

# Focus Interaction on tvOS

Session 215

Matthew Ricketson UIKit Frameworks Engineer

tvOS



Featured

Top Charts

Categories

Purchased

Search



New Games We Love



Icycle: On Thin Ice  
\$2.99



Symmetrica - Minima  
\$0.99



The Incident TV  
\$3.99



Sky Chasers TV  
\$1.99



Caterzillar  
\$2.99



Ske

What to Watch







# Siri Remote



Siri Remote

Game controllers

Bluetooth keyboards

Remote app

Universal remotes

Apple Remote





EDITORS' CHOICE

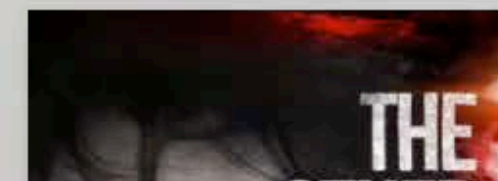
# MIDNIGHT SPECIAL



## Top Movies



## New & Noteworthy





EDITORS' CHOICE

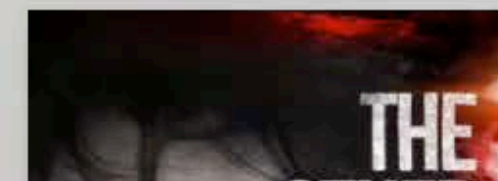
# MIDNIGHT SPECIAL



## Top Movies



## New & Noteworthy





# Agenda



# Agenda

What's new in tvOS 10



# Agenda

What's new in tvOS 10

Case study: Building a custom control



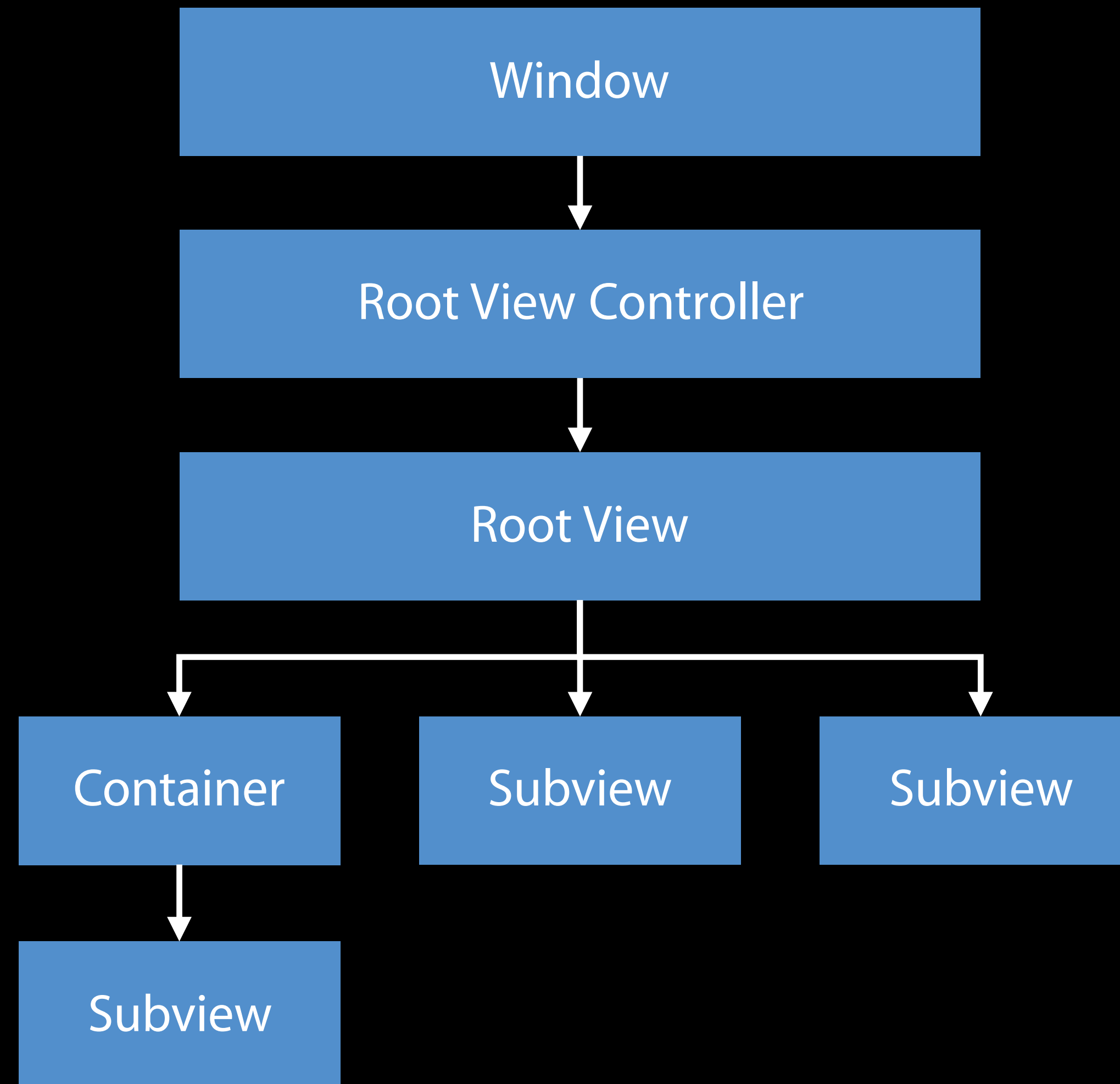
# What's New in tvOS 10

# Preferred Focus Enhancements



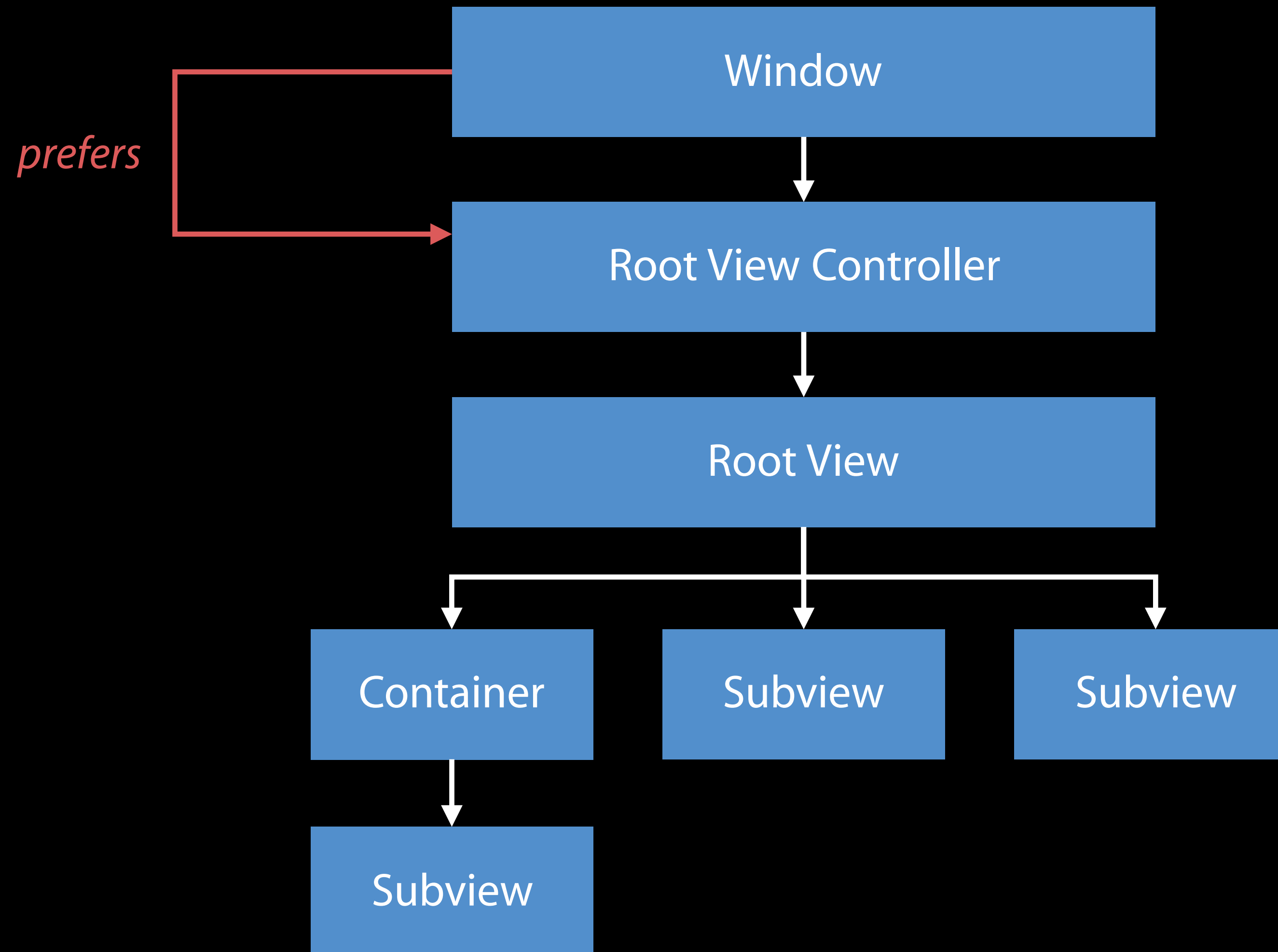
