Developer Tools

#WWDC17

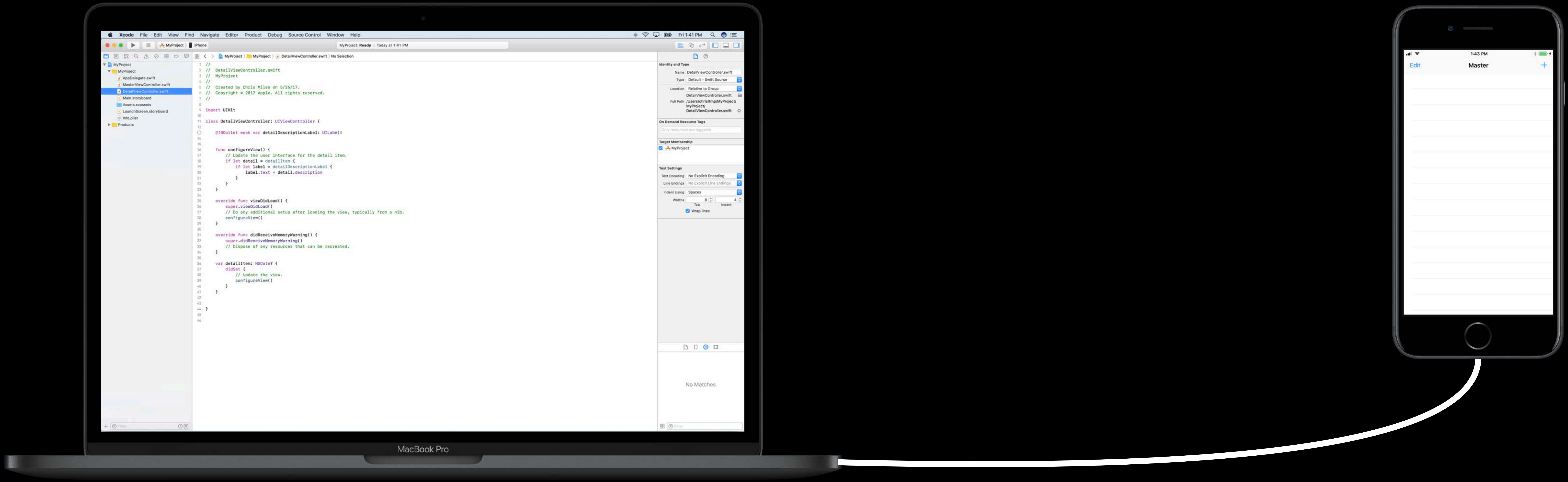
Debugging with Xcode 9

Session 404

Chris Miles, Xcode Engineering Manager
Breckin Loggins, Xcode Device Support Engineer
Sebastian Fischer, Xcode UI Engineer

Development: Unplugged

Chris Miles, Xcode Engineering Manager



```swift
//
//  DetailViewController.swift
//  MyProject
//
//  Created by Chris Miles on 5/26/17.
//  Copyright © 2017 Apple. All rights reserved.
//

import UIKit

class DetailViewController: UIViewController {

    @IBOutlet weak var detailDescriptionLabel: UILabel!


    func configureView() {
        // Update the user interface for the detail item.
        if let detail = detailItem {
            if let label = detailDescriptionLabel {
                label.text = detail.description
            }
        }
    }

    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
        configureView()
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

    var detailItem: NSDate? {
        didSet {
            // Update the view.
            configureView()
        }
    }


}
```

Identity and Type

Name: DetailViewController.swift

Type: Default - Swift Source

Location: Relative to Group

DetailViewController.swift

Full Path: /Users/chris/tmp/MyProject/MyProject/DetailViewController.swift

On Demand Resource Tags

Only resources are taggable

Target Membership

☑ MyProject

Text Settings

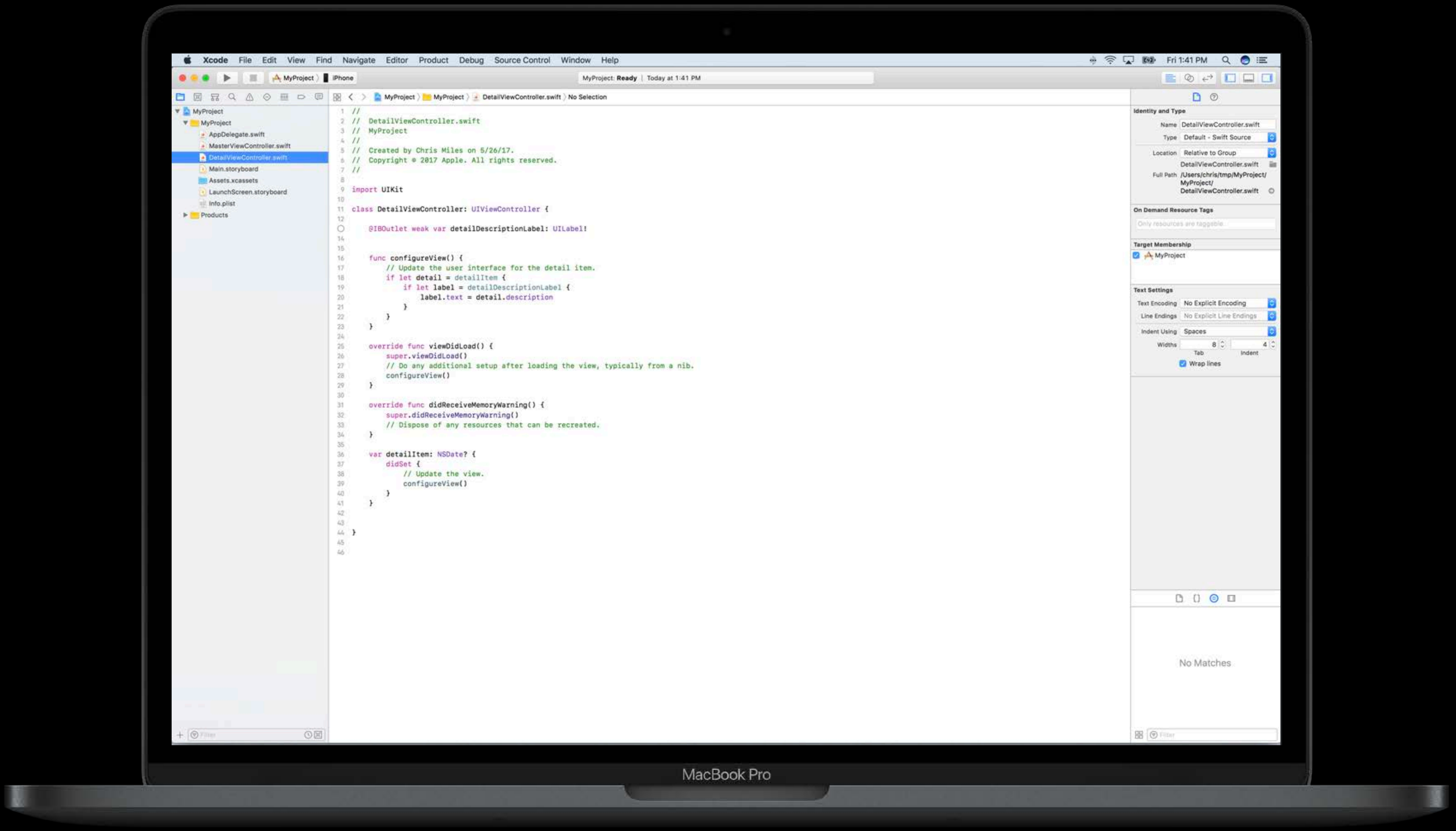
Text Encoding: No Explicit Encoding

Line Endings: No Explicit Line Endings

Indent Using: Spaces

Widths: 8 Tab, 4 Indent

☑ Wrap lines



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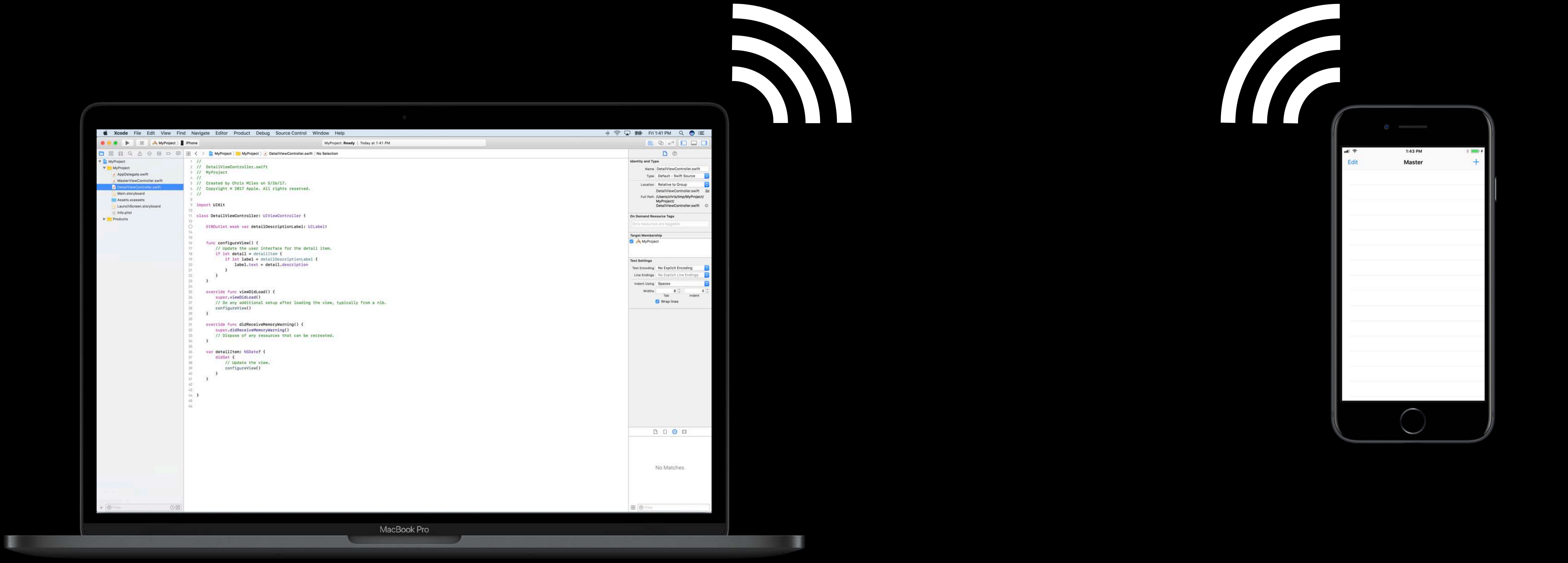
Wireless Development

NEW



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Wireless Development

Who is it for?

Wireless Development

Who is it for?

AR, VR, and camera app developers

Wireless Development

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AR, VR, and camera app developers

Motion-sensing and fitness app developers

Wireless Development

Who is it for?

AR, VR, and camera app developers

Motion-sensing and fitness app developers

Accessory makers

Wireless Development

Who is it for?

AR, VR, and camera app developers

Motion-sensing and fitness app developers

Accessory makers

Developer convenience

Wireless Development

Wireless Development

Wireless Development

Minimum requirements

iPhone, iPad, or iPod Touch running iOS 11

Apple TV running tvOS 11

macOS 10.12.4+

Wireless Development

Tools support

iOS/tvOS:

- Xcode
- Instruments
- Accessibility Inspector
- Console[1]
- Configurator

[1] Requires macOS 10.13

Wireless Development

Tools support

iOS/tvOS:

- Xcode
- Instruments
- Accessibility Inspector
- Console[1]
- Configurator

tvOS only:

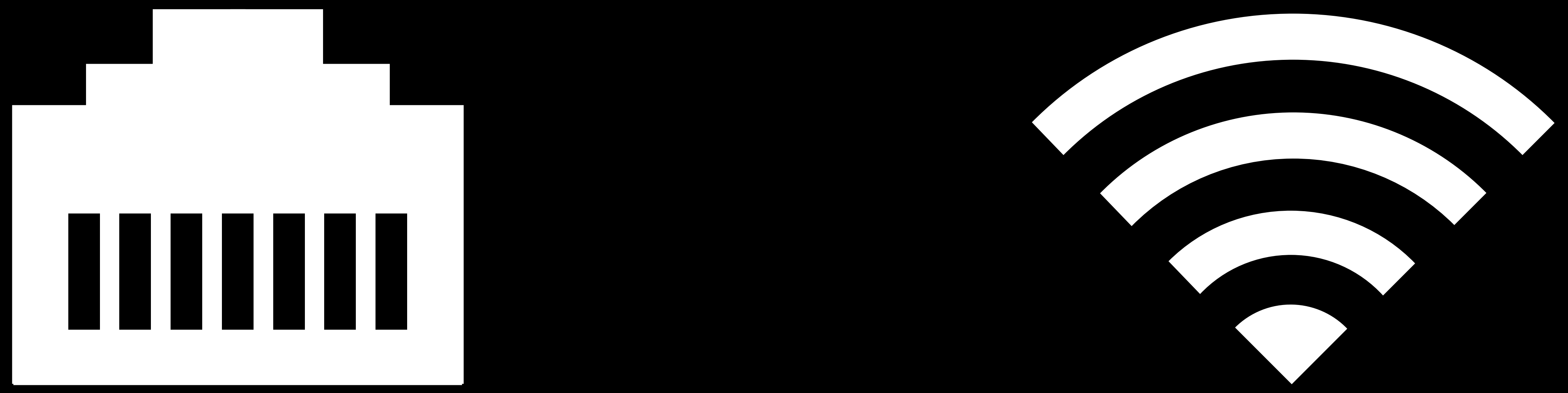
- Safari Web Inspector for TVMLKit
- QuickTime Screen Recording[1]

[1] Requires macOS 10.13

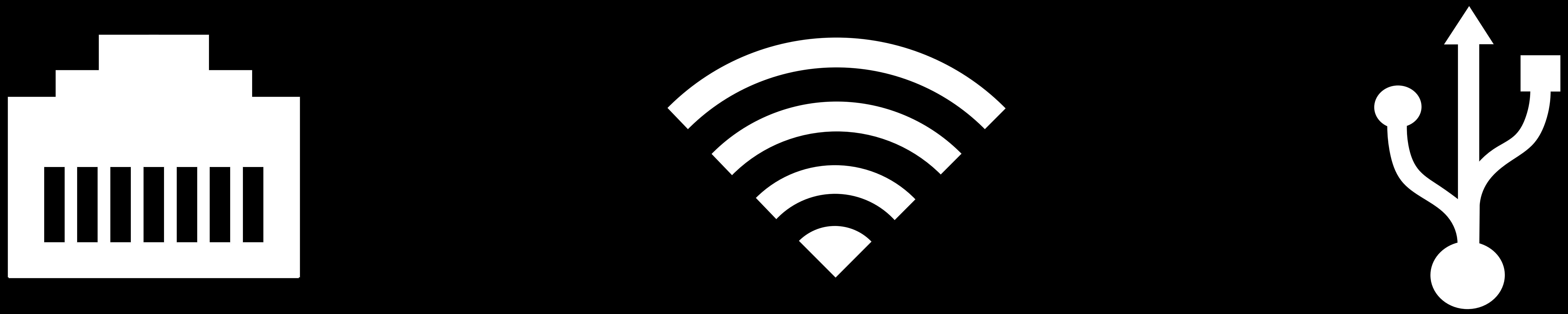
Device Connectivity

Device Connectivity

Device Connectivity



Device Connectivity



Wireless Development

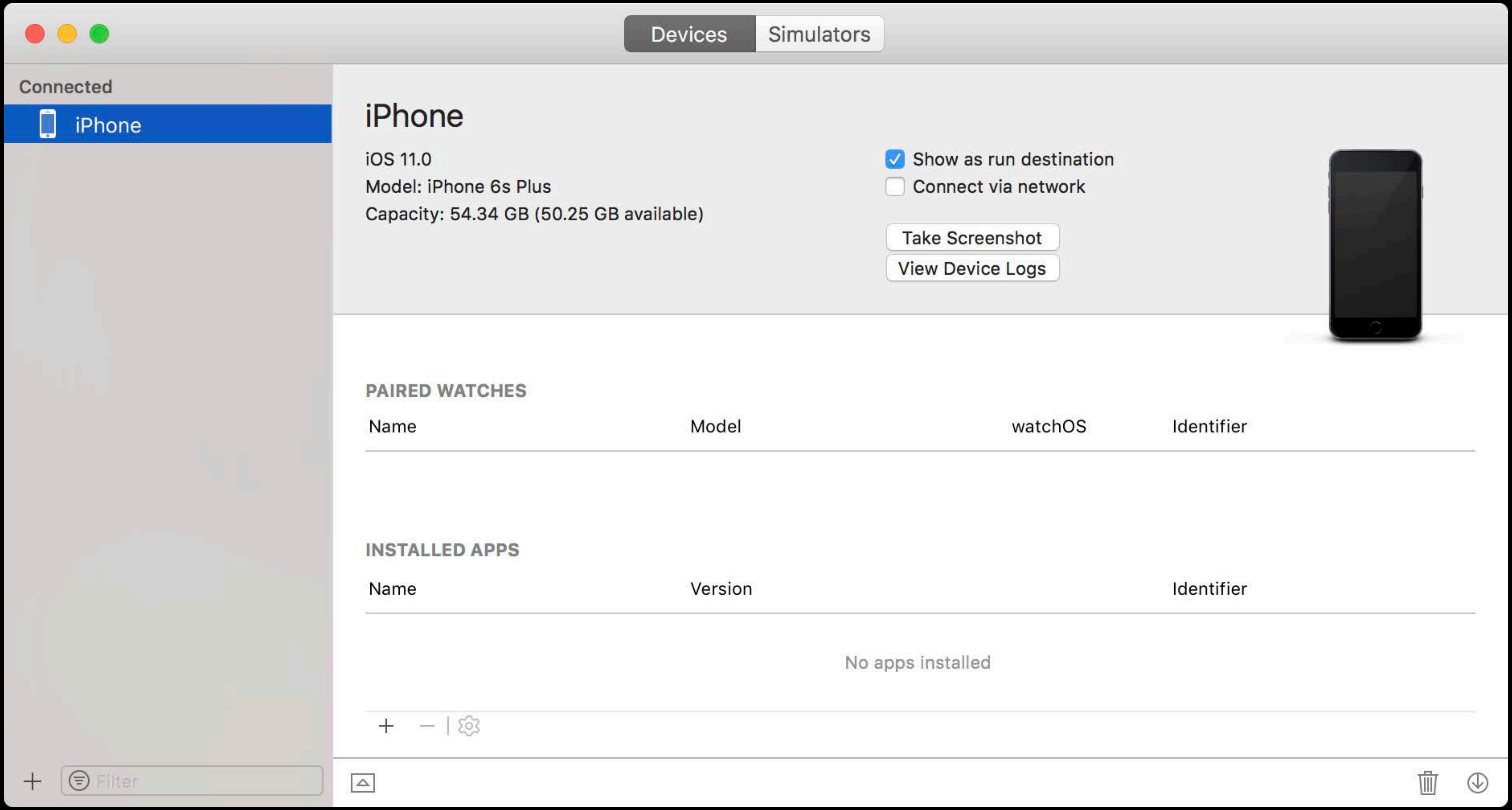
Device pairing and workflow

Breckin Loggins, Xcode Device Support Engineer

Wireless Development

iOS device pairing

NEW



iPhone

iOS 11.0
Model: iPhone 6s Plus
Capacity: 54.34 GB (50.25 GB available)

☑ Show as run destination
□ Connect via network

PAIRED WATCHES

Name	Model	watchOS	Identifier

INSTALLED APPS

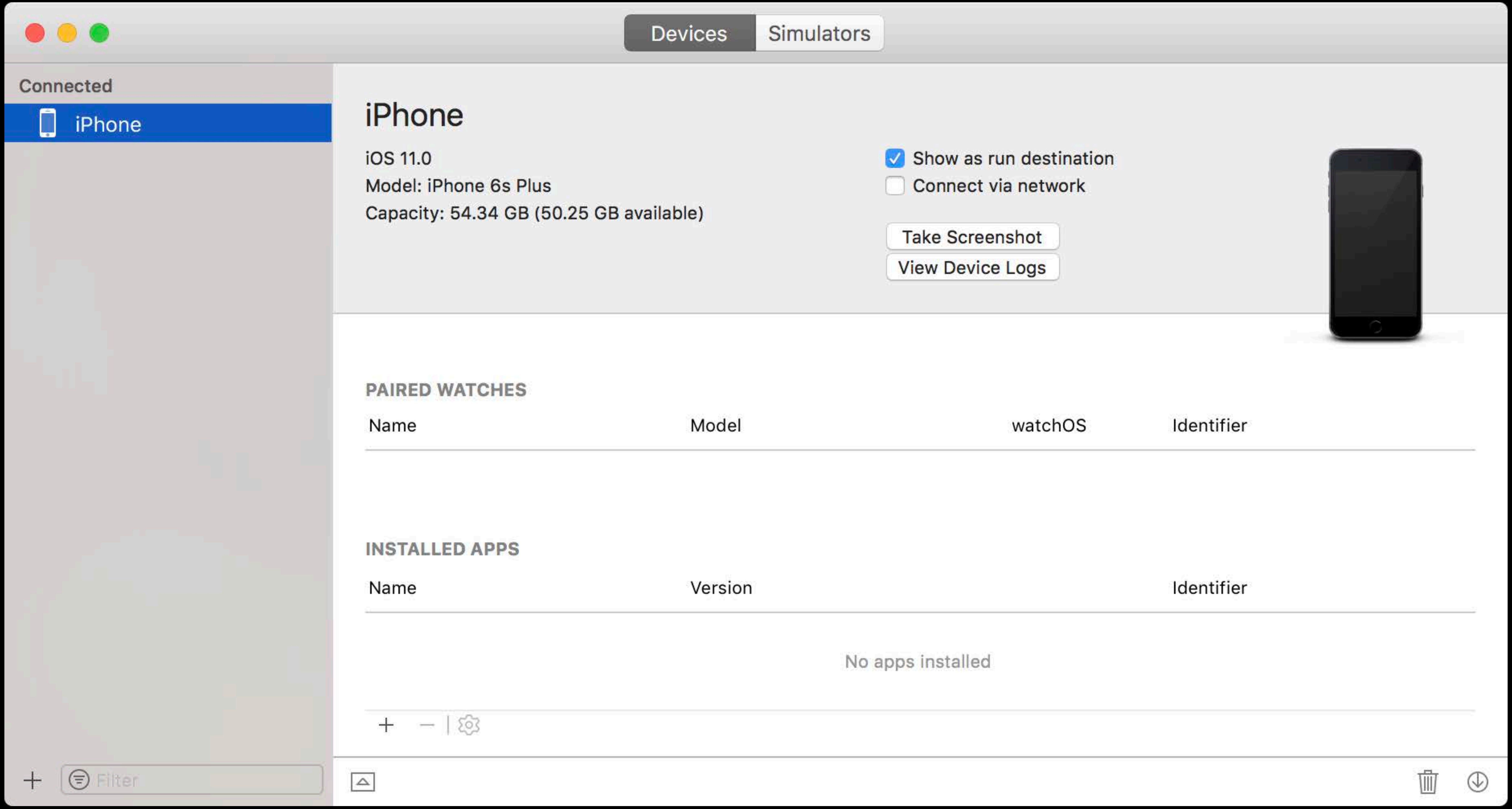
Name	Version	Identifier

No apps installed

Wireless Development

iOS device pairing

NEW



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Wireless Development

iOS device pairing

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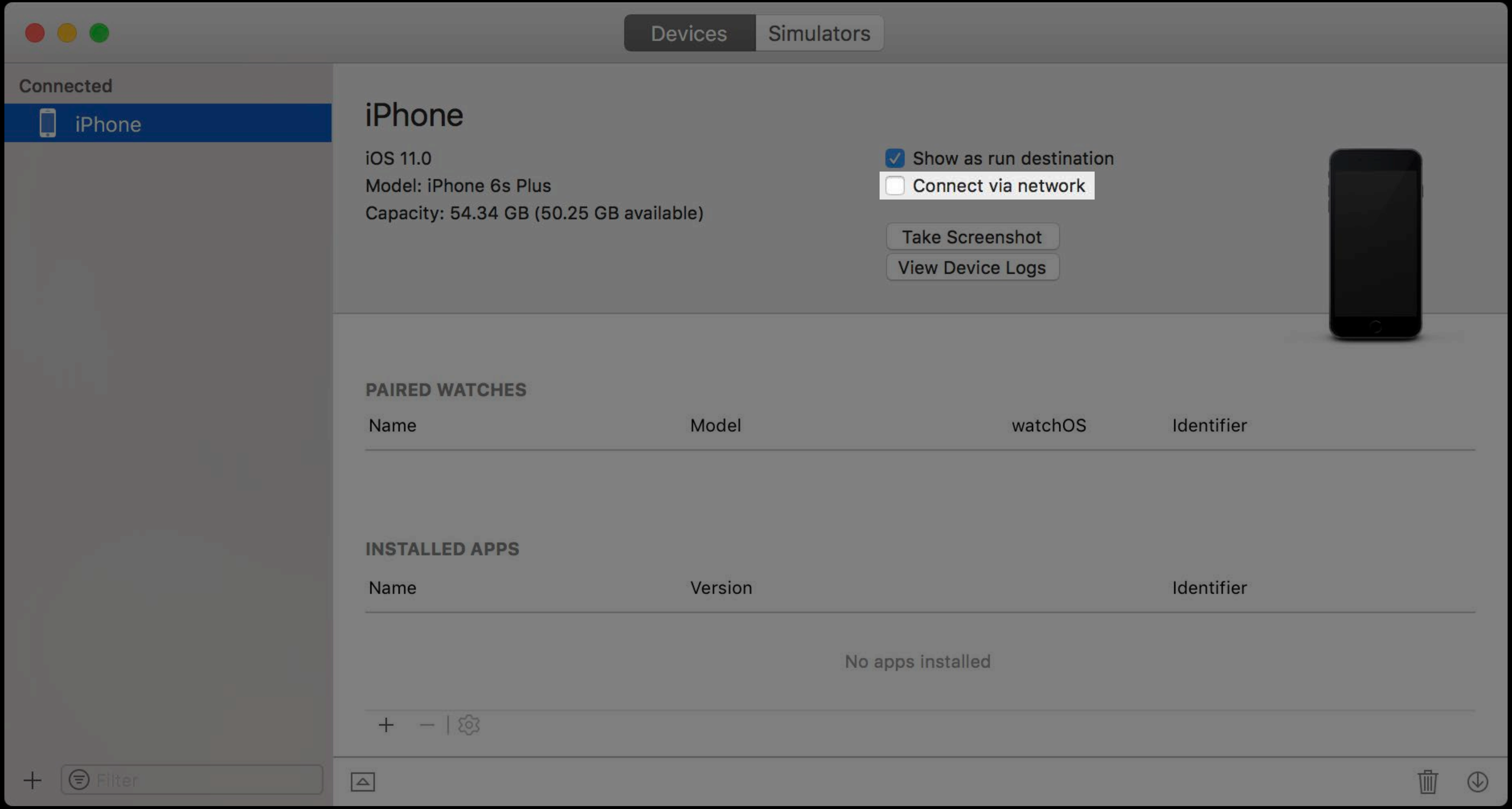

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Wireless Development

iOS device pairing

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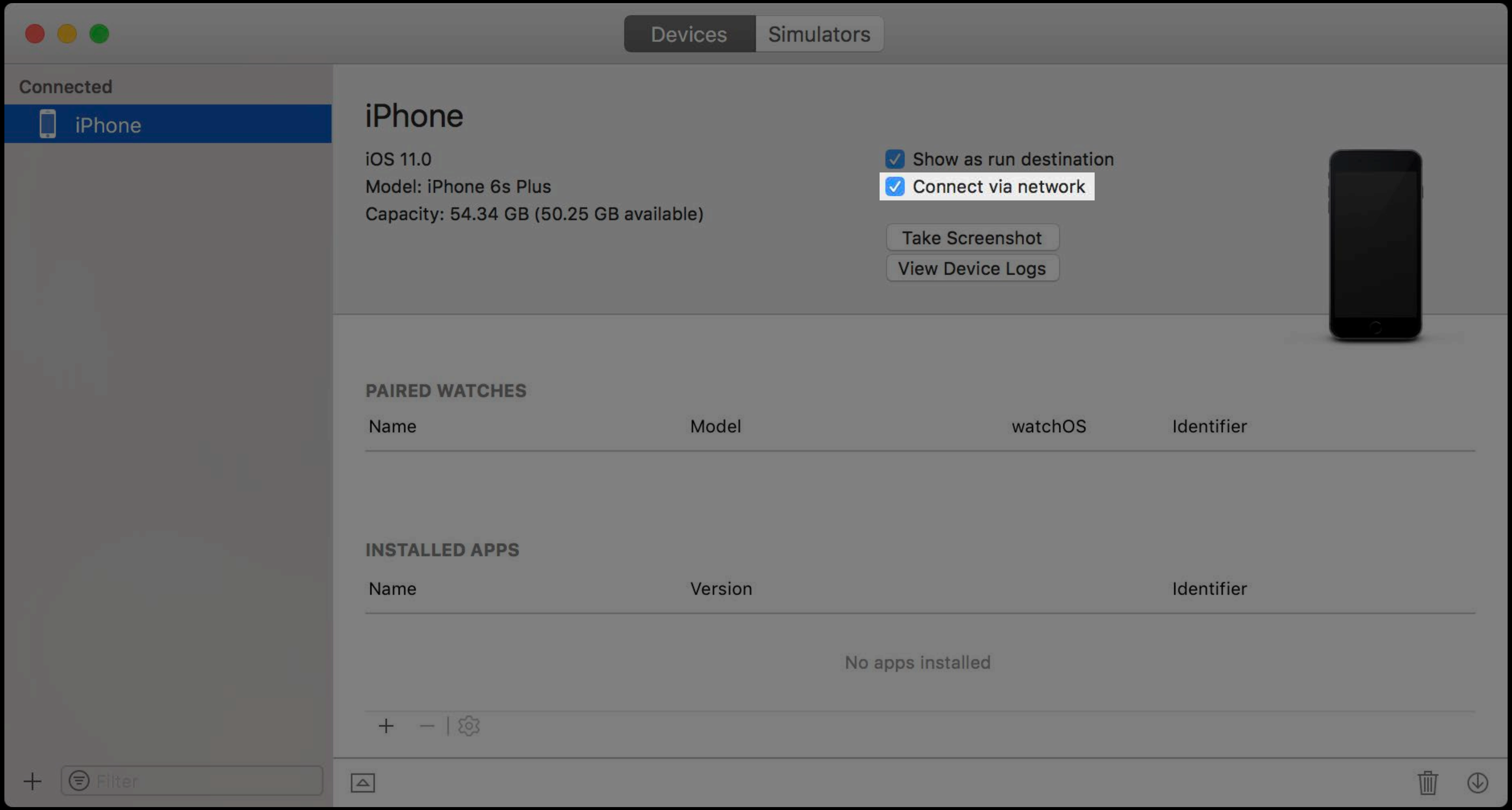

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iOS device pairing

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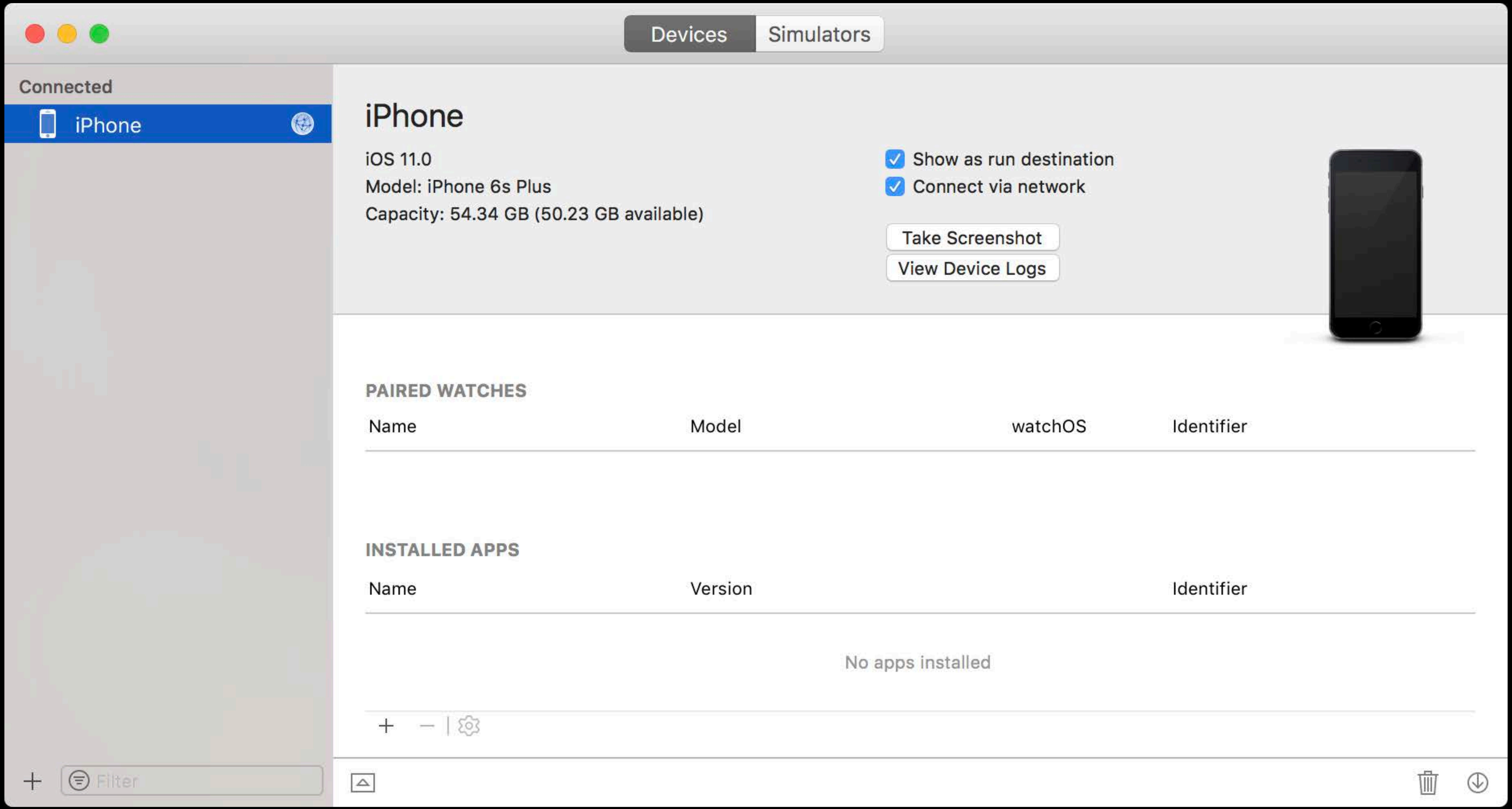

