App Frameworks

#WWDC15

WatchKit In-Depth, Part 2

Session 208

Nathan de Vries watchOS Engineer
Chloe Chang watchOS Engineer

Agenda

Digital Crown

Agenda

Digital Crown

Media Playback

Agenda

Digital Crown

Media Playback

Audio Recording

Agenda

Digital Crown

Media Playback

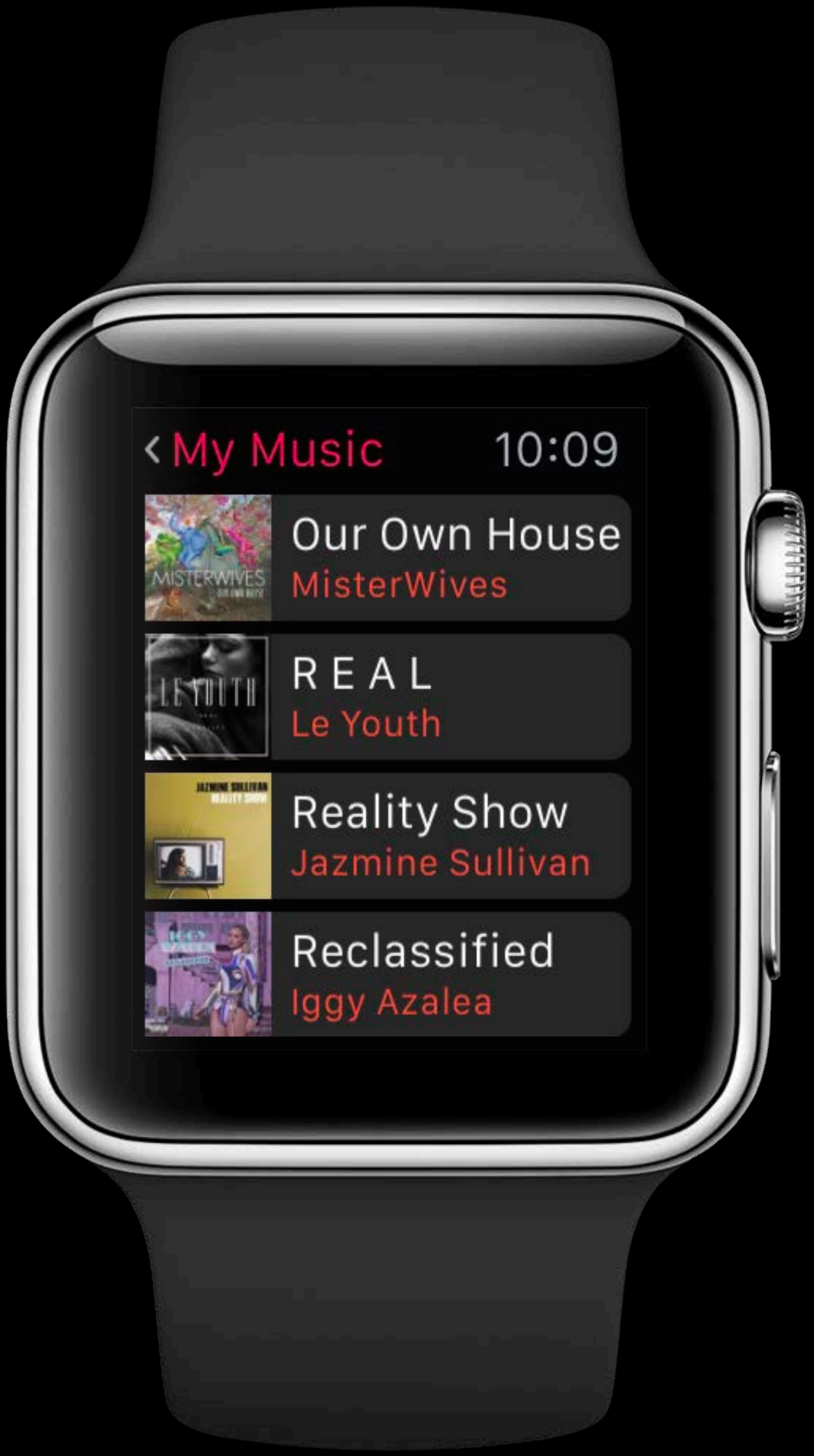
Audio Recording

Security

Digital Crown

Nathan de Vries watchOS Engineer

Core Interactions



‹ My Music 10:09

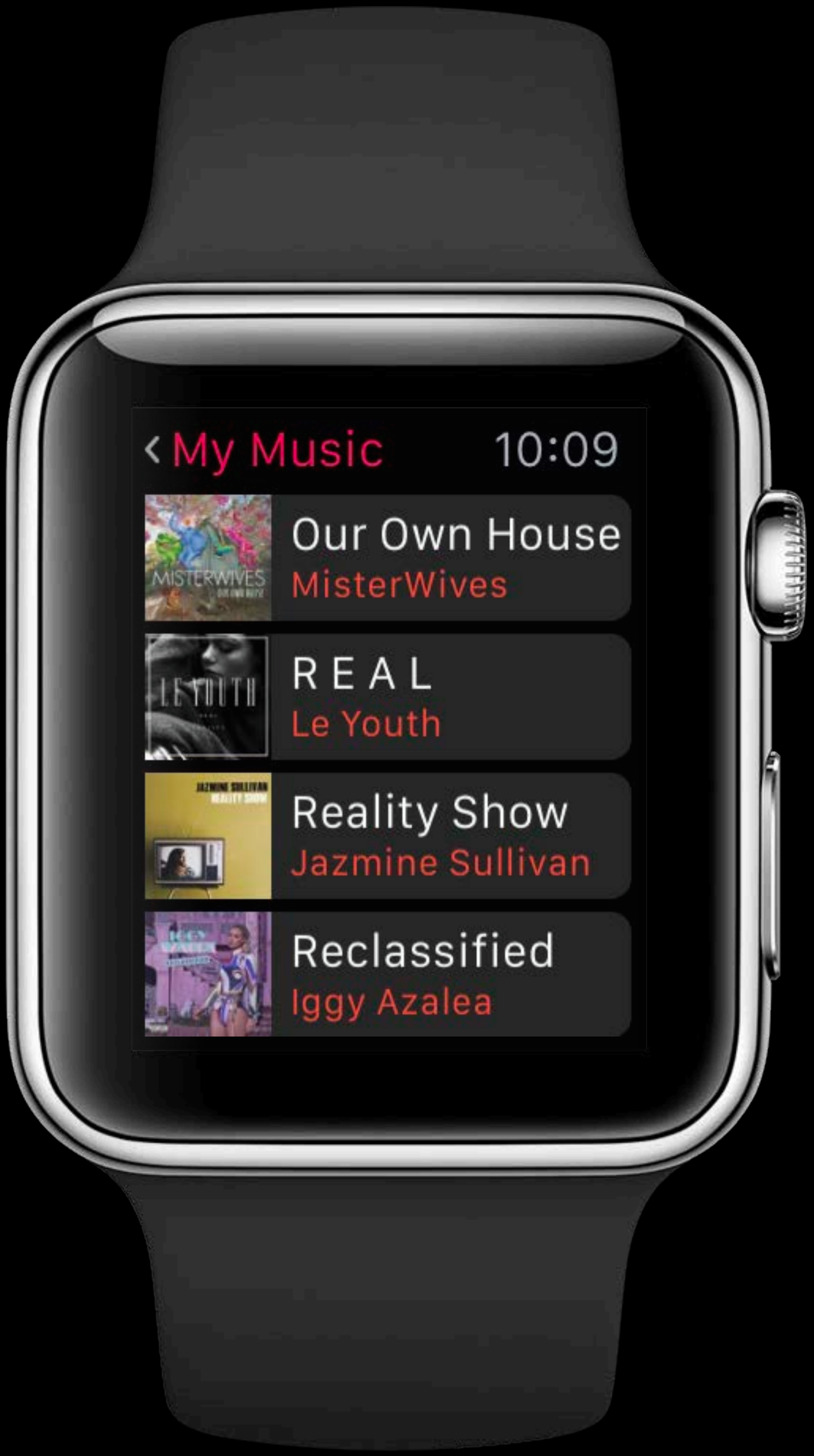
Our Own House
MisterWives

REAL
Le Youth

Reality Show
Jazmine Sullivan

Reclassified
Iggy Azalea

Core Interactions



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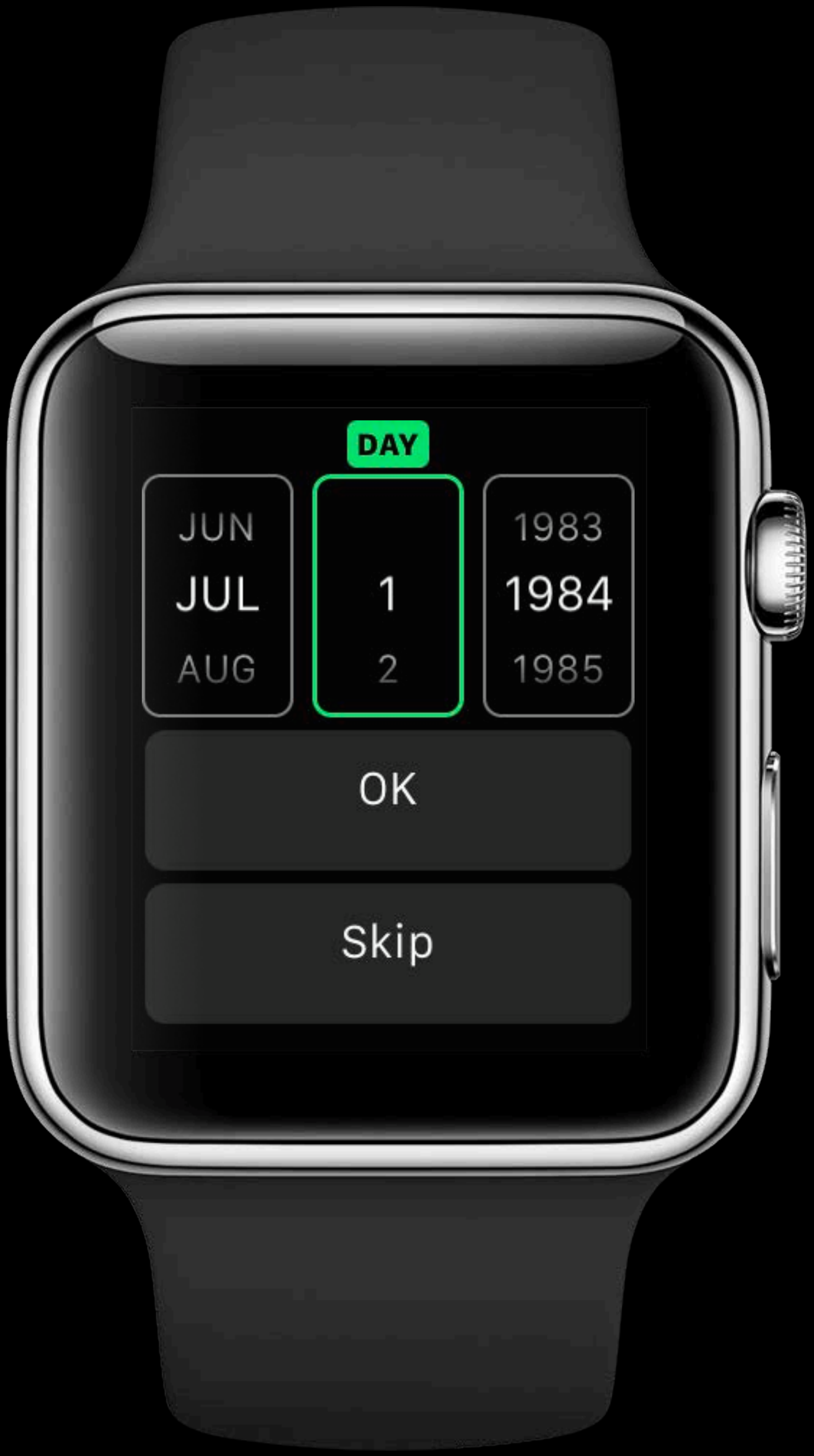
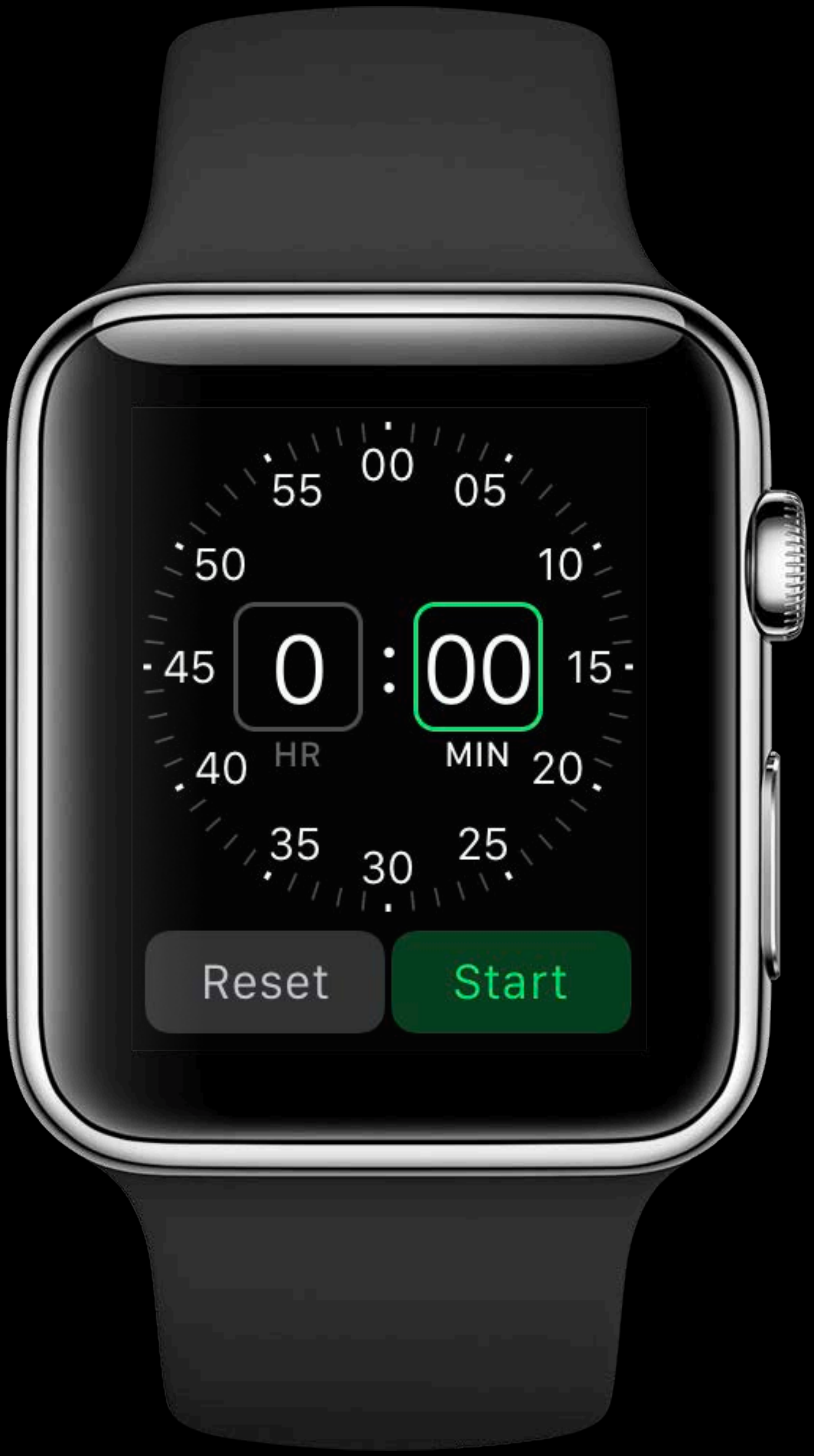


Core Interactions



Core Interactions

Digital Crown–Why?

Intuitive

Digital Crown–Why?

Intuitive

Keep your UI visible

Digital Crown–Why?

Intuitive

Keep your UI visible

Precise

Digital Crown–Why?

Intuitive

Keep your UI visible

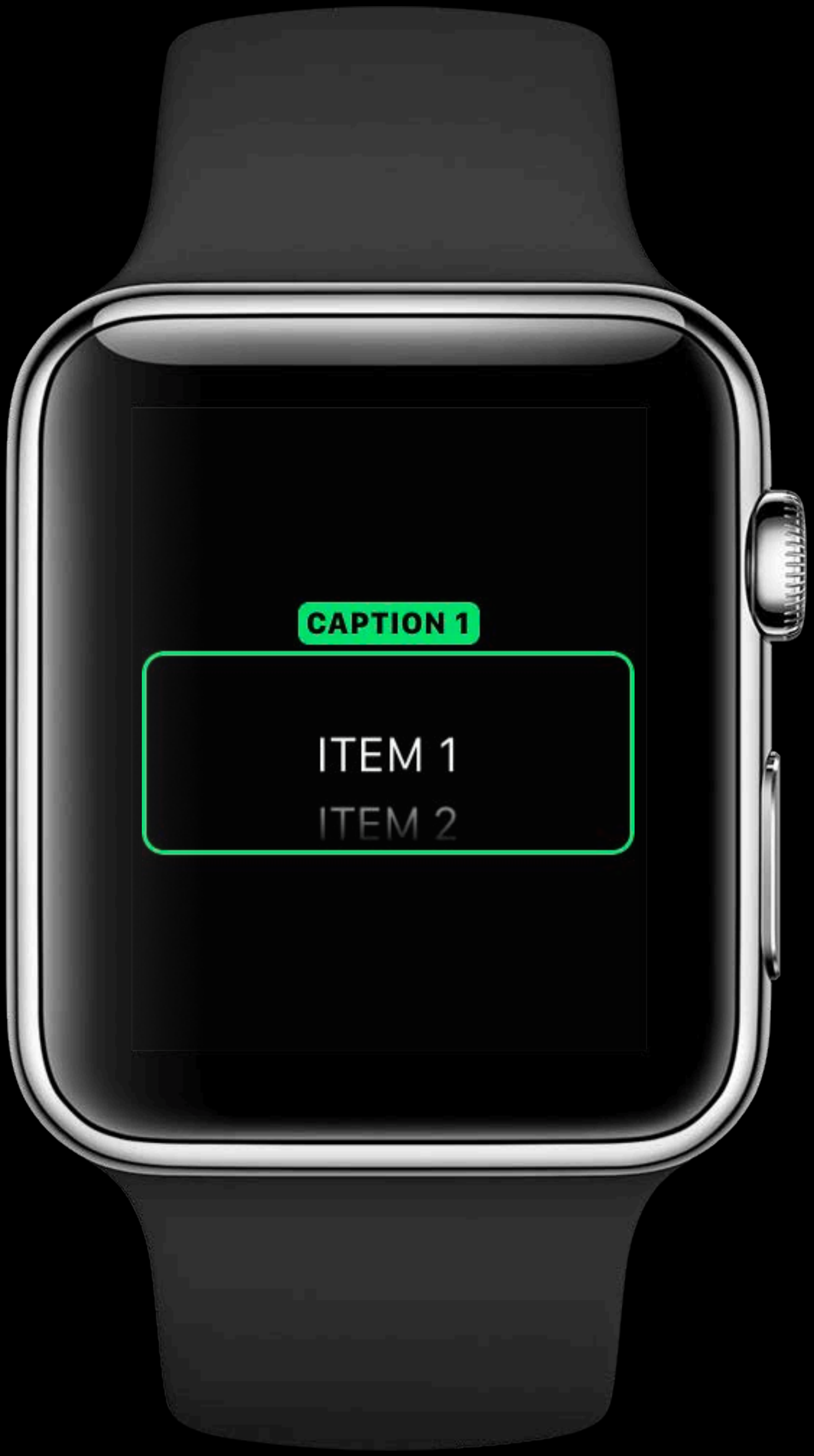
Precise

Playful

WKInterfacePicker

List style

NEW



WKInterfacePicker

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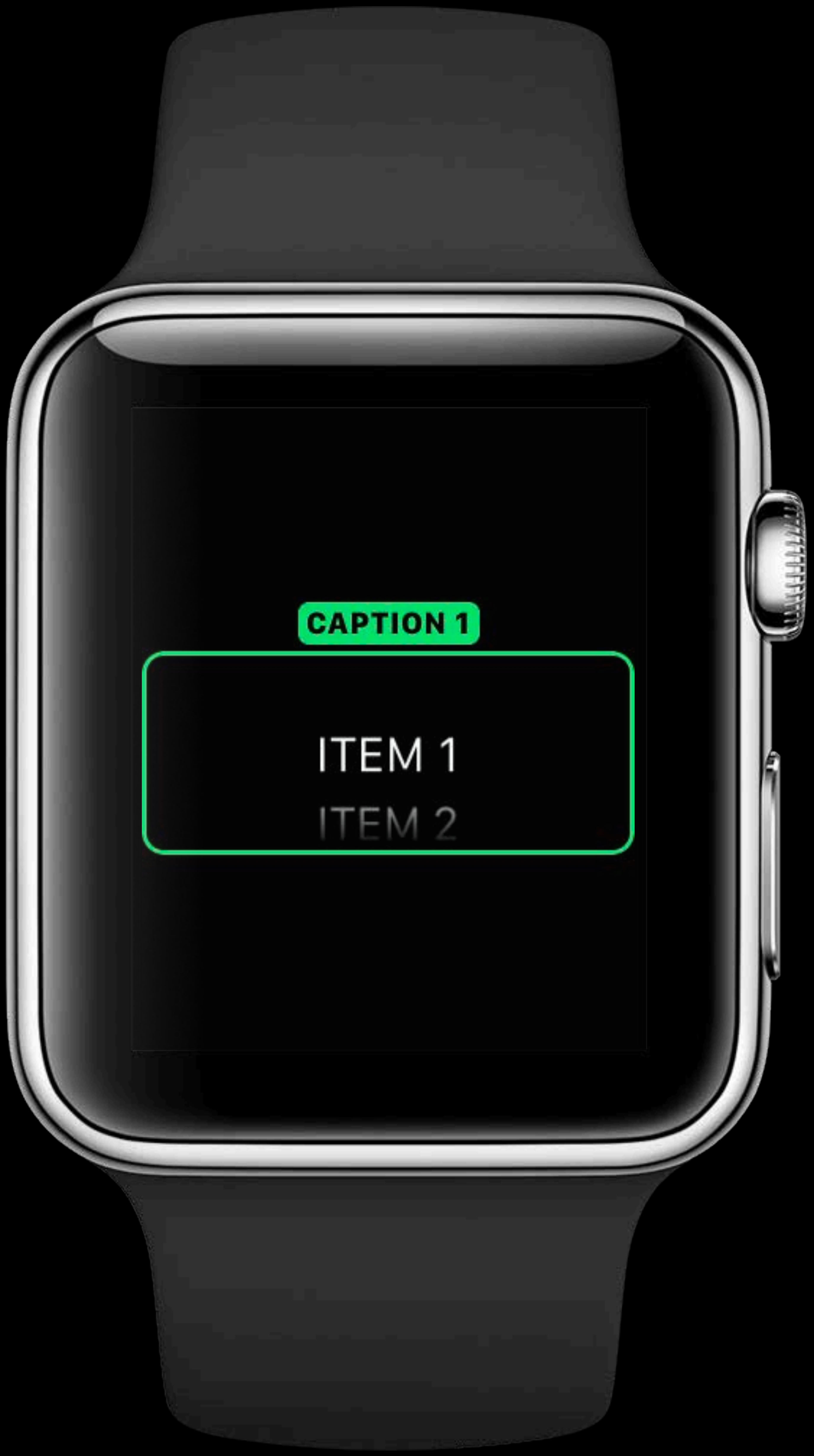


