

Security Configuration Benchmark For

Apple iOS 4.3.3

Version 1.3.0

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Overview

This document, *Security Configuration Benchmark for Apple iOS 4.3.3*, provides prescriptive guidance for establishing a secure configuration posture for the Apple iOS version 4.3.3. This guide was tested against the Apple iOS 4.3.3 and the iPhone Configuration Utility (iPCU) v3.3.0.247. This benchmark covers the Apple iOS 4.3.3 and all hardware devices on which this iOS is supported. As of the publication of this guidance, mobile devices supported by iOS 4.3.3 include the following:

- iPhone 4 (GSM model)
- iPhone 3GS
- iPad 2
- iPad
- iPod touch (4th generation)
- iPod touch (3rd generation)

In determining recommendations, the current guidance treats all iOS mobile device platforms as having the same use cases and risk/threat scenarios. In all but a very few cases, configuration steps, default settings, and benchmark recommended settings are identical regardless of hardware platform; for the few cases where variation exists, the benchmark notes the difference within the respective section. To obtain the latest version of this guide, please visit <http://cisecurity.org>. If you have questions, comments, or have identified ways to improve this guide, please write us at feedback@cisecurity.org.

Consensus Guidance

This guide was created using a consensus review process comprised of volunteer and contract subject matter experts. Consensus participants provide perspective from a diverse set of backgrounds including consulting, software development, audit and compliance, security research, operations, government, and legal.

Each CIS benchmark undergoes two phases of consensus review. The first phase occurs during initial benchmark development. During this phase, subject matter experts convene to discuss, create, and test working drafts of the benchmark. This discussion occurs until consensus has been reached on benchmark recommendations. The second phase begins after the benchmark has been released to the public Internet. During this phase, all feedback provided by the Internet community is reviewed by the consensus team for incorporation in the CIS benchmark. If you are interested in participating in the consensus review process, please send us a note to feedback@cisecurity.org.

Intended Audience

This document is intended for system and application administrators, security specialists, auditors, help desk, end users, and platform deployment personnel who plan to use, develop, deploy, assess, or secure solutions that incorporate the Apple iOS 4.3.3.

Acknowledgements

This benchmark exemplifies the great things a community of users, vendors, and subject matter experts can accomplish through consensus collaboration. The CIS community thanks the entire consensus team with special recognition to the following individuals who contributed greatly to the creation of this guide:

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Typographic Conventions

The following typographical conventions are used throughout this guide:

Convention	Meaning
<code>Stylized Monospace font</code>	Used for blocks of code, command, and script examples. Text should be interpreted exactly as presented.
<code>Monospace font</code>	Used for inline code, commands, or examples. Text should be interpreted exactly as presented.
<i><italic font in brackets></i>	Italic texts set in angle brackets denote a variable requiring substitution for a real value.
<i>Italic font</i>	Used to denote the title of a book, article, or other publication.
Note	Additional information or caveats

Configuration Levels

This section defines the configuration levels that are associated with each benchmark recommendation. Configuration levels represent increasing levels of security assurance.

Level-I Benchmark settings/actions

Level-I Benchmark recommendations are intended to:

- be practical and prudent;
- provide a clear security benefit; and
- not negatively inhibit the utility of the technology beyond acceptable means

Level-II Benchmark settings/actions

Level-II Benchmark recommendations exhibit one or more of the following characteristics:

- intended for environments or use cases where security is paramount
- act as defense in depth measure
- may negatively inhibit the utility or performance of the technology

Scoring Status

This section defines the scoring statuses used within this document. The scoring status indicates whether compliance with the given recommendation is discernable in an automated manner.

Scorable

The platform's compliance with the given recommendation can be determined via automated means.

Not Scorable

The platform's compliance with the given recommendation cannot be determined via automated means.

Recommendations

The settings recommended in this benchmark are those available through configuration of the device either directly through its local interface, through manufacturer-provided external configuration tools, and through configuration capabilities provided by Exchange ActiveSync mailbox policies. In considering the recommendations made in this benchmark, the device was considered both as a target itself and as a method of accessing other resources. These benchmark settings provide certain protections from remote attacks against the device and from unauthorized device access in the event the device is lost.

In determining the recommendations provided in this benchmark, the team considered the built-in encryption feature provided with the iOS 4.3.3-capable devices and has determined that this encryption feature does not obviate any of the recommendations made in the guide. The recommendations do not assert sufficient protections against advanced local attacks to gain device access or data recovery which may be possible in the event a device is lost.

Loss of Physical Custody of an iPhone and Compensating Controls

The combined *Set a passcode*, *Set auto-lock timeout*, and *Erase data upon excessive passcode failures* recommendations in the Level I and Level II Benchmark profiles provide a basic level of protection against unauthorized device and data access in the event of a lost device.

Certain non-configuration controls are available through 3rd-party and subscription-based tools and should be considered.

- A remote wipe feature can be activated as a compensating corrective control for iOS 4.3.3 devices, available through four mechanisms:
 - Exchange ActiveSync Mobile Administration Web Tool (MS Exchange Server 2003 and MS Exchange Server 2007)
 - Exchange Management Console (MS Exchange Server 2007)
 - Outlook Web Access (MS Exchange Server 2007)
 - Apple MobileMe Subscription Service
- In addition to supporting *Remote Wipe*, the MobileMe subscription service also supports a *Find My iPhone/iPad/iPod touch* feature (to locate an iOS device on a map), a *Set a passcode* feature (to remotely set a passcode on and lock a device), and the option to display a message or play a sound on a lost device.
- Third-party encryption apps are available to protect the confidentiality of data for advanced applications and should be considered where advanced protections are required.

Organizational policies and education/awareness programs to ensure device owners know to notify the appropriate channels in a timely manner for incident response, including the activation of remote wipe and related actions, are important to effectively realize the benefits the remote action features can provide.

1. Settings in the iOS User Interface

This section provides guidance on the secure configuration of iOS mobile devices using the device user interface.

1.1 System Settings

This section provides guidance on the secure configuration of system settings.

1.1.1 Update firmware to latest version (Level 1, Not Scorable)

Description:

An iOS mobile device ships with whichever version of the firmware was current when it was manufactured, but updates may have been released since then. It is recommended that the device firmware remain current.

Rationale:

Firmware updates include not only new features and bug fixes but security fixes as well. Also, the device must be running firmware version 4.3.3 for these benchmark recommendations to apply; if a newer version of the firmware is available, some recommendations may not apply.

Remediation:

1. Connect the device to the computer.
2. Open iTunes.
3. Click on the device under “Devices” in the source list.
4. Click on “Check for Update”.
5. Click “Download and Install”.
6. Do not disconnect the iPhone until the update is finished.

