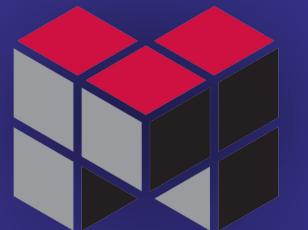


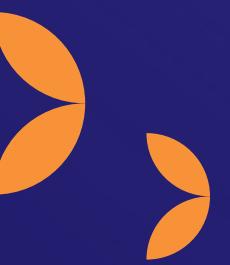


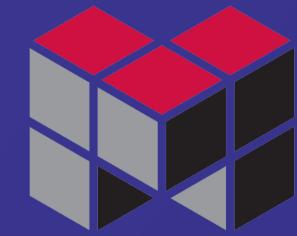
20<sup>th</sup> *Nashville* 24

# Flawless MDM Communication



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# Isaac Ordonez

Director of Technology

Mann Consulting

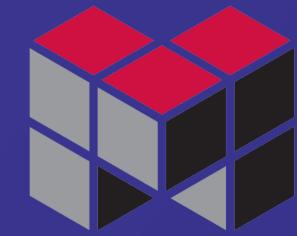


# Patrick Weber

Sr. Consultant

Mann Consulting



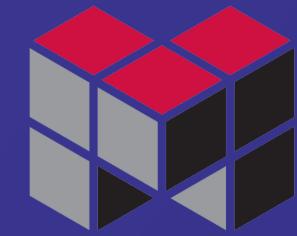


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# Announcement!

We'll provide a URL to all scripts, EAs and workflows at the end. Kick back and relax!



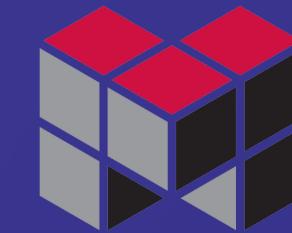


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# Who Is Mann?

- MSP
- Lots of Jamf Instances
- Security and Compliance focused
- Workflows provide common automations
  - Patching and upgrades
  - Security Controls (CIS/STIG/Custom)
  - Computer Health
- Gather reports and data at scale





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## Computer Report Card

Customer	Created On
Company, Inc.	August 12, 2024
Total Computers	250
Active Computers	224

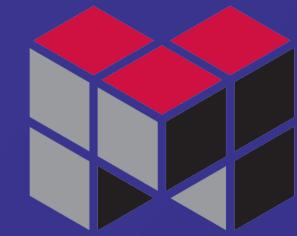
### Compliance

Item	Total Failed	Compliance
Hardware Supports Latest Operating System	3	98.35%
Operating System Is Latest Major Version	2	98.90%
Operating System Is Supported By Apple	0	100.00%
All Apple-provided Software Is Current	0	100.00%
Apple Push Notification Service Communications Verified	5	97.13%
FileVault Is Enforced	0	100.00%
FileVault Key Is Escrowed	0	100.00%
Sealed System Volume (SSV) Is Enabled	0	100.00%
Apple Mobile File Integrity (AMFI) Is Enabled	0	100.00%
System Integrity Protection Status (SIP) Is Enabled	0	100.00%
Ensure the System Has a Valid User Assigned	2	98.90%
Unmanaged Devices Are Inactive	0	100.00%
Jamf Check-in Last 14 Days	40	81.98%
Inventory Update Verified	0	100.00%
MDM Configuration Profile Settings Have Conflicts	5	97.25%
XProtect Is Running and Updated	18	90.11%
Endpoint Protection Is Installed And Active - Jamf Protect	0	100.00%

### Patching

Application	Total Installed	Patched	Last Update
Keynote.app	191	86.70%	6/10/2024
Google Chrome.app	190	85.11%	8/6/2024
JamfProtect.app	189	100.00%	4/25/2024
Slack.app	186	31.32%	7/30/2024
zoom.us.app	186	60.87%	7/30/2024
1Password.app	184	12.64%	8/8/2024
NordLayer.app	184	81.32%	6/11/2024
Pages.app	146	90.78%	6/10/2024
Numbers.app	144	89.93%	6/10/2024
iMovie.app	141	21.01%	6/20/2024
GarageBand.app	137	10.10%	6/10/2024

JNUC  
2024



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# How We Got Here

## CIS Benchmark 1.8

Ensure the System is Managed by a Mobile  
Device Management (MDM) Software

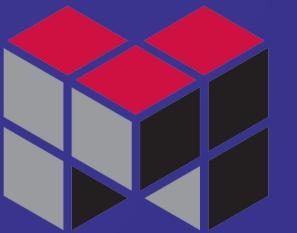
### Terminal Method:

Run the following to verify the system is enrolled in a Mobile Device Management software:

```
$ sudo /usr/bin/profiles status -type enrollment | /usr/bin/awk -F: '/MDM  
enrollment/ {print $2}' | /usr/bin/grep -c "Yes (User Approved)"
```

1



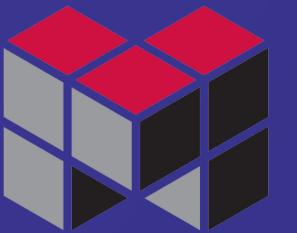


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# But What About...

- Apple Push Notification issues
- Jamf binary communications
- Jamf recon failing
- Jamf policies hanging
- Enrolled in the wrong MDM server



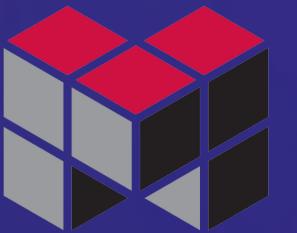


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# Issues Caused...

- Config profiles not installing
- Inventory incorrect
- Some, or all policies not running
- Security software not properly installing
- Security benchmarks report incorrectly





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# How Clients Communicate

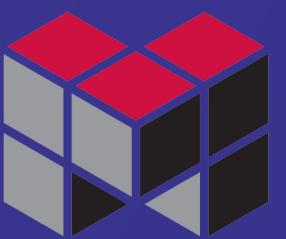
Jamf Check-in

Jamf Binary Recon

Jamf Daemon

Apple MDM (APNs)





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# Apple MDM

## Persistent Communication

1. Apple notifies device with push
  2. Device queries MDM Server
  3. MDM Server sends device command
  4. Device Acknowledges
- Profiles, Wipe, Lock, VPP!

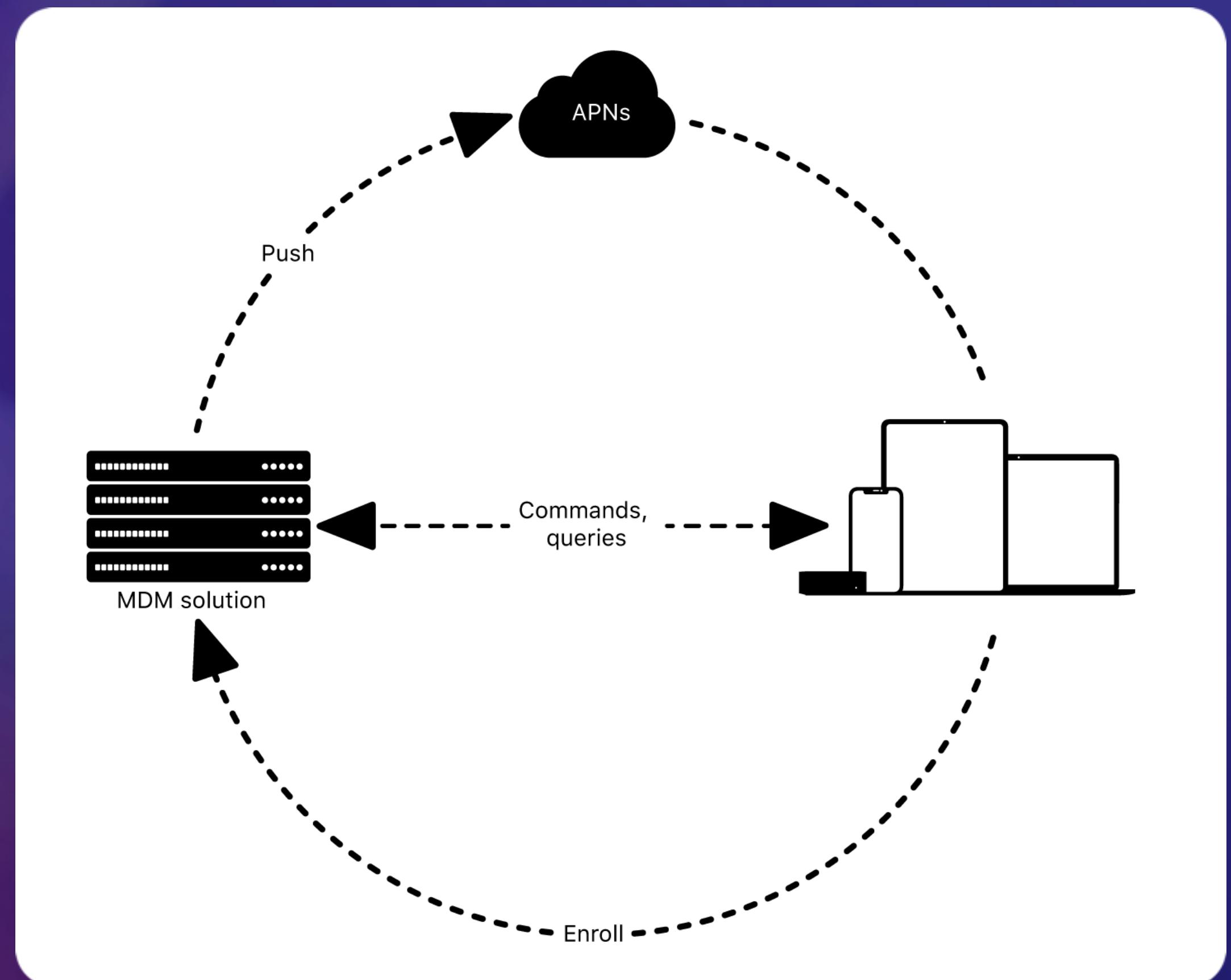
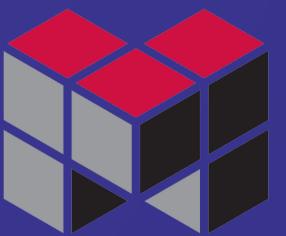