WKInterfacePicker

Stack style

NEW

WKInterfacePicker

Stack style

NEW

WKInterfacePicker

Sequence style

NEW

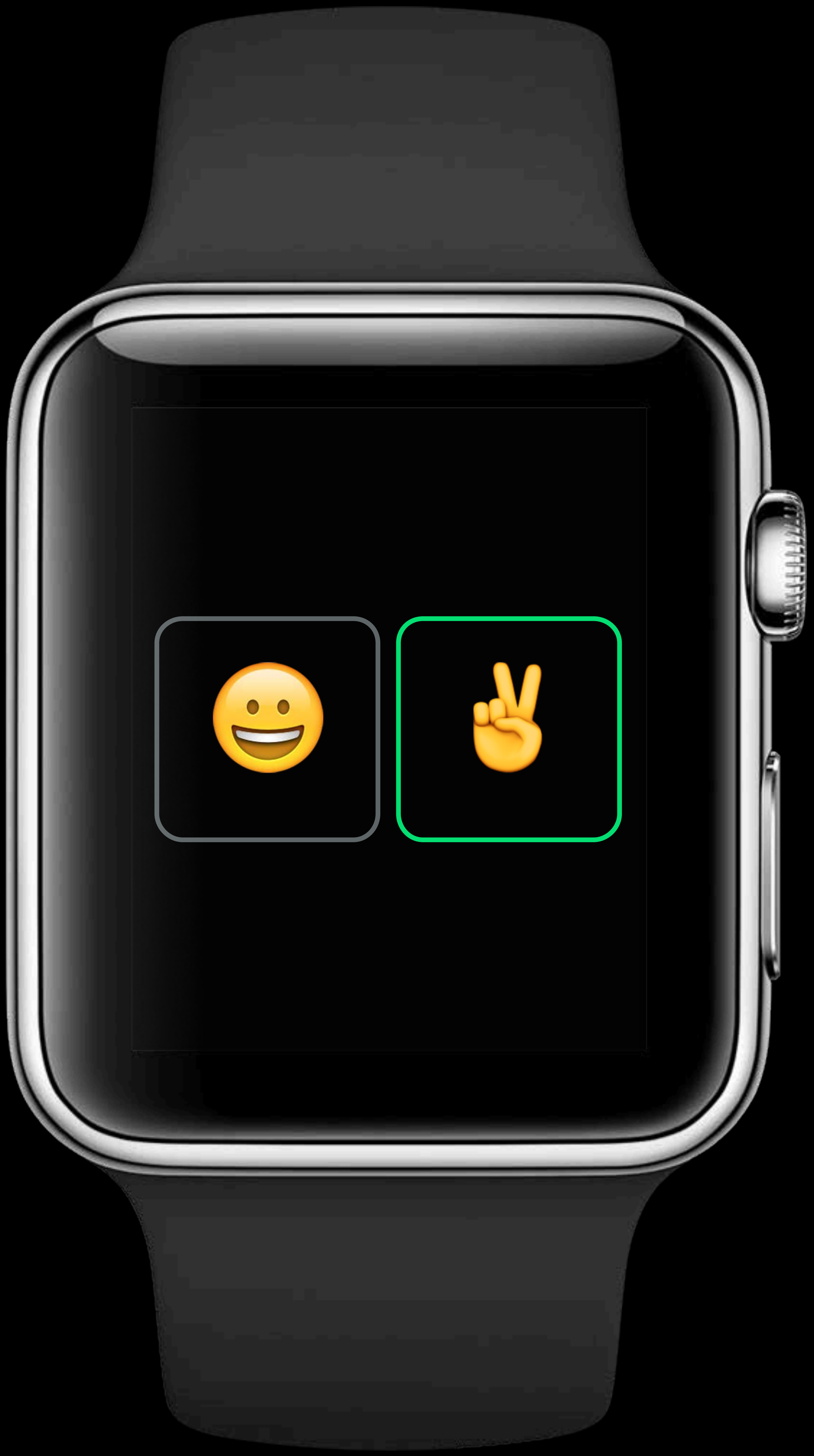
WKInterfacePicker

Sequence style

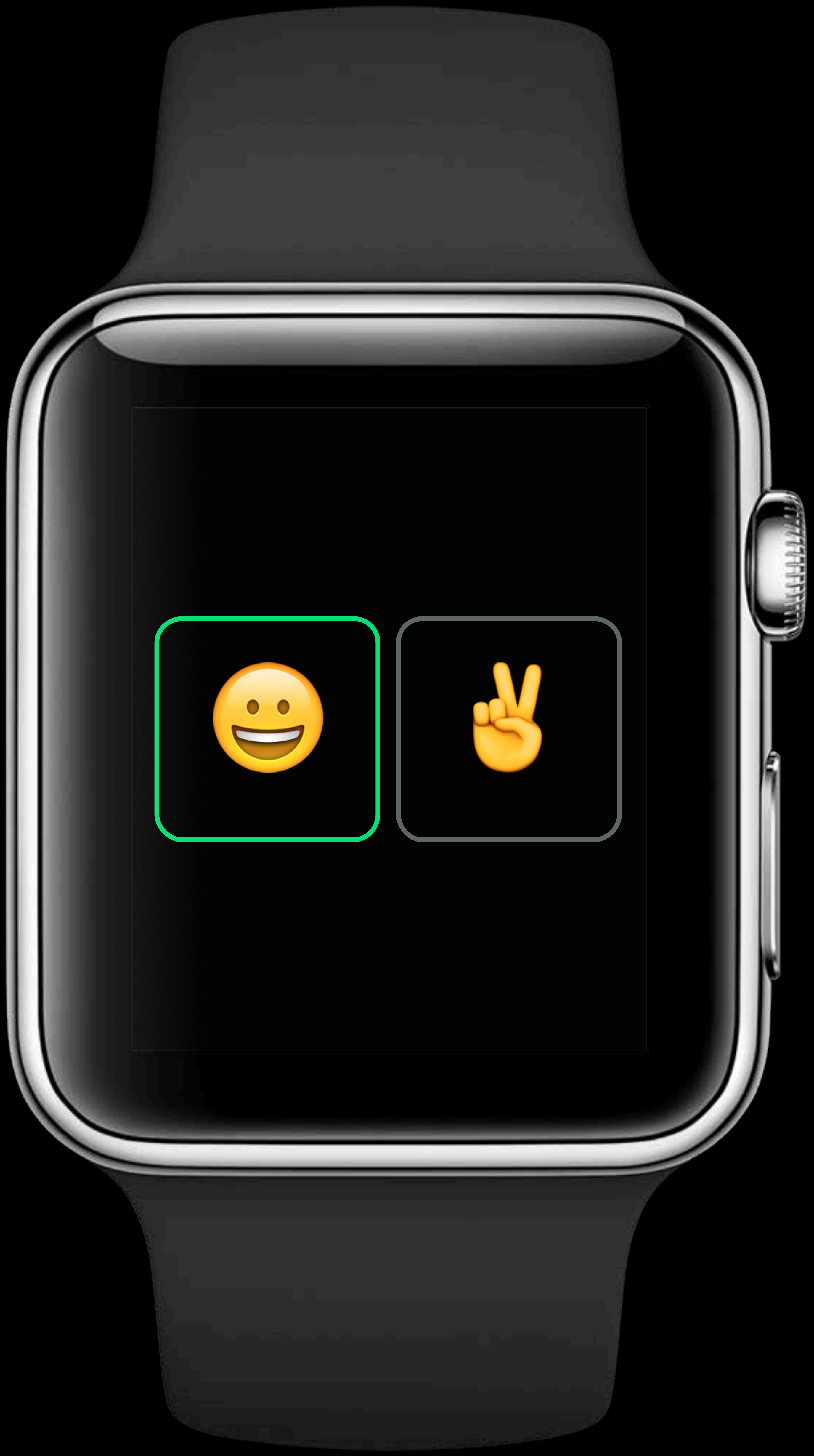
NEW

Focus Styles

Focus Styles



Focus Styles



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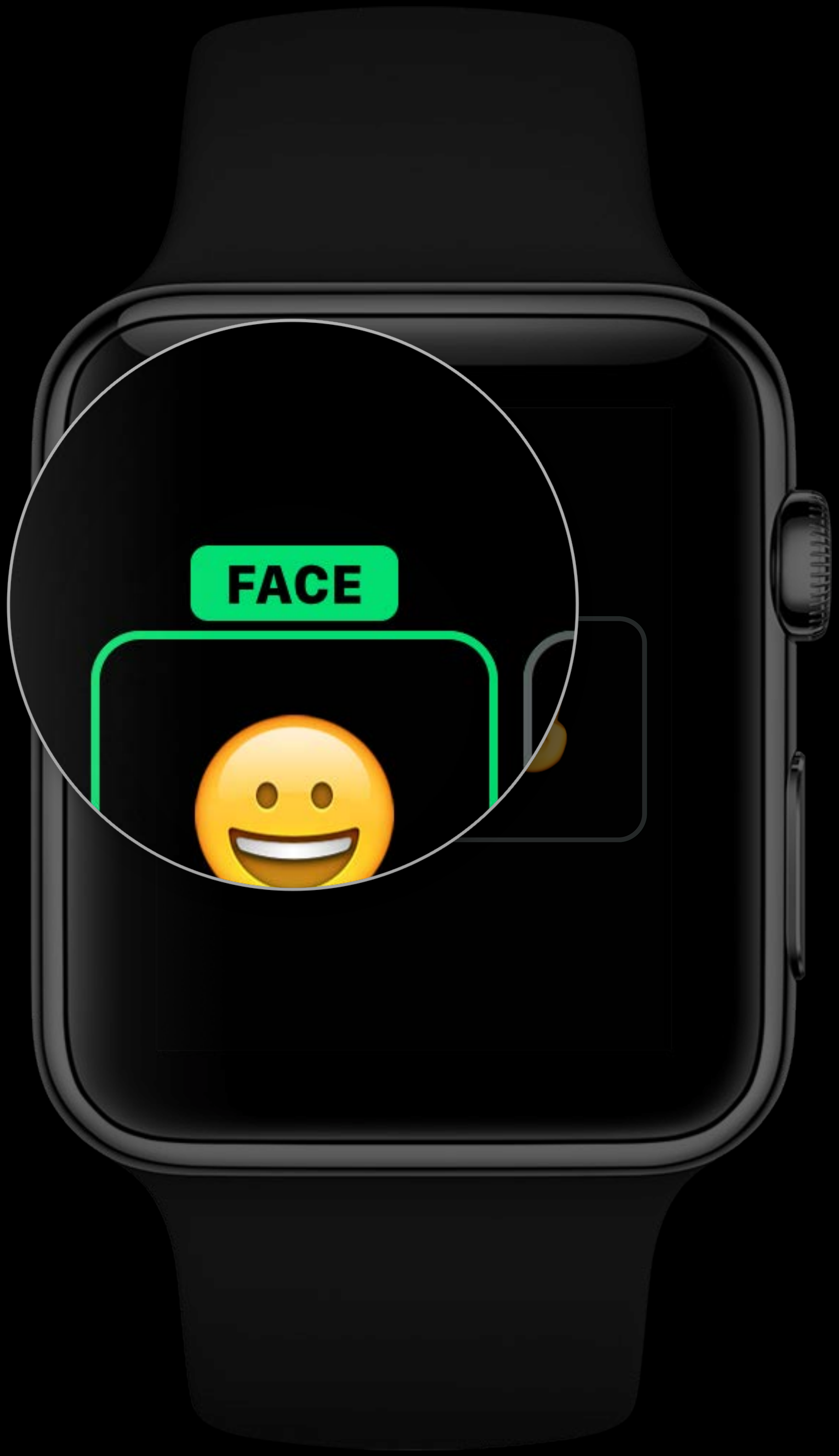
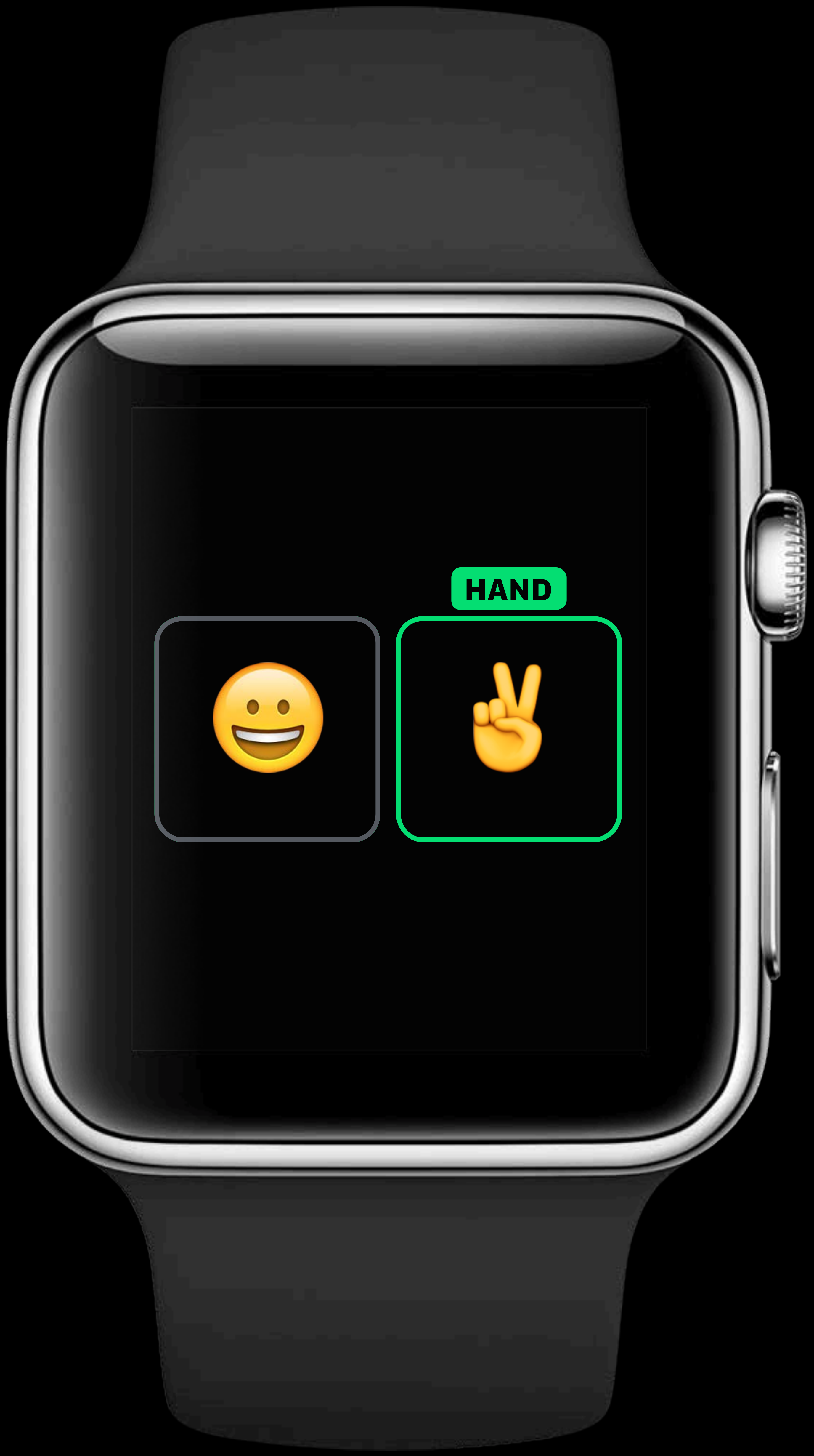
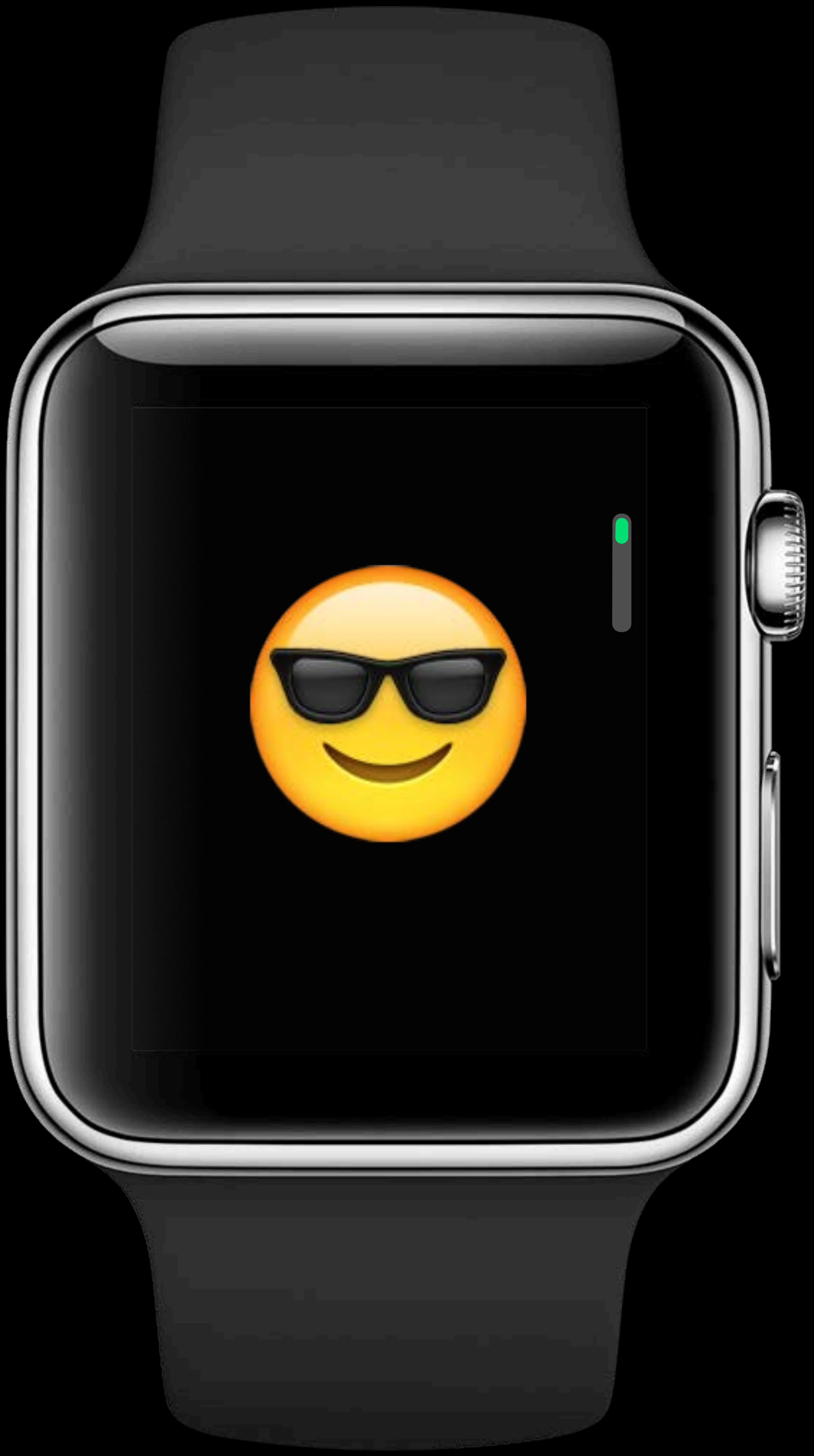


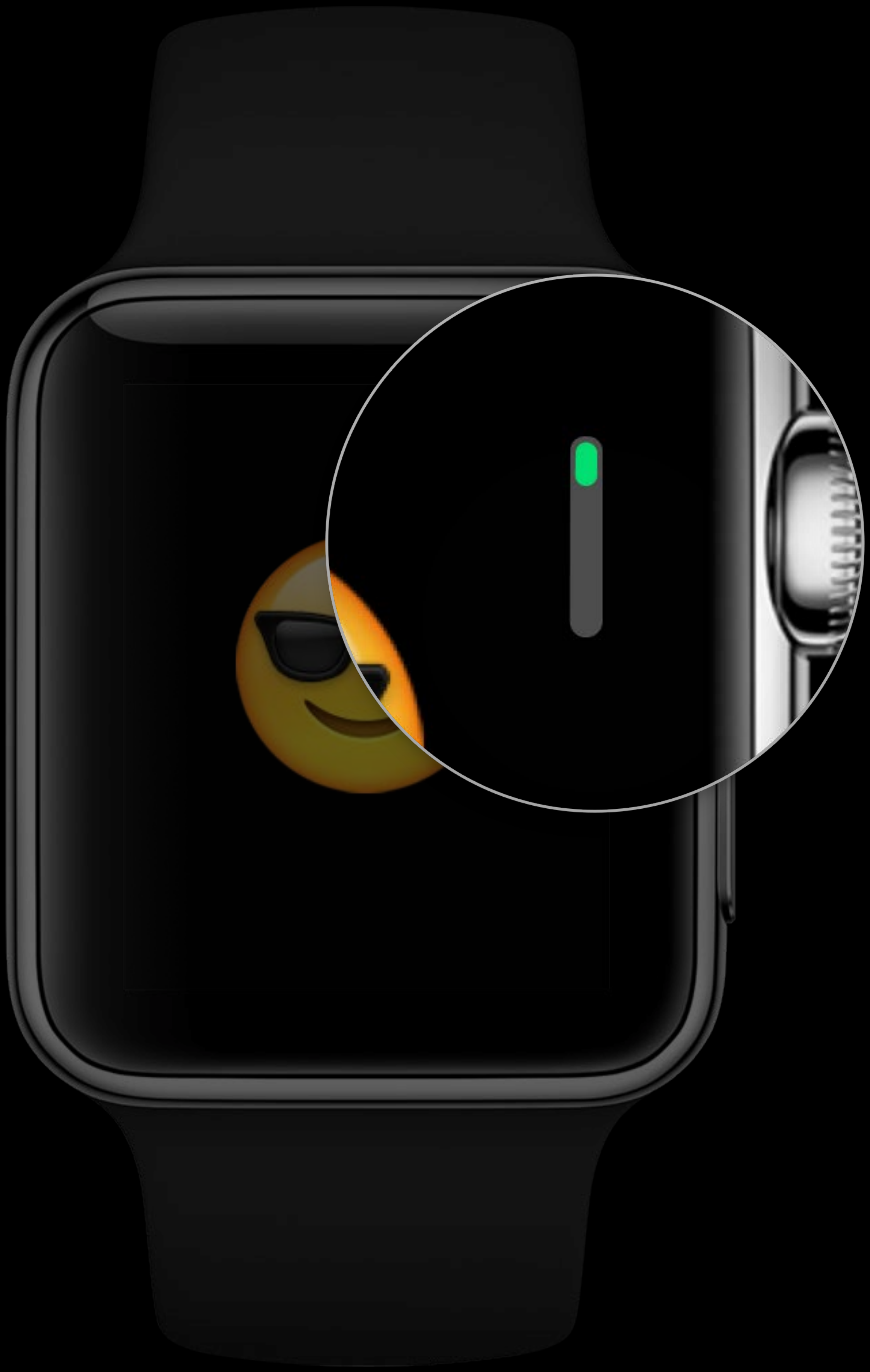
Focus Styles



Contextual Indicator



Contextual Indicator



Coordinating Images

Coordinating Images

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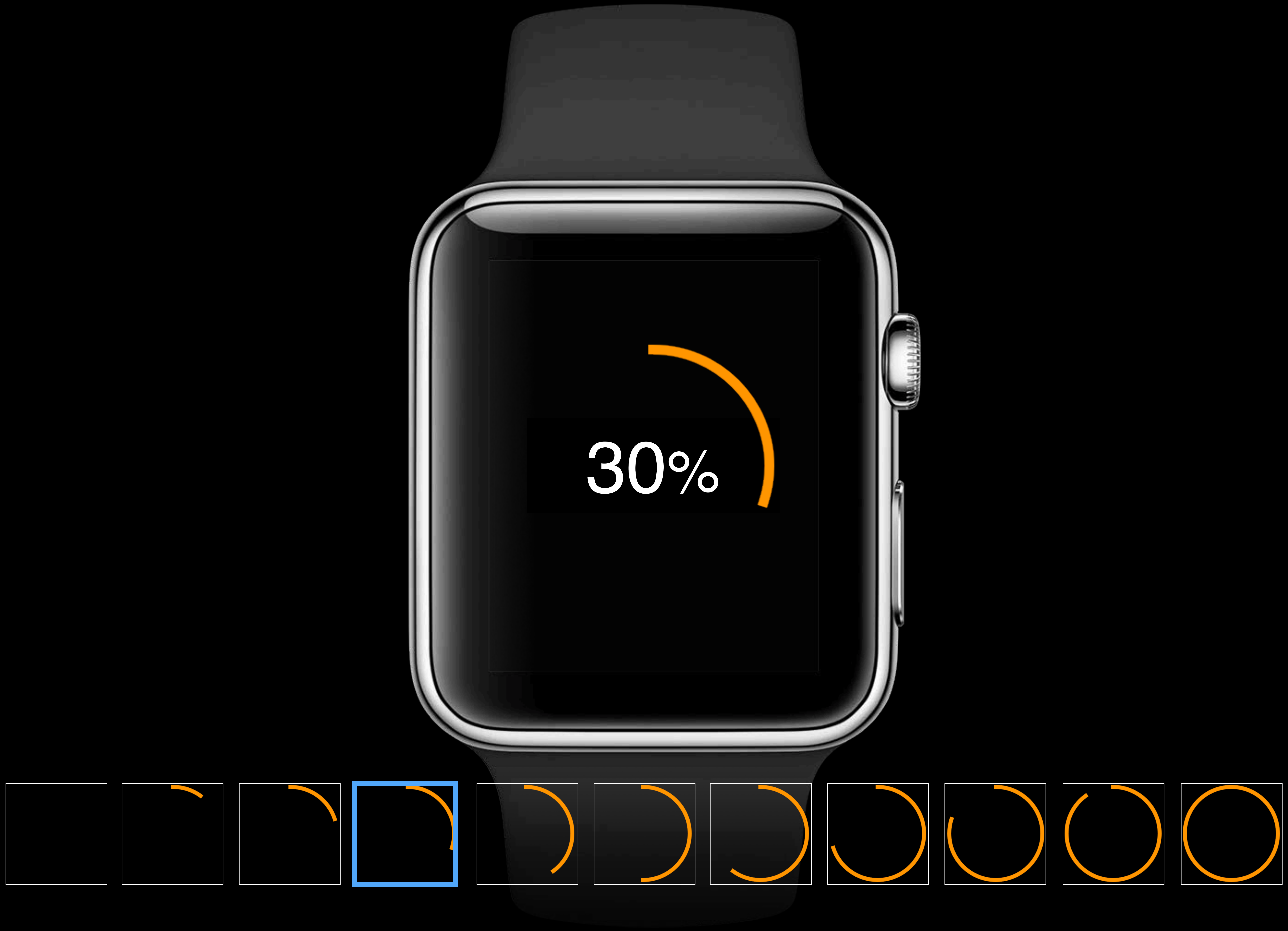

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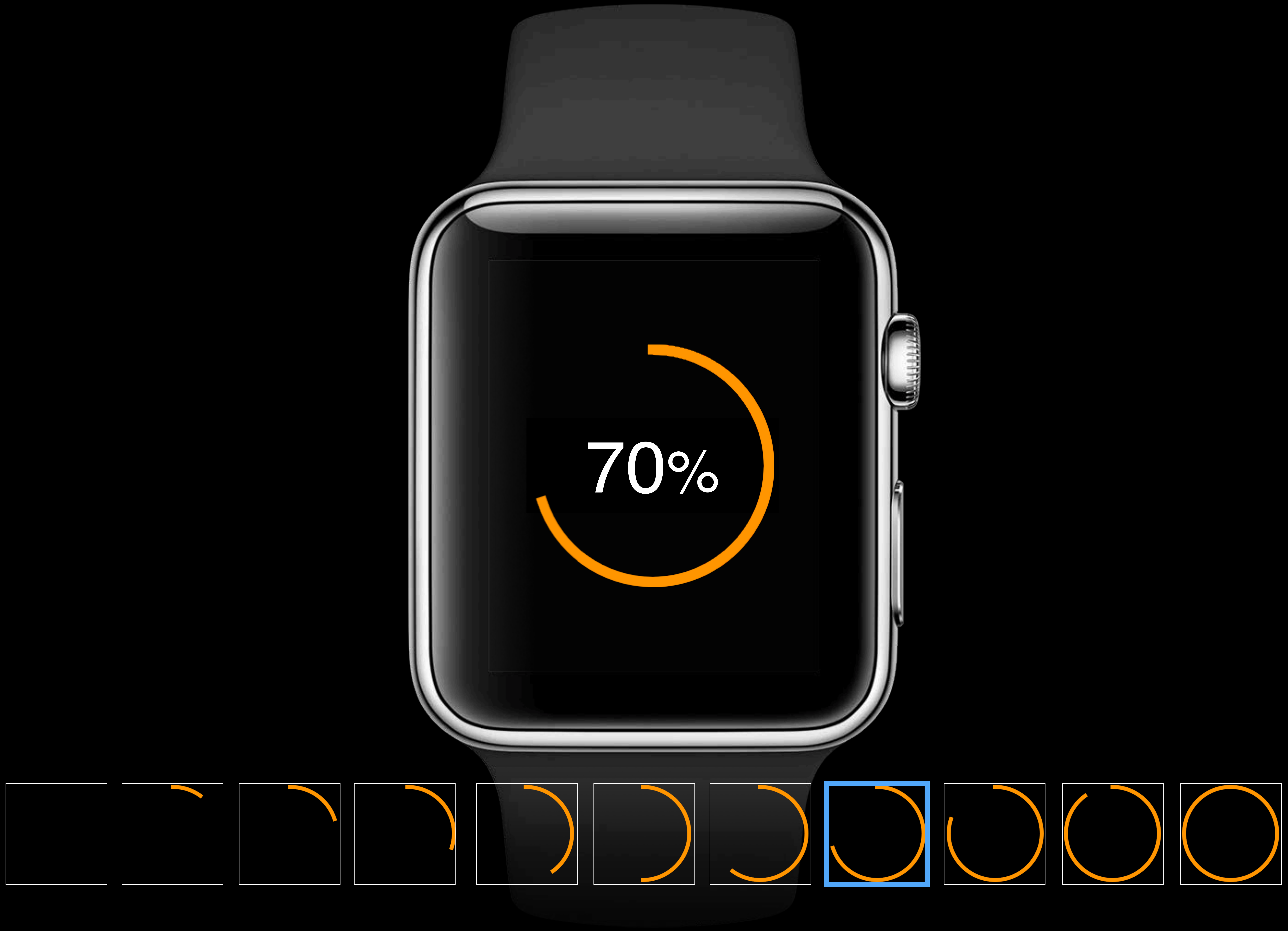
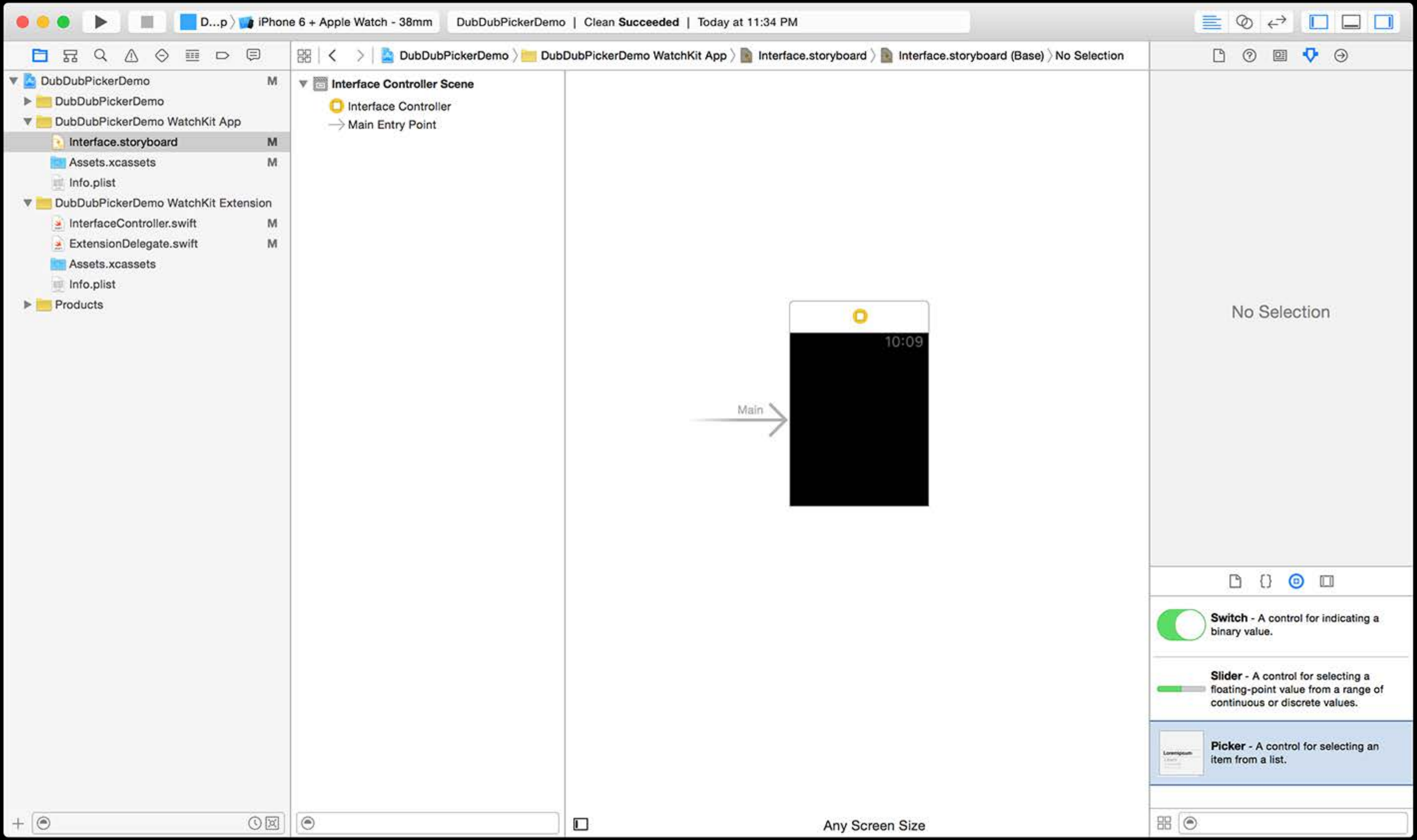