Audit:

1. Tap Settings.
2. Tap General.
3. Tap About.
4. Confirm that “Version” is 4.3.3.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.2 Require Passcode on Device (Level 1, Not Scorable)

Description:

iOS can be configured to require a passcode before allowing usage via the touch screen. By default, a passcode is not required to unlock the screen. It is recommended that a passcode be set.

Rationale:

In the event of a physical security incident, a passcode will not guarantee data integrity, but it will raise the bar of effort required to compromise the device.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Passcode Lock.
4. Tap “Turn Passcode On”
5. Tap in a four-digit passcode.
6. Tap in the same four-digit passcode.

Note: The passcode can also be set via the iPhone Configuration Utility (iPCU) as described in section [Settings in the iPCU](#).

Audit:

1. Tap Settings.
2. Tap General.
3. Confirm that Passcode Lock is turned on.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.3 Configure an alphanumeric value (Level 2, Not Scorable)

Description:

iOS can be configured to allow a passcode comprised of numeric, alphabetic, and non-alphanumeric values. By default, iOS does not permit a complex passcode. It is recommended that numeric, alphabetic, and non-alphanumeric values comprise the passcode. Note that this configuration setting does not require that the password entered contain a letter, number, or symbol, it just allows that such characters from the alphanumeric keyboard be input in the passcode dialog.

Rationale:

Using a mix of alphabetical, numerical, and non-alphanumerical characters increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Passcode Lock
4. Enter current passcode if configured.
5. Turn off Simple Passcode.
6. Enter previous password when prompted.
7. Enter new complex passcode twice as prompted.

Note: Passcode complexity can also be set—and can be enforced—via the iPhone Configuration Utility (iPCU) as described in section [Settings in the iPCU](#).

Audit:

1. Tap Settings.
2. Tap General.
3. Tap Passcode Lock
4. Enter current passcode as prompted.
5. Confirm that Simple Passcode is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.4 Set auto-lock timeout (Level 1, Not Scorable)

Description:

An iOS device can be configured to auto-lock after a pre-defined inactivity period. By default, if a passcode is defined, the device will automatically lock after one minute of inactivity. It is recommended that an inactivity timeout be set.

Rationale:

If the user has set an auto-lock interval of greater than five minutes, there is a greater risk that the device will be in an unlocked state during a physical security breach.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Auto-Lock.
- 4a. For typical use cases, tap “5 Minutes” or less.
- 4b. For high-security use cases using an iPhone or iPod touch,, tap “1 Minute”.
- 4c. For high security use cases using an iPad, tap “2 Minutes”.

Note: The auto-lock timeout can also be set via the iPhone Configuration Utility (iPCU) as described in section [Settings in the iPCU](#).

Audit:

1. Tap Settings.
2. Tap General.
- 3a. For typical use cases, confirm that the Auto-Lock is set to 5 minutes or less.
- 3b. For high-security use cases with an iPhone or iPod touch,, confirm that Auto-Lock is set to 1 minute.
- 3c. For high security use cases using an iPad, confirm that Auto-Lock is set to 2 Minutes.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.5 Erase data upon excessive passcode failures (Level 1, Not Scorable)

Description:

An iOS device can be configured to erase the user's settings and data as stored on the device after excessive (10) passcode failures. It is recommended that this feature be enabled.

Rationale:

Excessive passcode failures typically indicate that the device is out of physical control of its owner. Upon such an event, erasing data on the phone will ensure the confidentiality of information stored on the device is protected when facing a novice attacker.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Passcode Lock.
4. Enter current passcode as prompted.
5. Turn on Erase Data.
6. Tap "Enable" on confirmation dialog.

Note: The "Erase data upon excessive password failures" setting can also be set via the iPhone Configuration Utility (iPCU) as described in section [Settings in the iPCU](#).

Audit:

1. Tap Settings.
2. Tap General.
3. Tap Passcode Lock.
4. Enter current passcode as prompted.
5. Confirm that Erase Data is turned on.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.6 Forget Wi-Fi networks to prevent automatic rejoin (Level 2, Not Scorable)

Description:

An iOS device can be configured to forget Wi-Fi networks that it has previously associated with. By default, a device will remember and automatically join networks that it has previously associated with. It is recommended that networks be forgotten after use in use cases where security is paramount.

Rationale:

A trusted but unauthenticated Wi-Fi network may be spoofed and automatically joined if it is not forgotten after last use. Additionally, if such a network has a common SSID, such as "default" or "linksys", it is probable that the iPhone will encounter an untrusted instance of a same-named Wi-Fi network and automatically join it.

Remediation:

1. Tap Settings.
2. Tap Wi-Fi.
3. From the Choose a Network list, locate the network SSID and tap the chevron next to the Wi-Fi network you want to forget.
4. Tap “Forget this network.”
5. Tap “Forget” on the confirmation dialog.

Note: Wi-Fi must be turned on and the Wi-Fi network must be in range for it to appear in the list of available networks to configure. The Wi-Fi network must be remembered or currently connected for the “Forget this network” option to be present. If the Wi-Fi network is no longer in range, the user will not be able to selectively forget it, but instead must reset all network settings to forget all Wi-Fi networks.

Audit:

1. Tap Settings.
2. Tap Wi-Fi.
3. From the Choose a Network list, locate the network SSID and tap the chevron next to the Wi-Fi network to check.
4. Confirm that the network configuration does not have the “Forget this network” option available.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.7 Turn off Ask to Join Networks (Level 2, Not Scorable)

Description:

When the user is trying to access the Internet, by using Safari or Mail for example, and the user is not in range of a Wi-Fi network the user has previously used, this option tells the device to look for another network. A list of all available Wi-Fi networks that the user can choose from will be displayed. If “Ask to Join Networks” is turned off, the user must manually search for a network to connect to the Internet when a previously used network or a cellular data network is not available. It is recommended that this capability be disabled in environments where security is paramount.

Rationale:

Requiring the user to manually configure and join a Wi-Fi network reduces the risk of inadvertently joining a similarly named yet untrusted network (i.e. “default” vice “defualt”).

Remediation:

1. Tap Settings.
2. Tap Wi-Fi.
3. Turn off “Ask to Join Networks”.

Note: Wi-Fi must be turned on for the above Wi-Fi configuration option to appear.

Audit:

1. Tap Settings.
2. Tap Wi-Fi.
3. Confirm that “Ask to Join Networks” is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.8 Turn off Auto-Join for all Wi-Fi networks (Level 2, Not Scorable)

Description:

When Wi-Fi Auto-Join is turned on for a Wi-Fi network, the device remembers the network and login information and automatically reconnects to that Wi-Fi network whenever the device is in range. Some subscription Wi-Fi networks may not support Auto-Join and require a manual log in each time.

