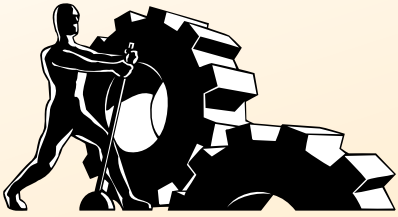


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Read Me First

Welcome to *Take Control of VMware Fusion 2*, version 1.0, published in November 2008 by TidBITS Publishing Inc. This book was written by Joe Kissell and edited by Tonya Engst.

VMware Fusion is a powerful and convenient tool for running Windows or other operating systems on a Mac. This book teaches you all the fundamentals of Fusion, as well as tips and tricks to get the most out of running Windows on your Mac.

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BASICS

In reading this book, you may get stuck if you don't know certain fundamental facts about using your Mac or if you don't understand Take Control syntax for things like working with menus or finding items in the Finder. Keep reading to learn about these basics, and pay special attention to the information about right clicking, since it covers the best way to do so not only on the Mac but also in Fusion's virtualization environment.

Note: I cover basic terminology and concepts relating to Fusion and virtualization in [Understand Fusion Basics](#) (p. 11).

Menus

Where I describe choosing a command from a menu in the menu bar, I use a compact description. For example, to create a new virtual machine in Fusion, you choose New from the File menu; I abbreviate this by saying “File > New.”

Finding an Application's Preferences

I often refer to preferences in an application that you may want to adjust. Don't confuse an application's preferences with the system-wide settings found in System Preferences.

To access an application's preferences, choose *Application Name* > Preferences. For example, in VMware Fusion, you would choose VMware Fusion > Preferences. Within some applications, all preference controls appear in a single window. In others (including Fusion), a row of buttons is located across the top. In those cases, click a button to display a pane with that category of preferences. Instead of providing detailed directions each time, I may use an abbreviated notation such as “go to the General preference pane.”

Paths

I occasionally use a *path* to show the location of a file or folder in your file system. For example, Mac OS X stores most utilities, such as Terminal, in the Utilities folder. The path to Terminal is:
[/Applications/Utilities/Terminal](#).

The slash at the start 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 a user's home directory. For example, if a person with the user name `joe` wants to install fonts that only he can access, he would install them in his `~/Library/Fonts` folder, which is another way of writing `/Users/joe/Library/Fonts`.

Windows uses a different convention for paths, so in cases where I'm talking about files in Windows, I start from the hard drive letter (usually `C:`) and use backslashes instead of regular slashes—like so: `C:\Documents and Settings\Joe Kissell`.

Note: In either Mac OS X or Windows, when typing a path that includes spaces, you should enclose the entire path in quotation marks: `"C:\Documents and Settings\Joe Kissell"`. Alternatively, in Mac OS X, you can precede each space with a backslash and skip the quotation marks: `/Users/jk/My\ Folder/My\ Document`.

Right-Clicking

In Mac OS X, when you hold down the Control key and click your mouse button, a pop-up *contextual menu* appears, with commands appropriate to whatever is under the pointer. For example, if you Control-click on a file in the Finder, you'll see commands such as Get Info, Duplicate, and Make Alias. Although Control-clicking nearly always works to open a contextual menu, your mouse or trackpad might support a better method:

- **Multi-button mouse:** If you have a multi-button mouse (such as an Apple Mighty Mouse), you can click the right mouse button ("right-clicking") to display the same menu, assuming you've set the right button to Secondary Button in the Mouse view of the Keyboard & Mouse pane of System Preferences. (You can also set a different button to produce a secondary click, if you prefer.)
- **Mac notebook:** If you have a Mac notebook computer, you can configure the trackpad to display contextual menus when you tap with both fingers, or when you put two fingers on the trackpad and click the button. To configure this setting, open the Trackpad view of the Keyboard & Mouse preference pane. If Clicking is selected (meaning you can tap on the trackpad to click), check Tap Trackpad Using Two Fingers for Secondary Click. Otherwise, check For Secondary Clicks, Place Two Fingers on the Trackpad Then Click the Button.