Image Source: [apple.com](https://apple.com)





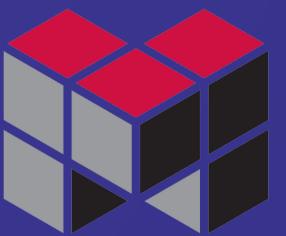
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## Jamf Check-In

- LaunchDaemon as root
- Runs at set interval
- Client pulls commands from MDM server over HTTPS

Scripts, Packages, Commands, Recon!



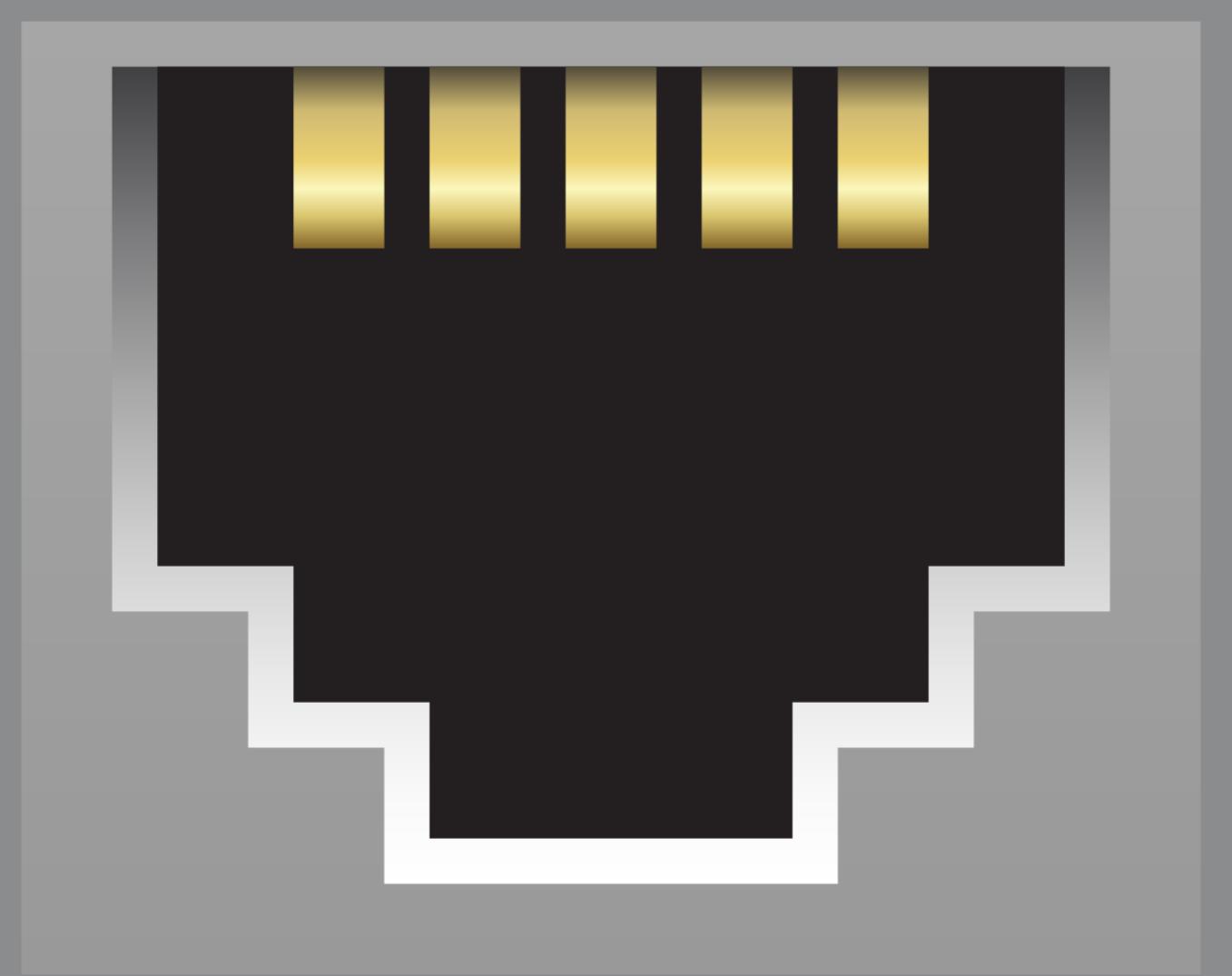


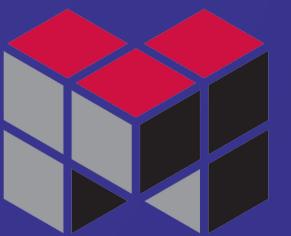
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## Jamf Daemon

- LaunchDaemon as root
- Always running
- Policies with Network State Change Trigger
- Runs in Power Nap! 😱

Scripts, Packages, Commands, Recon





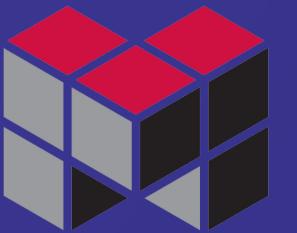
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## Jamf Recon

- Policy action
- Pre-defined inventory objects
- Extension Attributes for custom inventory

Validates Patching, Benchmarks and  
Security!





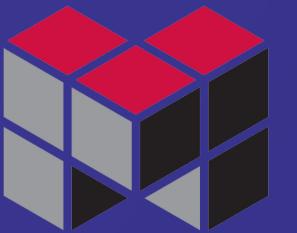
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# APNs Communications



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2024



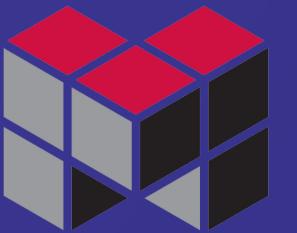
mann

# Announcement!

MDM Profiles can't have an expiration date after the Jamf Pro CA's expiration date.

Renew your Jamf Pro CA at least 2 years before it expires to avoid shortened MDM Profile validity.





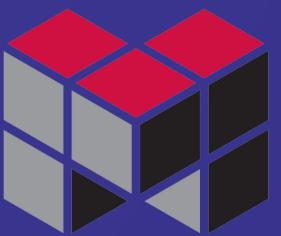
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# Announcement!

Example:

- Today is 01/01/2024
- Your Jamf Pro CA expires 11/23/2024
- Client MDM Profiles can only renew with a expiration date of 11/23/2024





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# APNS Failure Symptoms

Computer has recent check-in but...

Management Commands Pending

- Config Profiles not installing
- VPP Apps not installing
- Remote commands failing
- Jamf App Installers don't work

The screenshot shows two views of the Jamf Pro interface for an Employee's MacBook Pro.

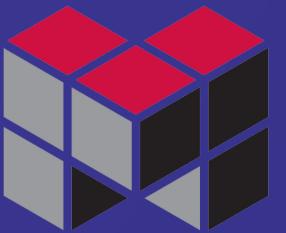
**Top View (Management - History):**

- Shows 1525 Completed Commands, 48 Pending Commands, and 9 Failed Commands.
- A yellow box highlights the "48 Pending Commands" section.
- A yellow box highlights the "DATE/TIME COMPLETED" column for the pending commands, showing dates from 01/31/2024 at 11:28 AM to 01/31/2024 at 7:30 AM.
- A yellow box highlights the "USERNAME" column for the pending commands.

**Bottom View (Inventory):**

- Shows Last Inventory Update: 08/08/2024 12:18 PM.
- Shows Last Check-in: 08/08/2024 02:32 PM.
- Shows IP Address: 199.116.73.180.





