iOS Configuration and APIs for Kiosk and Assessment Apps

Session 716

Steve Hayman, Consulting Engineer
Locking iPad to a Single App
The Four Ways to Lock an App
# The Four Ways to Lock an App

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- **Guided Access**: No device supervision required. Requires passcode or device restart. API support not required.
- **Single App Mode**: Requires MDM or Apple Configurator 2. API support not required.
- **Autonomous Single App Mode**: Requires MDM. App releases itself or device restart. API support required.
- **Automatic Assessment Configuration**: No device supervision required. App releases itself or device restart. API support required with app entitlement.
Locking iPad to a Single App
Programmatically
Guided Access
Circle areas on the screen you would like to disable.
Guided Access
User Considerations

- Any application
- Any device
- Timer Feature
- Setup by anyone
- Restart releases app lock
Guided Access
User Considerations

- Any application
- Any device
- Timer Feature
- Setup by anyone
- Restart releases app lock

⚠ Must touch the device
⚠ Lock requires a passcode
Single App Mode
A quick look at single app mode
Virtual Tour of New York

Welcome to NYC

Statue of Liberty
Ellis Island
Empire State Building
Grand Central Terminal
Brooklyn Bridge
Times Square

This Month in NYC

What’s on Broadway

Tours
Lock To App
The app to run in Single App Mode (supervised only)

Kiosk App

Options
Settings enforced when in Single App Mode

- Touch
- Motion
- Volume Buttons
- Side Switch
- Sleep/Wake Button
- Auto-Lock
- VoiceOver
- Zoom
- Invert Colors
- AssistiveTouch
- Speak Selection
- Mono Audio
Lock To App
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Single App Mode
User Considerations

- Can lock 1000s of iOS Devices
- Device stays locked after restart
- Can force accessibility options
Single App Mode

User Considerations

- Can lock 1000s of iOS Devices
- Device stays locked after restart
- Can force accessibility options

Requires Device Supervision

Requires MDM or Apple Configurator 2

IT intervention to lock or unlock

Developers can't control this
Can an App Control Exactly When App Lock Happens?
# Upcoming Appointments

<table>
<thead>
<tr>
<th>Name</th>
<th>Appointment Type</th>
</tr>
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<tbody>
<tr>
<td>Elizabeth Abeles</td>
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</tr>
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<td>Lamont Andrews</td>
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### Messages
- **834750345**
  - Lab results available for Xavier Galloway
- **740455212**
  - Lab results submitted for Avery Bishop

### Dr. Steve Hayman's Dashboard

- **Sex:**
- **Birth Date:**
- **Chart ID:**

### Payment
- **Payment:**
- **Co-Pay:**
- **Billing Status:**

### Begin Onboarding
<table>
<thead>
<tr>
<th>Upcoming Appointments</th>
<th>Photo</th>
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**Messages**

- 834750345 Lab results available for Xavier Galloway
- Philip Allen Insurance Claim Approved
- 740455212 Lab results submitted for Avery Bishop

**Dr. Steve Hayman’s Dashboard**

- Begin Onboarding
Patient Check In

First Name
Last Name
Telephone No.
Insurance
Reason for Visit
Please List Any Known Allergies

Check In
Patient Check In

First Name: Lamont
Last Name: Andrews
Telephone No.: 408-555-1212
Insurance: Example
Reason for Visit: WWDC brain overload
Please List Any Known Allergies: Shellfish, peanuts, gluten, broccoli
Thank you!

Please return to front desk
Upcoming Appointments

Elizabeth Abeles
General Visit

Philip Allen
Followup

Lamont Andrews
New Patient

Savannah Cashman
Annual Visit

Jordon Alvarez
General Visit

Abigail Fisher
New Patient

Michelle Auger
New Patient

Andrew Boddiford
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Messages

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Have We Got a Function for You
UIAccessibilityIsGuidedAccessEnabled()

UIAccessibilityRequestGuidedAccessSession()
UIAccessibilityRequestGuidedAccessSession()

UIAccessibilityIsGuidedAccessEnabled()

UIAccessibilityGuidedAccessStatusDidChangeNotification
UIAccessibilityRequestGuidedAccessSession()

UIAccessibilityIsGuidedAccessEnabled()

UIAccessibilityGuidedAccessStatusDidChangeNotification
At Last, Some Code
UIAccessibilityRequestGuidedAccessSession
UIAccessibilityRequestGuidedAccessSession(true)
UIAccessibilityRequestGuidedAccessSession(true) {

}
UIAccessibilityRequestGuidedAccessSession(true) { requestSucceeded in }

UIAccessibilityRequestGuidedAccessSession(true) {
    requestSucceeded in
    if requestSucceeded {
        // the device is now locked
    }
}
startPatientCheckin()
UIAccessibilityRequestGuidedAccessSession(true) {
    requestSucceeded in
    if requestSucceeded {
        startPatientCheckin()
    }
}
finishPatientCheckin()
UIAccessibilityRequestGuidedAccessSession(false) {
  requestSucceeded in
  if requestSucceeded {
    finishPatientCheckin()
  }
}
if UIAccessibilityIsGuidedAccessEnabled() {
    print("App Lock is On")
}

