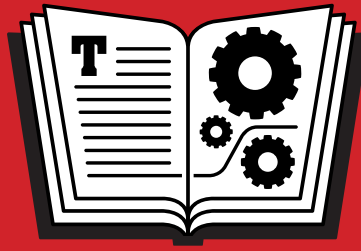


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TAKE CONTROL OF

UPGRADING TO HIGH SIERRA

by JOE KISSELL

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Read Me First

Welcome to *Take Control of Upgrading to High Sierra*, version 1.1.2, published in October 2017 by alt concepts inc. This book was written by Joe Kissell and edited by Tonya Engst.

Upgrading your Mac to a new operating system can be a daunting prospect, but with some expert advice, you'll be running macOS 10.13 High Sierra in no time. This book eliminates the uncertainty and the confusion, guiding you through every step of the process.

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Basics

To review background information that might help you understand this book better, such as finding System Preferences and working with files in the Finder, read Tonya Engst’s free ebook [Read Me First: A Take Control Crash Course](#), available on the web or as a standalone ebook in PDF, EPUB, and the Kindle’s Mobipocket format.

What’s New in Version 1.1.2

Version 1.1.2 fixes a couple of shortcomings in version 1.1.1. In [Learn about APFS](#), I added a note about external SSDs, and clarified that Time Machine disks must not be formatted as APFS, regardless of the format your startup volume uses. I also corrected erroneous information about content caching found in previous versions of this book, and added instructions for using a High Sierra Mac as a Time Machine server; for both topics, see [System Preferences Changes](#).

Version 1.1.1 was a minor “bug fix” update that corrected the minimum system requirements for installing High Sierra from 10.7.5 Lion to 10.8 Mountain Lion, mentioned a couple of missing features in [Find Out What’s New in High Sierra](#), slightly updated the details in [Firmware Updates](#) and [Free Disk Space](#), and added a brief note in [Obtain the Installer](#) about automatic downloads.

And version 1.1 updated the book to cover the official 10.13.0 release version of High Sierra. Among other changes, that version added a largely rewritten [Learn about APFS](#) topic, a sidebar called [About Microsoft Office and High Sierra](#), and updated information in [System Preferences Changes](#).

Introduction

In the summer of 2017, my family and I took a road trip to some scenic California locations—mostly in and around the Sierra Nevada mountain range, or as it’s known colloquially, the High Sierra. Our travels included a visit to Yosemite National Park, where of course we saw the massive El Capitan rock formation. We went to these places because they’re beautiful and relatively nearby, but the fact that they were also the namesakes of the last four versions of macOS was not lost on us. I’d like to think we found a bit of inspiration for working on our books about High Sierra, including this one.

Several times over the years, Apple has released new versions of the Mac operating system that focused mainly on performance improvements, bug fixes, and usability—with only modest changes in user-facing features. (Think: Leopard to Snow Leopard, Lion to Mountain Lion, and Yosemite to El Capitan.) macOS 10.13 High Sierra is such an upgrade—it looks and acts almost like its predecessor 10.12 Sierra, but has a more robust infrastructure (plus a few interesting new features).

Upgrading to High Sierra involves steps nearly identical to installing any of the past several versions of macOS. Apple has gone to great lengths to make it both easy and safe to keep your Mac up to date, and the installer is about as user-friendly as you can get. Most people will upgrade painlessly.

And yet, here I am again—for the eleventh time!—with a book about how to upgrade your Mac. I keep writing these books because, despite Apple’s excellent efforts to make their installers bulletproof, things can and do go wrong. If anything surprises me during my many test installations of High Sierra (and indeed, a few things did!), I know that other people will encounter similar things and will want to know what to expect.

Even when nothing goes wrong, you may face questions or decisions you don’t know how to handle. This book, like its predecessors, is intended to walk you through every step of the process, anticipate the

issues that may confuse or frustrate you, and make upgrading as smooth as possible.

For example, one of the most important changes to High Sierra is the long-awaited switch to a new file system (Apple File System, or APFS—see [Learn about APFS](#)). In most cases, this change will be entirely invisible. Assuming your Mac supports APFS, you'll notice that certain things happen more quickly in the Finder, but your Mac won't *look* any different. And yet, this otherwise wonderful new feature has a number of maddening gotchas, so I show you what you're getting yourself into before you make the leap. The advice in this book, which includes making thorough backups before you upgrade, will enable you to avoid or solve most of the problems you may encounter.

I also explain why Apple's minimum system requirements don't tell the whole story about what you need to run High Sierra successfully, offer advice on avoiding software incompatibilities, show you how to recover disk space if you don't have enough to upgrade your system, and explore several other issues that can complicate the process.

If you've upgraded your Mac numerous times, keep excellent backups, have up-to-date hardware and software, and consider yourself technically proficient, then really...you don't need this book. But if you count yourself among those feeling anxiety, confusion, or uncertainty about upgrading to High Sierra, you've come to the right place.

As of the initial release of High Sierra 10.13.0, some promised features are either missing or not yet fully working. So I'll be keeping an eye on future releases, and if major changes warrant it, I'll update this book accordingly. For less urgent information, I'll post a notice on the book's blog. To check for an updated copy of this ebook (or any other important information), click the link in [Ebook Extras](#).

High Sierra Upgrade Quick Start

I've arranged this book in logical order, and I recommend performing these steps in the order I present them. You need not learn every last detail, but I hope you'll at least skim the whole thing.

Start on the right foot:

- Discover what you have to look forward to when you upgrade to High Sierra, as well as what features were added (and removed) in the last several upgrades. Read [Catch Up with macOS Changes](#).
- If you're upgrading from the High Sierra *beta*, read the sidebar [Upgrading from the High Sierra Beta](#).

Prepare to upgrade:

- Make sure your computer can run High Sierra. See [Check Your Mac for Compatibility](#).
- Back up before you go forward! See [Back Up Your Disk](#).
- Make sure key software is up to date, and remove clutter that could interfere with the upgrade. See [Clean Up Your Mac](#).
- Decide which overall upgrade strategy is best for you. See [Decide on an Installation Method](#).

Perform the upgrade:

Follow the strategy you selected earlier to run the High Sierra installer, choosing all the optimal settings and options, and making sure all your personal data is still in place afterward. You'll do one of the following:

- [Upgrade Using Plan A: In-place Upgrade](#)
- [Upgrade Using Plan B: Clean Install](#)

After the upgrade:

- [Perform Post-installation Tasks](#), such as responding to login requests, installing updates to macOS, and tweaking preferences. You'll also deal with any surprises that may occur along the way.
- Problems? If your computer isn't working properly after the upgrade, don't panic. See [Troubleshoot Upgrade Problems](#).

Take In the Scenic View

Since you've bought this book, I assume you've already decided to upgrade to High Sierra and don't need convincing that it's worth your time and effort. However, I would like to call attention to some of the biggest changes in High Sierra that you can look forward to.

In addition, if you're upgrading from an operating system older than macOS 10.12 Sierra, you may be interested to know what other features were added along the way—as well as some that were removed.

Find Out What's New in High Sierra

Apple has a list of new High Sierra features on [this webpage](#). I won't catalog them all here, but I'd like to list some of the most notable changes and improvements since Sierra:

- **Apple File System:** Replacing the decades-old Mac OS Extended (or HFS Plus) file system, Apple File System improves security, performance, and reliability. See [Learn about APFS](#).
- **Better video encoding:** High Sierra supports a new video encoding standard—HEVC, or High Efficiency Video Coding—which greatly reduces the storage space required for videos.
- **Metal 2:** This significantly improved version of Apple's graphics API (application programming interface) enables developers to squeeze more power out of your Mac's graphics processor, or GPU.
- **Safari:** Safari has new tools to block advertisers from tracking you, stop videos from autoplaying when you load a page, show articles in Safari Reader by default, and customize your browsing experience in other ways.
- **Siri:** Siri now has a more human-sounding voice. It also gives you the option to type (rather than speak) your questions, and has more extensive integration with Apple Music.

- **Photos:** The Photos app has improved organizational features, an expanded sidebar, new filters and editing tools, a looping effect for Live Photos, better integration with third-party apps, and more.

Apple also removed a few minor features—ones I’ve noticed so far include the All My Files category in the Finder sidebar and the Shared Links feature (for keeping track of RSS feeds) in Safari.

If you’re already running 10.12 Sierra, that’s all you need to know for now—skip ahead to [Learn about APFS](#). But if your Mac is still using an older operating system, read on to learn about some changes in the past few releases that you may not be fully prepared for.

Note: Microsoft Office users, pay special attention to the sidebar [About Microsoft Office and High Sierra](#), later, which discusses which versions of Office may or may not work.

Catch Up with macOS Changes

The older the operating system you’re upgrading from, the more changes you’ll notice in High Sierra—and the greater the likelihood that you’ll encounter compatibility problems with old hardware and software. You’ll find great new features, but you may also have to abandon software you’ve used for many years, adopt new habits, or reorient your thinking about how a Mac works. Before you jump in, you should understand what awaits you.

Read the topics below covering any operating systems you’ve never installed on your Mac.

Changes in Sierra

If you’re running OS X 10.11 El Capitan or earlier, here’s what you need to know about the changes in macOS 10.12 Sierra (apart from the fact that Apple rebranded the operating system from “OS X” to “macOS”).

Sierra finally brought Siri to the Mac. It also added Apple Pay (in Safari); Auto Unlock with Apple Watch; Universal Clipboard (so you

can copy something on one of your Apple devices and paste it on another); iCloud Drive sync for your Desktop and Documents folders; optimized storage (the option to delete local copies of files stored in iCloud Drive if you run low on disk space); tabs in almost every app; a picture-in-picture view for videos; and various improvements to Photos, Messages, Mail, and iTunes.

Unfortunately, fax and modem support was largely discontinued starting in Sierra. If you previously used an Apple USB Modem with your Mac—either for dial-up internet access or to send and receive faxes—you should know that High Sierra no longer supports your modem. Some third-party USB modems and multifunction (printer, fax, scanner, copier) devices that include their own driver software *may* still work with High Sierra for both internet access and faxing, as long as the drivers support a 64-bit kernel. In particular, I've read (although I haven't tested them myself) that the [USRobotics USR5637](#) and [Zoom 3095](#) modems should be compatible, but I can't guarantee it.

If you need to send or receive faxes in High Sierra, there are a few alternatives (such as running a virtual machine, using an internet fax service, and copying the old drivers from El Capitan). Adam Engst lays out the options in his TidBITS article [Lost in Sierra: Five Missing Features](#).

Changes in El Capitan

If you're still using OS X 10.10 Yosemite or earlier, you'll want to know what changed in 10.11 El Capitan. El Capitan added Split View (like Full Screen, but for two apps at a time); major improvements to Spotlight, Notes, Safari, Maps, and Photos; new system fonts; improved performance; and a security feature called System Integrity Protection (SIP), about which you can read in Glenn Fleishman's Macworld article [Private I: El Capitan's System Integrity Protection will shift utilities' functions](#).

Changes in Yosemite

Still running Mavericks or earlier? In OS X 10.10 Yosemite, Apple added Continuity features that enable Macs and iOS devices to work together more seamlessly, a significantly redesigned Spotlight, iCloud Drive, an expanded Notification Center, and several improvements to Mail.

Yosemite also changed how the Mac handles Java. Java is a popular cross-platform programming language, which once enjoyed full support on the Mac. But largely due to security concerns, Apple stopped bundling the Java runtime (the software that enables Java code to run) with the Mac operating system. In High Sierra (as in Sierra, El Capitan, and Yosemite), a prompt still appears when you try to run Java software, directing you to download the Java runtime from Oracle and install it manually.

Changes in Mavericks

In OS X 10.9 Mavericks, Apple switched from using big cats to California landmarks in the names of its Mac operating systems. Mavericks also improved support for multiple displays, added both tags and tabs to the Finder, added the iBooks and Maps apps, and introduced interactive notifications, all while improving performance on several fronts.

Changes in Mountain Lion

In OS X 10.8 Mountain Lion, Apple switched from calling the Mac operating system “Mac OS X” to just “OS X.” Mountain Lion introduced Messages, Notification Center, Dictation, and Power Nap (among many other features). iCal was renamed Calendar, and Address Book was renamed Contacts. In addition, Apple added the Reminders app to replace the Reminders feature in iCal, as well as a new Notes app to replace the Notes feature previously in Mail.

Mountain Lion also dropped Web Sharing controls in System Preferences and support for RSS feeds in Apple Mail and Safari.

Last but not least, with Mountain Lion, Apple began distributing upgrades to the Mac operating system by download only. The High Sierra installer is over 5 GB—a problem for people without broadband internet connections, or with restrictions on the quantity of data they can download. I offer some ways to deal with that problem later, in [Obtain the Installer](#).

Changes in Lion

I'm guessing that very few readers are still using Mac OS X 10.6 Snow Leopard and upgrading all the way to High Sierra. But if you are, you may be interested to know that Mac OS X 10.7 Lion added features such as iCloud support, Versions and Auto Save, FileVault 2, Launchpad, Mission Control, full-screen apps, and multi-touch gestures.

More significant, however, for people still running Snow Leopard, are the following features that disappeared in Lion (and are still gone):

- **Rosetta:** Rosetta was the software that enabled PowerPC apps to run on Intel-based Macs. Upgrading to High Sierra entails living without software that requires Rosetta.

To learn how to find installed apps that still rely on Rosetta, see Matt Neuburg's TidBITS article [Preparing for Lion: Find Your PowerPC Applications](#). If you discover any such apps, you must upgrade them to Intel-native (or Universal) versions, migrate to alternative apps, or find a way to continue running Snow Leopard (for example, by keeping it on a separate Mac, drive, or partition; or running Snow Leopard Server in a virtual machine using Parallels Desktop or VMware Fusion).

- **Flash:** Adobe's Flash Player, which enables dynamic web content such as video, games, and interactive navigation, was bundled with previous versions of the Mac operating system but was removed from Lion and remains missing from High Sierra. If you need Flash, you can [download Flash Player](#) for free from Adobe. However, you may have good reasons for wanting to avoid Flash, and to encourage the use of more modern standards such as HTML5. John Gruber

explains one method of living without Flash in a [Daring Fireball post](#).

Learn about APFS

If you’ve ever erased or partitioned a disk in Disk Utility, you’ve probably seen the term “Mac OS Extended”—it’s one of several file systems you can choose from to format a Mac volume, and except for situations in which a disk must be usable on non-Mac computers, it has been the preferred format since the very beginning of Mac OS X.

A [file system](#), in case you’re wondering, is a mechanism for storing files on a disk or SSD—it’s the technology that enables your computer to figure out where all the individual pieces of each file are stored, what the files and folders are called, what their other metadata are, and so on. In other words, it’s just plumbing—you, as a user, never interact directly with the file system, but instead you use a high-level app like the Finder to do things like move, copy, rename, and delete files. All the gory details of the filing system are handled behind the scenes.

Mac OS Extended is nearly two decades old, and let’s just say that it hasn’t aged especially well. Since this file system was introduced, computers and their storage devices have gotten way faster, storage capacities have increased dramatically, SSDs have become much more popular and far less expensive, and security concerns have become a vastly bigger deal. The Mac has been needing a better and more modern file system for a long time, and High Sierra finally provides it, in the form of Apple File System, or APFS (for more on the name, see the sidebar [Why APFS and Not AFS?](#)).

“That’s nifty,” you may say, “but if it is just plumbing, why should I care?” Well, imagine that your house has rusted pipes, clogged drains, and leaky faucets, and then someone comes in and replaces all that. Now the dripping faucet doesn’t keep you awake all night, the tub drains quickly, and—oh!—that water pressure in the kitchen is something else! That’s what APFS does for your Mac.

For example, duplicating even a multi-gigabyte file is essentially instantaneous in APFS. Using the Finder's File > Get Info command to check a folder's size is also quite fast. (That's something I've frequently had to wait many minutes for, and it always drove me crazy!) Many day-to-day activities like that will become much faster. And, if you have a Mac laptop that uses Time Machine, the temporary backups it makes while you're disconnected from your Time Machine backup disk will go much faster and take up far less space; for details, see [Mobile Time Machine and its transformation in High Sierra](#).

APFS is also far more resistant to data loss or corruption due to crashes, and it natively supports advanced backup and encryption capabilities that will help keep your data more secure. (And, in case you're wondering, FileVault still exists and still works just fine with APFS—even though the underlying encryption mechanism will change during the upgrade process, it will look and act the same as it always has.)

Note: As of October 2017, I've been unable to determine how users will take advantage of, or interact with, some of the more sophisticated features of APFS. It may be that some APFS capabilities won't appear in a user-accessible form until a future update to High Sierra, or even a later version of macOS.

APFS can be used on devices of any size (including an Apple Watch). In addition, APFS was explicitly designed to work well with fast SSDs, and to scale gracefully to storage devices with capacities that are unheard of today, but may be commonplace before long.

As a matter of fact, if you have an iPhone, iPad, or iPod touch running iOS 10.3 or later, you're already using APFS! That's right, Apple designed the iOS 10.3 installer to quietly convert the file system to APFS as it ran. So the process of safely converting to the new format has already been field-tested many millions of times!

To summarize thus far:

- High Sierra will give you the benefits of the new APFS “plumbing,” and that will make you happy.

- The conversion process will be effectively seamless, and the only thing you're likely to notice is that installing High Sierra takes a bit longer than you expected.

But...

Of course, there had to be a “but.” In fact, there are several, and some of them are pretty significant.

APFS is great, and once the majority of Apple devices are using it, the world is going to be a better place. There are, however, a few niggling “gotchas,” at least for now:

- First, as of the initial 10.13.0 release of High Sierra, *only* Macs with all-solid-state storage can be converted to APFS. If your Mac contains a spinning hard drive, or a Fusion drive (which combines an SSD with a hard drive), you can't convert your startup volume to APFS yet.

This is a major limitation, and as it appeared partway through the public beta testing process, some users running the beta version of High Sierra may have allowed the installer to convert their Fusion drives to APFS. (This conversion did not occur with hard drives.) Unfortunately, High Sierra 10.13.0 cannot be installed at all on a non-solid-state device formatted as APFS, yet an APFS-formatted drive can't be converted back to Mac OS Extended without erasing it! So, those unlucky Fusion drive users must completely erase and reformat their drives, restore a pre-High Sierra backup, and *then* install the release version of High Sierra. Yeah, it's ugly. Apple details the whole messy process in [Preparing your Fusion Drive Mac for the macOS High Sierra install](#).

- Assuming your Mac has built-in, solid-state storage, the conversion to APFS during installation of High Sierra is both automatic and mandatory. You can't opt out, even though that was an option in a few of the early beta versions.