# Preferred Focus

## Review



# Preferred Focus

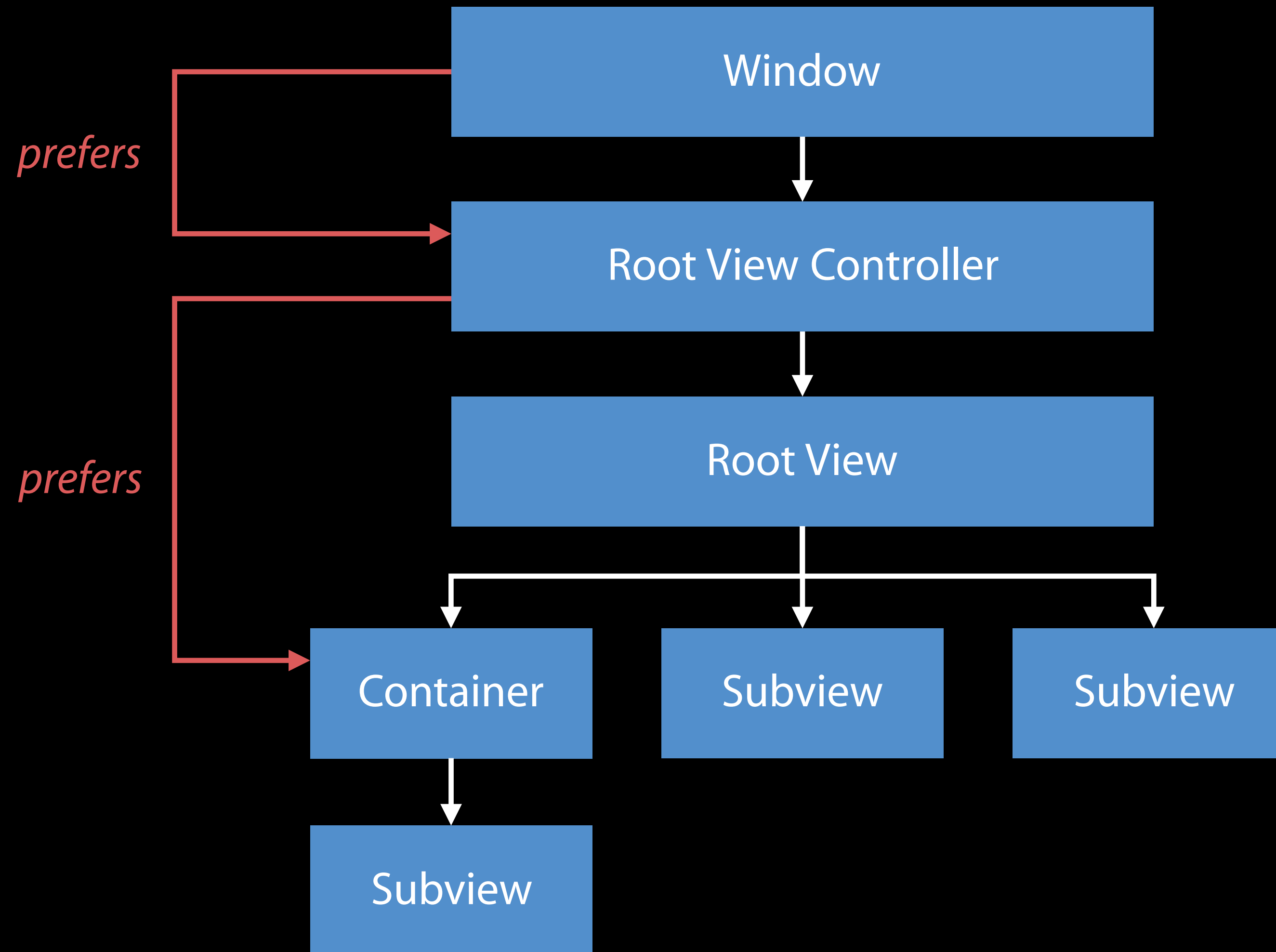
## Review





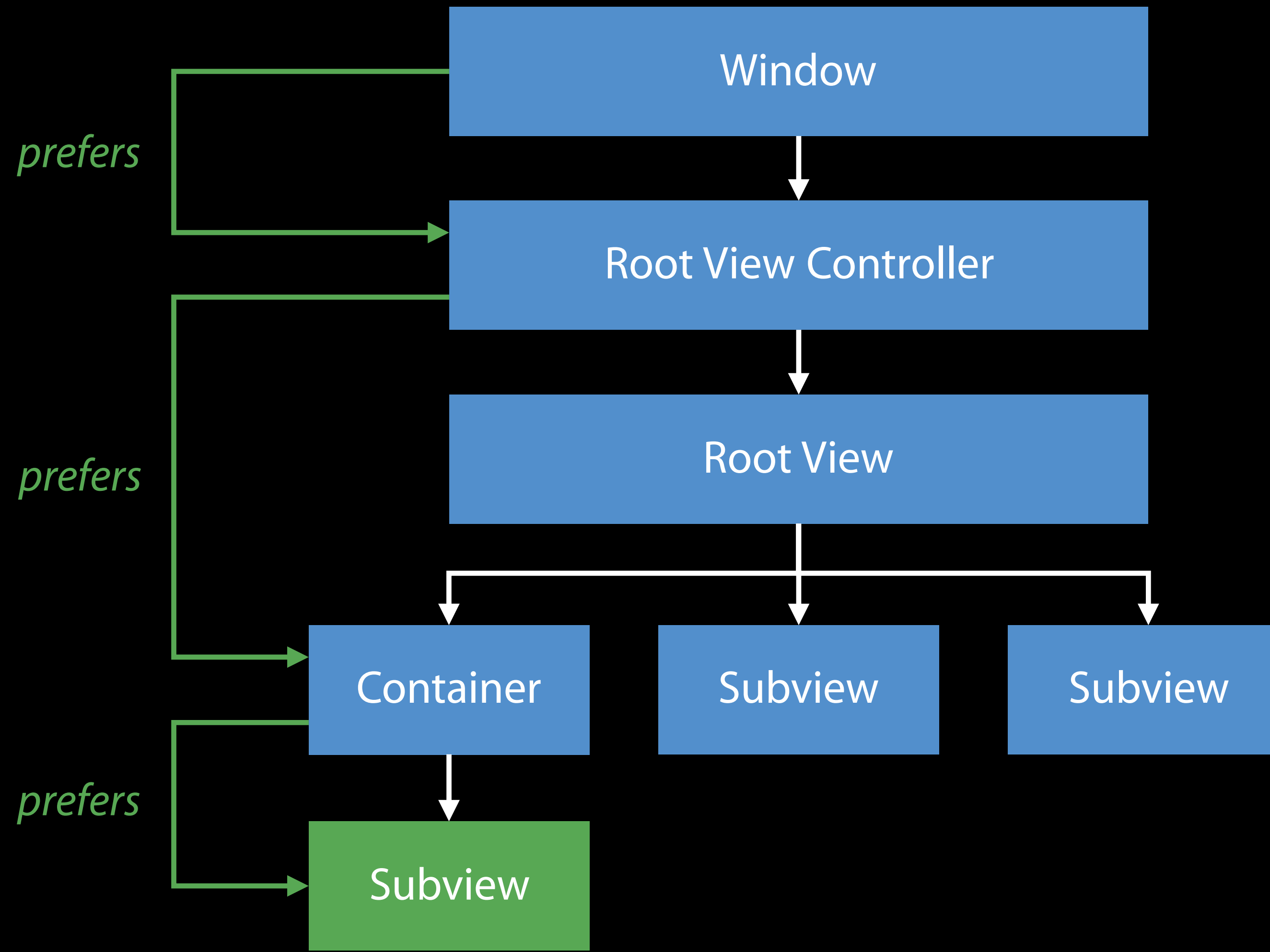
# Preferred Focus

## Review



# Preferred Focus

## Review





# Preferred Focus Environments

New API

NEW

# Preferred Focus Environments

NEW

New API

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }  
}
```

# Preferred Focus Environments

NEW

New API

Benefits:

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }  
}
```



# Preferred Focus Environments

NEW

New API

Benefits:

- Prefer non-item focus environments

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }  
}
```

# Preferred Focus Environments

NEW

New API

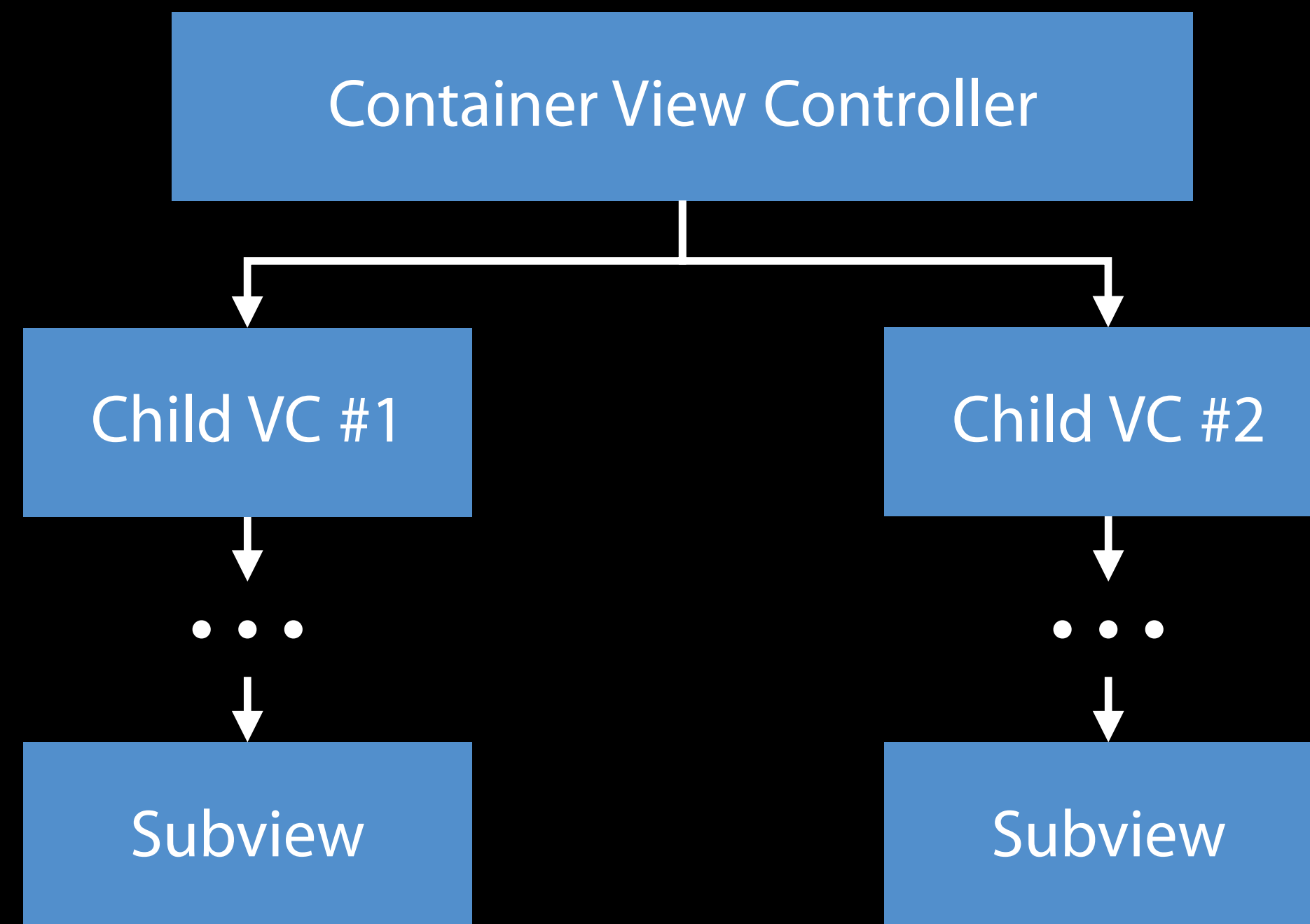
Benefits:

- Prefer non-item focus environments
- Prefer multiple ordered focus environments

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }  
}
```

