# Deploying macOS 10.7-10.12.6 with Jamf Pro

Technical Paper Jamf Pro 9.21 or Later 11 March 2019



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Jamf has made all efforts to ensure that this guide is accurate.

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## Introduction

### What's in This Guide

This guide provides step-by-step instructions on how to deploy macOS 10.7-10.12.6 with Jamf Pro.

### **Additional Resources**

For more information on Jamf Pro-related topics, see the Jamf Pro Administrator's Guide.

## **Overview**

This guide provides workflows for two different macOS deployment scenarios:

- Deploying a macOS upgrade—This should be used for upgrading macOS on computers that are already configured in your environment. It allows you to preserve the settings and files on computers. For instructions, see <u>Deploying a macOS Upgrade</u>.
- **Deploying macOS by imaging**—This should be used for configuring newly purchased computers or re-purposing computers that are already part of your environment. It gives you complete control over the settings and files on computers. For instructions, see <u>Deploying macOS by Imaging</u>.

## **Deploying a macOS Upgrade**

Deploying macOS 10.7-10.12.6 as an upgrade involves the following steps:

- 1. Add the .app file for macOS to Jamf Admin.
- 2. Cache the InstallESD.dmg file using a policy.
- 3. Create a smart computer group.
- 4. Create a Self Service policy for upgrading macOS.

Note: The name of the InstallESD.dmg file in Jamf Admin will vary depending on the version of macOS that you plan to deploy. For example, the name of the InstallESD.dmg file for OS X 10.10 would be Install OS X Yosemite.InstallESD.dmg.

#### Requirements

- Jamf Pro 9.21 or later
   Note: If you are using Jamf Pro 8.3-9.1, see the <u>Deploying macOS 10.7 or Later with Jamf Pro</u> Knowledge Base article for instructions on deploying a macOS upgrade.
- Jamf Admin
- The .app file for the version of macOS that you plan to deploy (For example, Install OS X Mountain Lion.app.)

You can obtain the latest .app file for macOS from the Mac App Store.

- Managed computers with:
  - (For deployments of macOS 10.10 or later only) macOS 10.7 or later
     Computers with macOS 10.5 or macOS 10.6 must be upgraded to macOS 10.7 or later before upgrading to macOS 10.10.
  - Self Service
  - The system requirements for the version of macOS that you plan to deploy
    - macOS 10.7: <u>http://support.apple.com/kb/HT4949</u>
    - macOS 10.8: <u>http://support.apple.com/kb/HT5444</u>
    - macOS 10.9: <u>http://support.apple.com/kb/HT5842</u>
    - macOS 10.11: <u>https://support.apple.com/kb/SP728?locale=en\_US</u>
    - macOS 10.12: <u>https://support.apple.com/en-us/HT201475</u>

#### Step 1: Add the .app File for macOS to Jamf Admin

Add the .app file for macOS to Jamf Admin. Jamf Admin extracts the InstallESD.dmg file from the .app file so you can cache and install it using policies.

- 1. Open Jamf Admin and authenticate to the Jamf Pro server.
- 2. Drag the .app file to the main repository in Jamf Admin. Jamf Admin extracts the InstallESD.dmg file, analyzes its contents, and adds it to the master distribution point and Jamf Pro.

The InstallESD.dmg file is displayed in blue text until you add it to a category.

$\bigcirc \bigcirc \bigcirc$			Casper Admin					
New Config New Ca	ategory Add Printers Add Do	ock Items New Adol	be Install Info Delet			Qr	Filter	8
REPOSITORY All Items CONFIGURATIONS	View Type All Packages Scripts Printers Directory Bindings Dock Items			Categories All Categories Unknown				
JDS INSTANCES * JDS Instance FILE SHARE DISTRIL File Share DP CLOUD DISTRIBUT. Amazon Web S		Type OS X Installer	Category Unknown		Priority 1	FUT No	FEU No	No No
	Rep		onfigurations: 1 Packages: 5 Scripts: 1 Printers: 0 Dock items: 0 tory Bindings: 0					

3. Double-click the package in the main repository.

4. Click the General tab and choose a category for the package.

Display Name Category						
Install OS X Maveri	cks.InstallESD.dmg	Unknown				
Filename	2					
Install OS X Maveri	cks.InstallESD.dmg					
V Item is a DMC wit	th an OS X Installer or A	dobe Updater/Installer fo	r CS3 or CS4			
	an an OS A Installer, or A	dobe opuater/installer it	1 635 01 634			
Info						
Notes						
Notes						
Notes						
Notes						
Notes						
Notes						

