

What's New in Core Location

Simplify

Session 714

Adam Driscoll Apple

Core Location

Core Location

- Authorization

Core Location

- Authorization
- Location updates

Core Location

- Authorization
- Location updates
- Indoor updates

Core Location

- Authorization
- Location updates
- Indoor updates
- Region monitoring

Core Location

- Authorization
- Location updates
- Indoor updates
- Region monitoring
- Visit monitoring

Core Location

- Authorization
- Location updates
- Indoor updates
- Region monitoring
- Visit monitoring
- Significant location change monitoring/Geocoding/etc.

Core Location

- Authorization
- Location updates
- Indoor updates
- Region monitoring
- Visit monitoring
- Significant location change monitoring

Background location

Single location

Authorization

Apple Watch: Best practices

Background Location Updates

No background!

Background Location Updates

Recap

Background Modes

Background Location Updates

Recap

Background Modes

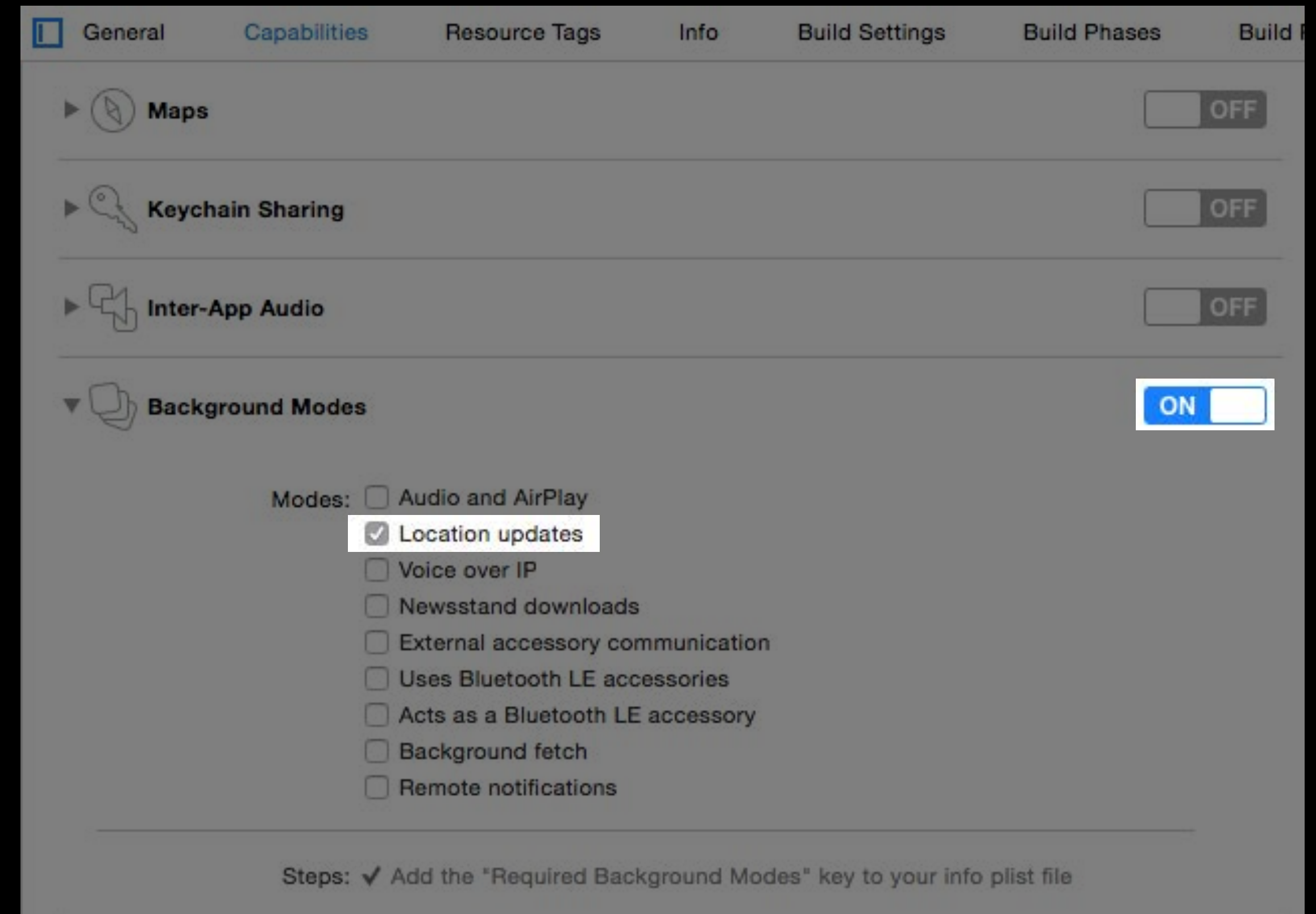
- Default: foreground only

Background Location Updates

Recap

Background Modes

- Default: foreground only

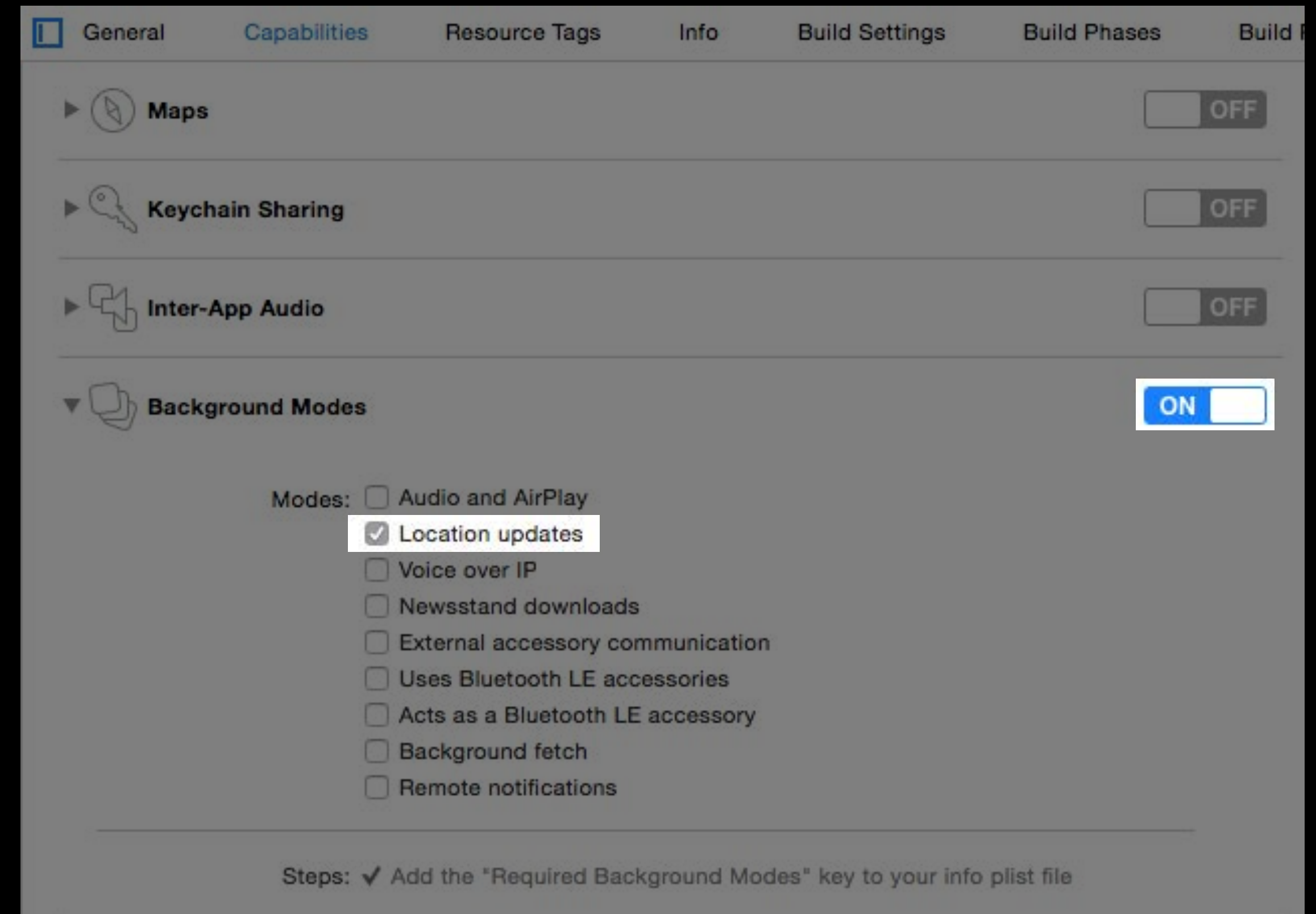


Background Location Updates

Recap

Background Modes

- Default: foreground only
- Info.plist
 - UIBackgroundModes



Background Location Updates

How it works:



Background Location Updates

How it works:

- Start



Background Location Updates

How it works:

- Start
- Continue



Background Location Updates

How it works:

- Start
- Continue
- Stop



Background Location Updates

How it works:

- Start
- Continue
- Stop



Room for Improvement?

Simplify



Room for Improvement?

Simplify

- Lower stakes



Room for Improvement?

Simplify

- Lower stakes
- Looser coupling



Room for Improvement?

Simplify

- Lower stakes
- Looser coupling



Background: When You Want It

Background: When You Want It

`allowsBackgroundLocationUpdates`

Background: When You Want It

`allowsBackgroundLocationUpdates`

- Per `CLLocationManager`

Background: When You Want It

`allowsBackgroundLocationUpdates`

- Per CLLocationManager
- Activates Info.plist election

Background: When You Want It

`allowsBackgroundLocationUpdates`

- Per CLLocationManager
- Activates Info.plist election
- Default value:

Background: When You Want It

`allowsBackgroundLocationUpdates`

- Per CLLocationManager
- Activates Info.plist election
- Default value:

NO

Background: When You Want It

Compatibility

`allowsBackgroundLocationUpdates`

Background: When You Want It

Compatibility

`allowsBackgroundLocationUpdates`

- Grandfathered

Background: When You Want It

Compatibility

`allowsBackgroundLocationUpdates`

- Grandfathered
- Deploy with `-respondsToSelector:`

Background: When You Want It

Compatibility

`allowsBackgroundLocationUpdates`

- Grandfathered
- Deploy with `-respondsToSelector:`

```
let locationManager = CLLocationManager()  
if #available(iOS 9.0, *) {  
    locationManager.allowsBackgroundLocationUpdates = true  
}
```

Sidebar

Audible Cues?

What's New in Core Audio

Nob Hill

Wednesday 4:30PM

Sidebar

Audible Cues?

`AVAudioSessionCategoryOptionInterruptSpokenAudioAndMixWithOthers`

What's New in Core Audio

Nob Hill

Wednesday 4:30PM

Single Location

–requestLocation

Single Location

–requestLocation

Automatically

Single Location

–requestLocation

Automatically

- Starts

Single Location

–requestLocation

Automatically

- Starts
- Thresholds

Single Location

–requestLocation

Automatically

- Starts
- Thresholds
- Calls delegate once

Single Location

–requestLocation

Automatically

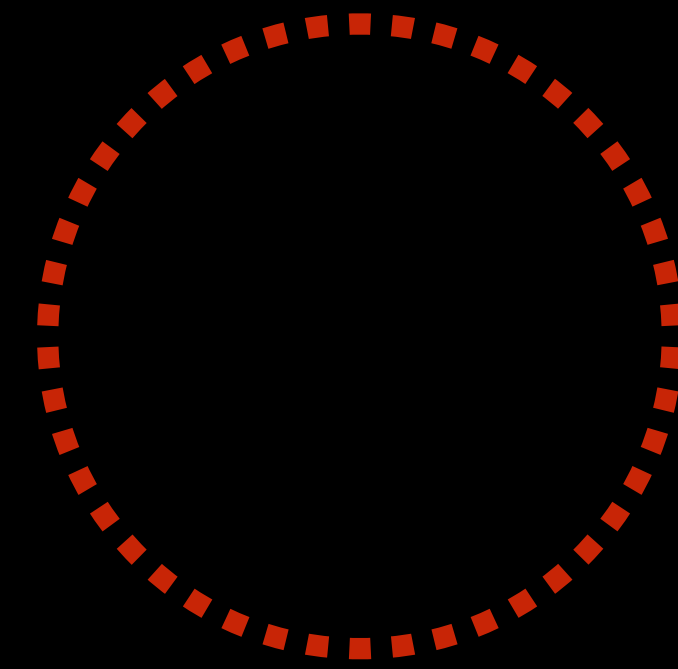
- Starts
- Thresholds
- Calls delegate once
- Stops

