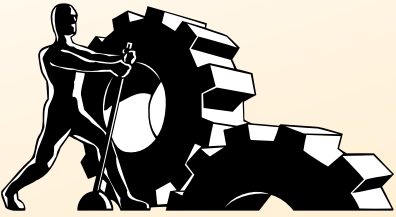


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# Upgrading to **Lion**

**Joe Kissell**

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# Read Me First

Welcome to *Take Control of Upgrading to Lion*, version 1.2, published in July 2011 by TidBITS Publishing 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 Mac OS X 10.7 Lion in no time. This book eliminates the uncertainty and the confusion, guiding you through every step of the process.

If you have an ebook version of this title, please note that if you want to share it with a friend, we ask that you do so as you would a physical book: “lend” it for a quick look, but ask your friend to buy a new copy to read it more carefully or to keep it for reference. Discounted [classroom and Mac user group copies](#) are also available.

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## Updates and More

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You can access extras related to this book on the Web (use the link in [Ebook Extras](#), near the end of the book; it's available only to purchasers). On the ebook's Take Control Extras page, you can:


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- Get a discount when you order a print copy of the ebook.

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## Basics

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Here are a few “rules of the road” that will help you read this book:

- **Menus:** Where I describe choosing a command from a menu in the menu bar, I use an abbreviated description. For example, the abbreviated description for the menu command that creates a new folder in the Finder is “File > New Folder.”
- **Contextual menus:** *Contextual* menus appear when you Control-click various elements on a Macintosh screen, including Dock items and files in Finder windows. To describe opening a contextual menu, I usually I tell you to Control-click (right-click) an item on the screen. If your mouse offers a right-click option, or if you use a trackpad or other means of opening a contextual menu, you should feel free to use the method you prefer.
- **Finding System Preferences:** I sometimes refer to settings in System Preferences that you may want to adjust. To open System Preferences, click its icon in the Dock or choose Apple  > System Preferences. When the System Preferences window opens, click the icon of the pane whose settings you want to adjust. (To see the icons if they aren’t visible, click the Show All button near the upper left.) I refer to these panes using an abbreviated notation such as “the Network preference pane.”
- **Path syntax:** This book occasionally uses a *path* to show the location of a file or folder in your file system. For example, OS X stores most utilities, such as Terminal, in the Utilities folder. The path to Terminal is: `/Applications/Utilities/Terminal`.

The slash at the beginning of the path tells you to start from the root level of the disk. You will also encounter paths that begin with `~` (tilde), which is a shortcut for the user’s home directory. For example, if the person currently logged in has the user name `joe` and wants to install fonts that only he can access, he would install the fonts in his `~/Library/Fonts` folder, which is just another way of writing `/Users/joe/Library/Fonts`.

- **Library:** The library folder mentioned in the previous paragraph, `~/Library`, is normally invisible in Lion. To see it, hold down the Option key and choose Go > Library in the Finder.

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## What's New in Version 1.2

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Version 1.2 is a minor update intended to address a few issues that came to my attention after the release of version 1.1:

- Clarifies target volume requirements for Windows Backup (see [Back Up Windows Volumes](#))
- Corrects and updates information about how business and education customers can [Buy Lion in Volume](#)
- Explains that because certain common Mac OS X features may be turned off at the end of your Lion installation, you should [Check Service Settings](#) before upgrading, and afterward [Turn Deactivated Features Back On](#)
- Mentions how to unlock a FileVault-protected disk in Disk Utility after you [Boot into Recovery Mode](#)

# Introduction

Since the introduction of Mac OS X in 2001, Apple has named each version of its operating system for Macs after big cats—Cheetah, Puma, Jaguar, Tiger, Leopard, Snow Leopard, and now, Lion. Each release adds features, fixes bugs, and alters the user interface at least a bit. The result is a Mac that's more powerful, more secure, and easier to use.

In Apple's relentless drive forward, each new release also has greater minimum system requirements than the one before it and enforces new standards for software. Older hardware becomes obsolete; older software becomes incompatible. Inevitably, some users feel left out—especially if keeping up with Apple means laying out a significant amount of money, giving up a favorite piece of software that's no longer being developed, or changing deeply ingrained habits. But most people find that the rewards outweigh the pain.