Creating a Picker

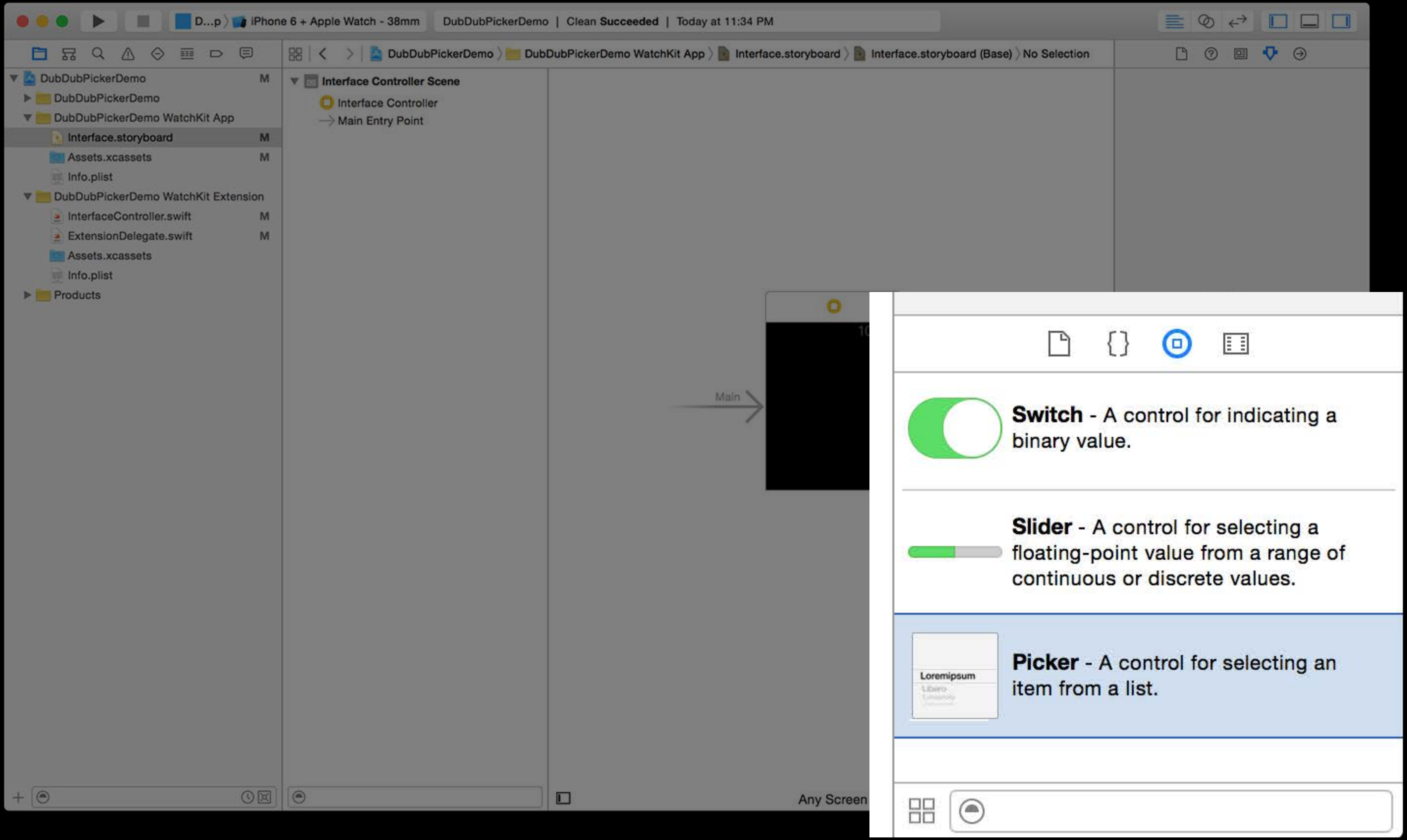

D...p
iPhone 6 + Apple Watch - 38mm
DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM
DubDubPickerDemo
DubDubPickerDemo WatchKit App
Interface.storyboard
Interface.storyboard (Base)
No Selection
DubDubPickerDemo M
DubDubPickerDemo
DubDubPickerDemo WatchKit App
Interface.storyboard M
Assets.xcassets M
Info.plist
DubDubPickerDemo WatchKit Extension
InterfaceController.swift M
ExtensionDelegate.swift M
Assets.xcassets
Info.plist
Products
Interface Controller Scene
Interface Controller
Main Entry Point
Main
10:09
Any Screen Size
No Selection

Switch - A control for indicating a binary value.

Slider - A control for selecting a floating-point value from a range of continuous or discrete values.

Picker - A control for selecting an item from a list.

Creating a Picker


D...p 〉 iPhone 6 + Apple Watch - 38mm
DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM
DubDubPickerDemo 〉 DubDubPickerDemo WatchKit App 〉 Interface.storyboard 〉 Interface.storyboard (Base) 〉 No Selection
DubDubPickerDemo M
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Loremipsum

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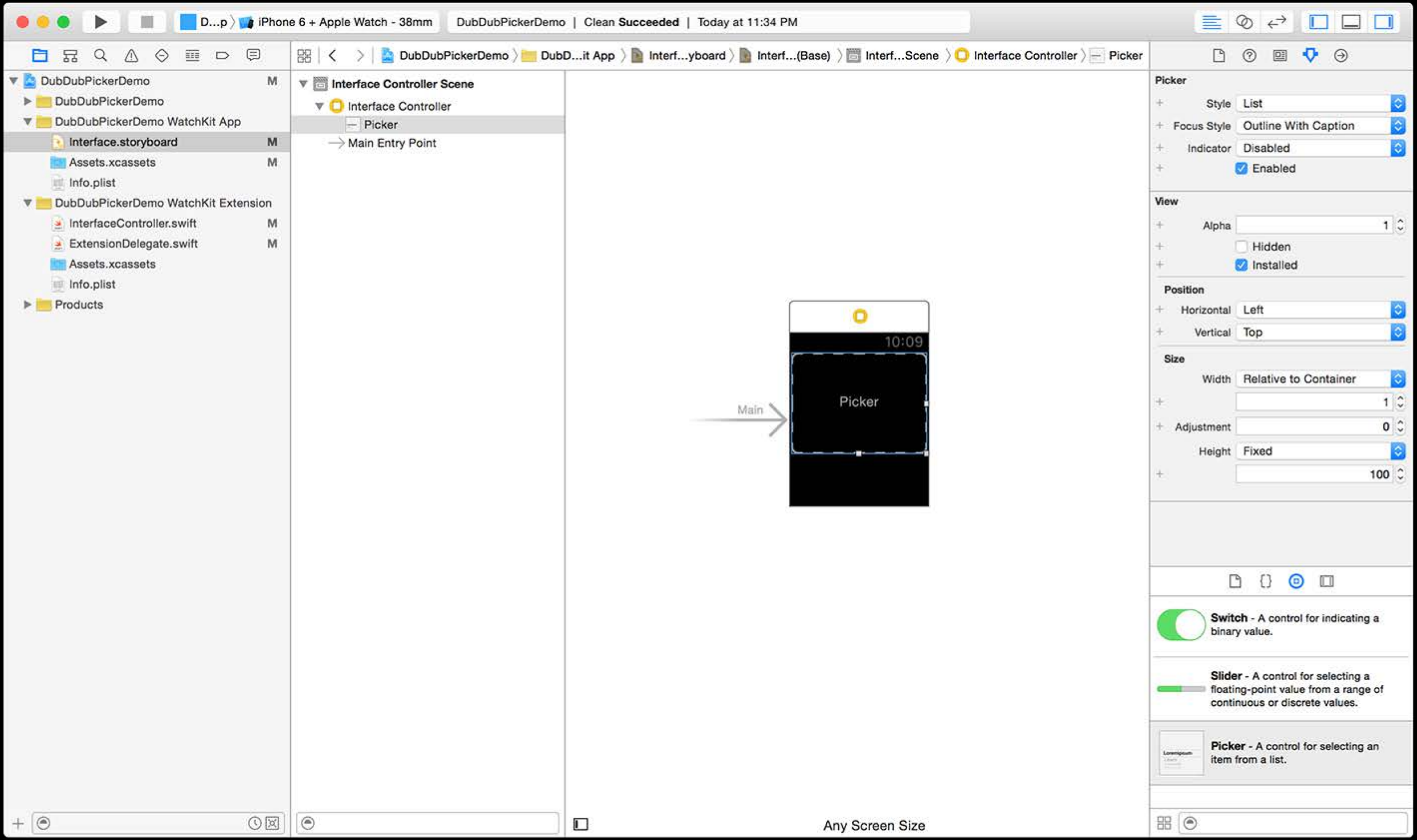

DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM

Picker

Style: List

Focus Style: Outline With Caption

Indicator: Disabled

☑ Enabled

View

Alpha: 1

☐ Hidden

☑ Installed

Position

Horizontal: Left

Vertical: Top

Size

Width: Relative to Container

1

Adjustment: 0

Height: Fixed

100

Switch - A control for indicating a binary value.

Slider - A control for selecting a floating-point value from a range of continuous or discrete values.

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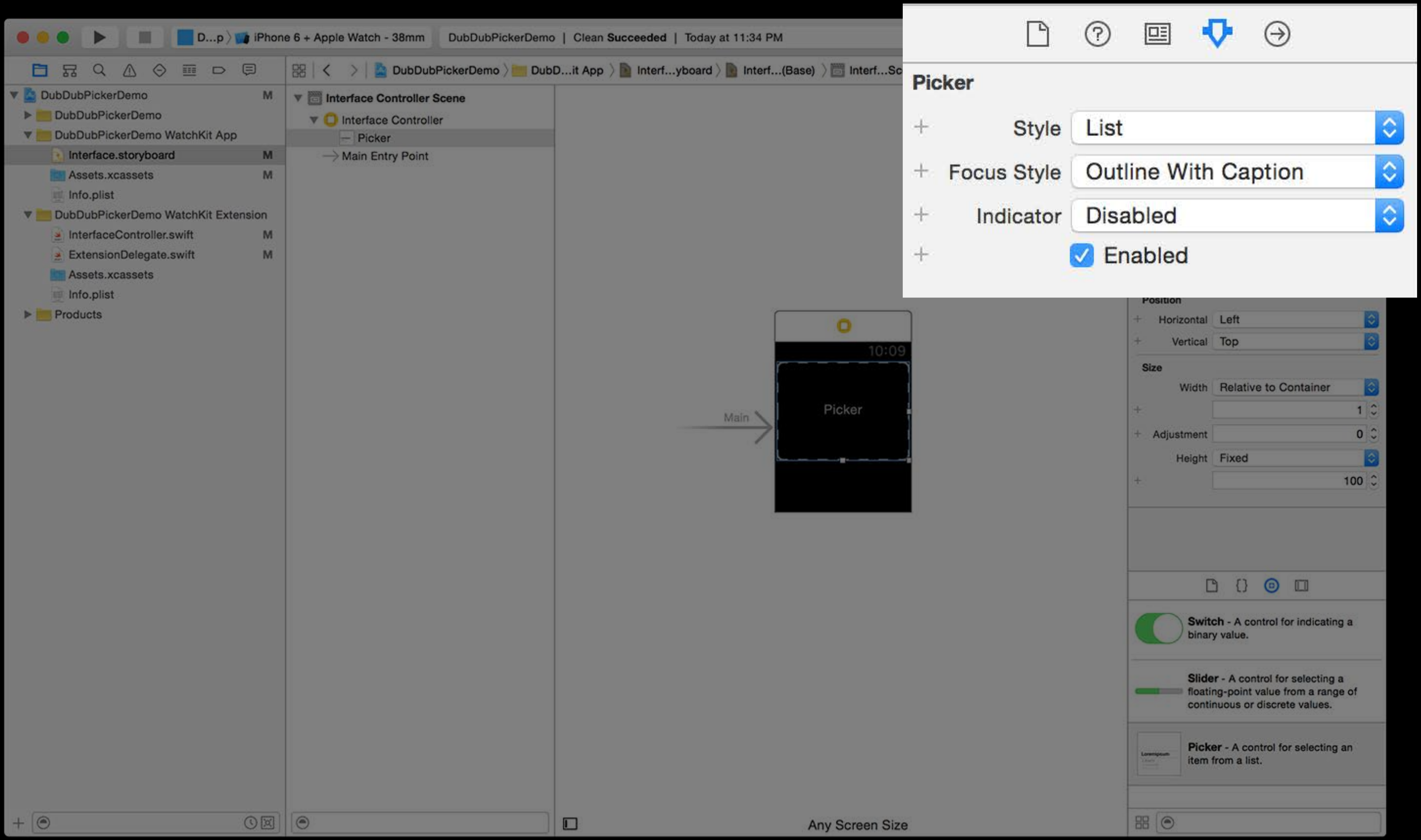
Creating a Picker



Picker

- Style: List
- Focus Style: Outline With Caption
- Indicator: Disabled
- ☑ Enabled

Position
- Horizontal: Left
- Vertical: Top

Size
- Width: Relative to Container
- 1
- Adjustment: 0
- Height: Fixed
- 100

D...p
iPhone 6 + Apple Watch - 38mm
DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM
DubDubPickerDemo
DubD...it App
Interf...yboard
Interf...(Base)
Interf...Sc
DubDubPickerDemo M
DubDubPickerDemo
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Interface.storyboard M
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10:09
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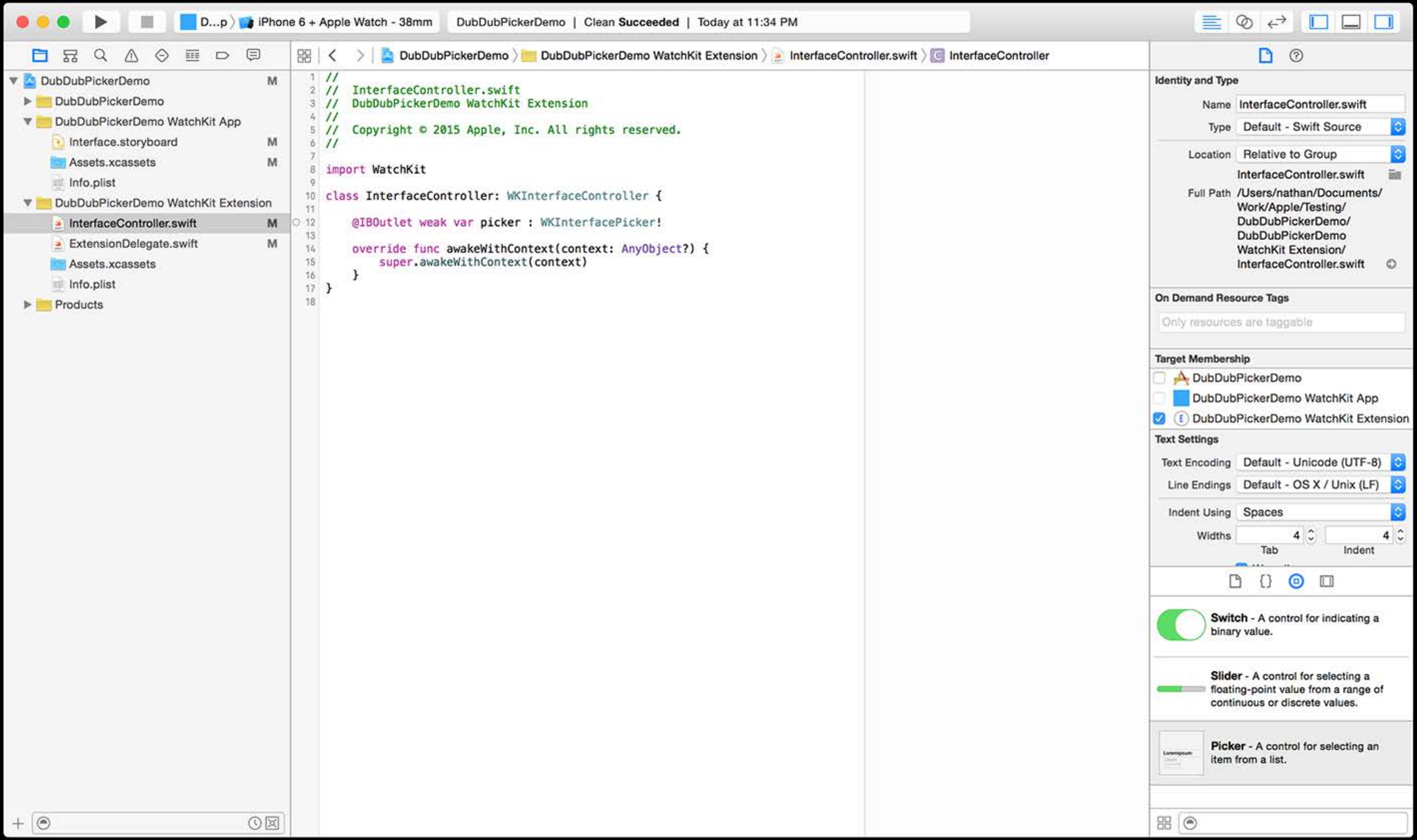

D...p 〉 iPhone 6 + Apple Watch - 38mm
DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM
DubDubPickerDemo 〉 DubDubPickerDemo WatchKit Extension 〉 InterfaceController.swift 〉 InterfaceController
DubDubPickerDemo M
DubDubPickerDemo
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Interface.storyboard M
Assets.xcassets M
Info.plist
DubDubPickerDemo WatchKit Extension
InterfaceController.swift M
ExtensionDelegate.swift M
Assets.xcassets
Info.plist
Products

```
//
//  InterfaceController.swift
//  DubDubPickerDemo WatchKit Extension
//
//  Copyright © 2015 Apple, Inc. All rights reserved.
//

import WatchKit

class InterfaceController: WKInterfaceController {

    @IBOutlet weak var picker : WKInterfacePicker!

    override func awakeWithContext(context: AnyObject?) {
        super.awakeWithContext(context)
    }
}
```

Identity and Type

Name: InterfaceController.swift

Type: Default - Swift Source

Location: Relative to Group

InterfaceController.swift

Full Path: /Users/nathan/Documents/Work/Apple/Testing/DubDubPickerDemo/DubDubPickerDemo WatchKit Extension/InterfaceController.swift

On Demand Resource Tags

Only resources are taggable

Target Membership

- □ DubDubPickerDemo
- □ DubDubPickerDemo WatchKit App
- ☑ DubDubPickerDemo WatchKit Extension

Text Settings

Text Encoding: Default - Unicode (UTF-8)

Line Endings: Default - OS X / Unix (LF)

Indent Using: Spaces

Widths: 4 Tab, 4 Indent

Switch - A control for indicating a binary value.

Slider - A control for selecting a floating-point value from a range of continuous or discrete values.

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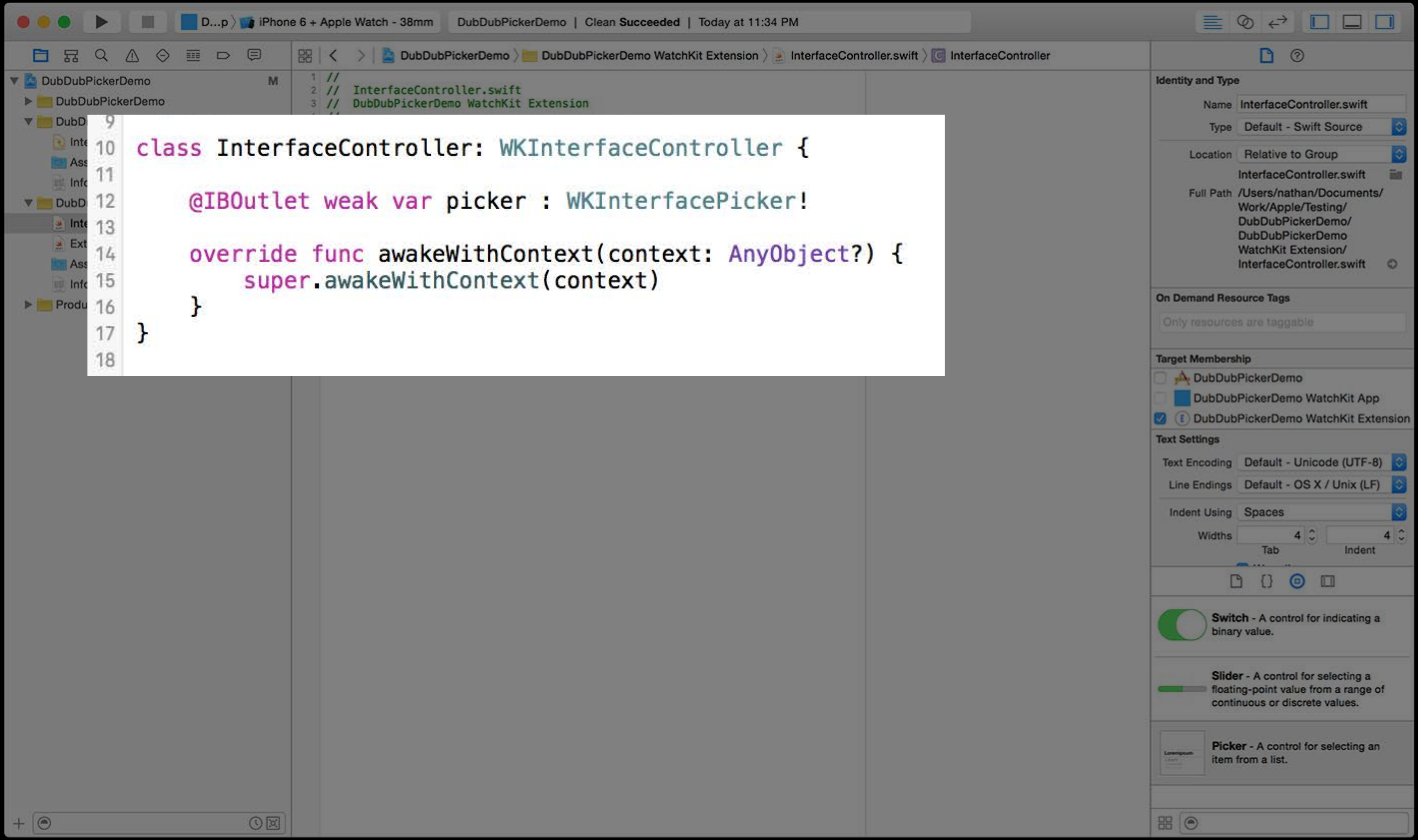
Creating a Picker