Some newer Mac notebooks (released starting in October 2008) have a glass multi-touch trackpad without a separate button. On these computers, you configure trackpad behavior in the Trackpad pane of System Preferences. To display a contextual menu with a single click, check the Secondary Click box under “One Finger,” and choose either Bottom Right Corner or Bottom Left corner. Press the trackpad in the selected corner with one finger to display a contextual menu. Instead or in addition, you can check Secondary Click under “Two Fingers,” in which case pressing anywhere on the trackpad with two fingers displays a contextual menu.

Windows, too, has contextual menus accessed with a right click. (All mice included with Windows PCs—in fact, virtually all non-Apple mice—have at least two buttons.) In Fusion, you can execute a right click even if your mouse has only one button—Control-click, just as in Mac OS X, and Fusion translates that into a Windows right-click.

In this book, when I tell you to “right-click” in Windows, that means click the right mouse button if you have one (or whichever button you’ve designated as “secondary”); Control-click if you have a desktop Mac with a one-button mouse; or, on a notebook Mac, use the gesture(s) you’ve configured in the Keyboard & Mouse preference pane or the Trackpad preference pane.

Introduction

As an enthusiastic Mac user for many years, I'd developed a common habit. Every time I heard of some fantastic program that's available only for Windows, I scowled and grumbled, miffed at the fact that we Mac users had been marginalized yet again. Mac OS X may be the superior operating system, but my Windows-using friends could still do cool things with their computers that I couldn't do with mine—I didn't like that one bit.

My, how times have changed. Today, I can run virtually any Windows program on my Mac as easily as I run native Mac software. For that matter, most Linux/Unix programs run beautifully too. In fact, my biggest problem is breaking that old habit. I still have an impulse to cringe when I see "Windows XP or later" as a system requirement, but then I remember: I have an Intel-based Mac. I have the power.

Maybe it's a Web site using ActiveX controls that work only in the Windows version of Internet Explorer. Maybe it's a Microsoft business application that was never ported to Mac OS X. Or maybe it's an obscure, one-of-a-kind shareware program. Whatever the case, I don't sweat it. It'll work. Everything works. This magic resulted from Apple's choice to switch to Intel processors, which turned out to be a brilliantly shrewd move.

Apple provides its own way to install Windows on your Mac—Boot Camp, included as part of Mac OS X 10.5 Leopard. It works well, but it's awkward in that you must restart your computer to switch operating systems. You can't run a Mac application at the same time as a Windows application, and sharing information between the two platforms is cumbersome at best.

This is where virtualization software like VMware Fusion comes in. It lets Windows run at near-native speeds right alongside Mac OS X on your Intel-based Mac. Not only do you avoid the inconvenience of rebooting and gain easy file sharing, you can also even make Windows itself effectively disappear so the only traces of Windows you see are your Windows applications themselves. In fact, that's just the start of

the ways in which you can integrate Windows and Mac OS X, for a truly seamless environment that can run just about anything.

VMware Fusion isn't the only way to do this. Parallels Desktop was the first competitor in this category, and a less-powerful but free program, VirtualBox (now owned by Sun), also lets you run Windows under Mac OS X. (I cover both of these alternatives, as well as Boot Camp, in my book *Take Control of Running Windows on a Mac*.)

Regardless of the virtues of other approaches to running Windows on a Mac, the book you're now reading focuses entirely on VMware Fusion 2. (By the way, the program's official, trademarked name is "VMware Fusion," but for simplicity I refer to it throughout this book simply as "Fusion" or, in some cases, "Fusion 2.") My goal here is not to provide a comprehensive reference guide, but rather to help you make the most of Fusion by focusing on the most common, important, and interesting tasks you're likely to perform. By the time you've finished with this book, you should know how to create that magical combination of Windows and Mac OS X that lets you run nearly any software on either platform with equal ease.

