meraki

Solution Guide

Deploying Apple iOS in Education

MARCH 2013

This document covers strategies for deploying, monitoring, and supporting iOS devices in education environments.

Table of Contents

1 Executive Summary

Mobile devices are seeing remarkable adoption in education, and their use is poised to have a dramatic effect on students across grade and curriculum levels. iOS-powered devices from Apple, including the iPad and iPod, along with the ecosystem of educational content available through iTunes and the Apple App Store, are key learning platforms schools and educators are embracing.

To successfully deploy mobile devices like the iPad in a school setting, tech coordinators need deployment and device content strategies.

This document provides education-relevant deployment best practices for iOS devices using Meraki's mobile device management solution, Systems Manager, and Apple Configurator.

This document is not intended to cover or recommend any element of curriculum development.

2 Requirements

To deploy iOS devices using the instructions in this solution guide, you will need:

1. **A Meraki dashboard account with a Systems Manager network**

   Note: Systems Manager is completely free! To begin, obtain a Meraki Dashboard account by visiting: **www.meraki.com/form/systems-manager-signup**

   If you already have a Meraki dashboard account, log in to **https://dashboard.meraki.com** and select "Create a Systems Manager Network" from the dropdown menu

2. **Mobile devices running iOS 6 or later**

3. **For supervised devices, a computer running:**
   - Apple OS X v10.8.2 or later
   - Apple Configurator 1.2.1 or later
   - Apple iTunes 10.6 or later

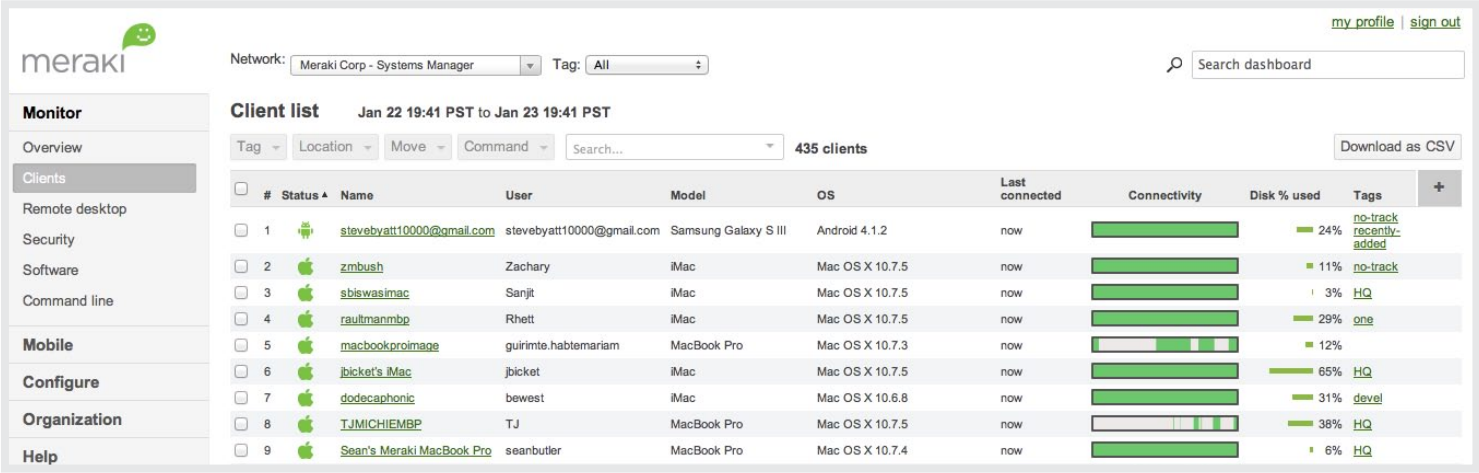
3 Meraki Systems Manager Overview

Meraki's Systems Manager is a cloud-based device management solution for iOS and Android devices, and it also provides desktop management for Windows and MAC OS X computers.

Systems Manager provides several features, including Over-the-air (OTA):

- Management of configuration profiles
- App delivery for iOS devices
- Real-time reporting and management of enrolled devices

Additionally, Systems Manager integrates with Apple Configurator to supervise iOS devices. Supervision provides additional control beyond that of configuration profiles.



Meraki, Inc. | 660 Alabama St, San Francisco, CA 94110 | (415) 432-1000 | sales@meraki.com

4 Apple Configurator

Apple Configurator is a free Apple utility that configures and enables advanced settings options via a method known as Supervision. This utility requires devices be physically connected via USB to a Mac running OS X; up to 30 connected devices at a time are supported. A typical deployment of Apple Configurator in a school environment uses mobile carts.

Apple Configurator supports three simple workflows:

Prepare: for updating iOS devices to the latest version of iOS, enrolling devices in Systems Manager, or restoring device backups.

Supervise: once a supervised device is enrolled in Systems Manager, advanced settings can be configured.

Assign: for assigning devices to individual users; individual users can be specified manually or via a directory service.

5 Volume Purchase Program (VPP)

Apple's Volume Purchase Program allows educational institutions to purchase iOS apps and books in volume and distribute them to persons associated with the institution including students, faculty, and other employees in accordance with the App store terms and conditions.

Apps can be reassigned to other students or installed on another iOS device in the future, but this requires upfront planning and selecting the appropriate deployment method. On the other hand, books must be redeemed by a student using his or her personal Apple ID and cannot be reassigned to another student once redeemed.

Content purchased via VPP is downloaded using redemption codes provided by Apple. There is one code per app or book purchased.

6 WiFi Planning

When deploying iOS devices, careful consideration of WiFi infrastructure in light of coverage area, device density, security, and OTA encryption requirements is paramount.

A best practice when using Apple Configurator is to provide two separate SSIDs in conjunction with Systems Manager. A basic SSID is used for initial device staging, and a secure SSID connects devices to a school's WiFi network:

1. **A staging SSID (SSID-open) for initial device provisioning that is open for Internet access but restricted otherwise**

   Note: Coverage for this open SSID need not be pervasive; making it available only where iOS device provisioning occurs is sufficient.