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Wireless Development

iOS device pairing

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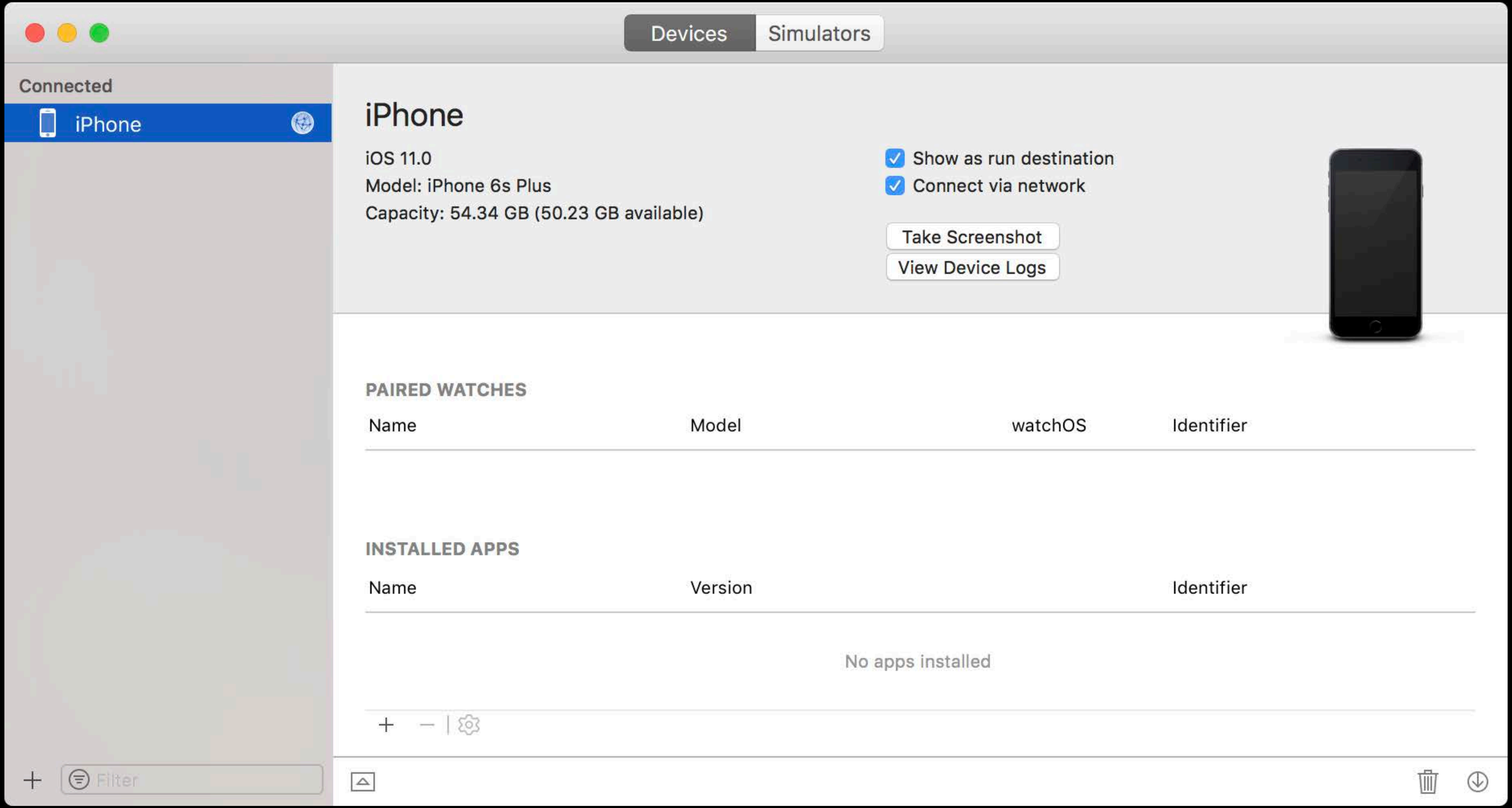

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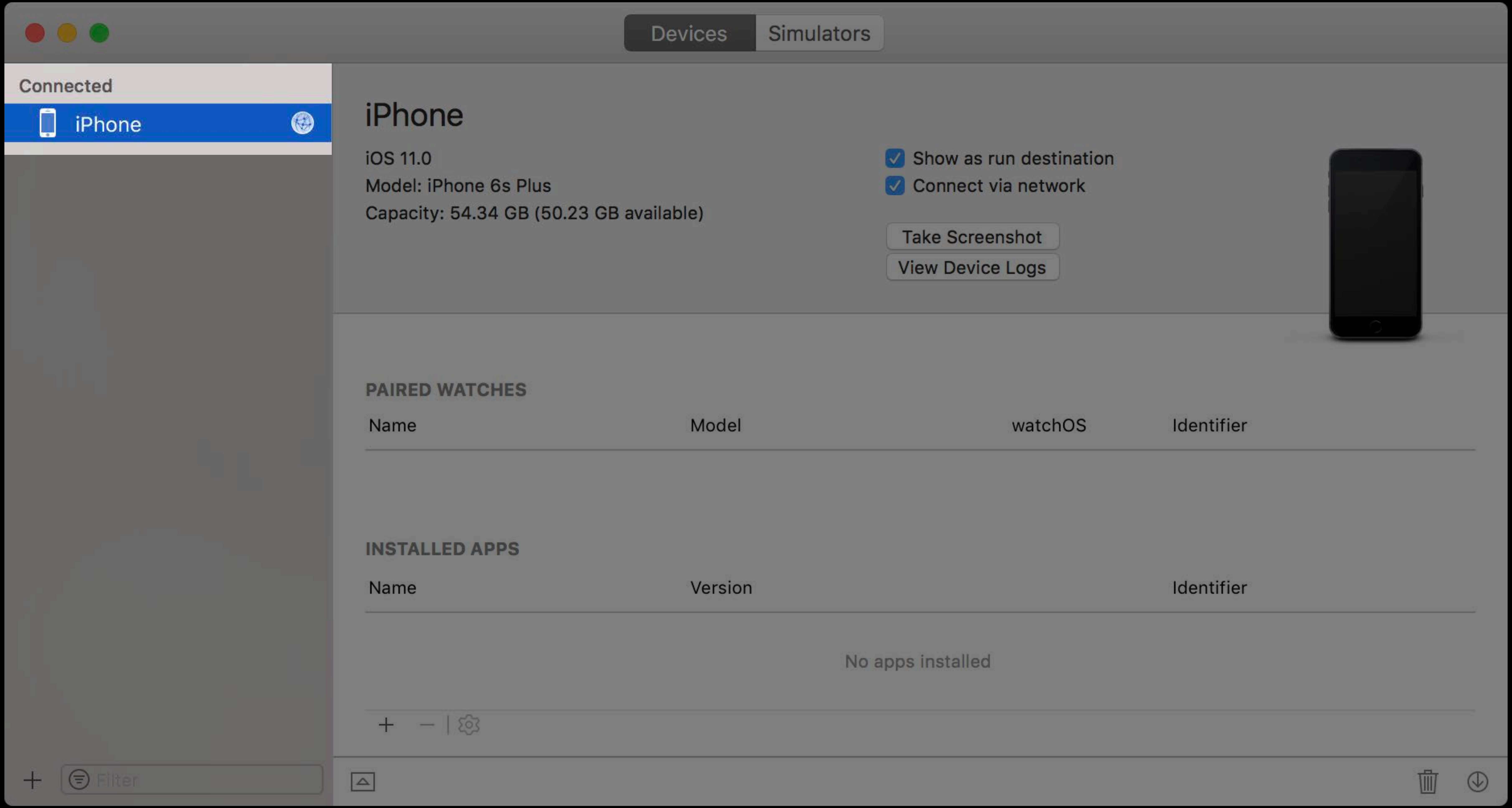

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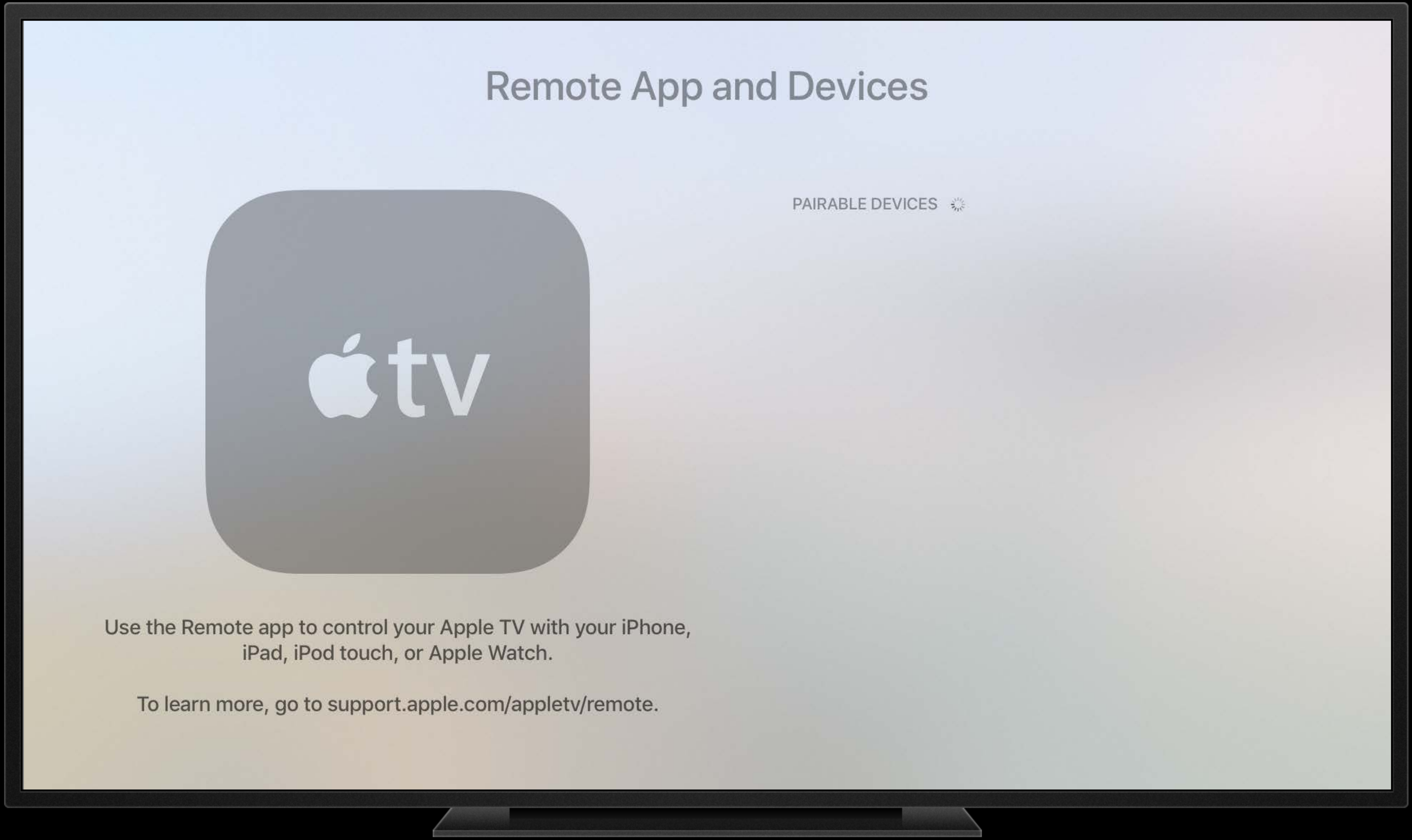


Remote App and Devices

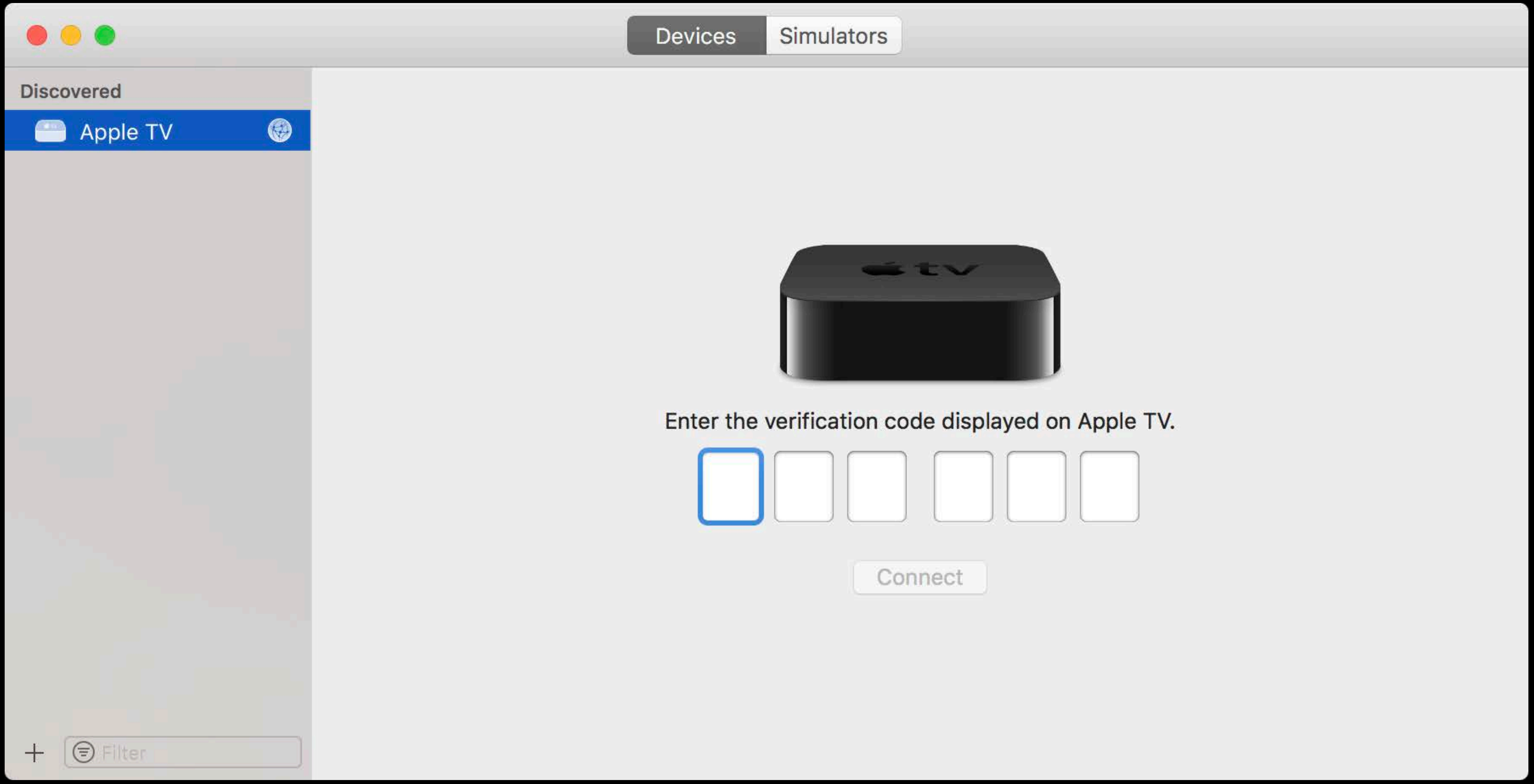
PAIRABLE DEVICES

Use the Remote app to control your Apple TV with your iPhone, iPad, iPod touch, or Apple Watch.

To learn more, go to support.apple.com/appletv/remote.

Wireless Development

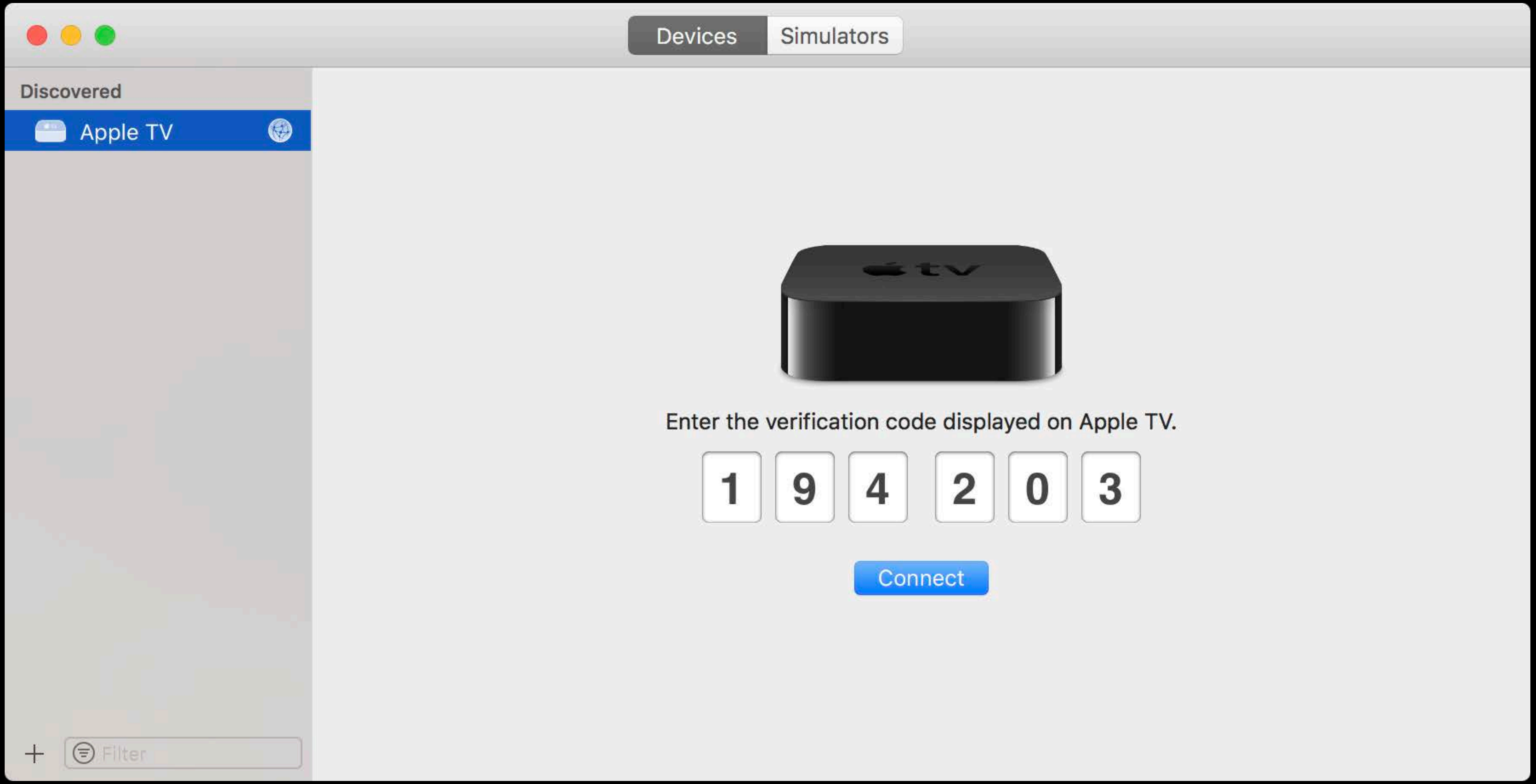
tvOS device pairing



Enter the verification code displayed on Apple TV.

Wireless Development

tvOS device pairing

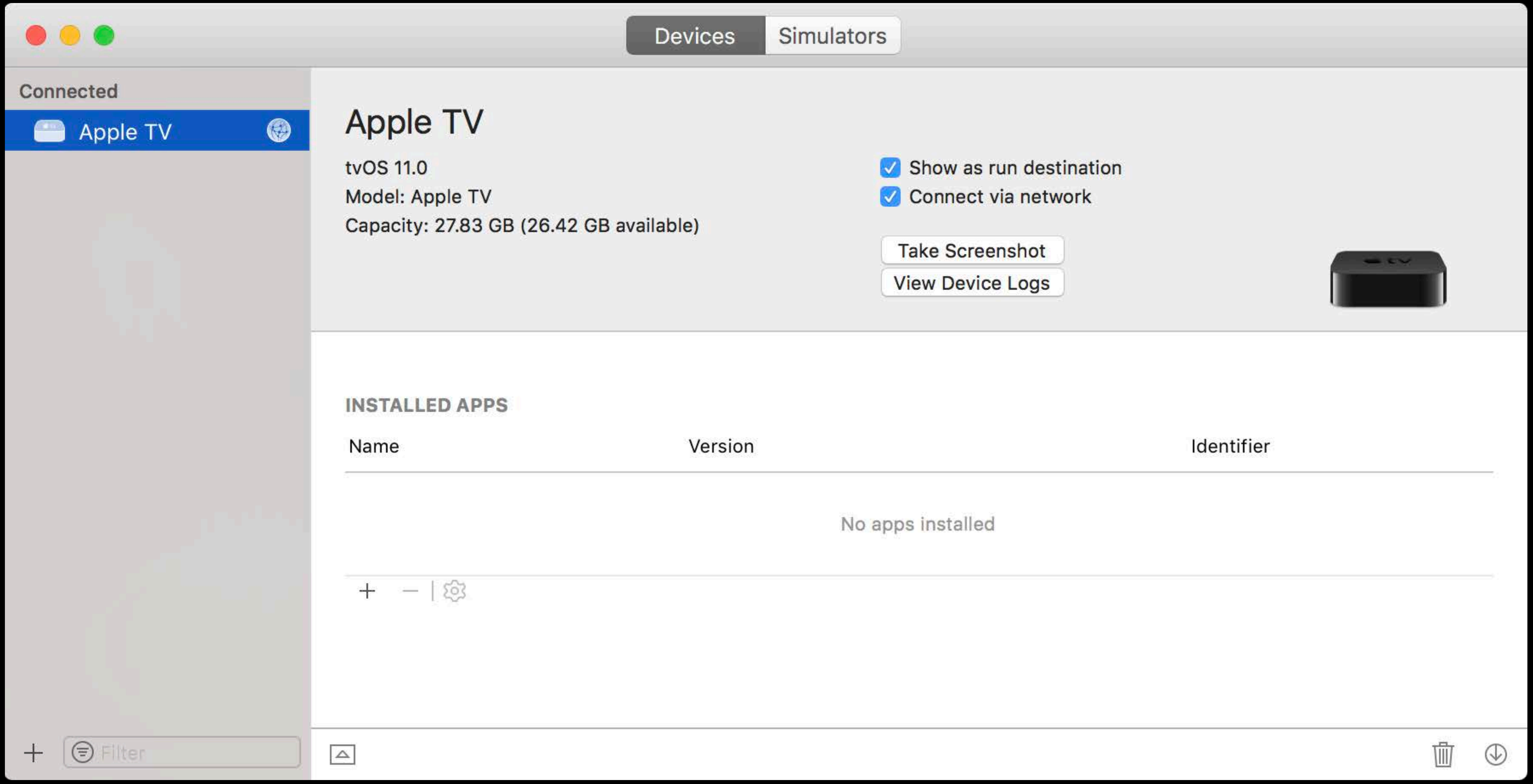


Enter the verification code displayed on Apple TV.

1 9 4 2 0 3

Wireless Development

tvOS device pairing



Apple TV

tvOS 11.0
Model: Apple TV
Capacity: 27.83 GB (26.42 GB available)

☑ Show as run destination
☑ Connect via network

INSTALLED APPS

Name	Version	Identifier

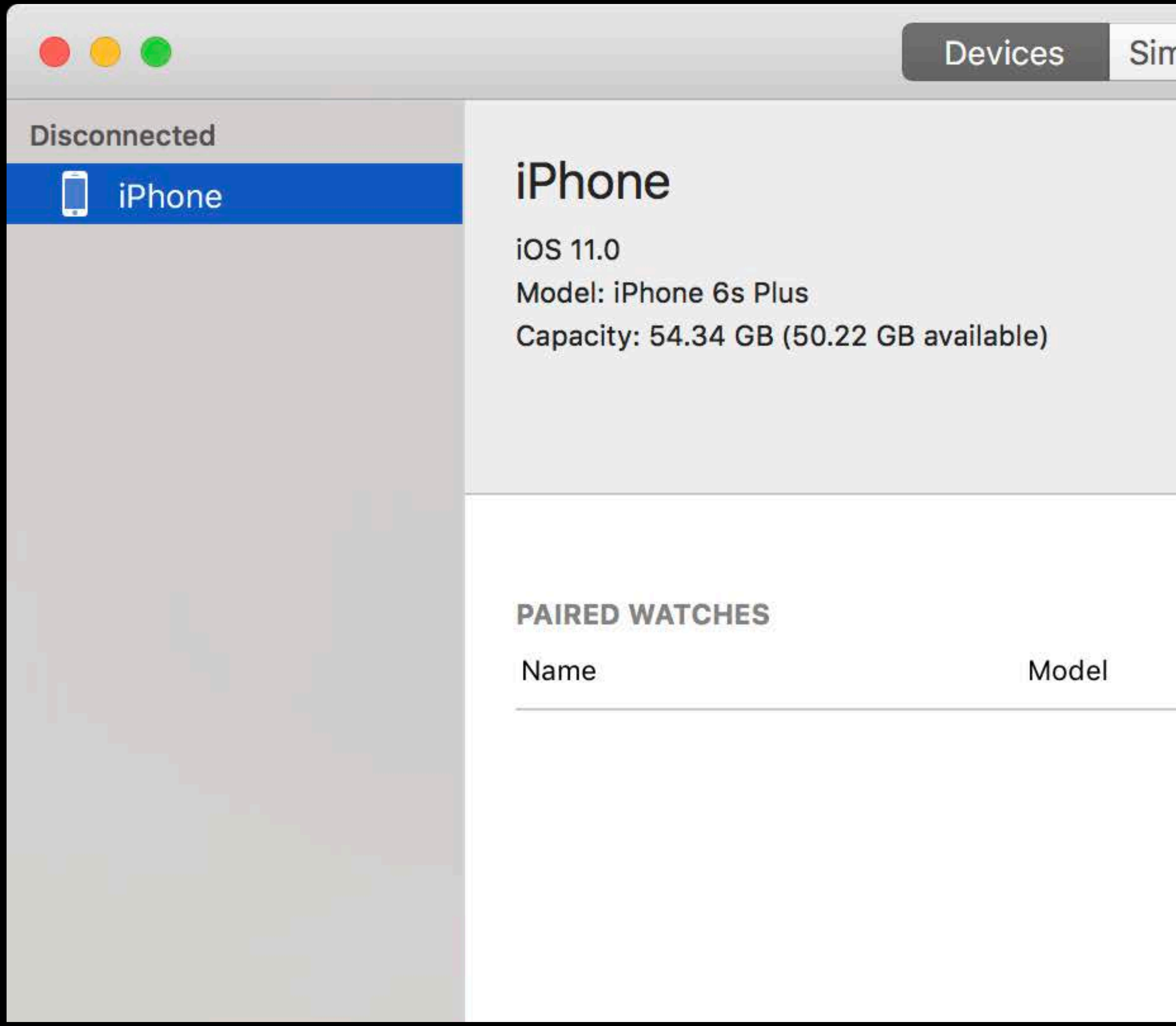
No apps installed

Wireless Development

Connection discovery

Most home and small business networks

- No configuration required



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Wireless Development

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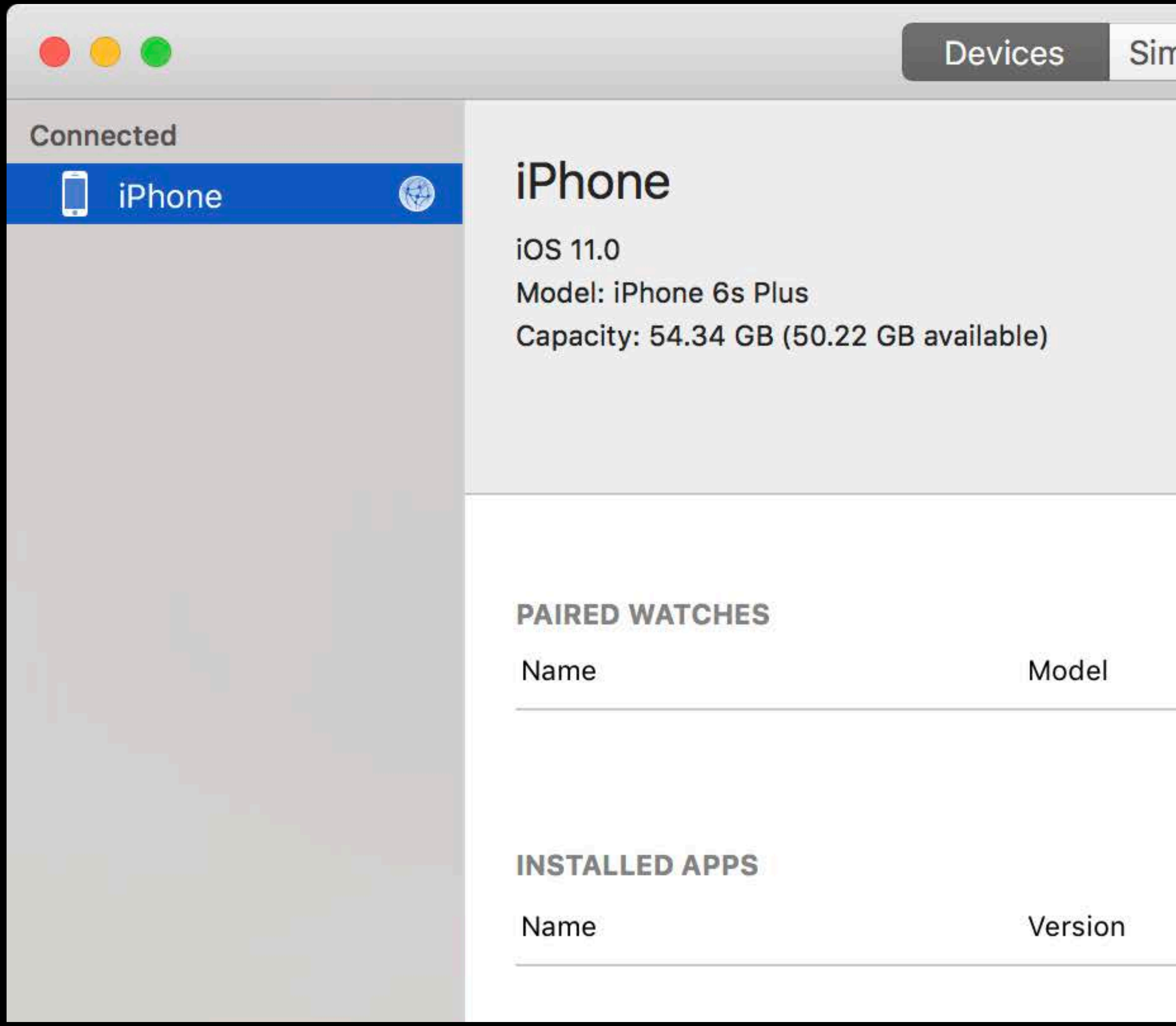

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Wireless Development

Connection discovery

Most home and small business networks

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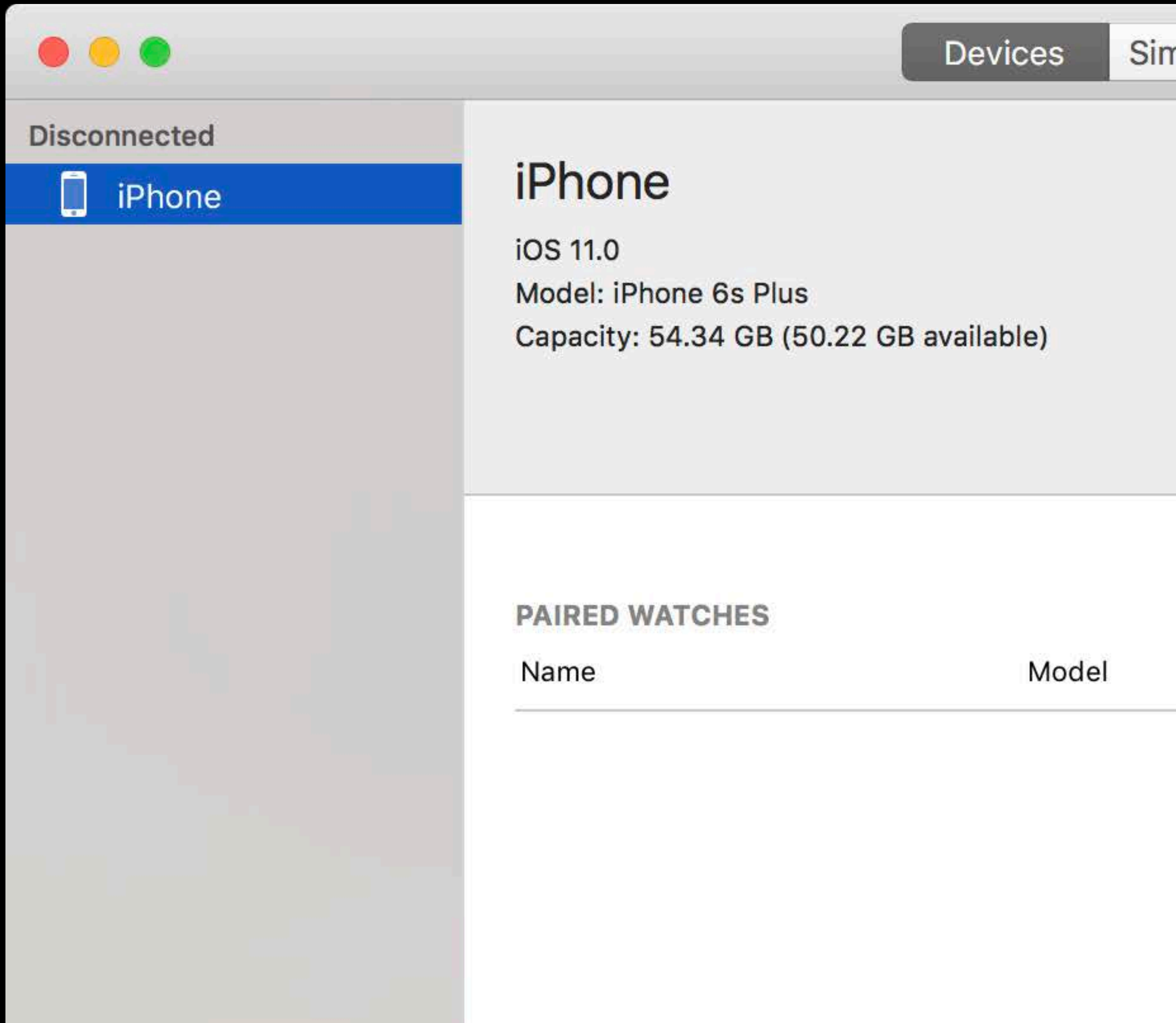
More complex networks