# Preferred Focus Environments

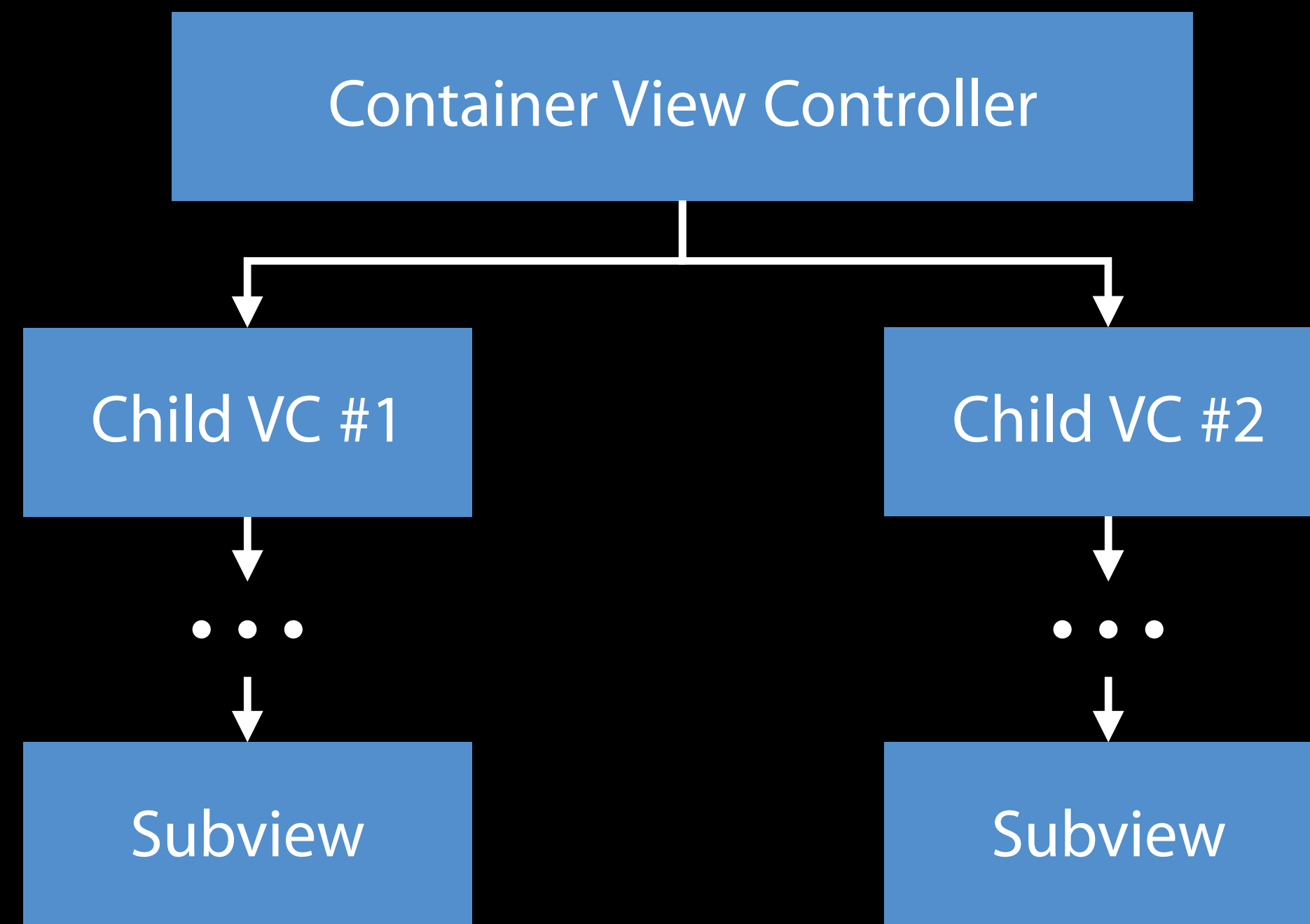
NEW





# Preferred Focus Environments

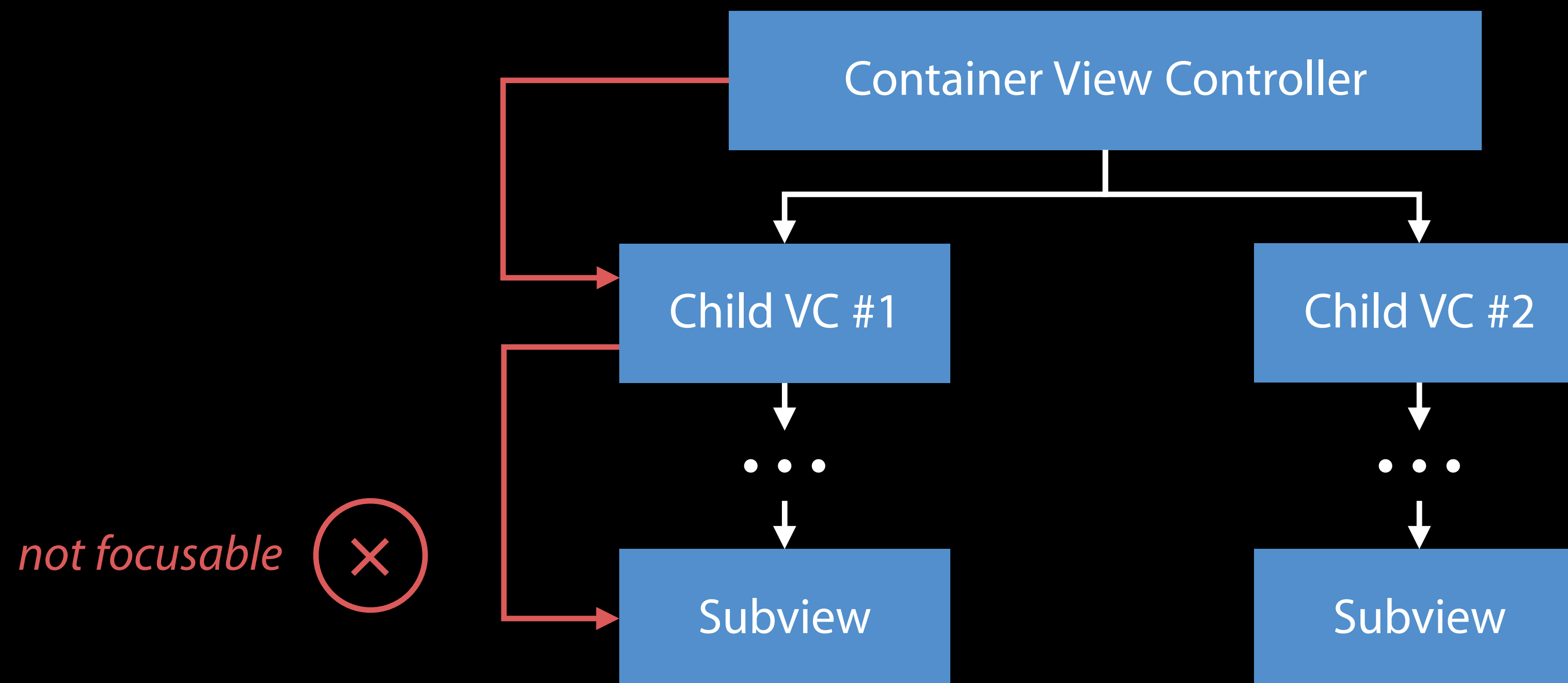
NEW



```
class ContainerViewController: UIViewController {
    override var preferredFocusEnvironments: [UIFocusEnvironment] {
        return [childVC1, childVC2]
    }
}
```

