WatchKit Tips and Tricks

Optimizing Watch apps

Session 228

Jake Behrens watchOS Frameworks Evangelist
Agenda
Agenda

Data and communication
Agenda

Data and communication

Interface elements
Agenda

Data and communication

Interface elements

Notifications
Agenda

Data and communication
Interface elements
Notifications
Glances
Data and Communication
Data and Communication

Networking
Data and Communication
Networking

https request
Data and Communication

Networking

https request

Ask for a background task assertion
Data and Communication

Networking

https request

- Ask for a background task assertion
- Hold background task assertion until request finishes
Data and Communication

Networking

https request

Default NSURLSession

Ask for a background task assertion

Hold background task assertion until request finishes
Data and Communication
Networking
Request a background task assertion

```swift
NSProcessInfo().performExpiringActivityWithReason("networkReq")
{
    expired in
    if !expired {
        // We have a background task assertion.
    } else {
        // No background task assertion was given or we’re out of time.
    }
}
```
Request a background task assertion

Executes block when called

- Block executes on an asynchronous queue

```swift
NSProcessInfo.processInfo().performExpiringActivityWithReason("networkReq")
{ expired in
    if !expired {
        // We have a background task assertion.
    } else {
        // No background task assertion was given or we’re out of time.
    }
}
Data and Communication
Networking
Data and Communication
Networking
dispatch_semaphore
Data and Communication

Networking

dispatch_semaphore

dispatch_semaphore_wait pauses execution

---

Queue to pause:
let time = dispatch_time(DISPATCH_TIME_NOW, Int64(30 * Double(NSEC_PER_SEC))))
dispatch_semaphore_wait(semaphore, time)
dispatch_semaphore

dispatch_semaphore_wait pauses execution

Signaling the semaphore resumes execution

Queue to pause:
let time = dispatch_time(DISPATCH_TIME_NOW, Int64(30 * Double(NSEC_PER_SEC))))

dispatch_semaphore_wait(semaphore, time)

Other Queue:
dispatch_semaphore_signal(semaphore)
Demo
Data and Communication
Across processes
Data and Communication
Across processes

openParentApplication(reply:)
Data and Communication

Across processes

openParentApplication(reply:)
application(handleWatchKitExtensionRequest:reply:)
Data and Communication

Across processes

openParentApplication(reply:)
application(handleWatchKitExtensionRequest:reply:)

• Begin a background task for asynchronous work
Data and Communication
Across processes

openParentApplication(reply:)
application(handleWatchKitExtensionRequest:reply:)
• Begin a background task for asynchronous work
• Turn custom objects into NSData for reply
Data and Communication

Device to device
Data and Communication
Device to device

openParentApplication(reply:) is unavailable in watchOS 2
Data and Communication

Device to device

openParentApplication(reply:) is unavailable in watchOS 2

Use WatchConnectivity in watchOS 2
Data and Communication
Device to device

openParentApplication(reply:) is unavailable in watchOS 2
Use WatchConnectivity in watchOS 2

Introducing Watch Connectivity
Pacific Heights    Thursday 11:00AM
Data and Communication

Shared data
Data and Communication

Shared data

Make use of app groups in existing watchOS apps
Data and Communication

Shared data

Make use of app groups in existing watchOS apps
Use NSUserDefaults for state data, not model data
Data and Communication

Shared data

Make use of app groups in existing watchOS apps
Use NSUserDefaults for state data, not model data
Think of simplifying your model for watchOS
FRIDAY 10:00 AM

WatchKit Tips and Tricks
10:00 - 10:40 AM – Presidio

Try and guess this one.
10:00 - 10:40 AM – Mission

Shhyyyy!
10:00 - 10:40 AM – Nob Hill

Surprise!
10:00 - 10:40 AM – Pacific Heights

To Be Announced
10:00 AM - 1:10 PM – Frameworks Lab E

To Be Announced
10:00 AM - 12:00 PM – Graphics, Games, and Me...

Game Controllers Lab
10:00 AM - 12:00 PM – Graphics, Games, and Me...

To Be Announced
9:00 - 10:40 AM – Frameworks Lab A

To Be Announced
Data and Communication

Handoff
Data and Communication

Handoff

updateUserActivity(userInfo:webpageURL:)
updateUserActivity(userInfo:webpageURL:)
System invalidates user activities automatically
Data and Communication

Handoff

`updateUserActivity(userInfo:webpageURL:)`

System invalidates user activities automatically

- You can manually invalidate user activities, if needed
Interface Elements
Interface Elements
Interface Elements

Prioritize content loading
Interface Elements

Prioritize content loading
Interface Elements

Prioritize content loading

- Use `dispatch_async()` in `willActivate()`
Interface Elements

Prioritize content loading

- Use `dispatch_async()` in `willActivate()`

Load fewer table cells up front
Interface Elements

Prioritize content loading

• Use `dispatch_async()` in `willActivate()`

Load fewer table cells up front

Update information that has changed
Interface Elements
Interface Elements

- Interface Controller Scene
  - Interface Controller
    - Group
      - Lbl Friday
    - Group
    - Group
    - Group
  - Main Entry Point
Interface Elements

- Label
- Switch
- Button

Monday

Group

- Layout: Horizontal
- Insets: Default
- Spacing: Default
- Background: No Image
- Mode: Scale To Fill
- Animate: No
- Color:
- Radius: 50

View

- Alpha: 1
- Hidden
- Installed

Position

- Horizontal: Center
- Vertical: Center

Size

- Width: Fixed
- Height: 100

- Interface Controller - Manages a screen’s interface objects.
- Glance Interface Controller - Manages the application’s glance interface.
- Notification Interface Controller
Interface Elements
Interface Elements
Interface Elements

Use properly sized assets from your server/app
Interface Elements

Use properly sized assets from your server/app

Optimize images using `setImageData()`
Interface Elements

Use properly sized assets from your server/app
Optimize images using `setImageData()`
Use asset catalogs
Interface Elements
Interface Elements

Apple Watch

- 2x
- 38 mm 2x
- 42 mm 2x
Interface Elements

Apple Watch
Interface Elements

2x

Apple Watch
Interface Elements

2x  38 mm 2x

Apple Watch
Interface Elements

Apple Watch

2x
38 mm 2x
42 mm 2x
Interface Elements
Interface Elements
Interface Elements
Interface Elements
Interface Elements

Multiple animated images means more processing and rendering
Interface Elements

Multiple animated images means more processing and rendering
Reduce size and FPS for animated images
Interface Elements

Multiple animated images means more processing and rendering
Reduce size and FPS for animated images
Run animated images in reverse