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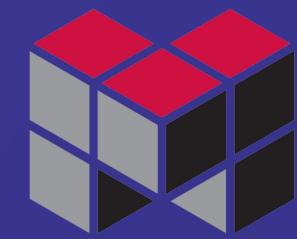
## APNs Failure Causes

- Client MDM Profile expired
- Client Identity cert missing
- Server APNs cert expired
- Server APNs cert mismatch
- Server errors
- macOS issues

The screenshot shows the Jamf Pro interface with the following details:

- Left sidebar:** Shows "Dashboard", "Computers", "Devices", "Users", and "Settings".
- Current View:** "Push certificates" under "Global Settings".
- Task List:** Includes "Choose Option", "Download CSR", "Create Certificate", "Upload Certificate", and "Verify" (which is highlighted).
- Verify Certificate Section:** Contains three warning messages:
  - "WARNING Existing devices that are enrolled with Jamf Pro will no longer respond to push notifications."
  - "Your new push notification certificate has a new "topic"."
  - "Your new push notification certificate has a new "topic"."
- Topic Information:** Existing Topic: com.apple.management.cbf4d040-0a3b-... and New Topic: com.apple.management.c9db8347-ad2e-...
- Buttons:** "Cancel", "Previous", and "Next".





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# APNs Failure Detection

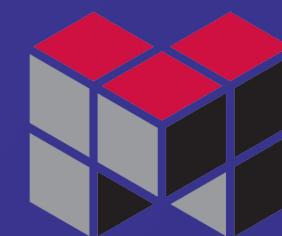
Extension Attribute That...

- Checks MDM Profile validity
- Checks for valid MDM Client Private Key
- Reports last time client got HTTP 200

Acknowledge from Jamf Server after  
completing a task

Computers		
13 Computers in "APNs Communications Verified"		
NAME	APNS COMMUNICATIONS VERIFIED	MODEL
iMac	2024-06-20 09:22:23	iMac Intel (Retina 5K, 27-Inch, 2019)
Mac mini	2000-01-01 00:00:03	Mac mini (2018)
Mac mini	2000-01-01 00:00:03	Mac mini (2018)
MacBook Pro	2024-07-09 13:55:47	MacBook Pro (15-inch, 2019)
MacBook Pro	2024-07-01 09:01:07	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-06-26 04:27:46	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-01 09:41:15	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-16 10:38:07	MacBook Pro (15-inch, 2018)
MacBook Pro	2000-01-01 00:00:03	MacBook Pro (16-inch, 2021)
MacBook Pro	2024-03-26 16:42:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-06-30 19:51:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2000-01-01 00:00:02	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-04-27 15:12:41	MacBook Pro (16-inch, Nov 2023) [M3 Pro]





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## APNs Failure

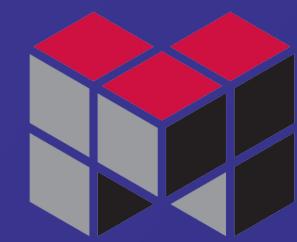
### Time Based Error Codes

2000-01-01...

- 00:00:02 - MDM Profile not found
- 00:00:03 - Client identity certificate missing from system keychain
- 00:00:04 - Client identity certificate expired in system keychain

Computers		
13 Computers in "APNs Communications Verified"		
NAME	APNS COMMUNICATIONS VERIFIED	MODEL
iMac	2024-06-20 09:22:23	iMac Intel (Retina 5K, 27-Inch, 2019)
Mac mini	2000-01-01 00:00:03	Mac mini (2018)
Mac mini	2000-01-01 00:00:03	Mac mini (2018)
MacBook Pro	2024-07-09 13:55:47	MacBook Pro (15-inch, 2019)
MacBook Pro	2000-01-01 00:00:02	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-06-26 04:27:46	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-01 09:41:15	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-16 10:38:07	MacBook Pro (15-inch, 2018)
MacBook Pro	2000-01-01 00:00:03	MacBook Pro (16-inch, 2021)
MacBook Pro	2024-03-26 16:42:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-06-30 19:51:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2000-01-01 00:00:02	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-04-27 15:12:41	MacBook Pro (16-inch, Nov 2023) [M3 Pro]





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## APNs Failure

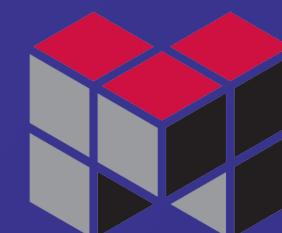
### Time Based Error Codes

2000-01-01...

- 00:00:02 - MDM Profile not found
- 00:00:03 - Client identity certificate or private key missing from System.keychain
- 00:00:04 - Client identity certificate expired in System.keychain

Computers		
13 Computers in "APNs Communications Verified"		
NAME	APNS COMMUNICATIONS VERIFIED	MODEL
iMac	2024-06-20 09:22:23	iMac Intel (Retina 5K, 27-Inch, 2019)
Mac mini Mac mini	2000-01-01 00:00:03	Mac mini (2018)
Mac mini Mac mini	2000-01-01 00:00:03	Mac mini (2018)
MacBook Pro	2024-07-09 13:55:47	MacBook Pro (15-inch, 2019)
MacBook Pro	2024-07-01 09:01:07	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-06-26 04:27:46	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-01 09:41:15	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-16 10:38:07	MacBook Pro (15-inch, 2018)
MacBook MacBook Pro	2000-01-01 00:00:03	MacBook Pro (16-inch, 2021)
MacBook Pro	2024-03-26 16:42:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-06-30 19:51:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2000-01-01 00:00:02	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-04-27 15:12:41	MacBook Pro (16-inch, Nov 2023) [M3 Pro]





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# APNs Failure Remediation

No Errors?

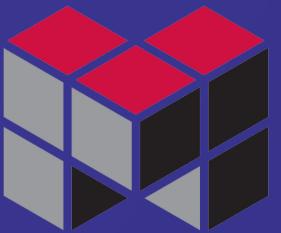
- Upgrade macOS!

Errors?

- Reinstall MDM Profile
  - May require MDM Profile removal in Recovery Mode

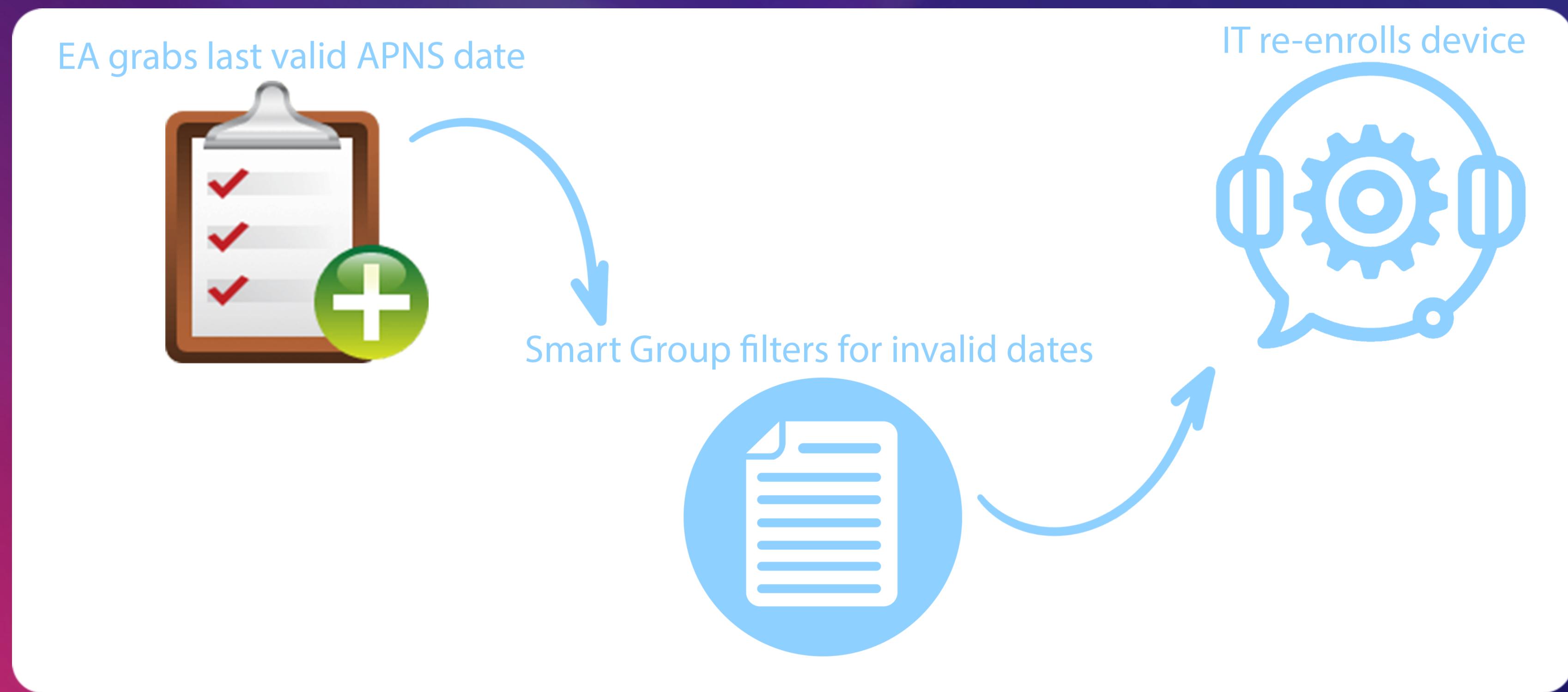
Computers		
13 Computers in "APNs Communications Verified"		
NAME	APNS COMMUNICATIONS VERIFIED	MODEL
iMac	2024-06-20 09:22:23	iMac Intel (Retina 5K, 27-Inch, 2019)
Mac mini Mac mini	2000-01-01 00:00:03	Mac mini (2018)
Mac mini Mac mini	2000-01-01 00:00:03	Mac mini (2018)
MacBook Pro	2024-07-09 13:55:47	MacBook Pro (15-inch, 2019)
MacBook Pro	2024-07-01 09:01:07	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-06-26 04:27:46	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-01 09:41:15	MacBook Pro (15-inch, 2018)
MacBook Pro	2024-07-16 10:38:07	MacBook Pro (15-inch, 2018)
MacBook MacBook Pro	2000-01-01 00:00:03	MacBook Pro (16-inch, 2021)
MacBook Pro	2024-03-26 16:42:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-06-30 19:51:35	MacBook Pro (16-inch, 2019)
MacBook Pro	2000-01-01 00:00:02	MacBook Pro (16-inch, 2019)
MacBook Pro	2024-04-27 15:12:41	MacBook Pro (16-inch, Nov 2023) [M3 Pro]