# Preferred Focus Environments

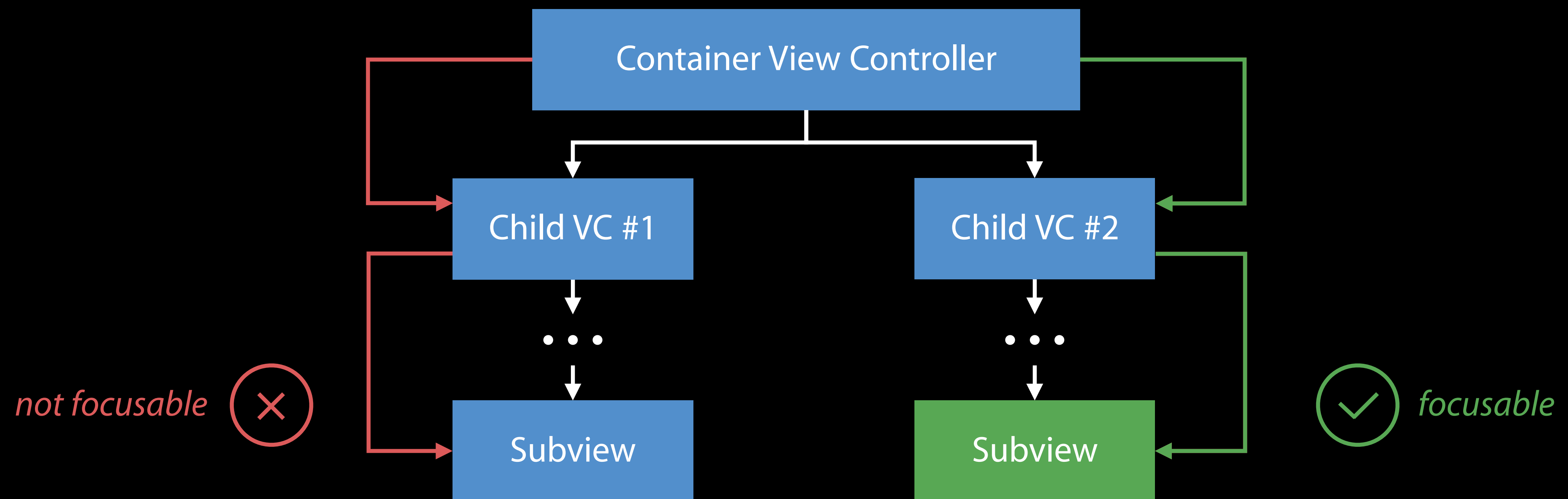
NEW



```
class ContainerViewController: UIViewController {
    override var preferredFocusEnvironments: [UIFocusEnvironment] {
        return [childVC1, childVC2]
    }
}
```

# Preferred Focus Environments

NEW



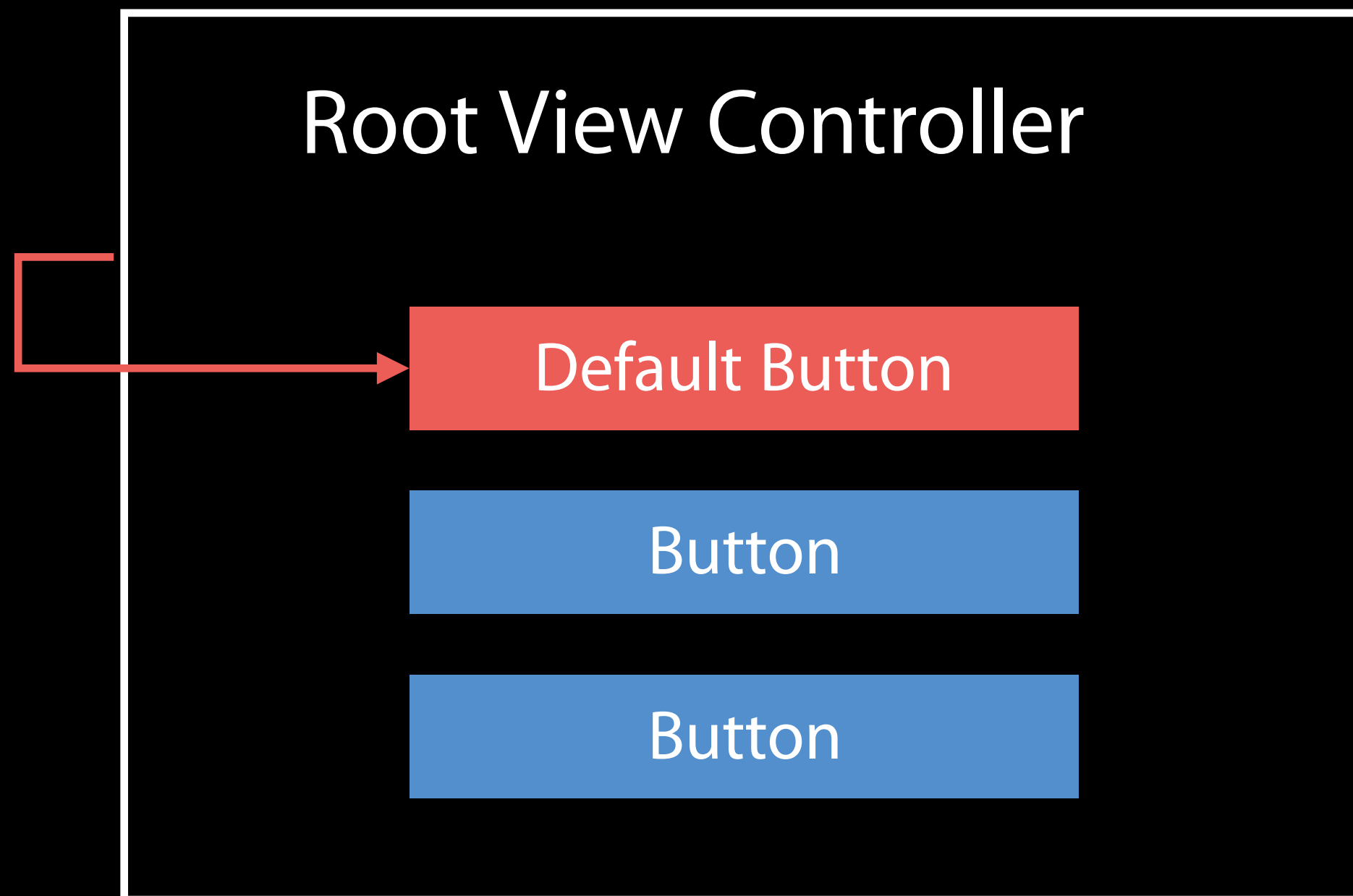
```
class ContainerViewController: UIViewController {  
    override var preferredFocusEnvironments: [UIFocusEnvironment] {  
        return [childVC1, childVC2]  
    }  
}
```