Single Location

–requestLocation

Automatically

- Starts
- Thresholds
- Calls delegate once
- Stops

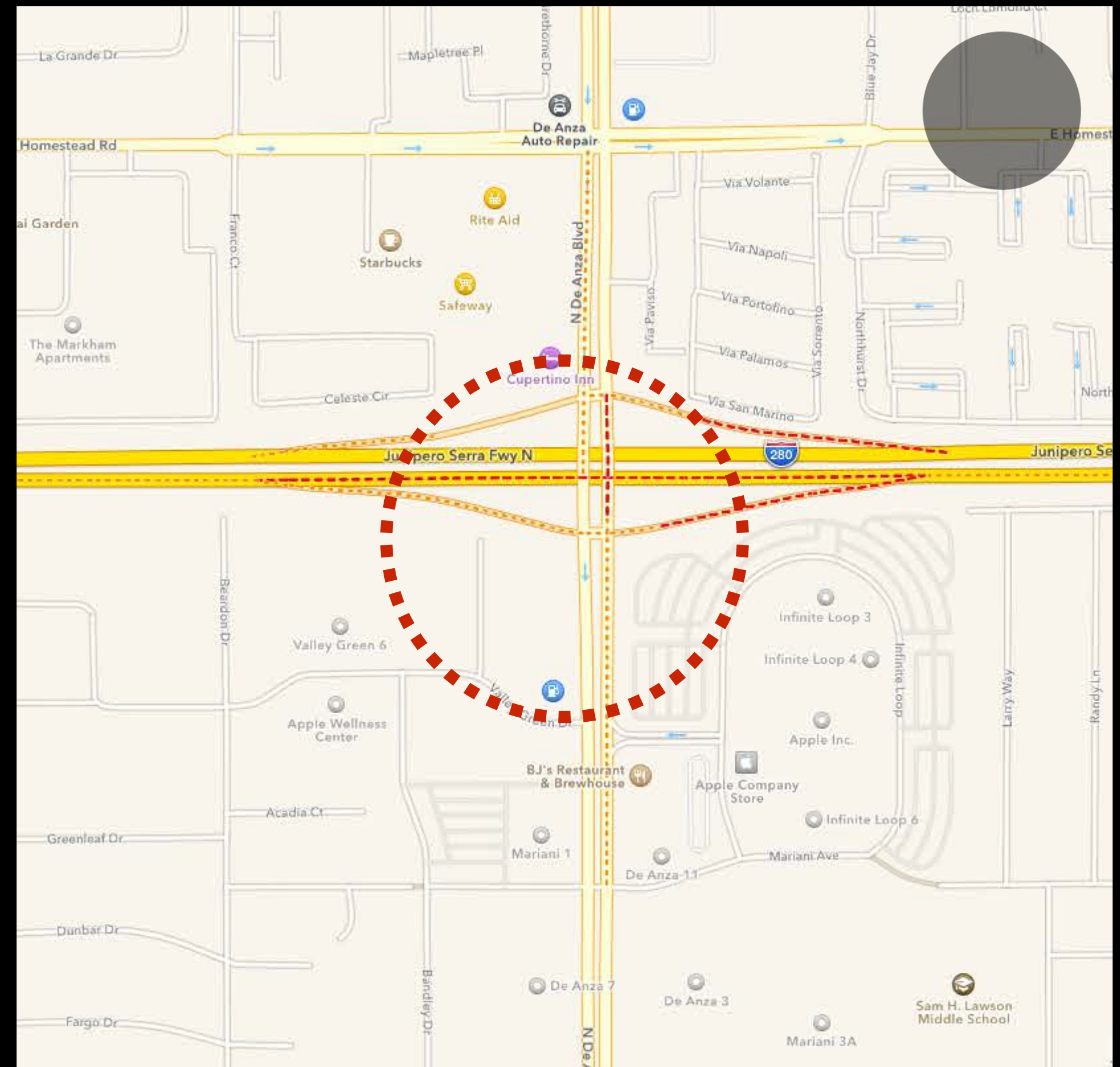


Single Location

–requestLocation

Automatically

- Starts
- Thresholds
- Calls delegate once
- Stops

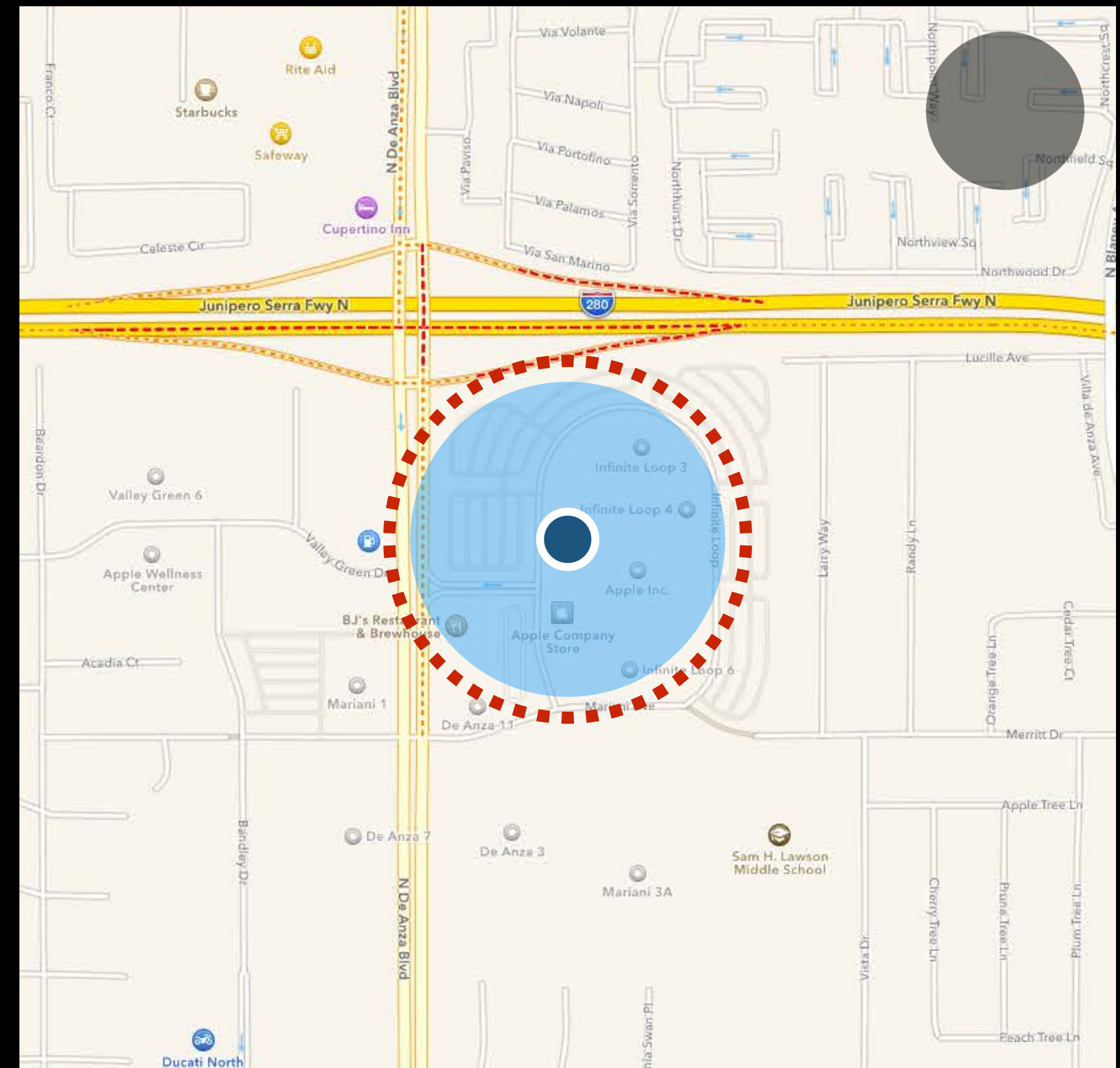


Single Location

–requestLocation

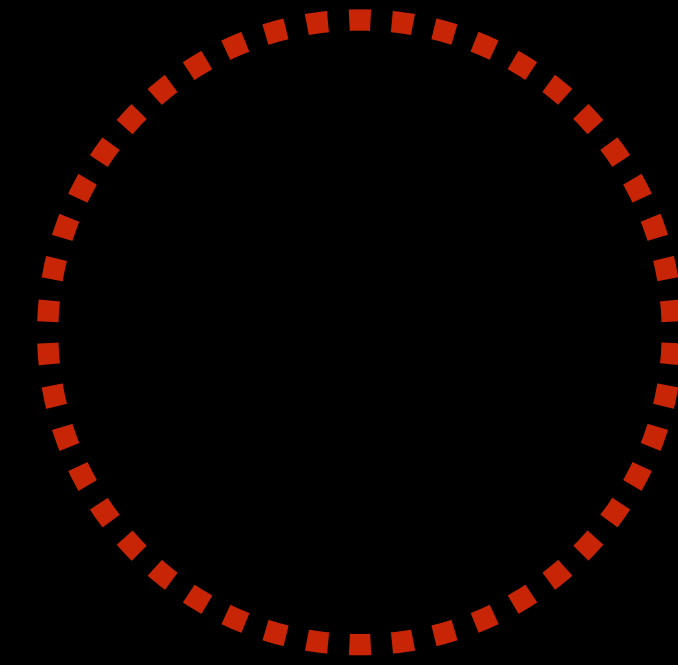
Automatically

- Starts
- Thresholds
- Calls delegate once
- Stops



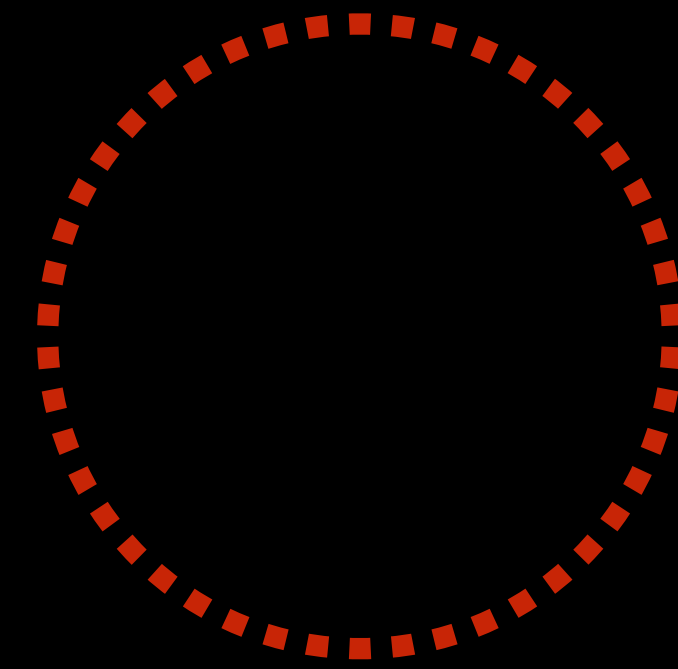
Single Location

–requestLocation



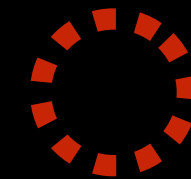
Single Location

- requestLocation
- desiredAccuracy



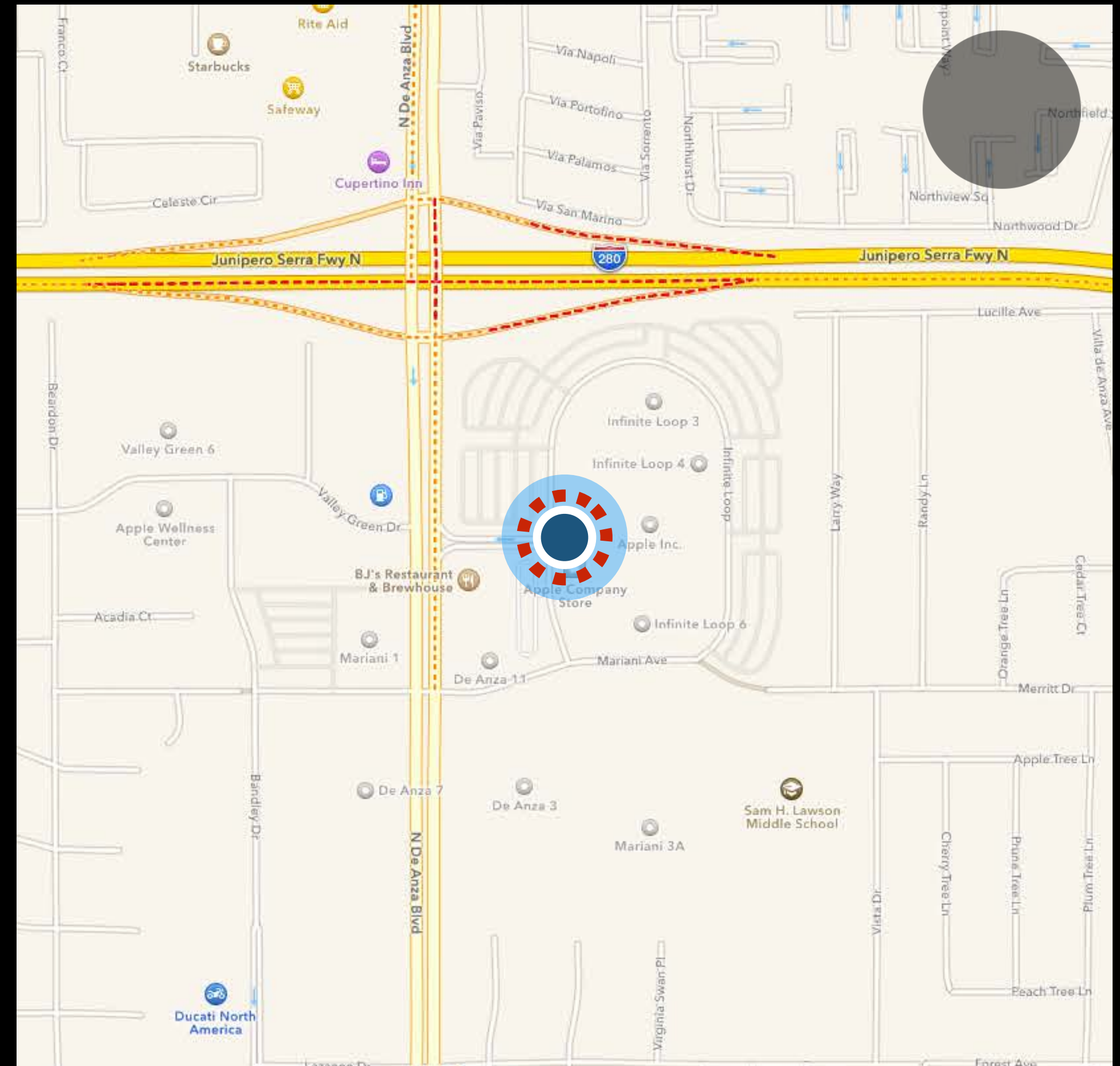
Single Location

- requestLocation
- desiredAccuracy



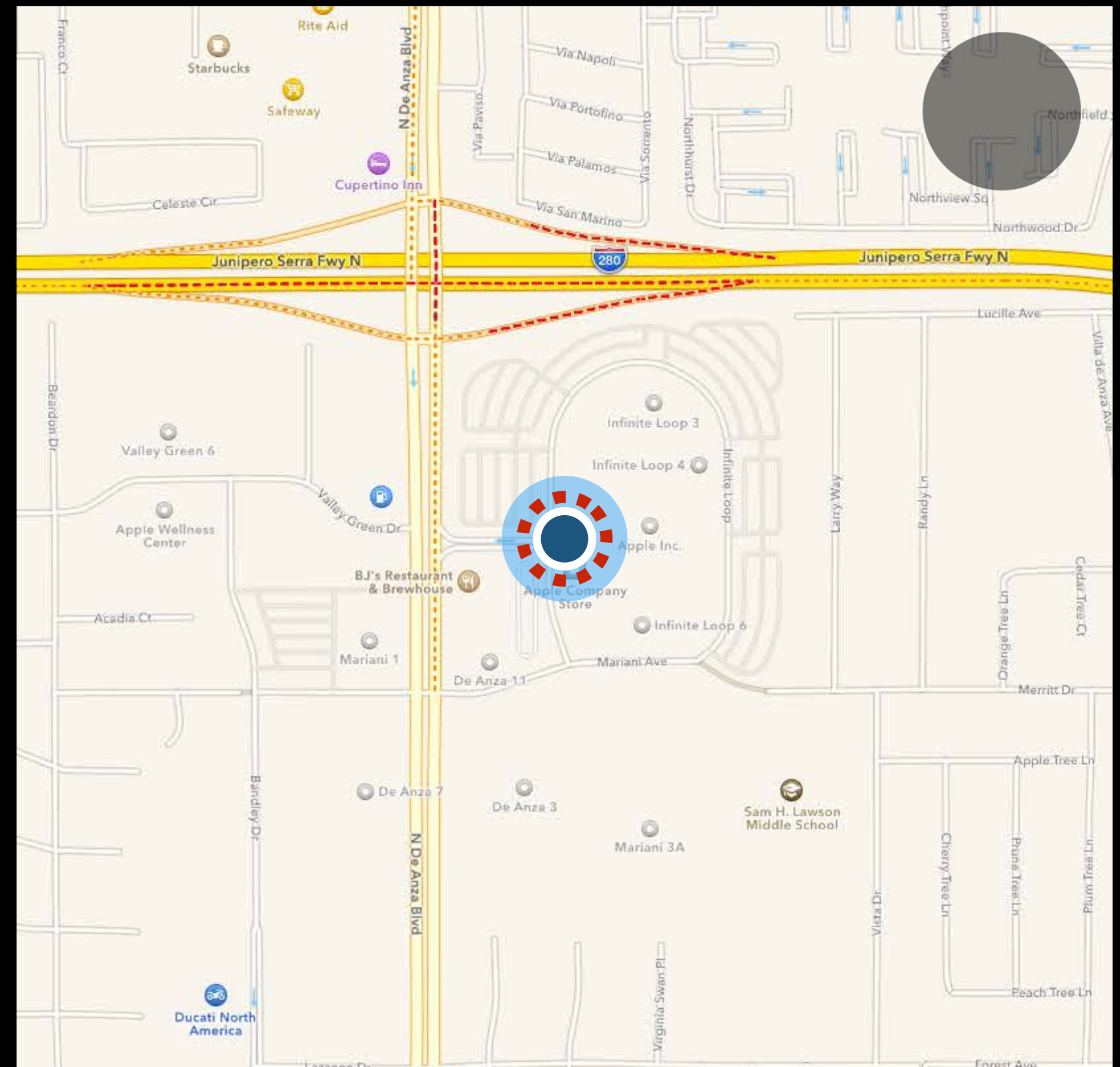
Single Location

- requestLocation
 - desiredAccuracy



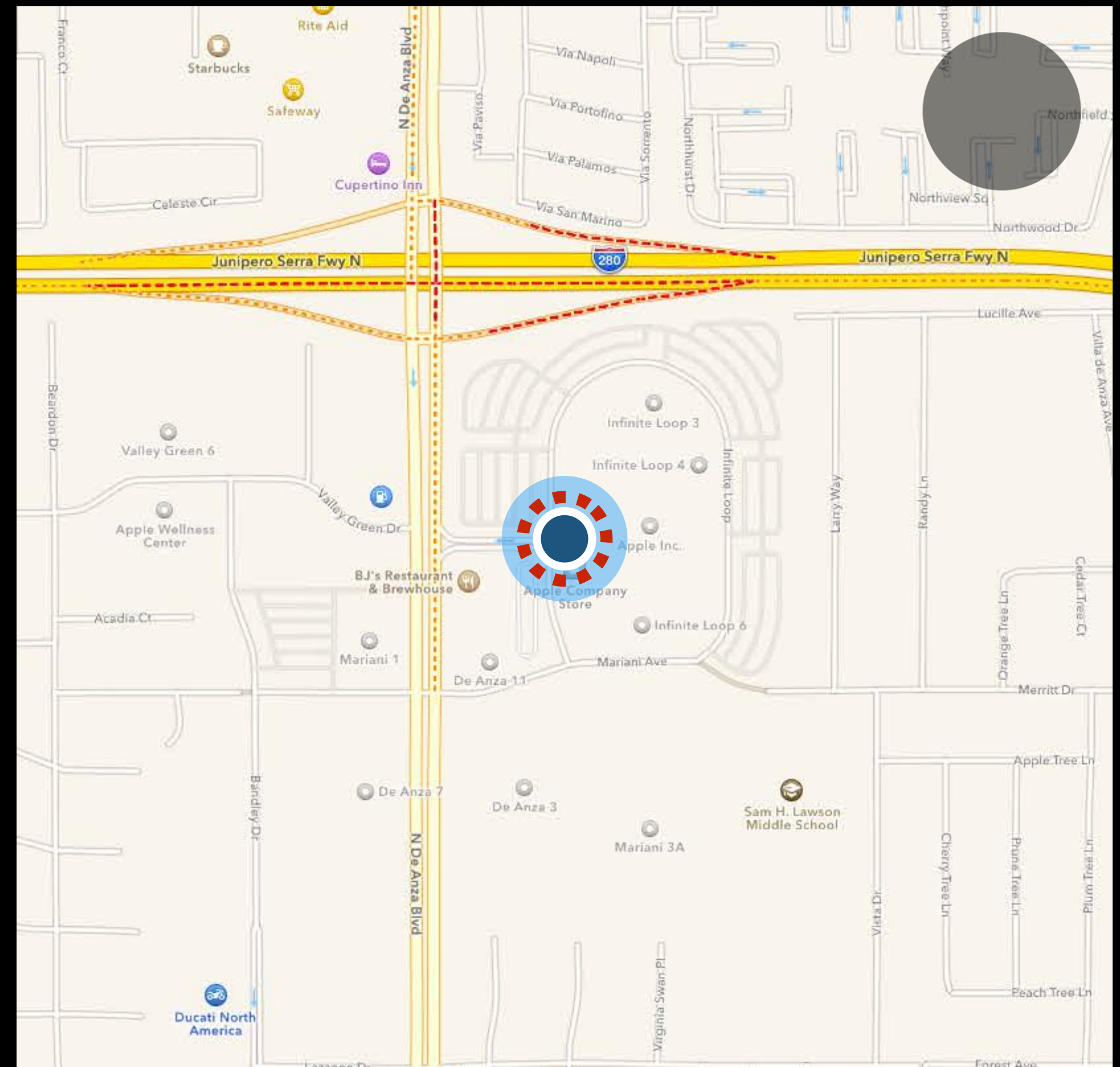
Single Location

- requestLocation
 - desiredAccuracy
 - -locationManager:didUpdateLocations:



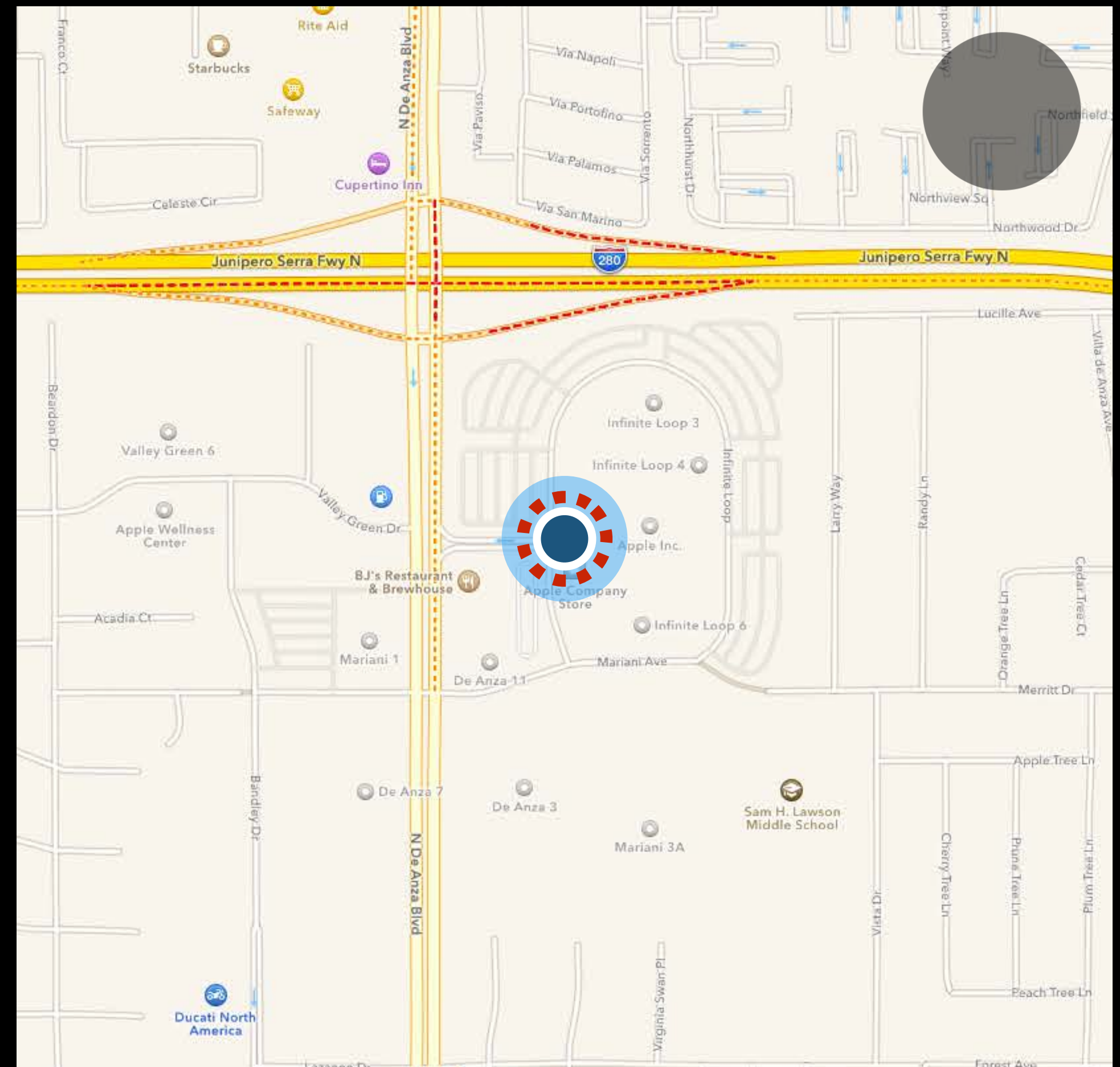
Single Location

- requestLocation
 - desiredAccuracy
 - -locationManager:didUpdateLocations:
 - -locationManager:didFailWithError:



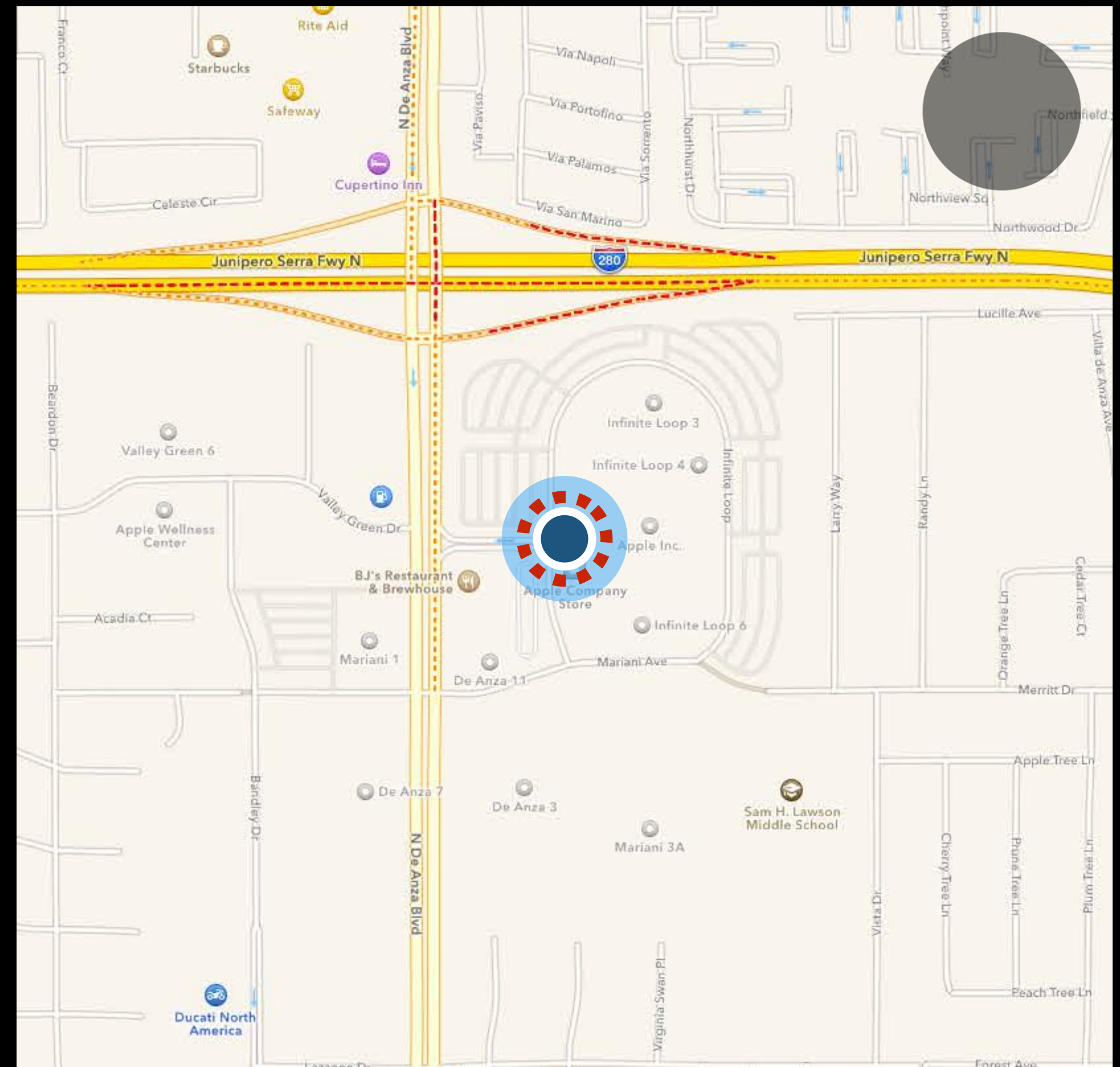
Single Location

- requestLocation
 - desiredAccuracy
 - -locationManager:didUpdateLocations:
 - -locationManager:didFailWithError:
 - kCLErrorLocationUnknown



Single Location

- requestLocation
 - desiredAccuracy
 - -locationManager:didUpdateLocations:
 - -locationManager:didFailWithError:
 - kCLErrorLocationUnknown
- Exclusive of -startUpdatingLocation
- Cancel with -stopUpdatingLocation



Apple Watch

Apple Watch



Apple Watch and iPhone



Apple Watch and iPhone

Devices: pair



Apple Watch and iPhone

Devices: pair

Apps: extension



Apple Watch and iPhone

Devices: pair

Apps: extension



iOS App

watchOS App



Apple Watch and iPhone

Devices: pair

Apps: extension



iOS App

watchOS Appex

watchOS Appex



Apple Watch and iPhone

Devices: pair

Apps: extension

Sub Topics:



iOS App

watchOS Appex

watchOS Appex



Apple Watch and iPhone

Devices: pair

Apps: extension

Sub Topics:

- Authorization



iOS App

watchOS Appex

watchOS Appex



Apple Watch and iPhone

Devices: pair

Apps: extension

Sub Topics:

- Authorization
- Cooperation



iOS App

watchOS Appex

watchOS Appex



Authorization

Recap

Authorization

Recap

User granted

Authorization

Recap

User granted

`-requestWhenInUseAuthorization`

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS WhenInUse Always

Location

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)		

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)	Yes	Yes

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)	Yes	Yes
Background (intermittent)		

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)	Yes	Yes
Background (intermittent)	No	Yes

Authorization

Recap

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)	Yes	Yes
Background (intermittent)	No	Yes
Monitor		

Authorization

Recap

User granted

`-requestWhenInUseAuthorization`
`-requestAlwaysAuthorization`

iOS	WhenInUse	Always
Location	Yes	Yes
Background (continuous)	Yes	Yes
Background (intermittent)	No	Yes
Monitor	Local Notification	Yes

Authorization

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

watchOS

WhenInUse

Always

Location

Background
(continuous)

Background
(intermittent)

Monitor

Authorization

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

watchOS	WhenInUse	Always
Location	Single	Single
Background (continuous)		
Background (intermittent)		
Monitor		

Authorization

User granted

- requestWhenInUseAuthorization
- requestAlwaysAuthorization

watchOS	WhenInUse	Always
Location	Single	Single
Background (continuous)	No	No
Background (intermittent)		
Monitor		

Authorization

User granted

`-requestWhenInUseAuthorization`
`-requestAlwaysAuthorization`

watchOS	WhenInUse	Always
Location	Single	Single
Background (continuous)	No	No
Background (intermittent)	No	Single
Monitor		

Authorization

User granted

`-requestWhenInUseAuthorization`
`-requestAlwaysAuthorization`

watchOS	WhenInUse	Always
Location	Single	Single
Background (continuous)	No	No
Background (intermittent)	No	Single
Monitor	No	No

Authorization

In Use status

Authorization

In Use status

In Use if:

Authorization

In Use status

In Use if:

- Foreground

Authorization

In Use status

In Use if:

- Foreground
- Blue Bar

Authorization

In Use status

In Use if:

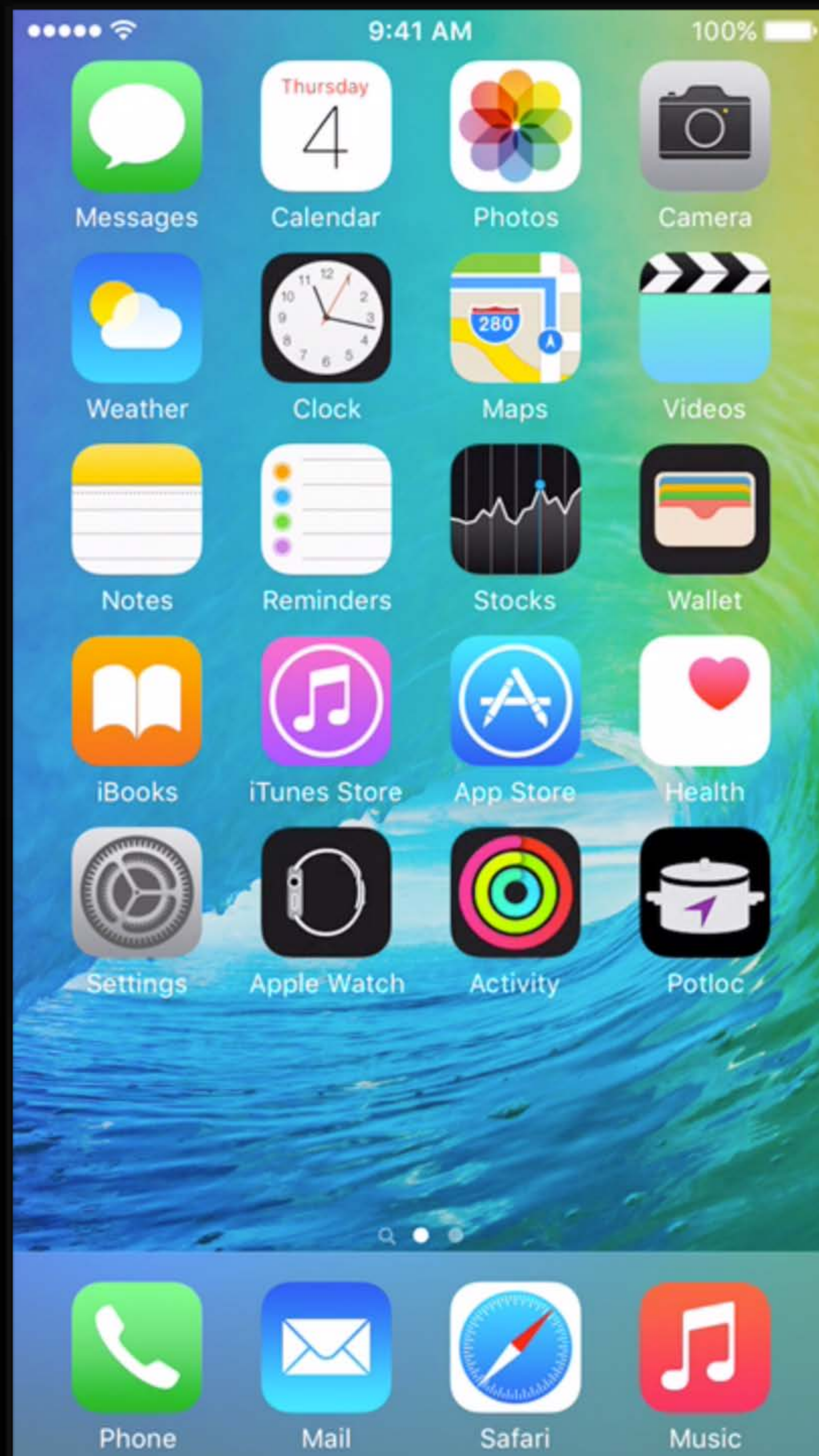
- Foreground
- Blue Bar
- Handling message from Apple Watch