5. Click OK.

#### Step 2: Cache the InstallESD.dmg File

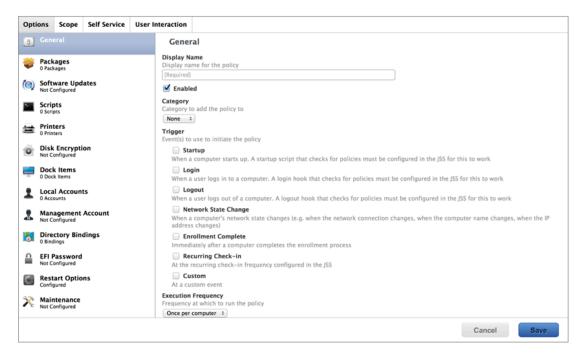
After adding the .app file to Jamf Admin, you can cache the InstallESD.dmg file using a policy. Caching the file ahead of time speeds up the upgrade process.

- 1. Log in to Jamf Pro.
- 2. Click **Computers** at the top of the page.
- 3. Click Policies.

On a smartphone, this option is in the pop-up menu.

4. Click **New** 🛨 .

5. In the General payload, enter a display name for the policy. For example, "Cache InstallESD.dmg".



- 6. Select Recurring Check-in as the trigger.
- 7. Choose "Once per Computer" from the Execution Frequency pop-up menu.
- 8. Select the Packages payload and click Configure.
- 9. Click Add for the InstallESD.dmg file.
- 10. Choose "Cache" from the Action pop-up menu.

Opti	ons Scop	e Self Service	User Interaction		
[8]	General		InstallE	SD.dmg	•
چ (٢)	Packages 1 Package Software U Not Configure Scripts 0 Scripts	lpdates	Cache Fill user Fill new home	e on computers  templates (FUT) e directories with the contents of the home directory in the package's Users folder. Applies to DMGs only ing user home directories (FEU) ome directories with the contents of the home directory in the package's Users folder. Applies to DMGs only	
iti Maria	Printers 0 Printers Disk Encry Not Configure	ption	Update A Add or remov	Autorun data re the package from each computer's Autorun data	
	Dock Item 0 Dock Items Local Acco 0 Accounts	5		Point opint to download the package(s) from ter's default distribution point :	
		nt Account			
5	Directory 0 Bindings	Bindings			
	EFI Passwo Not Configure	ł			
30	Restart Op Configured	tions			
				Cancel	Save

11. Specify a distribution point for computers to download the package from.

- 12. Select the Maintenance payload and click **Configure**.
- 13. Ensure that the **Update Inventory** checkbox is selected.
- 14. Click the **Scope** tab and configure the scope of the policy.

Options	Scope	Self Service	User Interaction
	_		
Targets	Limit	ations Exclusion	ins
Target Co Computer	omputers	y the policy to	
	Computers		
+	Add		
Target		Туре	
	_		
No 1	Targ	ets	

15. Click Save.

The InstallESD.dmg file is cached on computers in the scope the next time they check in with Jamf Pro and meet the criteria in the General payload.

#### Step 3: Create a Smart Computer Group

Create a smart group of computers with the InstallESD.dmg file cached. The smart group will be used as the scope of the Self Service policy for upgrading macOS.

- 1. Log in to Jamf Pro.
- 2. Click **Computers** at the top of the page.
- 3. Click **Smart Computer Groups**. On a smartphone, this option is in the pop-up menu.
- 4. Click New 🛨 .
- 5. On the Computer Group pane, enter a display name for the smart computer group. For example, "InstallESD.dmg Cached".

Computer Group	Criteria						
Display Name Display name for th	ie smart con	puter group					
[Required]							
		membership chang es, send an email not	ers with emai	l notification	s enabled. An	SMTP server must	be set up in t
Site Site to add the sma		group to					
None	\$						
						Cancel	Save

- 6. Click the Criteria tab.
- 7. Click Add 🛨 .
- 8. Click Choose for "All Criteria".
- 9. Click Choose for "Cached Packages".