Rationale:

There are some potential risks in using this feature. For Wi-Fi networks that require HTTP(S) forms authentication, this feature will cause credentials to persist on disk. If physical custody of the device is lost, the confidentiality of the persisted credentials—and the resources protected by them—may be at risk if the attacker retrieves the device’s contents prior to a remote wipe being successfully executed. Additionally, if the given forms-based authentication occurs over unencrypted HTTP, the confidentiality of the credentials is at risk while in transit. While this is also true in the absence of the Auto-Join feature, enabling the feature may expose credentials at unexpected times and locations.

Remediation:

1. Tap Settings.
2. Tap Wi-Fi.
3. From the Choose a Network list, locate the network SSID and tap the chevron next to the network to change.
4. Turn off Auto-Join.
5. Repeat steps 3 and 4 for each network SSID.

Note: Wi-Fi must be turned on and the Wi-Fi network must be in range for it to appear in the list of available networks to configure. The Wi-Fi network must be remembered or currently connected for the Auto-Join option to be present.

Audit:

1. Tap Settings.
2. Tap Wi-Fi.
3. From the Choose a Network list, locate the network SSID and tap the chevron next to the network to change.
4. Confirm that Auto-Join is turned off.
5. Repeat steps 3 and 4 for each network SSID.

References:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf
2. iPhone and iPod touch: Understanding subscription Wi-Fi networks
<http://support.apple.com/kb/HT3867>

1.1.9 Turn off Wi-Fi when not needed (Level 2, Not Scorable)

Description:

iOS devices can be configured to participate in Wi-Fi networks. It is recommended that Wi-Fi be disabled when not needed or where security is paramount.

If Wi-Fi is turned off on a device with cellular data service, connections to the Internet will occur via the cellular data network, when available. Applications such as Mail, Safari, YouTube, Stocks, Maps, Weather, and the App Store can be run over a cellular data network connection, but there may be a limit on the maximum download size of items for certain apps.

Rationale:

Disabling the Wi-Fi interface reduces the remote attack surface of the device. Additionally, at present, the cellular data network is a more difficult medium to sniff than Wi-Fi.

Remediation:

1. Tap Settings.
2. Tap Wi-Fi.
3. Turn off Wi-Fi.

Audit:

1. Tap Settings.
2. Tap Wi-Fi.
3. Confirm that Wi-Fi is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.10 Turn off VPN when not needed (Level 1, Not Scorable)

Description:

iOS devices can connect to VPNs that use the L2TP, PPTP, or Cisco IPSec protocols. VPN connections can be established over both Wi-Fi and cellular data network connections. It is recommended that VPN connections be disabled when not in use.

Rationale:

If the user has a VPN connection configured, it should only be turned on when VPN access is required. If the VPN is left on, the user may not be mindful of the nature of the information they are transmitting on the network. Additionally, malicious or exploited iPhone applications may access VPN resources.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Network.
4. Tap VPN.
5. Turn off VPN if turned on.

Audit:

1. Tap Settings.
2. Tap General.
3. Tap Network.
4. Tap VPN.
5. Confirm that VPN is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.11 Turn off Bluetooth when not needed (Level 1, Not Scorable)

Description:

Bluetooth allows devices to connect wirelessly to headsets, car kits, and other accessories for various Bluetooth profile functionality. It is recommended that Bluetooth be disabled when not in use.

Rationale:

If the user does not need Bluetooth enabled, it should be disabled to prevent discovery of and connection to supported Bluetooth services.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Bluetooth
4. Turn off Bluetooth.

Audit:

1. Tap Settings.
2. Tap General.
3. Tap Bluetooth.
4. Confirm that Bluetooth is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf
2. iPhone, iPad, iPod Touch: Supported Bluetooth Profiles
<http://support.apple.com/kb/ht3647>

1.1.12 Turn off Location Services (Level 2, Not Scorable)

Description:

Location Services allows applications such as Maps and Camera to gather and use data indicating the user's location. The user's approximate location is determined using available information from cellular network data, local Wi-Fi networks (if the user has Wi-Fi turned on), and GPS as available. If the user turns off Location Services, the user will be prompted to turn it back on again the next time an application tries to use this feature. It is recommended that location services be disabled in environments where security is paramount.

Rationale:

iOS enables the user to grant or deny individual applications access to location services. If the user does not intend to use location services at all, turning it off ensures that a previously allowed application will no longer be able to use location services by default.

Remediation:

1. Tap Settings.
2. Tap Location Services.
3. Turn off Location Services.

Note: Location services can also be disabled/enabled on a per-app basis within the Locations Services configuration menu above.

Audit:

1. Tap Settings.
2. Tap Location Services.
3. Confirm that Location Services is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.13 Turn on Airplane Mode (Level 2, Not Scorable)

Description:

Mobile devices running iOS can be configured to disable all receivers and transceivers. This option is called Airplane Mode. When Airplane Mode is on, no phone, GPS, radio, Wi-Fi, or Bluetooth signals are emitted from or received by the device. It is recommended that Airplane Mode be enabled when these capabilities are unneeded or where security is paramount.

Rationale:

If the user enters an environment where no signal transmission or reception is intended, Airplane Mode can be turned on to ensure that the device does not initiate or respond to any signals. This reduces the remote attack surface.

Remediation:

1. Tap Settings.
2. Turn on Airplane Mode.

Audit:

1. Tap Settings.
2. Confirm that Airplane Mode is on.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.1.14 Erase all data before return, recycle, reassignment, or other disposition (Level 1, Not Scorable)

Description:

In normal operations, iOS devices do not use a secure delete function to erase data from the disk, allowing it to persist in a recoverable state. Therefore, the disk should be overwritten via the “Erase All Content and Settings” setting before the device is out of the user’s control.

Rationale:

Overwriting the device’s disk before it is out of the user’s control will reduce an attacker’s ability to recover sensitive information from the device.

Remediation:

1. Tap Settings.
2. Tap General.
3. Tap Reset.
4. Tap Erase All Contents and Settings.

Audit:

To verify that the iPhone disk has been overwritten, it is necessary to install a warranty-voiding forensics recovery toolkit that is not within the scope of this document. Please review the references for more information.

References:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf
2. iPhone Forensics
<http://oreilly.com/catalog/9780596153588/>

1.1.15 Disable show SMS preview when iPhone is locked (Level 2, Not Scorable)

Description:

(iPhone iOS Devices Only) If the iPhone is passcode locked and receiving SMS messages, the messages are still previewed on the display. It is recommended that SMS previews be disabled in environments where security is paramount.

Rationale:

Parties who do not know the passcode lock should not have read access to the iPhone's SMS traffic.

Remediation:

1. Tap Settings.
2. Tap Messages.
3. Turn off Show Preview.

Audit:

1. Tap Settings.
2. Tap Messages.
3. Confirm that Show Preview is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.2 Safari Settings

This section provides guidance on the secure configuration of settings related to the Safari application on the iOS mobile devices.