2. **A preferred, pervasive, and secure SSID (SSID-secure) by which devices access the school's WiFi network and resources; Systems Manager is used to push this SSID's configuration settings to iOS devices**

The deployment scenarios in this paper assume the use of two separate SSIDs as described above.

7 iOS Deployment Models

Picking the right iOS deployment model is critical to eliminating management and support issues that can arise once devices are in use by students and instructors.

1. **App Ownership**
   Which Apple ID (institutional or personal) will be used to redeem app codes purchased by the school in volume?

2. **Device Personalization**
   Are users allowed to personalize content and settings on the device?

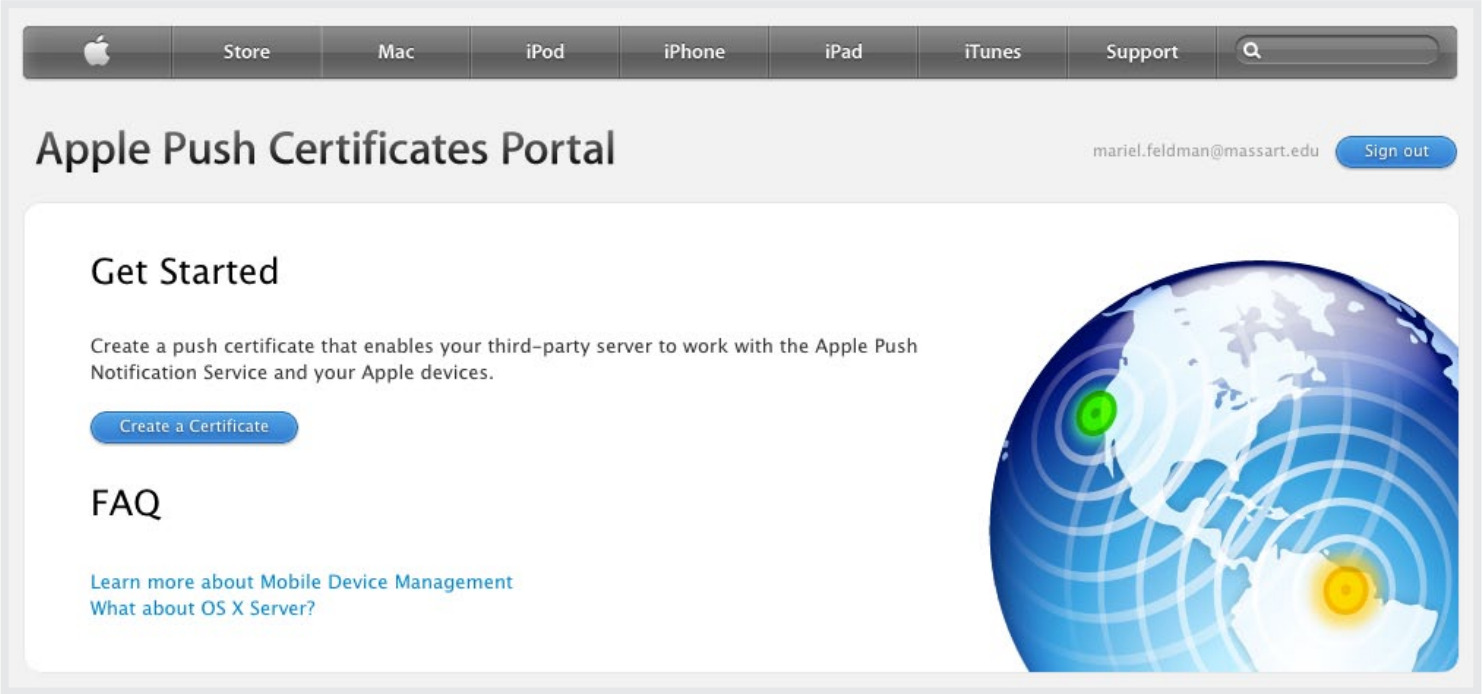
These questions guide the selection of a deployment model, the use of Meraki's Systems Manager, and the necessity of using Apple Configurator for initial setup and ongoing maintenance.

Table 1: Guide to selecting a suitable deployment model

	Personal Ownership	Institutional Ownership	Layered Ownership
Owner of Apps	Student Apps redeemed with personal iTunes ID	School Apps redeemed with ID associated with school	Both student and school Use school iTunes ID for purchased apps; personal ID after initial setup
Device Personalization	Yes	No	Yes
Usage Model	Single User	Multiple Users - Temporary Device Usage	Extended Single User - Future Reassignment
User's Age	13 years & Above	All Ages	13 years & Above
Initial Setup	Systems Manager	Apple Configurator* Systems Manager	Apple Configurator* Systems Manager
Maintenance	Systems Manager	Apple Configurator	Systems Manager
Reporting	Systems Manager	Systems Manager	Systems Manager

*Use Apple Configurator to initially supervise devices and deploy institutional apps