- Direct by IP address



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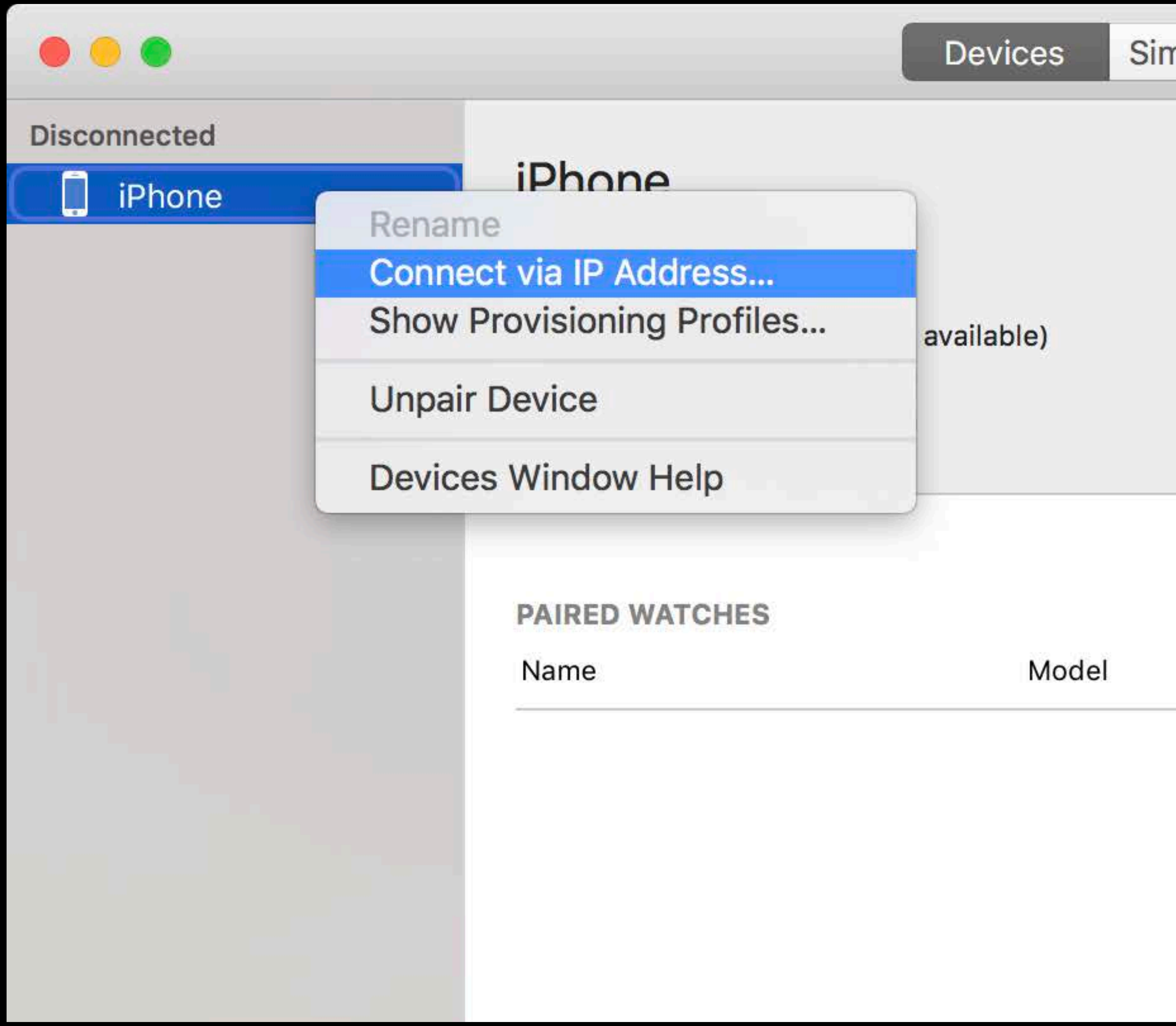


Wireless Development

Running your app

Wireless devices are always available to select

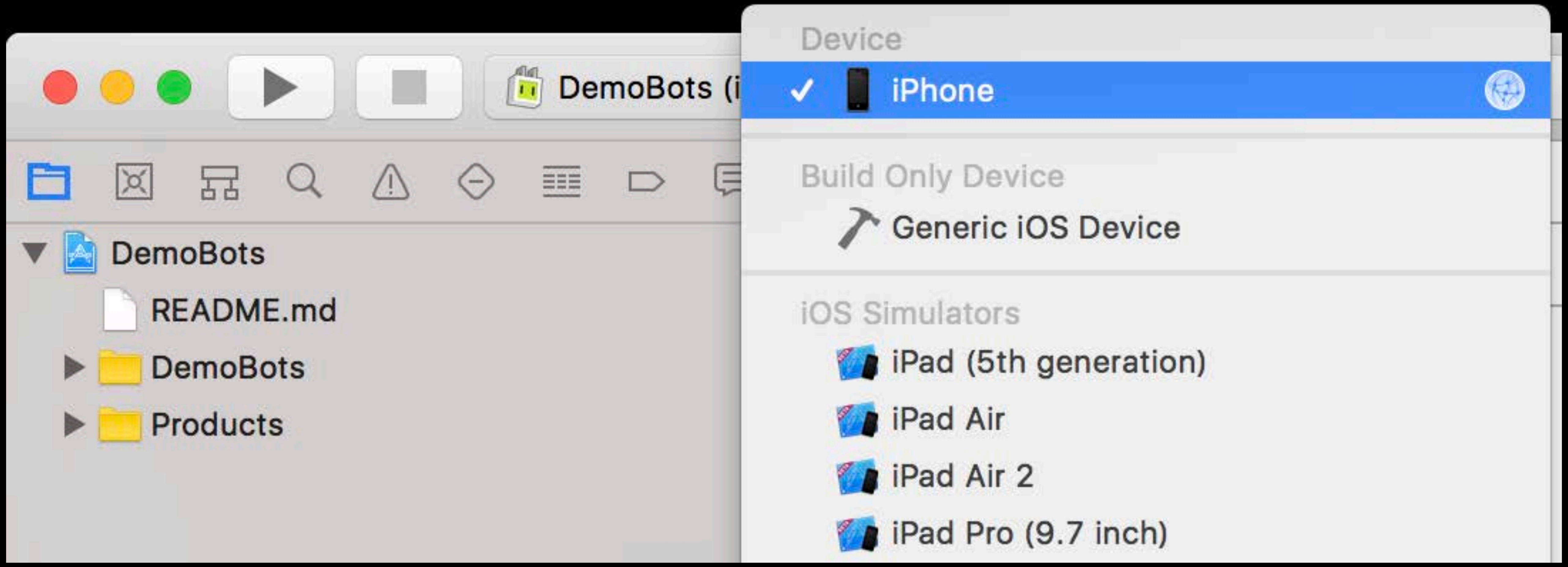
Xcode manages connections automatically

Wireless Development

Running your app

Wireless devices are always available to select

Xcode manages connections automatically



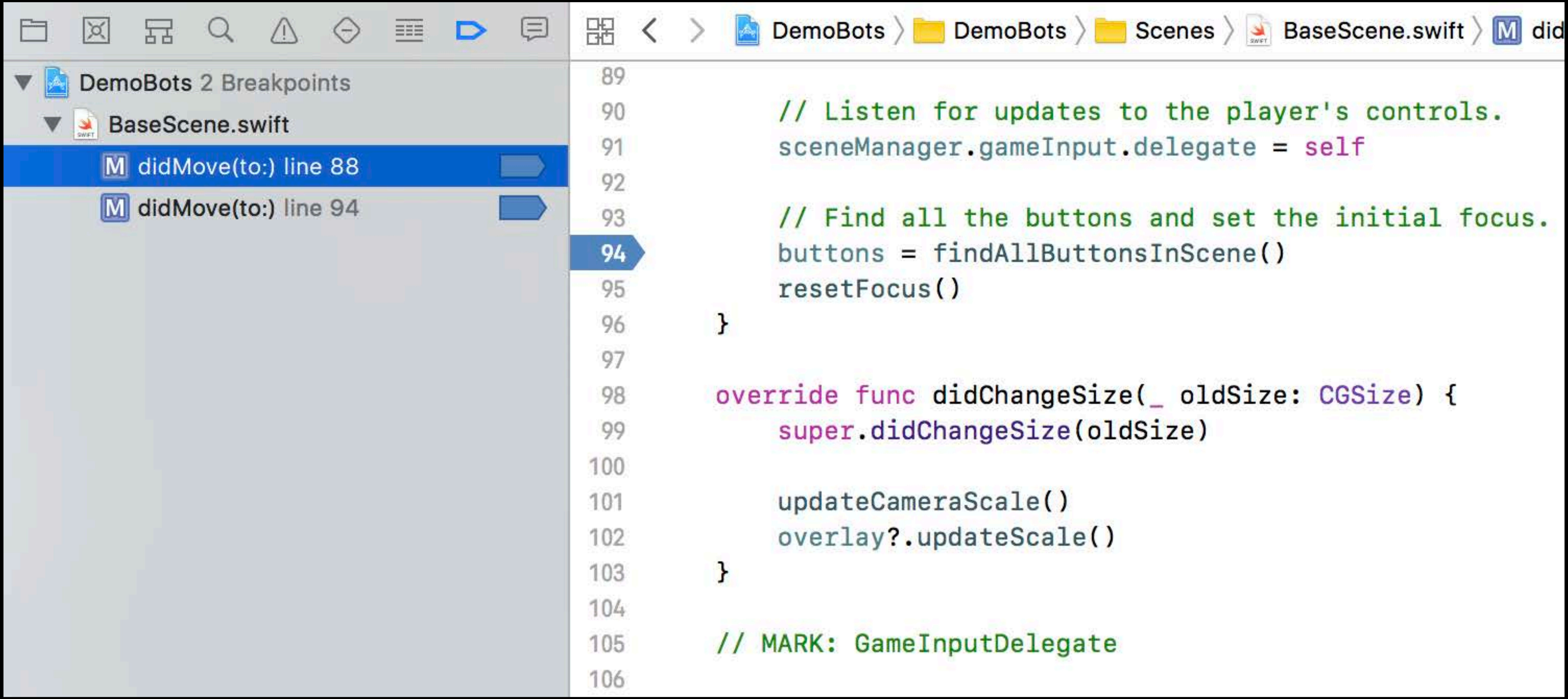
Demo

Wireless development

Breakpoint Workflow Enhancements

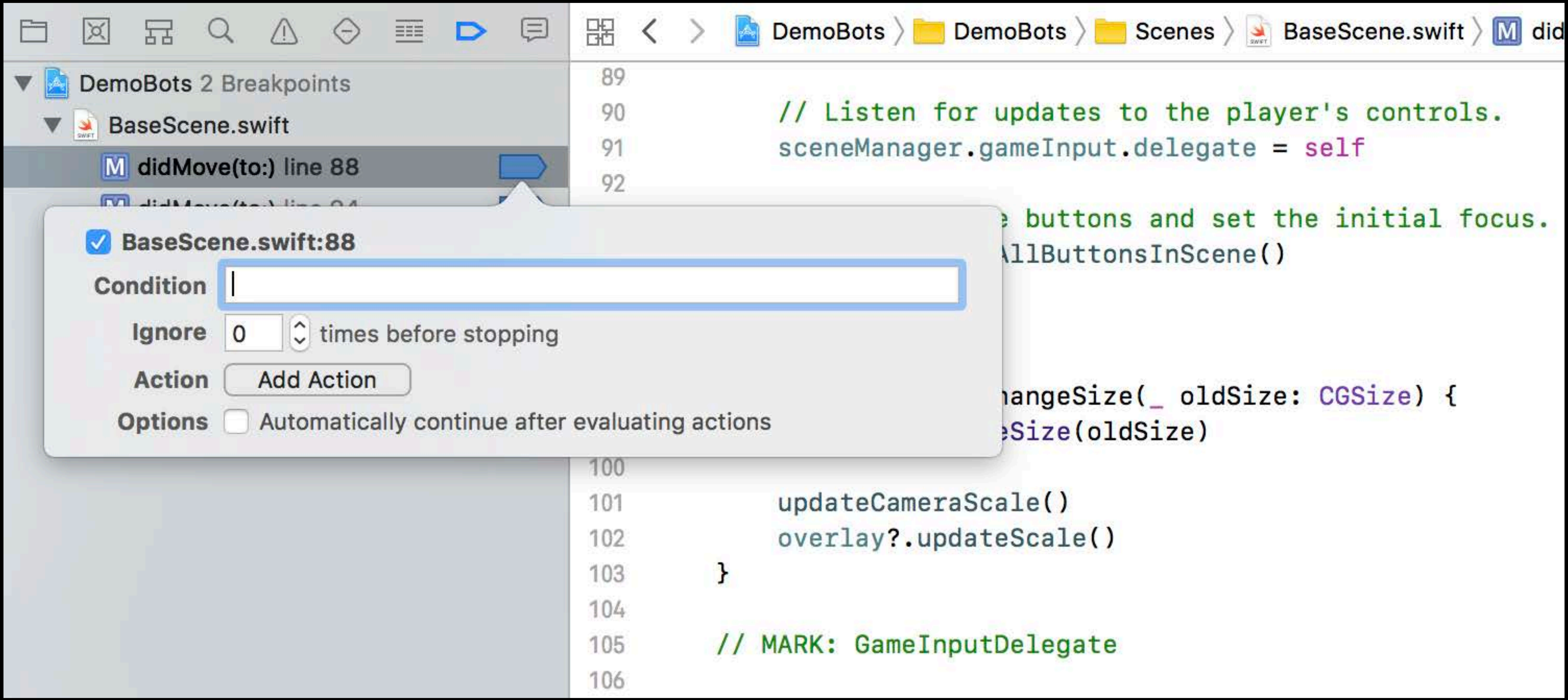
Chris Miles, Xcode Engineering Manager

Breakpoints



```
        // Listen for updates to the player's controls.
        sceneManager.gameInput.delegate = self

        // Find all the buttons and set the initial focus.
        buttons = findAllButtonsInScene()
        resetFocus()
    }

    override func didChangeSize(_ oldSize: CGSize) {
        super.didChangeSize(oldSize)

        updateCameraScale()
        overlay?.updateScale()
    }

    // MARK: GameInputDelegate

```

Breakpoints



DemoBots 2 Breakpoints

BaseScene.swift

didMove(to:) line 88

☑ **BaseScene.swift:88**

Condition

Ignore 0 times before stopping

Action Add Action

Options □ Automatically continue after evaluating actions

```
        // Listen for updates to the player's controls.
        sceneManager.gameInput.delegate = self

 buttons and set the initial focus.
AllButtonsInScene()


angeSize(_ oldSize: CGSize) {
eSize(oldSize)

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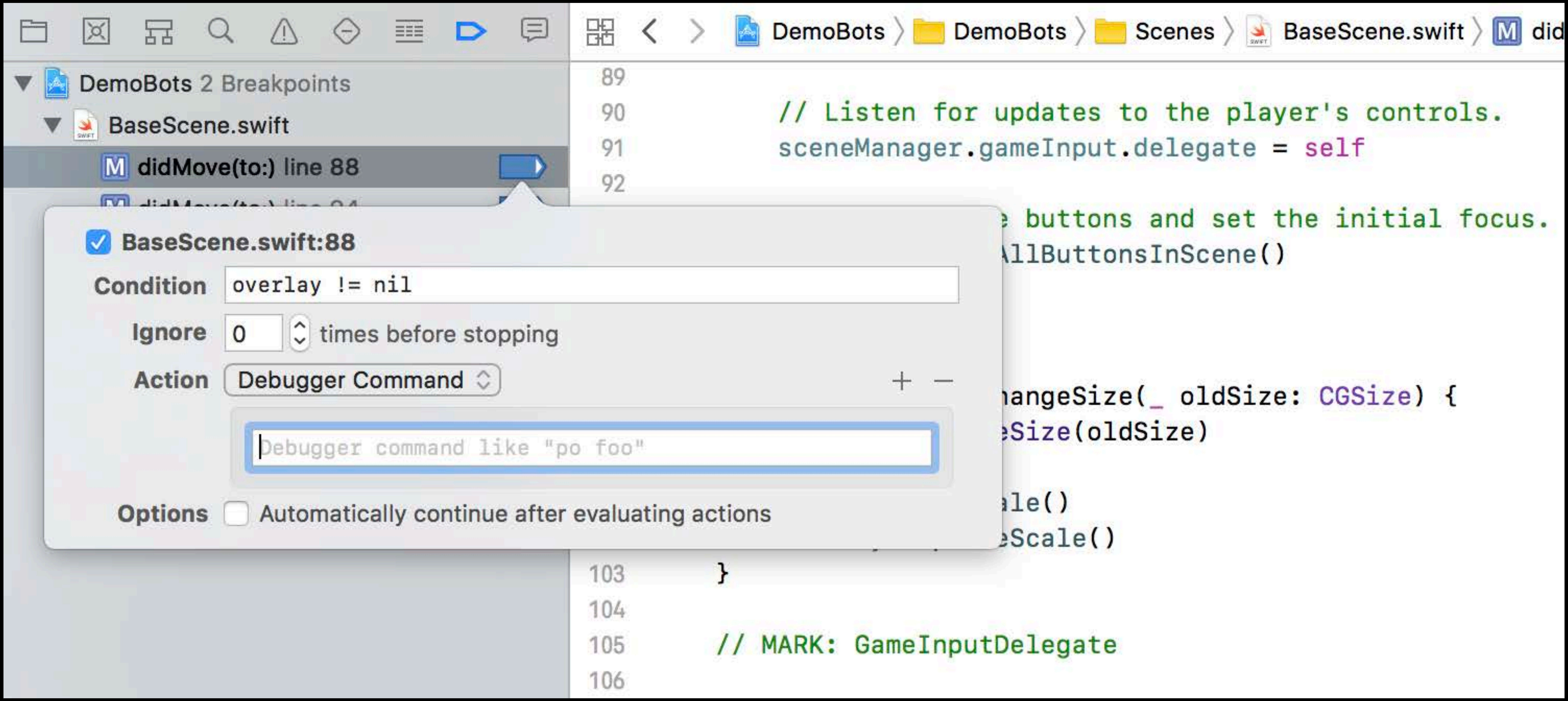
Breakpoints



DemoBots > DemoBots > Scenes > BaseScene.swift > did

DemoBots 2 Breakpoints

BaseScene.swift

didMove(to:) line 88

☑ BaseScene.swift:88

Condition: overlay != nil

Ignore: 0 times before stopping

Action: Debugger Command

Debugger command like "po foo"

Options: □ Automatically continue after evaluating actions

```
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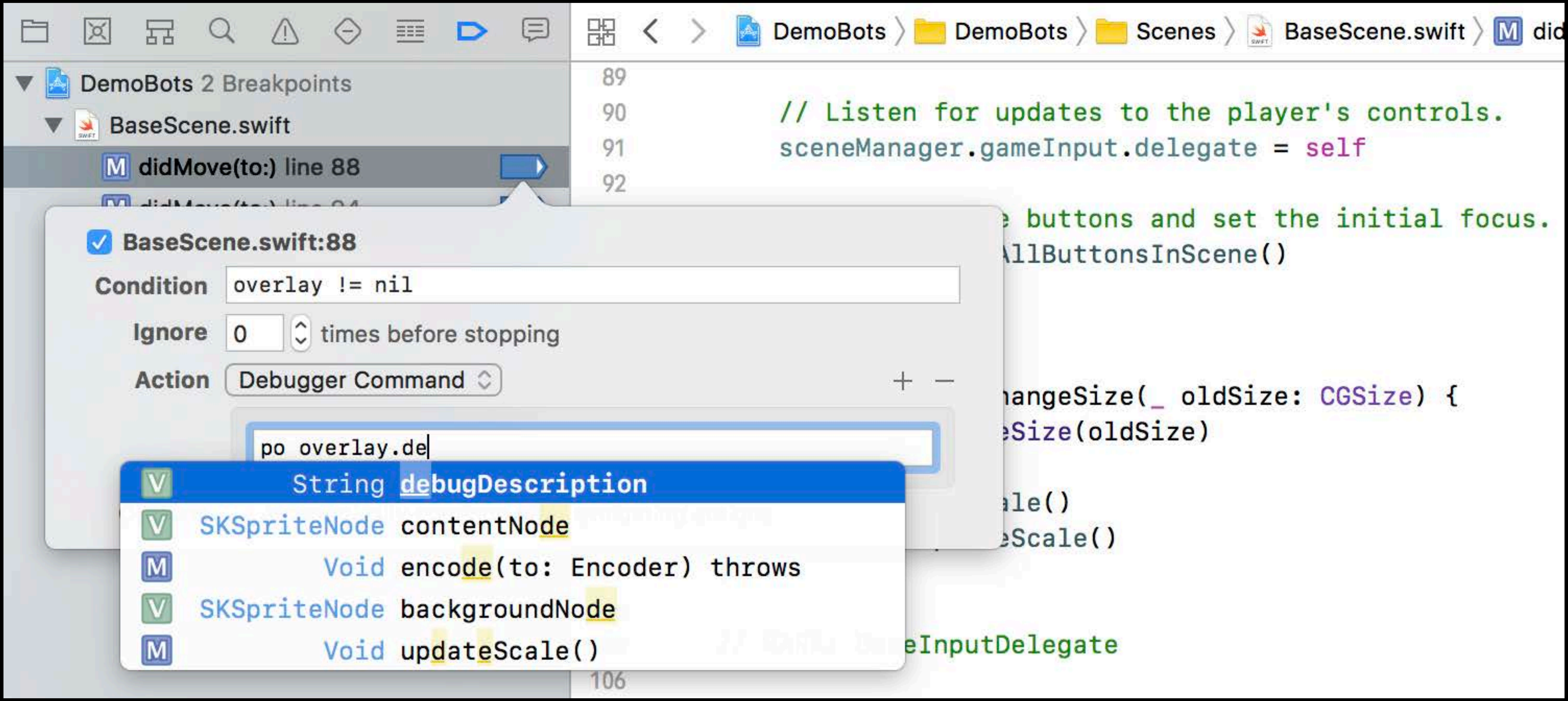
Breakpoints



DemoBots 2 Breakpoints

BaseScene.swift

didMove(to:) line 88

☑ BaseScene.swift:88

Condition: overlay != nil

Ignore: 0 times before stopping

Action: Debugger Command

```
po overlay.de
```

```
V  String debugDescription
V  SKSpriteNode contentNode
M  Void encode(to: Encoder) throws
V  SKSpriteNode backgroundNode
M  Void updateScale()
```

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e buttons and set the initial focus.
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hangeSize(_ oldSize: CGSize) {
eSize(oldSize)

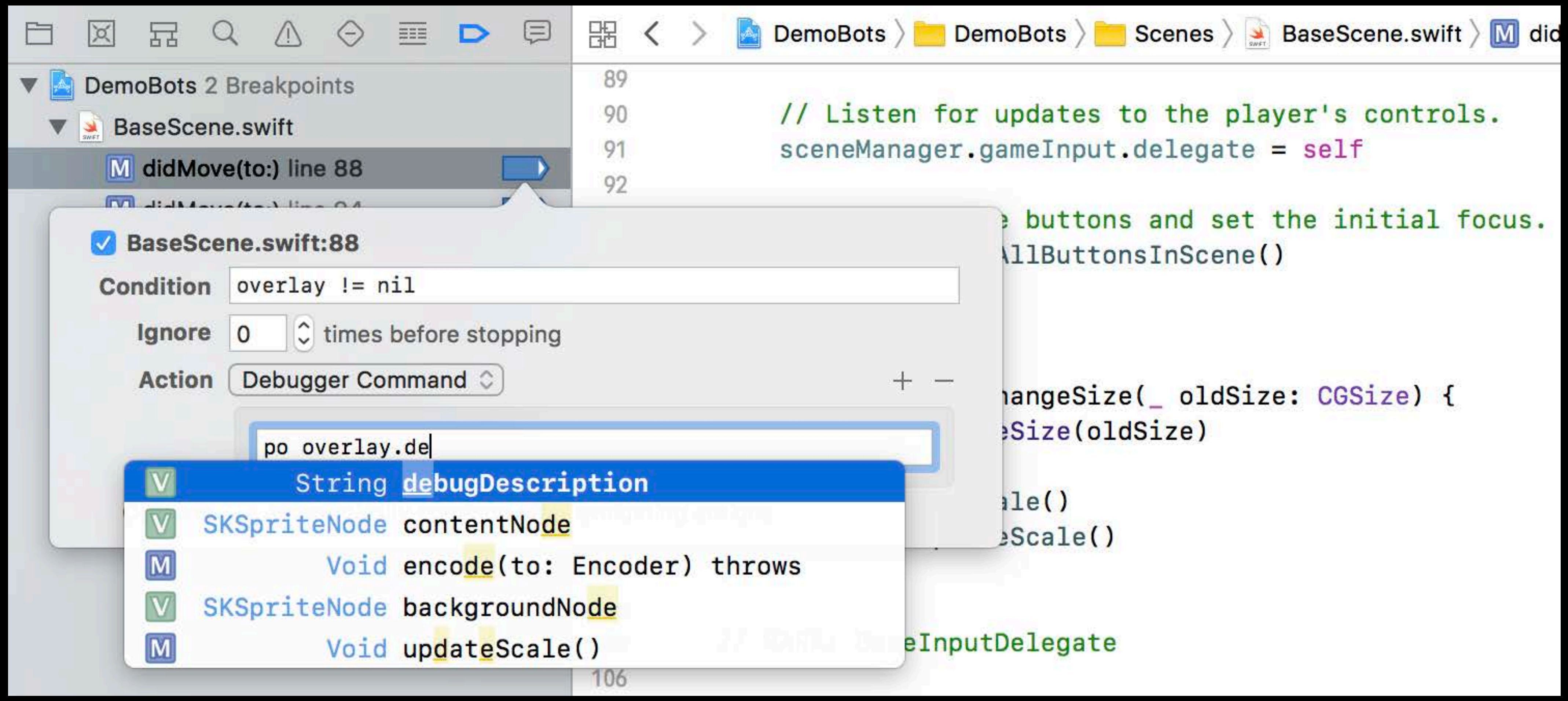
ale()
eScale()

eInputDelegate
```

Breakpoints

Code completion

- Condition field
- Expression action fields



DemoBots 〉 DemoBots 〉 Scenes 〉 BaseScene.swift 〉 did

DemoBots 2 Breakpoints

BaseScene.swift

didMove(to:) line 88

☑ BaseScene.swift:88

Condition: `overlay != nil`

Ignore: 0 times before stopping

Action: Debugger Command

```
po overlay.de
```

```
String debugDescription
SKSpriteNode contentNode
Void encode(to: Encoder) throws
SKSpriteNode backgroundNode
Void updateScale()
```

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  hangeSize(_ oldSize: CGSize) {
  eSize(oldSize)

  ale()
  eScale()

  eInputDelegate
```

Breakpoints

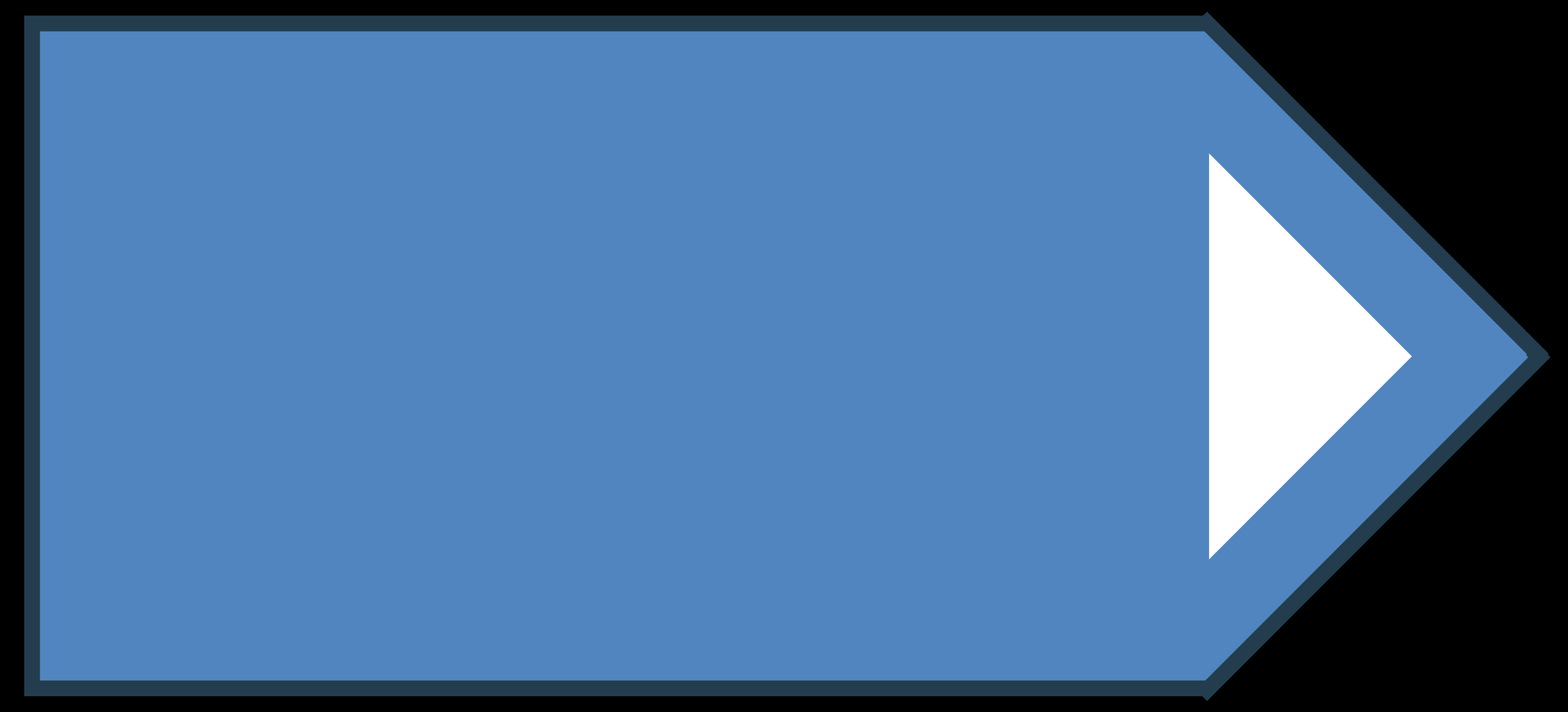
NEW

Breakpoint options indicator

Breakpoints

NEW

Breakpoint options indicator

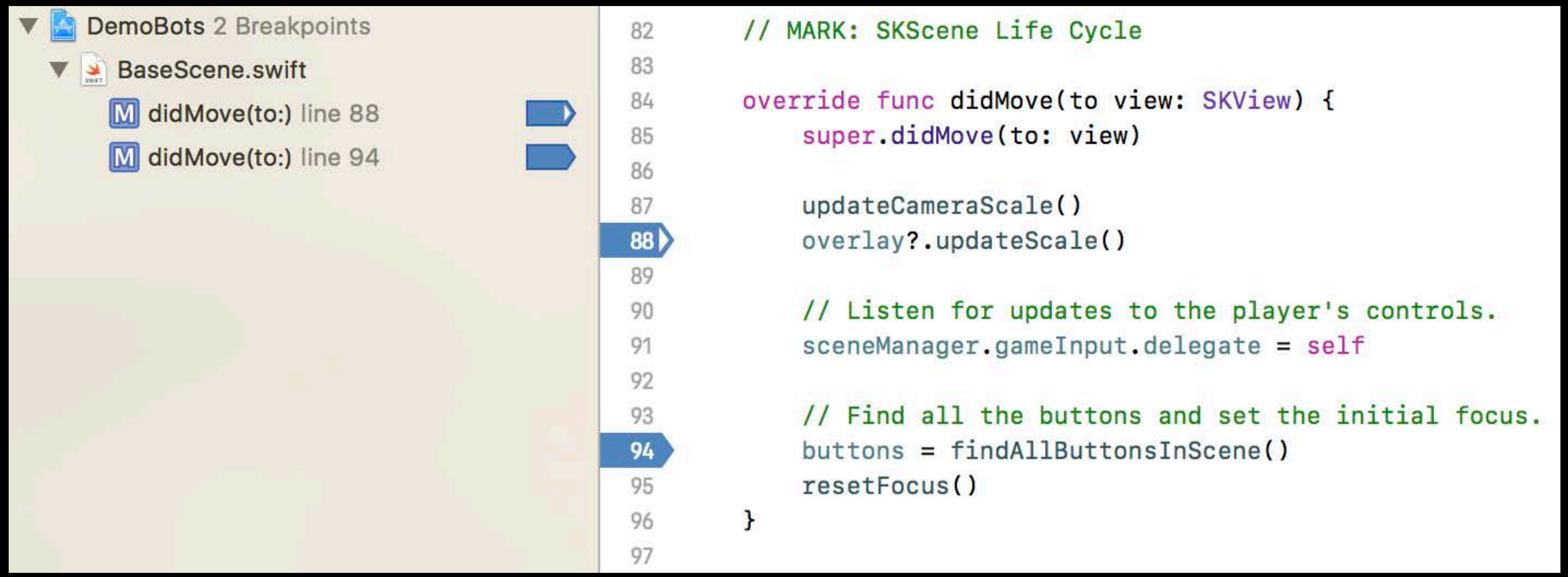


Breakpoints

NEW

Breakpoint options indicator

- Indicates an option is set
- Tooltip summarizes options



DemoBots 2 Breakpoints

BaseScene.swift

didMove(to:) line 88

didMove(to:) line 94

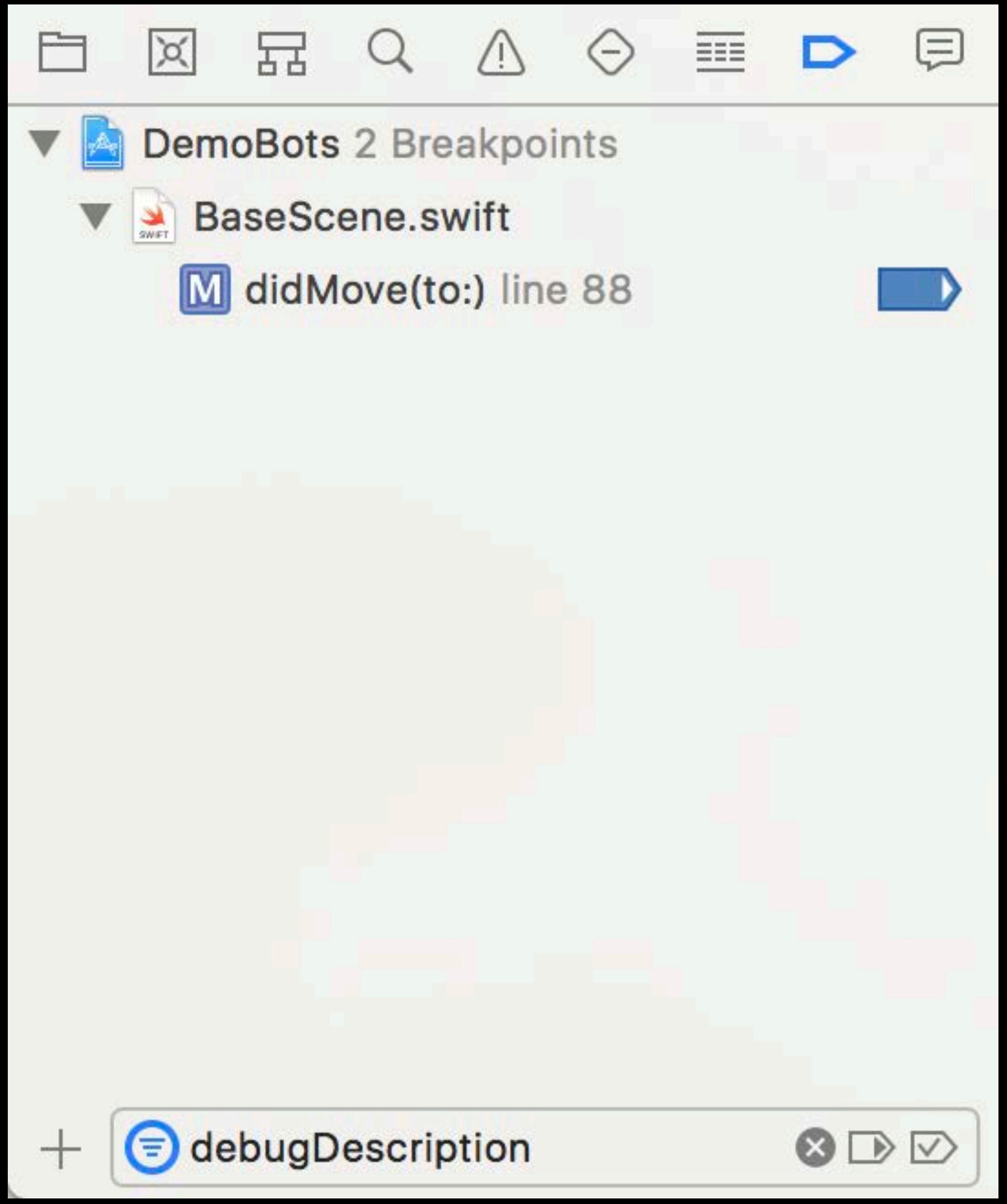
```
82    // MARK: SKScene Life Cycle
83
84    override func didMove(to view: SKView) {
85        super.didMove(to: view)
86
87        updateCameraScale()
88        overlay?.updateScale()
89
90        // Listen for updates to the player's controls.
91        sceneManager.gameInput.delegate = self
92
93        // Find all the buttons and set the initial focus.
94        buttons = findAllButtonsInScene()
95        resetFocus()
96    }
97
```