This time, however, the changes are especially profound. They start with something subtle yet important: Apple has quietly dropped the “Mac” from “Mac OS X” in many of its marketing materials, often referring to the new version, released in July 2011, as “OS X 10.7 Lion.” This hints at the fact that Apple's operating system for desktop and laptop Macs is starting to look more like its operating system for handheld devices. At the same time, iOS, which powers the iPad, iPhone, and iPod touch, is slowly gaining capabilities formerly found only in Mac OS X. Already pundits have begun to speculate that in a few years, the two operating systems will converge, and that Apple devices of every size and shape will use essentially the same software. Whether or not that eventually happens, Lion users will certainly notice a great many changes, mostly in the direction of greater simplicity and reduced clutter—but perhaps also a few unwelcome complications.

The good and bad news starts with installer. For the first time ever, Apple is selling a major operating system upgrade online, through the Mac App Store. For people who are already running Mac OS X 10.6 Snow Leopard and have fast Internet connections, this will mean a speedier upgrade—no waiting for a FedEx delivery or standing in line at an Apple Store, no messing with DVDs—and a surprisingly low price, too: \$29.99 for as many Macs as you own. On the other hand,

those with slow Internet access may prefer to wait for Apple to release Lion on a thumb drive in August for \$69—and those with older versions of Mac OS X (which can't use the Mac App Store) might find the upgrade process to be cumbersome.

Beyond the mechanics of obtaining and installing the upgrade, the changes in Lion have other potentially troubling implications. A great many Mac users are up in arms over the loss of Rosetta, the software that lets an Intel-based Mac run older software designed for PowerPC processors. And the absence of a bootable installer DVD raises worries about restoring a damaged system, or reinstalling Mac OS X if that becomes necessary. Despite Apple's efforts to make Lion easier to install than any previous big cat, the changes may leave users feeling disoriented and apprehensive about this upgrade.

That's why I wrote this book: to guide you through the entire process, eliminating confusion and uncertainty. I've written Take Control books about upgrading to the previous four big cats, and have performed a great many test installations of Lion under numerous conditions, so I have a good idea what works, what doesn't, how to prepare properly, and what to watch out for. I share all that with you in the coming pages. This ebook covers getting your Mac in shape for its new operating system, obtaining the Lion software, choosing an installation method, working your way through the installer, and dealing with post-installation steps and surprises. It will also tell you how to install Lion Server, use the new Recovery mode, troubleshoot installation problems, migrate to a new Mac running Lion, and more.

Version 1.0 of this ebook was released before Lion shipped, in order to help readers prepare for the upgrade so they could jump right in as soon as possible. If you've already read that version of the ebook, you should know that this new version, 1.1, not only takes you through the rest of the upgrade process but also fills in many details about Lion that I couldn't reveal previously because of my nondisclosure agreement (NDA) with Apple. I summarize this information, and tell you what to do next, in [Welcome Back, Version 1.0 Readers](#).

Meanwhile, I still expect new information about upgrading to Lion to emerge in the days and weeks after its official release, and if anything significant turns up, I'll mention it on this book's blog, update the text of the ebook, or both. To check for an updated copy of this ebook (or any other significant changes), click the link in [Ebook Extras](#).

# Lion Upgrade Quick Start

I've carefully arranged this book in logical order—I strongly recommend performing all these steps in the order I present them. You need not learn every last detail, but because the Lion upgrade process includes so many elements that surprised even me, I hope you'll take the time to read through the whole thing. Here's a brief overview of the steps you should take.

---

***New Mac?*** Does your “upgrade” involve moving from a Windows PC or from an older Mac to a new Mac? Read [Migrate to a New Mac](#) right away!

---

## **Pick up where you left off:**

- If (and *only* if) you read and followed the instructions in version 1.0 of this ebook, start with [Welcome Back, Version 1.0 Readers](#).

## **Prepare to upgrade:**

- Learn about software compatibility issues, the new and improved FileVault, how Lion is distributed, and some of the changes you can expect in the installer. See [Learn What You're Getting Yourself Into](#).
- Make sure your computer can run Lion. 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, get rid of clutter that could interfere with the upgrade, and test your hardware for errors. See [Clean Up Your Mac](#).
- Learn how encryption and partitioning can affect the way you install and use Lion, and what changes you might need to make to ensure a smooth transition. Read [Make Sure Your Disk Is Ready](#).
- Decide which overall upgrade strategy is best for you. See [Decide between In-place Upgrade and Clean Install](#).
- [Make Final Preparations](#) such as obtaining the Lion installer, updating your bootable duplicate, and ensuring that you have a way to refer to this book while you upgrade (since you won't be able to read it on the Mac that's in the process of being upgraded).