7.1 Prerequisites for Preparing Systems Manager for iOS Devices

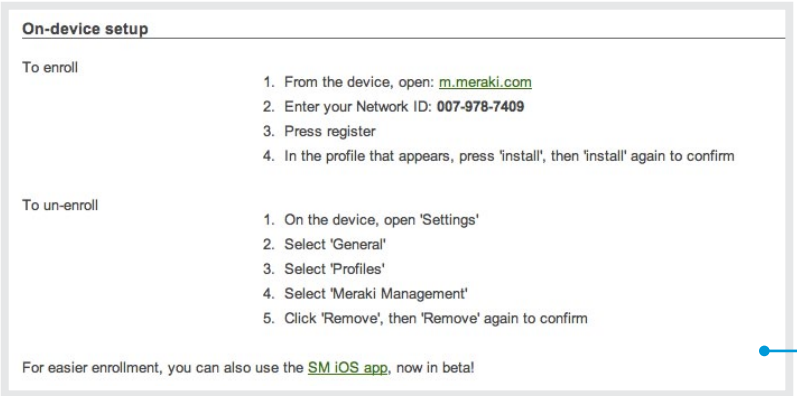


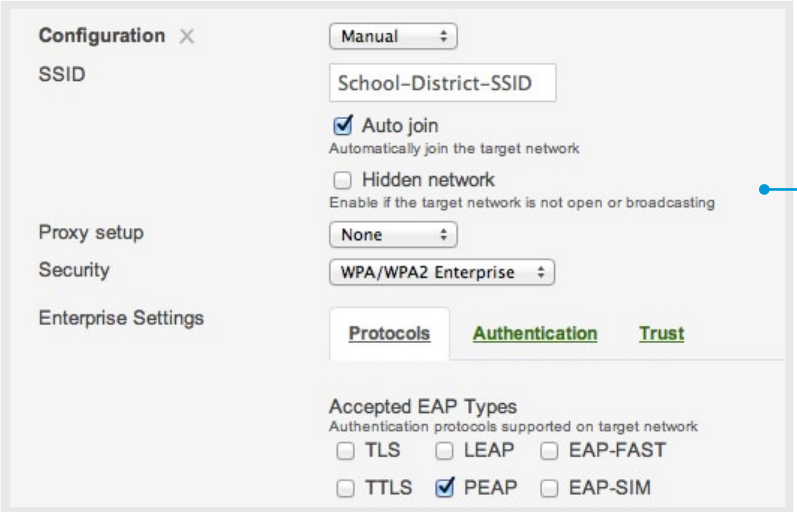
To start using Meraki Systems Manager with Apple iOS devices, you need to upload an SSL certificate obtained for free from Apple to the Meraki dashboard. This certificate is unique to your organization's Systems Manager account and very easy to install by following these steps:

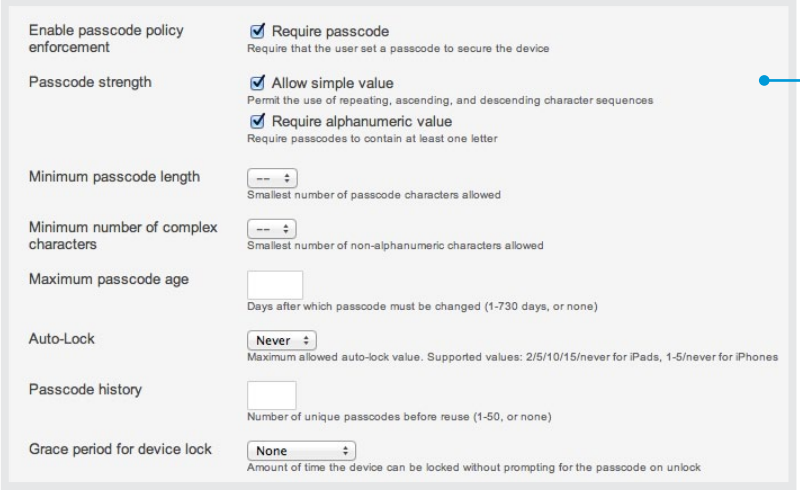
1. Log in to the Meraki dashboard and select your Systems Manager network.
2. Select the 'Organization' tab and go to the 'Settings' page.
3. Follow the instructions under the 'iOS mobile device management' section by downloading the certificate signing request (CSR) from this page to generate a signed certificate from Apple.
4. Visit identity.apple.com/pushcert and sign in with a verified Apple ID and follow the instructions.

   Once you upload the signed certificate from Apple into the Meraki dashboard, you are ready to get started securely enrolling Apple iOS devices.

Warning: There might be intermittent issues getting some versions of Internet Explorer (IE) to work properly with the Apple Push Notification Certificate (APNS). Try another browser if you have issues getting the APNS properly uploaded and accepted to the Meraki dashboard.





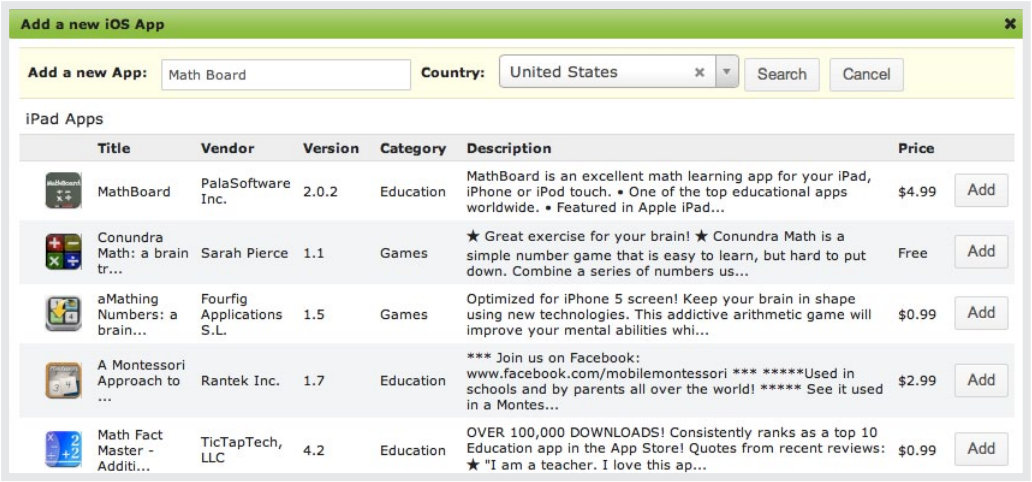


7.2 Personal Ownership

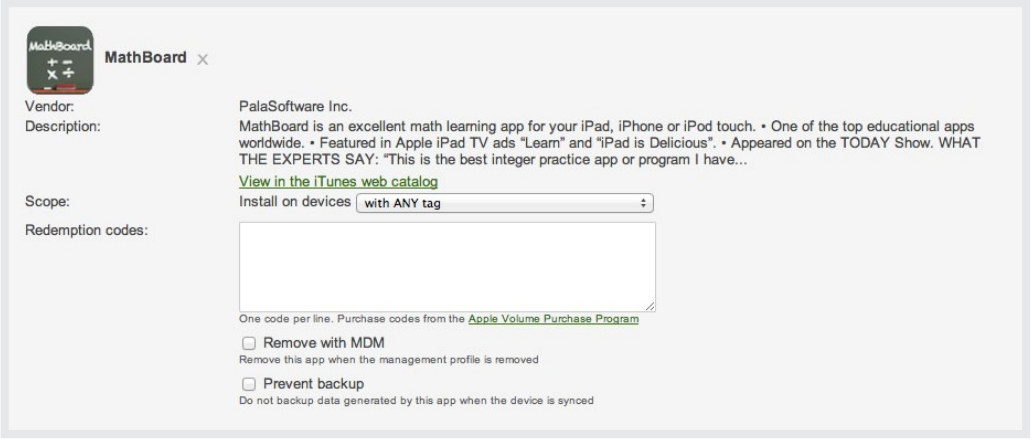
The personal ownership model allows students to use devices and apps in a manner typical of a consumer experience. In this deployment model, only the student's personal iTunes account is used for configuration and app installation. This means all redeemed apps are retained by the student. Apps purchased by the school but redeemed with the student's personal iTunes account cannot be reclaimed by the school.

