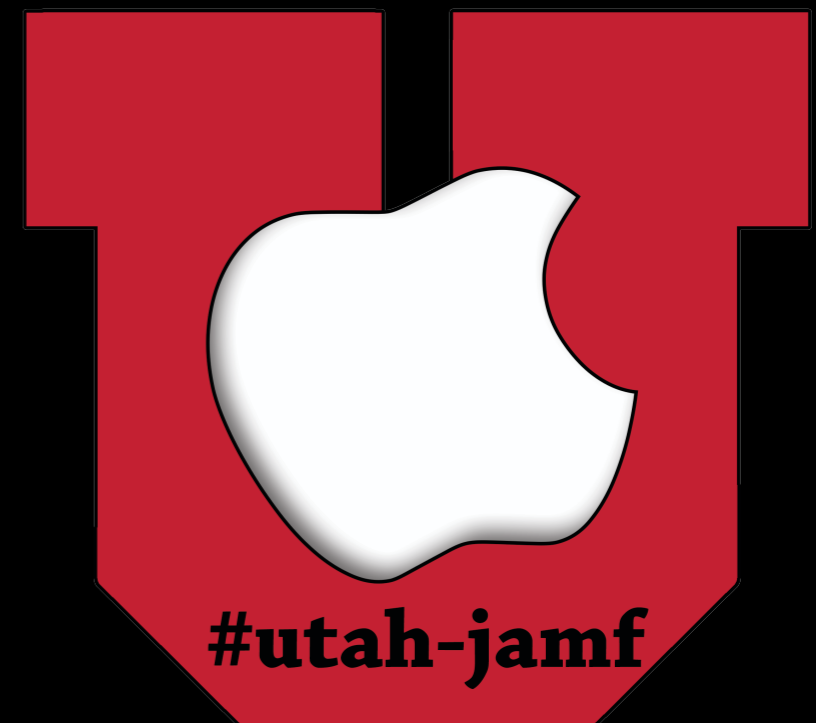


# iPad Management

The search for zero touch deployment

# Overview

- Apple School Manager
- iPads for Students
- Configuration Options
- iMazing
  - Jamf Pro
  - Configurator
  - UI Script



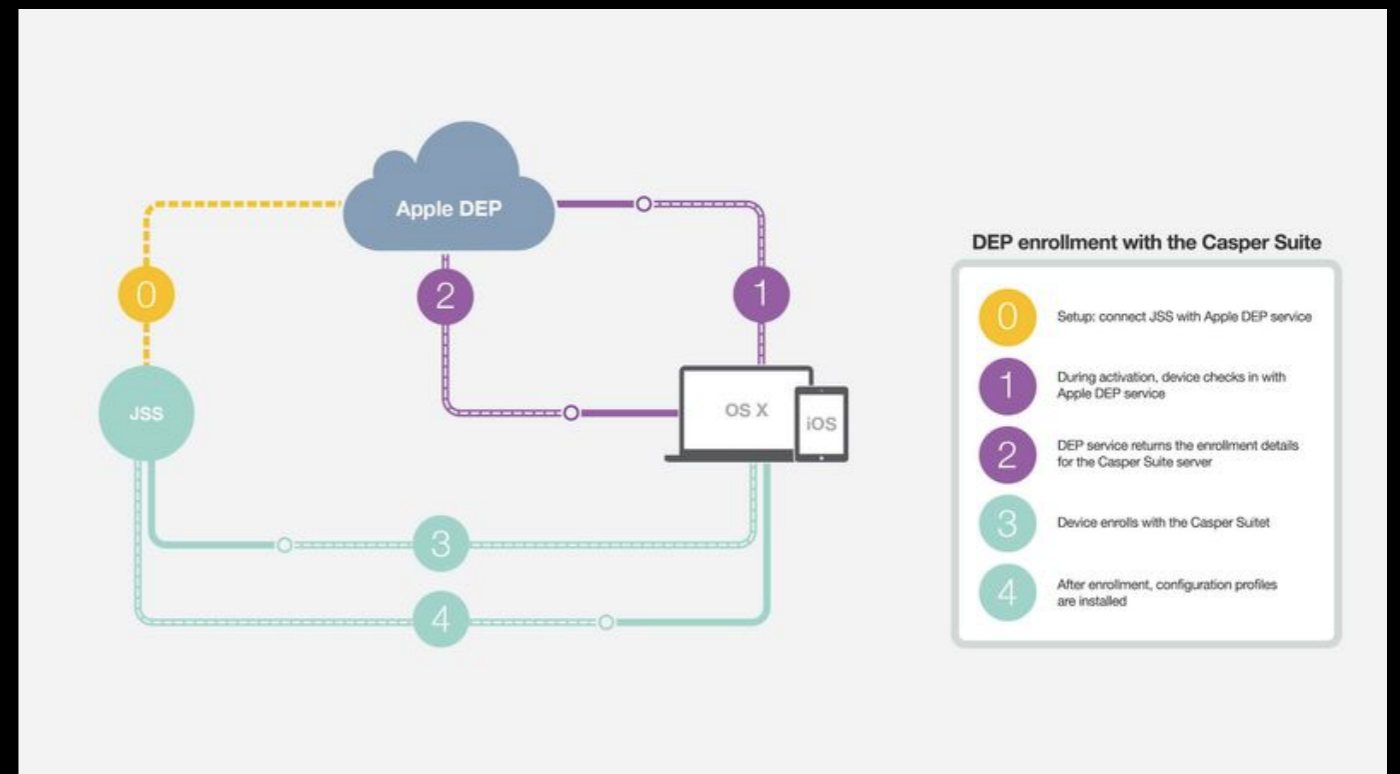
# iPads

- Come out in April 2010
- Apple sells more of them than Macs by volume
- Half of Dell's total sales of all hardware
- 27 iPads Models