```
backgroundGroup.startAnimatingWithImagesInRange(NSRange(location: 0, length: 15), duration: -1, repeatCount: 0)
```
Interface Elements
Interface Elements

Animation API in watchOS 2
Interface Elements

Animation API in watchOS 2
• Similar to UIView animations
Interface Elements

Animation API in watchOS 2

- Similar to UIView animations
- Animate height, width, alpha, insets, and more
Interface Elements

Animation API in watchOS 2
• Similar to UIView animations
• Animate height, width, alpha, insets, and more

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<thead>
<tr>
<th>Layout and Animation Techniques for WatchKit</th>
<th>Pacific Heights</th>
<th>Thursday 10:00AM</th>
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<tr>
<td>Apple Watch Design Tips and Tricks</td>
<td>Presidio</td>
<td>Friday 3:30PM</td>
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</table>
Interface Elements

Cancel

What's up?

I'm on my way.

OK
Interface Elements
Interface Elements

Take users directly to voice dictation

```swift
presentTextInputControllerWithSuggestions(nil, allowedInputMode: .Plain,
completion: { result in
    // Work with result
})
```
Notifications
Notifications

{
    "aps": {
        "alert": {
            "body": "This shows in the notification."
            "title": "Short-Look Title"
        },
        "category": "mainCategory",
        "sound": "default"
    }
}
Notifications

{
  "aps": {
    "alert": {
      "body": "This shows in the notification.",
      "title": "Short-Look Title"
    },
    "category": "mainCategory",
    "sound": "default"
  }
}

Notifications