D...p
iPhone 6 + Apple Watch - 38mm
DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM
DubDubPickerDemo
DubDubPickerDemo WatchKit Extension
InterfaceController.swift
InterfaceController
DubDubPickerDemo
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```
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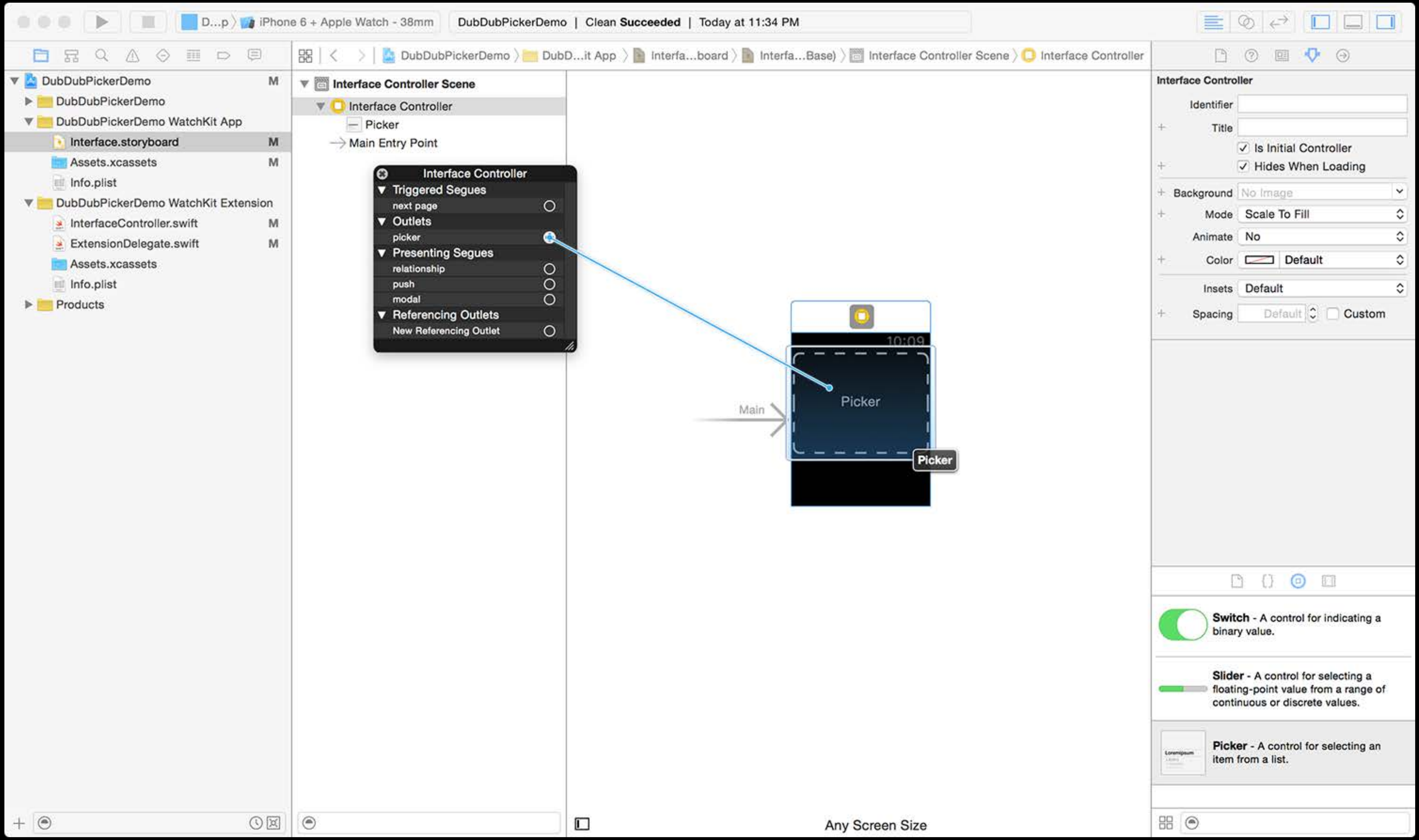

D...p 〉 iPhone 6 + Apple Watch - 38mm

DubDubPickerDemo | Clean Succeeded | Today at 11:34 PM

DubDubPickerDemo 〉 DubD...it App 〉 Interfa...board 〉 Interfa...Base) 〉 Interface Controller Scene 〉 Interface Controller

- DubDubPickerDemo M
  - DubDubPickerDemo
  - DubDubPickerDemo WatchKit App
    - Interface.storyboard M
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  - DubDubPickerDemo WatchKit Extension
    - InterfaceController.swift M
    - ExtensionDelegate.swift M
    - Assets.xcassets
    - Info.plist
  - Products

- Interface Controller Scene
  - Interface Controller
    - Picker
  - Main Entry Point

Interface Controller

- Triggered Segues
  - next page ○
- Outlets
  - picker ●
- Presenting Segues
  - relationship ○
  - push ○
  - modal ○
- Referencing Outlets
  - New Referencing Outlet ○

Interface Controller

Identifier

Title

☑ Is Initial Controller

☑ Hides When Loading

Background: No Image

Mode: Scale To Fill

Animate: No

Color: Default

Insets: Default

Spacing: Default ☐ Custom

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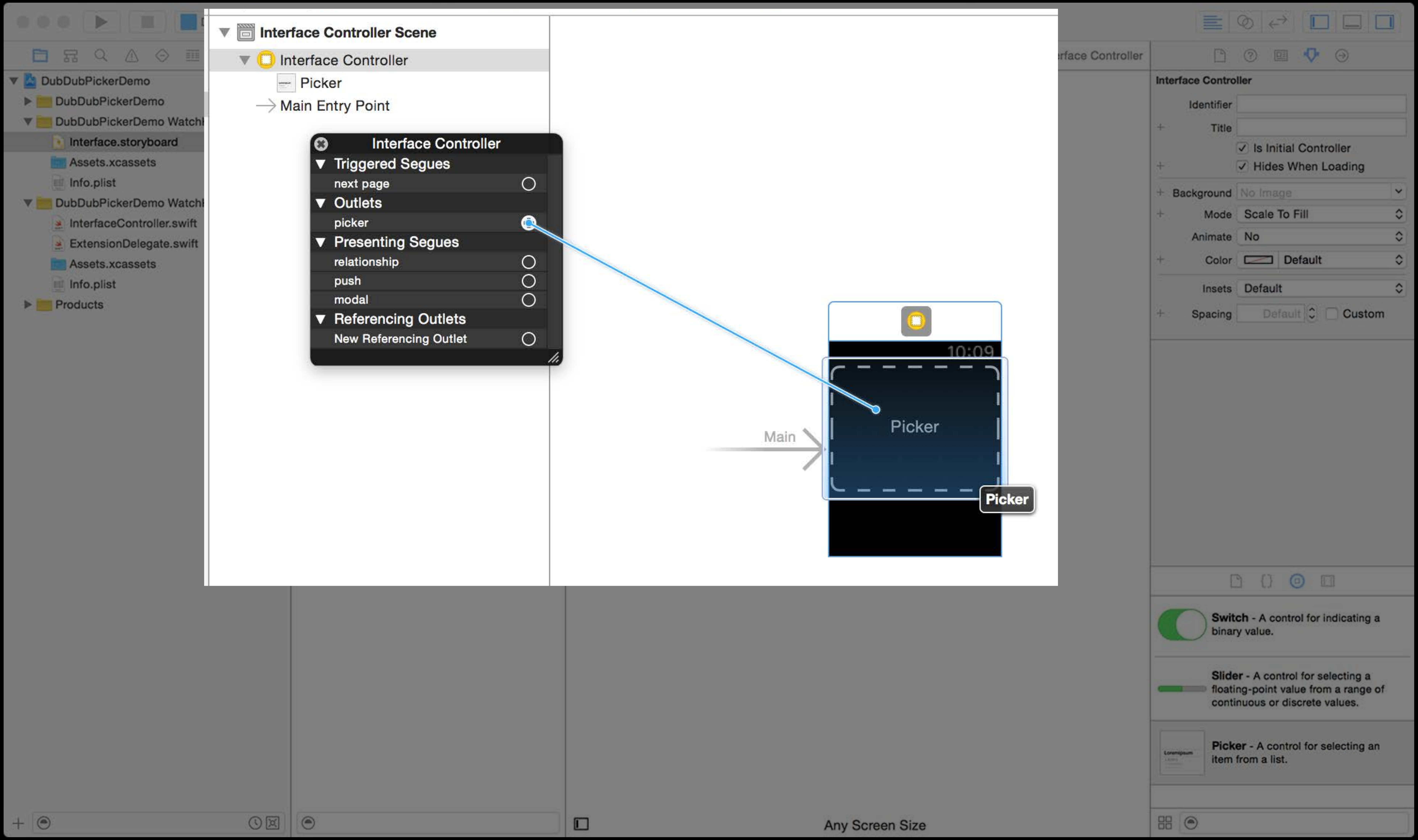

Interface Controller

Identifier

Title

☑ Is Initial Controller

☑ Hides When Loading

Background No Image

Mode Scale To Fill

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Color Default

Insets Default

Spacing Default □ Custom

Configuring Items

Configuring Items

Configuring Items

```
picker.setItems([ ])
```

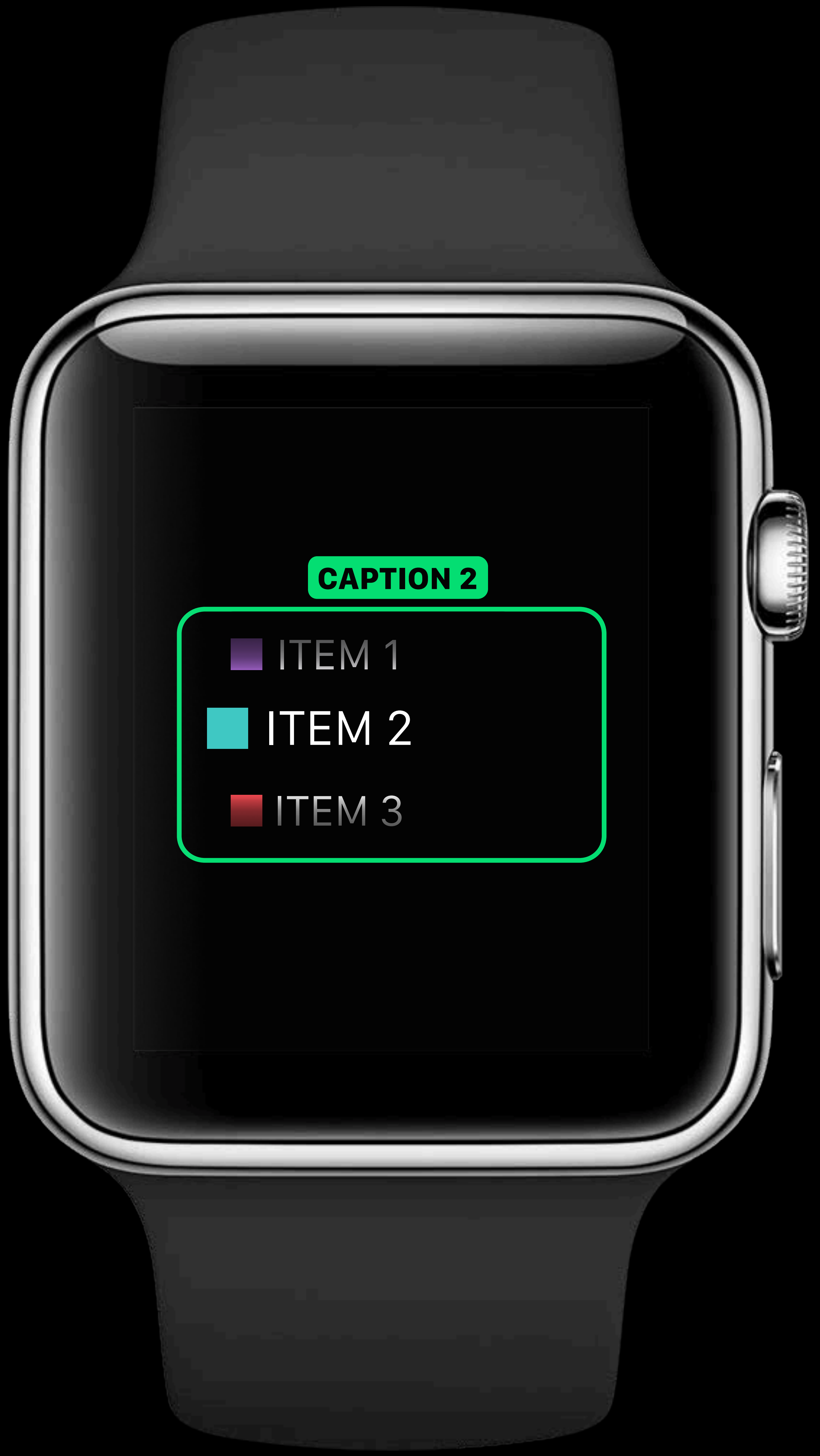
WKPickerItem

title: ITEM 1
caption: CAPTION 1
accessoryImage: 🟪

title: ITEM 2
caption: CAPTION 2
accessoryImage: 🟦

title: ITEM 3
caption: CAPTION 3
accessoryImage: 🟥

title: ITEM 4
caption: CAPTION 3
accessoryImage:



Configuring Items

WKPickerItem

`picker.setItems([`

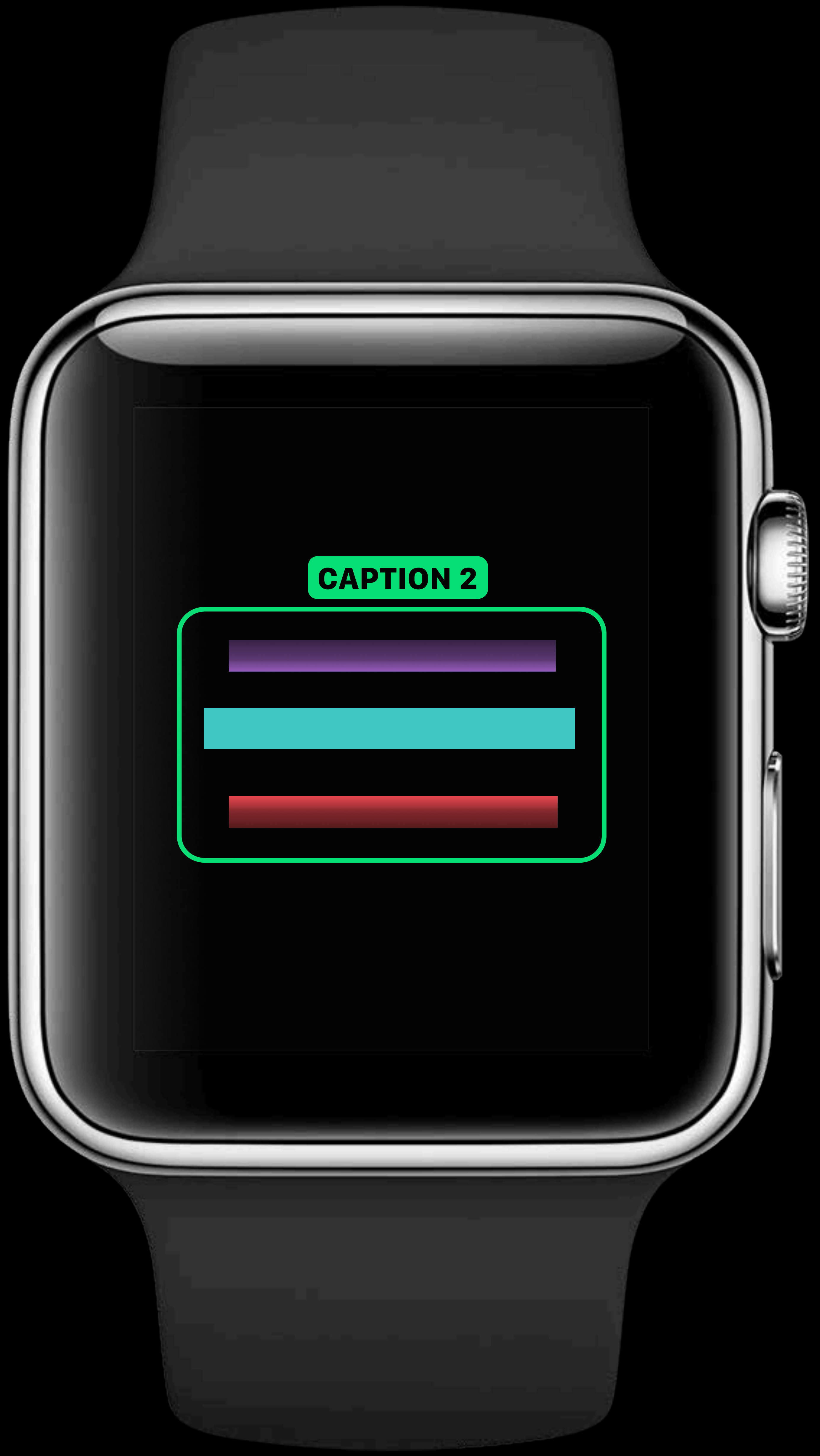
caption: CAPTION 1
contentImage: 🟪

caption: CAPTION 2
contentImage: 🟦

caption: CAPTION 3
contentImage: 🟥

caption: CAPTION 4
contentImage: 🟫

`])`



Specifying Item Images

```
// Image bundled with the app
let itemOne = WKPickerItem()
itemOne.contentImage = WKImage(imageName: "picker-item-content")

// Image data loaded from a file or network
let itemTwo = WKPickerItem()
itemTwo.contentImage = WKImage(imageData: contentImageData)

// UIImage drawn in code
let itemThree = WKPickerItem()
itemThree.contentImage = WKImage(image: contentImage)
```

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let itemThree = WKPickerItem()
itemThree.contentImage = WKImage(image: contentImage)
```

Handling Selected Item Changes

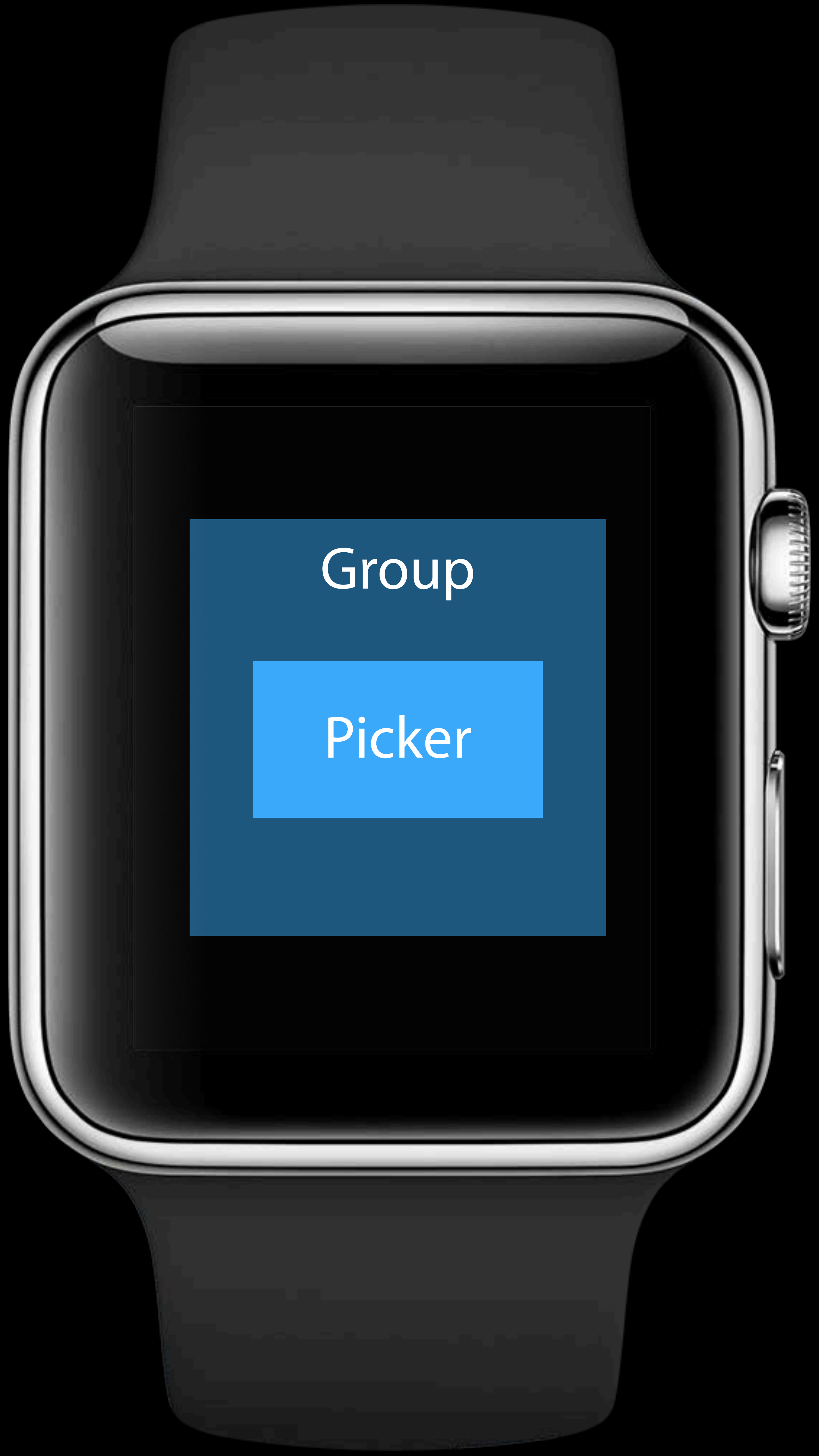
```
var pickerItems : [WKPickerItem]!

...

@IBAction func pickerAction(selectedIndex: Int) {
  var item = pickerItems[selectedIndex]
  print("The selected item is \(item.title) with index \(selectedIndex).")
}
```

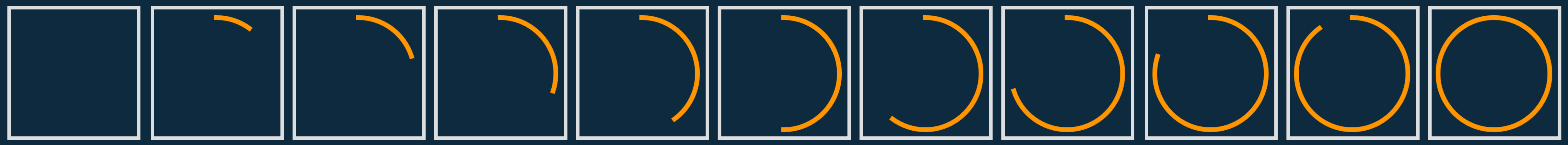
Coordinating Images

Coordinating Images



Coordinating Images