### **Perform the upgrade:**

Follow the strategy you selected earlier to run the Lion installer, choosing all the optimal settings and options for your computer and tastes, and making sure all your personal data is still in place afterward. You'll either:

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

or

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

### **After the upgrade:**

- [Perform Post-installation Tasks](#), such as running Software Update, setting up user accounts, and (perhaps) turning on FileVault and Time Machine. You'll also deal with any surprises that may have occurred along the way.
- Problems? If your computer isn't working properly after the upgrade, don't panic. See [Troubleshoot Upgrade Problems](#).

### **Go beyond the basics:**

- If you want to [Install Lion Server](#), read my basic instructions to get you started.
- Moving from an older Mac to a new Mac that already has Lion installed? Find the details on how to make the process painless in [Migrate to a New Mac](#).
- Learn how to [Use Recovery Mode](#) to fix disk problems, reinstall Lion, and perform other maintenance tasks.

# Welcome Back, Version 1.0 Readers

If you've read version 1.0 of this ebook already, you're way ahead of the game. Here's what you need to know now.

As long as you've already followed all the steps in version 1.0 of this ebook up through [Make Sure Your Disk Is Ready](#), there's no need to revisit those chapters; you're ready to pick up with the new material. However, I did add a few pieces of information to those earlier chapters that you may find interesting and will miss if you skip them, so let me briefly share with you a few new tidbits I now cover in those chapters that were not found in version 1.0:

- Once you have the Lion installer, you can install Lion on multiple Macs, but you can't perform an *in-place* upgrade of Lion on a volume containing 10.5 Leopard or 10.4 Tiger—at least, not unless you know a little trick, described in [Installing Lion over Leopard or Tiger](#). Alternatively, you can use [Plan B: Clean Install](#) to get the same end result. Either way, you can run the Lion installer only after booting from a Snow Leopard or Lion volume. (However, that volume can be a bootable Lion installer DVD or flash drive, including the one Apple will make available in August 2011.)
- The Lion installer has no customization options—no components you can choose not to install.
- The Lion installer may delete (or fail to copy, as the case may be) the contents of your `/usr/include` directory, if any. (Normally this is not at all serious, but I mention it as a warning that unexpected things could happen—so good backups are crucial!)
- If your Mac currently uses FileVault to encrypt any of its user accounts, you *can* maintain the old-style per-user encryption under Lion, with or without using the new FileVault 2 full-disk encryption. However, I recommend against this, and suggest turning off the old FileVault *before* upgrading to Lion.

That's all you need to know for now. You can skip directly to [Make Final Preparations](#) and proceed with the remaining installation steps!

# Learn What You're Getting Yourself Into

Lion is a fantastic operating system, and I've enjoyed using it more than any previous version of Mac OS X. But for many users, it's not the sort of no-brainer upgrade that previous big cats were. Some of the changes in Lion may force you 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—and what steps you'll have to follow to ensure a smooth transition.

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## Plot a Post-Rosetta Strategy

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I've read thousands of articles, blog posts, and message board comments about Lion in the past several months, and the one change that seems to provoke the most consternation is the loss of Rosetta—a component of Mac OS X that many Mac users were completely unaware of until recently. Upgrading to Lion entails living without software that requires Rosetta, and if you use such software regularly, you're going to be unhappy with Lion unless you take one of several steps to adapt to the new world order. I'll tell you how to do that in a moment (skip ahead to [Deal with Your PowerPC Software](#) for details), but first, for those who don't already understand what this is all about, let me explain what Rosetta is (or was) and why its loss is a big deal for some people.

### A Little Background on Rosetta

In 2006, Apple switched from using PowerPC processors in Macs to Intel processors. This move enabled Apple to build computers that were more powerful while consuming less energy, and among many other benefits it gave Mac users several ways (including Boot Camp and virtualization software) to run Windows on their Macs with performance every bit as good as on a PC.