# Mobile Device Management

- MDM
- Third-party product
- Uses Apple Push Notification Service (APNS) to send commands
- Over-the-air distribution
- Device Enrollment Program



# Apple School Manager

- Volume Purchase Program (VPP)
- Buy and manage App Licenses
- Assign Devices to a MDM server for Automated Device Enrollment
- Coordinated with Office of Software Licensing to create an account on ASM



# Library iPad History

- Started with 10 iPads
- Internal Management Solution
- High demand for iPad Pros
- Commercial Proof of Concept
- Cares Acts to increase to 100



# iPads for Students



# iPads for Students

- Ready for Checkout
- Zero to Minimal Touch
- Remove Student Data
- Install Apps from VPP
- Plug it in and forget it
- Scalable





# Configuration Options

- Apple Configurator 2
- AEMOS
- Jamf Pro
- Jamf Reset/Setup
- iMazing



# Apple Configurator 2

- Pros
  - Single Application
  - Supervises
  - Adds Apps from VPP
- Cons
  - Manual Process
  - Prone to error
  - Not scalable



# AEiOS

- Pros
  - Uses Apple Configurator
  - Automated with cfgutil
  - Apply changes to groups of iPads
- Cons
  - Prone to errors from AC
  - Developer left our group
  - Apps sometimes were missing



# Jamf Pro

- Pros
  - Automated Device Enrollment
  - True MDM solution
  - Add Apps anytime with VPP
- Cons
  - Apps installed later
  - User interaction
  - Re-enrollment



# Jamf Reset/Setup

- Pros

- Uses Jamf Pro
- Resets the iPad
- Preset Configurations via App

- Cons

- Setup Assistant needs to be passed
- One configuration needed
- Manual resets

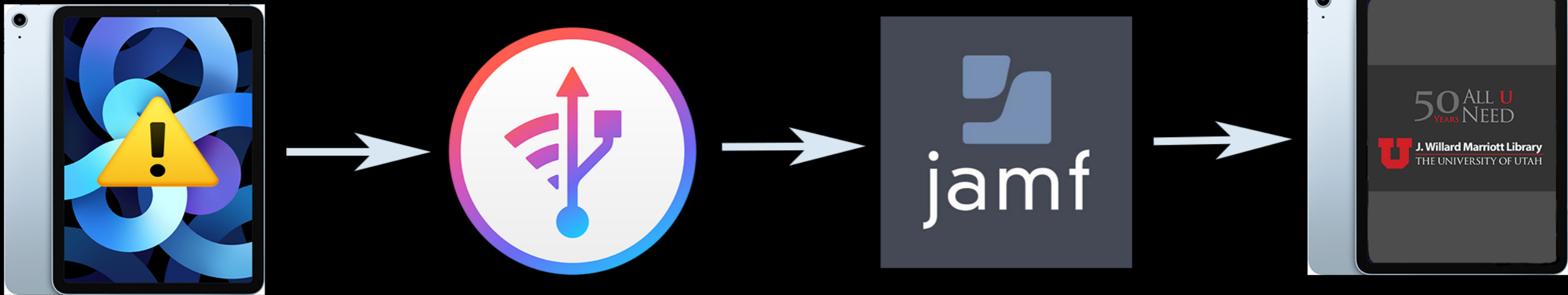


# iMazing

- Pros
  - Automated Device Enrollment
  - Blueprints
  - Enterprise App
- Cons
  - Missing some features from AEiOS
  - No Full Automation