# Preferred Focus Enhancements

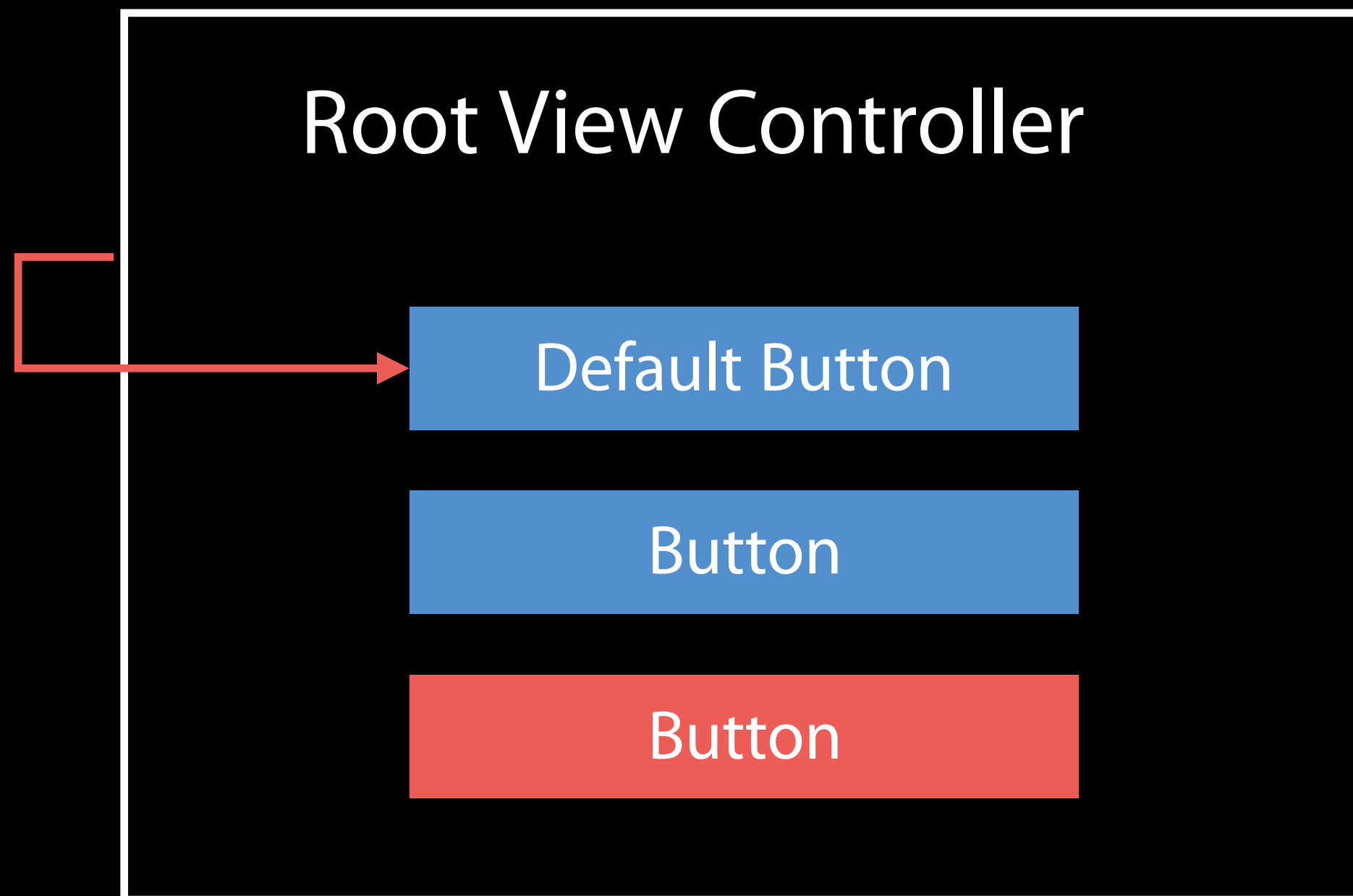
Restoring focus after transitions



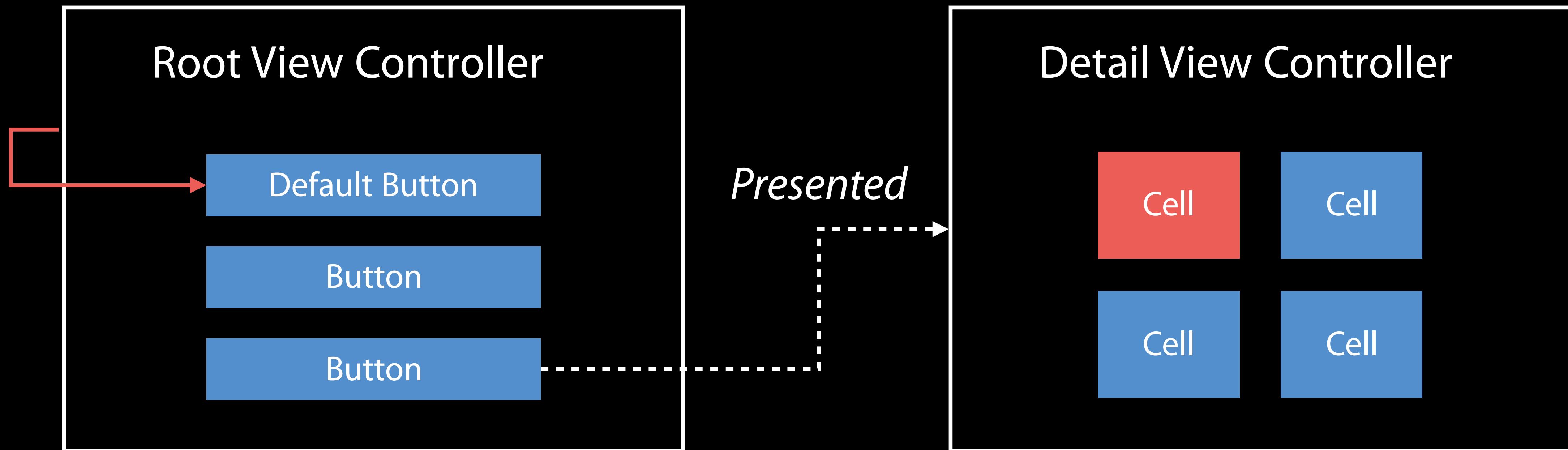
# Restoring Focus



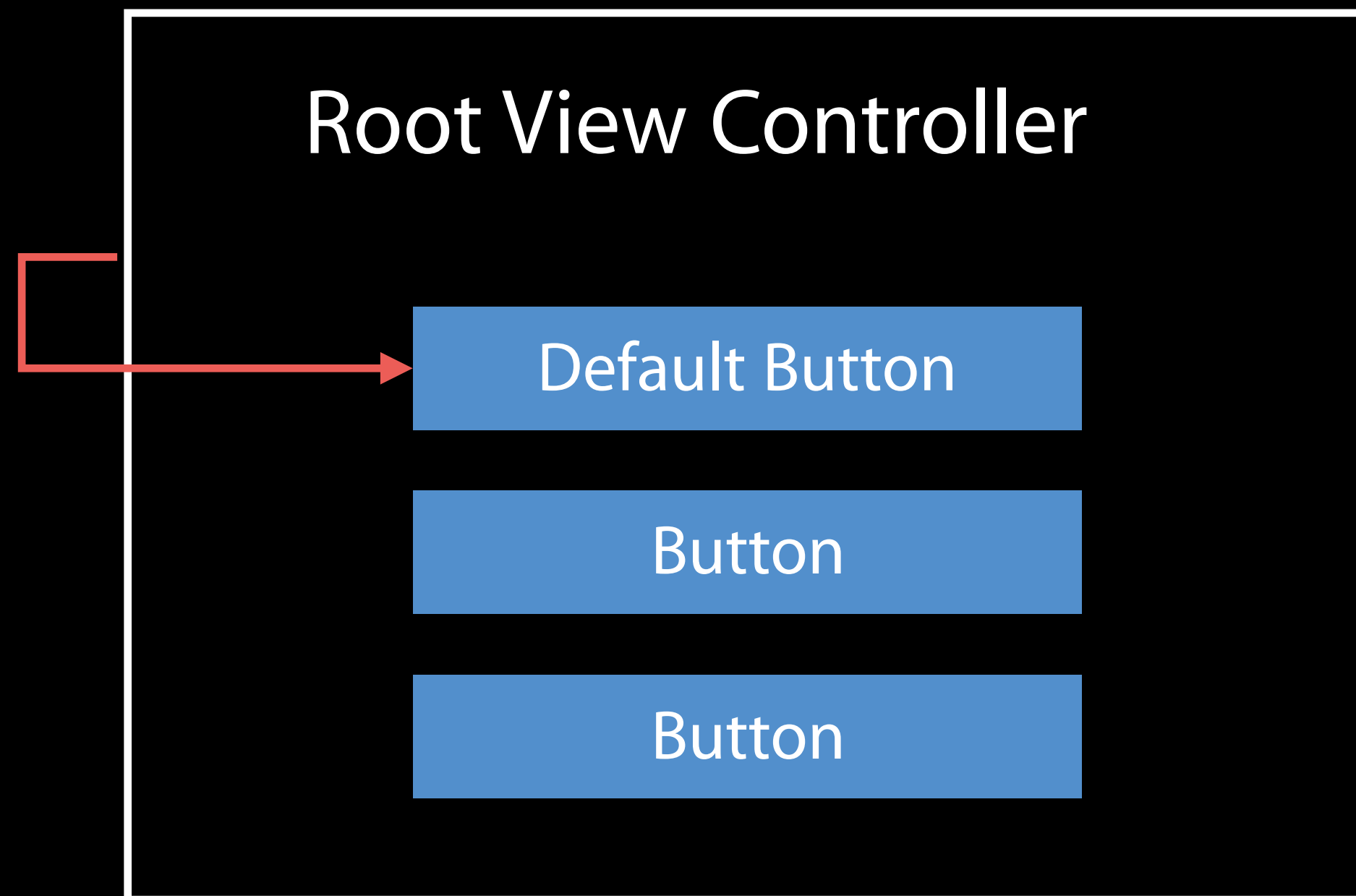
# Restoring Focus



# Restoring Focus

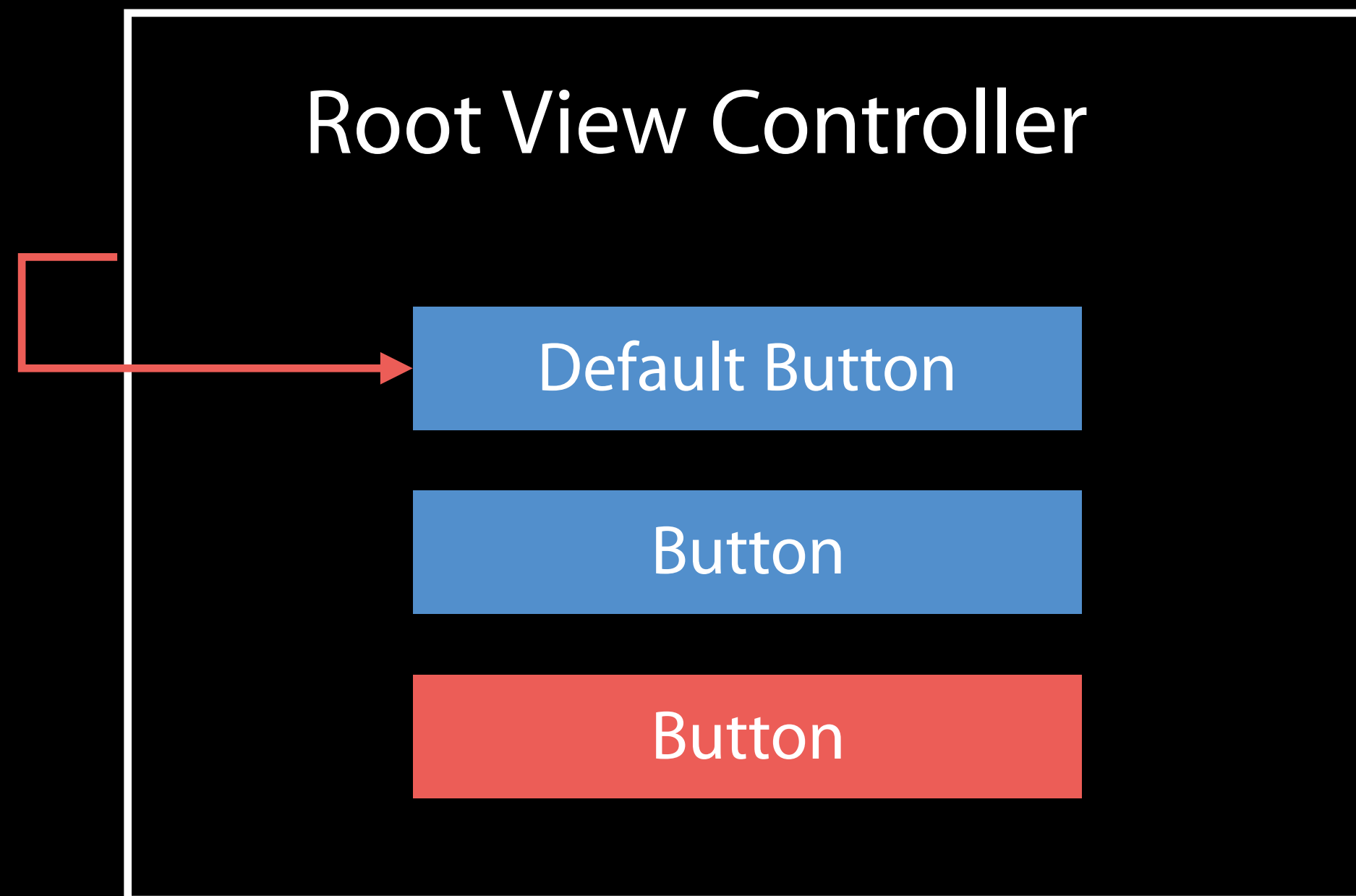


# Restoring Focus





# Restoring Focus



# Restoring Focus

New API

NEW

# Restoring Focus

New API

NEW

```
public class UIViewController : ... {  
    public var restoresFocusAfterTransition: Bool  
}
```

