Parallels Software International, Inc.

Parallels Desktop for Mac

User Guide

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CHAPTER 1

Introduction

This chapter provides common information on the virtual machine technology that is used by Parallels® Desktop and will familiarize you with the main characteristics of a virtual machine created by Parallels Desktop.

In This Chapter

Virtual Machine Technology and Key Terms

Virtual machine (VM) technology provides the following main features:

- Enables multiple guest operating systems (OSes) and their applications to simultaneously run on a single computer.

- Creates a number of virtual machines, each with a full set of standard virtual hardware. Operating systems and applications are isolated inside these virtual machines and share physical hardware resources.

- Offers an opportunity to switch between operating systems without rebooting and to consolidate and virtualize a computing environment, resulting in reduced hardware costs, lower operating expenses, and increased productivity.

For more on virtual machine configuration refer to Inside a Virtual Machine (on page 9) and Understanding Virtual Machine Configuration (page 36) sections.

Primary operating system (primary OS) denotes the operating system that controls the I/O devices of the computer and that loads when the real computer is turned on.

Guest operating system (guest OS) is an operating system that runs under virtual machine control. One primary OS and multiple guest OSes can be run at the same time on a single real computer.

About Parallels Desktop

Parallels® Desktop is the most powerful, easy-to-use, cost-effective desktop virtualization solution available today. It empowers any user, from experienced professional developers to sales executives and casual home users, with the ability to create completely networked, totally secure independent virtual machines on a single physical machine.

Parallels Desktop is powered by a lightweight hypervisor, a thin layer of software that is between part of the host computer's hardware and the primary operating system. The lightweight hypervisor controls some of the host computer's hardware resources, resulting in dramatically more stable, more secure, and higher-performing virtual machines.

Parallels Desktop's sophisticated virtualization engine enables each virtual machine to operate identically to a stand-alone computer. Each virtual machine works with its own processor, RAM, floppy, CD and DVD drives, I/O devices, and hard disk – everything a physical computer contains. See Inside a Virtual Machine (on page 9) for the full list of Parallels virtual machine devices.

Intel virtualization technology (VT-x) is fully supported by Parallels Desktop. See Intel Virtualization Technology (VT-x) Support (page 8).

Parallels Desktop has a set of special tools (utilities and drivers) that enhances the performance and functionality of your guest operating system (mouse synchronization tool, clipboard synchronization tool, etc.). See Parallels Tools Overview (page 64) for the full list of tools and their descriptions.

Intel Virtualization Technology (VT-x) Support

Intel Virtualization Technology (VT-x), which is incorporated in the newest Intel processors, provides enhancements implemented into processor architecture that are specially designed for platforms running multiple operating systems. VT-enabled processors facilitate more efficient virtual machine partitioning and more precise virtual processor simulation. An extended set of processor instructions performs on a hardware level tasks previously realized programmatically, thus reducing virtualization overhead and improving virtual machine performance, security and stability. To learn more about Virtualization Technology see the Intel site http://www.intel.com/technology/computing/vptech/.

Intel Virtualization Technology is fully supported by Parallels Desktop. If Parallels Desktop detects a VT-enabled CPU, support is automatically turned on if it is not blocked in BIOS. VT-x support can be manually enabled or disabled through a virtual machine configuration setting available in the VM Flags (page 97) section of **General Options**. If you run a guest OS with VT-x enabled, the **Virtualization Mode** flag in the **About Parallels Desktop** screen shows *Intel VT-x*. See the More Information (page 140) section of the **About Parallels Desktop** screen.

Inside a Virtual Machine

As we mentioned earlier, virtual machines work just like a stand alone computer. Each VM contains the following hardware:

- CPU Intel Pentium;

- Generic motherboard compatible with Intel i815 chipset;

- RAM up to 1500 MB;

- VGA and SVGA with VESA 3.0 support;

- 1.44 MB floppy drive mapped to an image file;

- Up to four IDE devices, that may be either virtual hard drives (from 20 MB up to 128 GB each, mapped to image file), or CD/DVD-ROM drives (mapped to physical drive or to image file), or both hard drives and CD/DVD-ROM drives;

- Ethernet virtual network card compatible with RTL8029. Parallels Desktop for Mac supports bridging to wireless network adapters;

- Up to four serial (COM) ports (mapped to a socket or to output file);

- Up to three bi-directional parallel (LPT) ports (mapped to output file);

- 2-port USB 1.1 controller;

- AC'97-compatible sound card. Sound recording is supported;

- A standard PC keyboard;

- A PS/2 wheel mouse.

Supported Guest Operating Systems

The current version of Parallels Desktop officially supports the following guest operating systems:

Microsoft Windows Guest Operating Systems:

- Windows Vista
- Windows Server 2003 Standard Edition SP0
- Windows Server 2003 Standard Edition SP1
- Windows Server 2003 Enterprise Edition SP0
- Windows Server 2003 Enterprise Edition SP1
- Windows Server 2003 Web Edition SP0
- Windows Server 2003 Web Edition SP1
- Windows XP SP2 Professional
- Windows XP SP2 Home
- Windows XP SP1 Professional
- Windows XP SP1 Home
- Windows XP SP0 Professional
- Windows XP SP0 Home
- Windows 2000 Professional Edition SP4
- Windows 2000 Server SP4
- Windows 2000 Advanced Server SP4
- Windows NT Workstation 4.0 SP6
- Windows NT Server 4.0 SP6
- Windows ME
- Windows 98
- Windows 95
- Windows 3.11
- Windows 3.1

Linux Guest Operating Systems:

- Red Hat Enterprise Linux WS4
- Red Hat Enterprise Linux AS4
- Red Hat Enterprise Linux WS3
- Red Hat Enterprise Linux ES4
- Red Hat Enterprise Linux ES3
- Red Hat Linux 9
- Red Hat Linux 8

- Red Hat Linux 7.3
- Debian Linux 3.1
- Fedora Core Linux 4
- Fedora Core Linux 3
- SUSE Linux 10
- SUSE Linux 9.3
- SUSE Linux 9.2
- SUSE Linux 9.1
- SUSE Linux 9.0
- Mandriva Linux 10.1
- Mandriva Linux 10
- Mandriva Linux 9.2

FreeBSD Guest Operating Systems:

- FreeBSD 5.4
- FreeBSD 5.3
- FreeBSD 4.5
- FreeBSD 4.1

OS/2 and eComStation Guest Operating Systems:

- OS/2 Warp 4.5
- OS/2 Warp 4
- OS/2 Warp 3
- eComStation 1.2
- eComStation 1.1

Sun Solaris Guest Operating Systems:

- Solaris 10
- Solaris 9

MS-DOS Guest Operating Systems:

- MS-DOS 6.22

Opening Parallels Desktop Help

To open this guide, select **Help**->**Contents** in the Parallels Desktop menu.

A `.pdf` version of this guide is included with this Parallels Desktop distribution. You can find it in the `Parallels-Desktop-XXXX-Mac.dmg` file.

Context-Sensitive Help

To access help topic that directly relates to the Parallels Desktop window you are currently working with, press `F1` on your keyboard.

Some windows, such as **Configuration Editor** and **Preferences**, contain **Help** buttons that open the appropriate topic.

Other Guides

There are two more guides provided with Parallels Desktop:

Parallels Desktop Quick Start Guide, a small guide that describes how to create your very first virtual machine, available via **Help**->**Quick Start** menu command and in the `Parallels-Desktop-XXXX-Mac.dmg` file.

Parallels Desktop Getting Started Guide, a little more extended one in comparison with Quick Start Guide, intended for newbies in virtualization. This guide is available in the `Parallels-Desktop-XXXX-Mac.dmg` file.

C H A P T E R 2

Installing Parallels Desktop

In this chapter you'll learn how to install Parallels Desktop on your Mac.

In This Chapter

System Requirements

Note. Before installing the product, please make sure your computer meets the hardware and software requirements described in this section.

Hardware Requirements

In order to install and successfully run Parallels Desktop you should have:

- An Intel-powered CoreDuo or CoreSolo Mac Mini, iMac, MacBook, MacBook Pro or Mac Pro.
- A minimum of 512MB of RAM. 1GB recommended.
- 40,5MB of available hard drive space for Parallels Desktop installation, plus sufficient space to allocate to virtual machines. 15GB of hard drive space is recommended. See also Planning Parallels Desktop Installation below to get an idea where to install the program itself and where to put virtual machines.

Planning Parallels Desktop Installation

The current version of Parallels Desktop can only be installed on the Mac OS X booting volume. Parallels Desktop installation takes small part of disk space while virtual machines created by it require much more space. By default, Parallels Desktop is configured to place a new virtual machine into home directory of the user created it, which is also located on the booting volume. If you have other disk(s) or partition(s) in your Mac, you may select any of them for storing virtual machines.

So, if you want to store virtual machines on a non-booting volume:

1 Install Parallels Desktop.

2   In the installed application, select in menu Parallels Desktop->Preferences->Common. In the Common (page 77) tab, specify the preferred disk/partition and folder for storing virtual machines in the Default directory for storing virtual machines field.

Note. You can specify a folder for a virtual machine when creating it. An existing virtual machine can also be moved to a different folder after creation.

Software Requirements

Parallels Desktop can be successfully installed if you are running Mac OS X 10.4.6 or higher as your operating system. To check your version of Mac OS X, go to the Apple menu in the menu bar, and click About This Mac.

Mac OS X 10.5 (Leopard) is supported experimentally.

Installing Parallels Desktop

To install Parallels Desktop:

1   First, download the Parallels Desktop installation file from the Parallels site.

   ▪   To download a trial version, visit the Parallels Download Center http://www.parallels.com/en/download.

   ▪   To buy a full-scale version, visit the Parallels Buy Online page http://www.parallels.com/en/buyonline.

   Select the Parallels Mac package for downloading.

2   When the download is completed, double-click the `Parallels-Desktop-XXXX-Mac.dmg` file on your desktop to open the Parallels Desktop window. In this window, double-click the `Parallels-Desktop.pkg` icon to start installing.

3 In the Introduction screen click the Continue button.

4 In the Software License Agreement screen use the scroll bar to read the entire agreement. We recommend printing the license agreement for your records using the Print button or save for future reading using the Save button. When you are ready, click the Continue button.
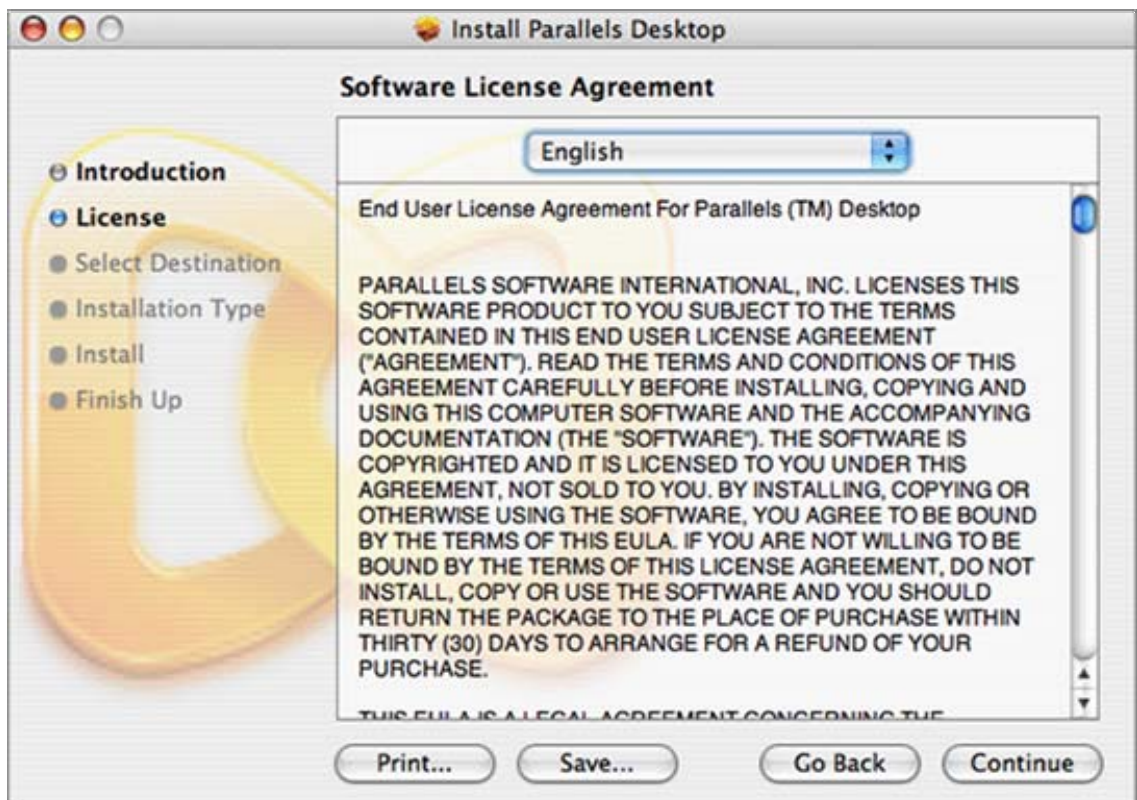
In the pop-up dialog, click the Agree button to continue installing.

To continue installing the software, you must agree to the terms of the software license agreement.

Click Agree to continue or click Disagree to cancel the installation.

(Disagree)   (Agree)

5 Next you'll see the Select a Destination screen. Currently you can install Parallels Desktop only on the same disk with Mac OS X, so select this disk. Other disks (if actually you have more than one) will be disabled for selection. Click Continue.

Install Parallels Desktop

Select a Destination

Select a destination volume to install the Parallels Desktop software.

⊖ Introduction
⊖ License
⊕ Select Destination
● Installation Type
● Install
● Finish Up

Macintosh HD
148GB (10.6GB Free)

Installing this software requires 30.8MB of space.

You have chosen to install this software on the volume "Macintosh HD."

(Go Back)   (Continue)

6 If you are satisfied with the destination entered, click Install to start the Parallels Desktop installation.

Note: Of course, you can return to the previous steps by clicking the Go Back button at any time.
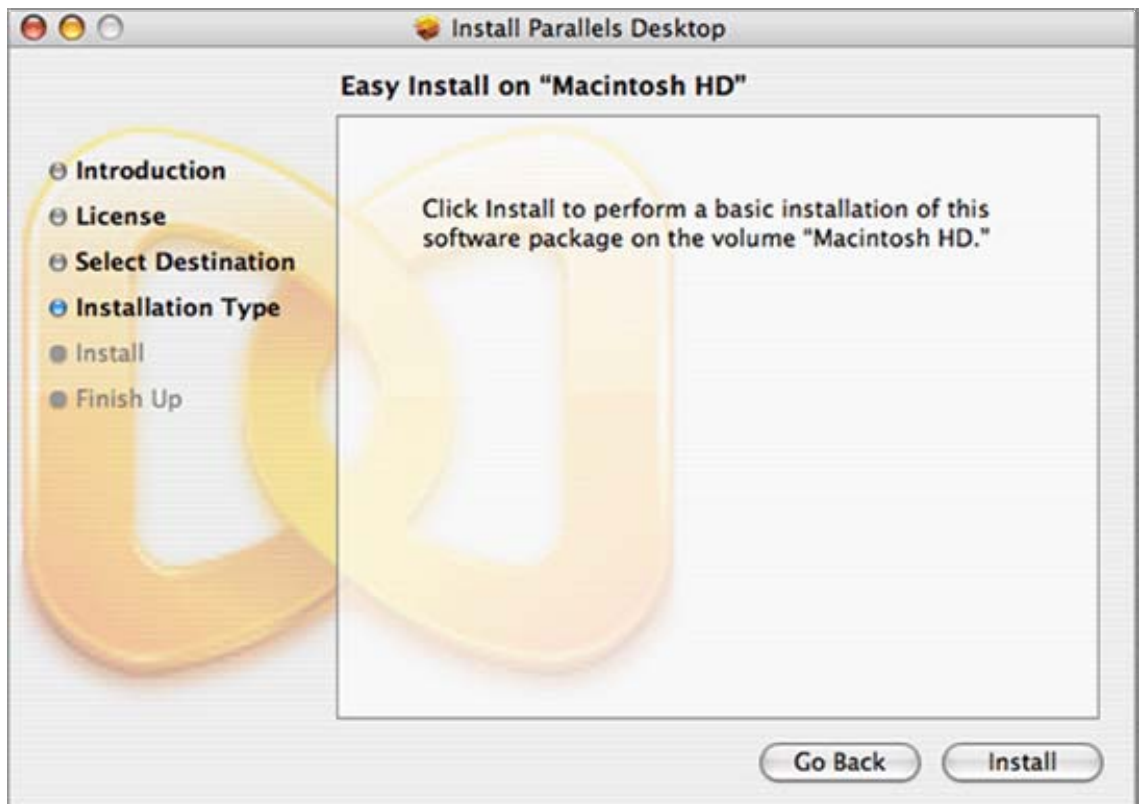
7 Installation progress is shown in the Installing Parallels Desktop window.
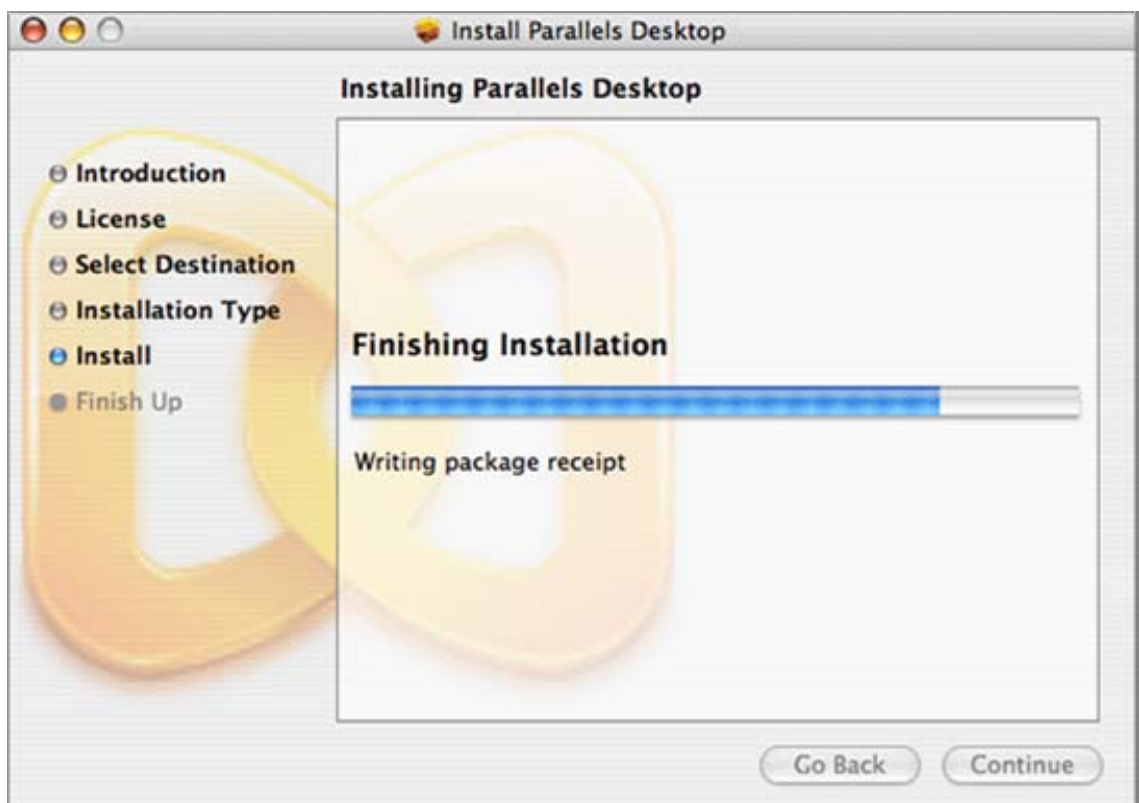
8   When Parallels Desktop is installed, the wizard displays its final screen. To complete the installation, click Close. Yes, it was that easy!
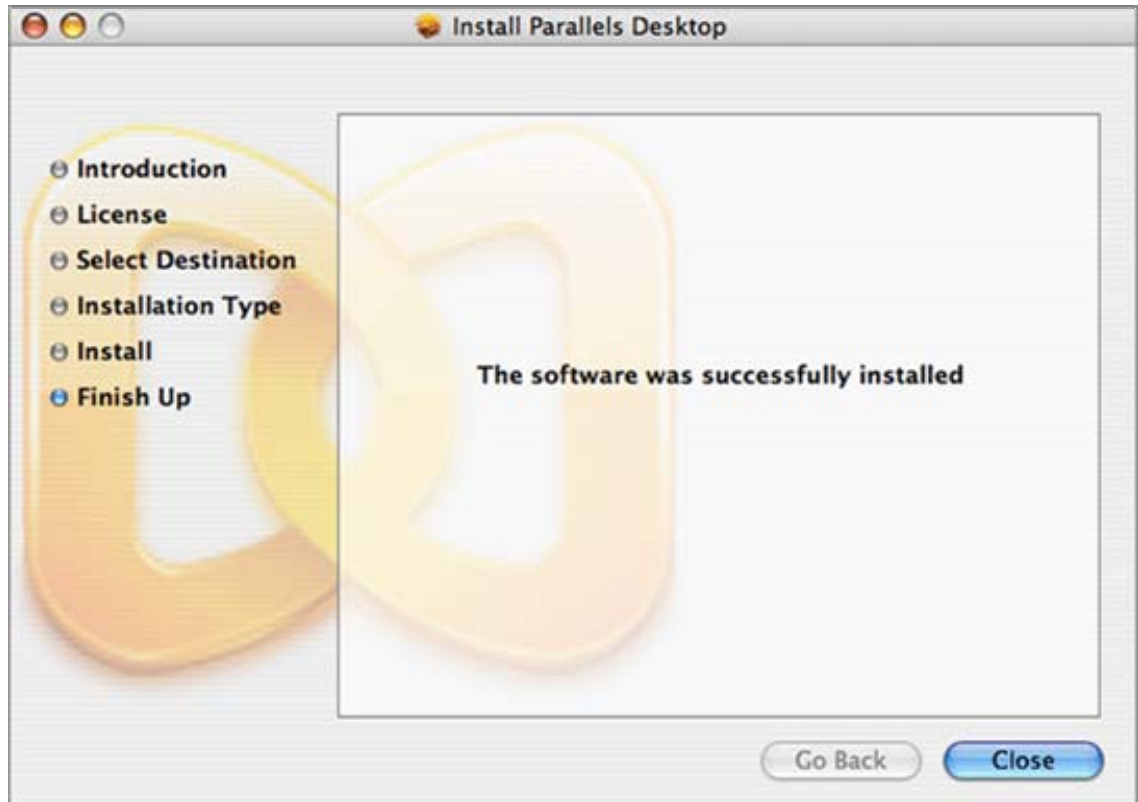
Starting Parallels Desktop

To start Parallels Desktop:

▪   In the Finder, open your Applications folder, and then double-click on the orange Parallels icon .