Note: As of version 10.13.0, the High Sierra installer apparently does not convert *external* SSD boot drives to APFS automatically.

- The High Sierra version of Disk Utility, including the copy available when running in macOS Recovery, can convert volumes from Mac OS Extended to APFS, without losing data (choose Edit > Convert to APFS). In fact, this process even works on some spinning hard drives (so far, I've been unable to determine why it works on some but not others), though the command is dimmed if any non-solid-state startup volume is selected. But I advise against doing such manual conversions for now, especially on non-SSD volumes, because it's clear that APFS still has significant kinks to be worked out—and because, as I mentioned, you can't reverse the process.

Warning! Do *not* attempt to reformat a Time Machine backup disk as APFS, as High Sierra will be unable to use it (regardless of whether your startup disk is formatted as APFS), and you'll have to erase it and start your backups over from scratch. This may change in the future, but for now, leave your Time Machine disk formatted as Mac OS Extended.

- Macs running El Capitan or earlier can't mount or read volumes formatted with APFS. (If a Mac can run High Sierra, it can *boot* from an APFS-formatted volume, even if the normal boot volume uses El Capitan or earlier. But while booted from El Capitan or earlier, it can't read an APFS volume.)

In other words, if you have an *external* SSD formatted as APFS, and you install High Sierra onto it, you can boot a Mac from that drive—but if you disconnect that drive and connect it to a Mac that's already booted from El Capitan or earlier, that Mac won't be able to read anything on it.

Note: Sierra 10.12.6 or later can read APFS-formatted volumes, but you can't create a *bootable* Sierra APFS volume. High Sierra is the first version of macOS that can boot from an APFS volume.

- Some virtualization apps that otherwise support High Sierra may not support APFS-formatted High Sierra volumes. If you use VMware Fusion or Parallels Desktop and want to run High Sierra as a guest operating system, be sure you've updated your software to

the latest version—and check with the developer for any limitations or special instructions.

- Third-party disk utilities must be updated to work with APFS. If you use DiskWarrior, Drive Genius, TechTool Pro, or other apps to perform disk maintenance or repair, be sure to check for an APFS-compatible update before you run it under High Sierra, or *bad things can happen*.

Having said all that, I think that the potential problems with APFS will affect only a tiny fraction of a percent of High Sierra users. Users with SSDs startup drives will get APFS automatically and, I expect, will enjoy the improvements that the new file system brings, while those with Fusion drives and hard drives can simply ignore the existence of APFS entirely unless or until Apple adds it to a future version of macOS.

Why APFS and Not AFS?

Somebody has to say it: Apple has a hard time picking good names for its file systems.

Way back in 1985, Apple introduced the Hierarchical File System, or HFS, as the standard way to format a Mac hard disk. In 1998, an enhanced version of the file system, HFS Plus, was introduced, and became the default for Mac OS X.

At some point, Apple decided that “Mac OS Standard” was a better way to refer to HFS, and “Mac OS Extended” was a better way to refer to HFS Plus. (Apple briefly called it “OS X Extended.”) So those longer names have been used (for example, in Disk Utility) for quite some time, even though HFS and HFS Plus are so much less cumbersome—and Apple hasn’t had software called “Mac OS” since 1999.

Then Apple File System comes along, and any reasonable person might expect it to be shortened to AFS. But no: that initialism was already in use, for a network technology called *Apple File Service*. Thus we’re left with the clunky term APFS, which can only be parsed as **AP**ple **F**ile **S**ystem. Geez.

Check Your Mac for Compatibility

All currently shipping Macs, as well as models introduced within the past 7 years or so, can run High Sierra. In fact, the system requirements are unchanged from 10.12 Sierra, so if your Mac can run Sierra, you know it can run High Sierra too. If your Mac is older or not already running Sierra, however, you'll want to make sure it is compatible.

In addition, even if your Mac can run High Sierra, you may not be able to use every part of it. Certain features, such as Handoff and AirDrop between a Mac and an iOS device, require a recent version of Bluetooth—see [Recent Bluetooth Hardware](#) for an explanation.

The next several pages will help you verify that your hardware is fully compatible with High Sierra. And, if you're running 10.7 Lion or 10.6 Snow Leopard, follow the advice in [OS X 10.8 Mountain Lion or Later](#) in order to use the High Sierra installer.

Model Support

High Sierra does not support Mac models introduced before late 2009. Macs that can run High Sierra include the following:

- iMac (Late 2009 or newer)
- MacBook (Late 2009 or newer)
- MacBook Air (Late 2010 or newer)
- MacBook Pro (Mid 2010 or newer)
- Mac mini (Mid 2010 or newer)
- Mac Pro (Mid 2010 or newer)


Of course, that list is helpful only if you know which model of Mac you have! If your Mac is running Lion or later, this is easy to check: choose Apple  > About This Mac and (if needed) then click More Info. You'll see something like **Figure 1**; the Overview pane spells out your Mac's model using Apple's current terminology.



Figure 1: This window on Macs running Lion or later gives you the exact marketing name of your Mac model.

However, if your Mac is running Snow Leopard, nowhere on your Mac can you *see* these designations (like “Late 2009”). Instead, you'll have to go by your Mac's Model Identifier. To find it, open System Profiler (in [/Applications/Utilities](#)). In the list on the left, make sure Hardware is selected, and look for the line that says Model Identifier. It consists of your Mac model name followed by a pair of numbers, without spaces—as in [MacBook6,1](#).

Once you know your Mac's Model Identifier, you can look it up in my *enhanced* version of Apple's list, below. (Keep in mind that the comma should be interpreted as a decimal point, so 6,2 is newer than 6,1, and 6,1 is newer than 5,6.)

Here are the Macs that can run High Sierra:

- iMac10,1 or newer

- MacBook6,1 or newer
- MacBookAir3,1 or newer
- MacBookPro6,1 or newer
- Macmini4,1 or newer
- MacPro5,1 or newer


If your Mac isn't on that list (or has an older model number), then regardless of its age or speed, I'm very sorry to say that it won't run High Sierra.

New Macs that ship after High Sierra is released will have High Sierra preinstalled; if necessary, you can use the Migration Assistant to transfer files, accounts, and settings from your old Mac, as I explain in my TidBITS article [How to Migrate to a New Mac](#).

RAM


High Sierra requires a minimum of 2 GB of RAM, and all Macs that can run High Sierra shipped with at least that much. But even though 2 GB is the official minimum, I strongly suggest having at least 4 GB—or even more, if your budget allows and your Mac's RAM is user-upgradable.

In general, the more RAM you have, the better your Mac's performance. If your Mac can hold 16 GB of RAM or less, I recommend maxing it out if possible. If it can hold more than 16 GB and you're doing heavy-duty video, audio, or graphics work, you might want to go even higher. But very few people would benefit from the maximum of 64 GB of RAM you can put in a Mac Pro or the 128 GB you'll be able to put in an iMac Pro (when it appears in late 2017).

To see how much RAM your Mac currently has installed, choose Apple  > About This Mac and look at the Memory line.



How Much RAM Can My Mac Hold?

If you are in a position to increase the RAM in your Mac, you'll want to know how much it can actually use. To determine the RAM limit for a Mac running Lion or later:

1. Choose Apple  > About This Mac.
2. If you see a More Info button, click it (the button isn't present in newer versions of macOS).
3. If you see a Memory button, click it. (If you don't, your RAM isn't upgradable.)

System Information should tell you how much RAM is installed and how much your Mac can accept. For further details and information on how to add RAM, click the Memory Upgrade Instructions link (if present; if not, your Mac's RAM is not user-upgradable).

Firmware Updates

Some Macs may require updated EFI or SMC firmware to run High Sierra. To see if a firmware update is available, check [this webpage](#). Unless you previously hid them from the list, firmware updates should also appear when you choose Apple  > App Store and click Updates (in Yosemite and later) or Apple  > Software Update (Mavericks and earlier).

Note: The High Sierra installer itself can, in some situations, download and apply firmware updates, but you shouldn't count on it working in every case; it's better to do this operation separately.

Free Disk Space

Apple says that the High Sierra installer requires 14.3 GB of free storage space to perform the upgrade (and that after the installation is finished, High Sierra will occupy about 1.5 GB more than Sierra did). Although you may be able to get away with exactly 14.3 GB free, you'll be doing yourself a favor by not cutting it so close. I recommend

starting with at least 20 GB of free space (before downloading the installer). More free space is even better, of course. Some High Sierra features will require increasing amounts of disk space as you use them, so it never hurts to have room to grow.

Tip: To find out how much free space a volume has, select the volume's icon in the Finder and choose File > Get Info. The window that appears lists (among other things) the volume's Capacity (total), Available (free), and Used space.

If you're running out of disk space, skip ahead to [De-clutter Your Disk](#) for suggestions as to how you can remedy the problem.

Recent Bluetooth Hardware

Although it's not a requirement for High Sierra as such, if you want to use certain Continuity features, including Handoff, Instant Hotspot, Universal Clipboard, AirDrop (when used for file transfers between a Mac and an iOS device), and unlocking your Mac with an Apple Watch—or if you want to use Apple Pay on the web—your Mac needs to have built-in support for a recent version of Bluetooth.

For all the above features except Auto Unlock with Apple Watch, your Mac must be among the following:

- **iMac:** 2012 or newer
- **MacBook:** Early 2105 or newer
- **MacBook Air:** 2012 or newer
- **MacBook Pro:** 2012 or newer
- **Mac mini:** 2012 or newer
- **Mac Pro:** Late 2013 or newer


For Auto Unlock with Apple Watch, you must have a Mac introduced in 2013 or later, plus an Apple Watch with watchOS 3 or later, and an iPhone 5 or later with iOS 10 or later. If you want to use Apple Pay

on the web in Safari on your Mac, you also need an iPhone 6 or later with iOS 10 or later, *or* an Apple Watch with watchOS 3 or later.

To find out which Mac model you have, flip back to [Model Support](#).

OS X 10.8 Mountain Lion or Later

Previous versions of this book said that High Sierra requires only OS X 10.7.5 Lion or later, but Apple apparently made a late change to the requirements: in order to install High Sierra, your Mac must be running 10.8 Mountain Lion or later.

If your Mac supports High Sierra but is currently running 10.6 Snow Leopard or 10.7 Lion, you must upgrade it to 10.11 El Capitan before you can install High Sierra. (The steps are just like those found later in this book for High Sierra, except that you'll [download El Capitan from the App Store](#). The reason you must install El Capitan rather than Mountain Lion is that Mountain Lion is no longer available from the App Store, but El Capitan is.) And, if your Mac is running a version of 10.6 earlier than 10.6.8, you'll have to choose Apple  > Software Update to install the 10.6.8 update before you can even download El Capitan—and *then* upgrade to High Sierra.

In addition to having 10.8 or later, you'll also want to [Update Your Third-party Software](#) before installing High Sierra.

Back Up Your Disk

If you've read pretty much any book I've written about the Mac, you know I consider a solid backup plan to be essential for every Mac user. I hope you already perform backups regularly, and if you don't, this is a perfect time to start.

Regardless of what you do normally (such as using Time Machine or Backblaze), I want to state emphatically that before upgrading to High Sierra, you should create a specific type of backup called a *bootable duplicate*. That's an exact copy of everything on your startup volume, stored on another disk in such a way that you could start up your Mac from that other disk and it would behave precisely as it does when you boot from your regular startup volume.

Even though the High Sierra installer doesn't force you to make this type of backup, it's not something you can safely skip if it's inconvenient or if you're fairly sure you won't have problems. In my professional opinion, creating a duplicate is a mandatory, integral part of the upgrade process. In this chapter I tell you both why and how to do this.

Note: I say "volume" here rather than "disk" because your startup volume could be an SSD (solid-state drive). Some Mac models use what Apple calls "solid-state storage," which is different from an SSD only in its physical configuration. I'll use the term "SSD" to refer to any type of solid-state storage.

After you duplicate your startup volume, I'm going to tell you to do some spring cleaning (see [Clean Up Your Mac](#)), and then I'm going to tell you to update your duplicate. I wanted to warn you about this up front so you know it isn't a mistake or capricious advice—it's for your own good. You need a great backup before you delete any files (in case you accidentally delete something you need), but you also need a freshly updated backup right before installing High Sierra.

Let me also point out that whatever the virtues of Time Machine, it's no substitute for a bootable duplicate, as I explain in the sidebar [But I Really Don't Want to Make a Duplicate!](#).

Tip: Upgrading or not, every Mac user should have a thorough backup strategy; you can learn how to minimize downtime and thoroughly protect your important information by reading my comprehensive book [Backing Up Your Mac: A Joe On Tech Guide](#).

Why You Need a Duplicate

As I said, the particular type of backup you want at this moment—regardless of any other backups you may have—is a bootable duplicate, which is a clone or mirror image of everything on your startup volume. You can't make a bootable duplicate in the Finder by dragging and dropping files onto another disk, and backup programs like Time Machine and Backblaze (though they're both fantastic for what they do) can't make them either. You must use a backup program that's designed specifically for making a bootable duplicate.

Everyone should create a bootable duplicate and update it regularly (at least once a week) as part of a solid backup regimen. In day-to-day use, duplicates are important because they let you get back to work almost instantly in the event of a major disk error or even a complete failure of your hard drive or SSD. You simply plug in the backup drive, reboot while holding the Option key, and select the external drive, and you're back up and running. You can then use the backup disk to repair your internal startup volume and restore your files—or if the drive is too far gone, replace it at your leisure.

However, aside from that “nice-to-have” reason for making a duplicate, you truly need one when it comes time to upgrade your operating system. Despite Apple's valiant efforts at idiot-proofing the installer, something could go wrong—either during the upgrade or afterward—that deletes important files, leaves your disk unusable, or results in your needing to revert to your previous version of macOS. Bootable duplicates let you recover from these situations handily.

In addition, you may choose (for reasons discussed later, in [Plan B: Clean Install](#)) to erase your entire startup volume, install a clean copy of High Sierra, and then copy your personal files, third-party software, and other data back to your High Sierra volume. To be sure you have everything you might need during this process (and in exactly the right form), you must have a bootable duplicate.

Prepare for a Duplicate

To create a duplicate, you'll need a few hardware and software ingredients, and you'll need to follow a few preliminary steps.

Hardware

You'll need an empty hard drive for your duplicate. If you don't happen to have an extra (internal or external) hard drive, take heart: hard drives are pretty cheap these days. For example, you can easily find a 4 TB external drive for less than \$120, and compared to the cost of losing your data, that's quite reasonable. Look for one with a fast interface (Thunderbolt 2 or 3, or USB 3), and with enough capacity to accommodate your growing backup needs over the next few years.

Software

Many (but not all) backup apps can create bootable duplicates. If you don't yet have a suitable tool, try [Carbon Copy Cloner](#) or [SuperDuper](#). These two apps operate similarly and are easy to use.

Which Volumes to Duplicate

You should create duplicates of your primary startup volume *and* any other volume on the same physical media. If you have a single, unpartitioned hard disk or SSD, then you have only a single volume to worry about. If you have multiple partitions (or multiple internal or external hard drives or SSDs) that contain bootable systems, I recommend making duplicates of all of them.

Prepare Your External Drive

Before you can create your duplicate, you must perform a few quick steps to partition and format your disk. If the drive is already empty and properly formatted, you can skip these steps. But many new hard drives come formatted in a way that's incompatible with bootable duplicates. (For example, I recently bought a 4 TB Seagate backup drive that came formatted as NTFS and included special software needed to use the drive on a Mac. That's fine for ordinary backups, but it won't work for a bootable duplicate.)

Gone, gone, gone! This process erases everything on the drive—which should be no problem if it's a new drive. If you already have important files on the drive, be sure to copy them elsewhere first!

To prepare your drive, connect it to your Mac, turn it on, and launch Disk Utility (in [/Applications/Utilities](#)). In the list on the left, select your external disk. (The disk is the topmost icon in any group, with any volumes it contains indented beneath it.) The remaining steps depend on which operating system your Mac is using.

Configure a Drive in El Capitan or Later

Follow these steps in Disk Utility, with your external disk selected:

1. Click the Erase button on the toolbar.
2. In the dialog that appears, type a name for your disk in the Name field. Leave the Format pop-up menu set to Mac OS Extended (Journaled) or OS X Extended (Journaled), choose GUID Partition Map from the Scheme pop-up menu (if present), and click Erase. If you want your disk to have a single partition, you're done; skip the remaining steps. (One partition is usually fine; to put both a duplicate and other backup data on the drive, make two partitions.)

Note: Why not use the new APFS format? Generally speaking, that option is available only if the drive was formatted on a Mac that's already running High Sierra or later. See [Learn about APFS](#).

3. To add a partition, leave the disk selected on the left and click Partition. A dialog appears with a pie chart showing a single partition on the disk.
4. Click the plus button to add a partition (**Figure 2**). Enter a name for the second partition in the Name or Partition field and leave the Format set to Mac OS Extended (Journaled) or OS X Extended (Journaled). To adjust the size of the partition, drag the handle on the pie chart or type a new number in the Size field. Repeat this step if you want to add more partitions.

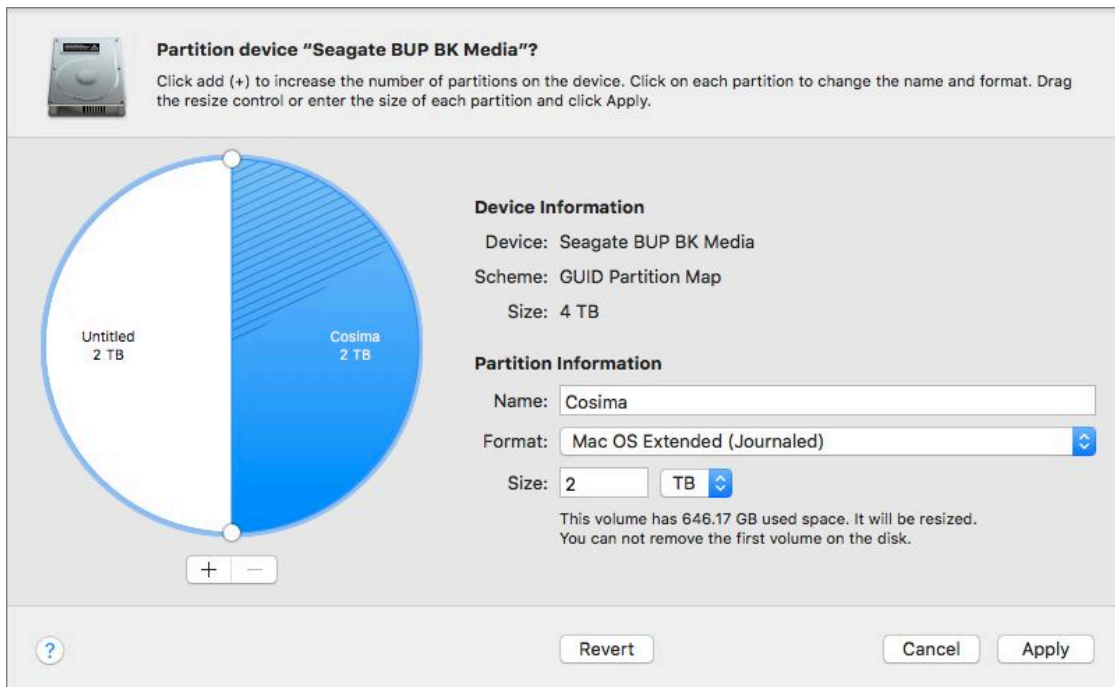


Figure 2: Use this dialog to configure a secondary partition in El Capitan or later. (Details vary based on your operating system.)