10. Choose "has" from the **Operator** pop-up menu.

Computer Group	Criteria						
+ Add							
And/Or	Criteria	Operator	Value				
\$	Cached Packages	has ‡		 •	Delete		
	Cached Packages	1112			Delete		
						Cancel	Save

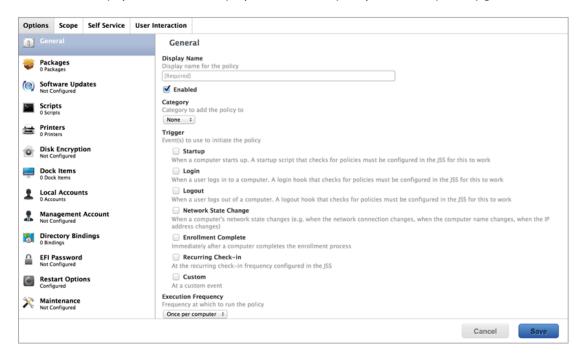
- 11. Click **Browse** .
- 12. Click Choose for the InstallESD.dmg file. Note: The InstallESD.dmg file is not available as a value until it has been cached on at least one computer.
- 13. Click Save.

## Step 4: Create a Self Service Policy for Upgrading macOS

After caching the InstallESD.dmg file, you can create a Self Service policy that allows users to upgrade macOS.

- 1. Log in to Jamf Pro.
- 2. Click **Computers** at the top of the page.
- 3. Click **Policies**. On a smartphone, this option is in the pop-up menu.
- 4. Click New 🛨 .

5. In the General payload, enter a display name for the policy. For example, "Upgrade macOS".



- 6. Choose "Once per Computer" from the **Execution Frequency** pop-up menu.
- 7. Select the Packages payload and click Configure.
- 8. Click Add for the InstallESD.dmg file.
- 9. Choose "Install Cached" from the Action pop-up menu.

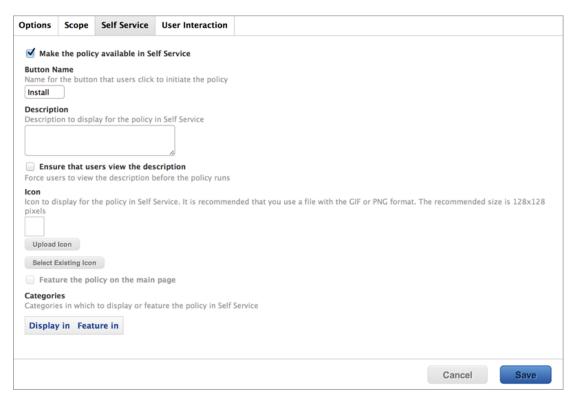
Opti	ons	Scope	Self Service	User Interaction	
[8]	Gene	ral		InstallESD.dmg	•
<ul> <li>(a)</li> <li>(b)</li> <li>(c)</li> <li>(c)</li></ul>	Not Co Scrip	age vare Upd nfigured ts	ates	Action Action to take on computers Install Cached •• Fill user templates (FUT) Fill new home directories with the contents of the home directory in the package's Users folder. Applies to DMCs only	
		ers	on	<ul> <li>Fill existing user home directories (FEU)</li> <li>Fill existing home directories with the contents of the home directory in the package's Users folder. Applies DMGs only</li> <li>Update Autorun data</li> <li>Add or remove the package from each computer's Autorun data</li> </ul>	; to
1	0 Dock Local 0 Acco	Account	-	Distribution Point Distribution point to download the package(s) from Each computer's default distribution point	
*		nfigured	Account	Cancel	

- 10. Click the Scope tab.
- 11. Click **Add** 🛨 .
- 12. Click the Computer Groups tab.

13. Click Add for the smart computer group you just created.

Options	Scope	Self S	Service	User Inte	raction	
Add De	ployme	nt Targ	ets			
Comput	ers (	Computer (	Groups	Buildings	Departr	nents
Group	Name					
All Man	aged Cli	ents	Add			
All Man	aged Se	rvers	Add			
InstallE	SD.dmg	Cached	Add			
Done						

- 14. Click the Self Service tab.
- 15. Select Make the policy available in Self Service.
- 16. Configure how the policy is displayed in Self Service using the settings on the pane.



#### 17. Click Save.

The policy is made available in Self Service on computers in the scope the next time they check in with Jamf Pro and meet the criteria in the General payload. macOS is upgraded when users run the policy from Self Service.

Upgrading FileVault 2-enabled drives from macOS 10.7 or 10.8 prompts users to enter their password after reboot. Upgrading FileVault 2-enabled drives from macOS 10.9 or later automatically bypasses authentication after reboot.