Apple showed developers how to modify their applications to run natively on Intel processors—a process whose complexity ranged from

# Check Your Mac for Compatibility

All currently shipping Macs, and most models sold within the past 5 years or so, can run Lion. However, Apple's new system requirements exclude certain models. In particular, not every computer that can run Snow Leopard can also run Lion. And even a relatively recent Mac may not have enough RAM or disk space, or may need a firmware update. In the next few pages I help you verify that your hardware fully supports Lion. I also talk about the requirement to have Snow Leopard in order to use the Mac App Store, and make a suggestion about input devices.


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## Processor Support

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Lion, like Snow Leopard before it, requires an Intel processor; PowerPC-based Macs—PowerBooks, iBooks, PowerMacs, eMacs, and pre-2006 iMacs and Mac minis—aren't invited to the party. But unlike Snow Leopard, it won't run on just *any* Intel-based Mac; it requires a Core 2 Duo or more powerful processor—in other words, any Mac released in approximately the last 5 years. This requirement eliminates some of the earliest Intel-based Macs—specifically iMac, MacBook, and MacBook Pro models introduced in the first half of 2006, and pre-2007 Mac mini models.

---

***Gathering Intel-ligence:*** *Not sure what processor your Mac has? Choose Apple  > About This Mac and look at what the Processor line says. Look for Intel Core 2 Duo, Core i3, Core i5, Core i7, or Xeon. Anything else—specifically, “Core Duo” (without the 2) or “Core Solo”—and you won't be able to run Lion.*

---

New Macs that ship after Lion is released will have Lion pre-installed; if necessary, you can use the Migration Assistant to transfer files, accounts, and settings from your old Mac, as I'll explain in [Migrate to a New Mac](#), much later.

# Back Up Your Disk

If you've read pretty much any book I've ever written on 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 normally do, I want to state emphatically that you *must* create a bootable duplicate of your entire disk before upgrading to Lion. Even though the Lion installer doesn't tell you to back up or check to see that you have an extra copy of your data, this is not an optional step, or something you can skip if it's inconvenient or if you're pretty sure you won't have problems. 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. (If you run Windows on your Mac with Boot Camp, as opposed to virtualization software, you should also [Back Up Windows Volumes](#).)

After you back up your disk, I'm going to tell you to do some spring cleaning (read [Clean Up Your Mac](#)), and then I'm going to tell you to back up *again*. 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 Lion.

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!](#)

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## Why You Need a Duplicate

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Of the many ways in which you can back up your Mac, one way involves making an exact copy of everything on your disk onto 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 start from your main disk. That type of backup is called a *bootable duplicate*.

# Clean Up Your Mac

Over time, most computers accumulate clutter, including outdated software, forgotten downloads, and obsolete files. Not only can this clutter slow down your Mac and make it harder to find things, it can cause problems when you upgrade to Lion—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 Lion.

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 backup so that it'll be closer to the state of your disk when you upgrade to Lion.

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## Update Your Third-Party Software

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Every major upgrade to Mac OS X results in software compatibility problems, where some applications work poorly or don't launch at all. Even factoring out PowerPC applications that depend on Rosetta (see [Plot a Post-Rosetta Strategy](#), earlier), most of us will have to update a few applications to get them to work correctly under Lion.

If history is any indication, some incompatible applications 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 Mac OS X, and “Lion-compatible” software updates have already been appearing for months.

**Tip:** RoaringApps maintains a wiki (<http://roaringapps.com/apps:table>) listing hundreds of Mac apps and the current status of their Lion compatibility, as reported by users. Although this list is neither exhaustive nor definitive, it provides a quick way to check on the applications most important to you.

# Make Sure Your Disk Is Ready

Two new features in Lion—FileVault 2 and Recovery mode—have special requirements when it comes to the state of your disk at the time you upgrade. In certain situations, you may need to make changes to your disk before you can upgrade. As I explain in a moment, you may choose to postpone changes like disabling encryption until just before you're ready to run the Lion installer; I mention this in case you're reading ahead but planning to perform the upgrade later. But bear in mind that making these changes to your disk may be time-consuming, so take that into account when scheduling time to install Lion.

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## Consider Disabling Encryption

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If you currently use neither FileVault nor a third-party full-disk encryption program, there's nothing for you to see here—move right along to [Consider Re-partitioning Your Disk](#). But if you do use one of these types of encryption, continue reading for important information about steps you might want to take before upgrading to Lion.