To save yourself from having to burrow into Applications every time you want to run the program, consider dragging its icon onto your Dock.

Activating Parallels Desktop

Getting an Activation Key

If you already have an activation key, skip this section and proceed to Activating Your Copy of Parallels Desktop below in this topic.

To get a free *trial activation* key:

1   Click Help in the menu and select Activate Product. This opens the Activate Product screen.

2   In the Activate Product screen, click the "obtain a free trial activation key" link in the License Information text to open the User Registration Form.

3   In the User Registration Form, specify your e-mail address and your name. Entering the name of your company is optional. Specify if you want news from Parallels to be sent to you through e-mail. We suggest allowing us to e-mail you in order for you to be informed of free software updates, new releases, and other Parallels-related news.

4   Finally, click the Register button to send this information to the Parallels Team. You will then have a free trial activation key sent immediately to the e-mail address you provided.

If you'd prefer, you may register online at the Parallels website as well. Click the Register On Site button at any time to proceed to the online registration. You will receive a free trial activation key through e-mail after completing the online form.

If your trial key has expired, or you're ready to start using Parallels Desktop with no time or feature restrictions, you'll need a *permanent* activation key. Here's how to get one:
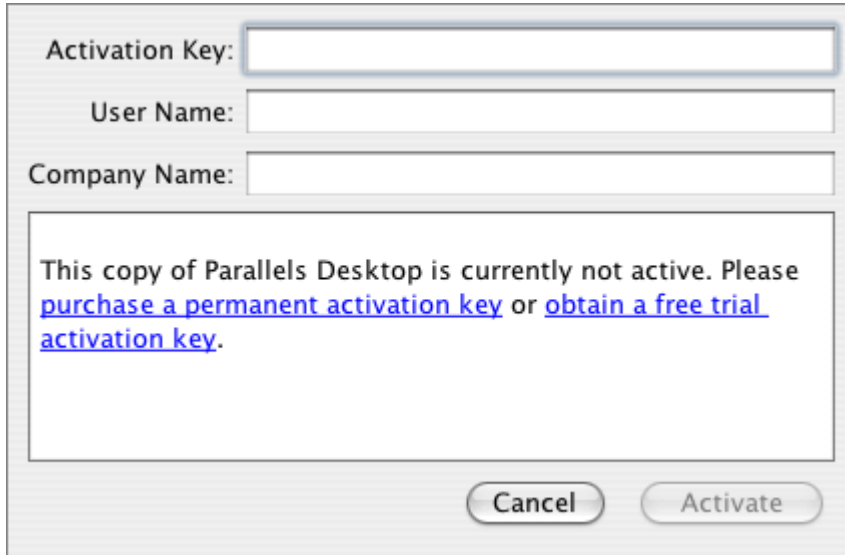
1   Click Help in the menu and select Activate Product. This opens the Activate Product screen.

2   In the Activate Product screen, click the "purchase a permanent activation key" hyperlink in License Information text to open the Parallels Online Store and purchase a permanent activation key. It's just that simple.

Activating Your Copy of Parallels Desktop

To activate Parallels Desktop, follow these easy steps:

1   Click Help in the Parallels Desktop menu and select Activate Product.

2   In the **Activate Product** window, fill in the following fields:

  ▪   In the **Activation Key** field type the key provided for you. When you fill in this field, the **Activate** button becomes active.

  ▪   Specify your name and name of your company in the **User Name** and **Company Name** fields. Both of these fields are optional.

After entering your activation key, click the **Activate** button. If you have entered a valid activation key, the following confirmation message will be displayed: `"Parallels Desktop has been activated successfully. Thank you!"` Now that your copy of Parallels Desktop is active, you can build, configure, and run virtual machines, congratulations!

If You Activated with a Permanent Key

After you have activated your copy of Parallels Desktop with a permanent activation key, you will be asked to register the next time you start Parallels Desktop. When you see the message shown below and click the **Register** button, the user registration online form will be opened in your Web browser. Please provide us with your contact information to receive notifications about our new updates and products.

Updating Parallels Desktop

Parallels Desktop includes an updating feature that helps you keep your Parallels Desktop installation up-to-date. To be able to use the update feature you Mac must be connected to Internet.

Update checks can be initiated either *automatically* or *manually*:

- We recommend that you turn on *automatic* update checking in order to be notified when an update is available. Parallels Desktop will regularly check the Parallels server in the background and will inform you only when an update is available.

- In addition to automatic checking, you may start the updater *manually* at any time.

Automatic Checking for Updates

System Requirements

To use the automatic checking for updates feature, your Mac should have:

- A stable Internet connection without firewall and/or antivirus software preventing Parallels Desktop from accessing the Internet.

Configuring Parallels Desktop

To configure Parallels Desktop:

1 Select **Help -> Check for Update** in the menu. You will see the following screen:

Current version: **2.1.1832**
Last check: **Thu May 25 13:53:31 2006 (0 day(s) ago)**
☐ Check for update automatically
Perform check every: 7 ⬍ day(s)
☐ Download updates in background
/Users/ms/Desktop ...
Check Now...   Cancel   OK
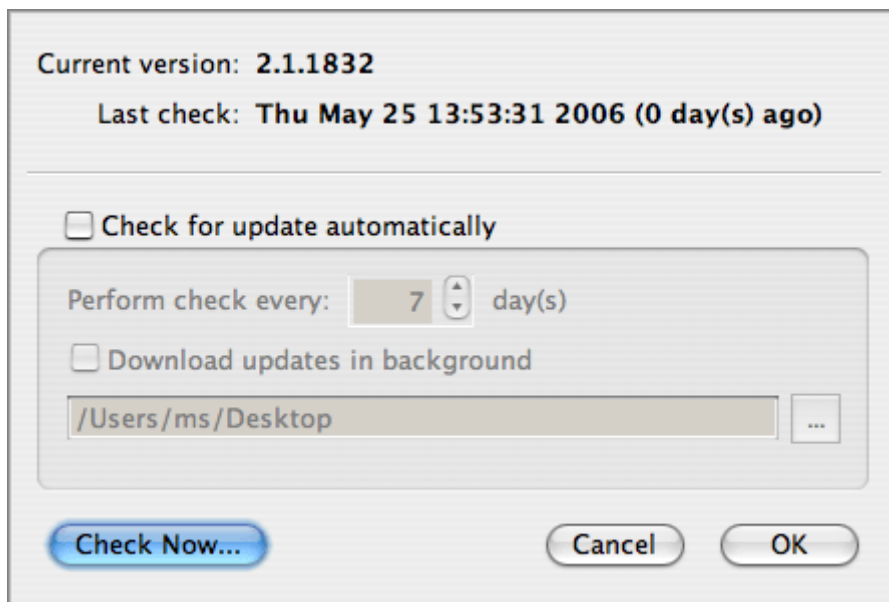
2 Select **Check for update automatically**.

3 Specify the frequency in the **Perform check every day(s)** field. With these options set, Parallels Desktop will access the Parallels server and notify you when an update is available.

4 If you want Parallels Desktop to automatically download the found update, select **Download updates in background** and specify the folder where updates will be placed.
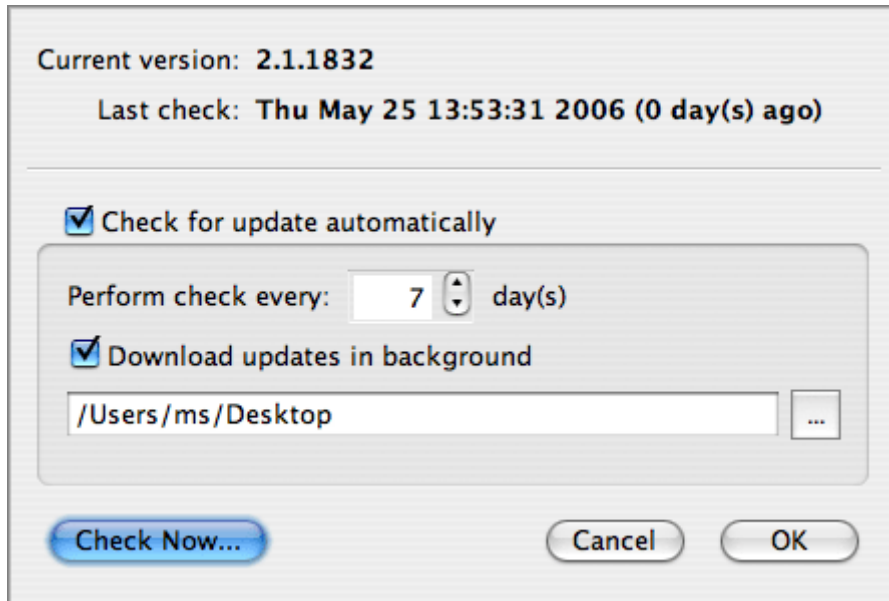
5 Click **OK** to close the screen and apply new settings.

After this:

- If you have not selected **Download updates in background,** you will be notified of an update found by the screen shown in step 3 of Manual Updating (page 22). To complete updating, follow the rest of the steps in this section.

- If you have selected to **Download updates in background,** you will be notified of an update downloaded by the screen shown in step 4 of Manual Updating (page 22). To complete updating, follow the rest of the steps in this section.

Manual Updating

1 In the menu select **Help -> Check for Updates**. You will see the following screen:
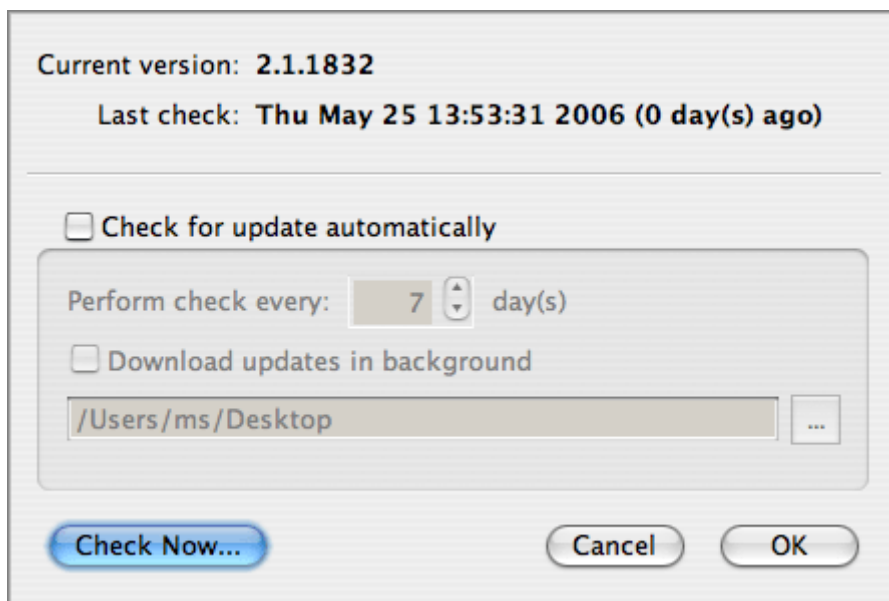
Settings on this screen are intended for auto-updating and are discussed in the previous topic, Auto-Updating Parallels Desktop (page 21).

To proceed with manual update click Check Now.

2 Updater accesses the server with Parallels Desktop updates and compares available updates with the installed version. If the wizard detects that the most recent version is installed, it shows the following screen:

Your version of the Parallels Desktop is up-to-date.

Click **OK** to return to the application.

OK
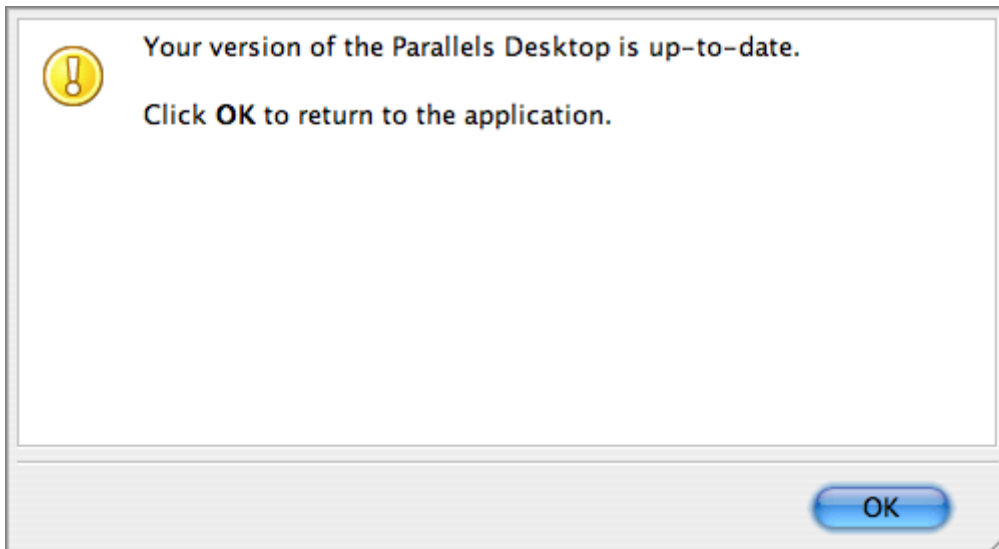
3 If the wizard finds a more recent version, the number of the newest version is displayed in the following screen. Click the Download button to start downloading.

See the table below for the list of updates available for Parallels Desktop. Click **Download** to begin downloading the selected update.

Update Title:

Name	Version	Size
Parallels Desktop (build 1832)	2.1.1832	19554Kb

Details:

Thank you for choosing Parallels Desktop.

Cancel   Download
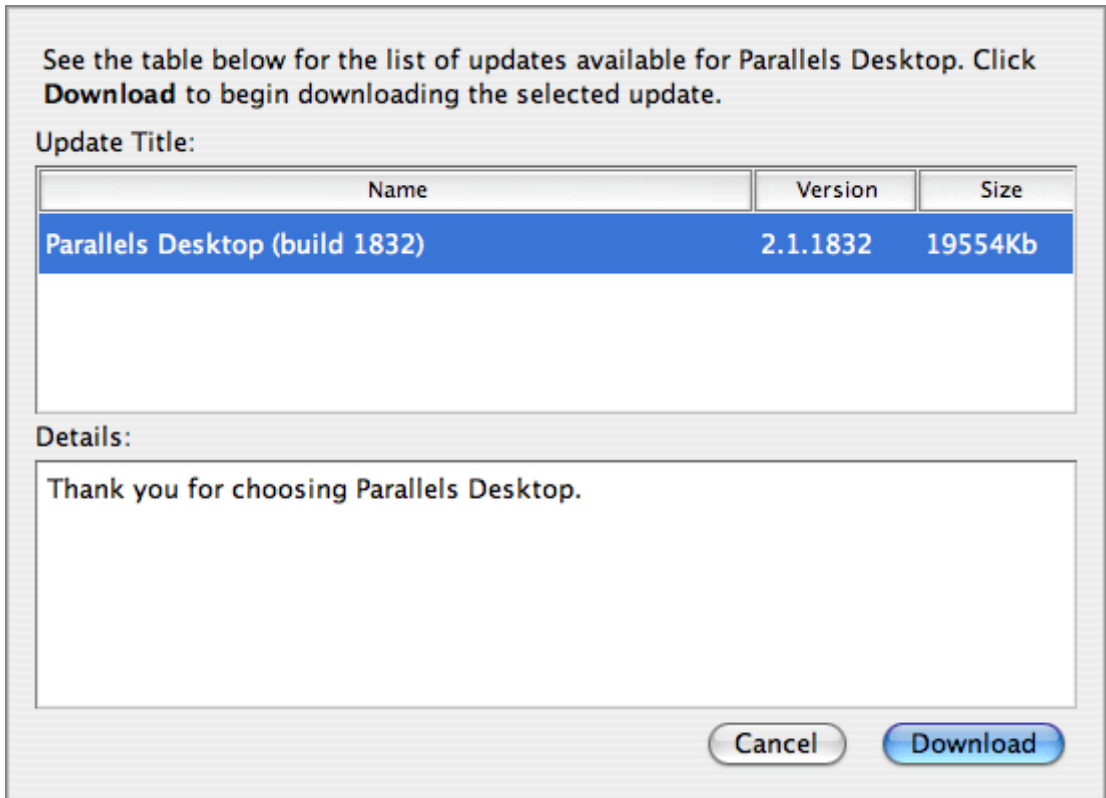
4 After the update is downloaded, you will see the following screen. To install the update, click Quit Application and follow the same steps as when Installing Parallels Desktop (on page 14).
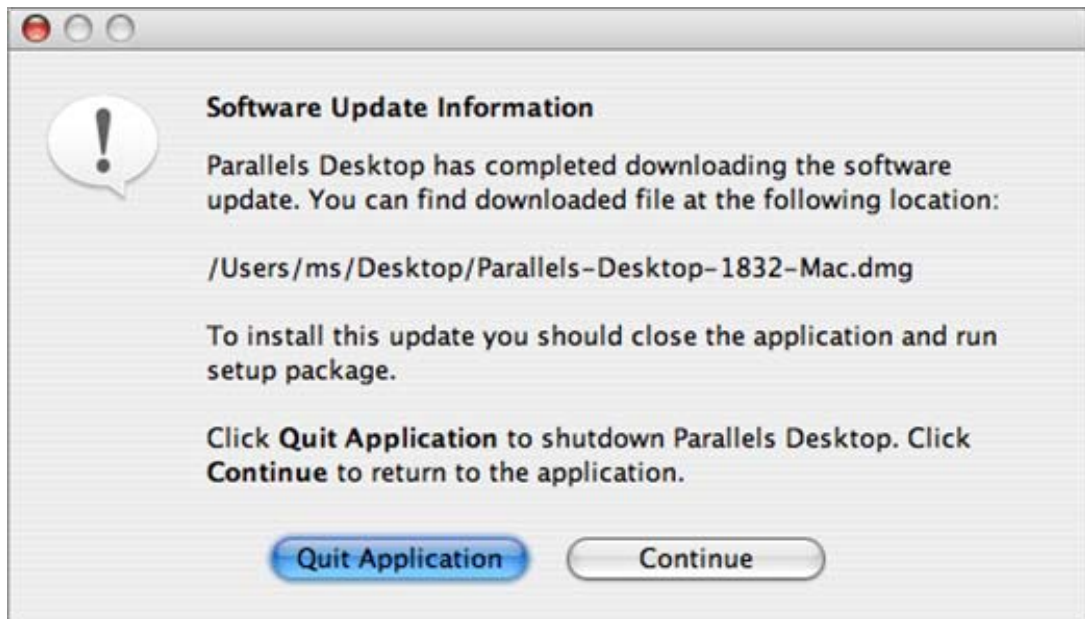
Uninstalling Parallels Desktop

To uninstall Parallels Desktop:

1 Open the `Parallels-Desktop-XXXX-Mac.dmg` file from which you installed Parallels Desktop.

2 Click the `Uninstall` icon. In the first uninstaller screen click the Continue button.

In the next screen click **Uninstall**.

3   Enter your password if you are asked for it and press `Enter` on your keyboard.

4   Uninstaller removes Parallels Desktop from your computer. When finished it displays the following screen. Click the **Finish** button.

C H A P T E R 3

Interface Basics

This chapter provides information about Parallels Desktop window and its controls.

In This Chapter

Main Window

The Parallels Desktop window displays an opened virtual machine and a set of visual controls for managing its behavior. If a virtual machine is not started, only its configuration and resources, i.e. connected devices, are seen. This is called *property page view*. See Property Page (page 29) to learn more about this. When you start the virtual machine, its console (page 31) is opened and acts as the display of a real computer.

The visual controls that help in managing virtual machine behavior are the:

- Parallels Desktop menu;
- Toolbar;
- Status bar.

The status bar is described in a separate topic; see Status Bar (page 32).

Toolbar

Toolbar buttons are used for controlling virtual machine especially when guest OS is running. See Starting Virtual Machine (page 146), Shutting Down and Resetting Virtual Machine (page 149), Suspending/Resuming Virtual Machine (page 150), Switching Virtual Machine to Fullscreen Mode (page 148), Console View (page 31), and Property Page (page 29) topics for explanations of the respective buttons.

Most of the toolbar buttons become active when you start the virtual machine. When the virtual machine is stopped, only the Power On Virtual Machine ► button is active letting you start the machine.

If you click a toolbar button it becomes visibly pressed reflecting the current virtual machine state. On the picture above, the Power On Virtual Machine ► and the Property Page View 🖼 buttons are pressed, that means firstly, the guest OS is running and, secondly, you are looking at the virtual machine's property page.

By default the toolbar is located at the top of the Parallels Desktop window. You may place it to the left or to the right of the window if you'd like. Parallels Desktop will keep this toolbar position next time you launch the system.

To change a toolbar position:

1   In the menu, select Parallels Desktop->Preferences to open the Preferences screen.

2   In the Preferences screen, select the User Interface tab (see the User Interface (page 82) topic).

3   In the User Interface tab, select the preferred position in the Toolbar placement option.

4   Click OK to activate settings.

If you don't see the toolbar in the Parallels Desktop window, do one of the following:

▪   Select View->Toolbar in menu. When toolbar is visible, this option is checked.