5. Click Apply.

Disk Utility has now erased your disk and added any partitions that you specified. If you see an alert asking whether you want to use the new volume for Time Machine, click Don't Use, since you'll be using different software to create your bootable duplicate.

Configure a Drive in Yosemite or Earlier

Follow these steps in Disk Utility, with your external disk selected:

1. Click the Partition button.

2. From the Partition Layout pop-up menu (called Volume Scheme in Snow Leopard), choose the number of partitions you want—do *not* leave it set to Current, even if you want to keep the same number of partitions. One is usually fine; to put both a duplicate and other backup data on the drive, make two partitions.
3. For each partition, give it a name and choose the Mac OS Extended (Journaled) format.
4. If you've chosen to create more than one partition, resize the partitions manually by dragging the dividers, or enter a size for each partition. (The first partition must be at least as large as the amount of data on your startup volume.)
5. Click Options. In the dialog that appears, select GUID Partition Table. Click OK.
6. Click Apply, and then click Partition.

Now that you've partitioned and formatted your disk, quit Disk Utility. If you see an alert asking whether you want to use the new volume for Time Machine, click Don't Use, since you'll be using different software to create your bootable duplicate.

Create a Duplicate

Creating a bootable duplicate with either of my recommended utilities is quite easy: you simply choose a source disk (your existing startup volume) and a destination disk (your backup drive), specify a few options, and click a button. Although each backup app comes with its own instructions, here's a quick overview of how to create a bootable duplicate with [Carbon Copy Cloner](#) (\$39.99, free 30-day trial available), my personal favorite.

Note: If you're running Carbon Copy Cloner 3.5.7 (which you will be in 10.7 Lion or earlier), the interface will be different from the one shown in the directions below, but the basic process is the same—just skip the step about turning off the SafetyNet switch.

To create a duplicate with Carbon Copy Cloner, follow these steps:

1. Launch Carbon Copy Cloner (**Figure 3**).

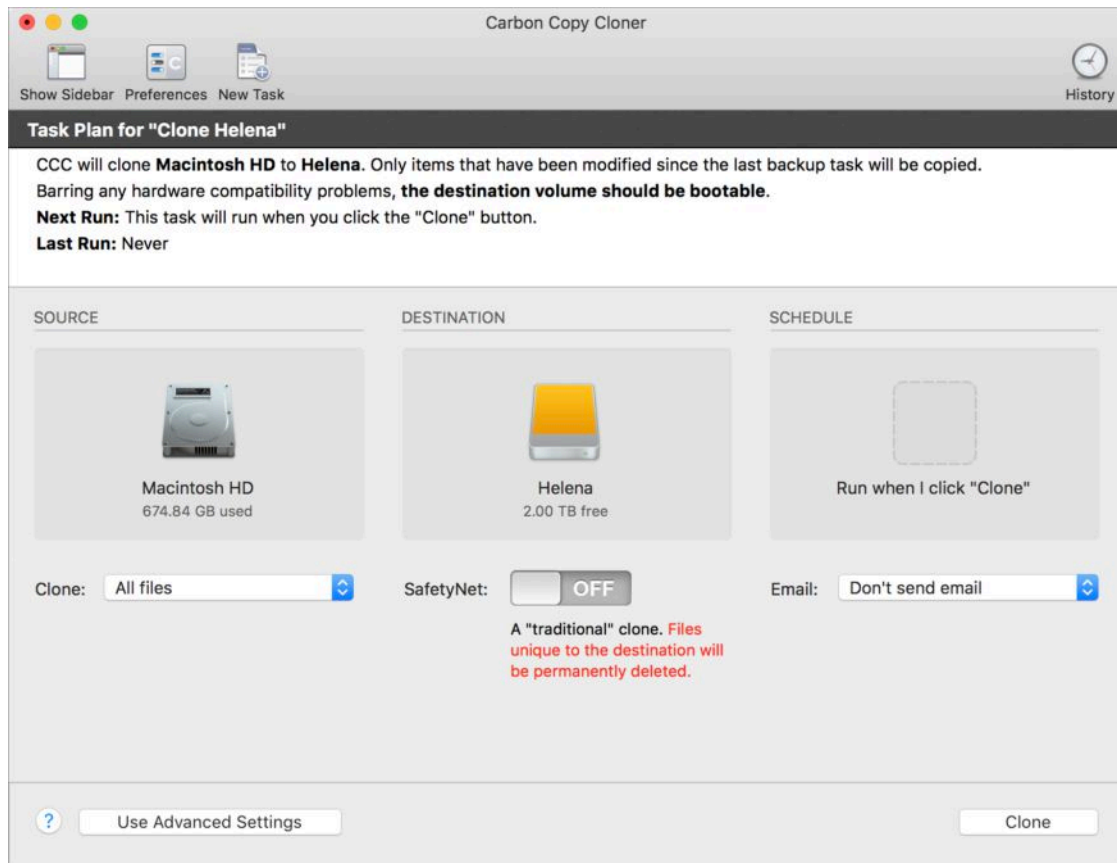



Figure 3: Carbon Copy Cloner shows you the source, destination, options, and an explanation of what's going to happen.

2. Click in the center of the SOURCE area, and select your startup volume from the popover that appears.
3. Click in the center of the DESTINATION area, and select the disk or partition set aside for duplicates on your external disk from the popover that appears.
4. Under the DESTINATION area, if you're using version 4.x of Carbon Copy Cloner, make sure the SafetyNet switch is set to Off. If you're using version 5.x, choose SafetyNet Off from the pop-up menu.
5. Click Clone and follow the prompts—you may be asked to enter your administrator password to make an immediate duplicate, and you may also be asked to install a helper tool (which is a good idea).



Carbon Copy Cloner creates the duplicate and displays a message when your backup is complete. This process may take several hours or more (depending on the size and speed of your drive, among other factors).

Test Your Duplicate

Even if your backup app reported no errors, you should test the duplicate to make sure it truly is bootable before taking the plunge and upgrading to High Sierra. Follow these steps:

1. Make sure the drive with your duplicate is connected to your Mac.
2. Choose Apple  > Restart.
3. Immediately press and hold the Option key until you see a screen with an icon for each available startup volume.
4. Click the volume containing your duplicate (or use the arrow keys to select it) and press Return.

Be prepared to wait much longer than usual for your Mac to start up—as much as 10–15 minutes. Longer boot times are normal when starting a Mac from any new volume, but the time can be longer still if your backup drive uses a slow interface, such as USB 2.0.

5. When your Desktop appears, you may see alerts about supplying passwords for services such as iCloud, Messages, FaceTime, and Dropbox; you can ignore and dismiss these since you're only conducting a brief test. Verify that your Mac used your duplicate as the startup volume. (If in doubt, choose Apple  > About This Mac and see what's listed next to Startup Disk.)
6. Do a few spot checks to confirm that important files are where they should be, that you have network access (try viewing a news page on the web), and that a few apps launch. I recommend not checking your email, though, as doing so may download messages and delete the originals from the server—you'll miss them when you return to your usual startup disk.
7. Choose Apple  > Restart to boot from your normal startup volume.

You've just confirmed that your duplicate works correctly.

But I Really Don't Want to Make a Duplicate!

I recognize that some readers may bristle at my insistence on a bootable duplicate, especially if they already have other types of backups. So I want to take a moment to explain why I say this: it's because I care! I'm trying to save you time and grief.

If you have *no* backups, then the only installation method open to you is an in-place upgrade (see [Plan A: In-place Upgrade](#)). If something goes seriously wrong during the upgrade, you could end up without a bootable disk—and switching to Plan B (see [Plan B: Clean Install](#)) would be impossible unless you're willing to erase your entire disk and lose all your data! And, if the installation succeeds but you later discover a serious software incompatibility or other problem, you would be unable to return your system directly to its previous state; downgrading would become much more complicated.

But suppose you do have a backup of some kind—but not a bootable duplicate. Then you're in less danger, right? Well, *maybe*. If you have a Time Machine backup, as Apple recommends, you could indeed use it (in lieu of a bootable duplicate) to transfer data after a clean install, and you could also use it to restore your disk to its previous state should that become necessary—but it's an awkward procedure that often takes much more time than restoring from a bootable duplicate.

A bigger worry with Time Machine is that you may have configured it to exclude certain files or folders. And anything Time Machine didn't back up can't be restored! Besides, you can't boot directly from your Time Machine backup as you can from a duplicate, so you can't use it to run your computer temporarily if the need arises—your only option is to spend many hours restoring your entire disk.

If you used some other backup app, then again, the in-place upgrade is your only option, because transferring data from your backup at the end of a clean install is impossible. You may or may not (depending on the app and how you have it set up) be able to return your disk to its previous state if needed, but the process is sure to be more complicated and time-consuming.

Simply put, in my professional opinion, a bootable duplicate is a crucial safety net and the best way to minimize inconvenience.

Clean Up Your Mac

Over time, most computers accumulate clutter, including outdated software, forgotten downloads, and obsolete files. Not only can this clutter make files harder to find, it can also cause problems when you upgrade to High Sierra—incompatibilities may show up, or you may run out of disk space, for example.

In this chapter, I suggest that you install some software updates and delete files you don't need anymore. I also show you how to check both your RAM and your disk for errors that could cause problems when installing or running High Sierra.

Because you'll be making so many changes, you should first make a complete backup—so if you skipped [Back Up Your Disk](#), go back and follow those steps now. After you've cleaned up your Mac, restarted, and verified that everything is working properly, you should [Update Your Duplicate](#) so that it'll be closer to the state of your disk when you upgrade to High Sierra.

Update Your Third-party Software

Every major upgrade to the Mac operating system results in software compatibility problems, where some apps work poorly or won't launch. Most of us will have to update at least a few apps to make them work correctly under High Sierra. If history is any indication, some incompatible apps won't be updated right away, and a few might never be. But many developers work hard to ensure that their software is ready for each new version of macOS, and “High Sierra-compatible” software updates have already been appearing for months.

Tip: [RoaringApps](#) maintains a wiki listing hundreds of Mac and iOS apps and the current status of their compatibility with various operating system versions, as reported by users. Although this list is neither exhaustive nor definitive, it provides a quick way to check on the apps most important to you.

About Microsoft Office and High Sierra



In the weeks before the release of High Sierra, some misinformation was circulating about Microsoft Office compatibility. Here's what I know, based on Microsoft's support article [Microsoft Office support for macOS 10.13 High Sierra](#):

- ✦ Microsoft Office 2016 for Mac, version 15.35 and later, *is* compatible with High Sierra, although it is not guaranteed to be bug-free. Microsoft intends to release an update, if necessary, soon after High Sierra is available.
- ✦ Older versions of Microsoft Office 2016 for Mac (that is, 15.34 and below) might have a variety of problems, including not launching at all. If you have such a version, update your copy of Office immediately.
- ✦ Microsoft Office for Mac 2011 is unsupported under High Sierra. It may or may not work, but as Microsoft support runs only through October 10, 2017, the company has no plans to make it compatible with High Sierra.

Long story short: If you use Microsoft Office, install the very latest version (or switch to a completely different set of apps); anything else, and you're taking your chances.

The High Sierra installer looks for, and disables, certain types of incompatible software—but there's no guarantee it will find everything. Given the choice, you're usually better off upgrading third-party software *before* you install a new version of your operating system. In cases where low-level incompatibilities exist, especially with things like drivers, preference panes, and kernel extensions, you can save yourself grief by preventing, rather than fixing, the problem.

Apple built an update mechanism into the App Store, so any apps you downloaded from the App Store can also be updated there—and App Store updates are free. To check for and apply App Store updates:

1. Open the App Store app by choosing Apple  > App Store. (In Mavericks or earlier, choose Apple  > Software Update.)
2. Click Updates in the toolbar to display a list of available updates.

3. To update a single app, click the Update button next to it. Or, to update all the listed apps at once, click Update All.
4. If prompted to do so, enter your Apple ID and password, and click Sign In.

The App Store downloads and installs the updates automatically.

Note: Even though updates from the App Store are free, some developers release entirely new apps (which require an additional purchase) to replace older apps. Which app version you use may depend on the version of macOS you're running.

Software that doesn't come from the App Store must use a separate update mechanism. Happily, most modern apps contain some sort of update feature. Unhappily, they don't all work the same way. Some check for updates every time they're launched, or on a fixed schedule, while others check only on demand; of those that do check automatically, not all have this feature turned on initially. Some programs can download *and* install new versions of themselves automatically, while others download a disk image and expect you to open it and run the installer yourself; still others do nothing but open a webpage with links to updates you can download manually.

Note: No matter how diligently you apply updates, you may find some software that still needs updating after you install High Sierra, because the newest version of the app may not run on your older version of macOS.

For now, do the following. In each non-App Store program that you use frequently, look for a Check for Updates command (the wording may vary). Such commands (**Figure 4**) usually appear in the application menu, the Help menu, or the Preferences window.

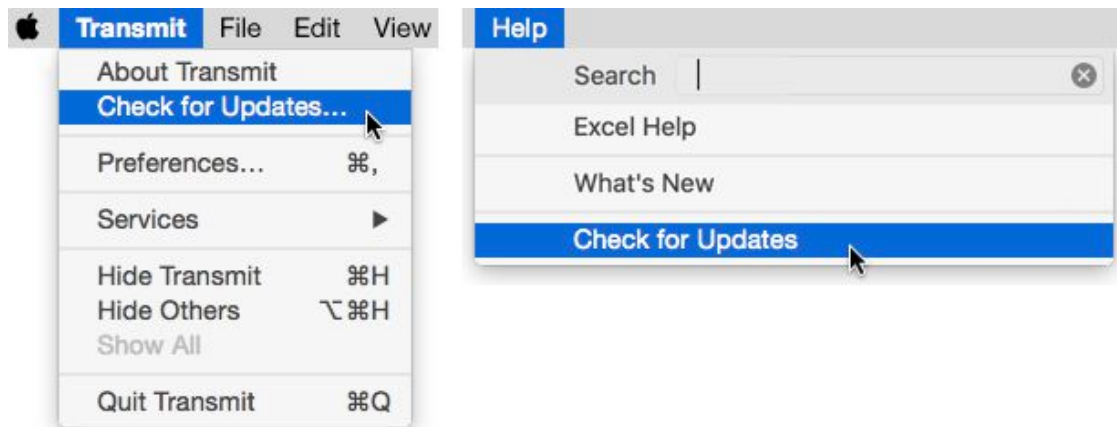


Figure 4: In some apps, such as Transmit (left), the Check for Updates command appears in the application menu—the one with the same name as the app. In others, such as Excel (right), it appears in the Help menu. Wording may also differ between apps.

While you're at it, check each app's Preferences dialog for a checkbox that enables scheduled updates, and if you can choose how often to check, choose the most frequent option. That way, even if an update isn't available now, you'll be informed as soon as the next update becomes available and you launch the app.

Tip: Remember to check for updates of preference panes, status menus, Mail plug-ins, browser extensions, and other system enhancements too.


If you've installed any Unix software on the command line, that will need to be updated too—and, in some cases, relocated. Unfortunately, much software of this sort is compiled specially for each version of macOS, so those updates—unlike most software updates—are better performed after you upgrade to High Sierra. See [Final Software Advice](#), later, for details.

De-clutter Your Disk

Over time, your disk accumulates obsolete, extraneous, or otherwise useless apps and files, often called *cruft*—hacker slang for digital detritus. Removing *cruft* increases the disk space available for High

Sierra (see [Free Disk Space](#)) and reduces the chance of software conflicts.

Determining which files you need and which can go may be quite a task. My advice is not to worry about removing every last obsolete file. However, you should at least go through your [~/Downloads](#) folder (and any other location where you may store downloads) and delete large files you no longer need, and then take a quick spin through [/Applications](#), [/Applications/Utilities](#), and System Preferences to remind yourself of anything you've installed over the past year but never use.

Note: In Sierra, you can also go to Apple  > About This Mac > Storage > Manage > Review Files to see options for removing some of the items that take up a lot of space on your disk, but in my opinion, this window provides too little information and insufficiently fine-grained control, making it far too easy to accidentally delete more than you should.

An better way to declutter your disk is to use a utility that can safely uninstall software, purge your disk of unneeded resource files, and identify old and large files you may be able to do without. The tool I prefer for these sorts of tasks is [CleanMyMac 3](#) (read my [review](#) in TidBITS for details), although there are numerous alternatives.

Whether you delete things manually or with the help of an app, be sure to empty the Trash (choose Finder > Empty Trash) afterward to recover the disk space that the files occupied.

If you'd like extensive, detailed advice on how to do a more thorough spring cleaning, as well as ongoing steps you can take to keep your Mac humming, see my book [Maintaining Your Mac: A Joe On Tech Guide](#).

Run Disk Utility

Over time, your disk can develop errors without manifesting obvious symptoms at first; such errors could interfere with installing High

Sierra or cause your Mac to misbehave afterward. You can nip many such problems in the bud with a simple procedure that looks for, and fixes, common disk errors that can crop up without your knowledge.

Use Disk Utility in El Capitan or Later

If your Mac is running El Capitan or later, follow these steps:

1. Launch Disk Utility (in `/Applications/Utilities`).
2. In the list on the left, select your startup volume (if it isn't already selected), which is indented underneath the name of the device (hard drive or SSD) that contains it (**Figure 5**).