As you may know, Fusion supports lots of operating systems—not just Windows. Although I mention some of these (particularly Linux and Mac OS X Server) from time to time, I assume that Windows is what most readers are interested in and direct my attention accordingly.

I should also mention that Fusion includes some fantastically powerful command-line tools for power users. Great as they are, I say little about them (except for [Appendix B: Fusion for Propellerheads](#)) because I assume most people with the geeky disposition to use those tools can also figure out how to use them on their own.

If you need help beyond what's in this book, you have several options:

- While running Fusion, choose Help > VMware Fusion Help.
- Visit the Fusion User Forums at <http://communities.vmware.com/community/vmtn/desktop/fusion>.
- Search the VMware Knowledge Base at <http://kb.vmware.com/>.

Feel free to write to me at jwk@me.com with comments about this book, but please understand that I'm unable to provide personal technical support.

Fusion Quick Start

For the most part, this book progresses from basic material through more advanced topics. So to get the most out of this book, and of Fusion, I recommend working through each section in order. At the very least, read [Understand Fusion Basics](#) and [Use Windows in a Virtual Machine](#) before delving into later sections.

Get started:

- Learn how virtualization works and some of the common terms Fusion uses; see [Understand Fusion Basics](#) (p. 11).
- Get Fusion—and Windows (or another operating system of your choice) up and running on your Intel-based Mac; see [Install Fusion and Windows](#) (p. 18). You can also [Use a Boot Camp Partition in Fusion](#) (p. 32). And for Linux details, see [Installing Linux](#) (p. 33).
- Find out how to use Windows from within Mac OS X; see [Use Windows in a Virtual Machine](#) (p. 34).

Customize and maintain your virtual machines:

- Select the best options for file sharing, RAM usage, and tons of other settings; see [Configure Virtual Machine Settings](#) (p. 55).
- Keep Windows safe from malware, user error, and data loss; see [Protect Your Virtual Machine](#) (p. 89).

Go beyond the basics:

- Import a Windows installation from Boot Camp, another virtualization program, or a PC; see [Move to Fusion from Another Environment](#) (p. 104).
- Simplify repetitive installations of Windows; see [Appendix A: Create a Slipstream Installer Disc](#) (p. 109).
- Use Mac OS X Server in a virtual machine and discover the new Fusion command-line tools; see [Appendix B: Fusion for Propellerheads](#) (p. 118).

Understand Fusion Basics

You'll have an easier time using Fusion if you start with a bit of background about how it works, what terminology it uses, and how it can interact with Apple's Boot Camp software. I describe all these things in the next few pages.

WHAT IS VIRTUALIZATION SOFTWARE?

Virtualization software, such as Fusion, provides a way for one operating system to work within another, while directly accessing the same CPU (central processing unit) most of the time. (By contrast, *emulation* software simulates a different type of CPU, resulting in much slower performance because of the constant need to translate instructions.) When such software is running, the environment it creates for another operating system (OS) is called a *virtual machine*, and an operating system that runs inside that virtual machine is called a *guest* operating system, in order to distinguish it from the main OS that the computer is running, called the *host* operating system.

Virtual Machines

Even though Intel Macs have the same type of CPU as PCs, you still need a virtual machine to run Windows within Mac OS X. One reason is that apart from the CPU, there are other hardware differences between Macs and PCs and thus other hardware components that must be *emulated* (simulated in software). Another reason is that Windows expects to have direct access to your hardware, but the host OS (Mac OS X in this case) controls the hardware. A virtual machine tricks the guest OS into believing it has direct access to the machine's CPU and other hardware, and it emulates any physical devices—such as sound cards—that might be different between platforms.

Each guest operating system that you install requires its own virtual machine. If you want, you can install several different operating systems or several instances of the same operating system; you can even run multiple virtual machines at the same time. Fusion gives you the choice to run each virtual machine in its own window, in full-screen mode, or in Unity view, which means the Windows Desktop disappears

and windows from your Windows applications act more or less like windows from Mac applications (see [Use Unity View](#) for details.)