Breakpoints

NEW

Breakpoint navigator deep filtering

- Matches text in all options fields



DemoBots 2 Breakpoints

BaseScene.swift

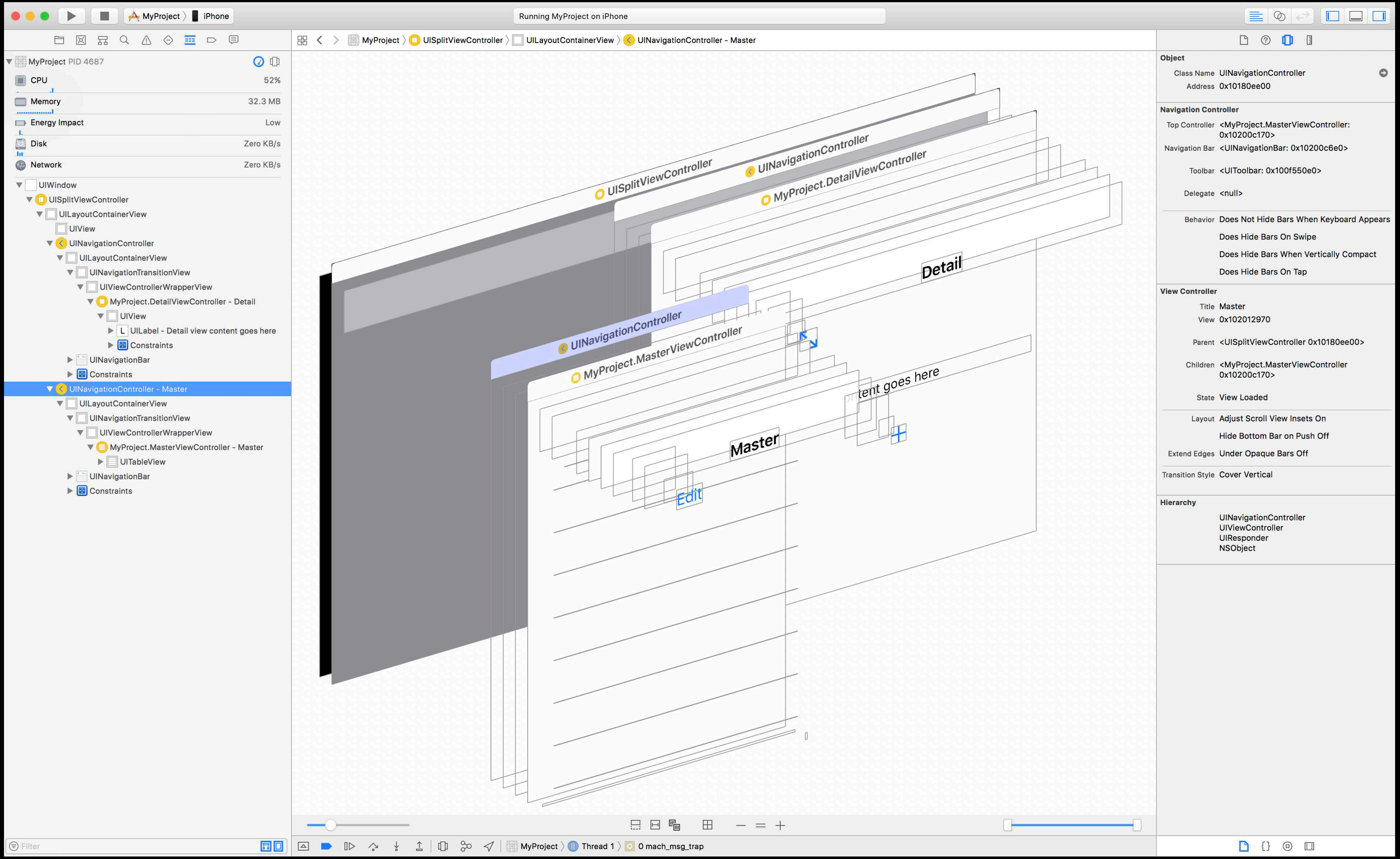
M didMove(to:) line 88

debugDescription

View Controller Debugging

View Controller Debugging

NEW



MyProject 〉 iPhone

Running MyProject on iPhone

MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master

MyProject PID 4687	
CPU	52%
Memory	32.3 MB
Energy Impact	Low
Disk	Zero KB/s
Network	Zero KB/s

```
▼ UIWindow
  ▼ UISplitViewController
    ▼ UILayoutContainerView
        UIView
      ▼ UINavigationController
        ▼ UILayoutContainerView
          ▼ UINavigationTransitionView
            ▼ UIViewControllerWrapperView
              ▼ MyProject.DetailViewController - Detail
                ▼ UIView
                  ▶ L UILabel - Detail view content goes here
                  ▶ Constraints
          ▶ UINavigationBar
          ▶ Constraints
      ▼ UINavigationController - Master
        ▼ UILayoutContainerView
          ▼ UINavigationTransitionView
            ▼ UIViewControllerWrapperView
              ▼ MyProject.MasterViewController - Master
                ▶ UITableView
          ▶ UINavigationBar
          ▶ Constraints
```

Filter

Object

Class Name	UINavigationController
Address	0x10180ee00

Navigation Controller

Top Controller	<MyProject.MasterViewController: 0x10200c170>
Navigation Bar	<UINavigationBar: 0x10200c6e0>
Toolbar	<UIToolbar: 0x100f550e0>
Delegate	<null>
Behavior	Does Not Hide Bars When Keyboard Appears Does Hide Bars On Swipe Does Hide Bars When Vertically Compact Does Hide Bars On Tap

View Controller

Title	Master
View	0x102012970
Parent	<UISplitViewController 0x10180ee00>
Children	<MyProject.MasterViewController 0x10200c170>
State	View Loaded
Layout	Adjust Scroll View Insets On Hide Bottom Bar on Push Off
Extend Edges	Under Opaque Bars Off
Transition Style	Cover Vertical

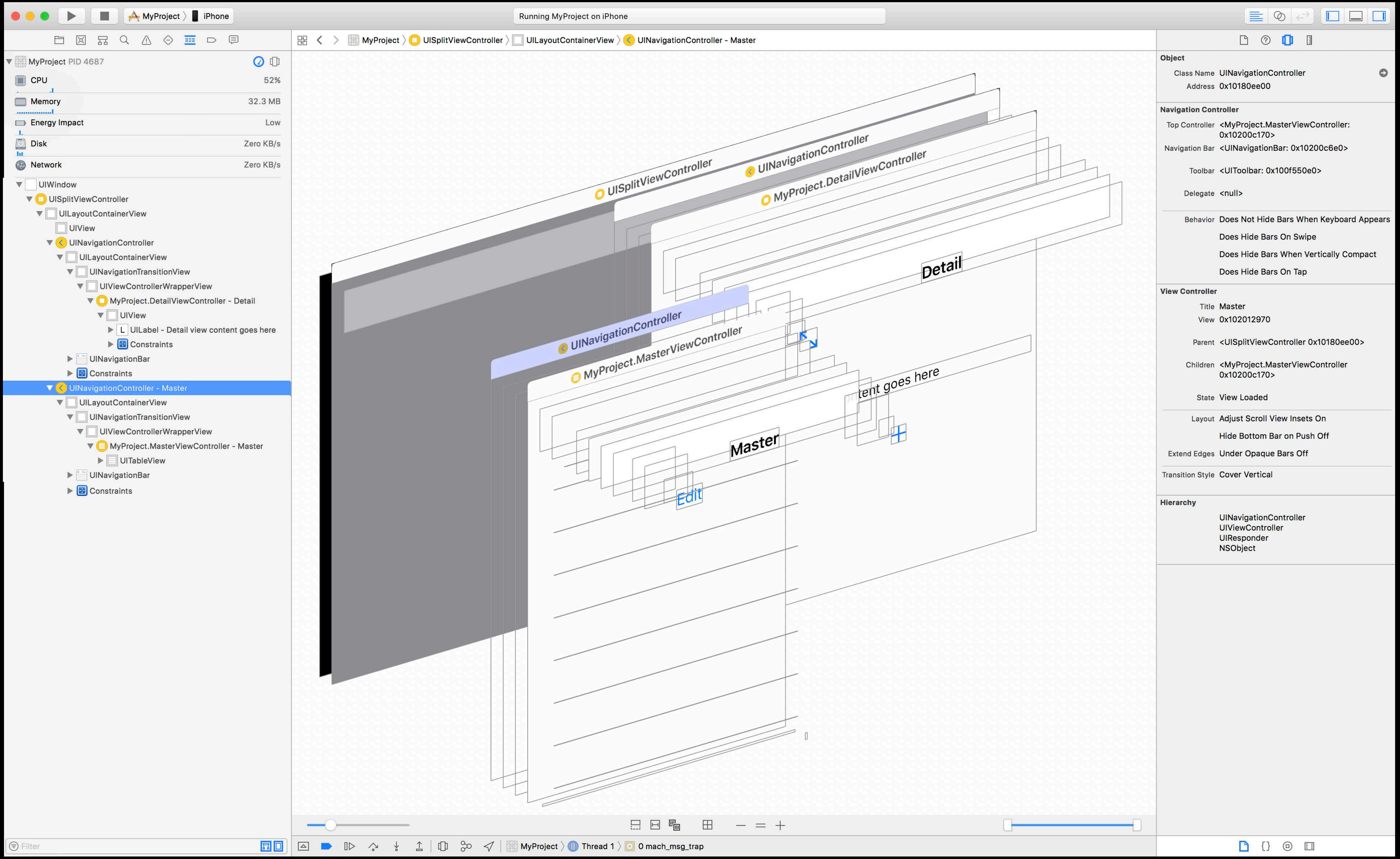
Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

MyProject 〉 Thread 1 〉 0 mach_msg_trap

View Controller Debugging

NEW



MyProject 〉 iPhone
Running MyProject on iPhone
MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master
UISplitViewController
UINavigationController
MyProject.DetailViewController
Detail
UINavigationController
MyProject.MasterViewController
Master
Edit
tent goes here
Filter
MyProject 〉 Thread 1 〉 0 mach_msg_trap

MyProject PID 4687

CPU	52%
Memory	32.3 MB
Energy Impact	Low
Disk	Zero KB/s
Network	Zero KB/s

- UIWindow
  - UISplitViewController
    - UILayoutContainerView
      - UIView
      - UINavigationController
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.DetailViewController - Detail
                - UIView
                  - UILabel - Detail view content goes here
                  - Constraints
          - UINavigationBar
          - Constraints
      - UINavigationController - Master
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.MasterViewController - Master
                - UITableView
          - UINavigationBar
          - Constraints

Object

Class Name UINavigationController
Address 0x10180ee00

Navigation Controller

Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
Toolbar <UIToolbar: 0x100f550e0>
Delegate <null>
Behavior Does Not Hide Bars When Keyboard Appears
Does Hide Bars On Swipe
Does Hide Bars When Vertically Compact
Does Hide Bars On Tap

View Controller

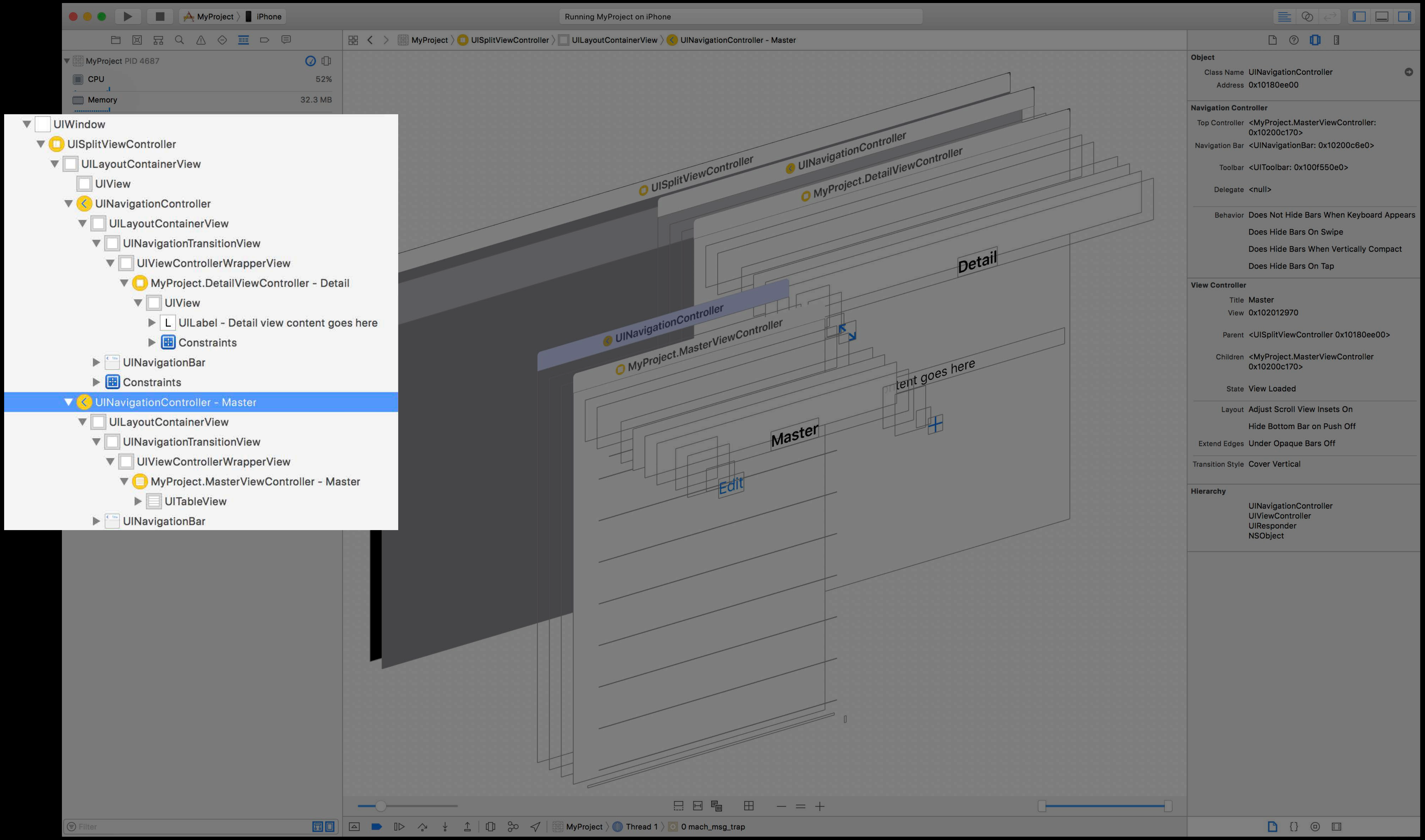
Title Master
View 0x102012970
Parent <UISplitViewController 0x10180ee00>
Children <MyProject.MasterViewController 0x10200c170>
State View Loaded
Layout Adjust Scroll View Insets On
Hide Bottom Bar on Push Off
Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

View Controller Debugging

NEW



Running MyProject on iPhone

MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master

MyProject PID 4687

CPU 52%

Memory 32.3 MB

```
▼ UIWindow
  ▼ UISplitViewController
    ▼ UILayoutContainerView
        UIView
      ▼ UINavigationController
        ▼ UILayoutContainerView
          ▼ UINavigationTransitionView
            ▼ UIViewControllerWrapperView
              ▼ MyProject.DetailViewController - Detail
                ▼ UIView
                  ▶ L UILabel - Detail view content goes here
                  ▶ Constraints
          ▶ UINavigationBar
          ▶ Constraints
      ▼ UINavigationController - Master
        ▼ UILayoutContainerView
          ▼ UINavigationTransitionView
            ▼ UIViewControllerWrapperView
              ▼ MyProject.MasterViewController - Master
                ▶ UITableView
          ▶ UINavigationBar
```

Object

Class Name UINavigationController
Address 0x10180ee00

Navigation Controller

Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
Toolbar <UIToolbar: 0x100f550e0>
Delegate <null>
Behavior Does Not Hide Bars When Keyboard Appears
Does Hide Bars On Swipe
Does Hide Bars When Vertically Compact
Does Hide Bars On Tap

View Controller

Title Master
View 0x102012970
Parent <UISplitViewController 0x10180ee00>
Children <MyProject.MasterViewController 0x10200c170>
State View Loaded
Layout Adjust Scroll View Insets On
Hide Bottom Bar on Push Off
Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

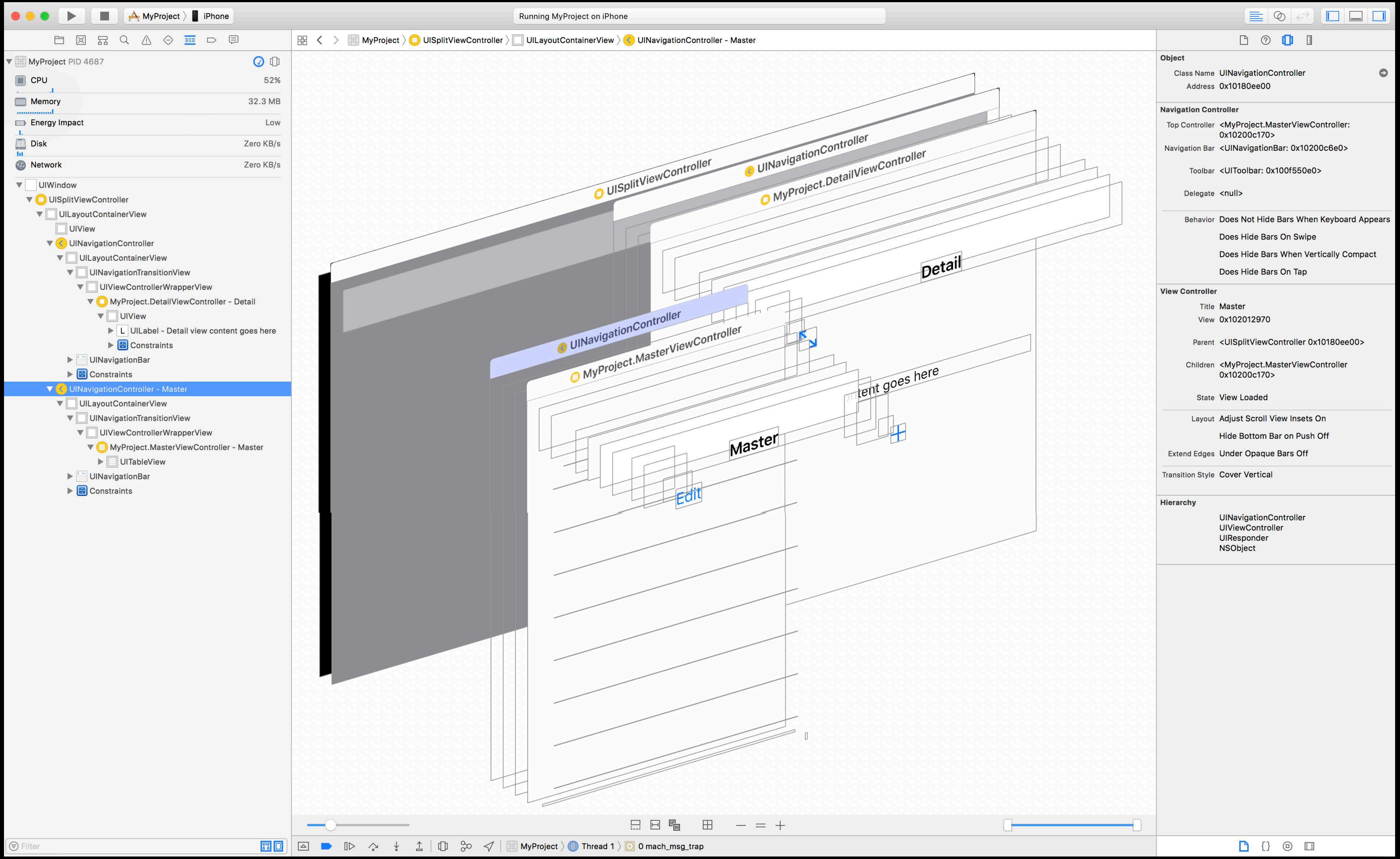
Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

MyProject 〉 Thread 1 〉 0 mach_msg_trap

View Controller Debugging

NEW


MyProject 〉 iPhone
Running MyProject on iPhone
MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master
UISplitViewController
UINavigationController
MyProject.DetailViewController
Detail
UINavigationController
MyProject.MasterViewController
tent goes here
Master
Edit
Filter
MyProject 〉 Thread 1 〉 0 mach_msg_trap

MyProject PID 4687

CPU	52%
Memory	32.3 MB
Energy Impact	Low
Disk	Zero KB/s
Network	Zero KB/s

- UIWindow
  - UISplitViewController
    - UILayoutContainerView
      - UIView
      - UINavigationController
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.DetailViewController - Detail
                - UIView
                  - UILabel - Detail view content goes here
                  - Constraints
          - UINavigationBar
          - Constraints
      - UINavigationController - Master
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.MasterViewController - Master
                - UITableView
          - UINavigationBar
          - Constraints

Object

Class Name UINavigationController
Address 0x10180ee00

Navigation Controller

Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
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View 0x102012970
Parent <UISplitViewController 0x10180ee00>
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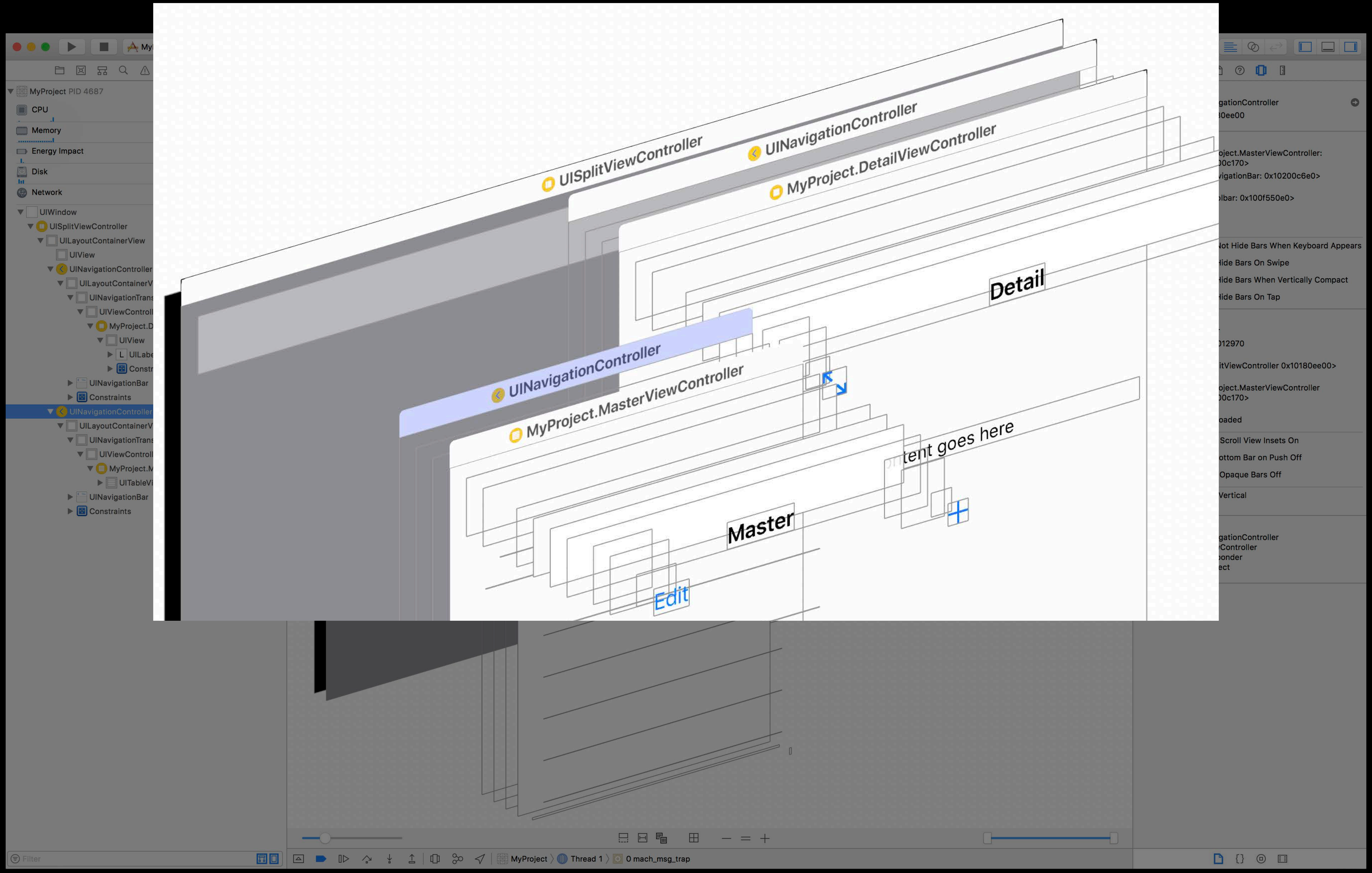
State View Loaded
Layout Adjust Scroll View Insets On
Hide Bottom Bar on Push Off
Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

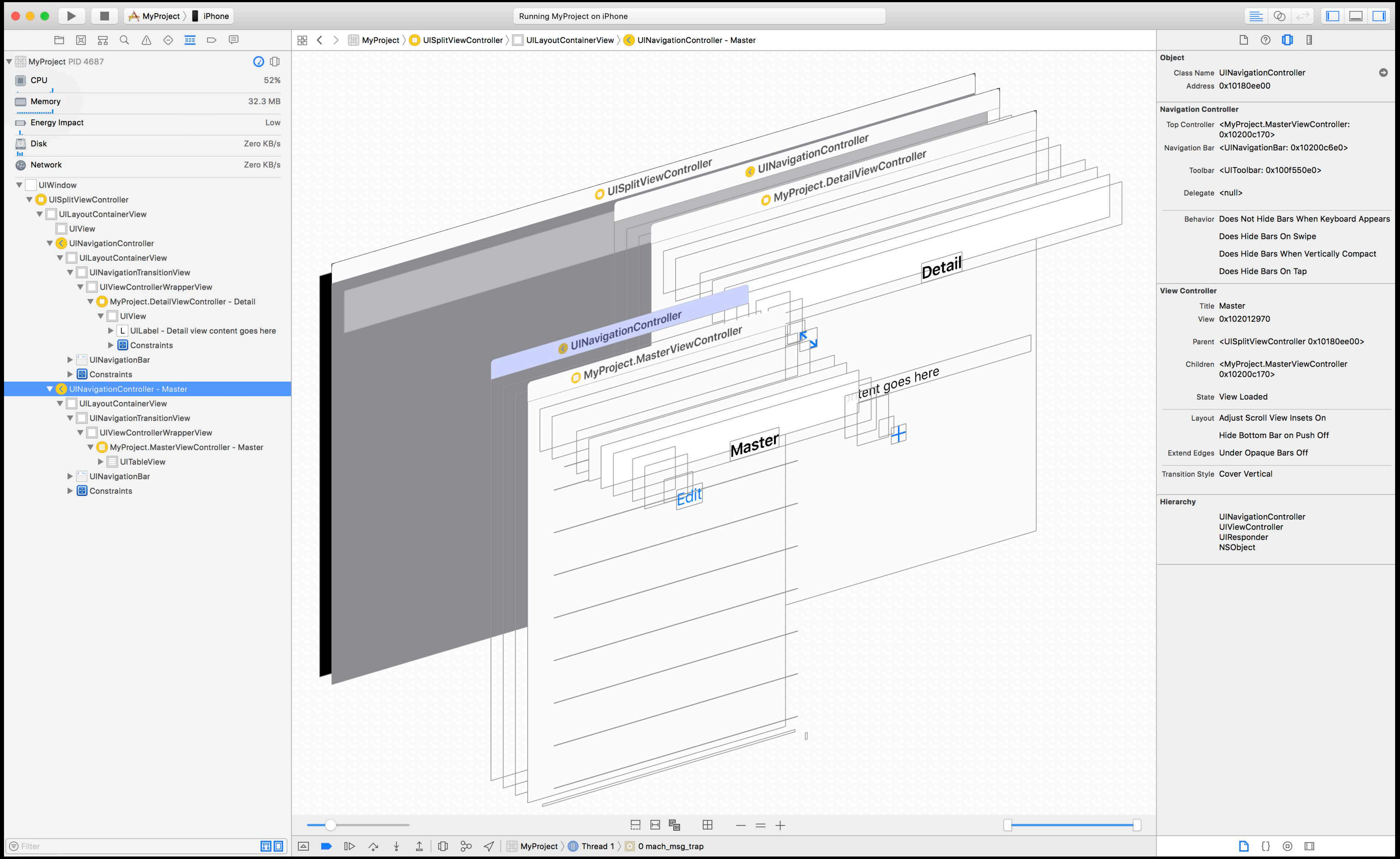
View Controller Debugging

NEW



View Controller Debugging

NEW



MyProject 〉 iPhone

Running MyProject on iPhone

MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master

MyProject PID 4687

CPU	52%
Memory	32.3 MB
Energy Impact	Low
Disk	Zero KB/s
Network	Zero KB/s

- UIWindow
  - UISplitViewController
    - UILayoutContainerView
      - UIView
      - UINavigationController
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.DetailViewController - Detail
                - UIView
                  - UILabel - Detail view content goes here
                  - Constraints
          - UINavigationBar
          - Constraints
      - UINavigationController - Master
        - UILayoutContainerView
          - UINavigationTransitionView
            - UIViewControllerWrapperView
              - MyProject.MasterViewController - Master
                - UITableView
          - UINavigationBar
          - Constraints