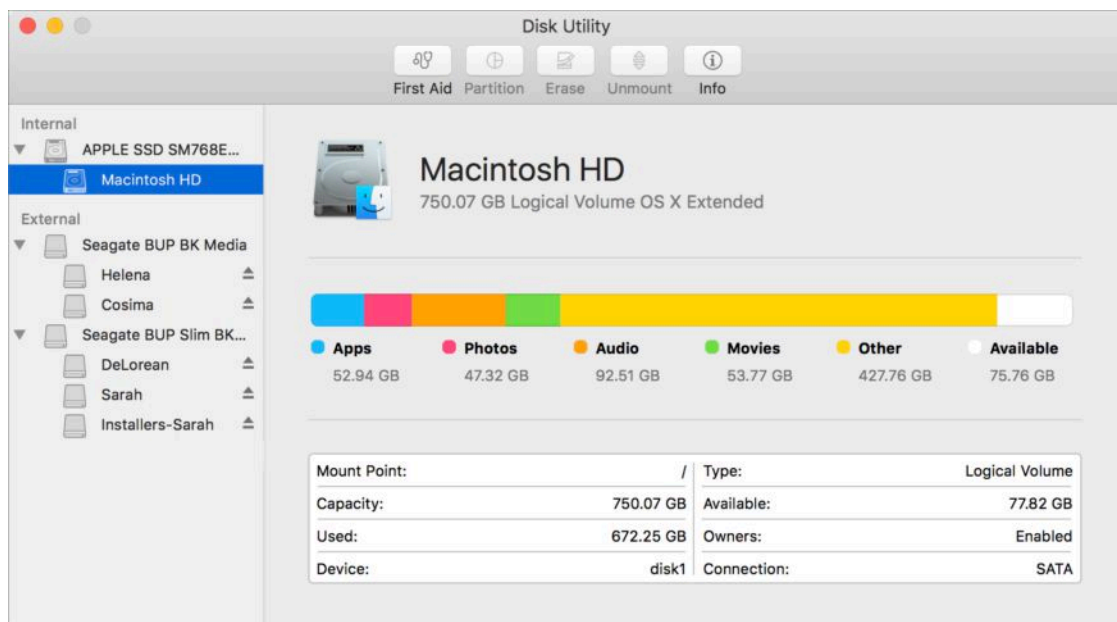



Figure 5: In Disk Utility, volume names are indented beneath device names; here, a volume (Macintosh HD) is selected.

3. Click First Aid on the toolbar, and then click Run. Disk Utility checks your disk and repairs it if necessary.
4. When the repair is finished, click Done and quit Disk Utility.

Use Disk Utility in Yosemite or Earlier


In Yosemite or earlier, Disk Utility can't repair the volume you booted from, so you'll have to use a different procedure that requires a secondary startup volume. Follow these steps:

1. Start up your Mac from media *other than* your regular startup volume that also contains Disk Utility. This could be, for example:
 - ▶ A bootable duplicate of your startup disk stored on an external hard drive or a second internal drive
 - ▶ A Mac OS X installation DVD or CD
 - ▶ A USB Software Reinstall Drive
 - ▶ The hidden Recovery HD volume on a Mac running 10.7 Lion or later, which enables OS X Recovery (choose Apple  > Restart and immediately press and hold Command-R to start in OS X Recovery)
2. Run Disk Utility:
 - ▶ If you're running from a bootable duplicate, you can find Disk Utility in [/Applications/Utilities](#).
 - ▶ If you're running from a Mac OS X installation disc or USB Software Reinstall Drive, click through the language selection screen and then choose Utilities > Disk Utility.
 - ▶ If you're using OS X Recovery, click through the language selection screen if it appears, and then select Disk Utility and click Continue.
3. At the left, select your regular startup volume (the one to repair, not the one from which you're currently booted).
4. On the First Aid pane to the right, click Repair Disk.

Disk Utility looks for common errors and repairs them if possible. Ordinarily, it displays a message saying that repairs were completed or that no repairs were necessary.

5. Quit Disk Utility.

6. Restart your Mac:

- ▶ If you find yourself within the installer, quit the installer too; then, click Startup Disk, select your main disk, and click Restart.
- ▶ Otherwise, choose Apple  > Restart.

If Disk Utility encounters a serious problem that it cannot solve, you may need to use a commercial repair tool such as [DiskWarrior](#), which most experts recommend as their top pick—or restore your entire disk from a bootable duplicate or other full backup. Alternatively, you could erase your entire disk (after updating your duplicate one last time) and start over from scratch with High Sierra, transferring all your apps and personal files from your duplicate after the installation, as I describe in [Plan B: Clean Install](#).

Update Your Duplicate

Now that your disk is updated with the latest software, cleansed of space-hogging residue, and verified as functioning properly, you should update your duplicate so it reflects the latest and greatest state of your disk. To do so, repeat the steps in [Create a Duplicate](#). With Carbon Copy Cloner (and most other backup software), updating a duplicate is much quicker than creating one from scratch, because only the files changed since the last duplicate are copied.

Consider Disabling Encryption

If your Mac is already running 10.7 Lion or later and has FileVault enabled, you need *not* disable it. If FileVault is enabled in Lion or later when you upgrade to High Sierra, it'll still be active at the end of the process (although behind the scenes, it will use the new encryption method build into APFS—see [Learn about APFS](#)).

However, if you have FileVault enabled in 10.6 Snow Leopard, you should turn it off (in System Preferences > Security & Privacy > FileVault) before installing High Sierra. In addition, if you're using third-party software to encrypt your whole disk—I'm thinking of products like [Check Point Full Disk Encryption](#) and [Symantec Endpoint Encryption](#)—check with the developer *before* you upgrade to High Sierra to confirm that the version you're already using is compatible. If not, or if you're unsure, the safest course of action is to disable the encryption before upgrading. Thereafter, you can either re-encrypt your disk with the same product or switch to FileVault.

Decide on an Installation Method

The High Sierra installer doesn't give you many options, but you can still approach the process in either of two ways:

- **Plan A: In-place Upgrade:** This easy, default method is appropriate for most people (including anyone [Upgrading from the High Sierra Beta](#)), with some qualifications.
- **Plan B: Clean Install:** Although the installer offers no built-in option to start fresh by erasing your disk, you can accomplish the same thing in a slightly roundabout way.

Most users should start with Plan A and then if (and only if) they encounter problems, move on to Plan B. A few people may want to skip Plan A and go directly to Plan B. In almost every case, the end result will be virtually identical, regardless of which path you take.

In the pages that follow, I describe the differences between these two plans and help you choose which way to go. Then, in later chapters, I give you step-by-step instructions for each plan.

Upgrading a New Mac

If your "upgrade" involves not only upgrading a new (or new to you) Mac to High Sierra but also moving your files to the new Mac from an old computer, you should generally choose [Plan B: Clean Install](#) so that you can get a fresh start on the new Mac. At the end of the Plan B installation, Setup Assistant will run, letting you transfer the files from your old Mac or PC to your new Mac.

However, if the new Mac contains software that you can't replace after erasing the disk in Plan B, you can do [Plan A: In-place Upgrade](#) and then run Migration Assistant immediately after rebooting in High Sierra. See my TidBITS article [How to Migrate to a New Mac](#).

Upgrading from the High Sierra Beta

If you previously installed the [High Sierra public beta](#) and are now upgrading to the final High Sierra release, you can still choose from Plans A and B—nothing changes there, because it's possible to do either an in-place upgrade from the beta to the final version or a clean install of the final version that migrates data from the beta.

There's one important exception, however: If you installed an early beta version of High Sierra on a Mac with a Fusion drive and let the installer convert your drive to APFS, you *must* erase and reformat the drive, and reinstall Sierra from a backup, before proceeding. See [Learn about APFS](#) for details.

If you installed the High Sierra beta on a separate volume—not your ordinary startup volume—and didn't save any files on that separate volume, my advice is to restart from your main Sierra volume, create a bootable duplicate of your startup volume, and then choose Plan A or Plan B as though you'd never used the beta at all. Once you're sure everything is present and functional, you can erase your High Sierra beta volume.

Note that if you used SuperDuper's sandbox feature to install the High Sierra beta on an external drive while keeping your user data (and perhaps your apps) on your Sierra volume, you can still upgrade your Sierra volume to High Sierra (again, using Plan A or Plan B). Doing so will break the sandbox—not that it's likely to matter much. To learn how to handle this situation, see [Upgrading from a SuperDuper Sandbox](#).

Plan A: In-place Upgrade

As has been true since Snow Leopard, the High Sierra installer offers a single upgrade method that attempts to make the transition simple by leaving almost all your files, apps, and settings in place. You run the installer as you would any other app, and it replaces all the components of your old macOS installation with their High Sierra equivalents, while deleting those that are obsolete—just as the App Store app does when it installs minor updates.

The High Sierra installer even helps you avoid many common incompatibilities. It contains a list of software known to conflict with the new operating system, and when you run the installer, as long as you have an active internet connection, it even checks for additions to the list. Software that's on the list is moved safely aside into an Incompatible Software folder.

Note: The installer can't know about every possible software conflict and thus disable all software that's incompatible with High Sierra—it disables only software that loads automatically on startup and that runs in the background, such as drivers and other kernel extensions. Ordinary apps are never moved aside, even if they can't possibly run under High Sierra.

In addition, some older software whose design is incompatible with High Sierra is left in place but rendered inert by the design of the operating system itself. This includes certain status menus, drivers, and other background processes. Still other incompatible items, such as older Apple Mail plug-ins, are disabled automatically when you first run the software that uses them.

As long as you have a complete backup, you have little to fear from an in-place upgrade to High Sierra, and it's entirely reasonable for Apple to have made it the default—indeed, the only official—option.

However, I must reiterate that as good as the installer is, there are no guarantees. Something could still go wrong before, during, or after the upgrade. It's also possible that, due to an error or design flaw in the installer, important files could be deleted. These are among the reasons to entertain the possibility of following the clean install procedure that I describe next.

Plan B: Clean Install

Whether or not you trust the installer (and High Sierra itself) to protect you from software incompatibilities, you might consider making a fresh start, erasing your entire disk and installing a clean,

pristine copy of High Sierra. This process requires a few extra clicks and a bit more time, but it's not hard to perform—you merely have to start up from another volume (which could be your bootable duplicate) to erase your previous system, run the installer, and restore your personal files.

The main reason to prefer a clean install over an in-place upgrade is that erasing your disk wipes out any hidden directory corruption, file system problems, and other disk gremlins that may cause problems. As a bonus, your entire disk is automatically defragmented, because the new files from your High Sierra installation and your backup are written to it in contiguous chunks. This can, in some situations, improve disk performance (though only for hard disks, not for SSDs).

If a clean install did nothing but erase your disk and install High Sierra, then all your preferences, network settings, user-installed software, and files would be gone, and you'd have to either restore them from a backup or recreate them from scratch: not fun. But as in other recent versions of macOS, the High Sierra installer offers an optional File Transfer feature—available only when you install onto a blank volume—that makes the process easy. As soon as the installation completes, Setup Assistant should run automatically and offer to migrate all your apps and personal files from another volume. Since you've made a bootable backup onto another disk, the installer can take all of your personal data from that disk and copy it to the analogous location on the High Sierra volume.

When copying your old data, you can be somewhat selective—copy only the contents of your home folder, say, or your third-party apps, or any of various other combinations—but you can't select individual files or folders to migrate (or skip). If you select every possible category of data (the default), Setup Assistant dutifully copies virtually everything from your backup to your startup volume (while moving aside any software it identifies as incompatible, just as occurs in an in-place upgrade). Almost to a file, the results should be identical to what you'd get by performing an in-place upgrade! (There are some tiny differences, such as certain cache and log files, but almost certainly nothing you'd ever notice if you didn't scrutinize every last file on your disk.)

The thing is, I recommend that you *do* copy all your old data, because otherwise you're likely to be left without something you need and expect. Therefore, since the net result is the same with the in-place upgrade method and a clean install, I now recommend the latter only in the following situations:

- You want the benefits of a freshly optimized hard disk—or your disk (or SSD) has errors that neither Disk Utility nor third-party utilities can repair.
- You want to be selective about which folders and files you let Setup Assistant copy (to reduce the clutter on your startup volume, for example, or to have a cleaner setup for testing purposes), and you're willing to manually copy other files you may need after the fact.

A Cleaner Clean Install?

People occasionally tell me they want to do a *completely* clean install—with little or no automated migration of old apps and data—in order to make a fresh, cruft-free start with a new version of macOS. They're worried that migration may transplant old problems to their new system and feel better about rebuilding everything manually.

You are, of course, welcome to skip the migration step after a clean install, but reinstalling all your software from scratch, entering all your license codes, resetting your preferences, and updating all your data will be a big, tedious, and time-consuming project. I say more about this later, in [The Nuke and Pave Option](#)—but fair warning: I don't recommend it.

- You're installing High Sierra onto a Mac that you just purchased, and you want to erase the drive and start fresh with High Sierra. You'll transfer your data from your old Mac or Windows PC during the installation process.
- You attempted an in-place upgrade and it failed, or it left your Mac in an unusable state.
- You're paranoid and you wouldn't trust an in-place upgrade no matter what assurances I give you!

Double backup warning! I want to remind you that Plan B really will destroy all the data on your disk (or partition) prior to installing a fresh copy of High Sierra. If anything were to go wrong with your bootable duplicate, you would be unhappy, and you'd be even more unhappy if you didn't also have some other backup. So check your backups!

Pick a Plan

To summarize, I believe Plan A is best for most people. Let Apple's installer do its thing. You'll already have a bootable duplicate (because, remember, I insist on it!), so the worst thing that could happen is you lose an hour or so of your time and have to start over with Plan B's clean install. The overwhelming probability is that everything will be just fine, however, if you go with the flow.

With any plan—even with an in-place upgrade—questions, choices, and issues may arise. I'll explain how to deal with all of them as we go.

Things You Need Not Do

I've received inquiries as to whether you should perform certain other procedures before upgrading. In all these cases, my advice is not to bother: they won't hurt, but they're also entirely unnecessary and won't help, either. Things you should not worry about before upgrading to High Sierra include:

- ♦ Deauthorizing your computer in iTunes
- ♦ Repairing permissions (using old versions of Disk Utility)
- ♦ Starting in Safe Mode (by holding down the Shift key)
- ♦ Removing all login items

Make Final Preparations

Now that you know which basic installation technique you're going to use, you're nearly ready to proceed. Your next major step (which could take hours, or even longer) is to obtain the High Sierra installer; then I'll recommend a few other quick, last-minute tasks before you dive in.

Turn Off Anti-malware Software

In general, anti-malware software doesn't interfere with purchases and upgrades from the App Store. However, when Apple released Mountain Lion, users reported that the Ad Banner Filter in Intego's VirusBarrier software sometimes interfered with the process of downloading the installer. Something similar could happen again, and other anti-malware apps could also conceivably prevent High Sierra from downloading properly. So, the easiest course of action is to turn off any anti-malware software you may have until you have downloaded High Sierra successfully, and then turn it back on.

Obtain the Installer

Depending on your situation, obtaining the High Sierra installer may be a trivial matter of a few clicks, or it may be an involved ordeal.

Download on the Destination Mac

If, in your App Store Preferences (see [Handle Software Updates](#)), the "Download newly available updates in the background" box is checked, the High Sierra installer may already have downloaded without any further intervention. Otherwise, if you have an internet connection that can handle a 5 GB download, obtaining High Sierra is just like downloading any other app:

1. Click the App Store icon in your Dock and locate macOS 10.13 High Sierra (or [click this link](#) to go straight to it).

2. Click Download (or Install, if there's no Download button).
3. If prompted, enter your Apple ID and password, and click Sign In.

The High Sierra installer downloads to your [/Applications](#) folder—a process that could take anywhere from minutes to days, depending on the bandwidth of your broadband connection.

Estimating Your Download Time

For an estimate of your download time, use a speed test website, such as Speedtest.net, to see the effective download bandwidth of your internet connection. Then visit a site like [Download Time](#) and enter 5 GB (the approximate size of the High Sierra download) and your bandwidth to find out how long your download should take.

After it downloads, the installer launches automatically.

But we're not ready to install High Sierra quite yet, so choose Install macOS High Sierra > Quit Install macOS High Sierra (if you didn't already do so after an automatic download) to quit the installer for the time being; we'll return shortly!

The App Store and Multiple Macs

If you have more than one Mac—each signed in to the App Store with the same Apple ID—then once you download High Sierra on one, it will show up in the Purchased view on the others too.

If you have bandwidth (and time) to spare, you can click Install on each Mac to download the High Sierra installer. (If your Macs use *different* Apple IDs in the App Store, you can choose Store > Sign Out, choose Store > Sign In, enter the other Apple ID, re-download High Sierra, and then repeat the procedure to sign in under the original account.)

But why go to that bother? It's faster and easier to copy the installer from [/Applications](#) on the first Mac to the others using the Mac's built-in File Sharing feature (hint: look in System Preferences > Sharing) or another method of your choice. Or, you may want to [Make a Bootable High Sierra Installer Volume](#).

If the destination Mac doesn't have sufficient internet bandwidth, consider taking it to a library, coffee shop, friend's house, the office, or somewhere else where you can use a higher-speed connection. If you take your Mac to a nearby Apple Store and download High Sierra while connected to the store's Wi-Fi network, the download will be ultra-fast, because it will come from a server within the store.

Tip: As long as you have a nice, high-speed connection at your disposal, I suggest doing the whole High Sierra installation, including the steps in [Perform Post-installation Tasks](#), so you'll be able to download any software updates you may need.

If your Mac isn't portable enough to make that feasible, however, there's another option...

Download on Another Mac

You need to get the High Sierra installer onto your Mac somehow, but you need not download it from the App Store directly onto the Mac where you'll install it. You can download the High Sierra installer on another Mac, and then copy the installer to your Mac over a network or by way of a USB thumb drive, a portable hard drive, or some other media.

Although there are many ways to do this, the basic steps you'd want to follow are these:

1. On the other Mac—the one where you'll download the installer—open the App Store app.
2. Download High Sierra, as described in the previous topic.
3. Copy the installer from `/Applications` onto the external media of your choice.

Note: Instead of (or in addition to) copying the installer, you could follow the steps in the sidebar [Make a Bootable High Sierra Installer Volume](#) to create a bootable copy.

Copy the Installer to a Safe Place

Unlike most software that you download from the App Store, what shows up in the `/Applications` folder after you download High Sierra is an installer (an application called Install macOS High Sierra); you must run the installer to put all the necessary pieces in place. During this process, something surprising happens: the installer is deleted! That's right—once High Sierra is up and running, if you look in `/Applications`, the installer will be gone.

I presume the reason for this is that once High Sierra is installed, Apple wants to give you back the 5 GB or so of disk space the installer was taking up, since you likely won't need the installer in the future (and can download it again if you do). But what if you want to install High Sierra on multiple Macs—or reinstall it later on the same Mac—without having to download that huge installer again? I'll tell you what: you'd better put that installer in a safe place before you run it!