1.2.1 Disable JavaScript (Level 2, Not Scorable)

Description:

JavaScript lets web programmers control elements of the page—for example, a page that uses JavaScript might display the current date and time or cause a linked page to appear in a new pop-up page. It is recommended that JavaScript be disabled in environments where security is paramount.

Rationale:

JavaScript should only be enabled before browsing trusted sites.

Remediation:

1. Tap Settings.
2. Tap Safari.
3. Turn off JavaScript.

Audit:

1. Tap Settings.
2. Tap Safari.
3. Confirm that JavaScript is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.2.2 Enable Fraud Warning (Level 1, Not Scorable)

Description:

Fraud warning protects you from potentially fraudulent Internet sites. When you visit a suspicious site, Safari warns you about its suspect nature and doesn't load the page. It is recommended that the Fraud Warning feature be enabled.

Rationale:

Enabling a warning can help you avoid accidentally visiting some known phishing and other fraudulent sites covered by this feature.

Remediation:

1. Tap Settings.
2. Tap Safari.
3. Turn on Fraud Warning.

Audit:

1. Tap Settings.
2. Tap Safari.
3. Confirm that Fraud Warning is turned on.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

1.2.3 Disable AutoFill (Level 2, Not Scorable)

Description:

The browser has a feature to remember information entered into common forms in order to automate the completion of later forms. Information auto-filled can include information from Contacts as well as remembered names and passwords. By default, this feature is disabled.

- If Use Contact Info is turned on and contact information selected, Safari will use the selected information from Contacts to fill in contact fields on web forms.
- If Names & Passwords is turned on, Safari will remember names and passwords to websites visited and automatically fill in the information when you revisit the website.

It is recommended that the AutoFill be disabled.

Rationale:

Disabling AutoFill can help avoid the storage of credentials locally on the device, as well as reduces the likelihood of automated unauthorized access to a site in the event unauthorized access is gained to the device.

Remediation:

1. Tap Settings.

2. Tap Safari.
3. Tap AutoFill.
4. Turn off “Use Contact Info”
5. Turn off “Names and Passwords”.

Audit:

1. Tap Settings.
2. Tap Safari.
3. Tap AutoFill
4. Confirm that AutoFill is turned off.

Reference:

1. iPhone User Guide - For iOS 4 Software
http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf

2. Settings in the iPCU

This section provides guidance on the secure configuration of iOS mobile devices with the iPhone Configuration Utility (iPCU), version 3.3.0.247. The iPhone Configuration Utility is a download available from Apple at <http://www.apple.com/support/iphone/enterprise> that lets users create, maintain, and sign configuration profiles, track and install provisioning profiles and authorized applications, and capture device information including console logs.

Configuration Profile Auditing and Distribution Note:

The configuration profiles created by the iPCU are stored as plain text XML files as iPCU application data in a location specific to the respective home/user-profile and operating system. The file names consist of an application-generated UUID for each profile and a .mobileconfig extension, and are not immediately recognizable by file name to the associated iPCU profile. Instead, to access a mobileconfig file for audit or distribution, export the respective configuration profile to a location of choice as described in the Enterprise Deployment Guide. Note that the "None" security option must be selected to produce a plain text file that can be easily read for auditing settings. The "Sign Configuration Profile" or "Sign and Encrypt Profile" export security options may be preferable for distribution depending on distribution method and target device requirements. Refer to the respective distribution instructions of the Installing Configuration Profiles section of the iPhone OS Enterprise Deployment Guide.

Further Information:

More information on the iPCU is available in the iPhone Configuration Utility How To guide available from Apple at http://developer.apple.com/library/ios/featuredarticles/FA_iPhone_Configuration_Utility/FA_iPhone_Configuration_Utility.pdf.

2.1 System Settings

This section provides guidance on the secure configuration of system settings.

2.1.1 Disallow profile removal (Level 1, Scorable)

Description:

The device can be configured to always allow the removal of a profile, to allow the removal of a profile only with a profile-specific password, or to never allow the removal of a profile, on a per-profile basis. By default, the iPCU configuration allows the profile to be removed by the user. To ensure profile settings remain in effect, profile removal must be disallowed.

Rationale:

Restricting the removal of a configuration profile is necessary to enforce the settings contained within the respective profile. If a user can circumvent profile requirements simply by uninstalling the profile, the continued enforcement of profile controls cannot be assured and intended device security is highly reduced.

Remediation:

1. Open iPCU.
2. Click on “Configuration Profiles” in the left windowpane.
3. Click on the “General” tab in the lower right windowpane.
4. Click on the “Security” combo box in the lower right window pane.
5. Select “With Authentication”.
6. Install the configuration profile on the device.

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>PayloadRemovalDisallowed</key>`.
3. Observe if the next line is `<true/>`.
4. Search for `<key>RemovalPassword</key>`.
5. Observe whether this value is present and whether a value is set.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

2.2 Passcode Settings

This section provides guidance on the secure configuration of passcode settings.

2.2.1 *Require passcode on device (Level 1, Scorable)*

Description:

The device can be configured to require a passcode before allowing access through the touchpad. By default, a passcode is not required to unlock the device after a period of inactivity. It is recommended that a passcode be set.

Rationale:

Requiring a passcode to unlock the device increases the effort required to compromise the features and data of the device in the event of a physical security breach.

Remediation:

1. Open iPCU.
2. Click on “Configuration Profiles” in the left windowpane.
3. Click on the “Passcode” tab in the lower right windowpane.
4. Click on the “Require passcode on device” checkbox in the lower right windowpane.
5. Install the configuration profile on the device.

Note: The passcode requirement can also be set via the iPhone UI as described in section [Settings in the iOS User Interface](#).

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>forcePIN</key>`.
3. Observe if the next line is `<true/>`.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

2.2.2 Require alphanumeric value (Level 2, Scorable)

Description:

The device can be configured to require that the passcode be comprised of both numeric and alphabetic values. By default, a passcode complexity policy is not enforced. It is recommended that both numeric and alphabetic values comprise the passcode.

Rationale:

Requiring a mix of alphabetical and numerical characters increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device.

Remediation:

1. Open iPCU.
2. Click on "Configuration Profiles" in the left windowpane.
3. Click on the "Passcode" tab in the lower right windowpane.
4. Click on the "Require alphanumeric value" checkbox in the lower right windowpane.
5. Install the configuration profile on the device.

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>requireAlphanumeric</key>`.
3. Observe if the next line is `<true/>`.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

2.2.3 Set minimum passcode length (Level 1, Scorable)

Description:

The device can be configured to require that the passcode be at least a pre-determined length. By default, the minimum passcode length is only four characters. It is recommended that passcode length be at least five (5) characters.