# Restoring Focus

New API

NEW

True by default

```
public class UIViewController : ... {  
    public var restoresFocusAfterTransition: Bool  
}
```



# Restoring Focus

NEW

New API

True by default

Affects presentation, push/pop, and tab bar selection

```
public class UIViewController : ... {  
    public var restoresFocusAfterTransition: Bool  
}
```

*Demo*

preferredFocusEnvironments and  
restoresFocusAfterTransition

Brandon Kieft tvOS Software Engineer

# Focus Interaction in SpriteKit

# Focus Interaction in SpriteKit

Use cases

# Focus Interaction in SpriteKit

Use cases

Game menus



# Focus Interaction in SpriteKit

Use cases

Game menus

Board games

# Focus Interaction in SpriteKit

Use cases

Game menus

Board games

Any “selection”-based game

# Focus Interaction in SpriteKit

Overview

NEW

# Focus Interaction in SpriteKit

NEW

Overview

Shared Focus API across UIKit and SpriteKit

# Focus Interaction in SpriteKit

NEW

Overview

Shared Focus API across UIKit and SpriteKit

Opt-in for SpriteKit



# Focus Interaction in SpriteKit

NEW

## Overview

Shared Focus API across UIKit and SpriteKit

Opt-in for SpriteKit

Seamless focus movement between views and nodes

# Focus Interaction in SpriteKit



UIView

# Focus Interaction in SpriteKit



UIView

# Focus Interaction in SpriteKit

UIView

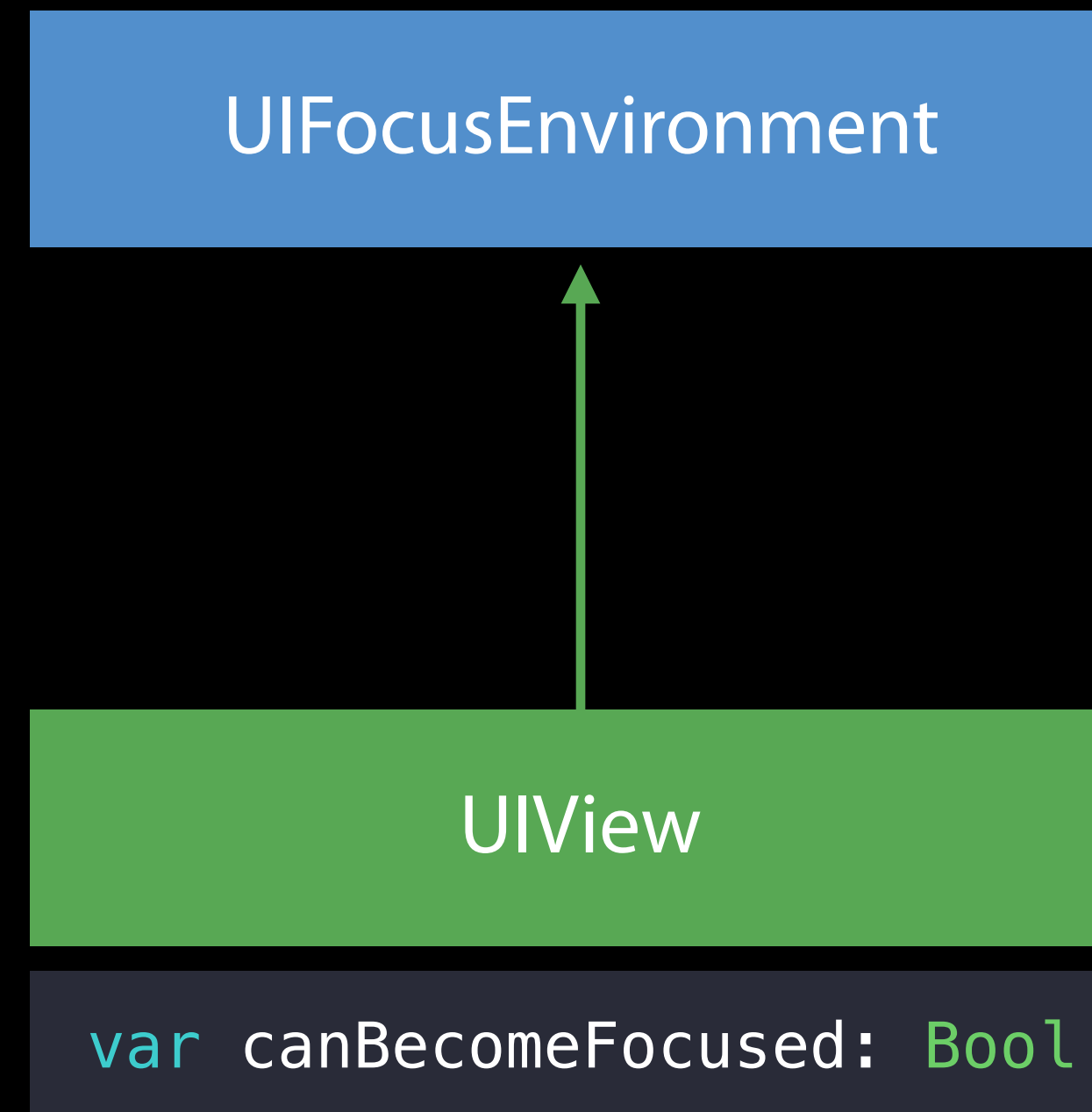
```
var canBecomeFocused: Bool
```

# Focus Interaction in SpriteKit

UIView

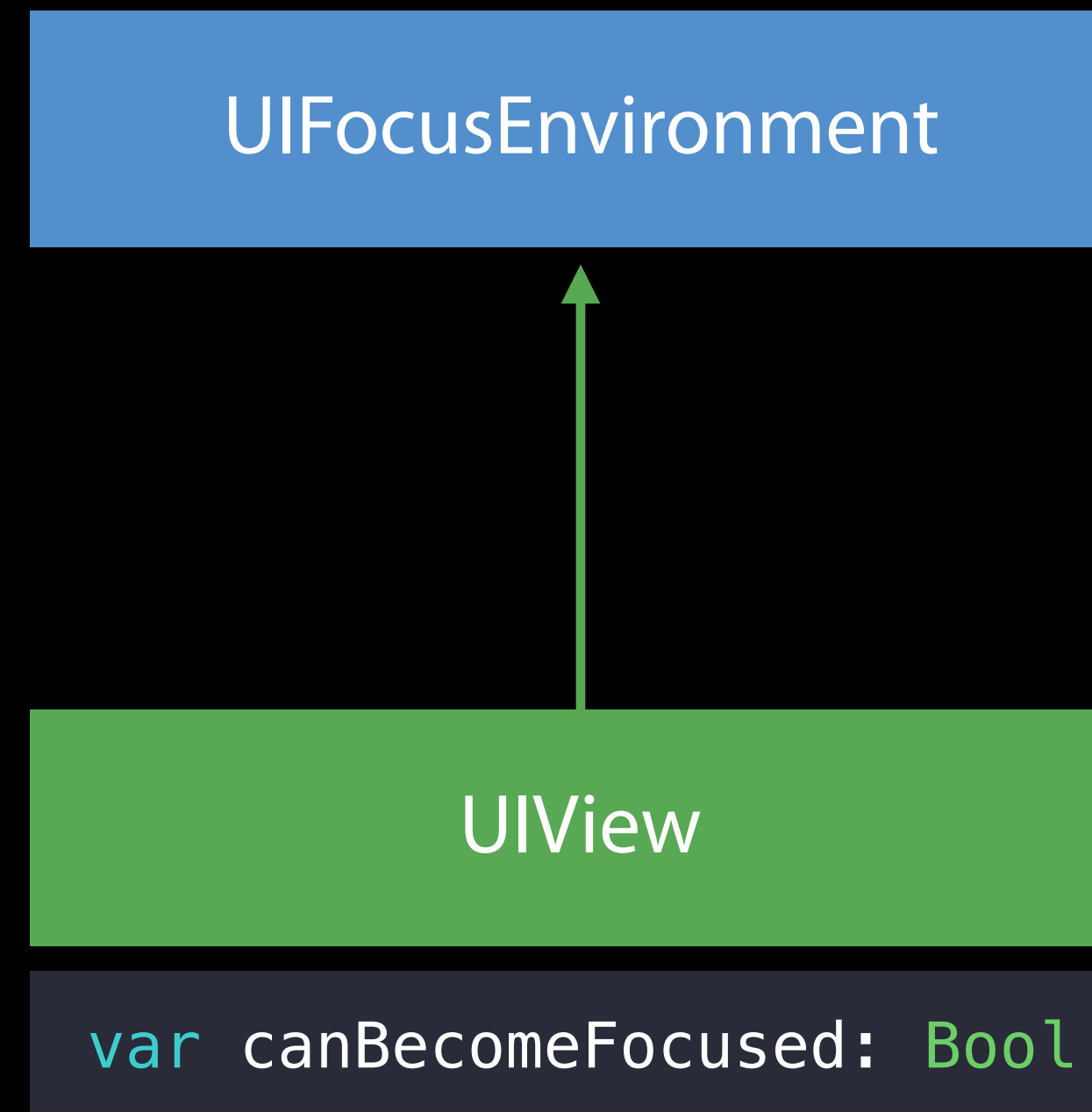