Now, before going any further, I should add some nuance to the “High Sierra installer deletes itself” concept. The installer deletes itself only when *both* of the following are true:

- The installer is in `/Applications` on your startup volume.
- You do an in-place upgrade of your startup volume.

If you put the installer anywhere else—your Desktop, `~/Downloads`, or wherever—it won't be deleted after it runs. Even so, because that big file is valuable, I urge you to make a copy just in case the unexpected should happen.

So, before you do anything else, you should either Command-drag the installer to *move* it from `/Applications` to another location (so it won't be deleted automatically, no matter what), or Option-drag the installer to *copy* it to another location—preferably another volume—so if it is deleted, you'll have a spare. Or, create a bootable installation volume, as I describe next.

Make a Bootable High Sierra Installer Volume

The High Sierra installer doesn't include or require boot media. But you might want to have a copy of the installer on a bootable disk as a backup, to simplify installing High Sierra on multiple Macs, to install High Sierra on a Mac without Snow Leopard or later, or for other reasons.

The easy way to create this sort of disk is to use an app that does all the work with a few clicks—all you'll need is a blank USB thumb drive, SD card, external hard drive, or other storage device with a capacity of at least 8 GB. Two apps that can do this, both free, are [Install Disk Creator](#) and [DiskMaker X](#).

The other option is a command-line tool called `createinstallmedia` that is buried inside the High Sierra installer (and thus is a method that Apple officially sanctions). Using this tool requires mucking around in Terminal—and it won't work in Snow Leopard—but it requires no help from third-party apps.

Roman Loyola explains how to use both approaches in his Macworld article [How to create a bootable macOS High Sierra installer drive](#).

Update Your Duplicate (Again)

Earlier in this book, I instructed you to make a bootable duplicate of your startup disk and then—after performing some cleanup tasks—to update that duplicate so it reflects the current state of your disk. If you did that just minutes ago—and your bootable duplicate includes the High Sierra installer file located outside of the `/Applications` folder—then you can move along to the next step. Otherwise, I suggest updating your duplicate one last time before running the installer.

Turn Off (Yes, Off) Automatic Duplicates

Picture this: shortly after you upgrade to High Sierra, your backup software (which is still installed, natch) runs at its scheduled time,

overwriting your bootable duplicate with a copy of your High Sierra installation. And then, an hour or two later, you discover that High Sierra has a major problem that requires you to go back to your previous version of macOS. But oops! The backup of your older system is already gone.

So, although you should certainly continue updating your duplicate after High Sierra is installed, either do so using a new backup drive or wait a few days or so to make sure everything is working well enough under High Sierra that you are unlikely to go back to your old system. Then, and only then, turn automatic duplicates back on.

Make a Copy of This Book

You'll want to refer to this book while you perform your installation, especially if something goes wrong during the process. If you are reading on the Mac where you'll be installing High Sierra, if possible, you should either copy it to another computer, iPhone, iPad, or other mobile ebook-reading device, or print portions of it.

For tips on transferring this book to a mobile device, read our [Device Advice](#) page (hint: popular methods include Dropbox and downloading directly to the mobile device from your [Take Control account](#)). To download a copy of the book in a different file format, click the link in [Ebook Extras](#).

If you print to paper, you can limit the printout to just these chapters (as appropriate to your situation): “Upgrade Using Plan A: In-place Upgrade,” “Upgrade Using Plan B: Clean Install,” “Perform Post-installation Tasks,” and “Troubleshoot Upgrade Problems.”

Upgrade Using Plan A: In-place Upgrade

Now that you've gone through all the preliminary steps, it's time to begin the upgrade. For most people, Plan A—essentially letting the installer do what it wants to do—is the logical choice. And remember, if it doesn't work out for any reason, you can always move on later to [Upgrade Using Plan B: Clean Install](#). Nevertheless, because you may encounter some questions or confusion during the process, I detail exactly what steps to take from start to finish.

Warning! If you installed an early beta version of High Sierra on a Mac with a Fusion drive and let the installer convert your drive to APFS, you *must* erase and reformat the drive, and reinstall Sierra from a backup, before proceeding. See [Learn about APFS](#) for details.

Start the Installer

Unlike installers of old, the High Sierra installer requires no separate startup disc; you simply run an app and it does its thing. However, if you haven't already done so:

- If you are installing onto a laptop, connect its AC adapter to a power source. (If you forget to do this, the installer will prompt you.)
- Quit all open apps. (The installer attempts to do this for you—and prompts you if it can't—but you might as well take care of this beforehand.)

Note: Not to belabor the point, but now that we're two clicks away from installing High Sierra, be sure you have an up-to-date bootable duplicate of your startup disk. If not, go no further until you've read and followed the instructions in [Back Up Your Disk](#).

To begin the process, double-click the Install macOS High Sierra icon in your `/Applications` folder or wherever else you put it. A window appears with just one button: Continue. Click it!

The Software License Agreement appears next; click Agree, and then click Agree again in the confirmation dialog to proceed.

Select a Destination

The next screen asks you confirm which volume you want to install High Sierra onto. In most cases, it displays its best guess—typically your startup volume (**Figure 6**)—but in some situations you may see multiple disks here, in which case you should select the one you want. To install High Sierra onto a volume that’s not shown, click Show All Disks to display all available options and then make your selection.

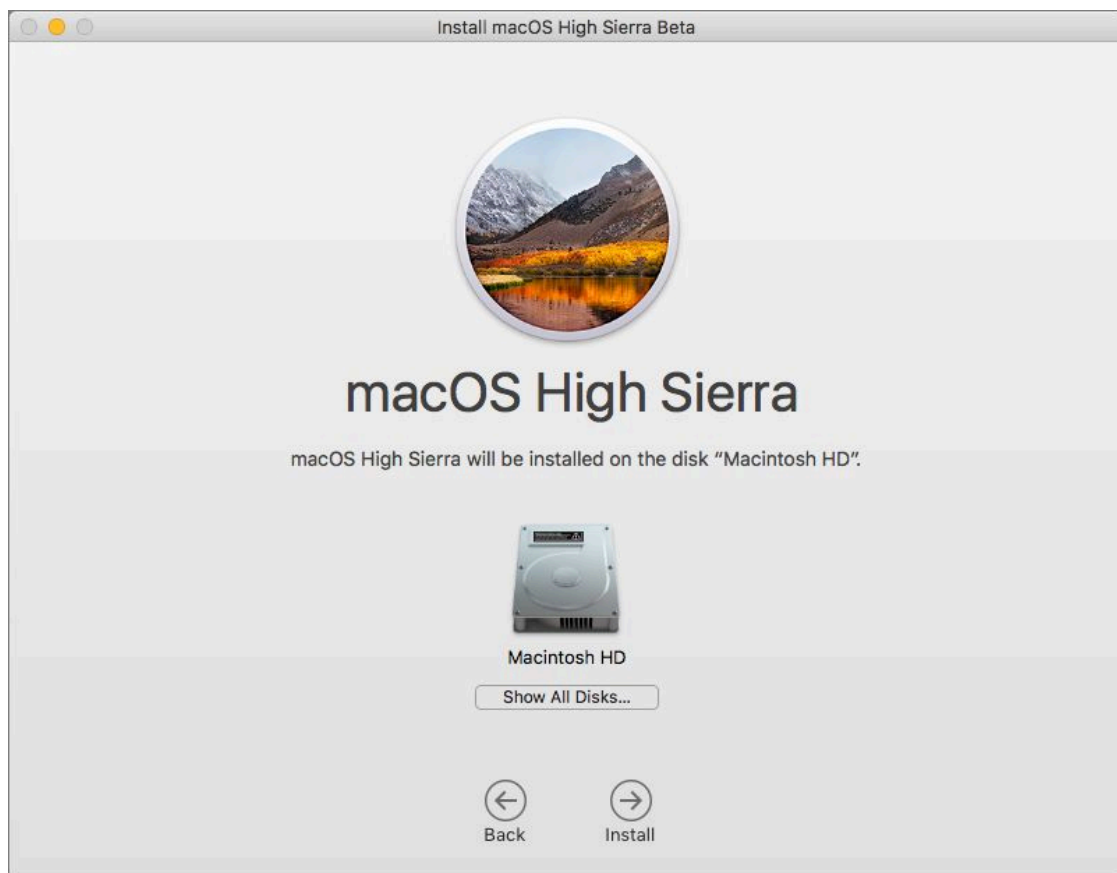


Figure 6: If the installer’s best guess as to your desired destination isn’t right and the one you want isn’t visible, click Show All Disks.

If the installer can't use a volume as the destination for any reason, that volume is dimmed; click it for an explanation. Note that you can't install High Sierra onto:

- A disk that uses a partition map scheme other than GUID Partition Table (see [Prepare Your External Drive](#))
- A volume formatted using anything other than Mac OS Extended (Journaled) or APFS, with or without case-sensitivity or encryption; you're prompted to reformat it using Disk Utility
- A volume containing an installation of 10.5 Leopard or earlier

Note: If you see an "Unsupported partition structure" error message, skip way ahead to [Can't Select Installation Volume...](#)

With your desired destination volume selected, click Continue or Install (the wording varies depending on your setup).

Next, you're prompted to enter your administrator credentials (in order to add a helper app); do so and click Add Helper.

The installer begins copying files. The copy process may take only a few moments or it may take several minutes, but when it finishes, the installer tells you that it will restart your computer automatically in 30 seconds; you can also click Restart to restart immediately. If any applications are still open and the installer is unable to close them automatically (for example, if there are unsaved changes you must respond to), the installer displays a prompt asking you to click Close Other Applications.

Note: If you are installing High Sierra onto a disk that's encrypted with FileVault, then immediately after the installer restarts your Mac, you may be prompted to enter your password to unlock the disk. There may also be a longer-than-expected delay before the installation proceeds; be patient.

Bake Some Cookies

Depending on a number of variables, including the speed of your computer and the size of your hard disk or SSD, installation may take less than a half hour or as long as several hours. But in general, it will be longer than the process of installing earlier versions of macOS, because of the extra time required to convert your volume to APFS. Apart from the steps you've already performed, the process normally requires no intervention until the very end. While the remainder of the installation proceeds, you won't be able to use your Mac for anything else, so now's a good time to bake some cookies, call your mom, or go for a jog—you have a bit of time to kill.

Note: If you insist on watching the installer's progress bar gradually make its way across the screen, beware: its time estimates ("About 43 minutes," "Less than a minute," etc.) are notoriously inaccurate, especially near the beginning and end of the process. And remember, a watched installer never boils.

As the installer progresses, your Mac will restart one or more times, and it may make some unusual sounds (like a long beep), but the startup chime may not play. At the end of the installation, you'll continue with several additional configuration steps.

Finish Setup Assistant

What happens next depends on how your Mac was *previously* set up:

- If you had Automatic Login turned on previously, High Sierra logs you in automatically.
- If Automatic Login was off, your entire screen becomes a login screen. Select (or enter) your username if necessary, enter your password, and press Return to log in. This initial login process may take longer than usual, so be prepared to wait a few minutes before the login screen disappears.

The first time you use High Sierra, macOS Setup Assistant runs, although you won't see that name—it looks like a continuation of the installer. With an in-place upgrade, this program has little to do compared with a clean install—most of your settings are already in place.

Depending on which version of macOS you're upgrading from and your previous settings, you *may* see one or more additional screens:

- **Enable Siri:** This screen has a single checkbox, Enable Siri on This Mac, which is selected by default. Leave it selected to enable Siri voice control after High Sierra is installed, or deselect it to disable Siri. (Either way, you can always enable or disable Siri later—go to System Preferences > Siri once High Sierra is up and running.)
- **Sign in with Your Apple ID:** Even if you were signed in to iCloud in your previous version of macOS, this screen may prompt you to sign in again. Depending on the circumstances, you may be asked only for your password, or for both your Apple ID and your password. If you have to enter both, be sure you're using the right Apple ID:
 - ▶ To use one Apple ID for everything, leave Sign in with Your Apple ID selected, enter your Apple ID and password, and click Continue.
 - ▶ To use one Apple ID for iCloud and a different one for iTunes purchases, click the “Use a Separate Apple ID for iCloud and iTunes” link. Enter the Apple ID and password you want to use for iCloud first. Click Continue, fill in the Apple ID and password you want to use for iTunes purchases, and click Continue again. (The option to sign in with separate accounts appears only under certain conditions.)
 - ▶ To make a new Apple ID, click Create New Apple ID and follow the prompts.
 - ▶ If you don't want to enter an Apple ID—and are willing to forgo all iCloud features for the present—select Don't Sign In (your wording may be slightly different), click Continue, and then click

Skip again to confirm. (You can enter this information later, in System Preferences > iCloud.)

- **Verify Your Identity:** If you've enabled Apple's [Two-Step Verification](#) for your Apple ID, an extra screen may ask you to choose an iOS device or SMS number to receive a numeric verification code. Make your selection and enter the code to continue. (In my tests, this screen did not appear during in-place upgrades when Apple's newer [Two-Factor Authentication](#) was enabled.)
- **Find My Mac:** If you hadn't previously enabled iCloud's Find My Mac (and Location Services, on which it depends), a dialog appears asking if you'd like to do so. Click Allow to enable Find My Mac, Not Now to do nothing (you can change your settings later in System Preferences > iCloud), or About Find My Mac to learn more.
- **Terms and Conditions:** Setup Assistant wants to be sure that you've consented to a bunch of additional legalese, so it may invite you to read, study, and agree to as many as three different statements: "macOS Software License Agreement," "Privacy Policy," and "Game Center Terms and Conditions." Handle these however you want; I've found that my lawyer enjoys chatting with me about each paragraph of such agreements in detail (at his usual hourly rates).
- **All Your Files in iCloud:** If you've already signed in to your iCloud account by this point in the installation but did not previously have iCloud configured to sync your Documents and Desktop folders, High Sierra may ask if you want it to store all the files from your Documents and Desktop folders in iCloud Drive (and, from there, to your other Macs).

This option, when it appears, is selected by default, but *I recommend waiting until after you install High Sierra*—and even then, thinking carefully about whether you want to upload all that stuff to the cloud. So my suggestion is to deselect "Store files from Documents and Desktop in iCloud Drive" for now, and if you decide later that you want that feature, you can turn it on then. To do so, go to

System Preferences > iCloud, click the Options button next to iCloud Drive, and then select Desktop & Documents Folders.

- **Diagnostics & Usage:** High Sierra can automatically send diagnostic and usage data to Apple and/or third-party developers to help them track down the causes of crashes and other bugs you may encounter. This information is anonymous and doesn't contain personal information.

If you want to send this troubleshooting data in the event that a problem occurs, select Send Diagnostics & Usage Data to Apple. With that selected, you may also select Share Crash Data with App Developers. (You can't share crash data with app developers unless you also share diagnostic data with Apple.)

- **iCloud Drive:** iCloud Drive makes all your iCloud files available to any app on your Macs (running Yosemite or later) and iOS devices (running iOS 8 or later). If you see an iCloud Drive screen during setup (which should be the case only if you're upgrading from Mavericks or earlier), it's asking whether you want to switch to this way of accessing iCloud documents:
 - ▶ Answer Not Now if you still need to access iCloud documents using *older* operating systems on any of your Macs or iOS devices. If you answer Not Now, you can turn it on later by going to System Preferences > iCloud and selecting iCloud Drive.
 - ▶ Answer Upgrade to iCloud Drive if all your devices are using (or are about to be updated to) Yosemite or later, or iOS 8 or later.
- **Incompatible Software:** In rare cases, you may see a screen in Setup Assistant labeled Incompatible Software (**Figure 7**). If so, glance at it and click Continue; I explain what to do about this software a bit later, in [Review the Incompatible Software Folder](#).

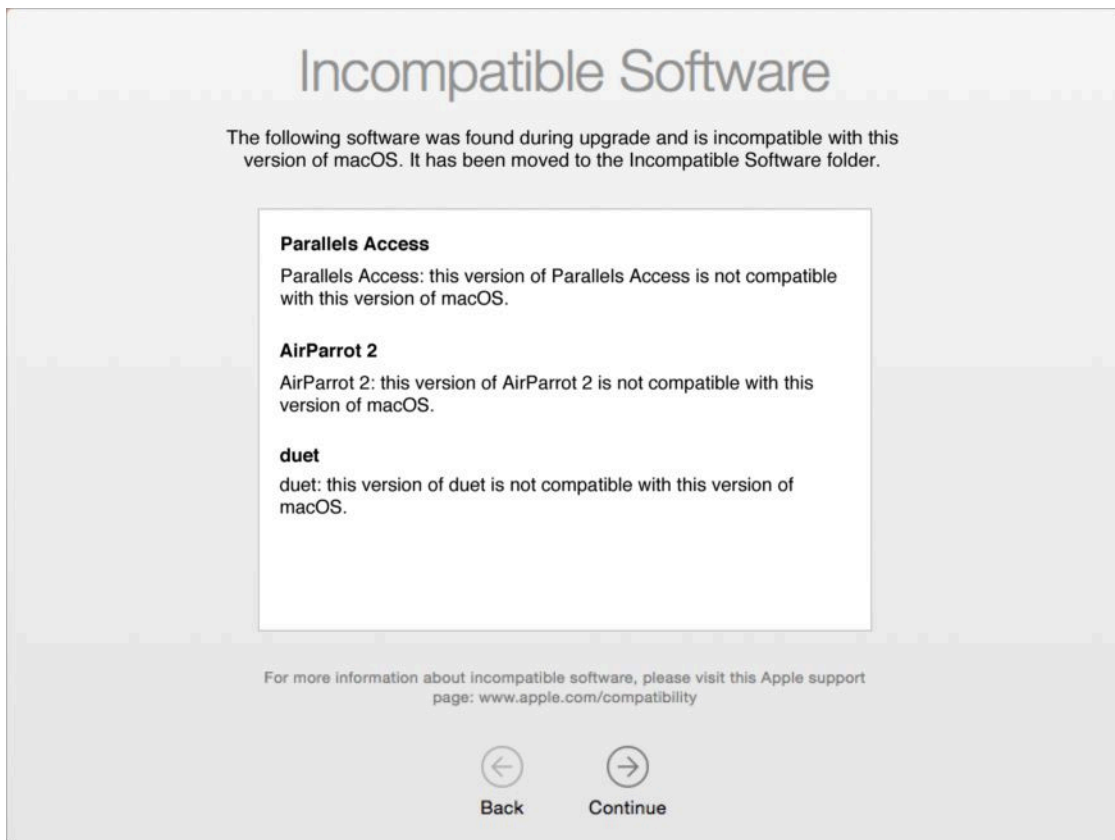



Figure 7: This screen lists any incompatible software the installer moved aside. Check with the developers for updated versions. (These old examples are from Sierra—so far, none of the software I use regularly has triggered this warning when installing High Sierra.)