1. Begin with new or unconfigured devices. Perform initial setup using the built-in Apple setup assistant. Skip the process of providing an iTunes ID.
2. Connect the devices to an open wireless SSID (SSID-open) and go to http://m.meraki.com.
3. In Meraki Systems Manager, enroll the devices under the Mobile > Deployment page. Use the provided network ID to complete enrollment.
4. To simplify management and to deploy apps to groups of devices, tag them in Systems Manager.
5. Define a Systems Manager profile to deploy secure WiFi settings (SSID-secure) and a passcode policy on the device.
6. Deploy devices to end users who then complete their set up using their personal iTunes ID.

The use of Apple Configurator in this deployment model is optional, but can be leveraged to enforce device restrictions unavailable with 3rd party mobile device management solutions.



Once the devices are enrolled in Systems Manager, apps from the app store as well as additional configuration profiles can be remotely pushed to them. Tags can group devices to receive specific apps.



Systems Manager integrates with Apple's Volume Purchase Program (VPP), allowing redemption of purchased apps via redemption codes.

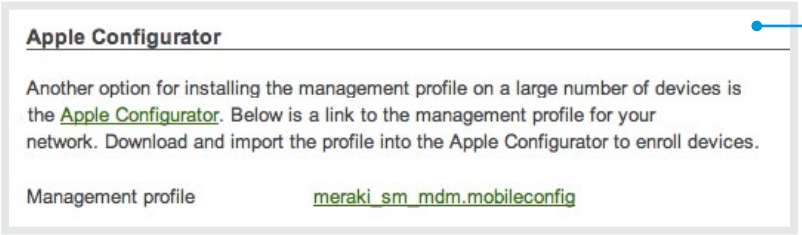
7.3 Institutional Ownership

In this model, the installation of the Meraki management profile, new apps, and any app updates are done by connecting each iOS device (via USB) to the computer running Apple Configurator that was originally used to stage the device. Because Systems Manager integrates with Apple Configurator, you can automatically enroll devices via management profiles.

Systems Manager provides asset tracking, hardware and software inventory management, reporting, and remote troubleshooting for enrolled devices.

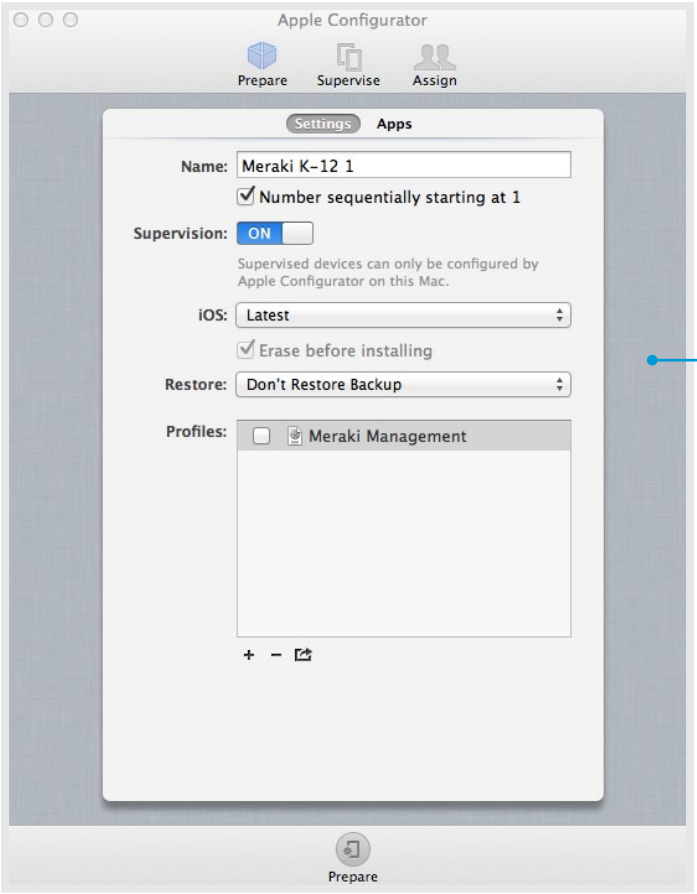
A mobile cart is commonly used in this deployment model. A Mac running OS X, connected to the school's network and running Apple Configurator, is needed. Additionally, it must have iTunes installed, using the school's iTunes account.

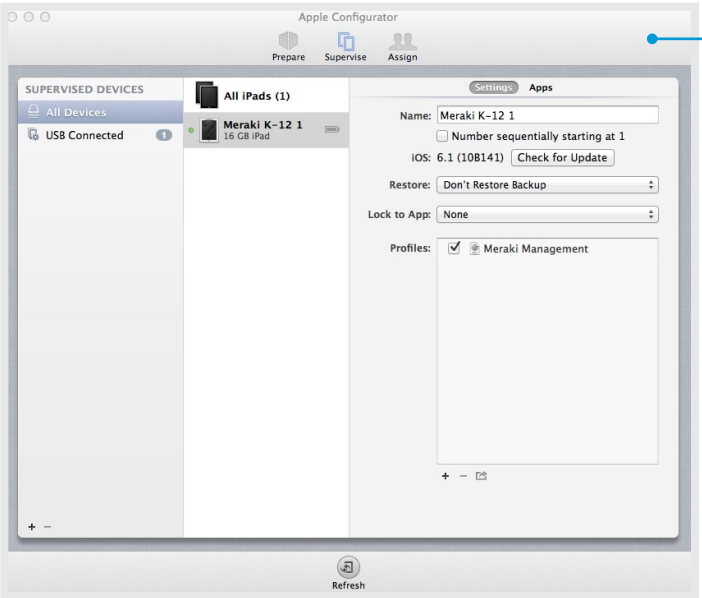
Warning: When you supervise a device, Apple Configurator performs a software restore.