Rationale:

Requiring at least five characters increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device. Additionally, requiring at least five characters prevents a user from selecting typically weak values, such as a year, date, or last four digits of a phone number, for their passcode.

Remediation:

1. Open iPCU.
2. Click on “Configuration Profiles” in the left windowpane.
3. Click on the “Passcode” tab in the lower right windowpane.
4. Click on the “Minimum passcode length” textbox in the lower right windowpane.
5. Enter the number “5”.
6. Install the configuration profile on the device.

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>minLength</key>`.
3. Observe if the next line is `<integer>5</integer>`.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

2.2.4 Set a minimum number of complex characters (Level 2, Scorable)

Description:

The device can be configured to require non-alphanumeric characters in the passcode. By default, complex characters are not required in the passcode. It is recommended that a non-alphanumeric character be used in the passcode.

Rationale:

Requiring at least one complex character increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device.

Remediation:

1. Open iPCU.
2. Click on “Configuration Profiles” in the left windowpane.
3. Click on the “Passcode” tab in the lower right windowpane.
4. Click on the “Minimum number of complex characters” textbox in the lower right windowpane.
5. Enter the number “1”.
6. Install the configuration profile on the device.

Note: Passcode complexity can also be configured—but not enforced—via the iPhone UI as described in section [Settings in the iOS User Interface](#).

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>minComplexChars</key>`.
3. Observe if the next line is `<integer>1</integer>`.

References:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf
2. NIST Electronic Authentication Guideline –
http://csrc.nist.gov/publications/nistpubs/800-63/SP800-63V1_0_2.pdf

2.2.5 Set auto-lock timeout (Level 1, Scorable)

Description:

The device can be configured to auto-lock after a pre-defined inactivity period. By default, if a passcode is defined, an iPhone or iPod touch device will lock after one minute of inactivity, and an iPad device will lock after 5 minutes of inactivity. It is recommended that an inactivity timeout be set.

Rationale:

Preventing the user from setting a long inactivity period reduces the risk that the device will be unlocked in the event of a physical security breach.

Remediation:

1. Open iPCU.
2. Click on “Configuration Profiles” in the left windowpane.
3. Click on the “Passcode” tab in the lower right windowpane.
4. Click on the “Auto-lock (in minutes)” drop-down menu in the lower right windowpane.
 - 5a. For typical use cases, select the number 5.
 - 5b. For high-security use cases using an iPhone or iPod touch, select the number 1.
 - 5c. For high security use cases using an iPad, select the number 2.
6. Install the configuration profile on the device.

Note: The auto-lock timeout can also be set via the iOS UI as described in section [Settings in the iOS User Interface](#).

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>maxInactivity</key>`.
 - 3a. For typical use cases, observe if the next line is `<integer>5</integer>`.
 - 3b. For high-security use cases using an iPhone or iPod touch,, observe if the next line is `<integer>1</integer>`.
 - 3c. For high-security use cases using an iPad, observe if the next line is `<integer>2</integer>`.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

2.2.6 Erase data upon excessive passcode failures (Level 1, Scorable)

Description:

The device can be configured to erase the user's settings and data as stored on the device after excessive (configurable from 4 to 16) passcode failures. It is recommended that this feature be enabled.

Rationale:

Excessive password failures typically indicate that the device is out of physical control of its owner. Upon such an event, erasing data on the phone will ensure the confidentiality of information stored on the device is protected when facing a novice attacker.

Remediation:

1. Open iPCU.
2. Click on "Configuration Profiles" in the left windowpane.
3. Click on the "Passcode" tab in the lower right windowpane.
4. Click on the "Maximum number of failed attempts" combo box in the lower right windowpane.
5. Select the number "6".
6. Install the configuration profile on the device.

Note: The password failure limit can also be set via the iOS UI as described in section [Settings in the iOS User Interface](#).

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>maxFailedAttempts</key>`.
3. Observe if the next line is `<integer>6</integer>`.

Reference:

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

3. iOS Mobile Device Settings in MS Exchange ActiveSync Policy

This section provides guidance on the configuration of certain policies on iOS mobile devices using Microsoft Exchange ActiveSync versions 2.5 and later. This guidance was developed and tested specifically with Exchange ActiveSync version 3.5 with the Client Access server role on Microsoft Exchange Server 2010.

All remediation and audit steps specified in this section apply to settings within an Exchange ActiveSync Mailbox policy, which are configured in the properties of the policy, accessed either via the Exchange Management Console (EMC) or the Exchange Management Shell.

To access the policy properties using the Exchange Management Console, follow the below steps:

1. Open the Exchange Management Console.
2. In the console tree, click on “Exchange ActiveSync” and then “Client Access” to open the Client Configuration work area.
3. Click on the “Exchange ActiveSync Mailbox Policies” tab.
4. Select the mailbox policy to modify.
5. Click on “Properties.”

The remediation steps and the audit steps specified in this manual for the EMC apply to the “Properties” configuration window available once the above steps are completed.

For more information on using the Exchange Management Console (EMC) and the Exchange Management Shell, please refer to the additional information and resources provided in Appendix D.

3.1 Passcode Settings

This section provides guidance on the secure configuration of passcode settings.

3.1.1 *Require passcode on device (Level 1, Scorable)*

Description:

The device can be configured to require a passcode before allowing access through the touchpad. By default, iOS devices do not require a passcode to unlock the device after a period of inactivity, and the default Exchange ActiveSync policy setting applied for users not assigned to a mailbox policy does not require a passcode. It is recommended that a passcode be set.

Rationale:

Requiring a passcode to unlock the device increases the effort required to compromise the features and data of the iPhone in the event of a physical security breach.

Remediation:

Using the Exchange Management Console (EMC):

In the “Properties” configuration window,

1. Click on the “Password” tab.
2. Click on the “Require passcode” checkbox
3. Click “OK”.

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-DevicePasswordEnabled: $true
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:

Using the Exchange Management Console (EMC):

In the “Properties” configuration window,

1. Click on the “Password” tab.
2. Observe if the “Require passcode” checkbox is selected.
3. Click “Cancel”.

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where *<PolicyName>* is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "DevicePasswordEnabled :"
configuration item.
3. Observe if the value following the colon is "True" as shown below:
`DevicePasswordEnabled : True`
4. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>

3.1.2 *Require alphanumeric value (Level 2, Scorable)*

Description:

The device can be configured to require that the passcode be comprised of both numeric and alphabetic values. By default, iOS devices do not enforce a passcode complexity policy, and the default Exchange ActiveSync policy setting applied for users not assigned to a mailbox policy does not require an alphanumeric passcode. It is recommended that both numeric and alphabetic values comprise the passcode.

Rationale:

Requiring a mix of alphabetical and numerical characters increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device.

