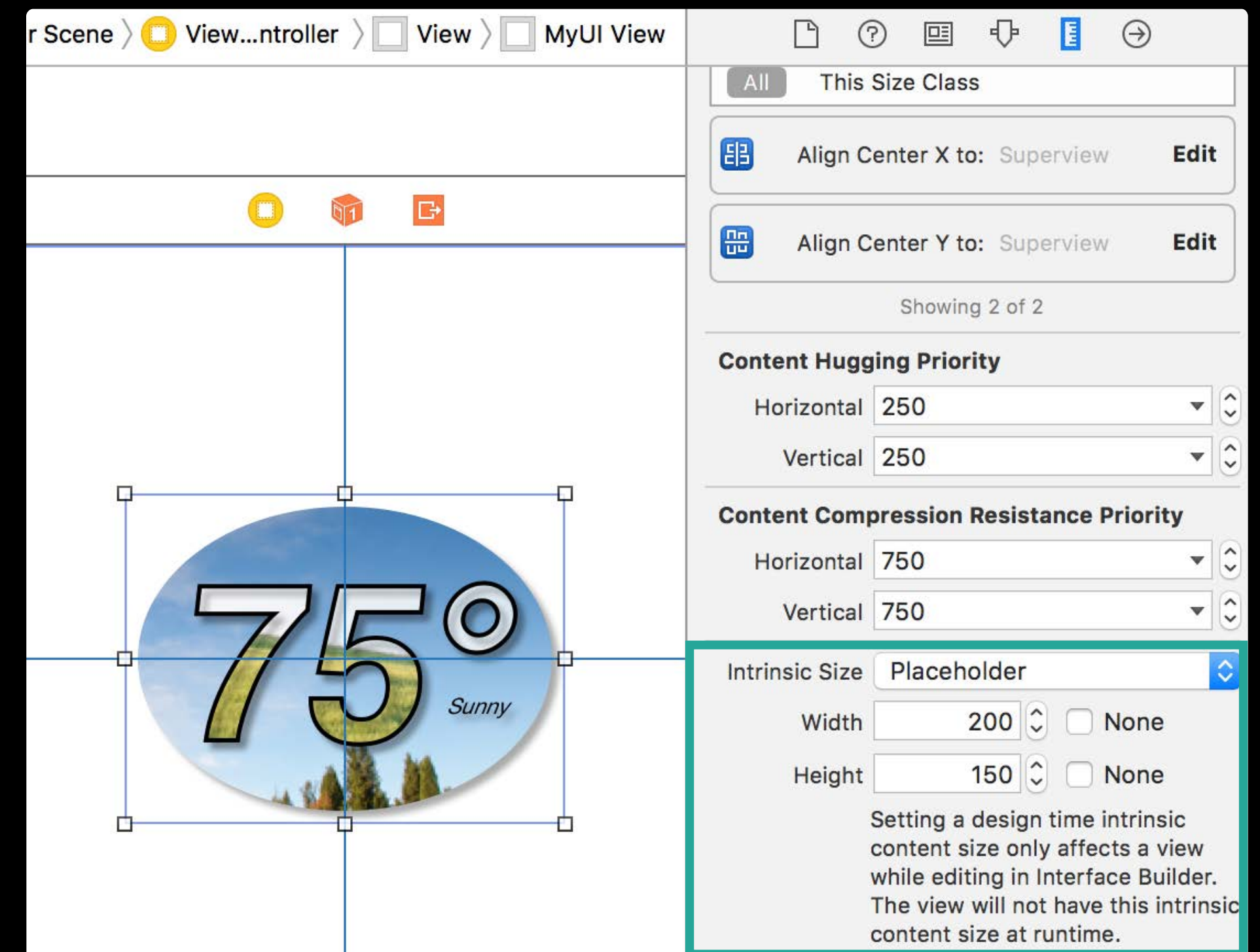


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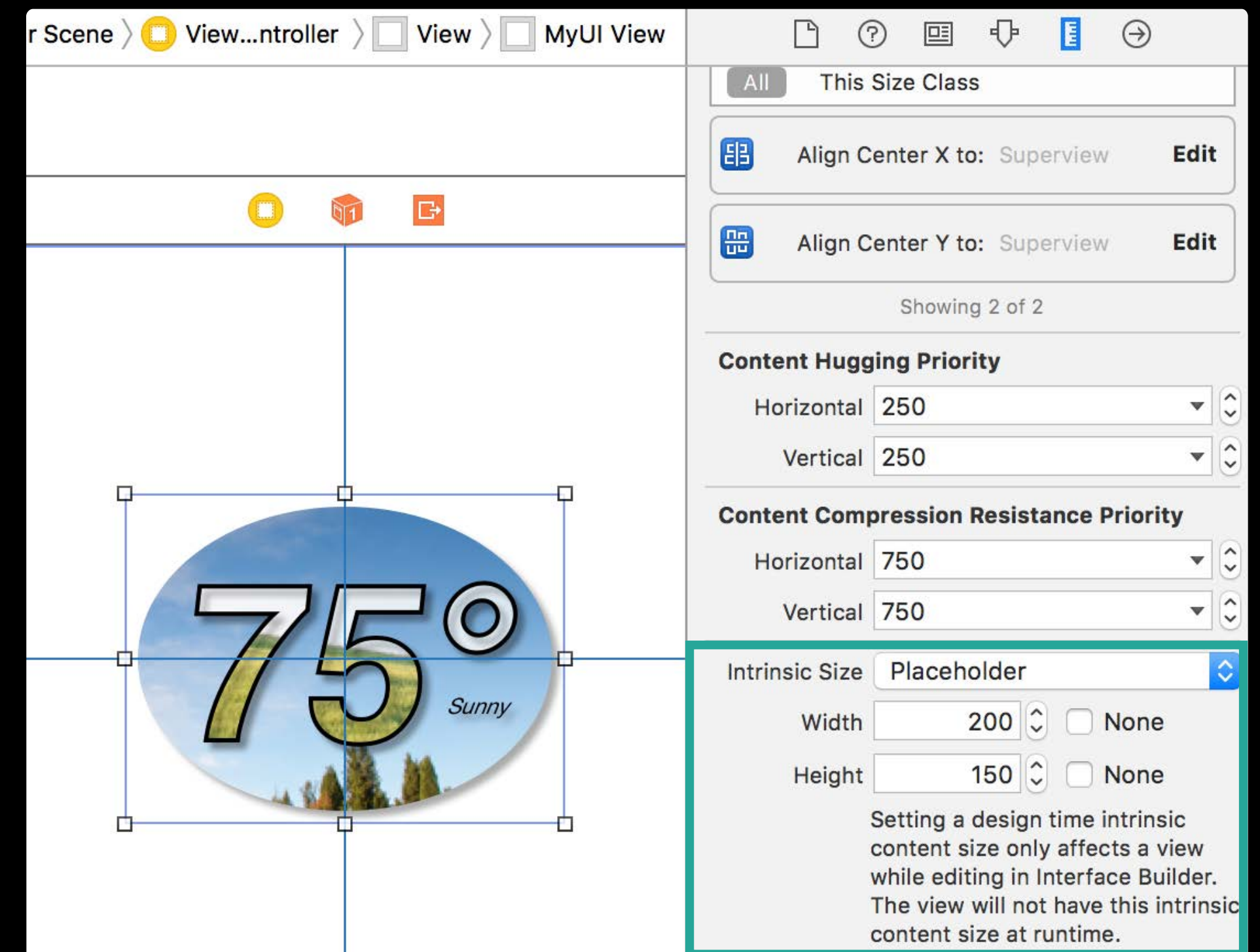
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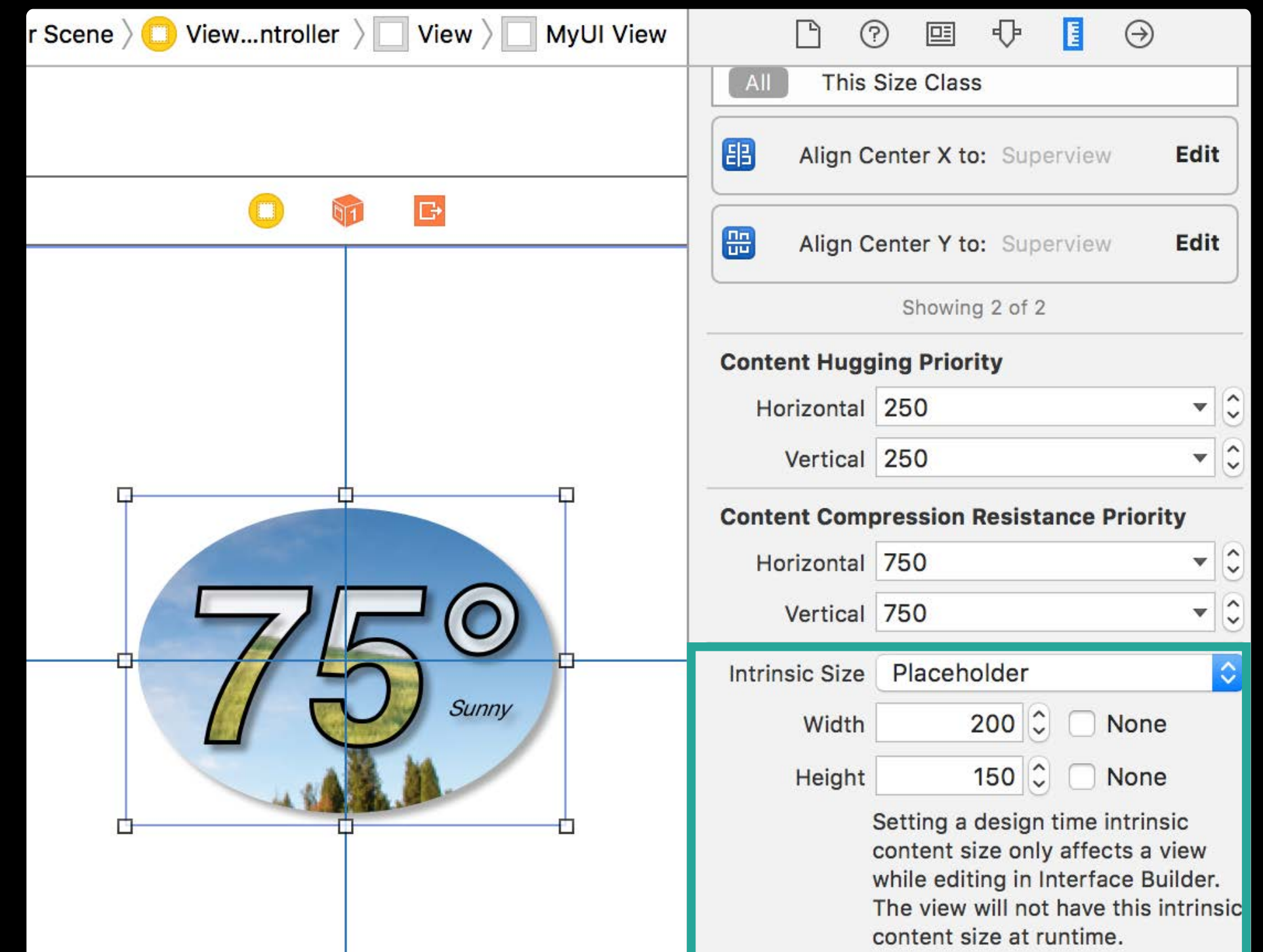
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Simulate content size

At runtime, may need to



Design Time Intrinsic Size

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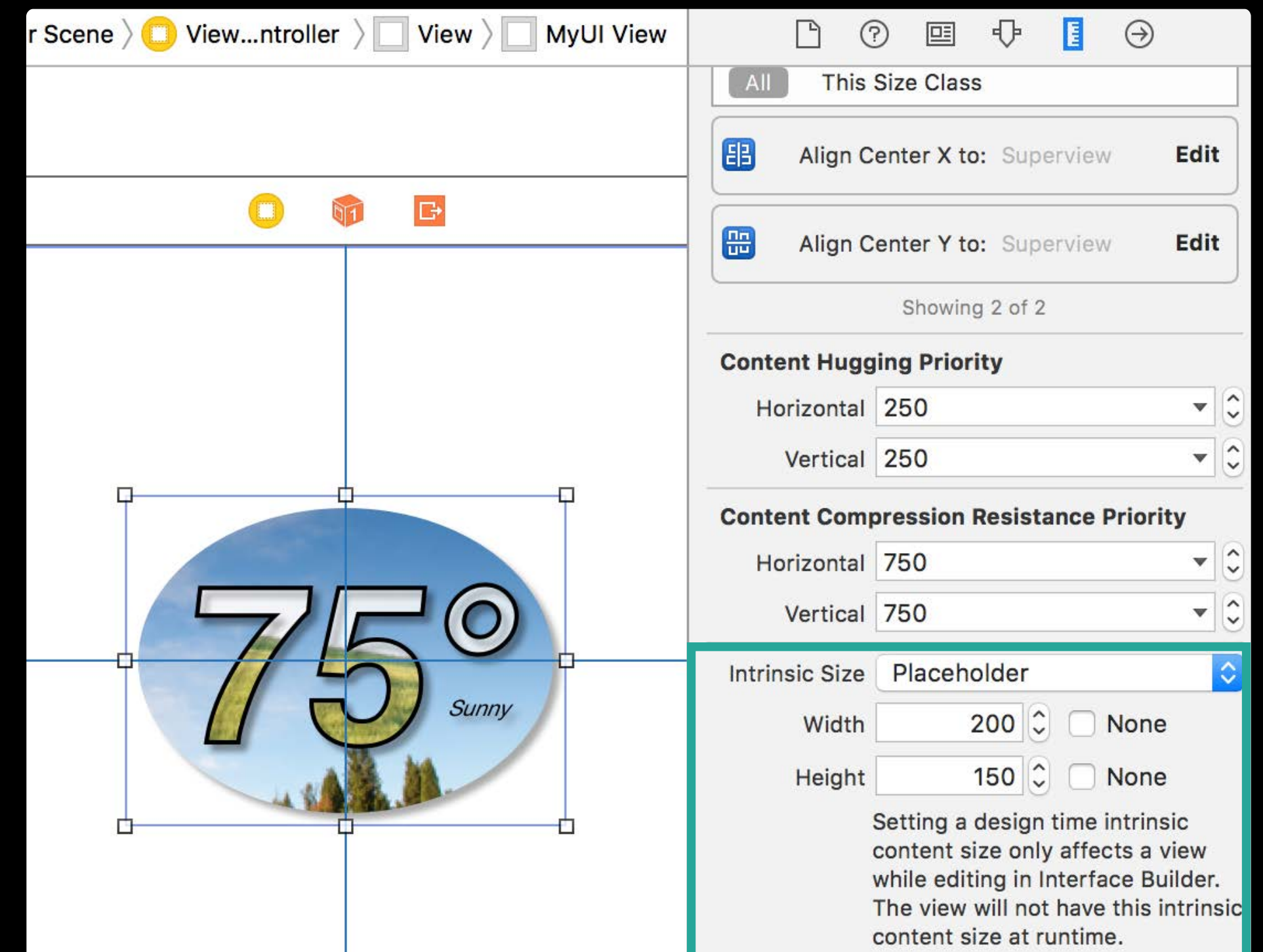
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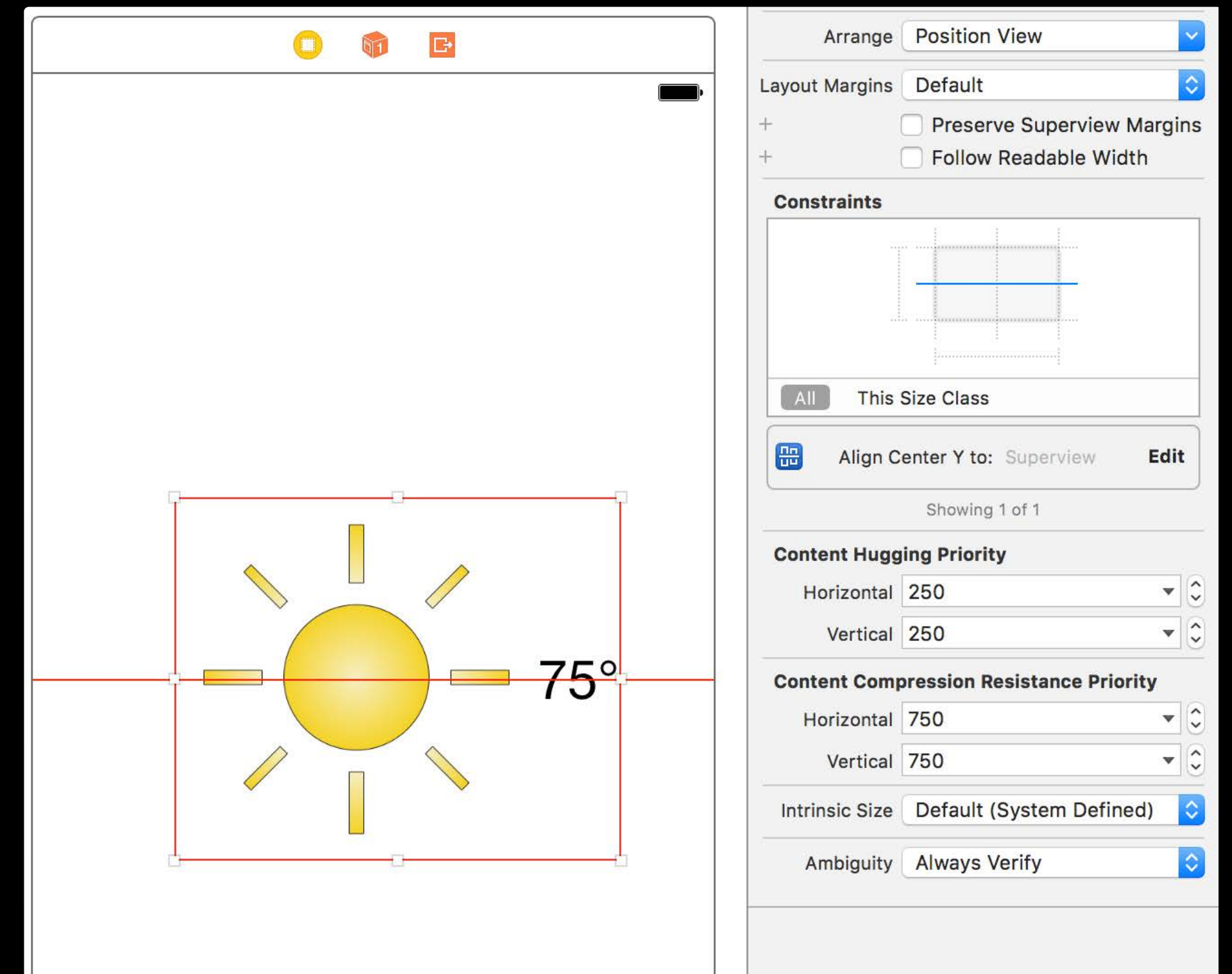
```
override var intrinsicContentSize: CGSize
```



Turn Off Ambiguity Per View

NEW

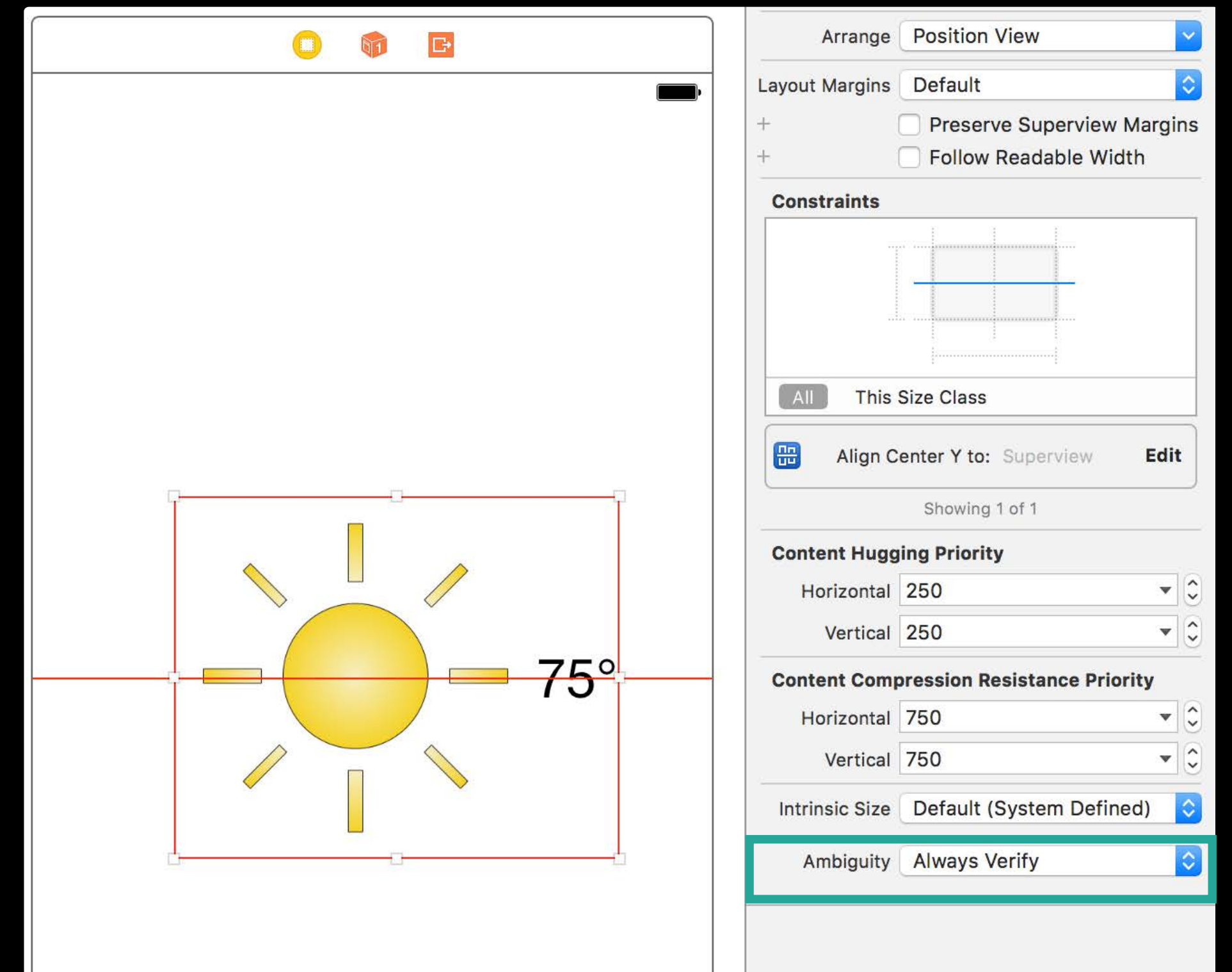
Arbitrary layout defined with runtime constraints



Turn Off Ambiguity Per View

NEW

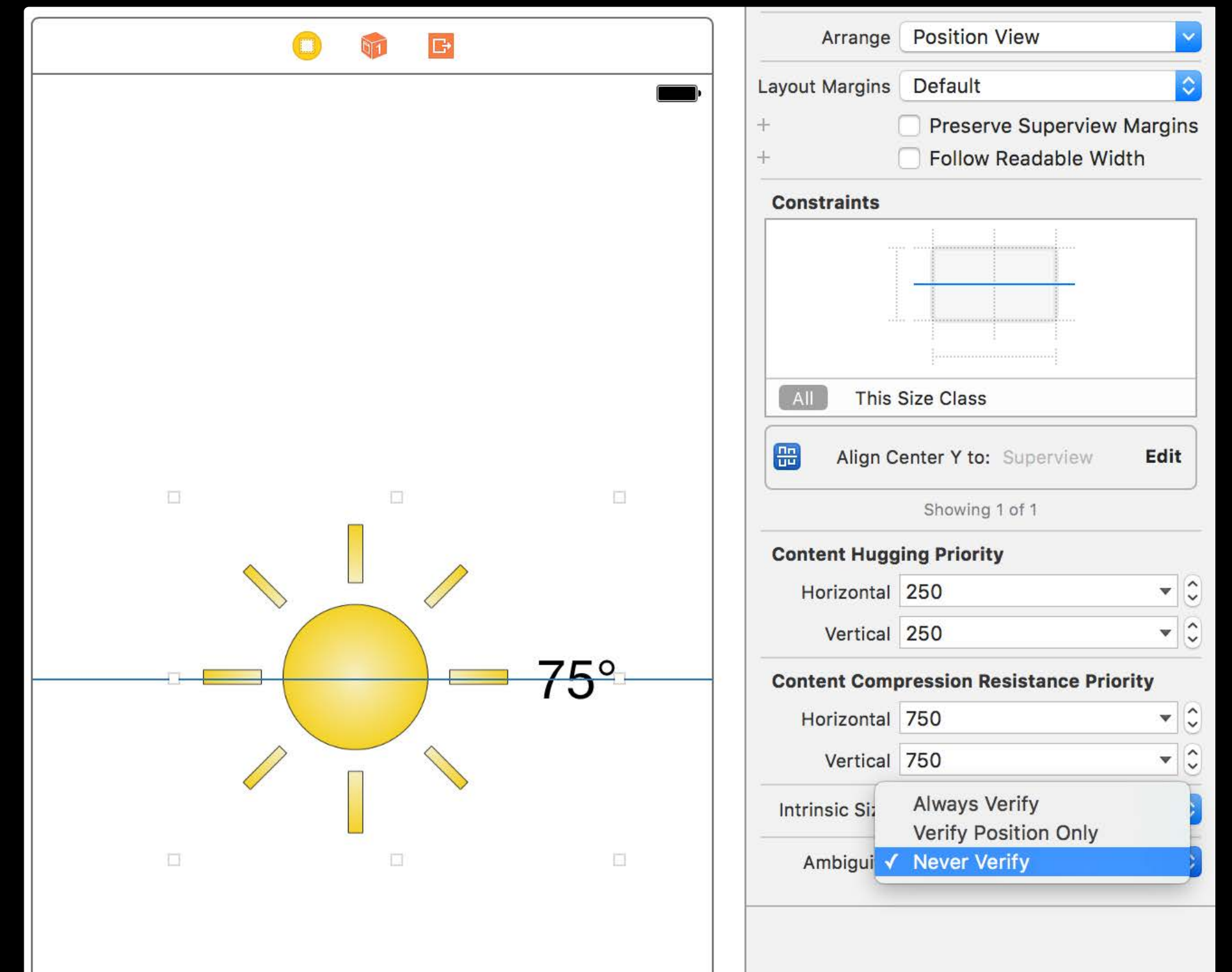
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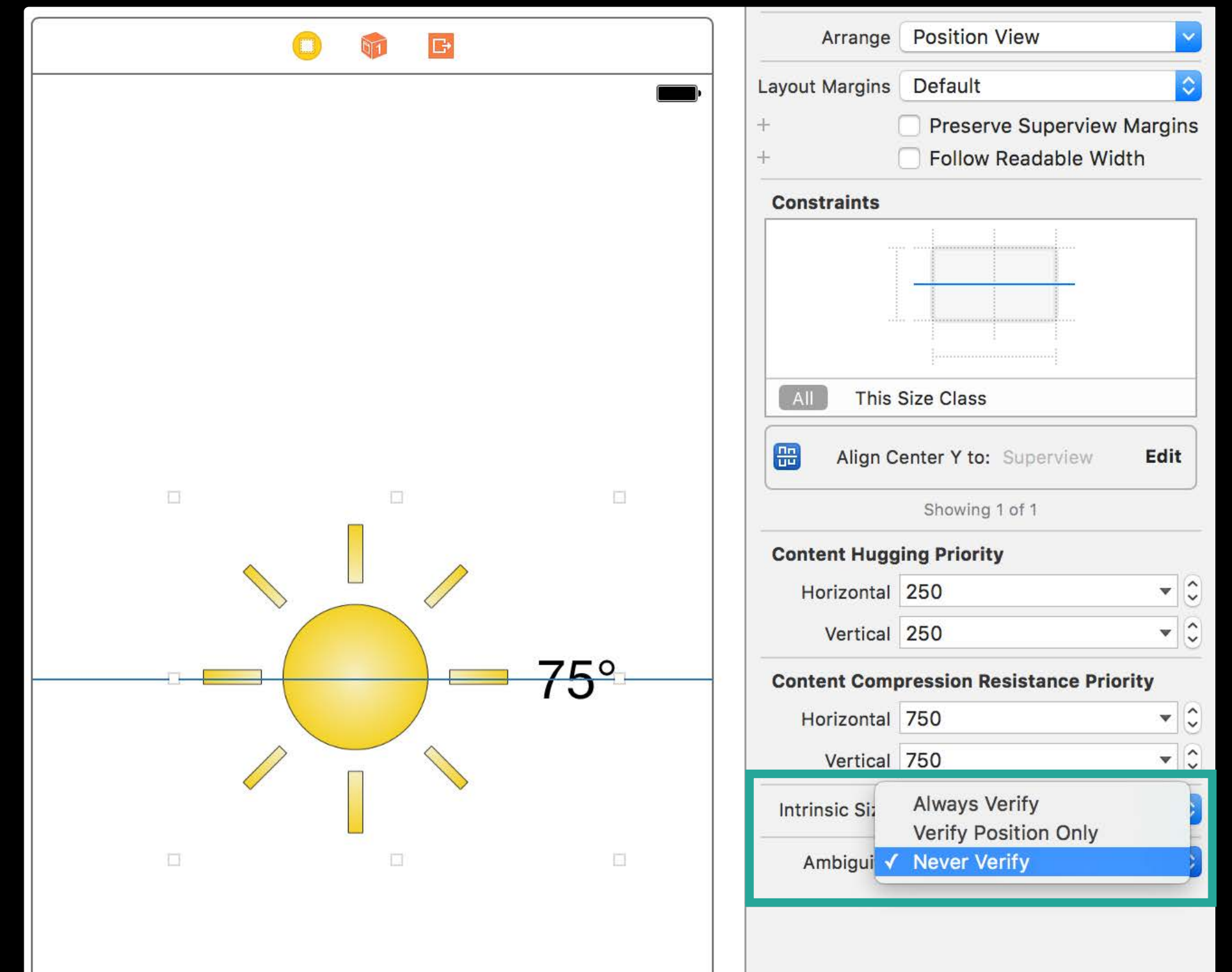
Arbitrary layout defined with
runtime constraints



Turn Off Ambiguity Per View

NEW

Arbitrary layout defined with runtime constraints



We Have Seen

Incrementally adopting Auto Layout

Playing well with design and runtime constraints

NEW

NSGridView

A new layout container for macOS

NSGridView

NEW

Maintenance on constraints is complicated

- Put hard disks to sleep when possible
- Wake for network access
- Start up automatically after a power failure
- Enable Power Nap

NSGridView

NEW

Maintenance on constraints is complicated

NS/UIStackView

- Arranging a sequence of items
- Fine control over content size and spacing

- Put hard disks to sleep when possible
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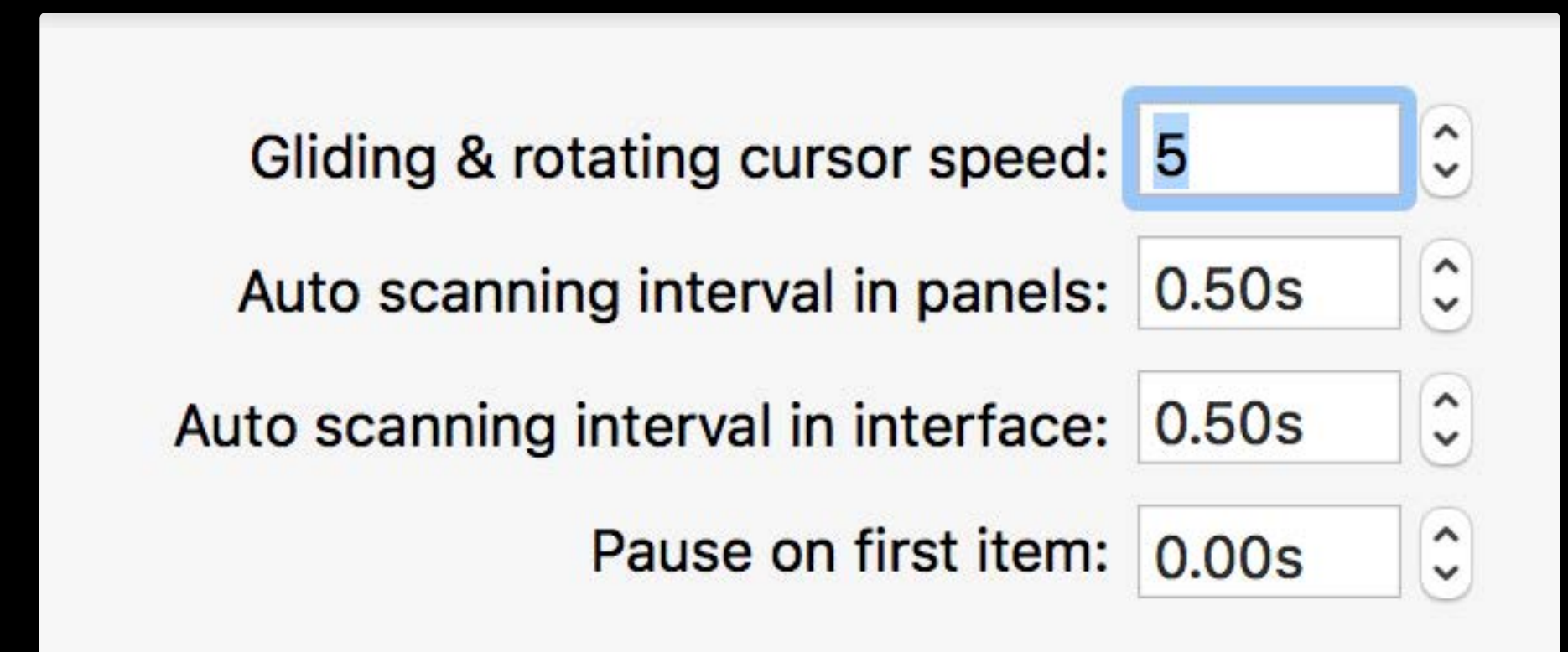
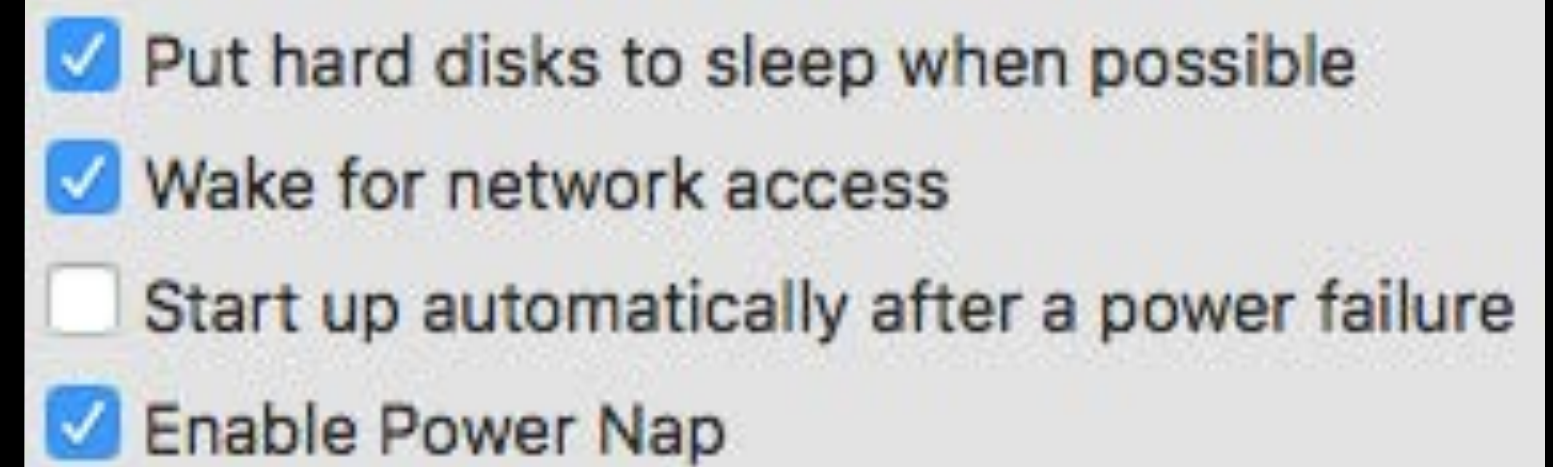
NSGridView

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NSGridView

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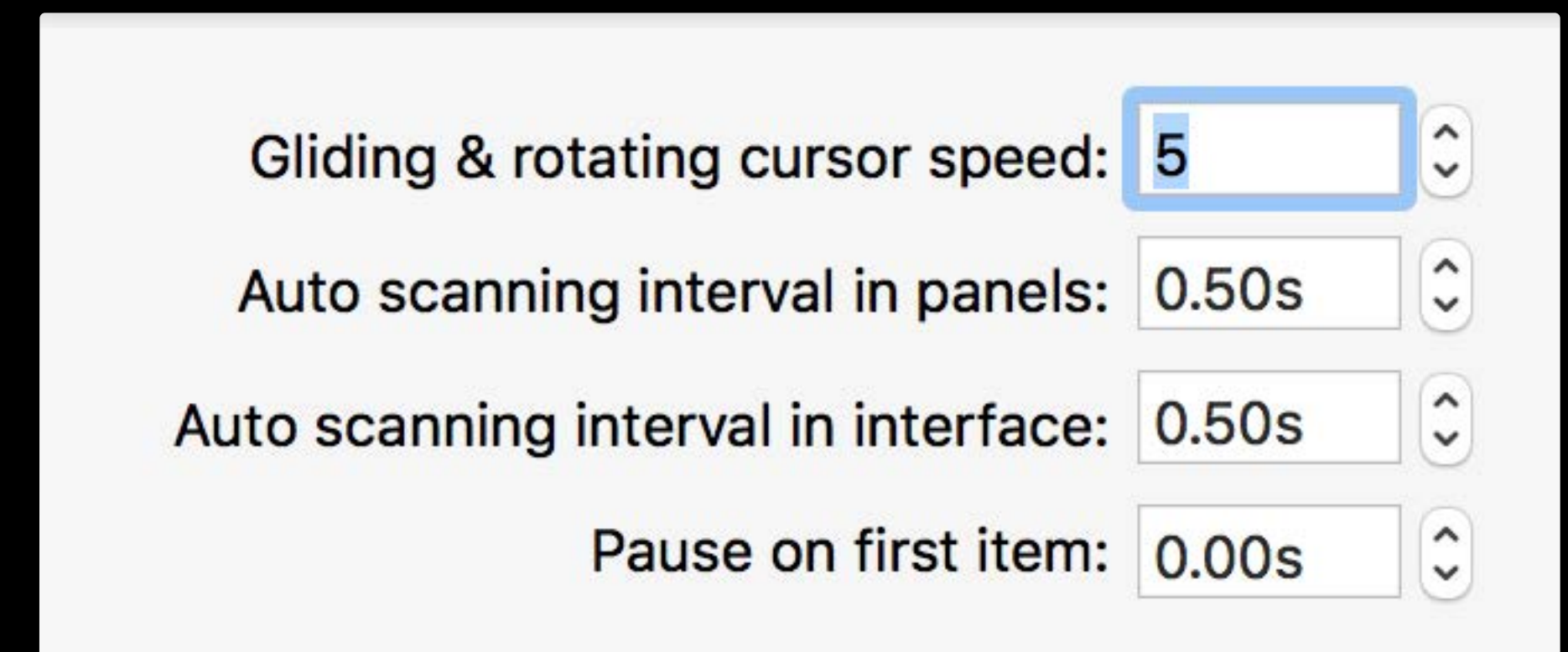
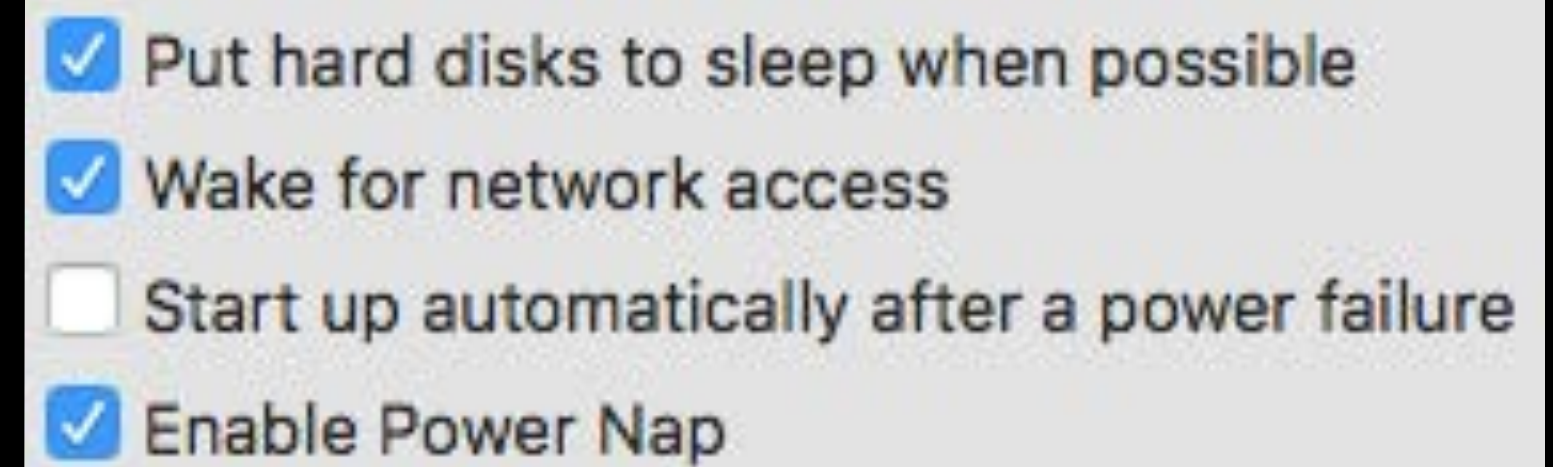
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NSGridView

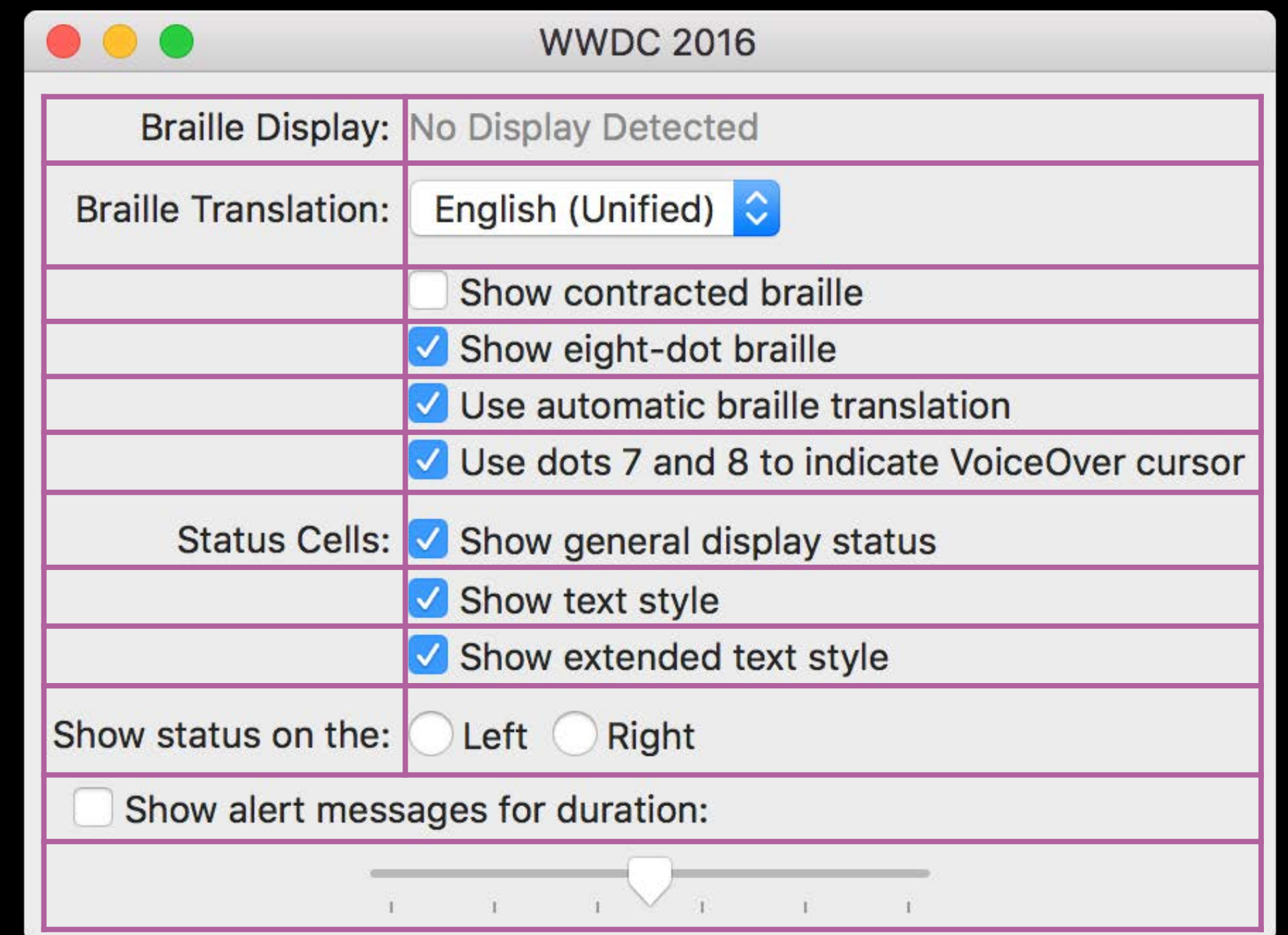
- Places views in an explicitly defined grid
- Content aligned across rows and columns



NSGridView

Overview

NEW

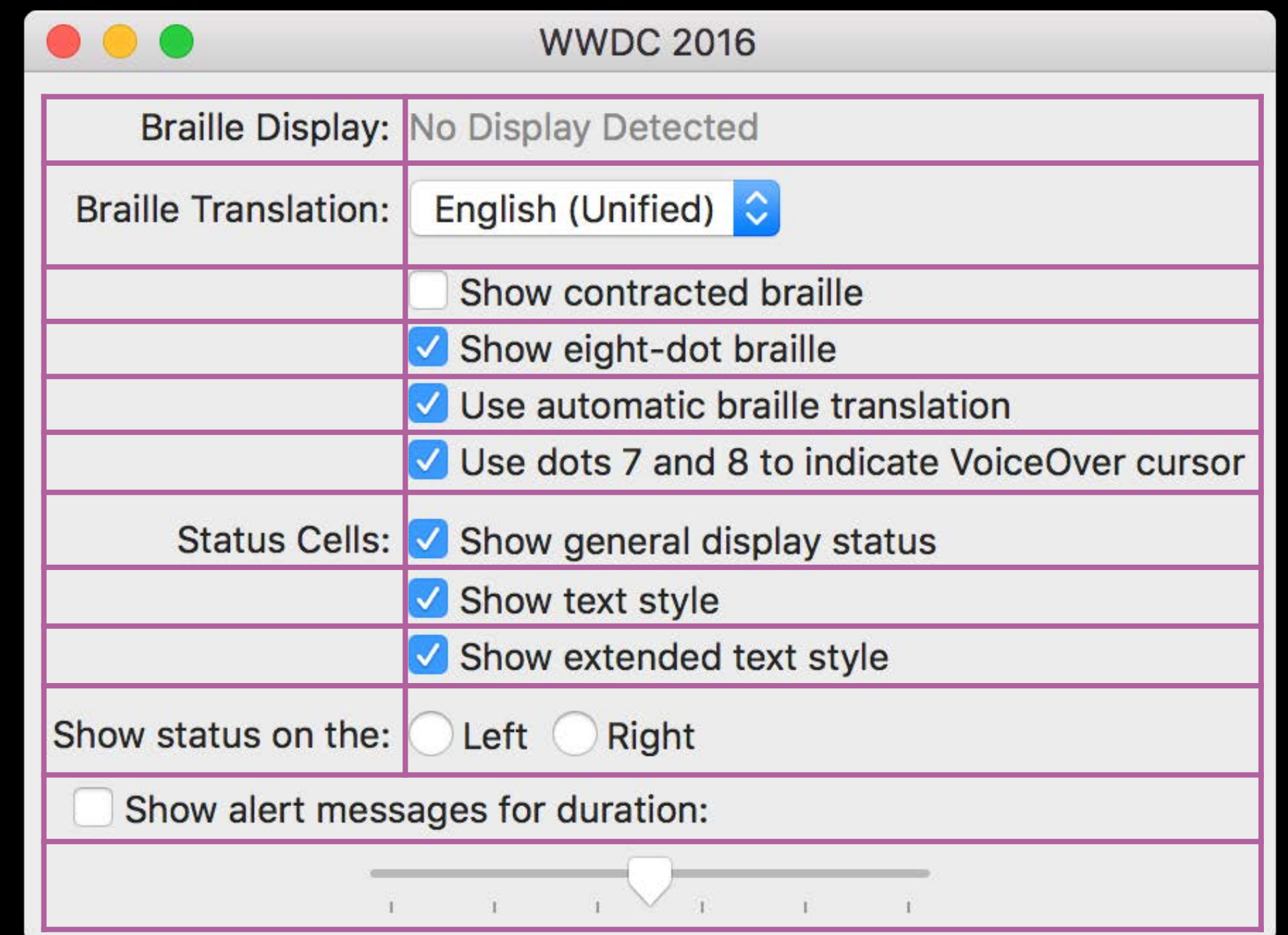


NSGridView

Overview

NSGridRow and NSGridColumn

NEW



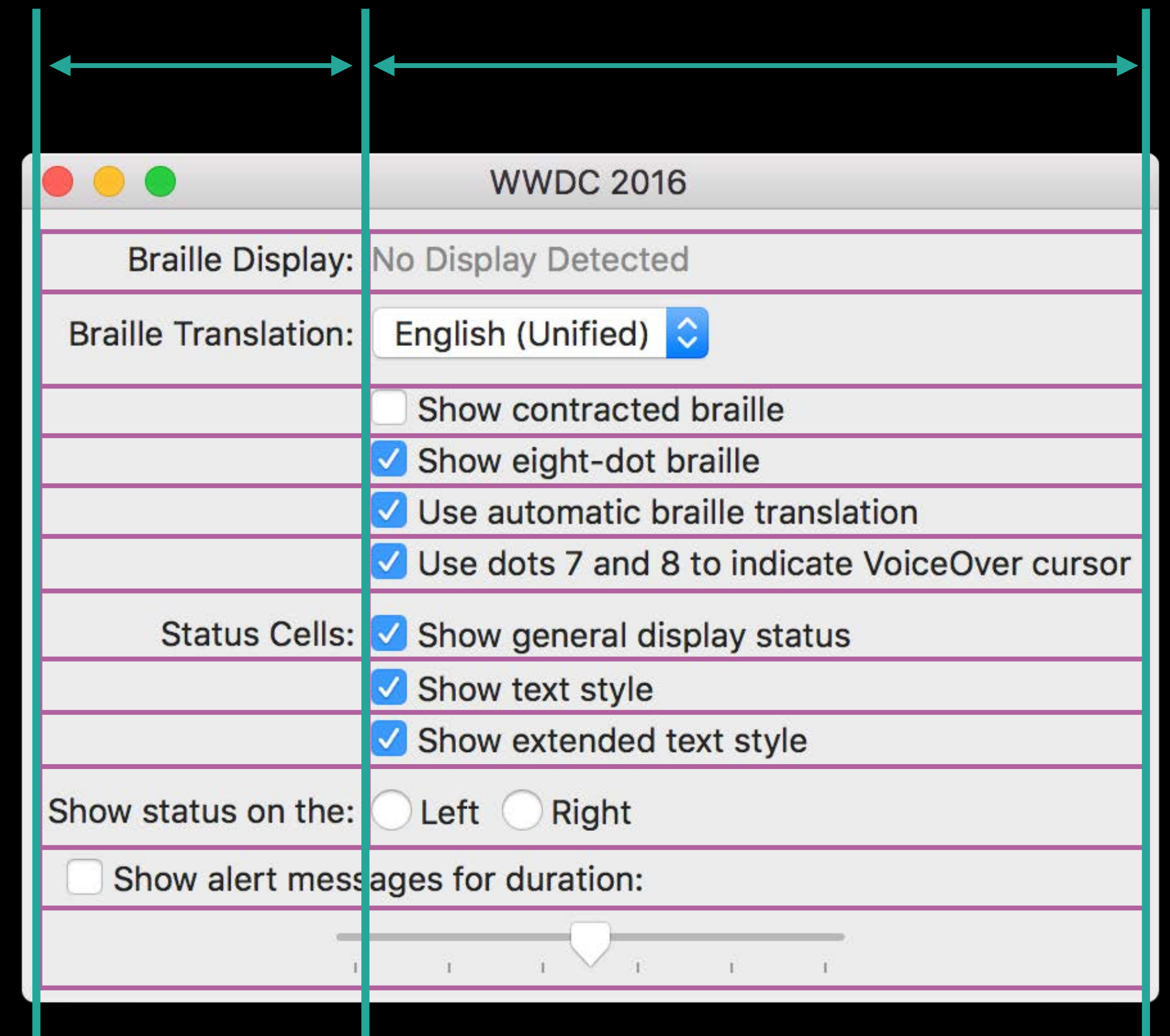
NSGridView

Overview

NEW

NSGridViewRow and NSGridViewColumn

- Automatic or explicit sizing



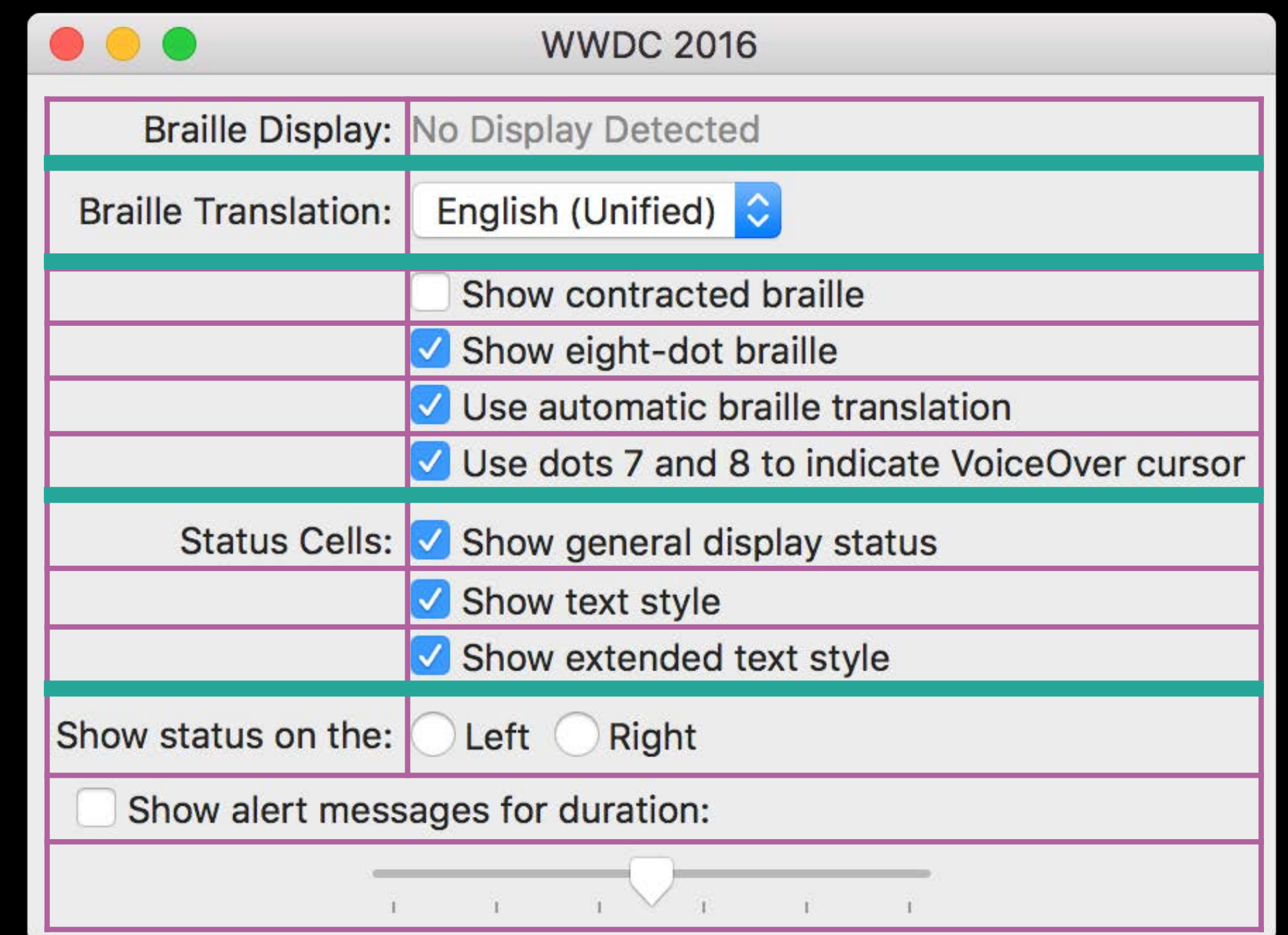
NSGridView

Overview

NEW

NSGridRow and NSGridColumn

- Automatic or explicit sizing
- Optional padding and spacing



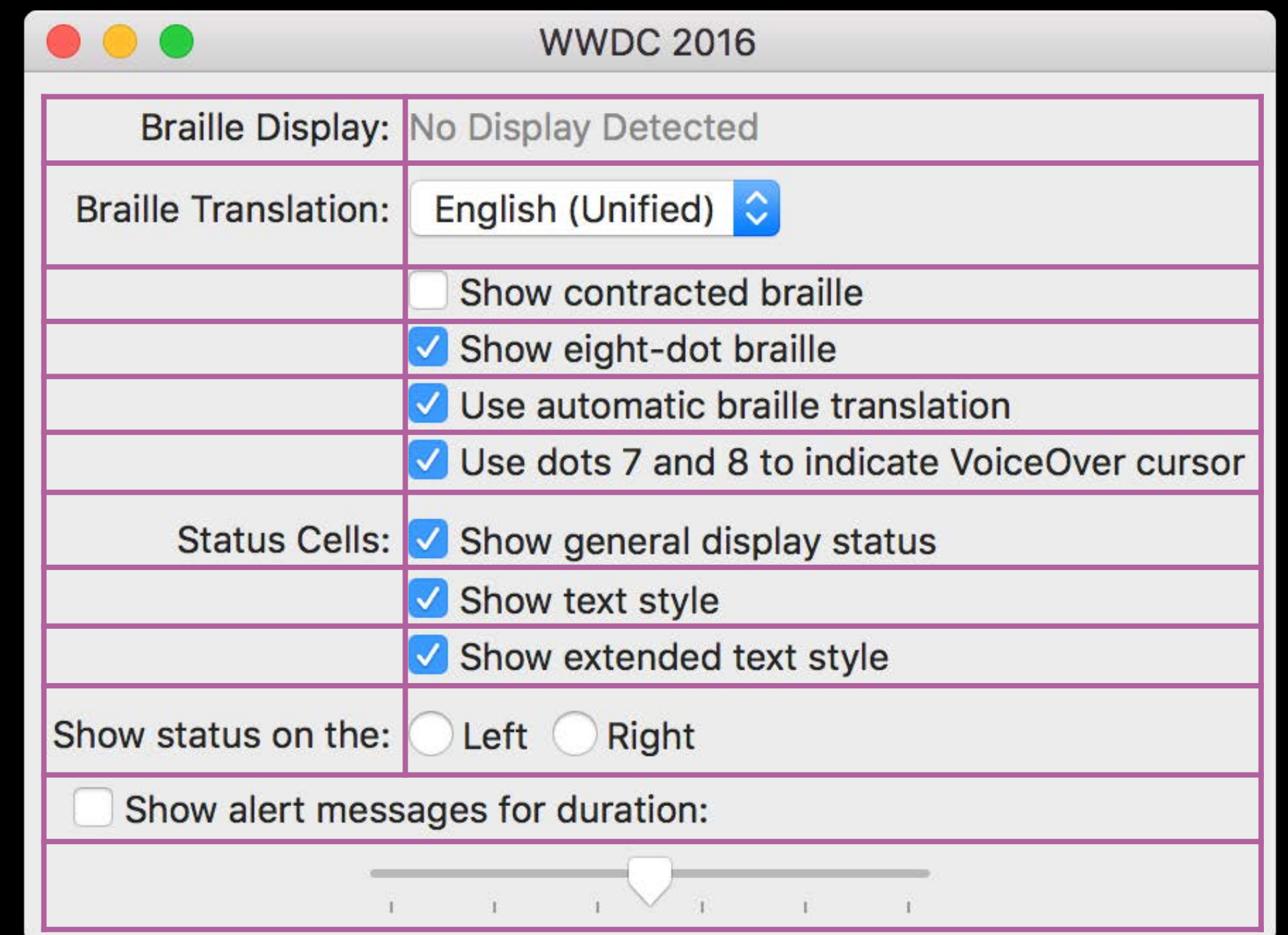
NSGridView

Overview

NEW

NSGridView and NSGridColumn

- Automatic or explicit sizing
- Optional padding and spacing
- Hidden rows and columns