Filter

MyProject 〉 Thread 1 〉 0 mach_msg_trap

Object

Class Name UINavigationController
Address 0x10180ee00

Navigation Controller

Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
Toolbar <UIToolbar: 0x100f550e0>
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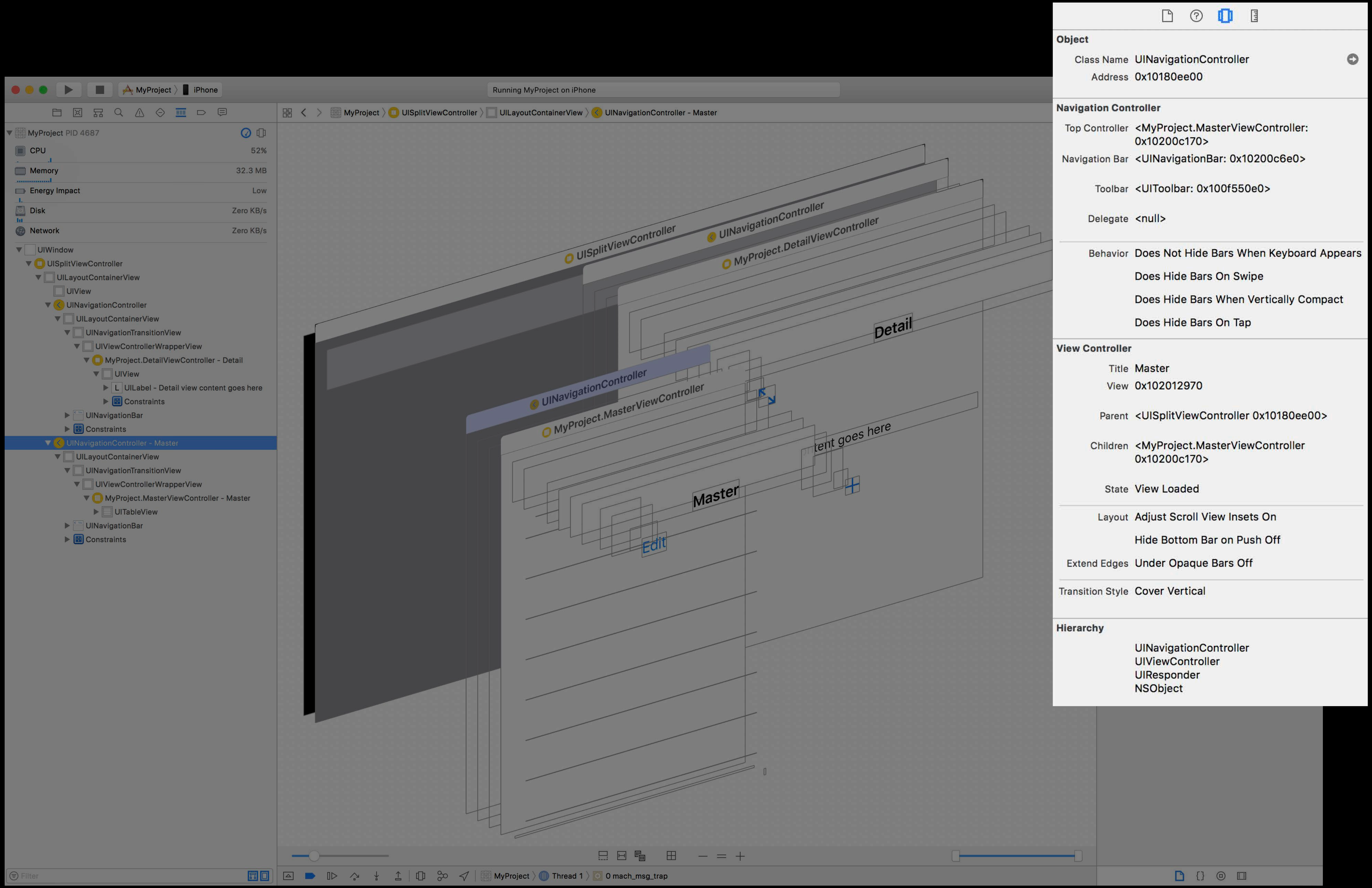
Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

View Controller Debugging

NEW


MyProject 〉 iPhone
Running MyProject on iPhone
MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master
MyProject PID 4687
CPU 52%
Memory 32.3 MB
Energy Impact Low
Disk Zero KB/s
Network Zero KB/s
UIWindow
UISplitViewController
UILayoutContainerView
UIView
UINavigationController
UILayoutContainerView
UINavigationTransitionView
UIViewControllerWrapperView
MyProject.DetailViewController - Detail
UIView
UILabel - Detail view content goes here
Constraints
UINavigationBar
Constraints
UINavigationController - Master
UILayoutContainerView
UINavigationTransitionView
UIViewControllerWrapperView
MyProject.MasterViewController - Master
UITableView
UINavigationBar
Constraints
UISplitViewController
UINavigationController
MyProject.DetailViewController
Detail
UINavigationController
MyProject.MasterViewController
tent goes here
Master
Edit
Filter
MyProject 〉 Thread 1 〉 0 mach_msg_trap

Object

Class Name UINavigationController
Address 0x10180ee00

Navigation Controller

Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
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View 0x102012970
Parent <UISplitViewController 0x10180ee00>
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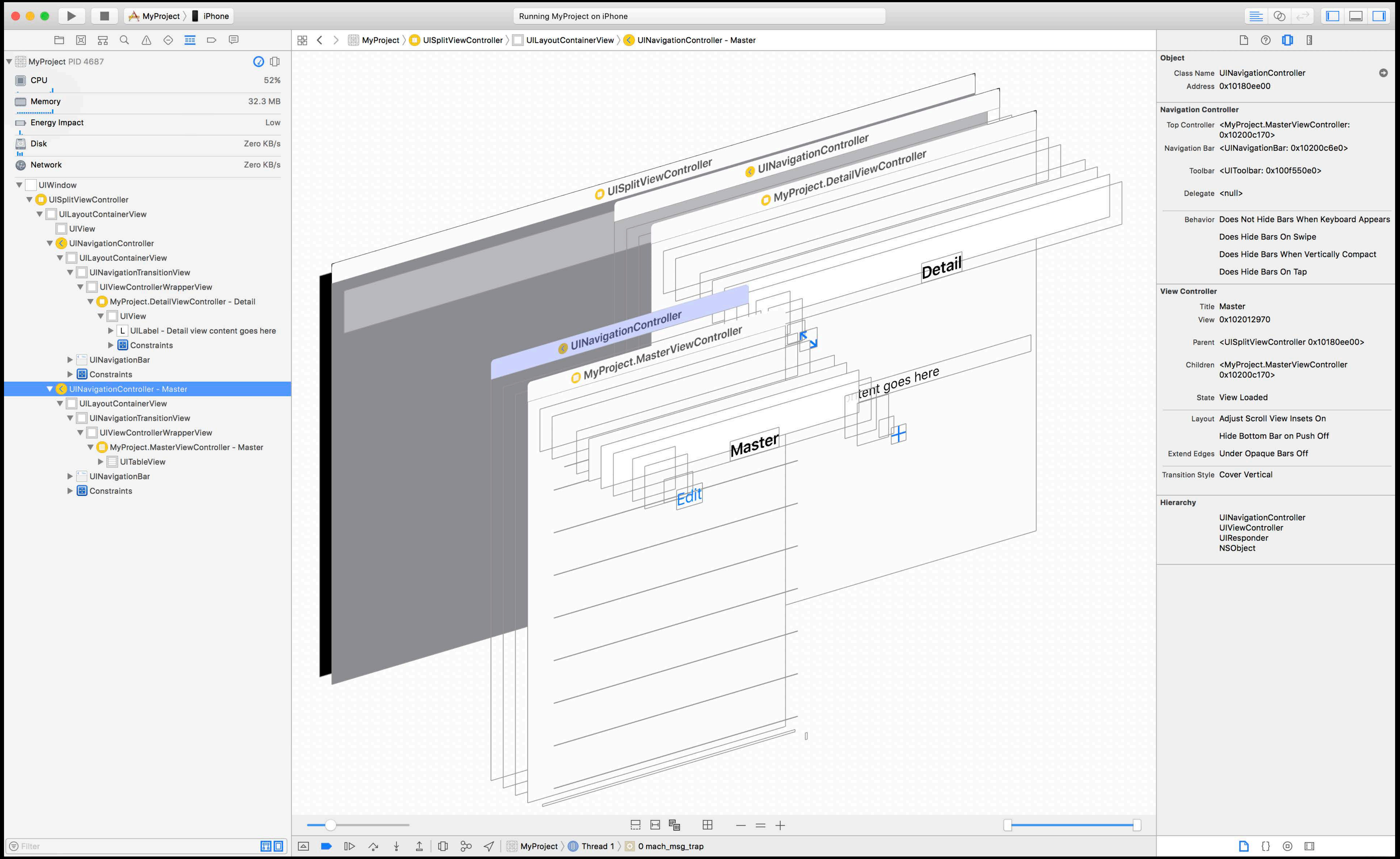
Layout Adjust Scroll View Insets On
Hide Bottom Bar on Push Off
Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

Hierarchy

UINavigationController
UIViewController
UIResponder
NSObject

View Controller Debugging

NEW



MyProject 〉 iPhone
Running MyProject on iPhone
MyProject 〉 UISplitViewController 〉 UILayoutContainerView 〉 UINavigationController - Master
UISplitViewController
UINavigationController
MyProject.DetailViewController
Detail
UINavigationController
MyProject.MasterViewController
tent goes here
Master
Edit
MyProject 〉 Thread 1 〉 0 mach_msg_trap
Filter

```
▼ MyProject PID 4687
  CPU                                   52%
  Memory                            32.3 MB
  Energy Impact                         Low
  Disk                           Zero KB/s
  Network                        Zero KB/s
  ▼ UIWindow
    ▼ UISplitViewController
      ▼ UILayoutContainerView
          UIView
        ▼ UINavigationController
          ▼ UILayoutContainerView
            ▼ UINavigationTransitionView
              ▼ UIViewControllerWrapperView
                ▼ MyProject.DetailViewController - Detail
                  ▼ UIView
                    ▶ UILabel - Detail view content goes here
                    ▶ Constraints
            ▶ UINavigationBar
            ▶ Constraints
        ▼ UINavigationController - Master
          ▼ UILayoutContainerView
            ▼ UINavigationTransitionView
              ▼ UIViewControllerWrapperView
                ▼ MyProject.MasterViewController - Master
                  ▶ UITableView
            ▶ UINavigationBar
            ▶ Constraints
```

Object

Class Name UINavigationController
Address 0x10180ee00

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Top Controller <MyProject.MasterViewController: 0x10200c170>
Navigation Bar <UINavigationBar: 0x10200c6e0>
Toolbar <UIToolbar: 0x100f550e0>
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Layout Adjust Scroll View Insets On
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Extend Edges Under Opaque Bars Off
Transition Style Cover Vertical

Hierarchy

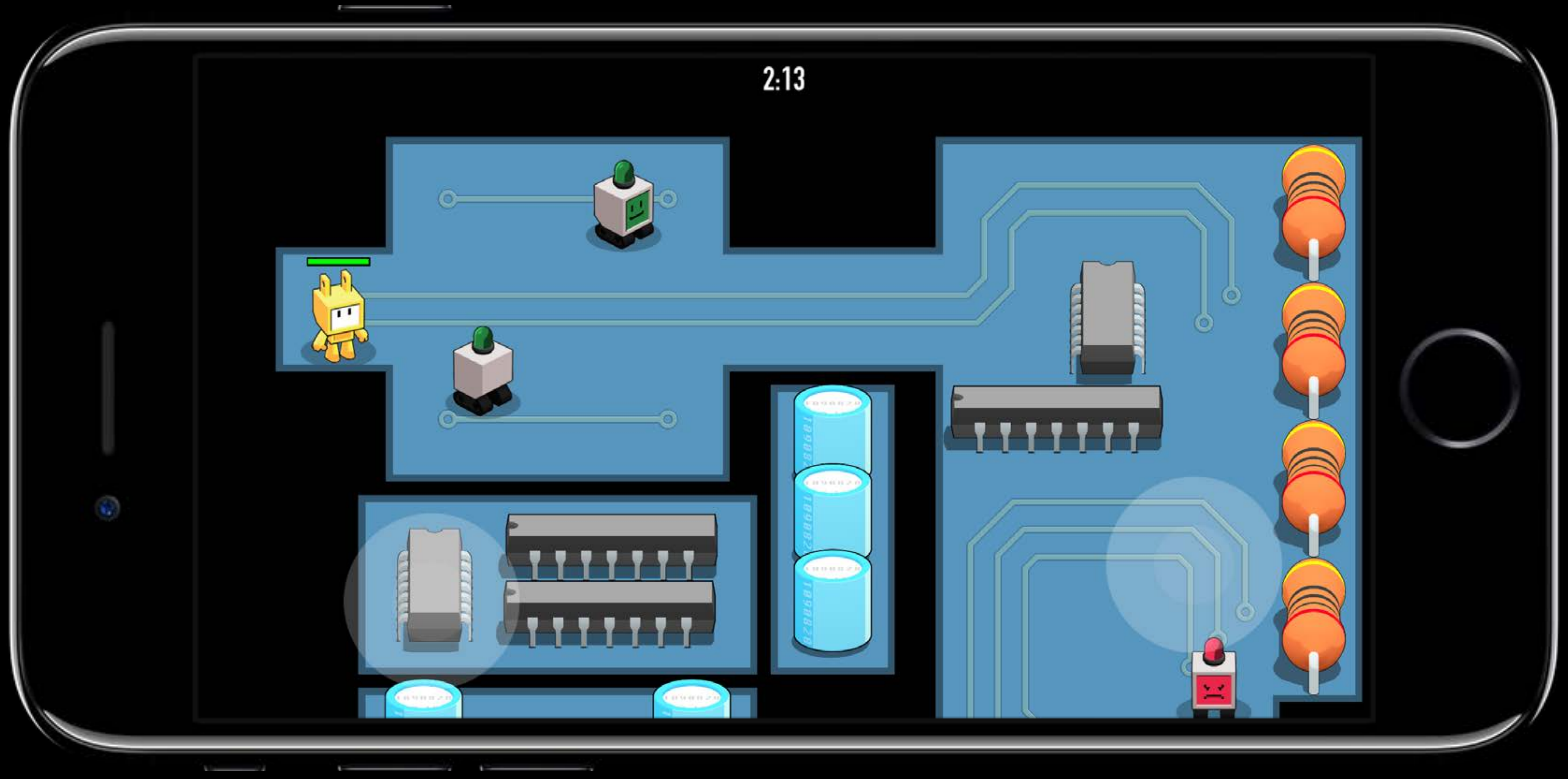
UINavigationController
UIViewController
UIResponder
NSObject

SpriteKit Debugging

SpriteKit Debugging

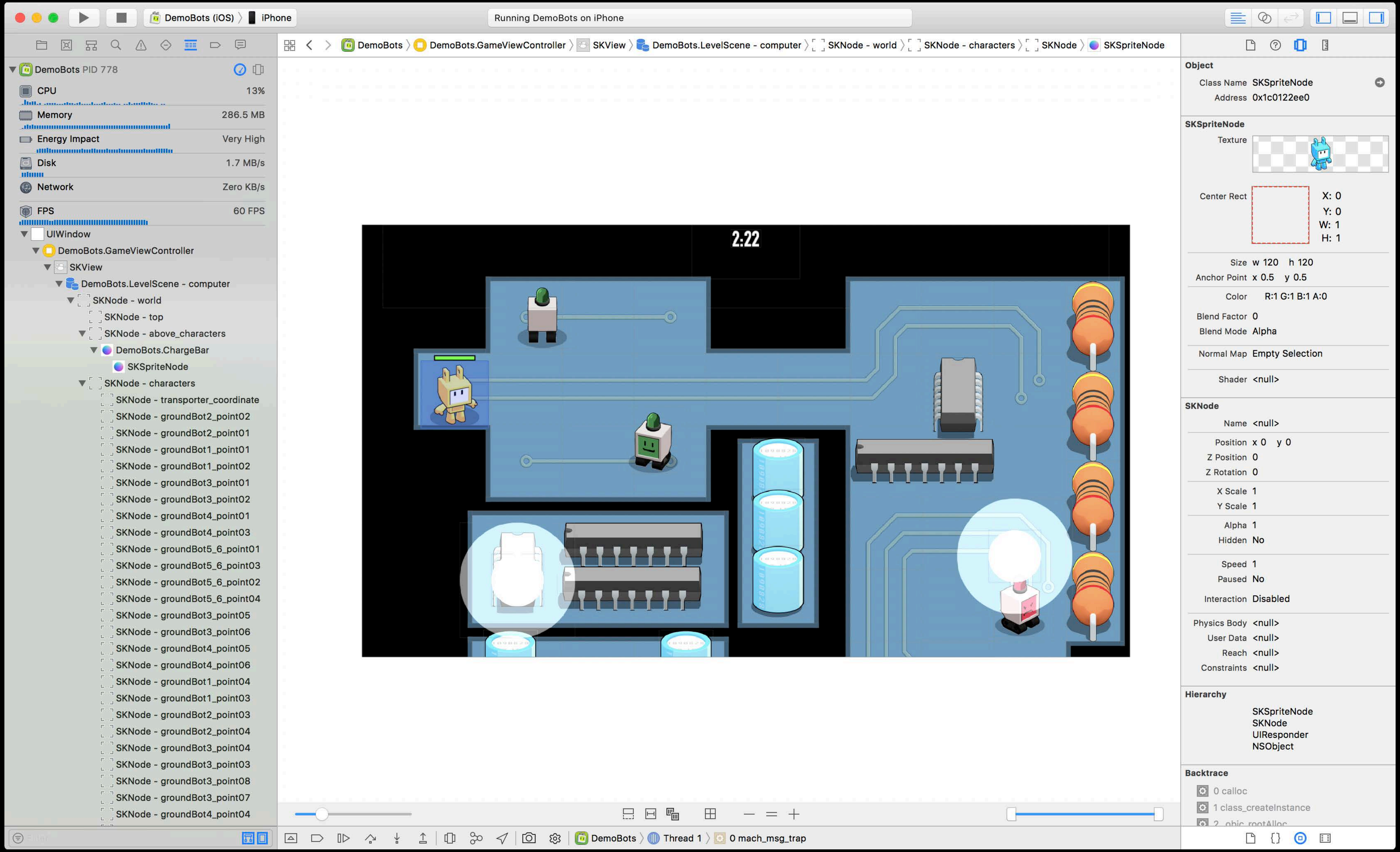
SpriteKit

- 2D graphics framework
- All Apple platforms
- Animation
- Physics engine
- Force fields
- Collision detection
- Lighting effects



SpriteKit Debugging

NEW



Running DemoBots on iPhone

DemoBots 〉 DemoBots.GameViewController 〉 SKView 〉 DemoBots.LevelScene - computer 〉 SKNode - world 〉 SKNode - characters 〉 SKNode 〉 SKSpriteNode

```
DemoBots PID 778
CPU                13%
Memory             286.5 MB
Energy Impact      Very High
Disk               1.7 MB/s
Network            Zero KB/s
FPS                60 FPS
UIWindow
  DemoBots.GameViewController
    SKView
      DemoBots.LevelScene - computer
        SKNode - world
          SKNode - top
          SKNode - above_characters
            DemoBots.ChargeBar
              SKSpriteNode
          SKNode - characters
            SKNode - transporter_coordinate
            SKNode - groundBot2_point02
            SKNode - groundBot2_point01
            SKNode - groundBot1_point01
            SKNode - groundBot1_point02
            SKNode - groundBot3_point01
            SKNode - groundBot3_point02
            SKNode - groundBot4_point01
            SKNode - groundBot4_point03
            SKNode - groundBot5_6_point01
            SKNode - groundBot5_6_point03
            SKNode - groundBot5_6_point02
            SKNode - groundBot5_6_point04
            SKNode - groundBot3_point05
            SKNode - groundBot3_point06
            SKNode - groundBot4_point05
            SKNode - groundBot4_point06
            SKNode - groundBot1_point04
            SKNode - groundBot1_point03
            SKNode - groundBot2_point03
            SKNode - groundBot2_point04
            SKNode - groundBot3_point04
            SKNode - groundBot3_point03
            SKNode - groundBot3_point08
            SKNode - groundBot3_point07
            SKNode - groundBot4_point04
```

Object

Class Name SKSpriteNode
Address 0x1c0122ee0

SKSpriteNode

Texture

Center Rect X: 0 Y: 0 W: 1 H: 1

Size w 120 h 120
Anchor Point x 0.5 y 0.5
Color R:1 G:1 B:1 A:0
Blend Factor 0
Blend Mode Alpha
Normal Map Empty Selection
Shader <null>

SKNode

Name <null>
Position x 0 y 0
Z Position 0
Z Rotation 0
X Scale 1
Y Scale 1
Alpha 1
Hidden No
Speed 1
Paused No
Interaction Disabled
Physics Body <null>
User Data <null>
Reach <null>
Constraints <null>

Hierarchy

SKSpriteNode
SKNode
UIResponder
NSObject

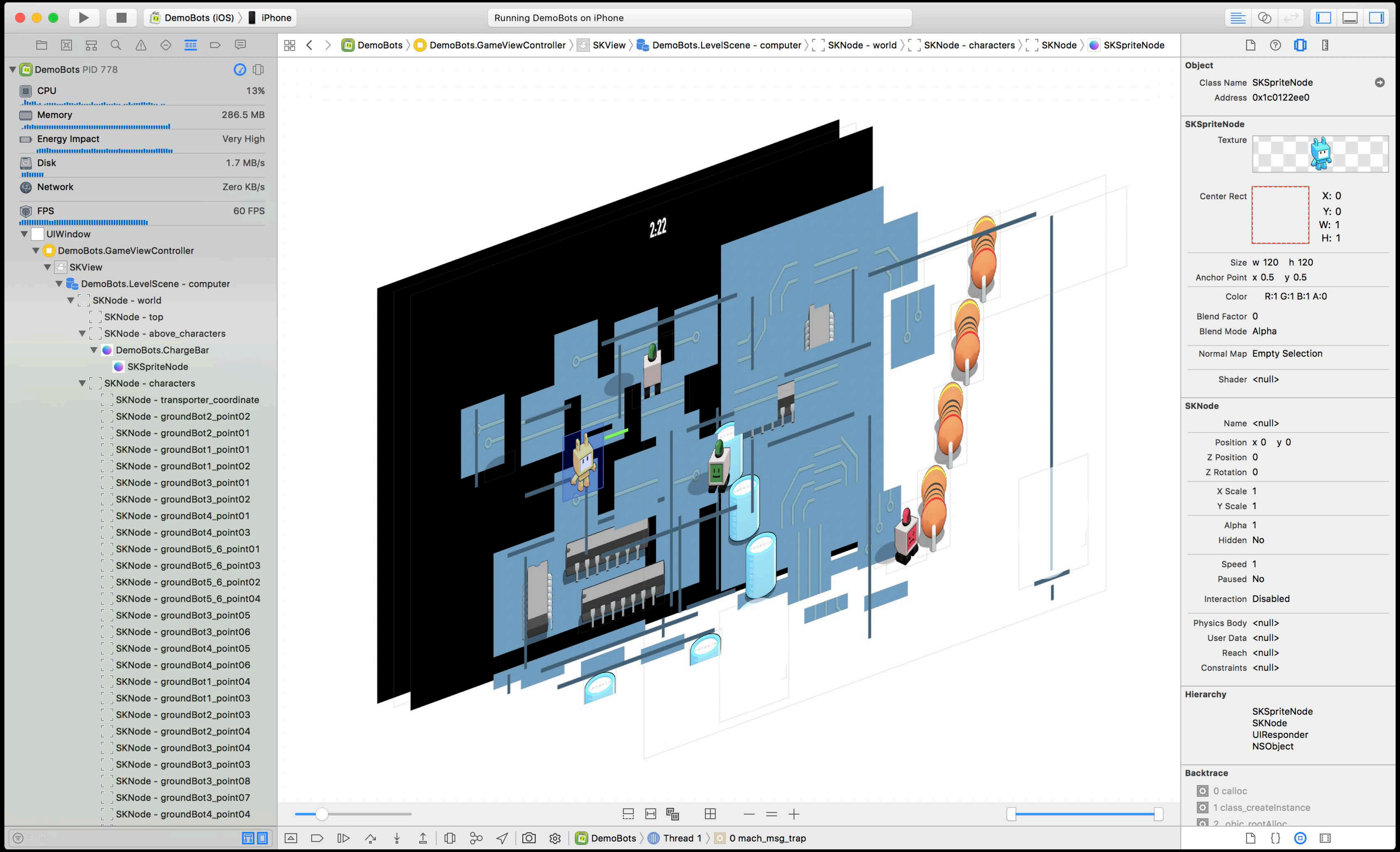
Backtrace

0 calloc
1 class_createInstance
2 objc_rootAlloc

DemoBots 〉 Thread 1 〉 0 mach_msg_trap

SpriteKit Debugging

NEW



DemoBots (iOS) 〉 iPhone

Running DemoBots on iPhone

DemoBots 〉 DemoBots.GameViewController 〉 SKView 〉 DemoBots.LevelScene - computer 〉 SKNode - world 〉 SKNode - characters 〉 SKNode 〉 SKSpriteNode

DemoBots PID 778

CPU	13%
Memory	286.5 MB
Energy Impact	Very High
Disk	1.7 MB/s
Network	Zero KB/s
FPS	60 FPS

- UIWindow
  - DemoBots.GameViewController
    - SKView
      - DemoBots.LevelScene - computer
        - SKNode - world
          - SKNode - top
          - SKNode - above_characters
            - DemoBots.ChargeBar
              - SKSpriteNode
          - SKNode - characters
            - SKNode - transporter_coordinate
            - SKNode - groundBot2_point02
            - SKNode - groundBot2_point01
            - SKNode - groundBot1_point01
            - SKNode - groundBot1_point02
            - SKNode - groundBot3_point01
            - SKNode - groundBot3_point02
            - SKNode - groundBot4_point01
            - SKNode - groundBot4_point03
            - SKNode - groundBot5_6_point01
            - SKNode - groundBot5_6_point03
            - SKNode - groundBot5_6_point02
            - SKNode - groundBot5_6_point04
            - SKNode - groundBot3_point05
            - SKNode - groundBot3_point06
            - SKNode - groundBot4_point05
            - SKNode - groundBot4_point06
            - SKNode - groundBot1_point04
            - SKNode - groundBot1_point03
            - SKNode - groundBot2_point03
            - SKNode - groundBot2_point04
            - SKNode - groundBot3_point04
            - SKNode - groundBot3_point03
            - SKNode - groundBot3_point08
            - SKNode - groundBot3_point07
            - SKNode - groundBot4_point04

Object

Class Name SKSpriteNode
Address 0x1c0122ee0

SKSpriteNode

Texture

Center Rect X: 0 Y: 0 W: 1 H: 1

Size w 120 h 120
Anchor Point x 0.5 y 0.5
Color R:1 G:1 B:1 A:0
Blend Factor 0
Blend Mode Alpha
Normal Map Empty Selection
Shader <null>

SKNode

Name <null>
Position x 0 y 0
Z Position 0
Z Rotation 0
X Scale 1
Y Scale 1
Alpha 1
Hidden No
Speed 1
Paused No
Interaction Disabled
Physics Body <null>
User Data <null>
Reach <null>
Constraints <null>

Hierarchy

SKSpriteNode
SKNode
UIResponder
NSObject

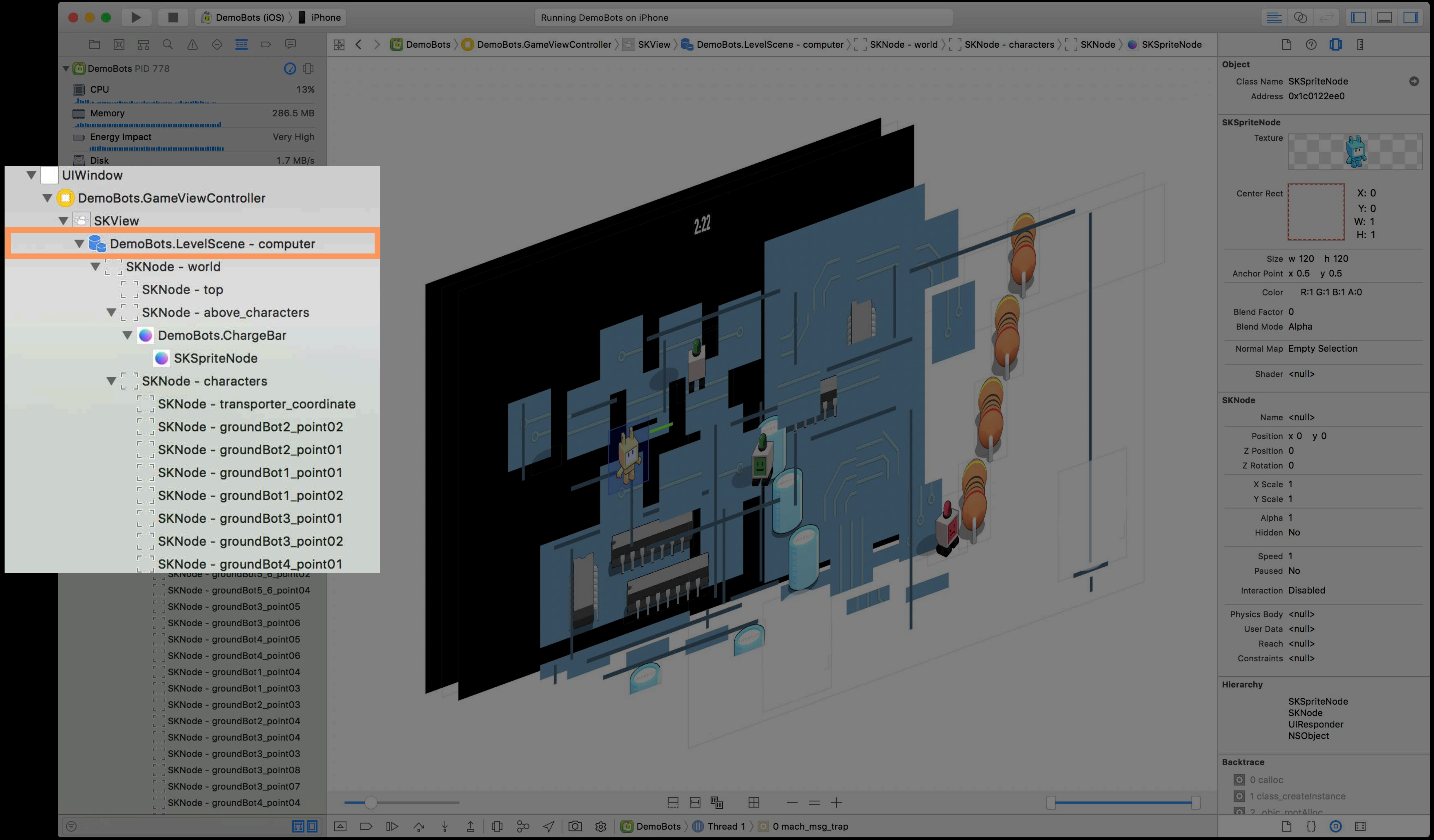
Backtrace

0 calloc
1 class_createInstance
2 _objc_rootAlloc

DemoBots 〉 Thread 1 〉 0 mach_msg_trap

SpriteKit Debugging

NEW



Running DemoBots on iPhone

DemoBots (iOS) 〉 iPhone

DemoBots 〉 DemoBots.GameViewController 〉 SKView 〉 DemoBots.LevelScene - computer 〉 SKNode - world 〉 SKNode - characters 〉 SKNode 〉 SKSpriteNode

DemoBots PID 778	
CPU	13%
Memory	286.5 MB
Energy Impact	Very High
Disk	1.7 MB/s

```
UIWindow
  DemoBots.GameViewController
    SKView
      DemoBots.LevelScene - computer
        SKNode - world
          SKNode - top
          SKNode - above_characters
            DemoBots.ChargeBar
              SKSpriteNode
          SKNode - characters
            SKNode - transporter_coordinate
            SKNode - groundBot2_point02
            SKNode - groundBot2_point01
            SKNode - groundBot1_point01
            SKNode - groundBot1_point02
            SKNode - groundBot3_point01
            SKNode - groundBot3_point02
            SKNode - groundBot4_point01
            SKNode - groundBot5_6_point02
            SKNode - groundBot5_6_point04
            SKNode - groundBot3_point05
            SKNode - groundBot3_point06
            SKNode - groundBot4_point05
            SKNode - groundBot4_point06
            SKNode - groundBot1_point04
            SKNode - groundBot1_point03
            SKNode - groundBot2_point03
            SKNode - groundBot2_point04
            SKNode - groundBot3_point04
            SKNode - groundBot3_point03
            SKNode - groundBot3_point08
            SKNode - groundBot3_point07
            SKNode - groundBot4_point04
```

Object

Class Name	SKSpriteNode
Address	0x1c0122ee0

SKSpriteNode

Texture	
Center Rect	X: 0 Y: 0 W: 1 H: 1
Size	w 120 h 120
Anchor Point	x 0.5 y 0.5
Color	R:1 G:1 B:1 A:0
Blend Factor	0
Blend Mode	Alpha
Normal Map	Empty Selection
Shader	<null>

SKNode

Name	<null>
Position	x 0 y 0
Z Position	0
Z Rotation	0
X Scale	1
Y Scale	1
Alpha	1
Hidden	No
Speed	1
Paused	No
Interaction	Disabled
Physics Body	<null>
User Data	<null>
Reach	<null>
Constraints	<null>

