

APPLE OS

Upgrades Guide For Beginners

Everything you need to prepare for macOS Catalina, iPadOS 13,
iOS 13 and tvOS 13



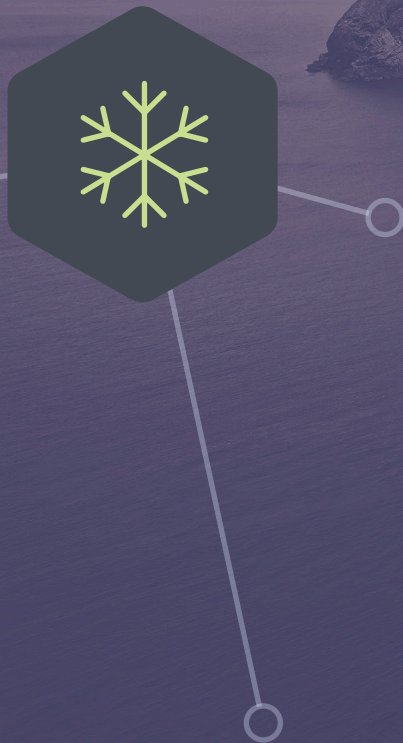


Apple OS upgrades are coming. Are you ready?

Exciting new versions of macOS (for Mac), iPadOS (for iPad), iOS (for iPhone) and tvOS (for Apple TV) are heading to a device near you. Your job is simple. Get these features into the hands of users, all without disrupting workflows or slowing productivity.

As most IT organizations know, this can often be easier said than done, especially when factoring in the speed at which Apple users like to upgrade. Now for the good news. At Jamf, we've been doing this for more than 17 years, and are here to provide step-by-step guidance for successful Apple upgrades — regardless if it is your first, fifth or 17th OS season.

Why an Apple upgrade is different



Contrary to other ecosystems, major new versions of Apple’s operating systems, macOS, iOS, tvOS and for the first time, iPadOS, are released annually. A combination of the simple upgrade path and \$0 cost help drive industry-leading adoption rates for consumers.

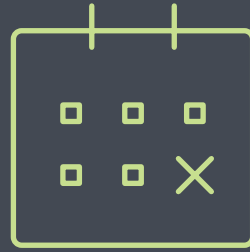
This trend is further accelerated by Apple’s vertical integration of hardware and software: any new Mac, iPad, iPhone, Apple TV or Apple Watch will always ship with the latest OS version and can’t be downgraded. The same cannot be said for Windows and Android, where hardware and software fragmentation is a major challenge for organizations, IT and users.

When devices are running old software, consistency, security and user experience are all compromised. And this is especially true when organizations attempt to support a variety of devices and OS platforms with a single management solution. Without the complications and cost of licensing, Apple’s user-initiated upgrades are easy for end users

to carry out autonomously. This is one of the reasons Apple’s operating systems have the [highest adoption rate of any ecosystem](#).

End users are so excited to access the new features; yet, you’re responsible for maintaining security controls and an accurate systems inventory at all times.

This guide provides you with a thorough understanding of the new operating systems, and ways to carefully prepare for and implement an upgrade. You’ll learn how to minimize disruptions and eliminate unplanned downtime, gaining the knowledge to deliver organizational value and walk users through their macOS Catalina, iPadOS 13, iOS 13 and tvOS 13 upgrades.



The business value of day-zero upgrades

There are four key reasons organizations should embrace upgrades and empower end users to update their device(s) the day new operating systems are released:

1 Reduce security vulnerabilities

Old versions of software are always less secure. It's in your best interest to empower and encourage users to upgrade to the latest operating systems. This will help ensure your organization doesn't fall prey to data breaches and system vulnerabilities, all because devices are out of date.

2 Keep end users happy

Apple trains users to keep their software up to date. In turn, Apple users expect to be able to successfully update their device(s) the day a new operating system becomes available. Day-zero upgrades ensure this expectation is met.

3 Keep users productive

The latest operating systems introduce new features that support greater efficiency and productivity. When day-zero upgrades are discouraged, users are unable to take advantage of helpful functionality, such as enhanced multitasking features with iPadOS 13.

4 Access new IT management features

Gain access to a wealth of new management features. Not only will you have access to new capabilities for Apple ecosystem management, but you can also customize and configure new end-user features based on the unique needs of your environment.

Join the beta party



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The best defense is a good offense. Arm yourself with previews of upcoming releases from the Apple Beta Software Program to get an early look at how new OS versions and features will impact your organization.