NSGridView

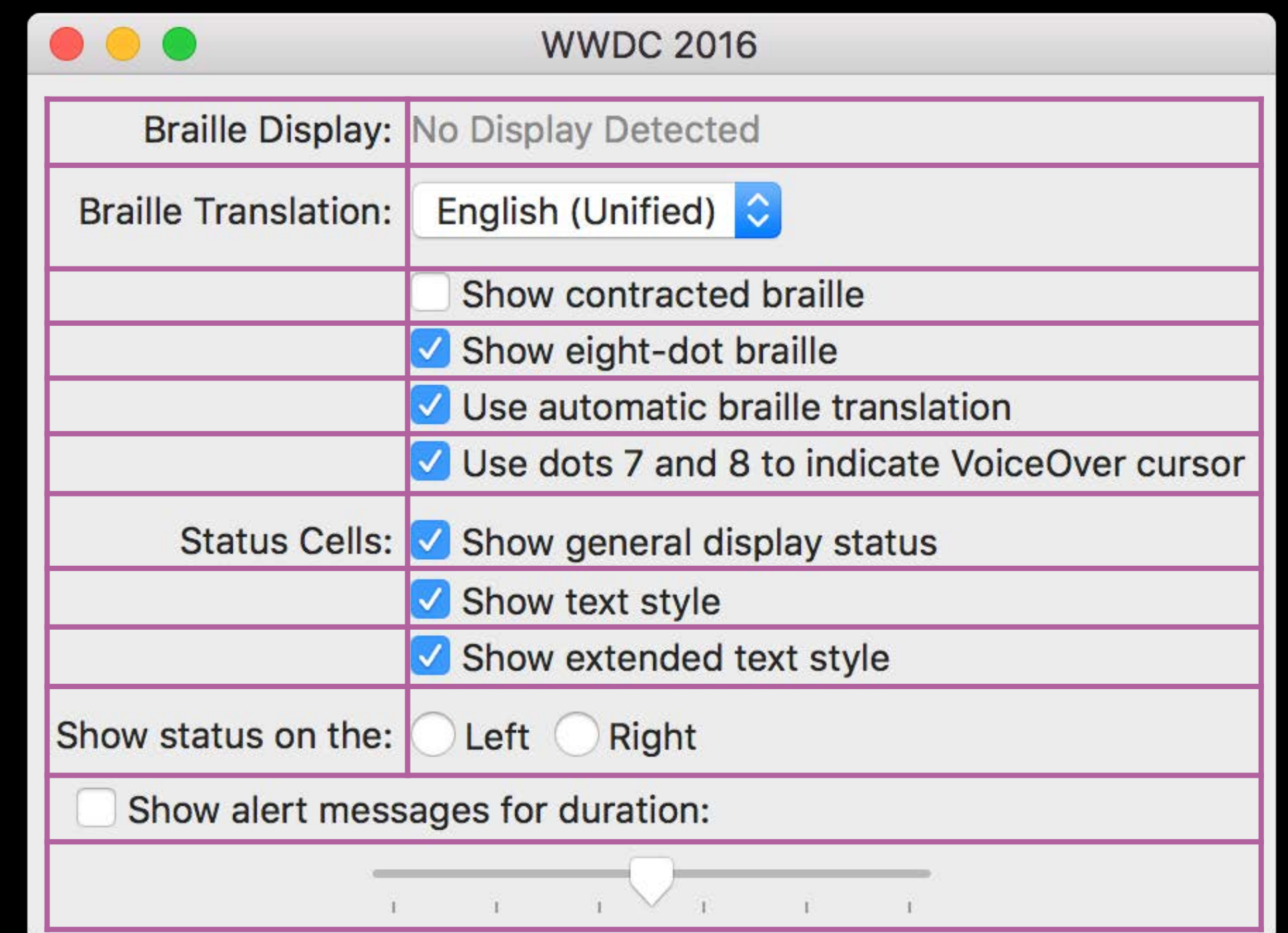
Overview

NEW

NSGridRow and NSGridColumn

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NSGridCell



NSGridView

NEW

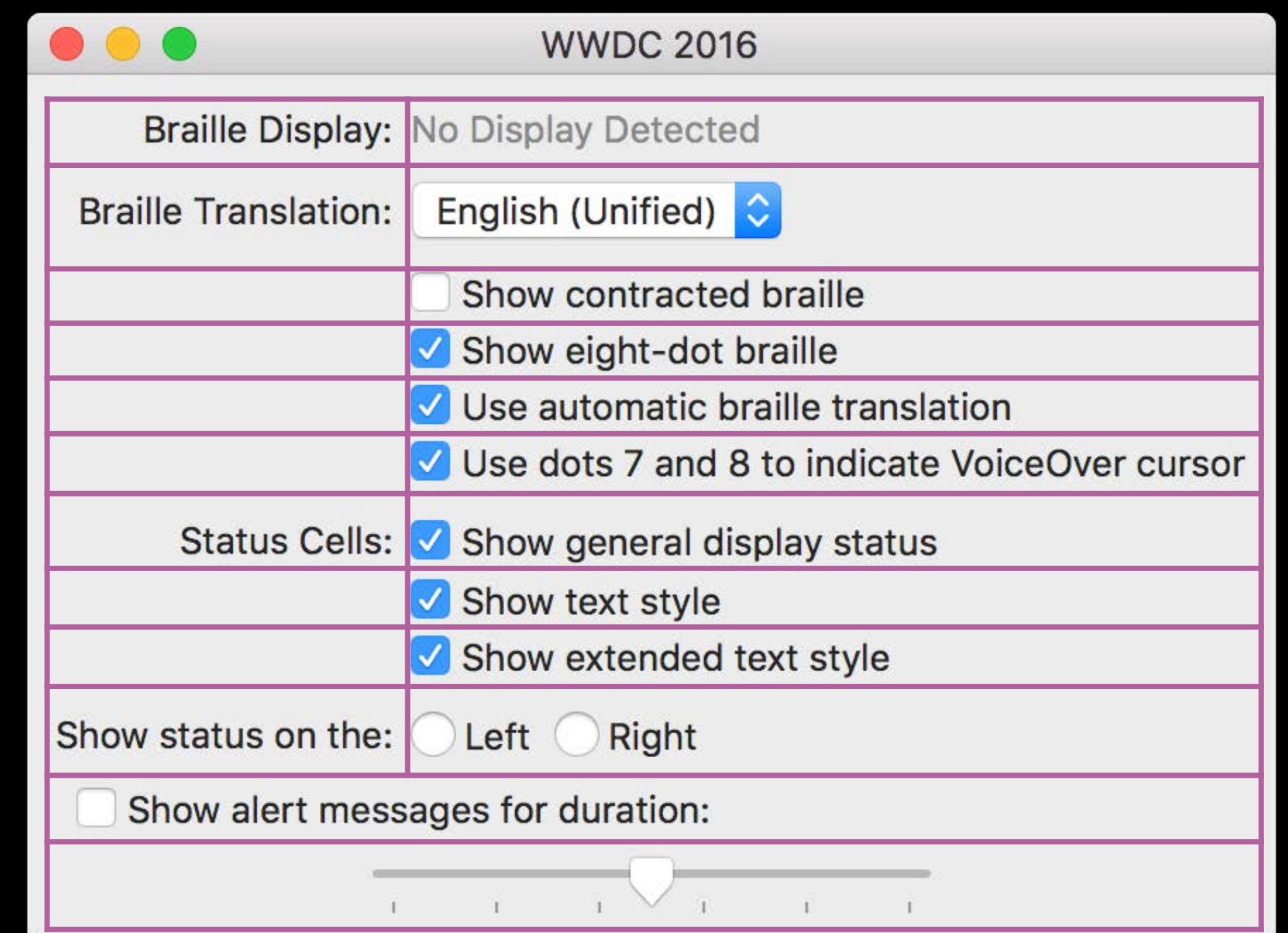
Overview

NSGridViewRow and NSGridViewColumn

- Automatic or explicit sizing
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- Hidden rows and columns

NSGridViewCell

- Each cell manages a content view



NSGridView

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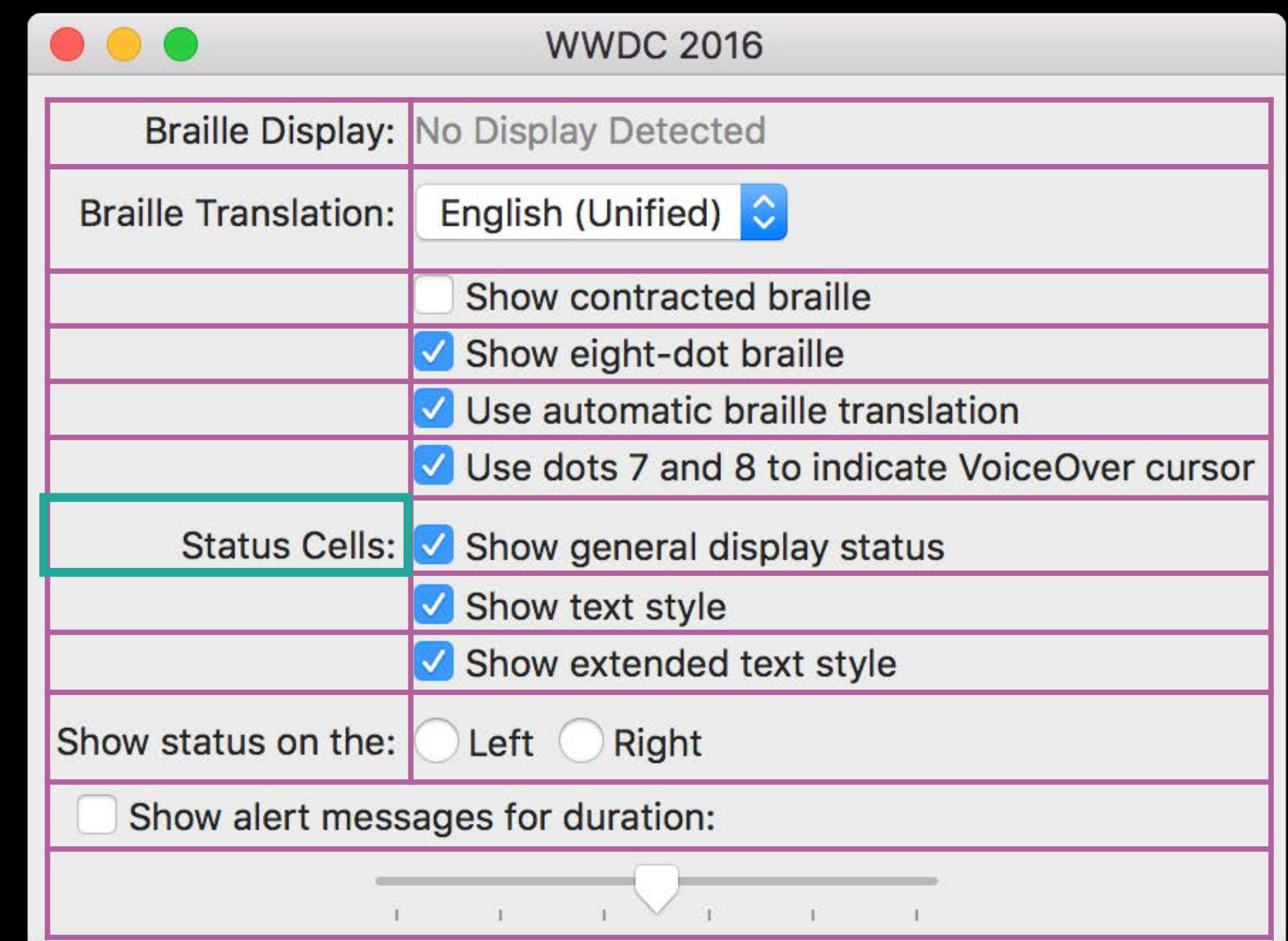
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NSGridViewCell

- Each cell manages a content view
- Adjustable placement



NSGridView

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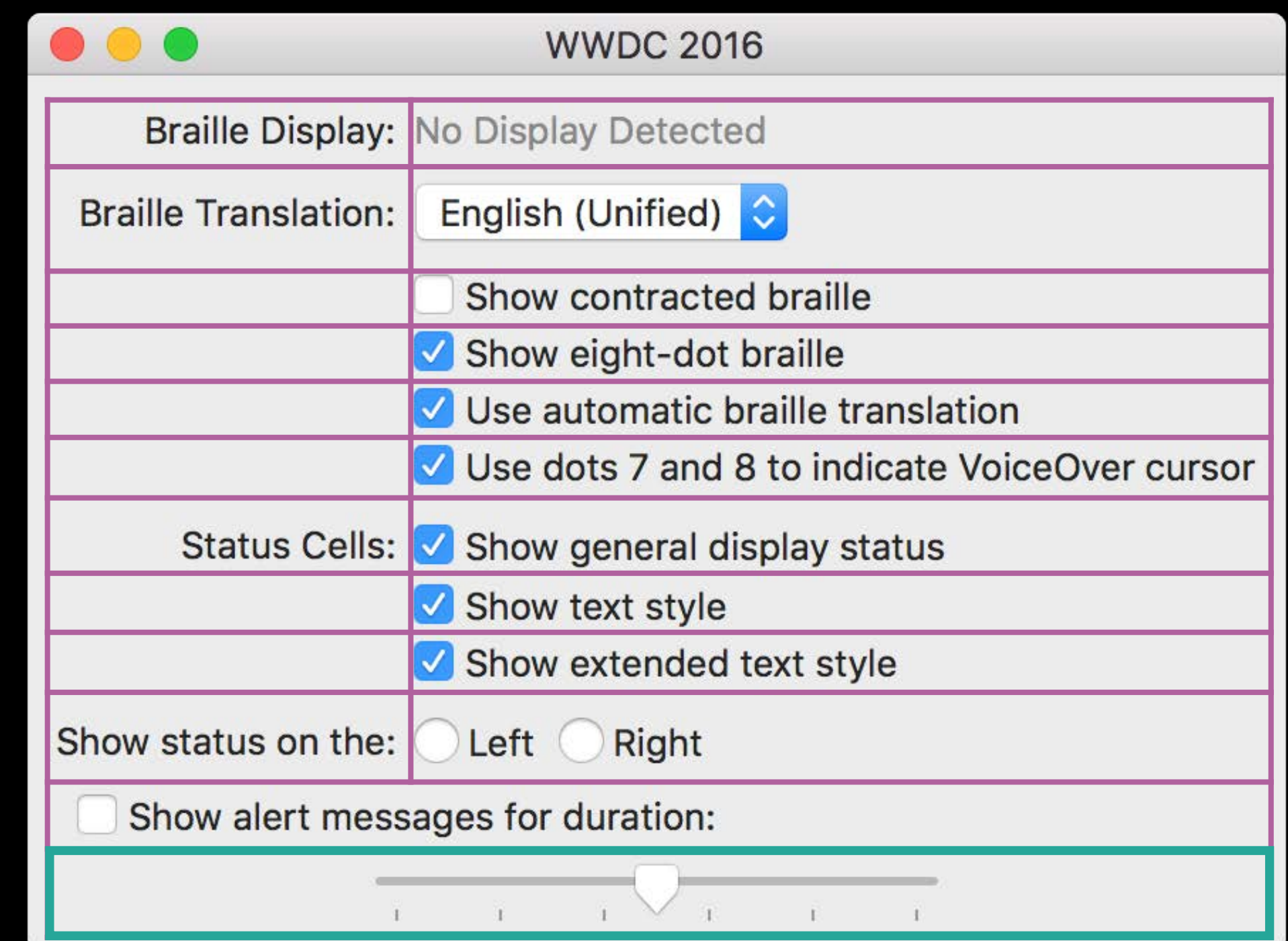
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NSGridCell

- Each cell manages a content view
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- Merged cells



NSGridView

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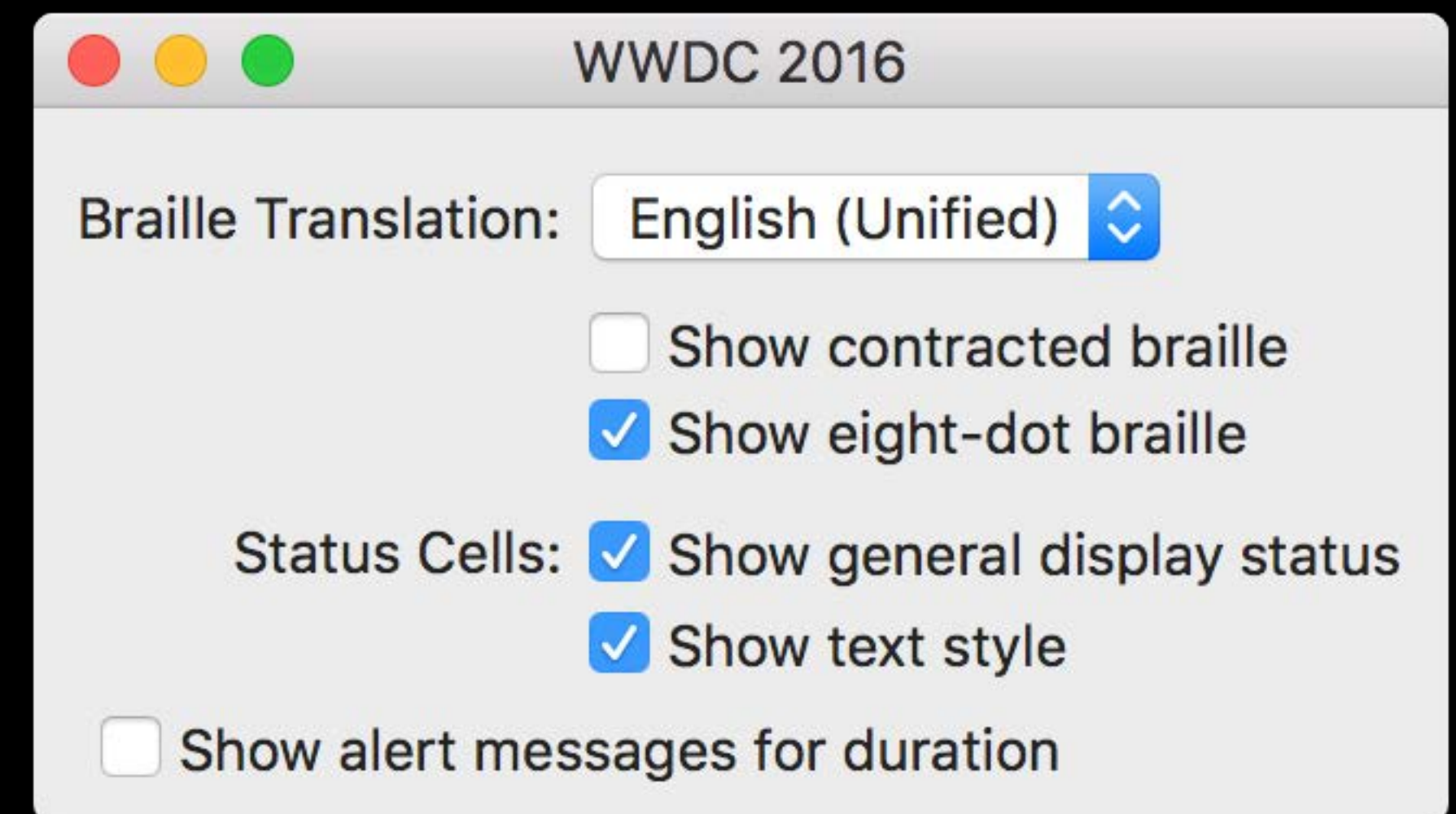
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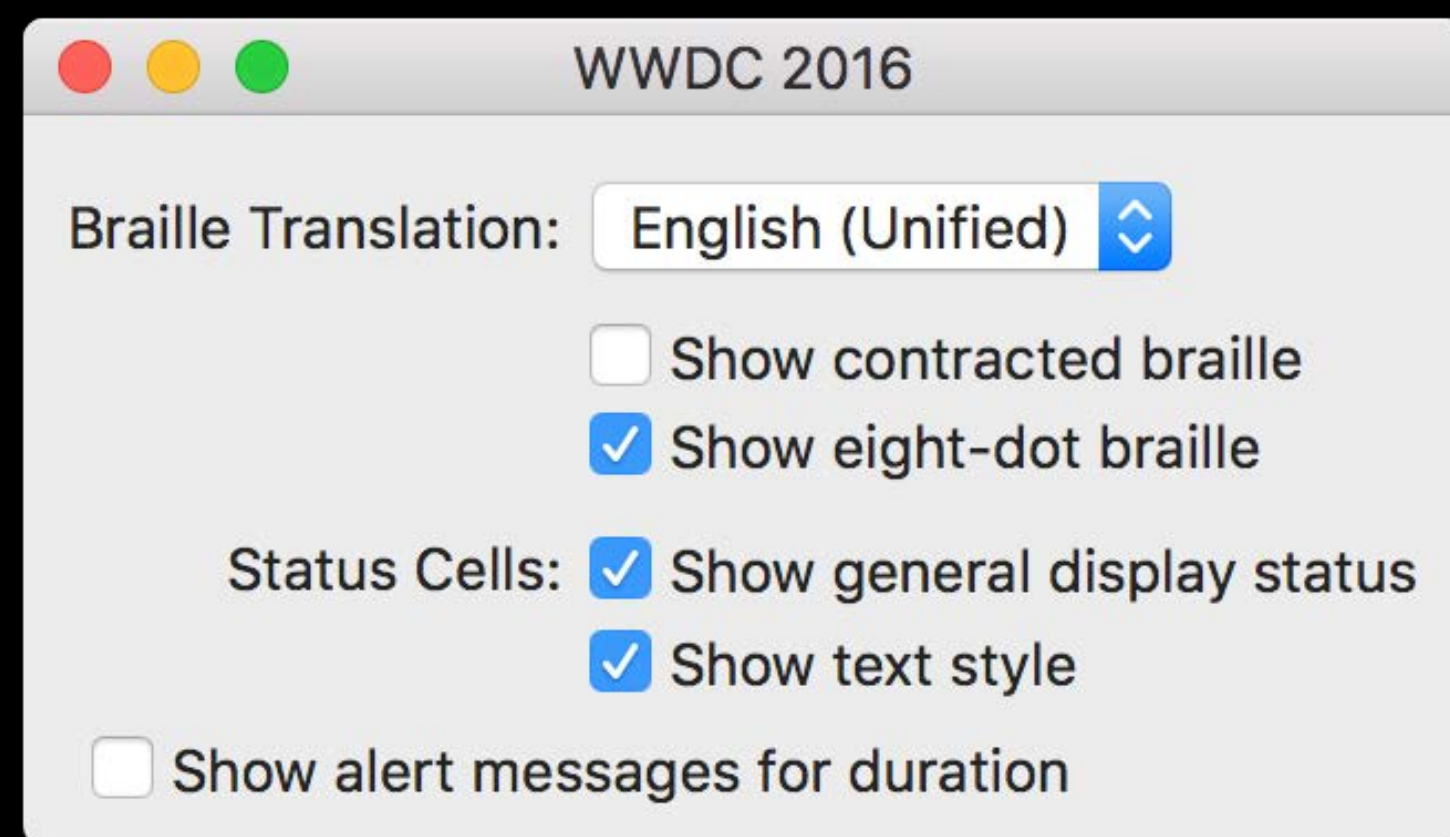
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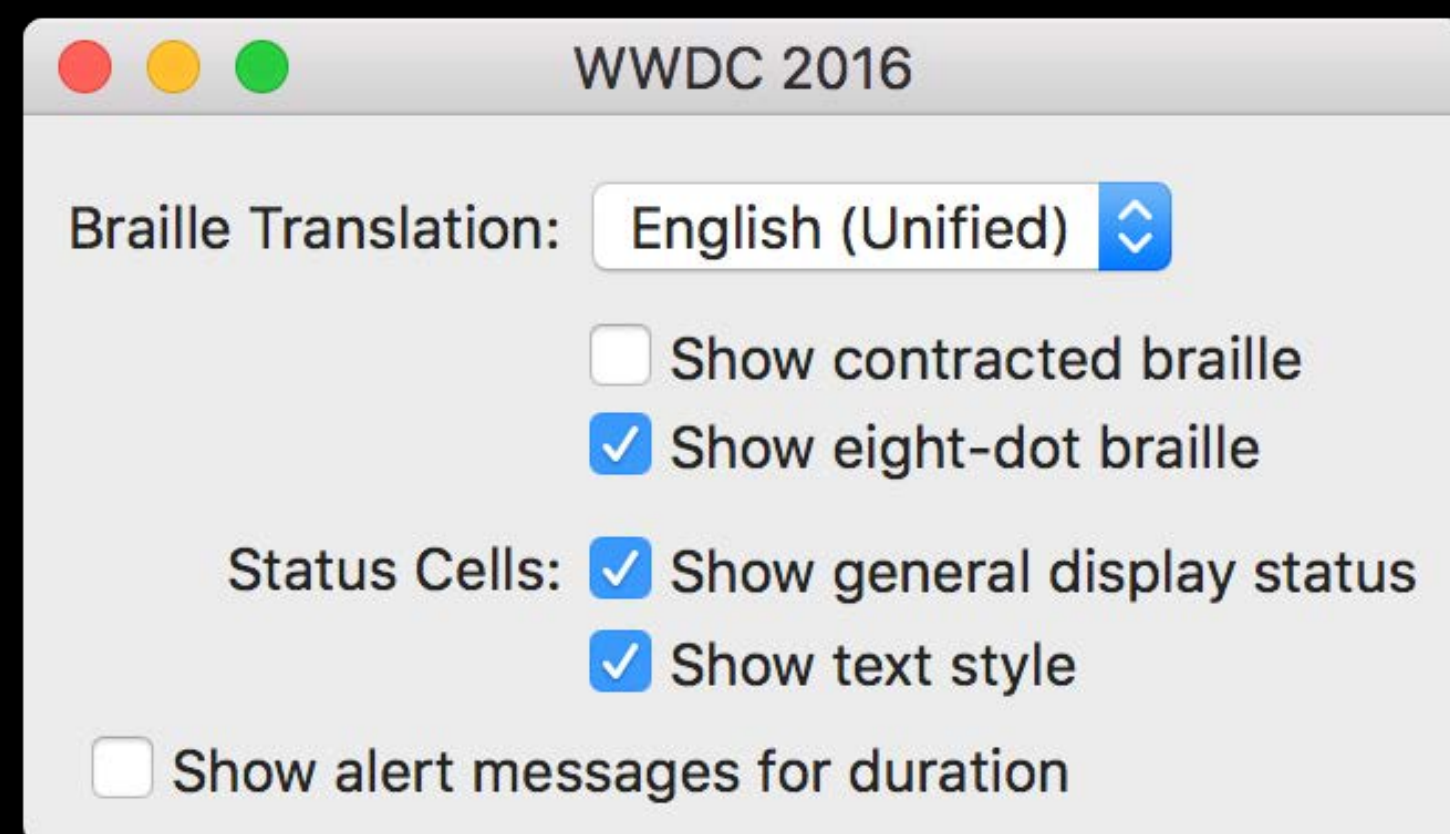
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let empty = NSGridCell.emptyContentView
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    [brailleTranslationLabel, brailleTranslationPopup],
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    [showAlertCB]
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Design



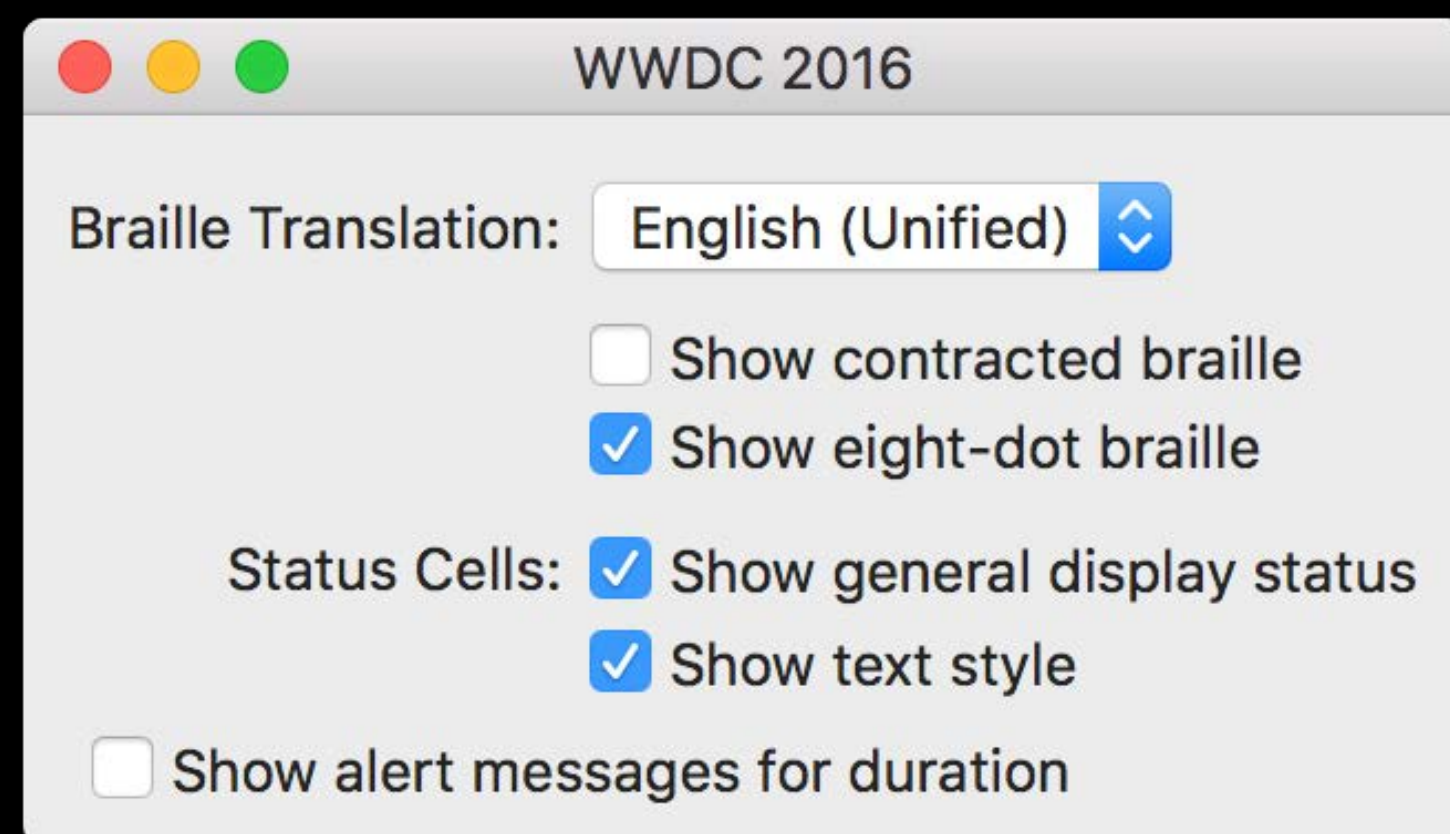
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Design

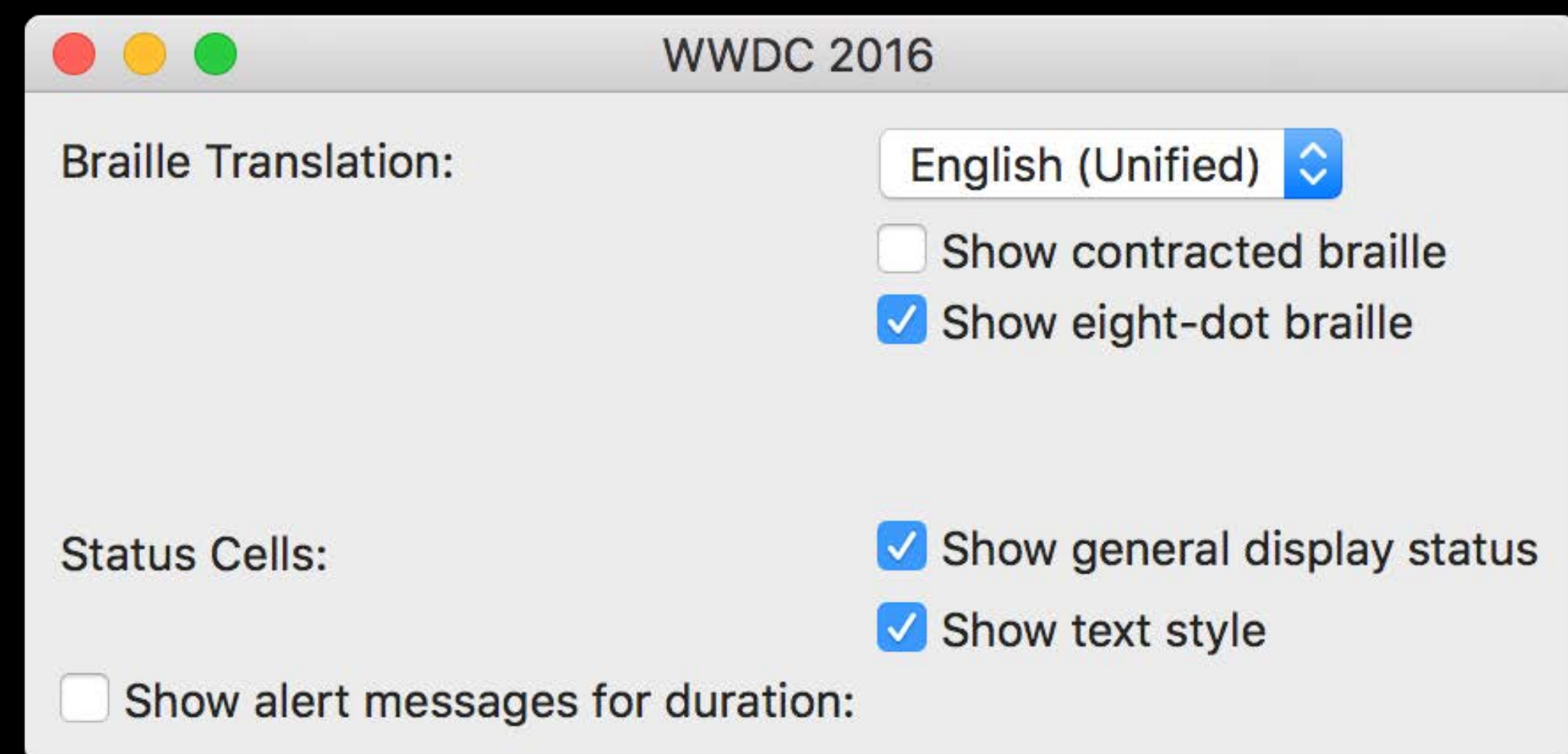



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Design



Implementation

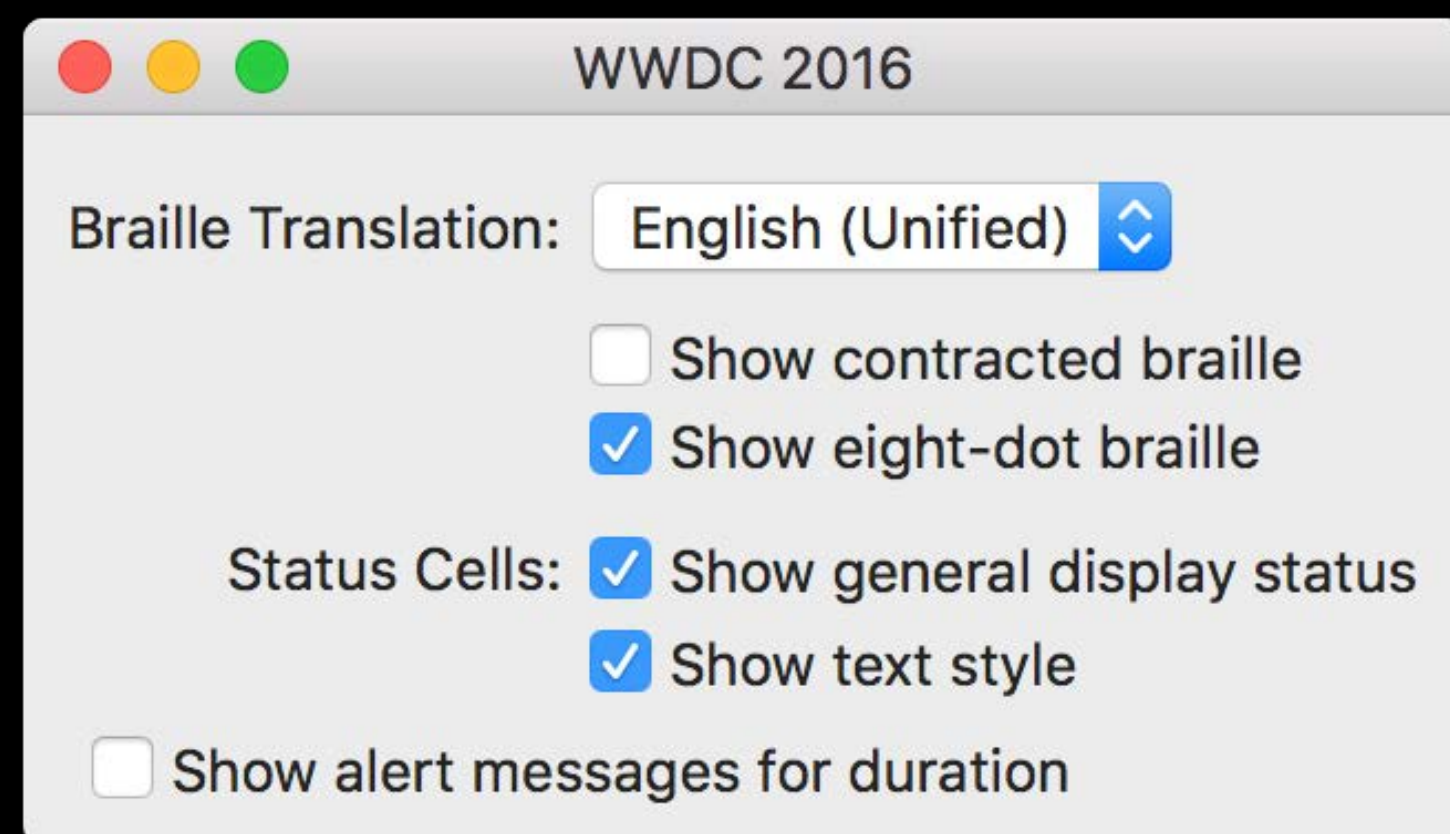


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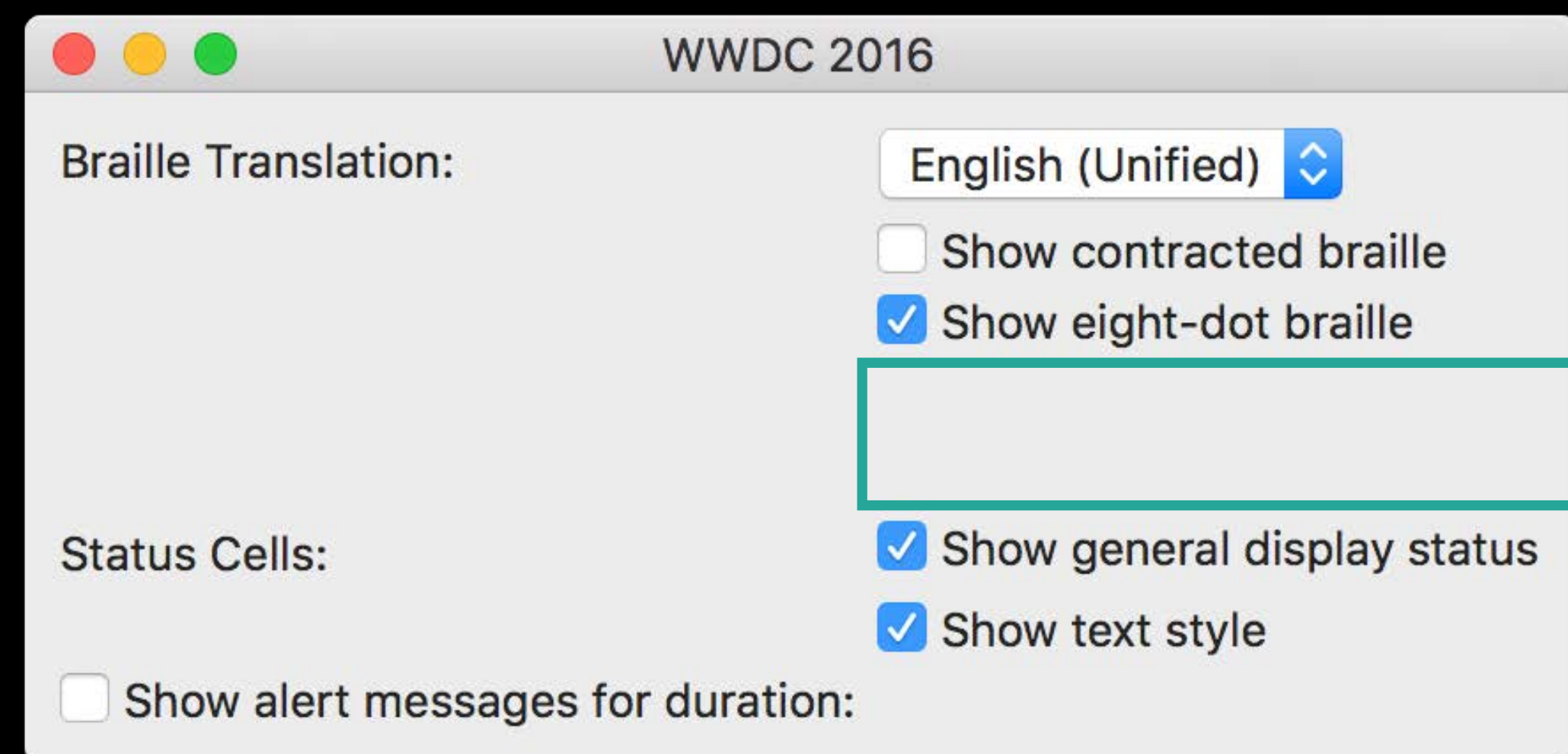
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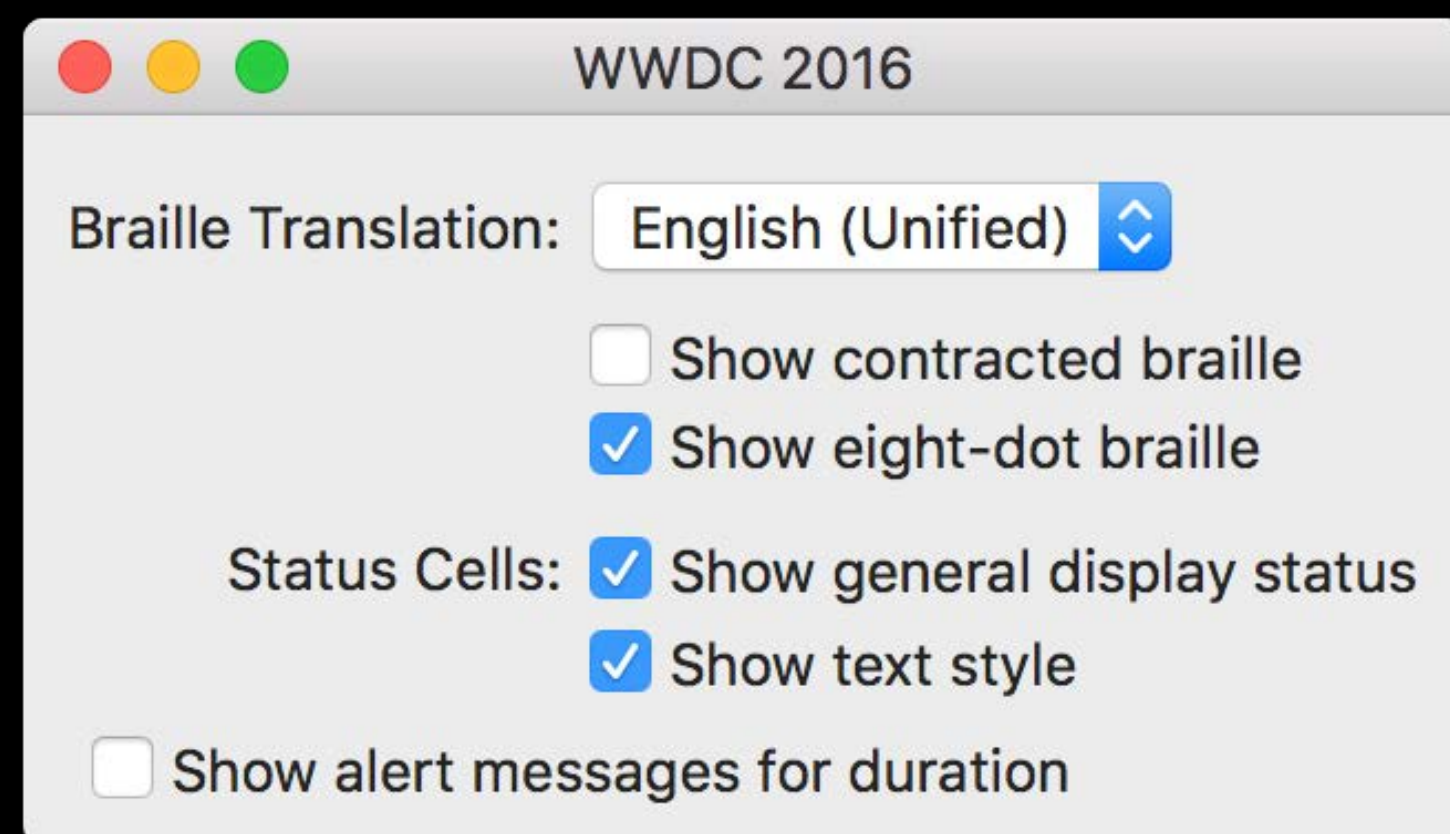


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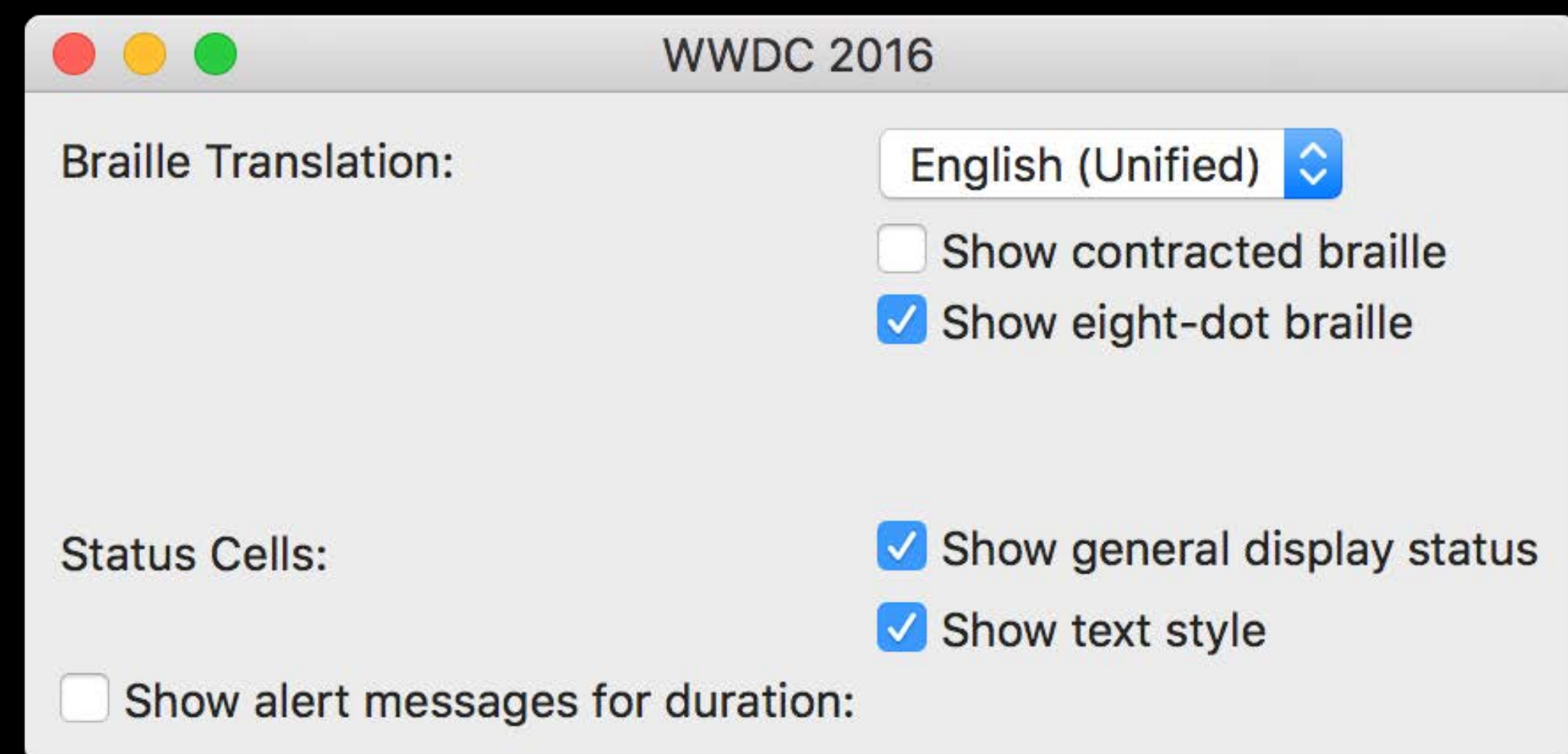