Fusion's Virtual Machine Library window displays a list of all the virtual machines you've configured and lets you change a wide variety of settings for each one, such as the amount of RAM they use and how networking is configured. With only a few exceptions, these settings can't be changed while the guest operating system is running.

Virtual Disks

When you set up a new virtual machine, Fusion also creates a special disk image file. When you run Windows, it will see this file as a separate disk. All your Windows files are installed in this virtual disk, but when you're running Mac OS X you won't see the individual files inside; it looks and acts like a single file. You can move this file to another disk or another Mac running Fusion, and the virtual machine runs just as it did on the original Mac.

Note: With Boot Camp volumes, which I discuss just ahead, the virtual disk is simply a pointer to your Boot Camp partition.

By default, Fusion gives each new virtual disk for Windows XP or Vista a 40 GB capacity (although the disk image file starts out much smaller). The disk size can grow to accommodate more files up to the maximum size you set, though of course not beyond the amount of free space on your real disk.

Note: Snapshots, which I discuss later (see [Save and Restore Your Windows State with Snapshots](#)), can increase the amount of real disk space used beyond the maximum capacity you set for your virtual disks.

Real and Virtual Hardware

A big challenge for any virtualization software is enabling communication between the guest operating system and the computer's hardware—including built-in devices (such as graphics cards and network adapters) and external devices (printers, external hard drives, and the like). I want to explain a bit about how Fusion handles this challenge so you'll understand what hardware will and won't work under various conditions—and why.

Drivers and Emulated Hardware

When an operating system is running directly on a computer (such as your regular installation of Mac OS X or a Windows installation running under Boot Camp), it can access all your hardware directly. In general, each device needs a *driver*—a piece of software that knows the device’s capabilities and lets it communicate with your operating system. Both Mac OS X and Windows include built-in drivers for hundreds of common devices, from keyboards to printers, so you can use most hardware without having to install extra software. For third-party devices that can’t use built-in drivers, manufacturers generally offer their own drivers, typically on a CD packaged with the product or as a free download.

But things are different in a virtual machine, because both the host operating system and the guest system need access to some of your hardware. For example, you must use your mouse in Mac OS X to operate Fusion itself (among other things), while the copy of Windows running in Fusion also needs to respond to mouse movement and clicks. But of course you wouldn’t want to switch to a different mouse when you’re running Windows, so Fusion takes your mouse data from Mac OS X and passes it through to Windows.

In some cases, Fusion emulates a particular type of hardware (say, a floppy drive or serial port) that isn’t physically there, and Windows obligingly uses an appropriate built-in driver to access that virtual hardware. In other cases, no existing driver enables proper communication between Windows and Fusion’s emulated hardware, so Windows needs special, Fusion-specific drivers.

VMware Tools

Fusion’s collection of drivers is included in a software package called VMware Tools. This software not only handles all the basic hardware functions (such as sound and video), but also lets Windows do fancy things like share files with your Mac OS X host operating system, adjust its display resolution automatically when you resize your Fusion window, and much more. Because these drivers make using Windows (or Linux) a vastly better experience, you should always be sure to install them. When you set up a new virtual machine using the Easy Install method, Fusion installs VMware Tools for you automatically; otherwise, you can install it manually by choosing Virtual Machine > Install VMware Tools.

Although VMware Tools contains drivers for Fusion’s emulated hardware, it doesn’t include drivers for some custom Apple hardware that may be built into your Mac. To use such hardware (including your iSight camera and Apple Remote) in Windows, you must install Apple’s drivers, which are included with Boot Camp—see [Install Boot Camp Drivers](#) for instructions.

Sharing vs. Taking Turns

Regardless of what drivers you have installed, most of your hardware can be used by only one operating system at a time. For example, your Mac’s SuperDrive can only be used either by Mac OS X or by Windows—but not both at once, because the drive can’t work correctly if two different operating systems are giving it competing instructions. The same goes for most USB and Bluetooth devices. As a result, you must configure your virtual machine to use (or ignore) certain hardware, or use controls in Fusion to manually connect or disconnect devices as the need arises. (I say more about this topic in [CD & DVD Settings](#), [USB Device Settings](#), and [Connect and Disconnect Devices](#).)