// Register for a notification
// whenever guided access state changes.
NotificationCenter.default.addObserver(
    forName: .UIAccessibilityGuidedAccessStatusDidChange,
    object: nil,
    queue: OperationQueue.main) { _ in

    let status = UIAccessibilityIsGuidedAccessEnabled()
    // App Lock status has changed.
    print("Notification: App Lock Status is now
    \(status ? "On" : "Off")")

}
Autonomous Single App Mode
(ASAM)
ASAM Requirements

Your app must call `UIAccessibilityRequestGuidedAccessSession()`

Devices must be supervised

App must be whitelisted with MDM
Autonomous Single App Mode (supervised only)

Allow these apps to enter Single App Mode

On-boarding App

Restrict App Usage (supervised only)

Allow All Apps
<key>autonomousSingleAppModePermittedAppIDs</key>
<array>
  <string>com.example.on-boarding</string>
</array>
Autonomous Single App Mode

User Considerations

- Apps can lock and unlock themselves
- Developer controls when app is locked
- Can prevent accidental exit of app
- Useful for customer on-boarding
Autonomous Single App Mode

User Considerations

- Apps can lock and unlock themselves
- Developer controls when app is locked
- Can prevent accidental exit of app
- Useful for customer on-boarding

Requires device supervision
Requires MDM
IT must specifically whitelist the app
Locking iPads for Assessment
Securing iPad for an Assessment App

Guided Access?

Single App Mode?

Autonomous single app mode with MDM?
Securing iPad for an Assessment App

Automatic Assessment Configuration
Assessment Challenges
Secure Test Environment

Locks into single dedicated testing app
Prevents access to outside resources
Prevents sharing of content
Securing iPad for Assessments
Securing iPad for Assessments

- Camera
- Home Button
- App and Lookup Functions
Securing iPad for Assessments
Securing iPad for Assessments

- Keyboard Shortcuts
- Dictionary / Definition Lookup
- Predictive Keyboard
- Autocorrect/Spellcheck
- Sharing
- Universal Clipboard
- Dictation
- Siri
Automatic Assessment Configuration
Automatic Assessment Configuration
Ideal for assessment apps
Automatic Assessment Configuration

Ideal for assessment apps

Lock the device, like Autonomous Single App Mode

- `UIAccessibilityRequestGuidedAccessSession()`
Automatic Assessment Configuration
Ideal for assessment apps

Lock the device, like Autonomous Single App Mode
- `UIAccessibilityRequestGuidedAccessSession()`

Automatically disabled
- Auto correct
- Spell Check
- Define
- Predictive Keyboard
- Keyboard shortcuts
- Sharing
- Universal Clipboard
- Background apps
- Dictation
- Siri
- Classroom Observation
Automatic Assessment Configuration

Requirements

Entitlement `com.apple.developer.edu-assessment-mode`

• Managed or unmanaged iOS devices
• No need for app whitelisting
Once It’s Locked, How Does It Unlock?

If the user allows locking

• iOS is locked to this app, until one of these happens
  - The app unlocks via `UIAccessibilityRequestGuidedAccessSession(false)`
  - The user restarts the device
  - Eight hours have elapsed
App Lock is Disabled

Enable App Lock  Disable App Lock

(Disabled) Notification: App Lock Status is now Off
App Lock is Disabled

Enable App Lock

Disable App Lock

(Disabled) Notification: App Lock Status is now Off

Confirm App Self-Lock
ASAMpie wants to start Single App Mode. You will be unable to use other apps on iPad until ASAMpie ends Single App Mode. Do you want to allow this?

No
Yes
Your iPad is now locked to ASAMple. Your iPad will be unlocked when ASAMple ends Single App Mode, or after 8 hours.

Enable App Lock

Try typing here. Test auto correct and lookup.

(Enabled) Enable App Lock request - Succeeded
(Enabled) Notification: App Lock Status is now On
(Disabled) Notification: App Lock Status is now Off

Disable App Lock
App Lock is Enabled

Enable App Lock

Disable App Lock

(Enabled) Enable App Lock request - Succeeded
(Enabled) Notification: App Lock Status is now On
(Disabled) Notification: App Lock Status is now Off
Your iPad is no longer locked to ASAMple.
Automatic Assessment Configuration

User Considerations

- Apps can lock and unlock themselves
- Inappropriate features automatically disabled
- Developer controls when app is locked
- No device supervision is required
- No MDM requirement
Automatic Assessment Configuration

User Considerations

- Apps can lock and unlock themselves
- Inappropriate features automatically disabled
- Developer controls when app is locked
- No device supervision is required
- No MDM requirement

⚠ Requires special app entitlement
⚠ Entitlement only useful for assessment developers
Implementing AAC
Implementing Automatic Assessment Configuration

Apply for the `com.apple.developer.edu-assessment-mode` entitlement
• It is granted only to assessment developers

Create a provisioning profile with this entitlement

Build your app with this profile
Requesting Code-level Support

Submit a [Technical Support Incident (TSI)](https://example.com) if you cannot fix a bug in your app, have trouble implementing an Apple technology, or have other questions about your code. Your incident will be assigned to an Apple support engineer who can help troubleshoot your code or provide workarounds to fast-track your development.