Remediation:

Using the Exchange Management Console (EMC):

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Click on the "Require alphanumeric passcode" checkbox
3. Click "OK".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-AlphanumericDevicePasswordRequired : $true
```

where *<PolicyName>* is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:

Using the Exchange Management Console (EMC):

In the “Properties” configuration window,

1. Click on the “Password” tab.
2. Observe if the “Require alphanumeric passcode” checkbox is selected.
3. Click “Cancel”.

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "AlphanumericDevicePasswordRequired :" configuration item.
3. Observe if the value following the colon is "True" as shown below:
`AlphanumericDevicePasswordRequired : True`
4. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>

3.1.3 Set minimum passcode length (Level 1, Scorable)

Description:

The device can be configured to require that the passcode be at least a pre-determined length. By default, the minimum passcode length is only four characters, and this is the default Exchange ActiveSync policy value applied for users not assigned to a mailbox policy if minimum password length checking is enabled. It is recommended that password length be at least five (5) characters.

Rationale:

Requiring at least five characters increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device. Additionally, requiring at least five characters prevents a user from selecting typically weak values, such as a year, date, or last four digits of a phone number, for their passcode.

Remediation:

Using the Exchange Management Console (EMC):

In the “Properties” configuration window,

1. Click on the “Password” tab.
2. Click on the “Minimum password length” checkbox.
3. Enter the number 5 in the box on the right hand side.
4. Click “OK”.

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-MinDevicePasswordLength 5
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:

Using the Exchange Management Console (EMC):

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Observe if the "Minimum password length" checkbox is selected.
3. Observe if the minimum password length value is set to 5.
4. Click "Cancel".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "MinDevicePasswordLength :"
3. Observe if there is a value following the colon and that the value is set to 5 as shown below:

```
MinDevicePasswordLength : 5
```

4. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>

3.1.4 Set a minimum number of complex characters (Level 2, Scorable)

Description:

The device can be configured to require non-alphanumeric characters in the passcode. By default, iOS devices do not require complex characters in the passcode, and the default minimum value Exchange ActiveSync policy applies for users not assigned to a mailbox policy is zero (0). It is recommended that a non-alphanumeric character be used in the passcode.

Rationale:

Requiring at least one complex character increases the complexity of the passcode an attacker may attempt to brute-force in order to gain access to the device.

Remediation:**Using the Exchange Management Console (EMC):**

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. The "Require alphanumeric passcode" checkbox should be checked. When this checkbox is checked, you may enter the "Minimum number of complex characters" in the box on the right hand side.
3. Enter the number 1 in the box on the right hand side.
4. Click "OK".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-AlphanumericDevicePasswordRequired $true  
-MinDevicePasswordComplexCharacters 1
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:**Using the Exchange Management Console (EMC):**

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Observe if the "Require alphanumeric passcode" checkbox is selected.
3. Observe if the "Minimum number of complex characters" value is set to 1.
4. Click "Cancel".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "MinDevicePasswordComplexCharacters :" configuration item.
3. Observe if there is a value following the colon and that the value is set to 1 as shown below:

```
MinDevicePasswordComplexCharacters : 1
```

4. Search the outputted policy setting list for the "AlphanumericDevicePasswordRequired :" configuration item.
5. Observe if the value following the colon is "True" as shown below:
`AlphanumericDevicePasswordRequired : True`
6. Exit the Exchange Management Shell.

References:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>
2. NIST SP800-63, Electronic Authentication Guideline – Version 1.0.2
http://csrc.nist.gov/publications/nistpubs/800-63/SP800-63V1_0_2.pdf

3.1.5 Set auto-lock timeout (Level 1, Scorable)

Description:

The device can be configured to auto-lock after a pre-defined inactivity period. By default, if a passcode is defined, an iOS device will automatically lock after one minute of inactivity, and the default Exchange ActiveSync policy setting applied for users not assigned to a mailbox policy sets an inactivity lock at 15 minutes. It is recommended that an inactivity timeout of no more than five (5) minutes be set for typical use cases, and one (1) or two (2) minutes depending on device capability for high-security use cases.

Rationale:

Preventing the user from setting a long inactivity period reduces the risk that the iPhone will be unlocked in the event of a physical security breach.

Remediation:**Using the Exchange Management Console (EMC):**

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Click on the "Time without user input before password must be re-entered (in minutes)" checkbox. When this checkbox is checked, you may enter the time in minutes for the auto-lock timeout in the box on the right hand side.
 - 3a. For typical use case, enter the number 5 in the box on the right hand side.
 - 3b. For high-security use cases, enter the number 1 (for an iPhone or iPod touch) or the number 2 (for an iPad) in the box on the right hand side.
4. Click "OK".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-MaxInactivityTimeDeviceLock: 00:05:00
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with

appropriate policy name) and specifying the time in minutes as appropriate according to use case and device as described for the EMC above.

Audit:

Using the Exchange Management Console (EMC):

In the “Properties” configuration window,

1. Click on the “Password” tab.
2. Observe if the “Time without user input before password must be re-entered (in minutes)” checkbox is selected.
3. Observe if the auto-lock timeout value is set to 5, 2, or 1 according to use case.
4. Click “Cancel”.

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "MaxInactivityTimeDeviceLock:" configuration item.
3. Observe if there is a value following the colon and that the value is set to 5, 2, or 1 according to use case as shown below:

```
MaxInactivityTimeDeviceLock : 5
```

4. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>

3.1.6 Erase data upon excessive passcode failures (Level 1, Scorable)

Description:

The device can be configured to erase the user’s settings and data as stored on the device after excessive (configurable from 4 to 16) passcode failures. , By default, the default Exchange ActiveSync policy setting applied for users not assigned to a mailbox policy configures the device to erase data after four (4) failed password attempts, if a password is configured on the device. It is recommended that this feature be enabled at six (6) failed password attempts.

Rationale:

Excessive password failures typically indicate that the device is out of physical control of its owner. Upon such an event, erasing data on the phone will ensure the confidentiality of information stored on the device is protected when facing a novice attacker.

Remediation:

Using the Exchange Management Console (EMC):

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Click on the "Number of failed attempts allowed:" checkbox. When this checkbox is checked, you may enter the maximum number of failed attempts in the box on the right hand side.
3. Enter the number 6 in the box on the right hand side.
4. Click "OK".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-MaxDevicePasswordFailedAttempts : 6
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:

Using the Exchange Management Console (EMC):

In the "Properties" configuration window,

1. Click on the "Password" tab.
2. Observe if the "Number of failed attempts allowed:" checkbox is selected.
3. Observe if the failed attempts value is set to 6.
4. Click "Cancel".

Using the Exchange Management Shell:

At the Exchange Management Shell command prompt,

1. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where <PolicyName> is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

2. Search the outputted policy setting list for the "MaxDevicePasswordFailedAttempts" configuration item.
3. Observe if there is a value following the colon and that the value is set to 6 as shown below:

```
MaxDevicePasswordFailedAttempts : 6
```

4. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: Configure Device Password Locking
<http://technet.microsoft.com/en-us/library/bb125004.aspx>

Appendix A: References

1. Apple, Inc. (2009). *iPhone User Guide - For i OS 4 Software*. Available: http://manuals.info.apple.com/en_US/iPhone_iOS4_User_Guide.pdf. Last accessed 7 September 2010.
2. Apple, Inc. (2009). *iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later*. Available: http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf. Last accessed 24 August 2010.
3. Apple, Inc. (2009). *iPhone and iPod touch: Understanding subscription Wi-Fi networks*. Available: <http://support.apple.com/kb/HT3867>. Last accessed 24 August 2010.
4. Jonathan Zdziarski (2008). *iPhone Forensics: Recovering Evidence, Personal Data, and Corporate Assets*. USA: O'Reilly.
5. National Institute of Standards and Technology. (2006). *NIST Special Publication 800-63: Electronic Authentication Guideline*. Available: http://csrc.nist.gov/publications/nistpubs/800-63/SP800-63V1_0_2.pdf. Last accessed 24 August 2010.
6. National Institute of Standards and Technology. (2008). *NIST Special Publication 800-124: Guidelines on Cell Phone and PDA Security*. Available: <http://csrc.nist.gov/publications/nistpubs/800-124/SP800-124.pdf>. Last accessed 24 August 2010.

Appendix B: Change History

Date	Version	Changes for this version
27 March 2009	1.0.0	- Public Release
30 October 2009	1.1.0	<ul style="list-style-type: none"> - Page 8, "Loss of Physical Custody of an iPhone and Compensating Controls": Added discussion - Section 1.1.6, Turn off Auto-Join for all Wi-Fi networks: Inserted new section - Section 1.2.3, Enable Fraud Warning (Level 1, Not Scorable): Added new section - Section 1.2.4, Disable AutoFill (Level 2, Not Scorable): Added new section - Section 2.1, System Settings: Added new section - Section 2.1.1, Disallow Profile Removal (Level 1, Scorable): Added new section - Section 2.1.5, Set maximum passcode age: Removed recommendation and moved to Section C.1, Set maximum passcode age, as informational - Section 2.2.2, Require alphanumeric value: Changed configuration level from Level 1 to Level 2 - Section 2.2.6, Erase data upon excessive passcode failures: Changed configuration setting for maximum number of failed attempts from 10 to 6 - Appendix C, Additional Security Notes: Added appendix - Throughout: Updated software and hardware version references in document as necessary - Throughout: Updated formatting, typographical, and grammatical errors in document as necessary
19 October 2010	1.2.0	<ul style="list-style-type: none"> - Updated to cover iOS 4.1.0 - Section 1.1.12, Disable show SMS preview when iPhone is locked (Level 2, Not Scorable): Corrected errors in Remediation and Audit steps - Section 3, iPhone Settings in MS Exchange ActiveSync Policy: Added section - Section C.2, Set passcode history (Informational): Added new section - Appendix D, Additional Information for Exchange ActiveSync Management: Added appendix - Throughout: Updated software version references in document as necessary - Throughout: Updated formatting, typographical, and grammatical errors in document as necessary
10 June 2011	1.3.0	<ul style="list-style-type: none"> - Expanded to cover iPad, iPod, and iPhone devices. - Throughout: Updated software version, iOS device

references, and related details as necessary to reflect the latest version of iOS (4.3.3) and the devices supported.

- Throughout: Updated instructions in document as necessary to reflect changes in user interface and menus in 4.3.3.
- Throughout: Updated formatting and organization and corrected typographical and grammatical errors in document as necessary

Appendix C: Additional Security Notes

The items in this section are security configuration settings that are available within the iOS but have been determined to provide relatively little incremental security benefit, either due to other settings in the benchmark document or inherent applicability or effectiveness as a control.

These settings may be required to meet compliance requirements or in a unique situation may provide a security benefits that outweighs the administrative cost of performing them, as determined by an organization's own risk analysis. These settings are purely optional and may be applied or not at the discretion of local site administrators.

C.1 Set maximum passcode age (Informational)

Description:

The iOS devices can be configured to expire the passcode after a pre-determined amount of time. By default, passcodes are not expired.

Rationale:

Requiring a passcode to expire may in certain circumstances additionally reduce the window of opportunity for an attacker to guess the password beyond the constraints already imposed by the *Erase data upon excessive passcode failures* control described in sections 1.1.14 and 2.2.6.

Note:

- The number of days for expiration should be determined by the organization based on the specific reason and risk for which it chooses to implement this optional control. A value divisible by 7 helps ensure the expiration occurs on the same week day.
- Remember that as expiring passcodes with high frequency results in requiring the user to frequently type new/unfamiliar passwords, this setting can result in more initial password failures counted by the *Erase data upon excessive passcode failures* control, as well as affect productivity and usability. It can also unintentionally induce poor user password management behavior (such as using sequential passcodes/minor variations or recording passwords insecurely).

Remediation:

1. Open iPCU.
2. Click on "Configuration Profiles" in the left windowpane.
3. Click on the "Passcode" tab in the lower right windowpane.
4. Click on the "Maximum passcode age (in days)" textbox in the lower right windowpane.
5. Enter a number that is appropriate for the organization.
6. Install the configuration profile on the device.

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>maxPINAgeInDays</key>`.
3. Observe if the next line is `<integer><maxPasscodeAge></integer>`, where `<maxPasscodeAge>` is the integer number of days corresponding to the desired maximum passcode age.

Reference

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

C.2 Set passcode history (Informational)

Description:

iOS devices can be configured to check new passcode selections against previously-used passcodes to discourage reuse. If enabled, the previous passcode list used for comparison is configurable from 1 to 50. By default, passcode history is not checked.

Rationale:

When used in conjunction with passcode expiration (via setting maximum passcode age), checking a new passcode against previously used passcodes may help support the goals of password change requirements by preventing a password from being reused upon expiration.

Remediation:

1. Open iPCU.
2. Click on "Configuration Profiles" in the left windowpane.
3. Click on the "Passcode" tab in the lower right windowpane.
4. Click on the "Passcode history (1-50 passcodes, or none)" textbox in the lower right windowpane.
5. Enter a number that is appropriate for the organization.
6. Install the configuration profile on the device.

Audit:

1. Open the configuration profile XML file.
2. Search for `<key>pinHistory</key>`.
3. Observe if the next line is `<integer><PasscodeHistory></integer>`, where `<PasscodeHistory>` is the number of historical passcodes to be compared upon passcode change.

Reference

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf

Appendix D: Additional Information for Exchange ActiveSync Management

Microsoft Exchange ActiveSync is a Microsoft Exchange mobile device communication and synchronization protocol based on HTTP and XML that allows mobile devices to access information on a Microsoft Exchange server. Exchange ActiveSync enables mobile phone users to access e-mail, calendar, contacts, and tasks and provides access to certain features that allow for the enforcement of security policies on mobile devices. Multiple policies can be created as needed to reflect organizational groups, device types, or combinations as desired; however, the policies are applied to users/user mailboxes and not devices specifically, and a user can belong to only one Exchange ActiveSync mailbox policy at a time.

Security configuration items that can be applied include the initiation of a remote wipe of a managed device and the enforcement of five password configuration policies (specifically, requiring a passcode, setting a minimum passcode length, requiring an alphanumeric passcode, requiring a complex passcode, and setting an inactivity time lockout) through the creation and application of an Exchange ActiveSync mailbox policy for a user. These ActiveSync configuration items can be applied through one or more of the following management interfaces: the MS Exchange Management Console (EMC), the MS Exchange Management Shell, the Microsoft Exchange Server ActiveSync Web Administration Tool, and the Outlook Web Access Mobile Device Management interface.

The instructions in this section have the following prerequisites:

- The Client Access server role has been installed on the Exchange Server.
- The appropriate Client Access Permissions have been assigned to permit the indicated configurations.
- Exchange ActiveSync is enabled for the user.
- The device ID for the mobile device has not been specifically removed from the ActiveSyncAllowedDeviceIDs parameter list
- An Exchange ActiveSync mailbox policy to be configured has already been created.

Additional information on MS EAS and its setup, configuration, and management is available from Microsoft, including the TechNet Library Article *Understanding Exchange ActiveSync* available at <http://technet.microsoft.com/en-us/library/aa998357.aspx>

D.1 General ActiveSync Settings

This section provides guidance on the configuration of general ActiveSync settings.

D.1.1 Disallow non-provisionable devices (Level 1, Scorable)

Description:

For a given mailbox policy, Microsoft Exchange ActiveSync classifies a mobile device attempting to connect as one of two types—a provisionable device or a non-provisionable device—based on the device’s ability to comply with the policy. Provisionable devices are devices that are capable of fully applying and enforcing a specified policy. Non-provisionable devices are devices that are capable of applying and enforcing only a subset of a policy, or even none of a policy.

This ActiveSync policy setting specifies whether a mobile device that cannot support the application of all policy settings can connect to MS Exchange through Exchange ActiveSync. By default, Exchange ActiveSync allows non-provisionable devices to connect through Exchange ActiveSync. To ensure that mobile devices connect only when the full policy can be assured, non-provisionable devices must be disallowed.

Rationale:

Restricting the devices which can connect to MS Exchange through ActiveSync to only those which can fully support the policy specified is the only way that Exchange ActiveSync can assure that an iPhone is configured fully according to the specified policy. If a device that does not meet any or all of the policy configuration items can continue to connect to Exchange ActiveSync and access the resources provided through the ActiveSync connection, the initial and continued enforcement of policy controls cannot be assured and intended device security is highly reduced.

Remediation:

Using the Exchange Management Console (EMC):

1. Open the Exchange Management Console.
2. In the console tree, click on “Exchange ActiveSync” and then “Client Access to open the Client Configuration work area.
3. Click on the “Exchange ActiveSync Mailbox Policies” tab.
4. Select the mailbox policy to modify.
5. Click on “Properties.”
6. Click on the “General” tab.
7. Click on the “Allow non-provisionable devices” checkbox to remove any check mark.
8. Click “OK”.

Using the Exchange Management Shell:

1. Open the Exchange Management Shell.
2. Enter the following command (all one line):