Hierarchy

SKSpriteNode
SKNode
UIResponder
NSObject

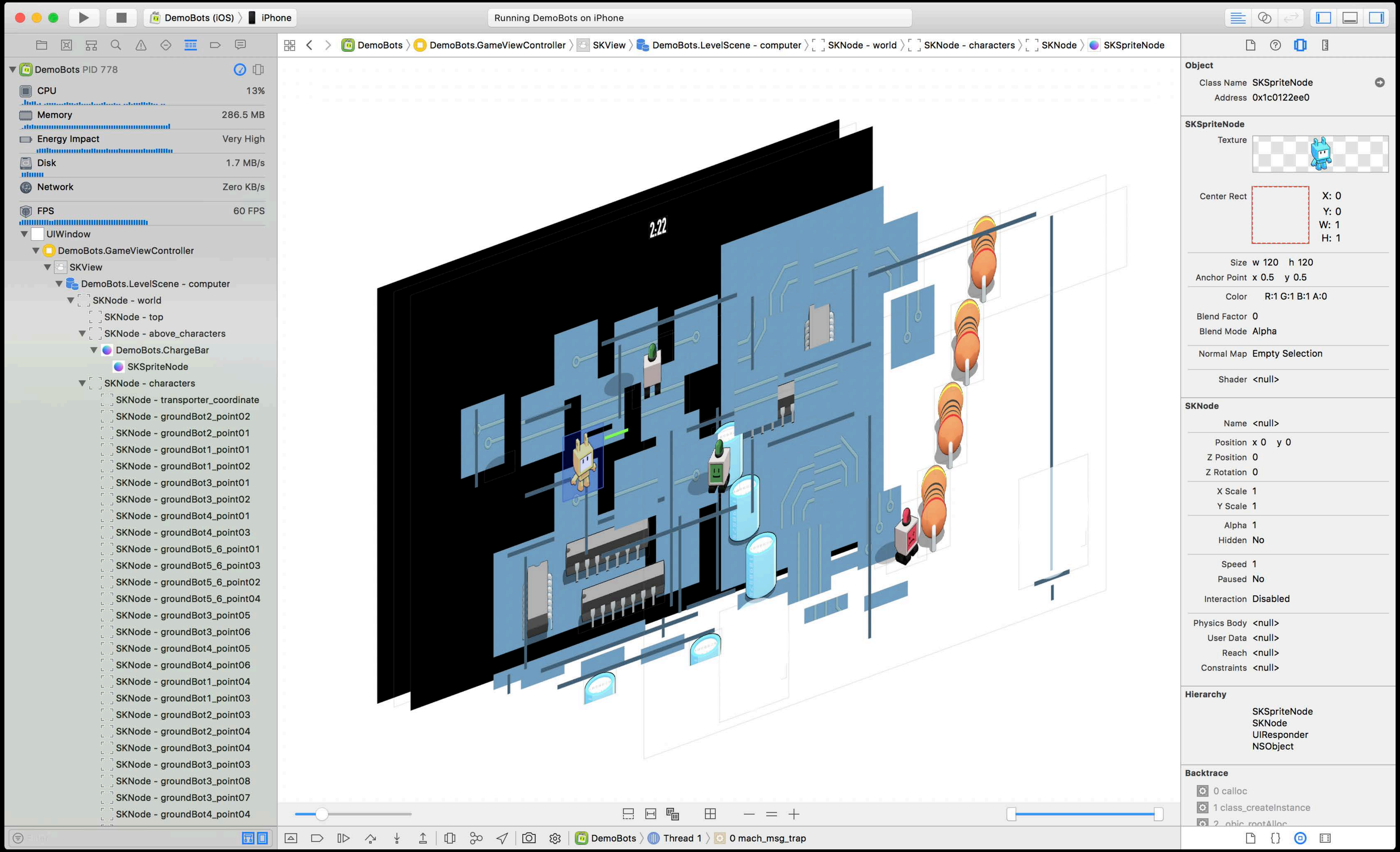
Backtrace

0 calloc
1 class_createInstance
2 _objc_rootAlloc

DemoBots 〉 Thread 1 〉 0 mach_msg_trap

SpriteKit Debugging

NEW



Running DemoBots on iPhone

DemoBots 〉 DemoBots.GameViewController 〉 SKView 〉 DemoBots.LevelScene - computer 〉 SKNode - world 〉 SKNode - characters 〉 SKNode 〉 SKSpriteNode

DemoBots PID 778

CPU	13%
Memory	286.5 MB
Energy Impact	Very High
Disk	1.7 MB/s
Network	Zero KB/s
FPS	60 FPS

- UIWindow
  - DemoBots.GameViewController
    - SKView
      - DemoBots.LevelScene - computer
        - SKNode - world
          - SKNode - top
          - SKNode - above_characters
            - DemoBots.ChargeBar
              - SKSpriteNode
          - SKNode - characters
            - SKNode - transporter_coordinate
            - SKNode - groundBot2_point02
            - SKNode - groundBot2_point01
            - SKNode - groundBot1_point01
            - SKNode - groundBot1_point02
            - SKNode - groundBot3_point01
            - SKNode - groundBot3_point02
            - SKNode - groundBot4_point01
            - SKNode - groundBot4_point03
            - SKNode - groundBot5_6_point01
            - SKNode - groundBot5_6_point03
            - SKNode - groundBot5_6_point02
            - SKNode - groundBot5_6_point04
            - SKNode - groundBot3_point05
            - SKNode - groundBot3_point06
            - SKNode - groundBot4_point05
            - SKNode - groundBot4_point06
            - SKNode - groundBot1_point04
            - SKNode - groundBot1_point03
            - SKNode - groundBot2_point03
            - SKNode - groundBot2_point04
            - SKNode - groundBot3_point04
            - SKNode - groundBot3_point03
            - SKNode - groundBot3_point08
            - SKNode - groundBot3_point07
            - SKNode - groundBot4_point04

Object

Class Name SKSpriteNode
Address 0x1c0122ee0

SKSpriteNode

Texture

Center Rect X: 0 Y: 0 W: 1 H: 1

Size w 120 h 120
Anchor Point x 0.5 y 0.5
Color R:1 G:1 B:1 A:0
Blend Factor 0
Blend Mode Alpha
Normal Map Empty Selection
Shader <null>

SKNode

Name <null>
Position x 0 y 0
Z Position 0
Z Rotation 0
X Scale 1
Y Scale 1
Alpha 1
Hidden No
Speed 1
Paused No
Interaction Disabled
Physics Body <null>
User Data <null>
Reach <null>
Constraints <null>

Hierarchy

SKSpriteNode
SKNode
UIResponder
NSObject

Backtrace

0 calloc
1 class_createInstance
2 objc_rootAlloc

SceneKit Debugging

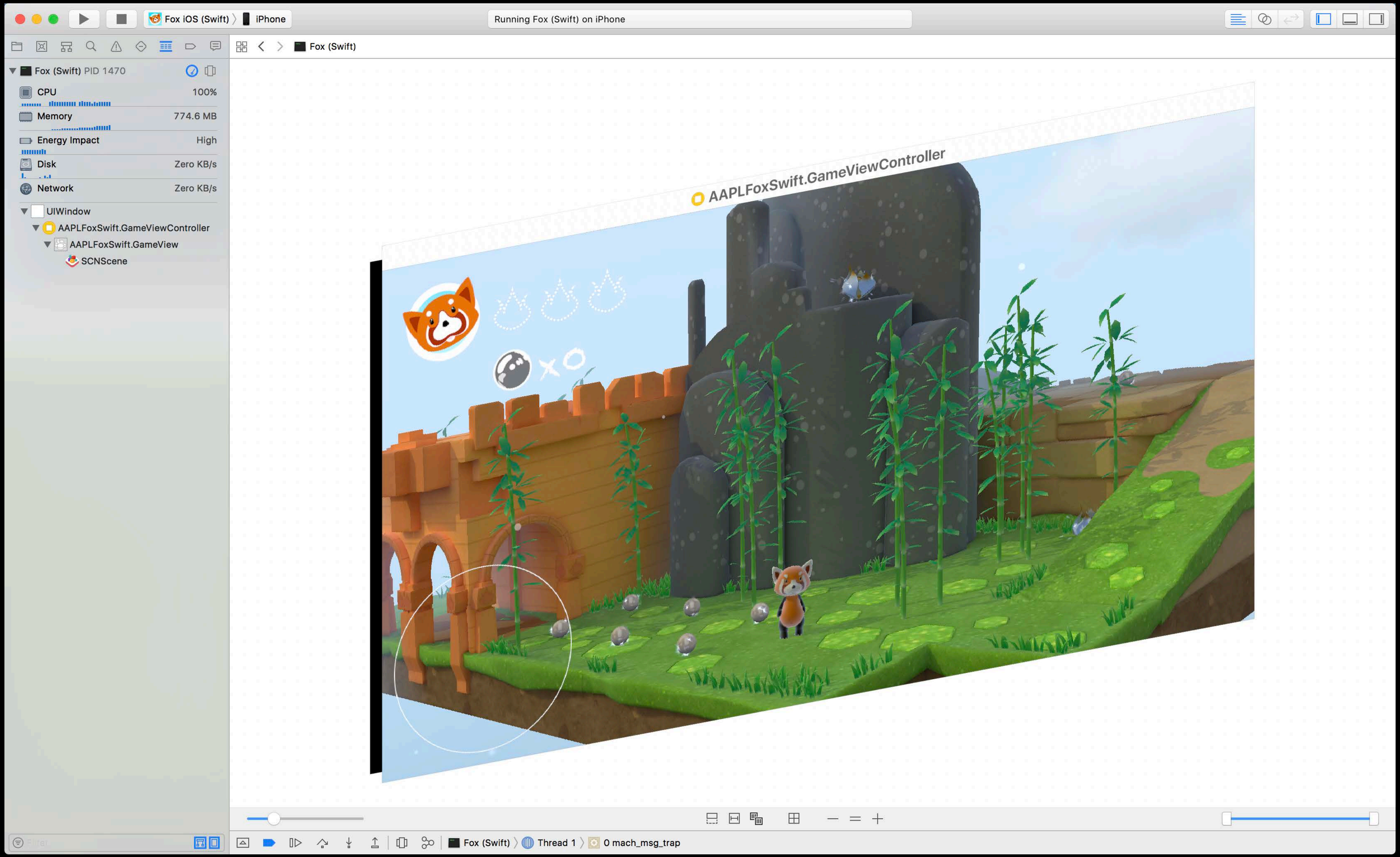
SceneKit Debugging

SceneKit

- 3D graphics framework
- Animations
- Physics simulation
- Particle effects
- Physically-based rendering

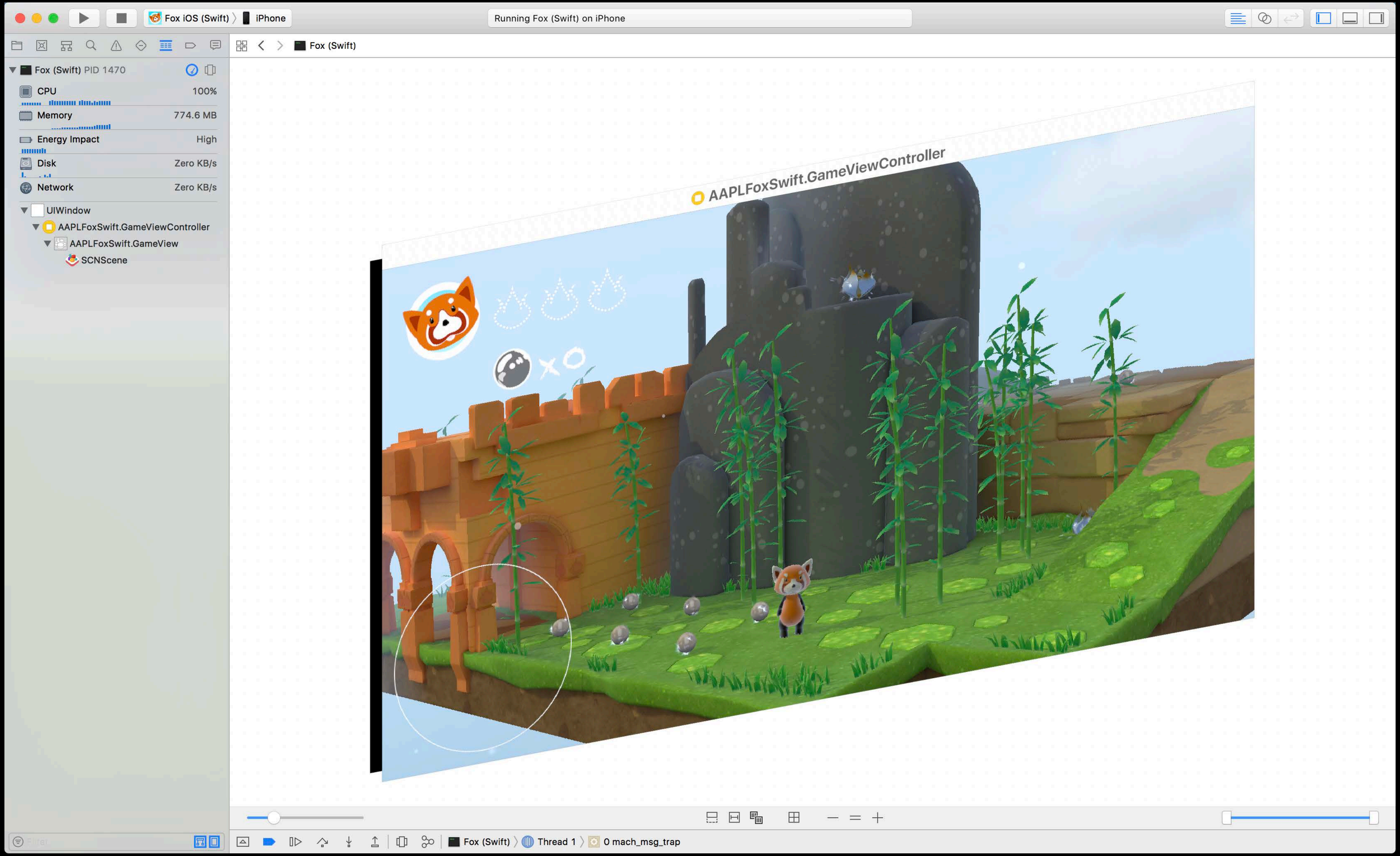
SceneKit Debugging

NEW



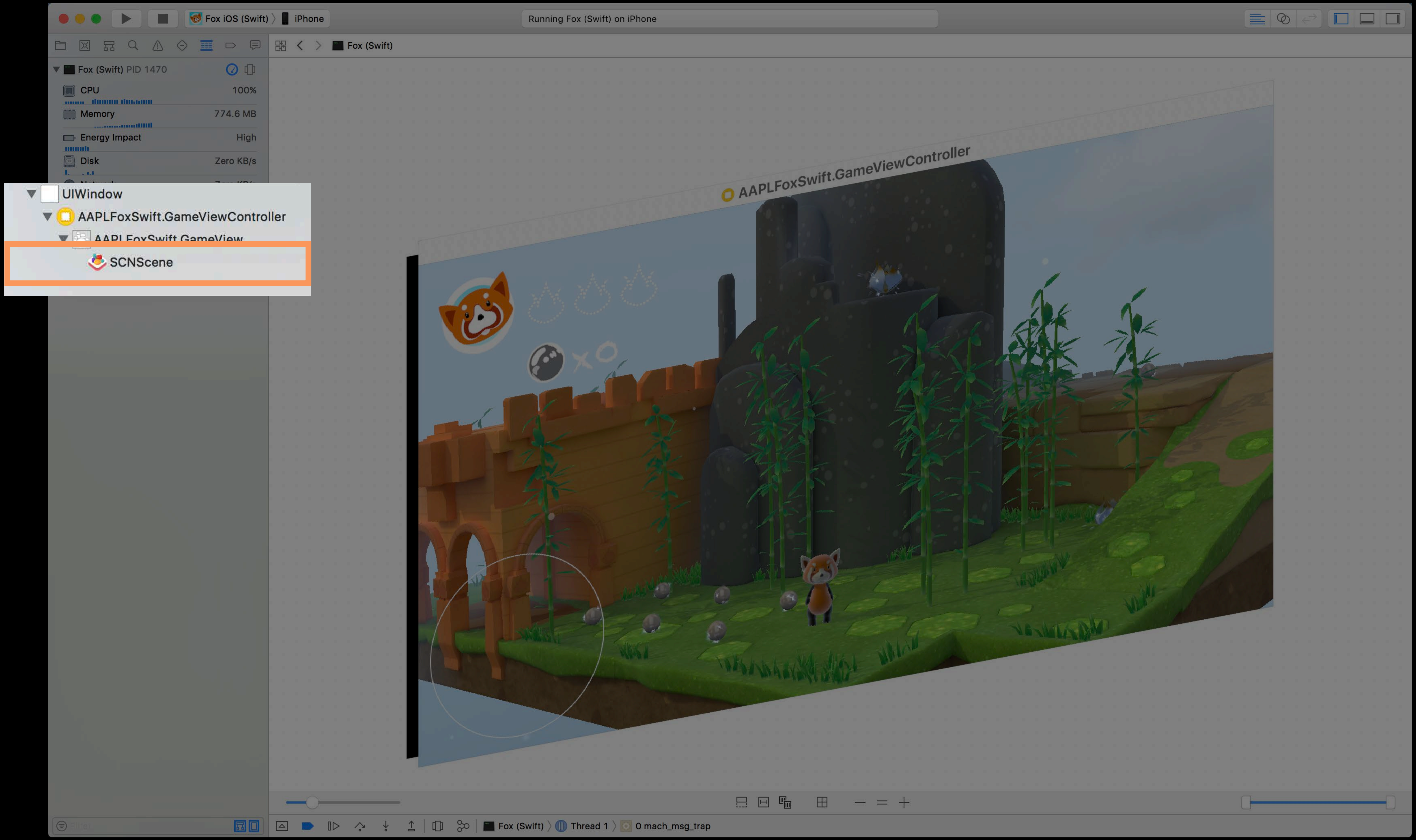
SceneKit Debugging

NEW



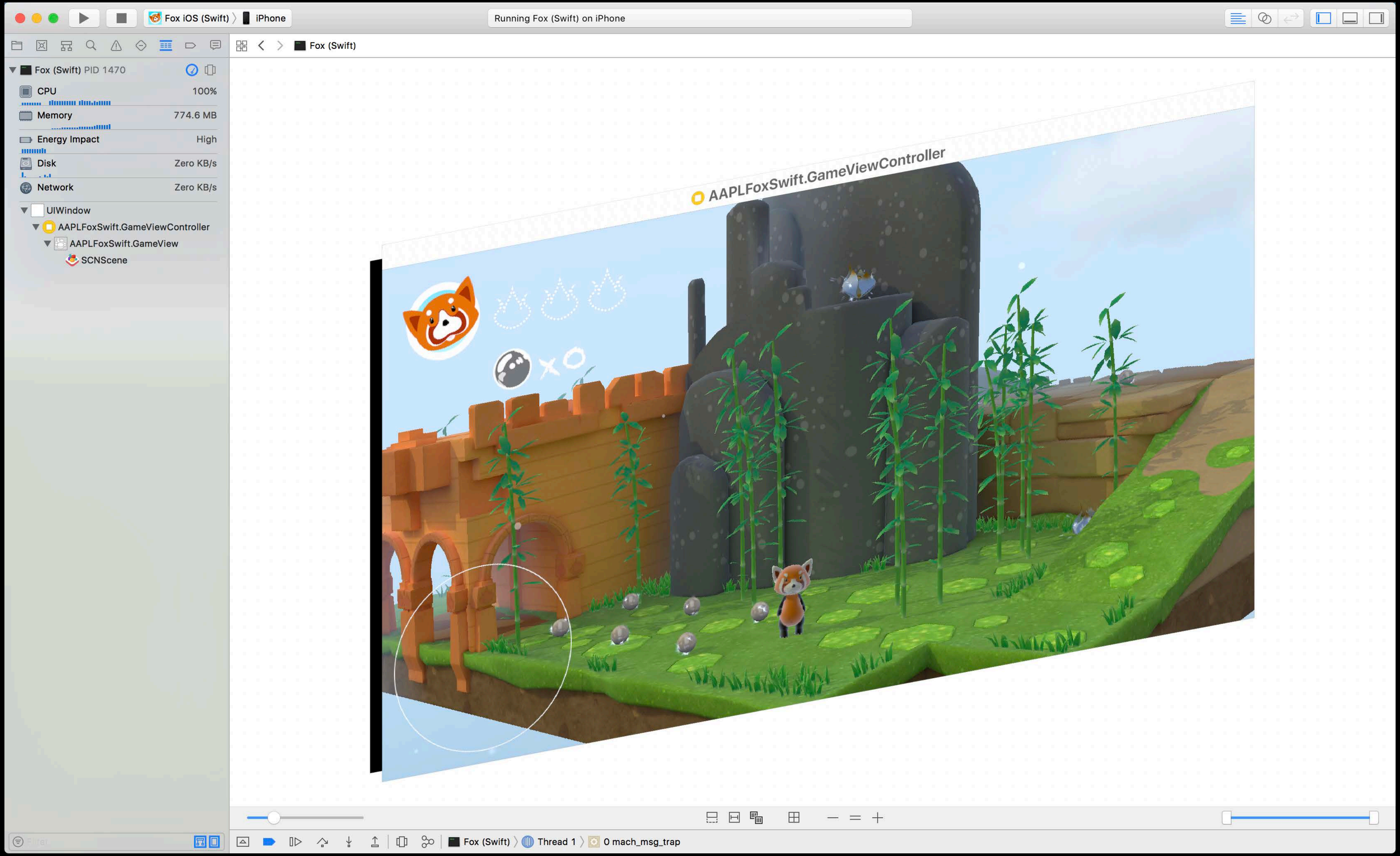
SceneKit Debugging

NEW



SceneKit Debugging

NEW



Fox (Swift) PID 1470

CPU 100%

Memory 774.6 MB

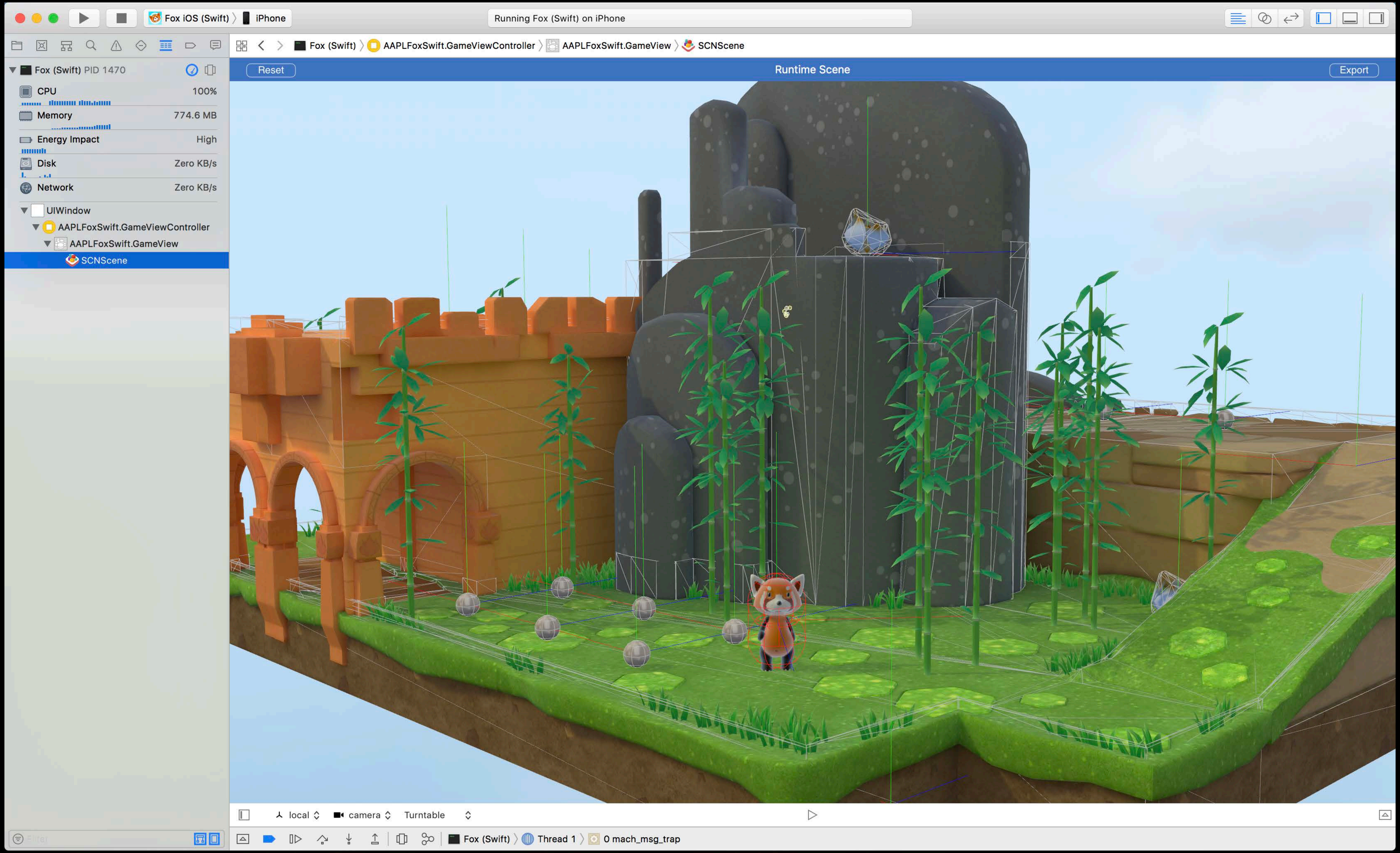
Energy Impact High

Disk Zero KB/s

Network Zero KB/s

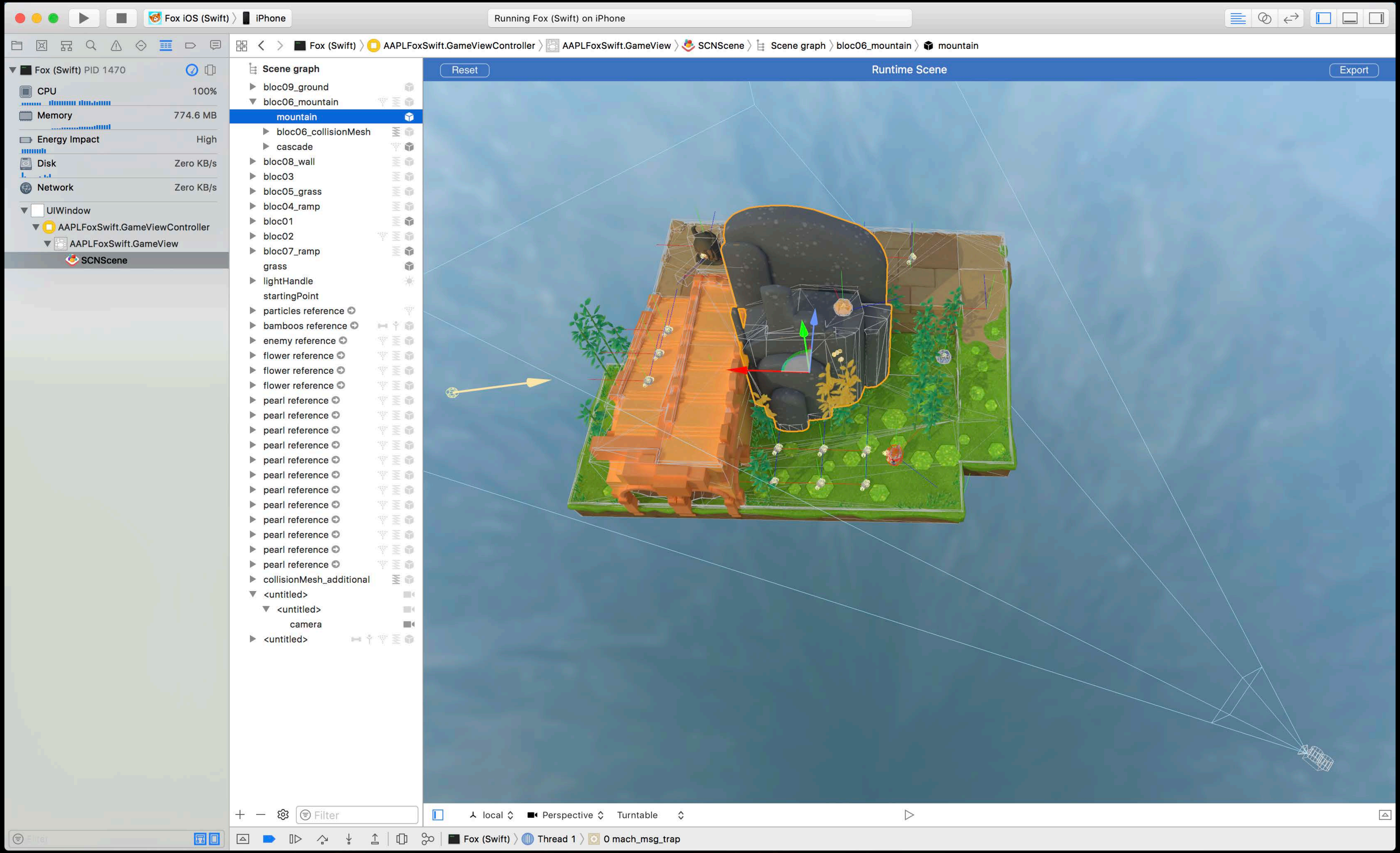
SceneKit Debugging

NEW



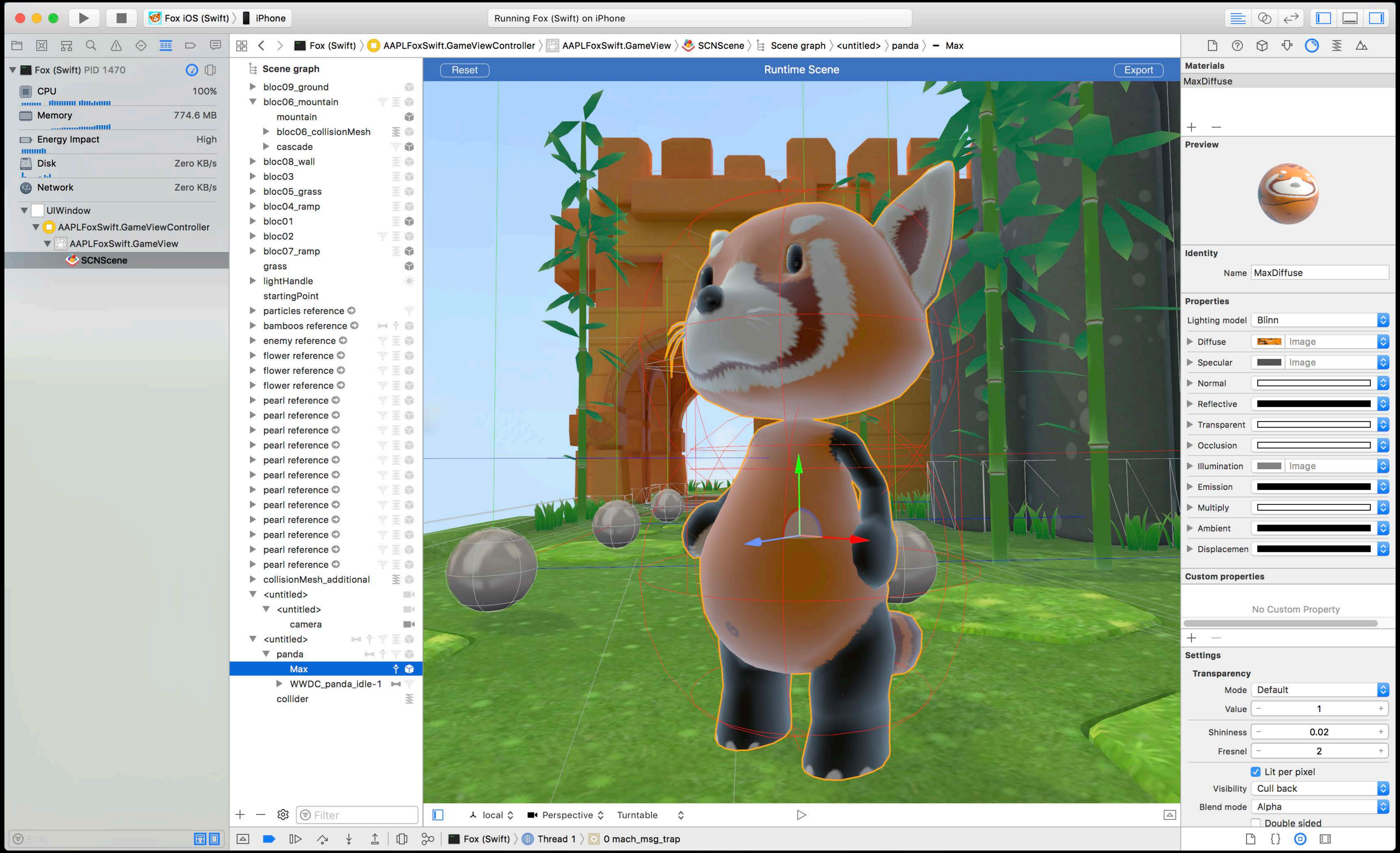
SceneKit Debugging

NEW



SceneKit Debugging

NEW



Fox iOS (Swift) 〉 iPhone

Running Fox (Swift) on iPhone

Fox (Swift) PID 1470

CPU 100%

Memory 774.6 MB

Energy Impact High

Disk Zero KB/s

Network Zero KB/s

- UIWindow
  - AAPLFoxSwift.GameViewController
    - AAPLFoxSwift.GameView
      - SCNScene

Fox (Swift) 〉 AAPLFoxSwift.GameViewController 〉 AAPLFoxSwift.GameView 〉 SCNScene 〉 Scene graph 〉 <untitled> 〉 panda 〉 Max

Scene graph

- bloc09_ground
- bloc06_mountain
  - mountain
  - bloc06_collisionMesh
  - cascade
- bloc08_wall
- bloc03
- bloc05_grass
- bloc04_ramp
- bloc01
- bloc02
- bloc07_ramp
- grass
- lightHandle
- startingPoint
- particles reference
- bamboos reference
- enemy reference
- flower reference
- flower reference
- flower reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- pearl reference
- collisionMesh_additional
- <untitled>
  - <untitled>
    - camera
- <untitled>
  - panda
    - Max
    - WWDC_panda_idle-1
  - collider