```
var canBecomeFocused: Bool
```

# Focus Interaction in SpriteKit



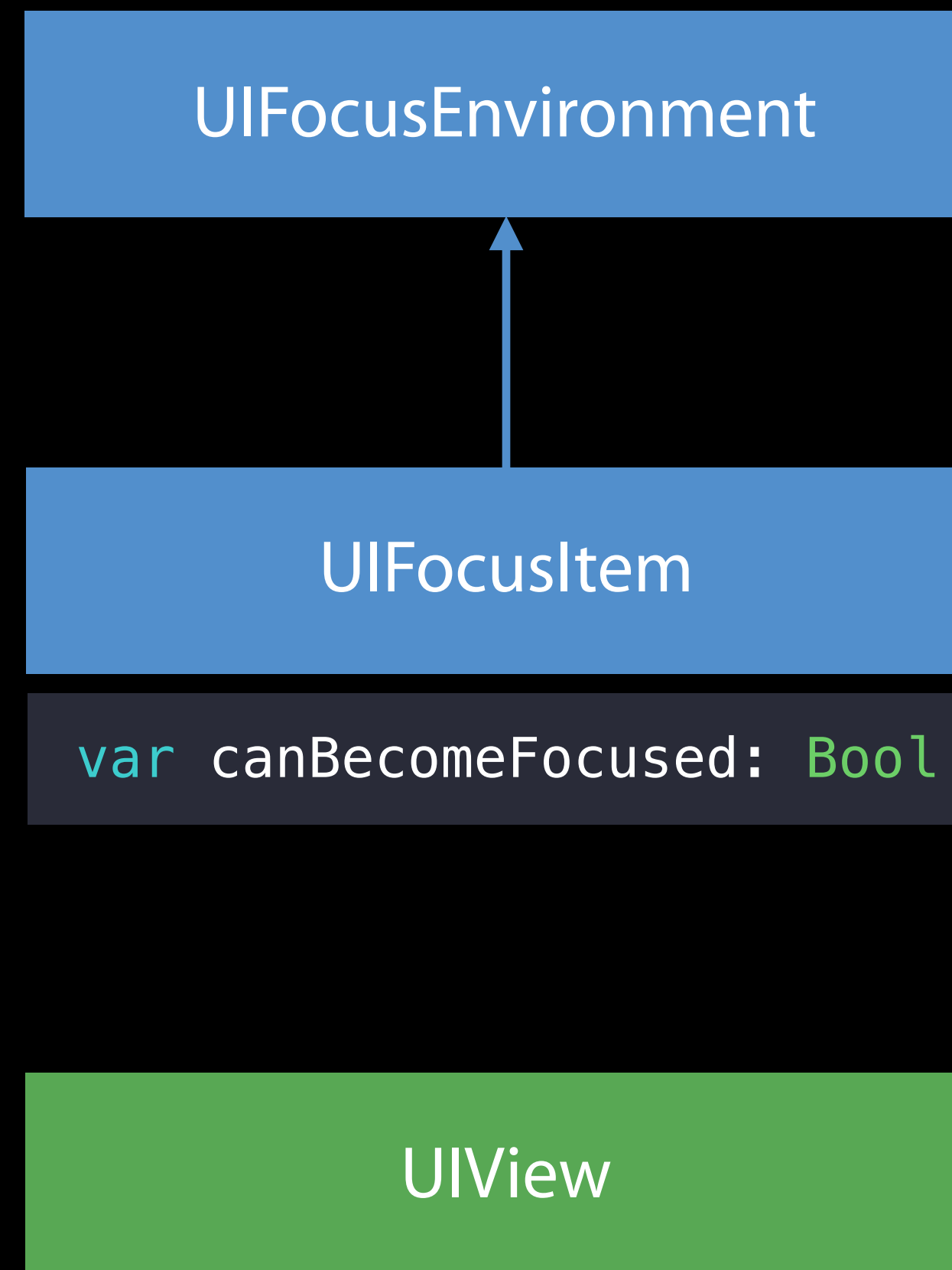


# Focus Interaction in SpriteKit



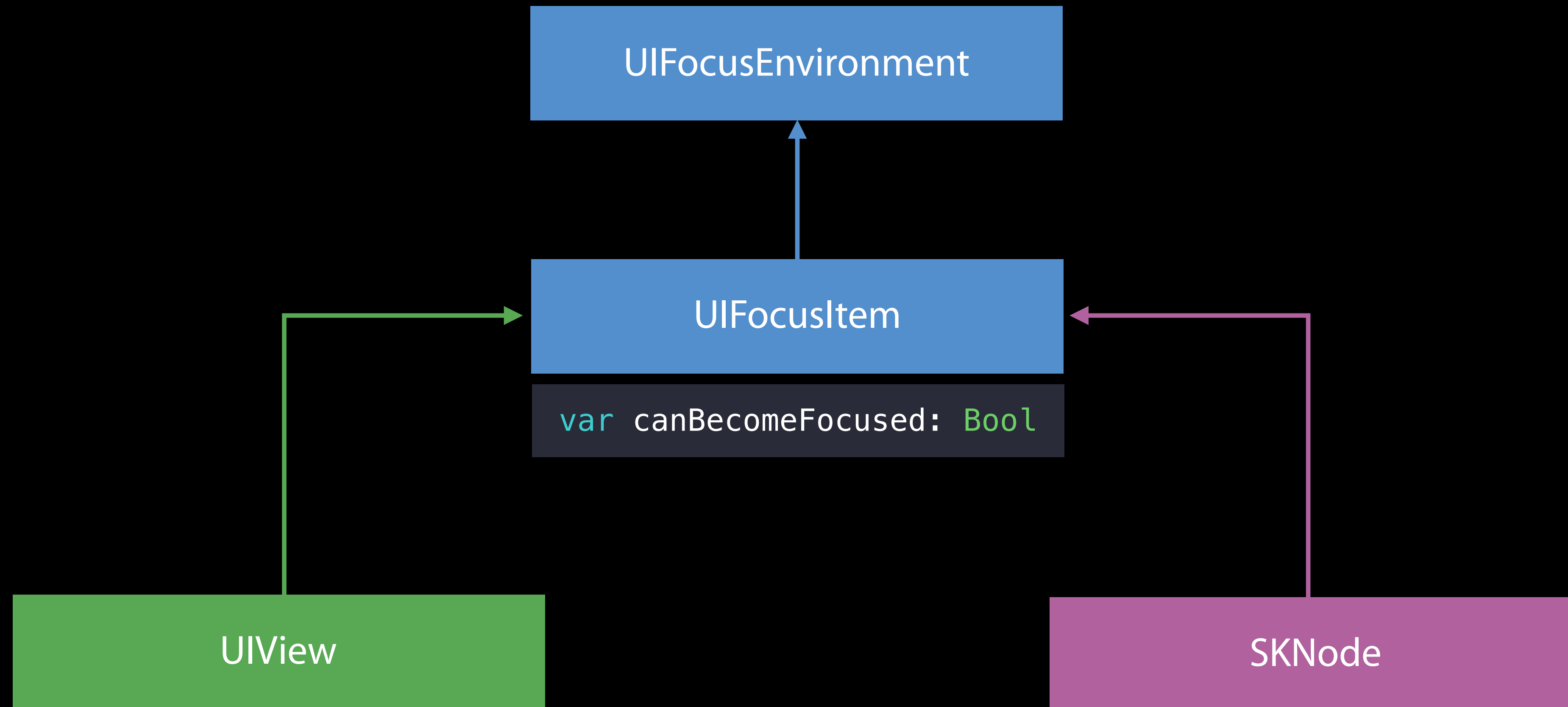
# Focus Interaction in SpriteKit

NEW



# Focus Interaction in SpriteKit

NEW



# Focus Interaction in SpriteKit

NEW

## UIFocusUpdateContext API

```
public class UIFocusUpdateContext : NSObject {  
    weak public var previouslyFocusedItem: UIFocusItem? { get }  
    weak public var nextFocusedItem: UIFocusItem? { get }  
}
```

# Focus Interaction in SpriteKit

NEW

## UIScreen API

```
public class UIScreen : NSObject {  
    weak public var focusedItem: UIFocusItem? { get }  
  
}
```





# Focus Interaction in SpriteKit

NEW

## UIFocusEnvironment API

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
  
    weak optional public var preferredFocusedView: UIView? { get }  
  
}
```

# Focus Interaction in SpriteKit

NEW

## UIFocusEnvironment API

```
public protocol UIFocusEnvironment : NSObjectProtocol {  
  
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }  
  
    weak optional public var preferredFocusedView: UIView? { get }  
  
}
```

# Focus Interaction in SpriteKit

NEW

## UIFocusEnvironment API

```
public protocol UIFocusEnvironment : NSObjectProtocol {
```

```
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }
```

```
    @available(tvOS, introduced: 9.0, deprecated: 10.0)  
    weak optional public var preferredFocusedView: UIView? { get }
```