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Design



Implementation

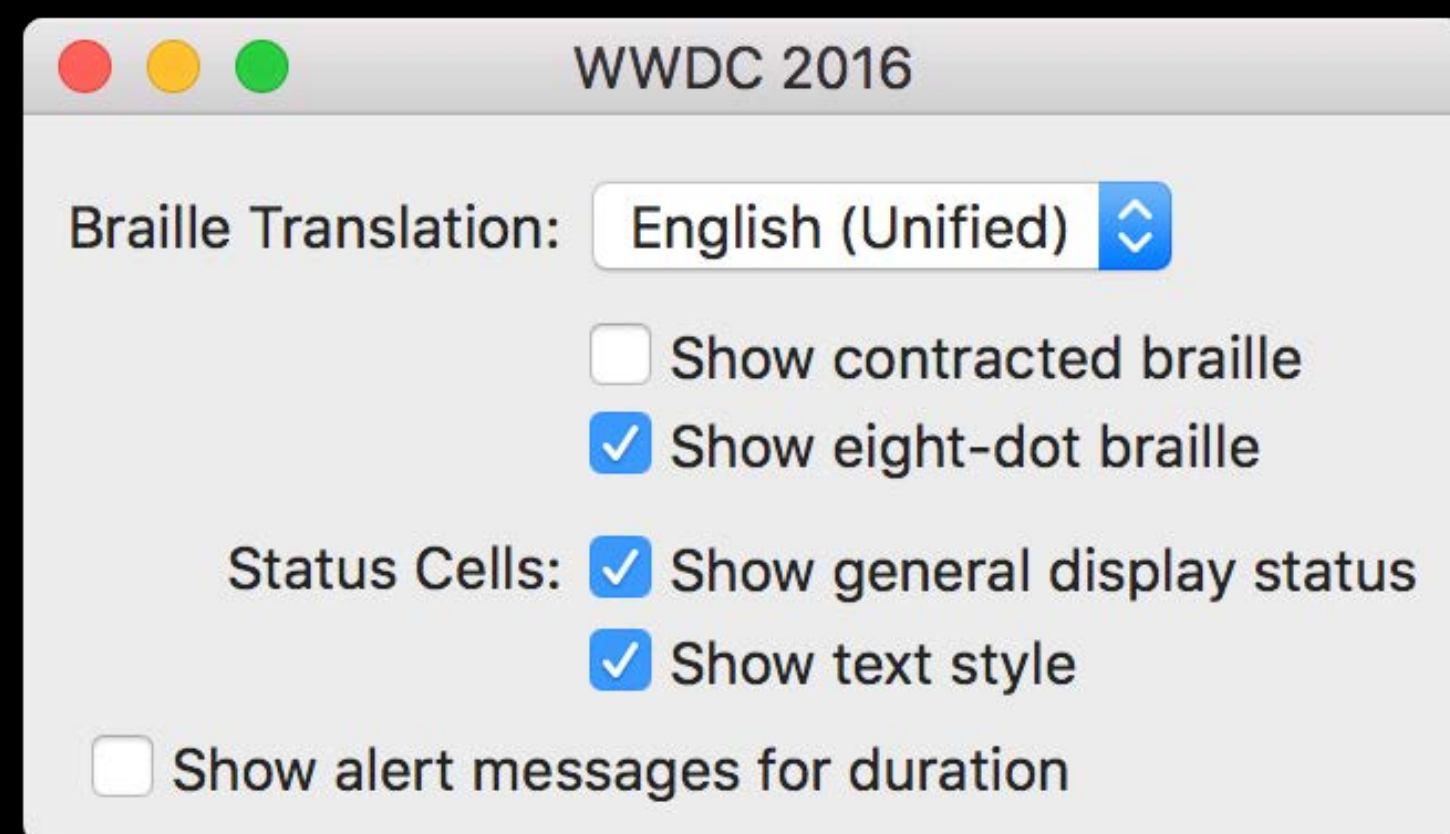



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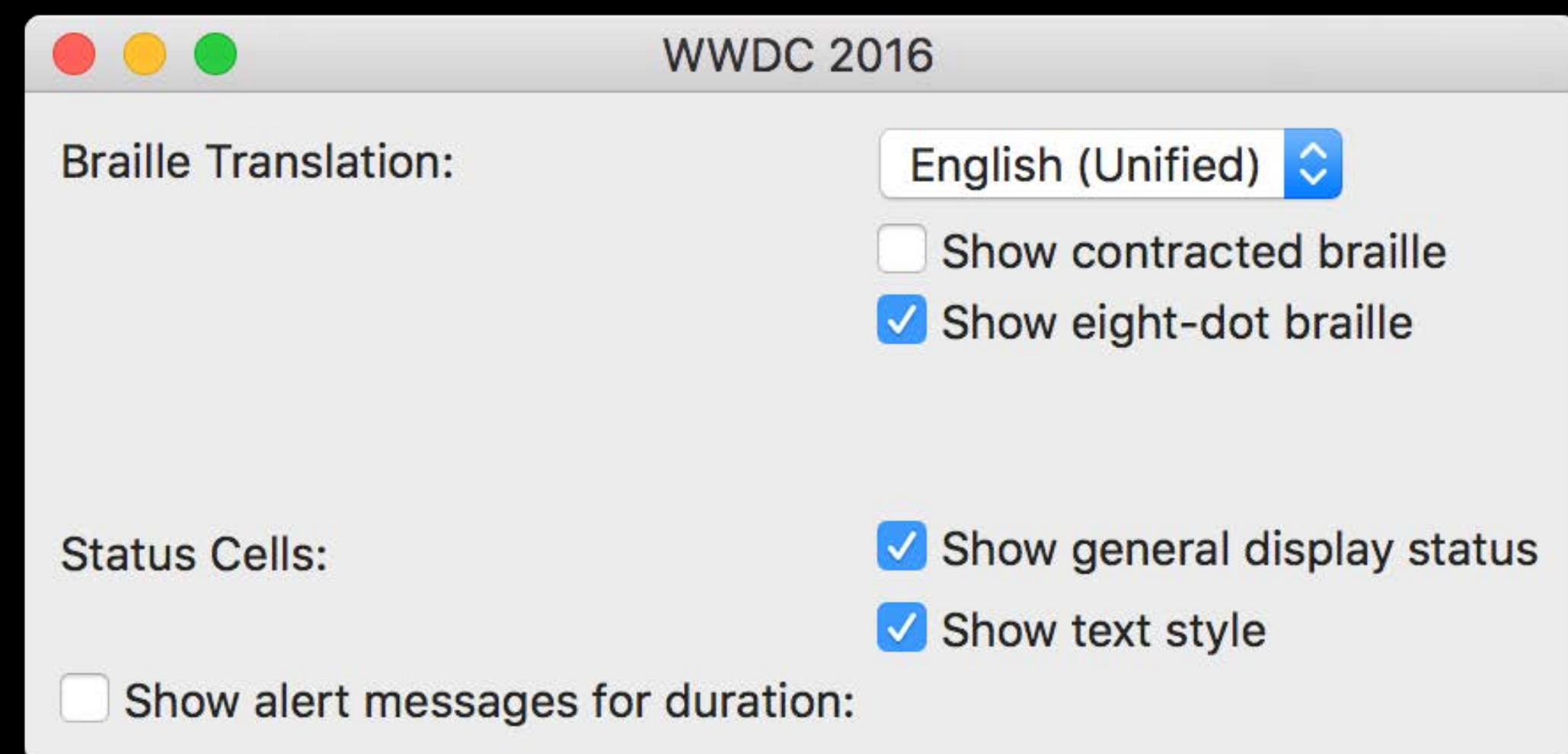
```
gridView.setContentHuggingPriority(600, for: .horizontal)
```

```
gridView.setContentHuggingPriority(600, for: .vertical)
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Design



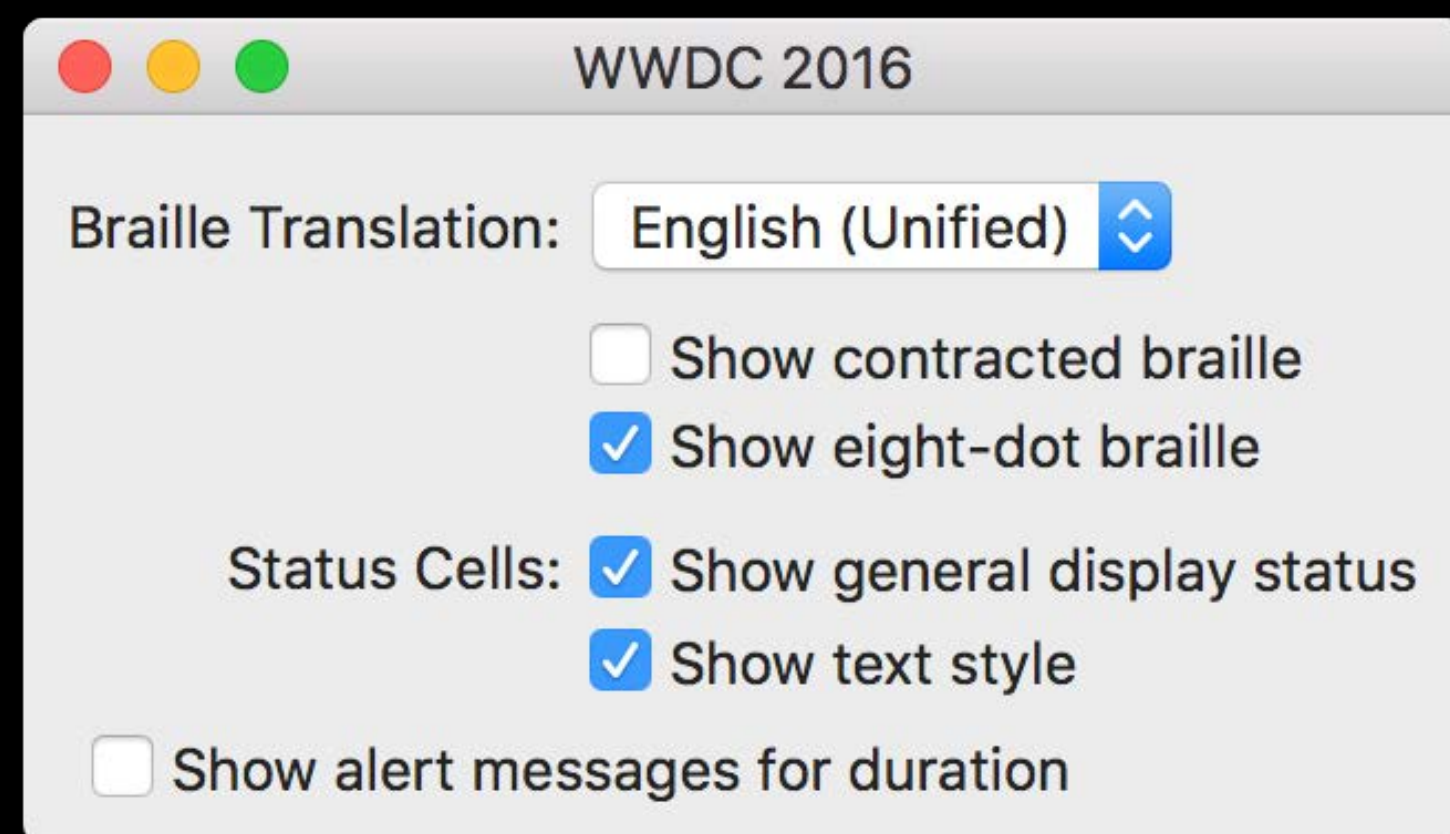
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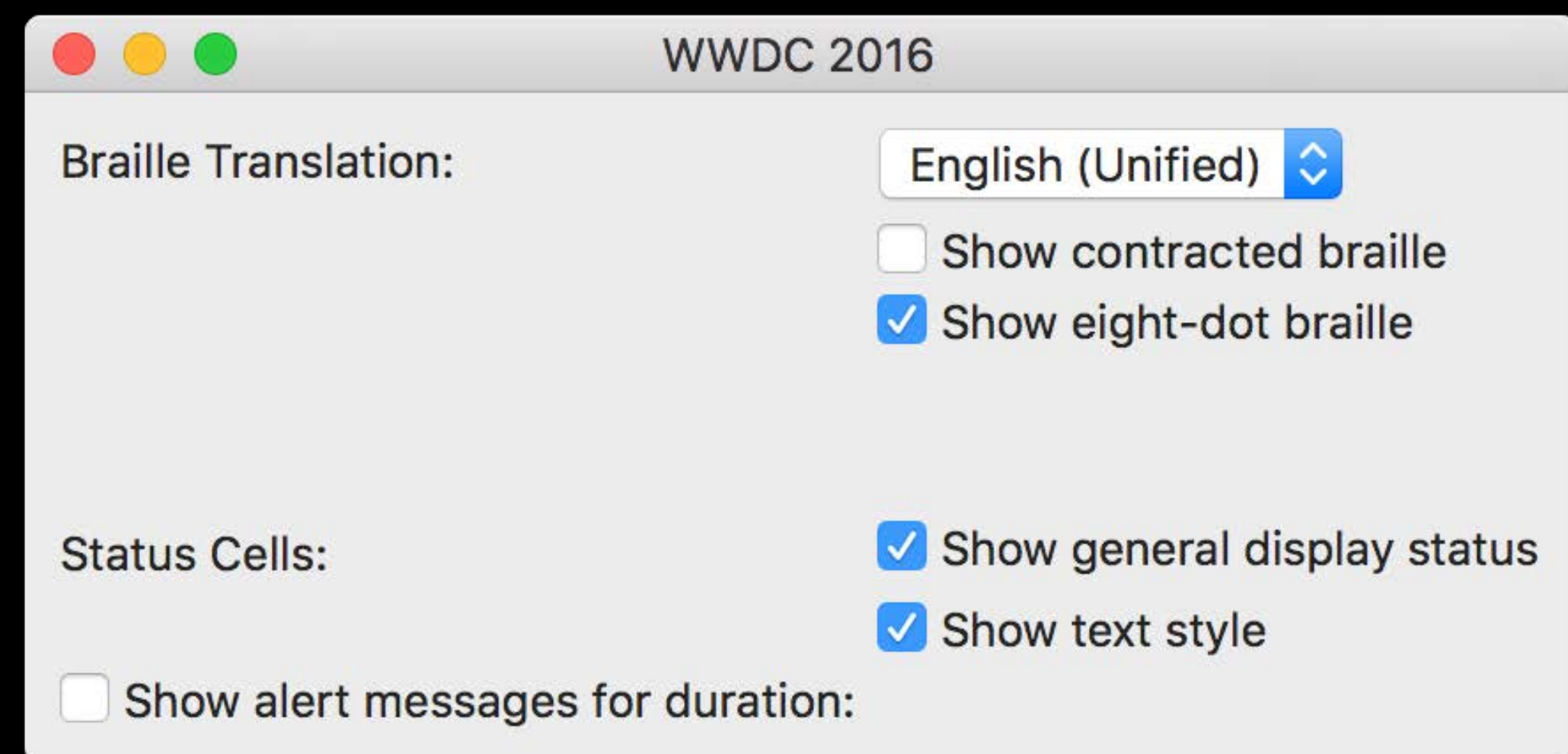
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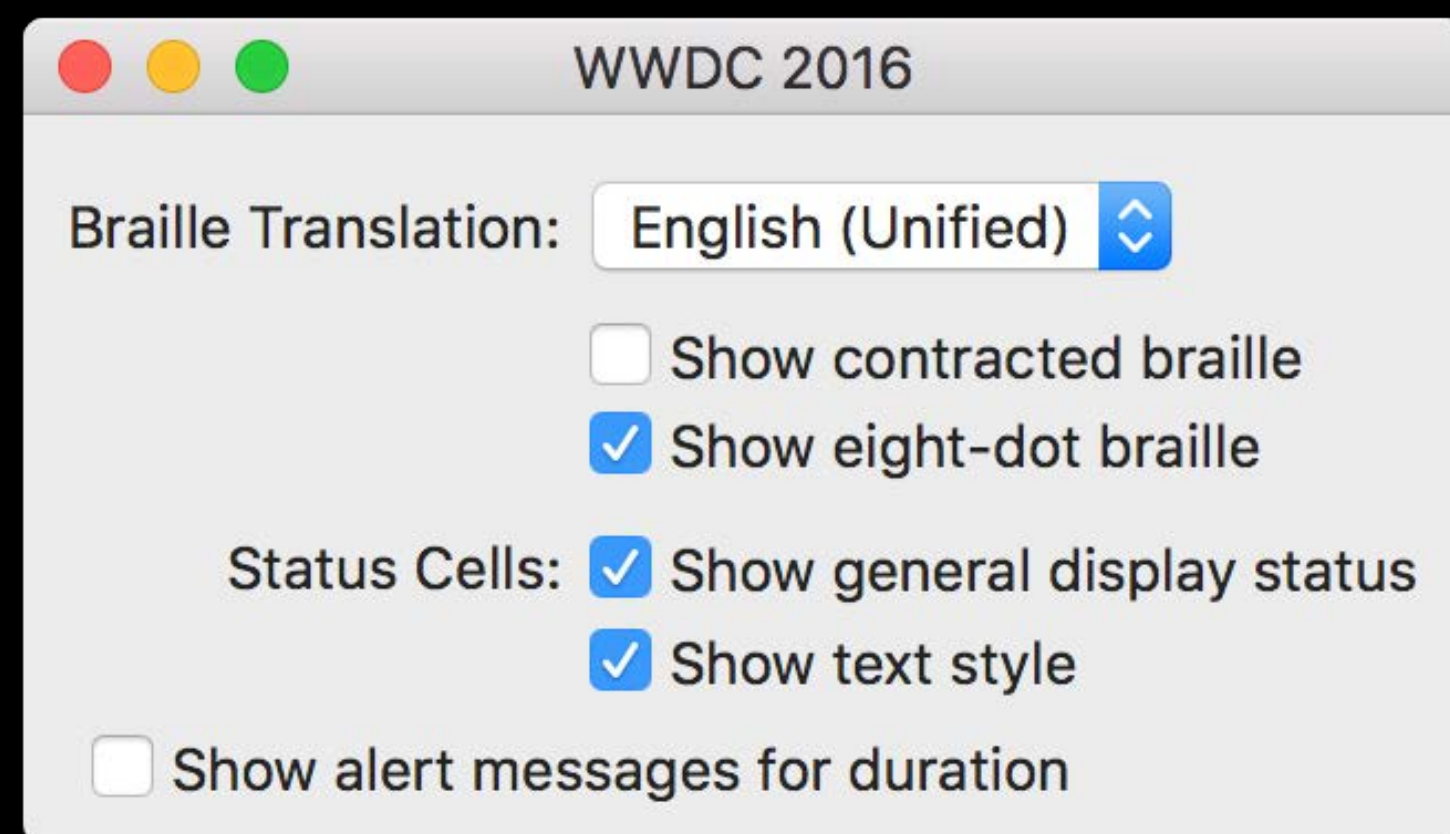
Implementation



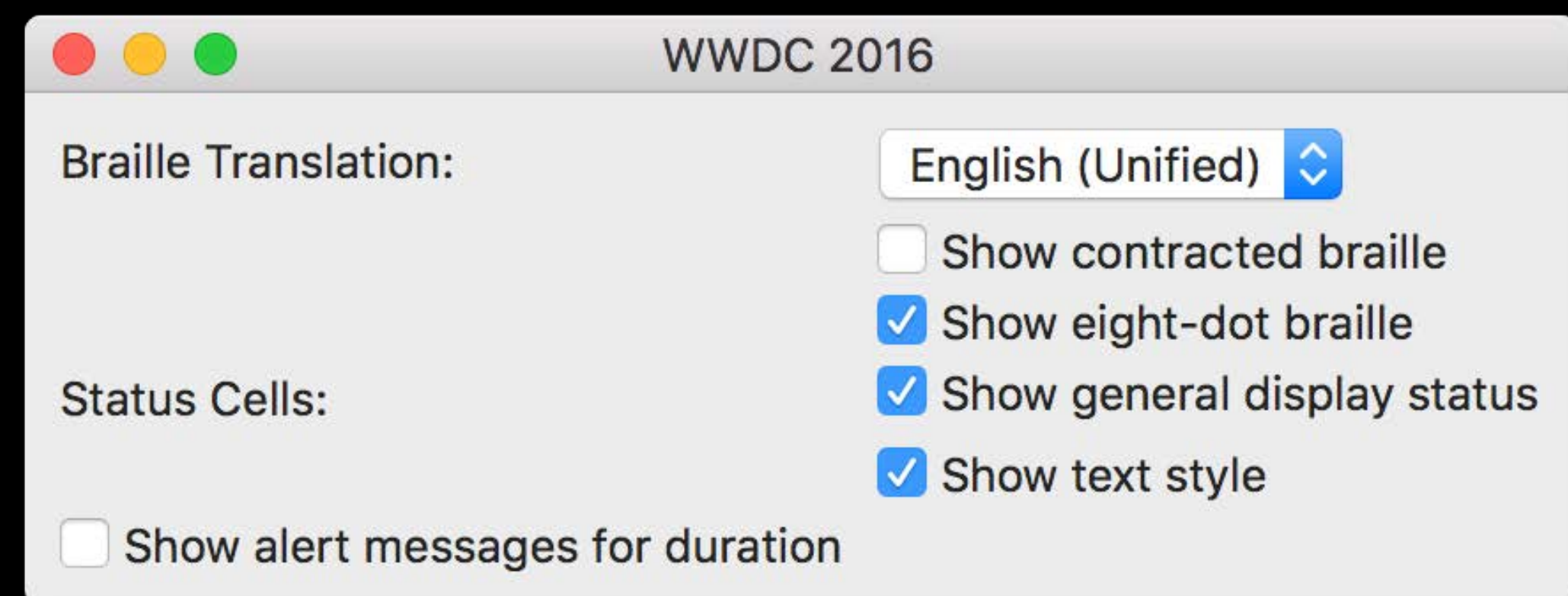

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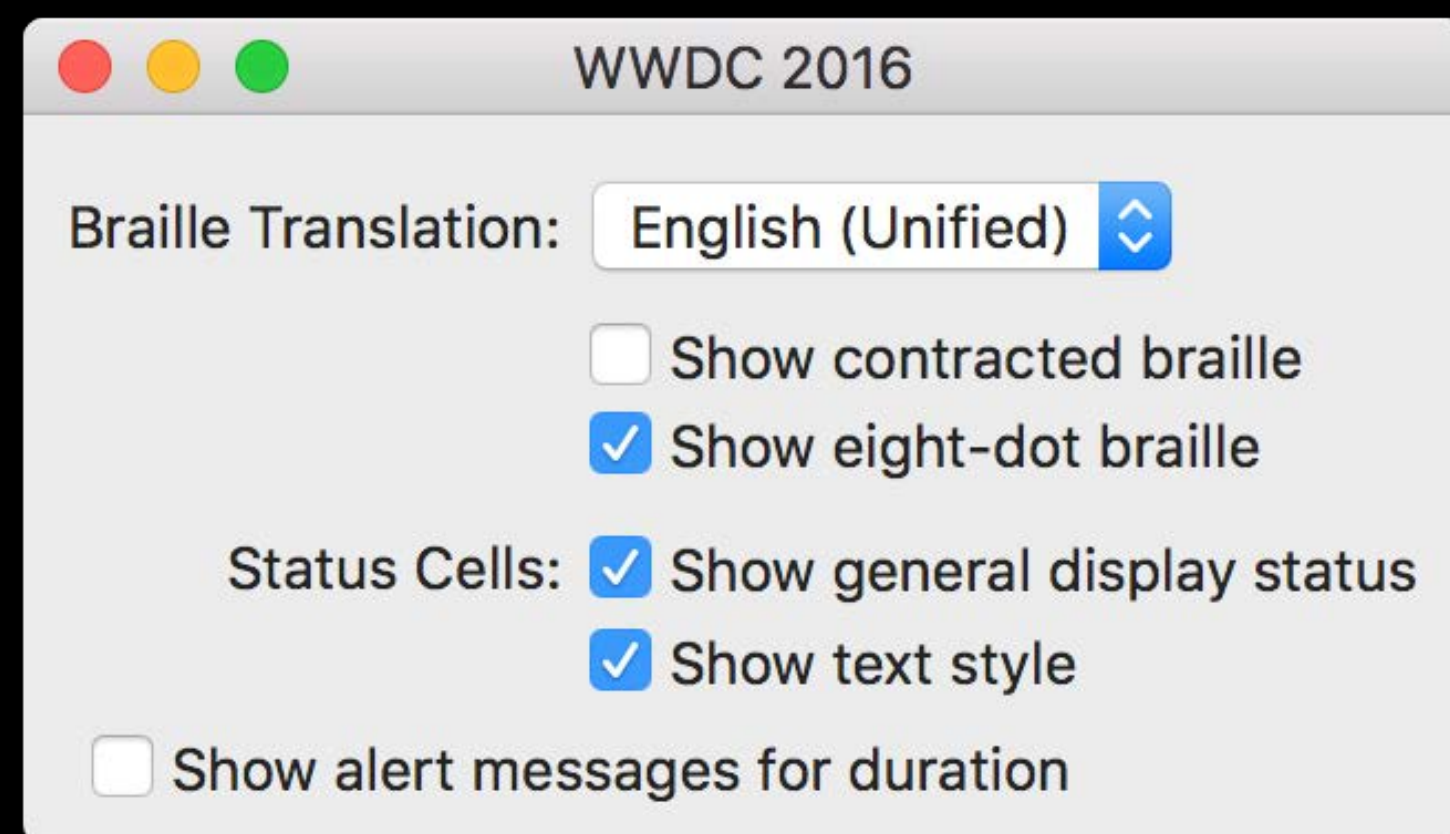
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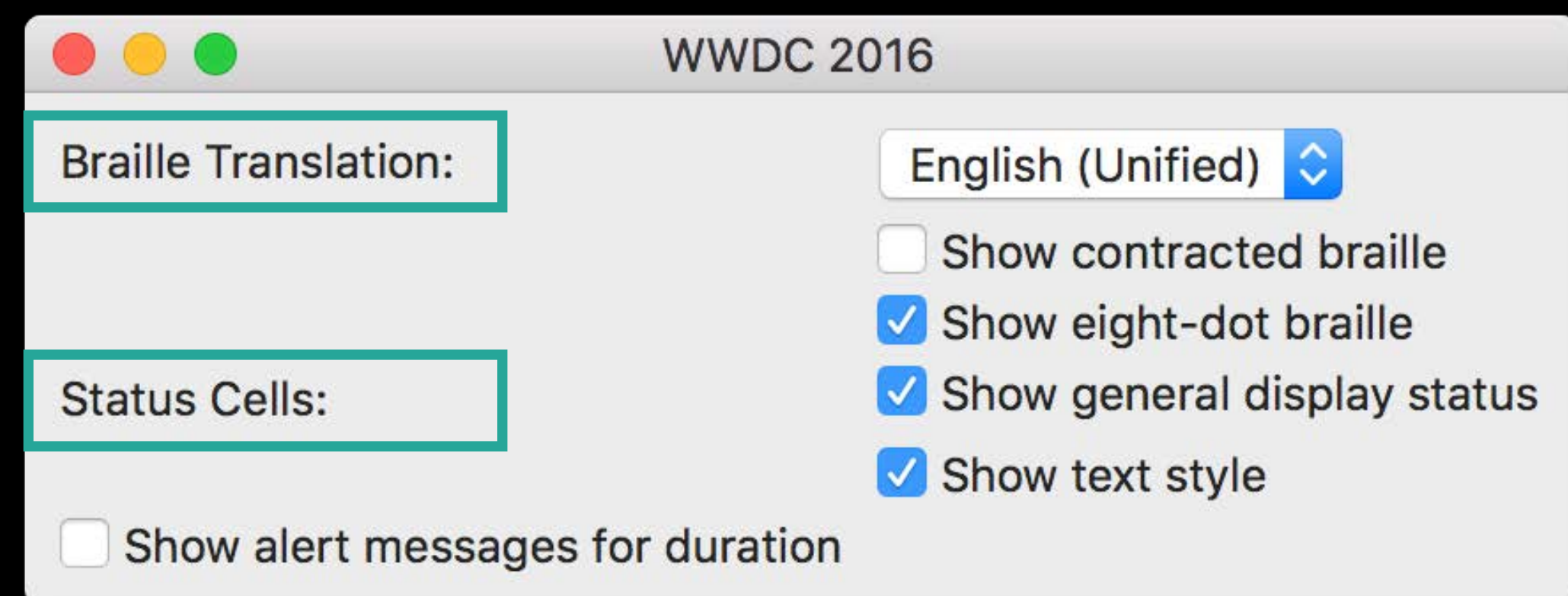
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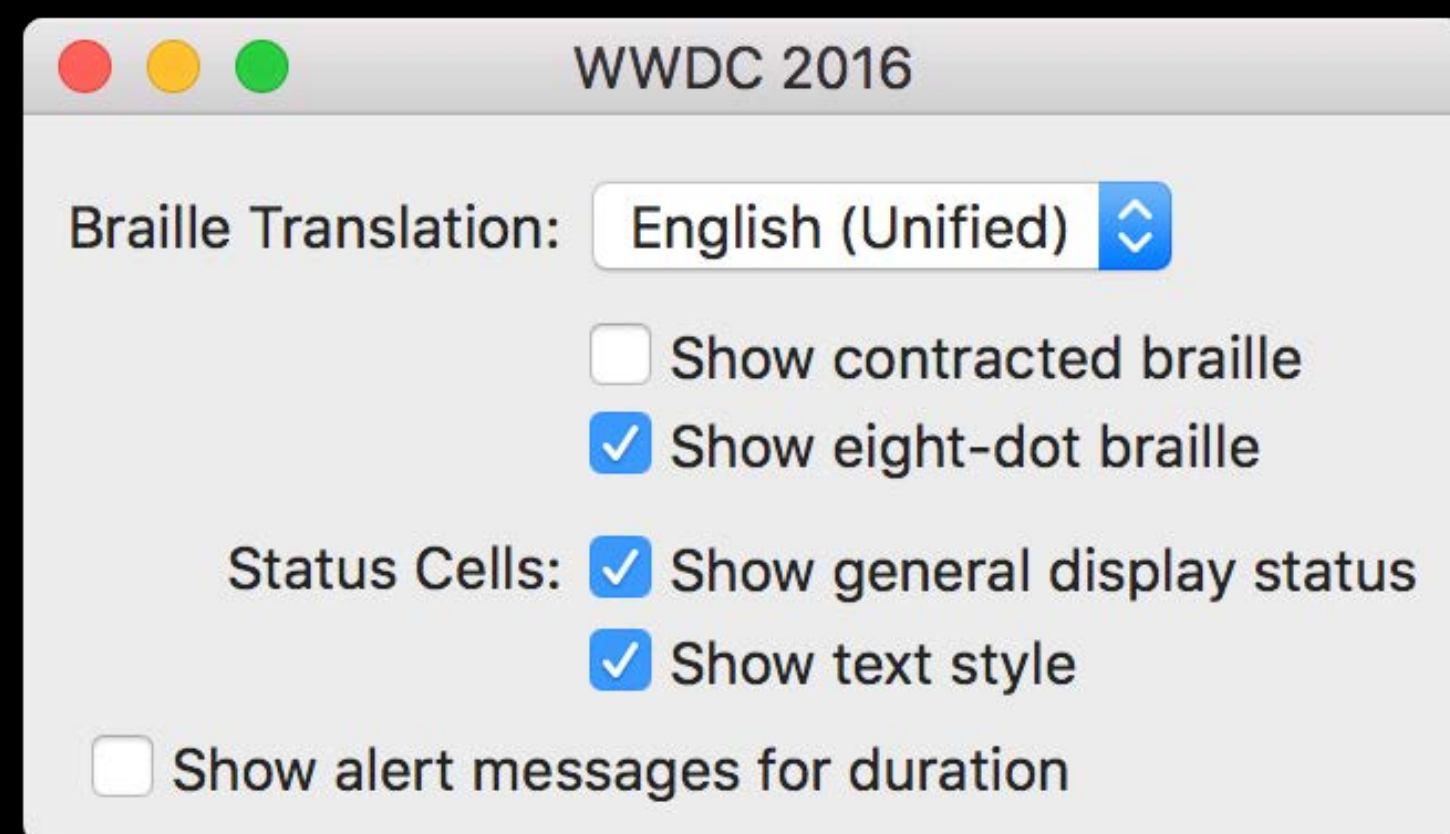



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[empty, showContractedCheckbox],  
[empty, showEightDotCheckbox],  
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

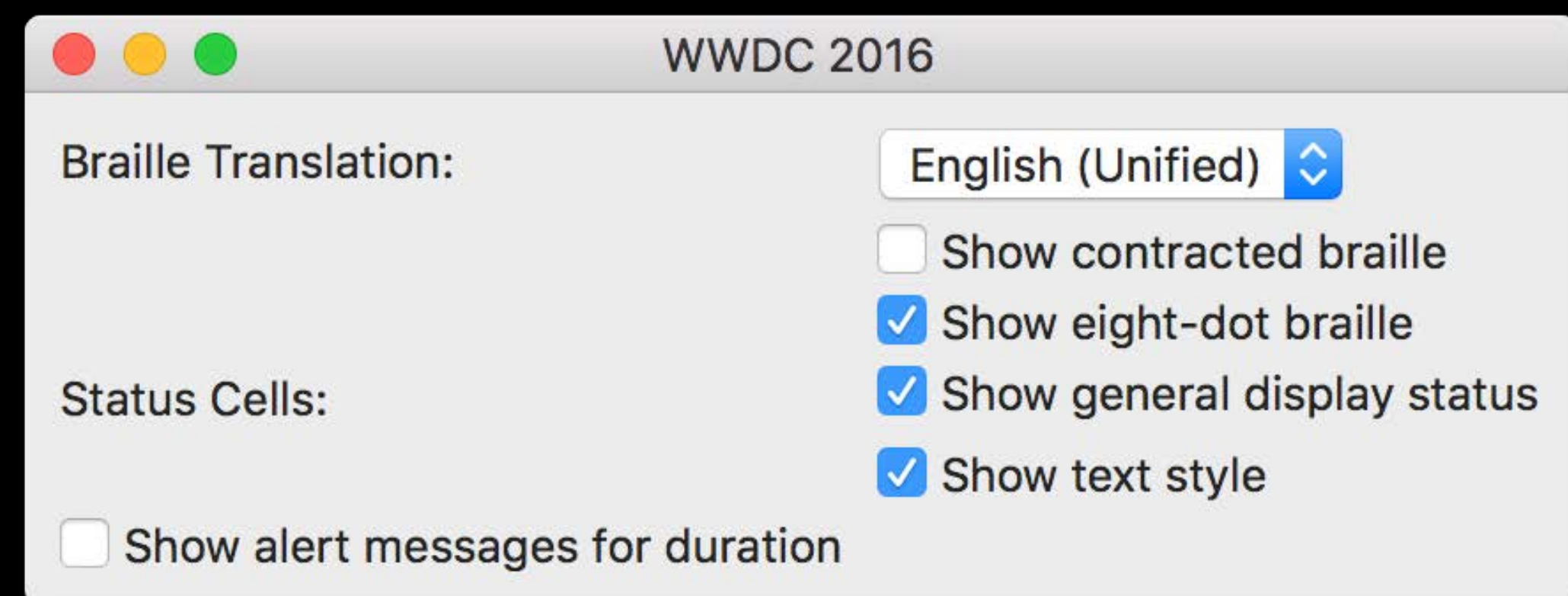
```
gridView.setContentHuggingPriority(600, for: .horizontal)
```

```
gridView.setContentHuggingPriority(600, for: .vertical)
```

Design



Implementation

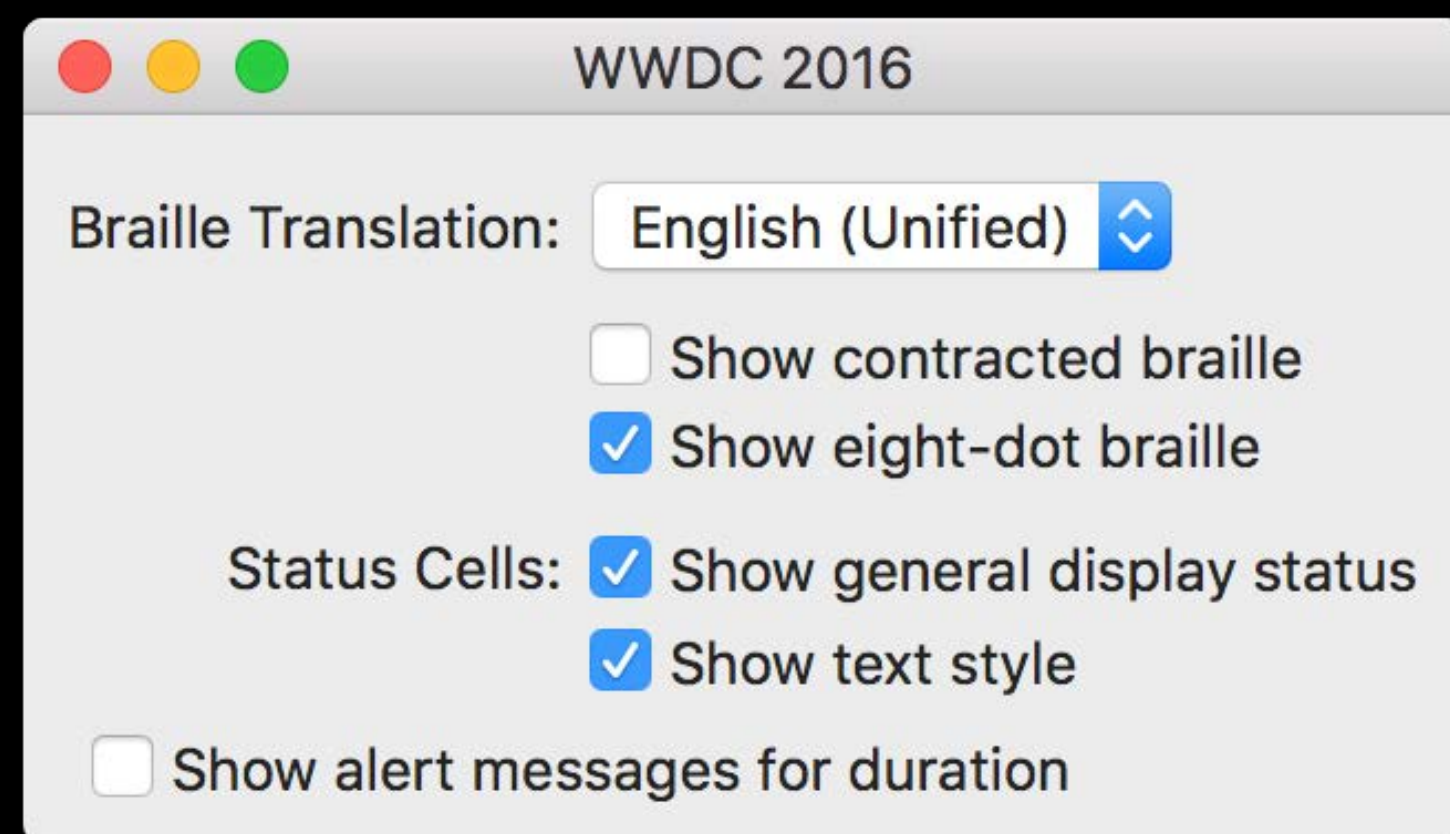


```
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

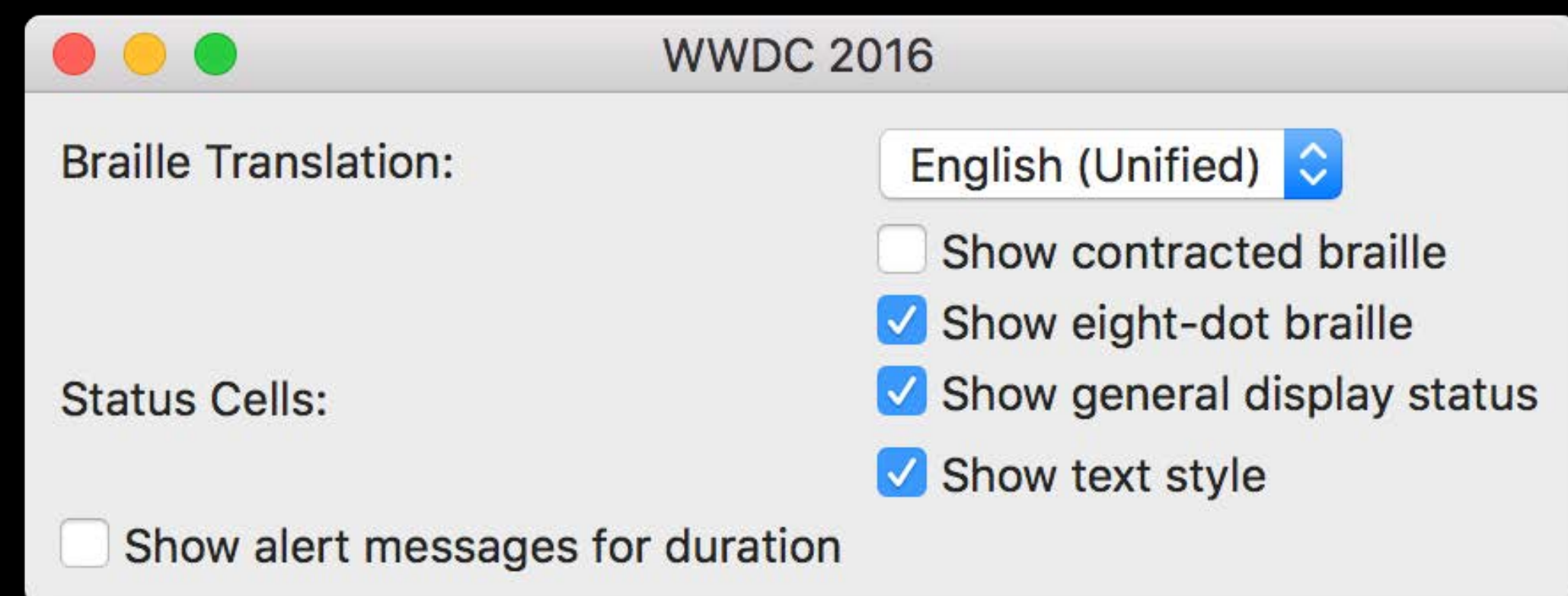
```
gridView.setContentHuggingPriority(600, for: .horizontal)  
gridView.setContentHuggingPriority(600, for: .vertical)
```

```
// the first column needs to be right-justified:  
gridView.column(at: 0).xPlacement = .trailing
```

Design



Implementation

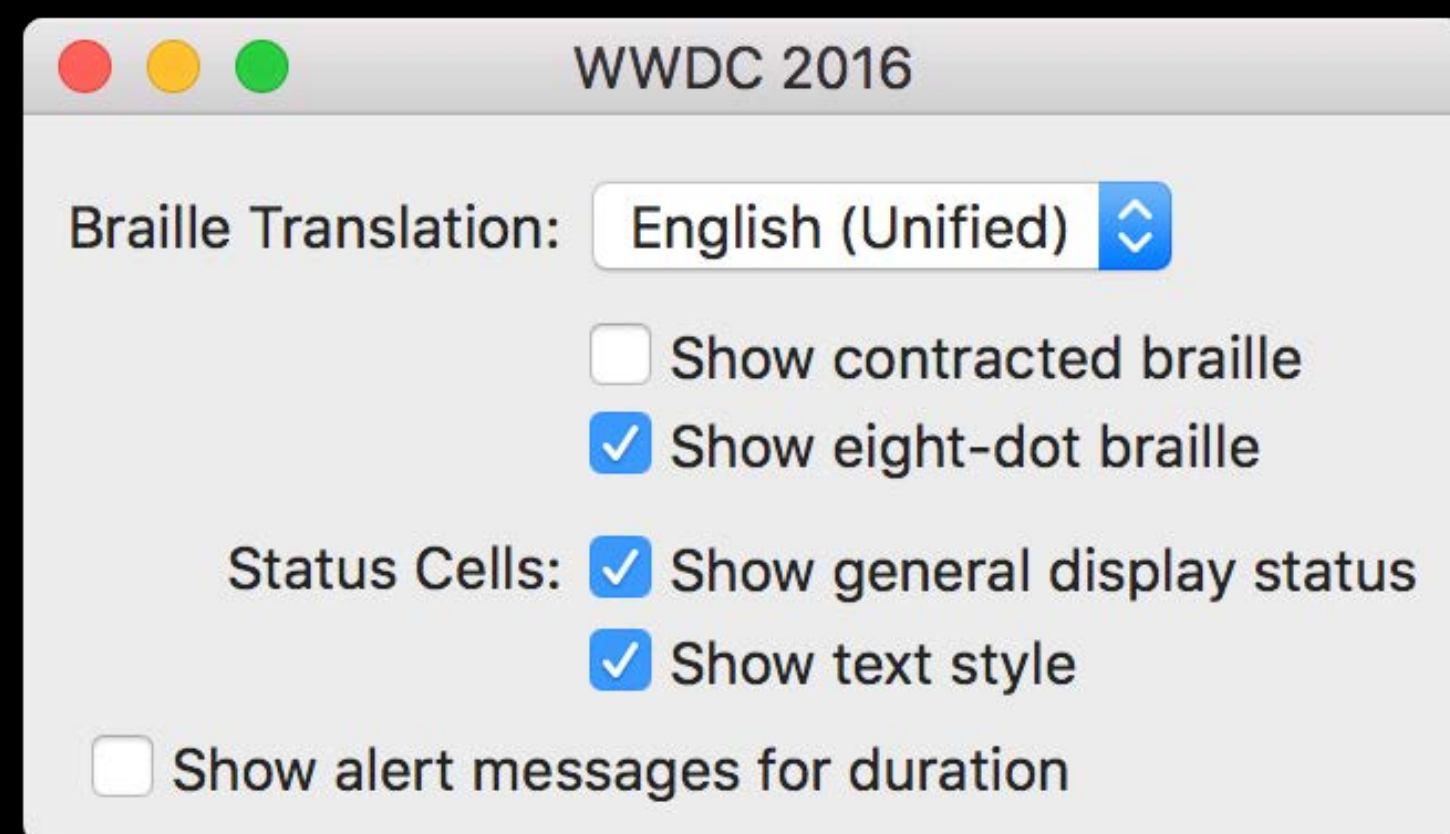



```
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

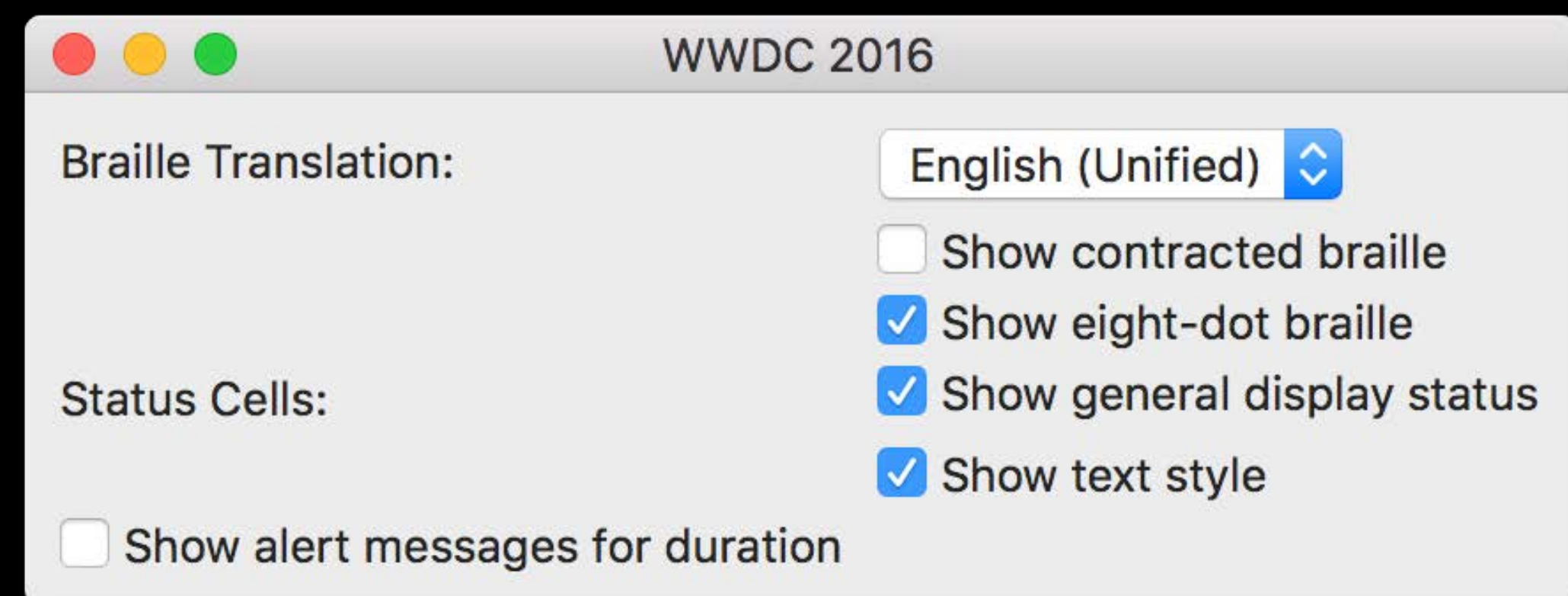
```
gridView.setContentHuggingPriority(600, for: .horizontal)  
gridView.setContentHuggingPriority(600, for: .vertical)
```

```
// the first column needs to be right-justified:  
gridView.column(at: 0).xPlacement = .trailing
```

Design



Implementation

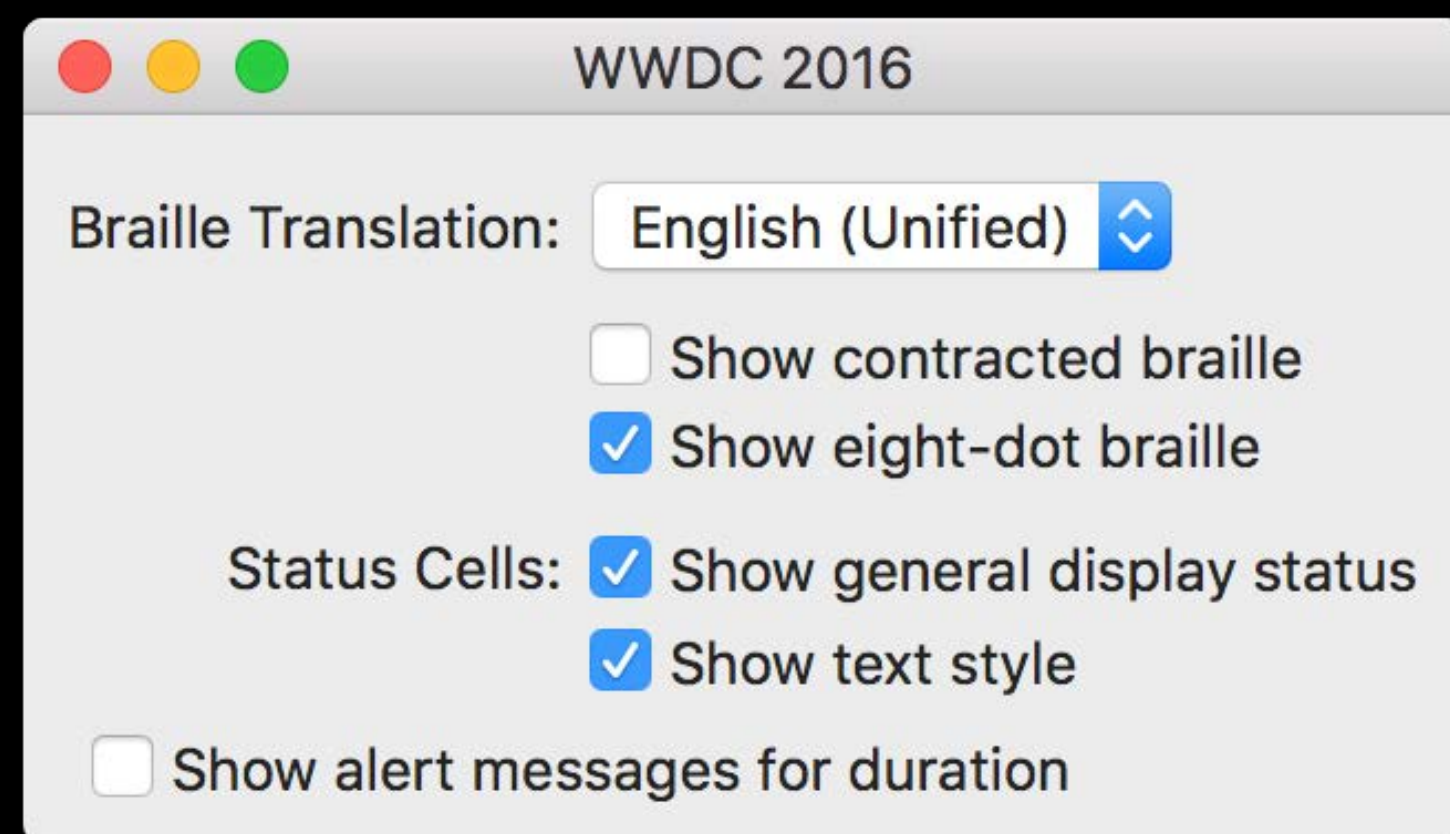


```
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

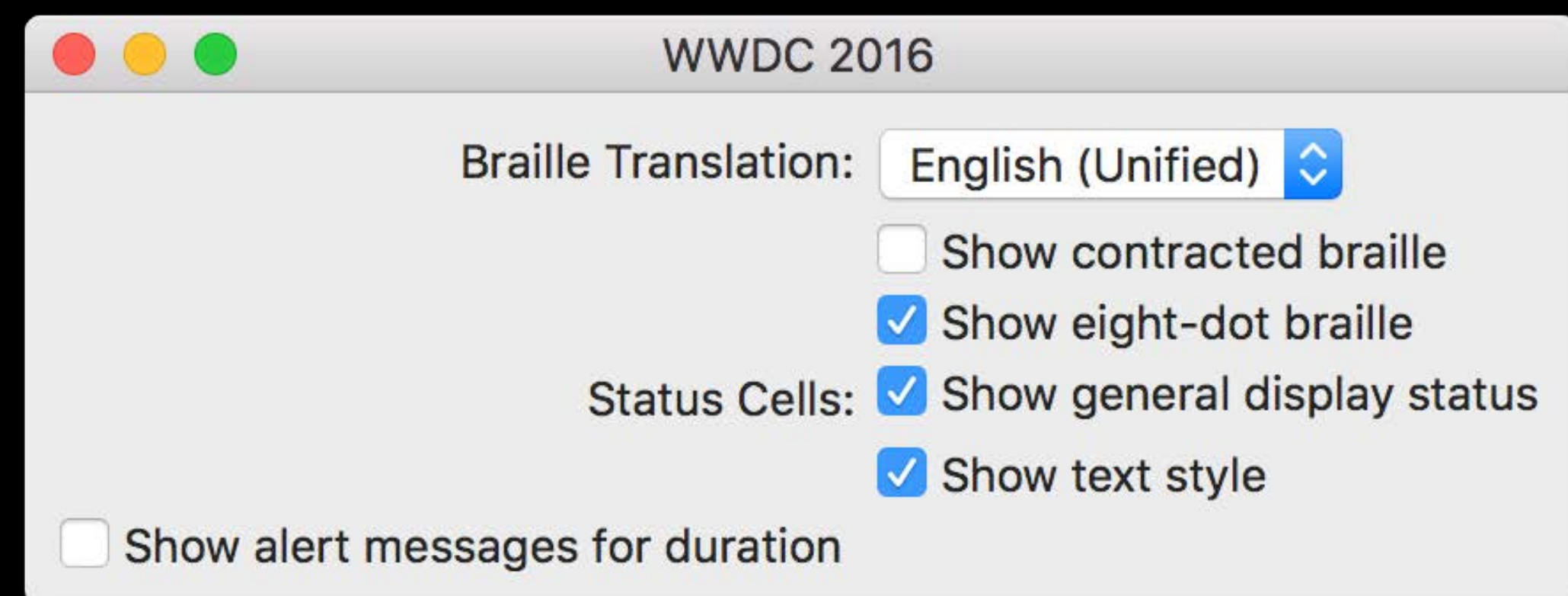
```
gridView.setContentHuggingPriority(600, for: .horizontal)  
gridView.setContentHuggingPriority(600, for: .vertical)
```

```
// the first column needs to be right-justified:  
gridView.column(at: 0).xPlacement = .trailing
```

Design



Implementation

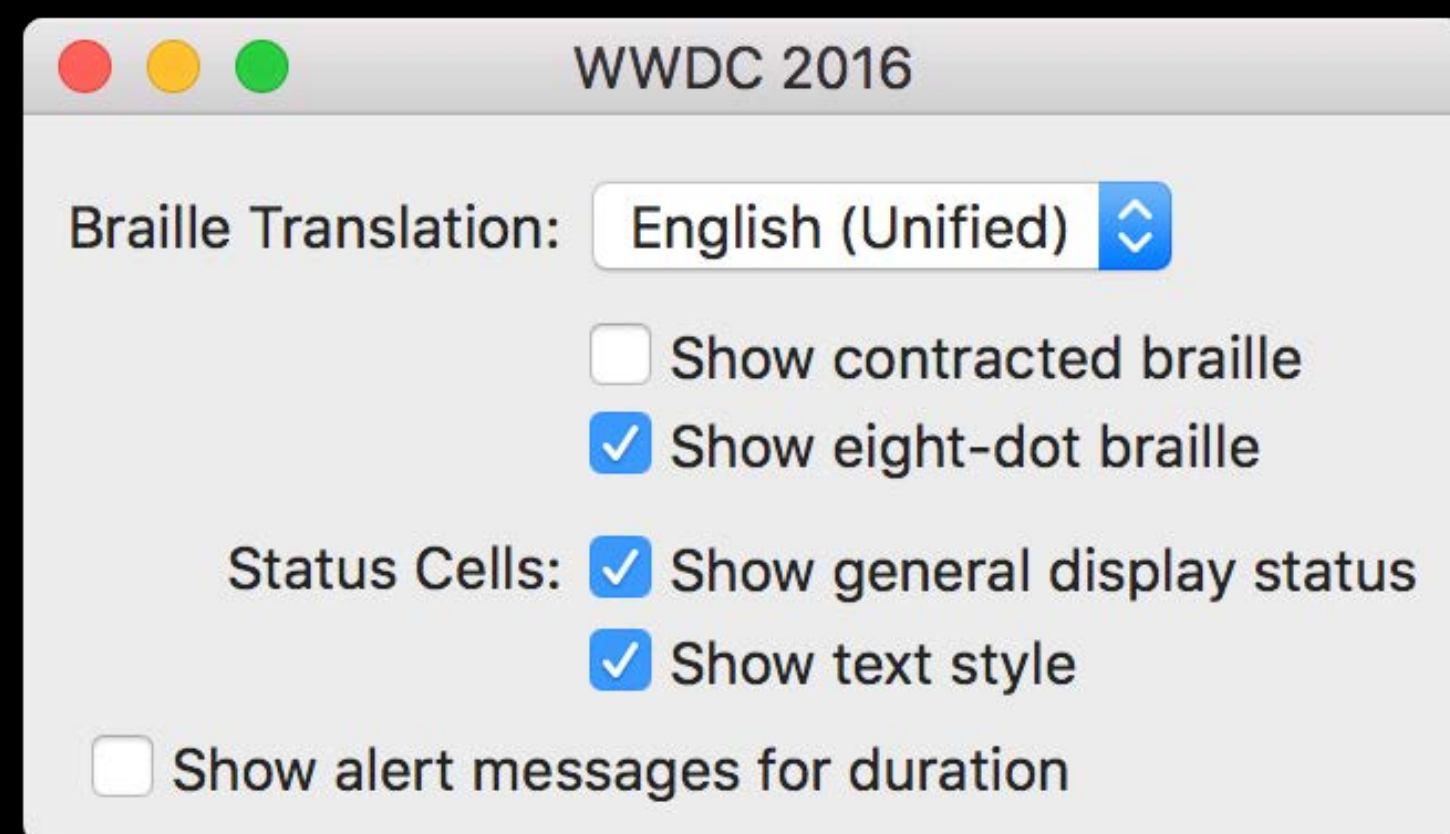



```
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

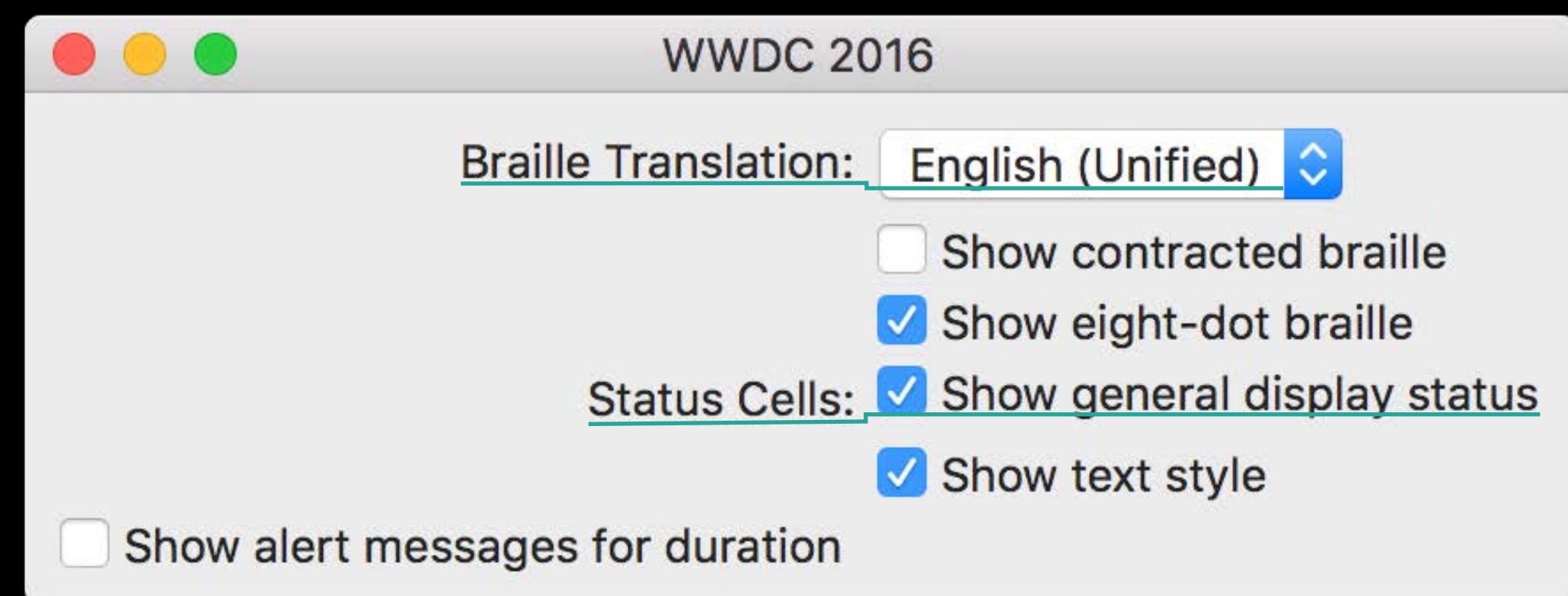
```
gridView.setContentHuggingPriority(600, for: .horizontal)  
gridView.setContentHuggingPriority(600, for: .vertical)
```

```
// the first column needs to be right-justified:  
gridView.column(at: 0).xPlacement = .trailing
```

Design



Implementation

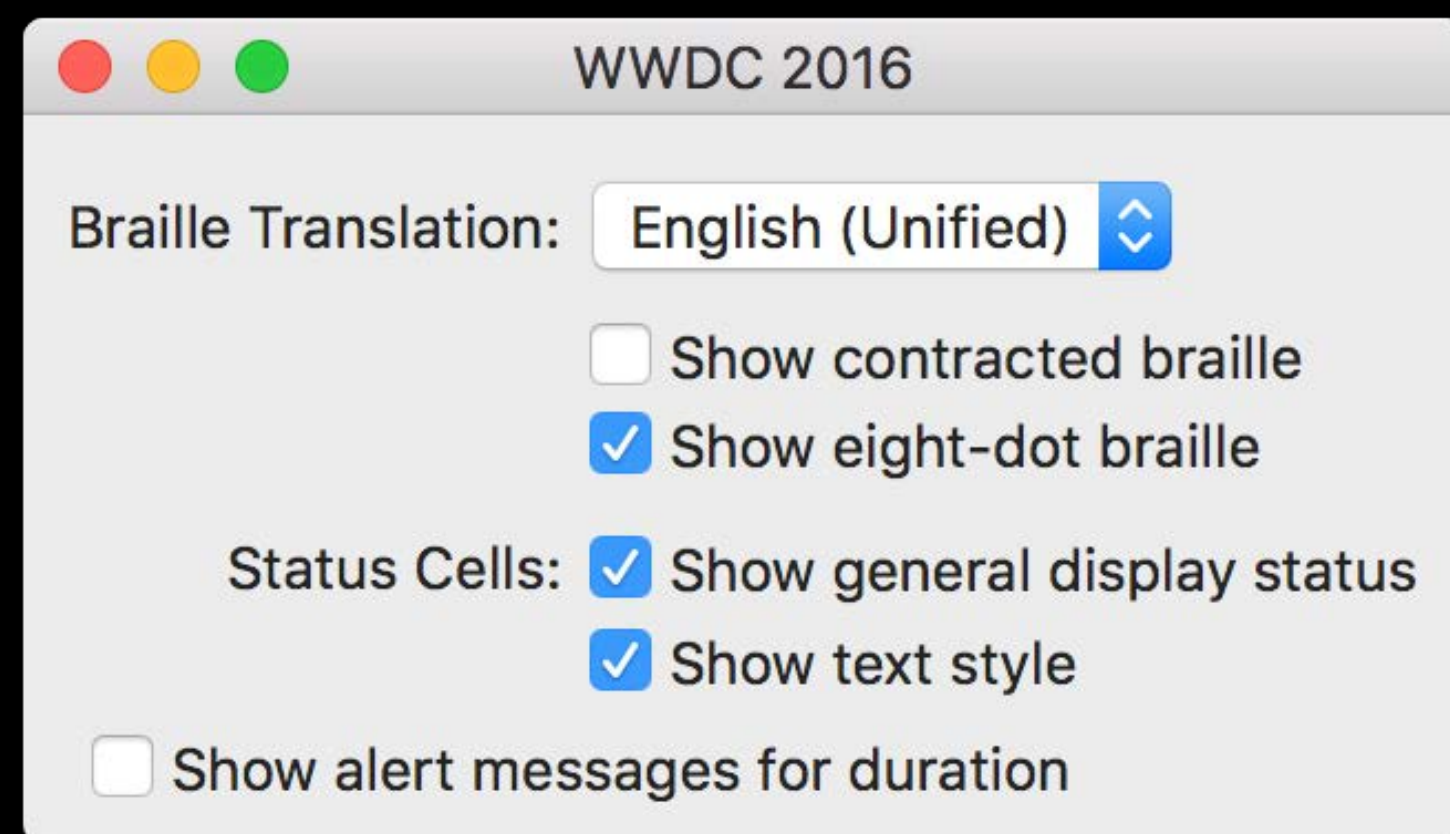


```
[statusCellsLabel, showGeneralDisplayCB],  
[empty, textStyleCB],  
[showAlertCB]  
])
```

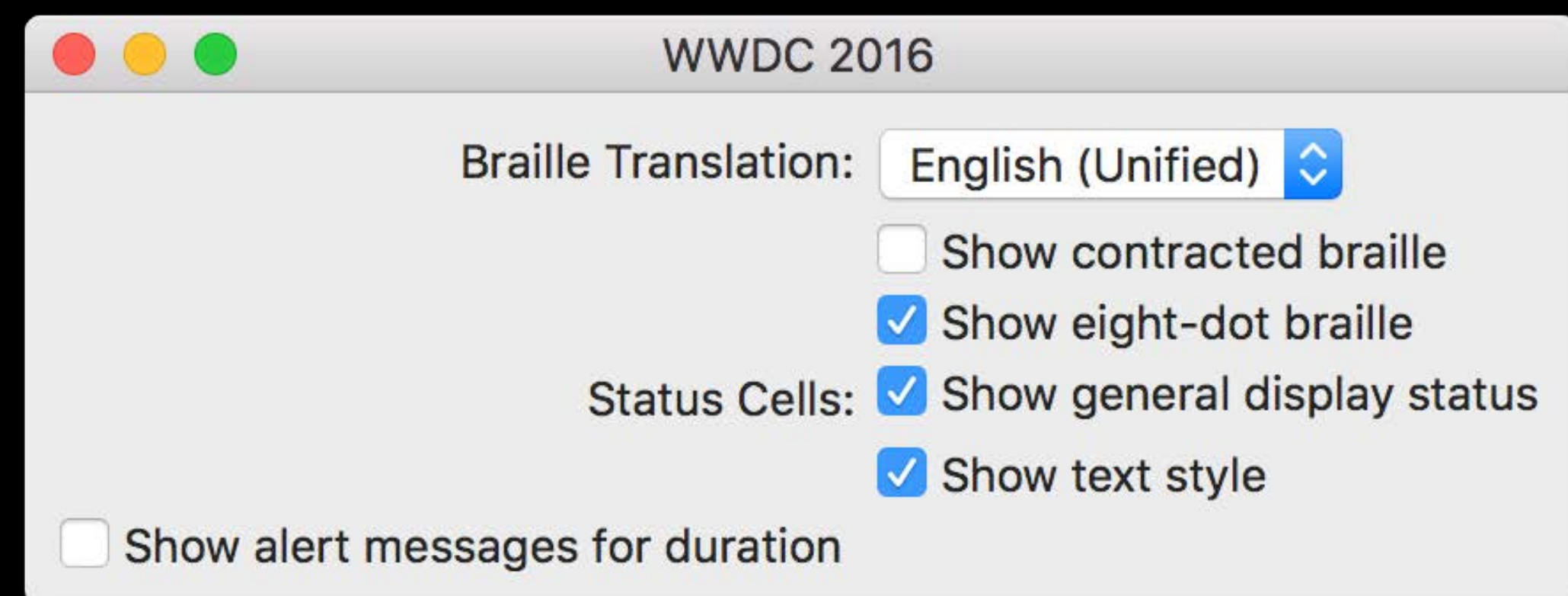
```
gridView.setContentHuggingPriority(600, for: .horizontal)  
gridView.setContentHuggingPriority(600, for: .vertical)
```

```
// the first column needs to be right-justified:  
gridView.column(at: 0).xPlacement = .trailing
```

Design



Implementation

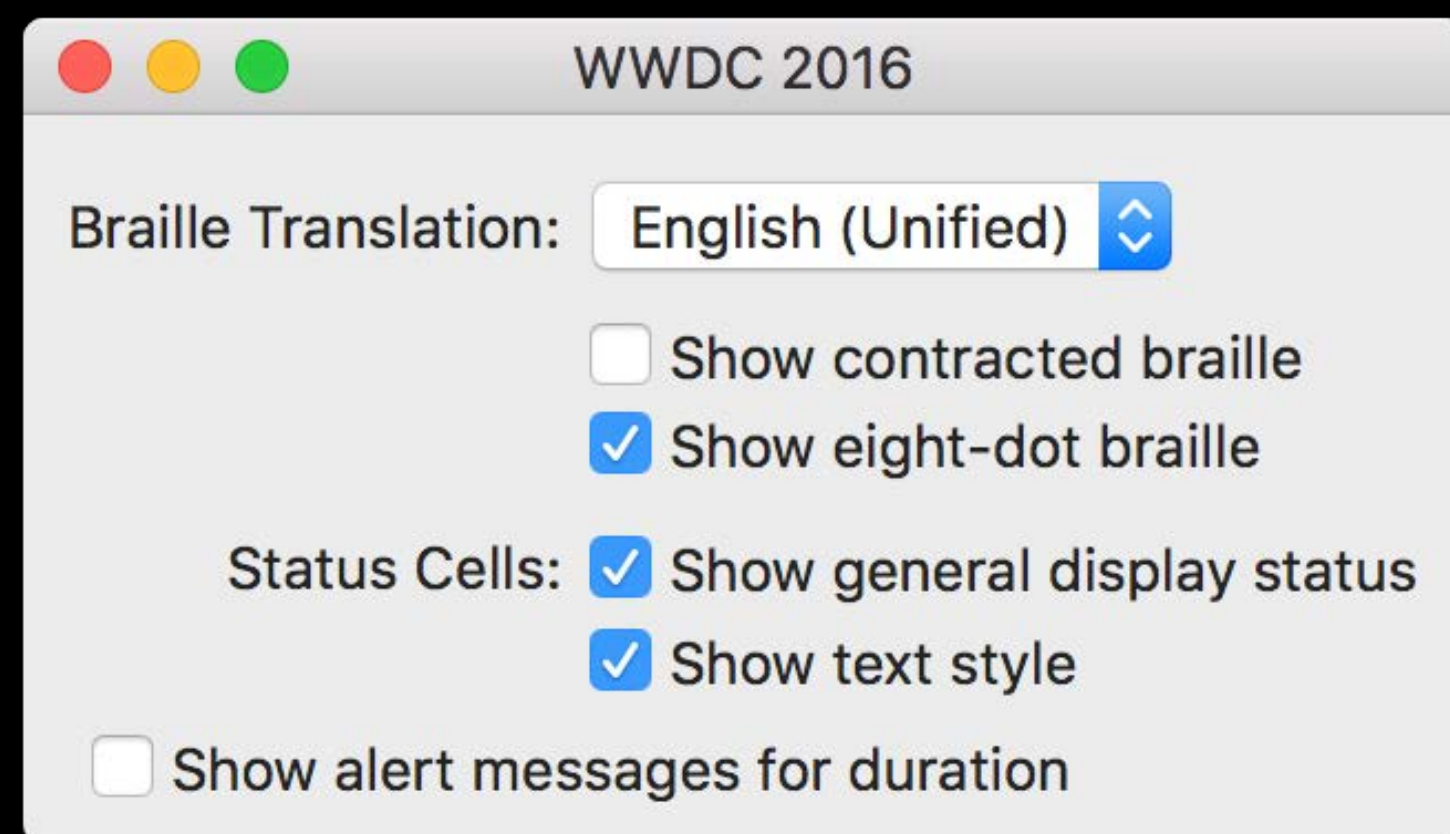



```
gridView.setContentHuggingPriority(600, for: .horizontal)
gridView.setContentHuggingPriority(600, for: .vertical)

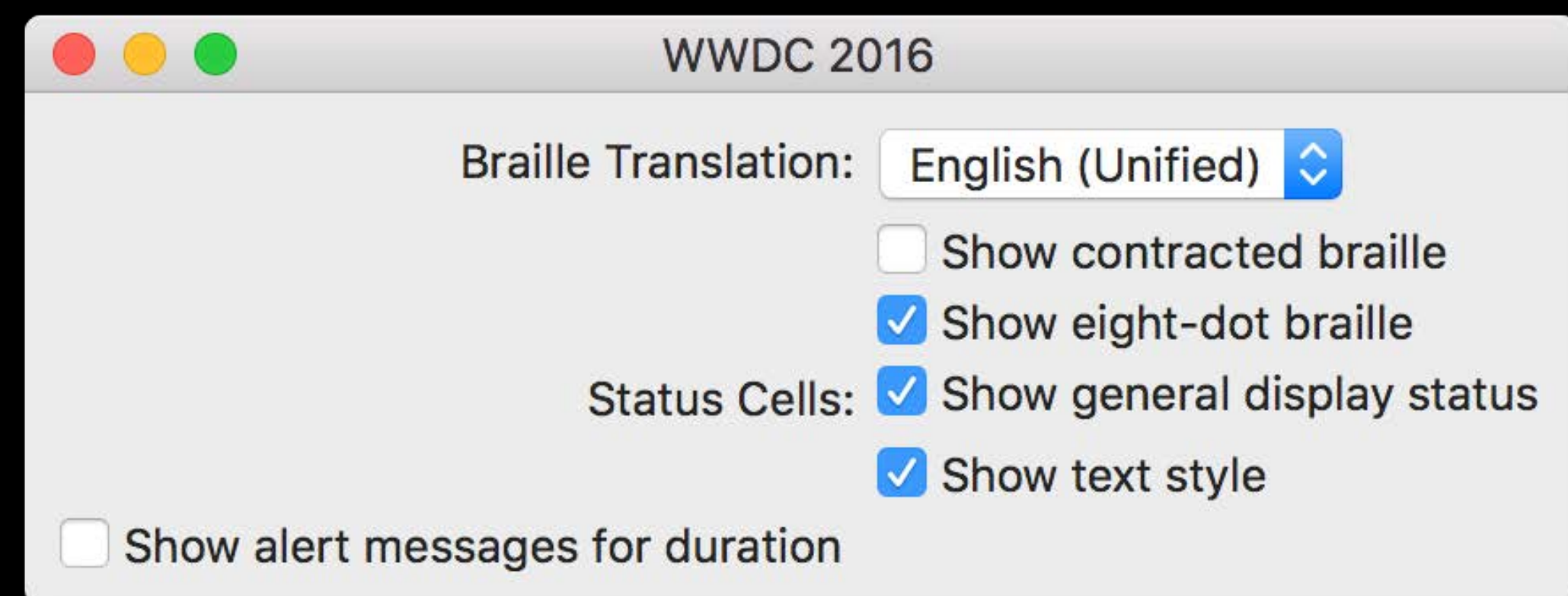
// the first column needs to be right-justified:
gridView.column(at: 0).xPlacement = .trailing

// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline
```

Design



Implementation

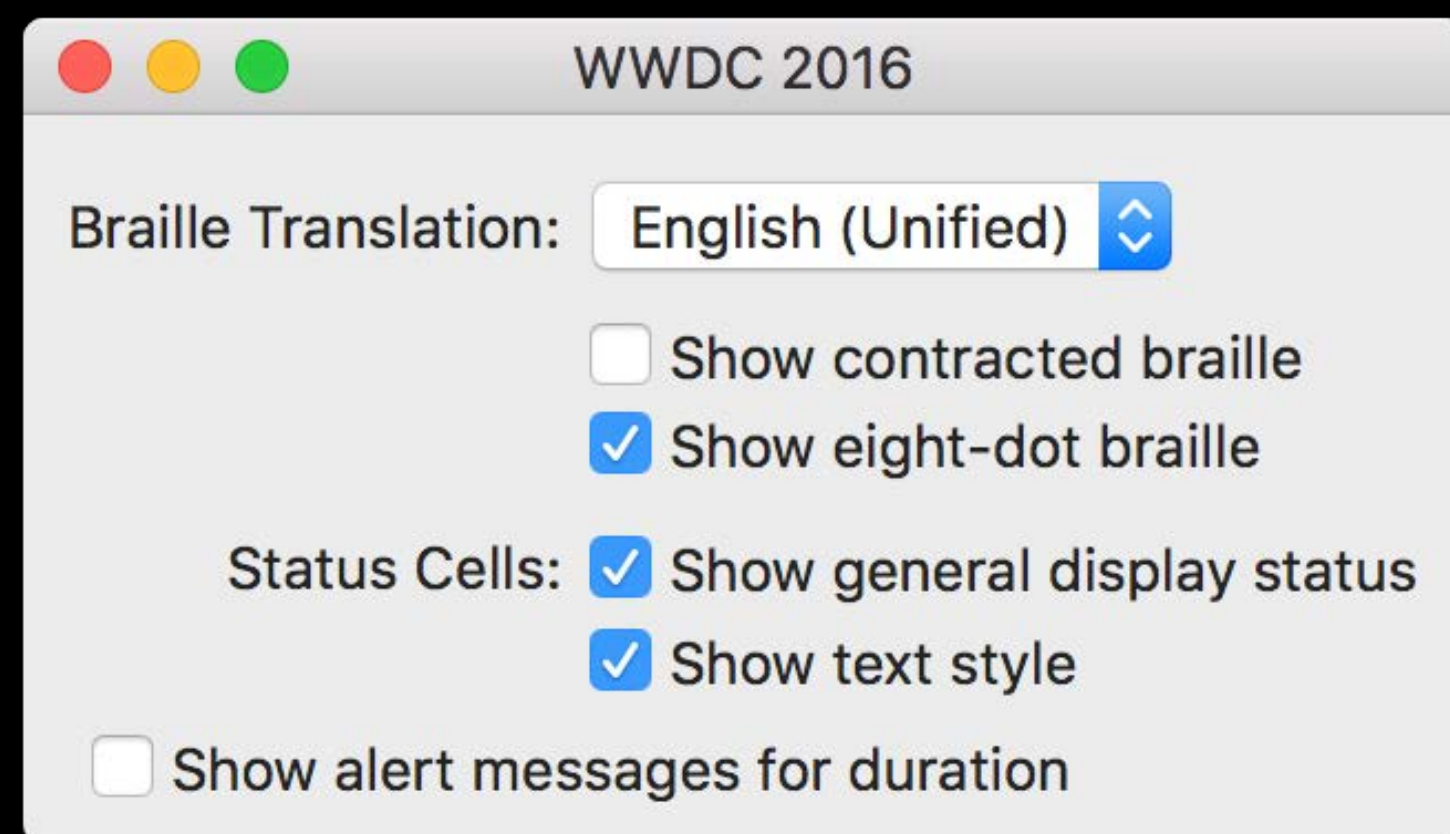



```
gridView.setContentHuggingPriority(600, for: .horizontal)
gridView.setContentHuggingPriority(600, for: .vertical)

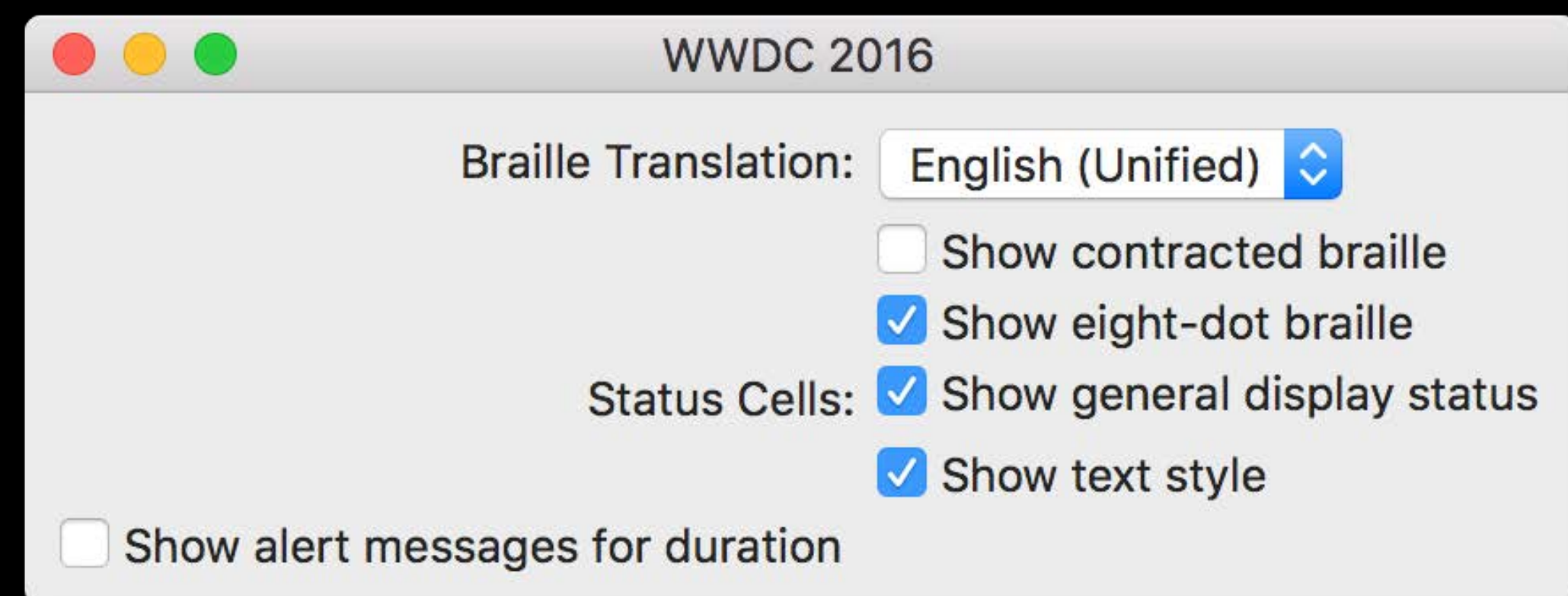
// the first column needs to be right-justified:
gridView.column(at: 0).xPlacement = .trailing

// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline
```

Design



Implementation

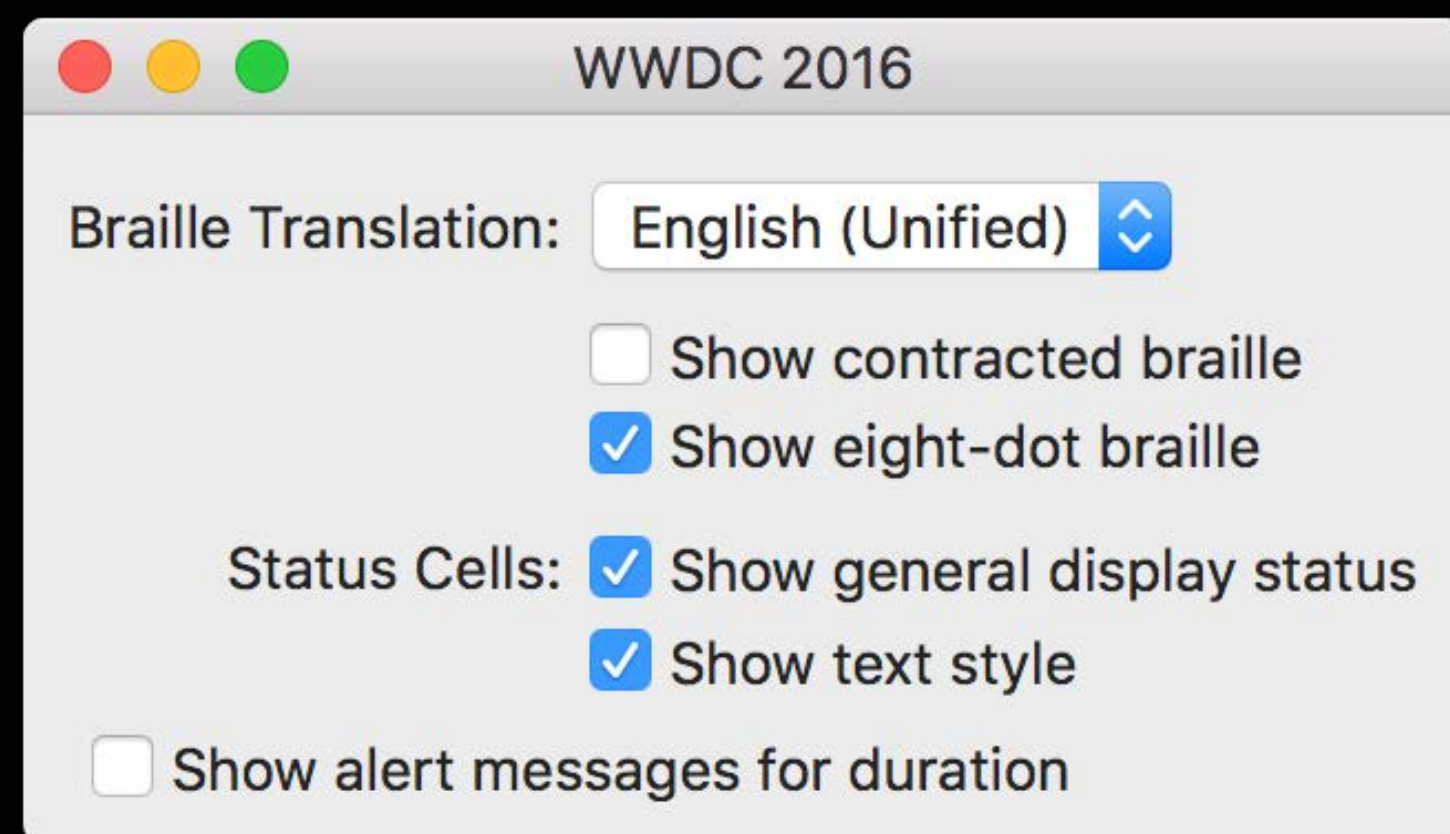


```
gridView.setContentHuggingPriority(600, for: .horizontal)
gridView.setContentHuggingPriority(600, for: .vertical)

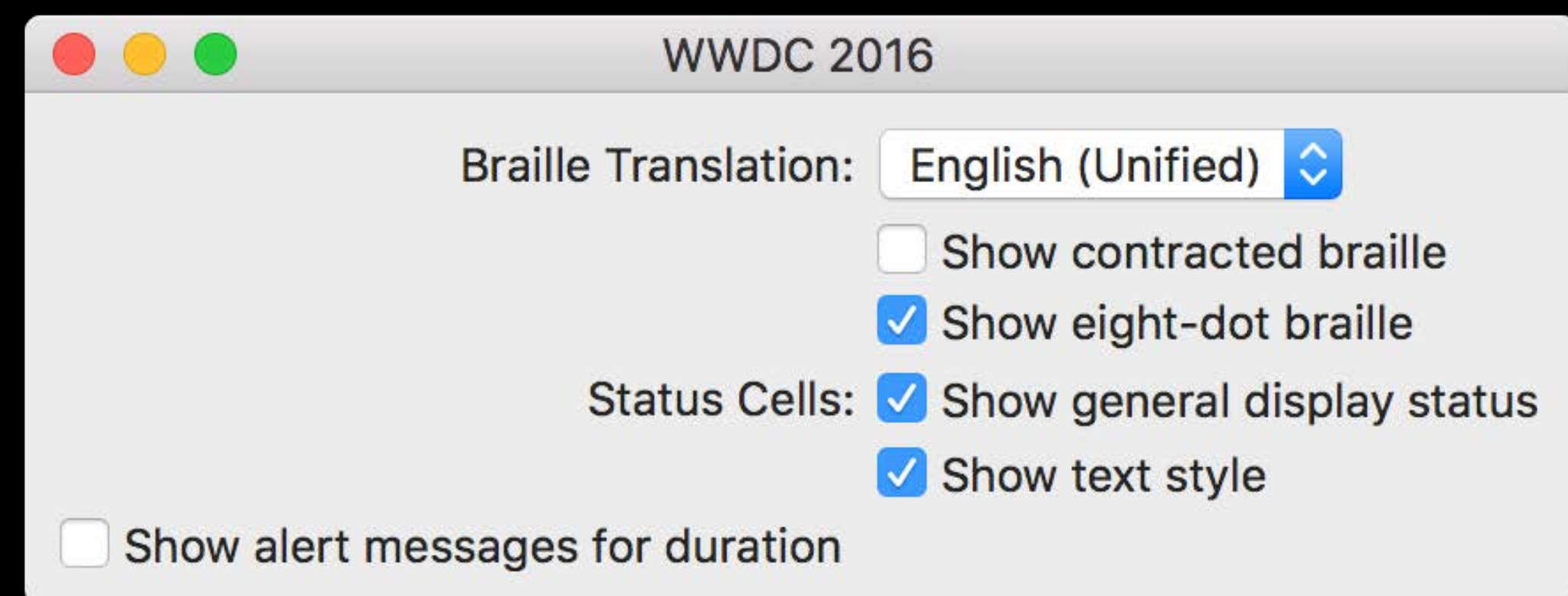
// the first column needs to be right-justified:
gridView.column(at: 0).xPlacement = .trailing

// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline
```

Design



Implementation

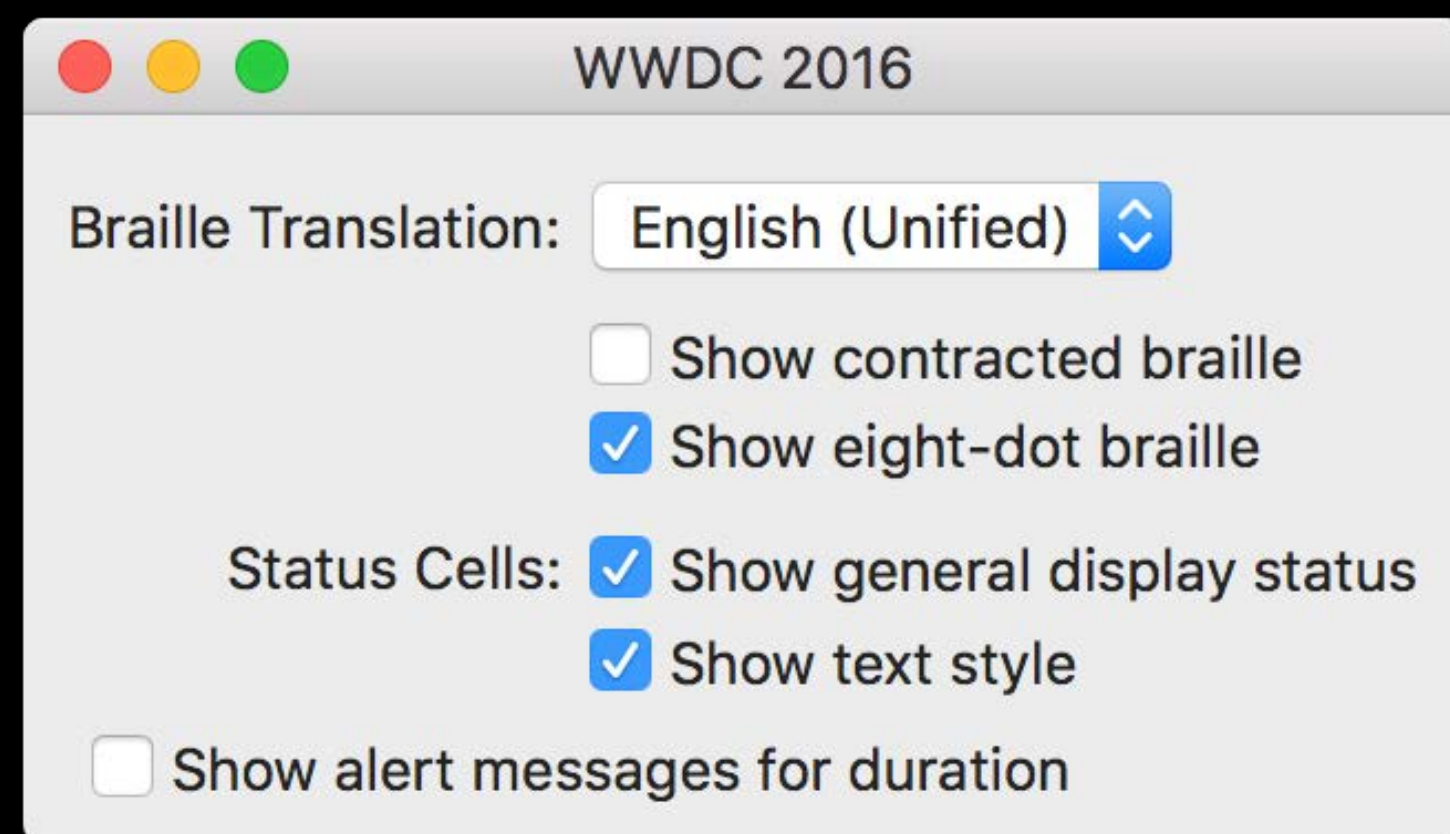



```
gridView.setContentHuggingPriority(600, for: .horizontal)
gridView.setContentHuggingPriority(600, for: .vertical)

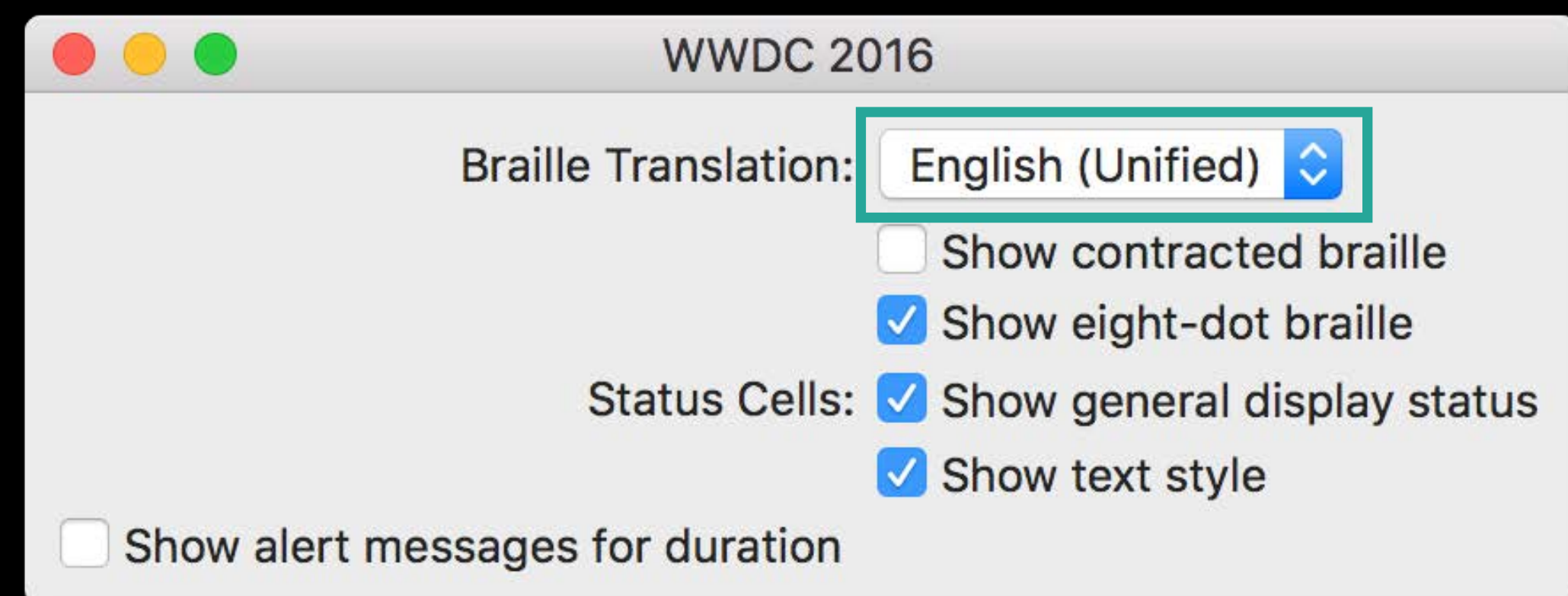
// the first column needs to be right-justified:
gridView.column(at: 0).xPlacement = .trailing

// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline
```

Design



Implementation

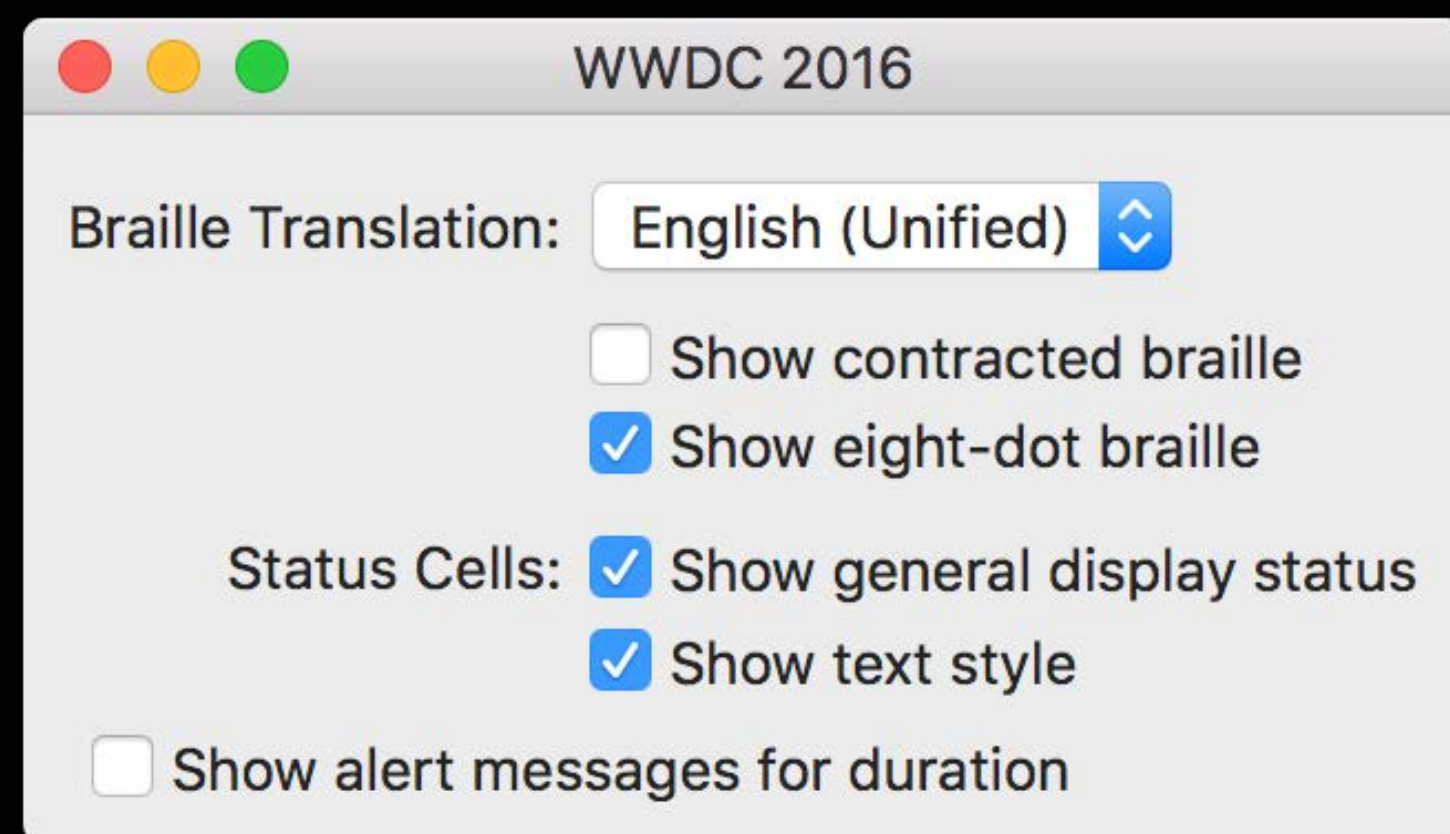


```
gridView.setContentHuggingPriority(600, for: .horizontal)
gridView.setContentHuggingPriority(600, for: .vertical)

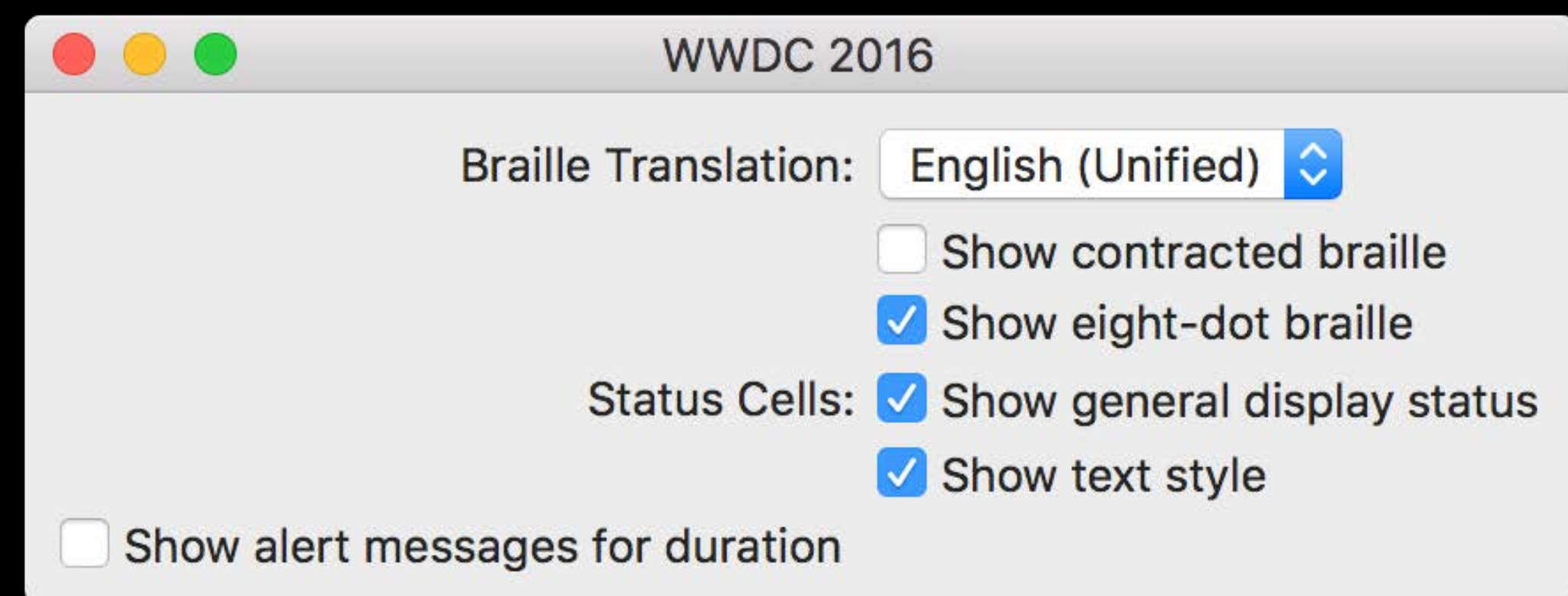
// the first column needs to be right-justified:
gridView.column(at: 0).xPlacement = .trailing

// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline
```

Design



Implementation

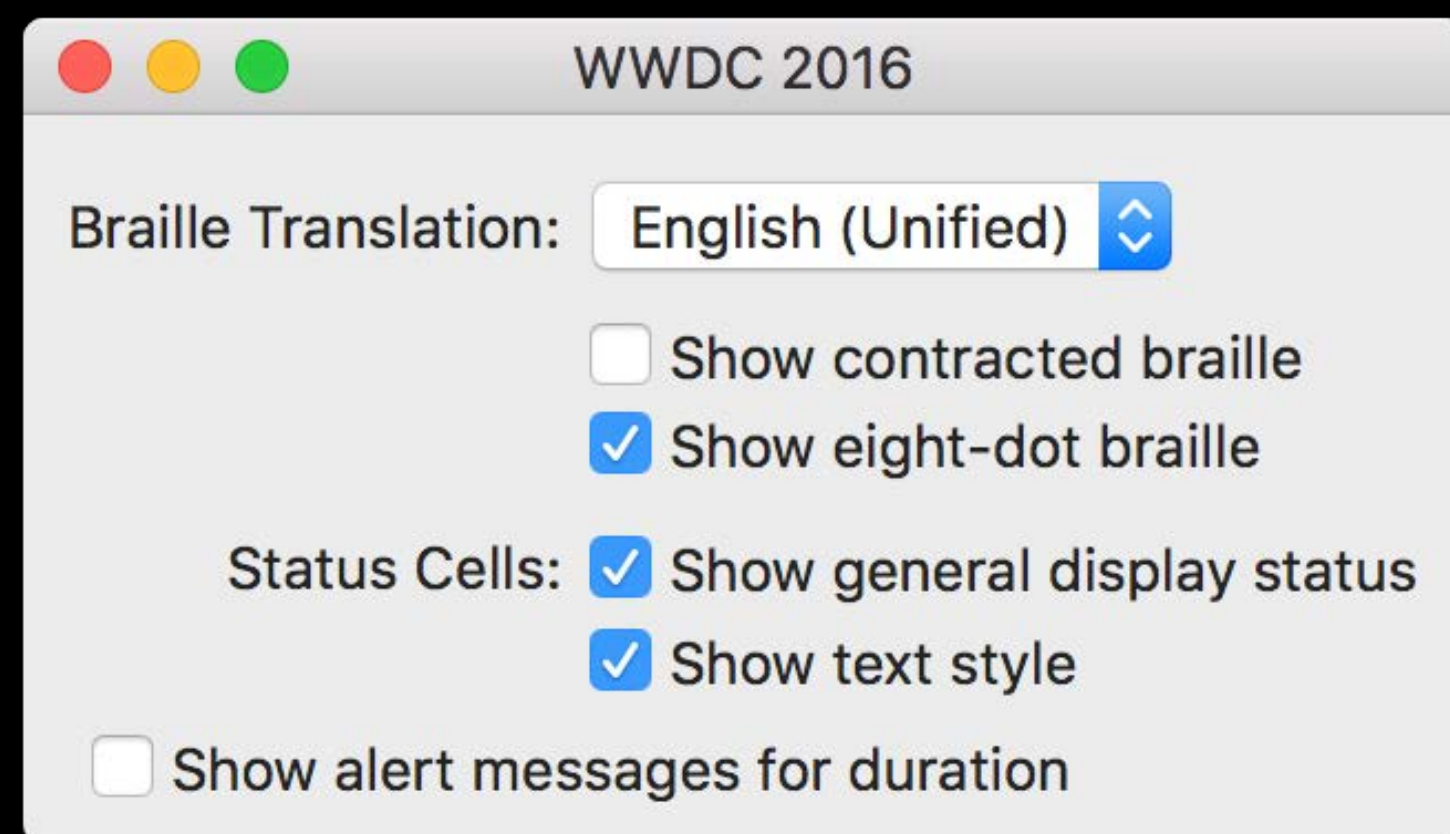



```
gridView.column(at: 0).xPlacement = .trailing

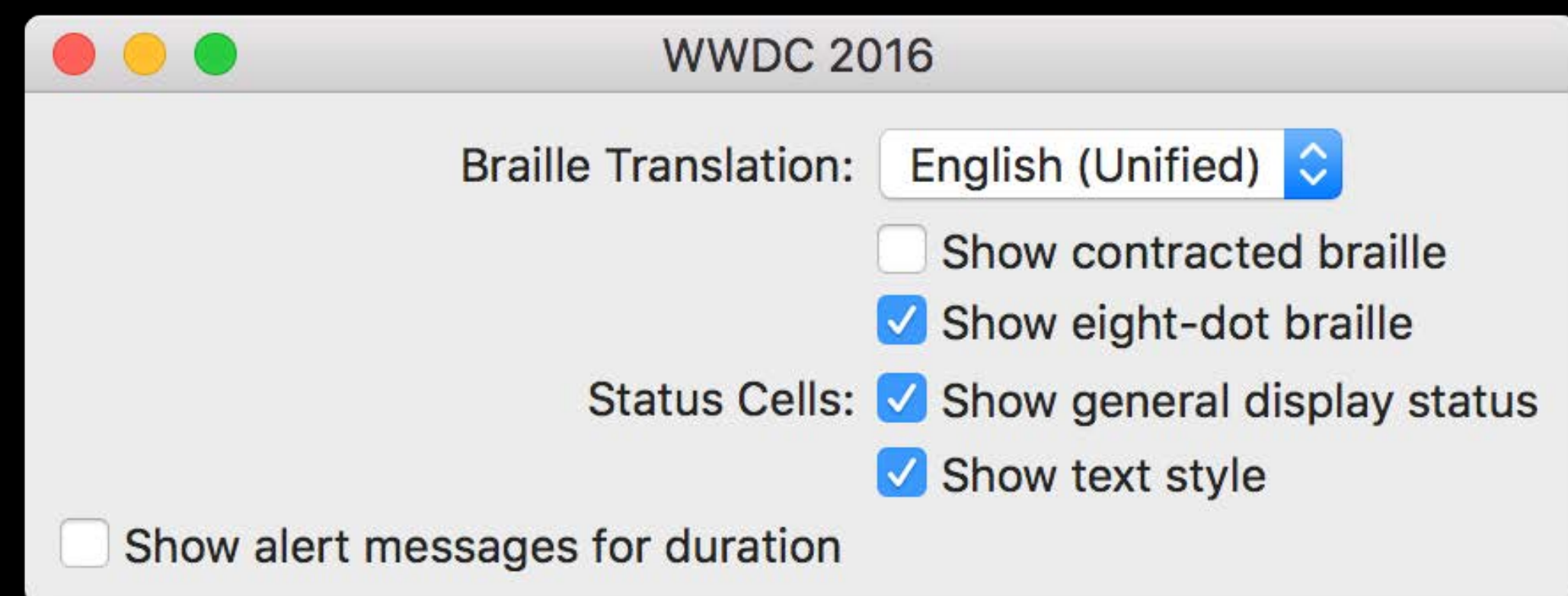
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5
```

Design



Implementation




```
gridView.column(at: 0).xPlacement = .trailing
```

```
// all cells use firstBaseline alignment
```

```
gridView.rowAlignment = .firstBaseline
```

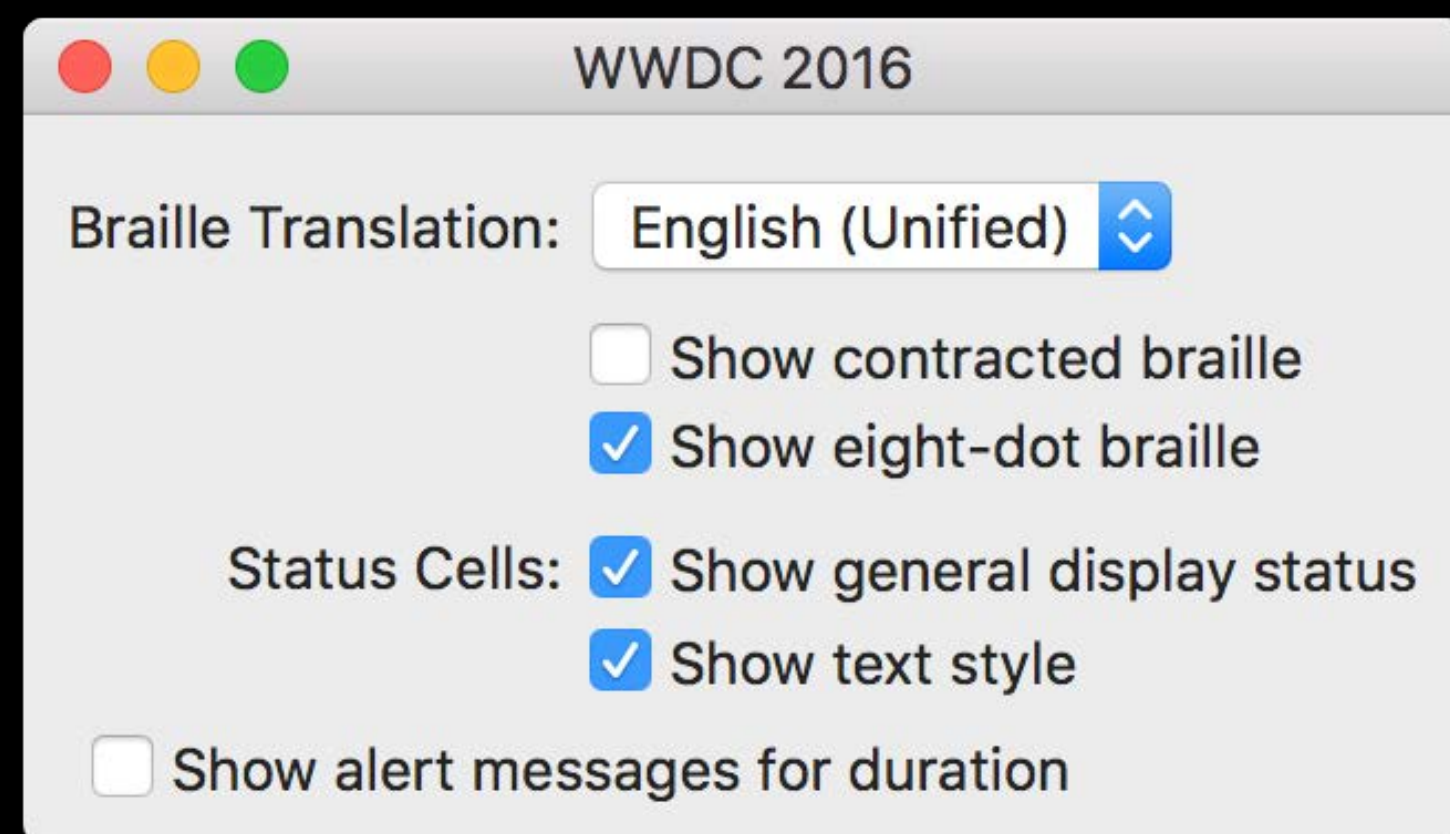
```
// We need a little extra vertical space around the popup:
```

```
let row = gridView.cell(for: brailleTranslationPopup)!.row!
```

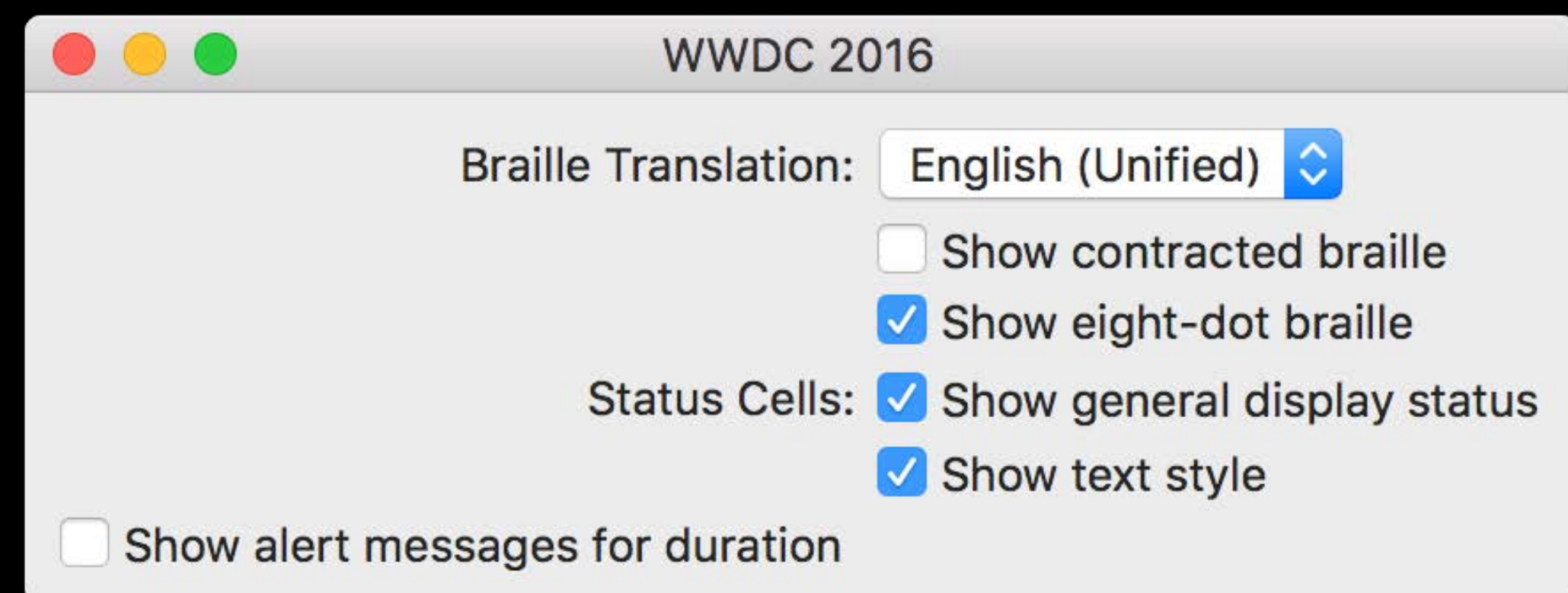
```
row.topPadding = 5
```

```
row.bottomPadding = 5
```

Design



Implementation



```
gridView.column(at: 0).xPlacement = .trailing
```

```
// all cells use firstBaseline alignment
```

```
gridView.rowAlignment = .firstBaseline
```

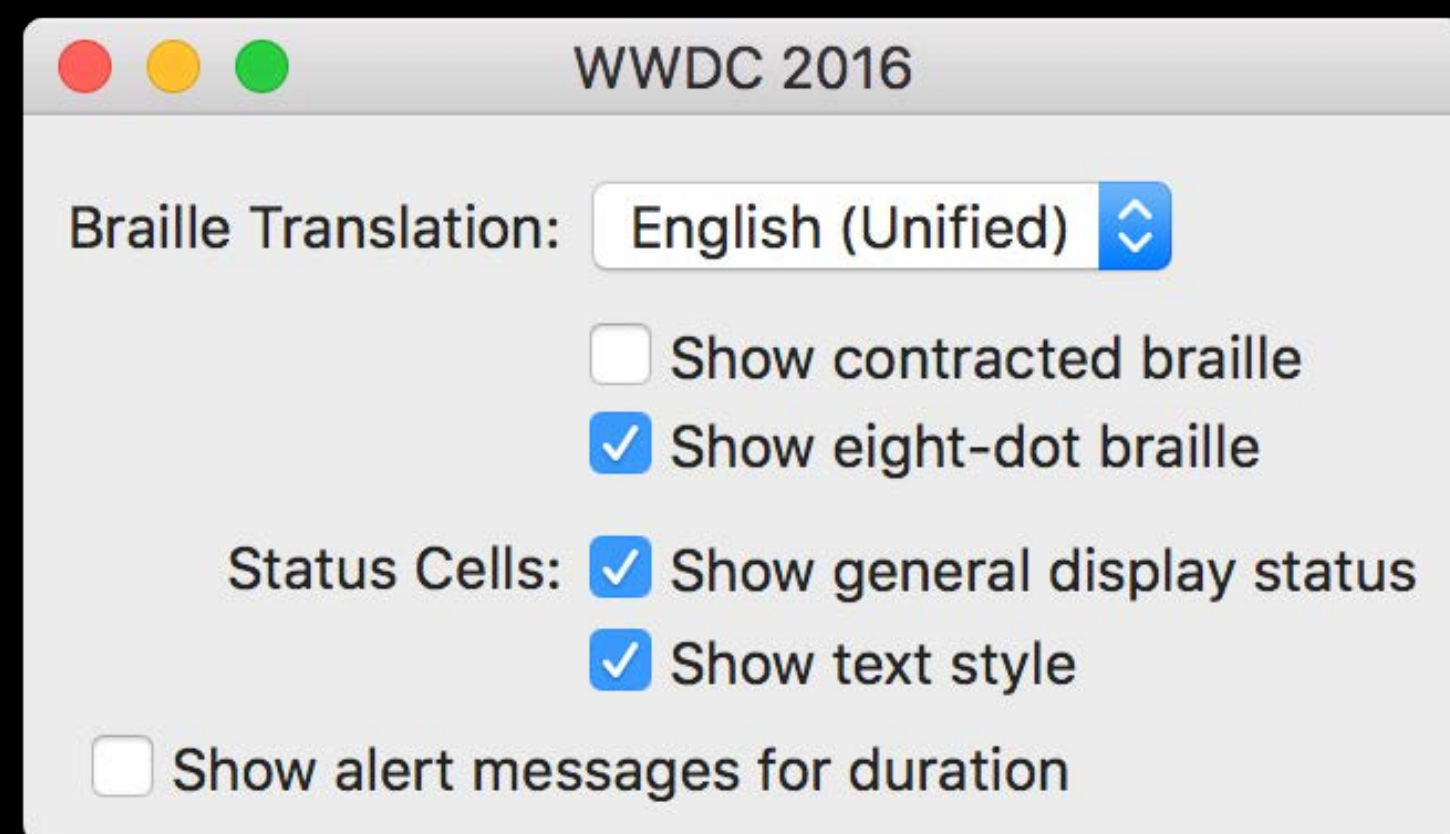
```
// We need a little extra vertical space around the popup:
```

```
let row = gridView.cell(for: brailleTranslationPopup)!.row!
```

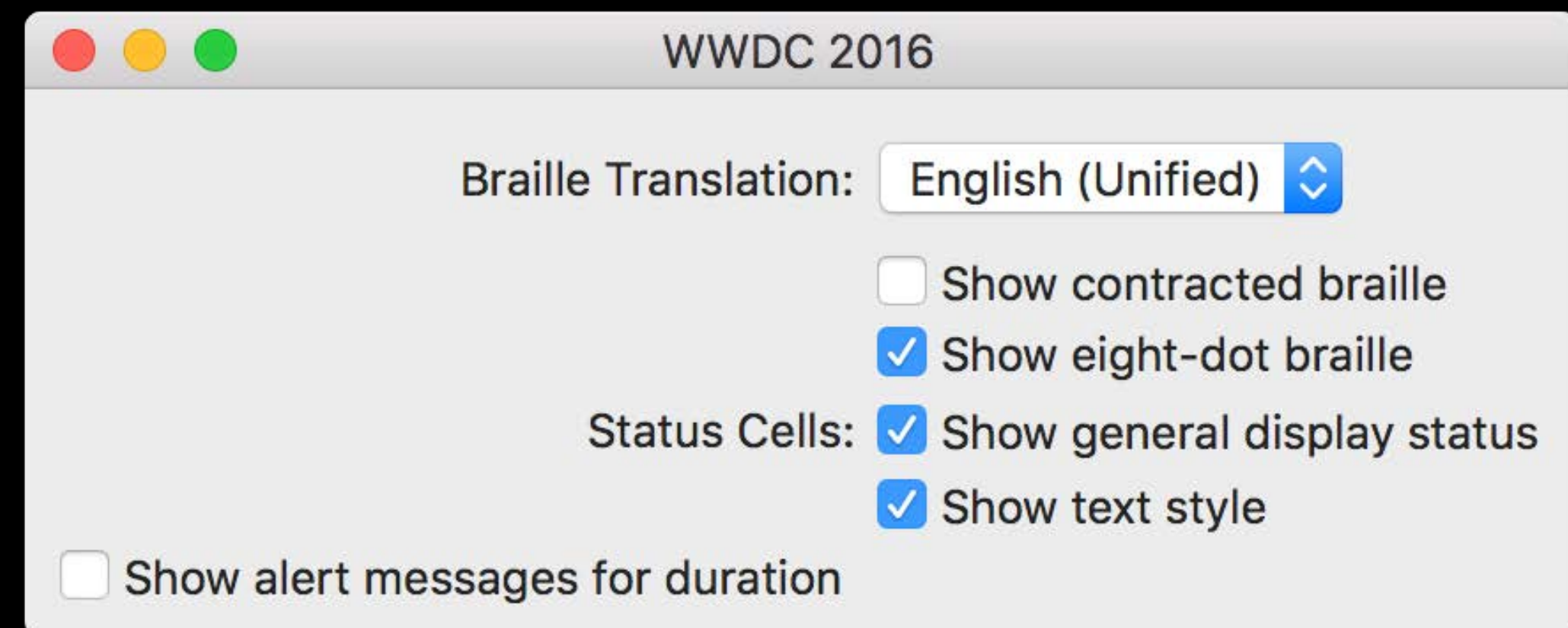
```
row.topPadding = 5
```

```
row.bottomPadding = 5
```

Design



Implementation

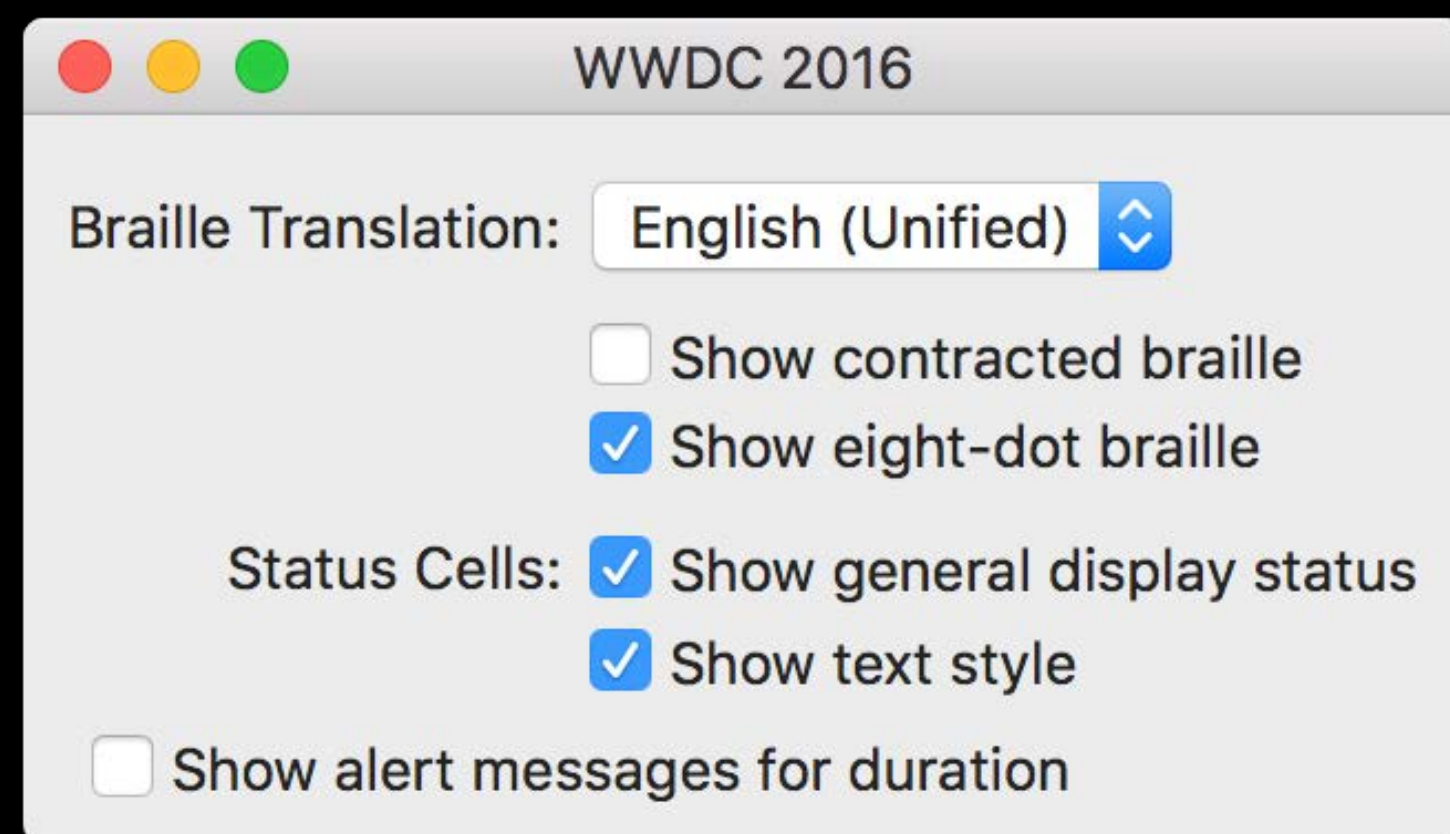



```
gridView.column(at: 0).xPlacement = .trailing

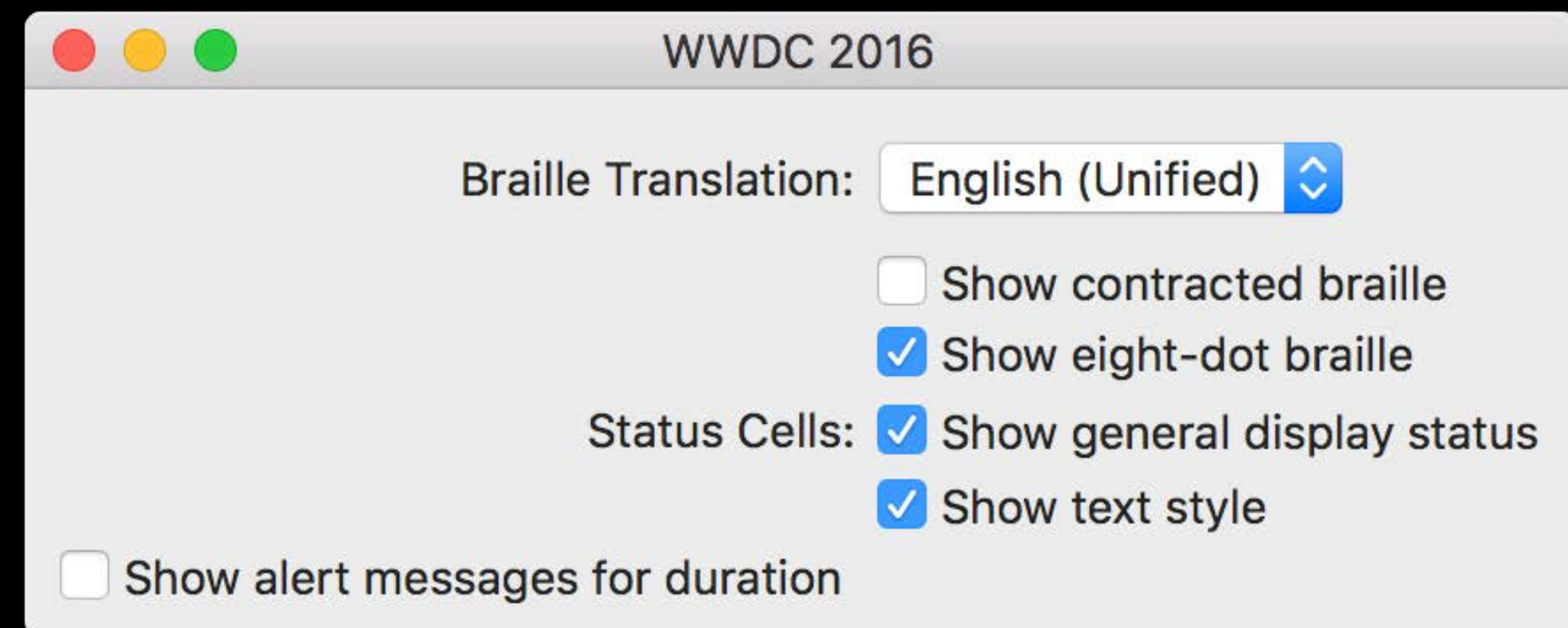
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5
```

Design



Implementation

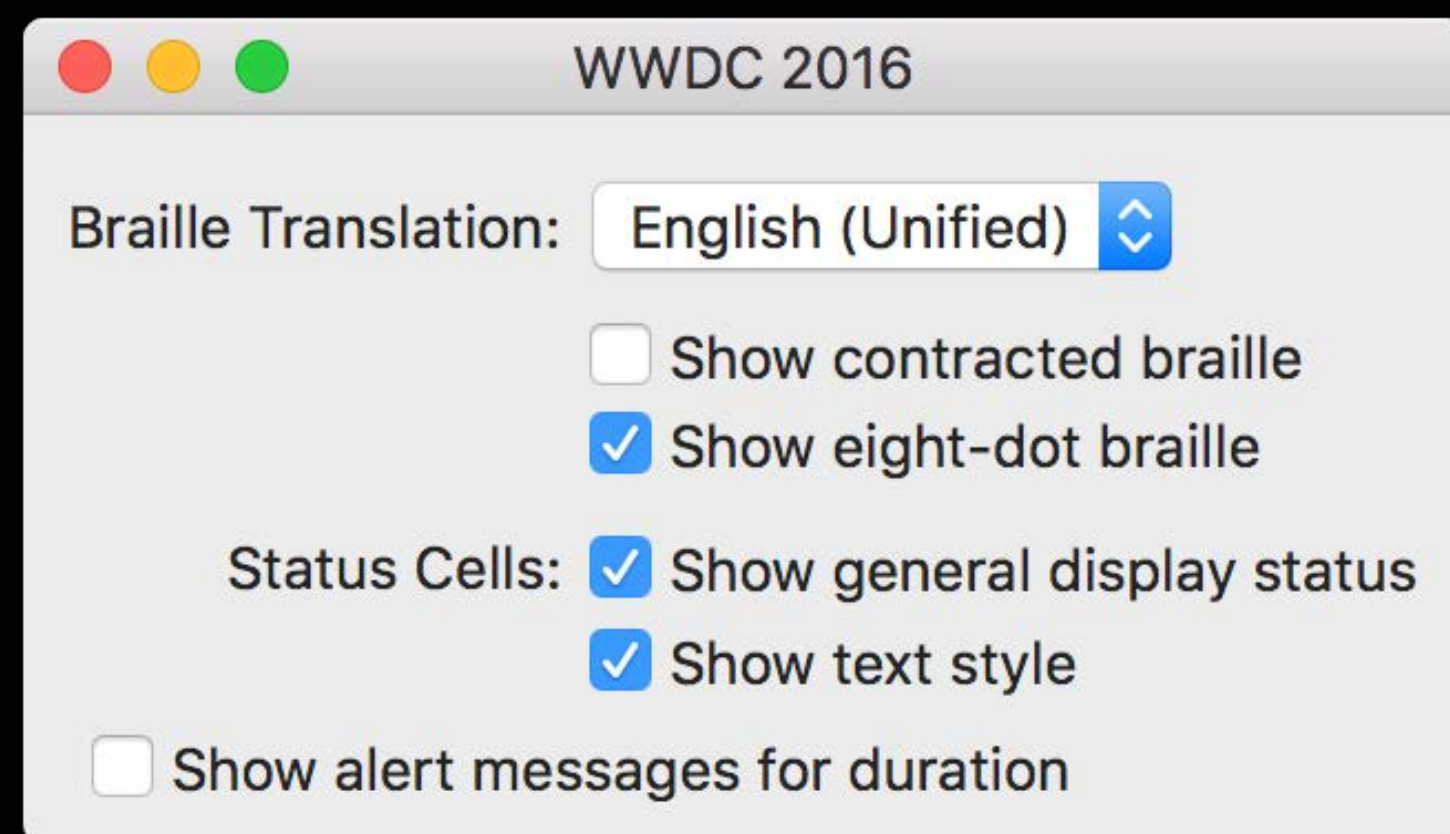


```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

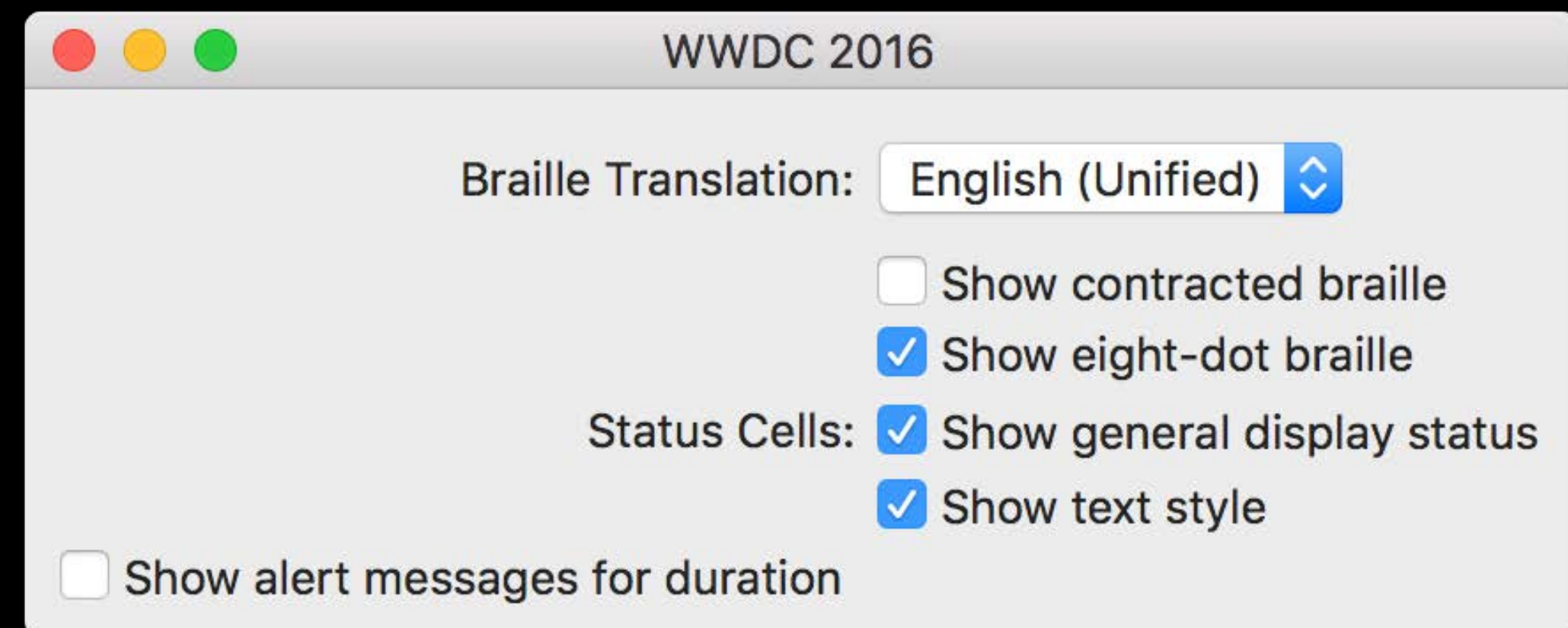
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design



Implementation

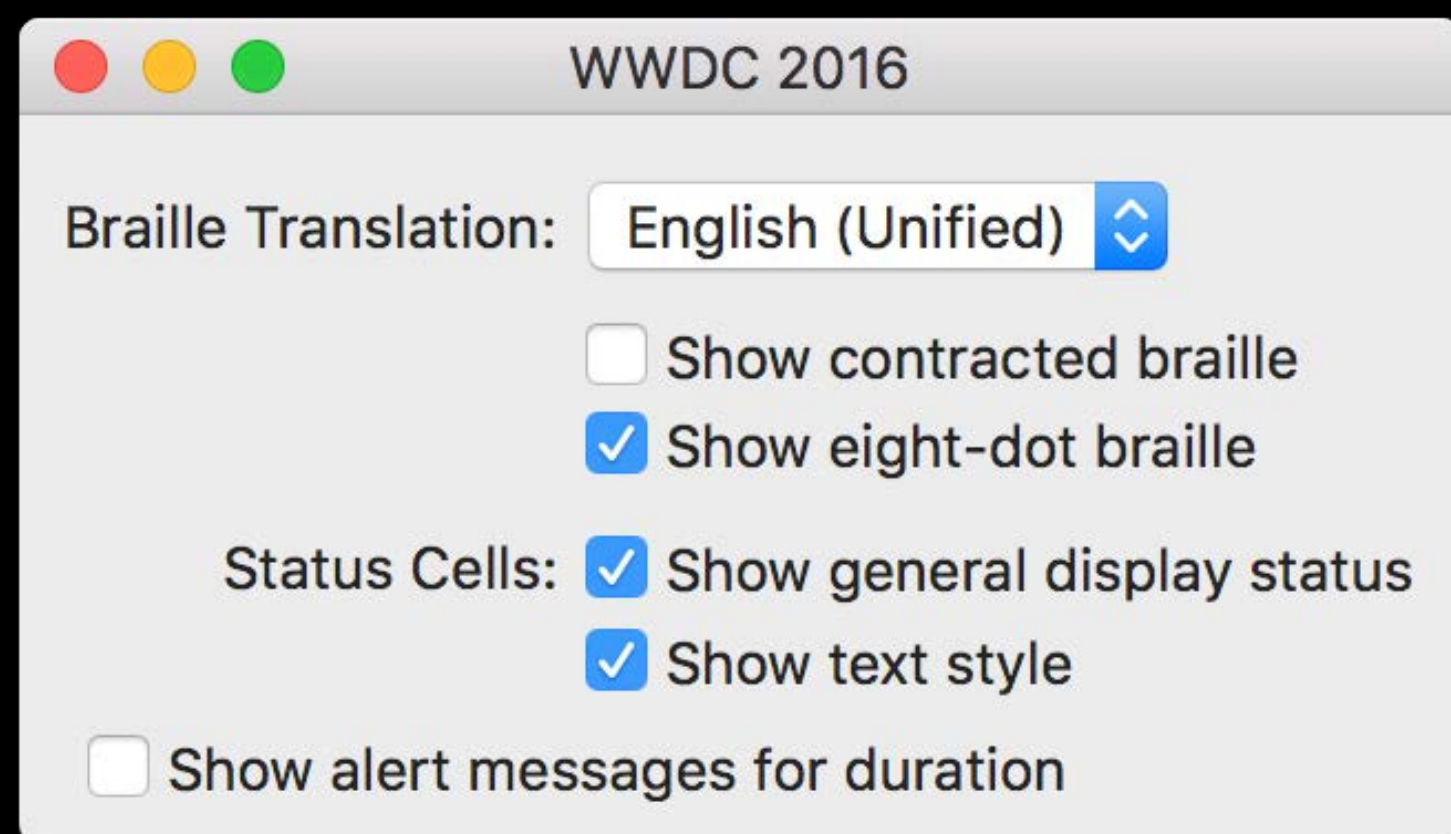



```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

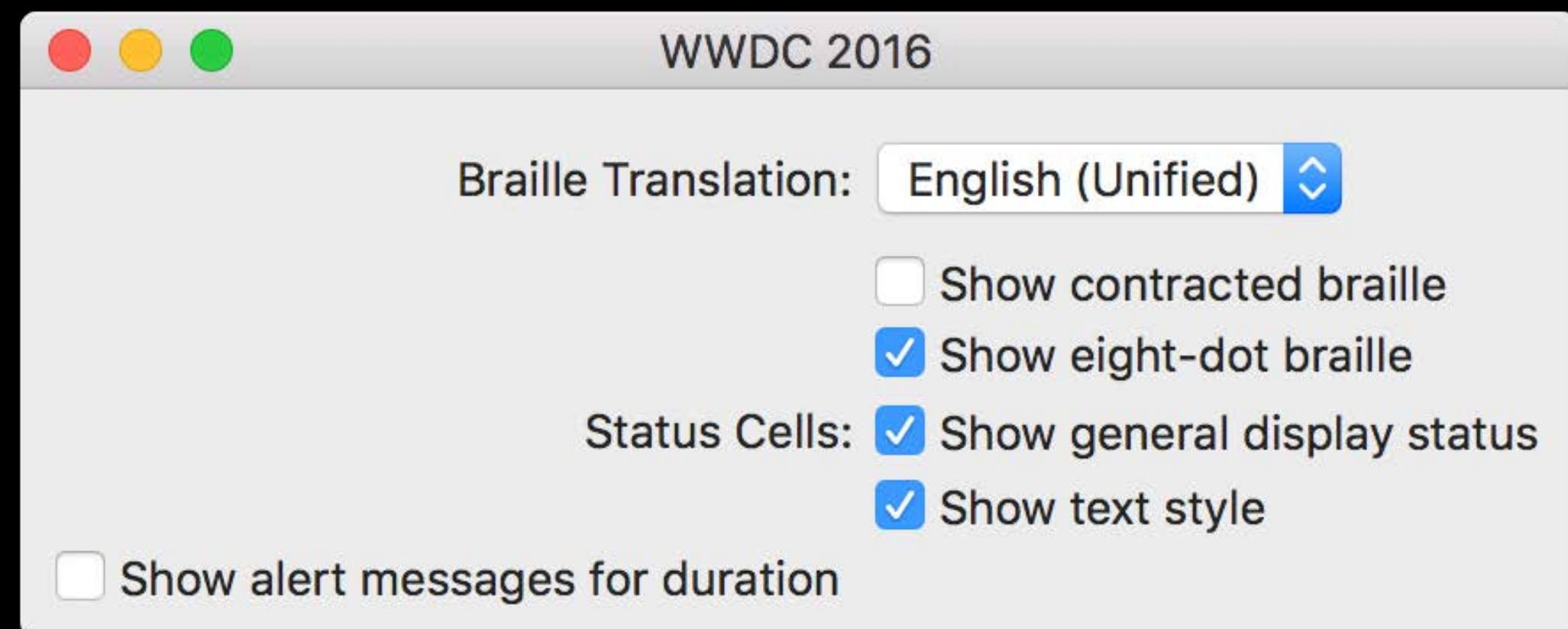
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design



Implementation

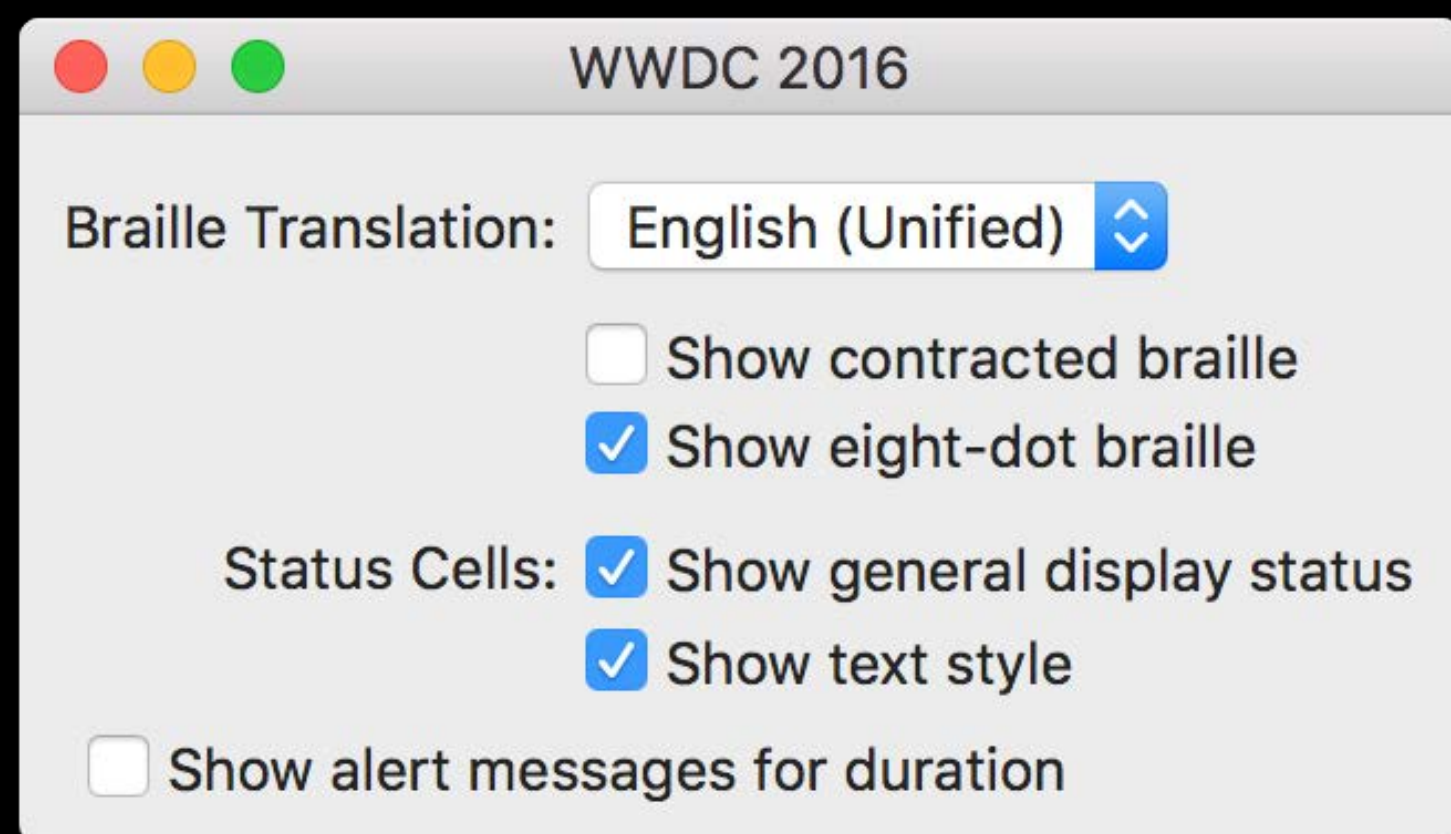