```
Set-ActiveSyncMailboxPolicy -Identity "<PolicyName>"  
-AllownonProvisionableDevices $true
```

where *<PolicyName>* is the name of the Exchange ActiveSync mailbox policy for which the configuration should be made (replace brackets and text with appropriate policy name).

Audit:

Using the Exchange Management Console (EMC):

1. Open the Exchange Management Console.
2. In the console tree, click on "Exchange ActiveSync" and then "Client Access to open the Client Configuration work area.
3. Click on the "Exchange ActiveSync Mailbox Policies" tab.
4. Select the mailbox policy to modify.
5. Click on "Properties."
6. Click on the "General" tab.
7. Observe if the "Allow non-provisionable devices" checkbox is unchecked.
8. Click "Cancel".

Using the Exchange Management Shell:

1. Open the Exchange Management Shell.
2. Enter the following command (all one line):

```
Get-ActiveSyncMailboxPolicy -Identity "<PolicyName>"
```

where *<PolicyName>* is the name of the Exchange ActiveSync mailbox policy for which the audit validation should be made (replace brackets and text with appropriate policy name).

3. Search the outputted policy setting list for the "AllowNonProvisionableDevices :" configuration item.
4. Observe if the value following the colon is "False" as shown below:
`AllowNonProvisionableDevices : False`
5. Exit the Exchange Management Shell.

Reference:

1. Microsoft Technet Library Article: View or Configure Exchange ActiveSync Mailbox Policy Properties
<http://technet.microsoft.com/en-us/library/bb123994.aspx>

D.2 General Resources for iOS Mobile Device ActiveSync Management

This section provides references to general resources supporting the use and management of iOS mobile devices using Microsoft Exchange ActiveSync.

1. iOS Enterprise Deployment Guide - Second Edition, for Version 3.2 or later
http://manuals.info.apple.com/en_US/Enterprise_Deployment_Guide.pdf
2. Microsoft Technet Library Article: Exchange 2010 Client Access Cmdlet Set-ActiveSyncMailboxPolicy Parameter Information

- <http://technet.microsoft.com/en-us/library/bb123756.aspx>
3. Microsoft Technet Library Article: Exchange 2010 Client Access Cmdlet Get-ActiveSyncMailboxPolicy Parameter Information
<http://technet.microsoft.com/en-us/library/bb124900.aspx>
 4. New User's Guide to the Exchange Management Console
<http://technet.microsoft.com/en-us/library/bb245702%28EXCHG.80%29.aspx>
 5. A Primer on the Exchange Management Shell
<http://technet.microsoft.com/en-us/library/bb245704%28EXCHG.80%29.aspx>
 6. Exchange Management Shell in Exchange 2010
<http://technet.microsoft.com/en-us/library/dd795097.aspx>
 7. Exchange Management Console (MS Exchange 2010)
<http://technet.microsoft.com/en-us/library/bb123762.aspx>
 8. Exchange Management Shell (MS Exchange 2010)
<http://technet.microsoft.com/en-us/library/bb123778.aspx>
 9. iPhone in Business Device Configuration Overview
http://images.apple.com/iphone/business/docs/iPhone_Device_Configuration_Overview.pdf