Reset | Runtime Scene | Export

local | Perspective | Turntable

Fox (Swift) 〉 Thread 1 〉 0 mach_msg_trap

Materials

MaxDiffuse

Preview

Identity

Name: MaxDiffuse

Properties

Lighting model: Blinn

Diffuse: Image

Specular: Image

Normal

Reflective

Transparent

Occlusion

Illumination: Image

Emission

Multiply

Ambient

Displacemen

Custom properties

No Custom Property

Settings

Transparency

Mode: Default

Value: 1

Shininess: 0.02

Fresnel: 2

☑ Lit per pixel

Visibility: Cull back

Blend mode: Alpha

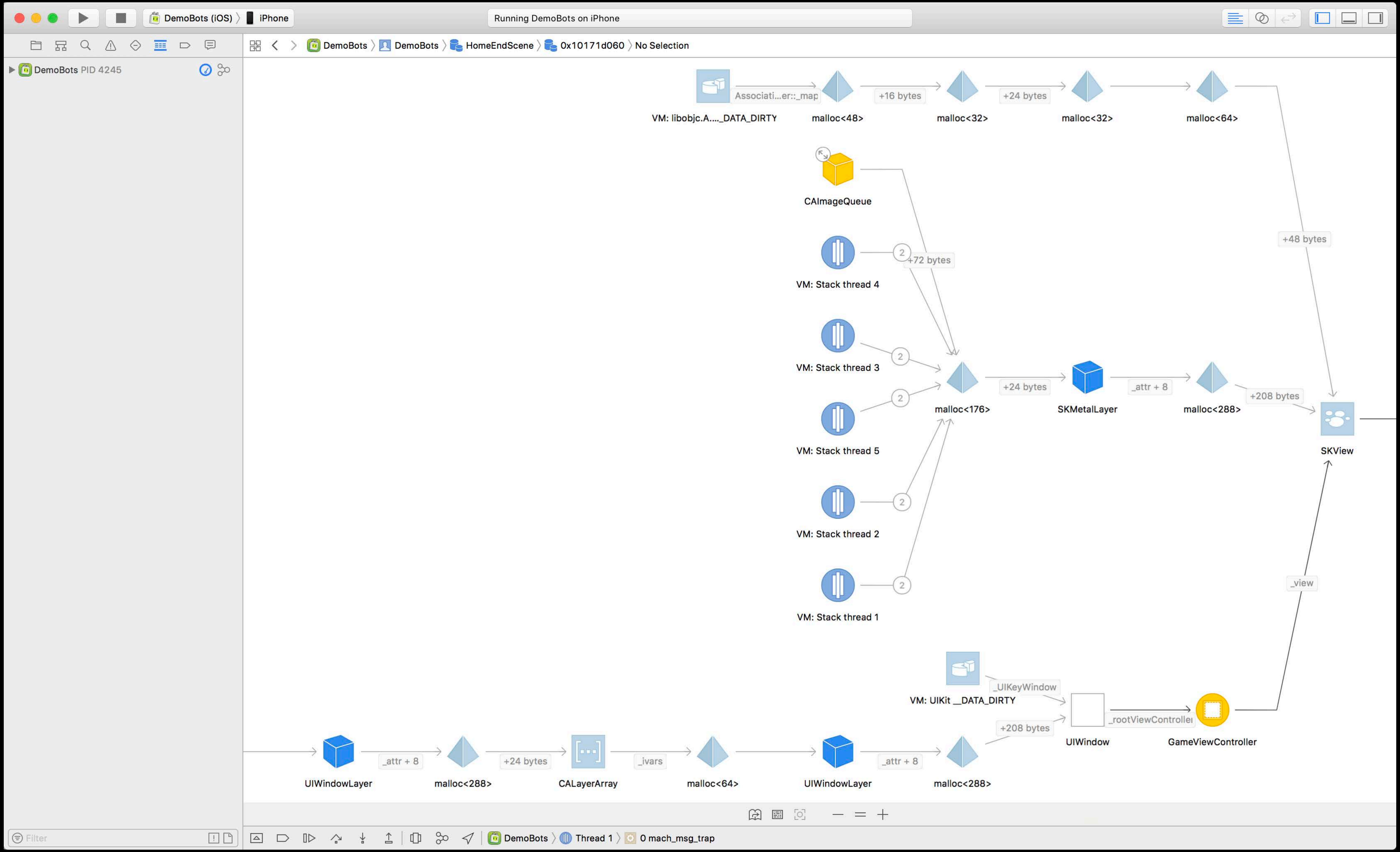
□ Double sided

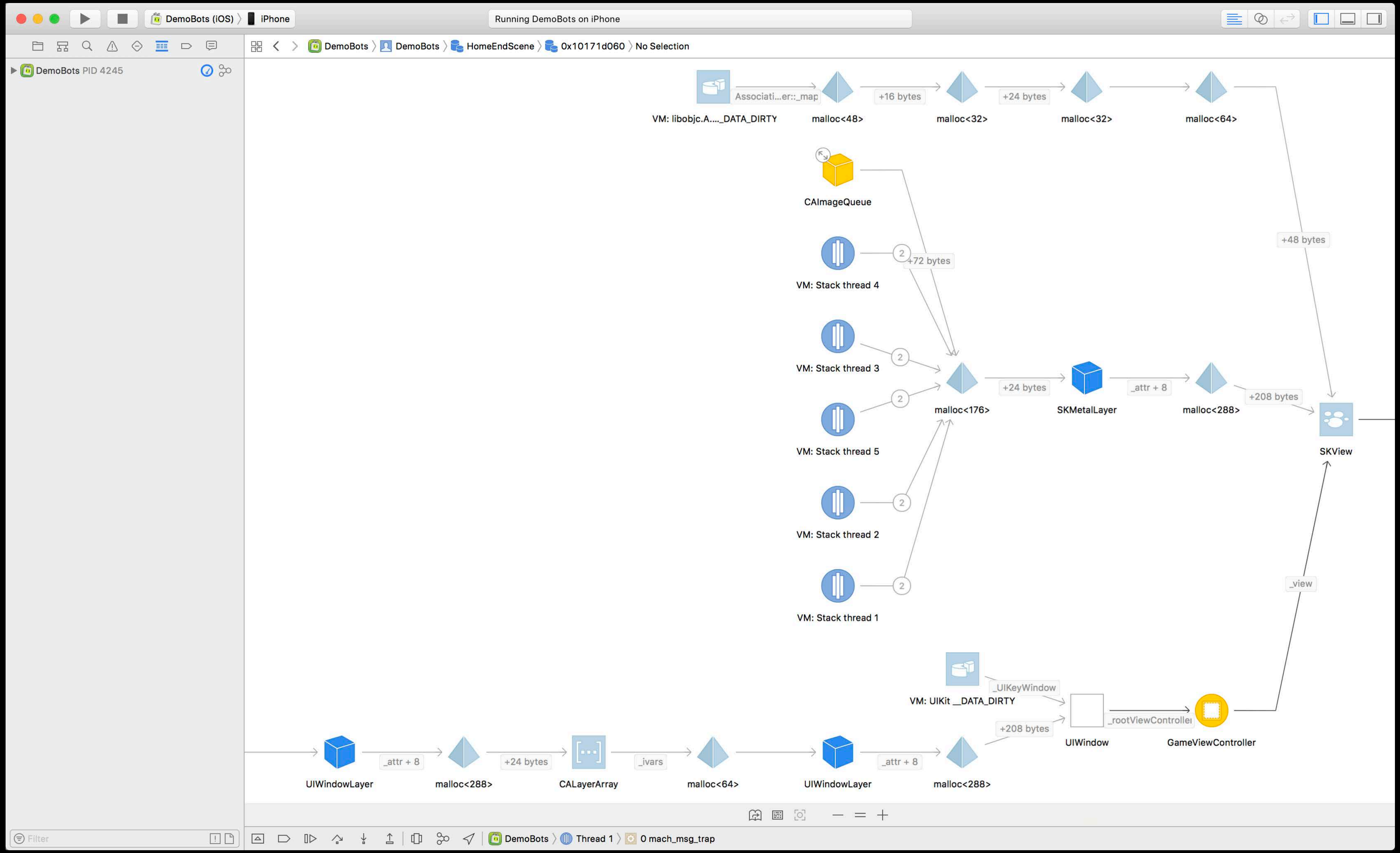
View Debugging Enhancements

Minimum requirements

For view controllers, SpriteKit and SceneKit debugging

- iOS 11
- tvOS 11
- macOS High Sierra


DemoBots (iOS)
iPhone
Running DemoBots on iPhone
DemoBots
DemoBots
HomeEndScene
0x10171d060
No Selection
DemoBots PID 4245
VM: libobjc.A..._DATA_DIRTY
Associati...er::_map
malloc<48>
+16 bytes
malloc<32>
+24 bytes
malloc<32>
malloc<64>
CAImageQueue
+48 bytes
VM: Stack thread 4
2
+72 bytes
VM: Stack thread 3
2
VM: Stack thread 5
2
malloc<176>
+24 bytes
SKMetalLayer
_attr + 8
malloc<288>
+208 bytes
SKView
VM: Stack thread 2
2
VM: Stack thread 1
2
_view
VM: UIKit __DATA_DIRTY
_UIKeyWindow
UIWindow
_rootViewControlle
GameViewController
+208 bytes
UIWindowLayer
_attr + 8
malloc<288>
+24 bytes
CALayerArray
_ivars
malloc<64>
UIWindowLayer
_attr + 8
malloc<288>
Filter
DemoBots
Thread 1
0 mach_msg_trap


DemoBots (iOS)
iPhone
Running DemoBots on iPhone
DemoBots PID 4245
DemoBots
DemoBots
HomeEndScene
0x10171d060
No Selection
VM: libobjc.A...._DATA_DIRTY
Associati...er::_map
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malloc<32>
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malloc<64>
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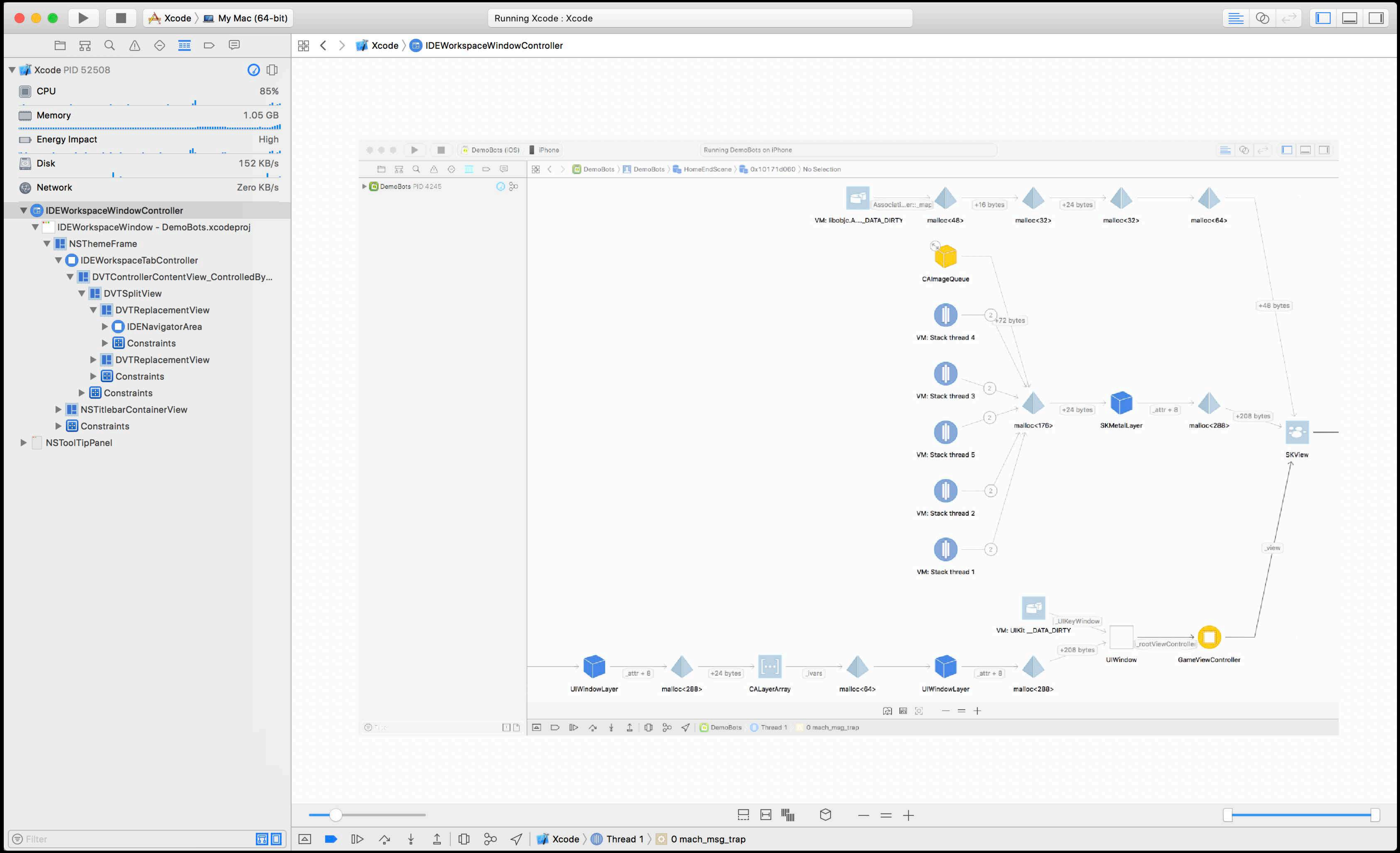
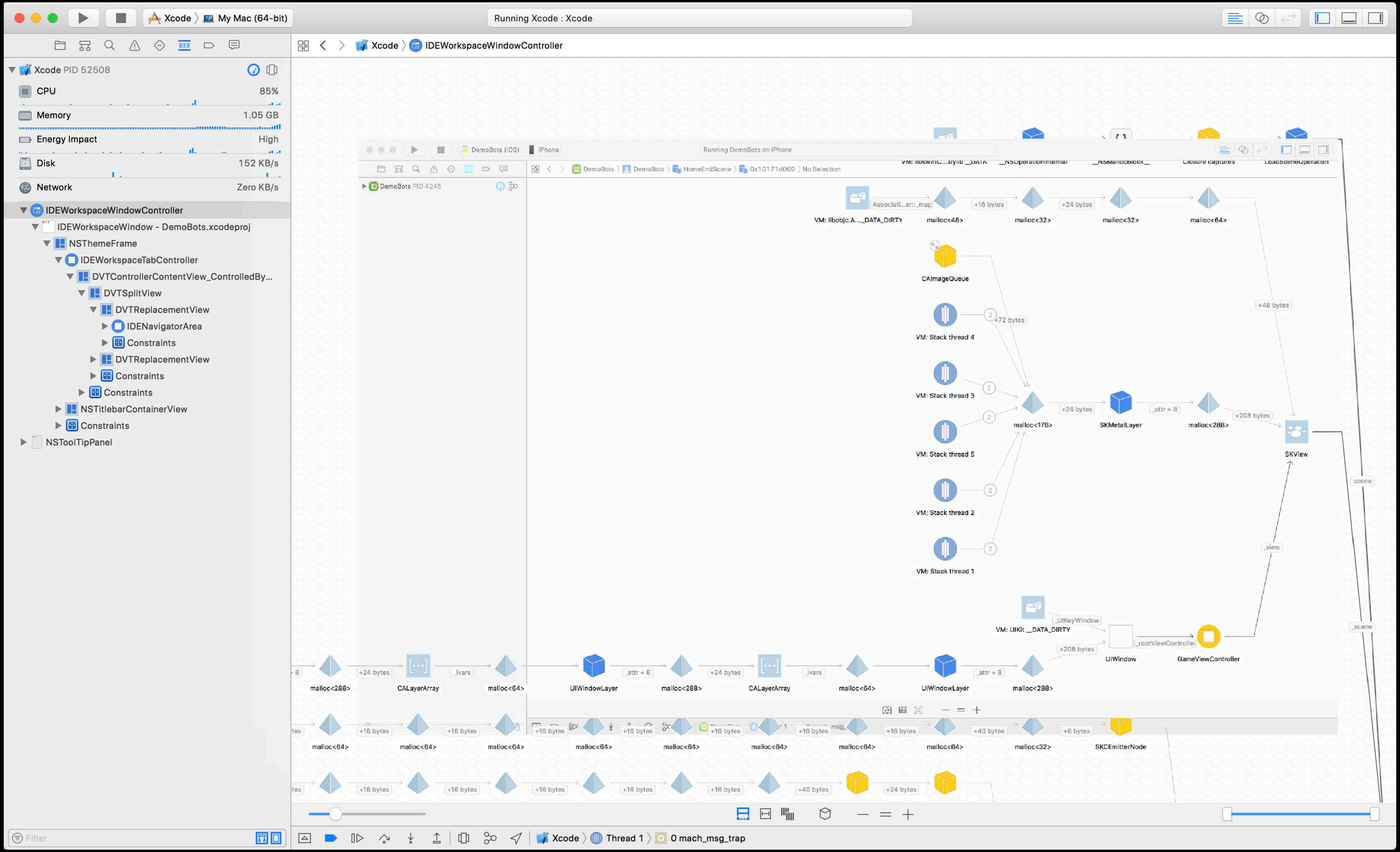
CAImageQueue
+72 bytes
VM: Stack thread 4
VM: Stack thread 3
VM: Stack thread 5
VM: Stack thread 2
VM: Stack thread 1
2
malloc<176>
+24 bytes
SKMetalLayer
_attr + 8
malloc<288>
+208 bytes
SKView
_view
VM: UIKit __DATA_DIRTY
_UIKeyWindow
UIWindow
_rootViewController
GameViewController
+208 bytes
UIWindowLayer
_attr + 8
malloc<288>
+24 bytes
CALayerArray
_ivars
malloc<64>
UIWindowLayer
_attr + 8
malloc<288>
Filter
DemoBots
Thread 1
0 mach_msg_trap


Xcode
My Mac (64-bit)
Running Xcode : Xcode
Xcode
IDEWorkspaceWindowController
Xcode PID 52508
CPU 85%
Memory 1.05 GB
Energy Impact High
Disk 152 KB/s
Network Zero KB/s
IDEWorkspaceWindowController
IDEWorkspaceWindow - DemoBots.xcodeproj
NSThemeFrame
IDEWorkspaceTabController
DVTControllerContentView_ControlledBy...
DVTSplitView
DVTReplacementView
IDENavigatorArea
Constraints
DVTReplacementView
Constraints
Constraints
NSTitlebarContainerView
Constraints
NSToolTipPanel
Filter
DemoBots (iOS)
iPhone
Running DemoBots on iPhone
DemoBots
DemoBots
HomeEndScene
0x10171d060
No Selection
DemoBots PID 4245
VM: libobjc.A..._DATA_DIRTY
Associati...er::_map
malloc<48>
+16 bytes
malloc<32>
+24 bytes
malloc<32>
malloc<64>
CAImageQueue
+48 bytes
+72 bytes
VM: Stack thread 4
VM: Stack thread 3
malloc<176>
+24 bytes
SKMetalLayer
_attr + 8
malloc<288>
+208 bytes
SKView
VM: Stack thread 5
VM: Stack thread 2
VM: Stack thread 1
_view
VM: UIKit __DATA_DIRTY
_UIKeyWindow
UIWindow
_rootViewController
GameViewController
+208 bytes
UIWindowLayer
_attr + 8
malloc<288>
+24 bytes
CALayerArray
_ivars
malloc<64>
UIWindowLayer
_attr + 8
malloc<288>
DemoBots
Thread 1
0 mach_msg_trap
Xcode
Thread 1
0 mach_msg_trap


Xcode
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Running Xcode : Xcode
Xcode PID 52508
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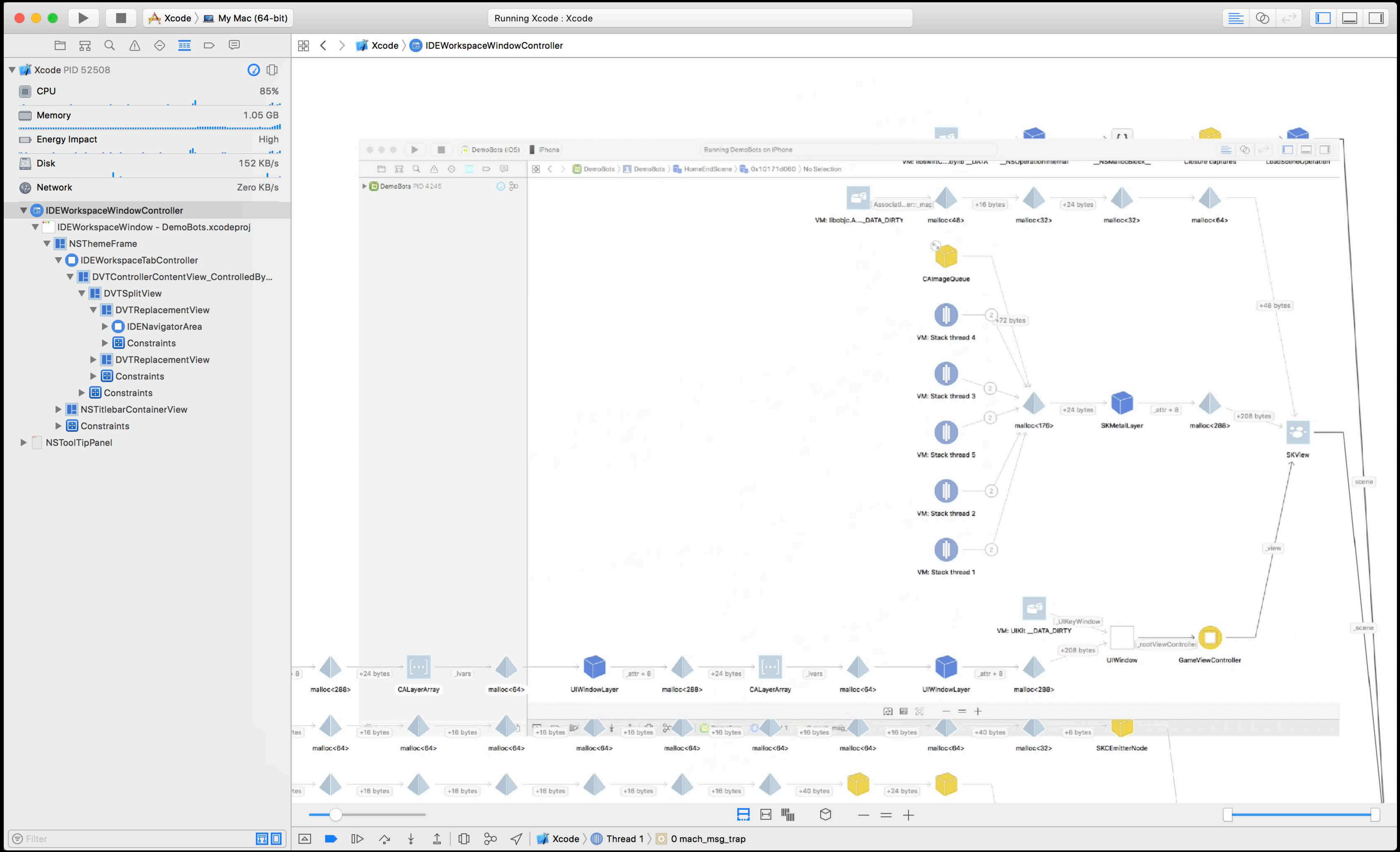
Constraints
Constraints
NSTitlebarContainerView
Constraints
NSToolTipPanel
Filter
Xcode
IDEWorkspaceWindowController
DemoBots (iOS)
iPhone
Running DemoBots on iPhone
DemoBots
DemoBots
HomeEndScene
0x10171d060
No Selection
DemoBots PID 4245
VM: libobjc.A..._DATA_DIRTY
malloc<48>
malloc<32>
malloc<32>
malloc<64>
CAImageQueue
VM: Stack thread 4
VM: Stack thread 3
VM: Stack thread 5
VM: Stack thread 2
VM: Stack thread 1
malloc<176>
SKMetalLayer
malloc<288>
SKView
VM: UIKit __DATA_DIRTY
UIWindow
GameViewController
malloc<288>
CALayerArray
malloc<64>
UIWindowLayer
malloc<288>
CALayerArray
malloc<64>
UIWindowLayer
malloc<288>
malloc<64>
malloc<64>
malloc<64>
malloc<64>
malloc<64>
malloc<64>
malloc<64>
malloc<64>
malloc<32>
SKCEmitterNode
+16 bytes
+24 bytes
+48 bytes
+72 bytes
+208 bytes
+40 bytes
+8 bytes
_attr + 8
_ivars
_view
_UIKeyWindow
_rootViewController
scene
_scene
Xcode
Thread 1
0 mach_msg_trap



Running Xcode : Xcode

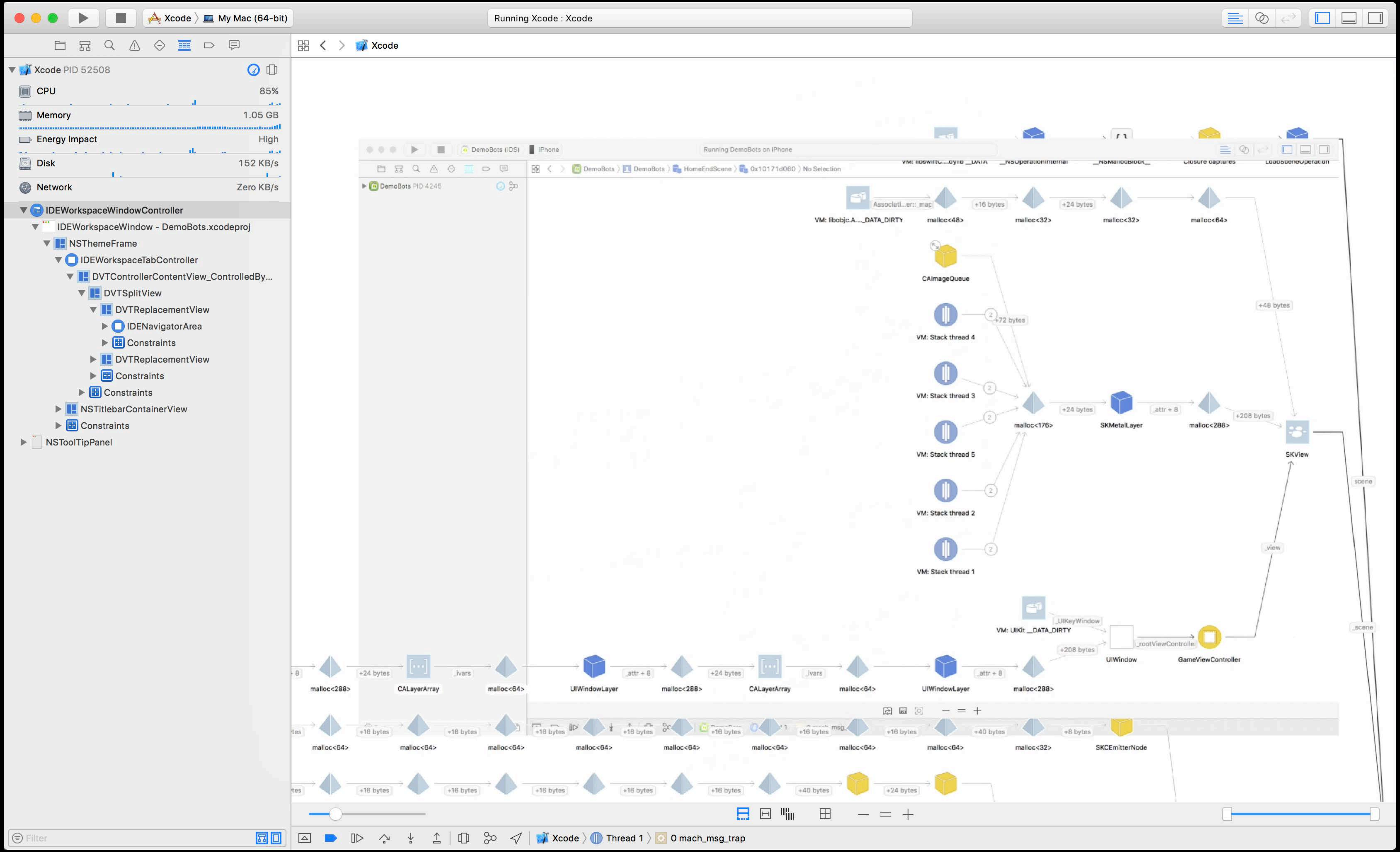
Xcode 〉 IDEWorkspaceWindowController

Xcode PID 52508

CPU	85%
Memory	1.05 GB
Energy Impact	High
Disk	152 KB/s
Network	Zero KB/s

- IDEWorkspaceWindowController
  - IDEWorkspaceWindow - DemoBots.xcodeproj
    - NSThemeFrame
      - IDEWorkspaceTabController
        - DVTControllerContentView_ControlledBy...
          - DVTSplitView
            - DVTReplacementView
              - IDENavigatorArea
              - Constraints
            - DVTReplacementView
            - Constraints
          - Constraints
      - NSTitlebarContainerView
      - Constraints
- NSToolTipPanel

Xcode 〉 Thread 1 〉 0 mach_msg_trap



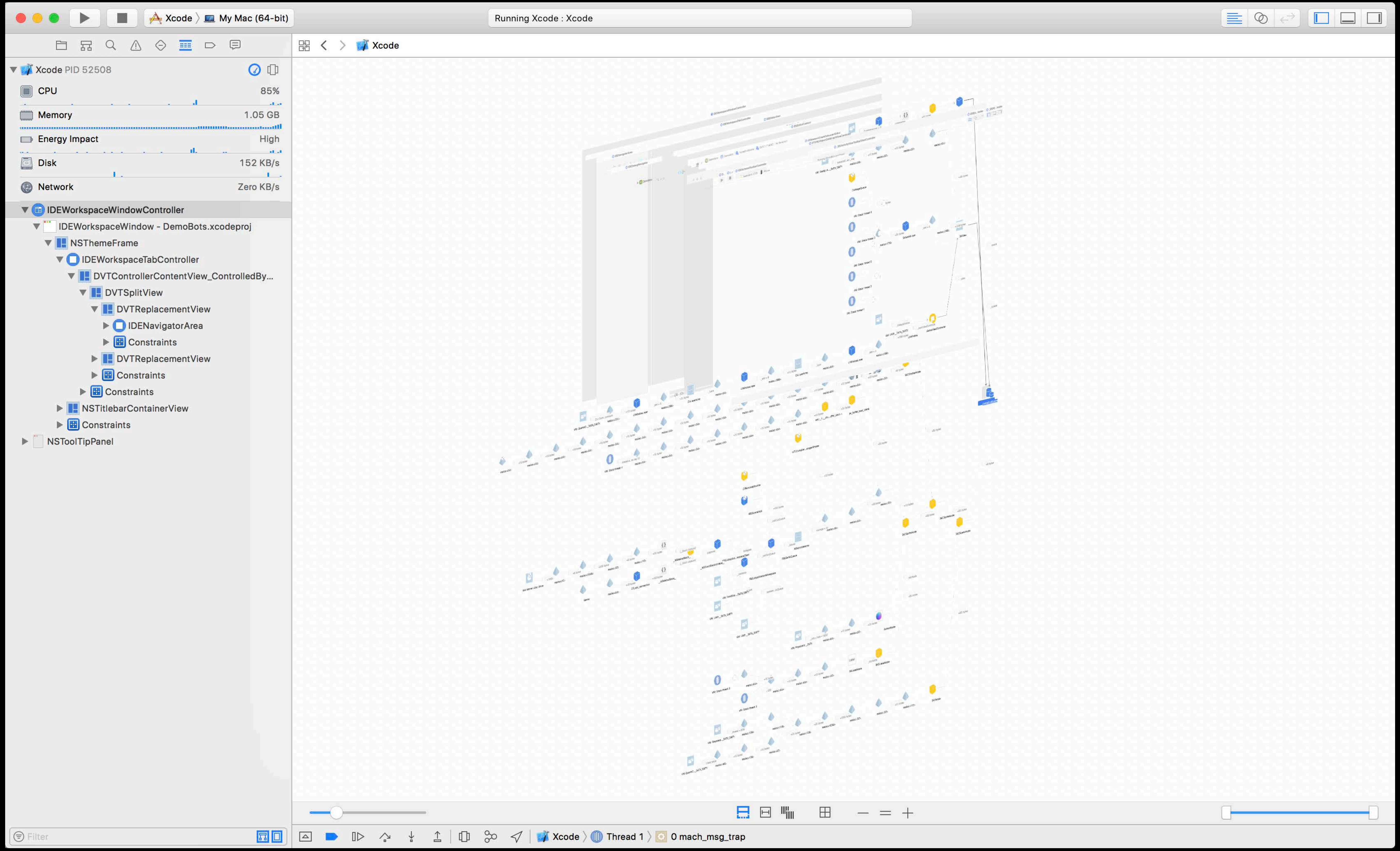
CPU 85%

Memory 1.05 GB

Energy Impact High

Disk 152 KB/s

Network Zero KB/s



Xcode PID 52508

CPU 85%

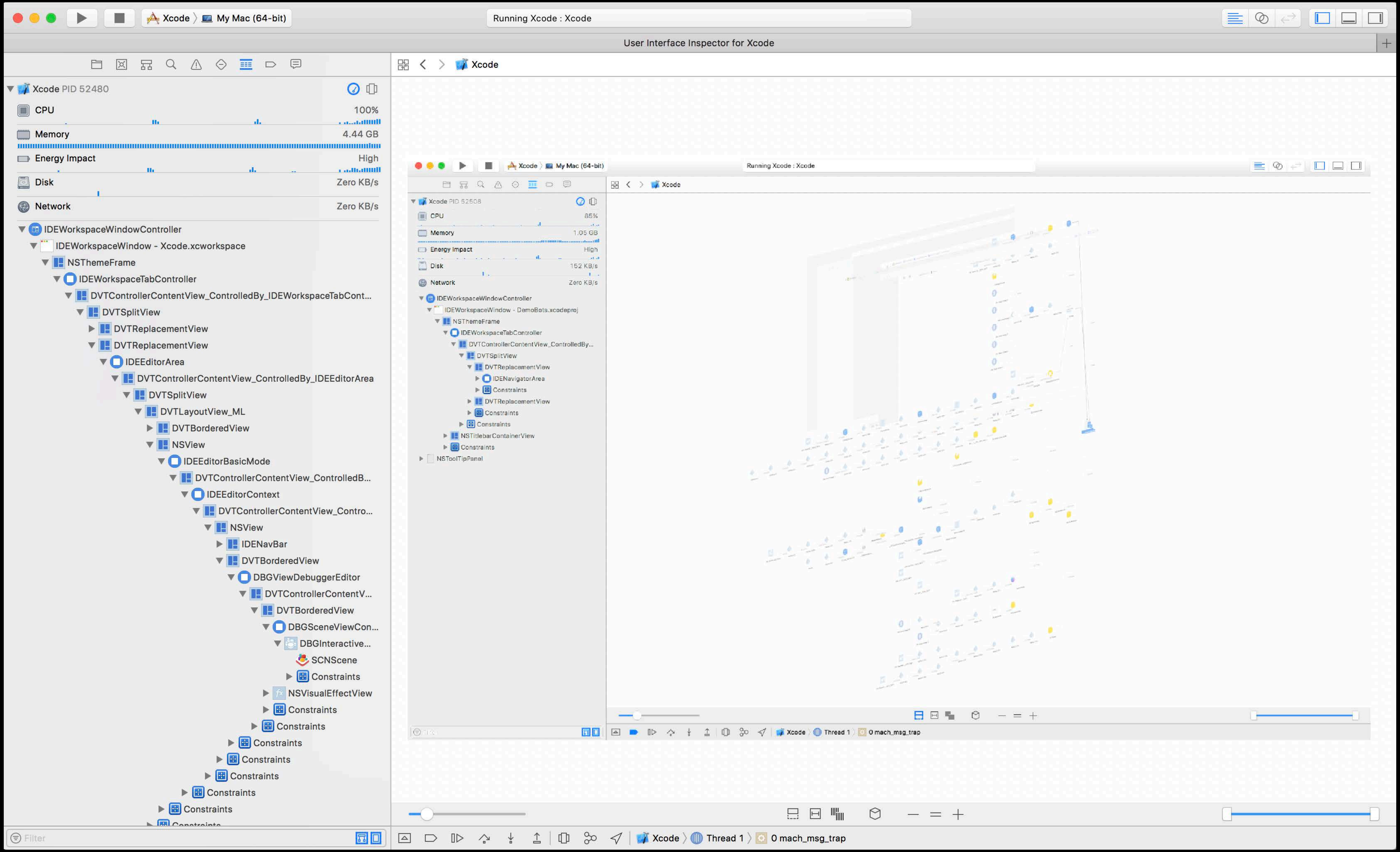
Memory 1.05 GB

Energy Impact High

Disk 152 KB/s

Network Zero KB/s

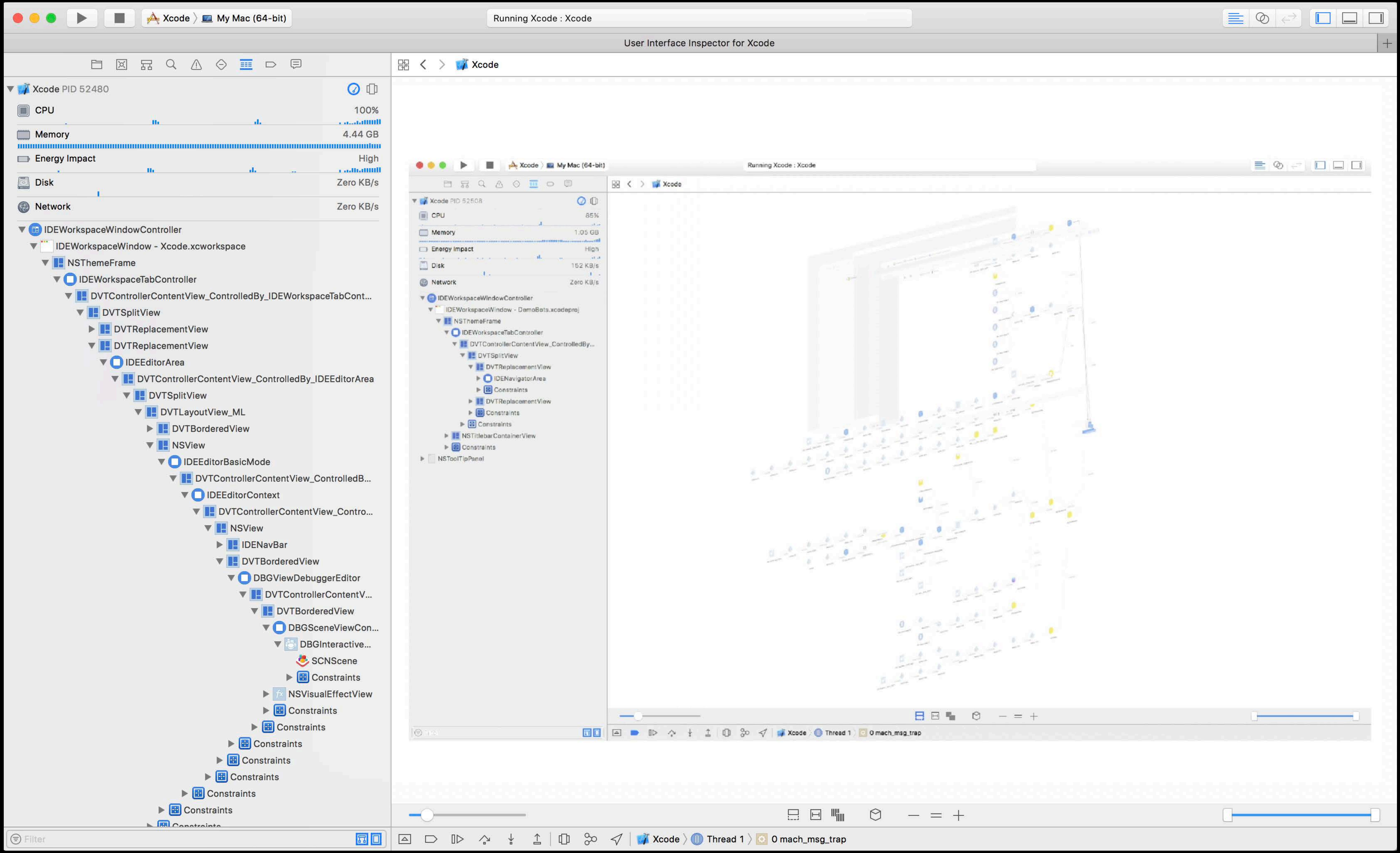
- IDEWorkspaceWindowController
  - IDEWorkspaceWindow - DemoBots.xcodeproj
    - NSThemeFrame
      - IDEWorkspaceTabController
        - DVTControllerContentView_ControlledBy...
          - DVTSplitView
            - DVTReplacementView
              - IDENavigatorArea
              - Constraints
            - DVTReplacementView
            - Constraints
          - Constraints
      - NSTitlebarContainerView
      - Constraints
- NSToolTipPanel