```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

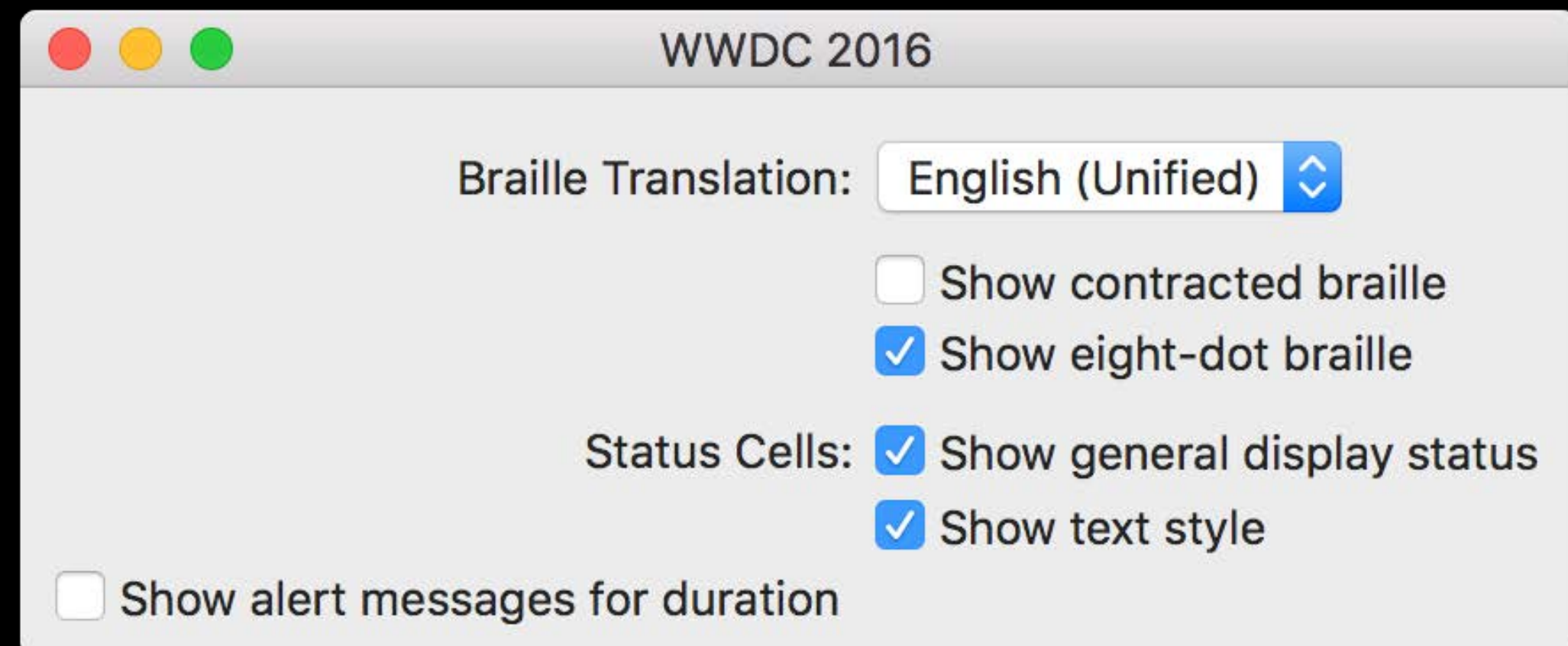
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design




Implementation



Design

WWDC 2016

Braille Translation: English (Unified) 

Show contracted braille

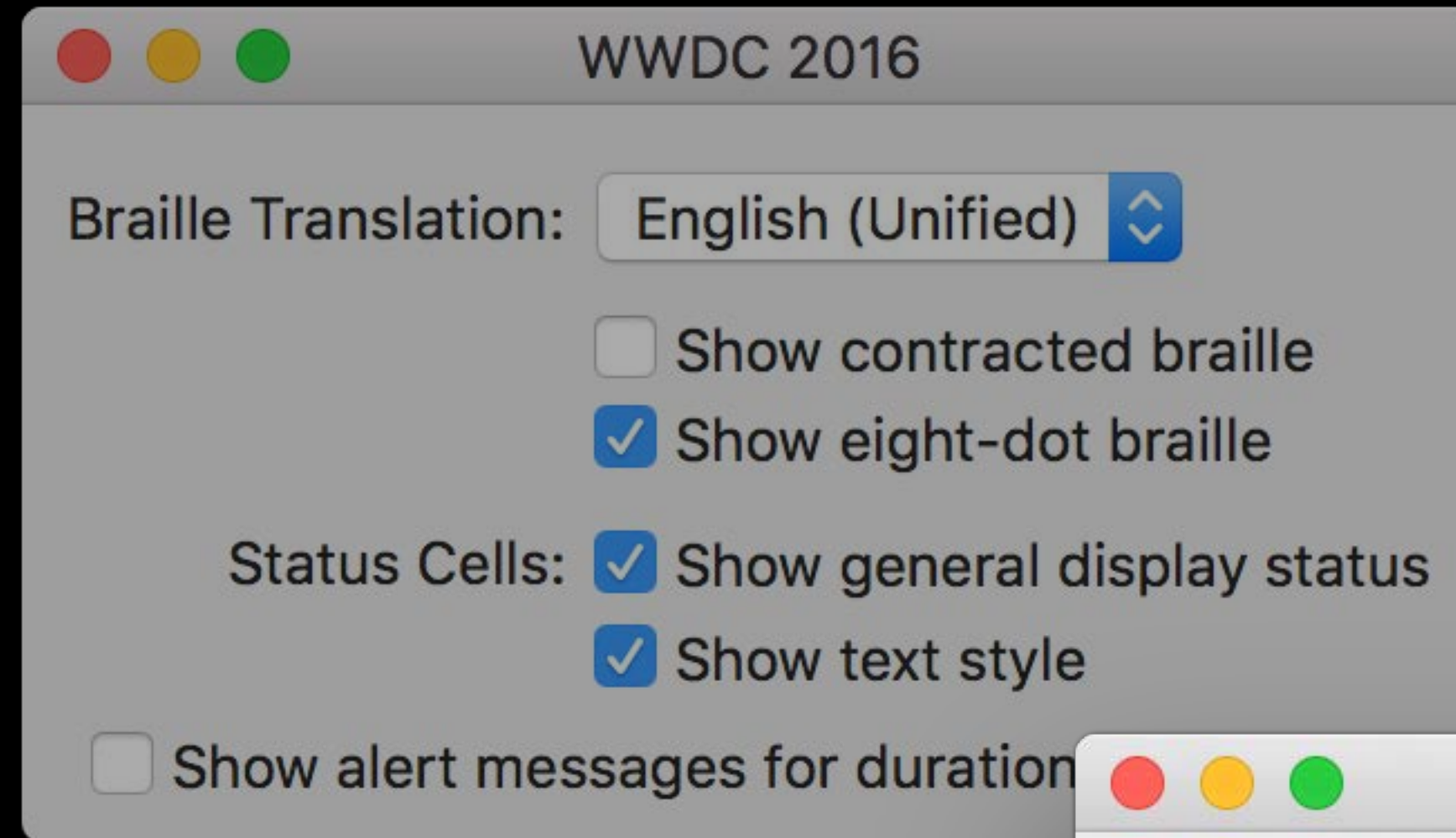
Show eight-dot braille

Status Cells: Show general display status

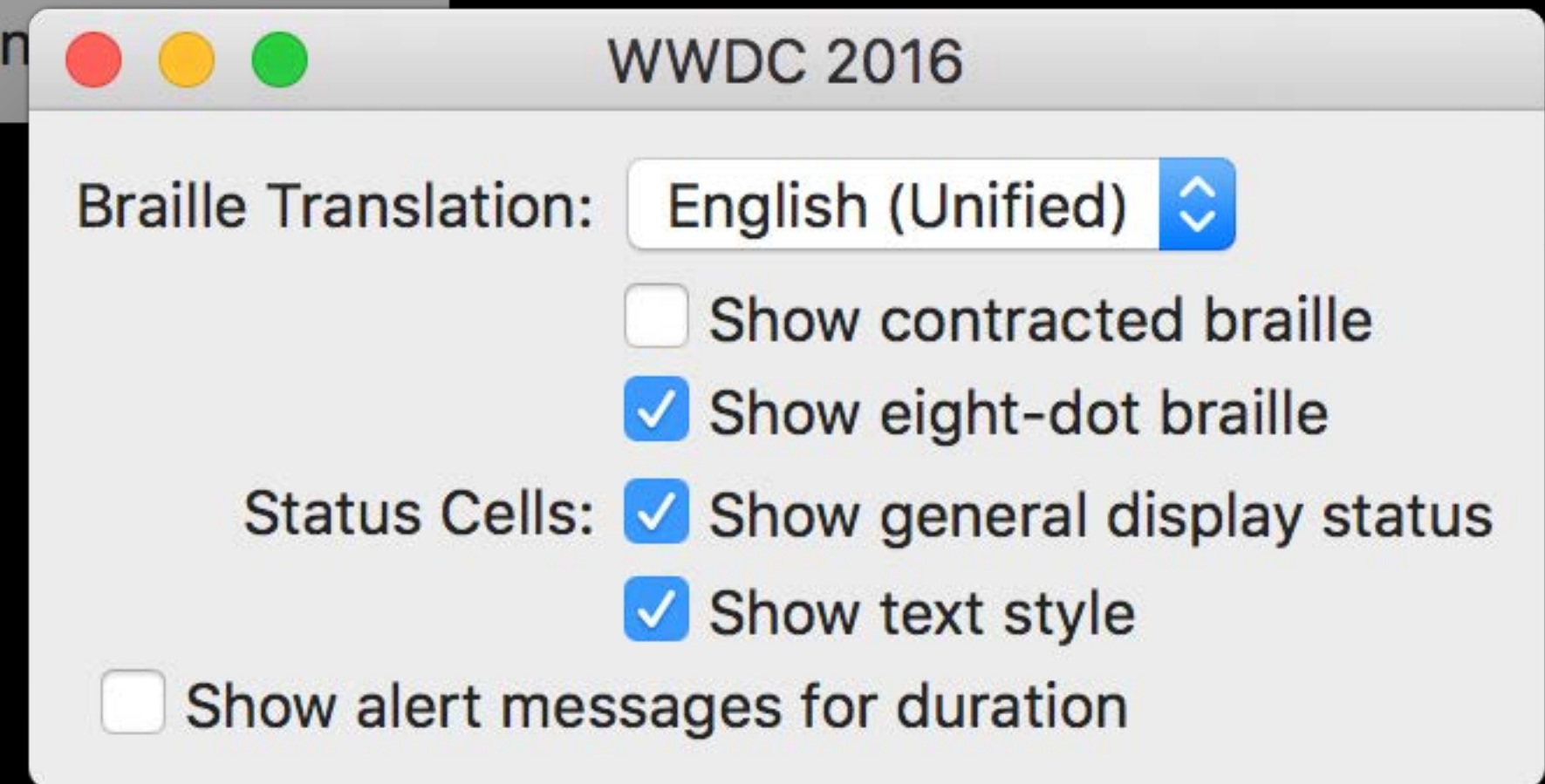
Show text style

Show alert messages for duration

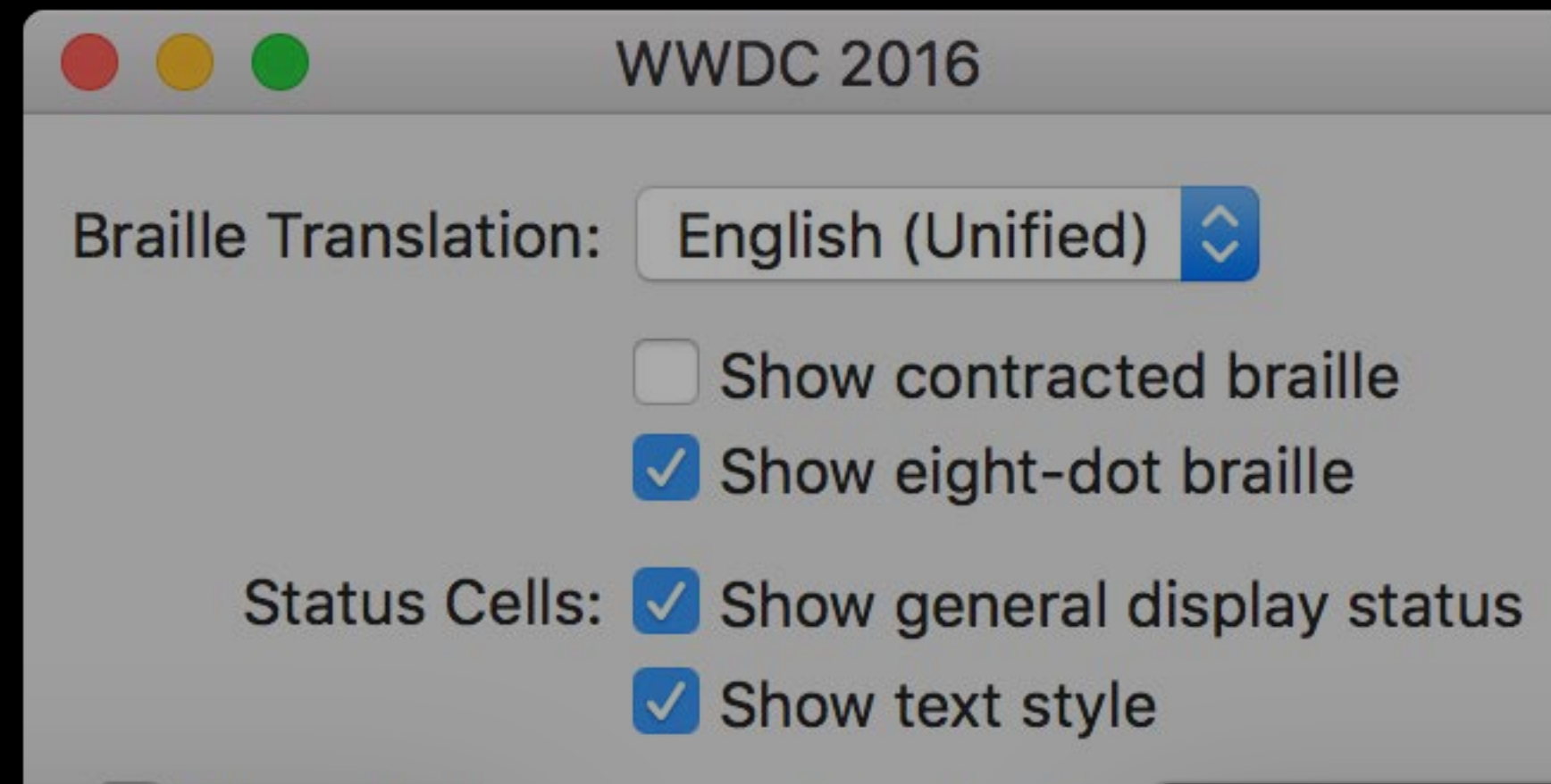
Design



No Padding

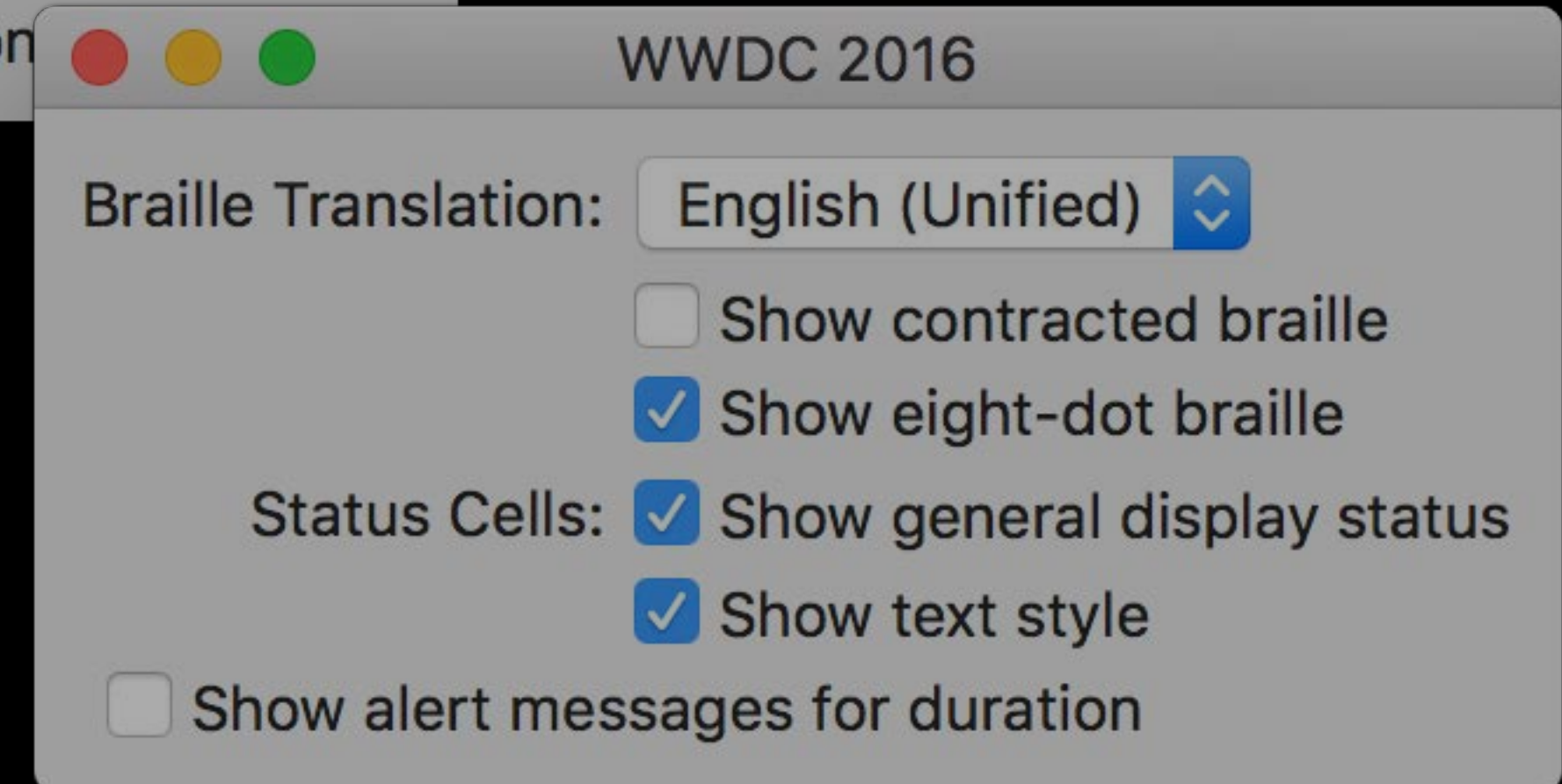
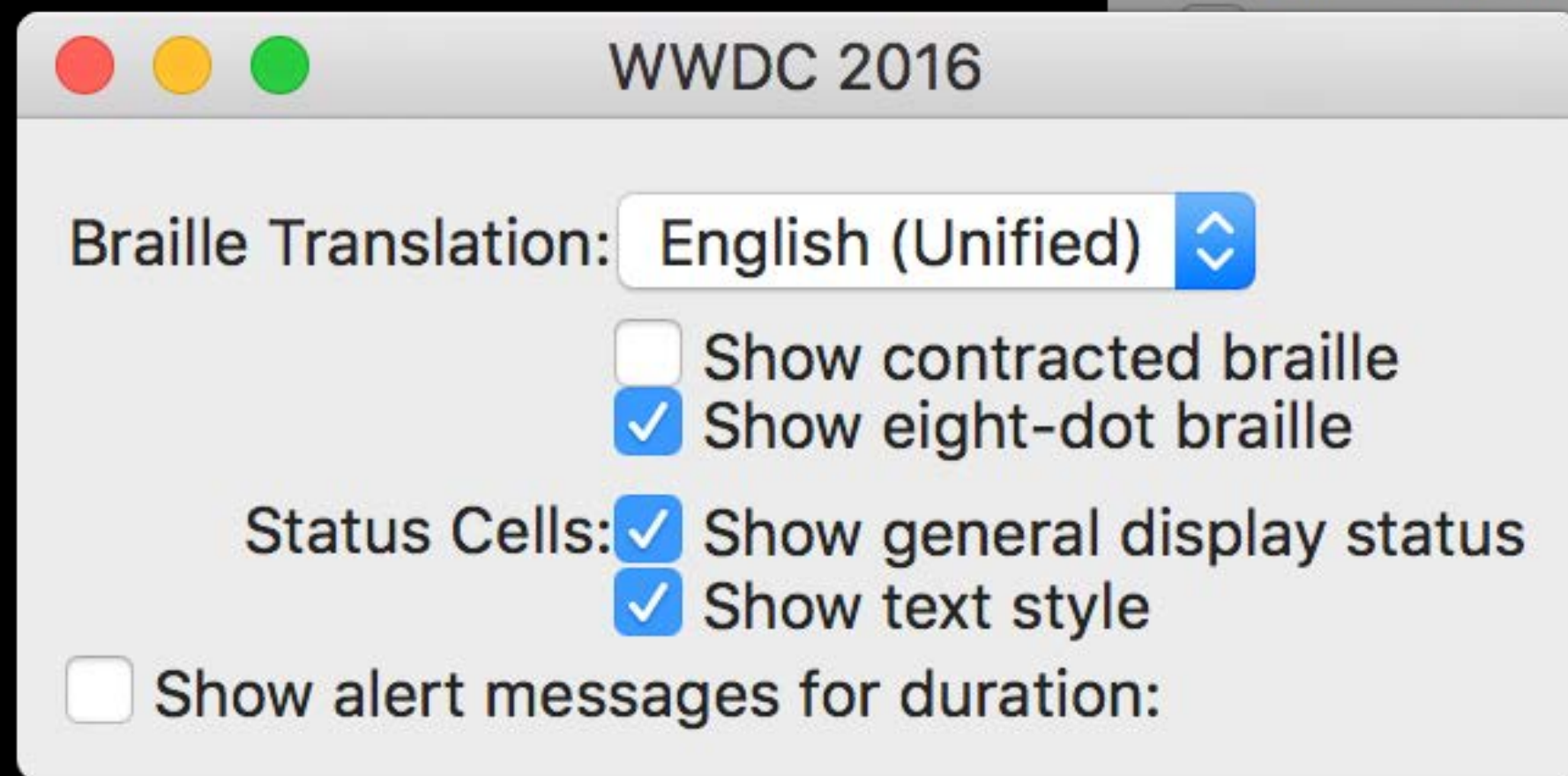


Design

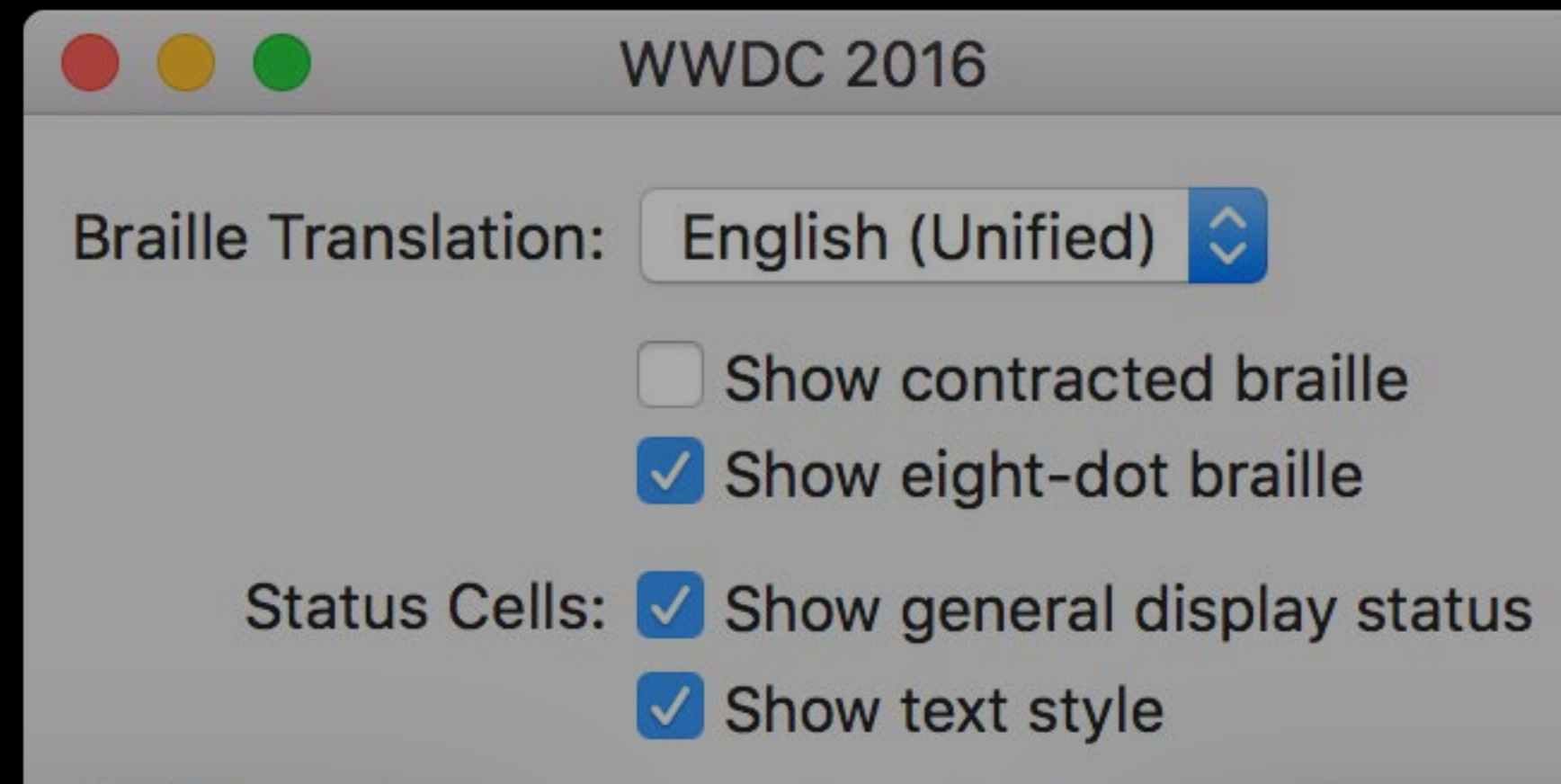


No Spacing

No Padding

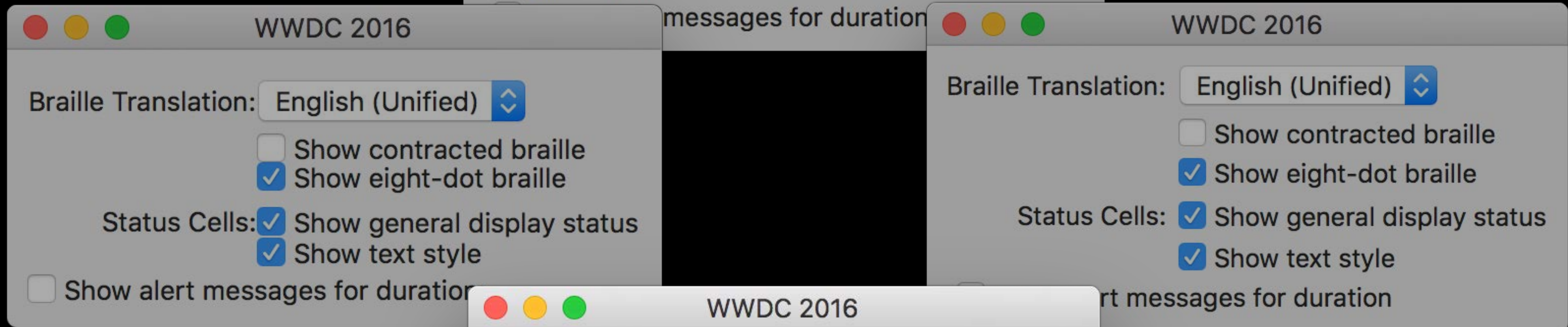


Design



No Spacing

No Padding



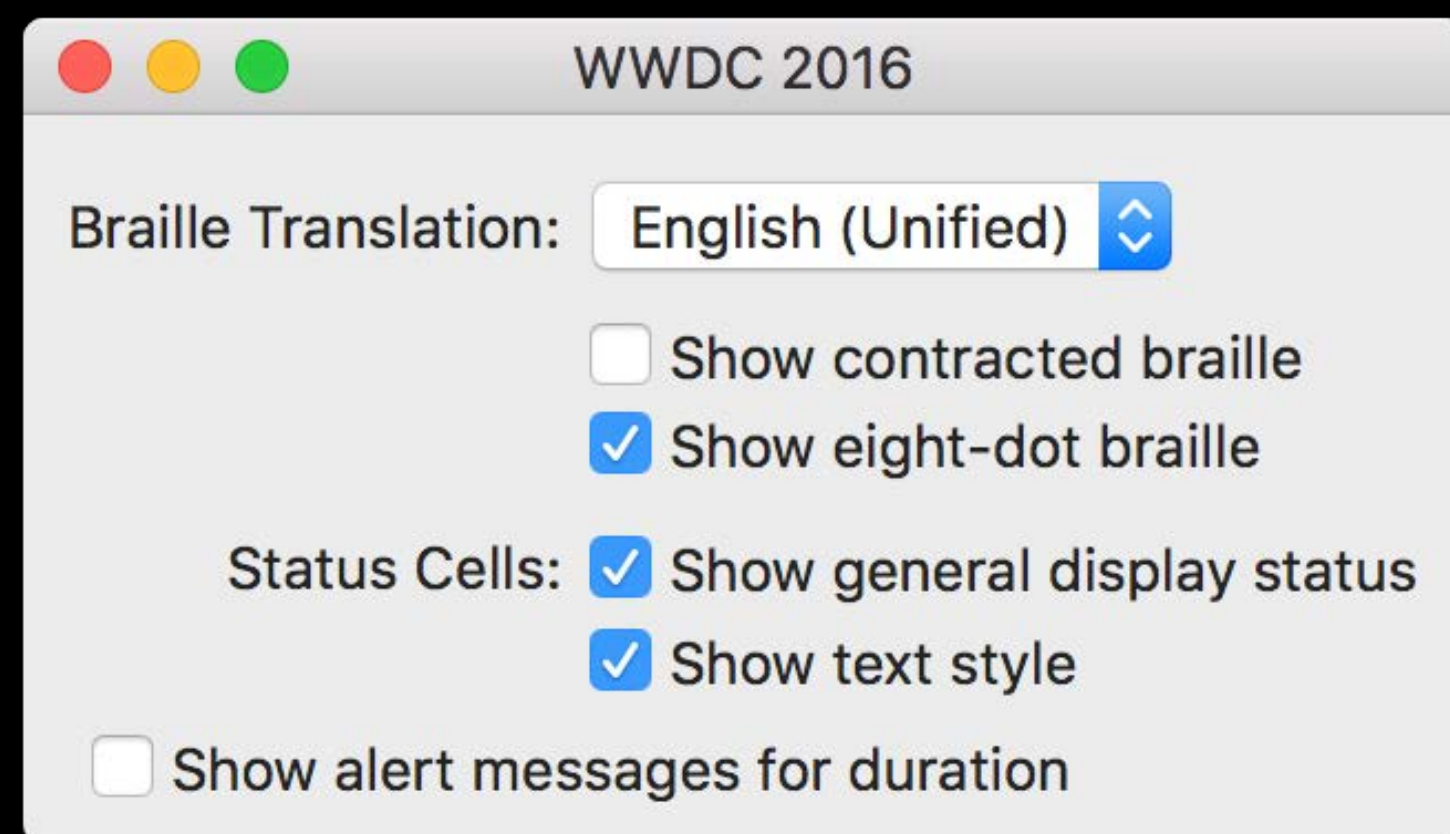
No Spacing or Padding


```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

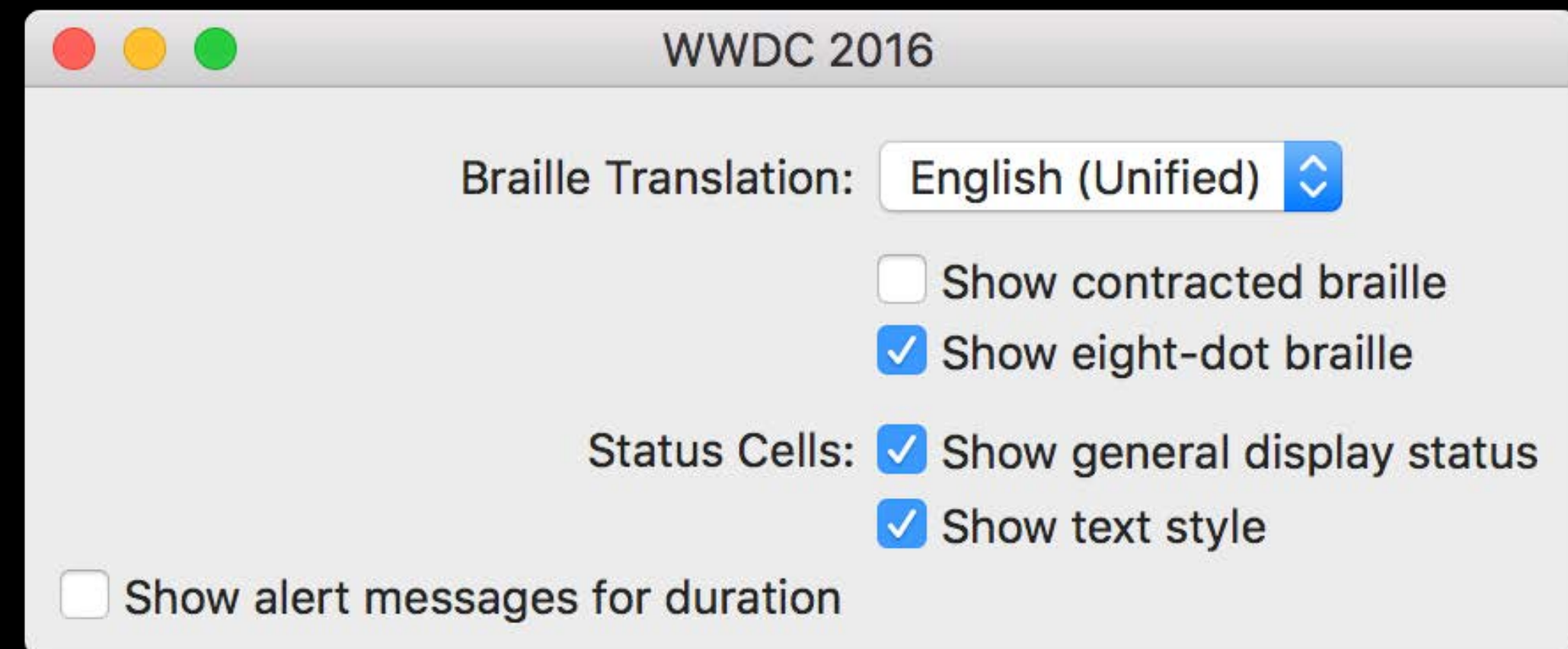
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design



Implementation

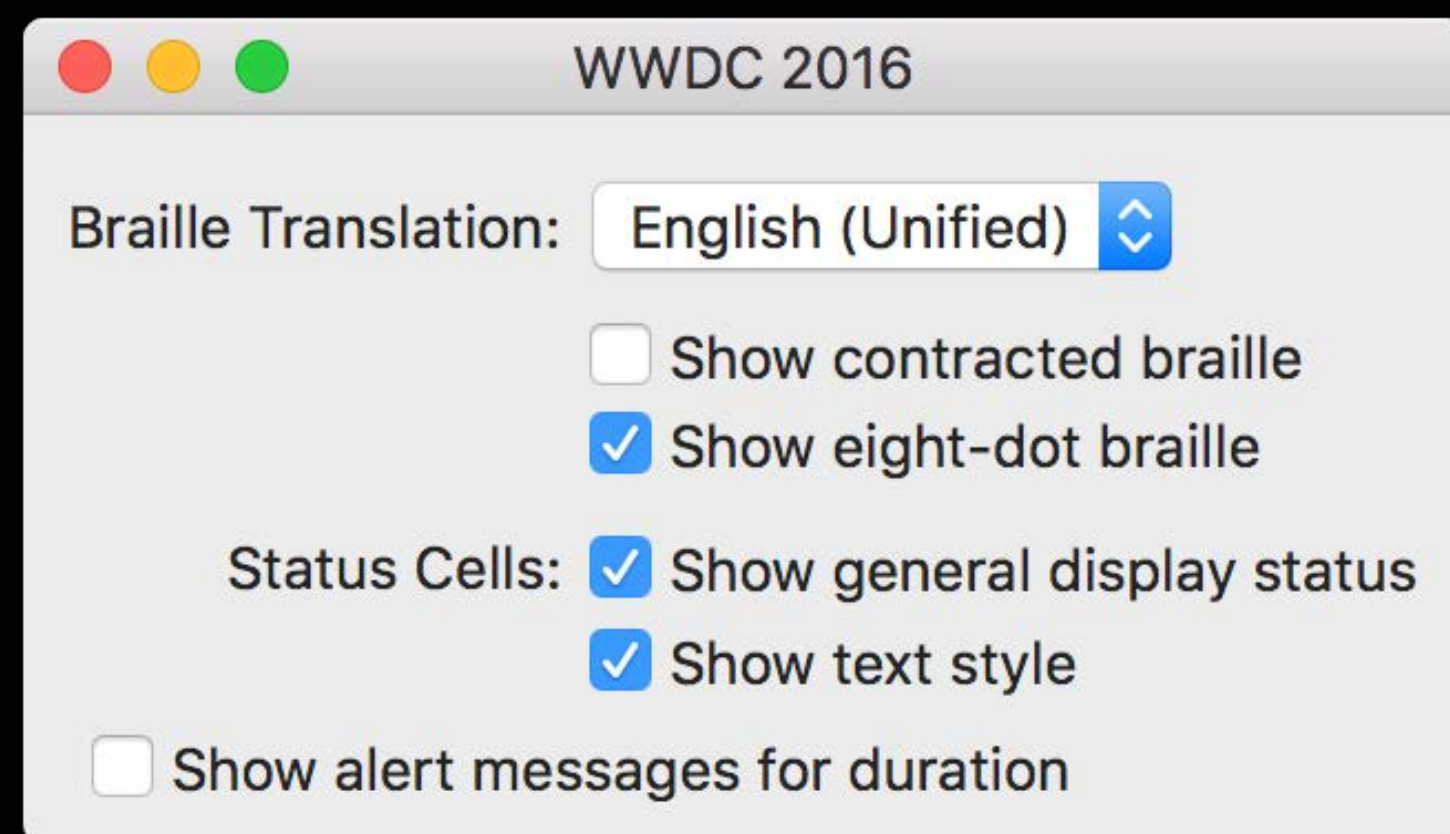


```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

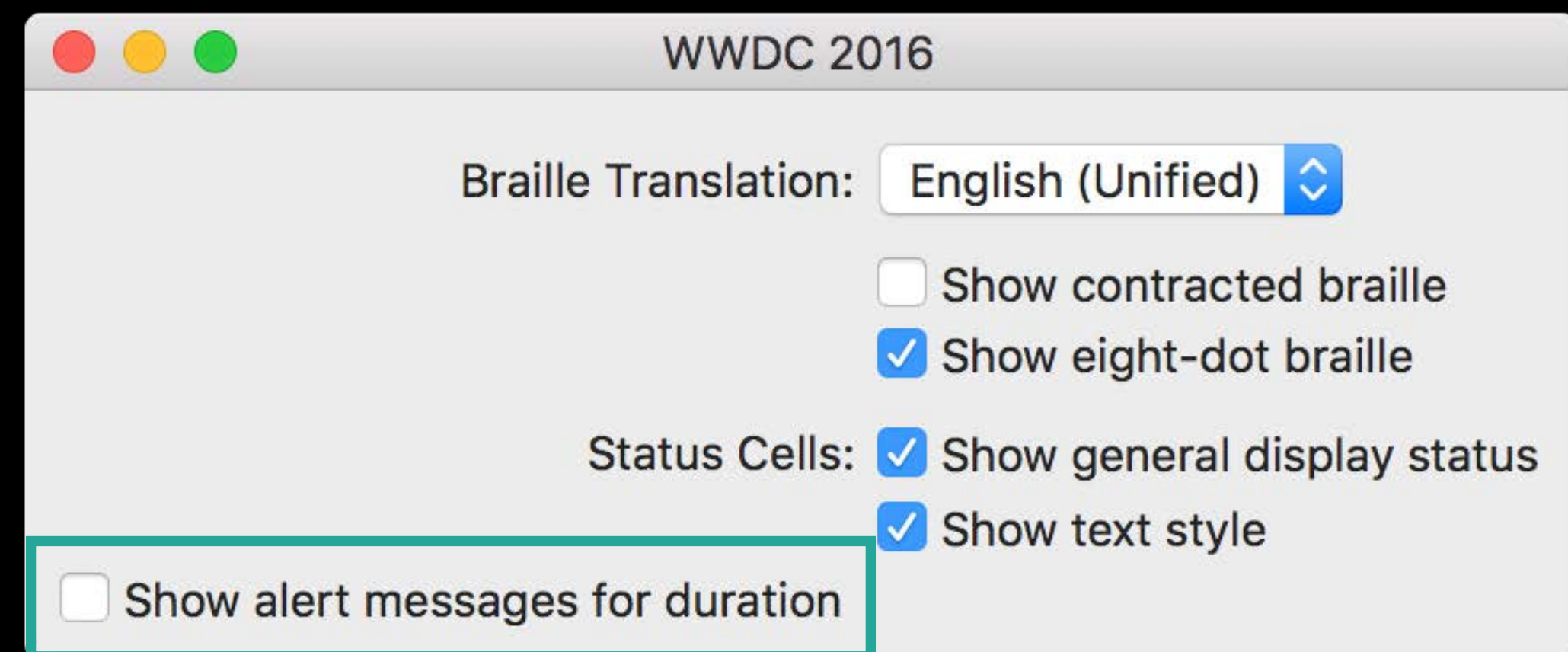
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design



Implementation

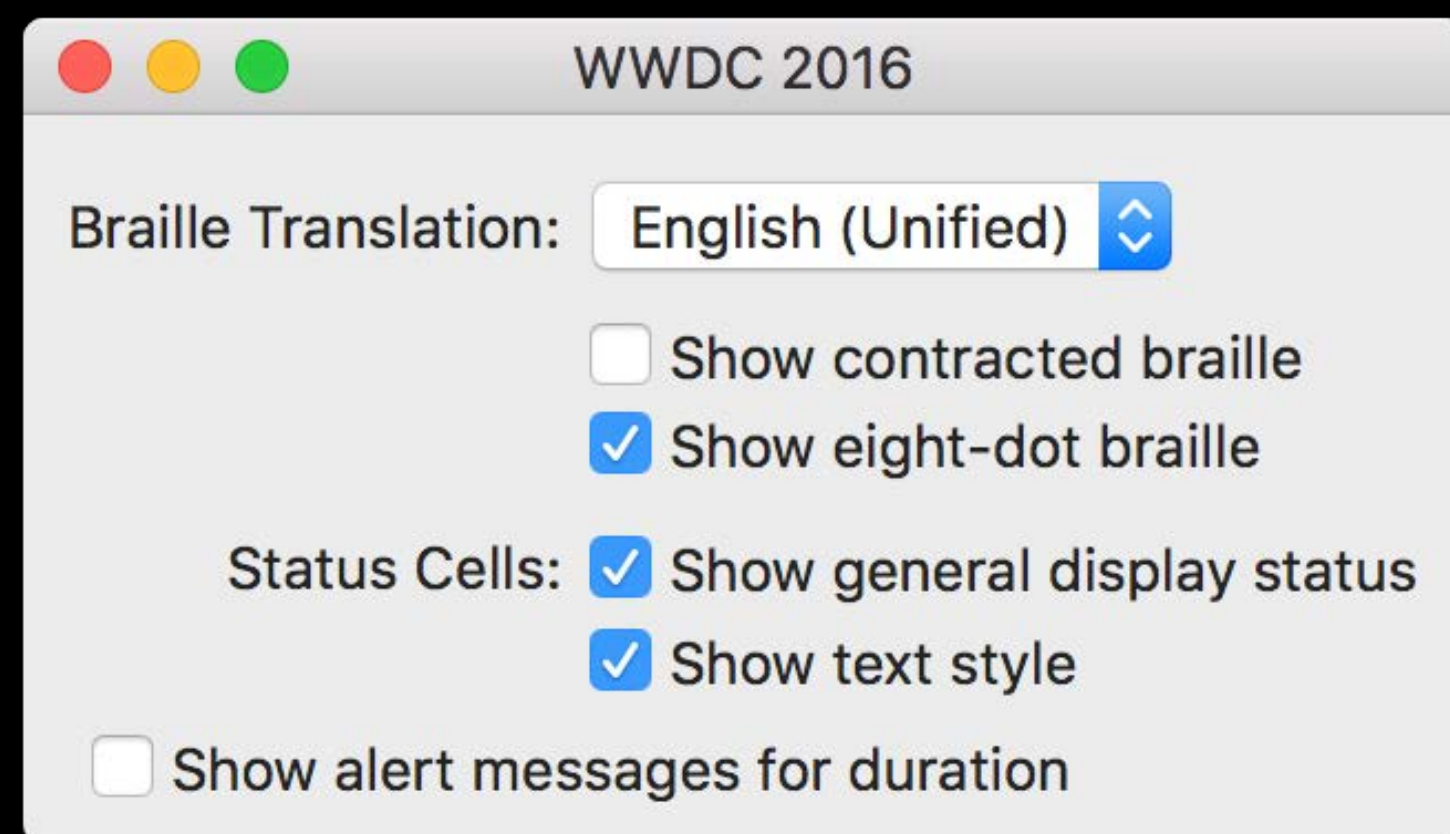



```
// all cells use firstBaseline alignment
gridView.rowAlignment = .firstBaseline

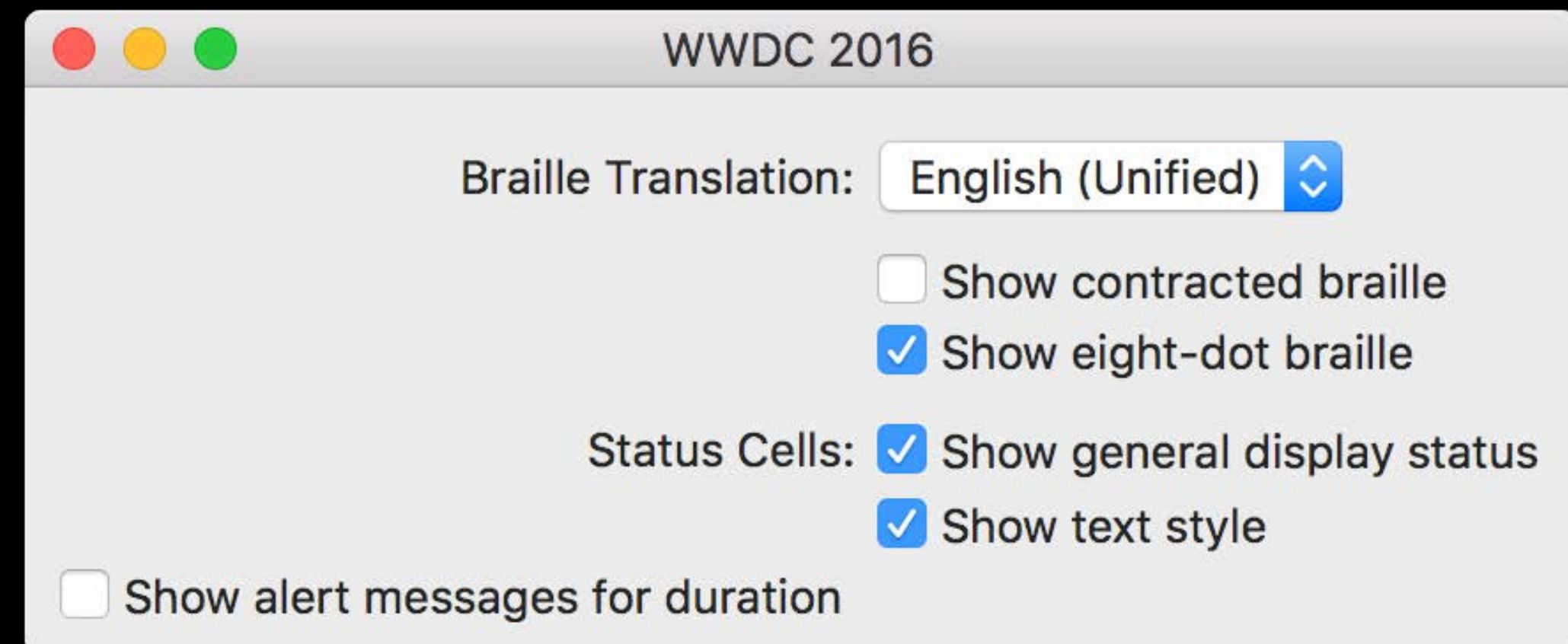
// We need a little extra vertical space around the popup:
let row = gridView.cell(for: brailleTranslationPopup)!.row!
row.topPadding = 5
row.bottomPadding = 5

gridView.cell(for: statusCellsLabel)!.row!.topPadding = 6
```

Design



Implementation

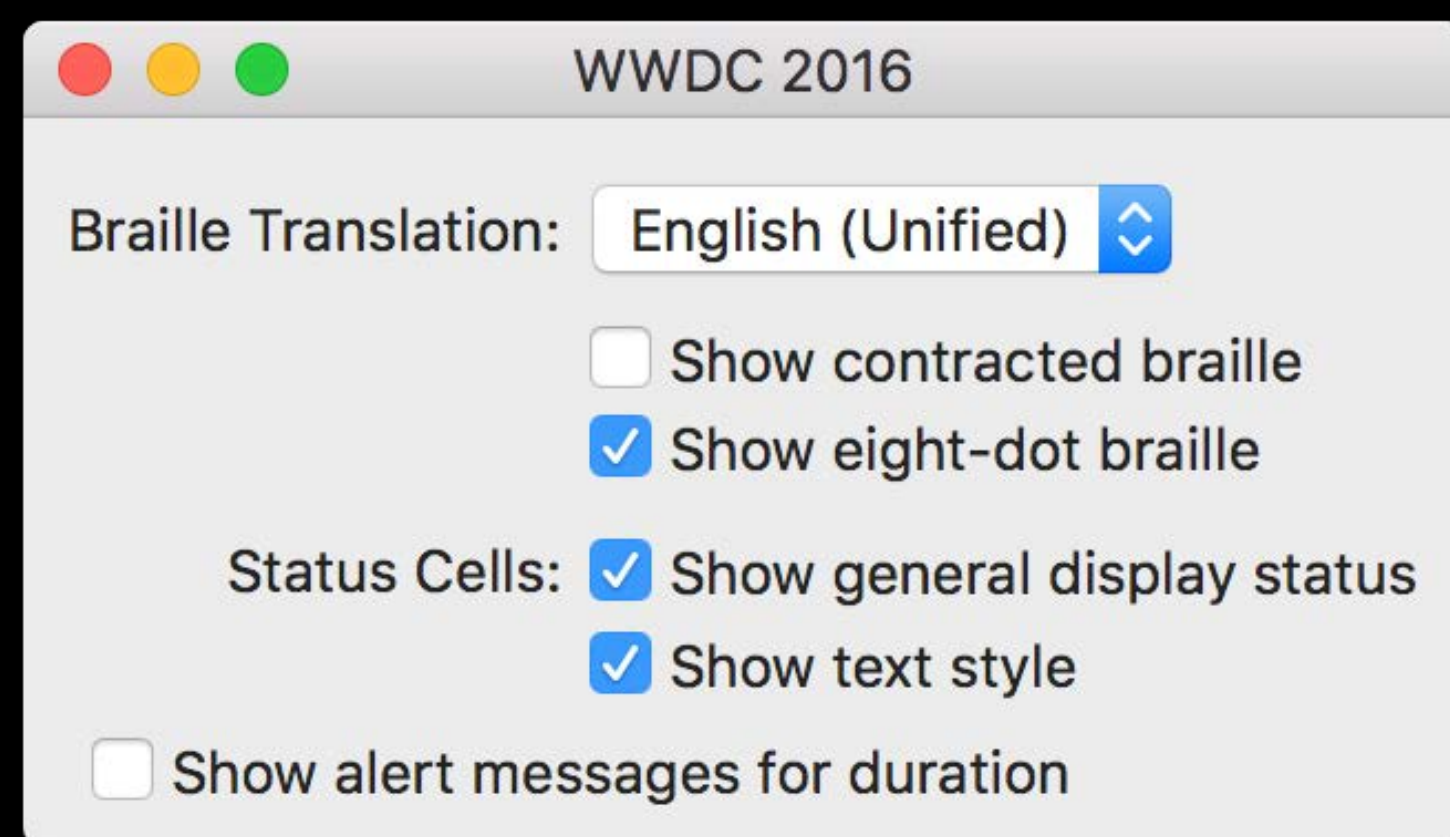


```
row.topPadding = 5
row.bottomPadding = 5

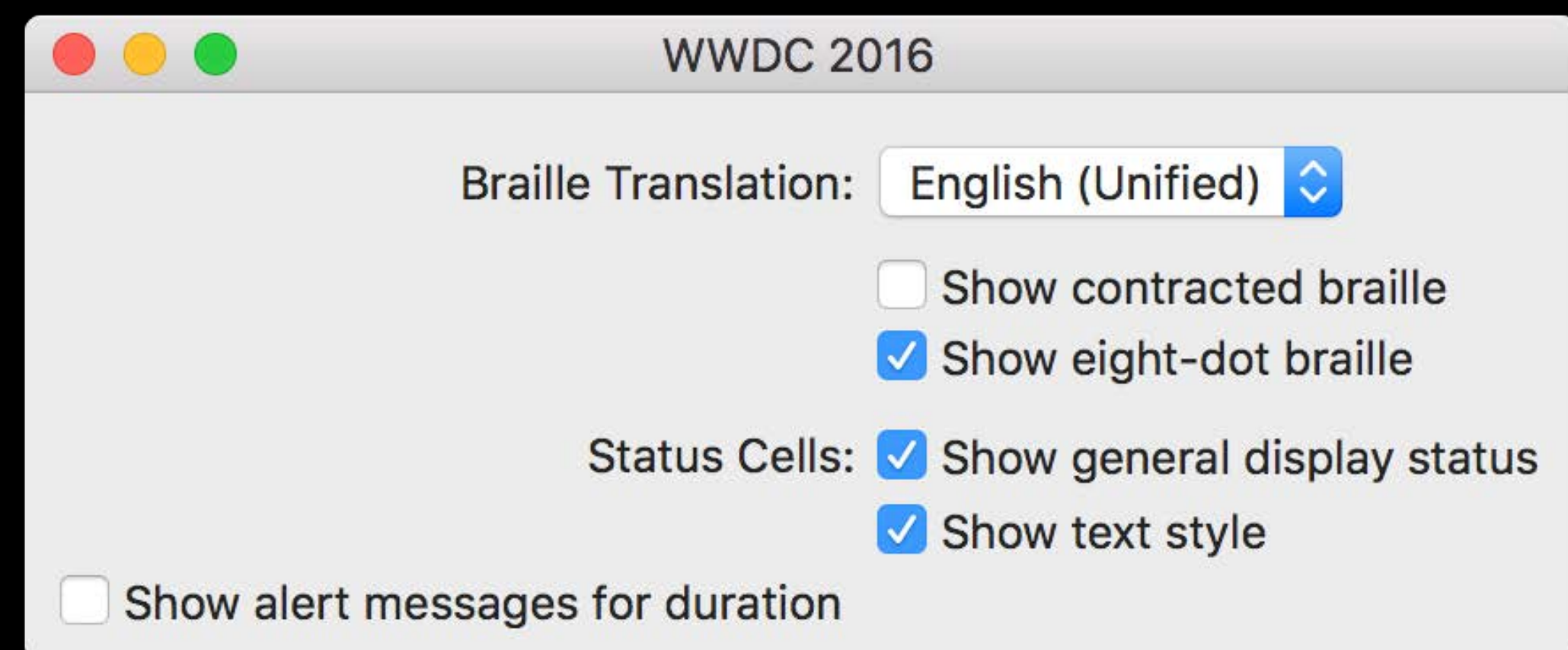
collectionView.cell(forKey: statusCellsLabel)?.row!.topPadding = 6

// Special treatment for centered checkbox:
let cell = collectionView.cell(forKey: showAlertCB)!
cell.row!.topPadding = 4
cell.row!.mergeCells(in: NSRange(0, 2))
```

Design



Implementation

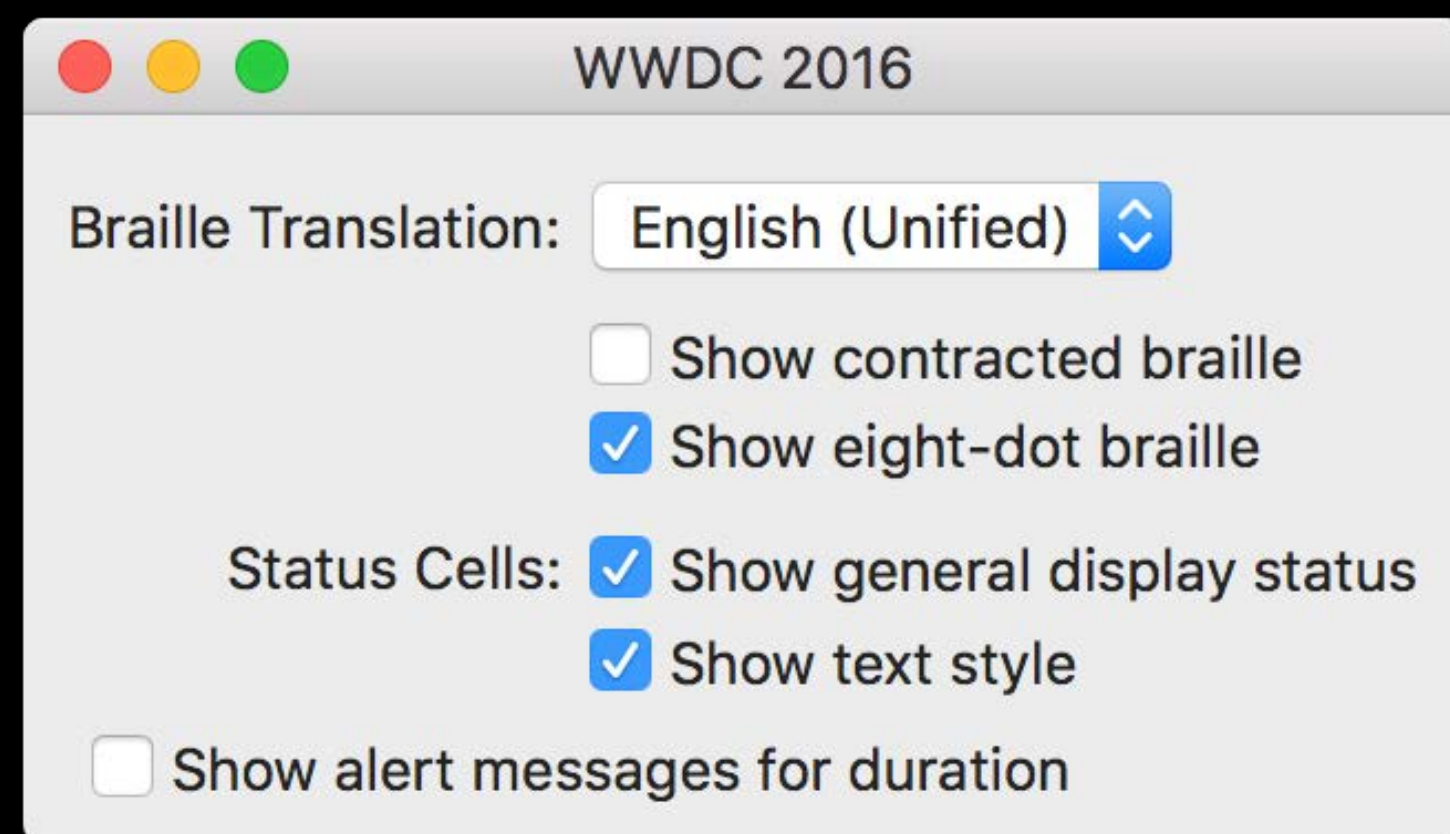



```
row.topPadding = 5
row.bottomPadding = 5

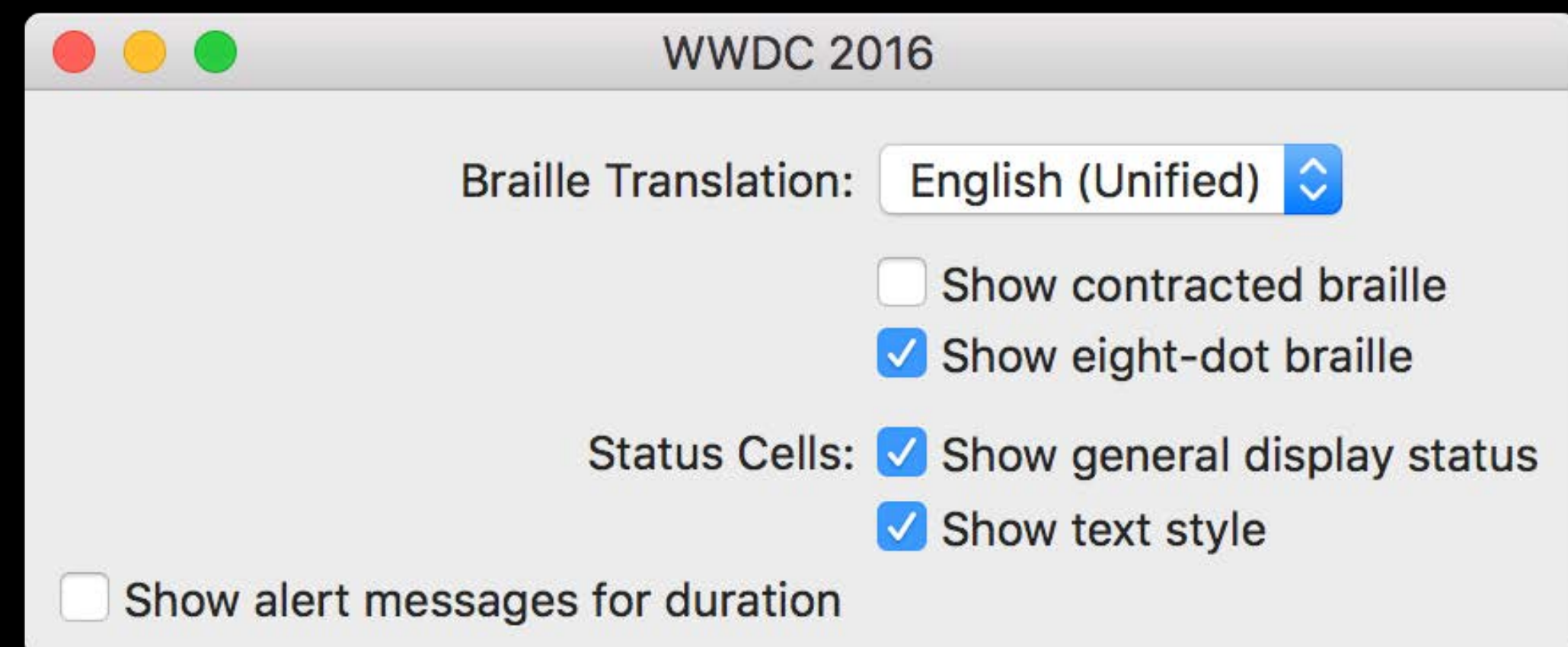
gridView.cell(forKey: statusCellsLabel)?.row!.topPadding = 6

// Special treatment for centered checkbox:
let cell = gridView.cell(forKey: showAlertCB)!
cell.row!.topPadding = 4
cell.row!.mergeCells(in: NSRange(0, 2))
```