Once you're through with all that, Setup Assistant may display a "Setting Up Your Mac" screen briefly. Then it quits automatically and displays your High Sierra Desktop.

Tip: Not sure if you've successfully upgraded since you missed the end of the process? Choose Apple  > About This Mac. If the window says 10.13 at the top under "macOS," you're running High Sierra!

Check for Proper Operation

In all probability, your upgrade will have gone smoothly, and everything will now work more or less the way you expect. However, even if everything looks fine, don't declare upgrade victory until you [Perform Post-installation Tasks](#), including dealing with any alerts and queries

that pop up shortly after installation, checking for software updates, and configuring a few new options in System Preferences.

If anything did go amiss, or if you later discover problems that aren't solved by following the advice in [Troubleshoot Upgrade Problems](#), you can fall back to [Upgrade Using Plan B: Clean Install](#).

Upgrading from a SuperDuper Sandbox

SuperDuper, one of the backup apps that I recommend for making bootable duplicates, has a feature called Sandbox that's ideal for testing new versions of macOS. When you create a Sandbox on an external drive, it looks and acts like a clone of your main disk, except that the `/Users` folder (and, optionally, the `/Applications` folder) aren't copied from the main disk—instead, the Sandbox contains links to those folders on your main disk. That way, changes you make to your documents or third-party apps while booted from the Sandbox appear when you reboot from your main disk, and vice versa.

If you beta-tested High Sierra, you may have used a SuperDuper Sandbox to do so—that is, you may have installed the High Sierra beta on your Sandbox drive to keep your main disk safe while keeping all your documents in sync. But now that you're upgrading to High Sierra for real, what are the consequences for your Sandbox?

- ♦ **Upgrading your Sandbox:** You can install the final release of High Sierra on your Sandbox drive if you're not quite ready to make the leap on your main disk yet. But when you're ready, you should separately upgrade your main disk to High Sierra—don't just copy your Sandbox back onto your main disk. Then you can erase your Sandbox and use the drive for something else.
- ♦ **Upgrading your main disk:** If you install High Sierra on your main disk, your Sandbox will most likely break. That may be irrelevant—after all, you have a *separate* bootable duplicate too (right?), so you may be finished with the Sandbox. However, if you want to install High Sierra on your main disk *and* update your Sandbox so it's also running High Sierra, you can. After upgrading your main disk, use SuperDuper's Smart Update feature to copy only new and changed files to your Sandbox drive.

Upgrade Using Plan B: Clean Install

If you prefer a cleaner installation of High Sierra than what an in-place upgrade provides—specifically, one that gets rid of any disk errors and gives you a chance to weed out some types of user-created data—Plan B is what you should follow instead of Plan A. It’s also the right choice if you tried Plan A and encountered problems.

Much of Plan B is just like Plan A, so I refer to earlier discussions for some details. The differences come at the beginning (erasing your disk manually) and the end (using Setup Assistant to configure numerous settings and, optionally, transfer data from your bootable duplicate).


Start Up from Your Bootable Duplicate

Unlike Plan A’s in-place upgrade, Plan B requires a bootable duplicate of a Snow Leopard, Lion, Mountain Lion, Mavericks, Yosemite, El Capitan, or Sierra volume, which accomplishes three things:

- You must erase the destination volume first. But you can’t erase the volume your Mac is currently running from, so you must start up from another volume.
- You’ll need access to the High Sierra installer too, of course, so it’ll be easiest if the volume you start up from contains the installer.
- Once High Sierra is installed, you’ll need your bootable duplicate (the one you created in [Back Up Your Disk](#), remember?) connected in order to transfer your old data.

To start up from your duplicate:

1. Make sure the disk containing your duplicate is physically connected to your Mac (via Thunderbolt, USB, FireWire, or eSATA).

2. Choose Apple  > Restart.
3. Press and hold the Option key until a list of available startup volumes appears on screen.
4. Use the arrow keys to select your duplicate, and then press Return to boot from it.

Now that you've booted from what is about to be your *old* copy of macOS, you can erase your main disk and install High Sierra onto it.

Erase Your Disk

Having started up from your duplicate, to erase your destination volume in preparation for High Sierra, follow these steps:

1. Open Disk Utility (on your duplicate, in [/Applications/Utilities](#)).
2. In the list on the left, select the volume you want to erase. Volume names (there may be one or more per disk) are shown indented under the disk name, so be sure to select one of the indented icons.

Choose carefully! Triple-check to be sure that the volume you're erasing is the one where you want to install High Sierra, and that it's the one you've backed up on your bootable duplicate!

3. On the toolbar, click the Erase button.
4. Make sure Format is set to Mac OS Extended (Journaled), and click Erase.

Note: You may recall that High Sierra reformats volumes to use APFS (see [Learn about APFS](#)), but since older versions of Disk Utility don't offer that format, it's fine to use Mac OS Extended and let the installer do the conversion afterward.

5. If you see a confirmation dialog, click Erase again. Disk Utility erases the disk, which normally takes just a few seconds. Click Done if prompted to do so when the Erase process is complete.

6. Choose Disk Utility > Quit Disk Utility.

You're now ready to install High Sierra on the empty volume.

Run the Installer

To proceed, make sure you've quit all running apps and then double-click the Install macOS High Sierra icon in your `/Applications` folder or wherever else you put it. A window appears with one button: Continue. Click it!

The next few steps are identical to those for an in-place upgrade:

1. The Software License Agreement appears next; click Agree, and then click Agree again in the confirmation dialog to proceed.
2. Now select your destination. If needed, click Show All Disks to display all available options and click the one you want to use.
3. With your desired destination volume selected, click Install.
4. Next, enter your administrator credentials and click Add Helper.

The installer begins copying files, a process that typically takes just a few moments, but may take longer. Then, depending on your configuration, it may restart automatically or it may ask you to click a Restart button. After the restart, the main portion of the installation process occurs.

Note: If you are installing High Sierra onto a disk that's encrypted, then immediately after the installer restarts your Mac, you may be prompted to enter your password to unlock the disk.

During the installation, you may want to [Bake Some Cookies](#). As the installer progresses, your Mac will restart one or more times, but the startup chime may not play. You'll know the process has finished when the Welcome screen appears. That's part of Setup Assistant, to which we now turn our attention.

Note: If the Welcome screen never appears or your Mac doesn't restart at all under High Sierra, find out what to do in [Mac Won't Start Up under High Sierra...](#)

Use Setup Assistant

Setup Assistant is a program that looks like a continuation of the High Sierra installer. It runs automatically after High Sierra restarts at the end of the installation process, and serves several purposes (some of which may not apply to you):

- If applicable, it offers to transfer files from another Mac or PC, another volume (which can be your bootable duplicate; see [Transfer Your Old Data](#), next), or a Time Machine backup.
- It enables you to select your preferred country or region, and keyboard layout.
- It configures your Mac to connect to the internet using a wireless network, if applicable.
- It sets up your Mac to use your Apple ID for iCloud, iTunes, and other services.
- It sets up an initial user account (with administrator privileges) if you're not transferring an account from a backup or other source.
- It lets you set your time zone, and the current date and time.
- It lets you pick a graphic (or, if you prefer, use your Mac's built-in camera to take a snapshot) to associate with your user account.

Your first task, on the Welcome screen, is to select a country or region and click Continue. You then see the Select Your Keyboard screen, which should be self-explanatory.

Setup Assistant next looks for a network connection. You'll see a screen called Select Your Wi-Fi Network. Select the network to which you want to connect and, if required, enter the password. Then click Continue. (If you connect to the internet some other way—or if you

have no internet connection—click Other Network Options and select the appropriate option.)

Next is the Transfer Information to This Mac screen (**Figure 8**), which enables you to transfer files from your bootable duplicate (as I cover next). If you're tempted to skip this step in order to have a completely clean copy of High Sierra, be sure to read the sidebar [The Nuke and Pave Option](#).

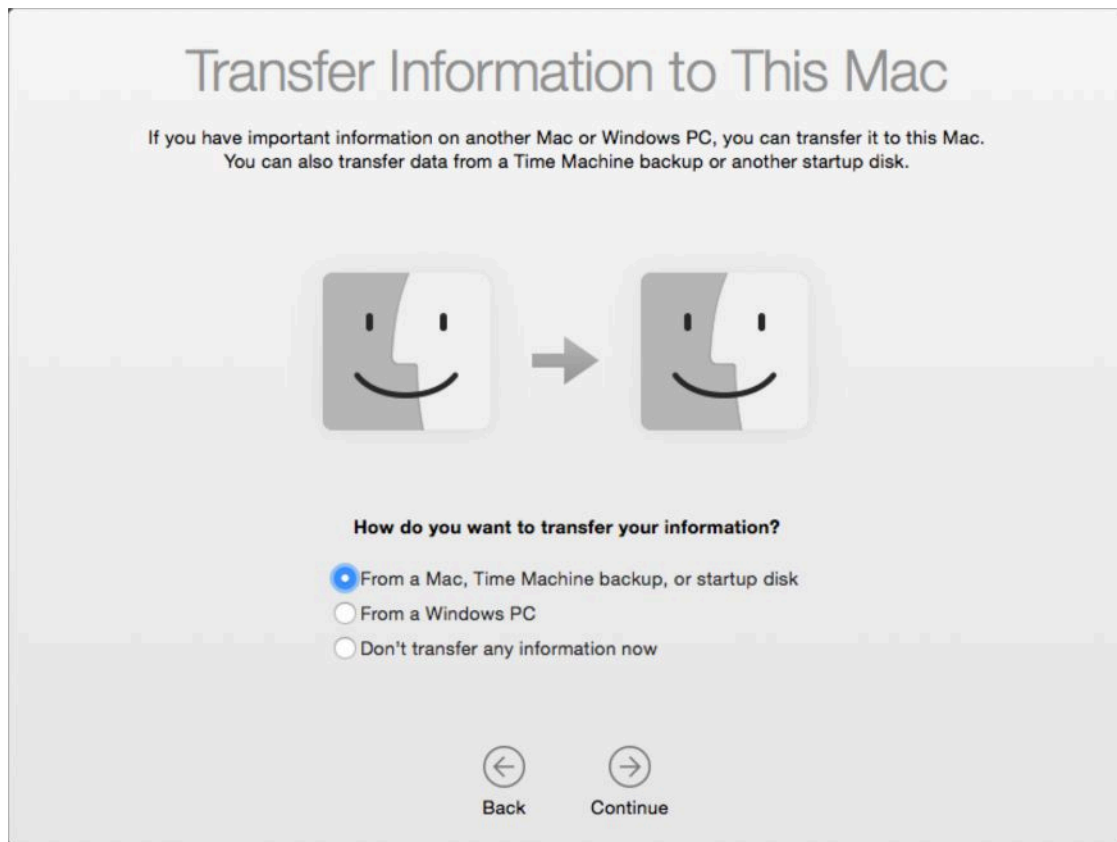


Figure 8: On this screen, you can begin the process of moving data from your bootable duplicate to your High Sierra volume.

Transfer Your Old Data

Setup Assistant includes “migration technology,” which is a fancy way of saying that it can copy important files from another computer or another volume in an intelligent way. We use it here to transfer the data from your bootable duplicate. (High Sierra includes a stand-alone app called Migration Assistant—found in [/Applications/Utilities](#)—but you probably won't need to use it because Apple has integrated this tool's capabilities into Setup Assistant.)

Note: Although you could choose not to transfer your information now and use Migration Assistant later, that may involve extra steps and hassle. In general, you'll get better results with less effort by transferring your files right now.

Other Setup Assistant Transfer Options

Besides the method I describe ahead, Setup Assistant lets you transfer your data from three other sources:

- ♦ **Another Mac:** This could be another Mac on your network, or one connected with a FireWire or Thunderbolt cable. (Newer Macs can also use a USB cable.)
- ♦ **A Windows PC:** High Sierra can migrate an account from a PC on your local network running Windows.
- ♦ **Time Machine:** You can also restore files from a Time Machine backup stored on a local disk, network volume, or Time Capsule.

I don't cover these methods in this book. A Time Machine backup may not contain all your important files, so I don't recommend it in this situation, but it's better than nothing. And the first two options are ones you might encounter if you're "upgrading" to High Sierra by buying a new Mac. To learn about any of these options, see my TidBITS article [How to Migrate to a New Mac](#).

To transfer your old data to your new installation, work your way through the following screens:

Transfer Information to This Mac

Begin by selecting "From a Mac, Time Machine backup, or startup disk." Click Continue. Now, select your bootable duplicate and click Continue.

Note: If your source disk is encrypted with FileVault, the Continue button becomes Unlock. Click it and enter the disk's password.

Select the Information to Transfer

Now, select the kinds of data you want to transfer. The screen shows the size of each item, and the total size of the selected items, along with

available space on your High Sierra volume, updates automatically as you change your selections. (It may take a few minutes for the installer to initially display and calculate the size of each option.)

If the volume you're transferring from has only one user account, you may see only three checkboxes, all selected by default: Applications, Documents & Data (with an accompanying Edit button), and Computer & Network Settings. If the volume has more than one user account, you'll see a scrolling list that contains numerous items—again, all selected by default: Applications, each user account listed by name, an “Other files and folders” entry, and Computer & Network Settings.

Here's an explanation of each option, and my recommendations:

- **Applications:** This option transfers the contents of your previous `/Applications` folder (and its subfolders, such as Utilities), skipping any applications for which the High Sierra installer has already loaded newer versions (Safari, Mail, and so on). Because you may find it tedious to reinstall your applications, leave this option selected, as it is by default.

Note: If you select Applications, the High Sierra installer also copies the contents of `/Library` on your previous system. This is extremely good, because that folder contains many support files without which some apps wouldn't run. As with `/Applications`, though, the installer won't copy any older files over newer versions it has just installed.

- **Documents & Data:** If you have just one user account, you'll see a checkbox labeled Documents & Data—this refers to the data in your user account. Click Edit to view its contents. In the dialog that appears, you can deselect any top-level folder within the account, except for the Library folder. Along with the visible top-level folders is a folder called Other Data. Apple doesn't specify what this includes and my tests to find out have been inconclusive, so I suggest leaving it selected just in case it contains anything you need. Finally, there's a checkbox labeled “Other files and folders.” This option refers to any files or folders at the root level of your old volume as

well as anything in the [/Users/Shared](#) folder. I suggest leaving this checkbox selected.

- **User accounts:** If you have more than one user account, each is shown at the top level of the list.

This list may include “users” that don’t have a conventional user account or home folder on your Mac, but which your Mac considers to have an account of a sort—people with whom you’ve shared files using System Preferences > Sharing, for example, or special low-level accounts added by software such as MacPorts or Cloak (the [cloakproxy](#) account). Some of these may display messages about having no home folder or having a home location that is no longer valid. You don’t have to worry about these messages; Setup Assistant is merely pointing out that these won’t create conventional user accounts, each with its own home folder. It’s best to leave such user accounts selected, even if they appear to contain no data.

Transferring a user means copying the user’s entire home folder, if any ([/Users/SomeUserName](#)), to the High Sierra volume; once a user is transferred, the user can log in without having to set up an account again. You should transfer all the existing users unless you have accounts that are no longer in use. You can, if you like, deselect any individual (top-level) folders within a user’s home folder to skip copying those to your High Sierra volume. As for the unexplained Other Data folder (mentioned in the previous bullet point), the safest course is to leave it selected.

If you don’t transfer at least one account, your screens later in these steps will be slightly different. Also, if you *ever* want to transfer any of these accounts, now is by far the best time to do so; copying files manually may cause you no end of grief and the Migration Assistant may not work as you’d hope.

- **Other files and folders:** As in the single-user account setting described in the second bullet point, this option refers to any files or folders at the root level of your old volume as well as anything in the [/Users/Shared](#) folder. I suggest leaving this checkbox selected.

- **Computer & Network Settings:** This category sometimes has up to three sub-items that you can select. Computer includes certain system-wide settings, such as sharing preferences, energy saver settings, and parental controls. Printers refers to your printer settings. Network includes the settings in your Network preference pane. I suggest leaving Computer & Network Settings (and all sub-items, if present) checked.

After making your selections, click Continue.

Transferring Your Information

Setup Assistant copies the selected items to your new High Sierra volume—a process that may take just a few minutes or several hours, depending on how much data you are transferring. (And you should completely disregard any time estimates you see—as elsewhere in the installer, they’re wildly inaccurate.)

Incompatible Software

If Setup Assistant doesn’t notice any software conflicts with the files you’ve selected, you won’t see this screen. But if it does, this screen displays an Incompatible Software warning notice and the conflicting items are moved to an Incompatible Software folder at the top level of your startup volume or home folder. I say more about this in [Review the Incompatible Software Folder](#). Click Continue to keep going.

FileVault

If FileVault was enabled on the volume you’re migrating data from, a screen appears to remind you that it’s not enabled automatically on your new volume—but that you can enable it manually.

Migration Complete

At the end of the migration process, a Migration Complete screen appears, stating that your data has been migrated and is ready to use. Click Quit to dismiss the window. At this point, your Mac should prompt you to log in, and then just a few questions remain.

Complete Setup Assistant

The next steps in Setup Assistant are mostly self-explanatory. Depending on which version of macOS you're upgrading from, what information you transferred, and your previous settings, you may see one or more additional screens. (You'll see even more screens if you're performing a clean installation of High Sierra *without* migrating any existing accounts—refer to [The Nuke and Pave Option](#) for an important recommendation.)

Here are some of the screens you *may* encounter. (Most of them are identical to those described earlier in [Finish Setup Assistant](#), so I describe them only briefly here.) After each one, click Continue to advance through the remaining screens:

- **Enable Siri:** This screen has a single checkbox, Enable Siri on This Mac, which is selected by default. (Regardless of your choice here, you can enable or disable Siri later—go to System Preferences > Siri once High Sierra is up and running.)
- **Sign in with Your Apple ID:** Depending on the circumstances, you may be asked only for your password, or for both your Apple ID and your password. In the latter case, enter the Apple ID you want to use for iCloud and iTunes, along with your password; or, if you prefer to use a different one for each, click Use a Separate Apple ID for iCloud and iTunes.
- **Verify Your Identity:** If you've enabled Apple's [Two-factor Authentication](#) or [Two-step Verification](#) for your Apple ID, an extra screen may ask you to perform a second verification step.
- **Find My Mac:** If prompted to do so, click Allow to enable Find My Mac, Not Now to do nothing, or About Find My Mac to learn more.
- **Terms and Conditions:** Yes, you already agreed to the High Sierra license, but this screen includes additional legalese, notably Apple's Privacy Policy and Game Center Terms and Conditions.
- **All Your Files in iCloud:** High Sierra may ask if you want it to store all the files from your Documents and Desktop folders in

iCloud Drive. I recommend that you deselect “Store files from Documents and Desktop in iCloud Drive” for now, and if you decide later that you want that feature, you can turn it on. To do so, go to System Preferences > iCloud, select the iCloud Drive checkbox if it is not already selected, click the Options button next to iCloud Drive, select Desktop & Documents Folders, and click Done.