Name: John Appleseed
Email: jappleseed@apple.com
Organization: Select team
Platform: Select platform
Do you need additional entitlements?

To include extended entitlements in this provisioning profile, select an option in the menu below. If you want to use only standard entitlements in this profile without adding extended entitlements, select default.

Entitlements: EDU Assessment Mode (Dev)

Extended Entitlements:

```
com.apple.developer.edu-assessment-mode true
```
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Entitlements: EDU Assessment Mode (Dev)

Extended Entitlements

com.apple.developer.edu-assessment-mode: true
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**Entitlements:** EDU Assessment Mode (Dev)

Extended Entitlements

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<td>ASAMple - Development</td>
<td>iOS Development</td>
<td>Active</td>
</tr>
<tr>
<td>ASAMple - Distribution</td>
<td>iOS UniversalDistribution</td>
<td>Active</td>
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Entitlements: 5 Included
- Includes get-task-allow
- com.apple.developer.edu-assessment-mode
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- Includes `get-task-allow`
- Includes `com.apple.developer.edu-assessment-mode`,
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When to Call These Functions

Call `UIAccessibilityRequestGuidedAccessSession(true)` when ready to enter the secure part of your test

Call `UIAccessibilityRequestGuidedAccessSession(false)` when ready to relinquish the lock

• Check the result to see if it worked!
AAC Additional Considerations
When Can an App Lock Request Fail?

UIAccessibilityRequestGuidedAccessSession(true) { didSucceed in
When Can an App Lock Request Fail?

For Autonomous Single App Mode

- The device isn’t supervised
- Your app’s Bundle Identifier hasn’t been white-listed via MDM
When Can an App Lock Request Fail?

`UIAccessibilityRequestGuidedAccessSession(true) { didSucceed in`

For Autonomous Single App Mode

- The device isn’t supervised
- Your app’s Bundle Identifier hasn’t been white-listed via MDM

For Automatic Assessment Configuration

- Your app doesn’t have the `com.apple.developer.edu-assessment-mode` entitlement
When Can an App Lock Request Fail?

For Autonomous Single App Mode
• The device isn’t supervised
• Your app’s Bundle Identifier hasn’t been white-listed via MDM

For Automatic Assessment Configuration
• Your app doesn’t have the com.apple.developer.edu-assessment-mode entitlement

Or—
• It’s already locked
Ensuring Automatic Assessment Configuration Setup
Ensuring Automatic Assessment Configuration Setup

AAC restrictions are only there if your app successfully requested App Lock.
Ensuring Automatic Assessment Configuration Setup

AAC restrictions are only there if your app successfully requested App Lock

Before enabling App Lock, check if it's already on

• If it's already on, do not proceed with the test
// On startup. Check at least 2 seconds after app launch.

DispatchQueue.main.asyncAfter(deadline: .now() + 2.0) {
    if UIAccessibilityIsGuidedAccessEnabled() {
        // Guided Access or SAM is enabled.
        // Test should not proceed
        // until this is fixed.
        print("Test should not proceed.")
    }
}
// Start the test, provided we aren't already locked

guard UIAccessibilityIsGuidedAccessEnabled() == false else {
    print("Unable to start test. Device already locked.")
    return
}

// Attempt to lock, and proceed if it worked.
UIAccessibilityRequestGuidedAccessSession(true) { didSucceed in
    if didSucceed {
        // successfully locked
        beginStandardizedTest()
    } else {
        print("Unable to lock.")
    }
}
Clearing the Pasteboard on Entry and Exit

```swift
UIPasteboard.general.items = []
```
Disabling Third Party Keyboards

iOS Allows third-party keyboards via App Extensions

They are not blocked by Automatic Assessment Configuration
What is the capital of Canada?
What is the capital of Canada?
What is the capital of Canada?
What is the capital of Canada?
// App Delegate

func application(_ application: UIApplication,
    shouldAllowExtensionPointIdentifier extensionPointIdentifier: UIApplicationExtensionPointIdentifier) -> Bool {

    // Disallow custom keyboard extensions
    if extensionPointIdentifier == .keyboard {
        return false
    }

    // Currently, the keyboard extension is the only one that can
    // be disallowed, but we will disallow all other types too
    return false

}
ASAM vs. AAC
Autonomous Single App Mode (ASAM)

Automatic Assessment Configuration (AAC)

UIAccessibilityRequestGuidedAccessSession()
<p>| ASAM (Device Supervision + MDM) | AAC (Any Device + App Entitlement) |</p>
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More Information

https://developer.apple.com/wwdc17/716