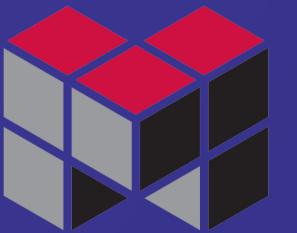




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# APNs Failure Recap





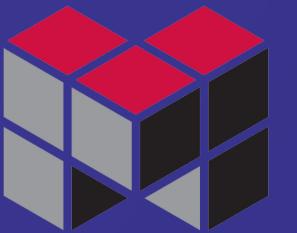
mann

# Announcement!

Admin users can break MDM communications by editing the System.keychain file and removing the client identity certificate.

This applies to non removable profiles installed in PreStage.

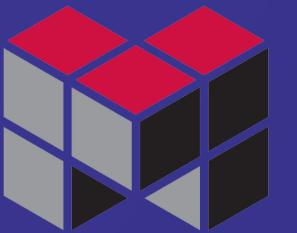




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# Jamf Check-In





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# Check-In Failure Symptoms

Computer receives MDM Profiles but...

Last Check-in is not current.

- Policies won't run
- Inventory won't update

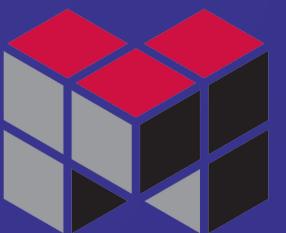
**Management History**

COMMAND	DATE/TIME COMPLETED	USERNAME
CertificateList	08/13/2024 at 5:05 PM	
ProfileList	08/13/2024 at 5:05 PM	
Remove Configuration Profile - Profile no longer exists	08/13/2024 at 5:05 PM	
CertificateList	08/13/2024 at 5:01 PM	

**General**

Computer Name:	Employee's Mac Mini
Jamf Pro Computer ID:	2
Jamf Pro Management ID:	
Last Inventory Update:	02/06/2023 05:30 PM
Last Check-in:	02/06/2023 05:46 PM
IP Address:	

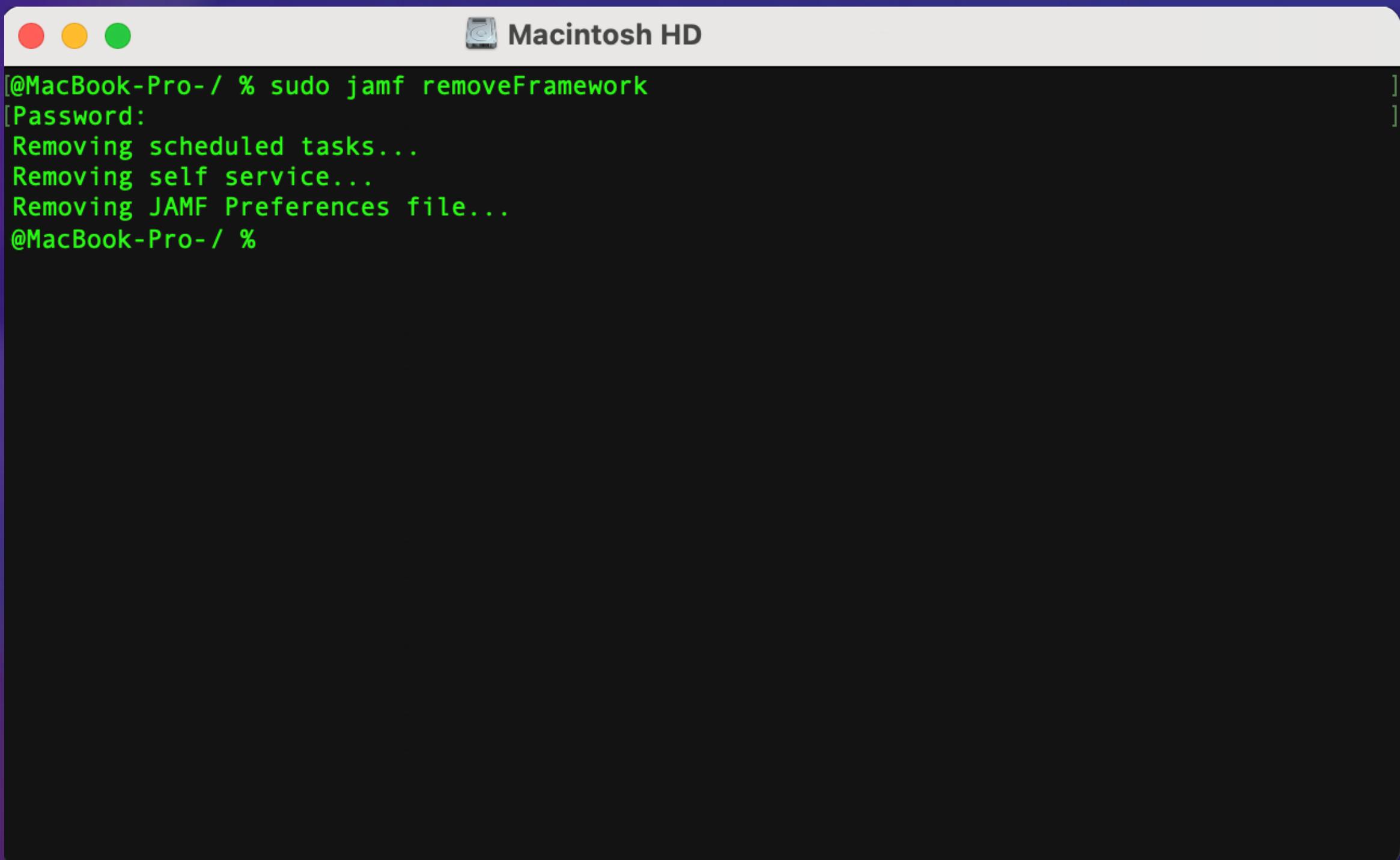




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## Check-In Failure Causes

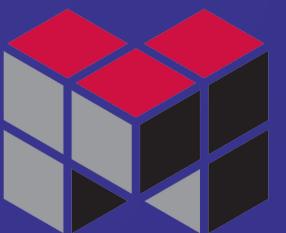
- Jamf LaunchDaemon removed
- Hung Policy
- Jamf Client Certificate issue



A screenshot of a Mac OS X terminal window titled "Macintosh HD". The window shows the command "@MacBook-Pro-/ % sudo jamf removeFramework" being run, followed by a password prompt "[Password:]". The output of the command shows it removing scheduled tasks, self-service items, and the JAMF Preferences file.

```
@MacBook-Pro-/ % sudo jamf removeFramework
[Password:
Removing scheduled tasks...
Removing self service...
Removing JAMF Preferences file...
@MacBook-Pro-/ %
```





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# Check-in Failure Detection

## Smart Group 1

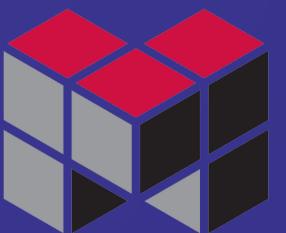
- Last Check-in more than 14 days ago

Computers : Smart Computer Groups

← Jamf Check-in Last 14 Days = Fail

Computer Group	Criteria	Reports	
AND/OR	CRITERIA	OPERATOR	VALUE
	Last Check-in	more than x days ago	14





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# Check-in Failure Detection Config Profile

- Null Custom Payload

Computers : Configuration Profiles

← Jamf Check-In Fail

Show in Jamf Pro Dashboard

Options Scope

Search...