Apple is regularly updating its operating systems, which means participating in the beta program provides months of testing ahead of an operating system release. Apple offers both paid developer and free public beta programs for macOS, iPadOS, iOS and tvOS. The paid developer account typically costs \$100 annually, but provides access to additional resources, such as release notes.

Why Beta?

1 The beta cycle for these operating systems typically occurs in multiple phases. Participating early and submitting feedback to Apple increases the likelihood that the features and issues that impact you most will be addressed. And, if you are the first to submit a bug report to Apple, you'll have visibility into the status of your ticket whereas duplicate bug reports are closed. That's one good reason to file reports early!

2 Participating in the beta not only gives you early access to test new features and compatibility, but it also offers a deeper understanding of how the end-user experience will be impacted. Knowing which new settings have been added, any features that have moved, or changes to labels can inform necessary updates to your training materials, onboarding kits, etc. This helps your organization best prepare for changes to the end-user experience, so you can execute a more user-centric support model and communication plan accordingly.

3 Lastly, in addition to new OS settings and features, application, infrastructure and management compatibility testing is critical for continuity with current software offerings in your environment. We recommend you run Apple's betas to test their deployed apps for issues. Reporting any issues to the associated vendors upon discovery will help ensure the apps work upon Apple's official release.

Beta tips

Use dedicated hardware for pre-release testing of Mac, iPad, iPhone and Apple TV devices. As always, avoid using personal or production hardware for beta testing.

Not only is it critical to test your organization's business tools with Apple's betas, but you should test your device management solution as well. Whichever solution your organization

uses to manage and secure your Mac, iPad, iPhone or Apple TV devices should provide active beta programs year-round and demonstrate the ability to test compatibility with Apple's beta software on all of your devices.

Check out Apple's [iOS Lifecycle Management white paper](#) for more details.

Join the beta party



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Conduct strategic testing



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For best results, be sure to test your entire tech stack

1 Infrastructure

Includes anything outside your application stack, such as VPN or testing printer drivers (which should always be tested with new operating systems). Testing infrastructure is less of a concern for organizations moving toward cloud hosting and services.

2 Applications

Includes both web and non-web based applications. If you don't have time to test all apps, prioritize based on an application vendor's statements related to compatibility. For vendors who don't proactively promote planned compatibility on their website, in documentation or within direct communications, it is best to validate the apps yourself.

3 Management

Includes device deployment and management solutions (MDM, EMM, UEM, etc.). Check that your device management solution offers the ability to test new restrictions, management capabilities and features.

Prioritization is essential, especially in resource-strapped organizations. Take inventory of all applications used across your organization and rank them by critical-business nature (financial software, CRM software, ERP software, etc.). Start with high-level business apps and move to mid-level apps, browsers and low-level apps.

Many organizations choose to prioritize based on automated inventory information from their device management provider, as well as frequency of use (most commonly used to least commonly used).

Consider recruiting end-user liaisons from each department you support (Finance, Marketing, Sales, Technology, HR, etc.) to discuss their daily business processes. Ask them to walk you through their workflows and which tools they use most. Then, document each item in a spreadsheet format for testing.

Due to the architecture of iPadOS, iOS and tvOS apps, light testing might be more appropriate for these platforms. Consider leveraging automated testing tools such as Selenium, TestPlant or Sikuli, which automate point-and-click tasks to execute a task and test it. For more information on testing frameworks, check out ITIL certification.

Incorporate a user-centric test process.



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When documenting use cases, lay out the key business units, critical level, applications, user tasks and whether you validated compatibility.

Example:

Business Unit	Critical	Apps	User Task	Operating System	Validate
Marketing	Mid-Level	Word	<i>"I want to create a Word document on a machine that was just upgraded, choose the Copperplate font, then print on a printer."</i>	macOS Catalina	Yes

Understand the new operating systems

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In addition to the testing guidance above, macOS Catalina, iPadOS 13, iOS 13 and tvOS 13 have differing sets of new features and unique impact on your environment.

Below you will find important information for what you need to know when upgrading to each operating system. For a comprehensive list, please review Apple's online resources, including articles on their support site.

Upgrading to macOS Catalina

There are several ways to accomplish upgrades on a Mac. The most common upgrade path for macOS is an in-place upgrade. An in-place upgrade involves installing the operating system while keeping user data intact.