- **iCloud Drive:** If all your devices are using (or are about to be using) Mavericks or later or iOS 8 or later, select Upgrade to iCloud Drive. Otherwise select Not Now.
- **Diagnostics & Usage:** Select one or both of these checkboxes to send just Apple or Apple and third-party developers data that could help them to fix crashes and other bugs.
- **Setting Up Your Mac:** When you see this screen, you know Setup Assistant has stopped asking you questions. It’ll disappear on its own in a moment and you’ll be looking at your High Sierra Desktop.

Whether Setup Assistant displays just one screen or many, High Sierra itself may display any number of dialogs and alerts the first time you use it, such as password prompts, software update messages, and requests to enable various features. To learn how to deal with these and other immediate concerns, see [Perform Post-installation Tasks](#).

The Nuke and Pave Option

Some people want to do a truly *clean* clean install of High Sierra—that is, install a pristine copy of macOS completely from scratch, with *no* migration of older apps and files. The technical term for such people is *gluttons for punishment*, because (having done this a few times myself) I can guarantee that it will involve many frustrating hours of tedious work. It's virtually never necessary, and my professional opinion is that life is too short—you should avoid doing this.

Nevertheless, if you insist on this approach, let me offer a few tips:

- ♦ Follow everything in this chapter *except* the transfer part—when asked, select Don't Transfer Any Information Now.
- ♦ Assuming you sign in with your Apple ID when Setup Assistant prompts you to, when you later get to the Create a Computer Account screen where you're asked to create an initial administrator account, the checkbox "Allow my Apple ID to reset this password" is selected by default. I recommend deselecting this option (and instead making a note of your password in a secure place), because it creates additional security risks.
- ♦ Besides the screens covered in [Complete Setup Assistant](#), you may be asked to set up iCloud Keychain and select your time zone.
- ♦ Once High Sierra is running, you'll have to reinstall all your apps. It's pretty easy to do that for apps from the App Store. For everything else, you're on your own—and I hope you kept track of your license codes, because you'll have to reenter them all!
- ♦ You'll have to reset most of your preferences from scratch. But...
- ♦ If you use iCloud, the settings and data for apps such as Mail, Contacts, and Calendar will restore themselves, as will your keychain contents (assuming you have the relevant checkboxes selected in System Preferences > iCloud).
- ♦ If you use Dropbox or similar cloud storage, you can log in and have all the files stored there sync back to your Mac—but be prepared for a long wait.
- ♦ You may want to copy at least some files—such as your Photos or iTunes libraries—from a backup. Guard that backup carefully until you're *certain* that you have everything you need from it.

Perform Post-installation Tasks

If everything has gone as expected, your Mac is now successfully running High Sierra. (If things haven't gone as expected, flip forward to [Troubleshoot Upgrade Problems](#).) But there are still a few tasks left to do before you get to work—or play—with your new operating system. In this chapter I cover some important initial setup and configuration activities you should get out of the way right now.

Respond to Immediate Questions

My test installations of High Sierra have used various combinations of starting points, configurations, and upgrade paths. In some cases, after installing, I saw a normal Desktop and nothing more. In other situations—especially when I upgraded older versions of macOS, had a lot of third-party software, or wasn't previously logged in to iCloud—I was immediately confronted with a large stack of overlapping dialogs and notifications.

Among the most common questions are requests for your user account password or Apple ID password. For example, certain apps may once again need an administrator's authorization to make changes to your data, and various apps that use your Apple ID (including iTunes and iBooks) may need you to sign in again.

Tip: Even if you're not prompted, it's a good idea to check System Preferences > iCloud to make sure you're signed in to iCloud (and with the correct Apple ID). Do the same in iTunes (Account > View My Account) and the App Store (Store > View My Account).

In some situations, you may also see a notification like the one in **Figure 9**. This appears to mean that, in the process of syncing your accounts via iCloud with your other Macs, High Sierra found one or

more email accounts that were either missing from this Mac or had different settings. To add (or update) the accounts, click Continue; High Sierra then opens System Preferences > Internet Accounts, where you can verify all the settings. Or, click Not Now to leave your accounts as is for the time being.

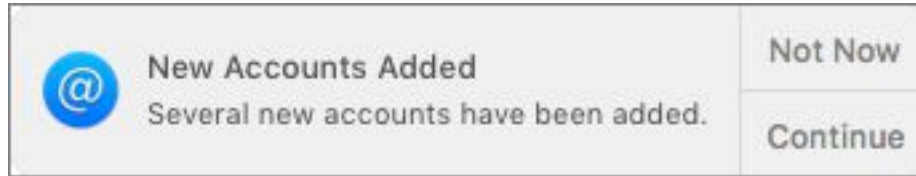



Figure 9: Sometimes email accounts are correctly configured but not turned on until you agree.

Work your way through any such dialogs you see, even if they seem redundant. After that one-time process, most of them will not reappear.

Handle Software Updates

The next thing you should do is to update macOS itself (and any other crucial Apple software) to the latest version. Sometimes Apple releases bug fixes and security updates almost immediately after a major upgrade, and if any such urgent updates are available, it's in your best interest to install them right away.

In High Sierra, as in every version of the Mac operating system since Mountain Lion, all updates to Apple software—including macOS itself, built-in software such as Safari and QuickTime, and optional purchases such as Final Cut Pro and Pages—are delivered through the App Store app. And, of course, you can update all the third-party apps you've purchased from the App Store at the same time.

In some cases, the App Store notifies you automatically of updates, but I recommend checking manually, shortly after your Mac starts up under High Sierra for the first time. You can open the App Store by clicking its Dock icon, double-clicking its icon in `/Applications` or in Launchpad, or choosing Apple  > App Store. Then click the Updates button on the toolbar.

Then, to update a single application, click the Update button next to it. (In some cases, Apple groups multiple software updates together; click the More link to see details on each one.) Or, to update all the listed apps at once, click Update All. The App Store downloads and installs the updates automatically.

In addition to installing any updates, decide how you want the App Store to handle *future* updates. Your Mac can check for, download, and even install updates in the background. Some people turn off all aspects of automatic updates—perhaps because they never want to be interrupted with alerts about new software, dislike the idea of anything downloading behind their backs, or need to keep an eye on a bandwidth cap. Others want all the new things right away without manual intervention and...ahem...have sufficiently robust backups that they can recover from any problems that may arise due to a buggy update.

Follow these steps to configure software updates:

1. Go to System Preferences > App Store (**Figure 10**).

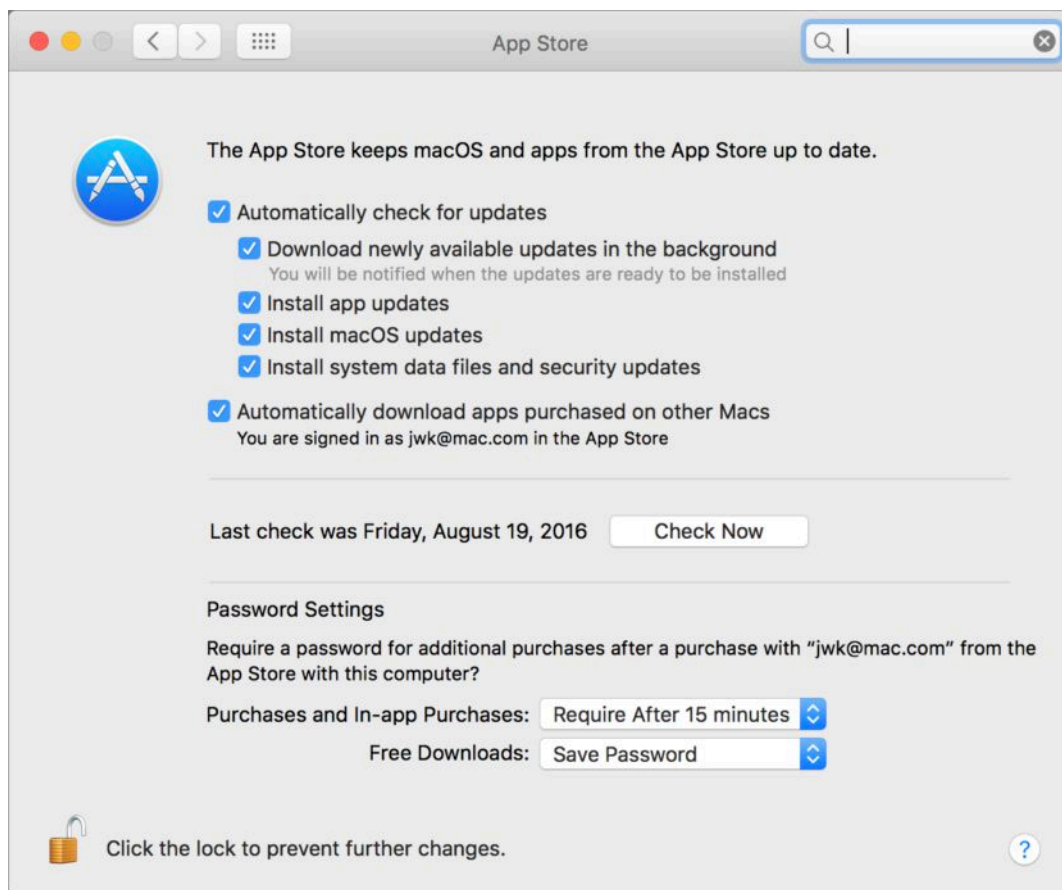


Figure 10: Configure automatic updates in the App Store pane.

2. Select or deselect (as you prefer) the Automatically Check for Updates checkbox to enable or disable automatic checking. If it's selected, you can also select any or all of:
 - ▶ *Download Newly Available Updates in the Background*, which not only notifies you of updates but downloads them for you so you can install them as soon as you're ready (click Install to install immediately; click Later and choose Try in an Hour, Try Tonight, or Remind Me Tomorrow from the pop-up menu to “snooze” the reminder; or click the notification itself to open the App Store and see which updates are available)
 - ▶ *Install App Updates*, which silently updates apps automatically after they're downloaded (except those requiring a restart or other interaction)
 - ▶ *Install macOS Updates*, which does the same as Install App Updates except for macOS itself—that is, macOS 10.13.x—and will presumably prompt you to restart your Mac
 - ▶ *Install System Data Files and Security Updates*, which automatically (without prompting you) installs these essential updates—but only after they've been available in the App Store for 3 days

Note: Regardless of these settings, you can always check for updates manually at any time by clicking Check Now (which changes to Show Updates if updates have already been downloaded).

3. If you're signed in to the App Store, you can also check or uncheck Automatically Download Apps Purchased on Other Macs, which does exactly what it says.
4. If you've previously felt that the App Store prompts you for your password too often, you can make some small adjustments to that behavior. At the bottom of the App Store pane are two pop-up menus under the heading Password Settings:
 - ▶ *Purchases and In-app Purchases*: Choose when a password prompt appears—either Always Require (the default) or Require after 15 Minutes.

- ▶ *Free Downloads:* Choose either Require Password (the default) or Save Password, which means you won't be prompted after the first time you enter your password for a free download.

Manual Updates of macOS

All updates to macOS are available not only through the App Store but also on Apple's website, so you can [download them manually](#) if you wish. This lets users decide whether to use a standard (or "delta") updater, which requires the most recent previous release of macOS, or a "combo" updater, which can update any previous version of the major system release (for example, 10.13.0 or 10.13.1) to the new version (say, 10.13.2).

Review the Incompatible Software Folder

If the High Sierra installer encounters any known incompatibilities, it moves the problematic software to an Incompatible Software folder and explains what it moved on one of the final screens of Setup Assistant. (After Setup Assistant quits, you can find the Incompatible Software folder at the top level of your startup disk, at the top level of your home folder, or even in both places, depending on the location of the software that was disabled.)

This notice appears only for extensions and other low-level background software that would otherwise run automatically when you start up your Mac. As it says, the items in question are moved aside but not deleted. Whatever you do, don't try to reenabte this software manually! Instead, contact the developer and get a version that's compatible with High Sierra, and then reinstall it.

Deal with Other Surprises


You may encounter a few other peculiarities when first using High Sierra that cause some initial surprise.

Apple Mail

If you've been using Apple Mail through a few macOS upgrades, you may not find this surprising, but if you're new to the upgrade experience, a few aspects of Mail's behavior are worth knowing about:

- **Importing Mail messages:** In some cases (more likely when using Plan B than Plan A), the first time you launch Mail, a window informs you that it's "upgrading" your mail database. This step should take no more than a few minutes, and is necessary because the High Sierra version of Mail has updated the database format it uses to store information about your messages.
- **Mail plug-ins:** The first time you open Mail after upgrading, it moves most incompatible third-party plug-ins (which are normally stored in `~/Library/Mail/Bundles`) into `~/Library/Mail/Bundles (Disabled)` and displays an alert telling you what it's disabled. Don't try to reenable these manually; Mail will thwart your every effort to get them working. Check with the developer to see if a High Sierra-compatible update is available.

If Mail hangs or crashes on startup or if Activity Monitor (found in `/Applications/Utilities`) shows it to be using excessive CPU power, it could be due to an incompatible plug-in that Mail was unable to disable automatically. Force-quit Mail, look in `~/Library/Mail/Bundles`, and move anything you find there into `~/Library/Mail/Bundles (Disabled)`. Then open Mail again. If it works, you can quit Mail, move a single plug-in back into `~/Library/Mail/Bundles`, and test again. Repeat until only the problematic plug-in(s) are disabled, and then see if the developers have updated versions of them.

- **Missing “On My Mac” messages:** A number of people reported that when upgrading to Sierra, messages in Mail that were stored locally (that is, in “On My Mac” mailboxes) were missing. I never experienced this myself, and I don’t know if anyone will see this behavior in High Sierra. But if you do, you can restore those messages from a backup. If you *don’t* use Time Machine, then quit Mail and restore the entire `~/Library/Mail` folder from a backup. If you *do* use Time Machine, open Mail, and then follow these steps:
 - a. With Mail in the foreground, click the Time Machine icon in the Dock or choose Enter Time Machine from the Time Machine  menu. Mail becomes the center of the Time Machine screen.
 - b. Navigate to a mailbox you want to restore, or the location where that mailbox should be.
 - c. Using the arrow buttons, or the navigation controls on the right side of the screen, browse your backups until you find one showing the desired mailbox(es).
 - d. Select one or more mailboxes and click Restore.

Restored mailboxes are put directly in the On My Mac section of the Mail sidebar.

First-run Alerts

After upgrading to High Sierra, you may see an alert (**Figure 11**) the first time you open a previously installed third-party application that wasn’t downloaded from the App Store.

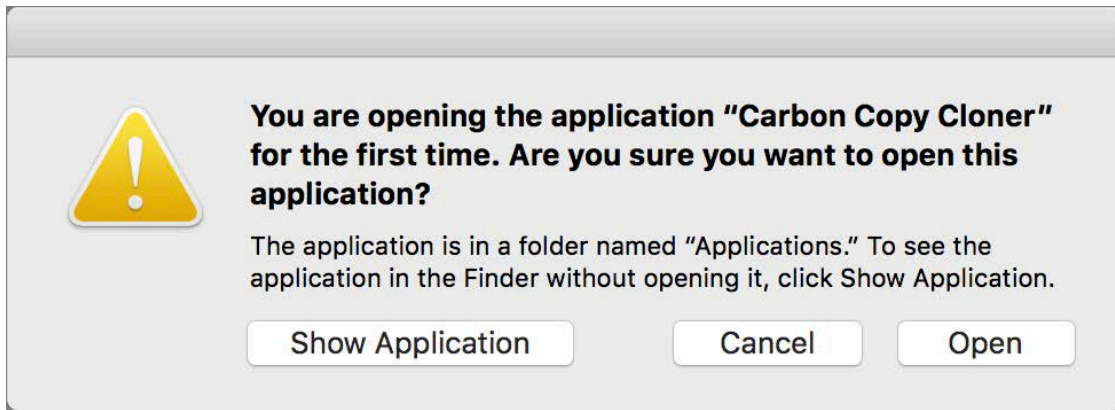


Figure 11: The first time you launch an application indirectly, High Sierra asks you to confirm that you really do want to open it.

This alert doesn't appear if you double-click the app icon, but only if you open it by an indirect method such as double-clicking one of its files. To confirm that you did intend to launch that app, click Open.

System Extension Blocking

If, *after* upgrading to High Sierra, you install a new third-party app that includes a kernel extension (or KEXT), a warning appears to tell you that the extension won't run unless you give it permission to run (**Figure 12**). This is a security feature to prevent malware from gaining low-level control of your Mac. (You can learn more about this new feature in Apple's developer technical note [Secure Kernel Extension Loading](#).)

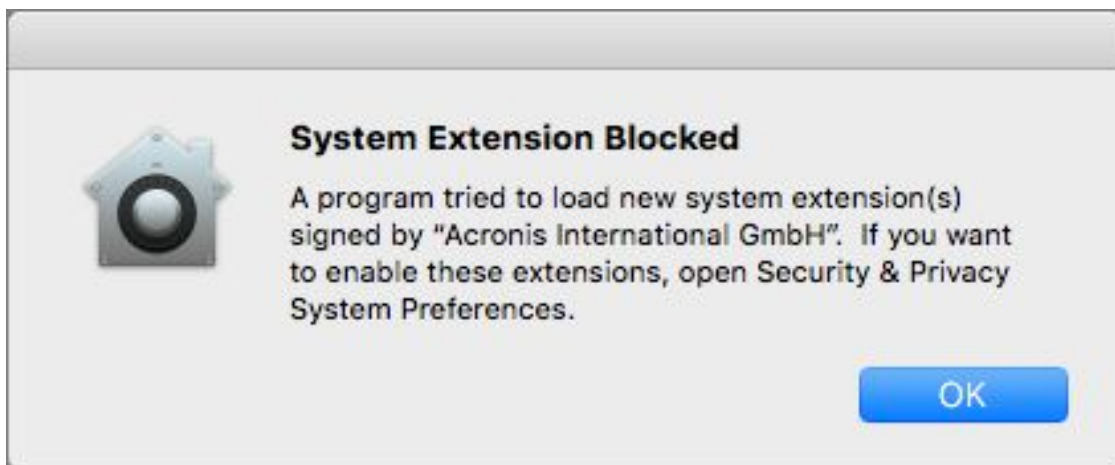


Figure 12: This alert appears when you try to install a new third-party kernel extension in High Sierra (or when an app attempts to do so for you).