General

Application & Custom Settings

1 payload configured

Upload

com.mann.null

Use this section to define generic settings for preference domains.

Preference Domain

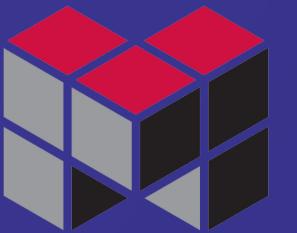
The name of the preference domain (com.company.application) com.mann.null

Upload File

PLIST file containing key value pairs for settings in the specified domain

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>examplesetting</key>
  <true/>
</dict>
</plist>
```





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# Check-in Failure Detection Config Profile

- Scoped to Smart Group 1

Computers : Configuration Profiles

← Jamf Check-In Fail

Options Scope  Show in Jamf Pro Dashboard

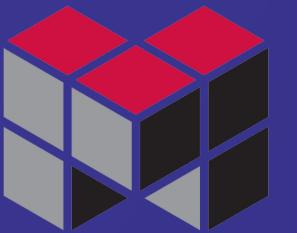
Targets Limitations Exclusions

Target Computers  
Computers to assign the profile to

Target Users  
Users to distribute the profile to

TARGET	TYPE
Jamf Check-in Last 14 Days = Fail	Smart Computer Group





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# Check-in Failure Detection

## Smart Group 2

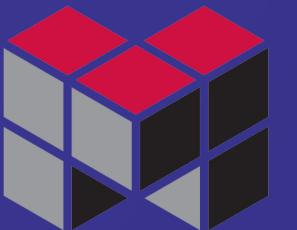
- Last Check-in more than 14 days ago
- Profile Name has Jamf Check-in Fail

Computers : Smart Computer Groups

← **Jamf Check-in Last 14 Days = Fix**

Computer Group	Criteria	Reports	
AND/OR	CRITERIA	OPERATOR	VALUE
	Last Check-in	before (yyyy-mm-dd)	14
and	Profile Name	has	Jamf Check-in Fail





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# Check-in Failure Remediation

## Redeploy Framework via API

- Last Check-in more than 14 days ago
- Profile Name has Jamf Check-in Fail

(We've got a script to help you automate!)

POST /v1/jamf-management-framework/redeploy/{id} Redeploy Jamf Management Framework

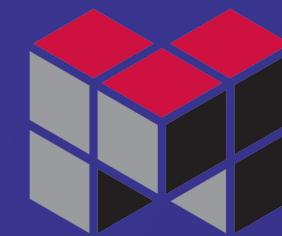
Redeploys the Jamf Management Framework for enrolled device

**Parameters**

Name	Description
<b>id</b> * required string (path)	instance id of computer <input type="text" value="5"/>

**Execute**

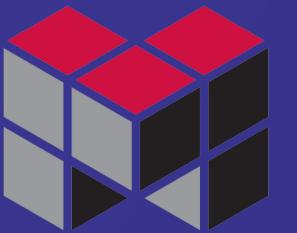




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# Check-in Failure Recap





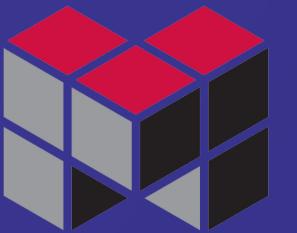
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# Intermission



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2024



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## ProTip

Add Network State Change to your Inventory

Update policy to gather inventory when a system is in Power Nap or policies are hung!

**General**

Display Name  
Display name for the policy  
Inventory Update

Enabled

Category  
Category to add the policy to  
Utilities

**Trigger**

Event(s) to use to initiate the policy

Startup  
When a computer starts up. A startup script that checks for policies must be configured in Jamf Pro for this to work

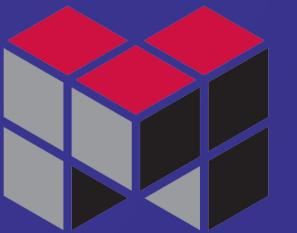
Login  
When a user logs in to a computer. A login event that checks for policies must be configured in Jamf Pro for this to work

Network State Change  
When a computer's network state changes (e.g., when the network connection changes, when the computer name changes, when the IP address changes)

Enrollment Complete  
Immediately after a computer completes the enrollment process