```
let progressImages = UIImage.animatedImageWithImages([
```



```
], duration: 0.0)
```

```
progressInterfaceGroup.setBackgroundImage(progressImages)
```

```
picker.setCoordinatedAnimations([ progressInterfaceGroup, ... ])
```

Coordinating Images

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let progressImages = UIImage.animatedImageWithImages([
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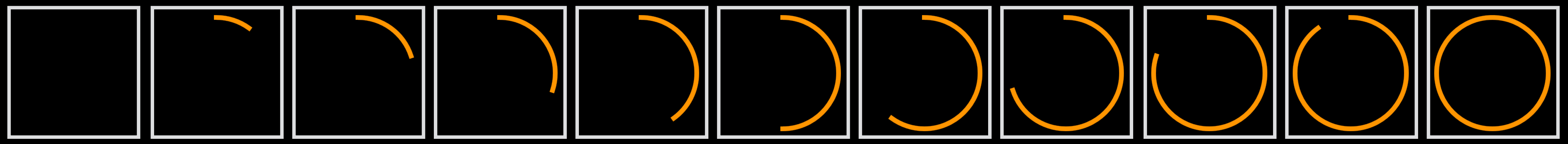

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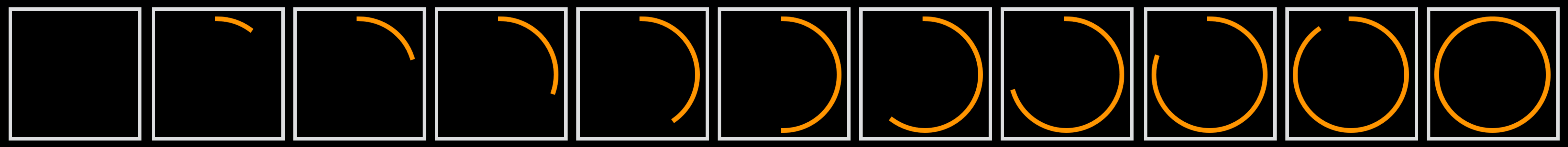

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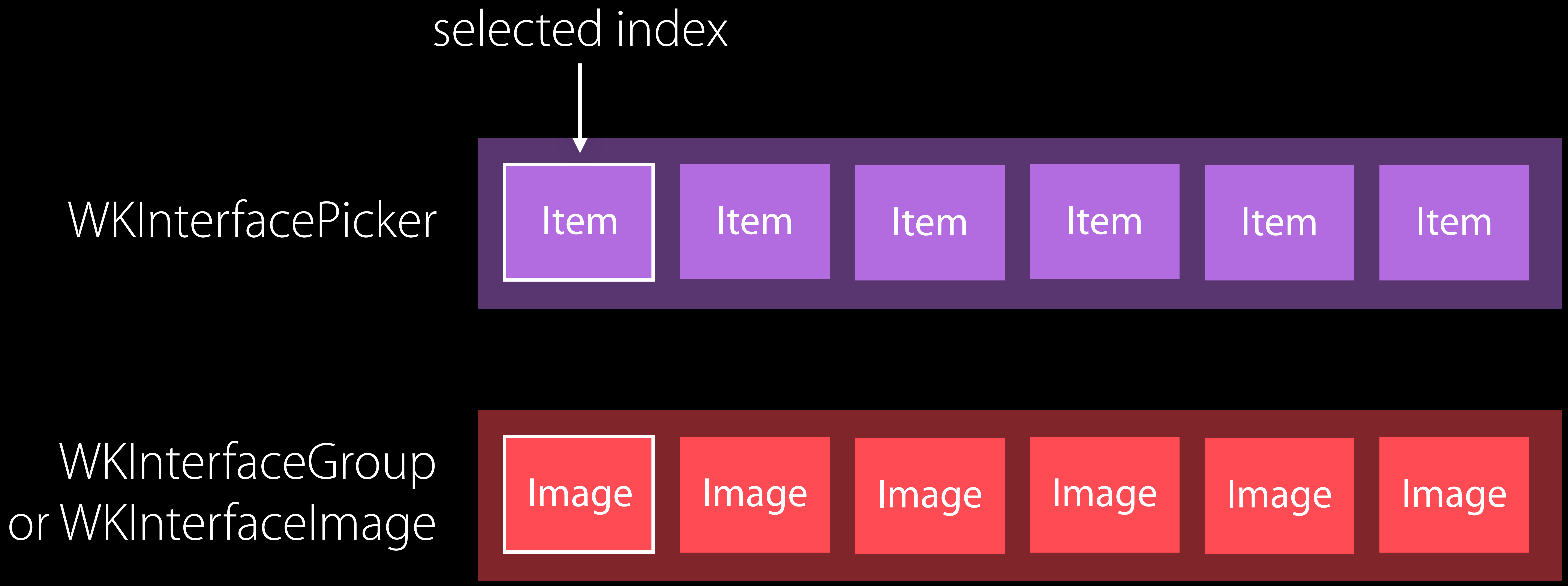

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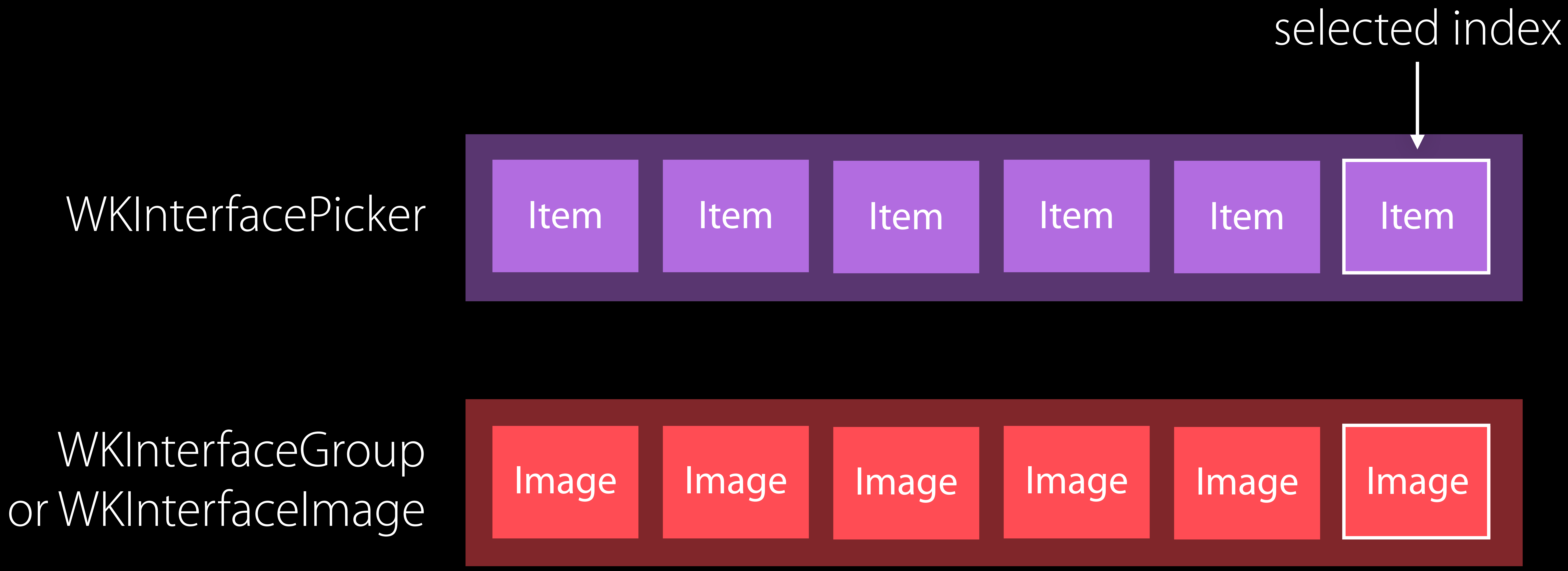


Demo

Digital Crown

Recap

Three customizable styles

Focus and indicator support

Image animation coordination

Media Playback

Chloe Chang watchOS Engineer

Media Playback

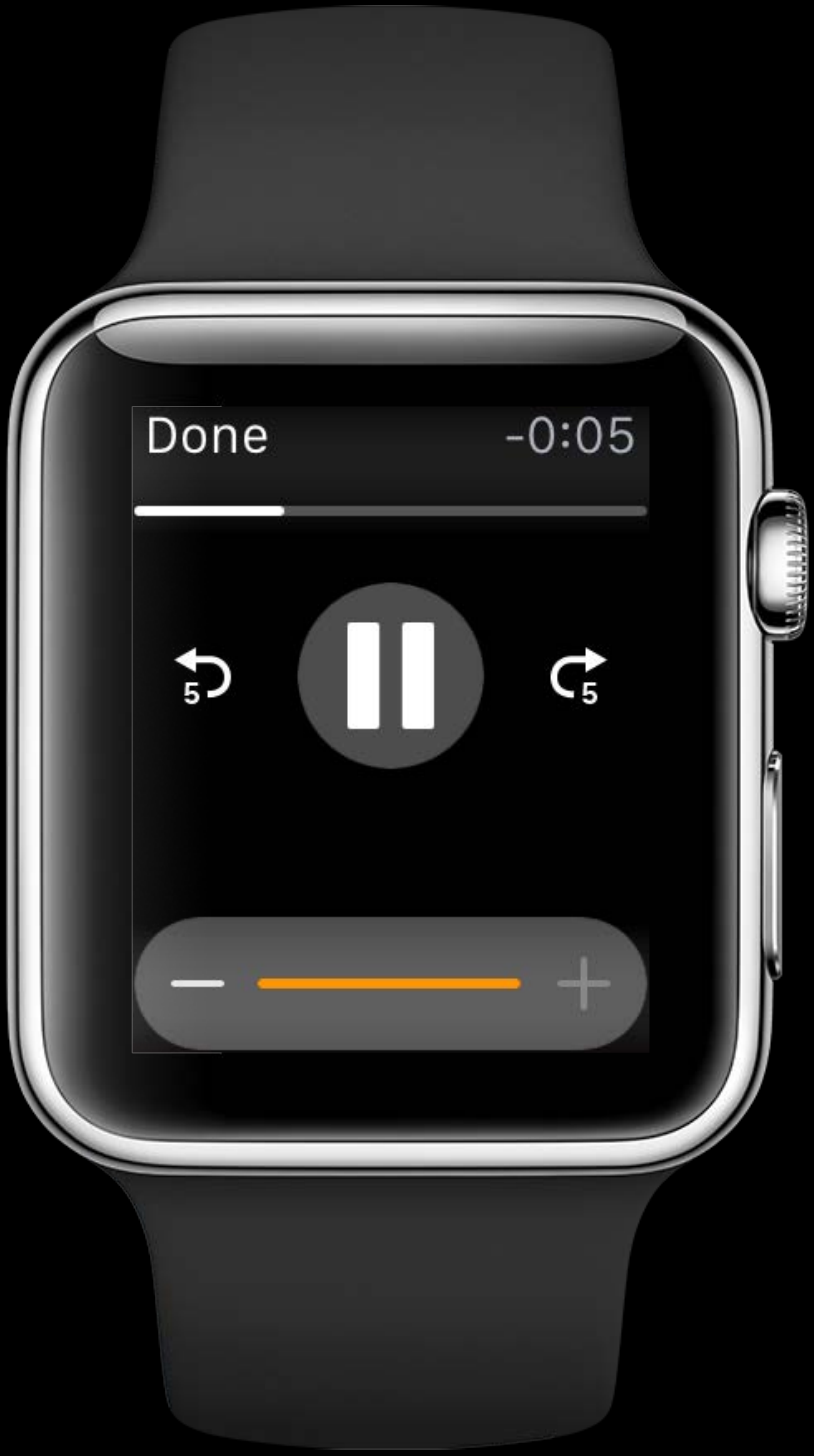
Audiovisual

Media Playback

Audiovisual

Media Playback

Audio-only



Media Playback

```
if let url = NSBundle.mainBundle().URLForResource("sample", withExtension:
"mov") {

   let options: [NSObject: AnyObject] = [
      WKMediaPlayerControllerOptionsAutoplayKey: true,
      WKMediaPlayerControllerOptionsStartTimeKey: 3.0,
      WKMediaPlayerControllerOptionsVideoGravityKey:
         WKVideoGravity.ResizeAspect.rawValue]

   presentMediaPlayerControllerWithURL(url, options: options) {
      didPlayToEnd, endTime, error in
       /* check playback result */
   }
}
```

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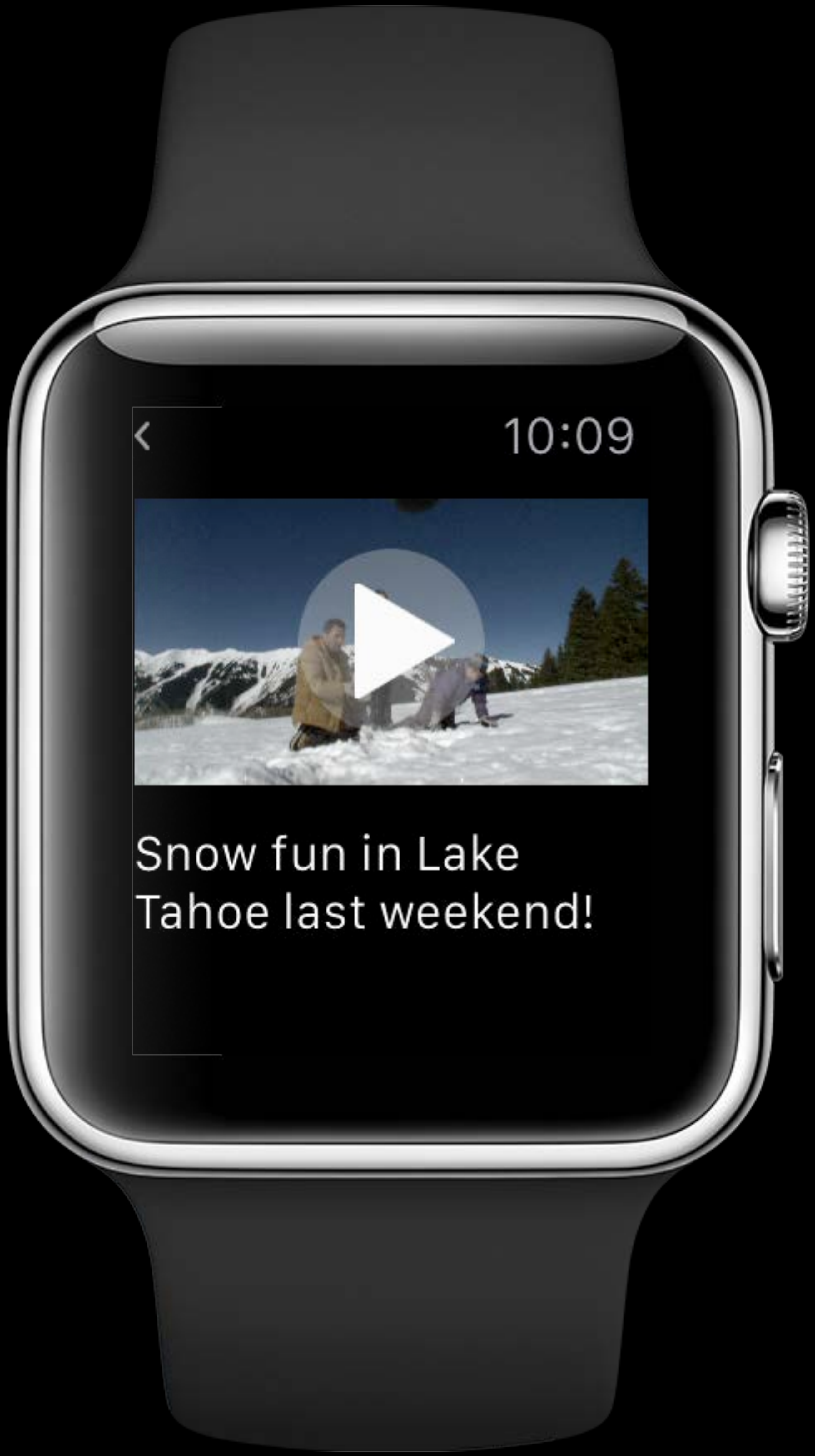
Media Playback

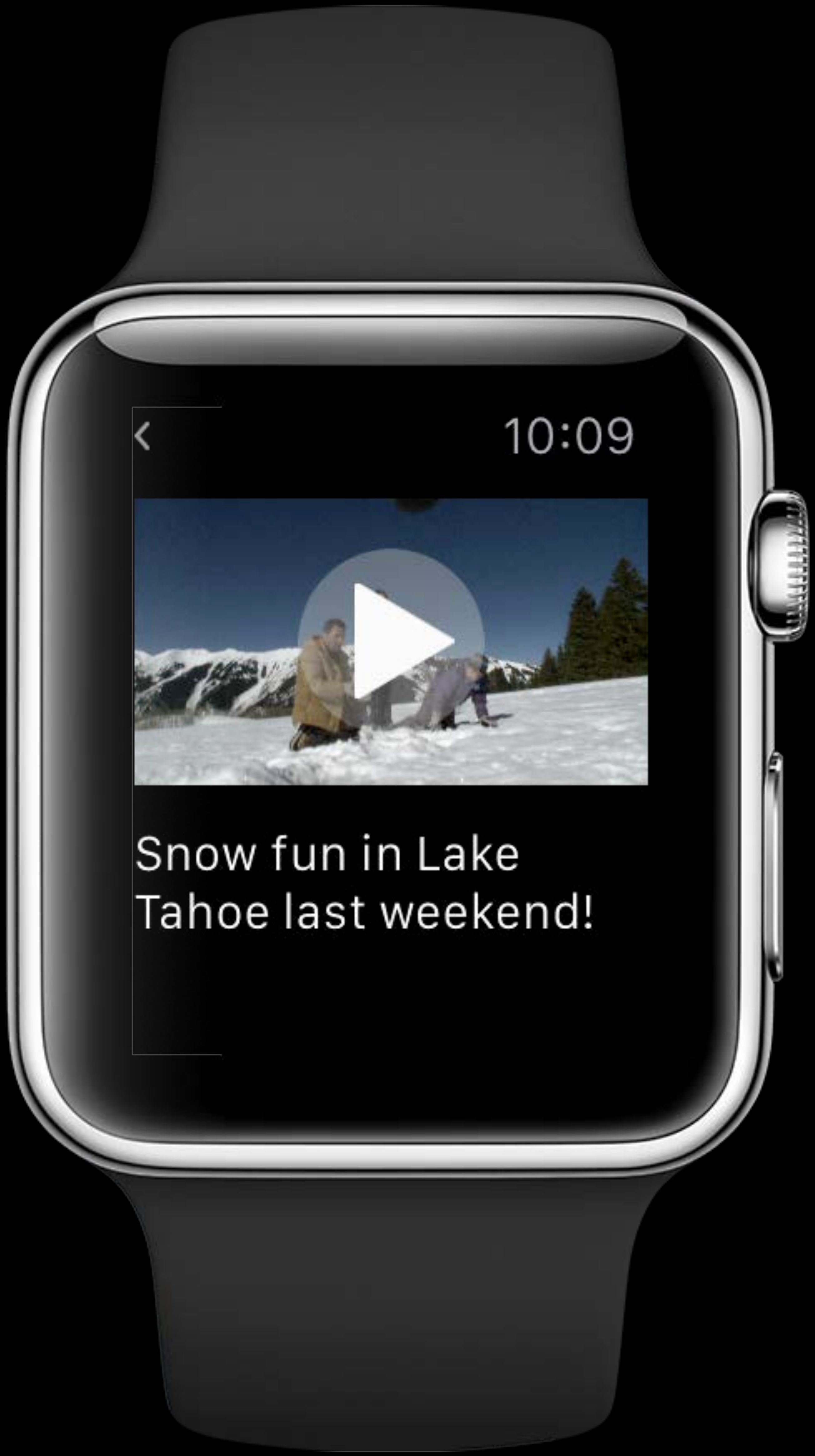
WKInterfaceMovie



Snow fun in Lake Tahoe last weekend!

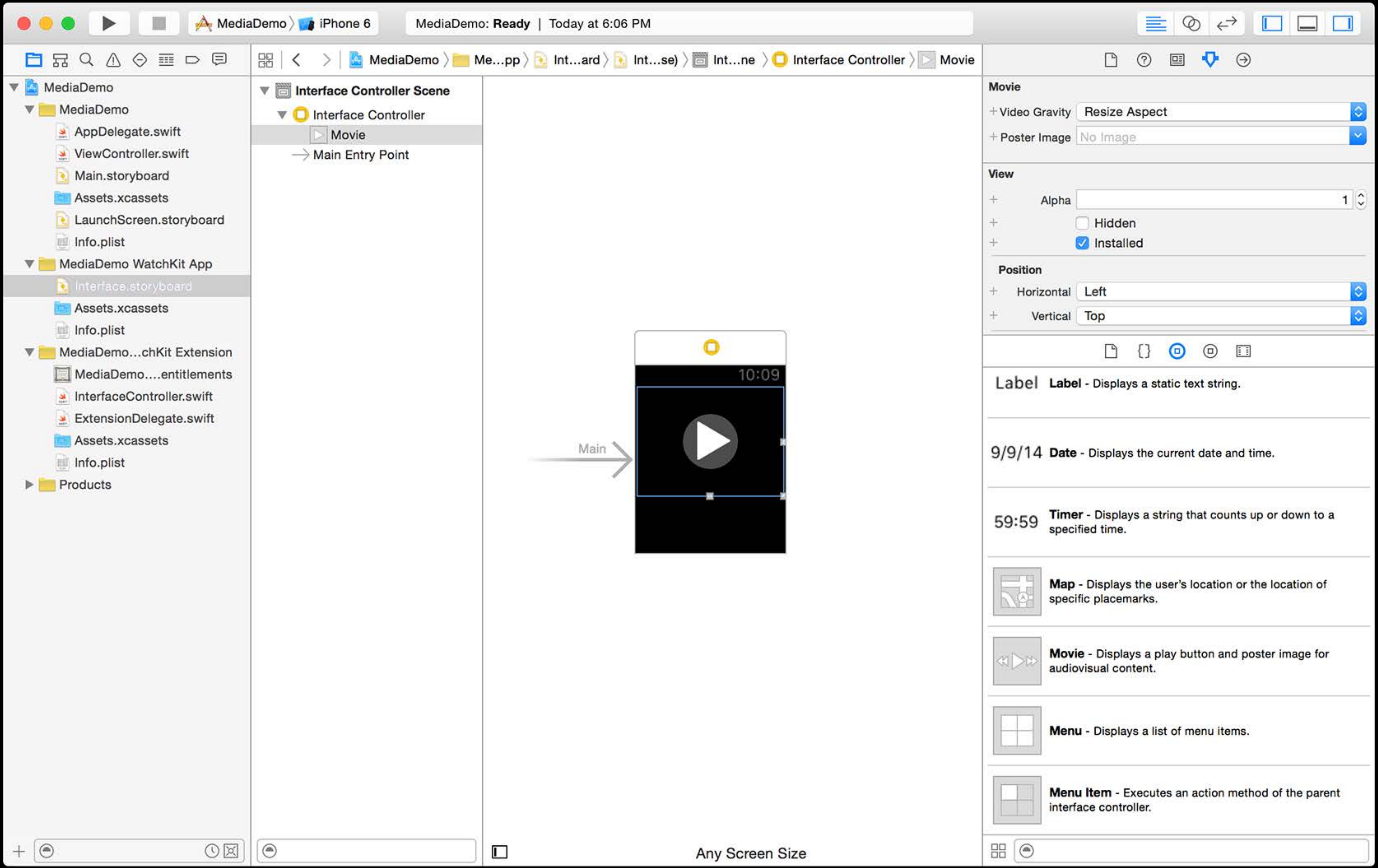
Media Playback

WKInterfaceMovie



10:09

Snow fun in Lake Tahoe last weekend!



MediaDemo 〉 iPhone 6

MediaDemo: **Ready** | Today at 6:06 PM

MediaDemo 〉 Me…pp 〉 Int…ard 〉 Int…se) 〉 Int…ne 〉 Interface Controller 〉 Movie

- MediaDemo
  - MediaDemo
    - AppDelegate.swift
    - ViewController.swift
    - Main.storyboard
    - Assets.xcassets
    - LaunchScreen.storyboard
    - Info.plist
  - MediaDemo WatchKit App
    - Interface.storyboard
    - Assets.xcassets
    - Info.plist
  - MediaDemo…chKit Extension
    - MediaDemo….entitlements
    - InterfaceController.swift
    - ExtensionDelegate.swift
    - Assets.xcassets
    - Info.plist
  - Products

- **Interface Controller Scene**
  - Interface Controller
    - Movie
  - Main Entry Point

Movie

Video Gravity: Resize Aspect

Poster Image: No Image

View

Alpha: 1

□ Hidden

☑ Installed

Position

Horizontal: Left

Vertical: Top

Label **Label** - Displays a static text string.

9/9/14 **Date** - Displays the current date and time.

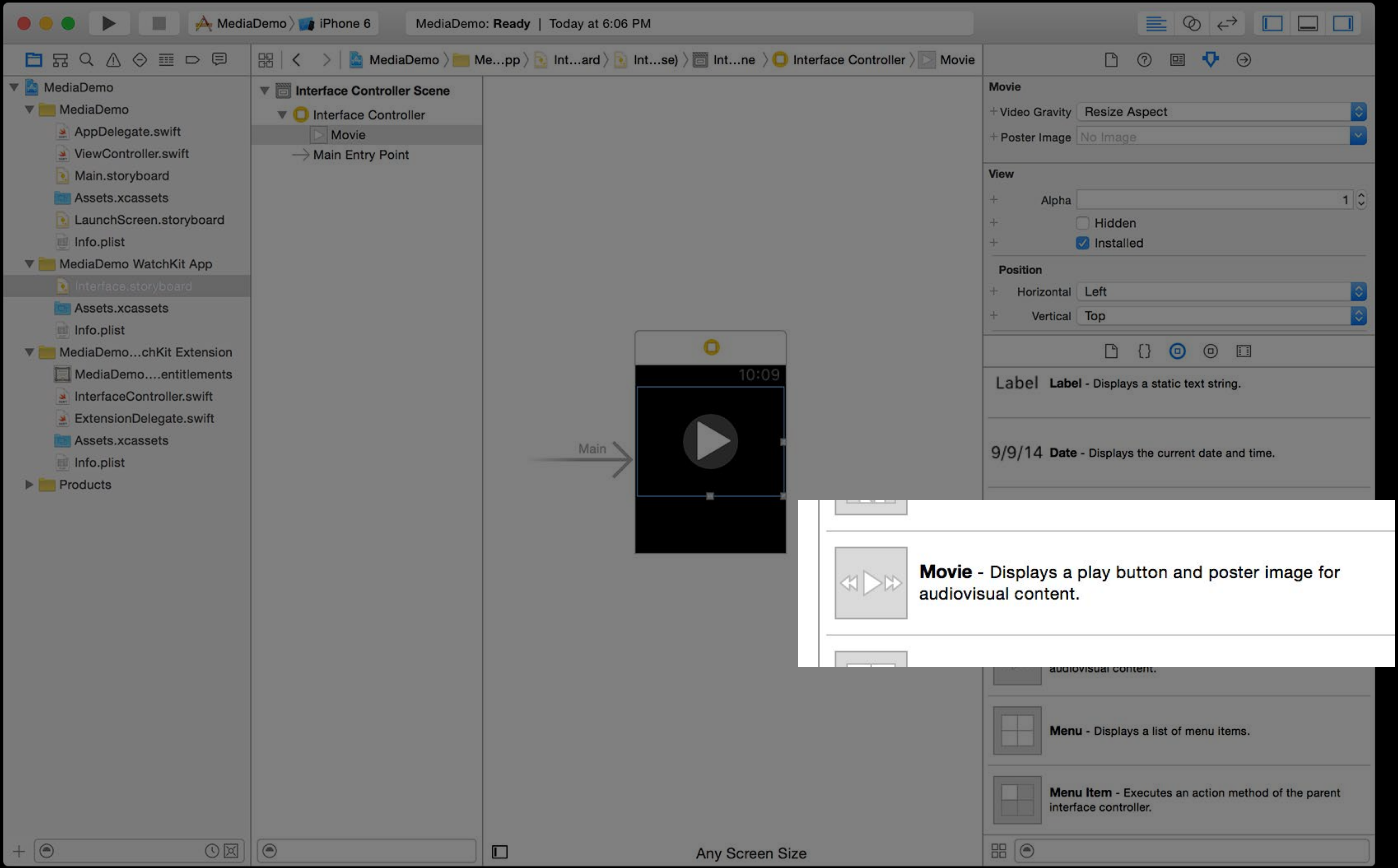
59:59 **Timer** - Displays a string that counts up or down to a specified time.

Map - Displays the user's location or the location of specific placemarks.

Movie - Displays a play button and poster image for audiovisual content.

Menu - Displays a list of menu items.

Menu Item - Executes an action method of the parent interface controller.



Movie

Video Gravity: Resize Aspect

Poster Image: No Image

View

Alpha: 1

☐ Hidden

☑ Installed

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Vertical: Top

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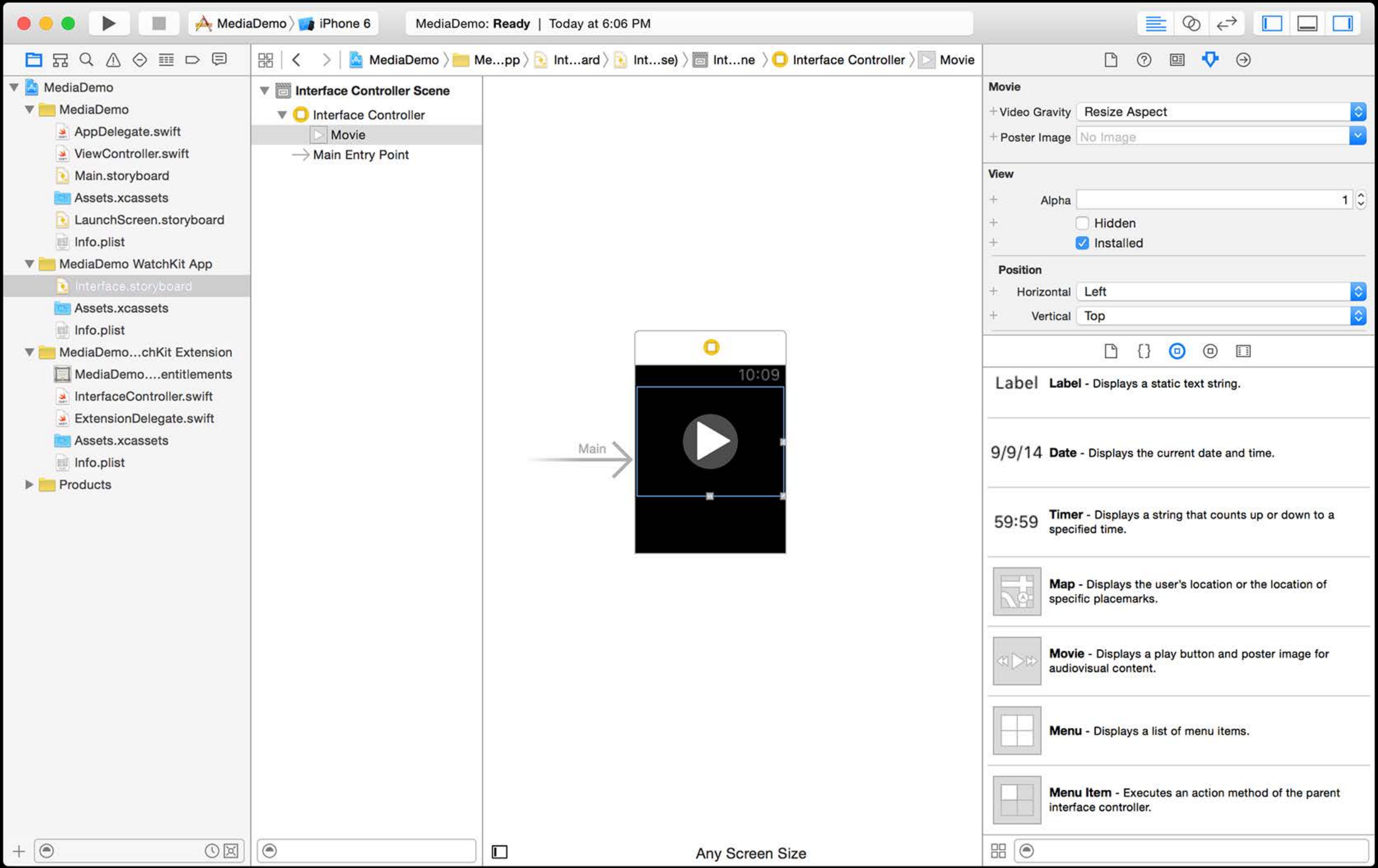

MediaDemo: **Ready** | Today at 6:06 PM

MediaDemo 〉 Me…pp 〉 Int…ard 〉 Int…se) 〉 Int…ne 〉 Interface Controller 〉 Movie

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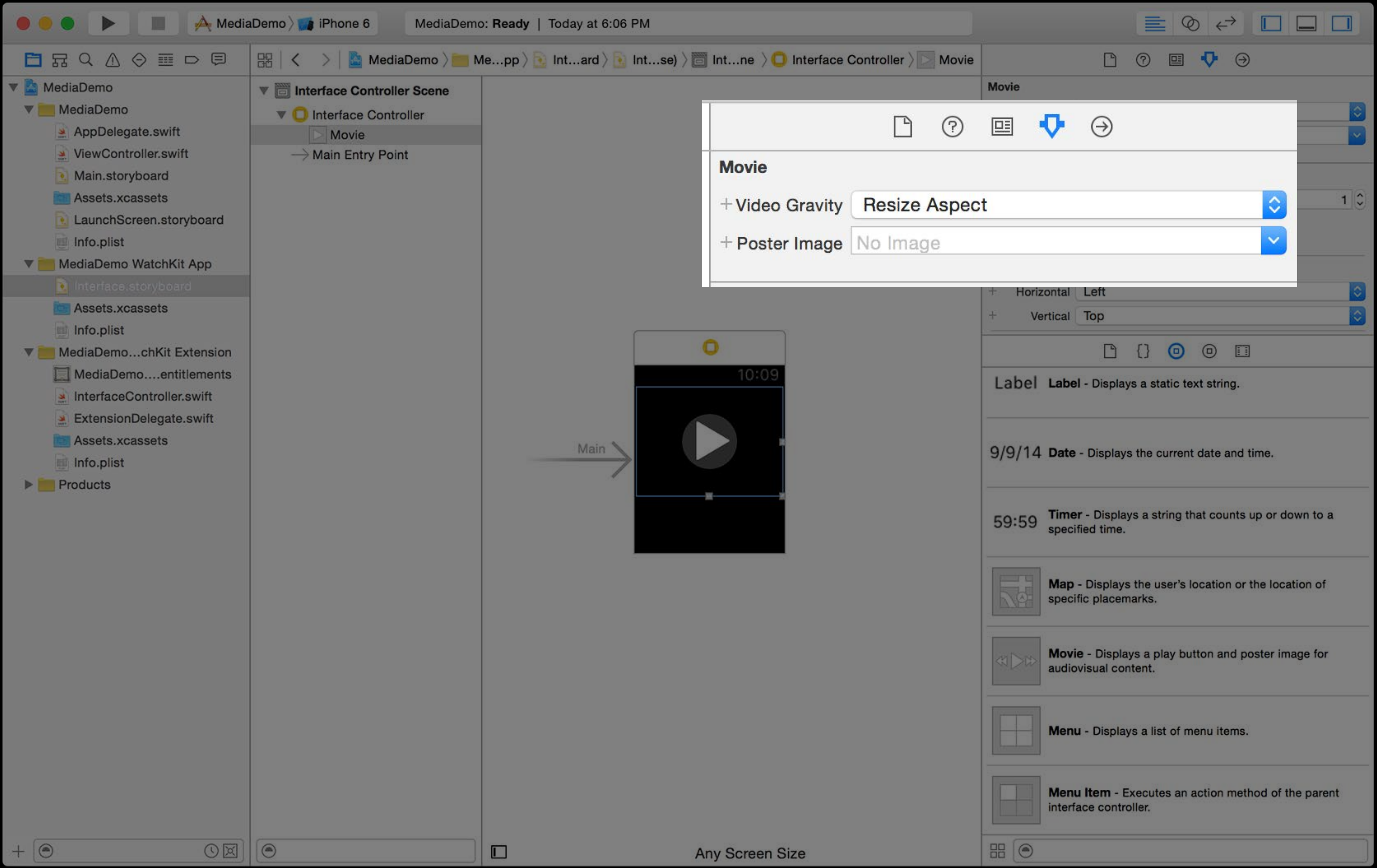

Movie

Video Gravity: Resize Aspect

Poster Image: No Image

Horizontal: Left

Vertical: Top

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Media Playback

WKInterfaceMovie