### FileVault

If FileVault is enabled for any account on your Mac (in Tiger, Leopard, or Snow Leopard), I suggest disabling it before you upgrade to Lion and then using the new FileVault 2 after the upgrade is complete. Surprisingly enough, if you have an account with FileVault enabled and then upgrade your Mac to Lion, *both* versions of FileVault will be active (even though, ordinarily, what Apple now calls Legacy FileVault is completely absent from Lion)—and when you visit the Security pane of System Preferences for any account with Legacy FileVault enabled, you'll be asked whether you want to disable it. But I recommend against using Legacy FileVault in any situation—and all the more so under Lion. So even though you *can* leave Legacy FileVault active when you upgrade, *please don't*.

# Decide between In-place Upgrade and Clean Install

In my books about upgrading to Panther, Tiger and Leopard, this was the point where I'd describe the three methods the installer could use (Upgrade Mac OS X, Archive and Install, and Erase and Install) and explain which method was best in which circumstances. Since all those options disappeared as of 10.6 Snow Leopard, I'm recasting the decision you have to make into a simple binary choice:

- **Plan A: In-place Upgrade:** This easy, default method is appropriate for most people, with some qualifications.
- **Plan B: Clean Install:** Although the installer no longer offers a radio button labeled Erase and Install, 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.

---

***New Mac?** If your “upgrade” involves not only upgrading a new Mac to Lion but also moving 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, the Lion installer will run Setup Assistant to transfer files from your old Mac or PC to your new Mac. However, if the new Mac contains important software that you would be unable to 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 Lion. In both cases, for best results, read [Migrate to a New Mac](#) before you begin installing.*

---

# Make Final Preparations

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

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## Obtain the Installer

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Depending on your situation, obtaining the Lion installer may be a trivial matter of a few clicks, or it may be an involved ordeal. Let's start with the easiest case first.

### Buy Lion on the Destination Mac

If you're running the latest version of Snow Leopard and have a broadband Internet connection that can handle a 4 GB download, obtaining Lion is easy—it's just like buying any other app:

1. Click the App Store icon in your Dock, click Featured, and locate OS X 10.7 Lion (which should be displayed rather prominently), or find it through <http://itunes.apple.com/us/app/os-x-lion/id444303913?mt=12>.
2. Click the price (\$29.99), followed by Install.
3. Enter your Apple ID and password, and click Sign In.

The Lion installer downloads to your `/Applications` folder—a process that could take anywhere from minutes to days, depending on the bandwidth of your broadband connection. The installer's icon appears in your Dock before the download is completed, and you'll see a bar on the icon gradually fill as the download proceeds, though it may take a while before you can discern the bar.

After it downloads, the installer launches automatically.

But we're not ready to install Lion quite yet, so choose Install Mac OS X Lion > Quit Install Mac OS X Lion to quit the installer for the time being; we'll return shortly!

# Upgrade Using Plan B: Clean Install

If you want the possibility of a cleaner installation of Lion than what an in-place upgrade provides—specifically, getting rid of any disk errors and having 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 you back to earlier discussions for some of the details. The differences come at the beginning (erasing your disk manually first) and the end (using Setup Assistant to configure numerous settings on your Mac and, optionally, transferring data from your bootable duplicate).

---

## Start Up from Your Bootable Duplicate

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Unlike Plan A’s in-place upgrade, Plan B requires three things:

- You must erase the destination volume first. But you can’t erase the volume Mac OS X is currently running from, so you must start up from another volume.
- You’ll need access to the Lion installer too, of course, so it’ll be easiest if the volume you start up from already contains the installer.
- Once Lion 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.

So to meet all of the above criteria, I assume in these directions that you’re using a bootable duplicate of a *Snow Leopard* volume. (Since you can’t run the Lion installer from a bootable duplicate of a Leopard or Tiger volume, anyone wanting to take a shortcut directly from one of those older cats to Lion while performing a clean install should read the sidebar [Plan B-and-a-Half](#), ahead.)

# Perform Post-installation Tasks

If everything has gone as expected, your Mac is now successfully running Lion. (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. Once you're finished with these simple tasks, I'll direct you to read Matt Neuburg's [Take Control of Using Lion](#), which picks up where I leave off and helps you learn about Lion's updated interface, new features, customization options, and more.