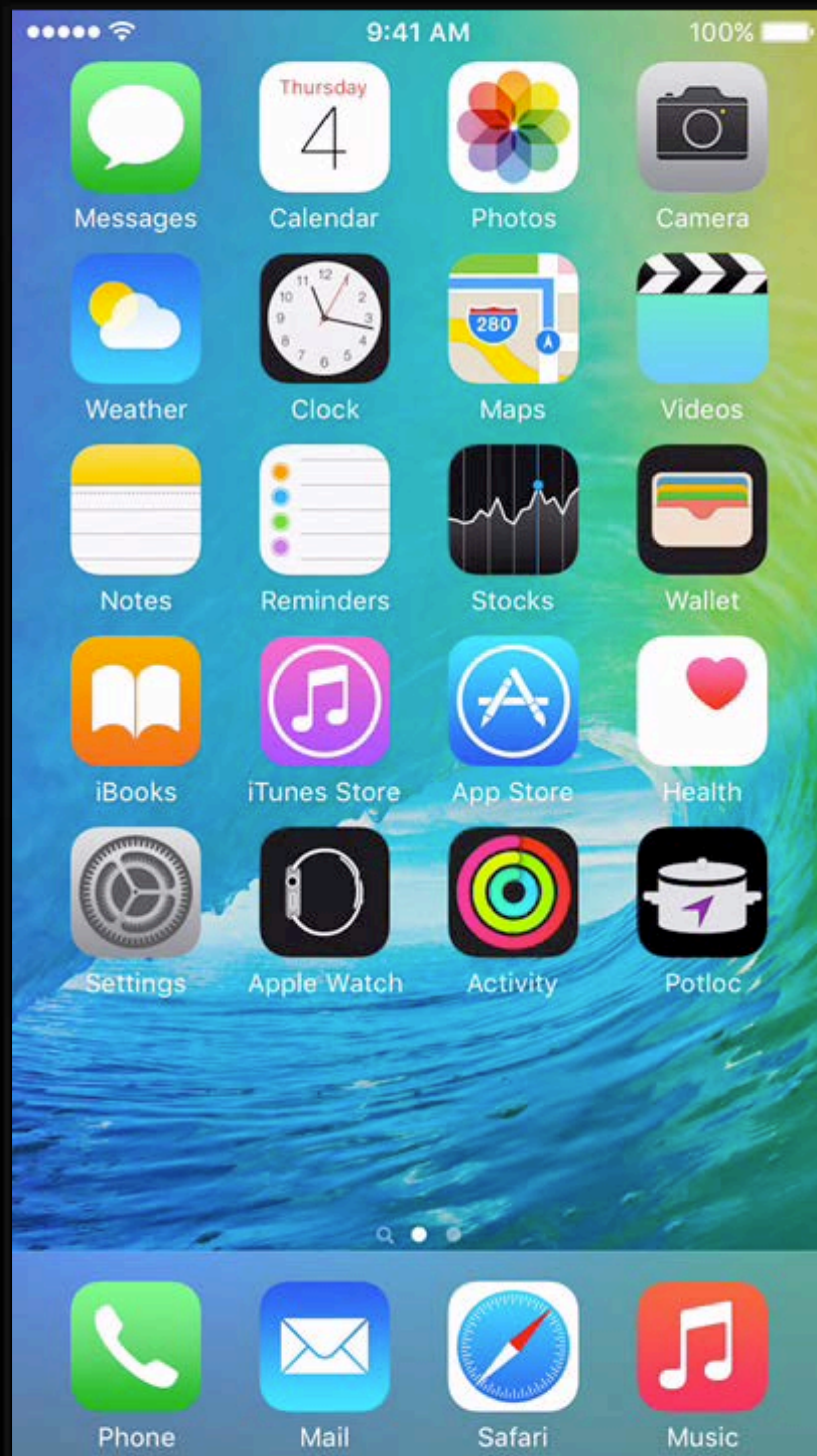
Authorization

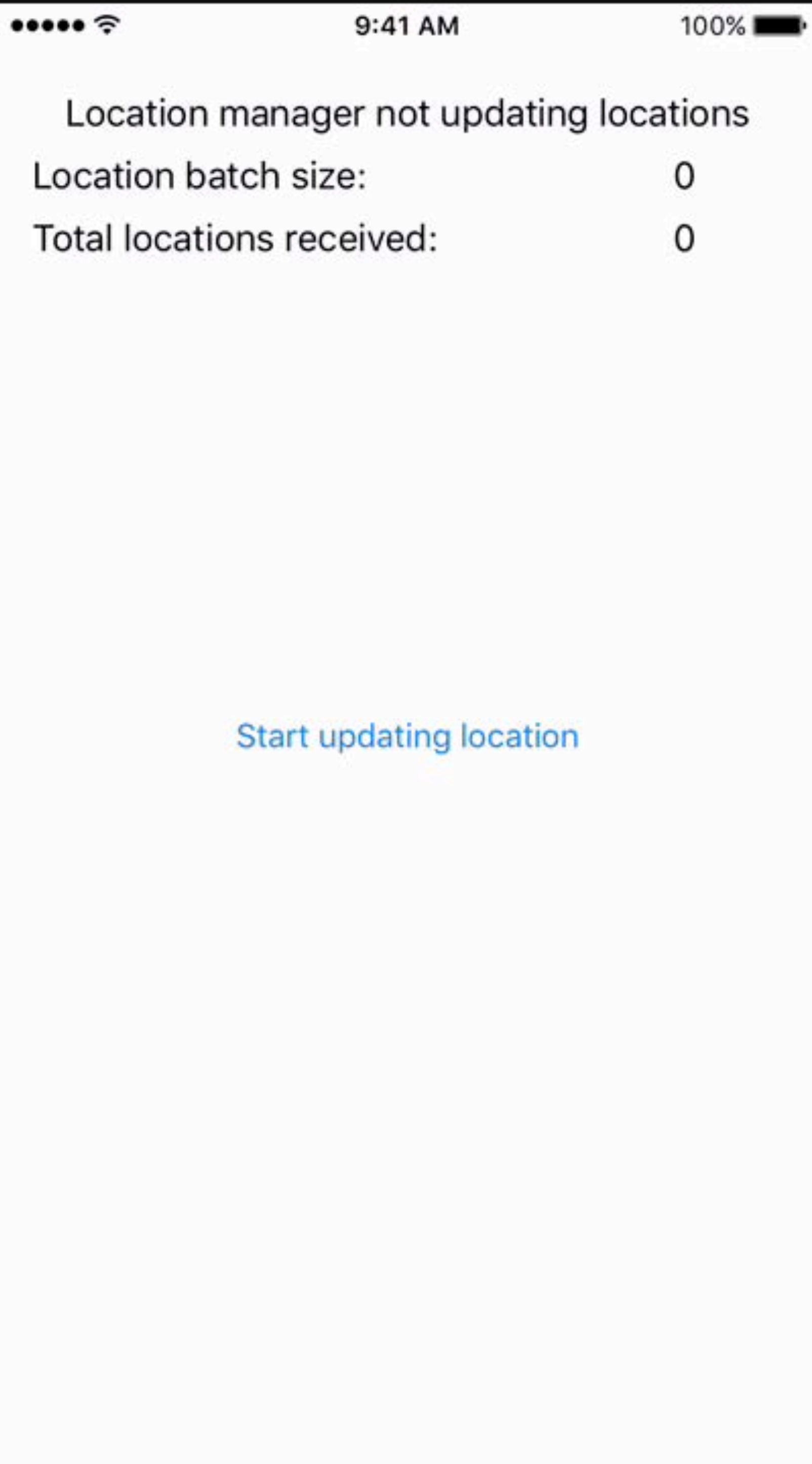
Prompting

Initiate on iPhone









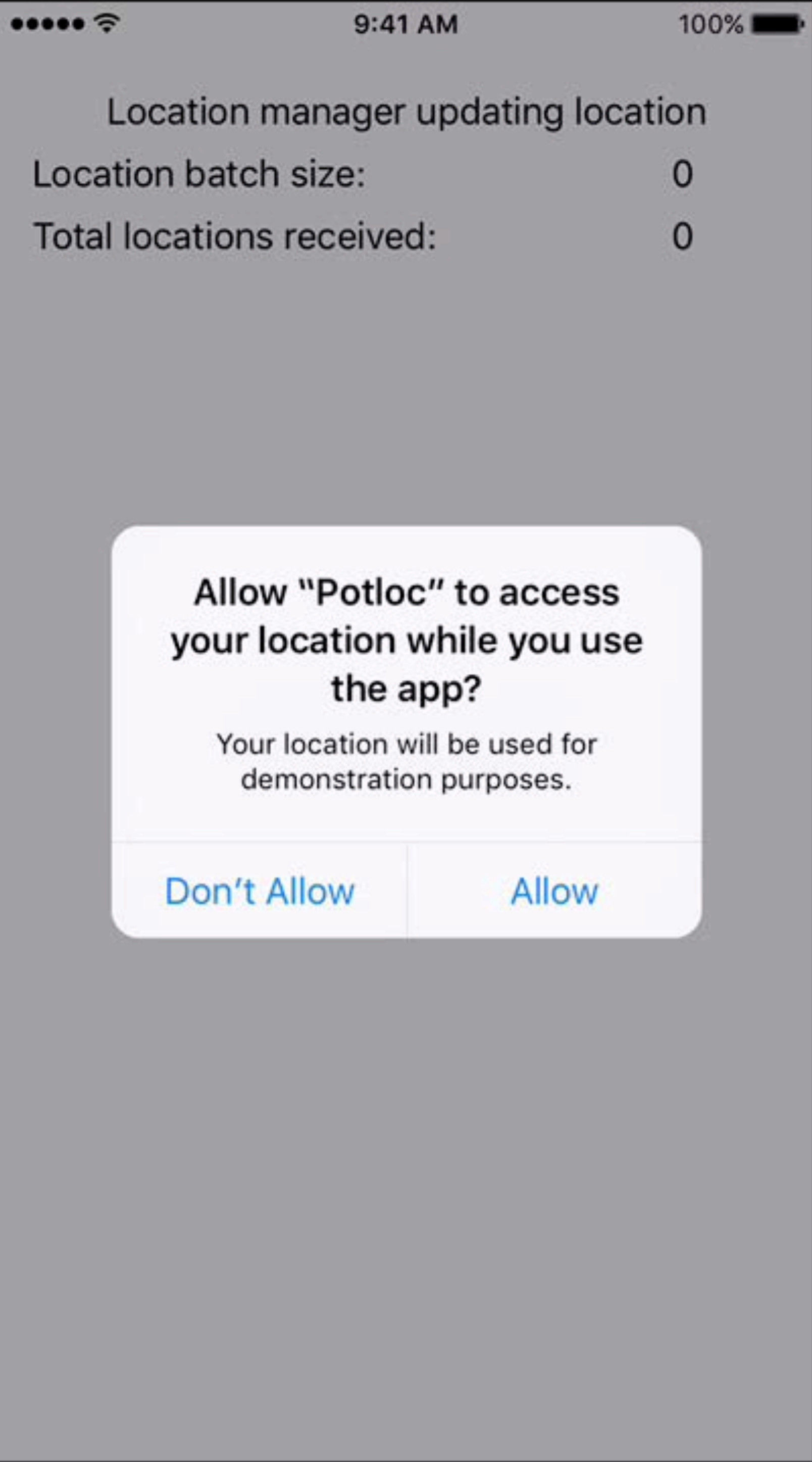
Location manager not updating locations

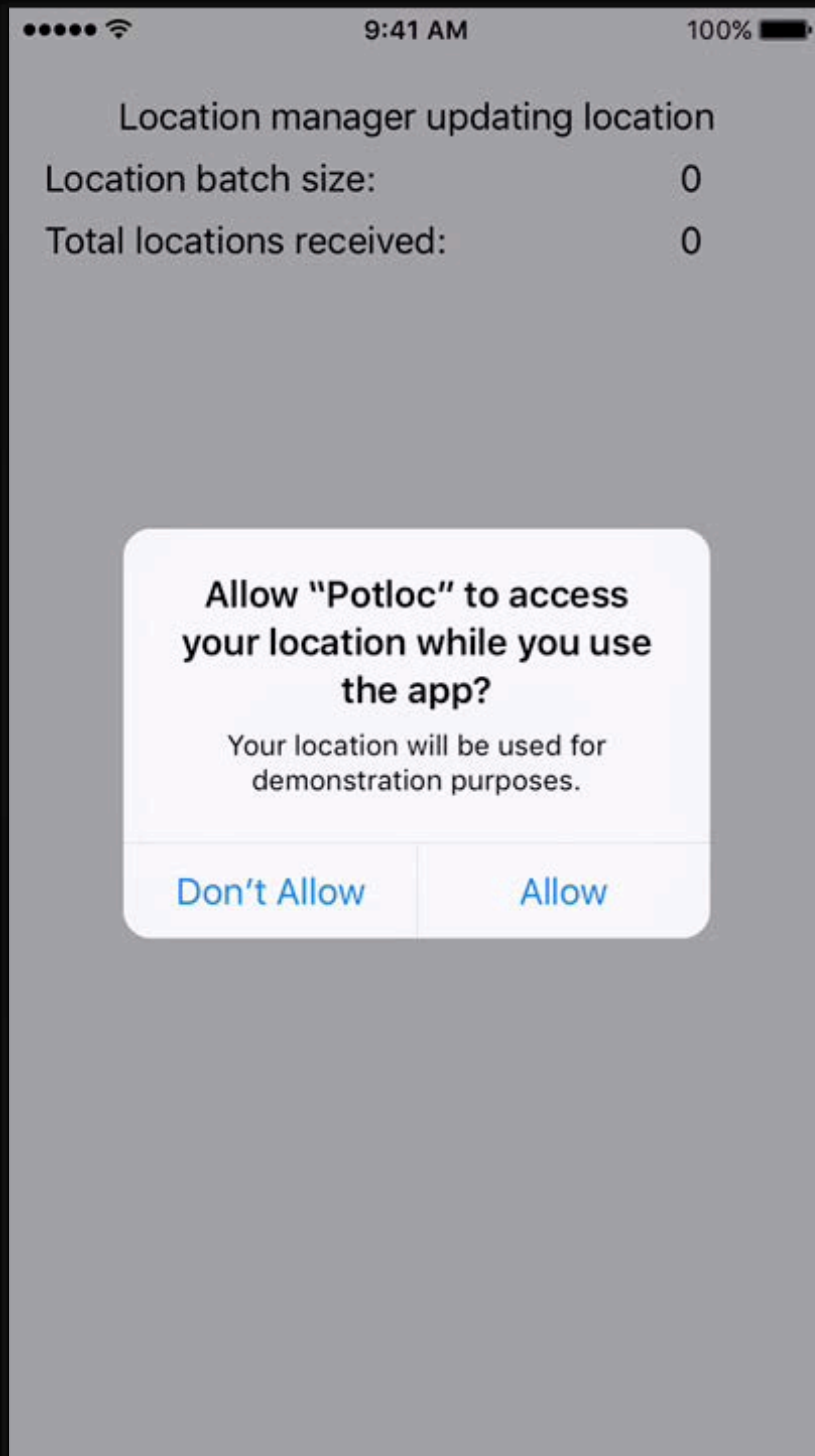
Location batch size: 0

Total locations received: 0

Start updating location







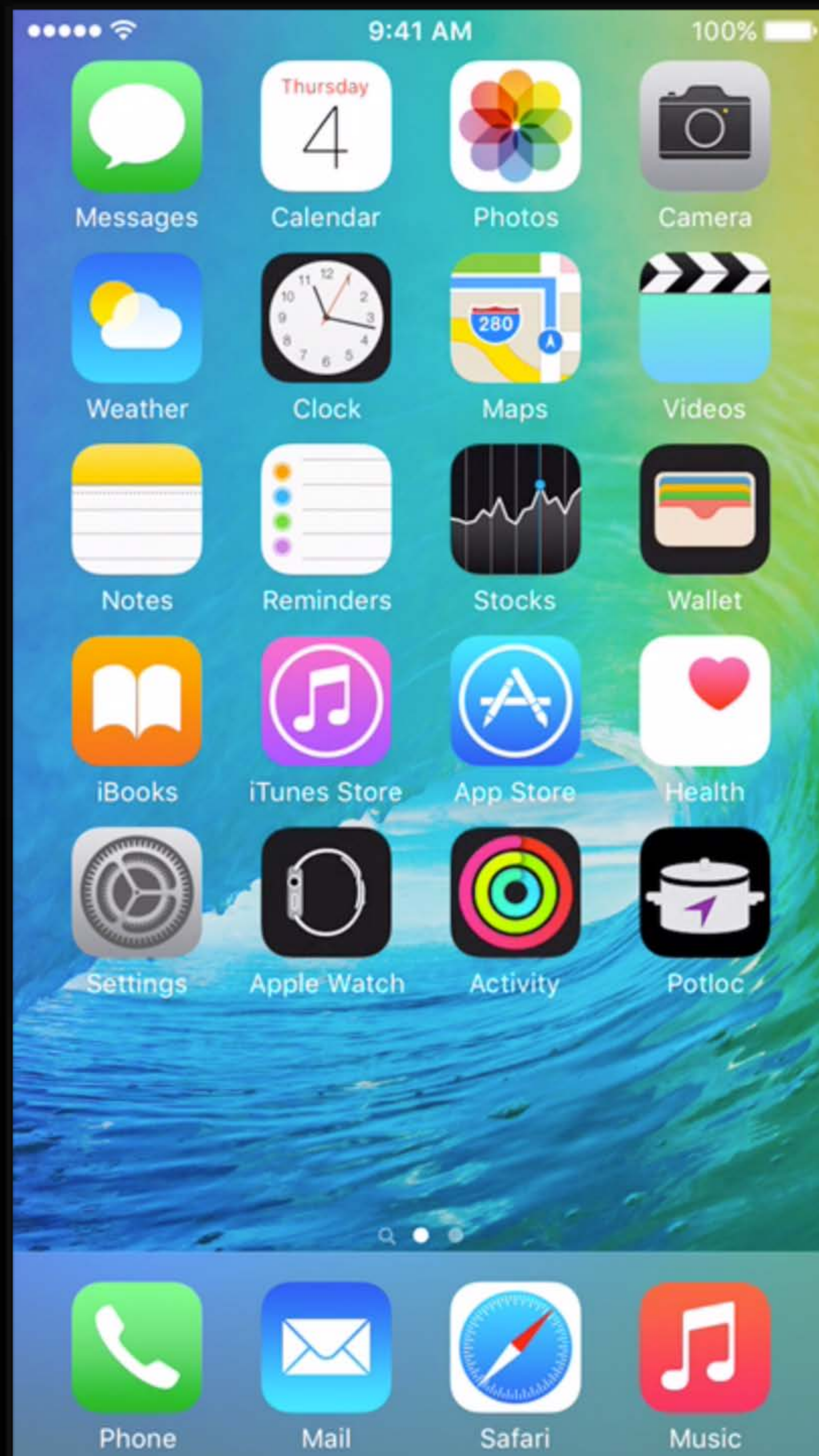
Location manager not updating location

Location batch size: 4

Total locations received: 7

Start updating location





Authorization

Prompting

Initiate on iPhone



Authorization

Prompting

Initiate on iPhone

- iPhone shows prompt



Authorization

Prompting

Initiate on iPhone

- iPhone shows prompt
- Apple Watch shows nothing



Authorization

Prompting

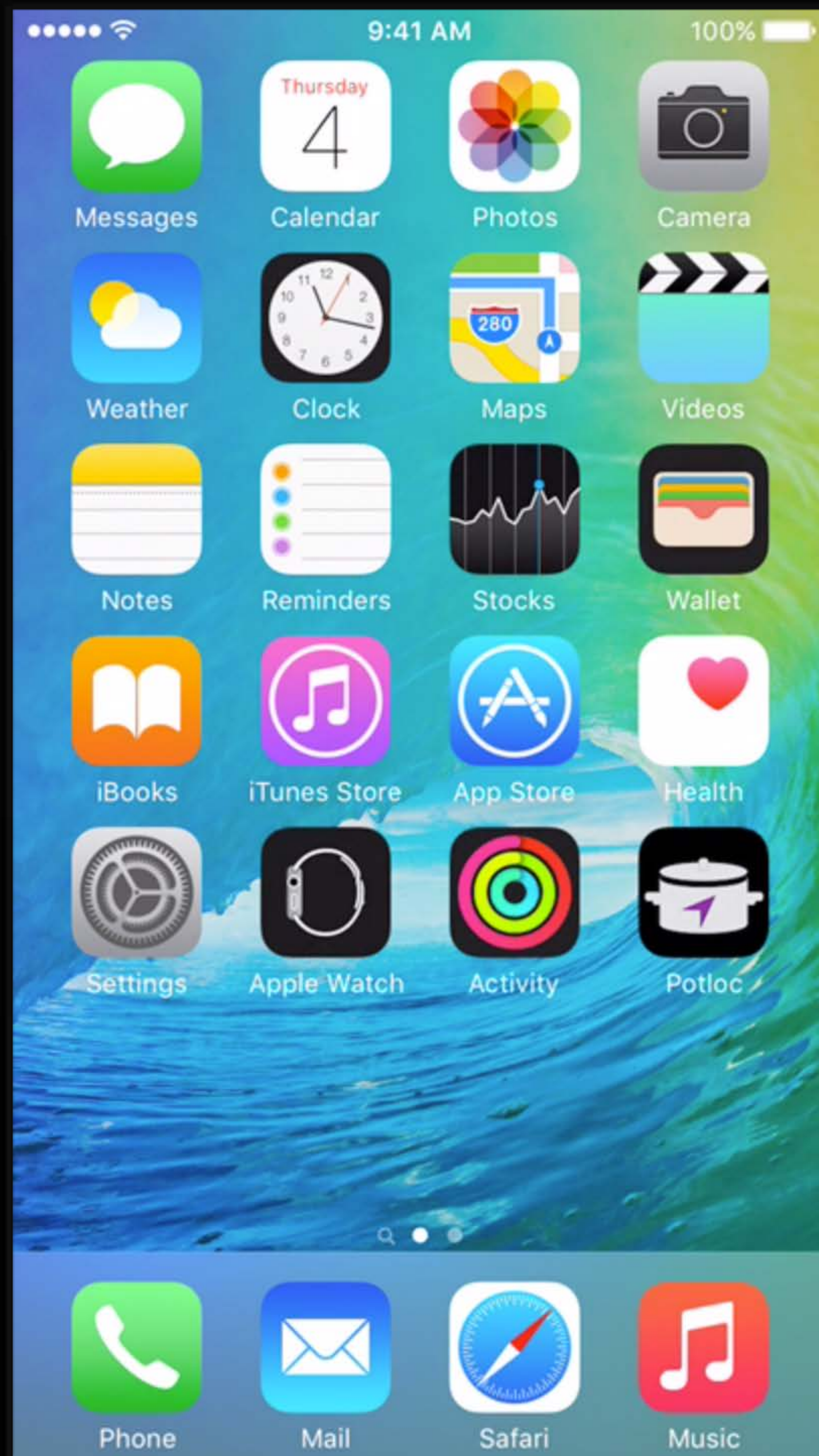


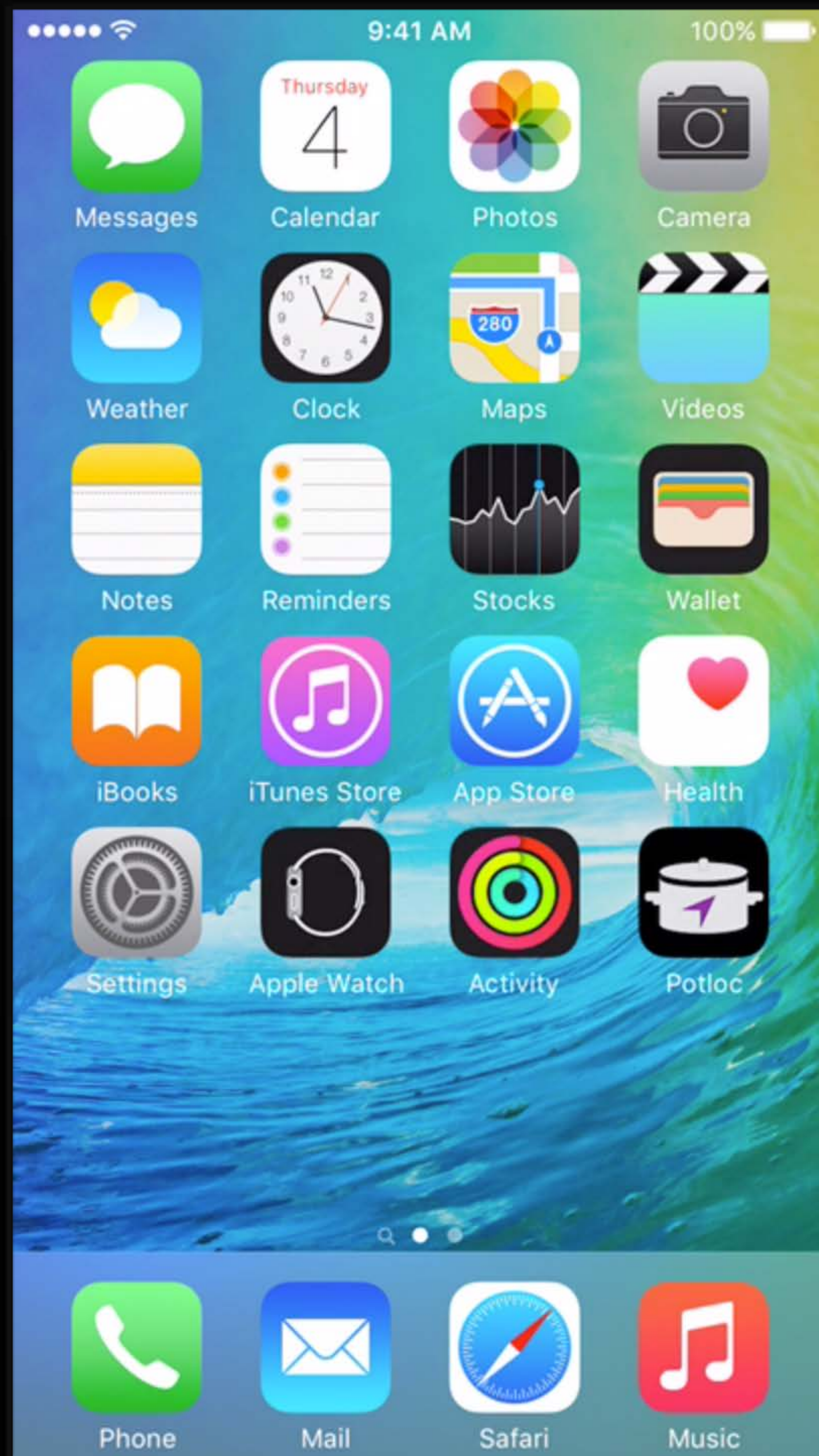
Authorization

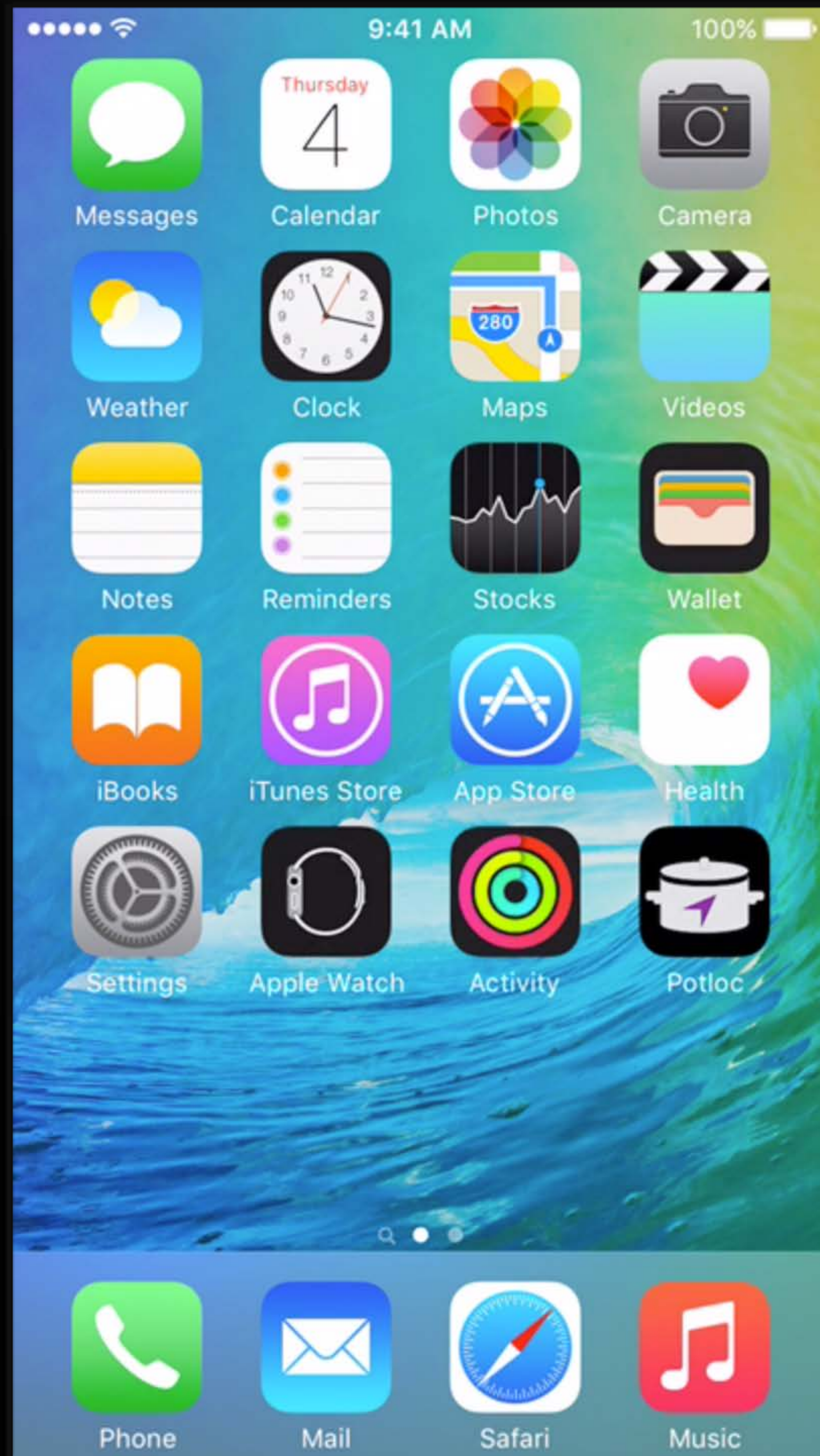
Prompting

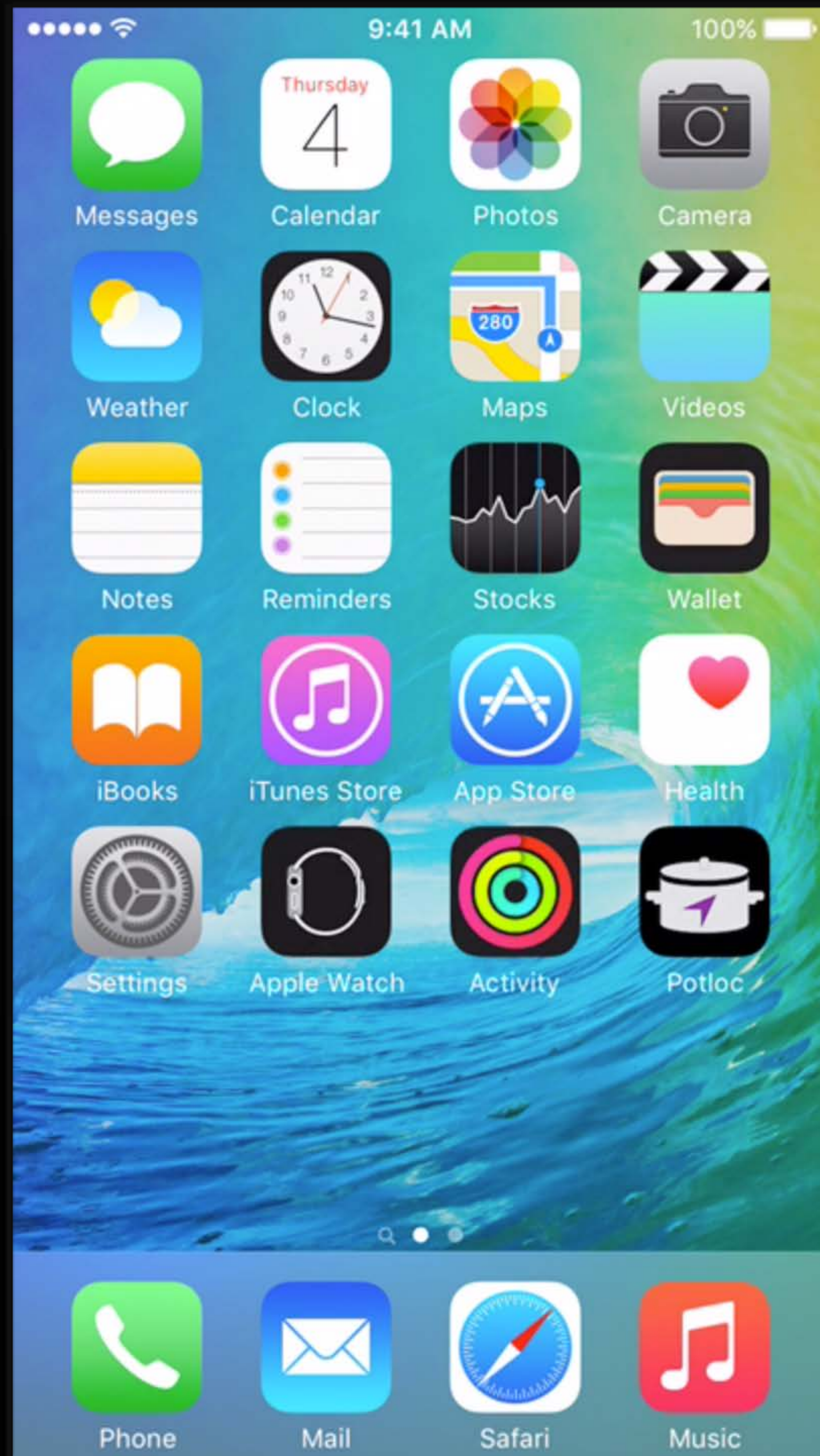
Initiate on Apple Watch

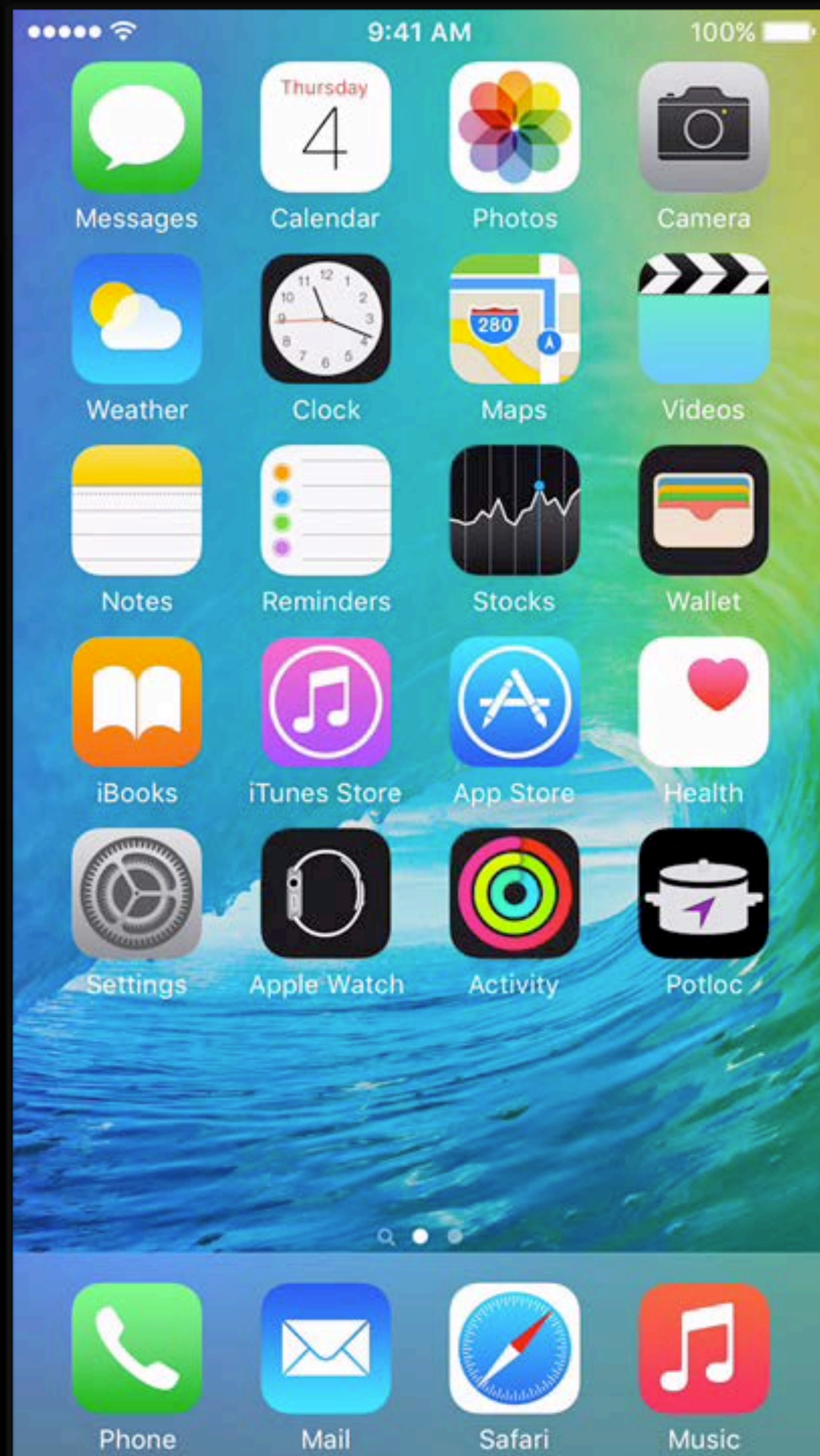


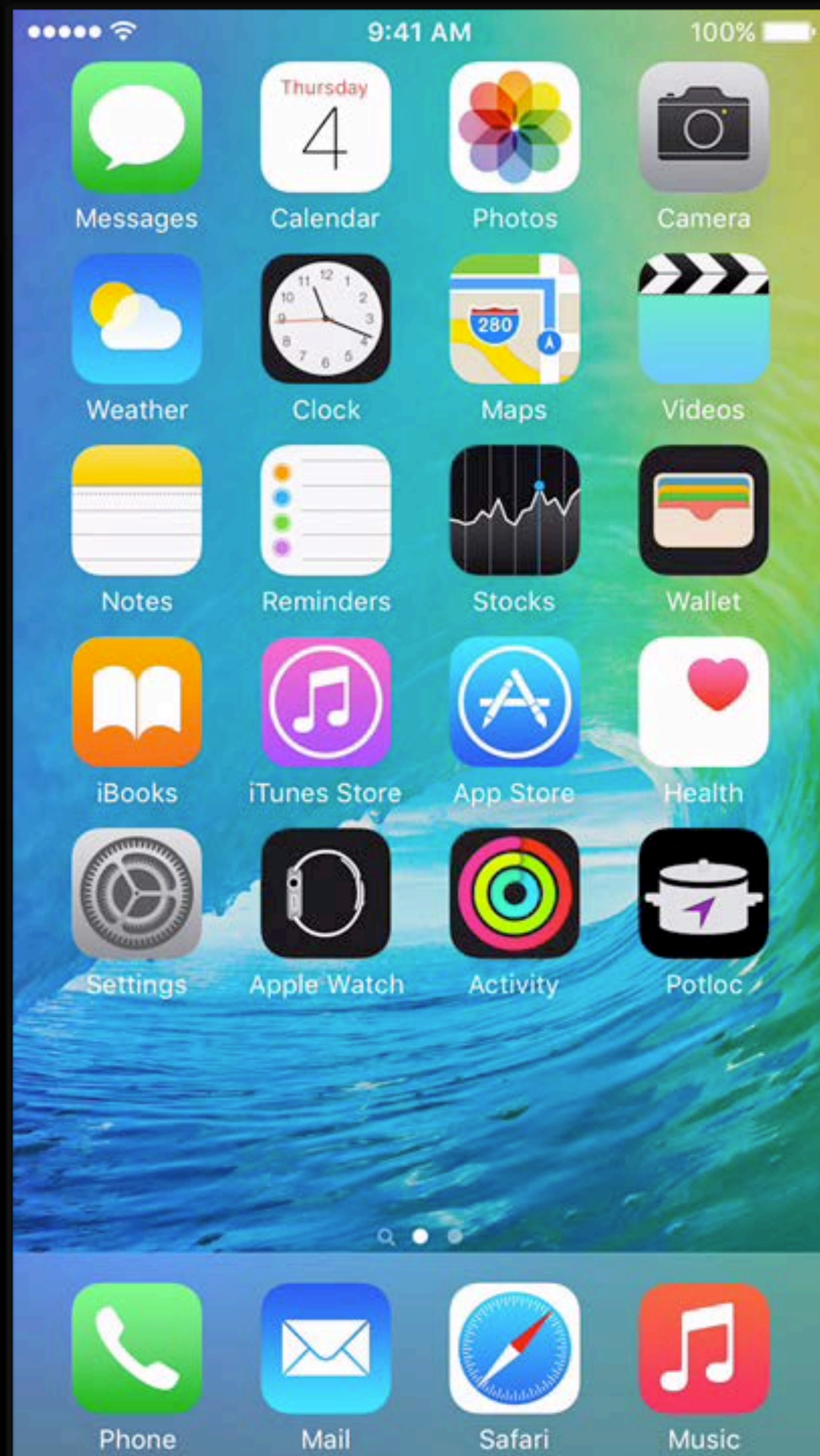


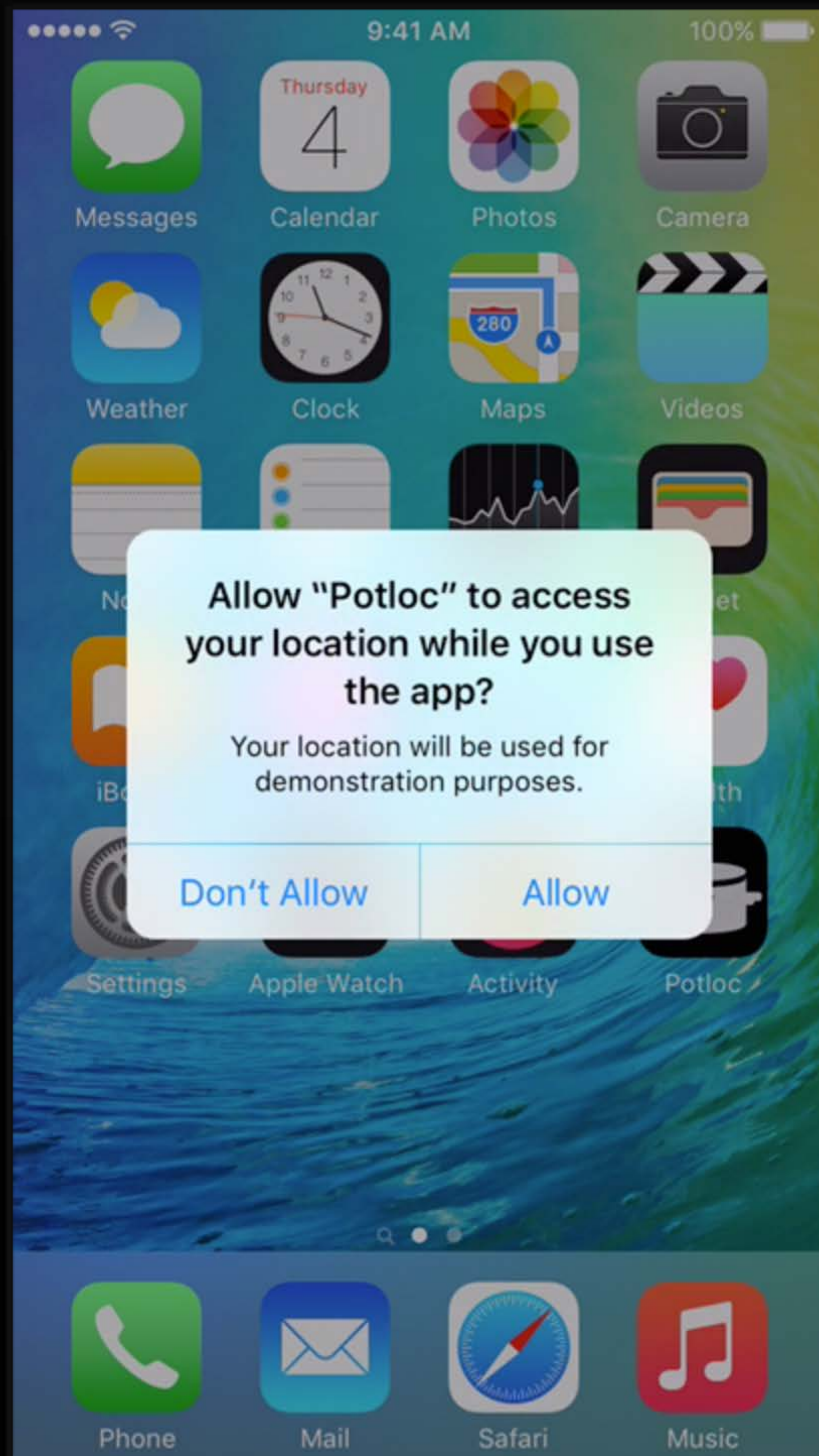


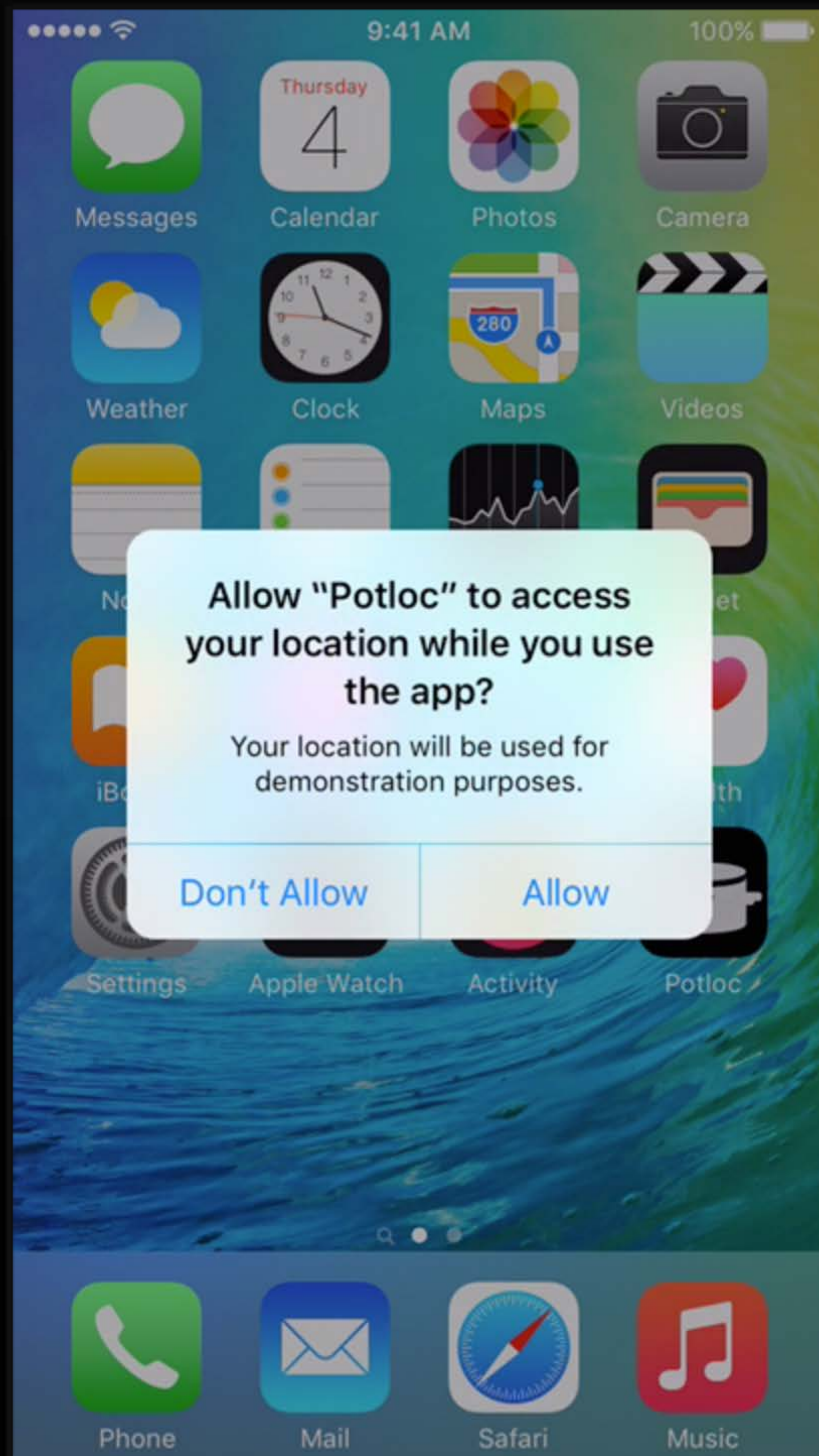


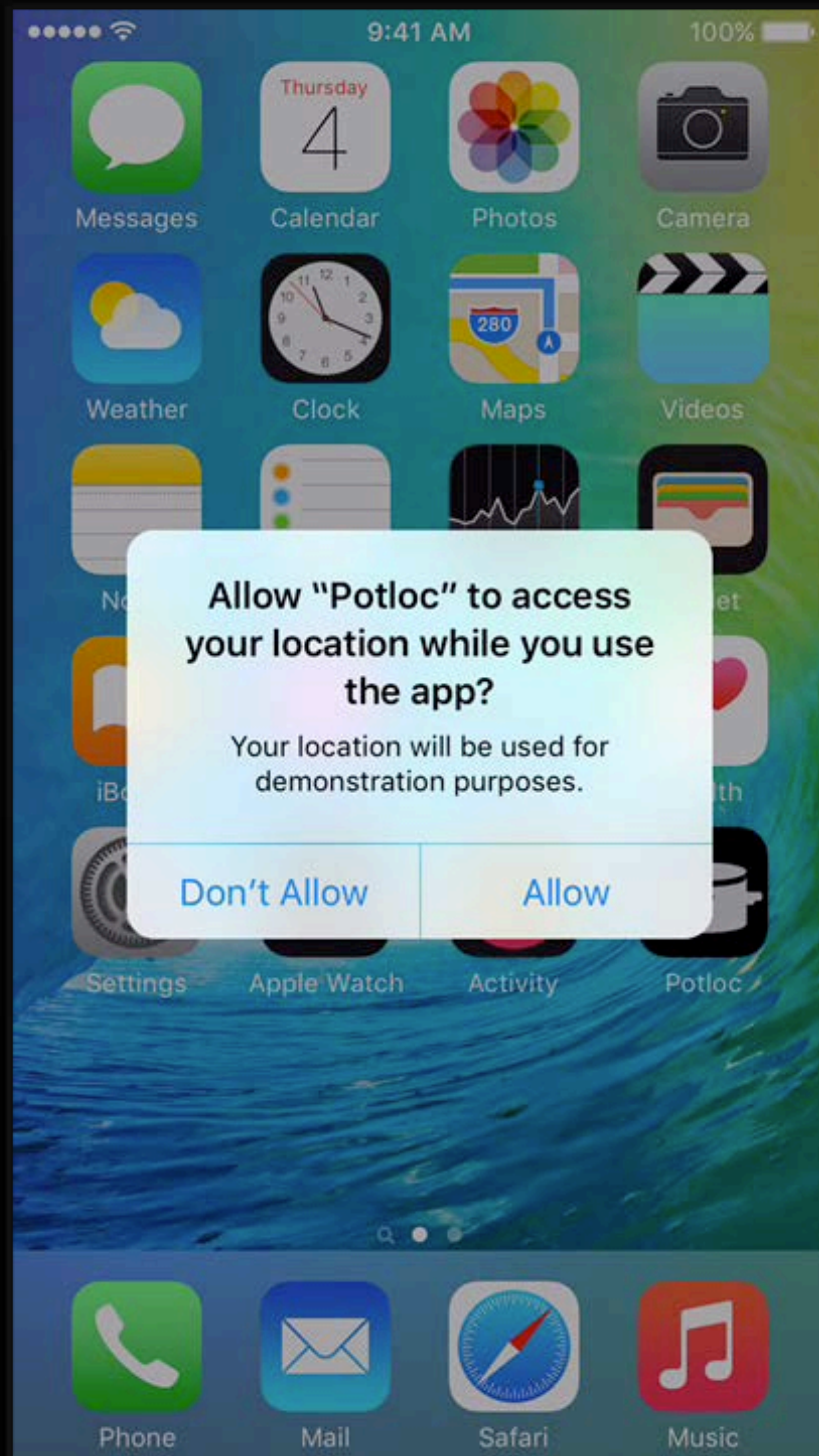