Xcode PID 52480

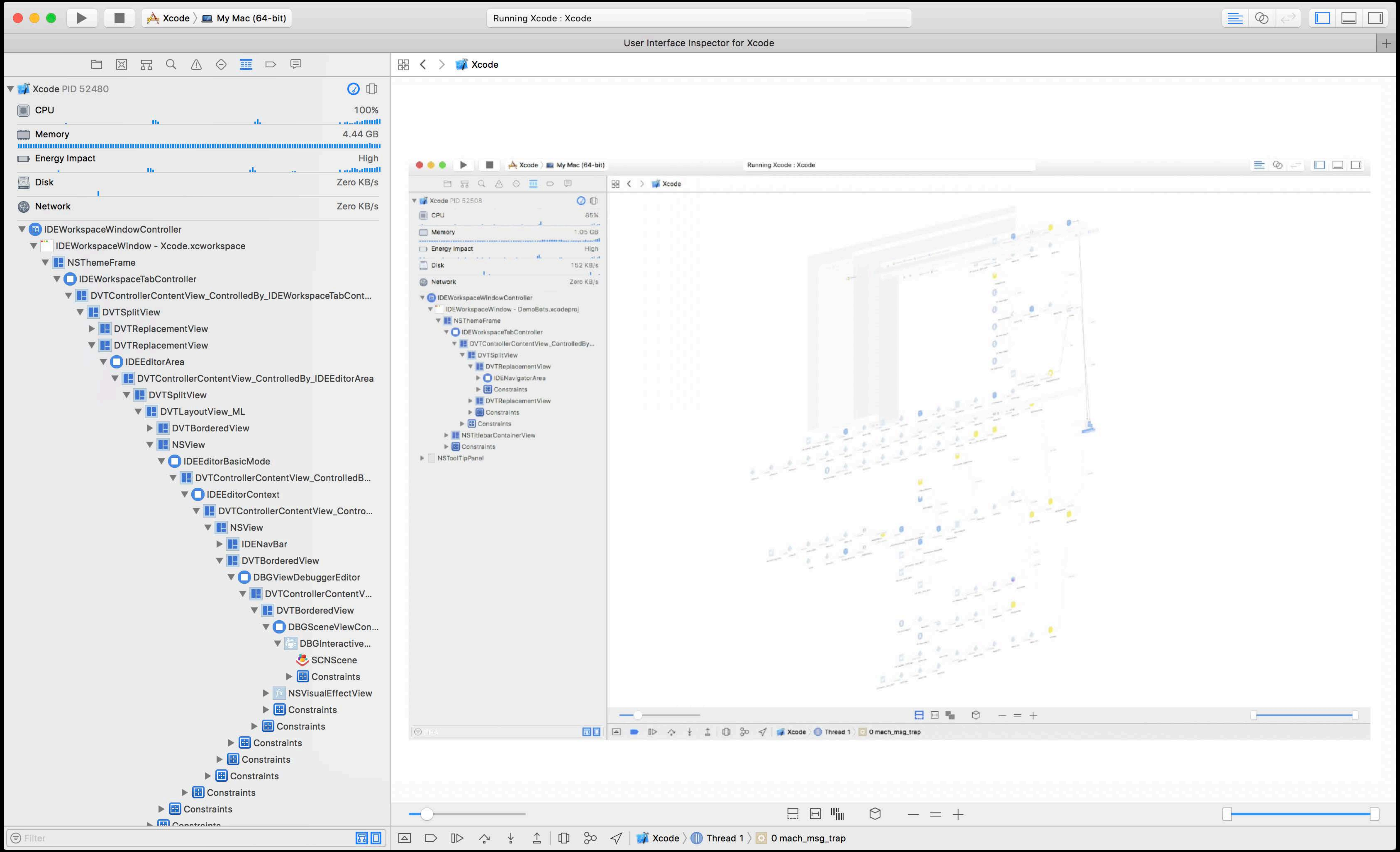
CPU	100%
Memory	4.44 GB
Energy Impact	High
Disk	Zero KB/s
Network	Zero KB/s

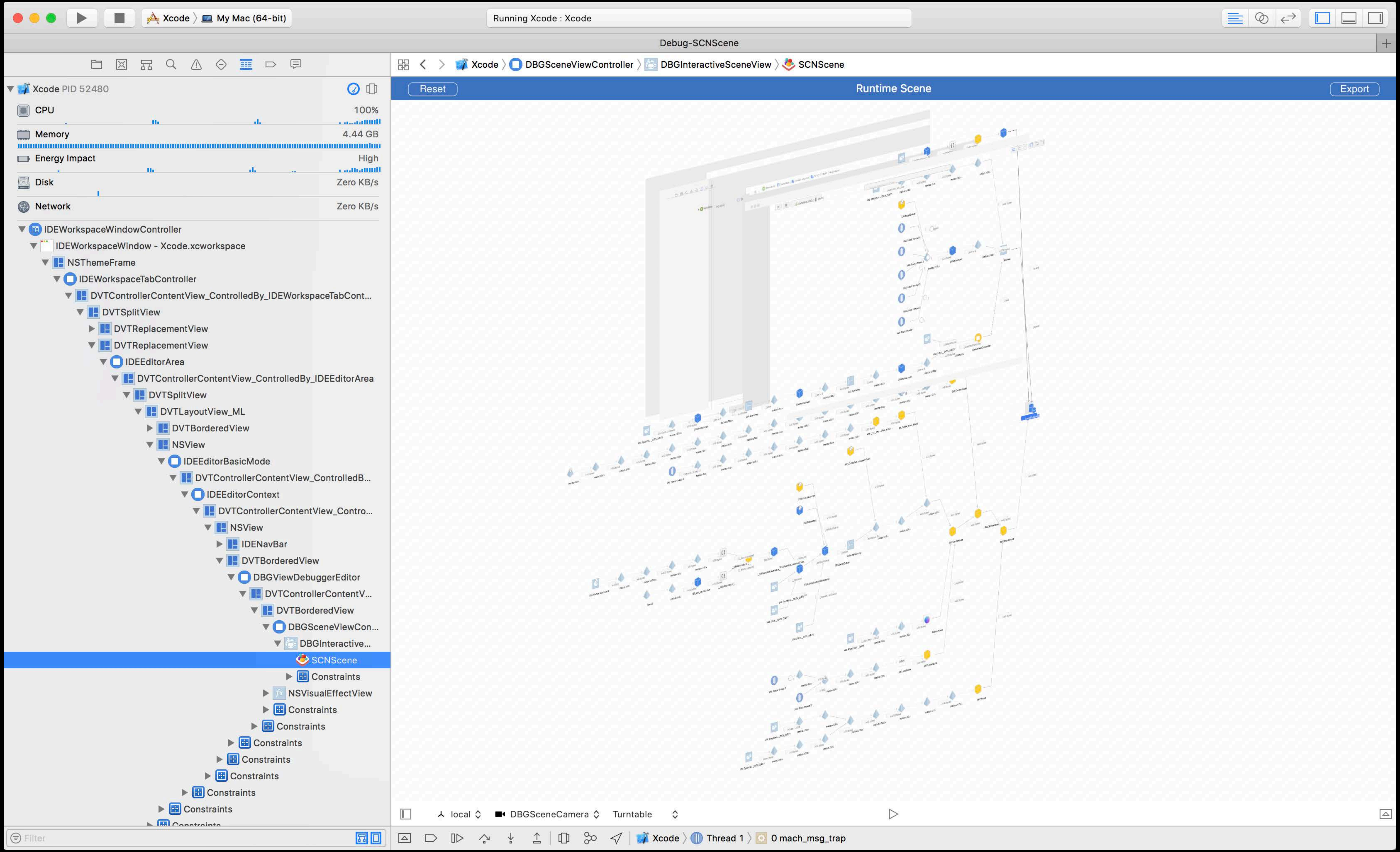
```
IDEWorkspaceWindowController
  IDEWorkspaceWindow - Xcode.xcworkspace
    NSThemeFrame
      IDEWorkspaceTabController
        DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont...
          DVTSplitView
            DVTReplacementView
            DVTReplacementView
              IDEEditorArea
                DVTControllerContentView_ControlledBy_IDEEditorArea
                  DVTSplitView
                    DVTLayoutView_ML
                      DVTBorderedView
                      NSView
                        IDEEditorBasicMode
                          DVTControllerContentView_ControlledB...
                            IDEEditorContext
                              DVTControllerContentView_Contro...
                                NSView
                                  IDENavBar
                                  DVTBorderedView
                                    DBGViewDebuggerEditor
                                      DVTControllerContentV...
                                        DVTBorderedView
                                          DBGSceneViewCon...
                                            DBGInteractive...
                                              SCNScene
                                              Constraints
                                          NSVisualEffectView
                                          Constraints
                                        Constraints
                                      Constraints
                                    Constraints
                                  Constraints
                                Constraints
                              Constraints
```



```
Xcode PID 52480
CPU                100%
Memory             4.44 GB
Energy Impact      High
Disk               Zero KB/s
Network            Zero KB/s
IDEWorkspaceWindowController
  IDEWorkspaceWindow - Xcode.xcworkspace
    NSThemeFrame
      IDEWorkspaceTabController
        DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont...
          DVTSplitView
            DVTReplacementView
            DVTReplacementView
              IDEEditorArea
                DVTControllerContentView_ControlledBy_IDEEditorArea
                  DVTSplitView
                    DVTLayoutView_ML
                      DVTBorderedView
                      NSView
                        IDEEditorBasicMode
                          DVTControllerContentView_ControlledB...
                            IDEEditorContext
                              DVTControllerContentView_Contro...
                                NSView
                                  IDENavBar
                                  DVTBorderedView
                                    DBGViewDebuggerEditor
                                      DVTControllerContentV...
                                        DVTBorderedView
                                          DBGSceneViewCon...
                                            DBGInteractive...
                                              SCNScene
                                              Constraints
                                          NSVisualEffectView
                                          Constraints
                                        Constraints
                                    Constraints
                                  Constraints
                                Constraints
                              Constraints
                            Constraints
                          Constraints
```

```
Xcode PID 52508
CPU                85%
Memory             1.05 GB
Energy Impact      High
Disk               152 KB/s
Network            Zero KB/s
IDEWorkspaceWindowController
  IDEWorkspaceWindow - DemoBots.xcodeproj
    NSThemeFrame
      IDEWorkspaceTabController
        DVTControllerContentView_ControlledBy...
          DVTSplitView
            DVTReplacementView
              IDENavigatorArea
              Constraints
            DVTReplacementView
            Constraints
          Constraints
      NSTitlebarContainerView
      Constraints
NSToolTipPanel
```

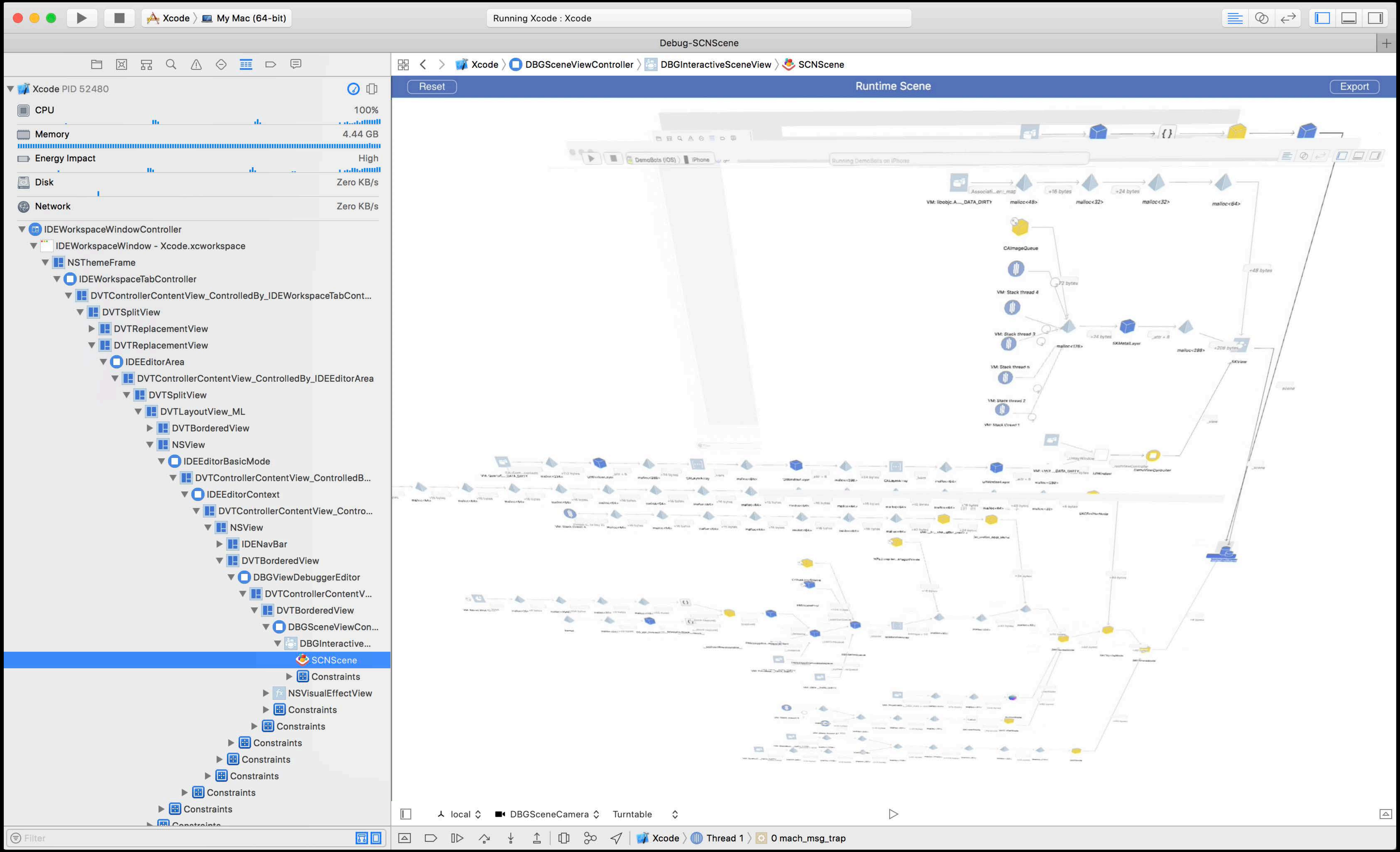

Xcode
My Mac (64-bit)
Running Xcode : Xcode
User Interface Inspector for Xcode
Xcode
Xcode PID 52480
CPU
100%
Memory
4.44 GB
Energy Impact
High
Disk
Zero KB/s
Network
Zero KB/s
IDEWorkspaceWindowController
IDEWorkspaceWindow - Xcode.xcworkspace
NSThemeFrame
IDEWorkspaceTabController
DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont...
DVTSplitView
DVTReplacementView
DVTReplacementView
IDEEditorArea
DVTControllerContentView_ControlledBy_IDEEditorArea
DVTSplitView
DVTLayoutView_ML
DVTBorderedView
NSView
IDEEditorBasicMode
DVTControllerContentView_ControlledB...
IDEEditorContext
DVTControllerContentView_Contro...
NSView
IDENavBar
DVTBorderedView
DBGViewDebuggerEditor
DVTControllerContentV...
DVTBorderedView
DBGSceneViewCon...
DBGInteractive...
SCNScene
Constraints
NSVisualEffectView
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Filter
Xcode
Thread 1
0 mach_msg_trap



Xcode PID 52480

CPU	100%
Memory	4.44 GB
Energy Impact	High
Disk	Zero KB/s
Network	Zero KB/s

- IDEWorkspaceWindowController
  - IDEWorkspaceWindow - Xcode.xcworkspace
    - NSThemeFrame
      - IDEWorkspaceTabController
        - DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont...
          - DVTSplitView
            - DVTReplacementView
            - DVTReplacementView
              - IDEEditorArea
                - DVTControllerContentView_ControlledBy_IDEEditorArea
                  - DVTSplitView
                    - DVTLayoutView_ML
                      - DVTBorderedView
                      - NSView
                        - IDEEditorBasicMode
                          - DVTControllerContentView_ControlledB...
                            - IDEEditorContext
                              - DVTControllerContentView_Contro...
                                - NSView
                                  - IDENavBar
                                  - DVTBorderedView
                                    - DBGViewDebuggerEditor
                                      - DVTControllerContentV...
                                        - DVTBorderedView
                                          - DBGSceneViewCon...
                                            - DBGInteractive...
                                              - SCNScene
                                              - Constraints
                                            - NSVisualEffectView
                                            - Constraints
                                          - Constraints
                                        - Constraints
                                      - Constraints
                                    - Constraints
                                  - Constraints
                                - Constraints
                              - Constraints


Xcode
My Mac (64-bit)
Running Xcode : Xcode
Debug-SCNScene
Xcode PID 52480
CPU
100%
Memory
4.44 GB
Energy Impact
High
Disk
Zero KB/s
Network
Zero KB/s
IDEWorkspaceWindowController
IDEWorkspaceWindow - Xcode.xcworkspace
NSThemeFrame
IDEWorkspaceTabController
DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont...
DVTSplitView
DVTReplacementView
DVTReplacementView
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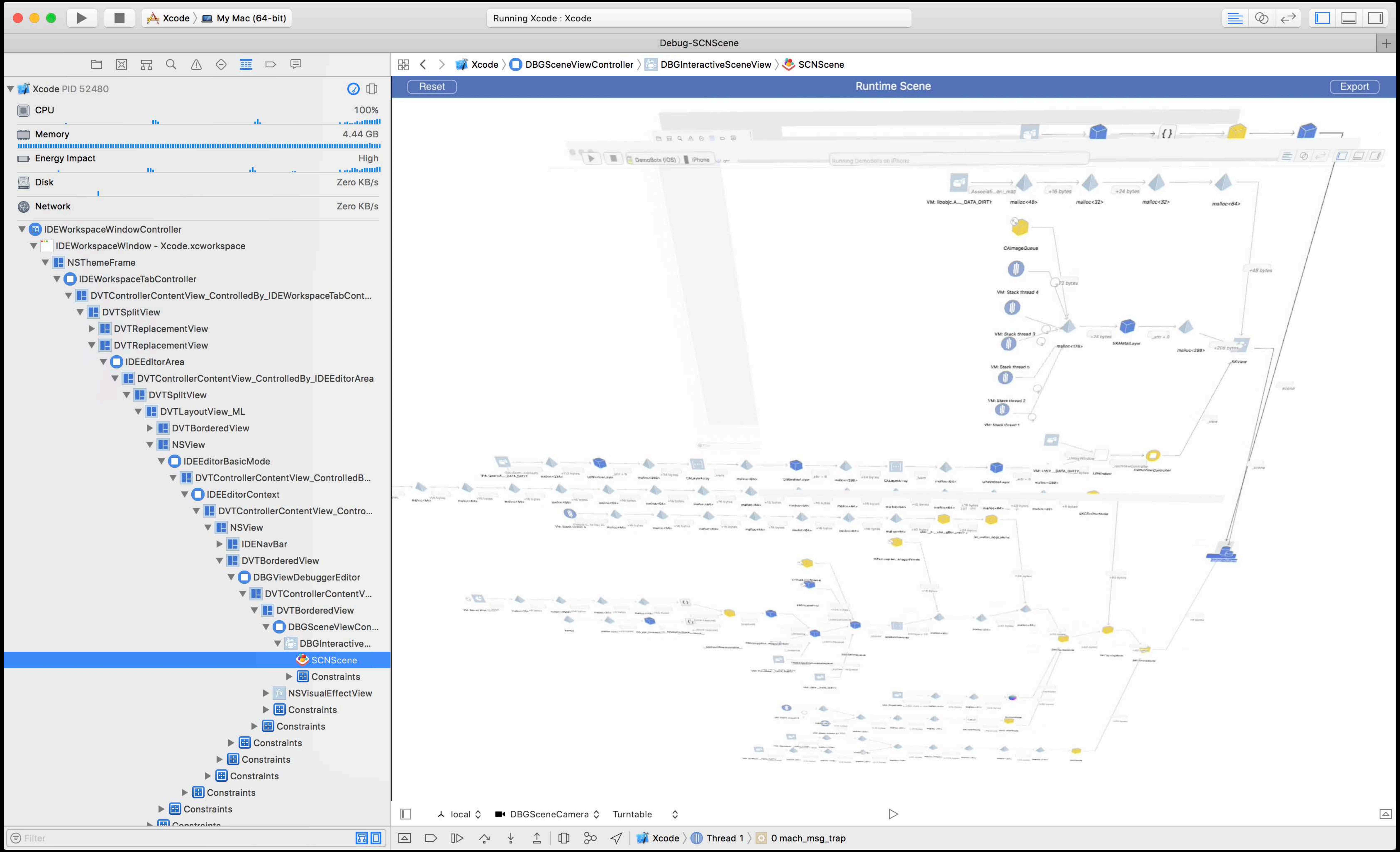
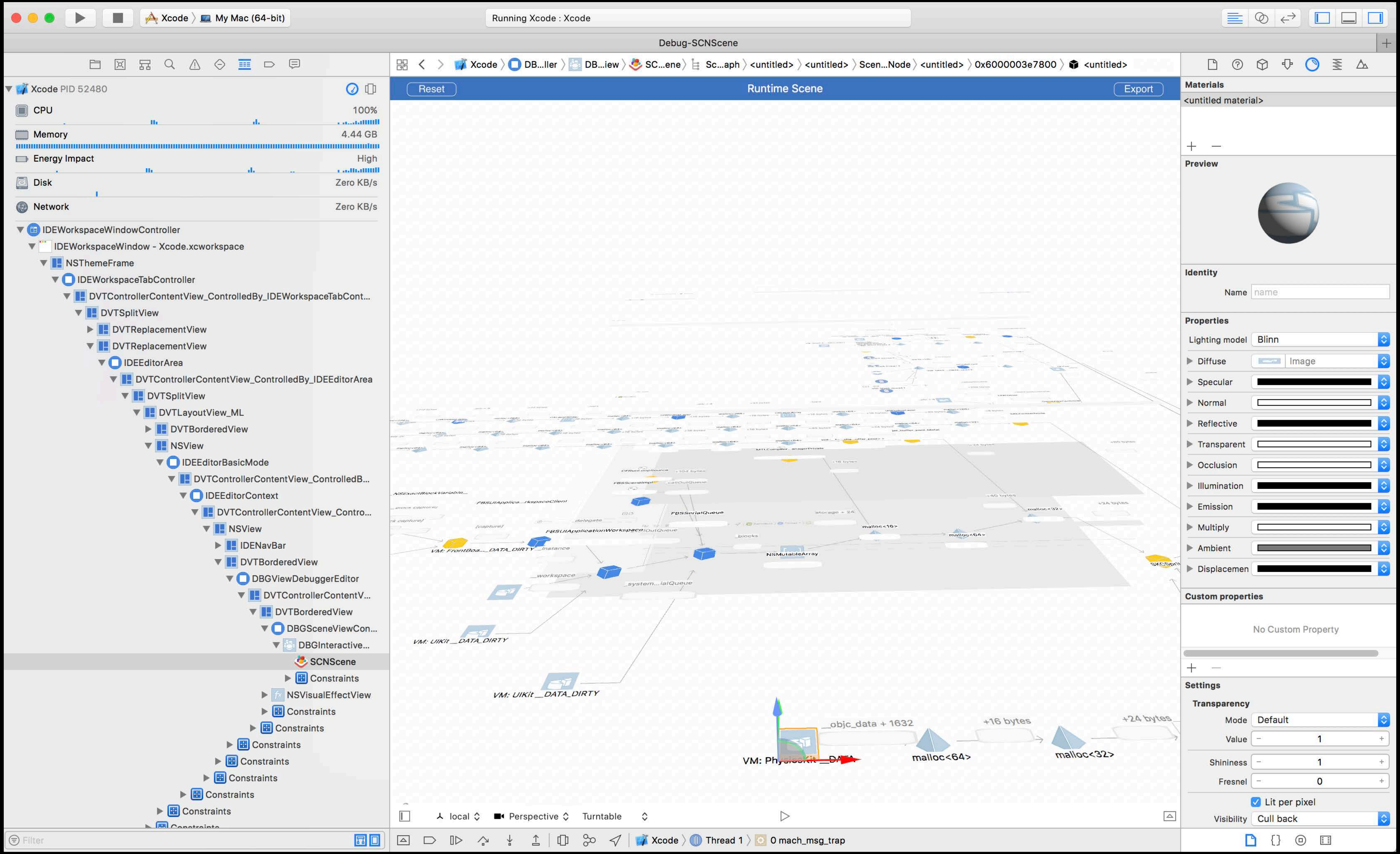
DVTLayoutView_ML
DVTBorderedView
NSView
IDEEditorBasicMode
DVTControllerContentView_ControlledB...
IDEEditorContext
DVTControllerContentView_Contro...
NSView
IDENavBar
DVTBorderedView
DBGViewDebuggerEditor
DVTControllerContentV...
DVTBorderedView
DBGSceneViewCon...
DBGInteractive...
SCNScene
Constraints
NSVisualEffectView
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Constraints
Filter
Xcode
DBGSceneViewController
DBGInteractiveSceneView
SCNScene
Reset
Runtime Scene
Export
local
DBGSceneCamera
Turntable
Xcode
Thread 1
0 mach_msg_trap



Xcode 〉 DBGSceneViewController 〉 DBGInteractiveSceneView 〉 SCNScene

```
Xcode PID 52480
CPU                                             100%
Memory                                       4.44 GB
Energy Impact                                   High
Disk                                      Zero KB/s
Network                                   Zero KB/s
```

```
▼ IDEWorkspaceWindowController
  ▼ IDEWorkspaceWindow - Xcode.xcworkspace
    ▼ NSThemeFrame
      ▼ IDEWorkspaceTabController
        ▼ DVTControllerContentView_ControlledBy_IDEWorkspaceTabCont…
          ▼ DVTSplitView
            ▶ DVTReplacementView
            ▼ DVTReplacementView
              ▼ IDEEditorArea
                ▼ DVTControllerContentView_ControlledBy_IDEEditorArea
                  ▼ DVTSplitView
                    ▼ DVTLayoutView_ML
                      ▶ DVTBorderedView
                      ▼ NSView
                        ▼ IDEEditorBasicMode
                          ▼ DVTControllerContentView_ControlledB…
                            ▼ IDEEditorContext
                              ▼ DVTControllerContentView_Contro…
                                ▼ NSView
                                  ▶ IDENavBar
                                  ▼ DVTBorderedView
                                    ▼ DBGViewDebuggerEditor
                                      ▼ DVTControllerContentV…
                                        ▼ DVTBorderedView
                                          ▼ DBGSceneViewCon…
                                            ▼ DBGInteractive…
                                                SCNScene
                                              ▶ Constraints
                                          ▶ NSVisualEffectView
                                          ▶ Constraints
                                        ▶ Constraints
                                      ▶ Constraints
                                    ▶ Constraints
                                  ▶ Constraints
                                ▶ Constraints
                              ▶ Constraints
                            ▶ Constraints
```



Xcode PID 52480

CPU	100%
Memory	4.44 GB
Energy Impact	High
Disk	Zero KB/s
Network	Zero KB/s

```
IDEWorkspaceWindowController
  IDEWorkspaceWindow - Xcode.xcworkspace
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            DVTReplacementView
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                  DVTSplitView
                    DVTLayoutView_ML
                      DVTBorderedView
                      NSView
                        IDEEditorBasicMode
                          DVTControllerContentView_ControlledB...
                            IDEEditorContext
                              DVTControllerContentView_Contro...
                                NSView
                                  IDENavBar
                                  DVTBorderedView
                                    DBGViewDebuggerEditor
                                      DVTControllerContentV...
                                        DVTBorderedView
                                          DBGSceneViewCon...
                                            DBGInteractive...
                                              SCNScene
                                              Constraints
                                    NSVisualEffectView
                                    Constraints
                                  Constraints
                                Constraints
                              Constraints
                            Constraints
                          Constraints
                        Constraints
```

Materials

<untitled material>

Preview

Identity

Name: name

Properties

Lighting model	Blinn
Diffuse	Image
Specular	
Normal	
Reflective	
Transparent	
Occlusion	
Illumination	
Emission	
Multiply	
Ambient	
Displacemen	

Custom properties

No Custom Property

Settings

Transparency

Mode	Default
Value	1
Shininess	1
Fresnel	0

☑ Lit per pixel

Visibility: Cull back

Demo

View debugging enhancements

Sebastian Fischer, Xcode UI Engineer

Summary

Wireless development

Breakpoint workflow enhancements

View controller debugging

SpriteKit debugging

SceneKit debugging

More Information

https://developer.apple.com/wwdc17/404

Related Sessions

Finding Bugs Using Xcode Runtime Tools	Executive Ballroom	Wednesday 5:10PM
SceneKit: What's New	Grand Ballroom A	Wednesday 11:00AM
Understanding Undefined Behavior	Executive Ballroom	Thursday 9:00AM
Writing Energy Efficient Apps	Executive Ballroom	Friday 9:00AM
Going Beyond 2D with SpriteKit	Executive Ballroom	Friday 10:00AM

Labs

Xcode Open Hours	Technology Lab K	Wed 9:00AM–12:00PM
Profiling and Debugging Lab	Technology Lab E	Wed 12:00PM–3:00PM
Xcode Open Hours	Technology Lab K	Thur 9:00AM–12:00PM
Performance Profiling and Runtime Analysis Tools Lab	Technology Lab K	Thur 1:00PM–4:10PM
Xcode Open Hours	Technology Lab K	Fri 1:50PM–4:00PM

WWDC17