Recurring Check-in  
At the recurring check-in frequency configured in Jamf Pro





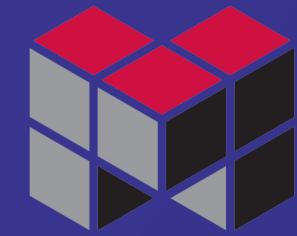
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# Incomplete Check-In



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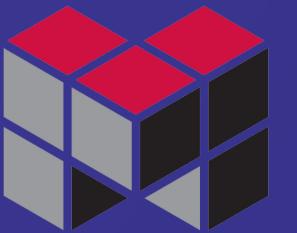


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# Announcement!

Jamf Policies run sequentially, and in alphabetical order.  
Policies have no TTL and can run for eternity.





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# Definitions

Last Check-in: Last time a check-in started

Last Full Check-in: Last time a check-in finished

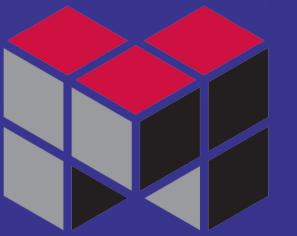


Last Check-in:



Last Full Check-in:





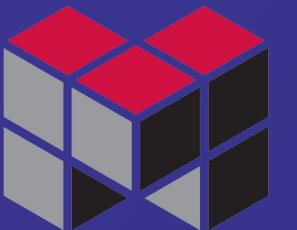
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## Partial Check-in Symptoms

Computer has recent check-in but...

Not all policies in scope have run



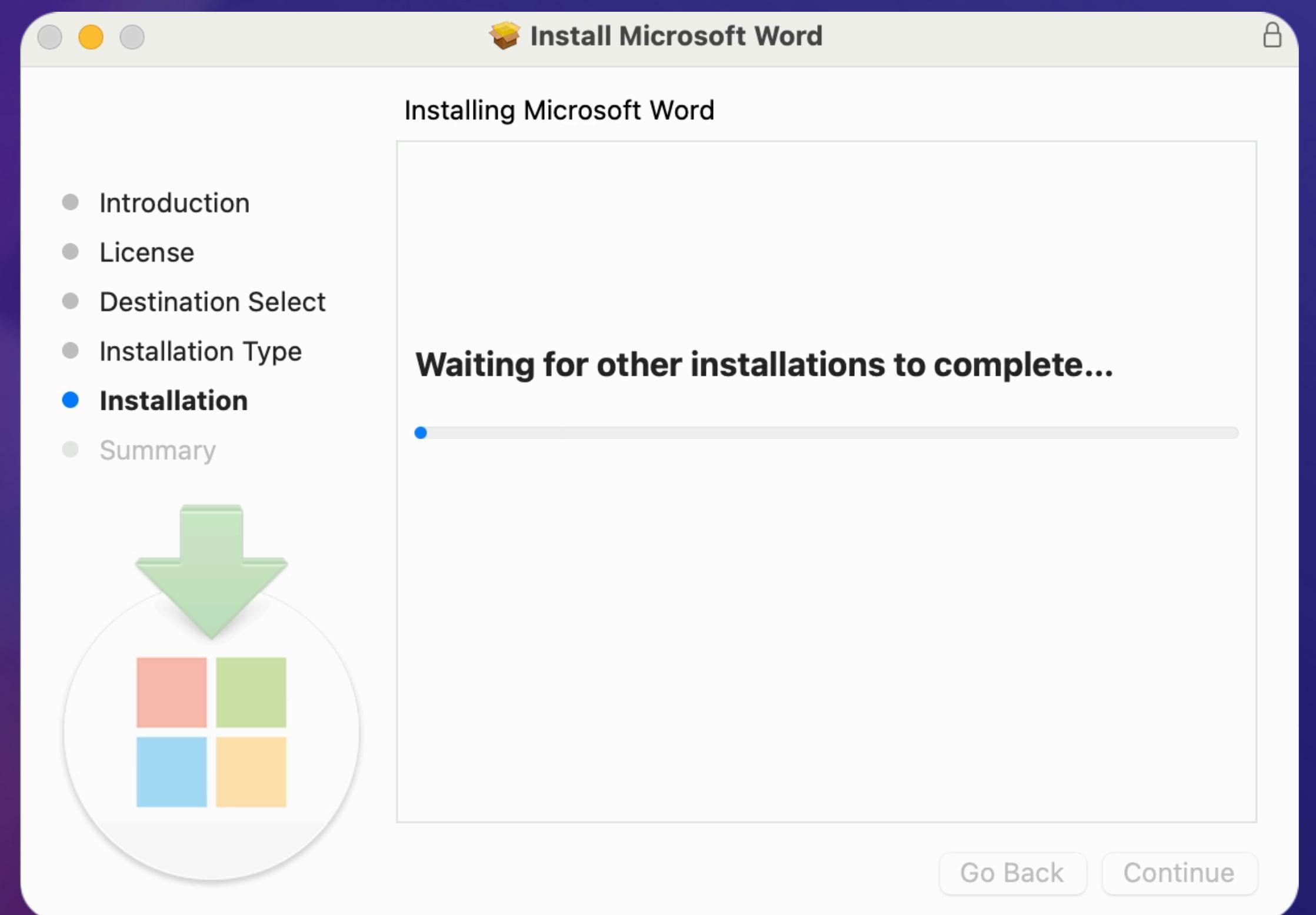


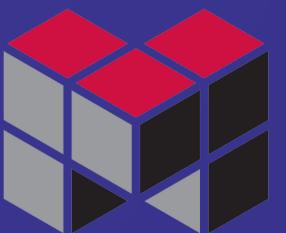
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## Partial Check-in Causes

### Blocking Installer

- macOS limitations
- One package installer can run at a time
- Additional Installs are queued up
- Malformed or malicious package can cause a permanent back log



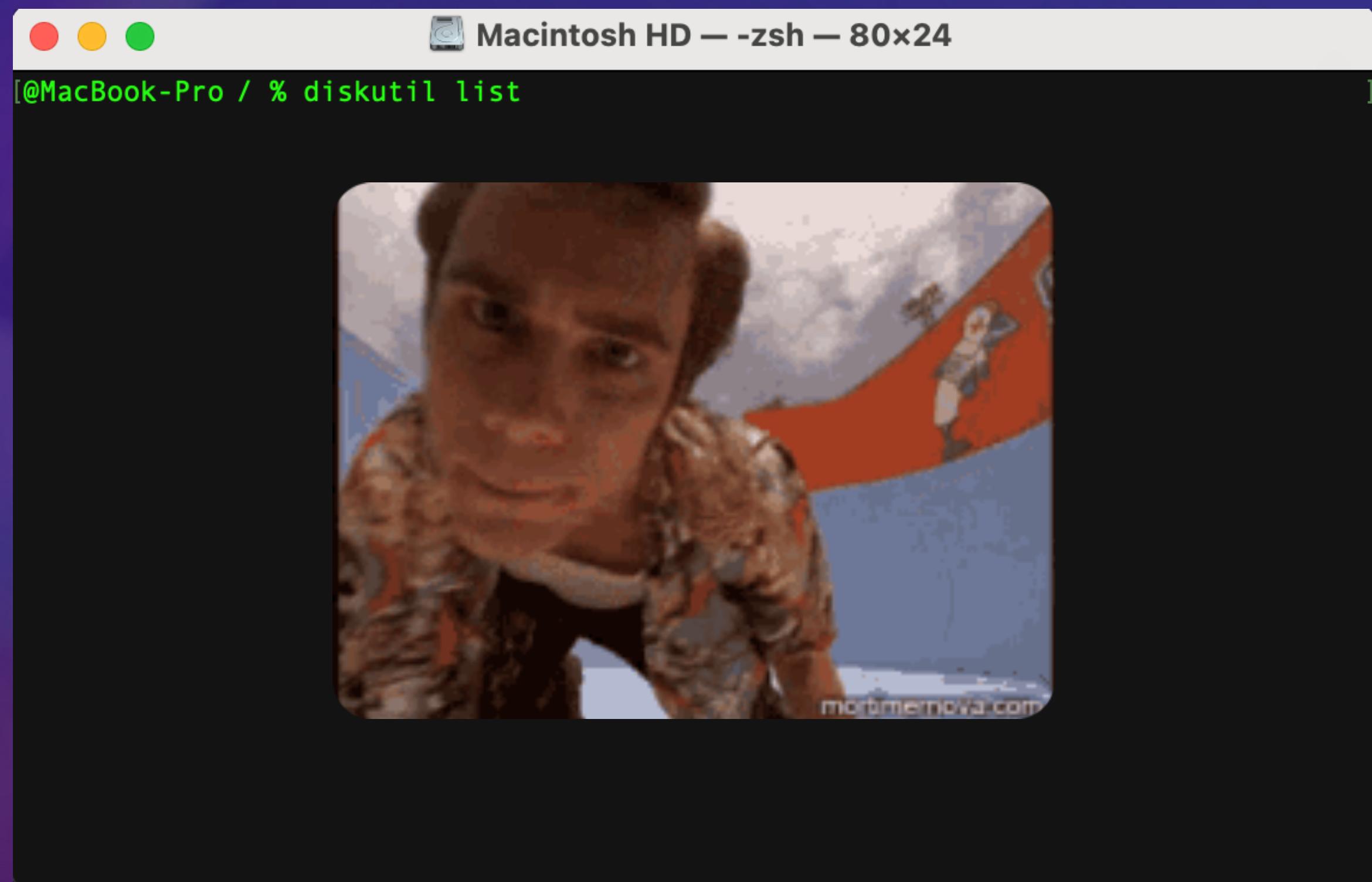


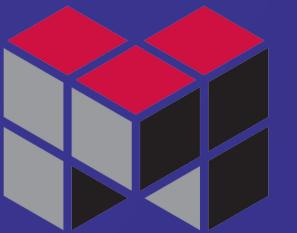
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# Partial Check-in Causes Hung Process in Script

Common script command offenders:

- profiles show all
- diskutil list
- log show
- zsh while loops





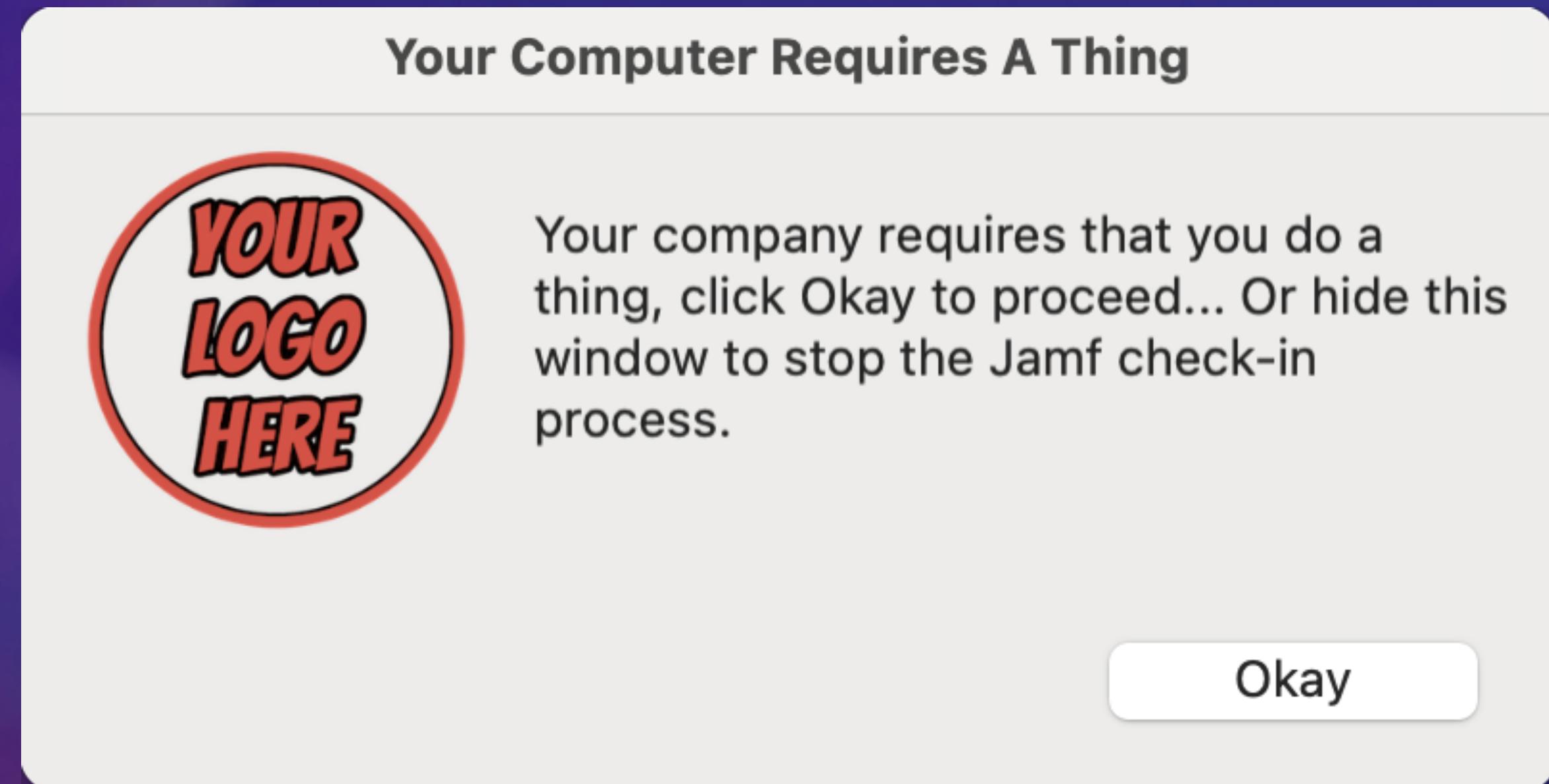
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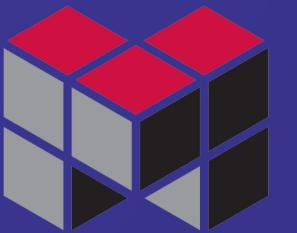
## Partial Check-in Causes

### Script Prompts

Script prompts block check in if not timeout  
is set

- JamfHelper
- Swift Dialog
- osascript





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# Partial Check-in Detection

## Policy

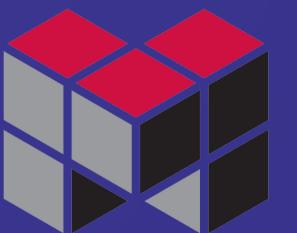
- Policy zzzz Policies Finished writes current time to disk

The screenshot shows the Jamf Pro 'Policies' page. On the left, a sidebar lists 'Computers' (Inventory, Search Inventory, Search Volume Content, Licensed Software), 'Content Management' (Policies, Configuration Profiles, Software Updates), and 'PreStaged Software'. The main area is titled 'Computers Policies' with a search bar and a filter for '1-1 of 1 (filtered from 380 total entries)'. A table displays a single policy:

NAME	FREQUENCY	TRIGGER	SCOPE
zzzz Policies Finished	Once every day	Check-in	All computers, All users
1	Run Unix command 'echo \$(date "+%Y-%m-%d %k:%M:%S") > "/Library/Application Support/JAMF/Last_Full_Policy_Run"		
2	Update Inventory		

A yellow box highlights the second row of the table, which contains the two actions of the policy.





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# Partial Check-in Detection

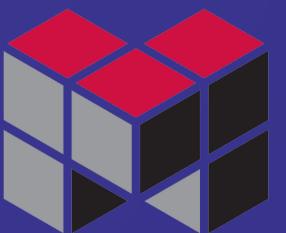
## Extension Attribute

- Extension attribute picks up zzzz Policies

Finished timestamp

Computers			
135 Computers in "Full Check-in > 14 days"			
NAME	LAST CHECK-IN	LAST FULL CHECK-IN	
MacBook Pro	07/31/2024 at 11:05 AM	2024-04-27 14:41:25	