1. Log in to your Meraki dashboard, select your Systems Manager network, and access the Mobile > Deployment page; download the Meraki management profile file, xxxx.mobileconfig, to your Mac's hard drive.
2. Download institutional apps from iTunes.
3. On your Mac, open the Apple Configurator > Preferences pane; in the General tab, check both boxes to automatically refresh and remove any non-sanctioned apps or profiles.
4. Use the Lock Screen tab to set additional preferences.
5. In the Apple Configurator Prepare pane, select the Settings tab; import the Meraki management profile file, xxxx.mobilconfig.

   NOTE: Ensure the Meraki management profile is unchecked. The management profile cannot be installed at this stage since the device does not have network connectivity.
6. In the Apple Configurator Prepare pane, select the Apps tab; import any paid apps, and include VPP codes.





At this stage, you are ready to create a master backup iOS device, which will be used as the template for additional devices.

7.3.1 Creating and enrolling your master backup device

1. Select a new or unconfigured iOS device and connect it to the Mac running Apple Configurator.
2. In the Apple Configurator Prepare pane, turn on Supervision and click “prepare.”
3. On the newly prepared iOS device, complete initial setup using the built-in Apple setup assistant. Skip the process of providing an iTunes ID. Connect the device to an open SSID (SSID-open).
4. Customize the device as needed including setting up your wallpaper, rearranging app icons, setting bookmarks, etc.
5. Once device customization is complete, go to the Apple Configurator supervise pane; check the Meraki management profile and select ‘Apply’/’Refresh.’

> **Important**: The iOS device requires network connectivity (SSID-open) in order to complete the installation of the Meraki management profile.

6. Your iOS device is now supervised and enrolled in your Systems Manager network; you now have a master/template iOS device.
7. Backup this device with Apple Configurator before applying any Systems Manager policies, and name the backup; now you are ready to prepare the remaining devices.
8. Disconnect the prepared master/template iOS device.

7.3.2 Enrolling remaining iOS devices

1. Connect new, unsupervised iOS devices (up to 30 at once).
2. In the Apple Configurator Prepare pane, set the devices to restore automatically from the backup created; name the devices and check the option to number them sequentially.
3. Make sure the Meraki management profile is now checked in the Apple Configurator Prepare pane.
4. Connect additional devices as needed, and click “prepare.”
5. Go to the Apple Configurator supervise pane, click ‘apply’/’refresh’ to ensure all devices are supervised.
6. Complete what is left of the iOS setup assistant to ready the iOS device for use.

At this stage all devices will be prepared, supervised, and enrolled into your Systems Manager network. Devices can now be tagged, and management profiles can now be pushed to the devices via the previously configured open SSID.

The secure wireless SSID (SSID-secure) should be selected as the preferred connection as part of the devices’ Systems Manager configuration.

Configure the following items and set the following best practice restrictions in Systems Manager:

- Configure secure WiFi SSID
- Configure a Global HTTP Proxy
- Disable Installing apps
- Disable iTunes Store
- Disable iBookstore
- Disable iCloud Backup
- Disable Game Center
- Disable iMessage

7.4 Layered Ownership

Use the layered ownership model to allow students to personalize a device while still allowing a school to retain ownership of paid apps. This model uses a slight variation on the institutional ownership model’s setup and configuration, as discussed above.

To configure devices in a layered ownership model, follow all the steps above for deploying the institutional ownership model, with one exception:

On your Mac, open the Apple Configurator > Preferences pane; in the General tab, check the box to automatically refresh devices; **de-select the check box to remove apps not installed by Apple Configurator.**

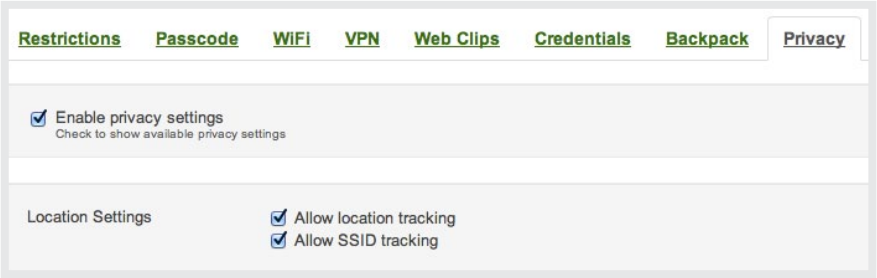
Once the layered ownership model’s configuration steps are complete, the iOS devices should be given to students to complete the iOS setup assistant, including inputting a personal Apple iTunes ID.

To install new, institution-owned apps (or updates to them) with this model, you will need to reconnect the iOS devices to the same Apple Configurator computer used for initial setup. Personal apps, however, can be downloaded by the user; free apps can be delivered via Systems Manager iOS app store integration.

8 Privacy

When managing and monitoring mobile devices, choices must be made regarding user privacy when implementing capabilities such as location tracking. Systems Manager allows you to disable these types of features, which can be especially useful if devices are taken home by students or faculty for personal use.

From within Systems Manager, selecting Mobile > Settings > Privacy provides the option to disable location tracking.



9 Apple ID Management

An Apple ID is an e-mail address that serves as a user's credentials for everything done with Apple, including buying and downloading apps from the App store, accessing content on iTunes, backing up content to iCloud etc.

One of the common areas of questions around deploying Apple iOS devices in education is how to handle Apple IDs and which specific one to use for deploying Apps.

- What Apple ID should be used to deploy apps? Should a school use a student Apple ID or an institution/district Apple ID?
- How many Apple IDs should an institution create?

While the question about student versus institutional ID can be easily resolved based on the ownership model used, dealing with an organization level ID design can range from a single Apple ID for the entire district to multiple IDs for individual schools or departments within a district. The choice one makes here usually depends on the administrative model and internal processes of a given school district.