If you see this alert, click OK. To approve the new kernel extension, go to System Preferences > Security & Privacy > General, look for the notice at the bottom (**Figure 13**), and click Allow. (If you don't do this within 30 minutes, the extension won't be permitted to run, and the notice will disappear until the next time that extension tries to load—but those subsequent load attempts won't re-trigger the warning dialog from **Figure 12**.)

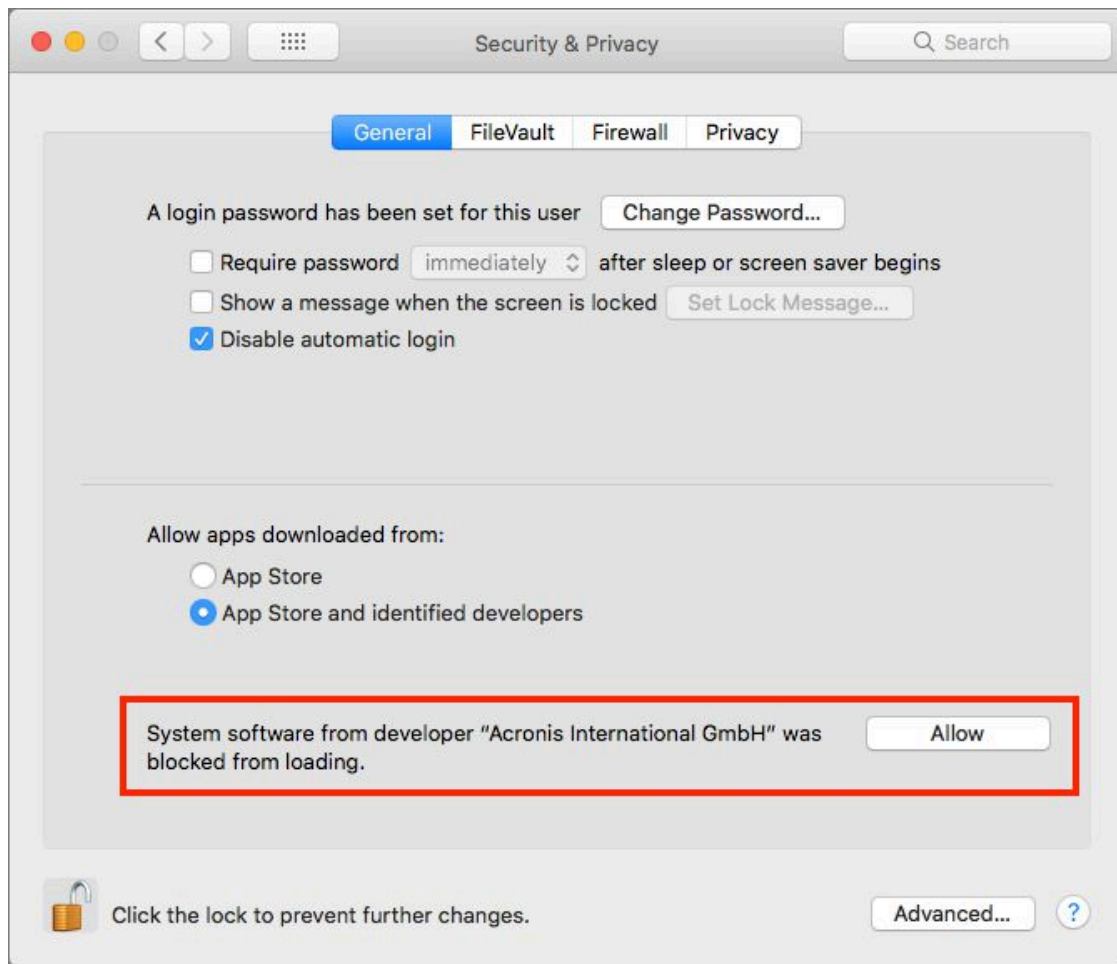


Figure 13: At the bottom of this preference pane, you can grant new kernel extensions permission to run.

System Preferences Changes

Apart from a few small cosmetic changes in System Preferences, the following new or modified preferences may be of interest:

- **iCloud:** There's a new Siri checkbox on the iCloud pane. When this is checked, macOS syncs Siri data among your Macs running High

Sierra and your iOS 11 devices; this enables Siri to use what it learns about you while using one of your devices on the others too.

- **Sharing—Content Caching:** There's a new category on the Sharing pane called Content Caching, which was previously available only in macOS Server. Contrary to what I said in earlier versions of this book, this feature does exactly what it appears to: when Content Caching is checked, your Mac becomes a distribution center for software updates and other content from Apple's cloud servers, so you can reduce network usage by downloading stuff only once and letting other Macs and iOS devices on your network fetch the data from your Mac. There are also a few optional sub-features:
 - ▶ *Cache iCloud Content:* Check this box to include photos and documents from your iCloud account in your cache.
 - ▶ *Share Internet Connection:* This checkbox enables [tethered caching](#), which is useful only for iOS devices that connect to your Mac with a USB cable. So it's the sort of thing a school or other institution might use, but not something the average consumer will find helpful.
 - ▶ *Options:* Click Options to set the maximum size of the cache on your Mac. Or, hold down Option to change the button's name to Advanced Options, which provides you with a more extensive set of (fairly technical) preferences.

Note: If you enable content caching, be sure to do so on only *one* Mac on your network.

To learn more about content caching, read Apple's articles [About content caching](#) and [Set up content caching](#).

- **Sharing—File Sharing:** A well-hidden new feature pulls in another capability that previously existed only in macOS Server: the option to use your Mac as a Time Machine server for other Macs on your network. To enable this feature, first check File Sharing. Next, click Options and make sure "Share files and folders using SMB" is selected. Then click the plus button under Shared Folders and

add a folder or volume where Time Machine backups for other computers will be stored. Now right-click (or Control-click) that folder in the list and choose Advanced Options from the contextual menu. Finally, check “Share as a Time Machine backup destination,” optionally fill in a size limit for Time Machine backups, and click OK. Once you’ve done this, other Macs on your network can choose this Mac as a destination in System Preferences > Time Machine > Select Disk.

- **Siri:** The Siri preference pane has been rearranged and now sports some new options:
 - ▶ *Enable Ask Siri:* This checkbox replaces “Enable Siri”; when it’s selected, you can control Siri with your voice, just as in Sierra. It was renamed because there’s now another way to communicate with Siri—see the second bullet under “Accessibility,” below.
 - ▶ *Siri Voice:* Siri’s audio quality is greatly improved, and the intonation sounds much more natural. Note, however, that the Irish (Female) and South African (Female) voices are available only if you choose English (Ireland) or English (South Africa), respectively, from the Language pop-up menu.
 - ▶ *Siri Suggestions & Privacy:* When you click this button, a dialog appears in which you can select or deselect individual apps Siri will consult to make suggestions.
- **Accessibility:** There are two major changes on this pane:
 - ▶ In the Zoom category, there’s a new “Speak items under the pointer” checkbox which tells macOS to identify items you hover over with the pointer, and an accompanying pop-up menu, from which you can choose “Always” or “Only when zoomed.” When the checkbox is selected, you can also adjust an “After delay” slider from Short to Long.
 - ▶ In the new Siri category, you can select the “Enable Type to Siri” checkbox (whether or not “Enable Ask Siri” is selected in System Preferences > Siri), which lets Siri respond to typed commands.

Note: For the complete details on what's new in High Sierra (as well as how to use many of the features that aren't new), read Scholle McFarland's [Take Control of High Sierra](#).

Final Software Advice

The best way to confirm that you have all your software installed and configured correctly is to try each application:

1. Go through your `/Applications` folder (including the `Utilities` folder and anyplace else you've stored applications) and launch each app, one at a time. If an application uses plug-ins that you're aware of, try to exercise at least one or two of them. When you've verified that the application works, quit it and move on to the next. Do the same with each of your third-party preference panes, by accessing them in System Preferences. (You needn't do this all in one sitting—feel free to spread it out over several days or longer.)
2. Make sure your important data displays correctly in the appropriate places, such as: contacts in Contacts, events in Calendars, stored email in Mail, photos and media in Photos and iTunes, and browser bookmarks in Safari.

Similarly, if you use any third-party cloud storage services (such as Dropbox, OneDrive, or Google Drive), confirm that the relevant apps are running and that your data is in sync.

3. If you use Unix software (including command-line tools and X11 applications), check to see that it's still present and functional. In particular, if you manually installed anything in `/bin`, `/sbin`, or `/usr` (except in `/usr/local` or `/usr/share`) in Yosemite or earlier, *it will be gone*—those are protected directories now, so you'll have to reinstall those items in another location or restore them to a different directory from your backup.

Also, if you use one of the following package managers, you'll want to update it and all the binaries you've installed using it:

- ▶ [Fink](#): Update to the latest version. Try `fink selfupdate` first; if that doesn't work, download a fresh copy.
- ▶ [Homebrew](#): Use `brew update` to update Homebrew itself, and then `brew upgrade` to upgrade all your packages.
- ▶ [MacPorts](#): Follow [these migration instructions](#) and install the latest version.

After following these steps and using High Sierra for a few days, if you haven't discovered any missing files or software that doesn't work, you can conclude that High Sierra is working properly, and you can overwrite your just-before-upgrading bootable duplicate with a new version (remember, you turned off duplicates in [Turn Off \(Yes, Off\) Automatic Duplicates?](#))—and turn automatic duplicates back on.

Troubleshoot Upgrade Problems

Even if you diligently followed all the instructions in this book, you might encounter problems while upgrading. I can't anticipate every difficulty you may have (or provide solutions in every case), but here are some of the most likely issues and how to deal with them.

Can't Run the High Sierra Installer...

If the High Sierra installer icon has a slash through it, or if you try to run it and it quits immediately, the likely causes are:

- You're trying to run it on a Mac whose CPU is incompatible with High Sierra (see [Model Support](#) for full details). Solution: Buy a new Mac. (Sorry.)
- The installer didn't fully download, or the file was damaged. Solution: First delete the installer. Then open the App Store app, click Purchased, and download High Sierra again.

Can't Select Installation Volume...

If you run the High Sierra installer, click Show All Disks when asked to choose a destination, and find that the volume on which you want to install High Sierra isn't available, chances are excellent that if you click the volume in question, the installer will tell you *why* it can't be used—for example, not enough disk space, wrong partition map scheme, or wrong format—and, at the same time, tell you how to fix that problem.

You may also see a message about an “unsupported partition structure,” which means the installer thinks the disk containing the volume where you want to put High Sierra isn't partitioned in one of

the officially sanctioned ways. Repartitioning your disk as described in [Prepare Your External Drive](#) is the only reliable solution.

Come to mention it, repartitioning is, in fact, the best (if brute-force) way to eliminate almost every possible cause of an unselectable volume. If all else fails, try that.

Mac Won't Start Up under High Sierra...

Following installation—either on the first restart or a subsequent restart—if your machine will not start up under High Sierra (or if you experience a kernel panic upon the first restart), try these steps in order until you are able to start up normally:


1. **Disconnect non-essential USB devices:** USB devices have been known to interfere with the Mac startup sequence, so if your Mac gets stuck on a gray screen and won't finish booting, try this:
 - a. Press and hold the power button for about 10 seconds until your Mac shuts down.
 - b. Disconnect all USB cables from your Mac *except* any that go to a keyboard, mouse, or other pointing device.
 - c. Press the power button again and wait for your Mac to start. If it starts normally, you can then reconnect your USB devices. If it's still stuck after 10 minutes or so—or if it starts but then you experience a kernel panic—move on to the next step.
2. **Try a Safe Boot:** Restart your Mac. (If the Mac is frozen or you see a kernel panic message, press and hold the power button for about 10 seconds until the Mac shuts down. Then press the power button to turn it back on.) As soon as you hear the startup chime, press Shift. Release the key when the Apple logo appears on the screen. The Mac will complete the startup process, which may take considerably longer than usual. You'll eventually see the words "Safe Boot" on the screen—likely in red at the top of the login screen.


If High Sierra starts up normally after a Safe Boot, a third-party extension or startup item may be the culprit. Check in `/System/Library/Extensions`, `Library/StartupItems`, `/System/Library/StartupItems`, `/Library/LaunchAgents`, `/Library/LaunchDaemons`, and `~/Library/LaunchAgents` for third-party items that haven't been updated recently (older items are more likely to have compatibility problems). This may include drivers for audio interfaces and input devices, security software, and certain system enhancements.

If you find any that you explicitly recognize and suspect as a culprit, look for an uninstaller from the developer, and if there is one, use it. If not, consult the documentation that came with the software, or the developer's website, for removal instructions. (I recommend against manually dragging these items to the Trash unless you can find no other way to remove them.)

Restart and see if the problem is still gone. If so, reinstall the programs that use the deleted items one at a time, restarting after each one, until you find the culprit.

If the problem does not go away after a Safe Boot, go to...

3. **Try macOS Recovery:** Assuming the High Sierra installer succeeded in installing the Recovery HD volume (or that your Mac already had one from a previous installation of macOS), you can boot into macOS Recovery by choosing Apple  > Restart, clicking Restart, and immediately holding down Command-R until the Apple logo appears. A few moments later, you'll see a macOS Utilities window; that tells you you're using macOS Recovery (more about this in a moment).

Note: If you can't see the Apple  menu (because your Mac can't even start up partway), hold down the power button for about 10 seconds until your Mac shuts down. Then press it again and immediately hold down Command-R until the Apple logo appears.

Once in macOS Recovery, select Disk Utility and click Continue. When it opens, click First Aid and follow the prompts to repair any problems that may have appeared on your High Sierra volume.

Choose Disk Utility > Quit Disk Utility to return to the macOS Utilities window. Then choose Apple  > Restart.

4. **Try another startup volume:** If you need to run Disk Utility but macOS Recovery isn't available, try:


- ▶ *A bootable duplicate:* The easiest option is to restart from your bootable duplicate (attach the drive, hold down the Option key when restarting, select the duplicate, and press Return), and then run Disk Utility.
- ▶ *Apple-supplied boot media:* Boot from a Snow Leopard Install DVD (if your Mac came with one). Then choose Utilities > Disk Utility.
- ▶ *Target Disk Mode:* If your Mac and another Mac you have access to (that can definitely start up correctly) both have FireWire or Thunderbolt ports, connect the two with a FireWire or Thunderbolt cable (or, if both Macs were made in 2012 or later, a USB cable). Restart the good Mac, holding down the T key to turn it into a fancy external drive. Then restart the misbehaving Mac, holding down the Option key, and select the good Mac's startup disk. Once you've booted, run Disk Utility from the good Mac to try to fix the boot disk of the misbehaving Mac.

5. **Remove any nonessential hardware:** Try restarting with only your Apple-supplied keyboard, mouse, and display attached, and without any third-party PCI or video cards. You may even need to remove extra RAM. If this works, check for driver updates, and then reattach the devices one at a time, restarting after each one.

6. **Reinstall High Sierra:** If you still can't start your Mac, consider reinstalling High Sierra. Perform a clean install (described in [Upgrade Using Plan B: Clean Install](#)), omitting items in the Applications category when you work your way through the file transfer portion of the installation to eliminate any possibility of software conflicts. (You can add those items later using Migration Assistant.)

In most cases, these steps will lead to a happy High Sierra installation.

Finder Crashes or Hangs...

Your Mac is likely to be slow for a bit after its first boot into High Sierra, but if it's unusable—as in, you get the Spinning Pinwheel of Doom for 15 minutes and you can't open any apps—try restarting. (And if you can't use the Apple  > Restart menu command, hold down the power button until your Mac turns off completely, and then press it again to turn it back on.) That has set things right for me on occasion. If that extra restart doesn't help, however, you could be looking at a software conflict.

Even if you diligently update all your software before installing High Sierra, you could run into a third-party app that has problems and yet isn't disabled by Setup Assistant. One symptom to look for is the Finder repeatedly crashing—that is, your Finder windows and Desktop icons keep appearing and disappearing. Another is a Finder hang—even after several minutes, the Finder doesn't respond to commands such as Finder > Empty Trash or File > New Finder Window.

If you suspect that the Finder is crashing or hanging, open Console (in [/Applications/Utilities](#)), and watch the error messages as they flit by. If you see an app or filename repeatedly, that could be the source of the misbehavior. Try disabling it (if you know what and where it is), or follow the instructions in [Mac Won't Start Up under High Sierra...](#)

If All Else Fails...How to Downgrade

As fantastic as High Sierra is, you might find it necessary to downgrade to your old system at some point if:

- ♦ An essential application does not work under High Sierra.
- ♦ You encounter frequent crashes or compatibility problems.
- ♦ Drivers for your third-party hardware are not available, and replacing that hardware is not an option.

Reverting to an older system is never pleasant, but if you followed the instructions for backing up your old system, it's not too bad.

Assuming that, before upgrading to High Sierra, you created a bootable duplicate of your old system on another volume (discussed in [Back Up Your Disk](#)), follow these steps:

1. If you downloaded or modified any data while working in High Sierra, be sure to save a copy of that data onto another volume before restoring your cloned system.
2. Start up your Mac from a volume other than the one containing High Sierra. This can be your bootable duplicate itself, a startup DVD, a USB thumb drive, or any other volume with a valid Mac system. (Unfortunately, macOS Recovery won't work in this instance because you need to run third-party software.)
3. Open Disk Utility and select the High Sierra volume. If the description says "APFS Volume," follow the instructions in [Configure a Drive in El Capitan or Later](#) to erase it and format it as Mac OS Extended (Journaled).
4. Launch your backup app (such as SuperDuper or Carbon Copy Cloner). Following the program's instructions for making a bootable duplicate, choose the volume where the duplicate exists as the source. For the destination (or target), choose the volume containing High Sierra.
5. Start the backup.
6. When the backup finishes, choose the newly restored volume in the Startup Disk pane of System Preferences and restart.

Your Mac should now be running your previous system again.

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Joe Kissell is the author of more than 60 books about technology, including [Take Control of Your Online Privacy](#) and [Take Control of Dropbox](#). He is a contributing editor to TidBITS, a senior contributor to Macworld, and a popular speaker at conferences and other events.

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