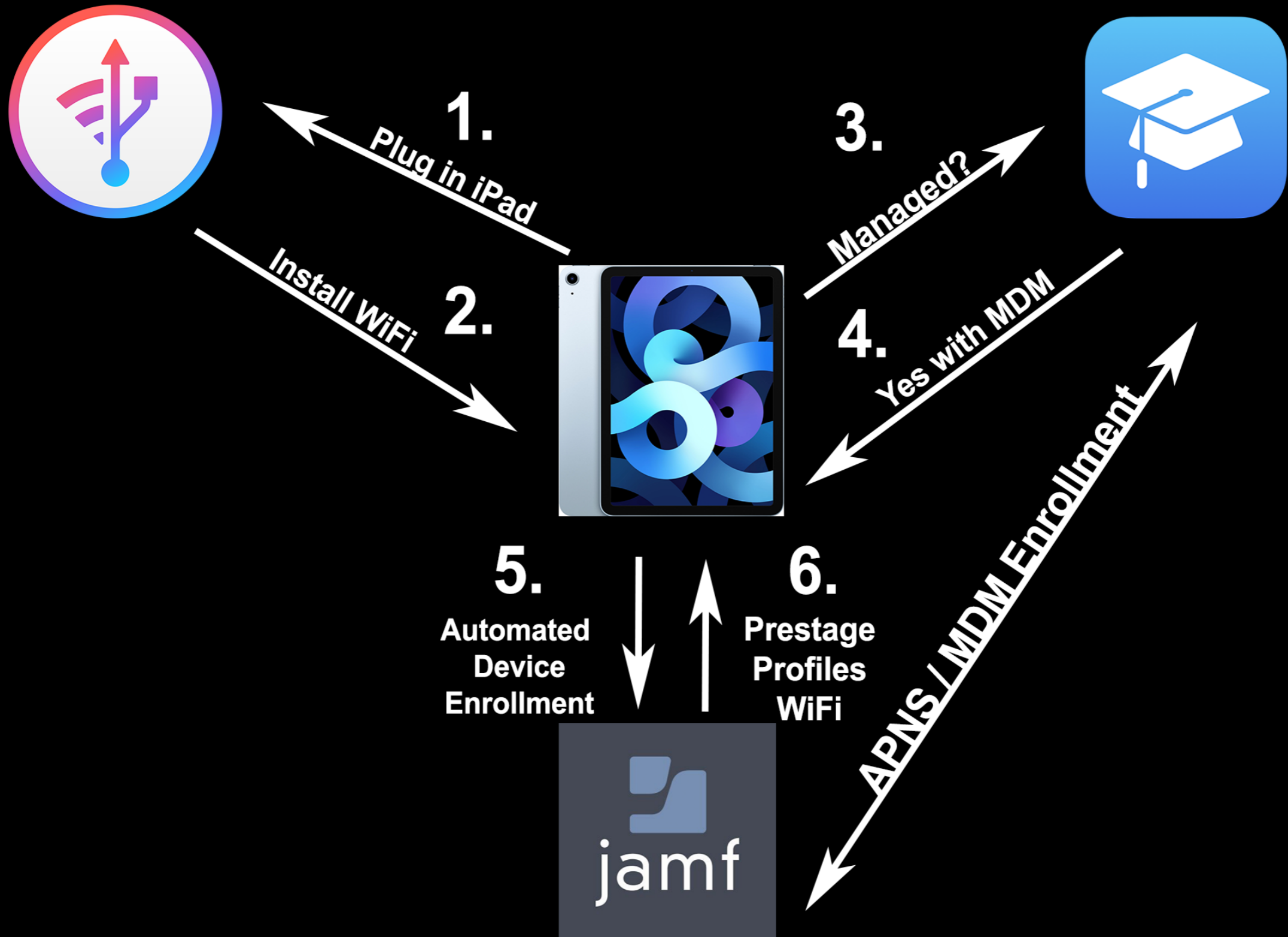
# New iPad Workflow







# iPad Workflow

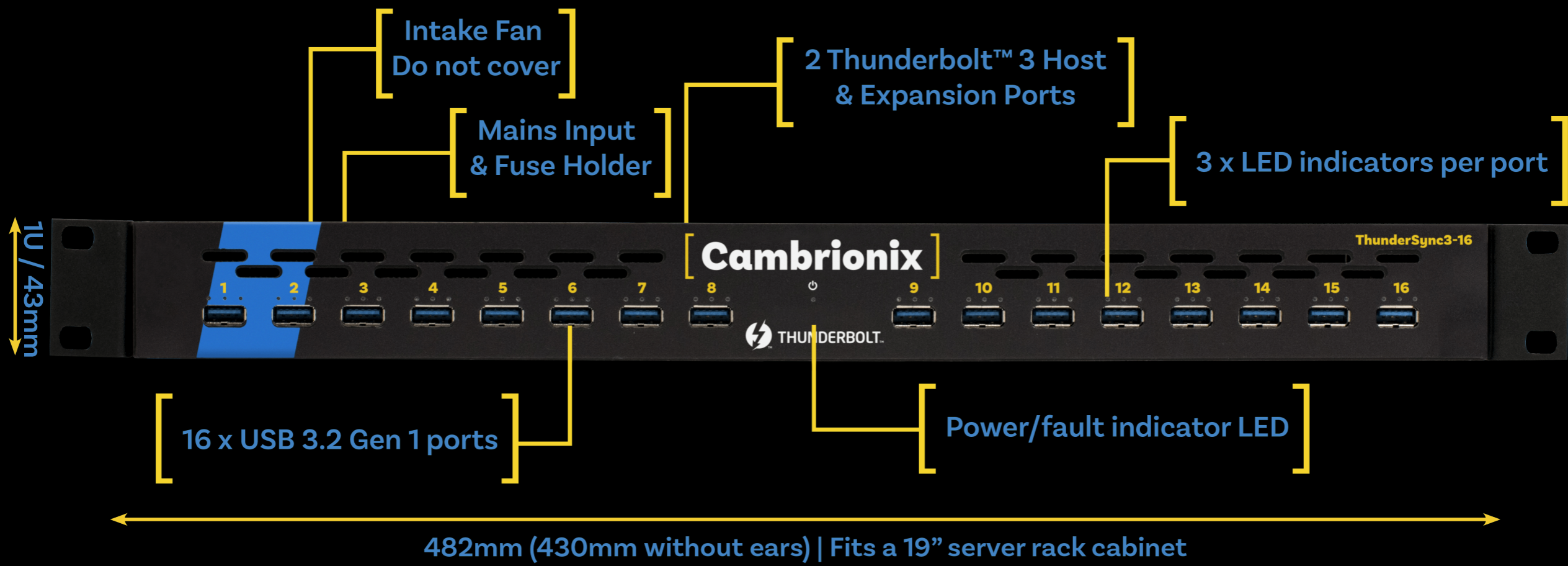


# iPad Setup - Hardware

- iPads
- Mac mini or iMac
- USB Hub
- Cambrionix - ThunderSync3-16
  - \$1700

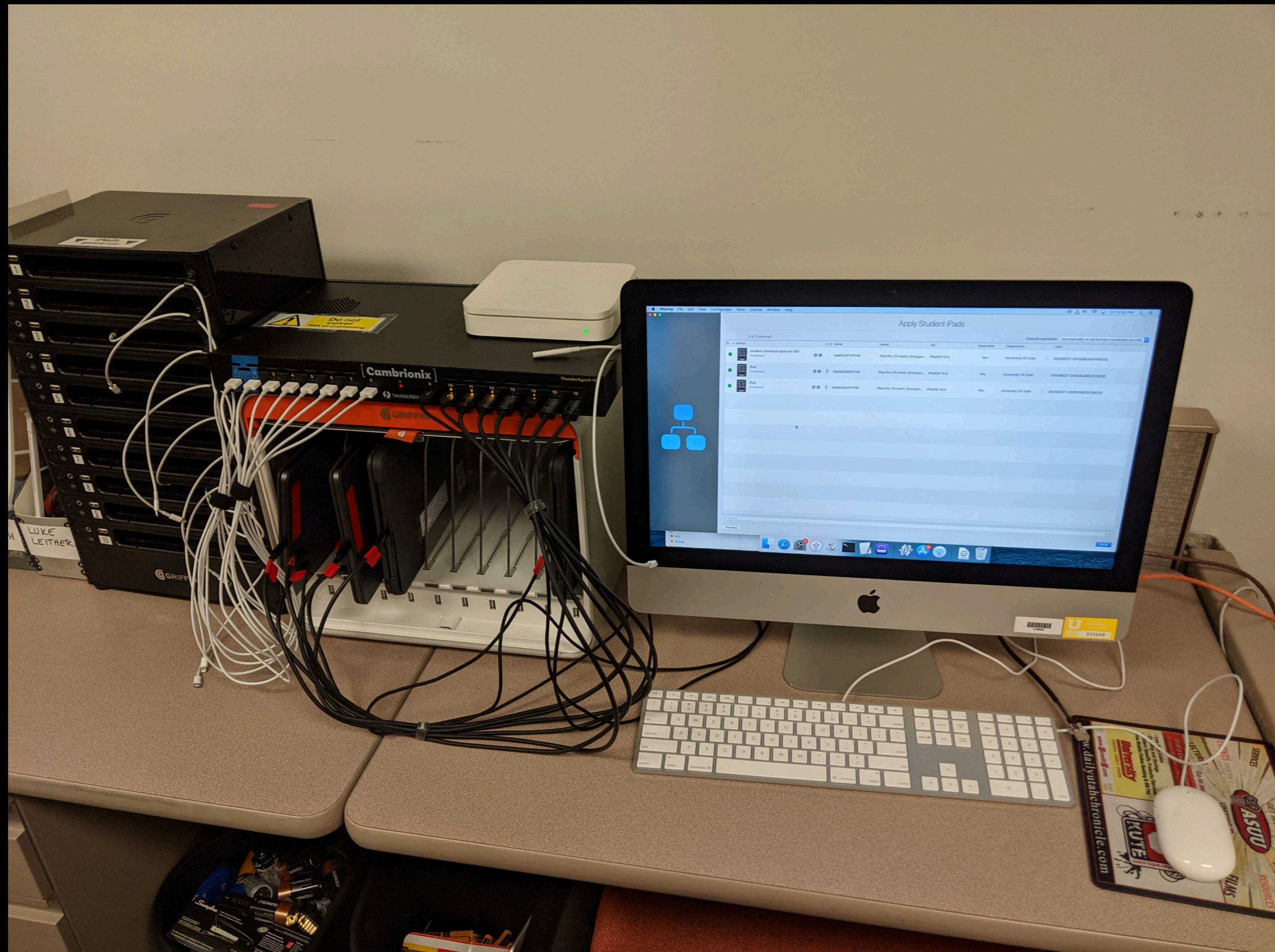