One method for conducting an in-place upgrade is to send an MDM command to Macs enrolled in Apple Business Manager or Apple School Manager. Like iOS, this MDM command will trigger your Mac devices to download the new OS from Apple and automatically install it on devices. However, this method will only work for Mac devices enrolled in Apple Business Manager or Apple School Manager.

For Mac devices not enrolled in Apple Business Manager or Apple School Manager, Jamf customers typically accomplish in-place upgrades by pre-packaging the macOS installer for the user. The macOS installer is then either installed automatically by IT or initiated by the end user through [Jamf Self Service](#) (an enterprise app catalog). To save on network bandwidth and maximize user productivity, the macOS installer can be pre-cached on the systems that are eligible for an upgrade. Additional software updates and configuration changes can be combined with the update to ensure a smooth transition.

But what about imaging? Imaging, a set of technologies that are used in a variety of deployment scenarios, is being replaced with native Apple technologies. Long-term, imaging options will continue to become less and less relevant when it comes to managing a Mac deployment. Apple doesn't recommend or support monolithic system imaging as an installation method, because the system image might not include model-specific information such as firmware updates. **See [this article on Apple's support site for more details.](#)** →

You must also be connected to the internet when you upgrade macOS. This is due to firmware updates Apple installs on the Mac, further strengthening the security of your devices. Only the macOS installer can download and install these firmware updates, which validates Apple as the source of the critical firmware. **In fact, installing macOS Catalina on a Mac connected by Target Disk Mode is no longer a supported installation method.**

The only supported imaging upgrade workflow for macOS Catalina leverages System Image Utility to create a NetInstall image. While this can be a more labor-intensive process, Apple supports this method. NetInstall does not work with Mac devices that have an Apple T2 chip; for this reason, consider other methods beyond NetInstall.

If you need to erase your hard drive, there is an option to install macOS and erase the hard drive at the same time. After you download the macOS Catalina installer from the Mac App Store and upload via your

Apple management solution, deploy with policies using the `--eraseinstall` flag with the `startosinstall` command. This will only work on computers that have been converted to Apple File System. For more information, [read this article](#).

Here are some other areas to consider as you prepare to upgrade to macOS Catalina:

Apple File System (APFS)

APFS, Apple's file system, shipped with macOS High Sierra for only solid-state drives. APFS is now the standard file system for all drives. Revisit any imaging workflows in your environment, as they may no longer be supported. See [Jamf's APFS white paper](#) for more information. →

Understand the new operating systems



Customer Quote

“Being able to deploy a Mac operating system upgrade without having to visit each machine is huge. Jamf Self Service allows us to put the power into our end users' hands, allowing them to kick off a system upgrade on their time.”

Steve Wood

Endpoint Services Manager, Omnicom Group

Understand the new operating systems

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Cisco Fast Lane QOS for macOS

macOS High Sierra introduced Cisco Fast Lane for macOS. Cisco Fast Lane enables you to optimize network traffic for business-critical apps. Organizations using Cisco networks can define what iOS, iPadOS and Mac apps get priority on the network. Inventory your most critical Mac apps and confirm that your device management provider supports the new Cisco Fast Lane QOS features for macOS.

Software update deferral

A configuration profile is available for IT admins who want to defer software updates on a Mac for up to 90 days or conduct macOS versioning. Evaluate your software update timelines and determine whether you need to defer future software updates for end users. This allows IT to test critical applications after a new OS is generally available. Taking advantage of Apple's beta program can mitigate the need to enforce any delay for your end users, giving them day-zero access to the latest and greatest.

User Approved MDM enrollment

Automatically creating User Approved enrollments for users allows IT to remotely manage security sensitive settings like User-Approved Secure Kernel Extension Loading. Profiles like Approved Kernel Extensions, require a macOS enrollment to be User Approved.

Kernel extension management

As Apple strengthens macOS security, there are user consent requirements to load kernel extensions with or after the installation of macOS Catalina. End users will only need to approve kernel extensions on their Mac if A) they were not on the Mac before the upgrade to macOS Catalina, or B) the kernel extensions are not replacing previously approved extensions. Review any existing kernel extensions (for example, with anti-virus software and virtualization software), and apply them prior to any upgrades.

OAuth support for Exchange

Apple added OAuth support for Microsoft Exchange. This provides a modern way of authenticating to Exchange accounts. IT admins will be able to enforce this whenever users are setting up their email accounts for the first time.

Password restrictions

Ability to restrict AutoFill passwords, block password proximity requests and prohibit password sharing via AirDrop.