```
}
```



# Focus Interaction in SpriteKit

Summary

# Focus Interaction in SpriteKit

## Summary

Focus API supports both UIKit and SpriteKit

# Focus Interaction in SpriteKit

## Summary

Focus API supports both UIKit and SpriteKit

UIView and SKNode conform to UIFocusItem

# Focus Interaction in SpriteKit

## Summary

Focus API supports both UIKit and SpriteKit

UIView and SKNode conform to UIFocusItem

Opt-in for SpriteKit



# Focus Interaction in SpriteKit

## Summary

Focus API supports both UIKit and SpriteKit

UIView and SKNode conform to UIFocusItem

Opt-in for SpriteKit

No changes required for UIKit-only apps

# Focus Interaction in SpriteKit

## Summary

Focus API supports both UIKit and SpriteKit

UIView and SKNode conform to UIFocusItem

Opt-in for SpriteKit

No changes required for UIKit-only apps

# Case Study

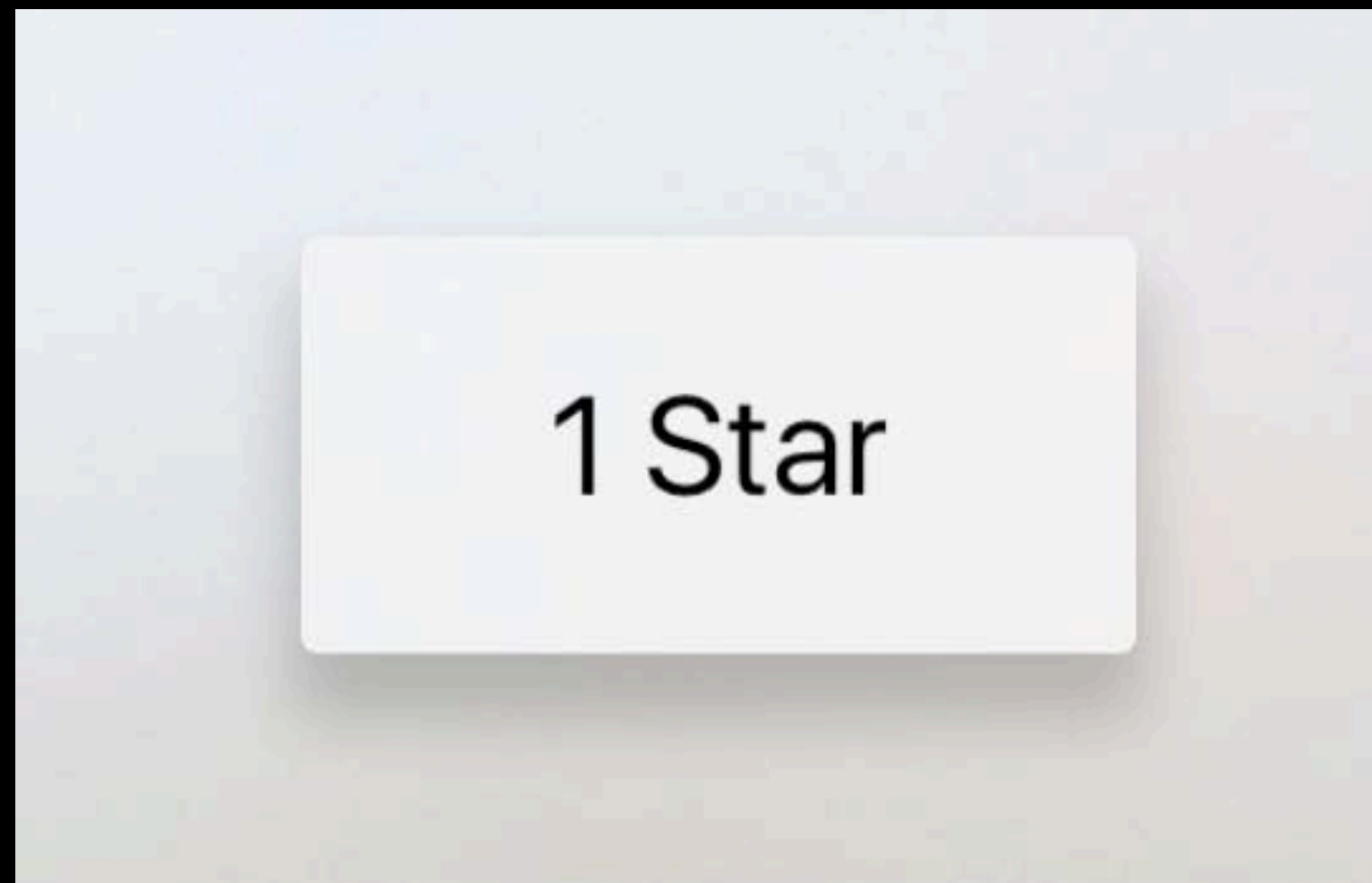
Building a custom control

# Building a Custom Control

Five star rating control

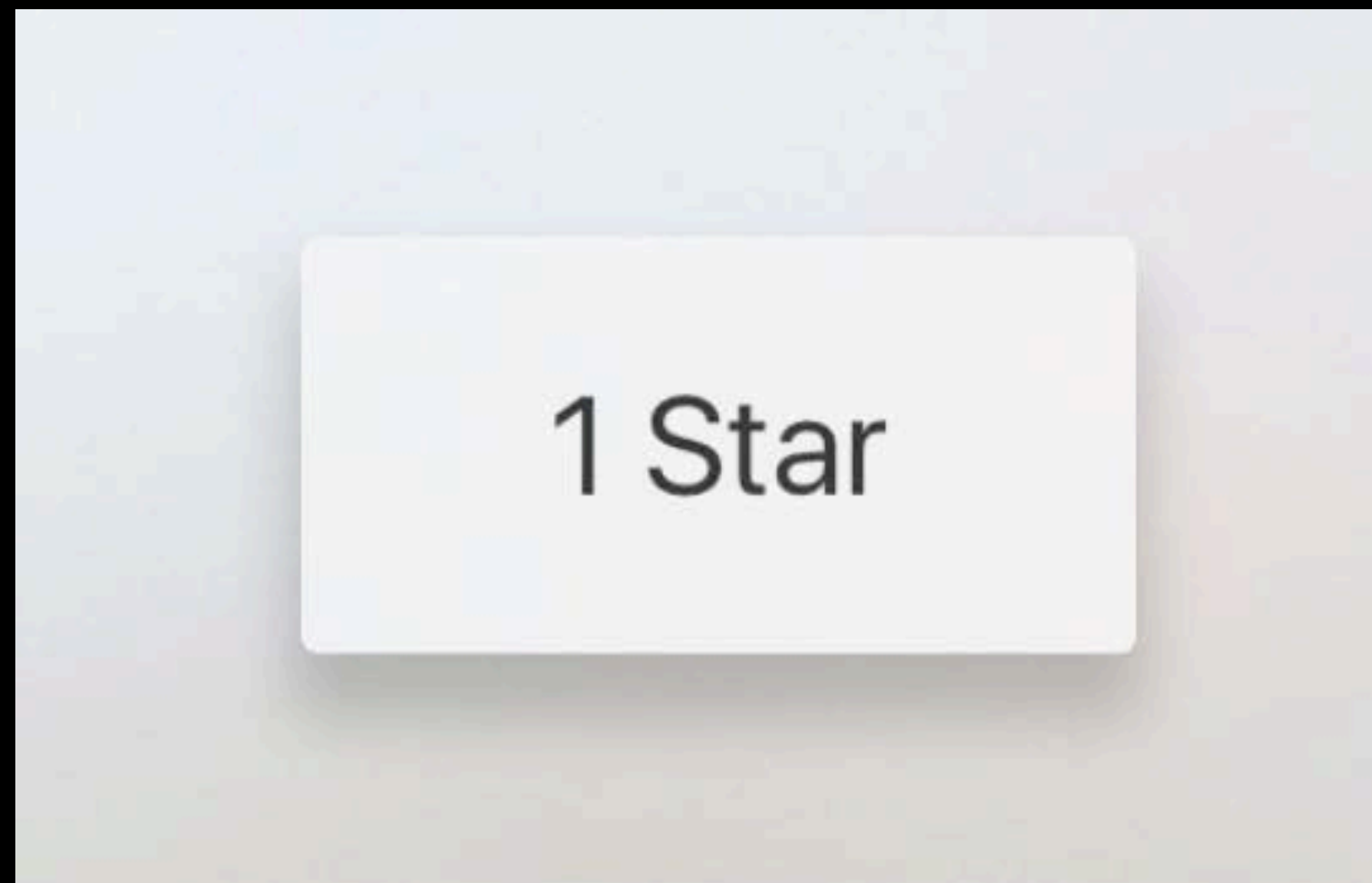
# Building a Custom Control

Five star rating control



# Building a Custom Control

Five star rating control



# Building a Custom Control

Five star rating control

1 Star



# *Demo*

Building a custom control

Brandon Kieft tvOS Software Engineer



# Building a Custom Control

Recommendations

# Building a Custom Control

Recommendations

Subclass UIControl

# Building a Custom Control

## Recommendations

Subclass UIControl

Use the focus animation coordinator

# Building a Custom Control

## Recommendations

Subclass UIControl

Use the focus animation coordinator

Use motion effects

# Building a Custom Control

Testing

# Building a Custom Control

## Testing

Input devices have different capabilities

# Building a Custom Control

## Testing

Input devices have different capabilities

Test using different input devices

# Building a Custom Control

## Testing

Input devices have different capabilities

Test using different input devices

Test with accessibility



# Summary

# Summary

Preferred focus enhancements

# Summary

Preferred focus enhancements

Focus interaction support for SpriteKit

# Summary

Preferred focus enhancements

Focus interaction support for SpriteKit

Building a custom, focusable control

# Focus-Driven Interfaces with UIKit

Apple TV Tech Talks 2016

Covers the basics

In-depth Focus API overview

Best practices

Tools and debugging support

<https://developer.apple.com/videos/techtalks-apple-tv/>

More Information

<https://developer.apple.com/wwdc16/215>

# Related Sessions

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What's New in tvOS

Presidio

Tuesday 3:00PM

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Mastering UIKit on tvOS

Presidio

Wednesday 10:00AM

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What's New in SpriteKit

Presidio

Thursday 5:00PM

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# Labs

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tvOS Lab

Frameworks Lab D Thursday 9:00AM

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