iMac	07/30/2024 at 2:22 PM	2024-06-20 10:36:06	
MacBook Pro	08/02/2024 at 12:08 AM	2024-06-23 17:31:45	
MacBook Pro	07/31/2024 at 11:05 AM	2024-04-27 14:41:25	
iMac	07/30/2024 at 2:22 PM	2024-06-20 10:36:06	
MacBook Pro	08/12/2024 at 2:52 PM	2024-07-09 08:53:25	
MacBook Pro	08/02/2024 at 5:49 AM	2024-07-10 01:10:50	
MacBook Pro	08/05/2024 at 6:07 PM	2024-07-10 20:53:04	
MacBook Pro	08/03/2024 at 9:20 PM	2024-07-11 21:40:56	
MacBook Pro	08/08/2024 at 8:52 PM	2024-07-15 08:08:58	
MacBook Pro	08/12/2024 at 11:07 AM	2024-07-15 09:58:05	
MacBook Pro	08/01/2024 at 3:02 PM	2024-07-15 13:50:02	





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# Partial Check-in Detection

## Smart Group

- Smart group finds computers with out of sync Last Check-In and Last Full Check-In

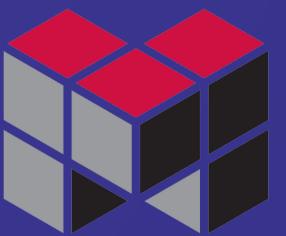
Computers : Smart Computer Groups  
← **Last Full Check-in > 14 days**

AND/OR	CRITERIA	OPERATOR	VALUE
	Last Check-in	less than x days ago	14
and	Last Full Check-in	more than x days ago	14

**Computers**

- Inventory
- Search Inventory
- Search Volume Content
- Licensed Software
- Content Management
- Policies
- Configuration Profiles
- Software Updates
- Restricted Software
- Mac Apps
- Patch Management
- eBooks
- Groups
- Smart Computer Groups**





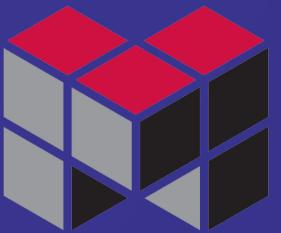
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## Partial Check-in Remediation

### Mann Jamf Doctor

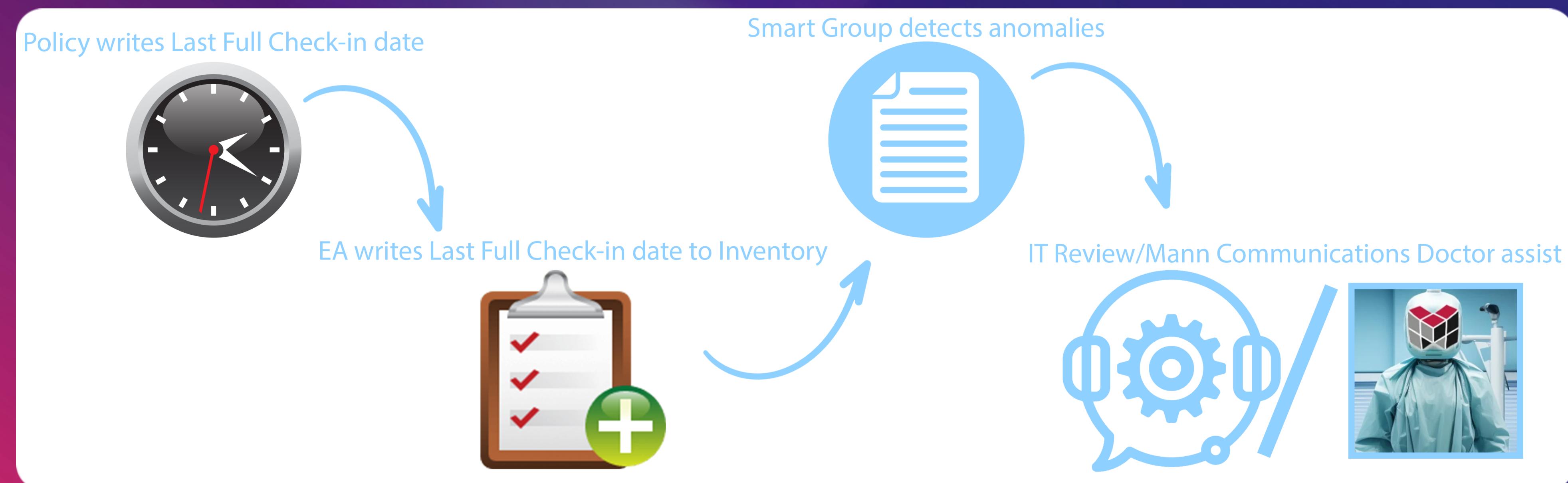
- LaunchDaemon that sets a TTL for processes
- 8 hours for Policies
- 60 minutes for Extension Attribute

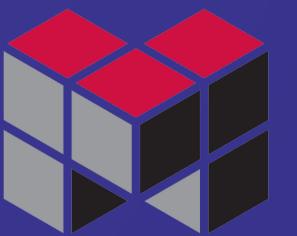




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# Partial Check-in Recap

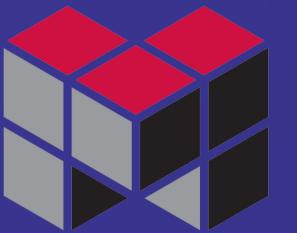




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# Incomplete Inventory



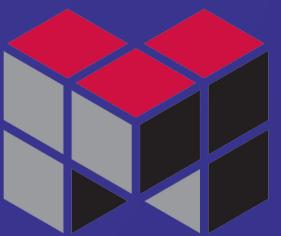


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# Announcement!

API or administrator actions can  
change “Last Inventory Update.”





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# Incomplete Inventory Symptoms

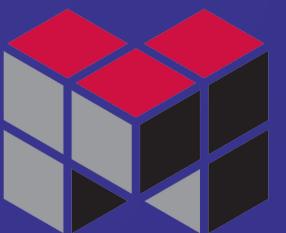
Computer has recent Inventory Update but...

Some inventory data may not be up to date

The screenshot shows the Jamf Pro interface for a MacBook Pro. The left sidebar lists categories like General, Hardware, Operating System, User and Location, Security, Purchases, Storage, Extension Attributes, Disk Encryption, Licensed Software, Applications, and Plug-ins. The main pane displays the 'General' tab for the computer. It shows the Computer Name, Jamf Pro Computer ID (164), and Jamf Pro Management ID. The 'Last Inventory Update' is listed as 07/21/2024 05:33 PM, while the 'Last Check-in' is 08/01/2024 03:02 PM. A yellow box highlights these two entries. Another yellow box highlights the 'Last Full Inventory Update' entry, which is 2024-07-15 14:22:06. The bottom right corner of the interface includes 'History' and 'Delete' buttons.

Last Inventory Update:	07/21/2024 05:33 PM
Last Check-in:	08/01/2024 03:02 PM
Last Full Inventory Update:	2024-07-15 14:22:06





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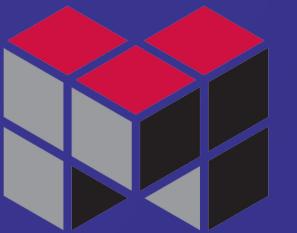