While every environment is different, a single Apple ID per school district typically provides the most flexibility for App reuse and reassignment across the school district. A single Apple ID, however, introduces other questions around password management for the Apple ID across potentially multiple administrators. Multiple Apple IDs tend to be appropriate for large school districts with several campuses and a distributed administrative team.

The table below captures the pros and cons of how educational institutions can think about Apple ID management and select the option that fits best in their environment for VPP apps.

Table 2: Apple ID management options for VPP apps.

Apple ID Option	Pros	Cons
Personal Apple ID	Low administrative overhead - users deploy all apps	Lack of app reuse across users; users retain apps
Single Apple ID per Institution	Institution retains apps for reuse	Administrative overhead
Multiple Apple IDs per Institution	School retains apps Facilitates distributed administration	Requires supervision to transfer apps to other Apple IDs Some administrative overhead

10 Supervision Caveats

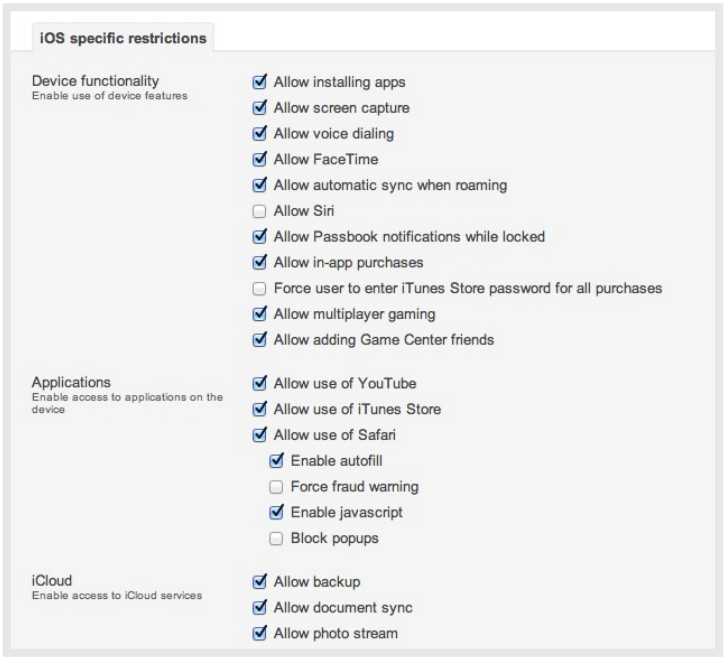
Supervision allows an organization to control additional aspects of the device beyond configuration profiles and restrictions.

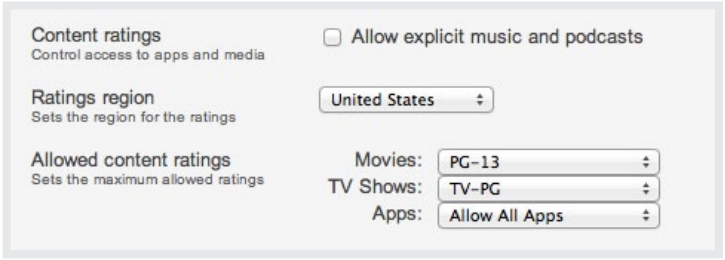
In addition, if you wish to reclaim apps deployed via VPP codes, the iOS device is required to have been supervised prior to initial app deployment.

Supervised devices must be re-connected to Apple Configurator for app updates and, with the Institutional deployment model, to remove any unsanctioned apps on the device.

Things to consider with respect to Supervision:

- Supervision requires devices running iOS 5 or later.
- A device can be supervised if it is unconfigured or has been factory reset; supervising a previously configured device will erase all apps and content on the device.
- Supervised devices are tied to the MAC OS devices running Apple Configurator that the device was supervised with; a supervised device can only sync with iTunes running on that same MAC OS device.
- Reconnecting a supervised device to Apple Configurator will reconfigure the device back to a desired configuration.
- Additional restrictions are available to supervised devices running iOS 6 or later (these settings can be controlled using Meraki Systems Manager):
  - Global Network Proxy: Routes all web traffic through a proxy server for content filtering.
  - Allow iMessage: Disabling this feature prevents students from iMessaging each other.
  - Allow Removing Apps: Disabling this feature prevents students from removing apps on the home screen.
  - Allow Game Center: Disabling this feature removes the Game Center icon from the home screen.
  - Allow iBookstore / Allow iBookstore Erotica: Disabling these options completely prevents access to iBookstore or to adult content, respectively.
  - Single App Mode: Locks users to a single app, even after the device is powered down and rebooted.





11 Setting Restrictions

A number of restrictions can be applied on any device, regardless of whether the device is supervised or not. While every school environment has its own set of policies, it is useful to think about what an institution is looking to accomplish with iOS devices, and set practical restrictions as necessary.

For instance, the restriction to disallow installation of apps make sense in an ownership model where additional device customizations is not desirable. When devices are shared among students, enabling syncing with iCloud might not be the right approach, as iCloud accounts might be associated with individuals and students are unlikely to always be assigned the same device in a share model.

On the other hand, there might be very good reason to set restrictions around age appropriate content, if iTunes is available for students to use.

As a best practice rule of thumb, an institution is well served by thinking through its use case and deployment model and having the relevant parties, which might include educators and parents, weigh in on what specific restrictions to enable.

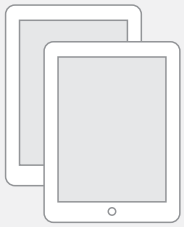
12 Meraki Systems Manager Deployment: Profiles & Tags

Once a deployment model — be it personal, institutional, or layered — is chosen, most large-scale deployments need to apply different settings, apps, or data to specific groups of devices. Common examples include grouping for separate student and instructor devices, grouping by specific educational course, and grouping by grade level.

Systems Manager makes it easy to create groups of devices that can receive different policies controlling settings, app management, security restrictions, and device settings. Simply create configuration profiles and assign these to groups of devices based on device tags. Once groups have been created, adding hundreds or thousands of devices to the same group definition is as easy as tagging those devices.