▪   Click the following button in the upper right corner of the Parallels Desktop window.

Property Page
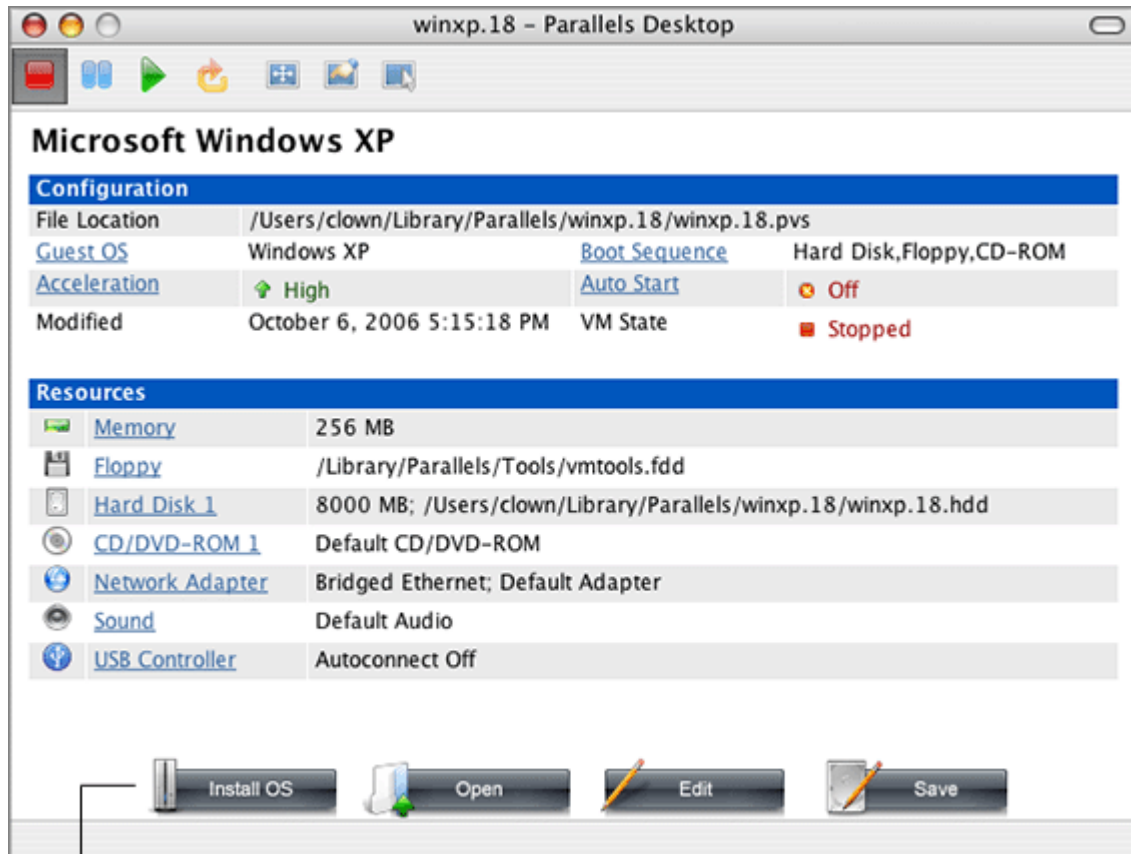
command buttons

When you open an existing virtual machine or create a new one its property page is displayed. The upper part of the page, Configuration, displays the virtual machine name, name of the configuration file with the path, and general VM settings: guest operating system type and version (regardless whether or not it is installed), acceleration level, last modification date, etc. These settings may be changed; and if you click on any of them, the Configuration Editor (page 94) will be opened on the appropriate page.

Note. The name of the virtual machine is not linked to the Configuration Editor, however it can be changed on the General Options (page 95) tab.

The Resources list shows all devices connected to the virtual machine and their current options. To edit any device simply click device name. The Configuration Editor will open the tab corresponding to that device.

The command button panel in the bottom of the property page contains buttons for creating a new virtual machine (page 35), browsing hard disk for a virtual machine to open (page 120), editing virtual machine configuration (page 94), and also saving an opened virtual machine configuration (page 94).

Parallels Desktop allows you to pick for the property page the text size that fits you the best. See Text Size (on page 33) for details.

When Running Guest OS

The property page remains available when a guest OS is running. You may open it to check the VM configuration. However, editing of the configuration is prohibited and the command buttons are disabled.

Console View

You interact with a running virtual machine via its console which is opened when you start the virtual machine (page 146). If you have a guest operating system installed it will be displayed on the console exactly as the primary OS is displayed in a real monitor. All toolbar buttons and many of the menu commands become active.

When a guest operating system is running, you can switch between the console and the property page. To switch to the property page while in the console view, do one of the following:

- click **Property Page View** ![icon] on the toolbar,
- select **Console View** in the **View** menu.

To return to console view while in the property page, do one of the following:

- click **Console View** ![icon] button,
- select **Console View** in the **View** menu.

Fullscreen Mode

Guest operating systems can be executed in fullscreen mode, when the Parallels Desktop menu, toolbar, and status bar are hidden. For detailed information see Switching Virtual Machine to Fullscreen Mode (page 148).

Console Screenshots

You can make screenshots of the console while the virtual machine is active. See Making Screenshots (page 34) for details.

Status Bar

The status bar displays information when virtual machine is running. Left part of the status bar displays prompts on the menu item currently pointed by cursor.

Each device (except memory) connected to the virtual machine is presented as an icon on the right side of the status bar.

The following devices have icons onto the status bar:

- hard disk ⬚,
- CD/DVD-ROM ◉,
- floppy disk drive ▣,
- network adapter ⬤,
- serial port ⬚,
- parallel port ⬚,
- sound device ⬤,
- USB controller ⬤.

When a device is involved in the current process, it is indicated by circle on its icon:

- green circle ⬤ when reading is being performed,
- orange circle ⬤ when writing is being performed.

If a device can be connected/disconnected when running a guest OS (actually most of the devices can be), these operations are executed using the device context menu. Click on the device icon to display its context menu and select the command you need. The picture below shows the context menu of the CD/DVD-ROM drive.
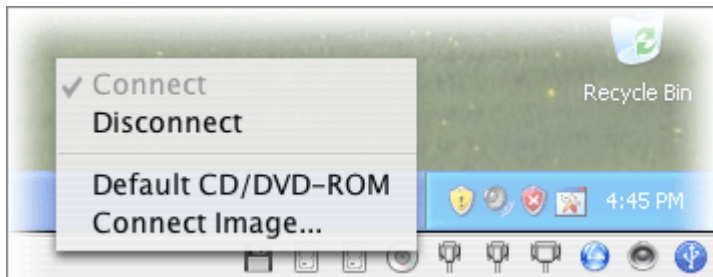
For more on this refer to the Working with Devices When Running a Virtual Machine (page 151) section.

If you don't see the status bar in the Parallels Desktop window:

- select View->Status Bar in menu. When status bar is visible, this menu item is checked.

Text Size

Parallels Desktop allows to adjust text size of the property page. Use View->Text Size-> Increase Text Size and Decrease Text Size commands. To return to initial text size click Reset Text Size command.

Making Screenshots

Parallels Desktop allows you to make screenshots of the guest operating system window when guest OS is running. Click Console Screenshot in the VM menu. Type or select a name and a directory to store the screenshot file. Parallels Desktop saves screenshots as .png files in a MAC primary OS.

C H A P T E R   4

Creating Virtual Machine

This chapter discusses the tasks you should perform when creating a new virtual machine.

In This Chapter

Overview of the Process

The process of creating a virtual machine consists of several steps. They are:

1 *Creating a virtual machine configuration.* It's like building a real computer hardware. This step is performed using OS Installation Assistant (page 38).

2 *Installing a guest operating system.* When you have got the computer's hardware, you need an operating system to control this hardware. For Windows XP and Vista virtual machines OS Installation Assistant creates a virtual machine configuration and installs an operating system for you automatically. For other guests OS Installation Assistant creates a VM and starts the installation that you continue by yourself. If you decide to skip this step see our notes on Installing Guest OS (page 60).

3 *Installing the Parallels Tools in the guest OS.* Tools are available for most of the Windows OSes and also for Solaris, OS/2, and eComStation. See Installing Parallels Tools (page 63).

After performing these steps you may proceed with "fine tuning" of the virtual machine such as setting up shared folders, creating custom screen resolutions, and installing applications.

Understanding Virtual Machine Configuration

Each virtual machine hardware configuration is defined by a special Parallels Desktop configuration file having the `.pvs` extension. It contains all the information about virtual devices attached to the virtual machine and files connected to it. In general, two files make up a virtual machine, a configuration file and a hard disk image file (several virtual hard disks can be attached). Other files may not be attached.

The following table explains all file types that may be related to a virtual machine:

`.pvs`	This is a virtual machine configuration file. One configuration file defines one virtual machine. One instance of Parallels Desktop can run only one opened configuration file, i.e. only one virtual machine. To run several virtual machines, you should launch several instances of Parallels Desktop. Typical configuration file can be easily generated using the OS Installation Assistant (page 38).
`.sav`	This is a virtual machine saved state file. This file is created when you suspend a virtual machine and contains the state of the guest OS and its applications in the moment when suspend was invoked. See Suspending/Resuming Virtual Machine (page 150) for more information.
`.hdd`	This is a virtual hard disk of a Parallels Desktop virtual machine. When you create a new virtual machine, the OS Installation Assistant prompts you to place a new virtual hard disk and `.pvs` configuration file into the same directory, however you may store these files in different folders. You may also attach an existing virtual hard disk to different virtual machines. More information about virtual hard disks can be found in the Hard Disk Images (page 86) topic.
`.iso`	This is a CD or DVD-ROM image file. `.iso` image files are treated by an operating system as real CD/DVD discs. More information about `.iso` images is given in the CD/DVD Real Discs and Images (page 92) topic.
`.fdd`	This is a floppy disk image file. `.fdd` image files are treated by an operating system as real floppy disks. More information about `.fdd` images is given in the Floppy Disk Images (page 92) topic.

`.txt`	Serial and parallel ports can be emulated via output `.txt` files. See Serial Port Options (page 110) and Parallel Port Options. (page 111)

Creating New Virtual Machine

This section discusses the process of creating a new virtual machine configuration.

OS Installation Assistant

OS Installation Assistant helps you to create a virtual machine and install guest OS. The assistant offers several installation modes. The appropriate mode should be chosen based on a user's experience with Parallels Desktop. Regardless of what method is selected, you will be able to change the configuration of a virtual machine later using the Configuration Editor (page 94).

Express Installation

This installation mode is available only for two guest operating systems: Windows XP and Windows Vista. OS Installation Assistant not only creates a virtual machine configuration, it automatically installs the chosen guest OS. It is the easiest way to get a new virtual machine. You only need to insert an installation disc with Windows XP or Vista into a CD/DVD-ROM. See Express Installation (page 39).

After the guest operating system is installed, OS Installation Assistant proceeds right to installing Parallels Tools (page 63), also unattendedly.

In this mode, virtual machines are created with typical configurations (see Typical Configurations (page 59) for details).

Typical Installation

Typical method is designed for new users and for fast virtual machine creation. When this method is chosen, you only need to specify a type/version of the guest operating system that will be installed, and where to store the virtual machine configuration file. OS Installation Assistant creates a virtual machine configuration and starts installation of the guest OS. See Typical Installation (page 44).

A virtual machine for the selected guest operating system is created with the most common parameters (see Typical Configurations (page 59) for details).

Custom Installation

Custom installation is intended for experienced users. It allows user to create configurations other than typical ones right from the beginning. When this installation mode is chosen, the user is asked to specify the amount of RAM, virtual hard disk parameters and networking parameters. Additional devices are added according to the same rules as in typical installation (see Typical Configurations (page 59) for details). After the OS Installation Assistant creates a virtual machine configuration, it starts installing the guest OS. See Custom Installation (page 48).

Express Installation

1   Start Parallels Desktop. Click the ⟦ Install OS ⟧ button or select New OS Installation in the File menu. The OS Installation Assistant's Welcome screen appears. Click the Next button.

2   In this step select the Express Windows OS installation option. Click the Next button to continue.

3 Here you have to select one of the Windows guest OSes for which unattended installation is available.

4 Enter a descriptive name for the virtual machine in the **Virtual Machine Name** field. Name is needed for identification of the VM and is especially essential if you plan to create several VMs running the same operating system. A name should be no longer than 50 characters. If required, specify your Windows product key and personal information.

5 Now, insert an installation disc of the selected Windows OS into CD/DVD-ROM drive of your Mac, click **Finish** and leave the Parallels Desktop for a while. It will create a new virtual machine for you and install the guest OS.

6 Parallels Desktop installs the guest OS, and right after that, it installs Parallels Tools.

7 During unattended installation Parallels Desktop creates an administrator account with a blank password. When the guest Windows installation is complete, we recommend that you change the password in order to protect the safety of your data.

To change the administrator password in *Windows XP*:

- Click the **Start** menu, then select **Settings->Control Panel->Administrative Tools->Computer Management**.

- In the **Computer Management** window, open **System Tools->Local Users** and **Groups->Users**. Right-click the **Administrator** account and select **Set Password** in context menu.

To change the administrator password in *Windows Vista*:

- Click the **Start** menu, then select **Control Panel->User Accounts and Family Safety->Change your Windows password**.

Typical Installation

1   Start Parallels Desktop. Click the ⬚ **Install OS** button or select **New OS Installation** in the **File** menu. **OS Installation Assistant** welcomes you. Click the **Next** button.

2   Select the Typical OS installation option. Click the Next button to continue.

OS Installation Assistant

Select OS installation mode

Specify how would you like to install your operating system:

◯ **Express Windows OS installation (recommended)**
The assistant creates a new virtual machine and allows you to choose between Windows XP or Windows Vista automatic installation.

◉ **Typical OS installation**
The assistant creates a new virtual machine with optimal options for a chosen guest OS. Installation starts in standard mode.

◯ **Custom OS installation**
The assistant creates a new virtual machine with a specific configuration for a chosen guest OS. Installation starts in standard mode.

< Back   Next >   Cancel

3   Here you should specify the type and the version of the guest operating system you want to install on the new virtual machine. When the guest operating system is specified, click Next.

OS Installation Assistant

Select guest OS

Select the guest operating system you want to install:

Guest OS Type:

Windows

Guest OS Version:

Windows XP

< Back   Next >   Cancel

4 In this step you should define a name for the virtual machine. Enter a descriptive name for the virtual machine in the **Virtual Machine Name** field. Name is needed for identification of the VM and is especially important if you plan to create several VMs running the same operating system. The name should be no longer than 50 characters.

In the **Configuration File** field the default name for the configuration file (including the complete path) is shown. (The default folder for Parallels virtual machines is specified in the Preferences->Common (page 77) window.) To change the name or path you may use the browse button to the left of the field. You may also edit the name directly in the field.
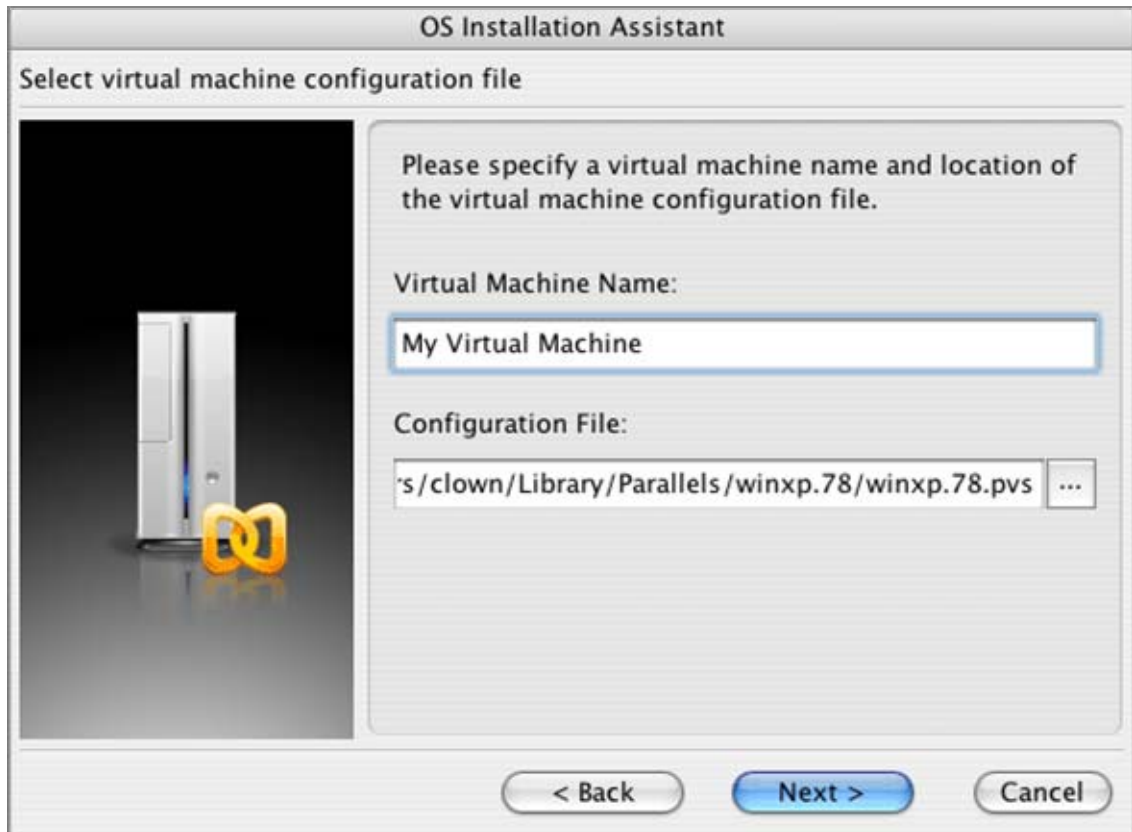
5 This screen prompts you to proceed to installation of the selected guest OS. After the installation is complete, install Parallels Tools if they are available for your guest OS. Refer to the Installing Parallels Tools (page 63) section.

However, if you don't want to install the guest OS right now, clear the check box for the Start guest OS installation option. To learn how to start the installation later refer to the Installing Guest OS (page 60) section.

Custom Installation

1   Start Parallels Desktop. Click the **[Install OS]** button or select **New OS Installation** in the **File** menu. The **OS Installation Assistant**'s Welcome screen appears. Click the **Next** button.

2   In the Select OS installation mode screen select the third option, Custom OS installation. Click Next.

3   On the Select guest OS screen you should specify the type and version of the guest operating system you want to install on the new virtual machine. When done, click Next to move to the next step.

4 On the Specify memory size screen you should set the amount of RAM for the new machine. You can choose any value from 4 to 1500 MB. We strongly recommend that you allocate no more than the half of the physical RAM installed on your computer. Memory size should be in multiples of 4 MB. Click Next to move to the next step.
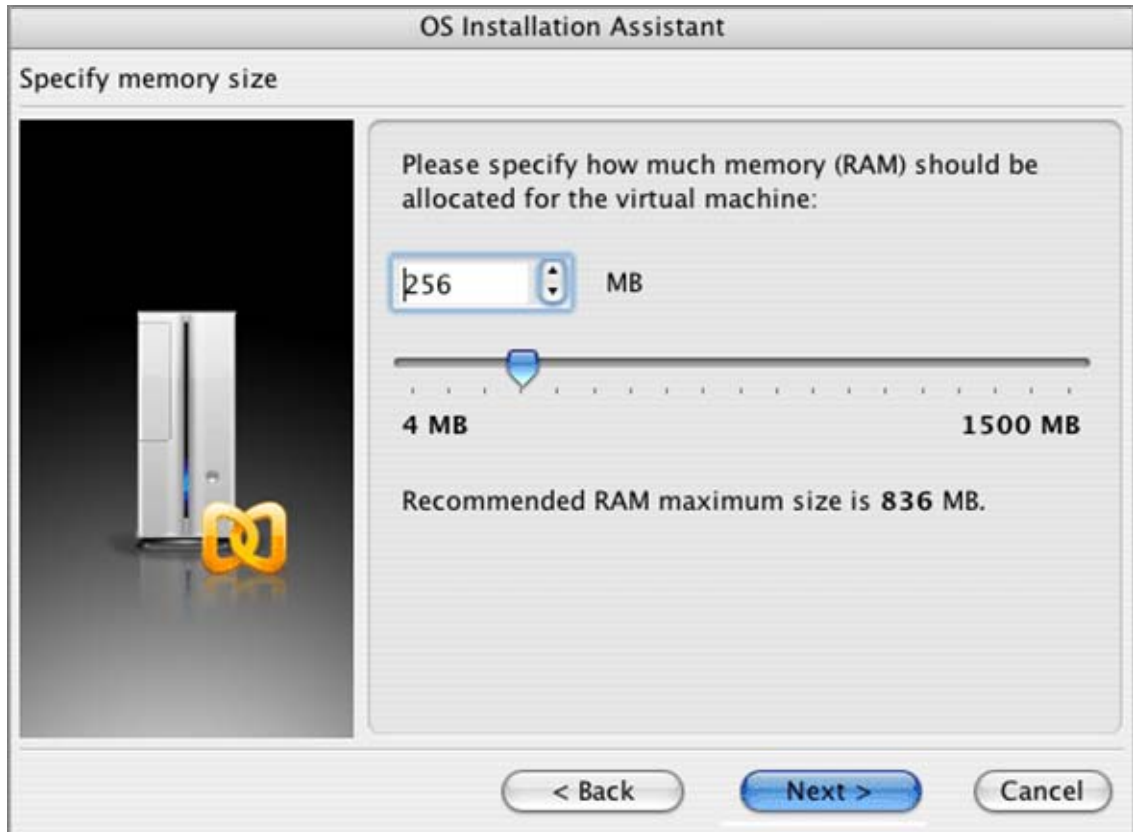
5 On the Select action type screen you have to decide whether you want to create a new virtual hard disk, attach the machine to an existing one, or not to add one at all. If you have selected to use an existing hard disk image, go directly to step 8. If you have decided not to add a disk at all, proceed to step 9.