FireWire Devices

FireWire devices present an entirely different challenge. For complex technical reasons, Fusion can’t take over or even “listen in on” your Mac’s FireWire devices, even if you have the proper drivers installed. (Neither can Parallels Desktop, by the way.) So as far as Windows is concerned, any FireWire devices you’ve may have installed are completely invisible.

This need not be a problem with FireWire hard drives, because you can work around the lack of FireWire support by sharing the drives (see [Sharing Individual Folders](#) for instructions). Likewise, if you have a FireWire printer that works in Mac OS X, you can share that printer with your virtual machine (as I describe in [Printer Settings](#)).

But other than that, FireWire is unfortunately a non-starter in Fusion. FireWire scanners, cameras, audio interfaces, and other gadgets that work great in Mac OS X won’t show up at all in Windows.

WHAT IS BOOT CAMP (AND WHY SHOULD YOU CARE)?

Fusion and other virtualization programs provide one way to run Windows on your Mac. Apple provides a different one—Boot Camp, software that's part of Mac OS X 10.5 Leopard. With Boot Camp, you divide your hard disk into two volumes: one for Mac OS X and all your Mac applications and data, and the other for Windows. To switch between operating systems, you must restart your Mac.

Apple provides drivers that give Windows access to some Mac-specific hardware features such as the built-in iSight camera (on portable Macs and iMacs) and the Apple Remote, but other than a few such niceties, your Mac running Windows via Boot Camp is, for all practical purposes, just another Intel-based PC.

The nice thing about Boot Camp is that it gives Windows full, direct access to your hardware—100 percent of your CPU power, RAM, graphics card, and network bandwidth, for example, go to Windows. In fact, some tests have shown that certain Mac models can run Windows under Boot Camp faster than PCs with similar specs. In Boot Camp, Windows can also use any FireWire devices you may have installed. By contrast, when using Fusion, Windows must share resources with Mac OS X, potentially making both somewhat slower and less efficient, and limiting the kinds of hardware you can use.

The downside of Boot Camp is that you must always make a choice to run one operating system or the other. Let's say you're developing a Web site using Dreamweaver or BBEdit in Mac OS X and you want to test the site, as you go, in Internet Explorer 6 for Windows. To do this, you must open the Startup Disk pane of System Preferences, select your Windows volume, restart your computer, and run Internet Explorer. Then, you have to repeat a similar procedure to restart in Mac OS X to make any changes...and repeat this over and over again. That's extremely time-consuming and awkward. Likewise, sharing files between the two operating systems may (depending on several variables) require jumping through a number of hoops.

As a result, Boot Camp works best for situations in which your use of Windows is entirely separate from your use of Mac OS X. For example, if you plan to play a resource-intensive Windows-only game (and do

nothing else) for a few hours, rebooting into Windows is no big deal, and Boot Camp will give you the best possible performance. But if you want to use Mac and Windows programs side-by-side or switch between them frequently, Boot Camp isn't what you want.

So why, as a Fusion user, should you care about all this?

Fusion offers two ways to work with Boot Camp. First, you can use Fusion to run the copy of Windows you've already installed under Boot Camp—and switch back and forth at any time between the two ways of running that copy of Windows. Second, if you think the benefits of Fusion outweigh the benefits of Boot Camp sufficiently that you'll never want to boot directly into Windows again, you can convert your Boot Camp installation into a virtual disk and then remove it—thus freeing up considerable space on your hard disk.

I tell you this now because once you install and configure Windows (along with your Windows software and documents), you'd most likely prefer not to repeat the process. So if you haven't yet installed Windows and think Boot Camp might be useful to you, you should install Windows there rather than on a virtual disk. But that choice may not be as straightforward as it sounds; read on for help making the decision.