```
var url: NSURL
var poster: WKImage
@IBOutlet weak var movie: WKInterfaceMovie!

func setupMovie() {
   movie.setMovieURL(url)
   movie.setVideoGravity(.ResizeAspectFill)
   movie.setPosterImage(poster)
}
```

Media Playback

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```

Media Playback

Recommended formats

Video	Audio
H.264 High Profile Bit Rate: 160 kbps Frame Rate: 30 fps Full screen: 208 x 260 16:9 aspect ratio: 320 x 180	Bit Rate: 32 kbps AAC Stereo

Media Playback

Long-form audio

Media Playback

Long-form audio

Play in the background

Media Playback

Long-form audio

Play in the background

Podcasts, music

Media Playback

Long-form audio

Play in the background

Podcasts, music

Routed to Bluetooth headphones

Media Playback

Long-form audio

Play in the background

Podcasts, music

Routed to Bluetooth headphones

Now Playing glance integration

Media Playback

Long-form audio

```
let asset = WKAudioFileAsset.assetWithURL(URL:url)
let playerItem = WKAudioFilePlayerItem.playerItemWithAsset(asset:asset)

let player = WKAudioFilePlayer.playerWithPlayerItem(playerItem:playerItem)
player.play()
//player.pause()
```

```
let queuePlayer = WKAudioFileQueuePlayer.queuePlayerWithItems(items:[…])
queuePlayer.play()
//queuePlayer.pause()
```

Media Playback

Long-form audio

```
let asset = WKAudioFileAsset.assetWithURL(URL:url)
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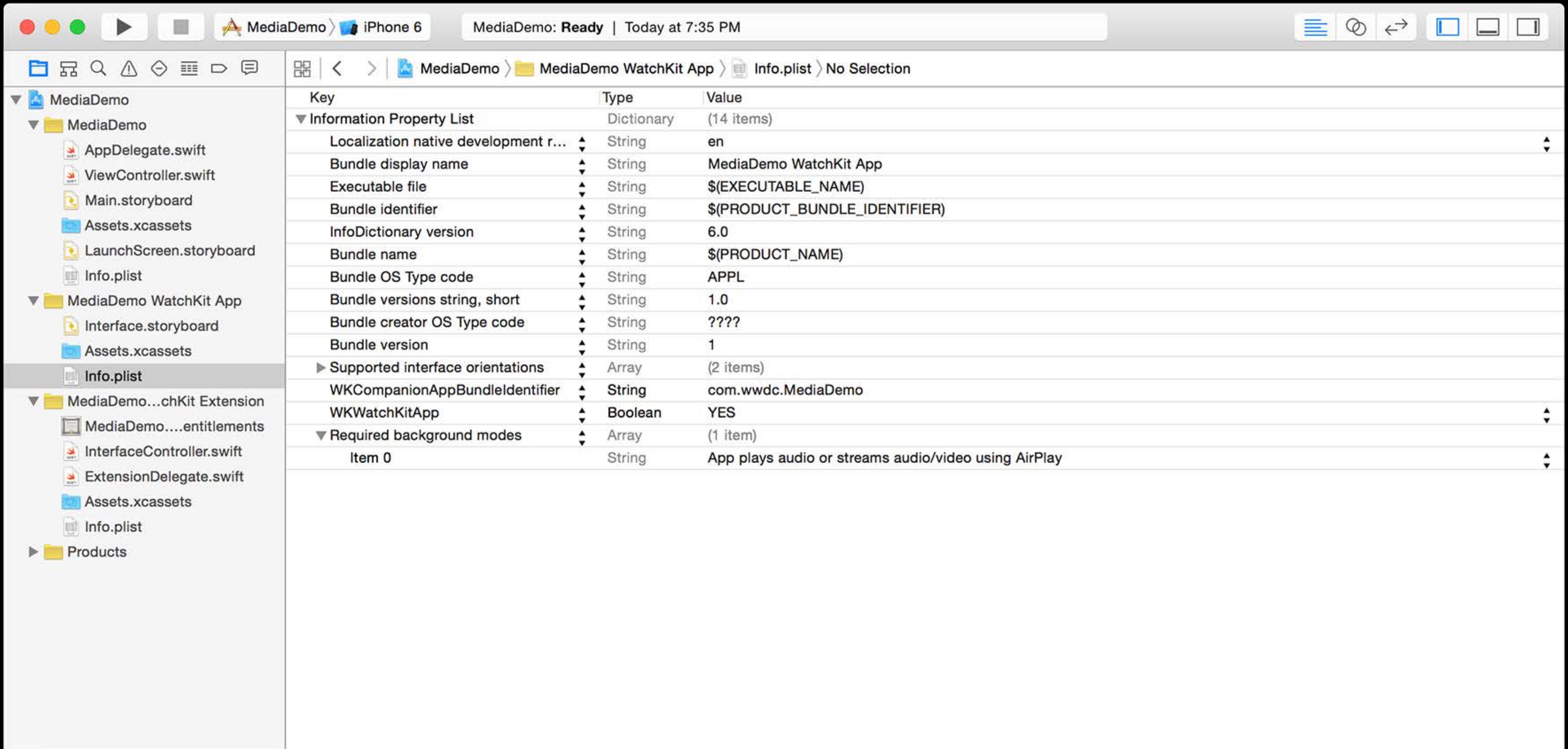
Media Playback

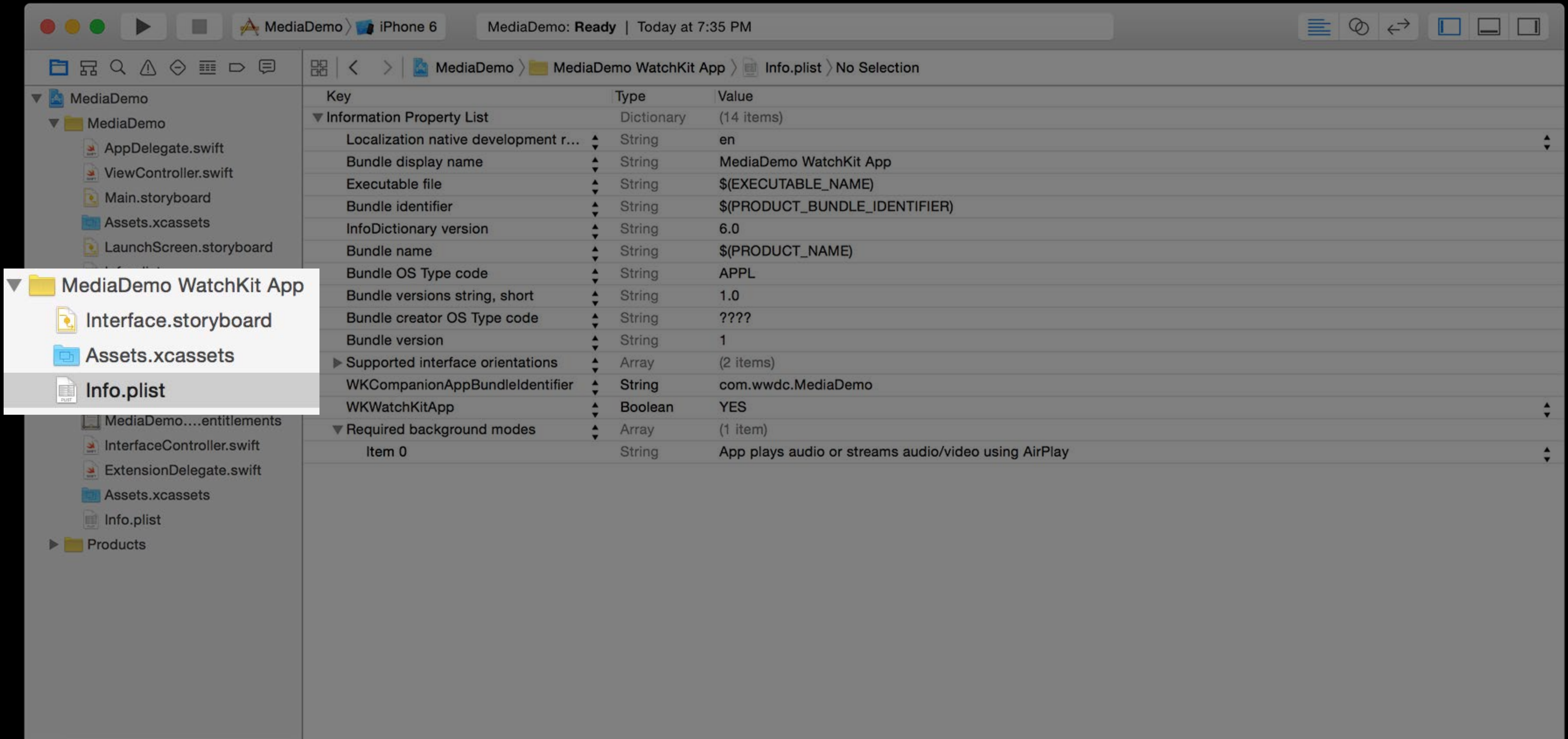
Long-form audio



Key	Type	Value
▼ Information Property List	Dictionary	(14 items)
Localization native development r…	String	en
Bundle display name	String	MediaDemo WatchKit App
Executable file	String	$(EXECUTABLE_NAME)
Bundle identifier	String	$(PRODUCT_BUNDLE_IDENTIFIER)
InfoDictionary version	String	6.0
Bundle name	String	$(PRODUCT_NAME)
Bundle OS Type code	String	APPL
Bundle versions string, short	String	1.0
Bundle creator OS Type code	String	????
Bundle version	String	1
▶ Supported interface orientations	Array	(2 items)
WKCompanionAppBundleIdentifier	String	com.wwdc.MediaDemo
WKWatchKitApp	Boolean	YES
▼ Required background modes	Array	(1 item)
Item 0	String	App plays audio or streams audio/video using AirPlay

Media Playback

Long-form audio



Key	Type	Value
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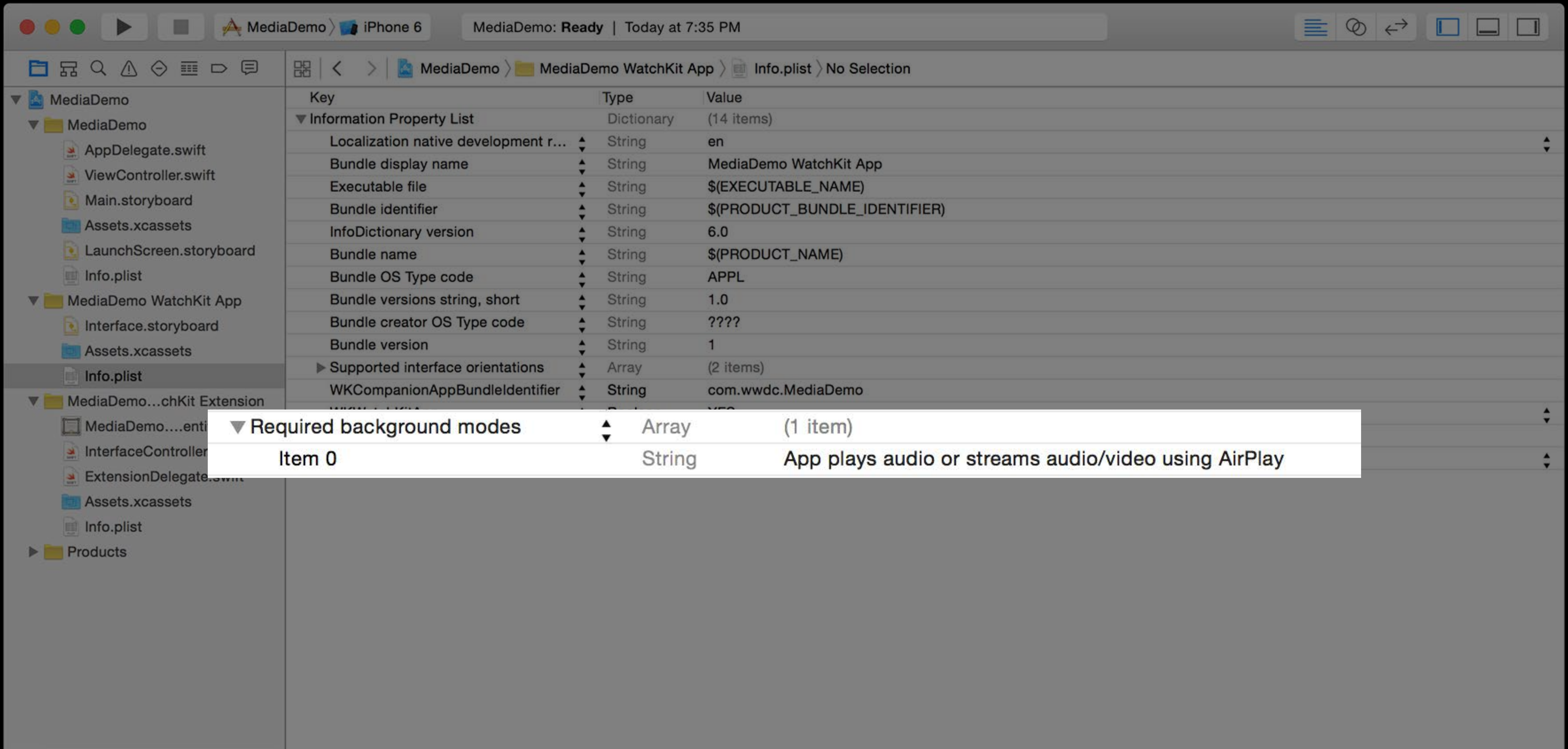
Media Playback

Long-form audio



MediaDemo 〉 iPhone 6

MediaDemo: **Ready** | Today at 7:35 PM

MediaDemo 〉 MediaDemo WatchKit App 〉 Info.plist 〉 No Selection

- MediaDemo
  - MediaDemo
    - AppDelegate.swift
    - ViewController.swift
    - Main.storyboard
    - Assets.xcassets
    - LaunchScreen.storyboard
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  - MediaDemo...chKit Extension
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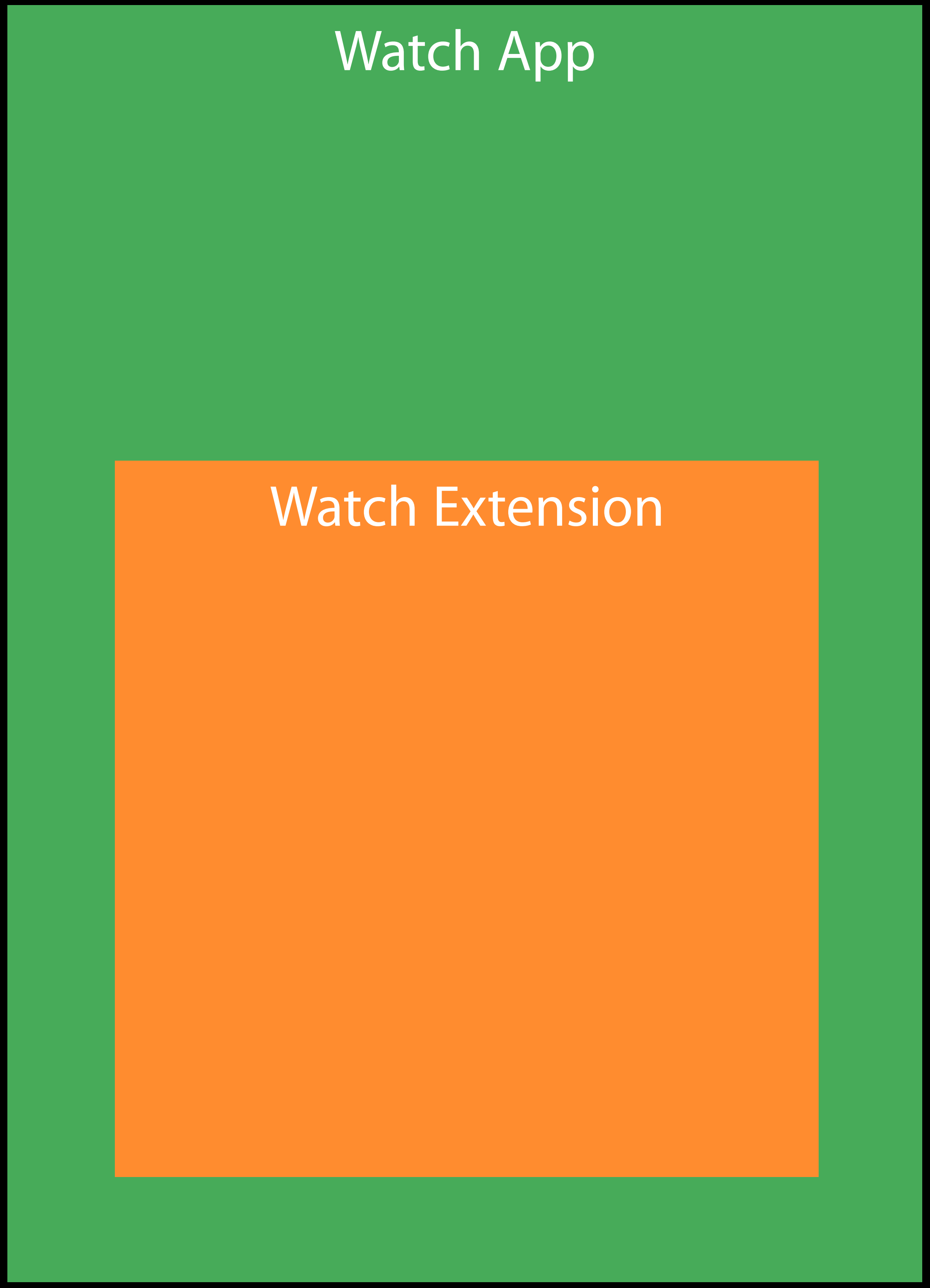
Item 0	String	App plays audio or streams audio/video using AirPlay