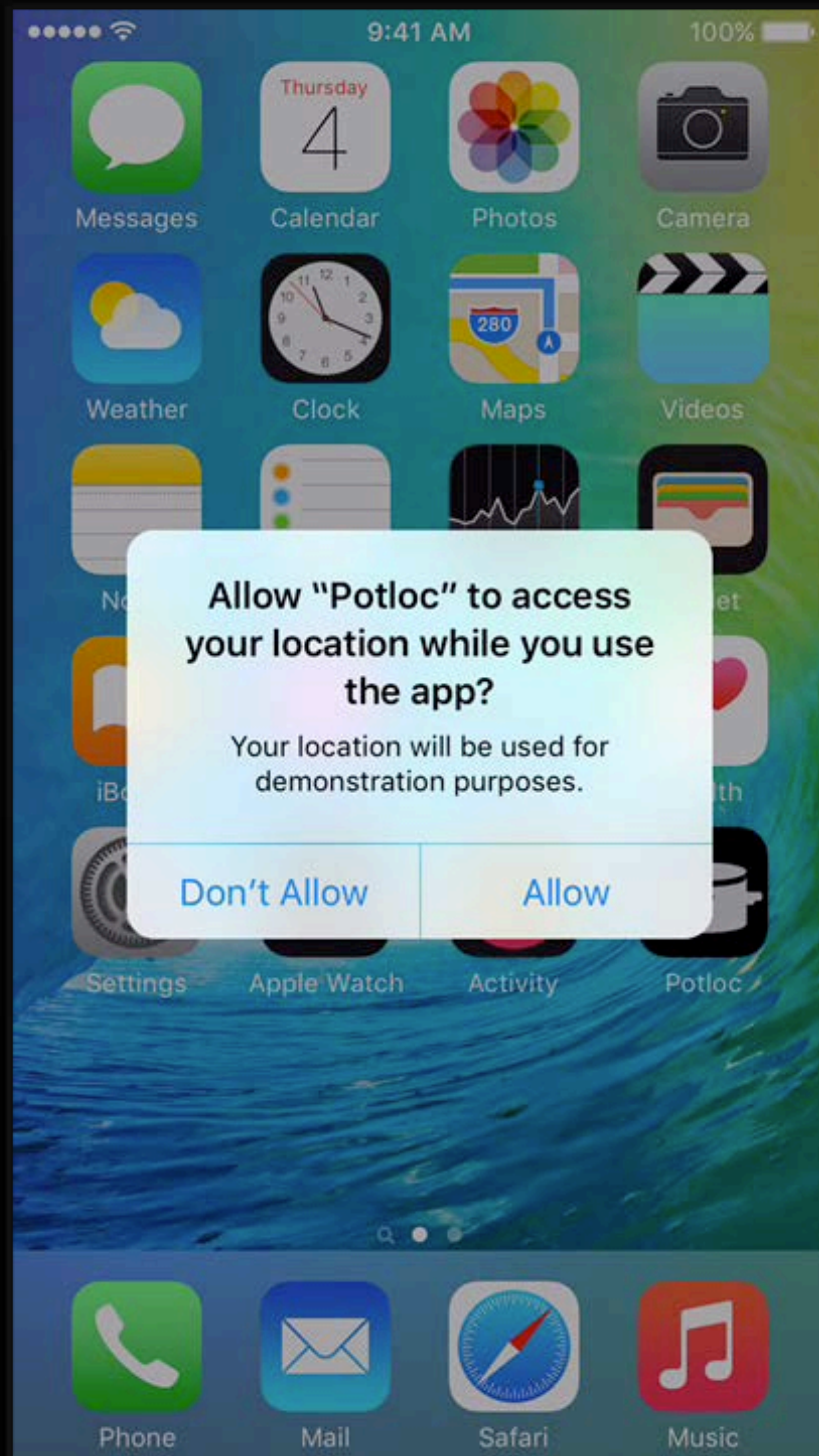


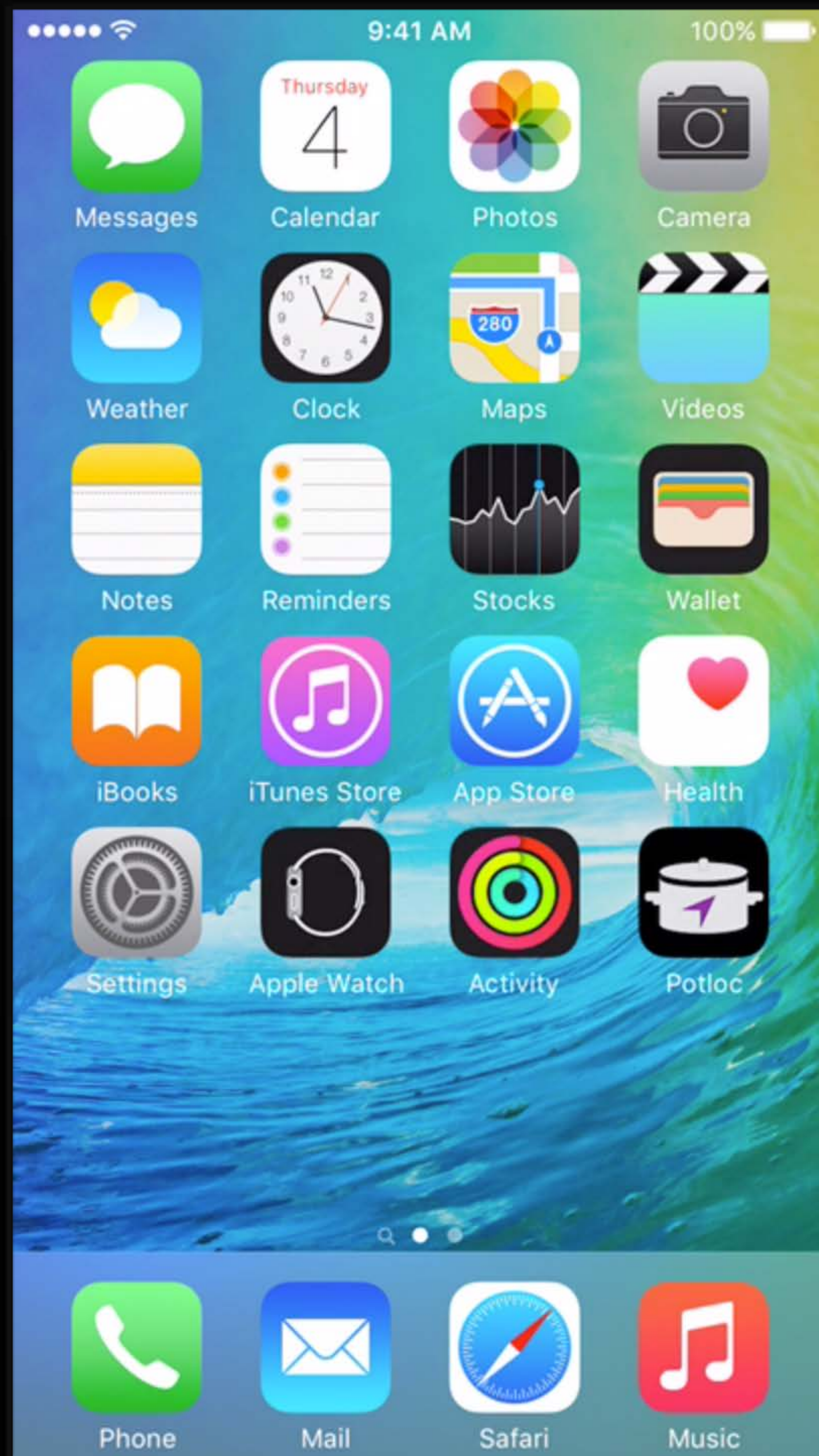


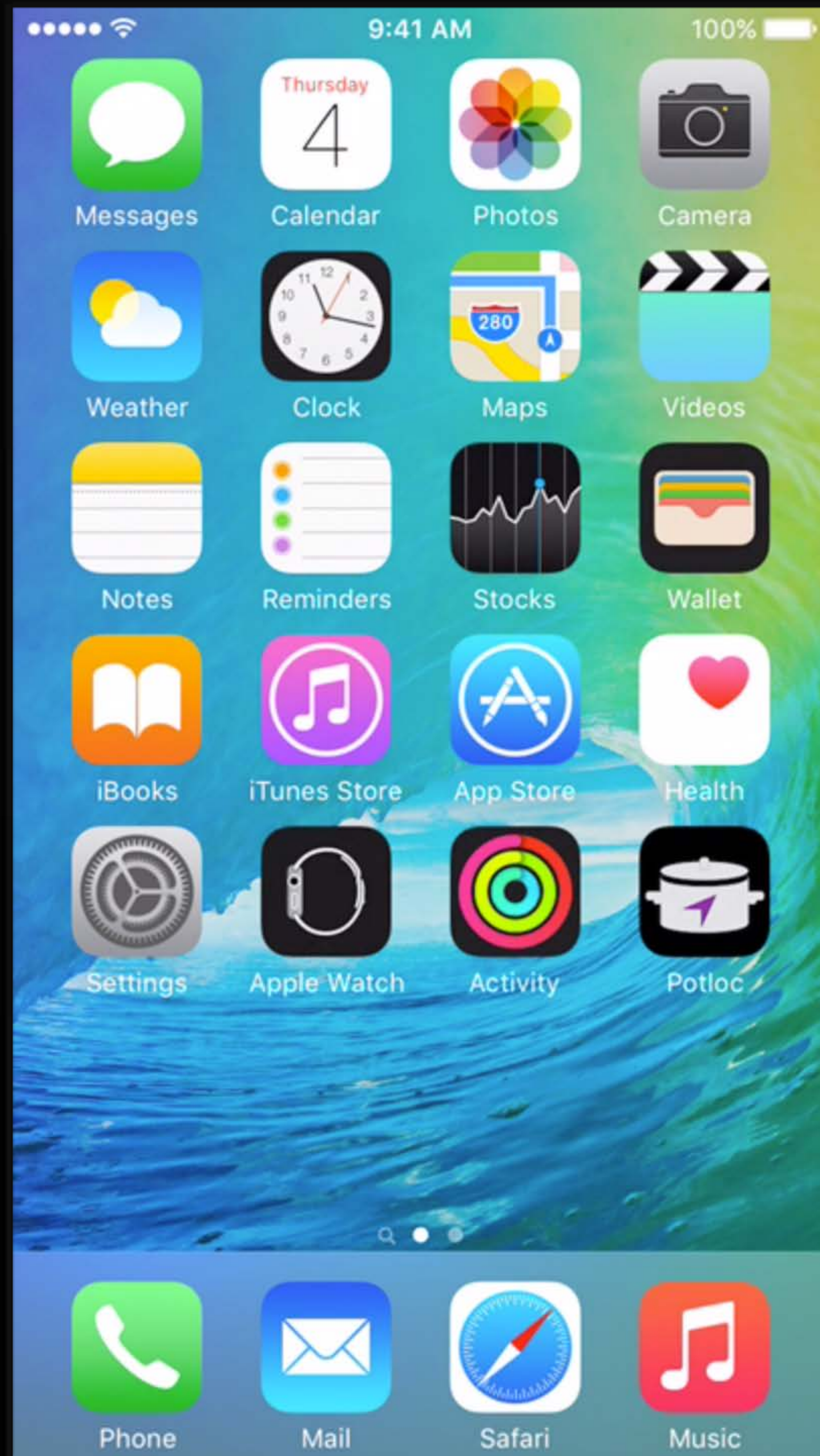












Authorization

Prompting

Initiate on Apple Watch



Authorization

Prompting

Initiate on Apple Watch

- Apple Watch shows alert



Authorization

Prompting

Initiate on Apple Watch

- Apple Watch shows alert
- iPhone shows prompt



Authorization

Prompting

Initiate on Apple Watch

- Apple Watch shows alert
- iPhone shows prompt
- Answer on iPhone



Available on watchOS

`-requestLocation`

Available on watchOS

`-requestLocation`

Accuracy with iPhone

Available on watchOS

–requestLocation

Accuracy with iPhone

- Even indoor

Available on watchOS

–requestLocation

Accuracy with iPhone

- Even indoor

Accuracy standalone

Available on watchOS

`-requestLocation`

Accuracy with iPhone

- Even indoor

Accuracy standalone

- `kCLLocationAccuracyHundredMeters`

Available on watchOS

`-requestLocation`

Accuracy with iPhone

- Even indoor

Accuracy standalone

- `kCLLocationAccuracyHundredMeters`
- Best effort

Cooperation

If you need:

Cooperation

If you need:

- Continuous background location

Cooperation

If you need:

- Continuous background location
- Region monitoring

Cooperation

If you need:

- Continuous background location
- Region monitoring
- Anything *available* on iOS, but *prohibited* on watchOS

Cooperation

WCSession

Introducing Watch Connectivity

Pacific Heights

Thursday 11:00AM

Cooperation

`WCSession`

- `-sendMessage:replyHandler:errorHandler:`

Cooperation

`WCSession`

- `-sendMessage:replyHandler:errorHandler:`
- `-updateApplicationContext:`

Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex

iOS App

watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex

iOS App

watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex

iOS App

watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



watchOS Appex

iOS App

watchOS Appex



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`



Sending Messages

Apple Watch → iPhone

`-sendMessage:replyHandler:errorHandler:`

- Launch if necessary



Sending Messages

Apple Watch → iPhone

–sendMessage:replyHandler:errorHandler:

- Launch if necessary
- In Use status transfers



Sending Messages

Apple Watch → iPhone

–sendMessage:replyHandler:errorHandler:

- Launch if necessary
- In Use status transfers
- Remember allowsBackgroundLocationUpdates