# iPad Setup - Hardware



482mm (430mm without ears) | Fits a 19" server rack cabinet

# iPad Setup - Hardware



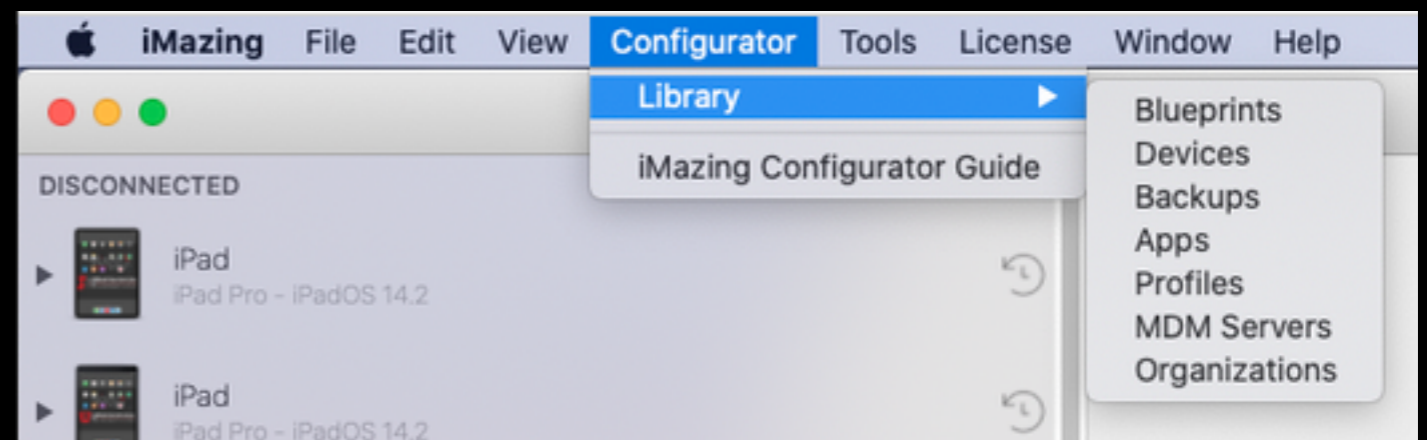
# iPad Setup - Software

- iMazing
  - Blueprints
- Jamf Pro
  - Prestage Enrollment
  - Configuration Profiles
- Apple Script
  - UI Scripting