DECIDE WHETHER (OR HOW) TO USE BOOT CAMP WITH FUSION

Fusion gives you three main options with respect to running Windows under Boot Camp:

- **Ignore Boot Camp:** If you aren't using Boot Camp now, and if you don't plan to use any Windows applications that need every last ounce of CPU power and RAM your Mac has (or direct access to FireWire devices), you'll be happiest ignoring Boot Camp altogether. Just install Windows conventionally under Fusion (see [Create a Virtual Machine in Fusion](#)) and go on your merry way. But bear in mind that Fusion offers no way to move a copy of Windows from a virtual disk to a Boot Camp volume—if you later decide you want to use Boot Camp after all, you'll have to reinstall Windows there from scratch.

- **Use your Boot Camp volume in Fusion:** If you've already installed Windows in Boot Camp—or if you know you'll need to—you can simply configure Fusion to use your Boot Camp installation and decide, on any given occasion, whether you want to run Windows within Fusion or by rebooting. However, be aware of some downsides to this approach:
 - ◇ Windows is significantly slower to start up and shut down in Fusion when running from a Boot Camp partition than when running from a disk image. So, using a Boot Camp volume in Fusion is more appropriate for occasional use than regular, repeated use (in which case installing Windows on a virtual disk is the better approach).
 - ◇ Several nifty Fusion features are unavailable when running a Boot Camp installation of Windows in a virtual machine. You can't take snapshots or use AutoProtect; you can't suspend and resume the virtual machine; and you can't mirror folders between Windows and Mac OS X.

Note: I cover how to use a Boot Camp Windows installation under Fusion in [Use a Boot Camp Partition in Fusion](#).

- **Migrate your Boot Camp volume to a virtual disk:** If you have Windows installed in Boot Camp, you can move that installation over to a Fusion virtual disk with very little effort—and then, once you're satisfied that it's running correctly—delete your Boot Camp partition, freeing up the disk space it was using. (For instructions, see [Import a Boot Camp Volume](#).)

Having trouble deciding? In my opinion, the convenience of using Windows without rebooting overwhelmingly outweighs the minor speed boost I get by using Boot Camp. Although installing Windows under Boot Camp and running it in a Fusion virtual machine may seem like the best of both worlds, my experience has been that Windows works far better when running from a virtual disk than a Boot Camp partition. After trying it both ways for a while, I finally gave up on Boot Camp altogether and imported my erstwhile Boot Camp volume into Fusion. So unless you're absolutely certain that you need something you can get only in Boot Camp—and few people do—my counsel is to stick with a virtual disk.

Install Fusion and Windows

Getting Windows up and running under Fusion can be even easier than doing so on a PC. Simply follow the steps in this section. However, if you want to do something special with the way you install Windows, you may need to refer to a different area of this book:

- To [Use a Boot Camp Partition in Fusion](#), skip ahead to the last topic in this section (p. 32).
- To upgrade from an older version of Fusion, read the sidebar [Upgrade from Fusion 1.x](#) (p. 24).
- To use an existing Windows installation created under Parallels Desktop, Virtual PC, or on an actual PC, see [Move to Fusion from Another Environment](#) (p. 104).
- For a few notes on installing Virtual Appliances, consult [Use Virtual Appliances](#) (p. 125).

COLLECT THE INGREDIENTS

Before you can begin setting up Windows under Fusion, you must have the necessary hardware and software.

An Intel-based Mac

If you have a Mac with an Intel processor (in other words, any model introduced in 2006 or later), you can run Fusion. Needless to say, the faster your processor(s) and the more cores you have, the better your performance will be, but even a slow, single-core Intel-based Mac can get the job done.

The 64-bit question: *To run Mac OS X Server or any 64-bit version of Windows under Fusion, you must have a Macintosh with a 64-bit processor (meaning, at the moment, a Core 2 Duo or Xeon processor).*

Use Windows in a Virtual Machine

Now that Windows is installed, you can run it almost as if you were using a PC. In this section, I walk you through the highlights of Fusion's interface—how you run and manage your virtual machines. I also discuss how to avoid some of the confusion that can occur when running two operating systems at the same time, especially when they have different expectations about basic things like mouse and keyboard behavior.