Sending Messages

iPhone -> Apple Watch

`-sendMessage:replyHandler:errorHandler:`



Sending Messages

iPhone -> Apple Watch

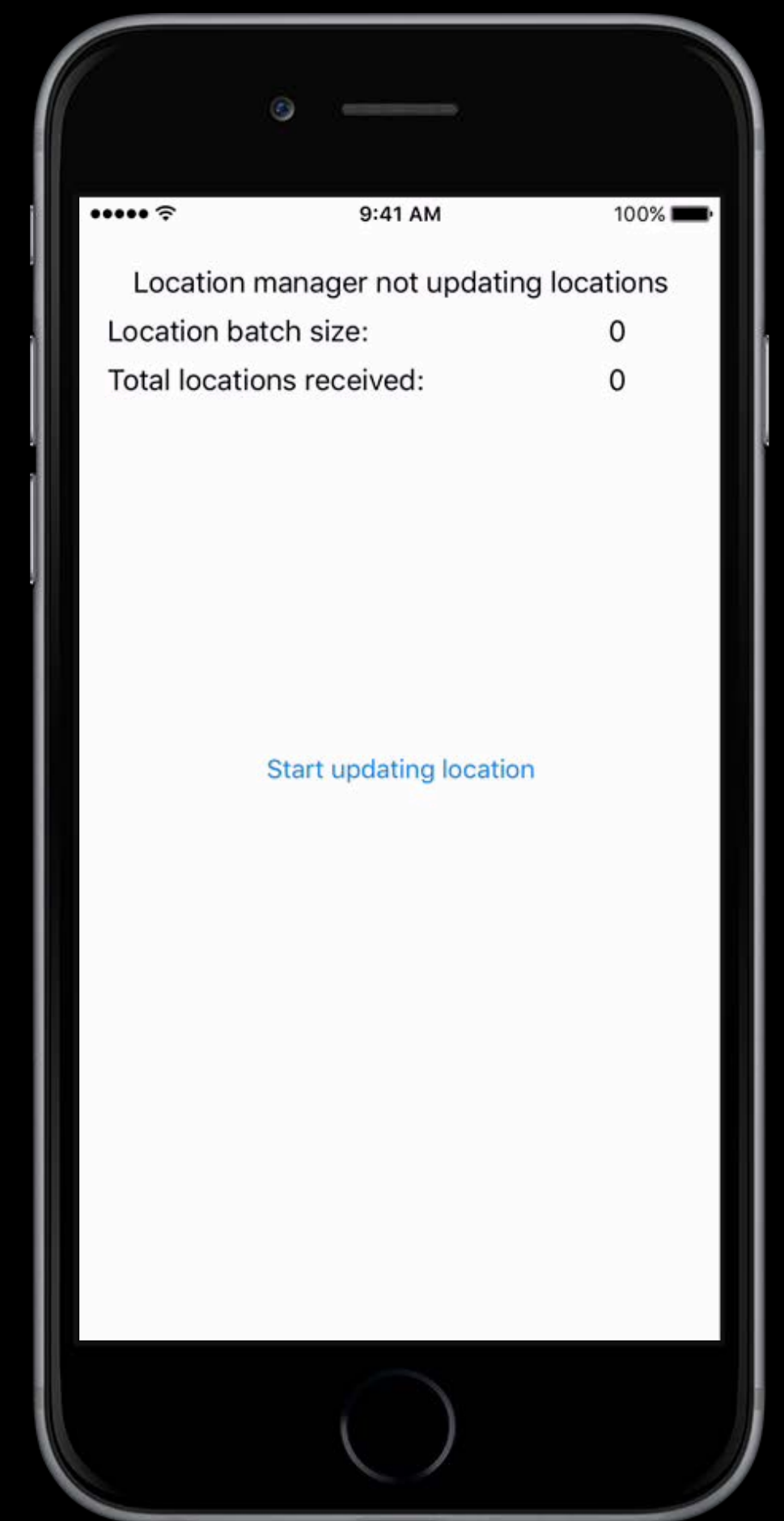
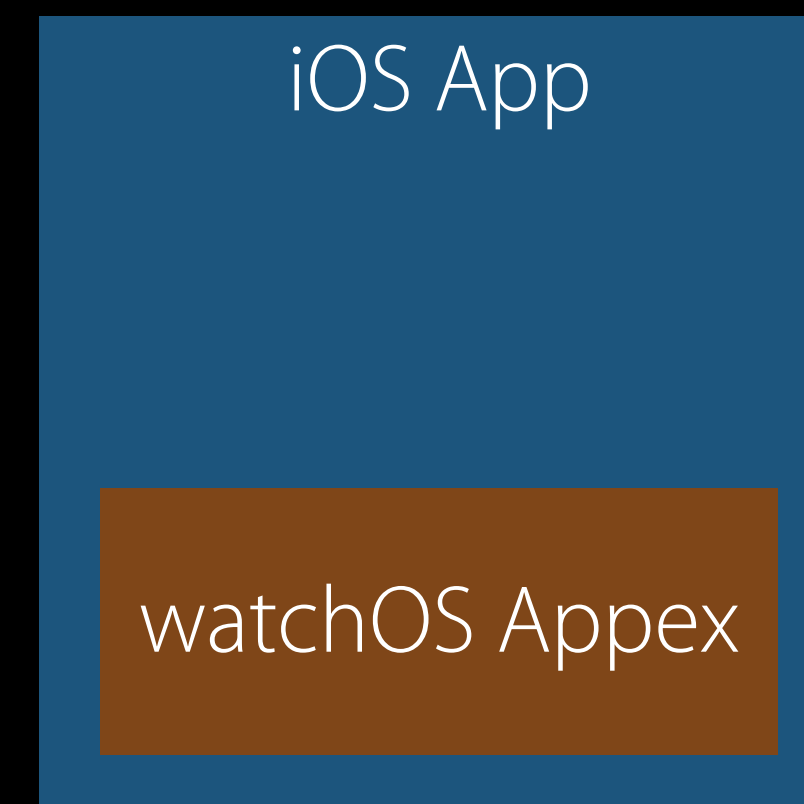
`-sendMessage:replyHandler:errorHandler:`



Sending Messages

iPhone -> Apple Watch

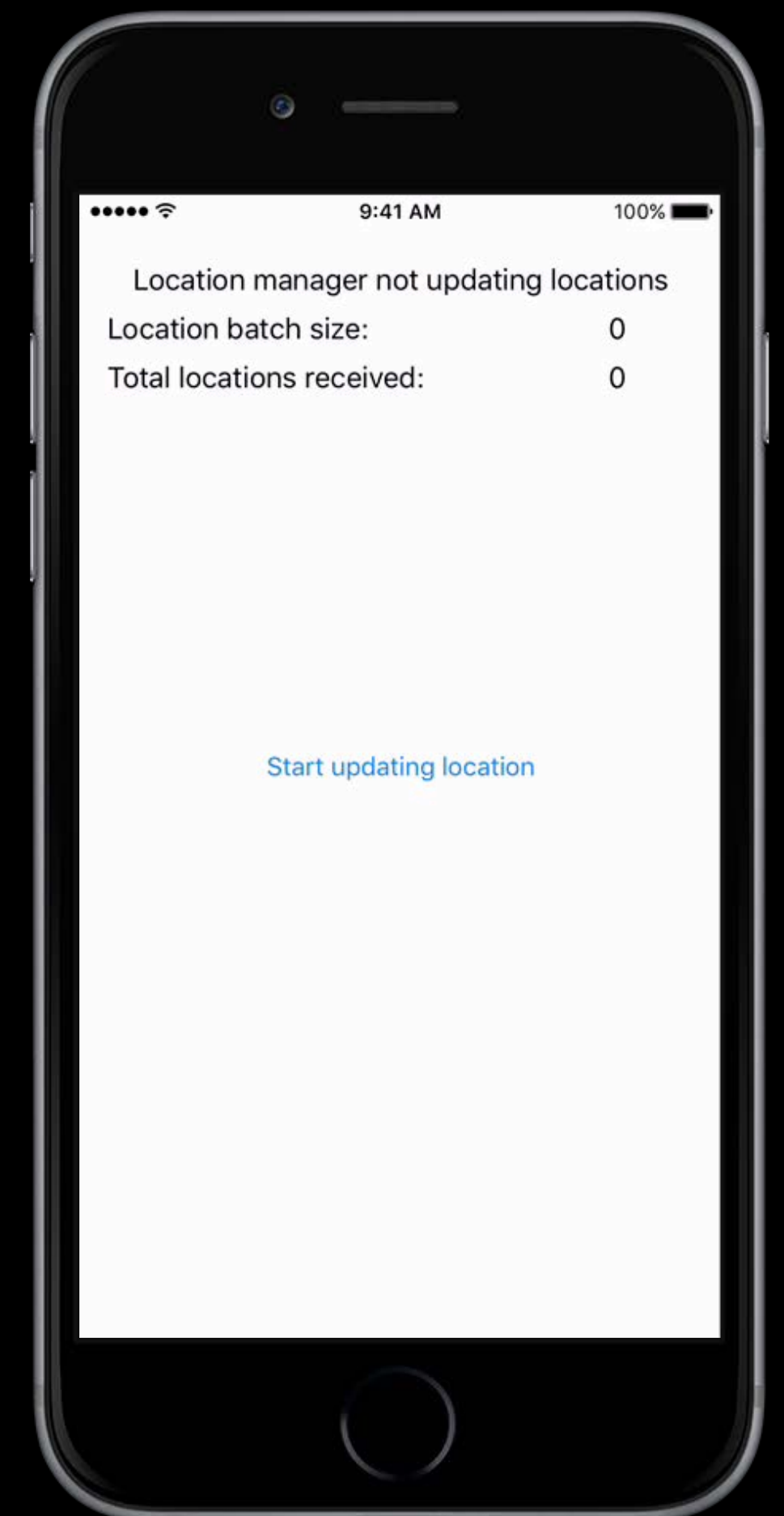
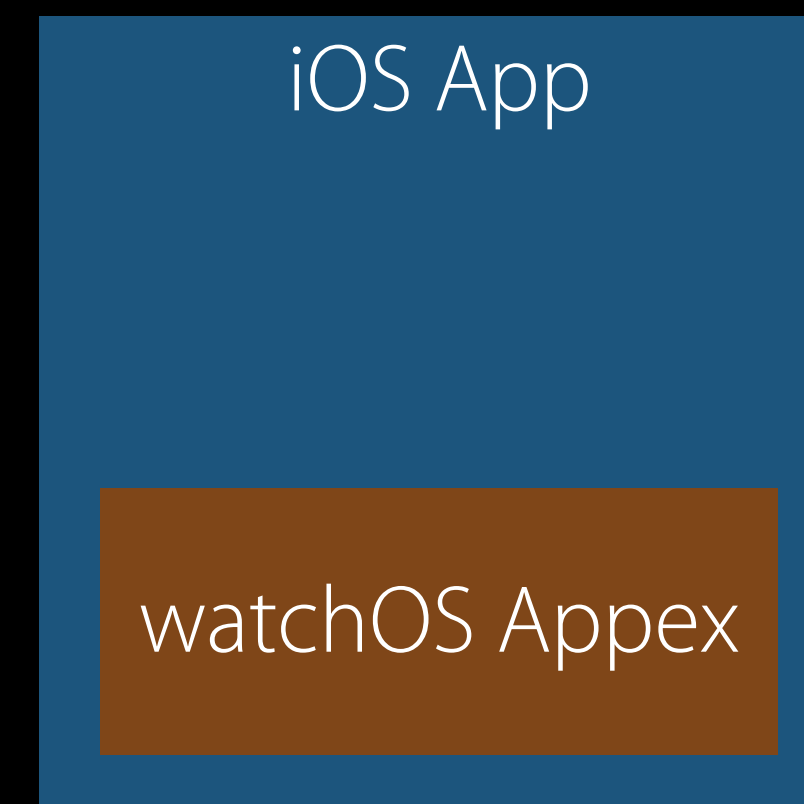
`-sendMessage:replyHandler:errorHandler:`



Sending Messages

iPhone -> Apple Watch

`-sendMessage:replyHandler:errorHandler:`

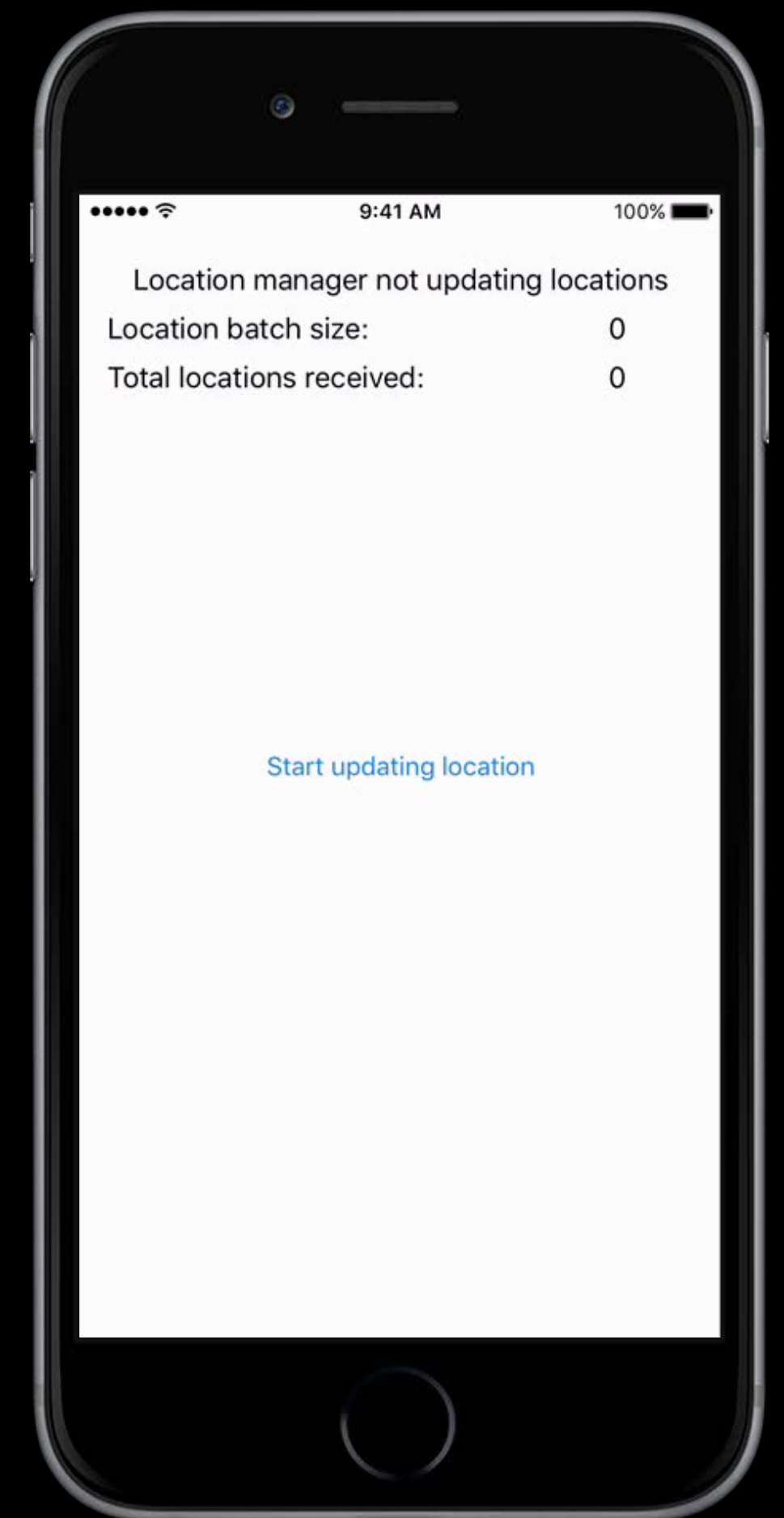


Sending Messages

iPhone -> Apple Watch

`-sendMessage:replyHandler:errorHandler:`

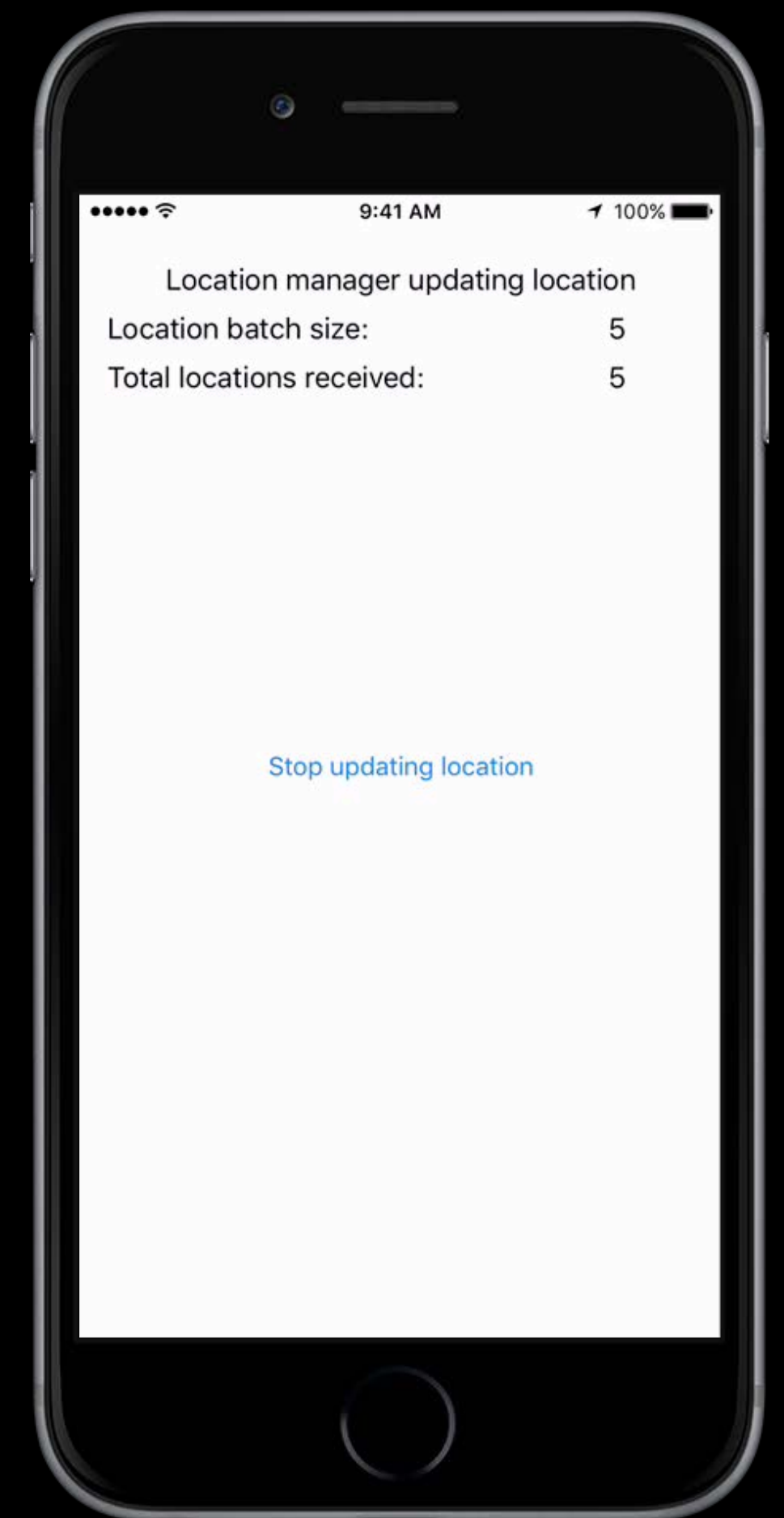
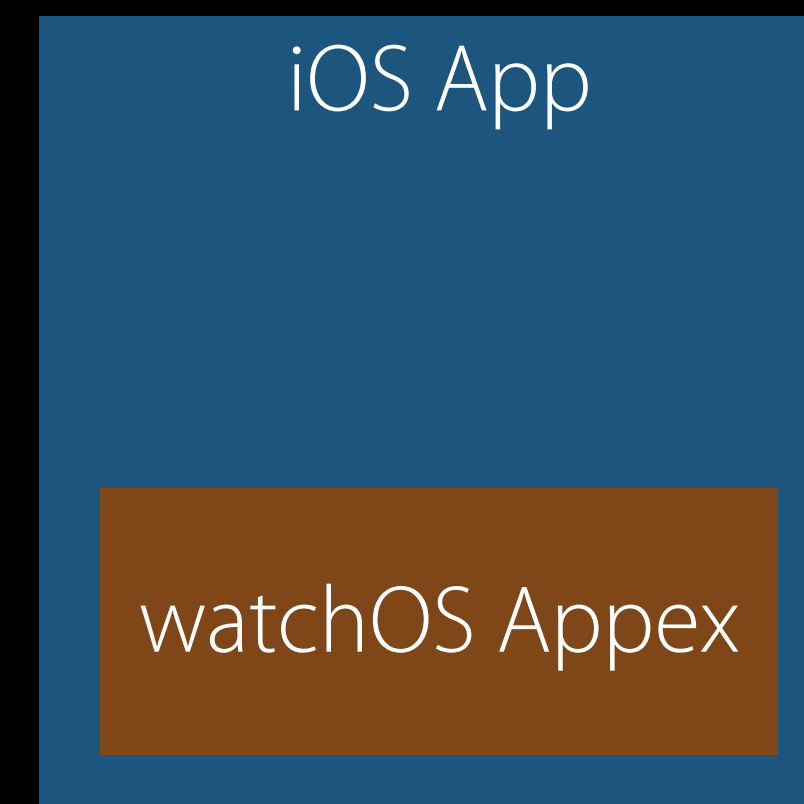
- Must be running