Design



Implementation

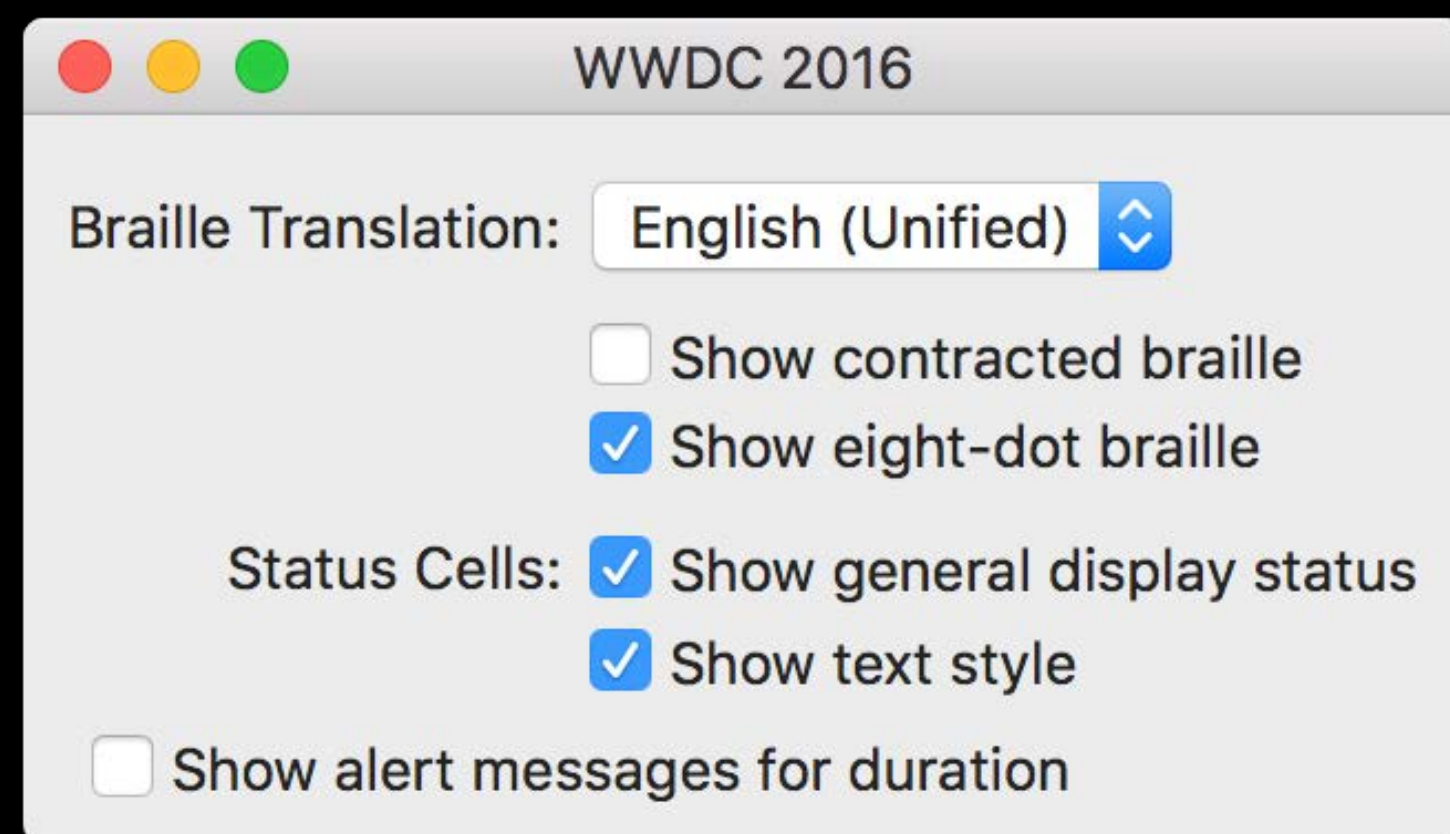



```
row.topPadding = 5
row.bottomPadding = 5

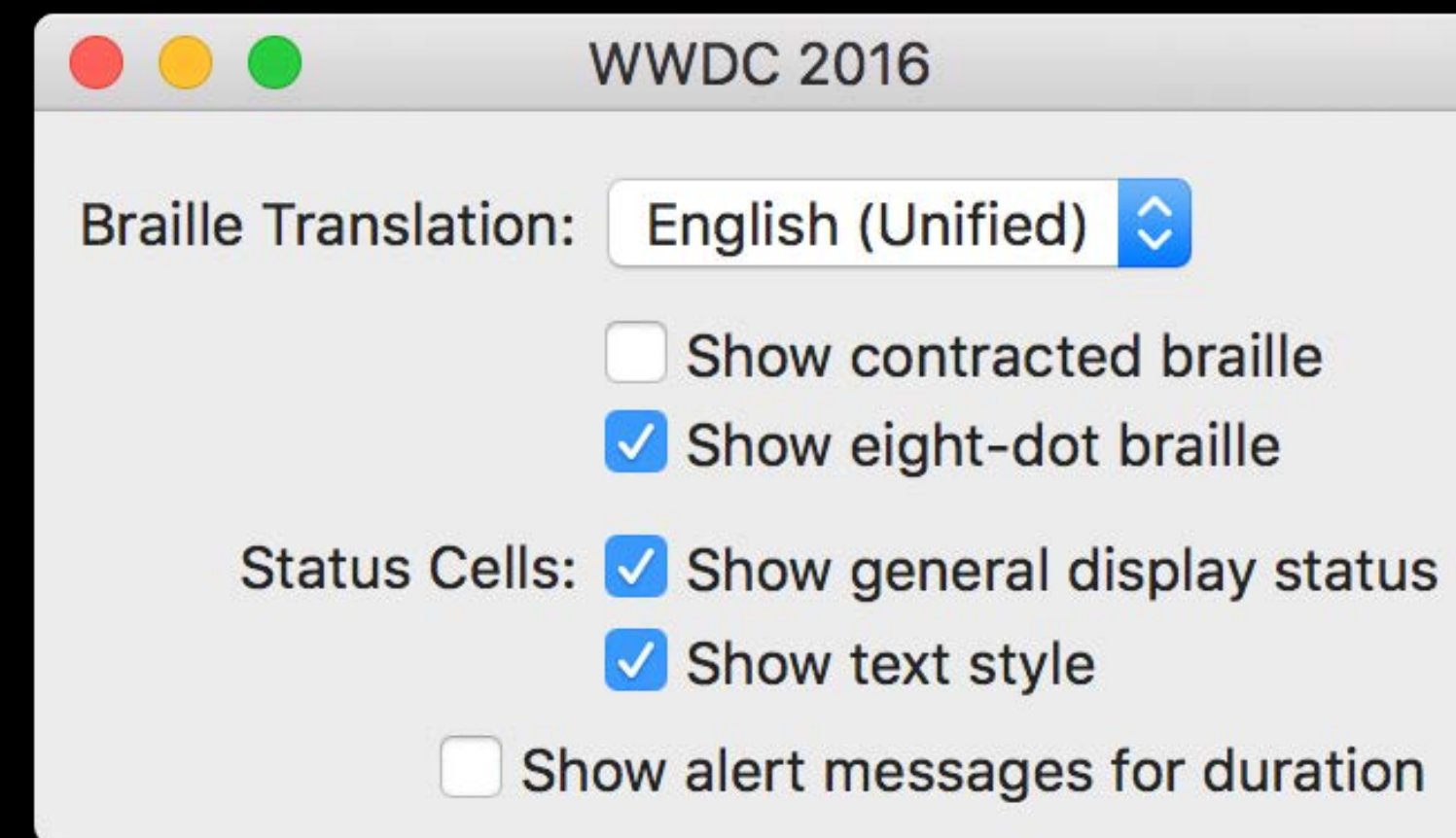
gridView.cell(forKey: statusCellsLabel)?.row!.topPadding = 6

// Special treatment for centered checkbox:
let cell = gridView.cell(forKey: showAlertCB)!
cell.row!.topPadding = 4
cell.row!.mergeCells(in: NSRange(0, 2))
```

Design



Implementation

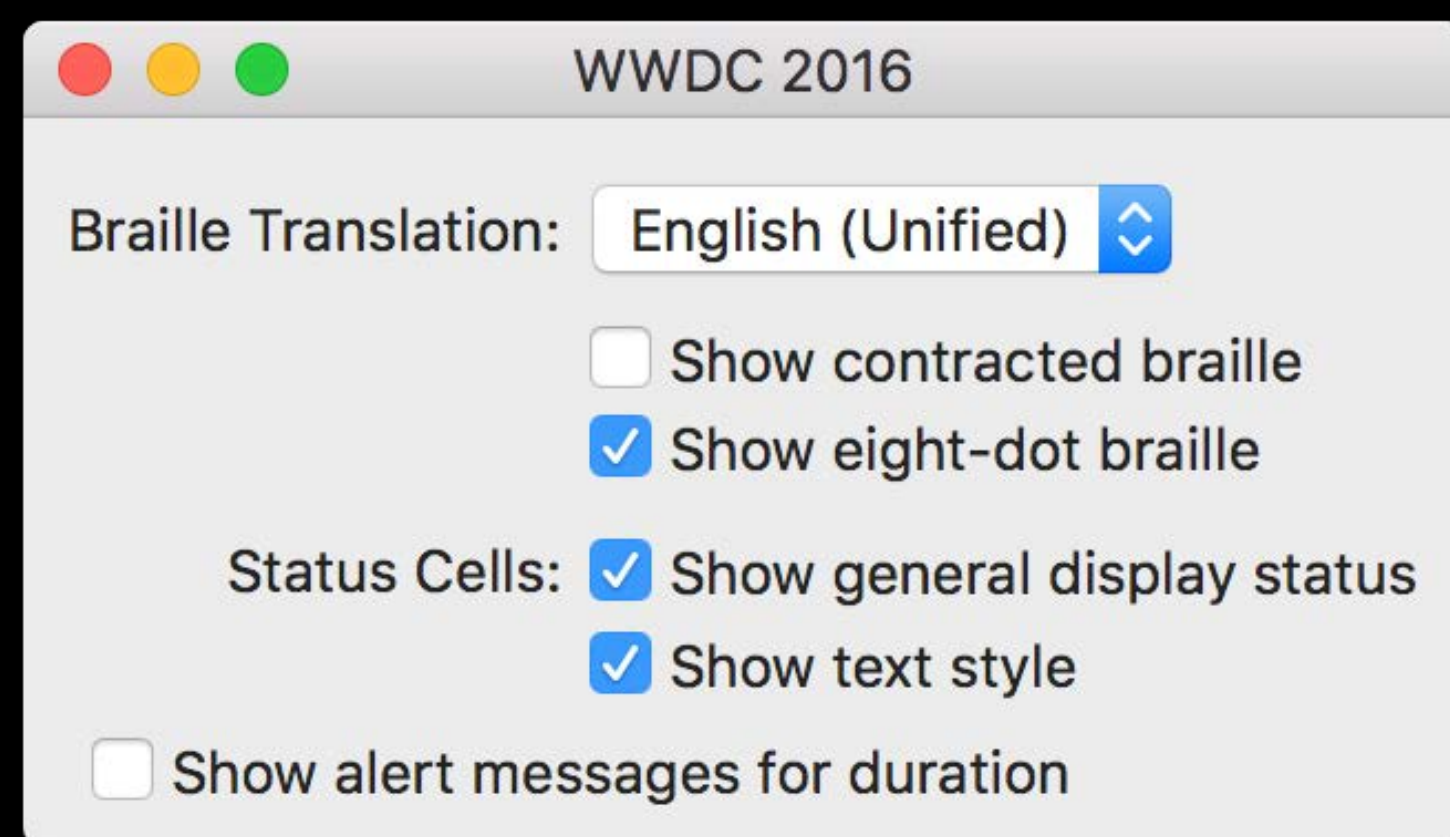


```
row.topPadding = 5
row.bottomPadding = 5

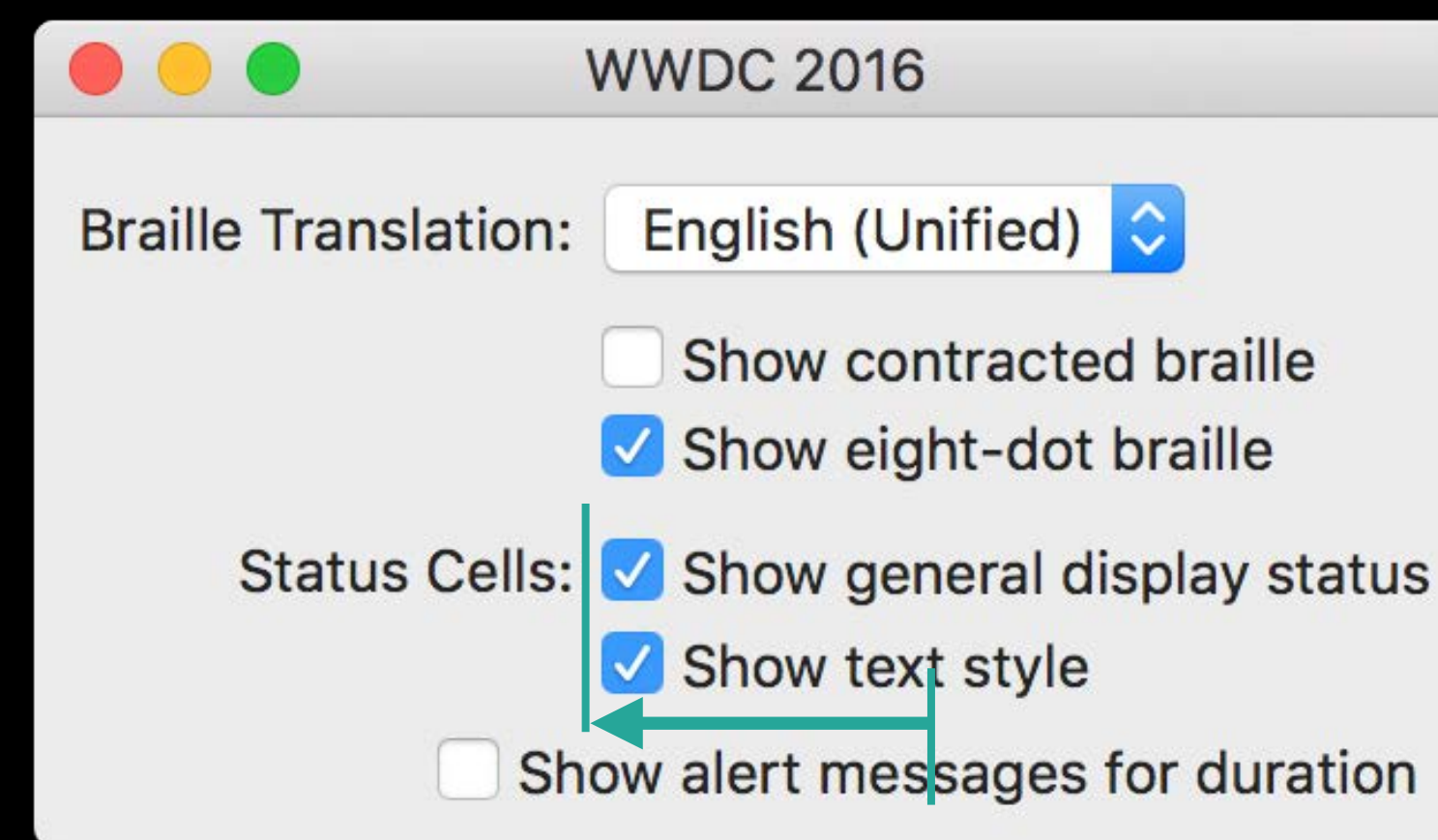
gridView.cell(forKey: statusCellsLabel)?.row!.topPadding = 6

// Special treatment for centered checkbox:
let cell = gridView.cell(forKey: showAlertCB)!
cell.row!.topPadding = 4
cell.row!.mergeCells(in: NSRange(0, 2))
```

Design



Implementation

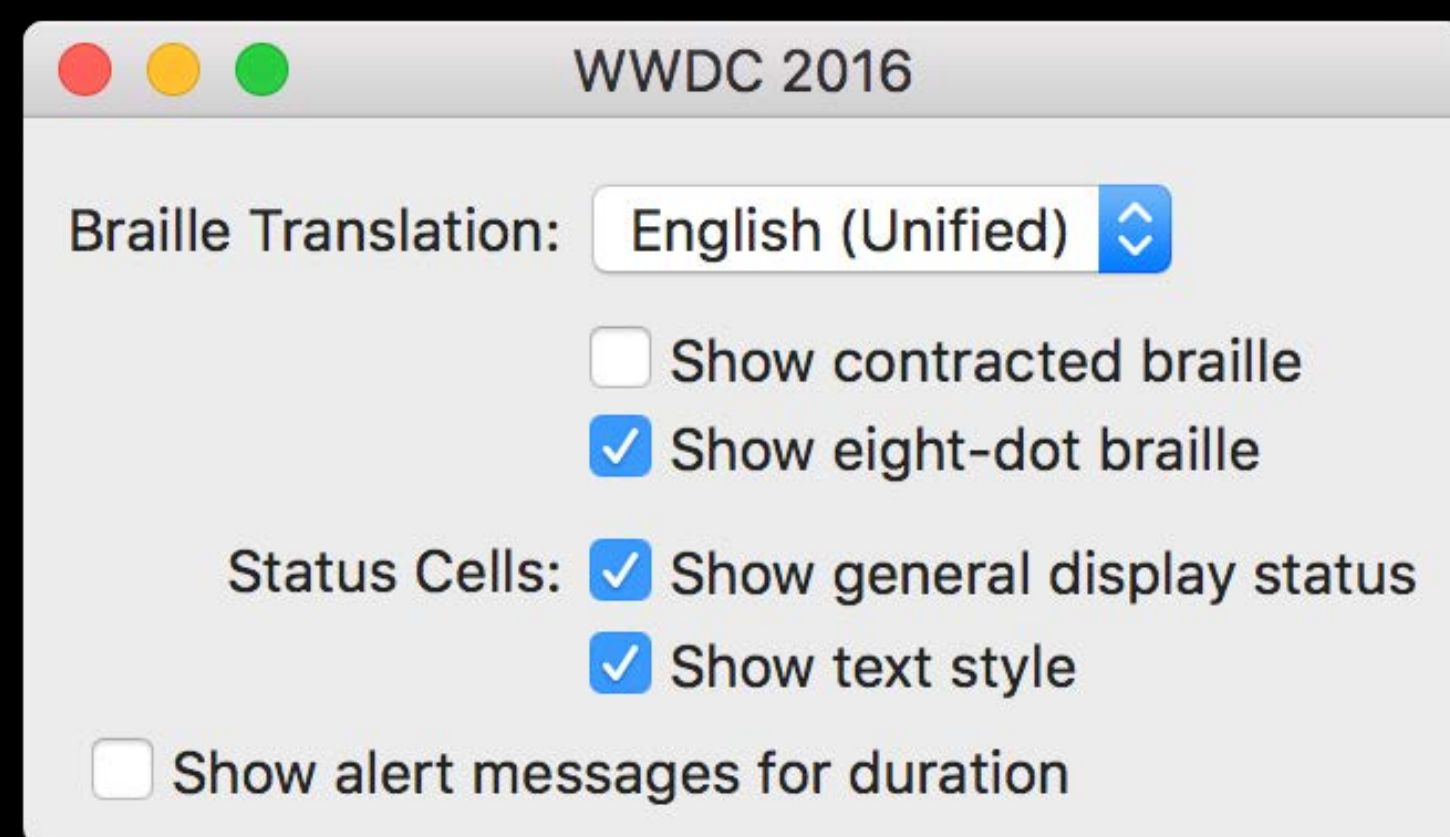



```
row.topPadding = 5
row.bottomPadding = 5

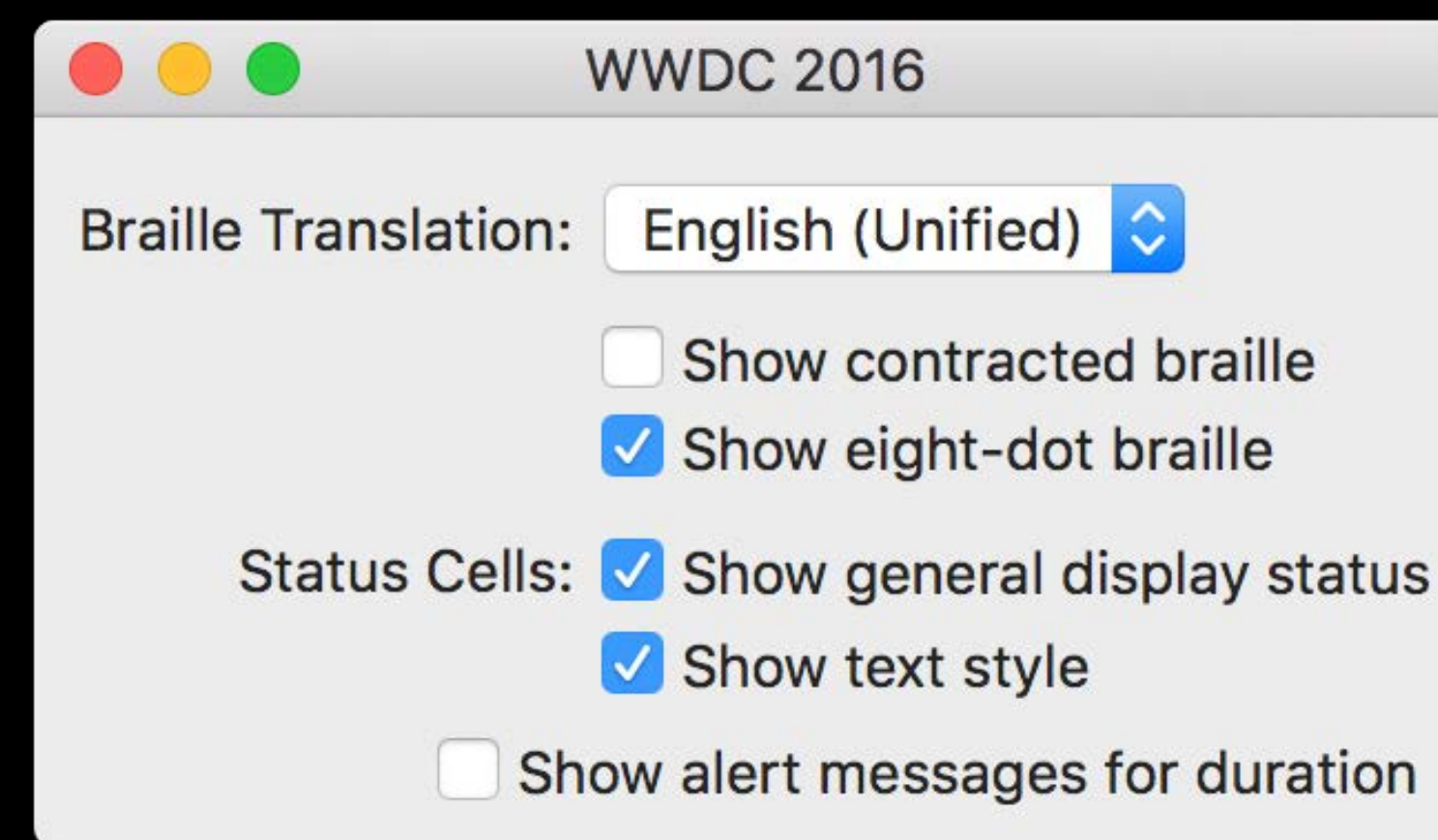
collectionView.cell(forKey: statusCellsLabel)?.row!.topPadding = 6

// Special treatment for centered checkbox:
let cell = collectionView.cell(forKey: showAlertCB)!
cell.row!.topPadding = 4
cell.row!.mergeCells(in: NSRange(0, 2))
```

Design

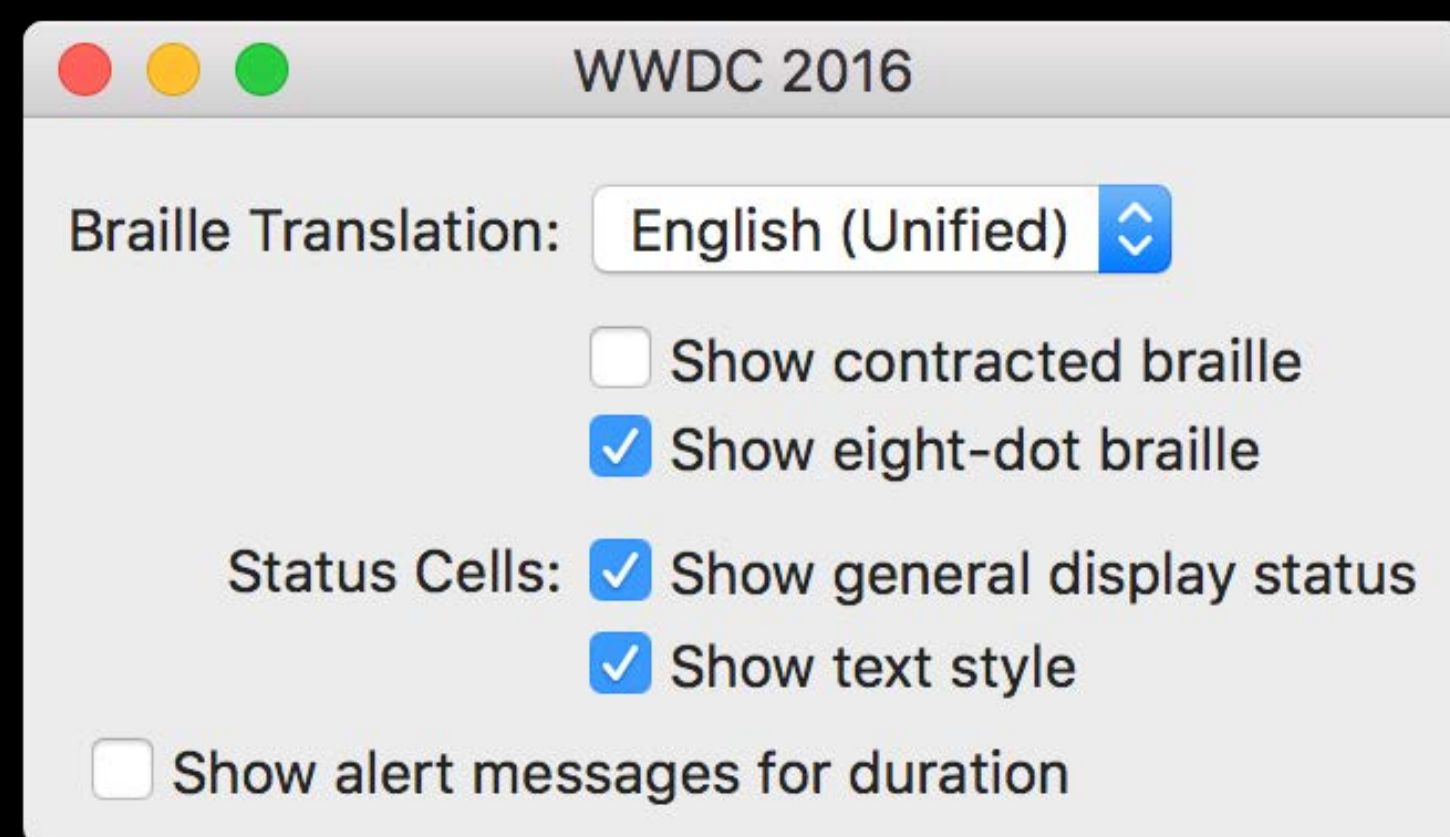


Implementation

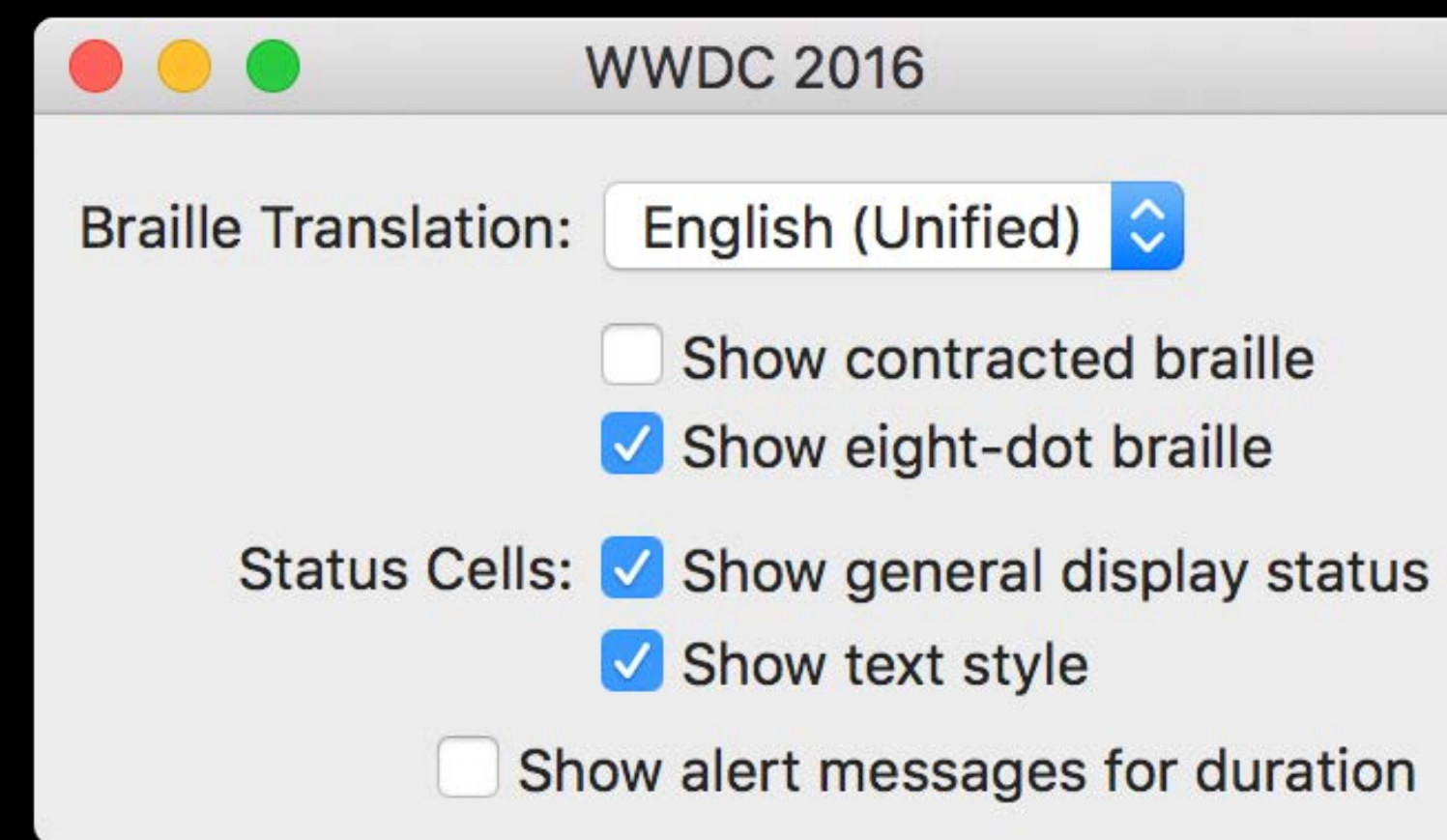



```
// Special treatment for centered checkbox:  
let cell = gridView.cell(for: showAlertCB)!  
cell.row!.topPadding = 4  
cell.row!.mergeCells(in: NSRange(0, 2))  
  
cell.xPlacement = .none  
let centering = showAlertCB.centerXAnchor.constraint(equalTo: textStyleCB.leadingAnchor)  
cell.customPlacementConstraints = [centering]
```

Design



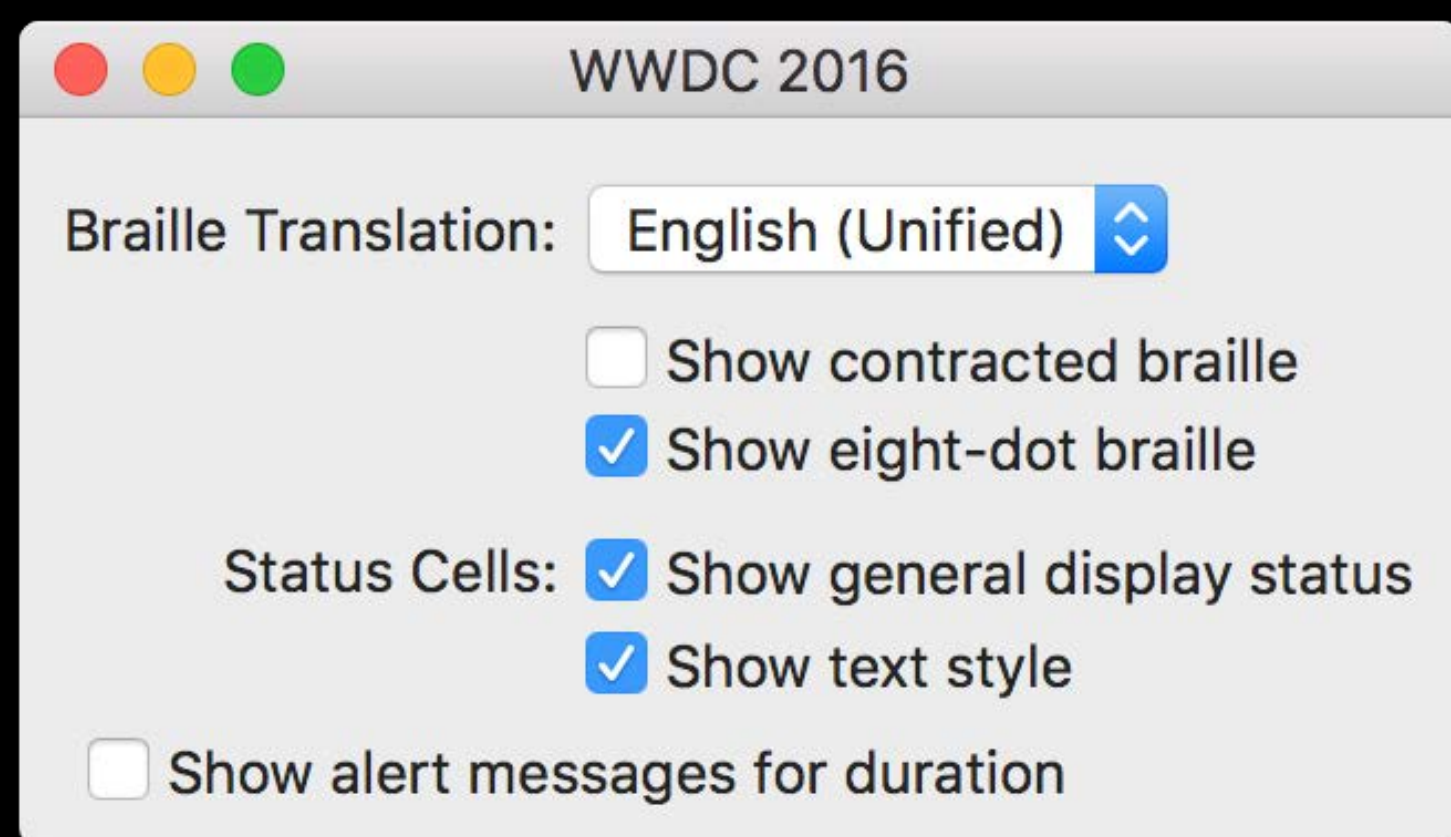
Implementation



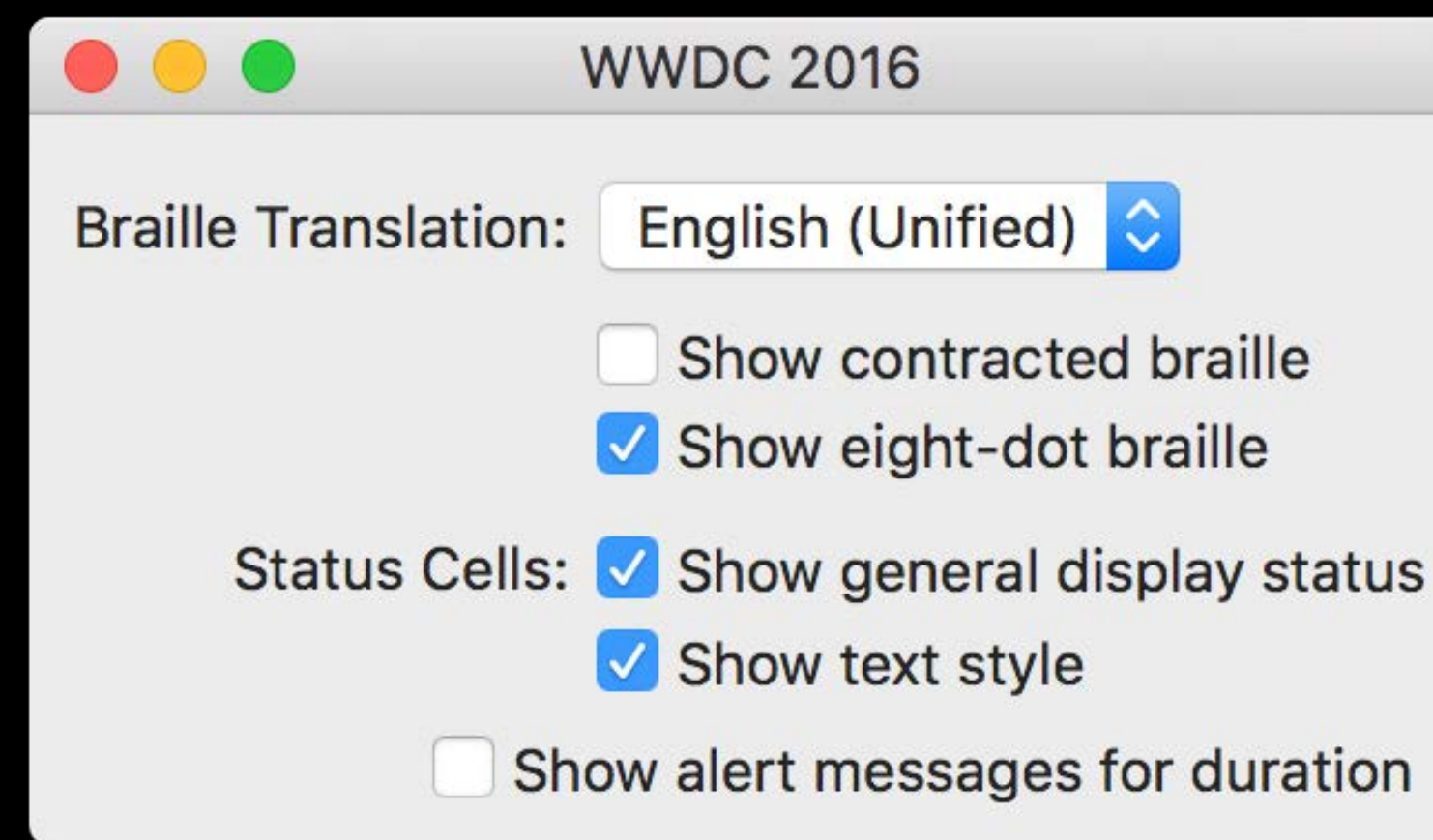
```
// Special treatment for centered checkbox:  
let cell = gridView.cell(for: showAlertCB)!  
cell.row!.topPadding = 4  
cell.row!.mergeCells(in: NSRange(0, 2))
```

```
cell.xPlacement = .none  
let centering = showAlertCB.centerXAnchor.constraint(equalTo: textStyleCB.leadingAnchor)  
cell.customPlacementConstraints = [centering]
```

Design



Implementation



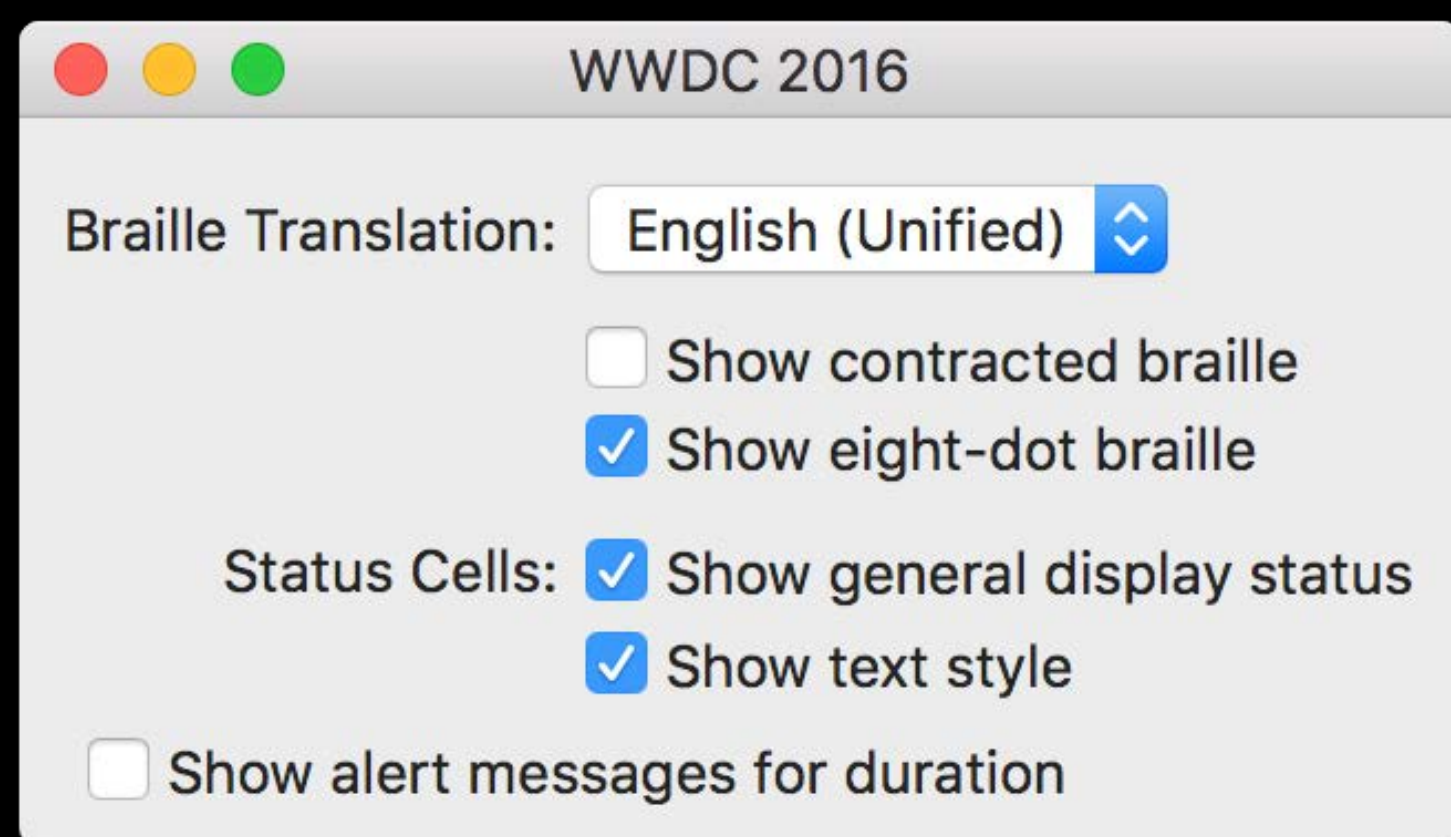

```
// Special treatment for centered checkbox:  
let cell = gridView.cell(for: showAlertCB)!  
cell.row!.topPadding = 4  
cell.row!.mergeCells(in: NSRange(0, 2))
```

```
cell.xPlacement = .none
```

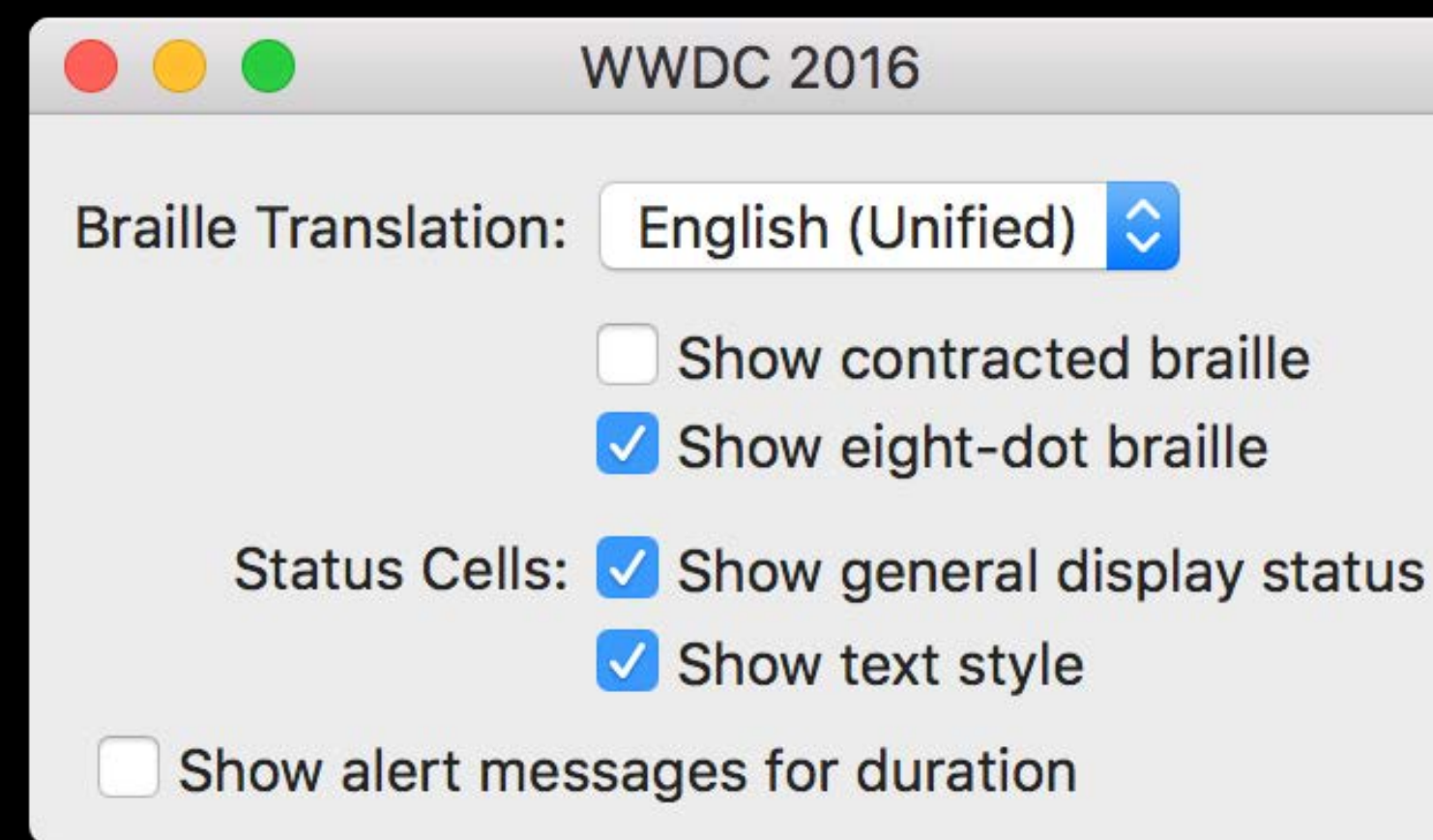
```
let centering = showAlertCB.centerXAnchor.constraint(equalTo: textStyleCB.leadingAnchor)
```

```
cell.customPlacementConstraints = [centering]
```

Design



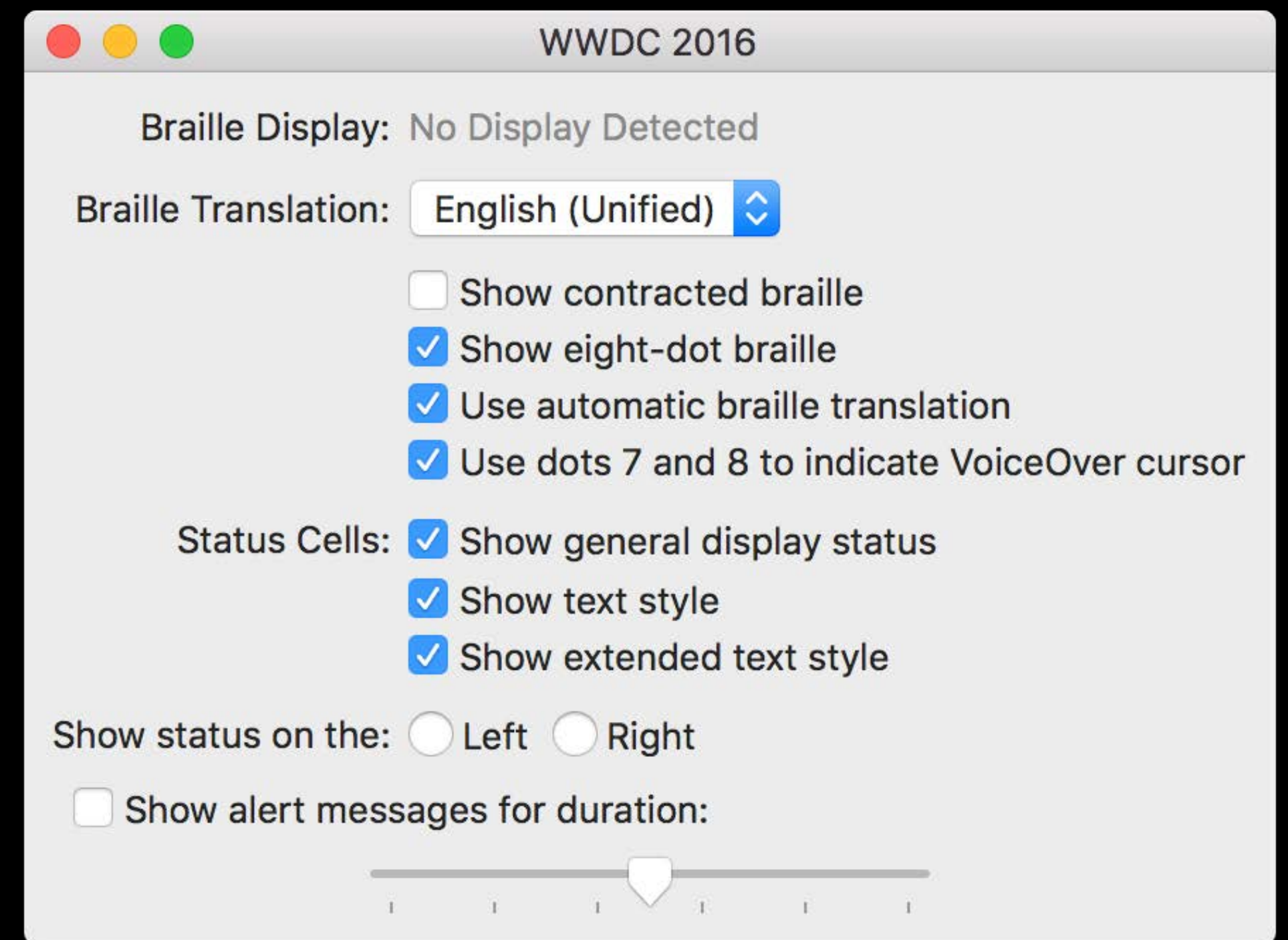
Implementation



Summary

Great for arranging static grid-like UI

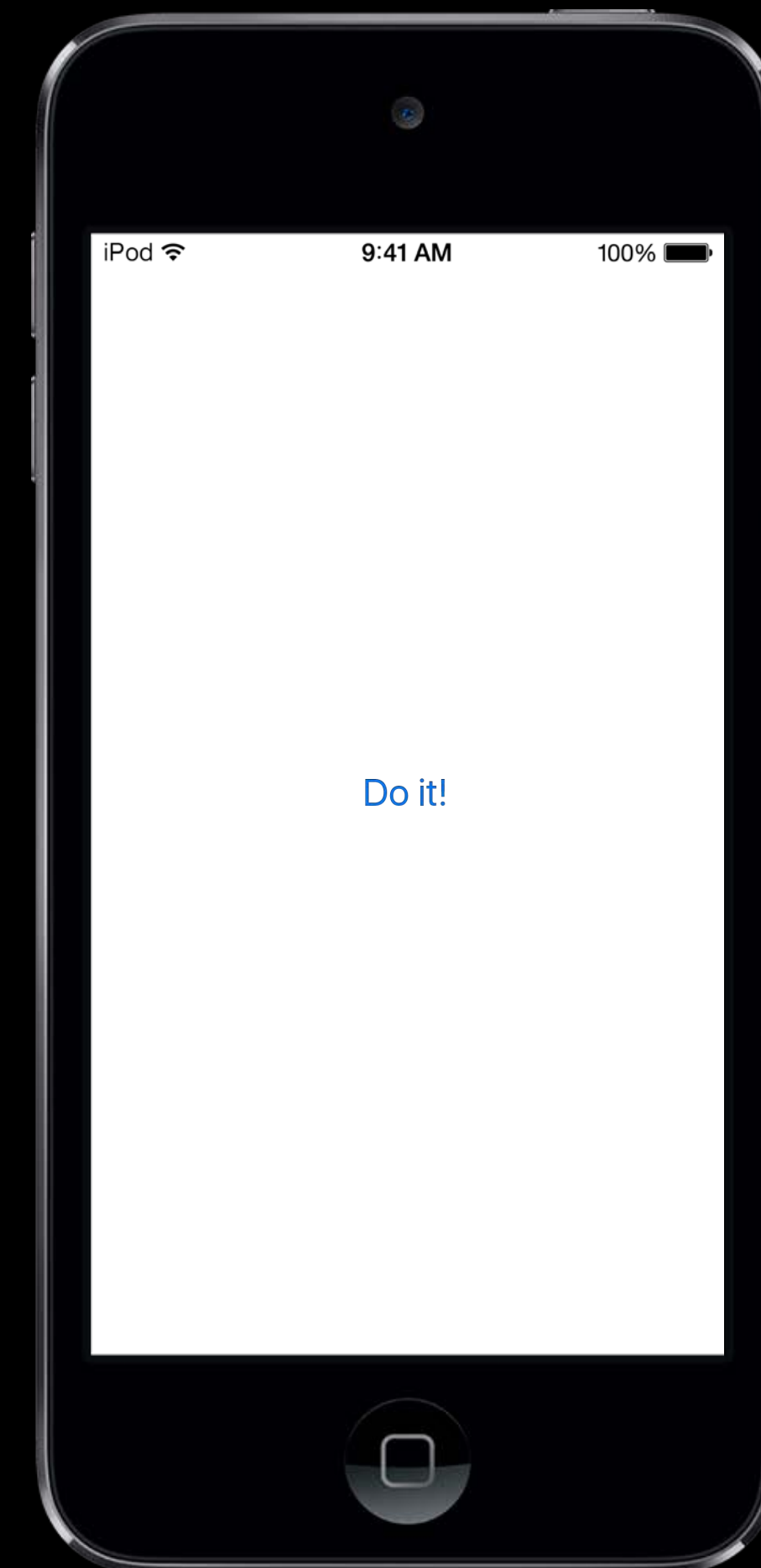
- Set up your content
- Adjust to fit your design



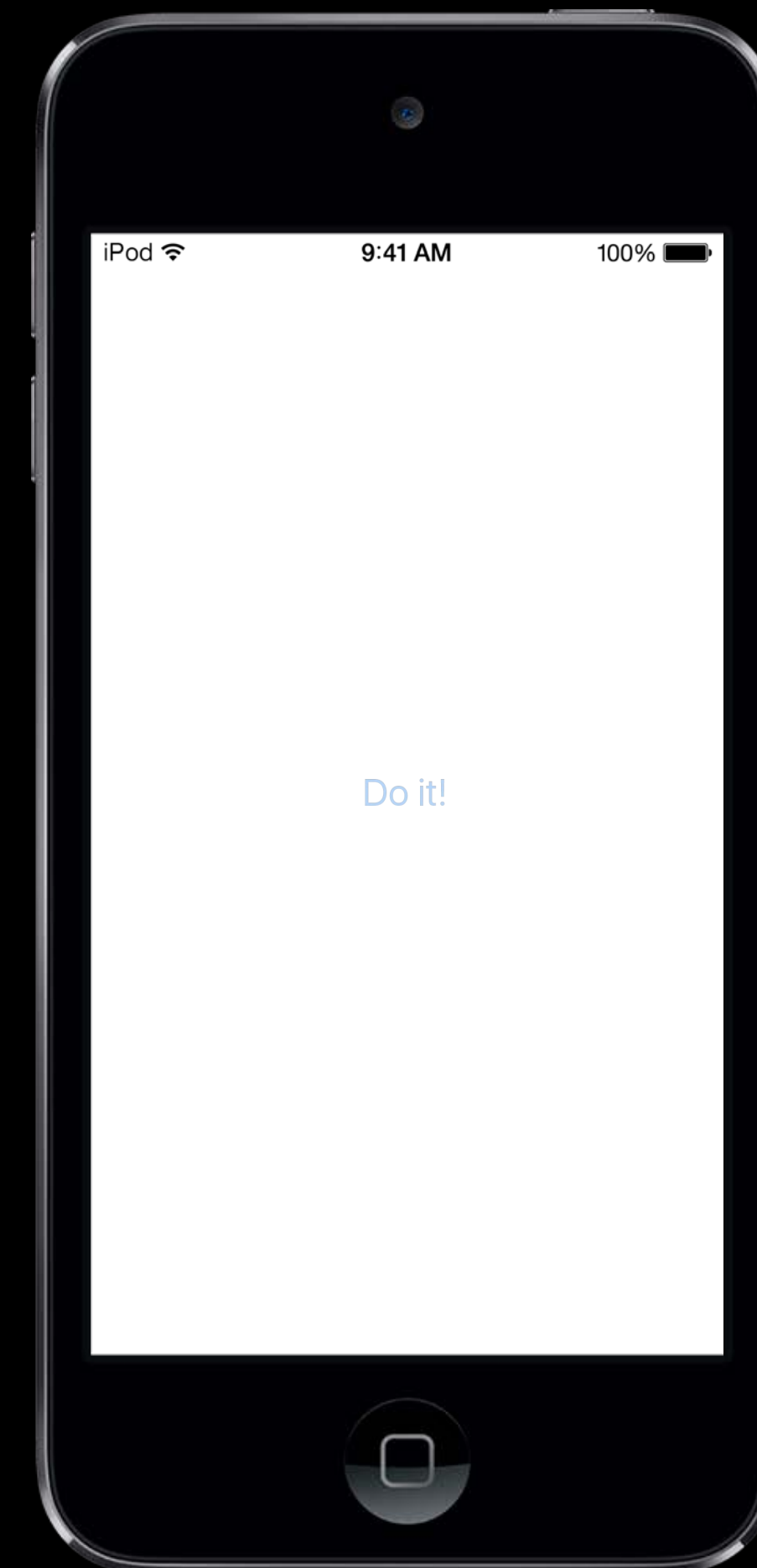
Layout Feedback Loop Debugging

A special kind of layout bug

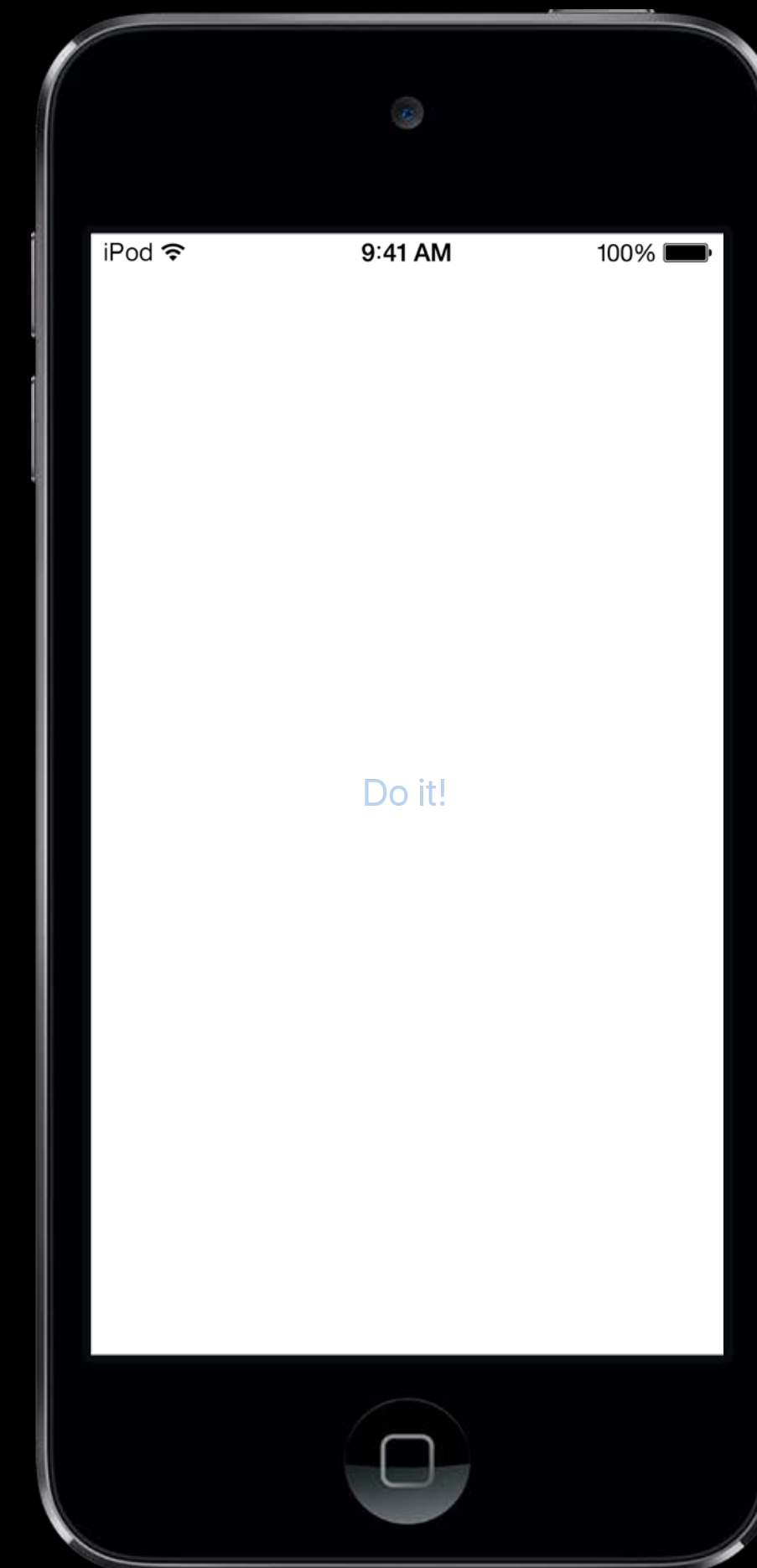
Layout Feedback Loop



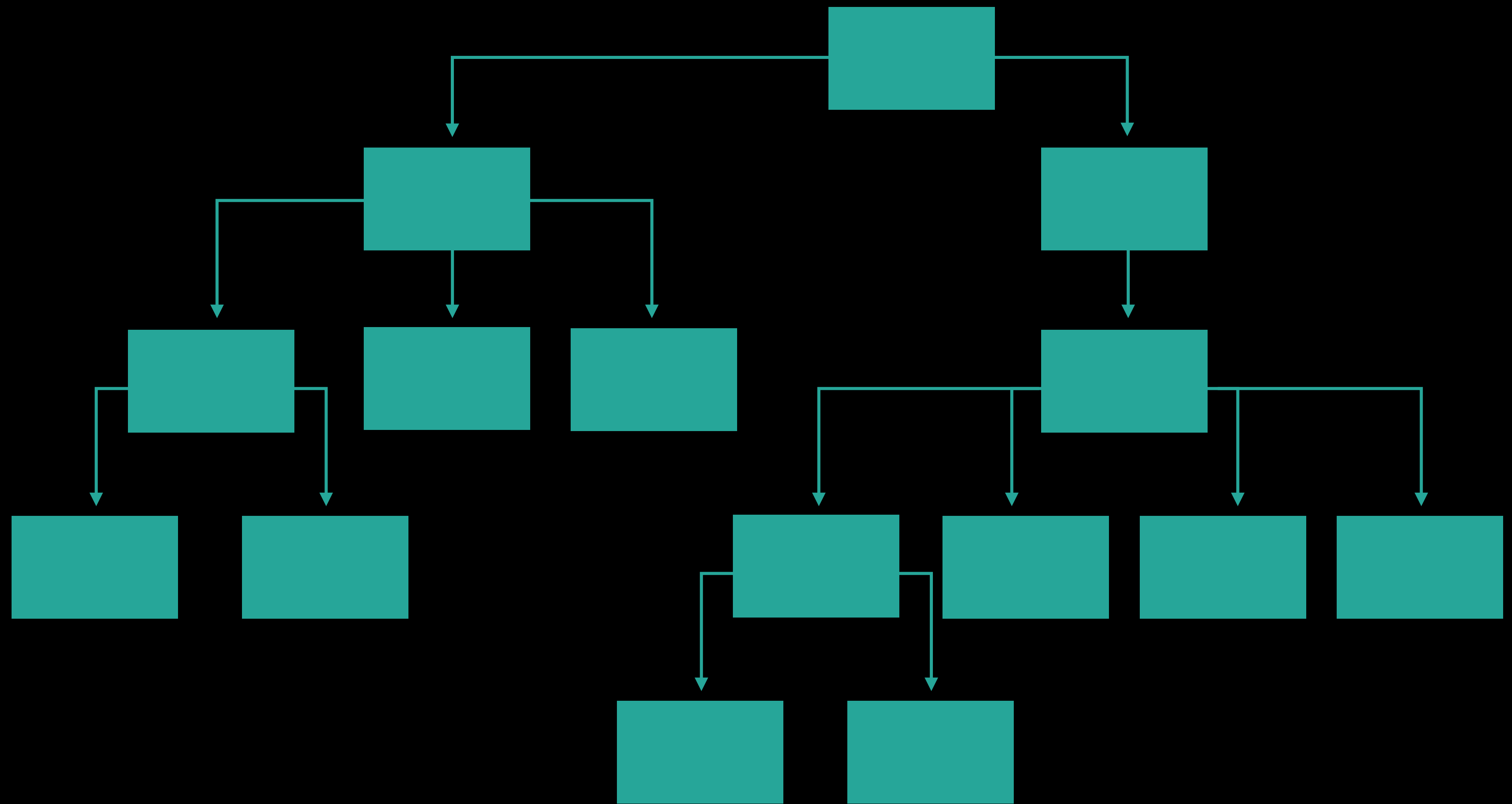
Layout Feedback Loop



Layout Feedback Loop

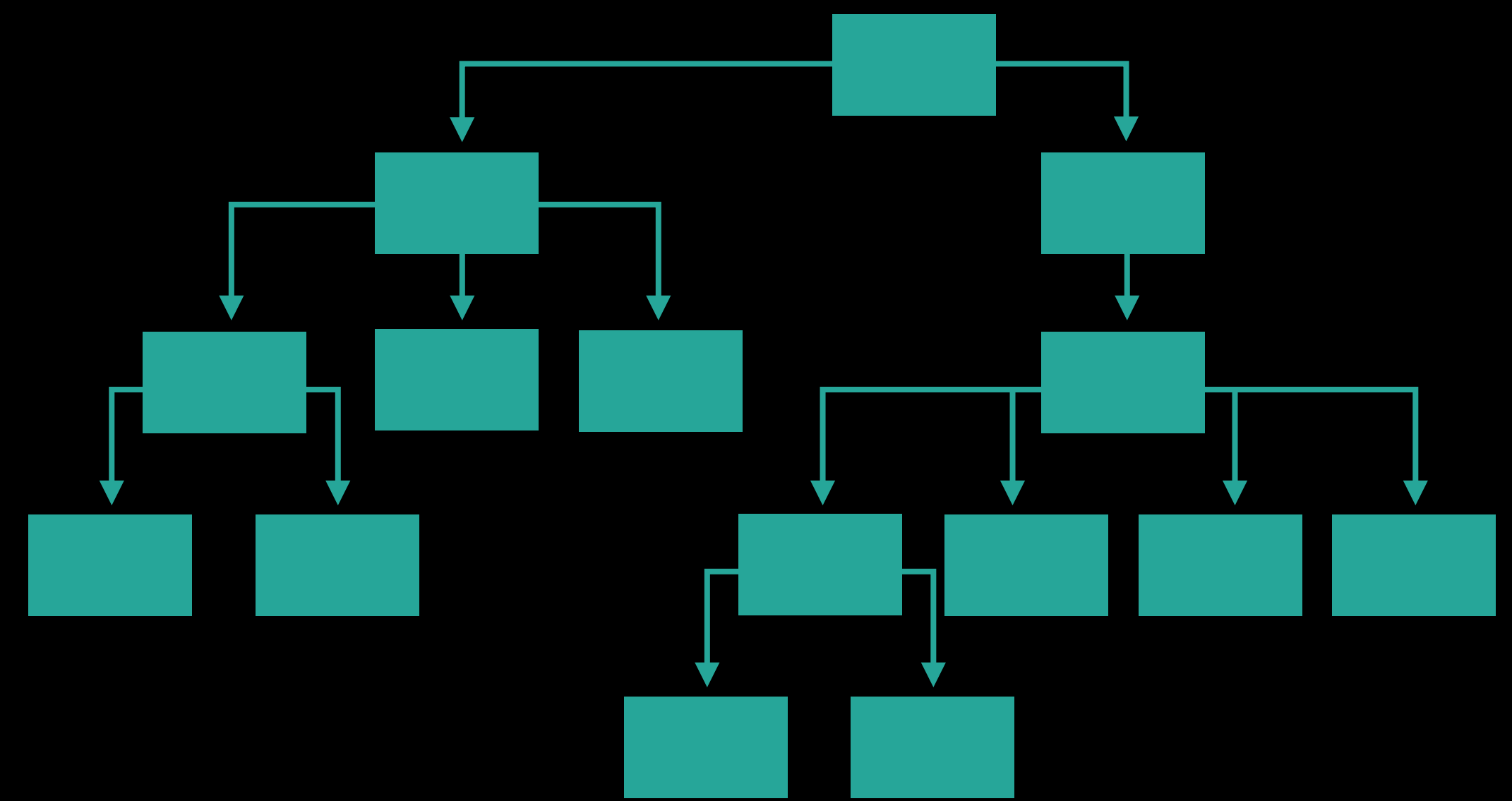


What's happening?