**Note:** The Jamf Binary automatically enables Core Storage on the target computer before installing an macOS 10.11 upgrade using a policy. This *only* occurs for macOS 10.11 upgrades that are installed using a policy.

## **Deploying macOS by Imaging**

Deploying macOS by imaging involves the following steps:

- 1. Prepare to image a partition.
- 2. Image computers.

#### Requirements

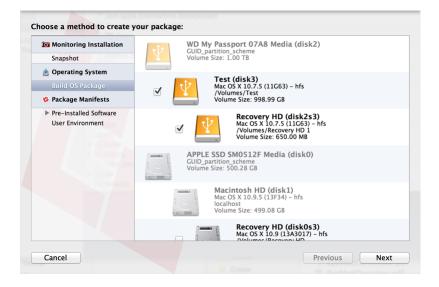
To deploy macOS by imaging, you need:

- Jamf Pro 9.7 or later
- A test computer with:
  - Composer
  - A "Recovery HD" partition
- Jamf Admin
- A distribution point
- A startup disk other than the target drive that has Jamf Imaging installed Some common startup disks used for imaging are USB or FireWire drives, Restore partitions, and NetBoot images.

#### Step 1: Prepare to Image a Partition

As of macOS 10.7, newly purchased Macs come with a "Recovery HD" partition that can be used for recovery tasks, such as repairing disks or reinstalling macOS. As of Jamf Pro 9.7, you have the option to build a deployable package of an operating system, a "Recovery HD" partition, or a whole disk in a single step.

- 1. Build an OS package:
  - a. On the test computer, install and configure the OS. For complete instructions, see the <u>Creating a Minimal Base OS Image</u> Knowledge Base article.
  - b. Open Composer and authenticate locally.
  - c. In the toolbar, click **New**  .
  - d. Under the Operating System heading in the sidebar, select **Build OS Package**. For information on how Composer 9.7 or later displays partitions when building OS packages, see the <u>How Composer Displays Partitions when Building OS Packages</u> Knowledge Base article.
  - e. Select the drive or drives you want to package and click Next.



**Important:** It is recommended that the macOS version of the "Recovery HD" partition matches the macOS version of the OS partition.

f. Choose options for removing unnecessary files from the package and click Next.

Choose options for building your OS package:	
<ul> <li>Compress disk image</li> <li>Delete temp files</li> <li>Delete virtual memory files</li> <li>Delete special files</li> <li>Delete caches</li> <li>Remove System keychain</li> <li>Ensure trashes are empty</li> <li>Delete MCX records in the local directory service</li> </ul>	
Cancel Previous No	ext

- g. Enter a package name and select a location to save the package, and then click **Build**.
- 2. Add the OS package to Jamf Admin:
  - a. Open Jamf Admin and authenticate to the Jamf Pro server.

b. Drag the package to the main repository in Jamf Admin.
 The package is displayed in blue text until you add it to a category.

000			Casper Admin					
New Config New Ca	tegory Add Printers Ad	d Dock Items New Ad	dobe Install Info Delet	e		Qr	Filter	8
REPOSITORY	View Type			Categories				
All Items	All Packages			All Categories Unknown				
CONFIGURATIONS	Scripts Printers Directory Bindings Dock Items							
JDS INSTANCES	Name	Type	Category		Priority	FUT	FEU	Indexed
() * JDS Instance	MainPartition.dmg	DMG Package	Unknown		10	No	No	No
FILE SHARE DISTRI.								
😁 File Share DP								
CLOUD DISTRIBUT_								
😁 Amazon Web S								
			Configurations: 1 Packages: 5 Scripts: 1 Printers: 0 Dock Items: 0 ectory Bindings: 0					

- c. Double-click the package in the main repository.
- d. Click the **General** tab and choose a category for the package.

	Summary	General	Options	
Display Name			Category	
MainPartition.dmg			Unknown	+
Filename				
MainPartition.dmg				
Item is a DMG wit	h an OS X Installer.	or Adobe Up	dater/Installer for CS3	or CS4
	r an ob X motaner,	or recover opt		01 00 1
Info				
Info Notes				

e. Click the **Options** tab and choose a priority for the package. The recommended priority is "1".

ackage Options		
Priority: 1	÷	Fill user templates (FUT)
Requires restart	t	<ul> <li>Fill existing user home directories (FEU)</li> </ul>
Install on boot	drive after i	maging
ackage Limitations		
Allow package	to be unins	talled
OS Requirement:		
Install only if a	rchitecture 1	type is: PowerPC +
Substitute Pa	ckage: Do	not install 🗧
		Software Update