6   If you selected to create a new virtual disk on the previous step, you should specify its size and format. Disk formats are shortly explained on this wizard screen, but a more detailed description is given in the Hard Disk Images (page 86) topic. After specifying the required data, click Next.

7   On the Select an image file screen you should determine a name and path for the virtual disk image. The wizard prompts you to store the new hard disk image under the default path that is specified on the Common tab (page 77) in the Preferences window, in a separate folder. All the files of related to a specific virtual machine are automatically stored in a separate folders that is named in the following format: `<guest OS>.<number of the machine of the same version - 1>`. For instance, the first Windows XP virtual machine is proposed to store in the `\winxp\` folder. For the second Windows XP VM `\winXP.1\` folder is offered, and so on. If you don't like the default name or path you may browse for another folder or specify a different name.

After you click Next the wizard checks if the specified folder exists, if not, permission for creation is asked: `"Directory does not exists. Do you want it to be created automatically?"` Click Yes.

Continue to the step 9.
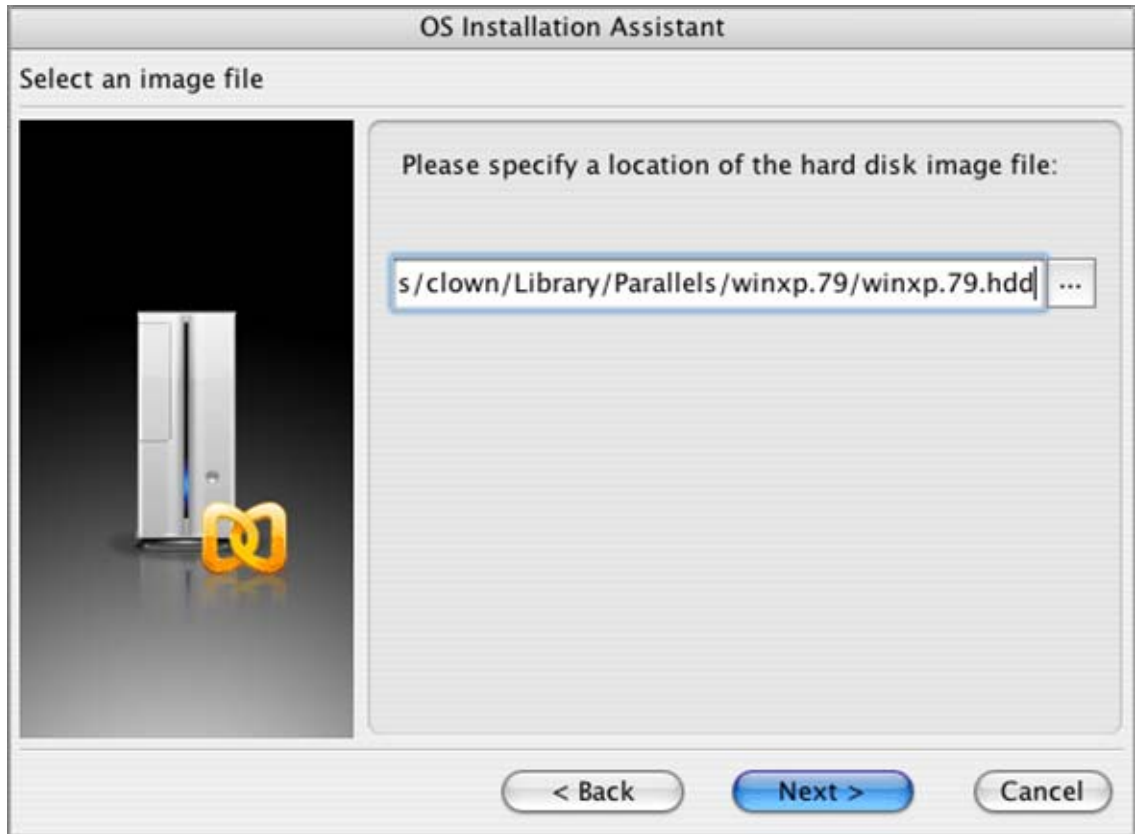
8 Since you decided to attach to the new VM an existing hard disk image (in step 5) you have to specify where this disk image is stored. Use the Browse button to locate it or type the file name with its path directly into the field.
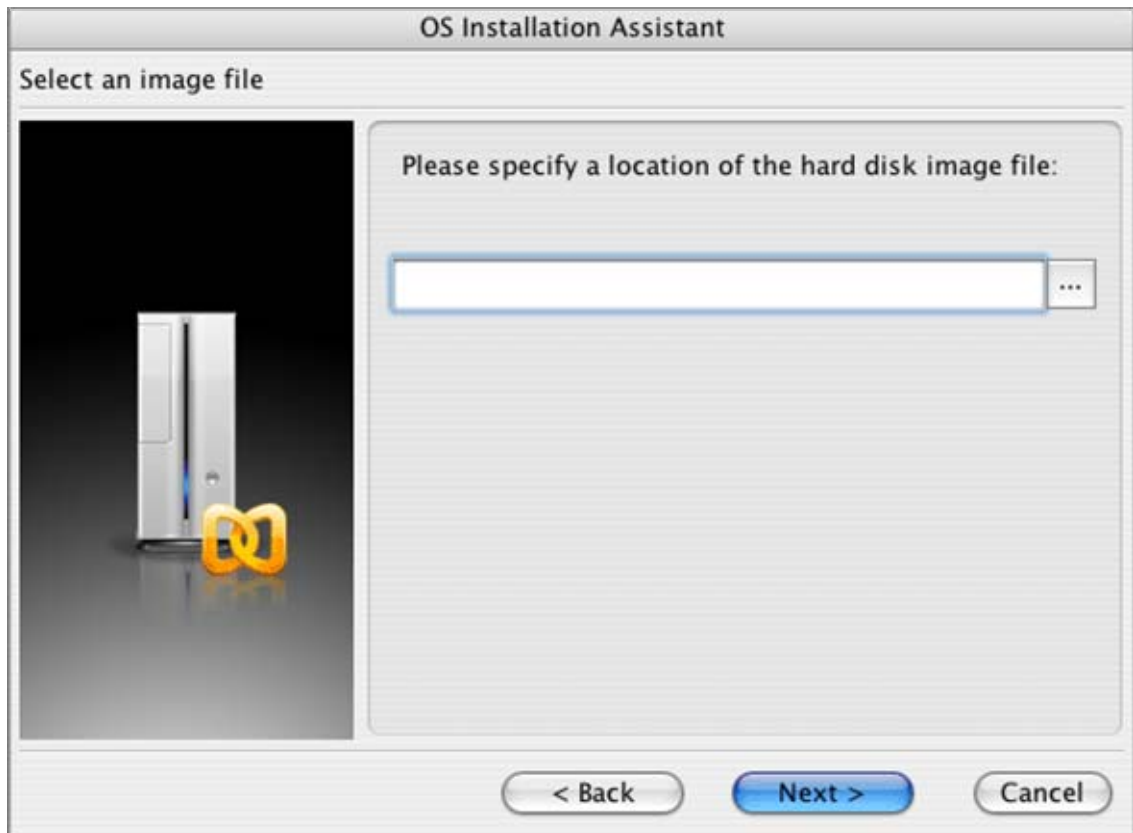
9 Here you will specify the type of networking for the new virtual machine. Select Bridged Ethernet if you want to access the Internet inside the virtual machine. Select Host-only Networking if you want to create a virtual network or you don't want to access the network outside your local computer. Select Shared Networking if you want to access the Internet but don't want your VM to accessible from outside of your Mac. (See Networking in Virtual Machine (page 117) for detailed information about different types of networking.) If you do not have a physical network interface card or do not need a network adapter in this virtual machine, select the Networking is not required option.

Click **Next**. If you have selected **Host-only Networking**, **Shared Networking**, or **Networking is not required** proceed to the step 11 of the current instructions.

10 If you have selected Bridged Ethernet networking for the new VM, on this screen you should specify which real adapter should be connected to the virtual one. Select one in the list and click Next.
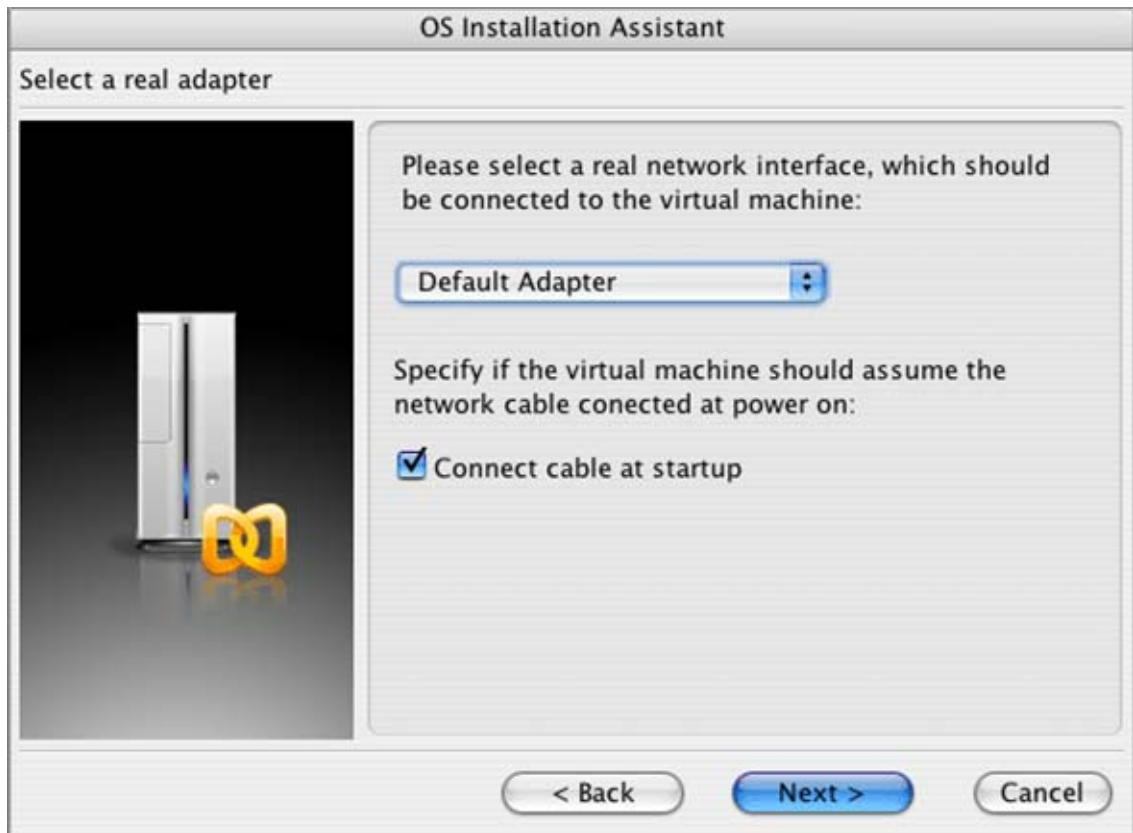
11 Enter a descriptive name for the virtual machine in the Virtual Machine Name field. Name is needed for identification of the VM and is especially essential if you plan to create several VMs running the same operating system. The name should be no longer than 50 characters.

In the **Configuration File** field the default path and name for the configuration file is shown. (The default folder for Parallels virtual machines is specified in the Preferences->Common (page 77) window.) If you do not like the default name or path you may browse your file system to locate an appropriate folder and name. You may also make changes directly in the field.
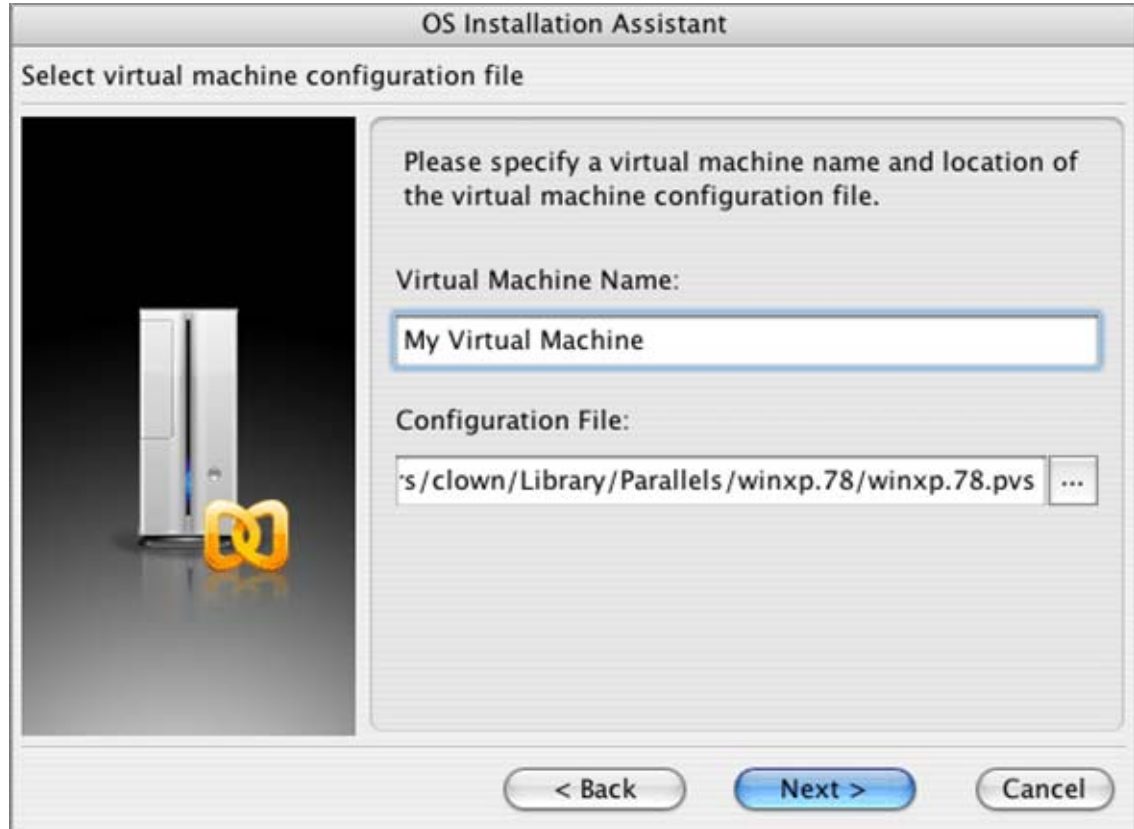
12 This screen prompts you to proceed to installation of the selected guest OS. After the installation is complete, install Parallels Tools if they are available for your guest OS. Refer to the Installing Parallels Tools (page 63) section.

However, you may skip installation of the guest OS right now by clearing the check box for the Start guest OS installation option. If later you want to learn how to start the installation, refer to the Installing Guest OS (page 60) section.

Typical Configurations

A typical virtual machine includes the following devices:

- memory
- hard disk drive
- floppy drive
- CD/DVD-ROM
- network adapter
- sound device (except for FreeBSD and MS-DOS configurations)
- USB controller (in Windows 98/ME/2000/XP/2003/Vista and all of the Linux typical configurations)

OS/2 typical configuration includes a serial port.

Amount of memory and hard disk size vary for different guest OSes. Look in the following table for memory amount and hard disk size provided for different guest operating systems. The virtual hard disk for typical virtual machines is always created in expanding format.

	RAM, MB	HDD size, MB
Windows Vista	512	16000
Windows 2003	384	8000
Windows XP/98/ME/2000	256	8000
Windows NT	128	6000
Windows 95	128	2000
Windows 3.11	64	2000
Linux	256	8000
FreeBSD	256	8000
OS/2 Warp 3 and 4	128	2000
OS/2 Warp 4.5 eComStation	256	6000
OS/2 other	128	6000
Solaris	256	12000
MS-DOS	32	2000
Other guest OSes	256	8000

Installing Guest OS

This section discusses how to install an operating system in a virtual machine.

Installing a Guest Operating System

Installation Media

With installing a guest OS you have a few options. You can install directly from a CD or DVD, or install the OS from an image of any of these discs. Sometimes, installation cannot be performed from a real CD/DVD because of disk reading problem. In such a case we also recommend that you try to install from an `.iso` image of this disk. CD/DVD `.iso` images can be made using the Parallels Image Tool included in Parallels Desktop distribution. For more information on Image Tool see the Using Parallels Image Tool (page 187) chapter.

Some operating systems are installed from floppy disks. For these issues you may use installing from floppy disk images option. Creating a floppy image is discussed in the Floppy Disk Images (page 92) topic.

General Steps:

1   Start Parallels Desktop.

2   Open or create a virtual machine configuration intended for installing a guest OS.

To Install from a Physical CD/DVD or CD/DVD .iso Image:

1   Select CD/DVD-ROM drive and open its options tab.

On the virtual machine property page (page 29) click on the desired CD/DVD-ROM drive to open its CD/DVD-ROM Options (page 106) in Configuration Editor. Make sure that the Enabled and the Connect at startup options are selected.

2   Connect the CD/DVD-ROM drive to the guest OS distribution.

If you install from a real CD/DVD:

Select the Use CD/DVD-ROM and specify which real drive to connect to the virtual device in the CD/DVD-ROM Drive list.

Insert the CD/DVD disk with the operating system distribution into the appropriate drive of your computer.

If you install from an `.iso` image file:

Check the Use image file option and specify the path to the `.iso` distribution file in the Image File field.

3   Specify the IDE channel for the virtual CD/DVD-ROM. In the Connect to list select 0:1.

4   Save the virtual machine configuration. See the Saving Virtual Machine Configuration (page 94) subtopic in the Editing Virtual Machine Configuration section.

5   Start your virtual machine by clicking Power On   on the toolbar. Follow the installation instructions for the operating system.

Note. When installing a Windows guest OS, you may need to press F8 or other functional keys in a virtual machine. If you use MacBook and MacBook Pro keyboard, you need to press Fn+F8 combination instead. You can configure you Mac in such a way that you will not have to press the Fn key. Please refer to How to Press F1-F12 and Other Functional Keys in MacBook and MacBook Pro in the Keyboard Shortcuts in a Virtual Machine (page 130) topic.

To Install from a Floppy Image:

1   Select the floppy drive and open its options tab.

On the virtual machine property page (page 29) click on the Floppy resource to open Floppy Options (page 102) in the Configuration Editor. In the Floppy Options tab, make sure that the Enabled and the Connect at startup options are selected.

2   Connect the floppy drive to the guest OS distribution.

For this, specify the path to the floppy image file with the distributive in the Image File field.

3   Save the virtual machine configuration. See the Saving Virtual Machine Configuration (page 94) subtopic in the Editing Virtual Machine Configuration section.

4   Start the virtual machine by clicking Power On   on the toolbar. Follow the installation instructions for the operating system.

When Installing on Non-empty Hard Disk

First of all we do not recommend to install a guest OS other than the one installed before. If you want to install a different guest OS, create a new virtual machine. Only you can re-install the same guest OS that was installed previously.

If you install a guest operating system onto a hard disk where the guest OS was previously installed, you have to change the boot sequence:

- after you perform the general steps listed above, open the Booting Options tab of the General Opt (page 95)ions,

- set the boot sequence to [CD-ROM, Hard Disk, Floppy] or [Floppy, Hard Disk, CD-ROM], if you installed from a CD/DVD or a floppy disc respectively.

During installation, when the guest OS reboots for the first time, return the boot sequence to booting from hard disk:

- When the virtual machine is off, set [Hard Disk, CD-ROM, Floppy] sequence, save the settings, and start the guest OS.

Configuring X Window System in FreeBSD Guest OS

If you want to use the X Window System graphic shell in a FreeBSD guest OS, you should configure it manually. Running automatic configuration command X -probeonly or X -configure may not work. The X Window System can be configured using xorgconfig text utility or xorgcfg graphical utility. You need root privileges to run them.

To start manual configuration:

1   Issue one of the following commands in the command line:

```
su -l root -c xorgconfig
```

or

```
su -l root -c xorgcfg
```

2 Enter the `root` password when you are asked for it.

When configuring set the following:

1 Select *Generic VESA compatible* video card.

2 Select *4096K* of video memory.

3 Select screen resolution for a color depth. You may specify single resolution for any color depth. For instance, specify 640x480 resolution for 8-bit color, 800x600 resolution for 16-bit color, and so on. Do not specify several resolutions for a color depth, because upon startup, X window will select the greatest one.

You may set a single resolution for a particular color depth (for instance, if you are going to work with 16-bit color only, select any single resolution for it), and later select only this color depth for your configuration .

4 Select preferred color depth for your configuration.

Installing Parallels Tools

Parallels Desktop includes specially developed tools that help you use your virtual machines in the most comfortable and efficient way. The current version of Parallels Desktop is supplied with tools for the following guest operating systems:

▪ Windows versions 95, 98, ME, NT, 2000, XP, 2003, Vista;

▪ OS/2 and eComStation;

▪ Solaris.

We provide PRL8029 driver for Solaris guest OS that should be installed if you want the Solaris virtual machine to support networking.

▪ For other guest operating systems we provide PRL8029 network adapter driver.

Most of the tools are located on the CD image VMTOOLS.ISO, however OS/2 network drivers that are conveniently installed during guest OS installation are also located on the floppy disk image VMTOOLS.FDD. Both CD and floppy images can be found in the directory where Parallels Desktop is installed: /Library/Parallels/Tools.