Sending Messages

iPhone -> Apple Watch

`-updateApplicationContext:`

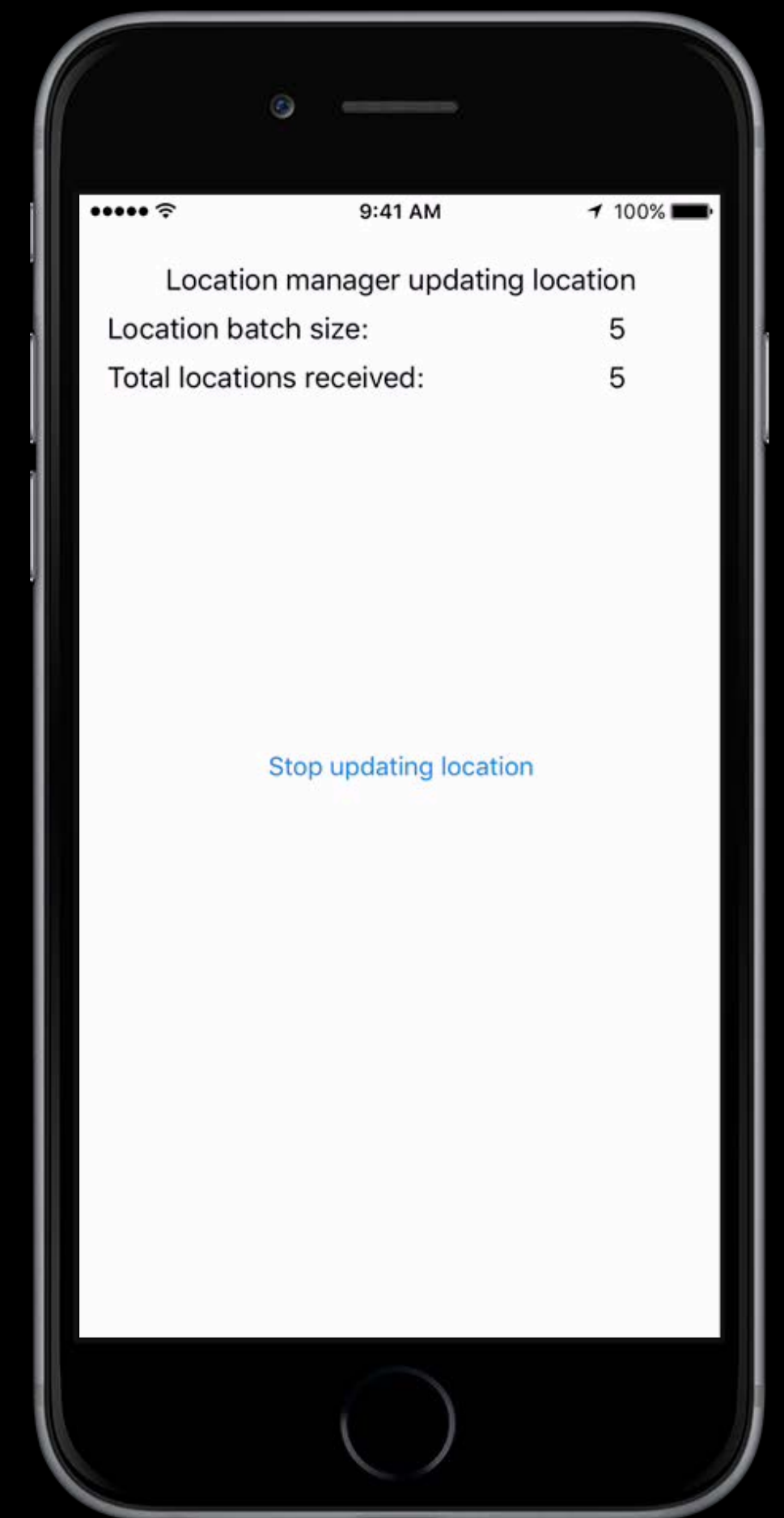
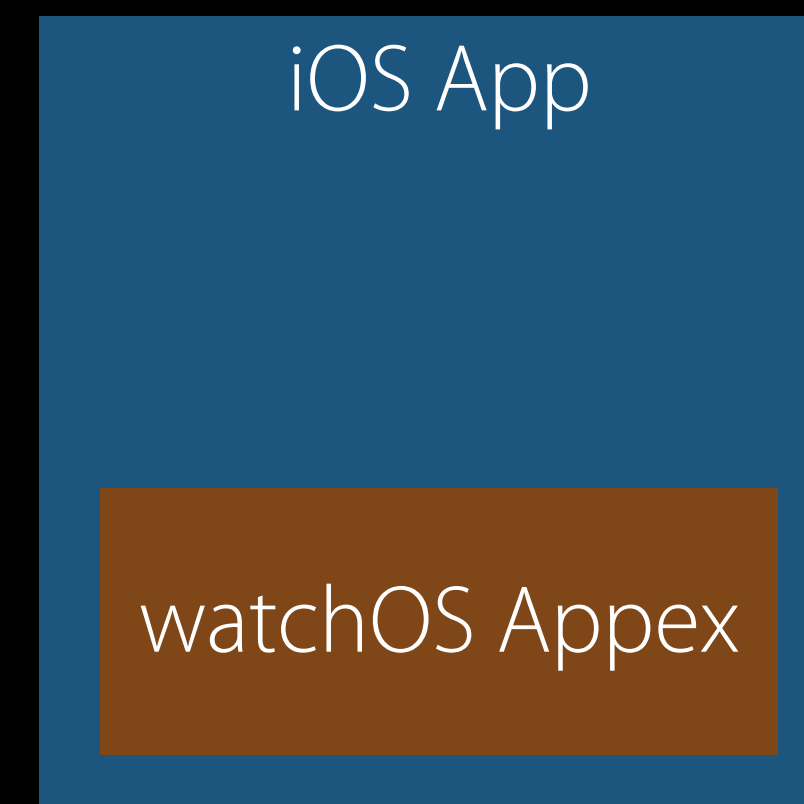


Sending Messages

iPhone -> Apple Watch

-updateApplicationContext:

- Last one kept

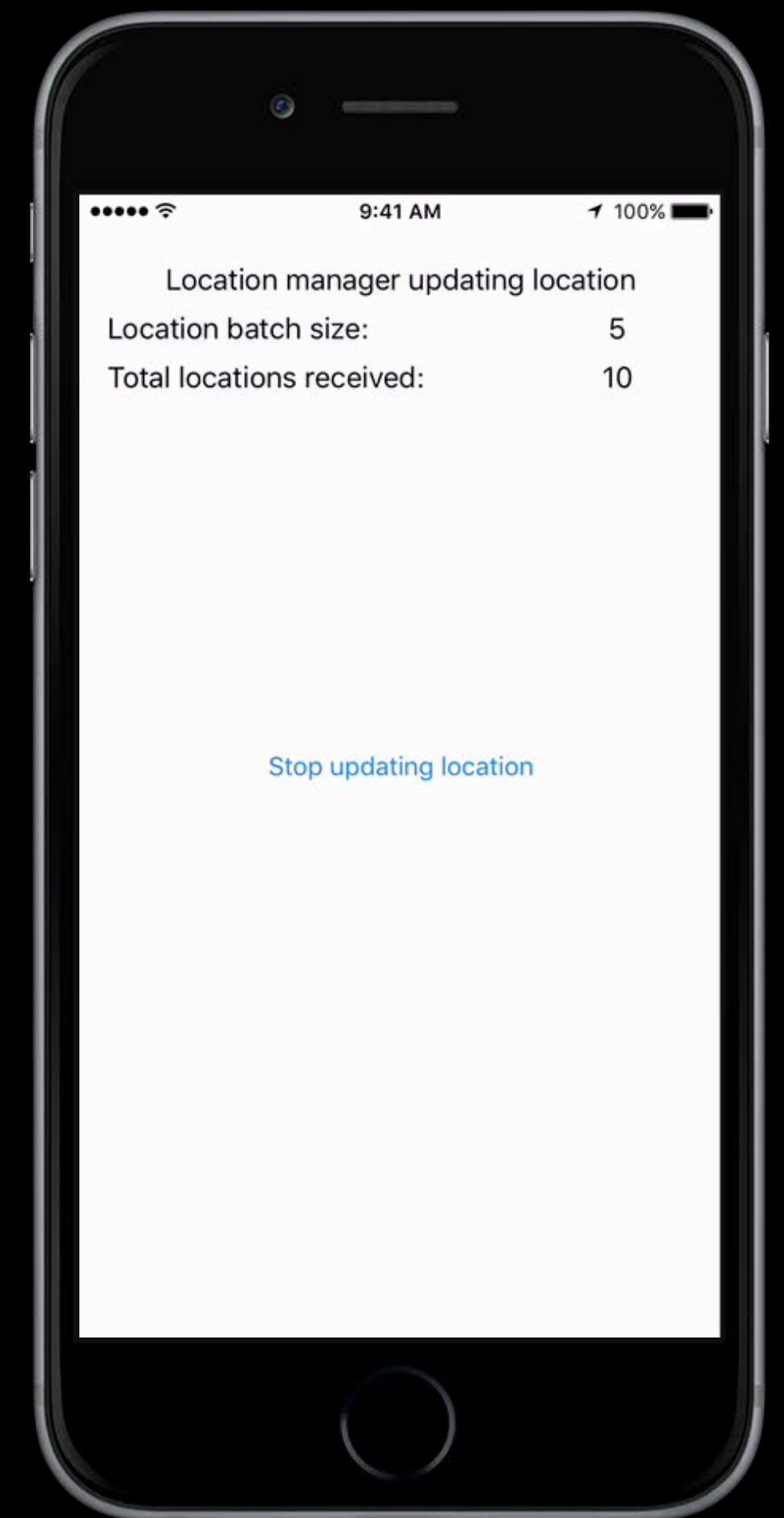
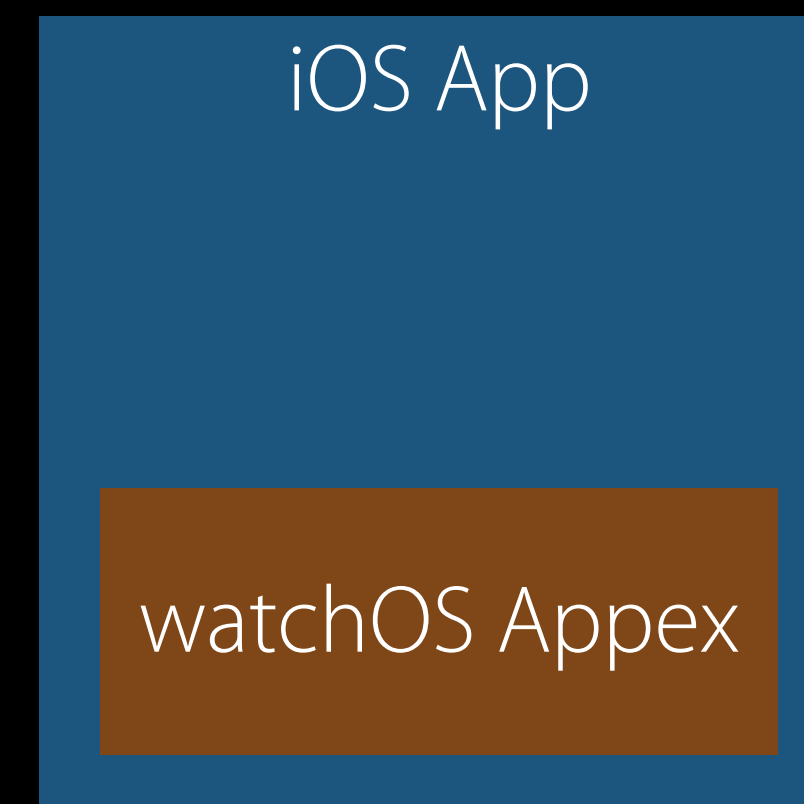


Sending Messages

iPhone -> Apple Watch

-updateApplicationContext:

- Last one kept

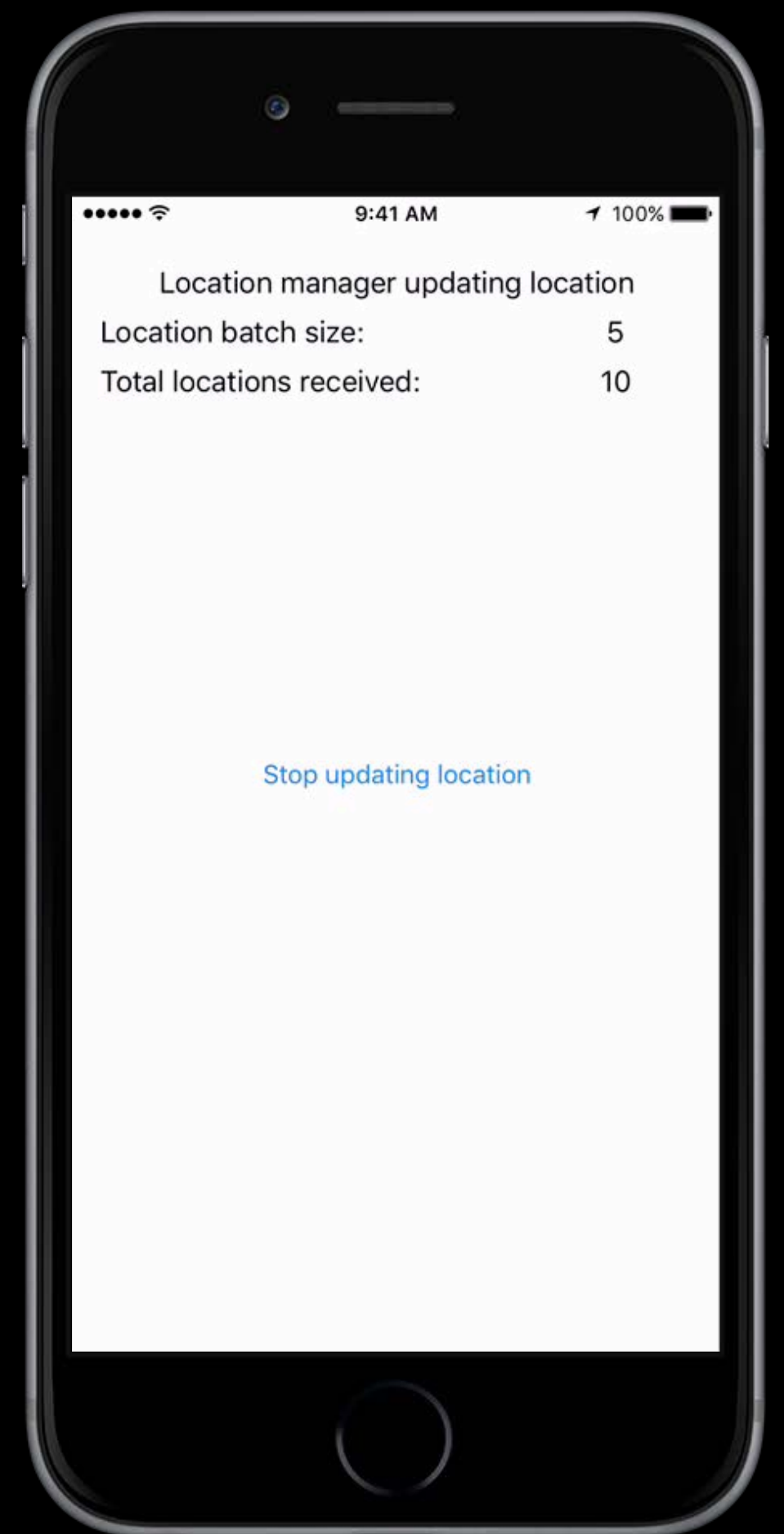


Sending Messages

iPhone -> Apple Watch

-updateApplicationContext:

- Last one kept

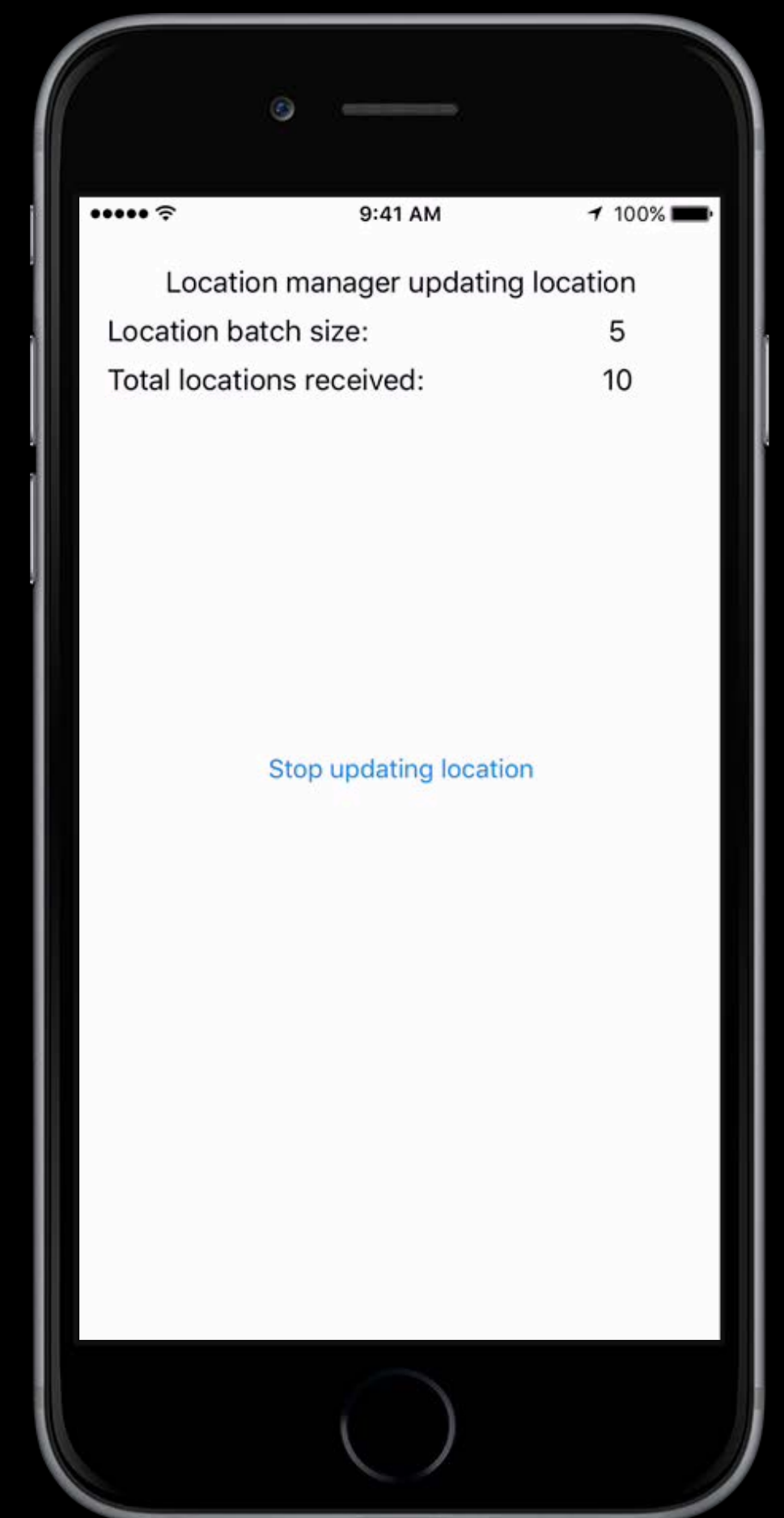


Sending Messages

iPhone -> Apple Watch

-updateApplicationContext:

- Last one kept
- -allowDeferredLocationUpdatesUntilTraveled:timeout:



allowsBackgroundLocationUpdates

allowsBackgroundLocationUpdates

–requestLocation

allowsBackgroundLocationUpdates

–requestLocation

Cooperation: PotLoc

allowsBackgroundLocationUpdates

–requestLocation

Cooperation: PotLoc

Frameworks Lab @ 2:30-4:10PM

More Information

Sample Code

PotLoc Sample Code

<https://developer.apple.com/sample-code/wwdc/2015/>

Technical Support

Apple Developer Forums

<http://developer.apple.com/forums>

General Inquiries

Craig Keithley Technology Evangelist

keithley@apple.com

Jake Behrens App Frameworks Evangelist

behrens@apple.com

Related Sessions

Introducing WatchKit for watchOS 2	Presidio	Tuesday 10:00AM
What's New in Core Motion	Nob Hill	Tuesday 3:30PM
What's New in MapKit	Nob Hill	Tuesday 4:30PM
Achieving All-Day Battery Life	Nob Hill	Wednesday 9:00AM
Debugging Energy Issues	Nob Hill	Wednesday 10:00AM
What's New in Core Audio	Nob Hill	Wednesday 4:30PM
Introducing Watch Connectivity	Pacific Heights	Thursday 11:00AM

Related Lab

Core Location Lab	Frameworks Lab A	Thursday 2:30PM
-------------------	------------------	-----------------