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## Wrangle Spotlight

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In most cases, as soon as Lion starts up the first time, Spotlight begins indexing (or re-indexing) all the files on all mounted volumes. This process can take anywhere from a few minutes to several hours, depending on how many files you have and the speed of your CPU and disk. During this time, you'll notice a lot of disk activity (along with, perhaps, somewhat sluggish overall performance), and you'll see a pulsing dot in the center of Spotlight's magnifying glass icon on the right side of your menu bar. (Clicking this icon during indexing displays an estimate of the time remaining for each volume.)

I don't know about you, but I find it mighty annoying to cope with a pokey Mac just at the time I'm eager to try out all the spiffy—but resource-intensive—features of my new operating system. If you feel the same way, you can *temporarily* disable Spotlight indexing long enough to set things up the way you like them and play with your new system a bit, and then turn it back on when you're ready to step away from your Mac for a few hours.

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***In the Spotlight:*** *And I do recommend leaving Spotlight enabled under normal circumstances—many features throughout Lion, including searching in Mail, rely on an up-to-date Spotlight index.*

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# 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.

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## Can't Run the Lion Installer...

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

- You're trying to run it on a Mac whose CPU is incompatible with Lion (such as a 2006-vintage, Core Duo Mac mini—see [Processor Support](#) for full details). Solution: Buy a new Mac. (Sorry.)
- You're trying to run it on a Mac that is booted under Leopard or Tiger. Solution: Boot from a Snow Leopard or Lion volume (if you have one), buy Apple's Lion installation thumb drive when it's available, or [Make a Bootable Lion Installer Volume](#).
- The installer didn't fully download, or the file was damaged. Solution: Delete the installer, open the Mac App Store application, click Purchased, and download it again.

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## Can't Select Installation Volume...

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

# Install Lion Server

For years, Apple has shipped two separate versions of Mac OS X—the standard version most people use, and a server version. Of course, any Mac can act as a server; just look at the Sharing pane of System Preferences and you'll see how easy it is to activate a simple file server, print server, Web server, and more.

Mac OS X Server takes these capabilities much further, expanding them with options a business might need to support hundreds or thousands of users—and adding more services, including email, iCal, iChat, and virtual private networks. Previous versions of Mac OS X Server, focused as they were on the needs of businesses and other large institutions, were also prohibitively expensive for ordinary users—and quite complex to set up and administer.

Lion Server changes all that. It costs only \$49.99 (in addition to the cost of Lion itself) rather than hundreds or thousands of dollars. And its completely rethought user interface makes it much easier to configure and use. As a result, professional server capabilities are now within the reach of mere mortals.

So, I thought it only right to give you a taste of Lion Server here. In this brief chapter, I walk you through installation and a few basic setup options. Even though Lion Server is much easier to use than earlier big cat servers, complete instructions for using it would run hundreds of pages—and that's not the point of this book. But if you're interested in running Lion Server, this will get you started.

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**Server to server:** *This chapter assumes you're installing Lion server for the first time on a Mac that didn't previously have a version of Mac OS X Server installed. Although it's certainly possible to upgrade from, say, Leopard Server or Snow Leopard Server to Lion Server, I don't cover that scenario in this book.*

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After you've installed Lion—it's a prerequisite—you can return to the Mac App Store to purchase, download, and install Lion Server. Follow these steps:

1. Click the App Store icon in your Dock, click Featured, and find OS X 10.7 Lion Server (it should be shown prominently), or go to <http://itunes.apple.com/us/app/os-x-lion-server/id444376097?mt=12>.

# Migrate to a New Mac

Every time I write a book about upgrading to a new big cat, a few people invariably write to ask why I didn't explain how to upgrade to a *new Mac*. In the past, I've always said that wasn't what I meant by "upgrade"—the purpose of my *Upgrading* books was to explain how to install a newer version of Mac OS X on an existing Mac. If you buy a new Mac and move over your old applications and data, that's not upgrading—it's *migrating*, because your new Mac already contains the latest and greatest (or nearly so) version of Mac OS X.

But, I get it: it *feels* like upgrading, because yesterday you were using a Mac running an old version of Mac OS X and by the end of the day today you want to be using a Mac running a new version. Fine! You've talked me into it! If you are, or are about to be, the proud owner of a new Mac and you want to know how to get your old files onto it, you've come to the right place.

And, with the advent of Lion, Apple's Migration Assistant utility can help you with not only upgrading from an old Mac to a new one but also from a Windows PC to a Mac. I talk about both options in this chapter.