Parallels Tools Overview

Tool	Description
Clipboard Synchronization Tool	The Clipboard Synchronization Tool syncs the guest OS clipboard and the primary OS clipboard, allowing you to easily exchange texts and pictures between the primary OS and the guest OS. Currently you can only exchange.bmp pictures having up to a 128KB size. In you enable the Clipboard Synchronization Tool in all of your guest OSes, all of them will share the same clipboard with the primary OS. In all the Windows guest OSes, this tool is installed automatically when you perform Parallels Tools installation. In OS/2 and eComStation you must install it manually.
Time Synchronization Tool	The Time Synchronization Tool allows the guest OS to keep the same system time as the primary OS. Without this tool the guest OS system time may differ from that of the primary OS. This tool also allows you to maintain a constant difference between the guest OS and primary OS system time. You may configure this tool while the guest OS is running. See Time Synchronization Tool Options (page 158) to learn how to perform this task. **Note**. Before starting the Parallels Time Synchronization Tool, all other time synchronization services must be stopped in order to avoid potential conflicts.
Video Driver	The best graphical mode available in Windows NT and 2000 guest operating systems without this driver is 16-color VGA with 640x480 resolution. The video driver allows Parallels Desktop to use SVGA graphical modes in guest OS monitors. In Windows XP/2003 the video driver is required for the mouse tool and is chosen automatically when you select the mouse tool installation. **Note**. If you install the video driver you will not be able to use VGA modes. To return to VGA, you must uninstall the Parallels Tools.

Mouse Synchronization Tool	The Mouse Synchronization Tool enables the mouse to be captured and released without a special hot key combination defined in the Hot Key Combinations (page 85) tab of the Preferences window. Using this tool makes mouse movements smoother and improves the system's reaction to the mouse.
Sound Driver	Parallels Tools pack includes an AC'97 sound driver for those guest operating systems that do not contain a standard AC'97 driver. Sound drivers for Windows XP/2003 are not included in the Parallels Tools pack since these operating systems contain sound drivers in their installations.
Shared Folders Tool	This tool is needed for a guest OS to view shared folders. Without it, the guest OS can not use the shared folders although they may be set up in your virtual machine configuration. To learn more about shared folders see Using Shared Folders (page 123).
Disk Compacting Tool	Parallels Desktop uses virtual hard disks of two types: plain and expanding. Expanding virtual disks grow in size as you work with them. The Disk Compacting Tool reduces the size of expanding virtual hard disks by cleaning up unused disk space. See Compacting Virtual Disk (page 164) for guidelines on using this tool. This tool does not reduces the size of plain virtual disks.
Network Adapters and Drivers:	

▪ Parallels Network Adapter Driver	This Ethernet driver for the RTL8029 adapter is specially developed for Parallels Desktop to improve network performance. We recommend that you install this driver whenever possible.
▪ RTL8029	CD with Parallels Tools includes native Realtek (all except for Solaris driver) drivers for the RTL8029 network adapter for many different operating systems. They are located in the Drivers\Network\RTL8029 directory of the vmtools.iso CD image. Some guest operating systems such as Windows 2000, contain an RTL8029 driver in their distributions, whereas others like Windows 2003 and OS/2 do not include this driver at all. **Note**. Unlike other guest OSes, a Solaris guest OS requires an RTL8029-compatible driver to be installed to support networking. Otherwise networking will not be possible. An RTL8029-compatible driver for Solaris has been created by an independent developer and is distributed under the terms of BSD license. A slightly modified version of this driver is included into the Parallels Desktop distribution.

The table below shows which tools have been developed for which operating systems.

	Windows			OS/2, eCS	Solaris	other
	95, 98, NT, ME	2000	XP, 2003, Vista			
Clipboard Synchronization Tool	+	+	+	+		
Time Synchronization Tool	+	+	+			
Video Driver	+	+	+			
Mouse Driver		+	+	+		
Sound Driver	+	+		+		
Shared Folders Tool		+	+			
Disk Compacting Tool	+	+	+			
Network Drivers:						
▪ Parallels Network Adapter Driver		+	+			
▪ RTL8029	+	+	+	+	+	+

In Windows guest OSes you can control the tools during guest OS execution. See the Parallels Tools Center (page 156) section to learn how to do this.

Windows Tools Installation

To install Parallels Tools in a Windows guest OS do the following:

1 Make sure that the virtual machine configuration includes a CD/DVD-ROM drive and it is enabled (the Enabled check box is selected). See CD/DVD-ROM Options (page 106).

2 Start your guest operating system and log in. In order to install tools properly do not begin the installation until OS completes its startup and you log in.

3 Select Install Parallel Tools in the Parallels Desktop VM menu.

4 You are warned about the necessity of having the guest OS fully started and being logged in: "You can install the Parallels Tools only if the guest operating system is running and you are logged in. If you are not logged in now, select Cancel and run Parallels Tools installation later." If you are logged in, click OK to start installing.

5 Parallels Tools Setup wizard starts and greets you. Click Next to move to the Choose Destination Location screen. If you do not like the default directory, select another one using the Change button. Then click Next.

6   On the Setup Type screen you should choose between the *complete* setup and a *custom* one. The complete setup installs all of the tools available for your guest OS. If you select custom setup, the Select Components screen asks you to select the desired tools from the tools available for your guest OS.

7   Choose the program folder on the Select Program Folder screen, then the Check Setup Information screen displays the options selected. If they are correct, click Next to begin the installation.

8   After the wizard copies tools, the Installation Completed screen asks if you want to restart the computer now. In all of the Windows guest OSes, except 98 and NT, you must restart the virtual machine after this setup procedure. Accept the selected option and click Finish. The virtual machine will be restarted and ready for work with the tools installed.

Notes: 1. In a Windows 98 guest OS, the Sound Driver requires you to perform additional steps after this setup. Proceed to Windows 98 Sound Driver Installation (page 68).

2. In a Windows NT guest OS, proceed to Windows NT Tools Installation (page 69) to complete setup in this guest OS.

Troubleshooting When Installing Tools

Parallels Tools installation is invoked by Windows AUTORUN feature for CD/DVD-ROM drive. It is enabled by default, however if you have disabled it manually, nothing happens after you select the Install Parallels Tools command. (In any case, the vmtools.iso CD image will be connected to the virtual machine CD-ROM drive, however it is not visible to the user.) To solve this problem do one of the following:

▪   Enable AUTORUN function for CD-ROM drive in guest Windows.

▪   Start tools installation manually.

    Open the contents of the vmtools.iso in Windows Explorer, find PrlTools.exe file, and start it.

Windows 98 Sound Driver Installation

The Sound Driver for a Windows 98 guest OS requires additional steps after the general Parallels Tools installation described in Windows Tools Installation (page 67).

To install AC'97 Sound Driver in Windows 98:

1   Open the Control Panel. To do this, click the Start system menu, select the Settings item, and then Control Panel.

2   Double-click the System icon to open the System Properties window. In the System Properties window select the Device Manager tab.

3   Locate the PCI Multimedia Audio Device in the hardware list. Select it and click the Properties button.

4   In the PCI Multimedia Audio Device Properties window click the Reinstall Driver button.

5   In the Update Device Driver Wizard select the Sound, video, and game controllers item and click the Next button.

6   In the second wizard screen select the second option: Display a list of all the drivers in a specific location, so you can select the driver you want, and click Next.

7 On the screen asking you to select the type of device click the Next button.

8 In the next wizard screen click the Have Disk button. The Install From Disk window is opened, in the Copy manufacturer's file from: field type the following path "`C:\Program Files\Parallels\Parallels Tools\Sound`" and click OK.

9 In the Select Device window select the AC'97 Audio and click OK.

10 In the Update Device Driver Wizard click the Next button. When the wizard asks, insert disc (or connect CD-ROM image file) with your Win98 distribution and type path to it in the field Copy files from. Click OK button. After wizard finishes copying files, click Finish button in its window.

11 Close the windows with AC'97 audio properties and system properties.

12 Restart the virtual machine if the wizard asks you to do so for the new settings to take effect.

Windows NT Tools Installation

To install Parallels Tools in Windows NT:

▪ Perform the installation procedure described in the Windows Tools Installation (page 67) topic. It is enough to install such tools as Clipboard Synchronization and Mouse Synchronization Tools.

▪ Perform these specific steps for installing the Video Driver and Sound Driver:

Video Driver Installation

To install the Video Driver do the following:

1 Open the Control Panel. For this click the Start system menu, select the Settings item, and then Control Panel.

2 Double-click the Display icon to open the Display Properties window.

3 In the Display Properties window select the Settings tab. Then click the Display Type button.

4 In the Display Type window select the Change button.

5 In the Change Display window select the Manufacturers --> Parallels and Display --> Parallels Video Driver. Click OK.

6 In the Third-party Drivers window click Yes.

7 The Installing Driver window informs you of the completed installation. Click OK.

8 Click the Close button in the Display Type window.

9 Click the Close button in the Display Properties window.

10 Click the Yes button in the System Settings Change window to restart the guest OS.

Note: You must restart the virtual machine after this setup procedure.

AC'97 Sound Driver Installation

To install the AC'97 Sound Driver do the following:

1 Open the Control Panel. Click the Start button in the system menu. Then select the Settings item, and then Control Panel.

2   Double-click the Multimedia icon to open the Multimedia Properties window.

3   In the Multimedia Properties window select the Devices tab. Then select Audio Devices from Multimedia devices: tree. Click Add button.

4   In the Add window select the Unlisted or Updated Driver from List of Drivers. Click OK.

5   In the Install Driver window click the Browse button and select the sound driver path.

If you have installed Parallels Tools to the default location, select `C:\Program Files\Parallels\Parallels Tools\Sound`.

If you have installed Parallels Tools to another directory, you should locate this directory.

Click OK. Then click OK in the Install Driver window.

6   In the Third-party Drivers window click Yes.

7   The Add Unlisted or Updated Driver window informs you that you are about to install the AC'97 Audio Driver. Click OK.

8   Click OK in the About AC97 Audio Driver window.

9   Click OK in the System Settings Change window.

10 Click Close button in the Display Type window.

Note: You must restart the virtual machine after this setup procedure.

OS/2 and eComStation Tools Installation

All of the OS/2 and eComStation tools can be installed from the `vmtools.iso` CD image. Network drivers can also be installed from the floppy disk image file `vmtools.fdd` during operating system installation. The latter is easier in most cases.

Before starting the installation you should connect the CD-ROM image with Parallels Tools to your virtual machine CD-ROM drive. Do the following:

▪   Select Install Parallels Tools in the Parallels Desktop VM menu.

Mouse Synchronization Tool Installation

The Mouse Synchronization Tool consists of the mouse driver and the video filter.

Note: To install the Mouse Synchronization Tool you should have a VESA video driver installed, such as SDD or GENGRADD. For instructions on how to do this refer to OS/2 documentation.

To install the mouse tool:

1   Click the Drives icon on the system panel. Select the CD-ROM drive and Drivers\Mouse\OS2 directory on it.

2   Launch the `INSTALL.CMD` batch file. The `INSTALL.CMD` copies files and make necessary modifications to the `CONFIG.SYS` file.

3   Restart the guest OS/2 operating system.

Note: The Mouse Synchronization Tool increases performance of the guest OS/2 operating system under Citrix.

Clipboard Synchronization Tool Installation

In OS/2 and eComStation you must launch the Clipboard Synchronization Tool manually. This tool is not a tool itself but an ordinary application, and should be treated as such. If you want the Clipboard Synchronization tool to start automatically when your guest operating system is started:

▪ include the tool file `PrlClip.exe` into autostart group (`startup.cmd` or another file as it is done in your operating system).

The Clipboard Synchronization Tool is located in the **ClipBrd\OS2** directory on the CD-ROM containing Parallels Tools.

Sound Driver Installation

Note: Before installing the Sound Driver you should have multimedia support installed in OS/2 guest OS.

To install the Sound Driver:

1 Click the **System Setup** icon on the system panel.

2 Select the **Install/Remove** line, and then select **Multimedia Application Install**.

3 In the **IBM Multimedia Presentation Manager/2 - Installation** window choose CD-ROM drive, then **Drivers\Sound\OS2** directory. Select the **ALC Codec** feature and click the **Install** button.

4 Restart the OS/2 guest operating system.

Network Driver Installation

Below we consider the installation of the Realtek RTL8029 driver inside the OS/2 Warp version 4.0.

1 Click the **System Setup** icon on the system panel.

2 Click the **MPTS Network Adapters and Protocol Services** icon to open the **Multi-Protocol Transport Services** window.

3 Click **Configure**.

4 In the **Configure** window that opens, click **Configure** again to open the **Adapter and Protocol Configuration** window.

5 Click the **Other adapters** button below the **Network Adapters** section of the window to open the **Copy Additional Network Adapter Drivers** window.

6 Specify the path to the Parallels driver on CD-ROM disc image. The path should be:

```
<CD-ROM drive>\Drivers\Network\RTL8029\NDIS2OS2
```

7 Click **OK**. The Parallels network adapter driver will be copied. After this you can see the name **RTL8029 PCI Ethernet Adapter** included in the **Network Adapters** list. Select this name.

8 Click **Change** in the **Network Adapters** section of the window to change the current network adapter into the selected one.

9 Click OK when the message "Are you sure you want to change this network adapter?" is displayed. After you click OK, the RTL8029 PCI Ethernet Adapter appears in the appropriate field of the Current Configuration section of the window. Now if you click Edit in the Current Configuration section of the window, you will see that you do not need to configure any driver properties, because it is self-configurable.

10 Click OK when finished.

11 Close both the Configure and Multi-Protocol Transport Services windows.

12 Click Exit in the Update CONFIG.SYS window.

13 Exit the configuration program and restart the guest OS.

Solaris Network Driver Installation

Unlike other guest OSes Solaris does not support the RTL8029 network driver emulated in virtual machines. To add RTL8029 support to a Solaris virtual machine you need to install the RTL8029 network adapter driver. We have created the special network.sh script that helps you to do this, or you may install and configure the driver manually. Both ways are described below.

Before Installing the Driver

Before installing the driver perform the following steps:

1 Make sure that the virtual machine configuration includes a CD/DVD-ROM drive and it is enabled. See CD/DVD-ROM Options (page 106).

2 Start your guest operating system.

3 Connect the CD image with tools, vmtools.iso, to the CD/DVD-ROM drive of the virtual machine:

- right-click the CD/DVD-ROM icon on the status bar and select the Connect image menu item (instead you may select Devices->CD/DVD-ROM <number>->Connect Image in the Parallels Desktop menu);

- browse for vmtools.iso in the folder where you installed Parallels Desktop.

Proceed to installing the RTL8029 network driver using the network.sh script or manually.

To install the RTL8029 network driver using **network.sh** script:

1 In the shell, run the

```
cd /cdrom/PRLTOOLS/Drivers/Network/RTL8029/SOLARIS/
```

command to move to the respective directory.

2 Issue the following command to begin installing the driver

```
./network.sh
```

3 You are sequentially informed that the driver is being extracted, compiled, and installed. When it is finished, you are asked "Will you receive IP addresses from DHCP server?" If IP addresses on your network are managed by DHCP server proceed to step 4, otherwise proceed to step 5.

4 If IP addresses on your network are managed by DHCP server, type "Y" and the script will configure the DHCP client. Proceed to step 6.

5 If IP addresses on your network are NOT managed by DHCP server, type "N" and then specify an IP address for your virtual machine, network address, network mask, and default gateway IP address when you are asked for them.

6 Restart the guest operating system by issuing the command

```
init 6
```

To install the RTL8029 network driver manually:

1 In the shell, issue the following command to get root privileges:

```
su
```

Enter the password to the root account when you are asked for it.

2 As a root run the following commands:

```
cd /tmp
gzcat /cdrom/PRLTOOLS/Drivers/Network/RTL8029/SOLARIS/ni0.8.11.tgz|tar
xf -
cd ni-0.8.11
/usr/ccs/bin/make install
./addni.sh
```

3 If IP addresses on your network are managed by DHCP server issue the following commands:

```
touch /etc/hostname.ni0
touch /etc/dhcp.ni0
```

If IP addresses on your network are NOT managed by DHCP server, see the Solaris System Administration Guide.

4 Leave the root account by running the command

```
exit
```

5 Restart the guest operating system by issuing the command

```
init 6
```

Upgrading Parallels Tools

If you have a virtual machine created by a previous version of Parallels Desktop with Parallels Tools installed, please upgrade Parallels Tools to use all capabilities of Parallels Tools Center.

To upgrade Parallels Tools:

1 Make sure that the virtual machine configuration includes a CD/DVD-ROM drive and it is enabled (the Enabled check box is selected). See the CD/DVD-ROM Options (page 106).

2 Start your guest operating system and log in. In order to install tools properly do not begin the installation until OS completes its startup and you log in.

3 Select the Install Parallel Tools item in the VM menu.

4 You are warned about necessity of having guest OS fully started and being logged in: "You can install the Parallels Tools only if the guest operating system is running and you are logged in. If you are not logged in now, select Cancel and run Parallels Tools installation later." If you are logged in, click OK to start installing.

5 Parallels Tools Setup wizard starts and informs you that you have the Parallels Tools already installed in your virtual machine and they will be updated. Click Next to move to the Setup Type screen.

6 In the Setup Type screen you should choose between the *complete* setup and a *custom* one. The complete setup installs all of the tools available for your guest OS. If you select custom setup, Select Components screen asks you to select desired tools from all the tools available for your guest OS.

7 In the Ready to Install the Program screen you are able to return back to review installation settings. When you are ready, start installation by clicking the Install button.

8 If your Windows guest system is configured to warn you every time an unsigned driver is installed, you will receive the following message: "Parallels Tools installation contains a number of unsigned drivers. These drivers are required for proper functioning of Parallels Tools. Currently your system is configured to warn you every time an unsigned driver is installed. Do you want to receive these warnings during Parallels Tools installation?" Click OK to disable warnings during Parallels Tools installation. They will re-enabled later when the installation will be complete.

If your system is configured to block the unsigned drivers installation, you will receive the similar message prompting you to allow installation of these drivers. Click OK, otherwise Parallels Tools can not be installed at all.

9 The wizard copies tools. When finished, Update Completed screen asks if you want to restart the virtual machine right now. Accept the selected option and click Finish.

Note that the virtual machine should be restarted in order that Parallels Tools function properly.

Windows NT

In Windows NT guest OS, readmes for continuing installation of the video and audio drivers will be opened. Close them since re-installation of the drivers is not needed.

Uninstalling Parallels Tools in Windows Guest OSes

To uninstall Parallels Tools in all Windows guest operating systems except Windows NT, you should activate the same wizard as when installing. Do the following:

1 Select Install Parallel Tools in the VM menu.

2 Parallels Tools Setup wizard performs the diagnostics of the operating system and asks "Do you want to completely remove the selected application and all of its components?" Click Yes to begin the process.

3 After the wizard removes the tools, the Uninstallation Completed window asks if you want to restart the computer now. Accept the selected option and click Finish. The virtual machine will be restarted.

4 After the OS is started up, the System Settings Change screen asks "Do you want to restart your computer now?". Click Yes. When the virtual machine is restarted once more, the tools are completely uninstalled.

Note: After uninstalling Parallels Tools and restarting the virtual machine, the guest operating system may display a warning that it should be restarted once more. In this case restart the guest operating system one more time to ensure its correct functioning.

Uninstalling Tools in Windows NT

In Windows NT Parallels Tools can be uninstalled using standard operating system techniques.

Managing Virtual Machines

This chapter discusses multiple ways to change a virtual machine configuration, provides information on setting user preferences, and using virtual disks.

In This Chapter

Setting Parallels Desktop Preferences

Settings that affect more than one virtual machine are contained under a single menu entry. To edit general preferences click Preferences in the Parallels Desktop menu.

Common, User Interface, and Hot Key preferences are assigned for each user. Memory and DHCP preferences concern all users that work on a particular computer and all virtual machines they launch.

Common
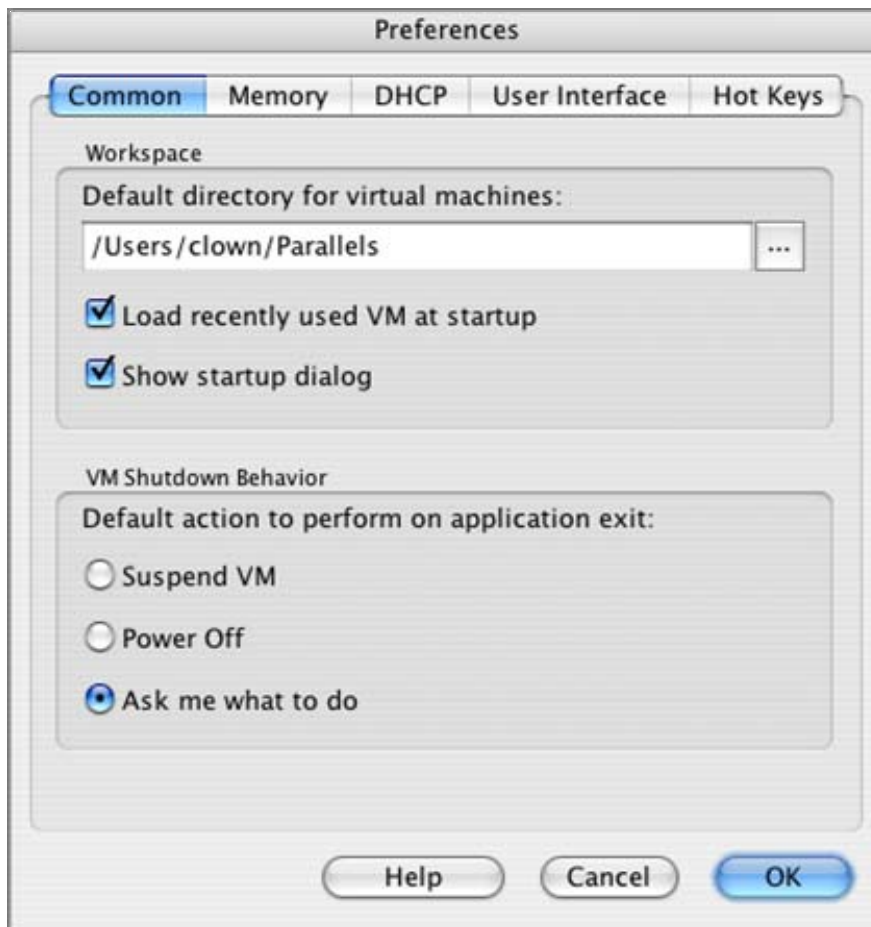
Settings on this tab can be different for each user of your computer.