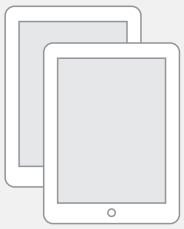
For instance, imagine an iPad deployment needing three groups to segment devices: two separate grade level groups for student devices and one group for faculty devices. In Systems Manager, all you need to do is create three tags — for example “5th-grade,” “6th-grade,” and “instructors.” Next, associate these tags with specific profiles that can be created in the Mobile > Profiles page in Systems Manager. Any profile-specific policies would now apply to the tagged devices. For example, perhaps a profile created for students would include the the 6th-grade and 5th-grade tags, applying those profile settings to the student devices.

Instructor Profile
WiFi settings, security restrictions

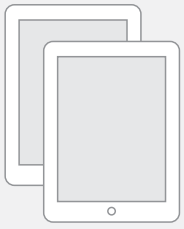


Instructor iPads
Teaching apps

Student Profile
WiFi settings, security restrictions

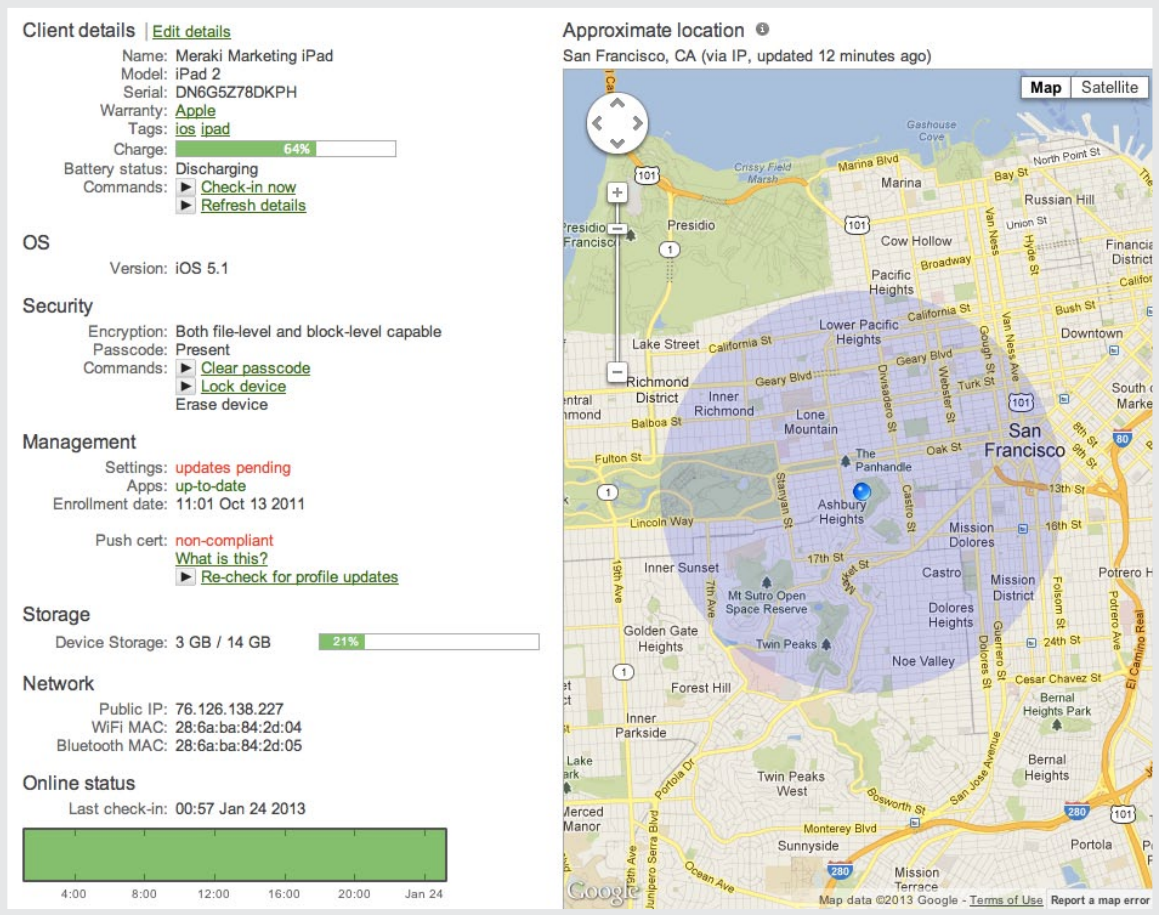


4th grade iPads
Targeted apps



7th grade iPads
Targeted apps

Meraki, Inc. | 660 Alabama St, San Francisco, CA 94110 | (415) 432-1000 | sales@meraki.com



13 Reclaiming apps — Institutional & Layered Model Only

Apps purchased via Apple VPP codes can be removed from one device and assigned to another device; however, this can only be done on devices supervised with the Apple Configurator utility.

There are two options when it comes to removing paid apps and reassigning them to another device.

- Use Apple Configurator to remove an app from a supervised device; this allows the redemption code to be used by any iOS device configured using the same Mac computer running Apple Configurator. The redemption code is only available to this particular computer — not any other also running Apple Configurator.
- Use Apple Configurator to un-supervise the device; all apps are removed and the redemption codes used will become available for reassignment on any device.

14 Real-Time Monitoring

Beyond mobile device management and app delivery, Systems Manager also provides real-time monitoring and troubleshooting capabilities.

Schools can collect real-time statistics and data on installed apps, perform inventory and asset management for hardware and installed software, and use integrated Live Tools to remotely troubleshoot the devices and perform operations such as clearing passcodes or locking/erasing a device.