# iMazing Configurator

- Blueprints
  - Post / Pre Actions
  - WiFi Install
- App Install
- Supervision
- Software Updates



# iMazing Blueprints

iMazing Configurator



Blueprints Devices Backups Apps Profiles MDM Servers Organizations

Student iPads

Student iPads

Edit

No description

**General**  
Target devices will be erased and configuration will be applied from DEP

**Organization & Supervision** ⚠️  
Some settings will not be applied because of DEP automatic enrollment

**Setup & Accessibility**  
Some settings will not be applied because of DEP automatic enrollment

**Actions**  
5 configured

**Apps**  
20 app(s) will be installed

+ - ▾

Cancel

Apply Blueprint

# Blueprints

## Editing Student iPads



- General**  
Target devices will be erased and configuration will be applied from DEP
- Organization & Supervision**  
Some settings will not be applied because of DEP automatic enrollment
- Setup & Accessibility**  
Some settings will not be applied because of DEP automatic enrollment
- Actions**  
5 configured
- Apps**  
20 app(s) will be installed
- App Files & Config**  
Transfer files to apps. Set their configuration.
- App Restrictions**  
Choose which app(s) are allowed
- Profiles**  
Configuration & provisioning profiles

### General

Name: Student iPads

Description:

Ignore non-critical errors when applying this blueprint

Device Type: iPad

Wi-Fi Profile: Imaging WiFi

Seconds to wait to let devices acquire Wi-Fi connection: 100

MDM and DEP Enrollment: Apply configuration from DEP (will erase device)

MDM enrollment credentials (if required):

Username: \_\_\_\_\_

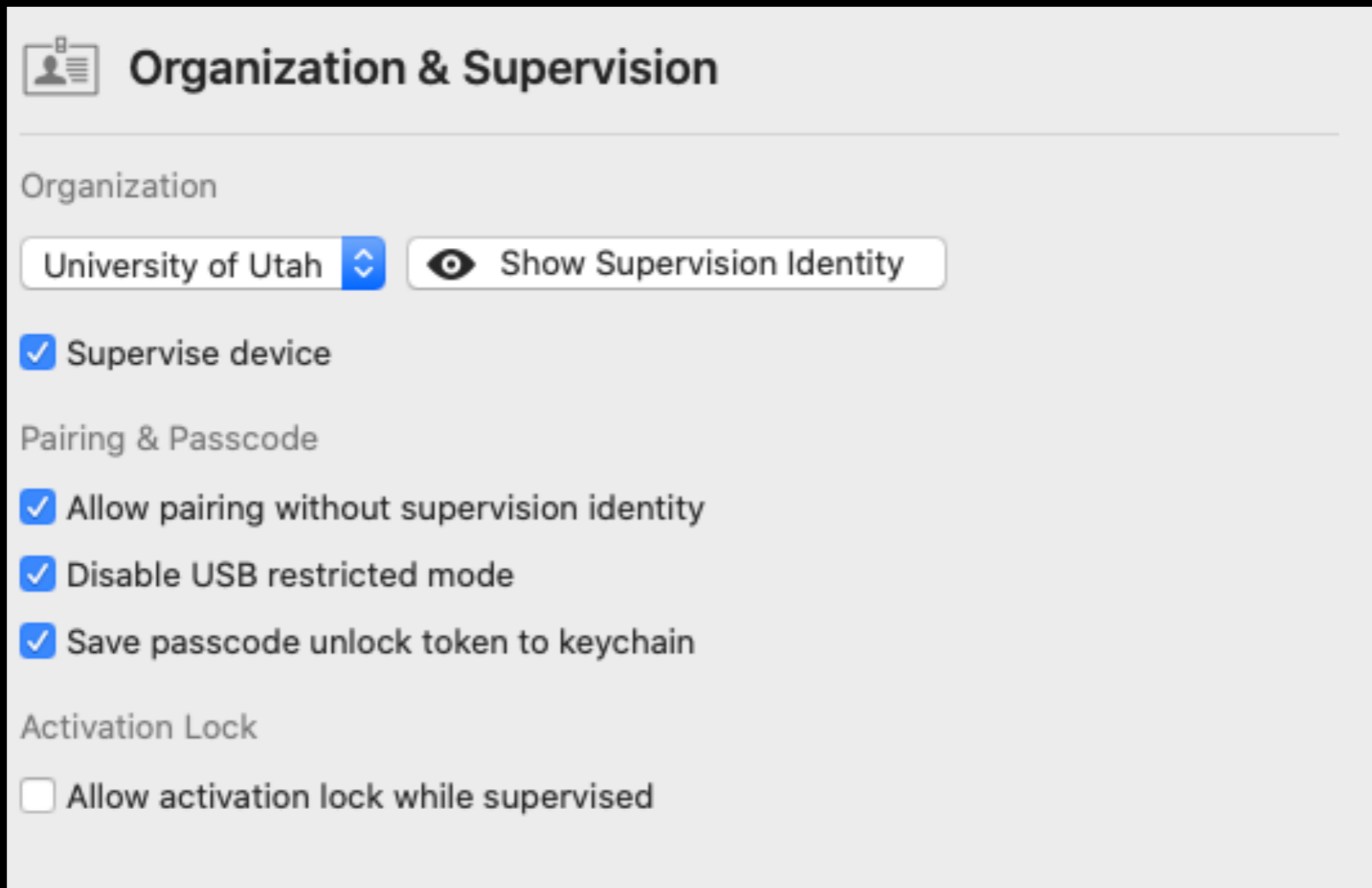
Password: \_\_\_\_\_


Cancel

Save





# Blueprints - Supervision



 **Organization & Supervision**

---

Organization

University of Utah   Show Supervision Identity

Supervise device

Pairing & Passcode

Allow pairing without supervision identity

Disable USB restricted mode

Save passcode unlock token to keychain

Activation Lock

Allow activation lock while supervised

# Blueprints - Setup



## Setup & Accessibility

### Device Name

{device\_name}

The following placeholders are available: {model}, {serial}, {number}, {device\_name}