Workspace:

- **Default directory for virtual machines**. A directory proposed by Parallels Desktop to a user for saving new configuration files and hard disk images is specified in this field. It is possible to choose another location when creating a configuration file or hard disk image.

- Two other options, **Load recently used VM at startup** and **Show startup dialog**, determine what happens at Parallels Desktop startup. By default, both options are selected and the application starts with the last used virtual machine configuration. If this configuration is already opened in another instance of Parallels Desktop or the configuration file cannot be found on the given path (for instance, it has been moved to another folder or deleted), then **Startup Options** dialog is opened upon Parallels Desktop startup.

  If the **Load recently used VM at startup** option is selected while the **Show startup dialog** option is turned off, Parallels Desktop will open a blank virtual machine upon startup if it is unable to open the last used virtual machine.

  If the **Load recently used VM at startup** option is not selected while the **Show startup dialog** is turned on, Parallels Desktop always starts with the **Startup Options** dialog.

  If both options are turned off, Parallels Desktop starts with a blank virtual machine.

More information about what happens upon Parallels Desktop startup can be found in Selecting and Opening Virtual Machine (page 120) and Startup Options Dialog (page 121) topics.

VM Shutdown Behaviour:

Radio buttons in this group control the effect upon selecting the **Parallels Desktop -> Quit Parallels Desktop** menu item and clicking the Macintosh close button 🔴 for the Parallels Desktop window.

- If you want all virtual machines to be suspended upon these actions, select the **Suspend VM** radio button.

- If you want all virtual machines to be stopped upon these actions, select the **Power Off** radio button.

- When you are unsure if you want virtual machines to stop or to suspend, select the **Ask me what to do** radio button. Every time you click the Mac close button 🔴 or select the **Parallels Desktop -> Quit Parallels Desktop** menu command, you will be asked to choose whether you want to stop or suspend the virtual machine.

  See the Suspending/Resuming Virtual Machine (page 150) topic to learn about suspending/resuming virtual machines.

Memory
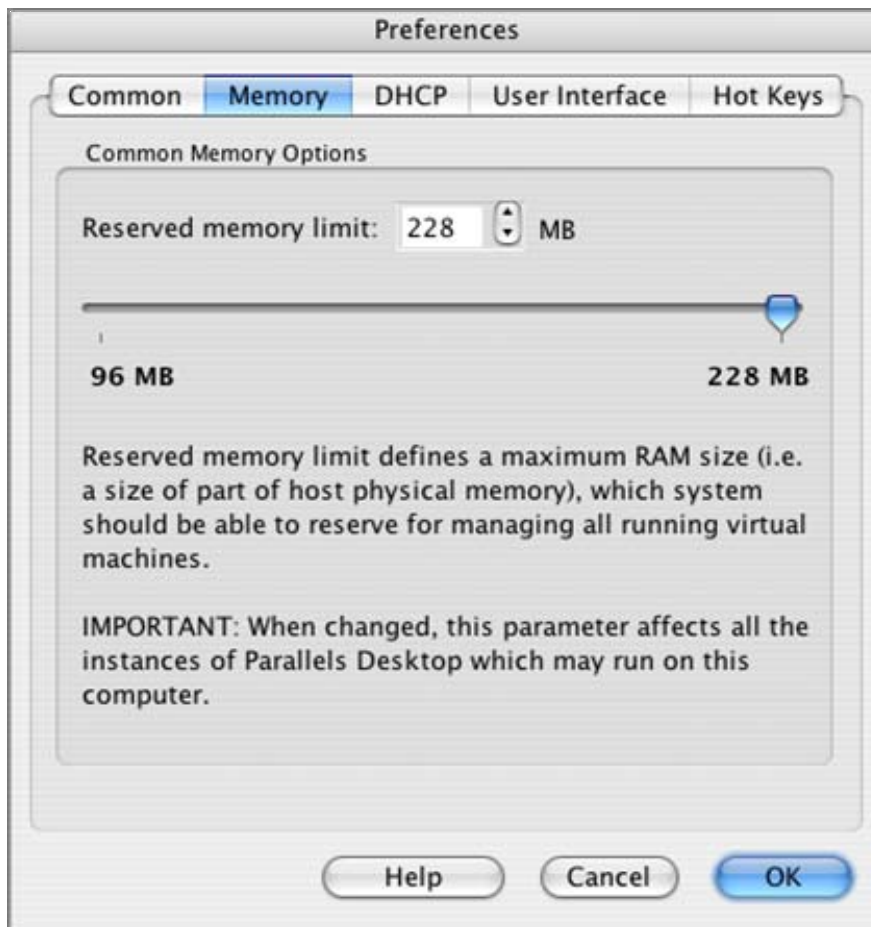
On this tab the maximum amount of physical memory (RAM) the system should reserve to all simultaneously running virtual machines on your computer can be adjusted. This setting applies to all users of your computer.

The maximum memory allowed depends on the physical RAM size of your computer. Some memory must be reserved for your primary operating system. From the remainder you can select the maximum RAM allowed for Parallels Desktop. If you have one instance of a virtual machine running, it may use all the memory allocated here. In the case of several simultaneously running virtual machines this memory will be shared between them. Memory for a particular virtual machine is set on the Memory tab (page 101) in the Configuration Editor.

Memory amount should be in multiples of 4. If it doesn't then you will receive an error notification when trying to save memory options. To set an appropriate memory amount you may use the slider, the spin buttons in the Reserved memory limit field, or type a value directly into the field.

DHCP

Parallels Desktop provides several types of networking in a virtual machine, particularly, host-only networking and shared networking (NAT). The DHCP tab is intended for specifying ranges of IP addresses to be assigned to virtual machines and primary OS in these two types of networking:

- DHCP Scope for Host-only Networking contains a range of IP addresses assigned by Parallels DHCP server for virtual machines running in the host-only network. Methods of configuring different types of host-only network are discussed in the Creating Host-Only Network (page 118) topic.

- DHCP scope for NAT Networking contains a range of IP addresses assigned by Parallels DHCP server for virtual machines in the shared networking (NAT) mode. Configuring of the shared networking is discussed in the Shared Networking (NAT) (page 119) topic.

Note. These two scopes must not contain the same IP addresses.

Particular fields contain the following:

- The Scope start address and Scope end address values determine the first and the last IP addresses. First address of this scope DHCP server usually assigns to itself. The second address is usually given to the primary system. Others are assigned to virtual machines. Scope start address and Scope end address should belong to the same subnet.

- Subnet mask should be set in the Scope mask field.

Note. Before changing any of the DHCP scopes in this tab make sure that there is no virtual machine running in host-only networking mode. To check the networking mode of a running virtual machine: point the mouse cursor to the network adapter icon 🔵 in the status bar and check the Mode line in the tooltip.

User Interface

User interface preferences can be different for each user of your computer.

Look and Feel:

- **Toolbar placement** option controls the position of the toolbar. By default the toolbar resides at the top of the Parallels Desktop window.

- **Show tooltips for command buttons** option controls the appearance of tooltips for the toolbar buttons and the command buttons on the property page (see Property Page (page 29)). By default this option is selected.

- **Show tooltips for devices on status bar** option controls the appearance of tooltips for devices connected to the virtual machine when it is running. By default this option is selected.

Fullscreen Options:

- **Allow to change guest screen resolution**. If this option is selected, a virtual machine switched to fullscreen mode tries to change its screen resolution to the Mac OS X screen resolution. This can be done when the video driver from Parallels Tools (page 63) is installed in your guest OS.

- **Allow to change Mac OS X screen resolution**. If this option is selected, resolution of your Mac monitor is changed to the resolution of the guest OS when a virtual machine is switched to fullscreen mode. Note that this option has lower priority than the previous one, so if both are selected this option is active only when the **Allow to change guest screen resolution** option can not be applied.

- **Advanced** button opens the **Advanced Fullscreen Options** dialog described below in this topic.

Restore Hidden Messages:

- If the Parallels Desktop wants to attract user's attention to an operation that is going to be performed or to some situation, it displays a message that contains a description and a **Do not show this message again** check box. If you select this check box, in the same situation the message will not be displayed. **Restore hidden messages** button on this tab allows you to reactivate all suppressed messages.

  The system does not allow you to suppress messages reporting potentially dangerous situations.

Advanced Fullscreen Options
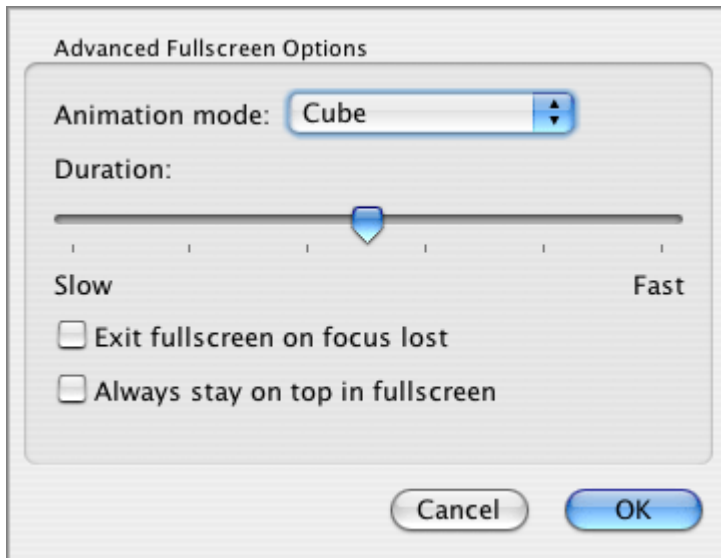
- **Animation mode** contains the list of animations that are displayed when switching a virtual machine to fullscreen mode. **Duration** slider allows you to select the speed of this animation.

- **Exit fullscreen on focus lost**. If this option is on, a virtual machine running in fullscreen mode exits this mode and returns to the usual windowed mode when focus is moved to another application. For instance this may happen due to a message box appearing in another application.

- **Always stay on top in fullscreen**. When this option is on, the display of a virtual machine in fullscreen mode is always above all other windows and dialogs. If you want to view the dashboard or some other pop-up window, this option should be off.

Hot Keys
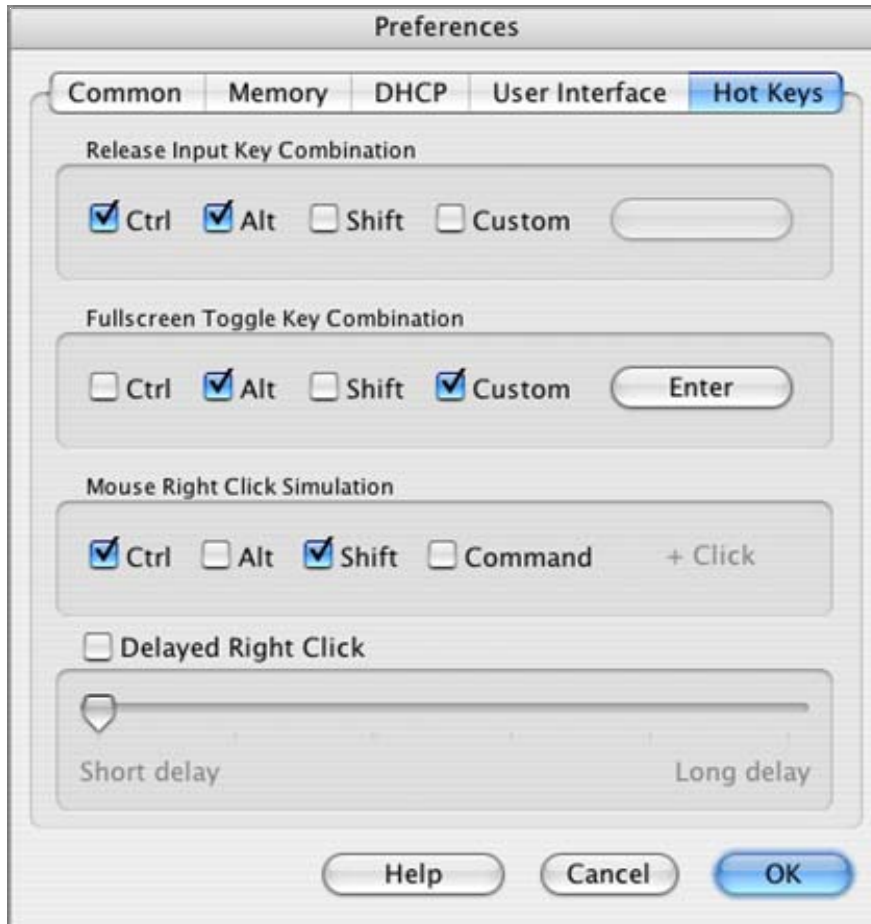
Hot key combinations can be different for each user of your computer.

Release Input Key Combination

▪   This key combination is used for releasing the keyboard and mouse that are captured in the virtual machine screen. The default hot key is Ctrl+Option(Alt).

Note. You can free the mouse and the keyboard from the virtual machine screen without pressing the hot key combination if you install the Parallels Tools. See Installing Parallels Tools (page 63) section to learn if this package is available for your guest operating system, and Capturing and Releasing the Keyboard and the Mouse (page 147) topic.

Fullscreen Toggle Key Combination

▪   This combination is used for switching a virtual machine screen from the Parallels Desktop default window size to the fullscreen mode and back. The default hot key is Option(Alt)+Enter.

Note. See Switching a Virtual Machine to Fullscreen Mode (page 148) for information on running virtual machine in fullscreen mode.

Mouse Right Click Simulation

- This key combination is used to imitate mouse right-click for a mouse that does not have the right key. The default hot key is `Ctrl+Shift+mouse click`.

  In addition to the key combination you may turn on another imitation method, Delayed Right Click. Preferred delay is specified on the slider.

  Both methods of imitation can be turned on at the same time.

  Note. See Keyboard Shortcuts in Virtual Machine (page 130) for more information on right-click imitation.

Defining New Key Combinations

Each key combination should include at least one special key (`Ctrl`, `Option(Alt)` and `Shift`).

To define a new key combination, do the following:

1 Select check boxes of one or more special keys.

2 If you want to add an ordinary key:

- select the Custom check box,
- place input focus in the field for an ordinary key (the extreme right field),
- then press the key you want to use on your keyboard.

Using Virtual and Real Disks

In this section all types of disks handled by Parallels Desktop virtual machines are discussed.

Hard Disk Images

File Type

The current version of Parallels Desktop creates and uses only virtual hard disks stored in `.hdd` files. The size of a virtual disk can be set within the range of 20 MB to 128 GB. Current version of Parallels Desktop does not allow to use physical hard disks.

Format of the Virtual Disk

A virtual hard disk can be in one of two formats: **plain** or **expanding**.

plain
: A disk of this format occupies all of the allocated space from the moment it is created. It takes more space on the real hard disk and more time to create as compared to an expanding virtual hard disk, but allows the guest OS to operate faster.

expanding
: A disk of this format is small initially and grows as you add applications and data to the virtual machine. The disk size you enter when creating the disk is the maximum size to which the disk can grow. When you just begin to operate with the disk, it's size is much less than this value.

: Expanding disks take less time to create and save disk space.

Disk format is set when you create a hard disk image. If you need to change the disk format after the hard disk file is created, a copy of the disk in another format can be made using the Parallels Image Tool (page 187).

Hard disk images of both formats are stored in .hdd files, however the structure of a disk file is different. Format of the virtual hard disk is displayed in the Disk format field on the Advanced (page 104) tab of Hard Disk Options.

If you discover that a hard disk's size is insufficient, you may increase disk capacity using the Parallels Image Tool (page 187).

Creating New Virtual Hard Disk

A new virtual hard disk can be created at the same time when a virtual machine is created and attached to this virtual machine. For a typical virtual machine, a new hard disk is created automatically, as for custom virtual machines, you have to select Create a new virtual hard disk option in step 6 of the New OS Installation Assistant (page 48).

To add a new virtual hard disk to an existing virtual machine use the Add Device Wizard. (page 114)

You may also replace the current virtual hard disk in an opened virtual machine configuration with a new one using the Recreate button on the Hard Disk Options (page 103) tab in Configuration Editor.

Maintaining Virtual Hard Disks

Virtual hard disks require periodic maintenance procedures to keep disk operations quick and efficient, similarly to real hard disks. An expanding disk is very size efficient at the beginning of a virtual machine's life cycle and becomes less and less efficient as time goes on, because each time writing to the disk is requested, the system allocates new space, and therefore disk size increases. Deleting files does not reduce the size of a virtual disk image file in the primary operating system. Eventually, an expanding virtual disk could grow enormously causing a number of inconveniencies.

Parallels Desktop includes two tools to serve both of the purposes described above:

- Parallels Compressor™, a powerful tool that effectively cleans up virtual hard disks (not only expanding disks but plain ones as well) allowing the user to select a level of cleaning and additional operations to perform. Currently Parallels Compressor can process virtual hard disks of the following guest operating systems:

    - Windows Vista

    - Windows 2003

    - Windows XP

    - Windows 2000

    For information on Parallels Compressor refer to the Using Parallels Compressor (page 169) chapter.

- Disk Compacting Tool which is recommended for all other guest operating systems. For more information on the Disk Compacting Tool refer to the Compacting Virtual Disk (page 164) topic.

Enlarging a Virtual Hard Disk

Enlarging of a virtual hard disk is a two-step procedure:

1 Increasing the size of a virtual disk with the help of Parallels Image Tool, see the Modifying Hard Disk Image (page 188) topic. After this, if the disk is in plain format, Finder will show that the disk file has increased its size. If the disk is in expanding format, Finder will show the same size of the disk file.

2 In the guest operating system the added space appears as a chunk of unpartitioned space. To use this additional unpartitioned space, you should do one of the following:

- either create a new partition on this unpartitioned space,

- or expand one of the partitions you already have.

Warning. Please back up your virtual machine by copying its files to a safe location before you start to enlarge its hard disk. This may help you to restore the virtual machine if something goes wrong with enlarging.

Creating a New Partition

In Windows Guest OS

To create a new partition on the unpartitioned space of your virtual hard disk you can use Windows build-in utility - Disk Management. Below, we describe the steps required for this in Windows XP (in other Windows guest systems the procedure will be very similar to this one).

1 Power on your virtual machine.

2 To start the Disk Management utility use one of the following ways:

- click Start -> Control Panel -> Administrative Tools -> Computer Management. In the Storage section select Disk Management.

- click Start -> Run and type diskmgmt.msc string and press Enter.

3 Right-click the Unallocated Capacity bar in the lower section of Disk Management window and on the context menu select the New Partition option.

4   The New Partition wizard opens. Select the Primary Partition option and click Next.

5   Specify the size for a new partition and click Next.

6   Assign a drive letter from the drop-down list and click Next.

7   In the Format partition dialog box select Format partition, select NTFS file system and Default allocation unit size. Specify a volume name and click Next.

8   Click Finish to exit the wizard and start formatting.

9   The new volume will appear in the Disk Management window and in My Computer.

In Linux Guest OS

In most of Linux systems, for creating a new partition and other disk management operations you can use the `fdisk` tool. You should have the `root` privileges to do this.

Below we describe a sequence of steps required for this assuming that you created a typical configuration for your Linux virtual machine.

1   Start a terminal, perform the

```
su
```

command and enter the `root` password to gain the `root` privileges.

2   Start `fdisk` using the following command:

```
/sbin/fdisk /dev/hda
```

where /dev/hda stands for the hard drive that you want to partition.

`fdisk` is the tool with text interface, so the next commands you have to type at the `fdisk` command prompt.

Note that the following `fdisk` commands may be helpful:

- m - displays the available commands

- p - displays the list of existing partitions on your `hda` drive. Note that unpartitioned space is not listed.

- n - creates a new partition

- q - exits `fdisk` without saving your changes (helps in case you did something wrong)

- l - lists partition types

- w - writes changes to partition table

3   To create a new partition type the following command:

```
n
```

When prompted, specify several parameters:

- *partition type* - type "p" to create a primary partition and "e" to create an extended one. There may be up to four primary partitions. If you want to create more than four partitions, make the last partition extended, and it will be a container for other logical partitions;

- *number* - in most cases, you already have two partitions, the number for a new partition will be three;

- *start cylinder* - enter a starting cylinder or just press Enter to use the first available cylinder;

- *last cylinder* - just press Enter to allocate all the available space or specify the size of a new partition in cylinders if you like not to use all the space available;

By default, fdisk creates a partition with system ID equal to 83. If unsure of the partition system ID, use the "l" command to check. As you can see, fdisk supports a wide variety of partition types.

4 Use the

```
w
```

command to write changes to the partition table.

5 Restart the virtual machine using

```
reboot
```

command. When restarted, start the terminal and perform

```
su
```

command to receive the root privileges once again.

6 Create a file system on the new partition. We recommend to use the same file system as on other partitions. In most cases it will be either ext3 or reiserfs file system. Assuming that we want to use ext3 file system, enter the following command:

```
/sbin/mkfs -t ext3 /dev/hda3
```

7 Make a directory that will be a mount point for the new partition. Let's say we want to name it **data**, the command will be

```
mkdir /data
```

8 Mount the new partition to the directory just created

```
mount /dev/hda3    /data
```

9 Now make changes in your static file system information by editing your /etc/fstab file in any of the available text editors. In our case, add to this file the following string:

```
/dev/hda3    /data ext3  defaults    0 0
```

In this string /dev/hda3 is the partition you've just created, /data is a mount point for the new partition, ext3 is the file type of the new partition. For exact meaning of other parameters consult man pages for the mount and fstab commands.

Save the /etc/fstab file.

10 Exit the root account

```
exit
```

Increasing the Existing Partition

In both Windows and Linux guest OSes, to increase the size of an already existing partition you can use a third-party Gnome Partition Editor 0.2.5 utility available for free.

Download Gparted 0.2.5 live CD `.iso` image:

http://superb-east.dl.sourceforge.net/sourceforge/gparted/gparted-livecd-0.2.5-5.iso
http://superb-east.dl.sourceforge.net/sourceforge/gparted/gparted-livecd-0.2.5-5.iso..