# Incomplete Inventory Detection Extension Attribute

- Extension attribute writes current date/time

The screenshot shows the Jamf Pro interface for managing computer inventories. On the left, a sidebar lists categories: Computers, Inventory (which is selected), Search Inventory, Search Volume Content, Licensed Software, Content Management, Policies, Mac Apps, Patch Management, eBooks, Groups, Smart Computer Groups, Static Computer Groups, and Classes. The main area is titled "Computers" and displays a summary: "12 Computers in 'Last Full Inventory Update > 14 days'". Below this, a table lists 12 computer entries, each with columns for Name, Last Check-in, Last Inventory Update, and Last Full Inventory Update. The table includes a header row and 12 data rows. A yellow box highlights the first four rows, which all show the same timestamp for Last Check-in (08/01/2024 at 3:02 PM) and Last Full Inventory Update (2024-07-15 14:22:06). The last eight rows show more recent dates for these metrics.

NAME	LAST CHECK-IN	LAST INVENTORY UPDATE	LAST FULL INVENTORY UPDATE
MacBook Pro	08/01/2024 at 3:02 PM	07/21/2024 at 5:33 PM	2024-07-15 14:22:06
MacBook Pro	08/02/2024 at 5:49 AM	07/16/2024 at 5:39 PM	2024-07-16 19:36:48
MacBook Pro	08/05/2024 at 11:00 AM	07/17/2024 at 6:55 AM	2024-07-17 09:52:39
MacBook Pro	08/01/2024 at 3:02 PM	07/21/2024 at 5:33 PM	2024-07-15 14:22:06
MacBook Pro	08/02/2024 at 5:49 AM	07/16/2024 at 5:39 PM	2024-07-16 19:36:48
Mac Apps	08/05/2024 at 11:33 AM	07/18/2024 at 8:55 PM	2024-07-18 23:51:35
Patch Management	MacBook Pro	08/13/2024 at 12:09 PM	07/30/2024 at 5:37 AM
eBooks	MacBook Pro	08/10/2024 at 10:16 PM	07/29/2024 at 7:46 PM
Groups	MacBook Pro	08/08/2024 at 8:52 PM	07/30/2024 at 5:27 AM
Smart Computer Groups	MacBook Pro	08/07/2024 at 4:10 PM	07/30/2024 at 6:06 AM
Static Computer Groups	MacBook Pro	08/13/2024 at 5:50 AM	07/30/2024 at 8:05 AM
Classes	MacBook Pro	08/01/2024 at 11:07 AM	07/30/2024 at 10:44 PM





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# Incomplete Inventory Detection

## Smart Group

- Smart group finds computers with out of sync last inventory and last date written

Computers : Smart Computer Groups  
← Last Full Inventory Update > 14 days

Computer Group	Criteria	Reports	
AND/OR	CRITERIA	OPERATOR	VALUE
	Last Inventory Update	less than x days ago	14
and	Last Full Inventory Update	more than x days ago	14

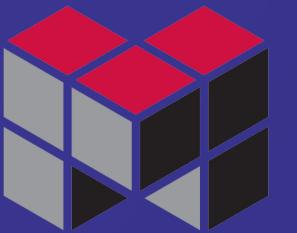
Inventory

- Search Inventory
- Search Volume Content
- Licensed Software

Content Management

- Policies
- Configuration Profiles
- Software Updates
- Restricted Software
- Mac Apps
- Patch Management



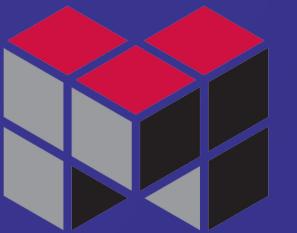


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## Incomplete Inventory Remediation

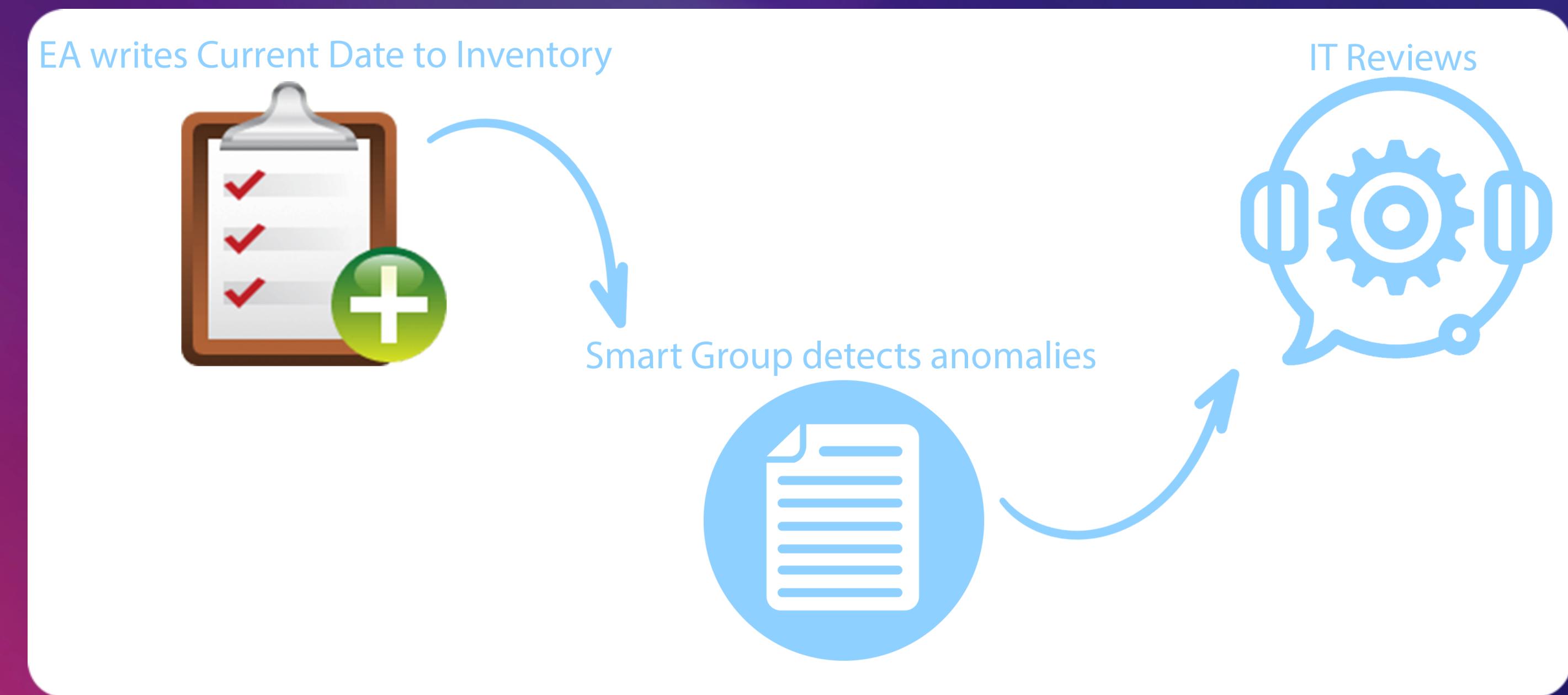
- sudo jamf recon -verbose
- Re-enroll via API
- File ticket with Jamf Support

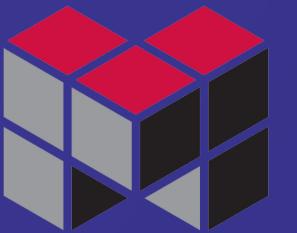




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# Incomplete Inventory Recap





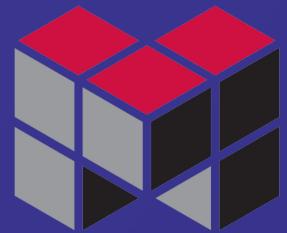
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Q&A

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