### Language & Region

Set Language

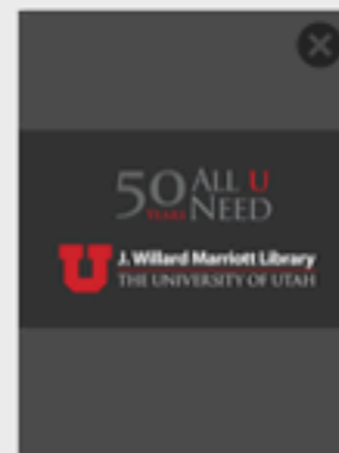
English

Set Region

United States

### Wallpapers (supervised only)

#### Lock Screen




Choose...

#### Home Screen



Choose...

# Blueprint - Actions

 **Actions**

---

The following actions will be executed in order.

**Pre-Configuration:**

- Back up
- Clear passcode with unlock token (supervised only)
- Clear Screen Time passcode (supervised only)
- Remove all profiles
- Uninstall all apps
- Erase all data and settings (MDM configured)
  - Preserve data plan
  - Prevent proximity setup
- Erase all photos
- Update OS to latest available version
- Restore OS (will erase target devices and install the latest available OS version)
- Fail if battery health is

# Blueprint - Actions

## Post-Configuration:

- Restore device's last backup
  - Don't skip DEP enrollment
- Restore backup
- Skip Setup Assistant
- Set backup encryption password
- Back up
- Launch app (supervised only)
- Remove Wi-Fi profile (if configured in General)
- Remove supervision (locally supervised only)
- Wait for full battery charge
- Shut down device
- Unpair device when done

# Blueprint - Apps

The screenshot displays the 'Apps' configuration page in the Blueprint management console. On the left is a navigation sidebar with several menu items, each with an icon and a status indicator (a blue circle with a number). The 'Apps' menu item is highlighted in blue and shows '6 app(s) will be installed'. The main content area is titled 'Apps' and features an Apple ID or Volume Purchase Account section with the email 'sl-apple-019@lists.utah.edu' and a 'Sign Out' button. Below this is a 'Single app mode (supervised only)' checkbox, which is currently unchecked. The 'Apps to install' section contains a list of six applications, each with its icon, name, and developer: Autodesk ReCap Pro for mobile (Autodesk Inc.), Box — Cloud Content Management (Box, Inc.), Canvas Student (Instructure Inc.), Microsoft OneDrive (Microsoft Corporation), Microsoft Word (Microsoft Corporation), and a partially visible 'Clock' app. At the bottom of the main area are '+' and '-' buttons. The interface concludes with 'Cancel' and 'Save' buttons at the bottom.

**General**  
Wi-Fi configured

**Organization & Supervision**  
Organization managing the device and supervision options

**Setup & Accessibility**  
Custom options are set

**Actions**  
6 configured

**Apps**  
6 app(s) will be installed

**App Files & Config**  
Transfer files to apps. Set their configuration.

**App Restrictions**  
Choose which app(s) are allowed

**Profiles**  
Configuration & provisioning profiles

**Apps**

Apple ID or Volume Purchase Account  
@ sl-apple-019@lists.utah.edu [Sign Out](#)

Single app mode (supervised only)

Apps to install

- Autodesk ReCap Pro for mobile  
Autodesk Inc.
- Box — Cloud Content Management  
Box, Inc.
- Canvas Student  
Instructure Inc.
- Microsoft OneDrive  
Microsoft Corporation
- Microsoft Word  
Microsoft Corporation
- Clock

[+](#) [-](#)

[Cancel](#) [Save](#)

# iMazing Configurator



### Apply Student iPads

Select All 0 of 6 selected Execute operation: On selected devices only

Status	Device	I / O	Serial	Model	OS	Supervised	Organization	UDID
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-012 Completed		DMQDG86VPTRF	iPad Pro (11-inch) (2nd gen...	iPadOS 14.3	Yes	University Of Utah	00008027-001009343E78402E
<input checked="" type="checkbox"/>	iPad Completed		DMPXT4GQKD6J	iPad Pro (11-inch)	iPadOS 14.4	Yes	University Of Utah	00008027-0011191C11F2002E
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-021 Cannot restore student-checkout-ipad-pro-021...		DMQDG6FYPTRF	iPad Pro (11-inch) (2nd gen...	iPadOS 14.3	Yes	University Of Utah	00008027-001E499202F8402E
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-018 Completed		DMQDG7ZLPTRF	iPad Pro (11-inch) (2nd gen...	iPadOS 14.4	Yes	University Of Utah	00008027-000529D90184402E
<input checked="" type="checkbox"/>	iPad Completed		DMQDG63YPTRF	iPad Pro (11-inch) (2nd gen...	iPadOS 14.3	Yes	University Of Utah	00008027-0003299202F8402E
<input checked="" type="checkbox"/>	iPad Completed		DMQDG6E6PTRF	iPad Pro (11-inch) (2nd gen...	iPadOS 14.4	Yes	University Of Utah	00008027-001605480CE2402E