Note. You can also use other third-party disk management utilities specific for Windows or Linux systems.

To resize the partition with Gnome Partition Editor do the following:

1   In the Parallels Desktop window, click the click the button, select Options in the Resource list, then select Booting Options and [CD-ROM, Hard Disk, Floppy] boot sequence.

2   Select CD\DVD-ROM in the Resource list and select Use Image File option and specify the path to the `gparted--livecd-0.2.5-5.iso` image file.

3   Power on the virtual machine to start Gnome Partition Editor.

4   Select the appropriate extra boot options, Live CD language and key map, screen depth and resolution. It is recommended to leave the default options.

5   On the next screen in the upper part you can see the bar graphically representing the virtual disk. Select the partition you want to increase and right-click it. On the context-menu select the Resize/Move option.

6   Now, expand the green bar by dragging the right green border up to the end of the disk bar. Click the Resize button, and then click Apply to resize the disk space.

7   When the operation is completed, click the CD/DVD-ROM icon on the status bar and select the Disconnect option to disconnect the `gparted--livecd-0.2.5-5.iso` file.

8   Restart the guest OS. When fully logged in, use Finder to check that the partition has increased its size.

CD/DVD Real Discs and Images

Parallels Desktop can access real CD/DVD discs, or create and use CD/DVD images that appear to the CD/DVD-ROM drive of a virtual machine as real discs. Parallels Desktop uses CD/DVD disc images in `.iso` format. Images in this format can be created by many applications, particularly by Parallels Image Tool (page 187), a special tool for creating images of different real media that is installed along with Parallels Desktop.

There is a set of limitations on using CD/DVD discs in Parallels Desktop in that it allows the use of only a single-session CD or DVD. Multi-session discs cannot be handled. Sound from audio CDs cannot be reproduced. Neither CD nor DVD discs can be written.

Ejecting CD/DVD Disk

In Windows guest OSes you may use standard method of ejecting CD/DVD from its drive of your computer:

- In Explorer, right-click on the CD/DVD disk, and select the Eject command in context menu.

In any guest OS the Eject key on Mac keyboard (the triangle with the line underneath) can be used.

Floppy Disk Images

Parallels Desktop can create and use `.fdd` floppy image files that appears to virtual machine floppy drive as real diskettes. `.fdd` images can be created in a number of methods. Blank `.fdd` image can be created either:

- using the Recreate button on the Floppy Options (page 102) tab of the Configuration Editor,
- when adding a floppy drive to a virtual machine use the Add Hardware Wizard (page 114).

`.fdd` image of a real diskette can also be created in a several ways. If you have an USB floppy drive you may create an floppy disk image in Mac (see Creating a FDD Image of a Floppy Disk below in this topic). If in addition to Parallels Desktop you use Parallels Workstation for Windows and Linux, you may create an `.fdd` image of a real diskette using the Parallels Image Tool, then transfer this image file to the Mac. Parallels Image Tool (page 187) provided with Parallels Desktop does not include the option of creating images of real diskette.

Parallels Desktop can also use `.img` and `.ima` floppy images created by WinImage or VMware applications.

In the guest OS you may also access real diskettes using an external USB floppy drive (see Using USB Devices in a Virtual Machine (page 125) to learn how to connect USB devices).

Creating a FDD Image of a Floppy Disk

To create an .fdd image of a diskette do the following:

1 Plug in an USB floppy drive to your Mac, insert the diskette from which you want to make image.

2   Open **Finder** -> **Applications** -> **Utilities** -> **Disk Utility**.

3   In the Disk Utility window, select the diskette in the left pane, then click the **New Image** button.

4   In the opened dialog specify:

name of the image in the **Save As** field,

where to save the image in the **Where** field,

select **Read/Write** in the **Image Format** drop-down list,

and **None** for the **Encryption**.

Then click **Save**.
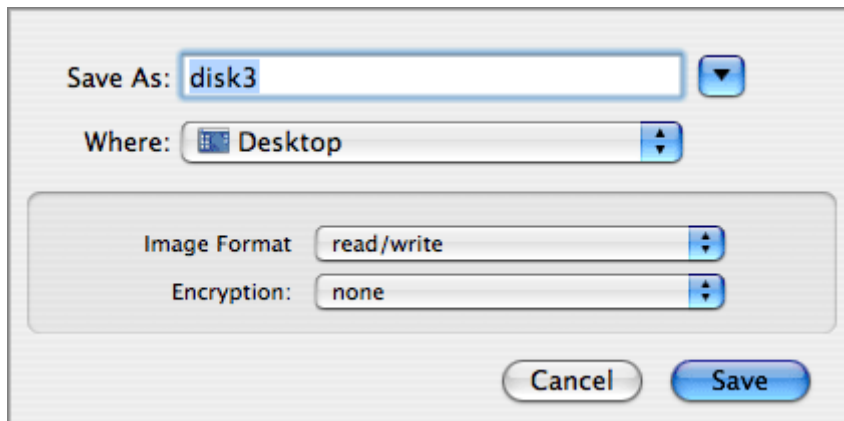
5   Find the ready `.dmg` image of the diskette. Right-click it and select **Get Info** in context menu. In the **Name & Extension** group change the `.dmg` extension to `.fdd`. Press `Enter`.

6   When you are asked if you are sure that you want to change the extension of the file click the **Use .fdd** button.

Editing Virtual Machine Configuration

Configuration of an existing virtual machine can be changed in the Configuration Editor. In this section we consider editing settings of devices already included in the configuration and general virtual machine settings. Adding and removing devices are discussed in a separate section, Adding New Devices to Virtual Machine. (page 114)

Changing Device Settings

To change device settings:

1   Open the Virtual Machine (page 120) you wish to make changes to.

2   Display the Configuration Editor. You are able to display it either by clicking the [Edit] button on the Command Button panel, by selecting Edit Configuration in the File menu, or by just clicking the device name in the Resource Name list.

3   Choose the hardware whose parameters you want to alter in the left part of the Configuration Editor window. (Options resource contains general virtual machine settings.) Tabs corresponding to the selected resource are displayed.

Note: To be able to connect any virtual device to a real one, you should have system privileges to access the real device. Otherwise the real device will not appear in the list of available devices despite it being installed on your computer.

Saving Virtual Machine Configuration

After you have changed devices settings and are satisfied with them, save the virtual machine configuration:

1   Click OK on the Configuration Editor screen, then click the [Save] button on the Command Button panel or select Save in the File menu. The file will be saved in its current location with the current name.

2   To save the configuration in another location or with another name select Save As in the File menu. After you have saved the file, its new file name appears in the title bar; its new name with path appears on the property page (page 29).

General Options

Under Options general virtual machine settings are collected.
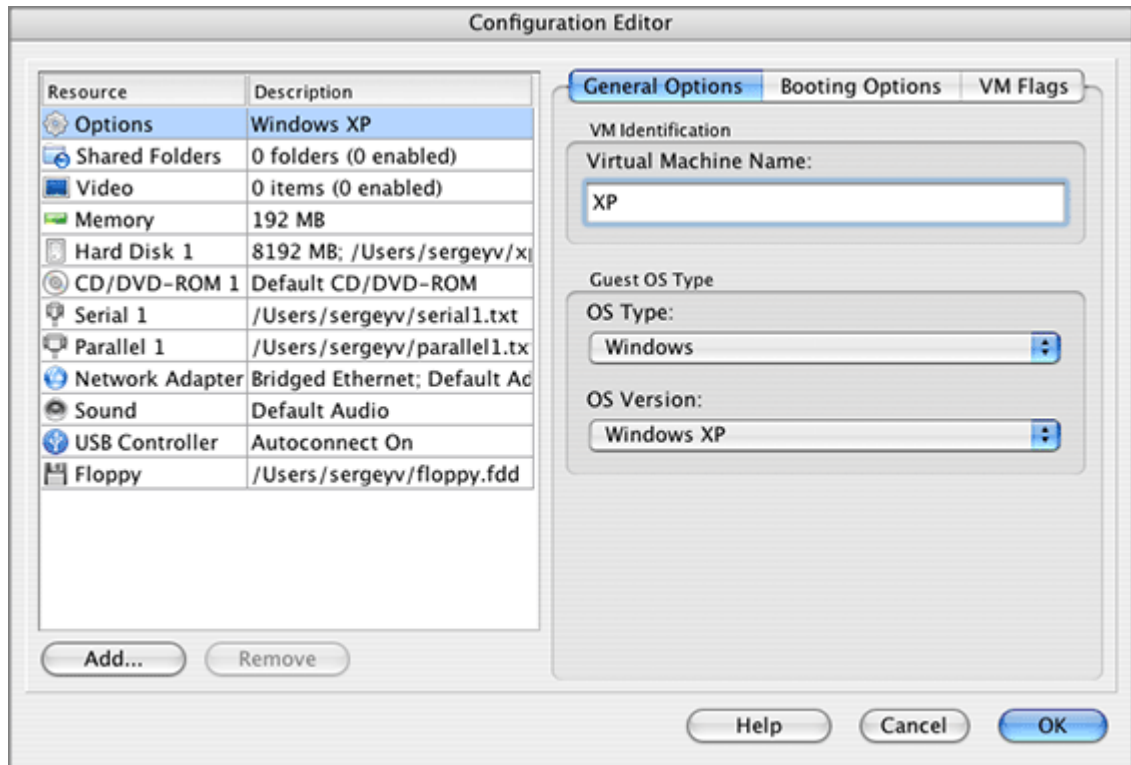
VM Identification:

- Virtual machine name field shows the name of the machine that has been specified when creating and can be changed. Its name should be descriptive, and its length should be no more than 50 symbols. The name of the virtual machine is displayed on its property page (page 29).

Guest OS Type:

- Here you can specify an operating system to be installed on the virtual machine (if you didn't choose the right one while creating the machine or want to install another OS). Be careful to choose the right operating system. If settings on this tab do not correspond with the operating system actually installed this may cause problems varying from slow performance to machine failure.

Booting Options
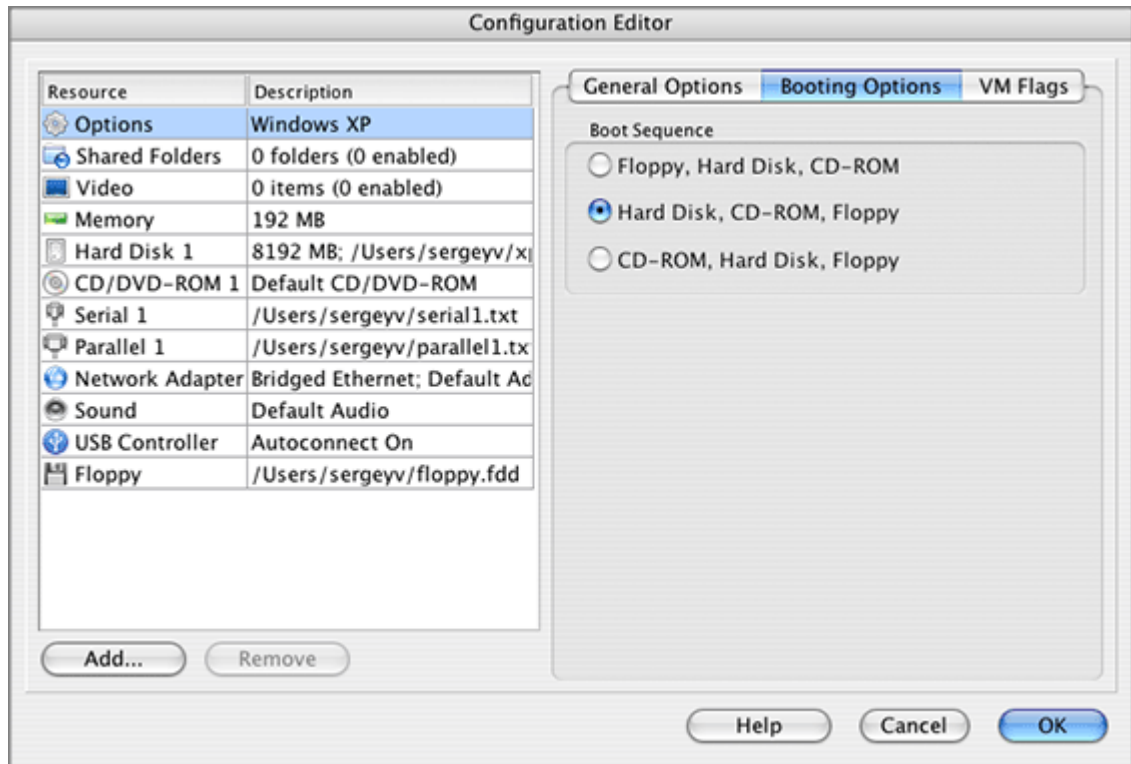
On the **Booting Options** tab you can select the order of devices from which the virtual machine will try to boot one-by-one. You can choose one of the three predefined sequences - [**Floppy, Hard Disk, CD-ROM**], [**Hard Disk, CD-ROM, Floppy**], [**CD-ROM, Hard Disk, Floppy**]. During its startup, the virtual machine checks media in the first device of the boot sequence and tries to boot from it. If the media is not found or is not bootable, the virtual machine will proceed with the next device in the boot sequence, and so on.

Note: Please make sure that a boot disk (hard disk, CD-ROM, floppy disk) is available and configured correctly. If you select a boot disk that does not exist, after starting up the guest operating system and loading BIOS, you will see the error message "`Currently opened virtual machine does not include any boot devices. In order to be successfully booted the virtual machine should have at least one of the following devices attached: floppy disk drive, hard disk drive, CD/DVD-ROM drive. Do you want to power on this virtual machine anyway?`". Click **No**, correct the configuration of your floppy or the corresponding IDE drive and try to start again.

VM Flags
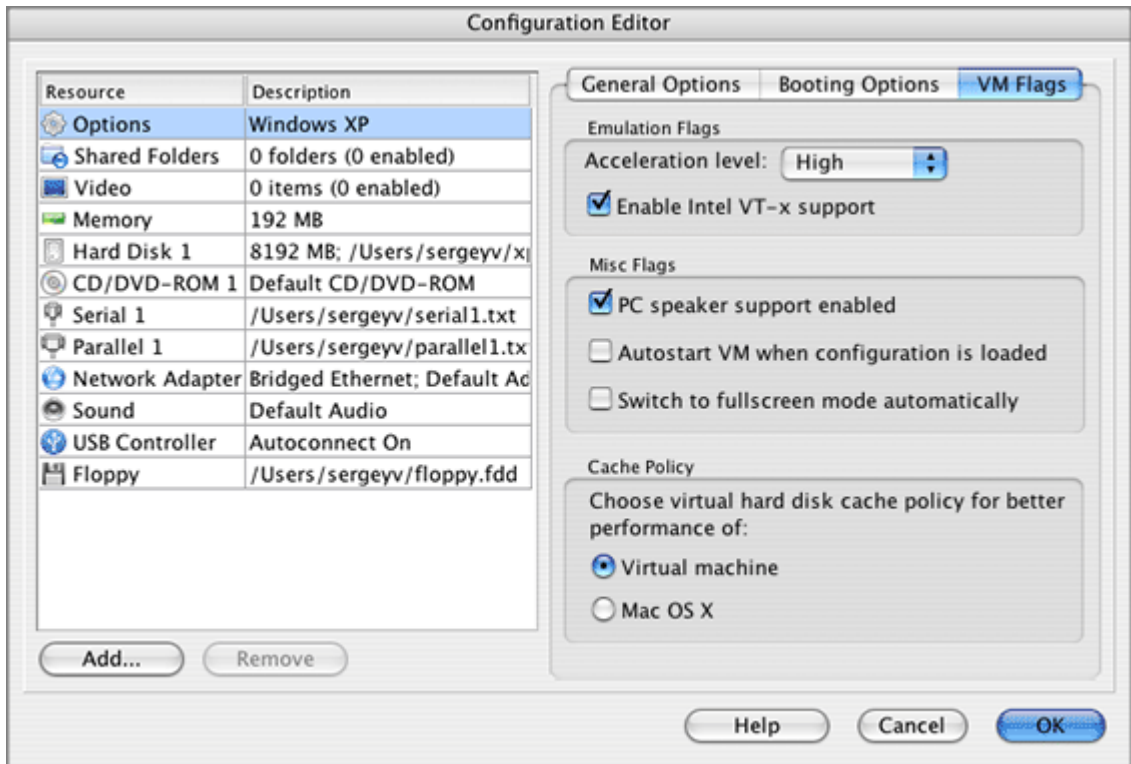
VM Flags tab contains various options that influence the performance of the virtual machine and startup configuration options.

Emulation Flags:

- **Acceleration level.** Acceleration enables a number of the guest OS specific performance optimization techniques. We recommend selecting the *High* level. If you notice incorrect guest operating system behavior while running with high acceleration, for example when installing software, shut down the OS and lower acceleration level. Note that without acceleration at all (*Disabled* level) the virtual machine runs very slowly. We recommend turning acceleration on after finishing the process that caused problems.

- **Enable Intel VT-x Support** option is available for editing if you have an Intel processor with Virtualization Technology in your Mac. By default VT-x support is enabled. See Intel Virtualization Technology (VT-x) Support (page 8) to learn about VT-x support in Parallels Desktop. If you are running a guest OS with VT-x support, it is indicated in the **About Parallels Desktop** screen (see the More Information (page 140) section).

Misc Flags:

- **PC speaker support enabled.** If this option is enabled the virtual machine can indicate its actions by PC speaker sounds.

- **Autostart VM when configuration is loaded.** After you open the virtual machine configuration file, the VM will be automatically started.

- **Switch to fullscreen mode automatically.** As soon as the virtual machine is started, it will run in fullscreen mode.

Cache Policy:

Caching of the virtual hard disk significantly increases the speed of virtual machine operations. However caching requires much of your host Mac memory and may result in slowing down your Mac OS X applications especially if the virtual hard disk is large. You may select whether you want to cache the virtual machine hard disk(s) or to disable caching.

- **Virtual machine.** With this option caching of the virtual hard disk(s) connected to the virtual machine is enabled.

- **Mac OS X.** With this option caching of the virtual hard hard disk(s) connected to the virtual machine is disabled.

Shared Folders

Note. This tab is active in Windows 2000/XP/2003/Vista guest OSes only. In other guest OSes you will see the message: "Feature is not available for this type of guest operating system".
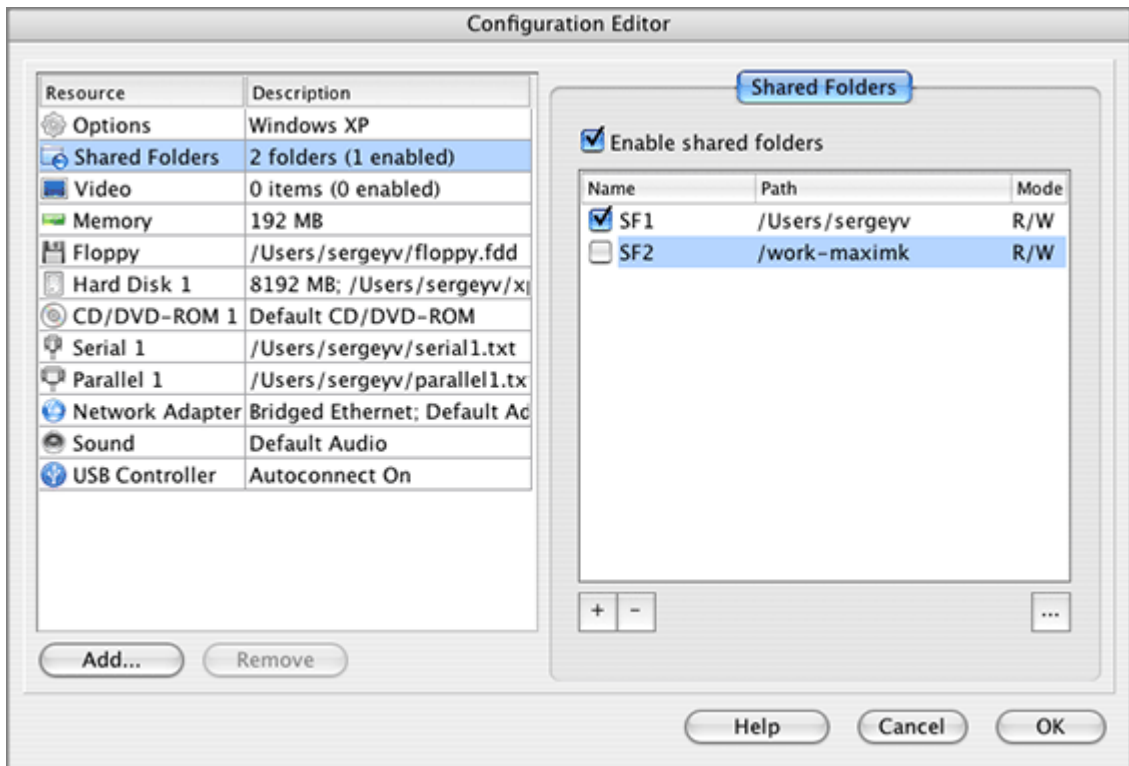

- **Enable shared folder** option allows/prohibits using shared folders in the virtual machine.

- The list below displays all the shared folders created for this virtual machine. The **Name** column shows name of the folder in the guest OS, the **Path** column shows the same folder in the file system of your Mac.

- Add button ☐ opens the **Shared Folder Properties** dialog for creating a new shared folder. See the Using Shared Folders (page 123) section for detailed description of this process.

- Delete button ☐ removes the selected shared folder.

- Edit button ☐ opens the **Shared Folder Properties** dialog where you can make changes in the shared folder properties. See the description of this dialog in the Using Shared Folders (page 123) section.