Privacy protocols

Data protection enhancements for apps accessing critical data, and new methods to prevent tracking from advertisers when utilizing Safari.



Upgrading to iPadOS 13 and iOS 13

Unlike macOS upgrades, there is only one workflow for iPadOS and iOS upgrades. They are made available by Apple and then installed by the end user. Here are some other areas to consider as you prepare for upgrades to iPadOS 13 and iOS 13:

Managed Software Updates

Organizations can now defer users from updating for up to 90 days and specify which iPadOS and iOS version to deploy.

Setup Assistant steps

Skip Setup Assistant screens during enrollment and help users to the Home screen as fast as possible. iMessage, FaceTime, Screen Time and Software Update setup panes are skippable in iPadOS 13 and iOS 13 (and macOS Catalina).

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Force date and time

Automatically set the date and time on iPadOS and iOS devices. Important for schools to prevent students from modifying the date and time on their devices; which potentially allowed them to circumvent IT protocols. →

Understand the new operating systems



New iPad operating system

Apple unveiled iPadOS at its 2019 Worldwide Developer's Conference (WWDC). Built on the foundation of iOS, iPadOS offers a full web-browsing experience on a mobile device and includes multi-task functionality such as Split View and Slide Over.

Understand the new operating systems

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Upgrading to tvOS 13

Apple TV devices enable wireless sharing without the need for adapters, all while delivering a modern conference room experience. Apple TV is also great for digital signage, wayfinding and specific industries, such as hospitality.

Building off the management functionality introduced with tvOS 12, tvOS 13 gives organizations even more control over the Apple TV experience.

Here are some areas to consider as you prepare for upgrades to tvOS 13:

Install software updates

Remotely install software updates to ensure all Apple TV devices are running the latest version of tvOS.

Install App Store apps

Purchase and remotely deploy apps from the App Store directly to Apple TV devices with MDM.

Password restrictions

Ability to restrict AutoFill passwords, block password proximity requests and prohibit password sharing via AirDrop.

AirPlay for Apple TV, iPad and iPhone

In addition to the new management features, you can further secure AirPlay for Apple TV by defining specific passwords for individual Apple TV devices and automatically sharing that password with specific iOS and iPadOS devices. This eliminates accidental sharing of private data to different rooms. To prepare, organizations can begin outlining which Apple TV devices pair with each iPadOS and iOS device in their environments.

A deep understanding of the new operating systems, careful planning and insight into the potential impact for end users ahead of an upgrade can minimize disruption, help desk calls and unhappy end users. Next, consider the following stakeholders and conversations ahead of your upgrade.

Loop in InfoSec

Some consumer features released by Apple may not be approved for use by your InfoSec team. This is why the MDM specs are updated to disable these features. Get together with your InfoSec team now to discuss which features are appropriate for your organization.

Establish a test plan, and communicate these new features to your InfoSec team. By participating in Apple's betas (if your device management solution supports them), you can preemptively block any features that concern your InfoSec team before they are available to end users on managed devices.

Steps to preparing end users

1 Not every end user is aware of the time it takes to upgrade a Mac. Inform users of the average upgrade time, and provide tips on the best time of day to upgrade.

2 Recommend that your end users back up their device(s) before they update. This applies to localized and iCloud backups.

* If you use a centralized backup tool for macOS, consider sending a policy to run a backup before you do an upgrade.

3 Implement a policy to require end users to update within 30 days, or let them know you will update for them. PCIDSS compliance requires 30 days.

When it comes to upgrades, err on the side of over communication. Use email, your company's intranet, or if your device management solution allows, your Jamf Self Service app catalog, to give users plenty of warning and recommendations prior to OS upgrades. They'll thank you for it (or if all goes well, they'll say nothing.)

Upgrades communications plan





Go forth and conquer

Apple's upcoming operating systems, macOS Catalina, iPadOS 13, iOS 13 and tvOS 13 bring innovative capabilities to all organizations.

A streamlined approach to Apple upgrades ensures security measures are met, accurate system inventory is maintained and downtime is eliminated. A purpose-built Apple ecosystem management solution equips you with the tools you need to take advantage of the latest Apple OSs without negatively impacting end users or putting abundant strain on IT personnel.

Jamf is committed to helping organizations succeed with Apple. We've offered day-zero support for all Apple releases for more than a decade, ensuring organizations can take advantage of new Apple technology as it becomes available.

Let Us Prove It