#### f. Click OK.

3. Create a configuration:

Monitoring Installation Snapshot	WD My Passport 07A8 Media (disk2) GUID_partition_scheme Volume Size: 1.00 TB	
Operating System Build OS Package	Test (disk3) Mac OS X 10.7.5 (11G63) - hfs	
🏇 Package Manifests	/Volumes/Test Volume Size: 998.99 GB	
Pre-Installed Software User Environment	Image: Second product of the second product	
	APPLE SSD SM0512F Media (disk0) GUID_partition_scheme Volume Size: 500.28 G8	
	Macintosh HD (disk1) Mac OS X 10.9.5 (13F34) - hfs localhost Volume Size: 499.08 G8	
	Recovery HD (disk0s3) Mac OS X 10.9 (13A3017) - hfs	

**Note:** Compiling a configuration with a multi-partition DMG will result in a DMG with a single partition.

- a. Open Jamf Admin and authenticate to the Jamf Pro server.
- b. Click New Config 🚞 .

c. On the General pane, enter a display name for the configuration.

0 0	Edit Configu	ration	
Gener	al Management H	lomepage Partitions	
Display Name:			
Description:			
💽 S	tandard Configuration	O Smart Configuratio	n
Parent Configuration:	None	4	
		Cancel	ОК

d. Click the **Management** tab and enter credentials for a local administrator account that you want to use for management.

000	Edit Configuration	
	General Management Homepage Partitions	
	Management Account	
	Username:	
	Password:	
	Verify Password:	
	Create management account if it does not exist	
	Hide management account	
Allow SSH for management account only		
	Cancel OK	

e. Click OK.

- The configuration is added to the list of configurations in the sidebar.
- f. Drag the OS package from the main repository to the configuration that you just created.

#### Step 2: Image Computers

- 1. On a target computer, boot to a startup disk other than the target drive.
- 2. Open Jamf Imaging and authenticate locally.
- 3. Authenticate to the Jamf Pro server when prompted.

4. Choose the drive to image from the **Target Drive** pop-up menu.

000	Casper Imaging		
Refresh Show Custom		Q- 🛞	
Refresh Show Custom Cus	Cache files	Macintosh HD Erase target drive Empty Boot to target drive after imaging JDS igs as Autorun data in the JSS	
		Image	

- 5. Select the Erase target drive checkbox.
- 6. Assign a name to the computer by entering a name in the **Computer Name** field.
- 7. From the **Configuration** pop-up menu, choose the configuration you created in "Step 1: Preparing to Image a Partition".
- 8. Select the **Boot to target drive after imaging** checkbox.
- 9. Choose a distribution point from the **Distribution Point** pop-up menu.
- 10. Click Image.
- 11. Repeat as needed for other target computers.

## **Revision History**

<b>Revision Date</b>	Changes		
11 March 2019	Updated for use with macOS 10.12 deployments. Removed the "Deploying OS X by Imaging Using the JSS 9.66 or Earlier" section.		
08 April 2016	Added information on naming conventions of the $\tt InstallESD.dmg$ file.		
05 February 2016	Added information on authentication action after reboot when a FileVault 2-enabled drive is upgraded.		
30 September 2015	Updated for use with macOS 10.11 deployments.		
07 May 2015	"Deploying macOS by Imaging Using the JSS v9.66 or Earlier" section: Updated procedure for preparing to create or modify a "Recovery HD" partition during imaging.		
25 March 2015	"Deploying an macOS Upgrade" section: Added a link to a Knowledge Base article from Apple that contains system requirements for macOS 10.10. Added the "Deploying macOS by Imaging Using the JSS v9.7 or Later" section.		
11 November 2013	<ul> <li>"Deploying an macOS Upgrade" section:</li> <li>Added a link to a Knowledge Base article from Apple that contains system requirements for macOS 10.9.</li> <li>Removed the note about the known issue that prevents drives encrypted with FileVault from being upgraded from macOS 10.7 to 10.8. This issue was fixed in 9.21.</li> <li>Updated procedure for adding the .app file for macOS to Casper Admin.</li> <li>Added a step for selecting the Update Inventory checkbox when creating a policy to cache the InstallESD.dmg file.</li> <li>"Deploying macOS by Imaging" section:</li> <li>Updated procedure for preparing to create or modify a "Recovery HD" partition during imaging.</li> </ul>		