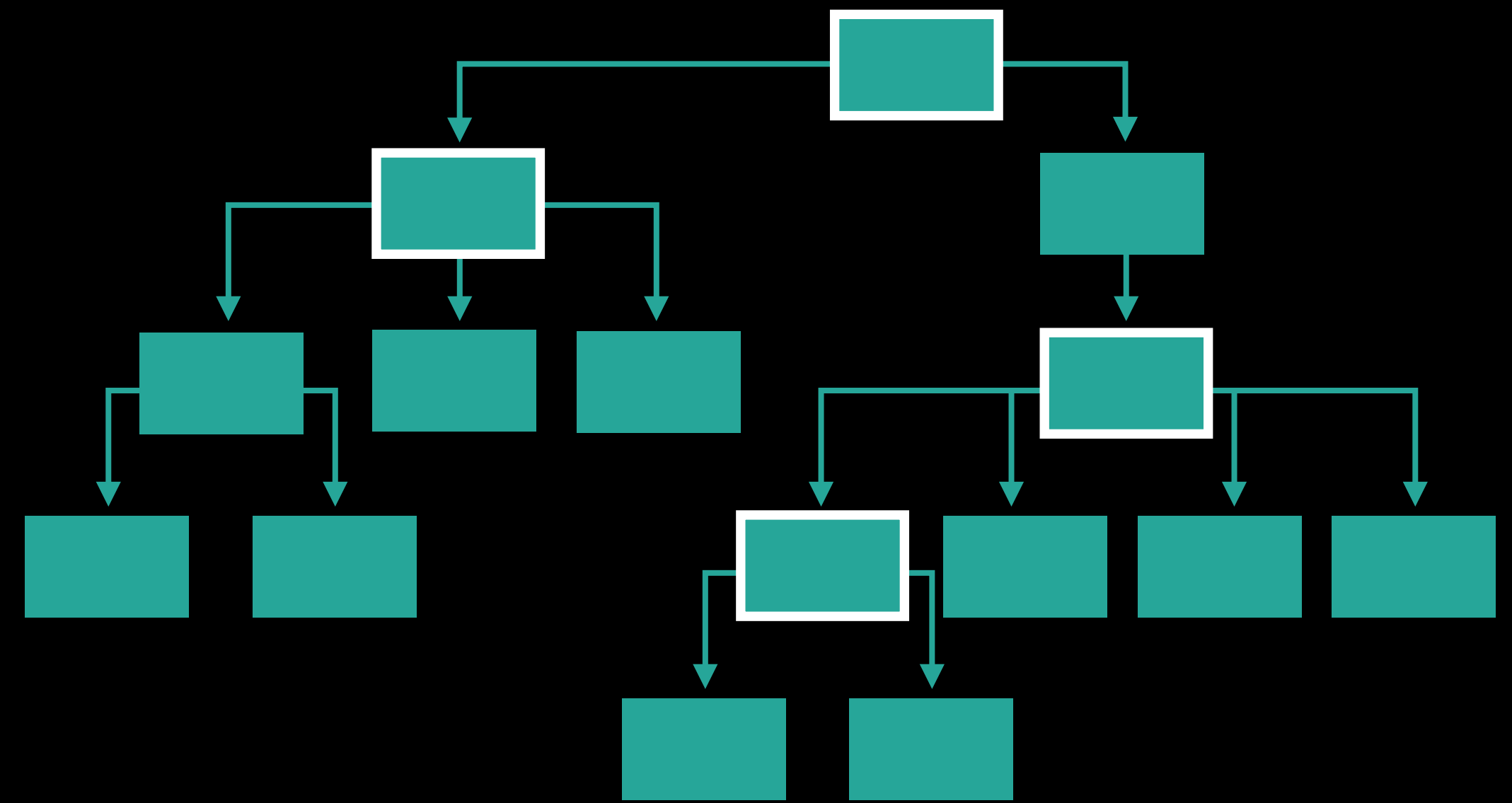
Upstream `setNeedsLayout()`

Upstream `setNeedsLayout()`



Upstream `setNeedsLayout()`

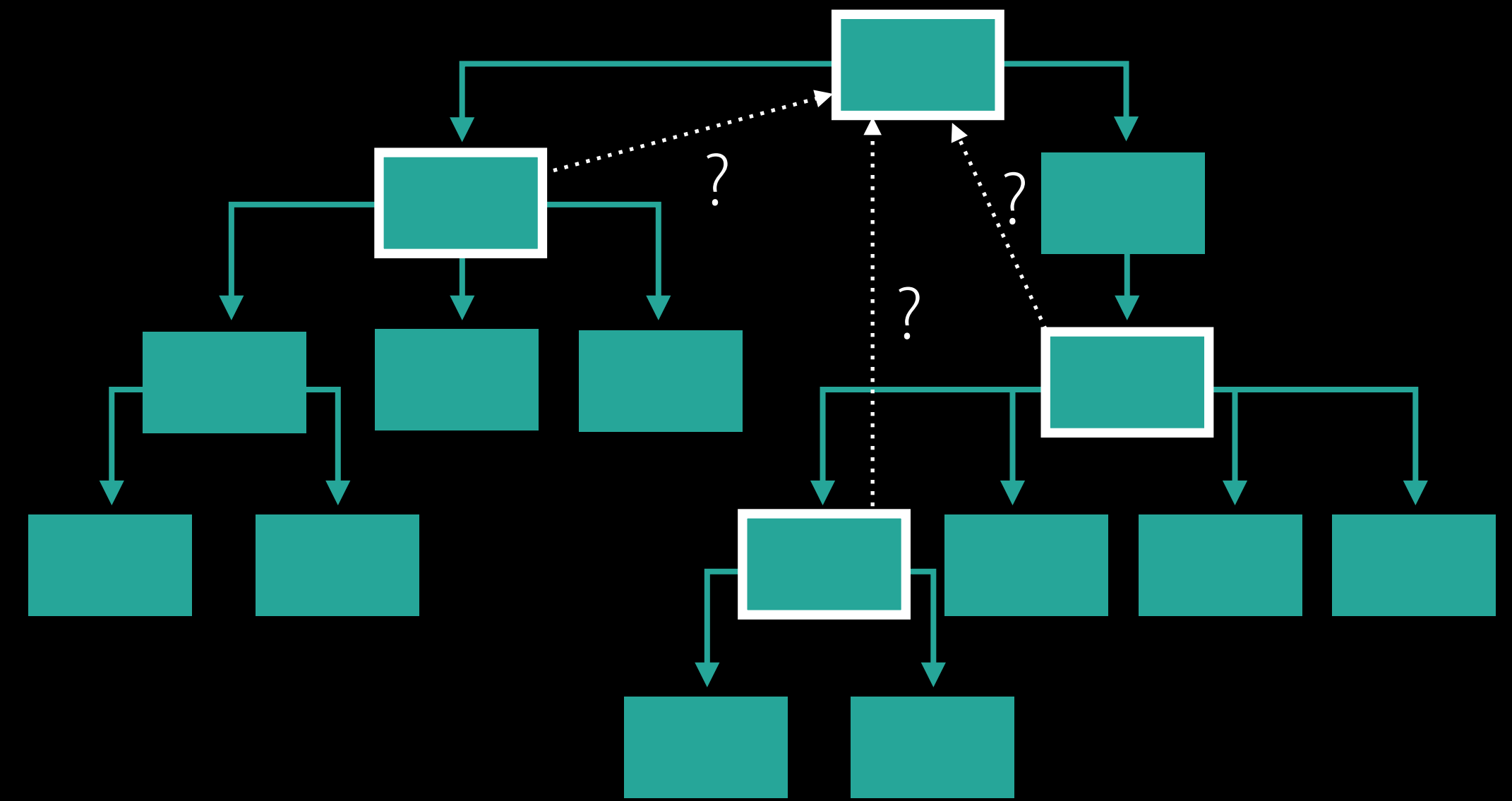
What views are involved?



Upstream `setNeedsLayout()`

What views are involved?

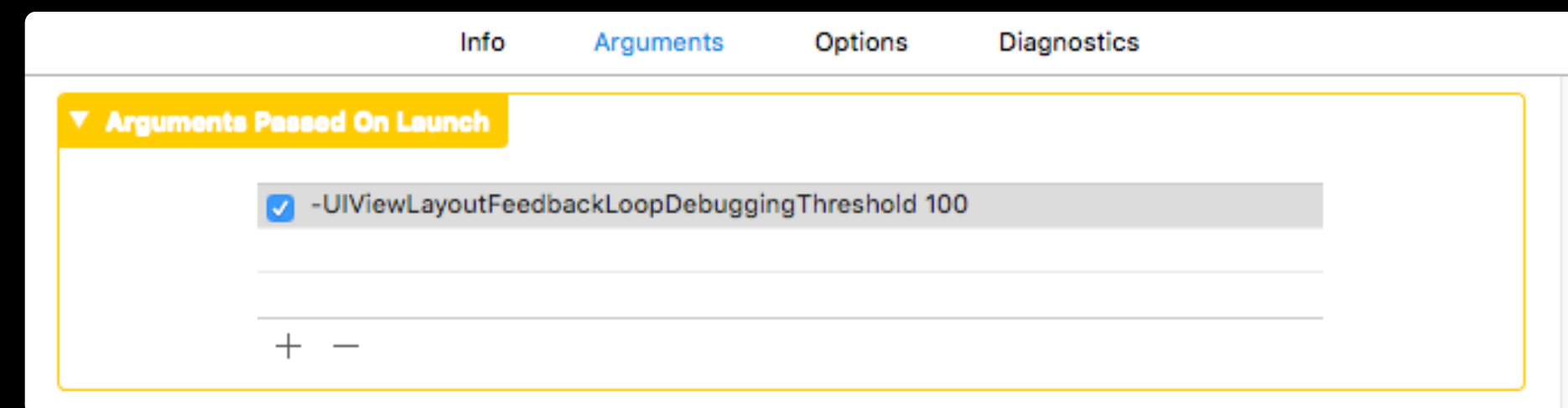
Where is the upstream `setNeedsLayout()`?



The Layout Feedback Loop Debugger

NEW

Launch argument



```
-UIViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

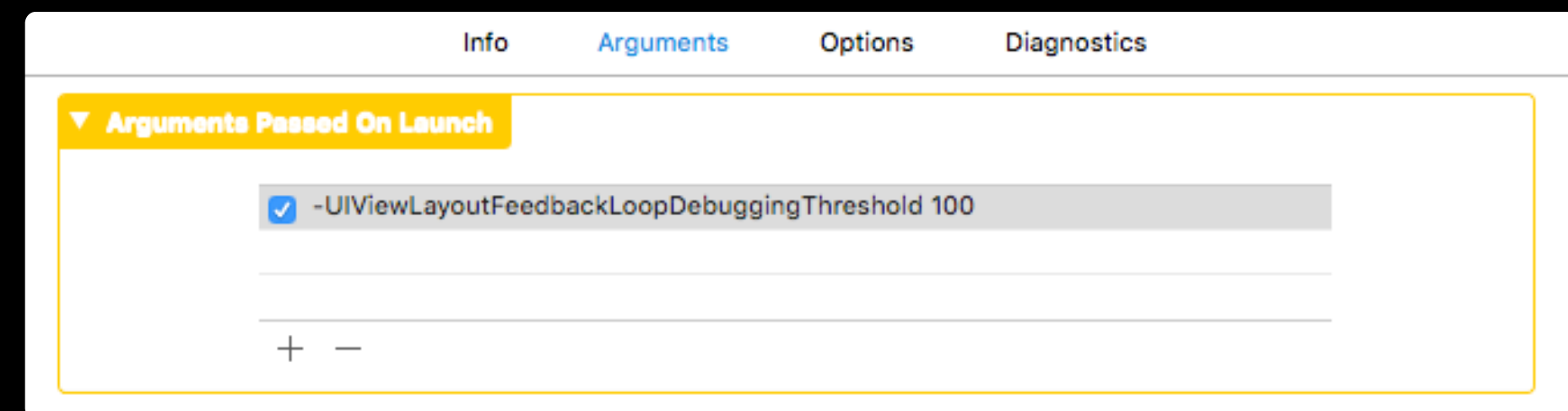
```
-NSViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

```
Logs to com.apple.UIKit:LayoutLoop or com.apple.AppKit:LayoutLoop
```

The Layout Feedback Loop Debugger

NEW

Launch argument



```
-UIViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

```
-NSViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

```
Logs to com.apple.UIKit:LayoutLoop or com.apple.AppKit:LayoutLoop
```

Unified Logging and Activity Tracing

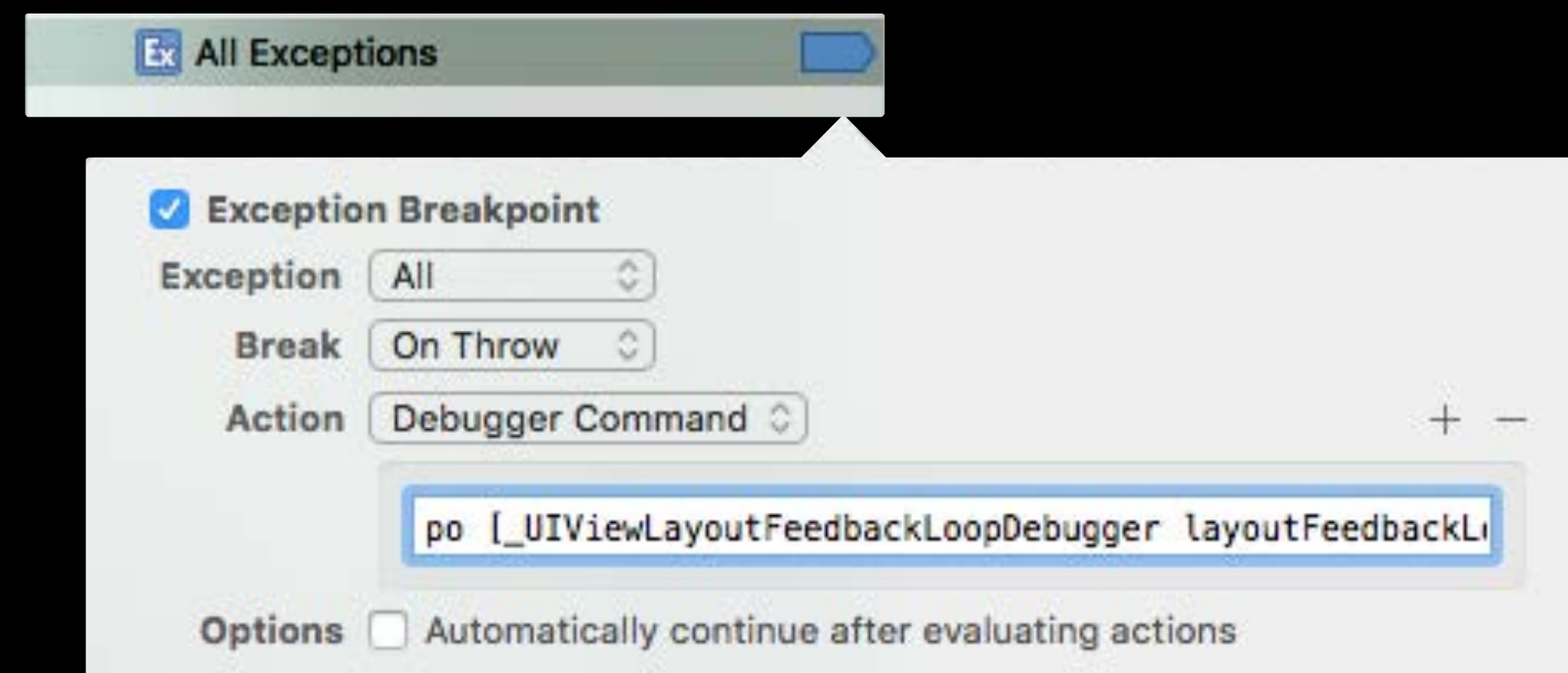
Nob Hill

Friday 5:00 PM

The Layout Feedback Loop Debugger

NEW

Launch argument



```
(lldb) po [_UIViewLayoutFeedbackLoopDebugger layoutFeedbackLoopDebugger]
```

The Layout Feedback Loop Debugger

Two examples

The Layout Feedback Loop Debugger

Two examples

Upstream geometry changes

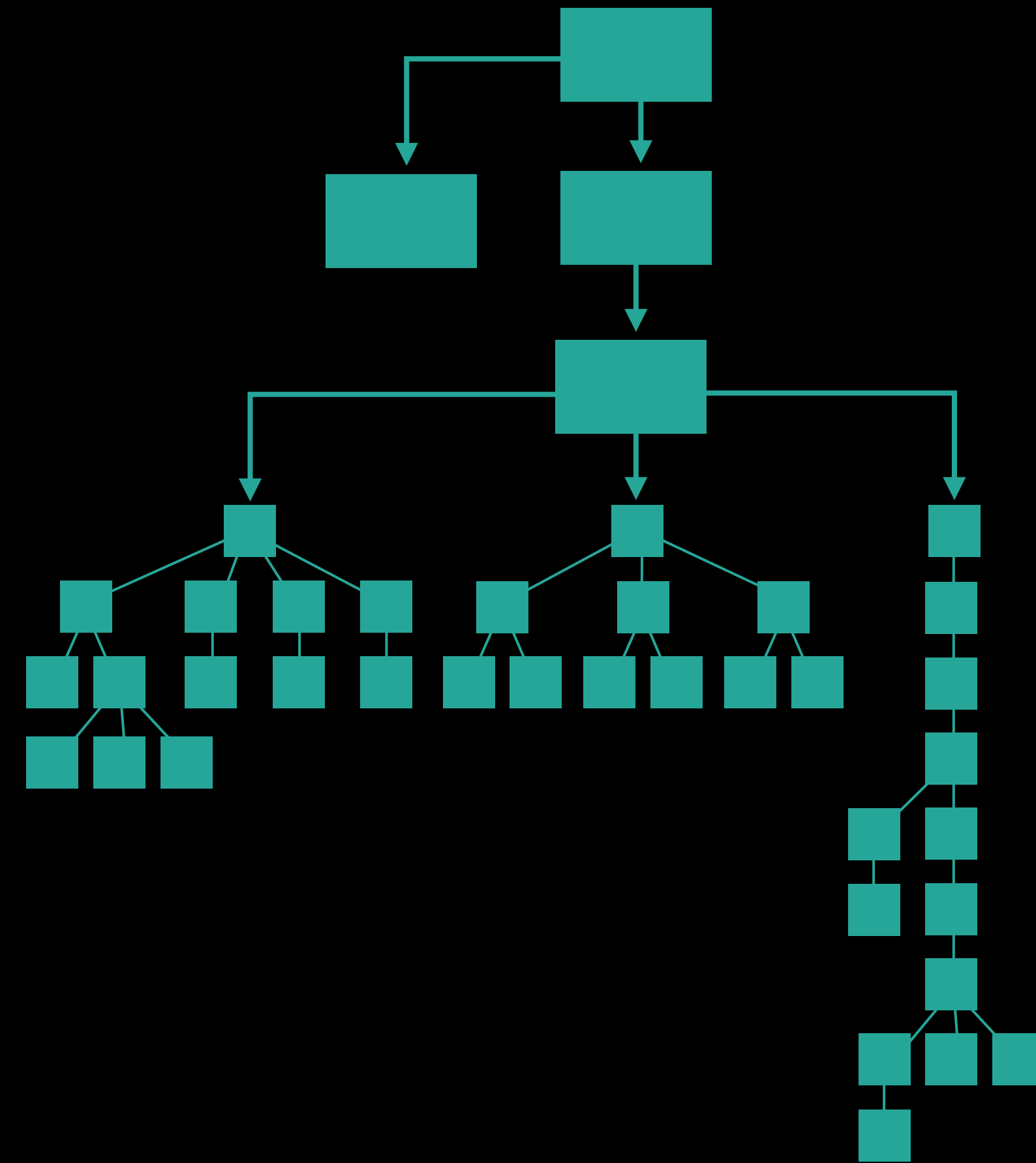
The Layout Feedback Loop Debugger

Two examples

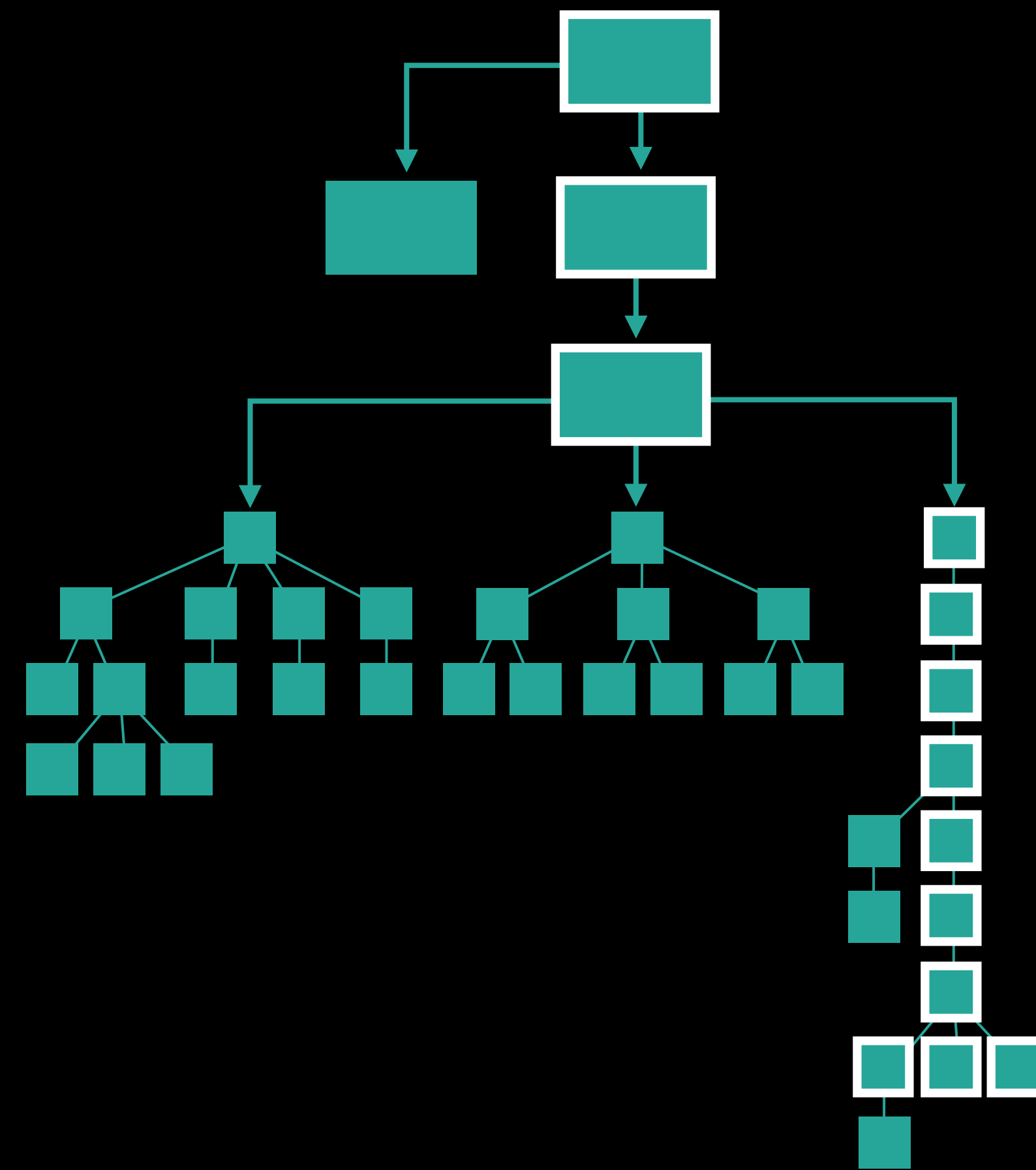
Upstream geometry changes

Ambiguous layout from constraints

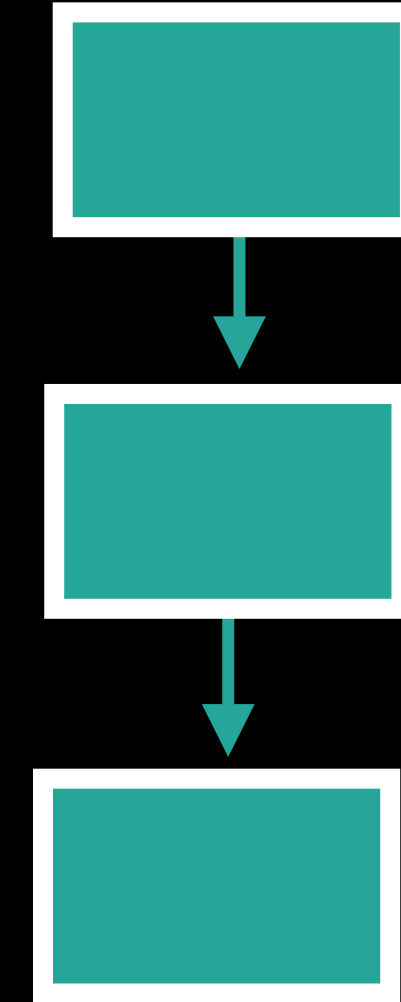
Example 1: Upstream Geometry Change



Example 1: Upstream Geometry Change

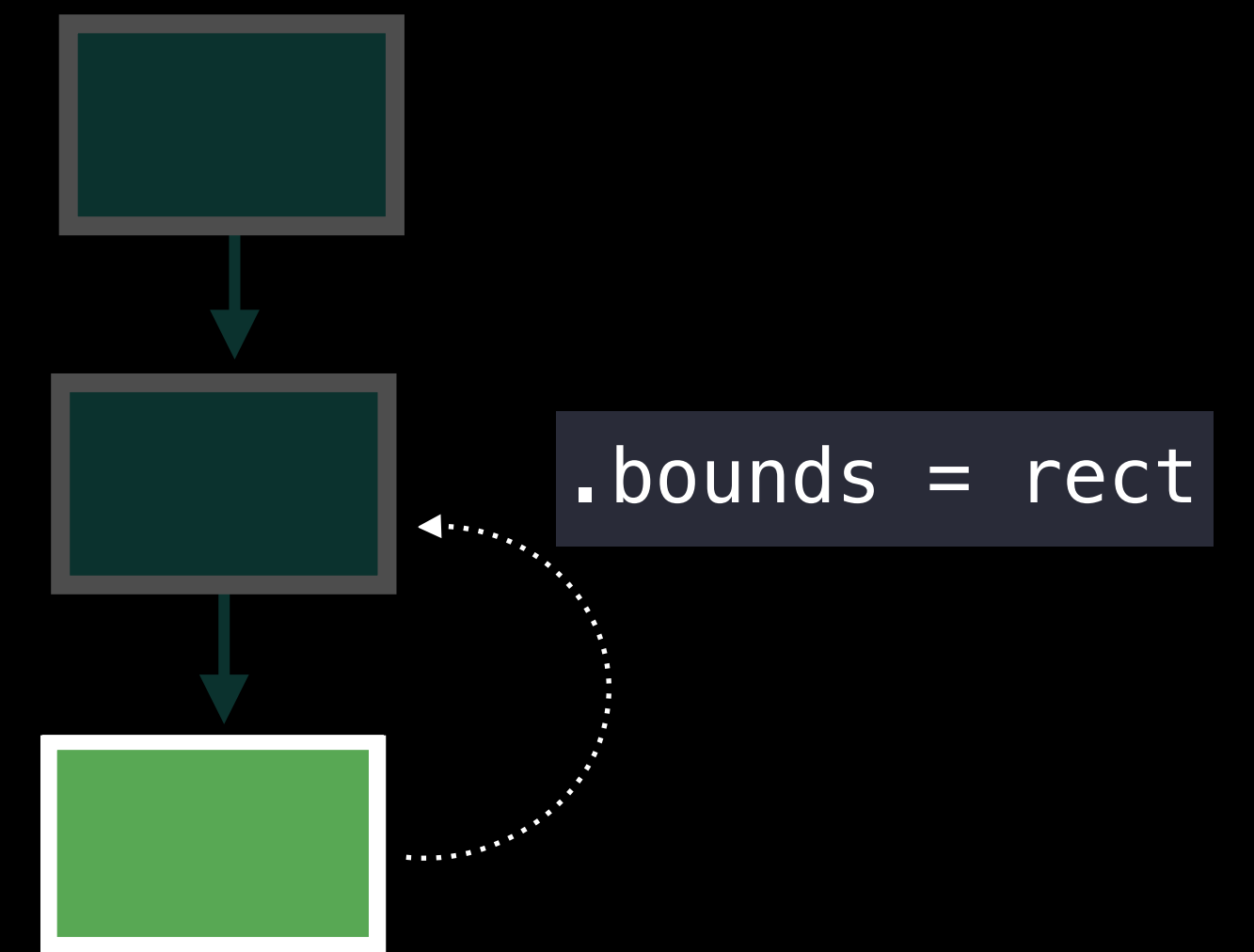


Example 1: Upstream Geometry Change



Example 1: Upstream Geometry Change

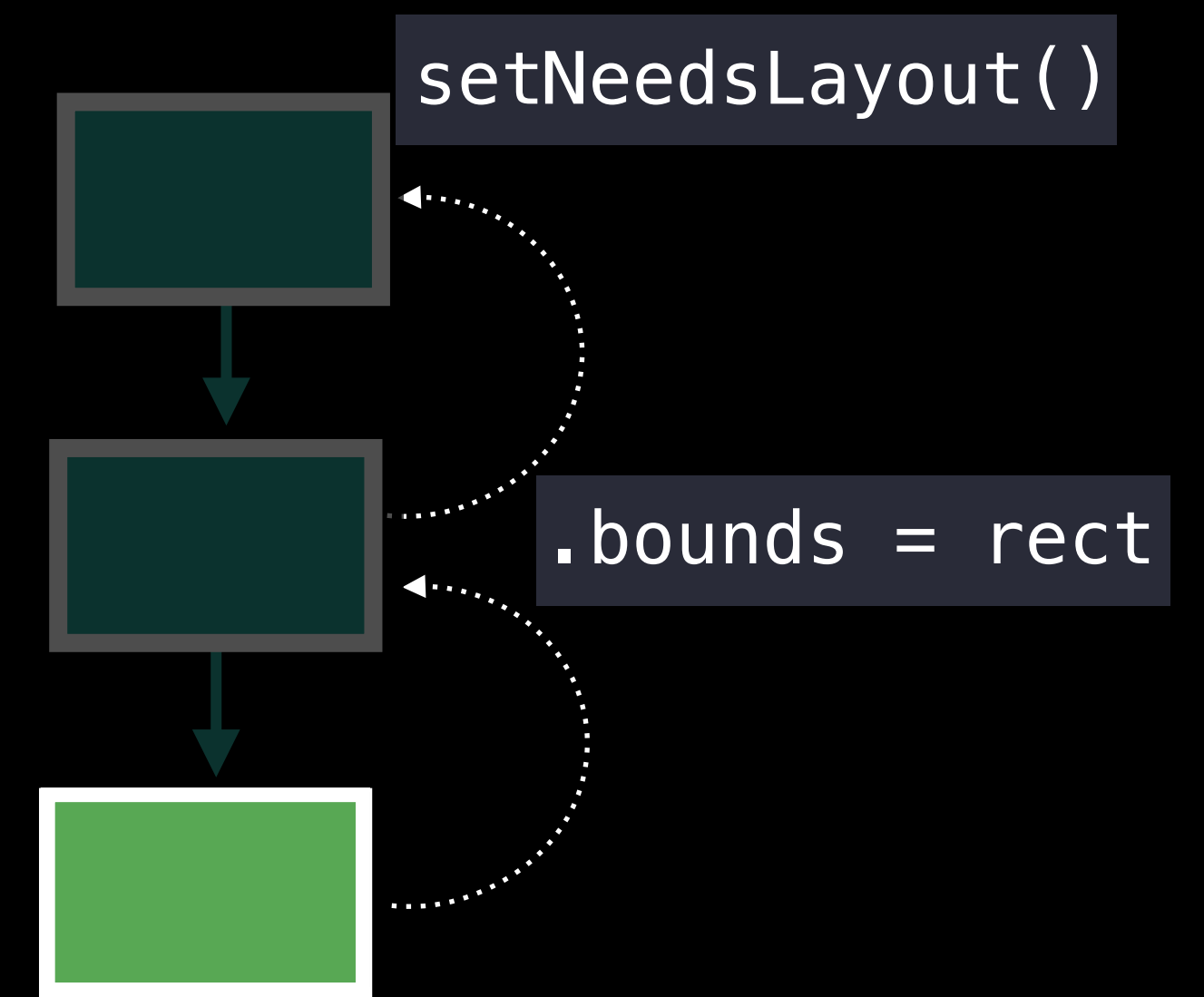
The view in layout changes the bounds of its superview



Example 1: Upstream Geometry Change

The view in layout changes the bounds of its superview

Because its superview is not in layout, that view receives `setNeedsLayout()`

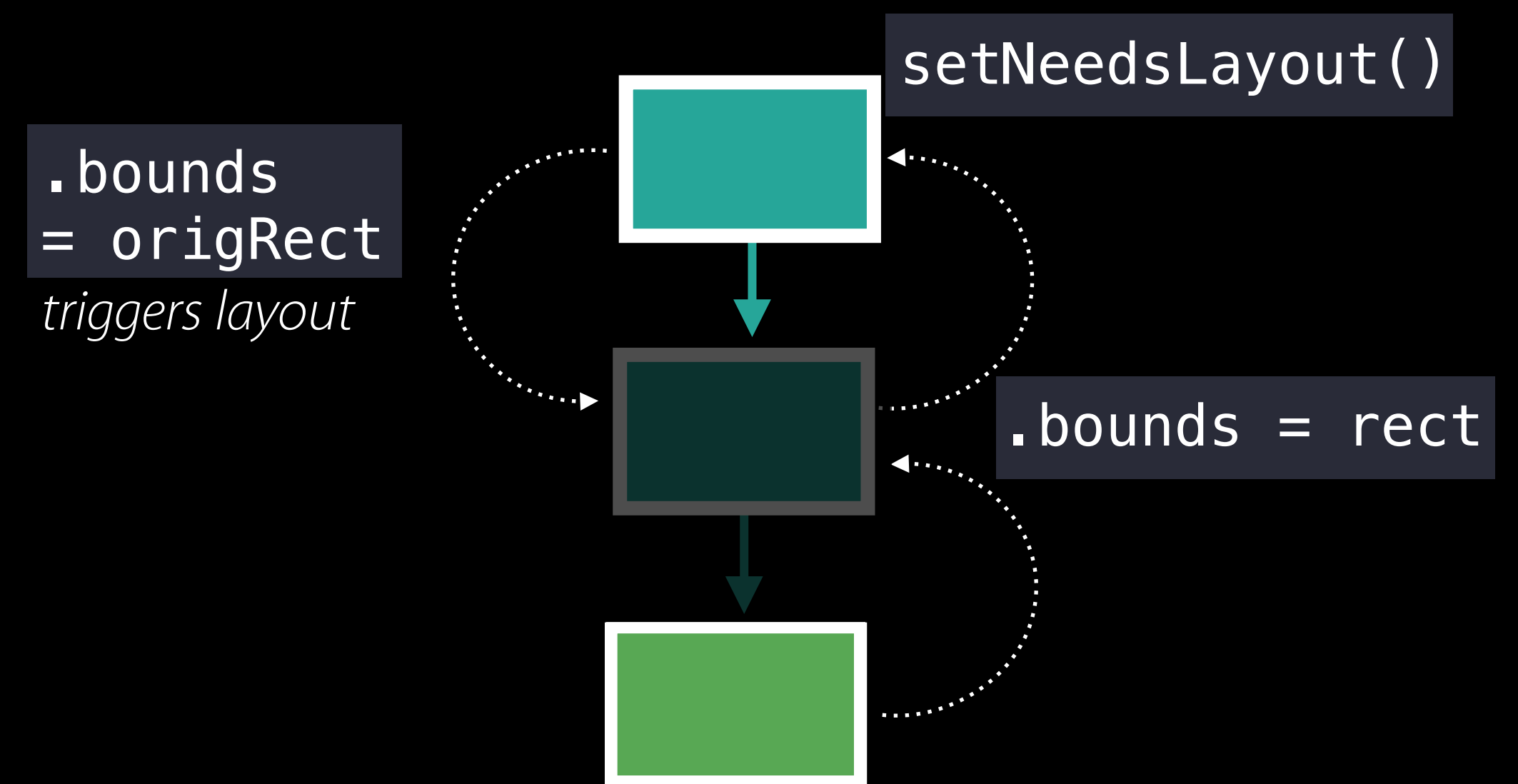


Example 1: Upstream Geometry Change

The view in layout changes the bounds of its superview

Because its superview is not in layout, that view receives `setNeedsLayout()`

During its layout, it resets the bounds of its subview



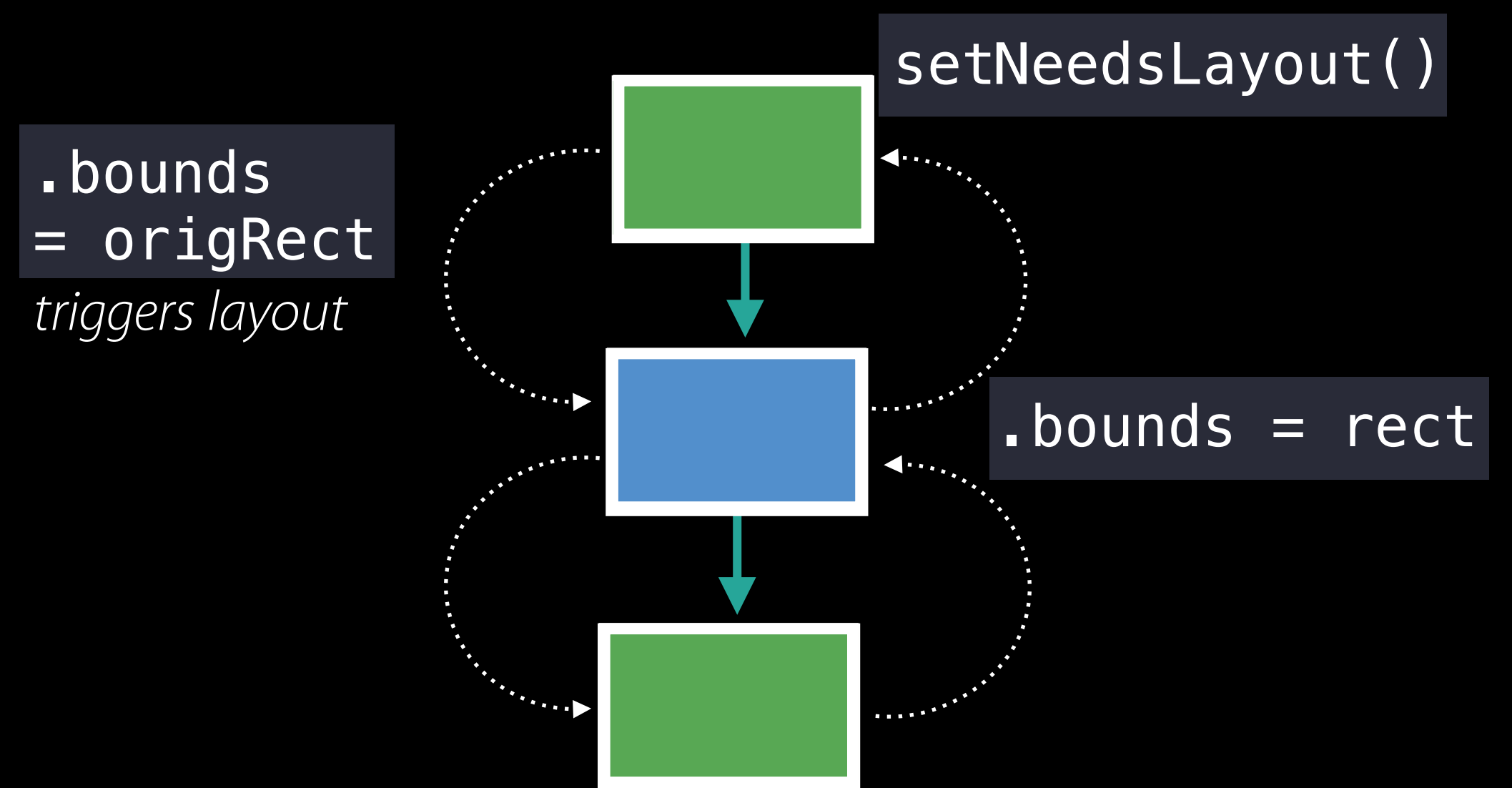
Example 1: Upstream Geometry Change

The view in layout changes the bounds of its superview

Because its superview is not in layout, that view receives `setNeedsLayout()`

During its layout, it resets the bounds of its subview

The loop is sustained by the two views fighting over the bounds of the view in the middle



Top-level view = <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >

Views caught in loop:

```
23 <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
| <UIDimmingView: 0x10354c440; frame = (0 0; 1024 768); >
| 11 <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
| | 12 <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants auto layout; tAMIC = YES; >
| | | <UINavigationController: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
| | | | < snip uninvolved navigation bar hierarchy >
| | | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
| | | | < snip additional uninvolved hierarchy >
| | 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
| | | 2 <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
| | | | 3 <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
| | | | | 4 <UIView: 0x1034c9a60; fr... = (0 0; 540 489); wants AL; tAMIC = YES;>
| | | | | | 5 <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants AL; tAMIC = NO; >
| | | | | | | 6 <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
| | | | | | | | 7 <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
| | | | | | | | | 10 <UIWebBrowserView: 0x10390b400; frame = (0 0; 604 460); >
| | | | | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
| | | | | | | | | | 9 <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
| | | | | | | | | | 8 <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
| | | | | | | | <UIButton: 0x10ec7d180; frame = (97 399; 410 44); wants AL; tAMIC = NO; >
| | | | | | | <UIButtonLabel: 0x10d262260; frame = (8 1; 394.5 42); >
```

Views receiving layout in order: (

```
<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```



```
Top-level view = <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
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```
Views caught in loop:
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```
23 <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
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```
| 11 <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
```

```
| | 12 <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants auto layout; tAMIC = YES; >
```

```
| | | <UINavigationBar: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
```

```
| | | | < snip uninvolved navigation bar hierarchy >
```

```
| | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
```

```
| | | < snip additional uninvolved hierarchy >
```

```
| 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
```

```
| | 2 <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
```

```
| | | 3 <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
```

```
| | | | 4 <UIView: 0x1034c9a60; fr... = (0 0; 540 489); wants AL; tAMIC = YES;>
```

```
| | | | | 5 <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants AL; tAMIC = NO; >
```

```
| | | | | 6 <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```

```
| | | | | | 7 <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
```

```
| | | | | | 10 <UIWebBrowserView: 0x10390b400; frame = (0 0; 604 460); >
```

```
| | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
```

```
| | | | | | 9 <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
```

```
| | | | | | 8 <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
```

```
| | | | | <UIButton: 0x10ec7d180; frame = (97 399; 410 44); wants AL; tAMIC = NO; >
```

```
| | | | | <UIButtonLabel: 0x10d262260; frame = (8 1; 394.5 42); >
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```
Views receiving layout in order: (
```

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<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
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<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
```

```
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
```

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<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
```

```
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
```

```
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```

```
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```
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23 <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
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```

```
| 11 <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
```

```
| | 12 <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants auto layout; tAMIC = YES; >
```

```
| | | <UINavigationBar: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
```

```
| | | | < snip uninvolved navigation bar hierarchy >
```

```
| | | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
```

```
| | | | < snip additional uninvolved hierarchy >
```

```
| 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
```

```
| | 2 <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
```

```
| | | 3 <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
```

```
| | | | 4 <UIView: 0x1034c9a60; fr... = (0 0; 540 489); wants AL; tAMIC = YES;>
```

```
| | | | | 5 <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants AL; tAMIC = NO; >
```

```
| | | | | 6 <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```

```
| | | | | | 7 <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
```

```
| | | | | | 10 <UIWebBrowserView: 0x10390b400; frame = (0 0; 604 460); >
```

```
| | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
```

```
| | | | | | 9 <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
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| | | | | <UIButton: 0x10ec7d180; frame = (97 399; 410 44); wants AL; tAMIC = NO; >
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| | | | | <UIButtonLabel: 0x10d262260; frame = (8 1; 394.5 42); >
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Views receiving layout in order: (
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<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
```

```
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
```

```
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```


Top-level view = <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >

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| 11 <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
| | 12 <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants auto layout; tAMIC = YES; >
| | | <UINavigationController: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
| | | | < snip uninvolved navigation bar hierarchy >
| | | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
| | | | < snip additional uninvolved hierarchy >
| | 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
| | | 2 <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
| | | | 3 <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
| | | | | 4 <UIView: 0x1034c9a60; fr... = (0 0; 540 489); wants AL; tAMIC = YES;>
| | | | | | 5 <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants AL; tAMIC = NO; >
| | | | | | | 6 <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
| | | | | | | | 7 <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
| | | | | | | | | 10 <UIWebBrowserView: 0x10390b400; frame = (0 0; 604 460); >
| | | | | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
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| | | | | | | | | | 8 <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
| | | | | | | | <UIButton: 0x10ec7d180; frame = (97 399; 410 44); wants AL; tAMIC = NO; >
| | | | | | | <UIButtonLabel: 0x10d262260; frame = (8 1; 394.5 42); >
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<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
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| | | <UINavigationBar: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
| | | | < snip uninvolved navigation bar hierarchy >
| | | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
| | | | < snip additional uninvolved hierarchy >
| | 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
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| | | | | 4 <UIView: 0x1034c9a60; fr... = (0 0; 540 489); wants AL; tAMIC = YES;>
| | | | | | 5 <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants AL; tAMIC = NO; >
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| | | | | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
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| | | | | | | | | | 8 <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
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<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
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<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
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| | 12 <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants auto layout; tAMIC = YES; >
| | | <UINavigationController: 0x10fe52490; frame = (0 0; 604 44); wants AL; tAMIC = NO; >
| | | | < snip uninvolved navigation bar hierarchy >
| | | <UIView: 0x111077d00; frame = (0 44; 604 90); wants auto layout; tAMIC = NO; >
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| | 1 <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
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| | | | | | 6 <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
| | | | | | | 7 <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
| | | | | | | | 10 <UIWebBrowserView: 0x10390b400; frame = (0 0; 604 460); >
| | | | | | | | | <_UIHighlightView: 0x103516400; frame = (399 91; 132 23); >
| | | | | | | | 9 <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
| | | | | | | | 8 <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
| | | | | | <UIButton: 0x10ec7d180; frame = (97 399; 410 44); wants AL; tAMIC = NO; >
| | | | | <UIButtonLabel: 0x10d262260; frame = (8 1; 394.5 42); >
```

Views receiving layout in order: (

```
<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
```

```
Views receiving layout in order: (  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >  
  <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >  
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(  
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",  
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```



```
Views receiving layout in order: (  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >  
  <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >  
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(  
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",  
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```

Views receiving layout in order: (

```
<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
<_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
<UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
<UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
<UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >
<UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
<UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >
<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
<_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
<UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
<UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
<UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >
<UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```



```
Views receiving layout in order: (  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >  
  <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >  
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(  
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",  
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```

```
Views receiving layout in order: (  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >  
  <UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >  
  <UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >  
  <UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >  
  <UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >  
  <UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >  
  <UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >  
  <UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >  
  <_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >  
  <UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >  
  <UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >  
  <UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >  
  <UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >  
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(  
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",  
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```



```
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
<_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
<UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
<UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
<UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >
<UIDropShadowView: 0x110870e50; frame = (242 20; 540 620); >
<UIView: 0x1110a72f0; frame = (0 0; 540 620); wants AL; hosts layout engine; tAMIC = YES; >
<UILayoutContainerView: 0x1110afab0; frame = (0 134; 540 489); >
<UINavigationControllerTransitionView: 0x110caf8f0; frame = (0 0; 540 489); >
<UIViewControllerWrapperView: 0x1110ba000; frame = (0 0; 540 489); >
<UIView: 0x1034c9a60; frame = (0 0; 540 489); wants AL; hosts layout engine; tAMIC = YES; >
<UIView: 0x1110ba8a0; frame = (0 0; 604 391); wants auto layout; tAMIC = NO; >
<UIWebView: 0x1034d5c60; frame = (0 0; 604 391); >
<_UIWebViewScrollView: 0x10387b800; frame = (0 0; 604 391); >
<UIImageView: 0x110b9e8d0; frame = (598.5 3; 2.5 99); >
<UIImageView: 0x1034165d0; frame = (3 174.5; 598 2.5); >
<UIWebViewBrowserView: 0x10390b400; frame = (0 0; 604 460); >
<UITransitionView: 0x110bbce40; frame = (0 0; 1024 768); >
)
```

*** Views With Geometry Changes ***

Geometry change records for <UIImageView: 0x110b9e8d0; >:

```
(
  "<frame = (598.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<frame = (598.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<frame = (534.5, 3; 2.5, 99); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<frame = (534.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<frame = (534.5, 3; 2.5, 153.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
```

*** Call stacks where -setNeedsLayout is sent to the top-level view ***

```
{(
  (
    0 UIKit      0x1... -[_UIViewLayoutFeedbackLoopDebugger _recordSetNeedsLayoutToLayerOfView:] + 864
    1 UIKit      0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetNeedsLayoutToLayerOfView:] + 72
    2 UIKit      0x1... -[_UIViewLayoutFeedbackLoopDebugger willChangeGeometryForLayerOfView:] + 372
    3 UIKit      0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetBounds:toLayerOfView:] + 88
    4 UIKit      0x1... -[UIView(Geometry) setBounds:] + 468
    5 UIKit      0x1... -[UIDropShadowView setBounds:] + 128
    6 Looper     0x1... Looper + 396932
    7 UIKit      0x1... -[UIView(CALayerDelegate) layoutSublayersOfLayer:] + 1200
    8 QuartzCore 0x1... <redacted> + 148
    9 QuartzCore 0x1... <redacted> + 292
    10 UIKit      0x1... -[UIView(Hierarchy) layoutBelowIfNeeded] + 1772
    11 UIKit      0x1... -[UIView(Hierarchy) layoutIfNeeded] + 56
    12 UIKit      0x1... __82-[_UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:]_block_invoke + 84
    13 UIKit      0x1... +[UIView(UIViewAnimationWithBlocks)
        _setupAnimationWithDuration:delay:view:options:factory:animations:
        start:animationStateGenerator:completion:] + 1024
    14 UIKit      0x1... +[UIView(UIViewAnimationWithBlocks) animateWithDuration:animations:] + 108
    15 UIKit      0x1... -[_UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:] + 468
    16 UIKit      0x1... -[_UIFormSheetPresentationController _keyboardWillShow:] + 204
    17 CoreFoundation 0x1... <redacted> + 20
    18 CoreFoundation 0x1... <redacted> + 400
    19 CoreFoundation 0x1... <redacted> + 60
    20 CoreFoundation 0x1... <redacted> + 1504
    21 CoreFoundation 0x1... _CFXNotificationPost + 376
    22 Foundation 0x1... <redacted> + 68
    23 UIKit      0x1... 0x0000000101ddd2dc -[UIInputWindowController postStartNotifications:withInfo:]
```


*** Call stacks where -setNeedsLayout is sent to the top-level view ***

```
{(
  (
    0 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger _recordSetNeedsLayoutToLayerOfView:] + 864
    1 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetNeedsLayoutToLayerOfView:] + 72
    2 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willChangeGeometryForLayerOfView:] + 372
    3 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetBounds:toLayerOfView:] + 88
    4 UIKit 0x1... -[UIView(Geometry) setBounds:] + 468
    5 UIKit 0x1... -[UIDropShadowView setBounds:] + 128
    6 Looper 0x1... Looper + 396932
    7 UIKit 0x1... -[UIView(CALayerDelegate) layoutSublayersOfLayer:] + 1200
    8 QuartzCore 0x1... <redacted> + 148
    9 QuartzCore 0x1... <redacted> + 292
    10 UIKit 0x1... -[UIView(Hierarchy) layoutBelowIfNeeded] + 1772
    11 UIKit 0x1... -[UIView(Hierarchy) layoutIfNeeded] + 56
    12 UIKit 0x1... __82-[UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:]_block_invoke + 84
    13 UIKit 0x1... +[UIView(UIViewAnimationWithBlocks)
        _setupAnimationWithDuration:delay:view:options:factory:animations:
        start:animationStateGenerator:completion:] + 1024
    14 UIKit 0x1... +[UIView(UIViewAnimationWithBlocks) animateWithDuration:animations:] + 108
    15 UIKit 0x1... -[_UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:] + 468
    16 UIKit 0x1... -[_UIFormSheetPresentationController _keyboardWillShow:] + 204
    17 CoreFoundation 0x1... <redacted> + 20
    18 CoreFoundation 0x1... <redacted> + 400
    19 CoreFoundation 0x1... <redacted> + 60
    20 CoreFoundation 0x1... <redacted> + 1504
    21 CoreFoundation 0x1... _CFXNotificationPost + 376
    22 Foundation 0x1... <redacted> + 68
    23 UIKit 0x1... 0x0000000101ddd2dc -[UIInputWindowController postStartNotifications:withInfo:]
```

*** Call stacks where -setNeedsLayout is sent to the top-level view ***

```
{(
  (
    0 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger _recordSetNeedsLayoutToLayerOfView:] + 864
    1 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetNeedsLayoutToLayerOfView:] + 72
    2 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willChangeGeometryForLayerOfView:] + 372
    3 UIKit 0x1... -[_UIViewLayoutFeedbackLoopDebugger willSendSetBounds:toLayerOfView:] + 88
    4 UIKit 0x1... -[UIView(Geometry) setBounds:] + 468
    5 UIKit 0x1... -[UIDropShadowView setBounds:] + 128
    6 Looper 0x1... Looper + 396932
    7 UIKit 0x1... -[UIView(CALayerDelegate) layoutSublayersOfLayer:] + 1200
    8 QuartzCore 0x1... <redacted> + 148
    9 QuartzCore 0x1... <redacted> + 292
    10 UIKit 0x1... -[UIView(Hierarchy) layoutBelowIfNeeded] + 1772
    11 UIKit 0x1... -[UIView(Hierarchy) layoutIfNeeded] + 56
    12 UIKit 0x1... __82-[_UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:]_block_invoke + 84
    13 UIKit 0x1... +[UIView(UIViewAnimationWithBlocks)
        _setupAnimationWithDuration:delay:view:options:factory:animations:
        start:animationStateGenerator:completion:] + 1024
    14 UIKit 0x1... +[UIView(UIViewAnimationWithBlocks) animateWithDuration:animations:] + 108
    15 UIKit 0x1... -[_UIFormSheetPresentationController
        _changeLayoutModeToAvoidKeyboard:withOrigin:] + 468
    16 UIKit 0x1... -[_UIFormSheetPresentationController _keyboardWillShow:] + 204
    17 CoreFoundation 0x1... <redacted> + 20
    18 CoreFoundation 0x1... <redacted> + 400
    19 CoreFoundation 0x1... <redacted> + 60
    20 CoreFoundation 0x1... <redacted> + 1504
    21 CoreFoundation 0x1... _CFXNotificationPost + 376
    22 Foundation 0x1... <redacted> + 68
    23 UIKit 0x1... 0x0000000101ddd2dc -[UIInputWindowController postStartNotifications:withInfo:]
```


Geometry change records for <UIDropShadowView: 0x110870e50; >:

```
(
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
)
```

Geometry change records for <UIView: 0x1110ba8a0; >:

```
(
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
)
```

Geometry change records for <UIDropShadowView: 0x110870e50; >:

```
(
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
)
```

Geometry change records for <UIView: 0x1110ba8a0; >:

```
(
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
)
```


Geometry change records for <UIDropShadowView: 0x110870e50; >:

```
(
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
)
```

Geometry change records for <UIView: 0x1110ba8a0; >:

```
(
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
)
```

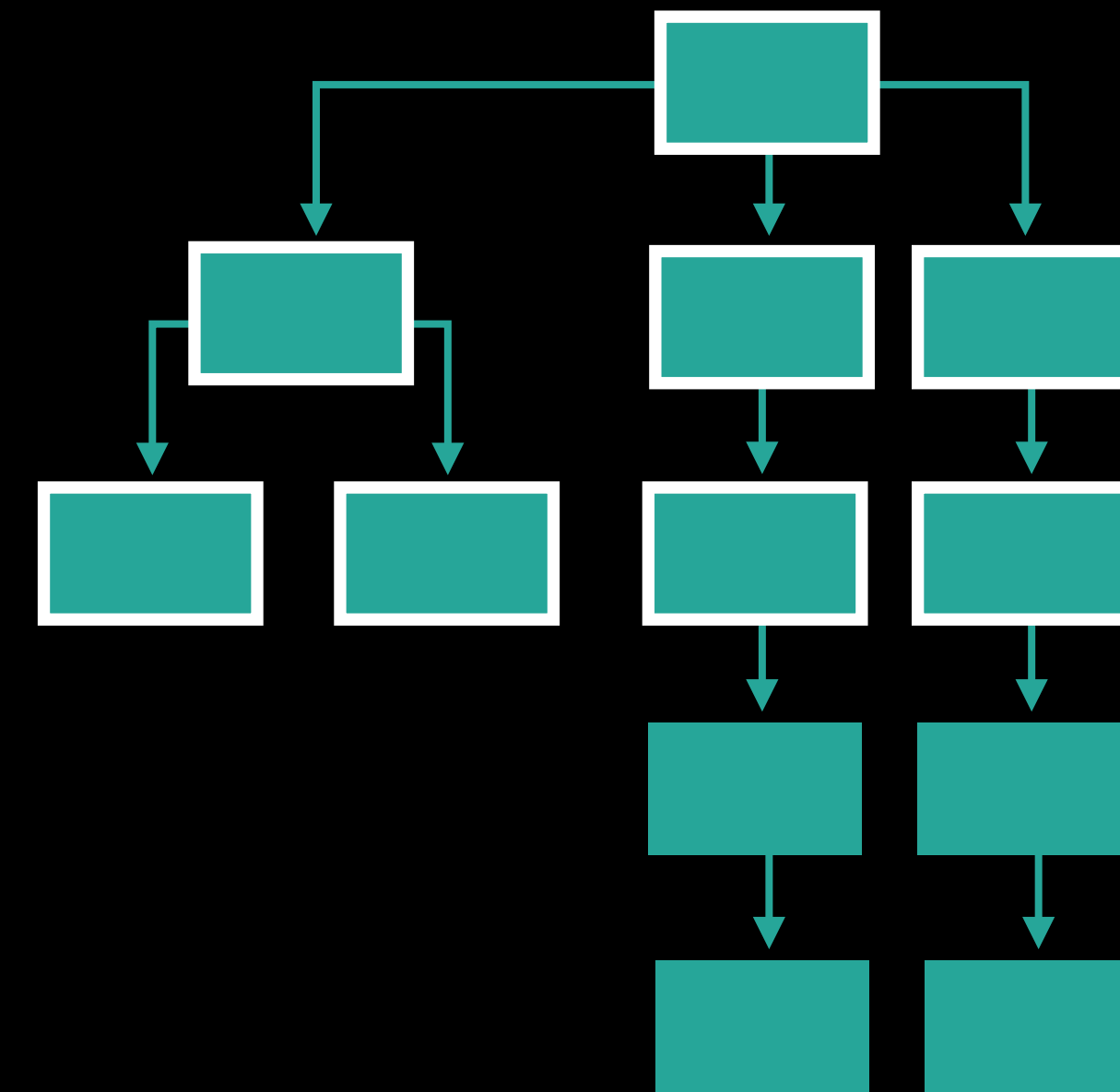
Geometry change records for <UIDropShadowView: 0x110870e50; >:

```
(
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  bounds = (0, 0; 604, 584); in -viewWillLayoutSubviews of LooperVC with <UIView: 0x1110a72f0;>,
  bounds = (0, 0; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
  frame = (242, 20; 540, 620); in -layoutSublayersOfLayer: of <UITransitionView: 0x110bbce40;>,
)
```

Geometry change records for <UIView: 0x1110ba8a0; >:

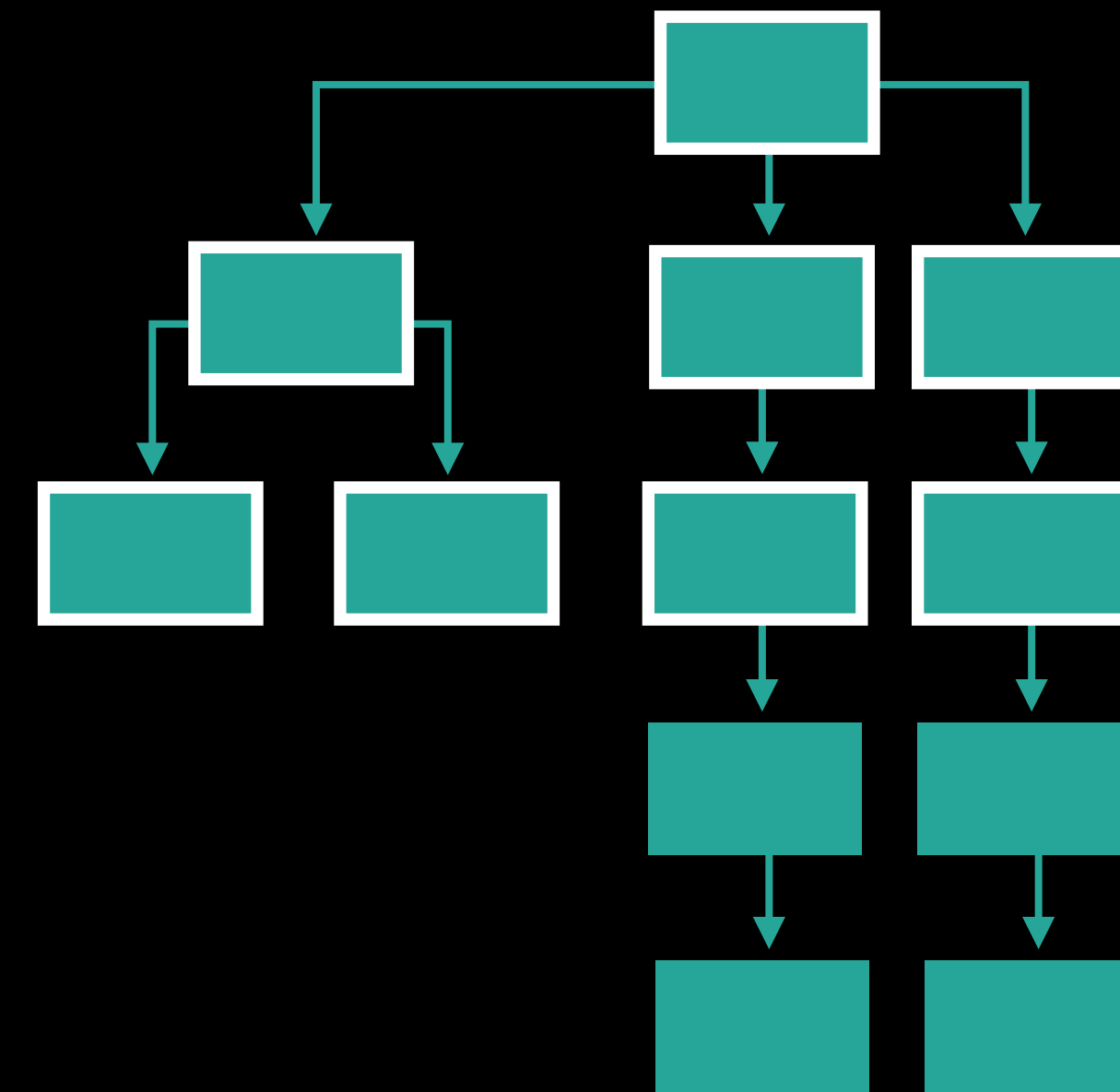
```
(
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (270, 213.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 604, 391); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<center = (302, 195.5); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
  "<bounds = (0, 0; 540, 427); in -layoutSubviews of <UIView: 0x1034c9a60; >; >",
)
```

Example 2: Ambiguous Layout



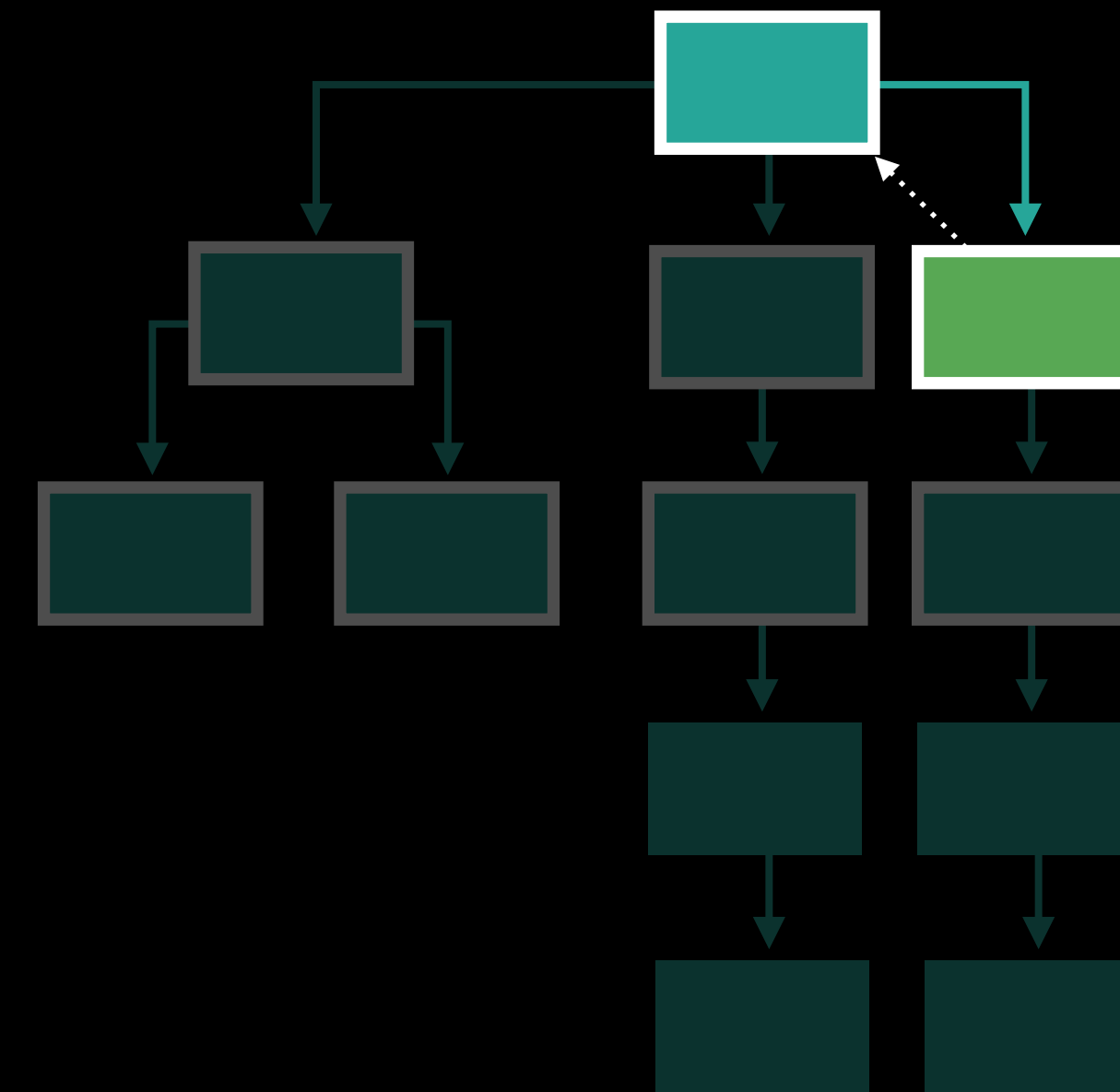
Example 2: Ambiguous Layout

Update-constraints pass precedes layout



Example 2: Ambiguous Layout

Update-constraints pass precedes layout
Ambiguous layout may result in oscillating solutions



Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.

Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >

Views caught in loop:

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

Views receiving layout in order: (

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

```
Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.
```

```
Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
```

```
Views caught in loop:
```

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

```
Views receiving layout in order: (
```

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

```
*** Views With Variable Changes Triggering Layout ***
```

```
Variable change records for <LLRepresentationView: 0x15be15b30; >:
```

```
(
```


Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.

Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >

Views caught in loop:

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

Views receiving layout in order: (

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.

Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >

Views caught in loop:

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

Views receiving layout in order: (

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.

Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >

Views caught in loop:

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

Views receiving layout in order: (

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

Looper: (UIKit) [com.apple.UIKit.LayoutLoop] Ambiguous layout suspected as a cause of this layout feedback loop.

Top-level view = <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >

Views caught in loop:

```
8 <LLTopView: 0x15be52b60; frame = (0 0; 470.667 57); wants AL; tAMIC = YES; >
| 6 <LLRepresentationView: 0x15be15b30; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 7 <LLActionView: 0x15be8f540; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be767b0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8f9c0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 4 <LLRepresentationView: 0x15be56b00; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 5 <LLActionView: 0x15be8fc20; . . . wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
| | | <UIView: 0x15be59db0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | | | <UILabel: 0x15be8fea0; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| 1 <LLSeparatorView: 0x15beb6240; . . . wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
| | 3 <UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
| | 2 <UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
```

Views receiving layout in order: (

```
<LLSeparatorView: 0x15beb6240; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<UIView: 0x15beb96a0; frame = (0 0; 0.66... 0); >
<UIView: 0x15beb9510; frame = (0 0; 0.66... 0); >
<LLRepresentationView: 0x15be56b00; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8fc20; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLRepresentationView: 0x15be15b30; frame = ...; wants AL; tAMIC = NO; AMBIGUOUS LAYOUT; >
<LLActionView: 0x15be8f540; frame = ...; wants AL; tAMIC = YES; AMBIGUOUS LAYOUT; >
<LLTopView: 0x15be52b60; frame = ...; wants auto layout; hosts layout engine; tAMIC = YES; >
)
```

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

```
(
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",
  "<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120"
```

```
)
Constraints affecting value of LLRepresentationView:0x15be15b30.minX{id: 2114}: (
  <NSLayoutConstraint:... LLLabelCntainrVw.centerX == LLActionView.centerX priority:250>,
  <NSLayoutConstraint:... LLLabel.trailing <= LLLabelCntainrVw.trailing>,
  <NSLayoutConstraint:... H:|-(>=0)-[LLLabel] ('|':LLLabelCntnrVw:0x15be767b0 )>,
  <NSARMaskLayoutConstraint:... h=--& v=--& LLActionView.midX == + 0.33...>,
  <NSLayoutConstraint:... LLRep..View-0x15be15b30.leading == LLRep..View-0x15be56b00.leading>
)
```

Variable change records for <UIView: 0x15be767b0; >:

```
(
  "<_labelContainerView.minX{id: 1672} = -60",
  "<_labelContainerView.minX{id: 1672} = 60",
  "<_labelContainerView.minX{id: 1672} = -60",
  "<_labelContainerView.minX{id: 1672} = 60",
  "<_labelContainerView.minX{id: 1672} = -60",
  "<_labelContainerView.minX{id: 1672} = 60",
  "<_labelContainerView.minX{id: 1672} = -60"
```


*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120"

)

Constraints affecting value of LLRepresentationView:0x15be15b30.minX{id: 2114}: (

<NSLayoutConstraint:... LLLabelCntainrVw.centerX == LLActionView.centerX priority:250>,

<NSLayoutConstraint:... LLLabel.trailing <= LLLabelCntainrVw.trailing>,

<NSLayoutConstraint:... H:|-(>=0)-[LLLabel] ('|':LLLabelCntnrVw:0x15be767b0)>,

<NSARMaskLayoutConstraint:... h=--& v=--& LLActionView.midX == + 0.33...>,

<NSLayoutConstraint:... LLRep..View-0x15be15b30.leading == LLRep..View-0x15be56b00.leading>

)

Variable change records for <UIView: 0x15be767b0; >:

(

"<_labelContainerView.minX{id: 1672} = -60",

"<_labelContainerView.minX{id: 1672} = 60",

"<_labelContainerView.minX{id: 1672} = -60",

"<_labelContainerView.minX{id: 1672} = 60",

"<_labelContainerView.minX{id: 1672} = -60",

"<_labelContainerView.minX{id: 1672} = 60",

"<_labelContainerView.minX{id: 1672} = -60",

*** Views With Variable Changes Triggering Layout ***

Variable change records for <LLRepresentationView: 0x15be15b30; >:

(

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -60",

"<LLRepresentationView:0x15be15b30.minX{id: 2114} = -120"

)

Constraints affecting value of LLRepresentationView:0x15be15b30.minX{id: 2114}: (

<NSLayoutConstraint:... LLLabelCntainrVw.centerX == LLActionView.centerX priority:250>,

<NSLayoutConstraint:... LLLabel.trailing <= LLLabelCntainrVw.trailing>,

<NSLayoutConstraint:... H:|-(>=0)-[LLLabel] ('|':LLLabelCntnrVw:0x15be767b0)>,

<NSARMaskLayoutConstraint:... h=--& v=--& LLActionView.midX == + 0.33...>,

<NSLayoutConstraint:... LLRep..View-0x15be15b30.leading == LLRep..View-0x15be56b00.leading>

)

Variable change records for <UIView: 0x15be767b0; >:

(

"<_labelContainerView.minX{id: 1672} = -60",

"<_labelContainerView.minX{id: 1672} = 60",

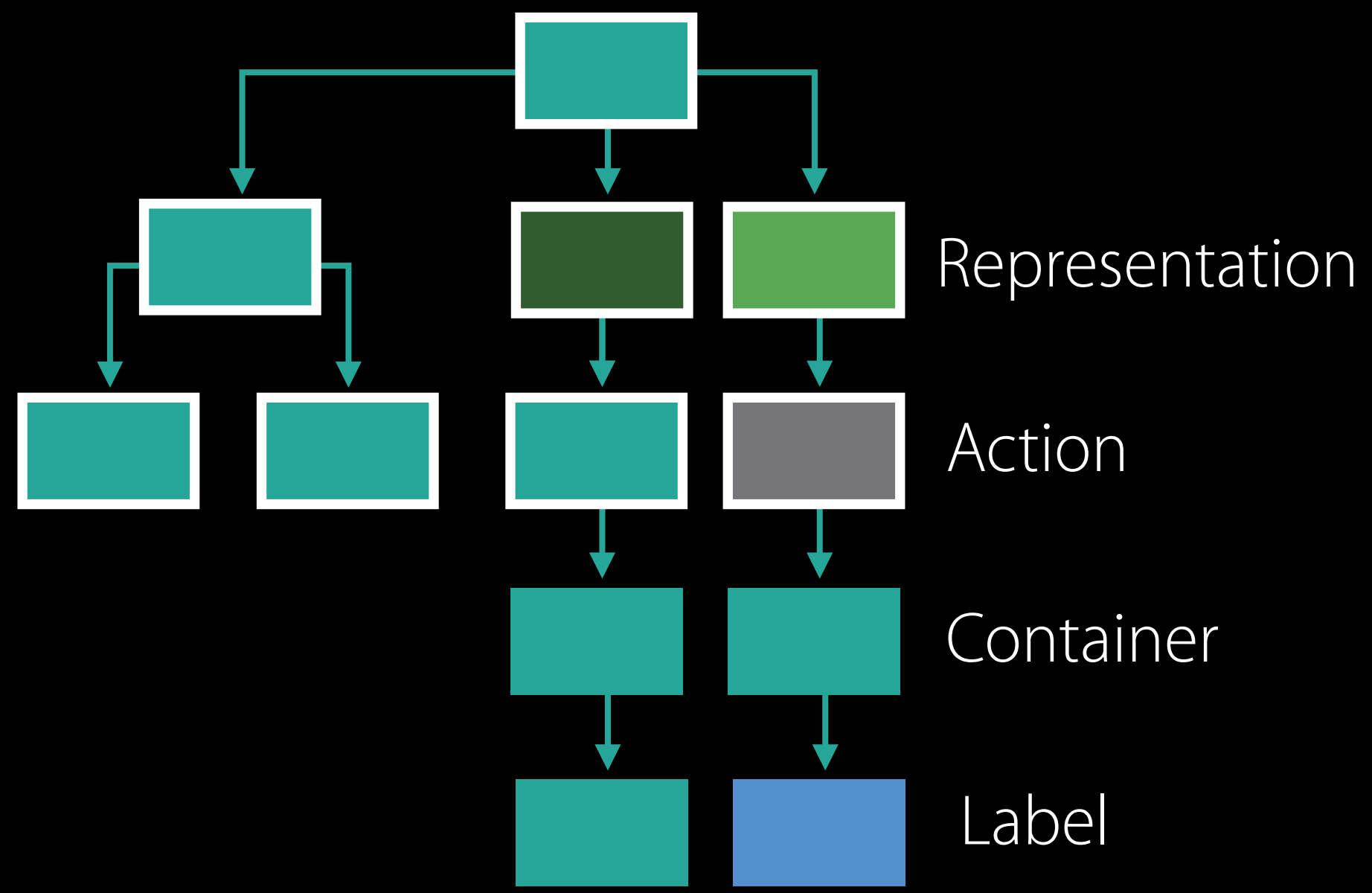
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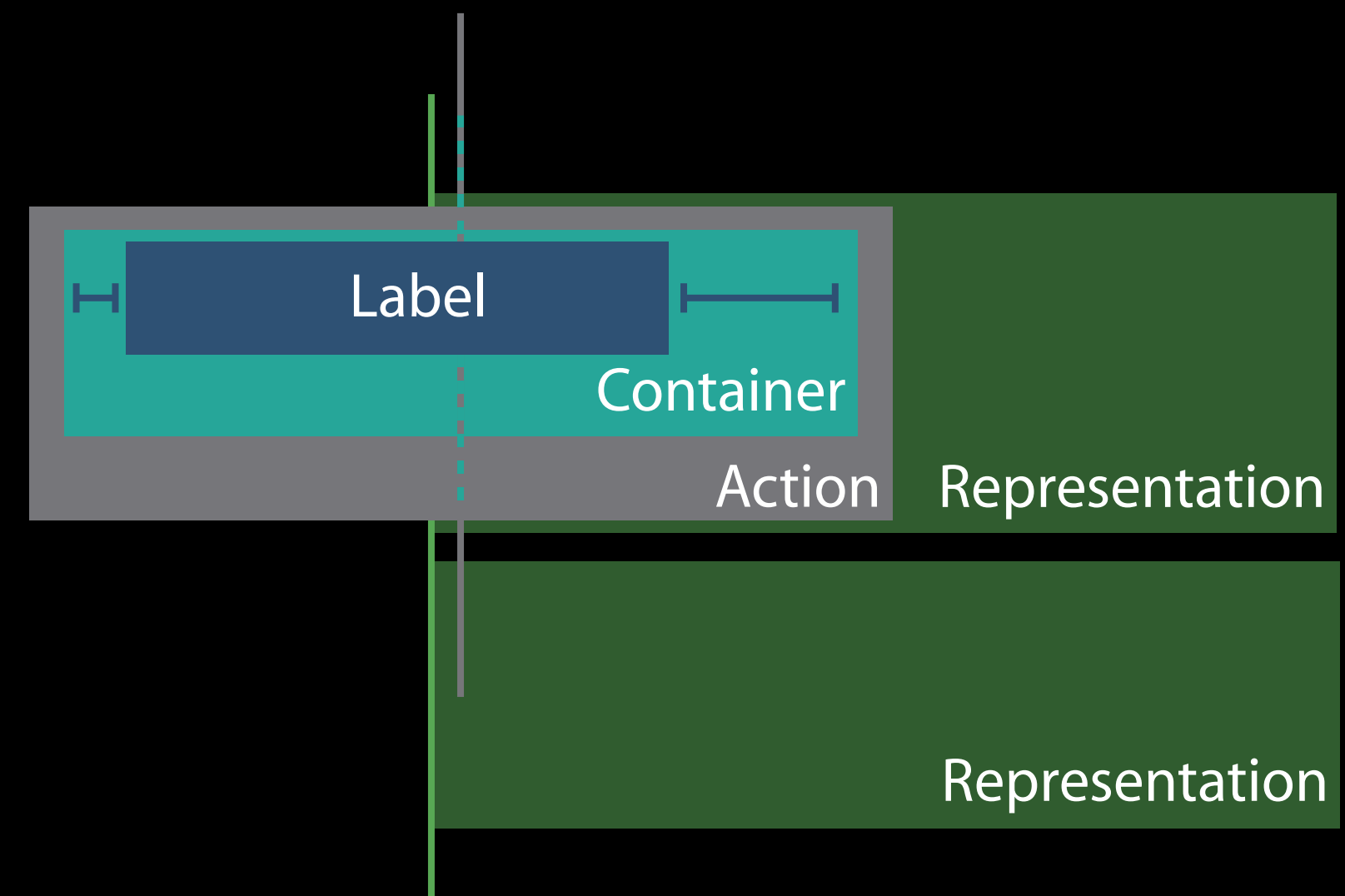
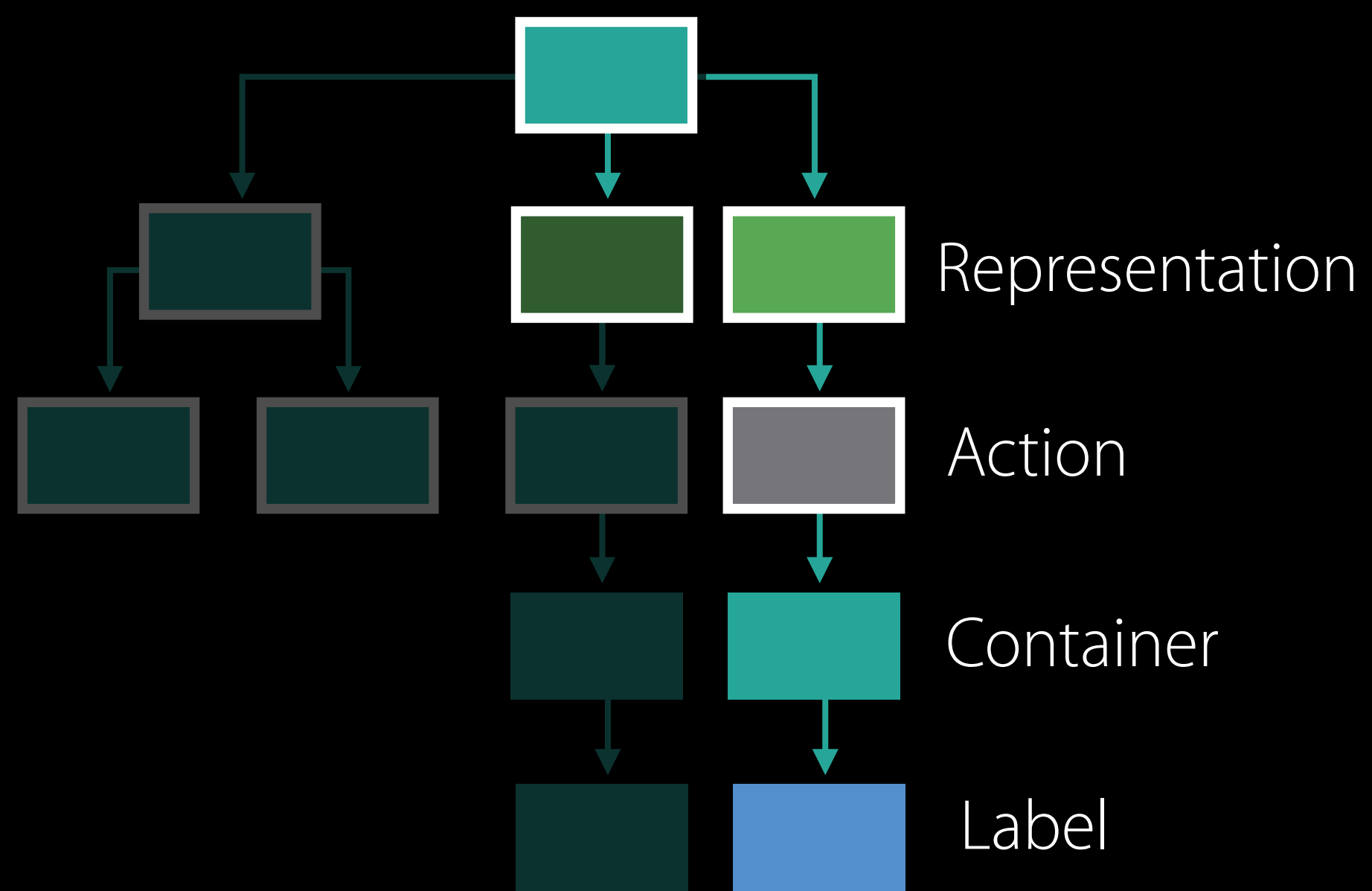
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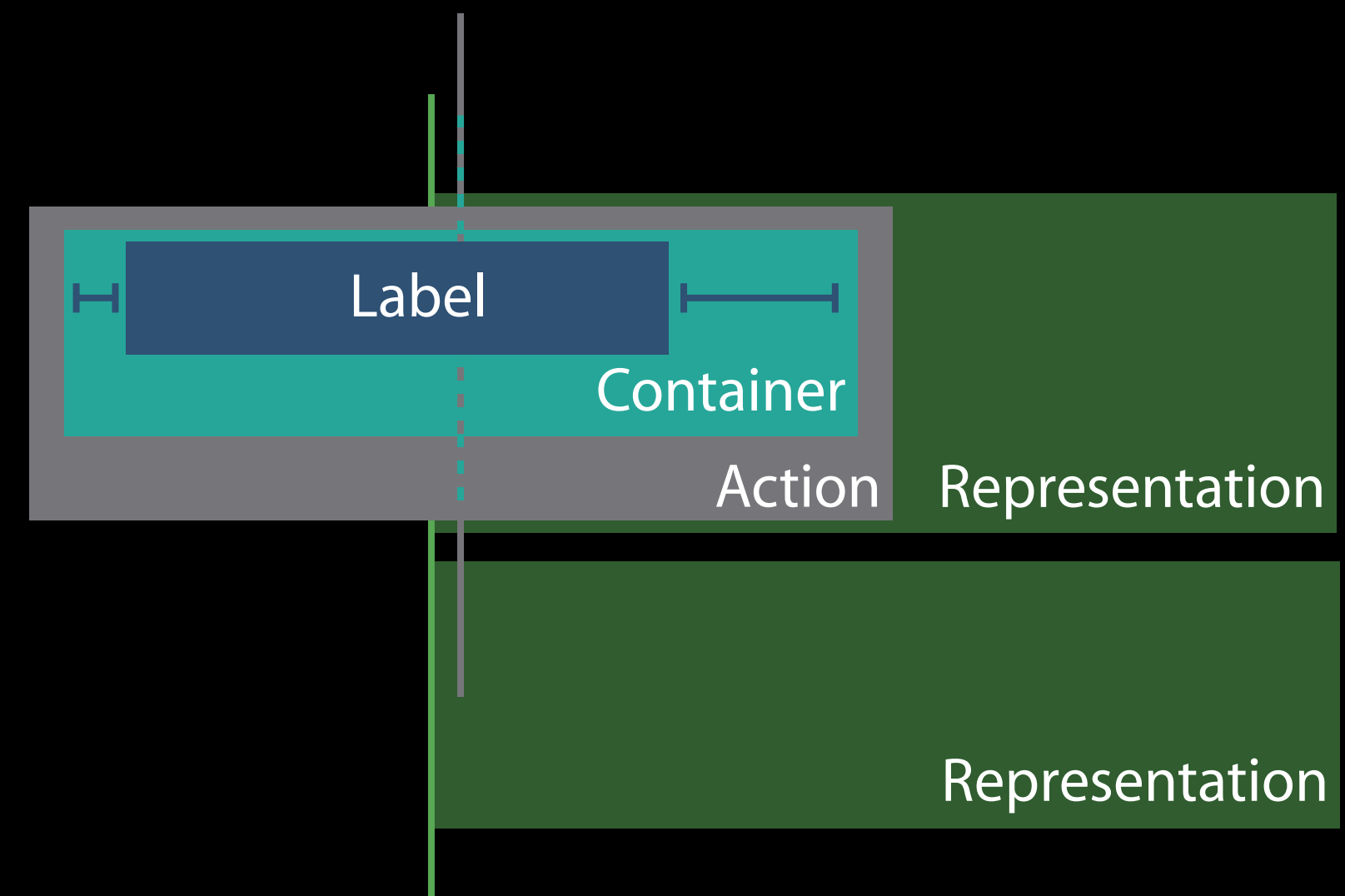
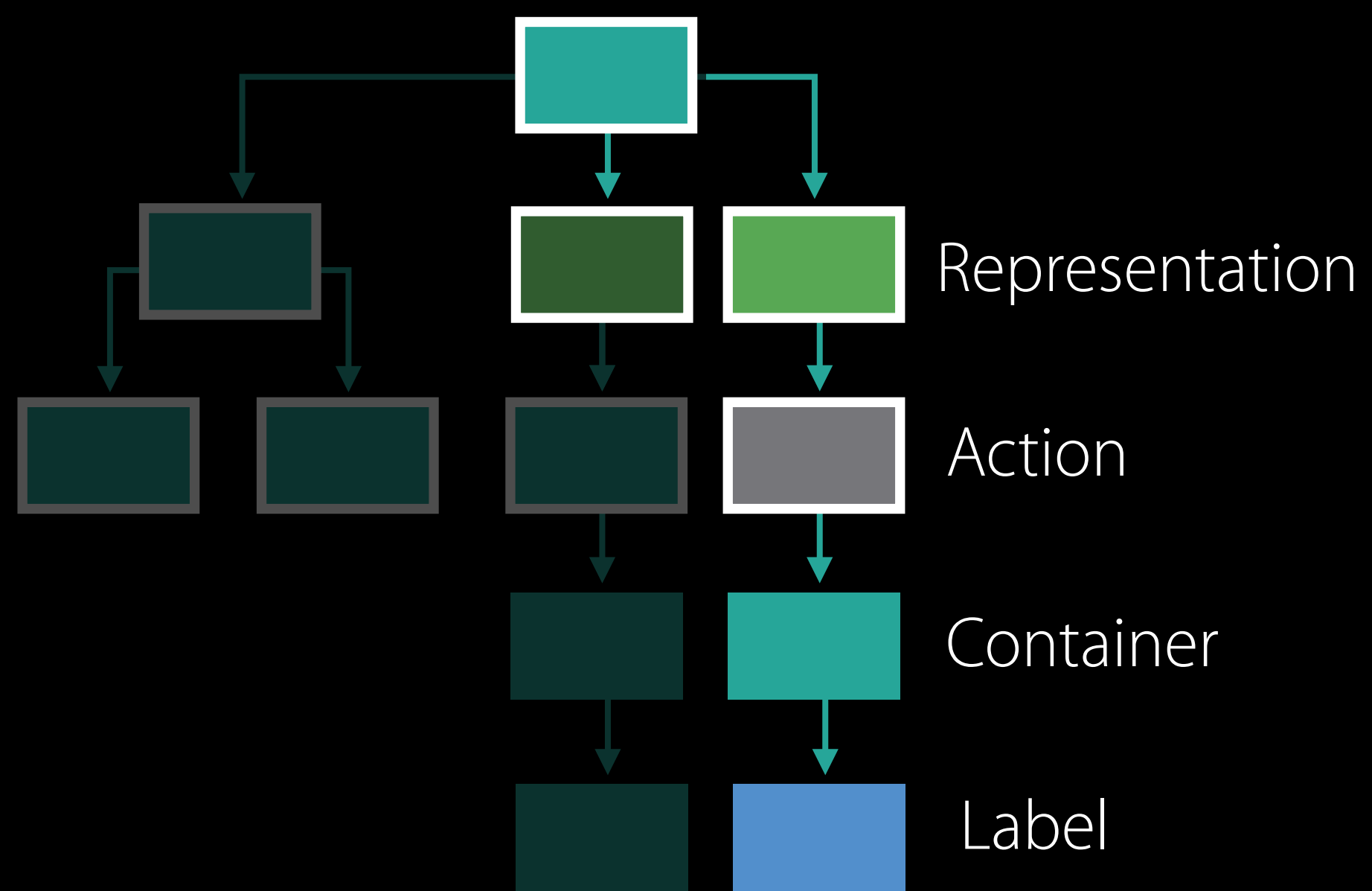
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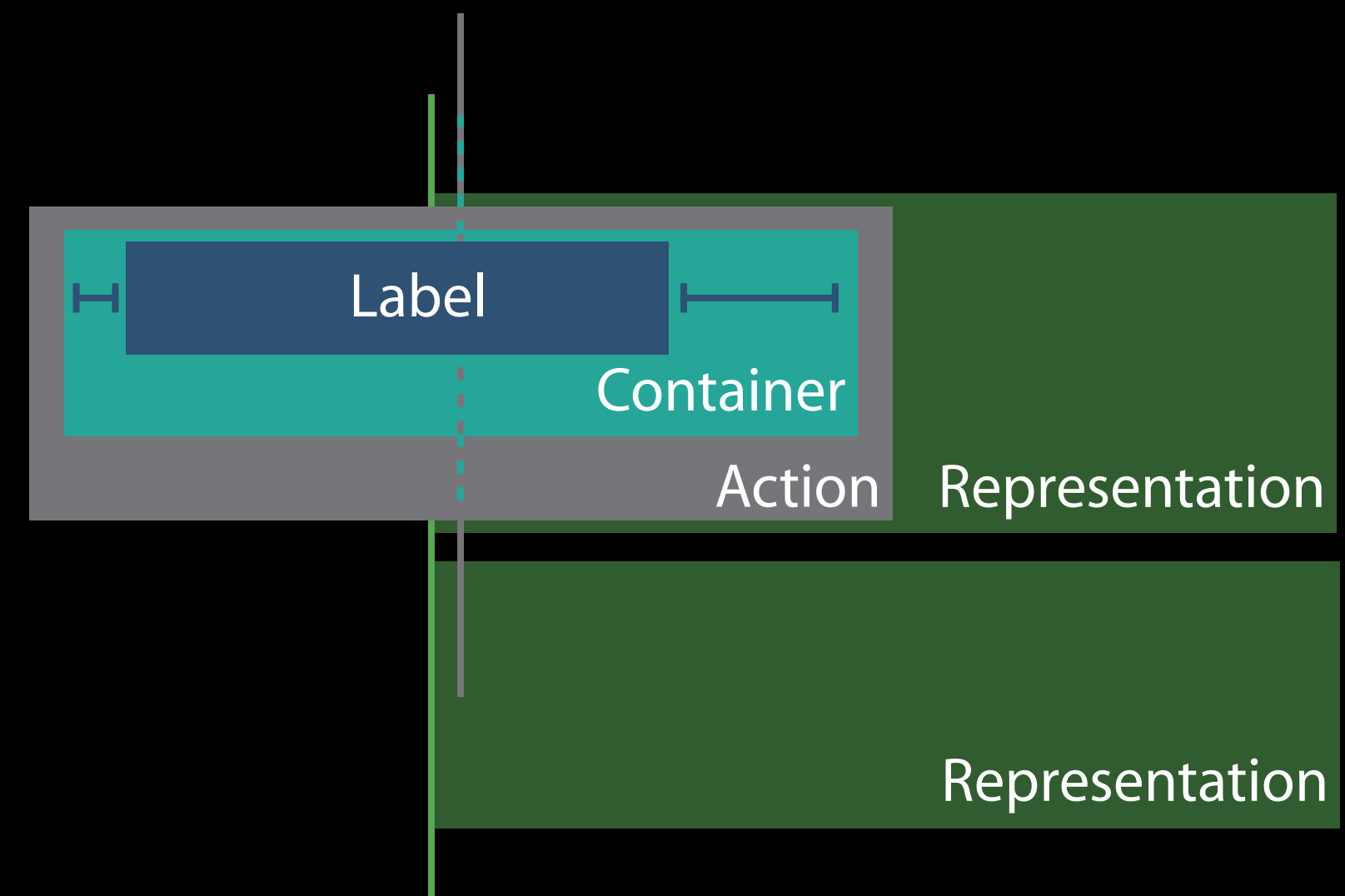
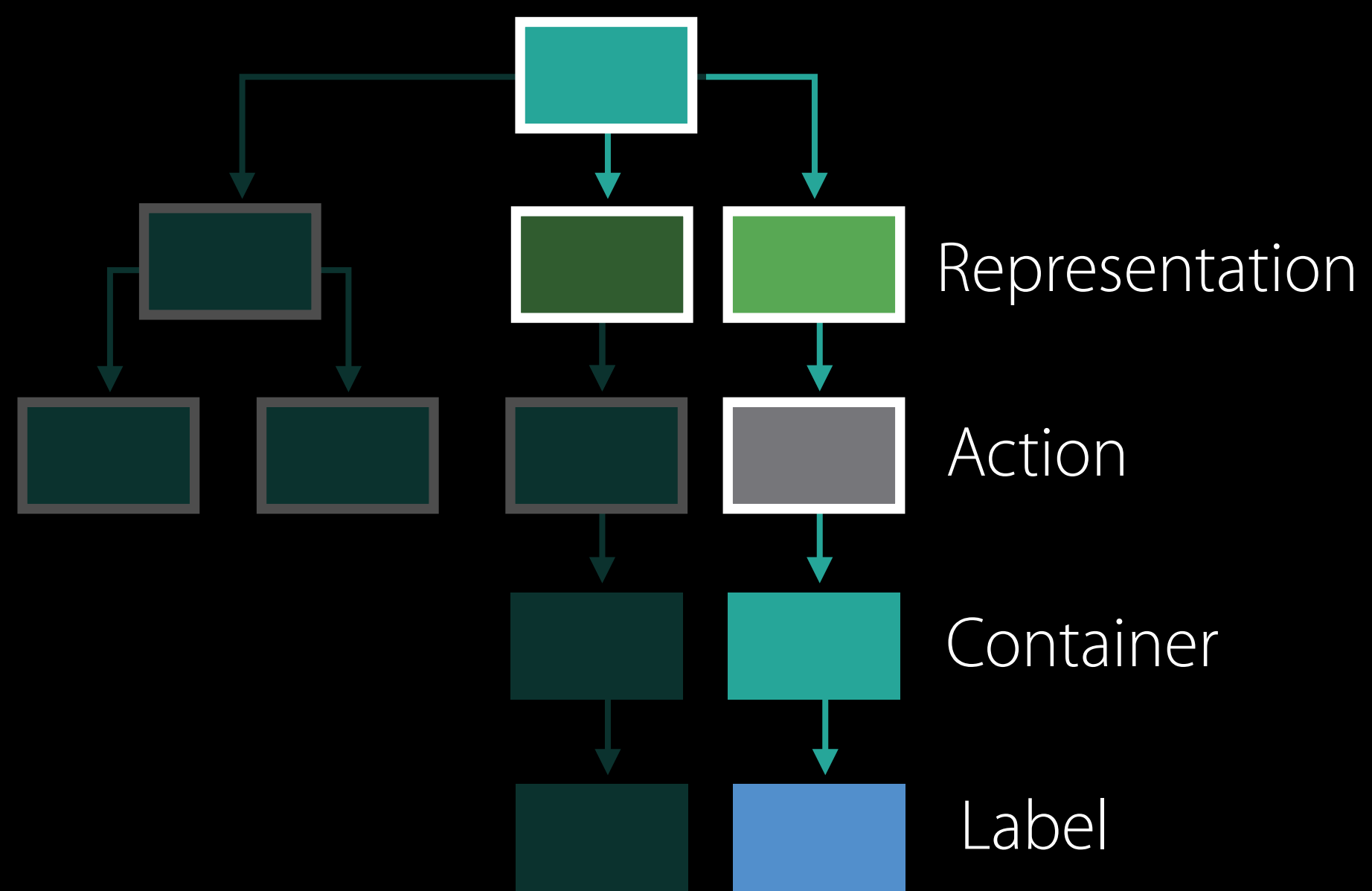
"<_labelContainerView.minX{id: 1672} = 60",

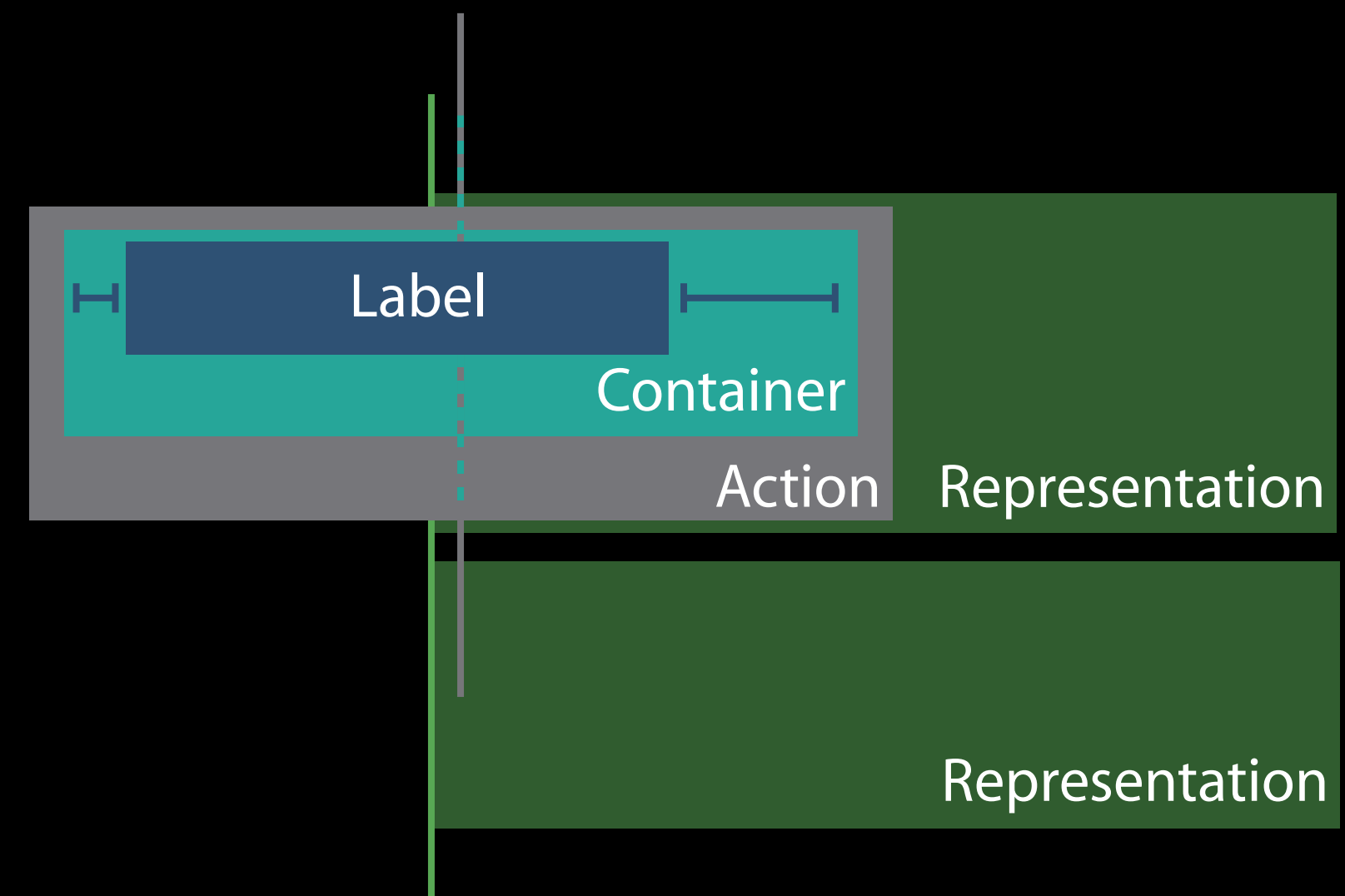
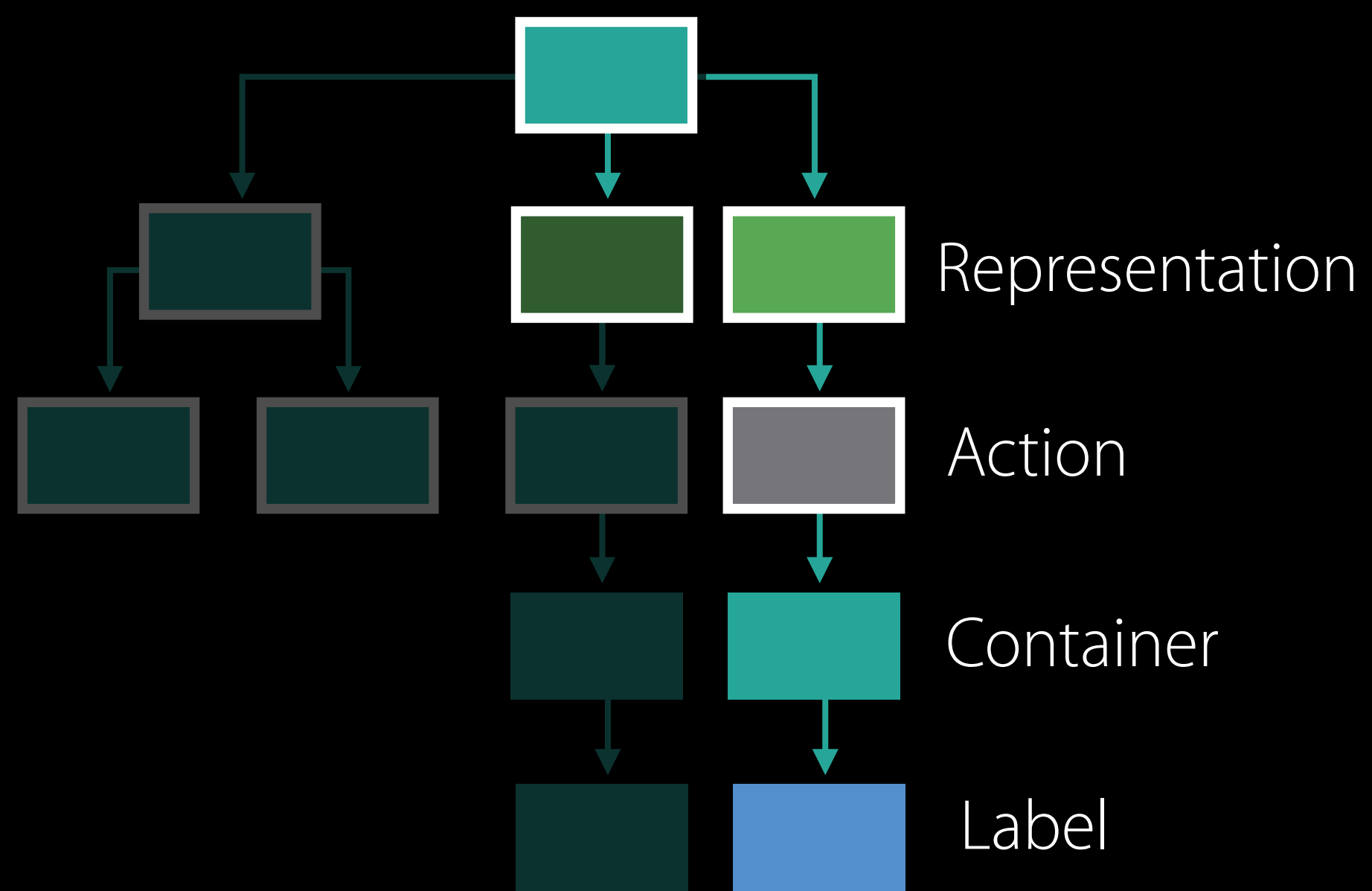
"<_labelContainerView.minX{id: 1672} = -60",

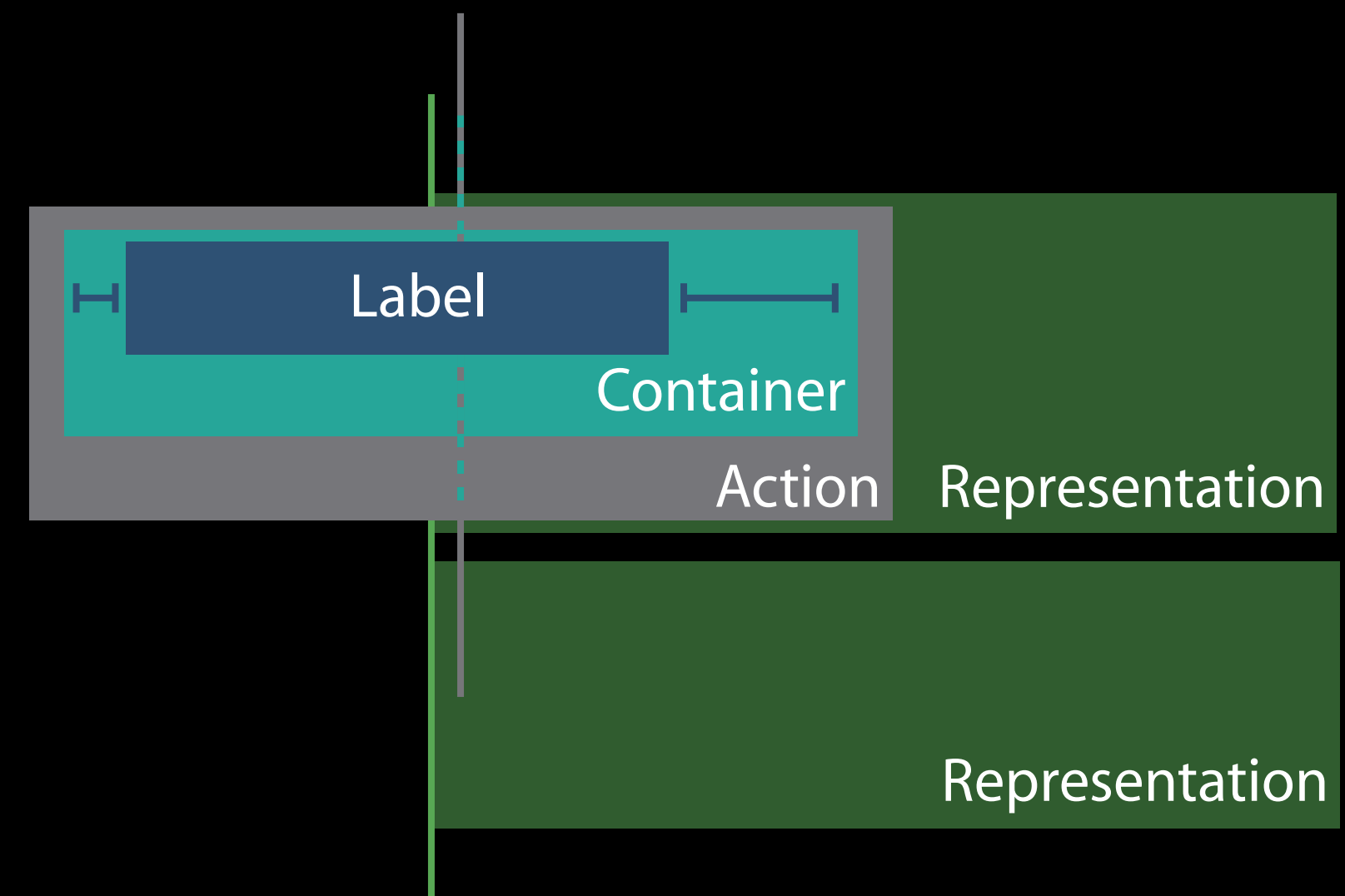
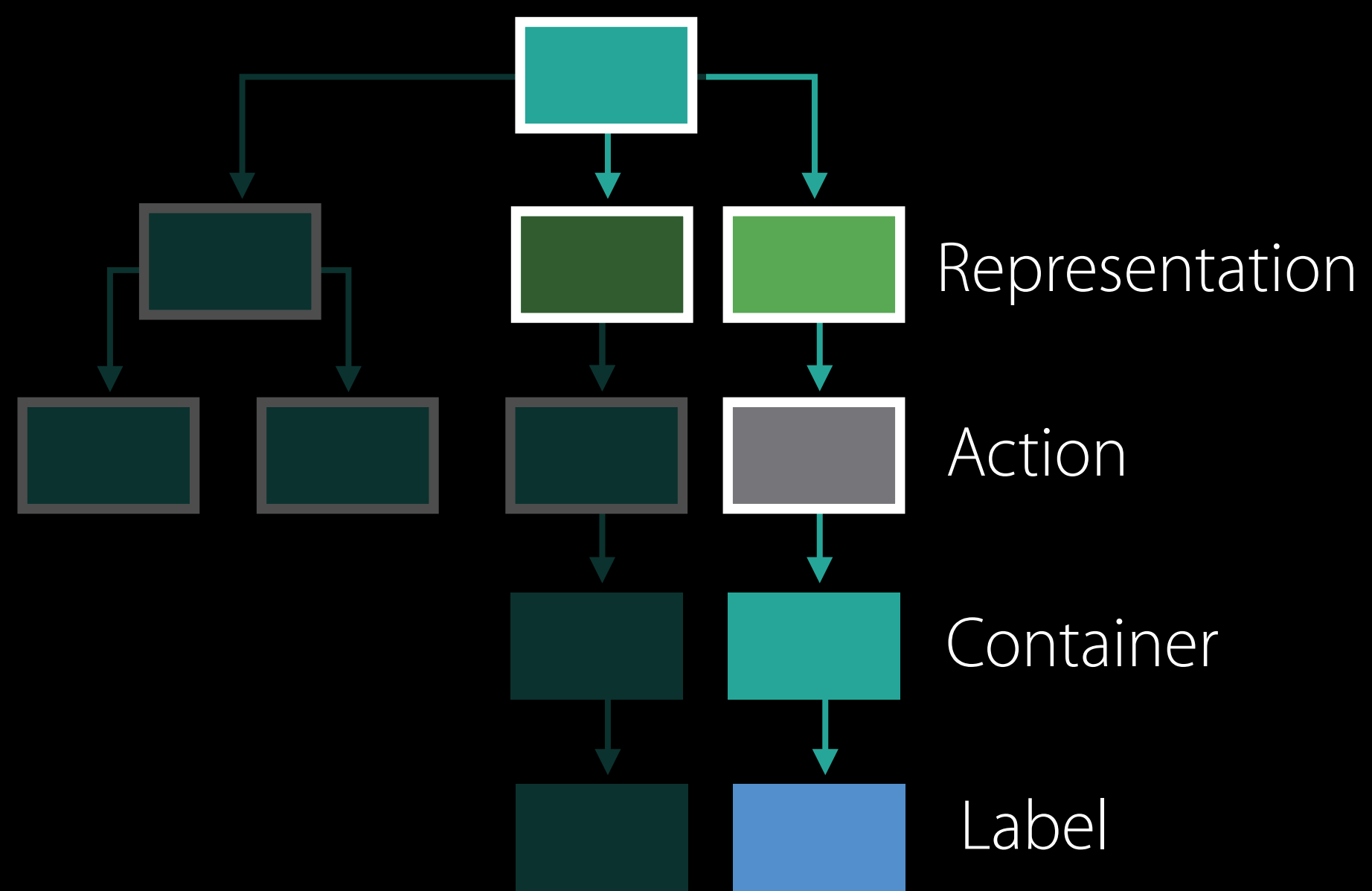


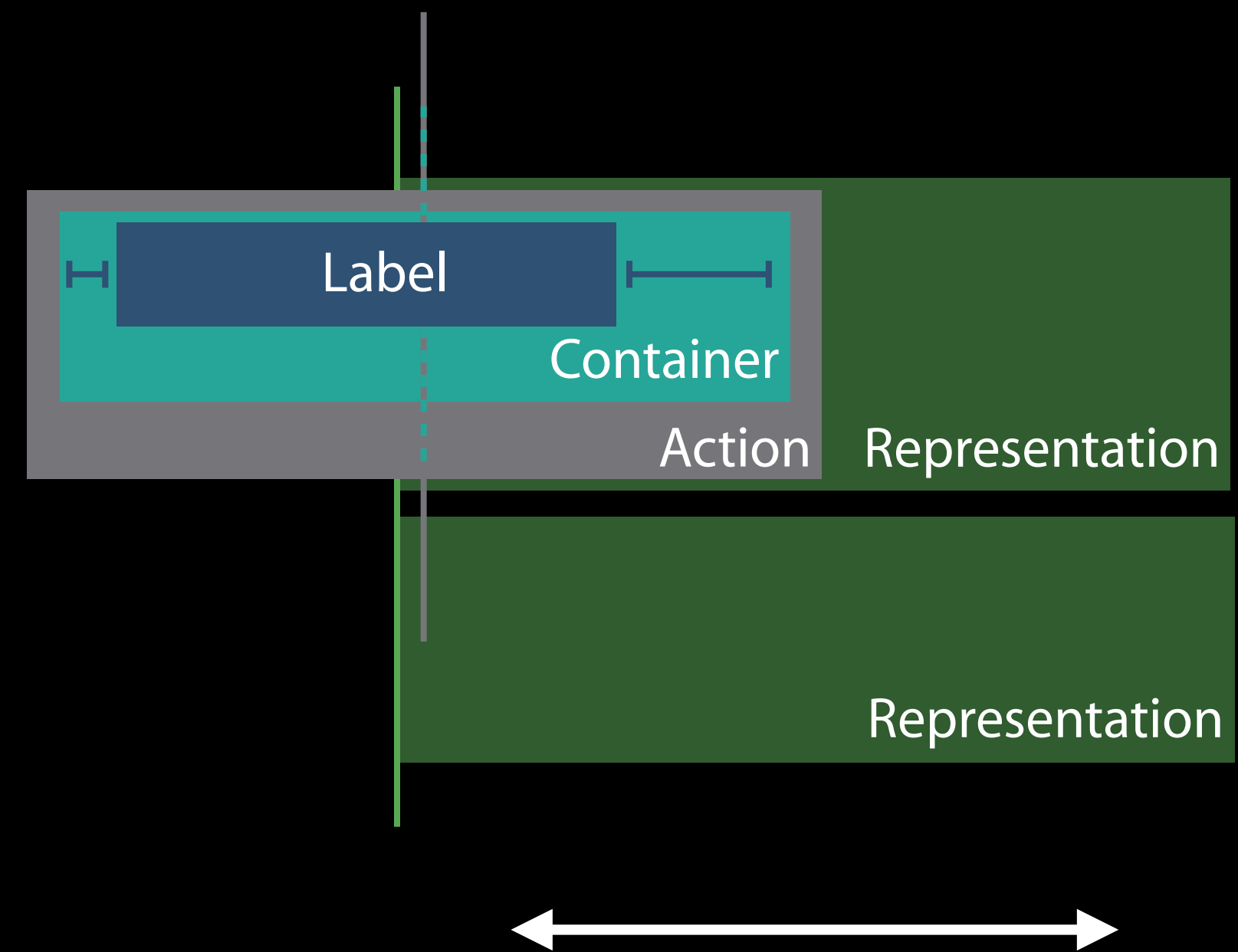
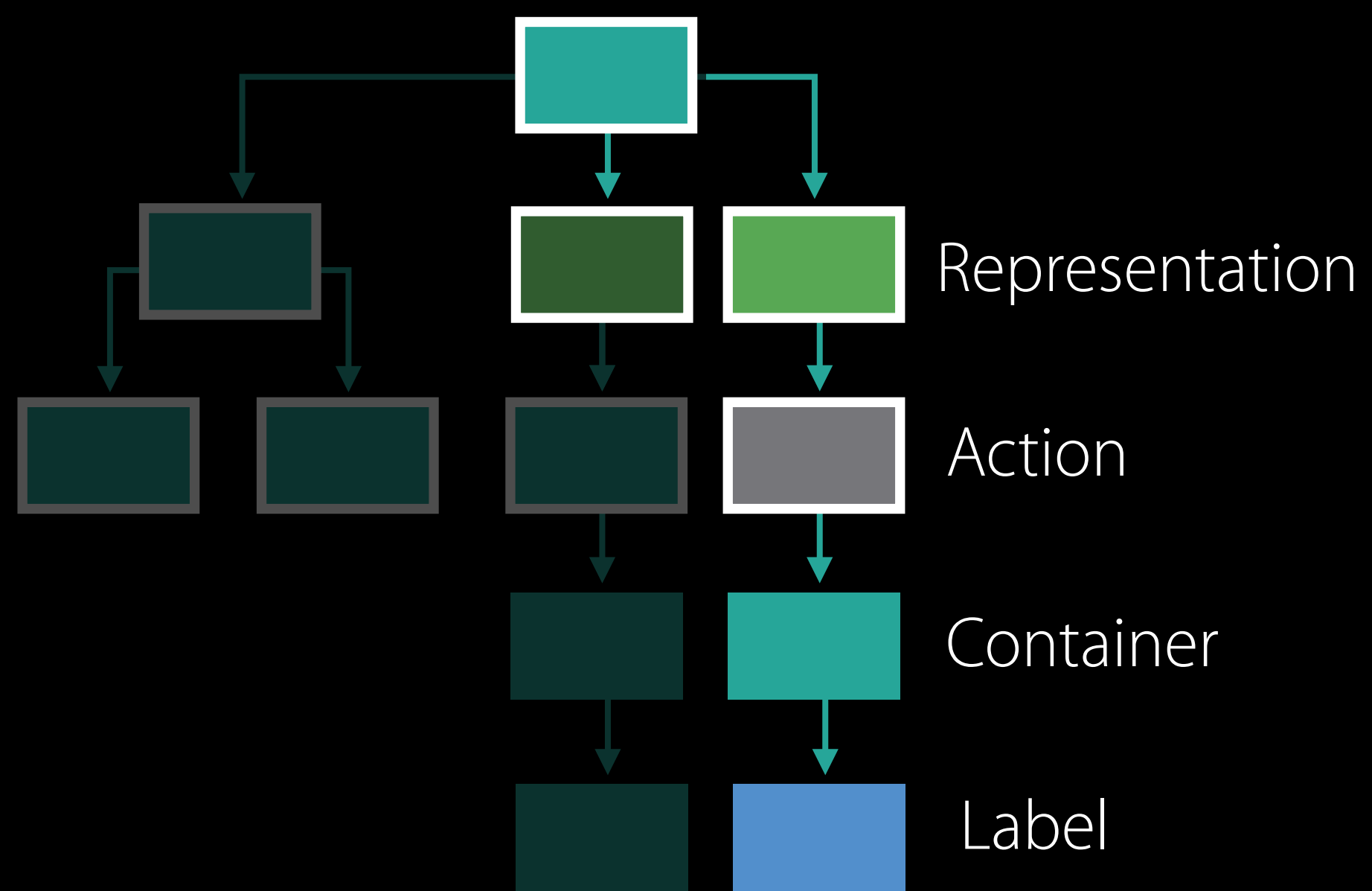












The Layout Feedback Loop Debugger

NEW

Launch argument

```
-UIViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

```
-NSViewLayoutFeedbackLoopDebuggingThreshold 100 // 50...1000
```

Logs to `com.apple.UIKit:LayoutLoop` or `com.apple.AppKit:LayoutLoop`

Summary

Summary

New in Interface Builder: Incrementally adopt Auto Layout

Summary

New in Interface Builder: Incrementally adopt Auto Layout

New for AppKit: NSGridView for grid-like layouts

Summary

New in Interface Builder: Incrementally adopt Auto Layout

New for AppKit: `NSGridView` for grid-like layouts

New for debugging: `NS/UIViewLayoutFeedbackLoopDebuggingThreshold`

More Information

<https://developer.apple.com/wwdc16/236>

Related Sessions

Making Apps Adaptive, Part 1

Presidio

Thursday 11:00AM

Making Apps Adaptive, Part 2

Presidio

Friday 9:00AM

Unified Logging and Activity Tracing

Nob Hill

Friday 5:00PM

Mysteries of Auto Layout, Part 1

WWDC 2015

Mysteries of Auto Layout, Part 2

WWDC 2015



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