Q Search Launch

Previous Done

# Jamf Pro Configuration

- 85% of configuration is from the server.
- Prestage Enrollment
  - Skips all Setup Assistant screens
  - Prevent Unenrollment
  - Supervise
- Configuration Profiles
  - Restrictions
  - Allowed iPad features
  - Device Based UConnect



# Automated Device Enrollment

Settings : Global Management > Automated Device Enrollment

← DEP - ESL

Details Devices

**Display Name** Display name for the Automated Device Enrollment instance

DEP - ESL

**Server Token File**

Marriott Library Casper Server\_Token\_2020-05-12T22-34-21Z\_smime.p7m

**Supervision Identity For Use With Apple Configurator** Supervision identity to be trusted by devices associated with this Automated Device Enrollment instance

MLIB-CPS-SUPERVISION-IDENTITY

**Site** Site to add the instance to

None

**Server Name** Identifiable name for the MDM server

Marriott Library Casper Server

**Server UUID** System-generated server identifier

[REDACTED]

**Admin ID** Apple ID of the person who generated the token that is in use

sl-ap[REDACTED]utah.edu

**Organization Name**

University Of Utah

**Organization Email Address**

sl2-[REDACTED]ah.edu

**Organization Phone Number**

801-5[REDACTED]27

**Organization Address**





# Prestage Enrollments

Computers   **Devices**   Users

INVENTORY

- Search Inventory
- Search Volume Content

CONTENT MANAGEMENT

- Configuration Profiles
- Provisioning Profiles
- Personal Device Profiles
- Mobile Device Apps
- eBooks

GROUPS

- Smart Device Groups
- Static Device Groups
- Classes

ENROLLMENT

- Enrollment Profiles
- Enrollment Invitations
- PreStage Enrollments**

Mobile Devices

## PreStage Enrollments

[+ New](#)

NAME	LAST SYNC	SITE
4K AppleTVs	05/19/2020 at 11:40 AM	None
Checkout iPad Test	05/19/2020 at 11:40 AM	None
Staff	05/19/2020 at 11:40 AM	None
Staff Test	05/19/2020 at 11:40 AM	None
Student Checkout iPads	11/06/2020 at 7:07 PM	None
Test - 4K Apple TV	05/19/2020 at 11:40 AM	None
Test Student Checkout iPads	09/24/2020 at 4:19 PM	None

# Prestage Enrollments

Mobile Devices : PreStage Enrollments

← Student Checkout iPads

Options

Scope

Filter Re

1 - 101 of 101

Select All

Deselect All

	DEVICE	SERIAL NUMBER	MODEL	DESCRIPTI...	ASSET TAG	DEVICE ASSIGNMENT STATUS	DEVICE ASSIGNED
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-083	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-084	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-090	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-085	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-081	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM
<input checked="" type="checkbox"/>	student-checkout-ipad-pro-089	DMPD	iPad Pro	IPAD PRO 11 WIFI 128GB SPACE GRAY-USA		Assigned	12/03/2020 at 1:59 PM

# Prestage Enrollments

## General

**Display Name** Display name for the PreStage enrollment

Student Checkout iPads

### Automated Device Enrollment Instance

Automated Device Enrollment instance to associate with the PreStage enrollment. Devices associated with the selected Automated Device Enrollment instance can be assigned the PreStage enrollment

DEP - ESL ▼

Automatically assign new devices  
Automatically assign all new devices to this PreStage enrollment

**Enrollment Site** Site that mobile devices will be added to during enrollment

Marriott Library ▼

Use existing site membership, if applicable

Use existing location information, if applicable

**Support Phone Number** Support phone number for the organization

801-██████ 11

# Prestage Enrollments

**Support Email Address** Support email address for the organization

**Department** Department to associate with the PreStage enrollment

**Require Credentials for Enrollment**  
Require the user to provide username and password on devices with iOS 7.1 or later

**Supervise Devices with iOS 12.x or earlier**  
Devices will be supervised

**Make MDM Profile Mandatory for devices with iOS 12.x or earlier**  
Require the user to apply the MDM profile

## Settings for Supervised Devices

**Pairing**  
Allow devices to connect to Mac computers

**Prevent Unenrollment**  
Disallow the user from removing the MDM profile

**Install configuration profiles before Setup Assistant**  
Install configuration profiles on mobile devices in the scope before a user is presented with the Setup Assistant screens

**Enable Shared iPad**  
Allow devices with iOS 9.3 or later to be shared

**Prevent user from enabling Activation Lock**

# Prestage Enrollments

Setup Assistant Options Selected items are not displayed in the Setup Assistant during enrollment for iOS or tvOS

None

## IOS And TvOS

- Location Services
- Siri
- Apple ID and iCloud
- Terms and Conditions
- App Analytics
- Privacy

## IOS Only

- Apps & Data
  - Move from Android
- Passcode Lock

# Prestige Enrollments

- Add Cellular Plan
- Home Button Sensitivity
- Touch ID / Face ID
- Apple Pay
- Display Zoom
- True Tone Display
- Cloud Storage
- Apple Watch
- New Feature Highlights
- iMessage and FaceTime
- Screen Time
- Software Update

# Prestage Enrollments

- Choose your Look
- Express Language Setup
- Preferred Language Order
- Get Started
- Transfer Data

# Configuration Profiles

Mobile Devices

## Configuration Profiles

	NAME	LOGS	COMPLETED	PENDING	FAILED	SCOPE	SITE
>	Apps - Internet						
>	Checkout iPads						
>	Configuration - Displays						
>	Configuration - Network						
>	Configuration - Security						
>	Configuration - Staff						
>	Requests						