```json
{
    "aps": {
        "alert": {
            "body": "This shows in the notification.\n",  
            "title": "Short-Look Title"
        },
        "category": "mainCategory",
        "sound": "default"
    }
}
```
Notifications
Notifications
Notifications

```json
{
    "aps": {
        "alert": {
            "body": "This shows in the notification."
        },
        "category": "mainCategory",
        "sound": "default"
    }
}
```
Notifications

{ "aps": { "alert": { "body": "This shows in the notification.", "title": "Short-Look Title" }, "category": "myCategory", "sound": "default" } }

WWDC Scene
- SessionsController Scene
- SessionDetailController Scene
- Glance Interface Controller Scene
- Static Notification Interface Controller
  - → mainCategory

Glance Interface

Alert Label
- mainCategory
- Dismiss

Notification Category
- Name: mainCategory
- Description: Has Notifications
- Sash Color
- Wants Sash Blur
- Title Color
- Has Dynamic Interface

Interface Controller - Manages a screen’s interface objects.
Glance Interface Controller - Manages the application’s glance interface.
Notification Interface Controller
Notifications

```json
"aps": {
  "alert": {
    "body": "This shows in the notification."
  },
  "category": "myCategory",
  "sound": "default"
}
```
Notifications

{
    "aps": {
        "alert": {
            "body": "This shows in the notification.",
            "title": "Short-Look Title"
        },
        "category": "mainCategory",
        "sound": "default"
    }
}
Notifications

```swift
let notification = UILocalNotification()
notification.fireDate = futureNotificationFireDate
notification.alertBody = "This shows in the notification."
notification.alertTitle = "Short-Look Title"
notification.category = "mainCategory"
notification.soundName = UILocalNotificationDefaultSoundName
```
Notifications
Notifications
Glances
Glances

It's a heartbeat away.

June 8th, 10:00 AM

Keynote

Presidio

Updated May 31, 2015
Glances

WWDC
It’s a heartbeat away.
June 8th, 10:00 AM
Keynote
Presidio

Updated May 31, 2015
Glances

Now
Good morning.

Starting Soon
WatchKit Tips and Tricks
Presidio
Glances

WWDC
It's a heartbeat away.

June 8th, 10:00 AM
Keynote
Presidio

Updated May 31, 2015
Glances

WWDC
It’s a heartbeat away.

June 8th, 10:00 AM
Keynote
Presidio

Updated May 31, 2015
Glances

Now
Good morning.

Starting Soon
WatchKit Tips and Tricks
Presidio
Glances

Good morning.

Starting Soon
- WatchKit Tips and Tricks
- Presidio
Glances

willActivate()
Glances

willActivate()

• Do full setup before `willActivate()` finishes
Glances

willActivate()

- Do full setup before `willActivate()` finishes

Reload deliberately
Glances

willActivate()

- Do full setup before `willActivate()` finishes

Reload deliberately

Limit number of alternate layouts
Glances

willActivate()

- Do full setup before `willActivate()` finishes

Reload deliberately

Limit number of alternate layouts

Use WKInterfaceDate or absolute times/dates
Glances
Glances

Good morning.

Started 35 mins ago
WatchKit Tips and Tricks
Presidio

Updated June 12, 2015
Good morning.

Started at 10:00

WatchKit Tips and Tricks

Presidio

Updated June 12, 2015
Summary

Optimize networking with NSURLSession
Summary

Optimize networking with NSURLSession
Improve layouts for performance
Summary

Optimize networking with NSURLSession
Improve layouts for performance
Ensure Glance always has content visible
Summary

Optimize networking with NSURLSession
Improve layouts for performance
Ensure Glance always has content visible
Become familiar with watchOS 2
More Information

Documentation and Videos
- watchOS 2 Transition Guide
- WatchKit Programming Guide
  http://developer.apple.com/watchOS

Sample Code
- Lister
- WatchKit Catalog
  http://developer.apple.com/watchOS

Technical Support
- Apple Developer Forums
  http://developer.apple.com/forums
- Developer Technical Support
  http://developer.apple.com/support/technical

General Inquiries
- Jake Behrens, watchOS Frameworks Evangelist
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# Related Sessions

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Lab

WatchKit and ClockKit Complications Lab  Frameworks Lab A  Friday 1:30PM