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## Understand Migration Concepts

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Let me begin by taking a bit of the mystery out of this whole migration thing. Migration is a fancy word for *copying*—a familiar, ordinary, everyday tasks that shouldn't seem in any way daunting. Whenever you make a backup, you copy stuff from one place to another; same thing when you share files over a network. You have stuff on your old computer, and you're going to copy it onto your new one. No big deal.

Migration essentially involves two parts:

- Making a connection between the new Mac and the old computer so they can talk to each other. This can be a simple matter of having them on the same wireless or Ethernet network, or stretching a FireWire cable between them. If you can't do either of those things, you can often copy everything from the first computer's disk onto an intermediate external hard drive and plug that into the new Mac.

# Use Recovery Mode

Recovery mode is a brand-new feature in Lion that lets you recover data (hence the name), perform disk maintenance, or even reinstall Lion without having a bootable DVD or external drive. It's both cool and useful—but it's not foolproof, and it has some rather surprising characteristics. In this chapter I discuss what it is, what it can and can't do, and how to use it. We begin with the mysterious hidden volume that makes this magic possible.

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## Get to Know the Recovery HD Volume

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Assuming everything works as it should—and, specifically, that you're using one of the officially sanctioned volume structures as I discussed in [Why to Avoid Extra Partitions](#)—the Lion installer creates a special, hidden partition on the same disk where you install Lion itself. This partition contains a bootable volume called Recovery HD. Ordinarily you'll never mount or use this volume directly; instead you'll invoke the magic procedure to reboot your Mac from the Recovery HD volume, as I describe just ahead in [Boot into Recovery Mode](#).

I know that a lot of people are concerned that Lion is using up vast amounts of precious disk space with this odd partition they might never need. But take heart: it's quite small—only 650 MB, in fact. On the other hand, if you're of a more geeky disposition and dream of co-opting this partition for your own purposes, I've got some bad news. It's read-only, so you can't make any changes, including installing any extra third-party software of your own. Nor can you delete it (without repartitioning your whole disk)—Apple did some seriously weird stuff to put this little bugger in place. Of course, that also means that even if you accidentally wipe out everything on your startup disk, the Recovery HD volume should still be there, which will give you a platform from which you can get back to work.

Alert readers may have noticed that you're supposed to be able to reinstall Lion from this volume—and yet the Lion installer is almost 4 GB while this volume is only 650 MB. Something doesn't add up! The Recovery HD volume does contain an application that *looks* like the Lion installer, but it's only about 14 MB in size. That doesn't mean

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## About the Author

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Joe Kissell is Senior Editor of *TidBITS*, a Web site and email newsletter about Apple and the Internet, and the author of numerous print and electronic books about Macintosh software, including [Take Control of Mac OS X Backups](#) and [Take Control of Maintaining Your Mac](#). He is also a Senior Contributor to *Macworld*, was the winner of a 2009 Neal award for Best How-to Article, and has appeared on the MacTech 25 list (the 25 people voted most influential in the Macintosh community) since 2007. Joe has worked in the Mac software industry since the early 1990s, including positions managing software development for Nisus Software and Kensington Technology Group.

In his increasingly imaginary spare time, Joe likes to travel, cook, walk, and practice t'ai chi. He lives in Paris with his wife, Morgen Jahnke,

their son, Soren, and their cat, Zora. To contact Joe about this book, send him email at [jwk@me.com](mailto:jwk@me.com) and include [Take Control of Upgrading to Lion](#) in the subject so his spam filters won't intercept it. Better yet, if appropriate, post your question publicly in our forums at <http://www.getsatisfaction.com/takecontrolbooks/>.



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This book has been brought to you by the letter L and the numbers 10 and 7.

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## Shameless Plug

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Although I write about computers as my day job, I have a great many other interests, which I write about on several Web sites, including [Interesting Thing of the Day](#) and my personal blog. You can find links to all my sites, a complete list of my publications, and more personal details about me at [JoeKissell.com](http://JoeKissell.com). You can also follow me on Twitter ([@joekissell](#)).

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## About the Publisher

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Publishers Adam and Tonya Engst have been creating Apple-related content since they started the online newsletter TidBITS, in 1990. In TidBITS, you can find the latest Apple news, plus read reviews, opinions, and more (<http://tidbits.com/>).

Adam and Tonya are known in the Apple world as writers, editors, and speakers. They are also parents to Tristan, who thinks ebooks about clipper ships and castles would be cool.



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