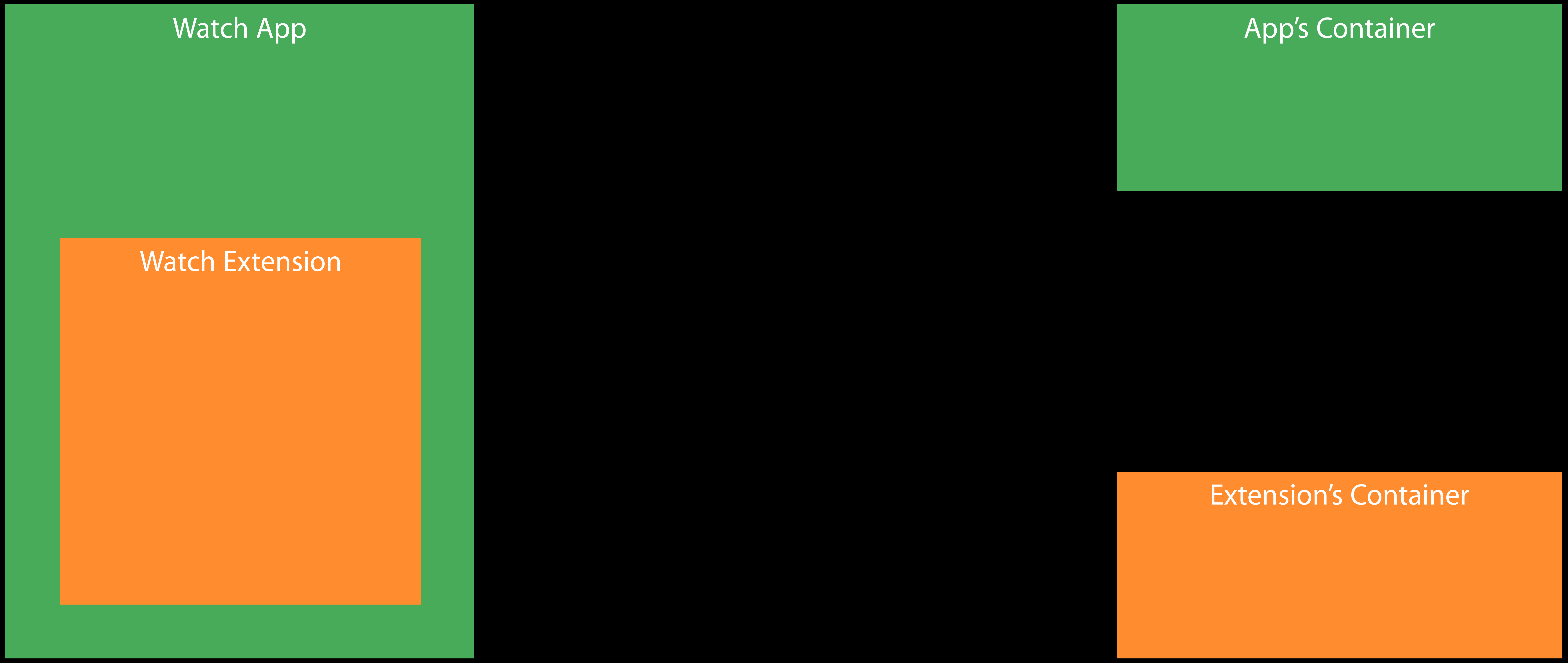
Media Playback

Resource locations



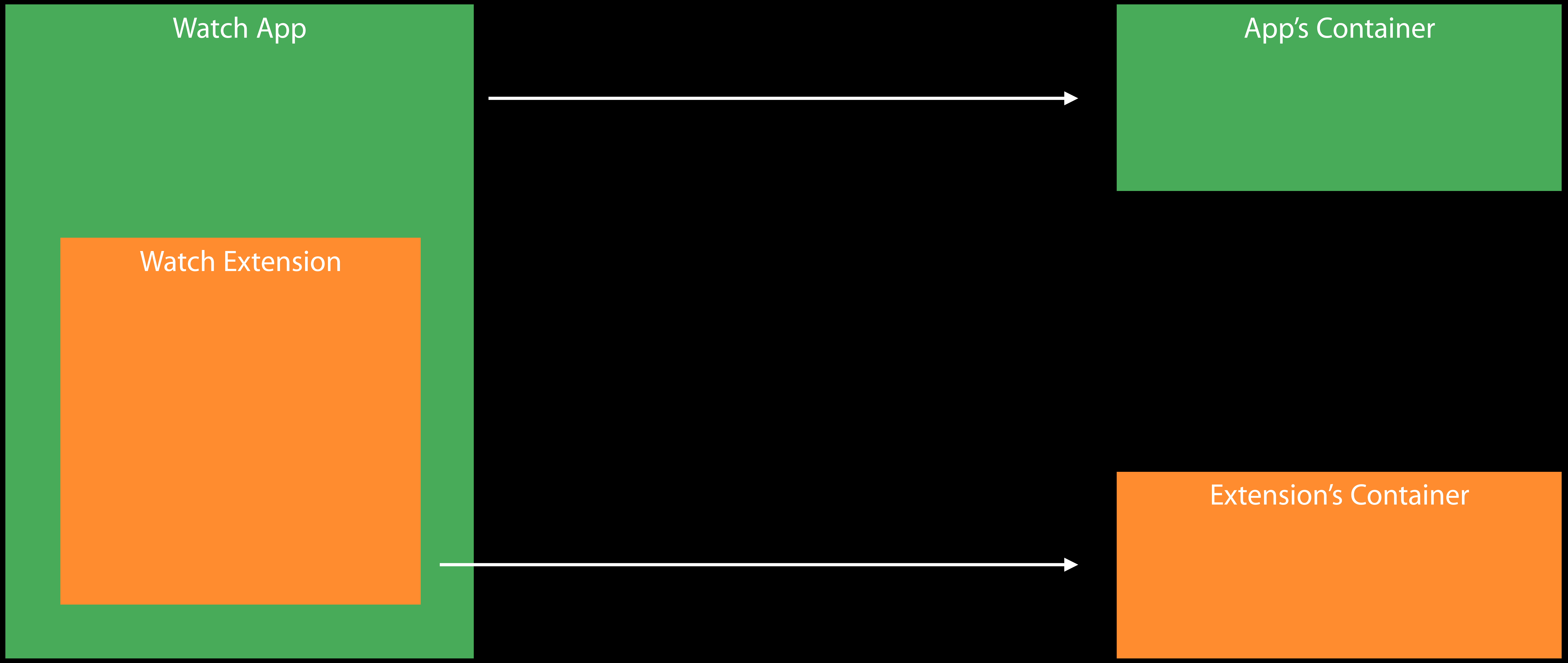
Media Playback

Resource locations



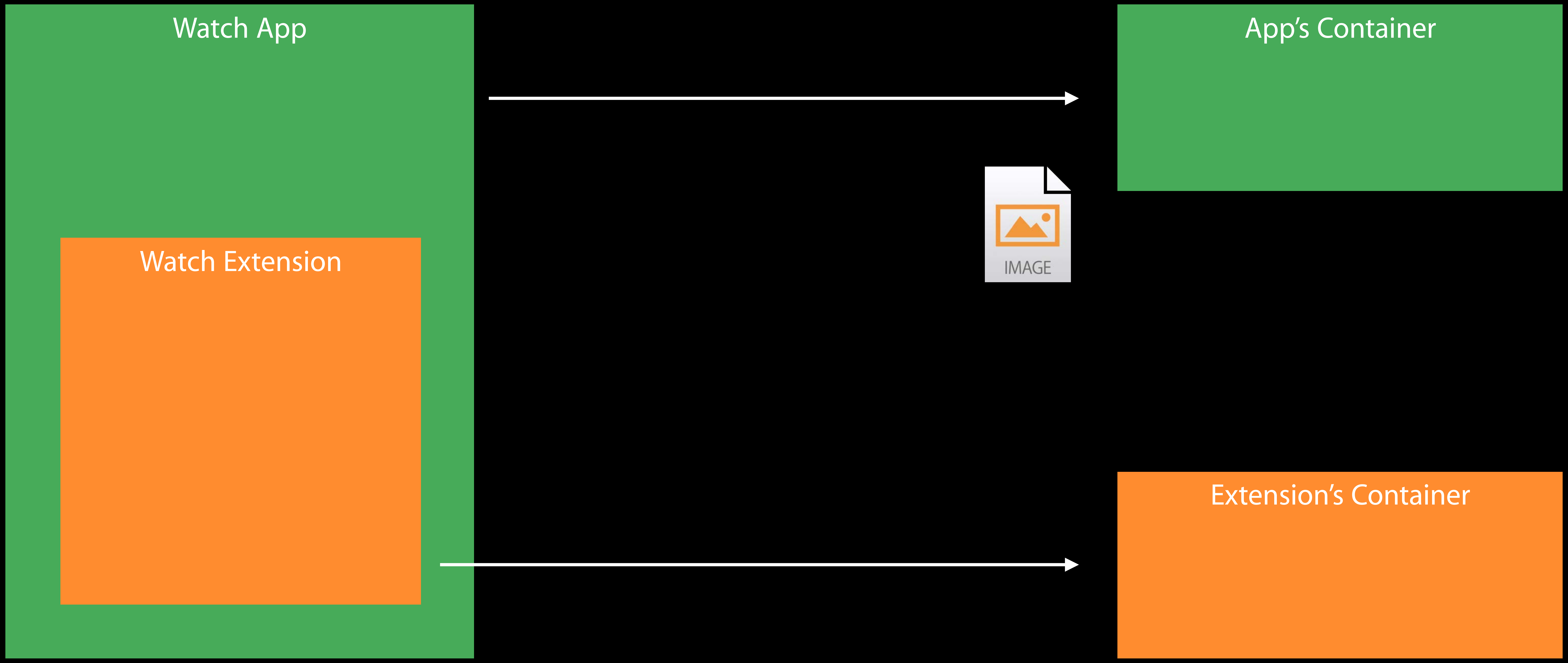
Media Playback

Resource locations



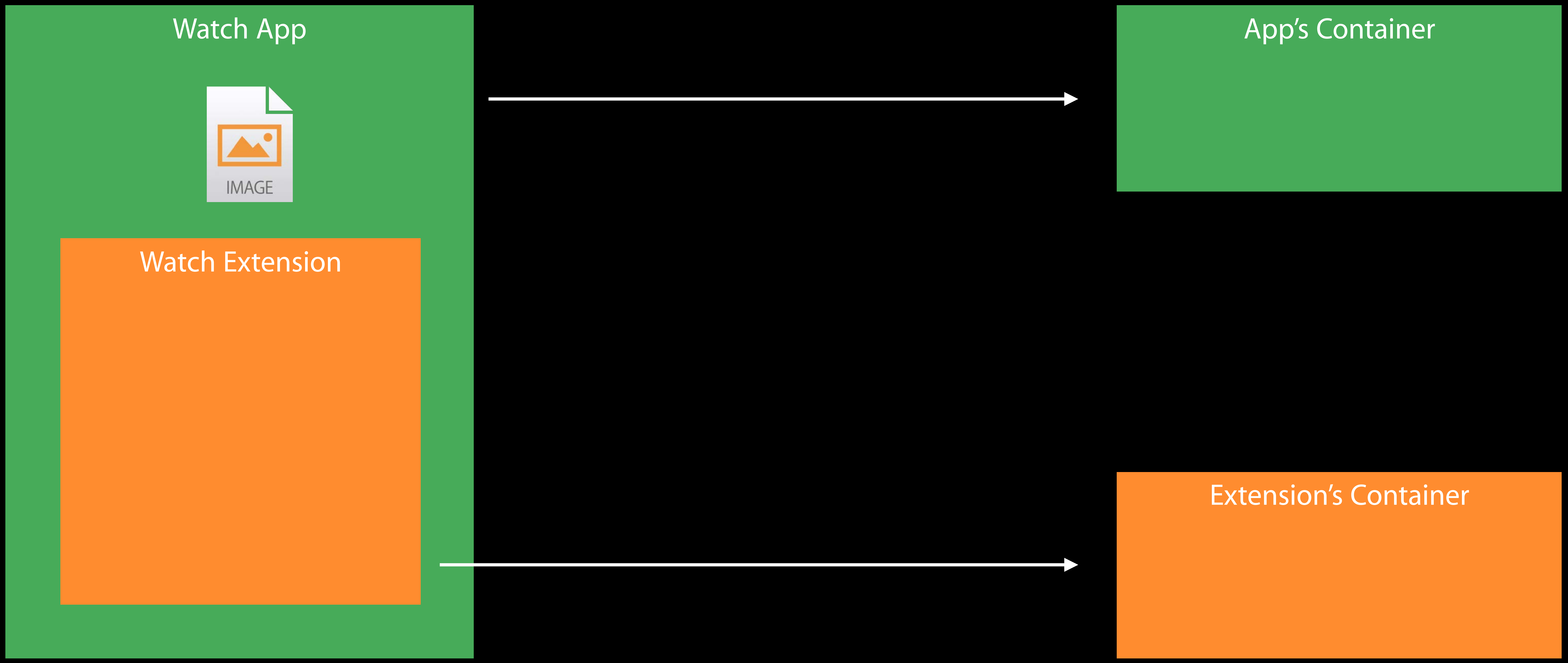
Media Playback

Resource locations



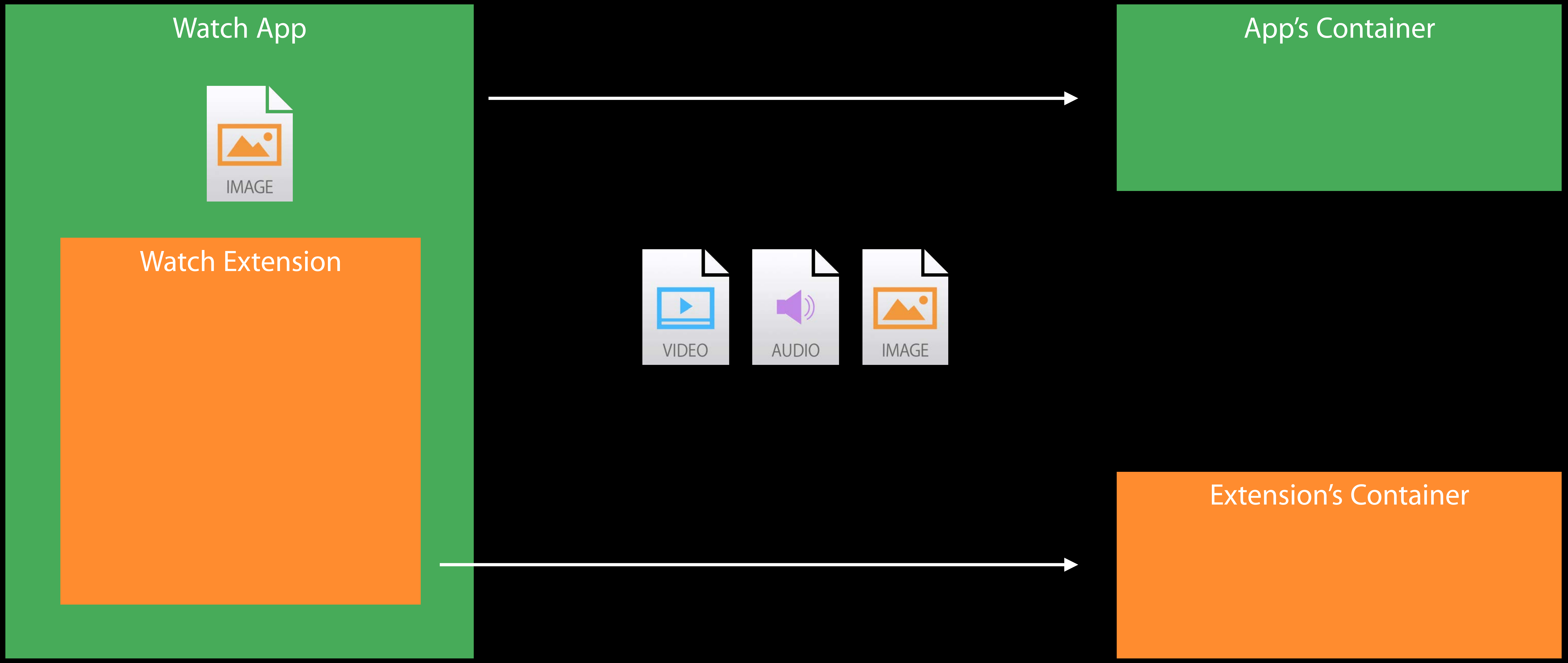
Media Playback

Resource locations



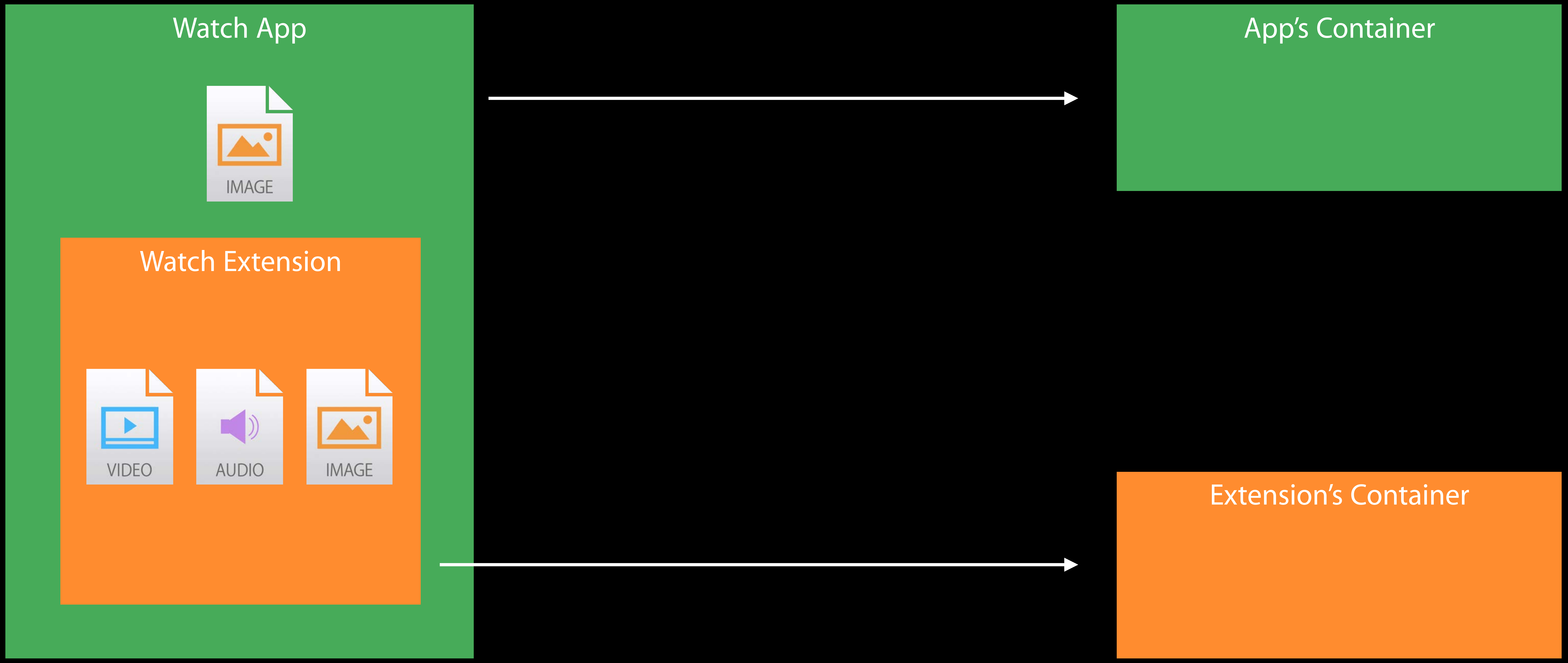
Media Playback

Resource locations



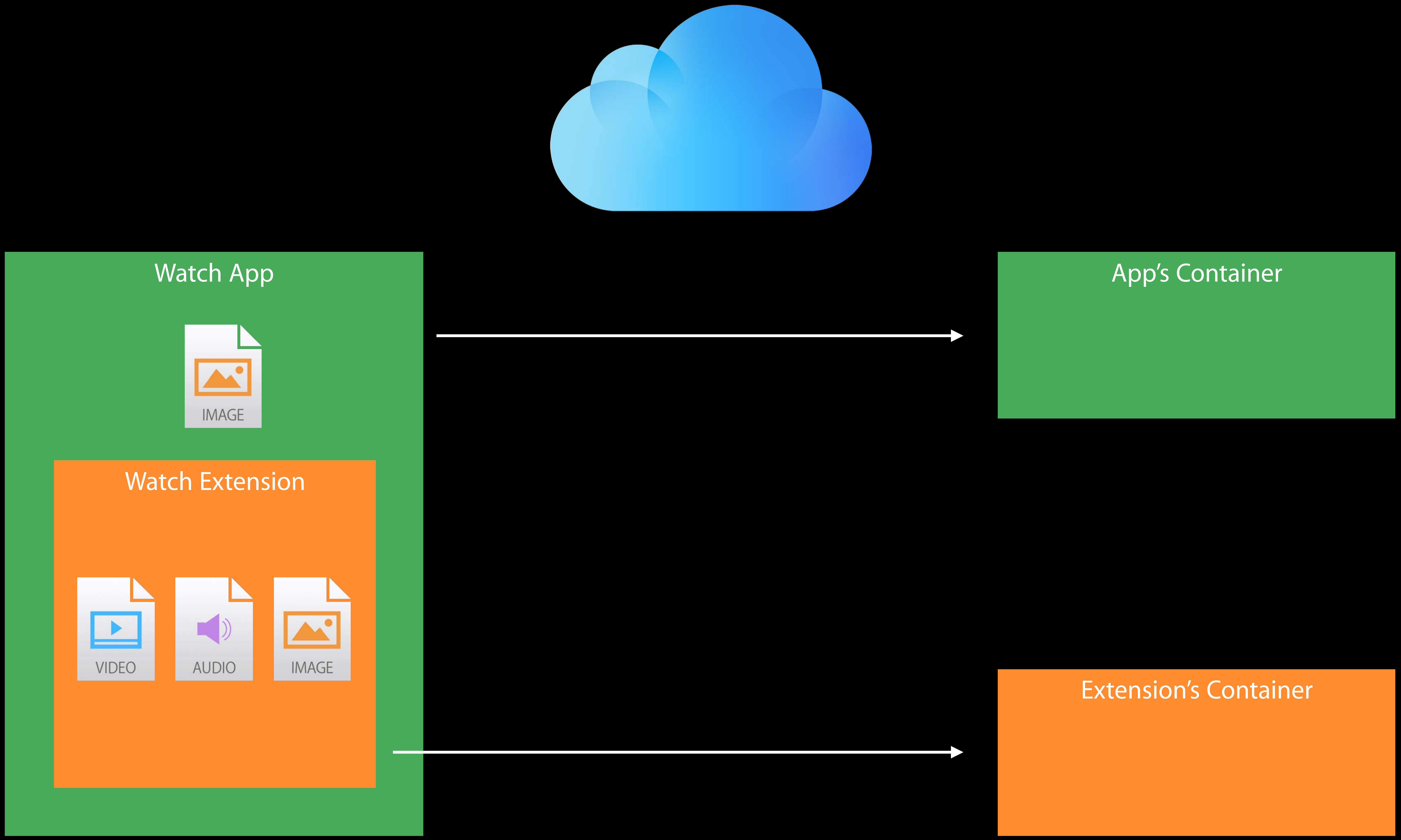
Media Playback

Resource locations



Media Playback

Resource locations



Media Playback

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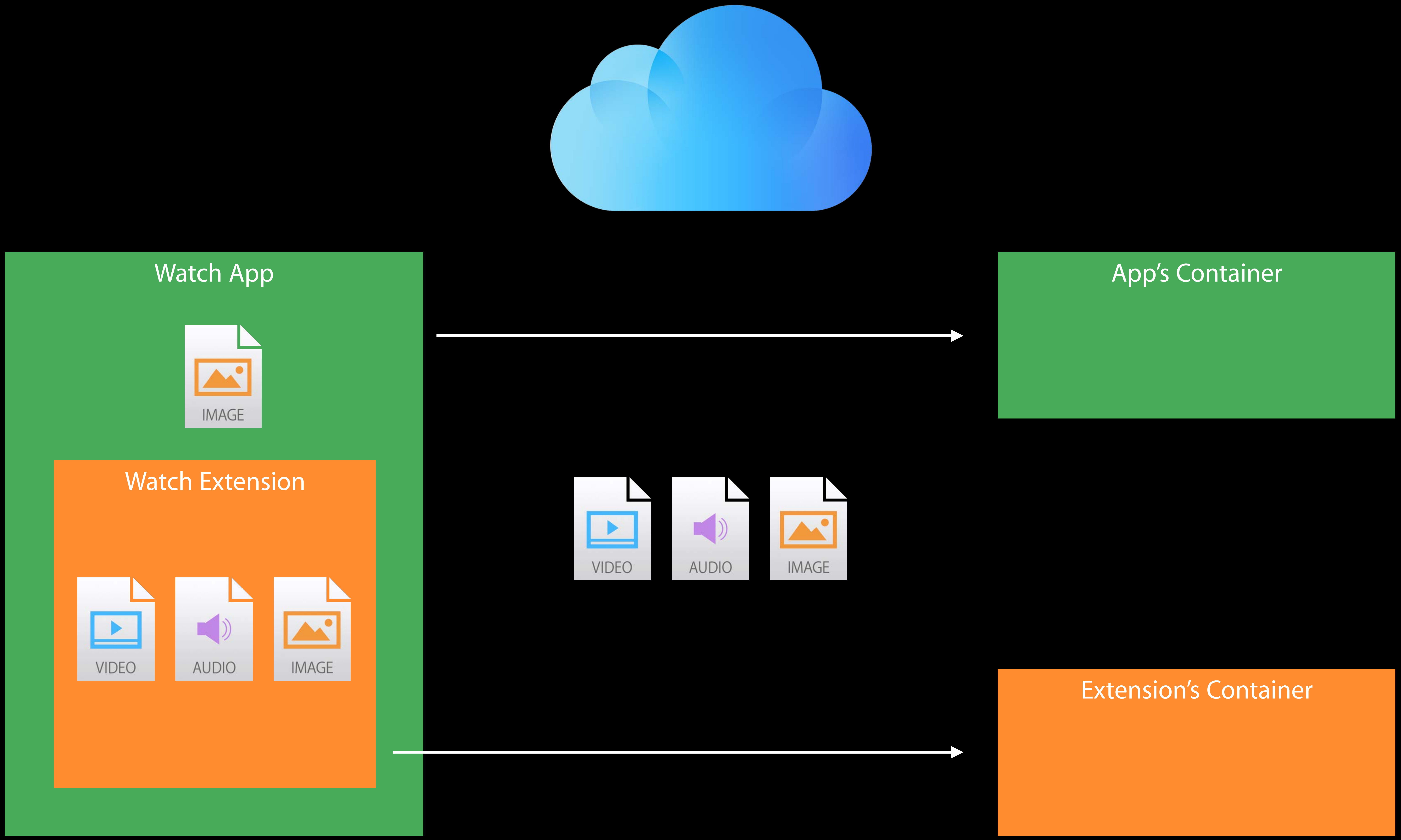

Media Playback

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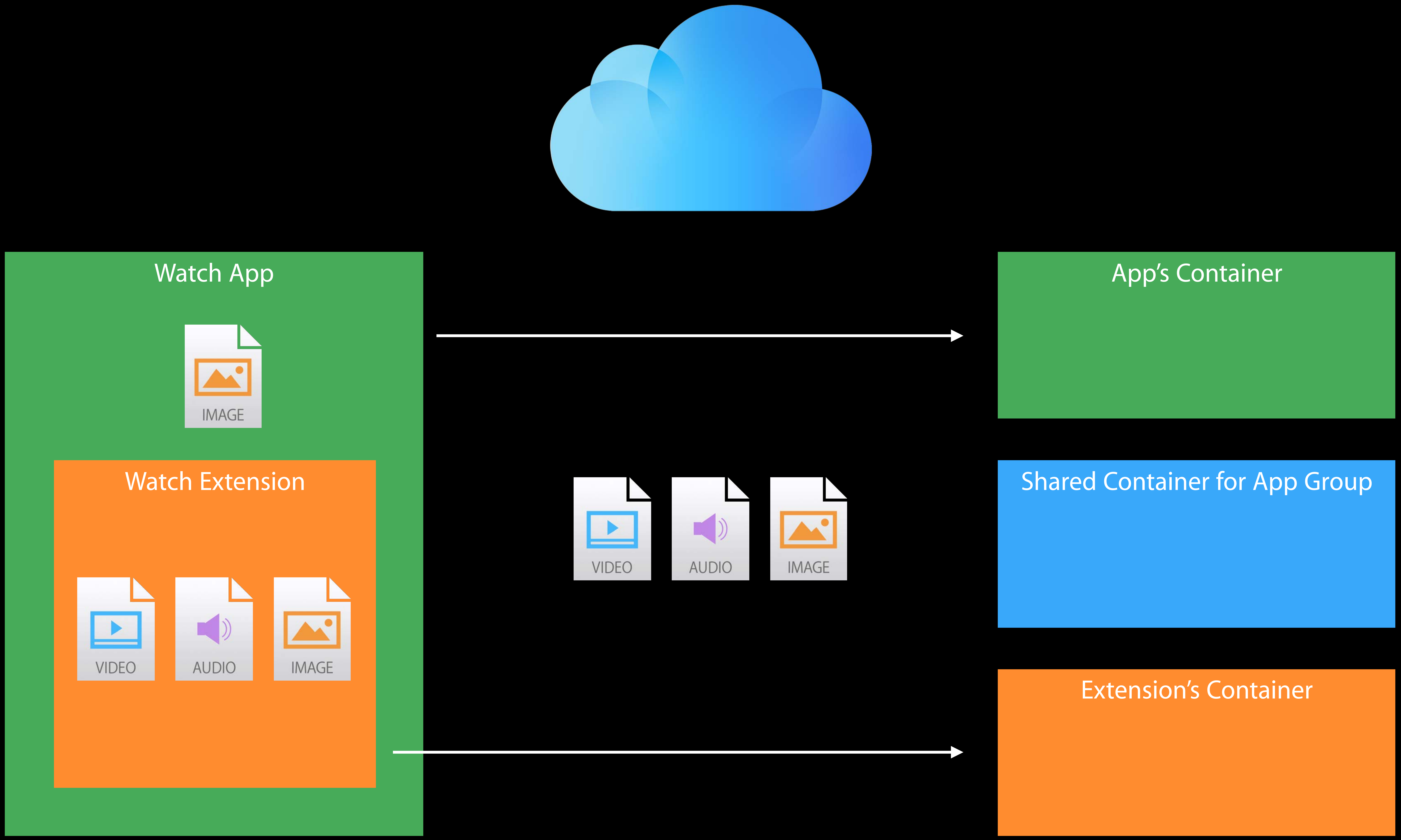
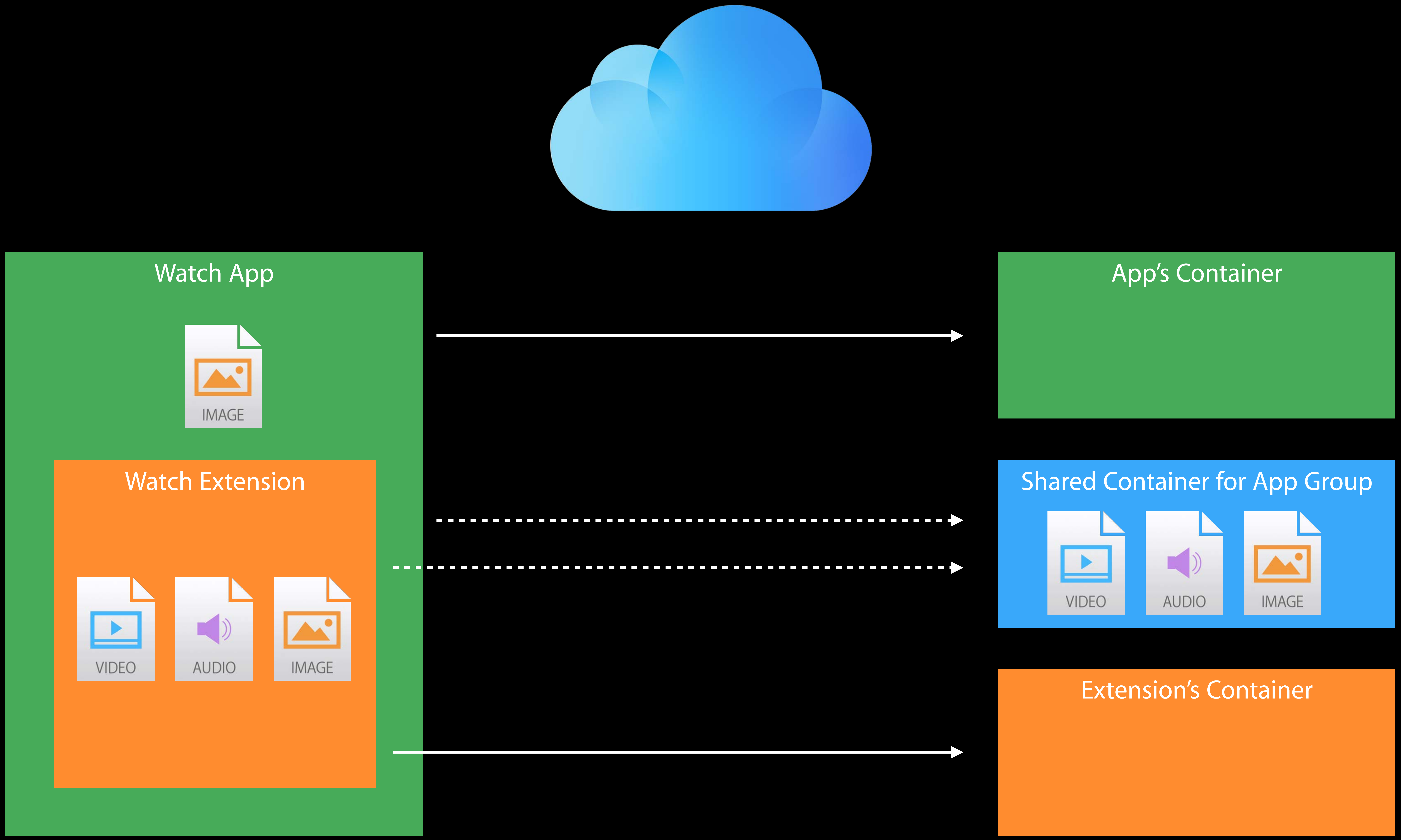