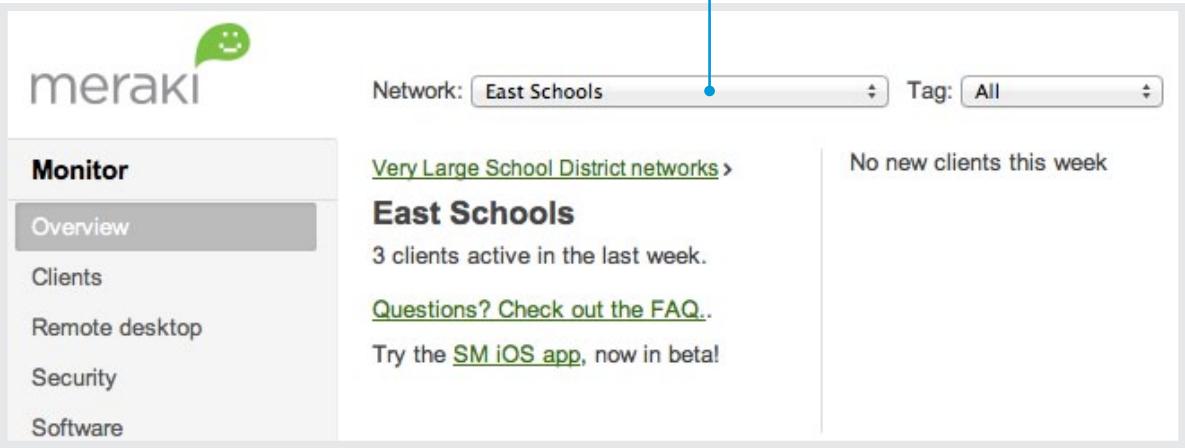
Troubleshooting capabilities give a real-time view of what specific restrictions and settings are applied on a particular device. A list of pending updates for a device, together with an event and activity log provide deep visibility required to effectively troubleshoot an iOS device environment.

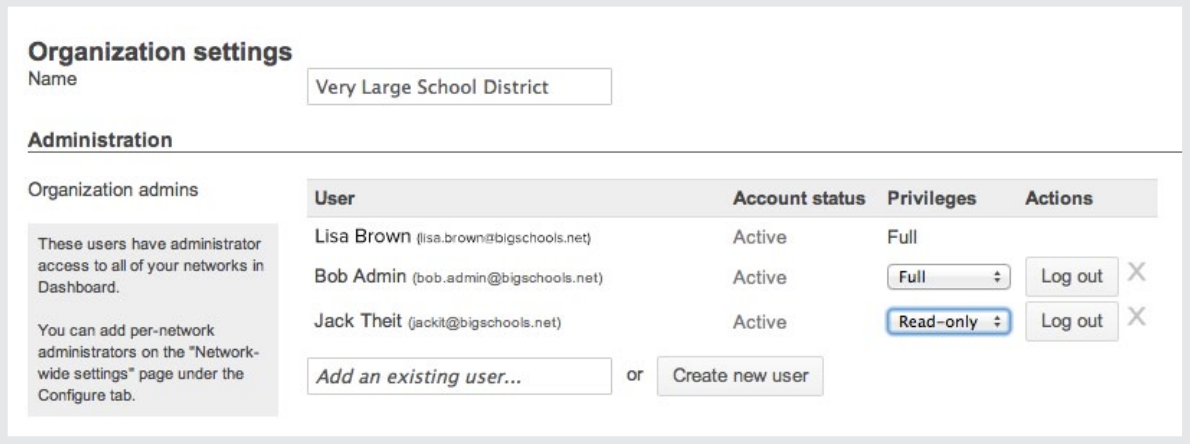
15 Administering a Systems Manager Network

The Meraki Dashboard provides an organizational hierarchy that allows for different administrative rights and grouping of managed devices. Within a school district or organization, multiple Systems Manager networks can be created with different administrators managing and with visibility to only their specifically assigned network.

You can create additional Systems Manager networks under the organizational overview page.

Administrators of a Systems Manager network can also be granted one of two permissions; read/write or administrator privileges. Adding new administrators and permission changes can be made under the Organization -> Settings page.





Meraki, Inc. | 660 Alabama St, San Francisco, CA 94110 | (415) 432-1000 | sales@meraki.com

16 Meraki Networking Portfolio

Systems Manager complements Meraki's networking product portfolio and utilizes the Dashboard like all of our other products for end-to-end visibility and control.

MR Cloud-Managed Access Points

- Industry leading cloud-managed wireless access points that include functionality like L7 application visibility, traffic shaping, and stateful firewall.
- MR access points deployed alongside Systems Manager include automatic WiFi setting sync options that make wireless configuration management a breeze.

MX Cloud-Managed Security Appliances

- Cloud-managed security appliance that includes a next-generation firewall, Auto VPN, content filtering, IDS/IPS and WAN Optimization.
- MX security appliance provides content filtering for CIPA compliance, as well as client VPN settings sync for mobile devices enrolled in Systems Manager.

MS Cloud-Managed Switches

- Industry first cloud-managed access switch with L7 application visibility and virtual stacking.
- MS switch deployed alongside Systems Manager, like the MR or MX solutions, provides an integrated network view and client drill-downs from the Meraki dashboard.

17 Conclusion

Meraki's complete portfolio of cloud-managed products, including Systems Manager, are ideal for school environments, businesses, and organizations where mobile devices and applications are the new norm, and where network deployments with management simplicity and ease of use are key requirements.

With support for iOS, Android, Mac OS, and Windows devices, Meraki Systems Manager provides an intuitive, easy to use device management solution with little to no training required. Systems Manager is available to use 100% free of charge on any network. Meraki provides complimentary phone support for Meraki networking customers and free email support for all other users.

Try out Systems Manager Today. It's 100% Free.

meraki.com/form/systems-manager-signup

References

Meraki Security & Cloud Architecture

http://www.meraki.com/trust/

Meraki Systems Manager Sign Up

http://www.meraki.com/form/systems-manager-signup

Meraki Systems Manager How to Videos

http://www.meraki.com/blog/2012/08/how-to-get-the-most-from-meraki-systems-manager/

Meraki Systems Manager User Guide

http://docs.meraki.com/sm

Meraki Systems Manager Datasheet

http://meraki.com/lib/pdf/meraki_datasheet_sm.pdf

Apple iOS 6 Education Deployment Guide

http://images.Apple.com/education/docs/ios_6_education_deployment_guide.pdf

Apple Volume Purchase Program Redemption Codes

http://support.Apple.com/kb/HT5188?viewlocale=en_US&locale=en_US

iOS Apple Configurator

http://images.Apple.com/au/iphone/business/docs/iOS_Apple_Configurator_Mar12.pdf

Systems Manager FAQ

http://docs.meraki.com/display/SM/Systems+Manager+FAQ