Although I focus on Windows in this section, most of what I describe here is equally true of other operating systems you may install in Fusion, especially Linux (in that Linux, like Windows—but unlike other operating systems—supports Unity view).

Tip: If, as you're using Fusion, anything seems not to work quite right, check to see if it's mentioned in the list of Known Issues in Fusion's release notes (http://www.vmware.com/support/fusion2/doc/releasenotes_fusion.html#issues).

LEARN YOUR WAY AROUND

Most of the time you spend working in Fusion will involve just two windows: the Virtual Machine Library, in which you can select, run, and modify virtual machines, and the main Fusion window that contains Windows (or the operating system of your choice) while it's running.

The Virtual Machine Library

Fusion's Virtual Machine Library window (**Figure 3**) lists all your virtual machines. (If it's not visible, choose Window > Virtual Machine Library to display it.) It gives you a central location where you can run them and change their settings, as well as create and delete virtual machines.

Configure Virtual Machine Settings

Each virtual machine that you create in Fusion (one per installation of Windows or other operating system) can have a wide variety of settings, affecting such features as file sharing with Mac OS X, use of system resources, and hardware configurations. In addition, Fusion has some global preferences that affect how all virtual machines behave. I cover these settings in the next several pages.

SETTINGS OVERVIEW

To adjust settings for a virtual machine, select the virtual machine in the Virtual Machine Library and click the Settings button at the bottom of the window. The Settings window (**Figure 11**) appears. If your virtual machine is running or suspended, this window shows a thumbnail on the left. Click a category to change its settings.



Figure 11: The Settings window. Click a category to configure its settings for the selected virtual machine.

Protect Your Virtual Machine

As a Mac user, you've probably never lost any sleep over viruses, Trojan horses, worms, spyware, adware, and all the other nasty stuff known collectively as *malware* (that is, malicious software). Such programs are few and far between on Mac OS X, but they're a gigantic problem on Windows. Now that you're running Windows, you have to worry about malware too, especially since a program could conceivably cause damage not only to your Windows partition (or virtual disk) but also to your Mac files. You can learn more about malware in Wikipedia: <http://en.wikipedia.org/wiki/Malware>.

One way to protect Windows is to check your security settings and make sure anti-malware software is installed. Fusion offers another layer of protection, too, in the form of snapshots that can restore Windows to an earlier state (for example, before virus damage occurred).

In addition, you should have a plan for backing up your Windows software and documents. In some situations, your existing Mac backup system may do the trick, but you should know about some hidden pitfalls and how to work around them—you may want to choose a different backup method altogether.

KEEP WINDOWS SAFE FROM MALWARE

Preventing attacks by malware (and repairing the damage they've caused) is a large and complex subject that could easily fill several large books. In this section, I want to outline just the basics, acquainting you with some of the most important steps you should take to protect your computer and a few good tools to help you.

Apply Windows Updates

In addition to major updates like service packs, Microsoft releases numerous smaller updates that fix bugs, plug security holes, and make Windows more resistant to malware. You should install these as soon as possible after installing Windows (and configure Windows to download and install new updates automatically as they appear). By default,

Move to Fusion from Another Environment

Installing Windows takes some time, and once you've downloaded dozens of software updates, added your own programs, and customized everything to your liking, the prospect of rebuilding all of that from scratch is unpleasant at best. So if you've already invested that effort on a Windows setup in another environment—Boot Camp, Parallels Desktop, Virtual PC, or a stand-alone PC—Fusion provides an easy way to import your entire existing Windows installation.

IMPORT A BOOT CAMP VOLUME

If you already have Windows running in Boot Camp (whether or not you've used that installation of Windows in Fusion), you can convert it to run from a virtual disk instead. As I described in [Decide Whether \(or How\) to Use Boot Camp with Fusion](#), doing this conversion not only lets Windows run side-by-side with Mac OS X, it also gives you access to more Fusion features (such as snapshots) and enables you to free up some of the disk space currently occupied by your Boot Camp partition.