# iPad Restrictions Profile

Mobile Devices : Configuration Profiles

← Checkout iPad Restrictions

Options Scope  Show in Jamf Pro Dashboard

General

Restrictions Settings configured: 114

Functionality

Apps

Media Content

## Restrictions: Functionality

Settings configured: 86

<b>Use of camera</b> iOS, Supervised only for iOS 13 or later	Allowed
<b>FaceTime</b> iOS, Supervised only for iOS 13 or later	Allowed
<b>Screenshots and screen recording</b> iOS	Allowed
<b>AirPlay, screen observation by Classroom, and screen sharing</b> iOS, Supervised	Allowed
<b>Classroom to perform AirPlay and screen observation without prompting</b> iOS, Supervised	Restricted
<b>AirPlay incoming request</b> tvOS, Supervised	Allowed
<b>Passcode on incoming AirPlay pairing requests</b> tvOS	Skipped
<b>Pairing TV with Remote app</b> tvOS 10.12, Supervised	Allowed
<b>AirDrop</b> iOS, Supervised	Allowed
<b>Messages</b> iOS, Supervised	Allowed
<b>Voice dialing while device is locked</b>	Allowed

History Logs Download Clone Delete Edit

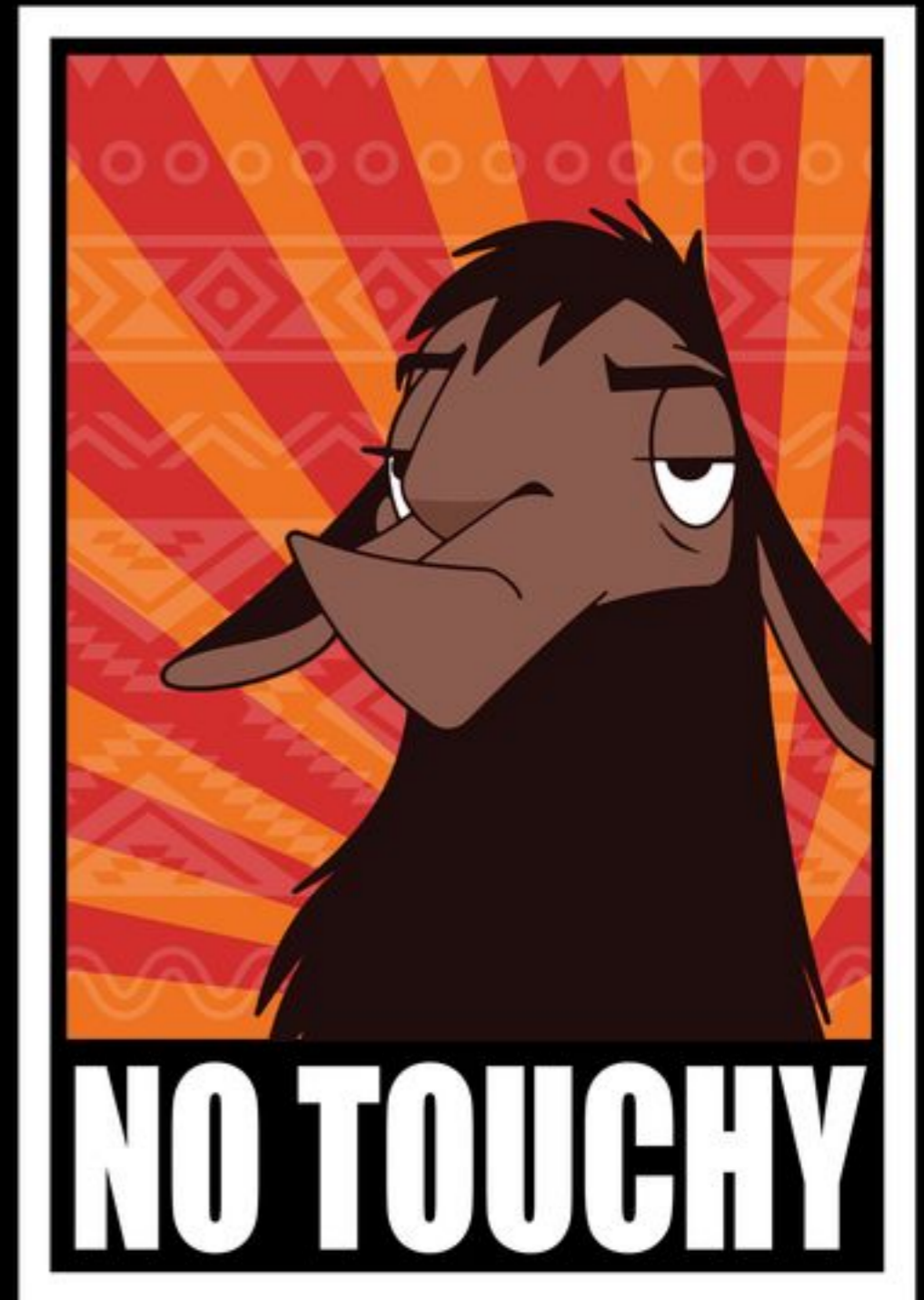
# WiFi Profiles

- Uconnect (802.1X Enterprise)
- ULink (IoT)
- Imaging Hidden WiFi (Legacy)



# Zero-Touch?

- Yes, with a little extra customization.
- iMazing has to be reset every night and iPads cleared.
- UI script to control iMazing



# UI Script

- Resets iMazing
- Picks Blueprint to use
- Selects devices to apply the Blueprint on attachment
- Suppresses Dialogs



# Automated Blueprint

# Ready for Checkout



# Questions?

**If Apple  
made a car...**

**would it have  
Windows!?**