Media Playback

Resource locations



Media Playback

App groups

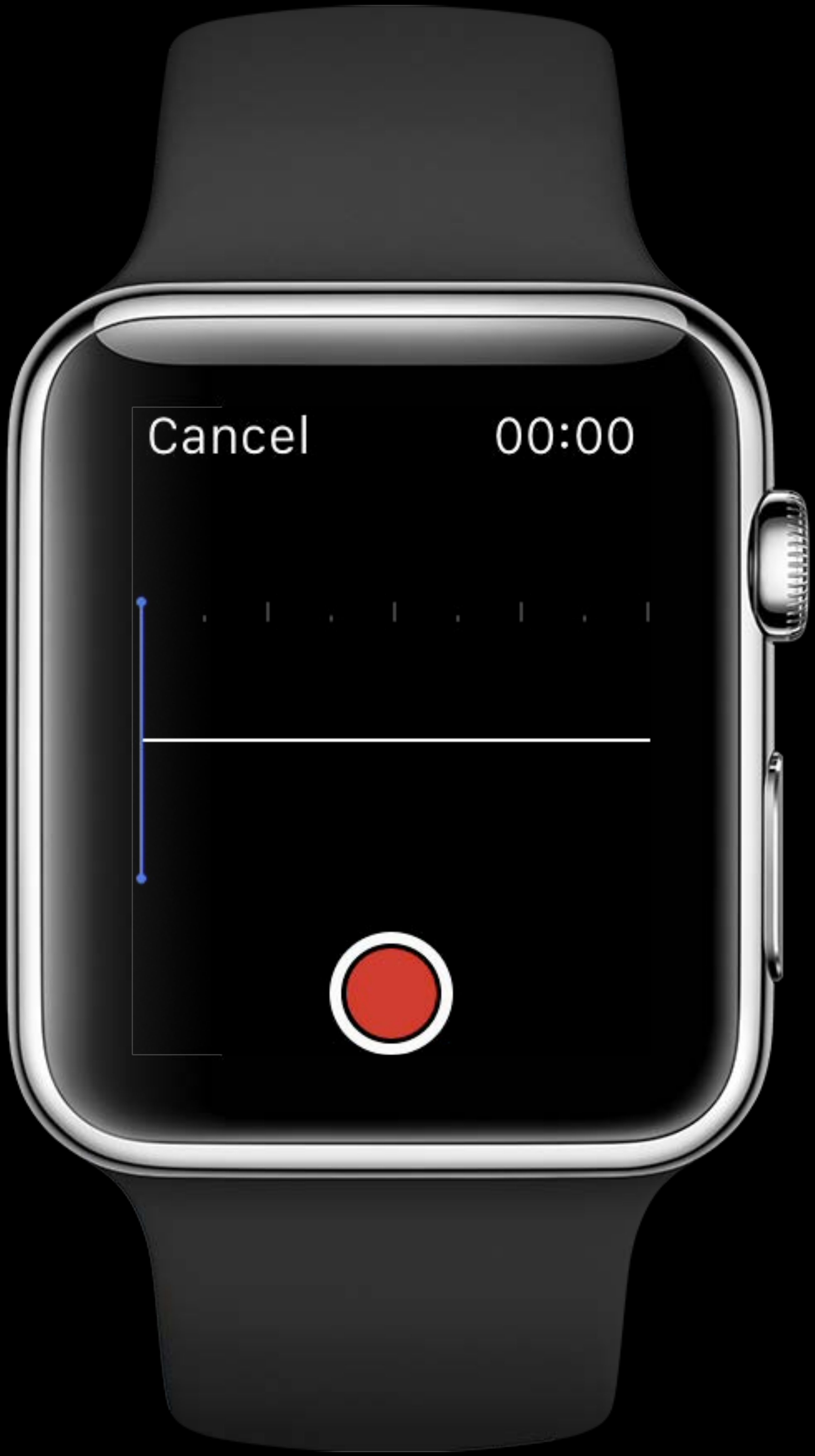
Sharing Data with Your Containing App

App Extension Programming Guide

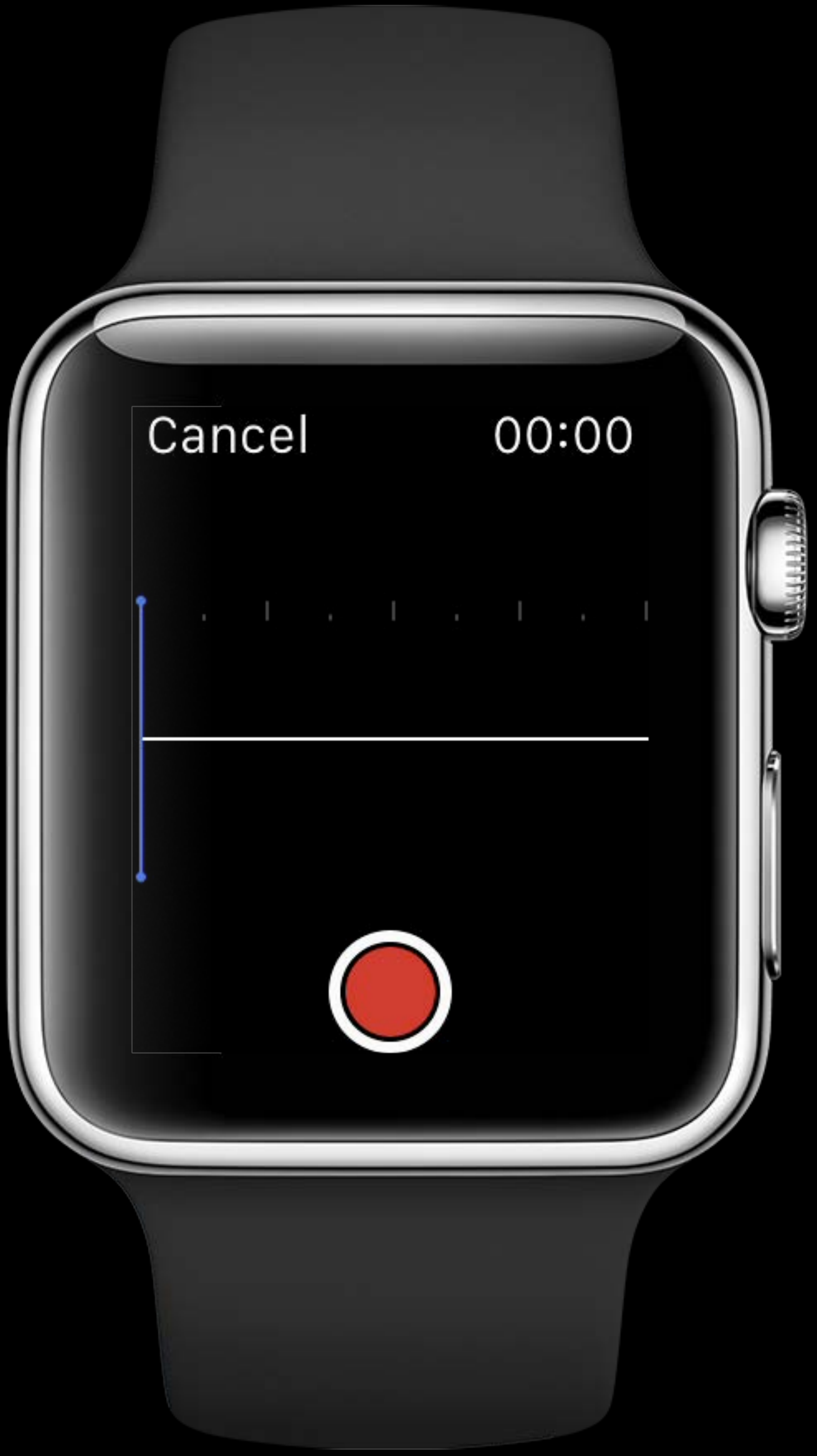
http://developer.apple.com/library/ios/documentation/General/Conceptual/ExtensibilityPG/ExtensionScenarios.html

Audio Recording

Audio Recording



Audio Recording



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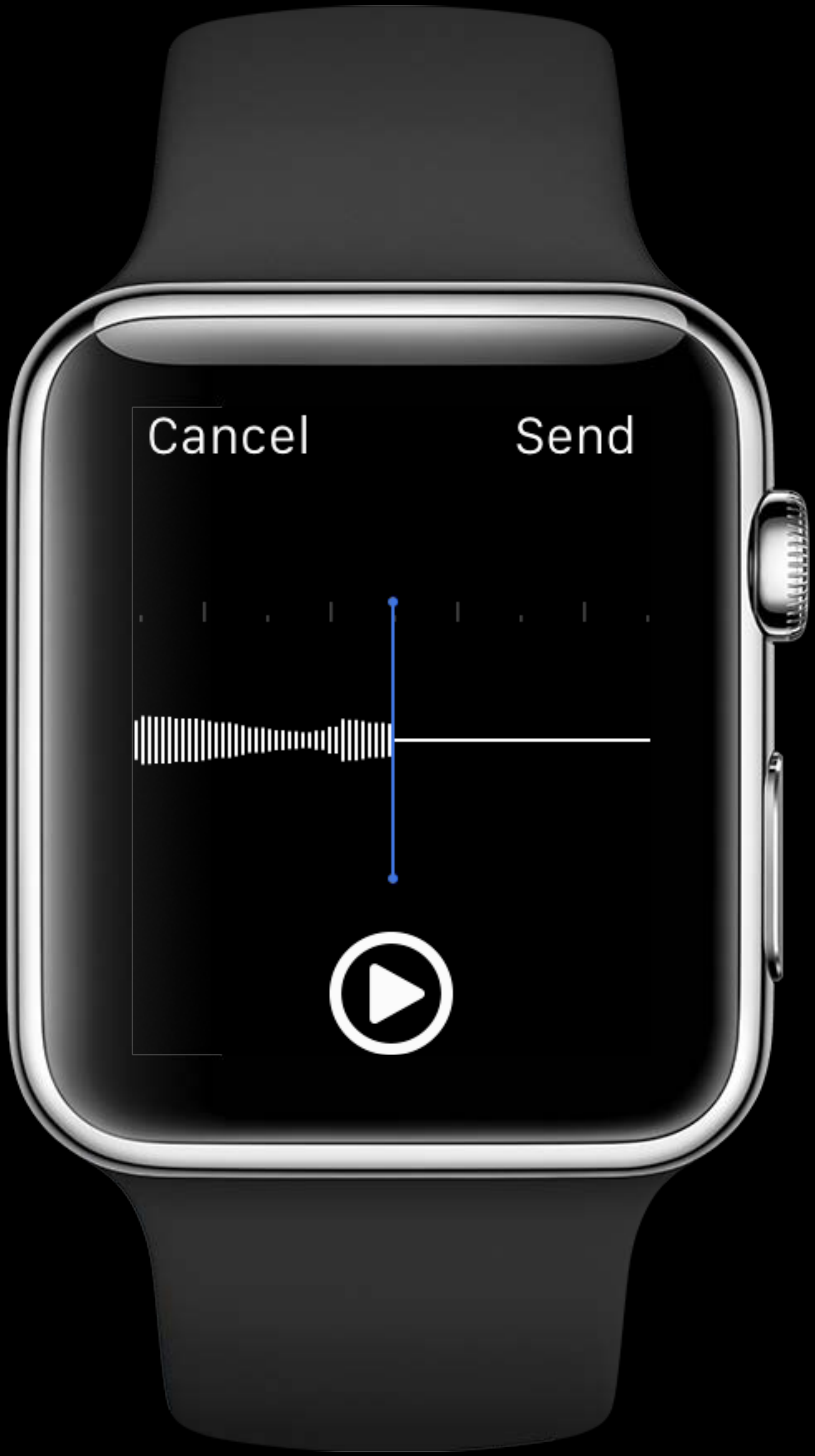
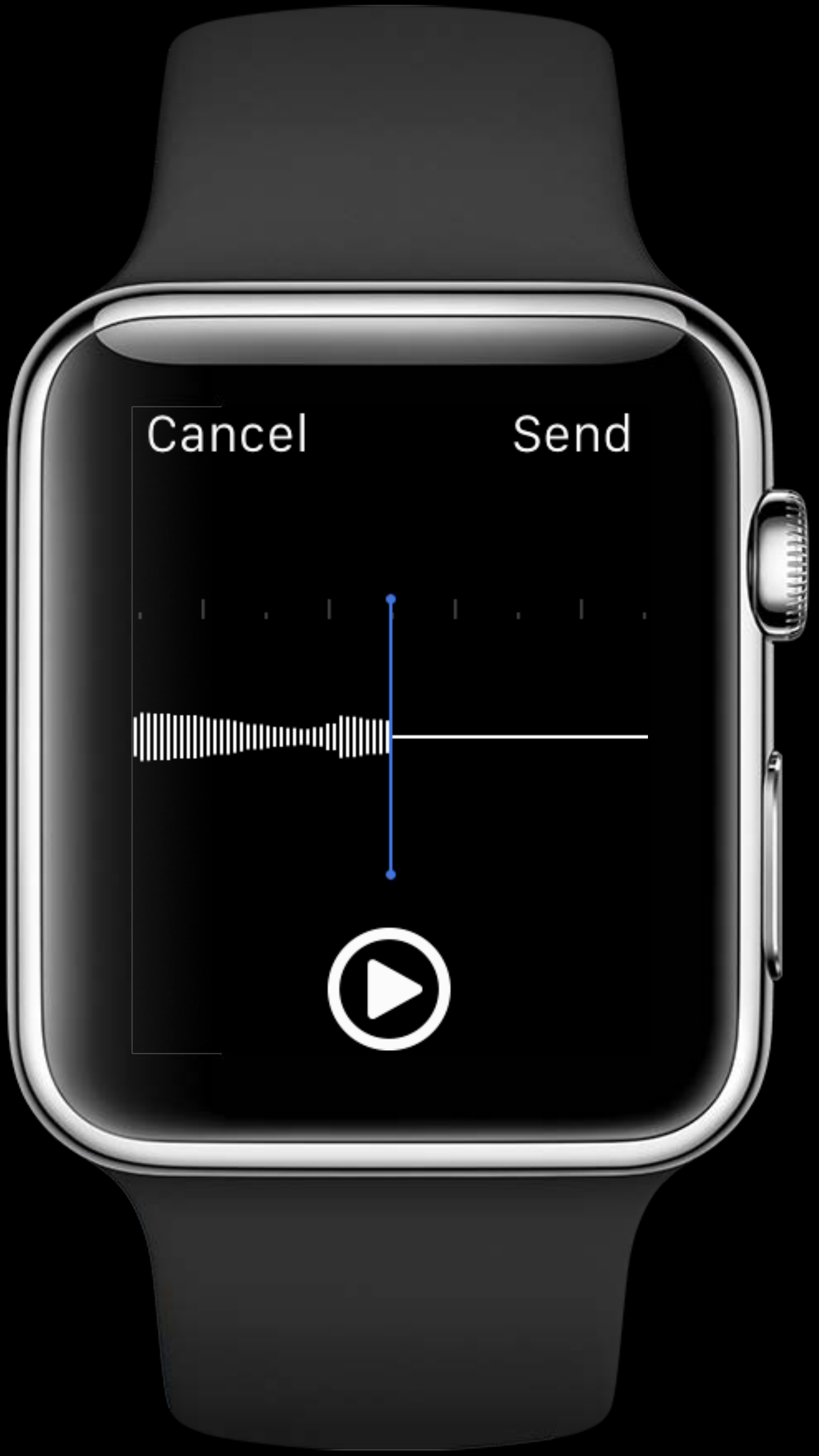


Audio Recording

```
presentAudioRecordingControllerWithOutputURL(url,
    preset: .NarrowBandSpeech,
    maximumDuration: 60.0,
    actionTitle:"Send") { didSave, error in
        /* check recording result */
}
```



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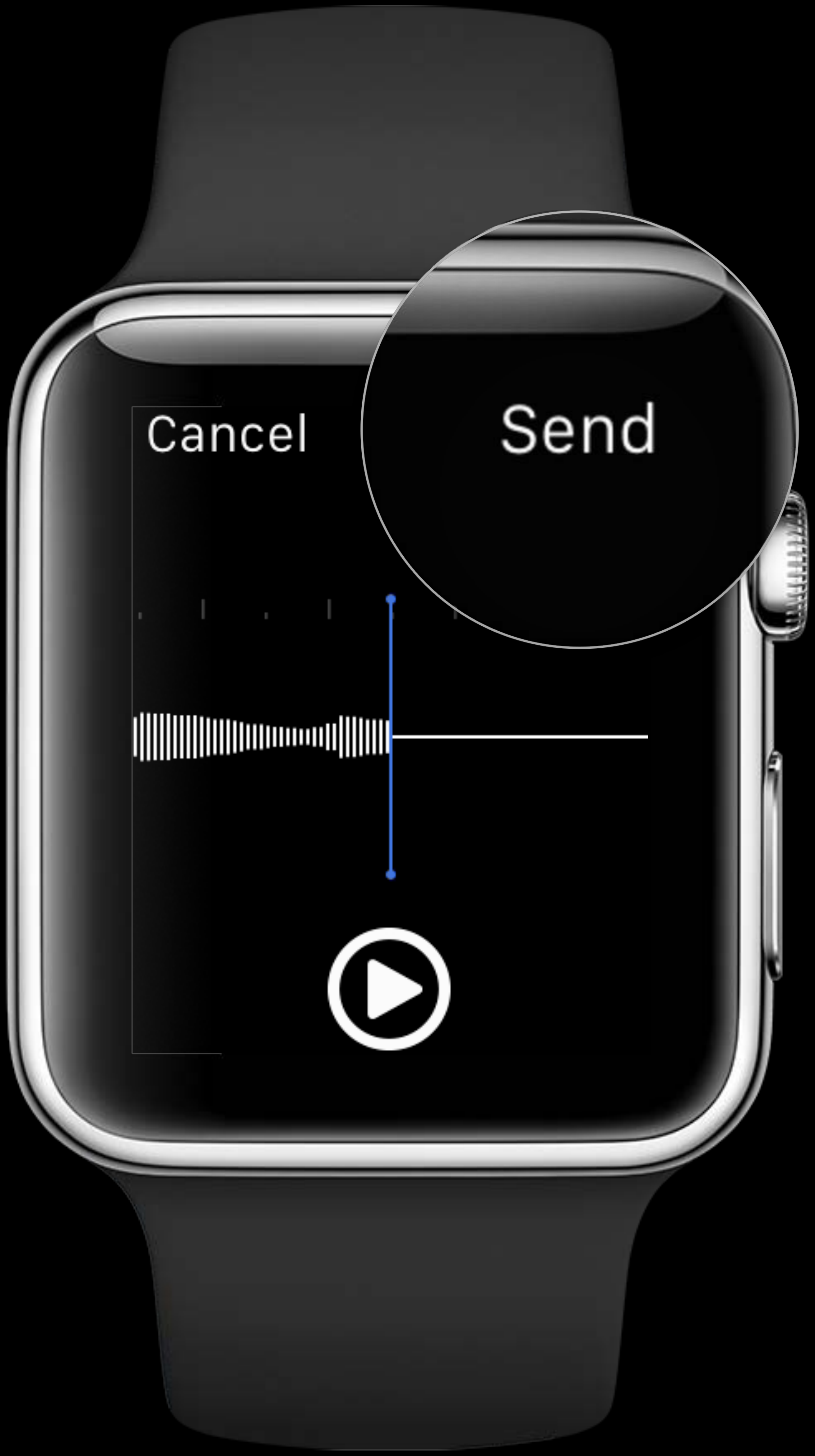
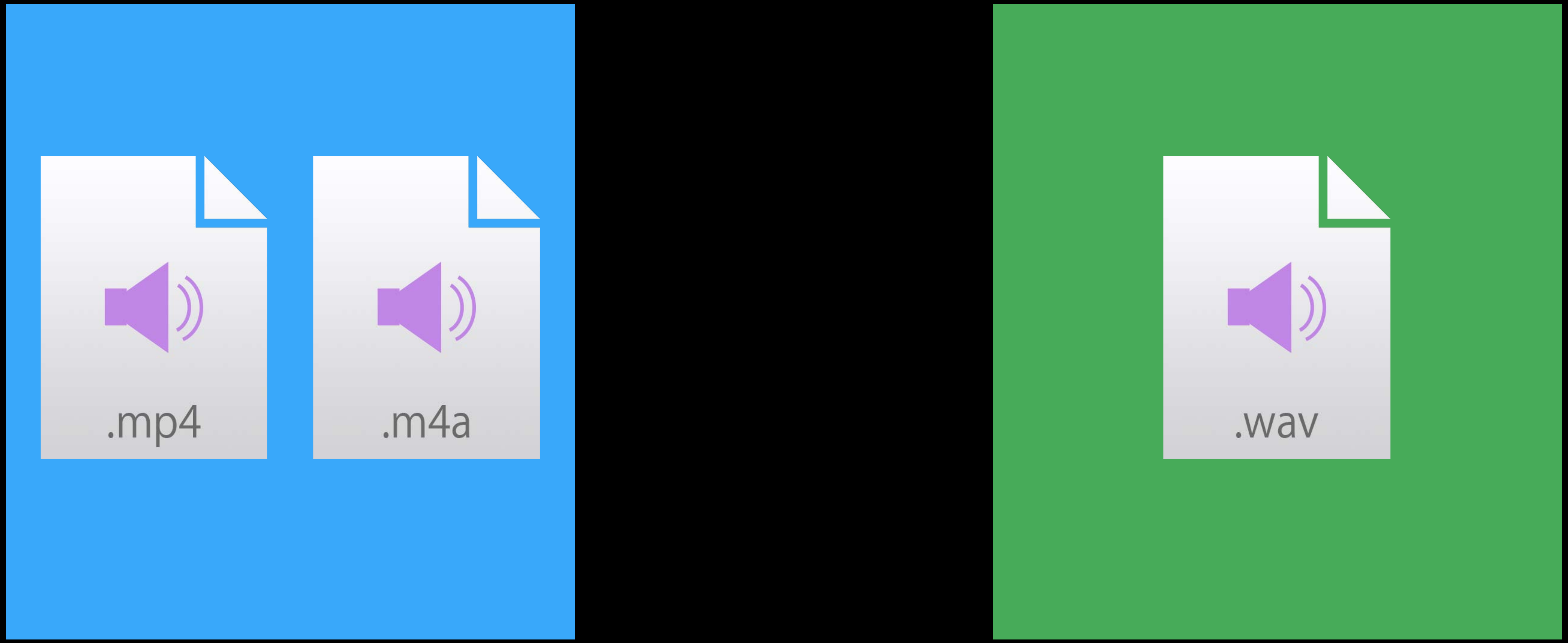


Audio Recording

Supported file types



.mp4

.m4a

.wav

AAC Codec

LPCM Codec

Audio Recording

Presets

Presets	Sample Rate	Bit Rate	
		AAC	LPCM
Narrow band speech	8 kHz	24 kbps	128 kbps
Wide band speech	16 kHz	32 kbps	256 kbps
High quality audio	44.1 kHz	96 kbps	705.6 kbps

Security

Security

Keychain

Security

Keychain

Locks/unlocks with Apple Watch

Security

Keychain

Locks/unlocks with Apple Watch

No iCloud Keychain

Security

Keychain example

```
let secret = "YouCanNeverGuess"
if let secretData = secret.dataUsingEncoding(NSUnicodeStringEncoding) {
   let attributes: [NSString: NSObject] = [
      kSecClass: kSecClassGenericPassword,
      kSecAttrAccessible: kSecAttrAccessibleWhenUnlocked
      kSecAttrService: "myservice",
      kSecAttrAccount: "account name",
      kSecValueData: secretData
   ]
   SecItemAdd(attributes, nil)
}
```

Summary

Digital Crown

Media playback

Audio recording

Security

More Information

Documentation

watchOS 2 Transition Guide

WatchKit Programming Guide

http://developer.apple.com/watchOS

Sample Code

Lister

WatchKitMoviePlayer

WatchKit Catalog

http://developer.apple.com/watchOS

Technical Support

Apple Developer Forums

Developer Technical Support

http://developer.apple.com/forums

General Inquiries

Jake Behrens, watchOS Frameworks Evangelist

behrens@apple.com

Related Sessions

Introducing WatchKit for watchOS 2	Presidio	Tuesday 10:00AM
Privacy and Your App	Pacific Heights	Tuesday 2:30PM
Building Watch Apps	Pacific Heights	Tuesday 4:30PM
Security and Your Apps	Mission	Tuesday 4:30PM
WatchKit In-Depth, Part 1	Pacific Heights	Wednesday 9:00AM
Introducing Watch Connectivity	Pacific Heights	Thursday 11:00AM
Designing for Apple Watch	Presidio	Wednesday 4:30PM

Related Sessions

Layout and Animation Techniques for WatchKit	Pacific Heights	Thursday 10:00AM
Networking with NSURLSession	Pacific Heights	Thursday 9:00AM
WatchKit Tips and Tricks	Presidio	Friday 10:00AM
Apple Watch Design Tips and Tricks	Presidio	Friday 3:30PM

Labs

AVKit and AV Foundation Lab	Graphics, Games, and Media Lab A	Wednesday 1:30PM
WatchKit Lab	Frameworks Lab D	Wednesday 3:30PM
AVKit and AV Foundation Lab	Graphics, Games, and Media Lab B	Thursday 11:00AM
Watch Connectivity Lab	Frameworks Lab B	Thursday 1:30PM
WatchKit and ClockKit Complications Lab	Frameworks Lab A	Friday 1:30PM
AVKit and AV Foundation Lab	Graphics, Games, and Media Lab B	Friday 1:30PM

WWDC15