Space: the intermediate frontier: Ironically, although switching from Boot Camp to a virtual machine ultimately reduces your disk space requirements, you need extra space to start with. To follow these steps, you should have at least as much free space on your disk as the size of your Boot Camp volume. You'll get much of that back after you deactivate Boot Camp.

To convert a Boot Camp partition to a virtual machine, follow these steps:

1. In Fusion's Library window, select your Boot Camp volume and click the Import button at the bottom of the window. Enter your administrator password when prompted.

Appendix A: Create a Slipstream Installer Disc

If you plan to install Windows just once and use it indefinitely, you can skip this appendix—the normal way of installing Windows, described earlier, will work just fine. However, if you expect to install Windows repeatedly in a virtual machine (say, for testing software under a variety of conditions), you can make your life easier by creating a customized Windows installation CD or DVD—or what’s commonly referred to as a *slipstream* disc.

This disc can contain not only Windows itself, but service packs, software updates, drivers, preset options (such as your Product Key, user name, and password), and other user preferences. Once these pieces are integrated into your new slipstream disc, you can install a customized version of Windows very quickly, without waiting for downloads and updates to complete each time.

Before we get to the instructions, I should mention that you can find dozens of different methods on the Web for creating slipstream installers. This is just one of many, but I like it because it’s easy, flexible, and fast, and it produced good results for me.

PREPARE YOUR COMPUTER

As always, you must assemble certain ingredients and configure your computer properly before proceeding. Follow these steps:

1. Run Windows in a Fusion virtual machine.
2. If your existing Windows installer disc does not already have the latest service pack (as of October 2008, that’s SP3 for Windows XP or SP1 for Vista), I strongly recommend obtaining it and integrating it into your slipstream installer:
 - You can download Windows XP Service Pack 3 from <http://www.microsoft.com/downloads/details.aspx?FamilyID=5b33b5a8-5e76-401f-be08-1e1555d4f3d4&DisplayLang=en>.

Appendix B: Fusion for Propellerheads

Fusion was designed to be easy for ordinary folks to use, without requiring any technical expertise. Because this book is geared toward a general audience, I've steered clear of the geekier features that would appeal mainly to system administrators, IT personnel, and those of a more technical bent who just like to fiddle. Nevertheless, if you are such a person, Fusion 2 contains a great many obscure but delightful capabilities you may want to explore.

In this appendix, I discuss mounting virtual disks in the Finder (when Fusion isn't running) and installing Mac OS X Server as a guest operating system. I also provide a brief overview of Fusion's command-line tool, `vmrun`, which lets you perform (and even script) nearly any Fusion action without touching the graphical user interface. Finally, I talk about Virtual Appliances.

Tip: To learn about many more of Fusion's extra-geeky features, check out a Web page in the Fusion forum called "A Power User's Guide to VMware Fusion," written by Fusion developer Eric Tung (<http://communities.vmware.com/docs/DOC-1201>).

MOUNT VIRTUAL DISKS IN THE FINDER

In some situations, you may want to get at files on your Windows volume when Windows is not running. Sure, you could launch Fusion and then open your virtual machine, but that may take longer than you have—especially if you're running numerous other programs on your Mac that are already maxing out its RAM and CPU. Once you've installed Fusion 2, you can make use of a shortcut that lets you mount your Windows virtual disk even if Fusion isn't running.

There are two catches, though. First, the virtual machine whose disk you're opening must be shut down, not suspended. (If the virtual machine is suspended, you'd have to launch Fusion and open the

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In his increasingly imaginary spare time, Joe likes to travel, cook, and practice t'ai chi. He lives in Paris with his wife, Morgen Jahnke, and their cat, Zora. To contact Joe about this book, send him email at jwk@me.com and be sure to include the words *Take Control of VMware Fusion 2* in the subject of your message.

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SHAMELESS PLUG

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](#).

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