Video (Screen Resolutions)
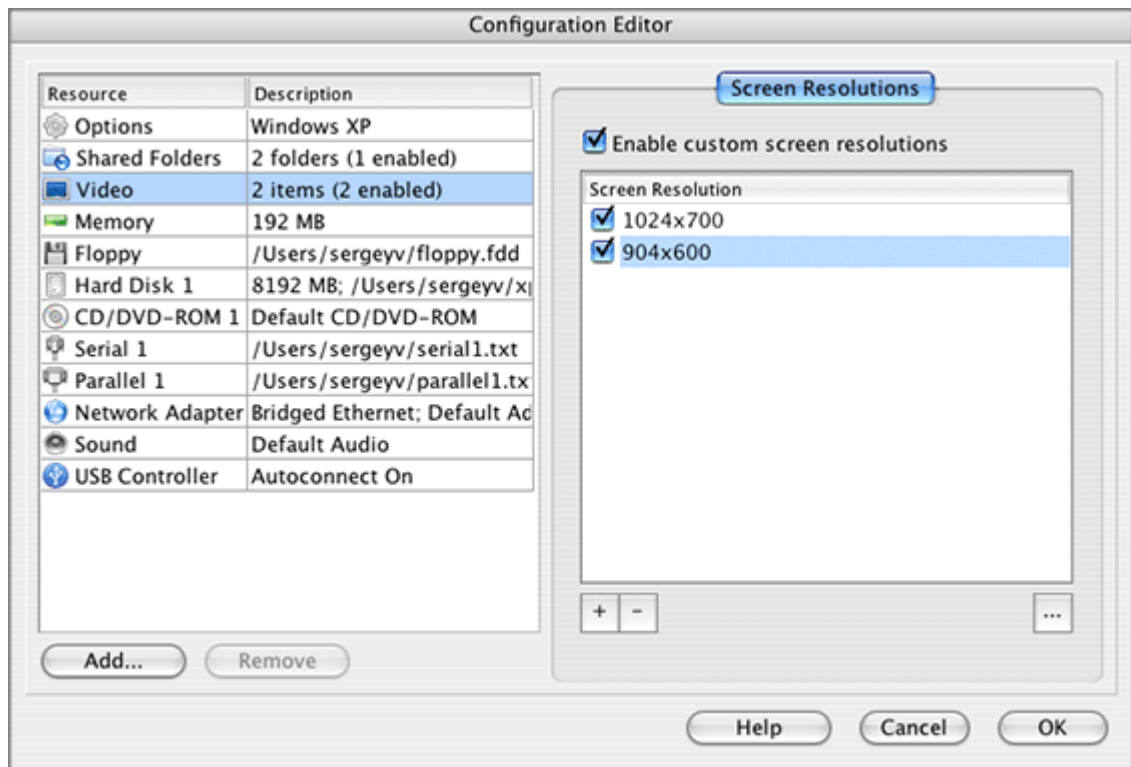
- **Enable custom screen resolutions** option allows/prohibits using different screen resolutions for the virtual machine.

- **Screen Resolutions** table displays all the custom resolutions defined for this virtual machine. The check mark near a resolution means that this resolution will be available for selection in the virtual machine. Those resolutions that are not checked will not be available for selection. To enable/disable a resolution, open its properties using the **Edit** button.

- Add button [+] opens the **Resolution Properties** dialog for creating a new resolution. See the Using Custom Screen Resolutions (page 126) topic for detailed description of this process.

- Delete button [−] removes the selected screen resolution.

- Edit button [...] opens the **Resolution Properties** dialog where you can make changes in the screen resolution properties. See description of this dialog in the Using Custom Screen Resolutions (page 126) section.

Memory Options
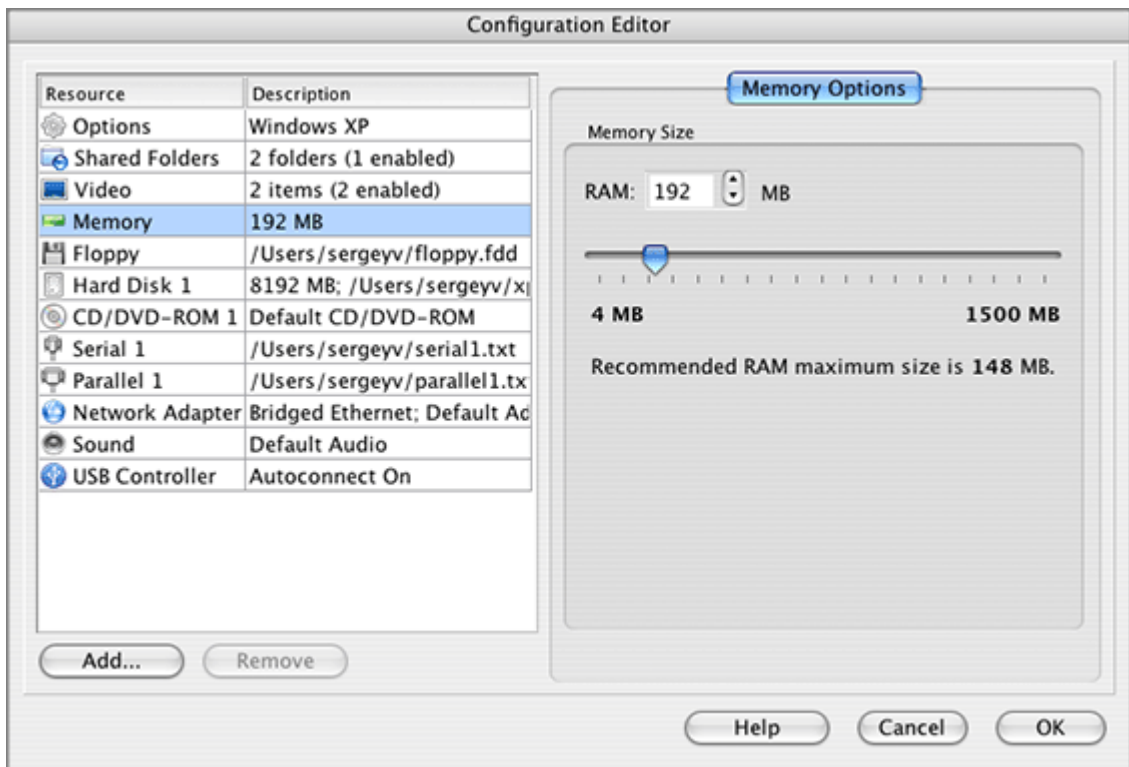
The Memory Size parameter describes the size of virtual memory (RAM) to be allocated for the virtual machine. You can choose any value from 4 to 1500 MB. We advise you not to exceed the recommended maximum because this is the limit of the physical RAM that your system should reserve for virtual machines. If this amount is not enough the redundant memory is swapped to disk, thus slowing down both guest OS and primary OS performance.

The recommended memory maximum size is specified on the tab below the slider. This value can be adjusted on the Memory tab (page 79) in the Preferences window.

To set memory size for the current virtual machine use slider, spin buttons in the RAM field, or type a value directly into the field. Memory size should be set at a multiple of 4. If not, when trying to save memory options you will receive an error message.

Floppy Options

A virtual machine floppy drive can be connected to a floppy disk image. To get information on floppy disk images used by Parallels Desktop read the Floppy Disk Images (page 92) topic.
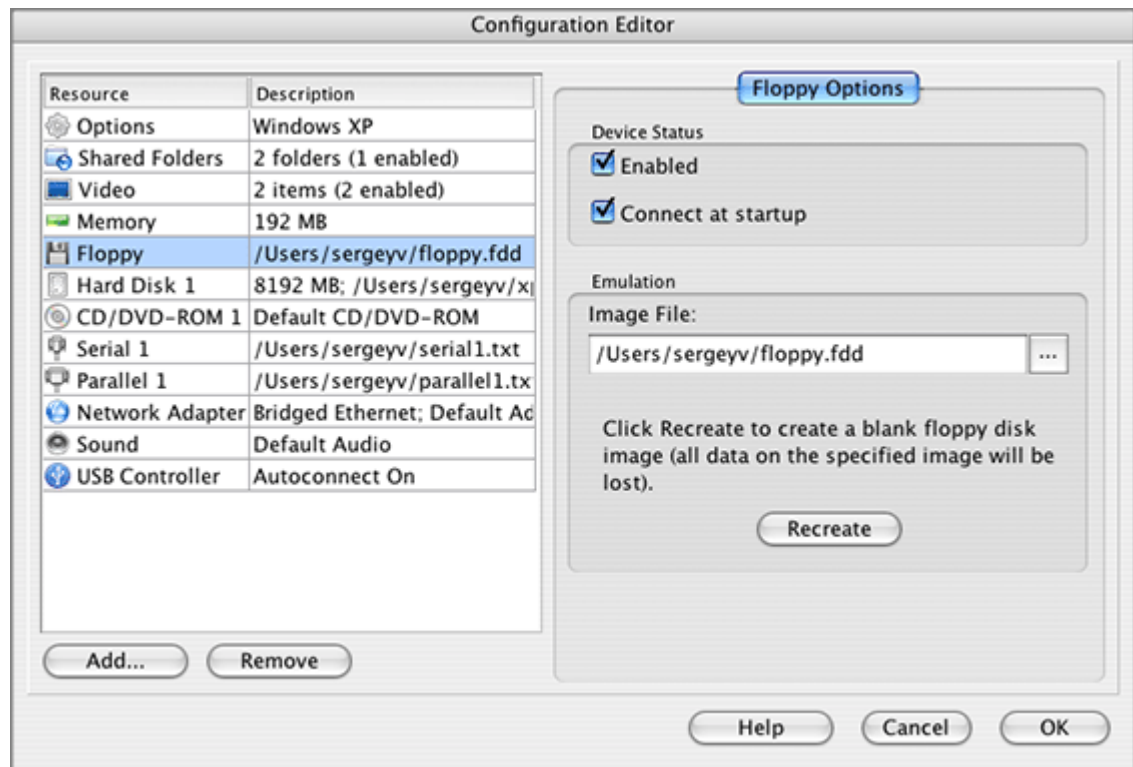
Device Status:

- To temporary disable floppy drive operations without deleting it from configuration, deselect Enabled check box.

  Note: If you start the virtual machine with the floppy drive disabled, you cannot change this option when virtual machine is running.

  If the floppy drive is enabled, it can be connected/disconnected while VM is running. Media that the floppy drive accesses can also be changed.

- To start guest OS with the floppy disk inserted, select the Connect at startup check box.

Emulation:

- To connect the virtual floppy drive to a floppy disk image, specify the name of the floppy disk image in the Image File field. You may use Browse button to locate the file.
- Parallels Desktop allows to create a blank floppy image. Type the file name and the path in the Image File field and click the Recreate button. The size of a floppy disk image equals 1.44 MB. The default extension for a floppy disk is .fdd.

Hard Disk Options

The current version of Parallels Desktop allows virtual machines to only use hard disk images in
.hdd format. Read the Hard Disk Images (page 86) topic to get acquainted with disk format
and its other options.

Up to four IDE devices (hard disks and CD/DVD-ROM drives) can be connected to a virtual
machine currently. This means, that there can be no more than four hard drives plus CD/DVD-
ROM drives, i.e., it doesn't matter how many of IDE devices are hard drives and how many are
CD/DVD-ROMs.
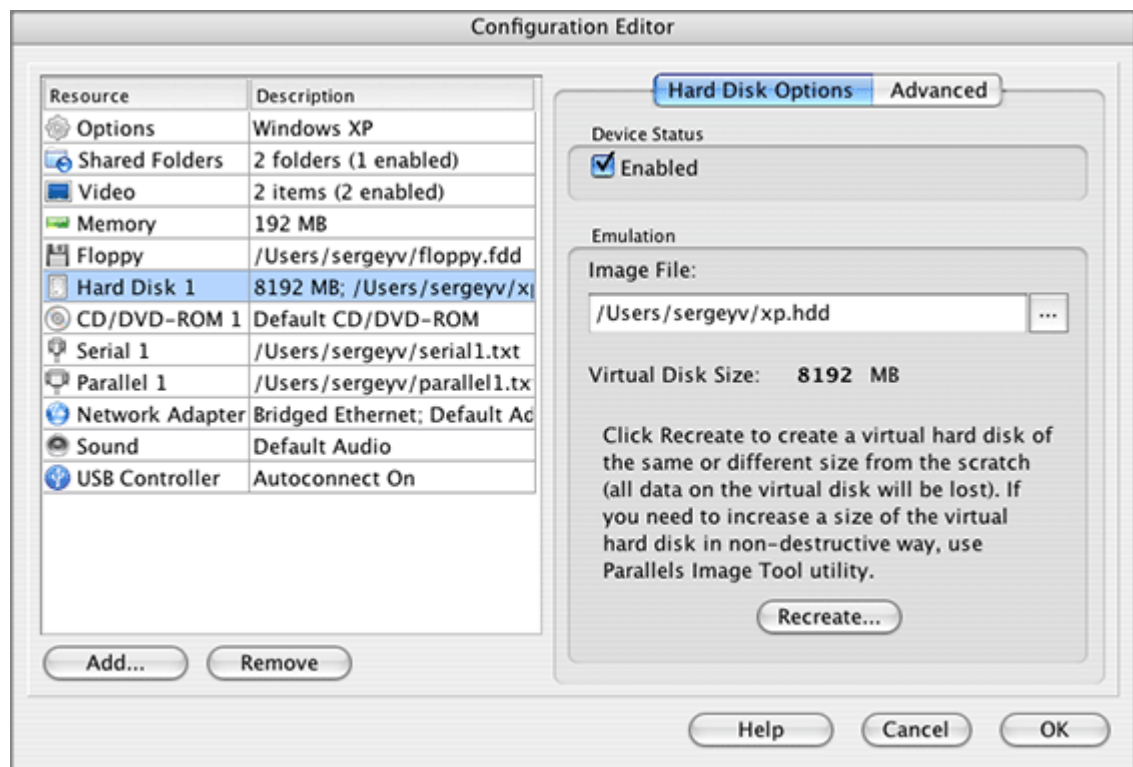
Device Status:

- To temporarily disable operations with this hard drive without deleting it from
  configuration, deselect Enabled check box.

Emulation:

- If you want to change the hard drive connected to your virtual machine, you may choose
  another .hdd file in the Image File field.

- Recreate button deletes an old hard disk and creates a new one. Use this opportunity if you
  want to create a disk from scratch. If you want to replace the current hard disk with a new
  one do the following:

1   Click the Recreate button.

2   Create HDD window appears. You can specify Disk size and whether the disk should be expanding (page 87) or plain (page 87). Select Expanding disk check box if you want the hard disk to be expanding.

3   Click Create.

4   You are asked to confirm that you are going to create a new disk instead of the old one. Click Yes. A new empty disk is now connected to your virtual machine.

Note: If while using a hard disk you discover that its size is insufficient, you may increase disk capacity using the Parallels Image Tool (page 187).

Advanced
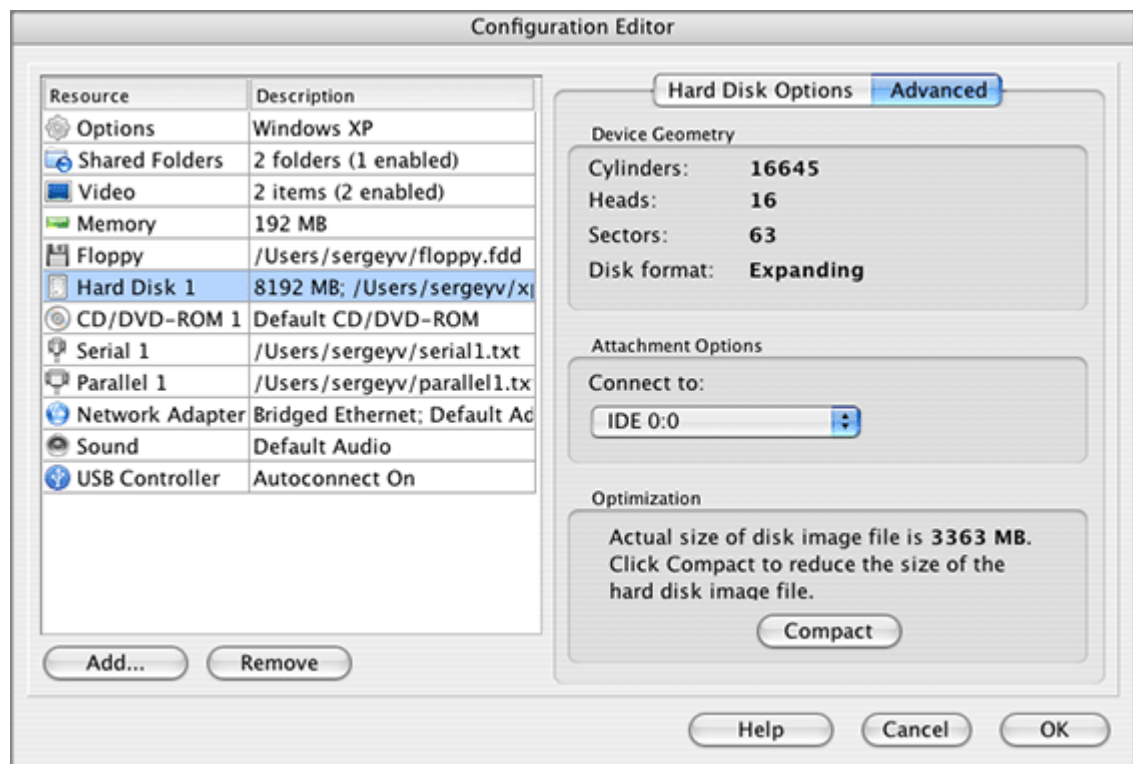
Device Geometry:

- Fields Cylinders, Heads, and Sectors in this group show geometry of a virtual HDD. Note that the geometry concerns virtual disk, not a real one where virtual disk is stored.

- Disk format label indicates virtual hard disk format. See the Format of The Virtual Disk (page 87) in the Hard Disk Images topic.

Attachment Options:

- Choose the IDE channel to connect to the HDD image in the Connect to field. If you want the HDD to be startup one select *IDE 0:0*.

  Note that if you set two startup drives at once - hard disk (IDE 0:0) and CD/DVD-ROM (IDE 0:1) - the guest OS will try to boot according to the sequence set on the Booting Options (page 96) tab under the General Options.

Optimization:

- If the selected disk is an expanding-type disk, the Compact button starts the process of compacting the disk. See the Compacting Virtual Disk (page 164) topic for information on this feature. The Compact button is disabled for plain virtual disks.

CD/DVD-ROM Options

A virtual machine CD/DVD-ROM drive can be connected to a real CD/DVD-ROM drive of your computer as well as to a CD/DVD .iso image. To get information on using CD/DVD images in Parallels Desktop look in CD/DVD Real Discs and Images (page 92) topic.

Up to four IDE devices (hard disks and CD/DVD-ROM drives) can be connected to a virtual machine currently. This means, that there can be no more than four hard drives plus CD/DVD-ROM drives, i.e., it doesn't matter how many of IDE devices are hard drives and how many are CD/DVD-ROMs.
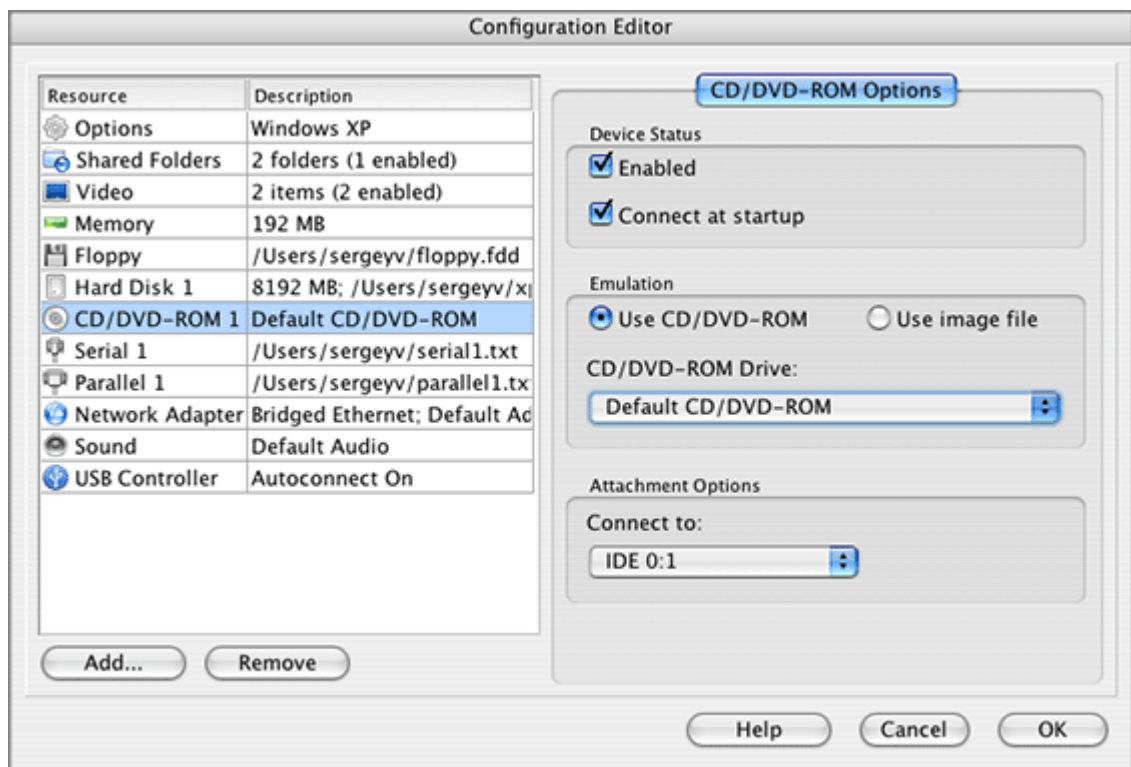
Device Status:

- If you wish to temporary disable a CD/DVD-ROM drive without deleting it from configuration, deselect Enabled check box.

  Note: If you start the operating system with the CD/DVD-ROM drive disabled, you cannot change this option when virtual machine is running.

  If the CD-DVD-ROM drive is enabled, it can be connected/disconnected while VM is running. Media that the CD/DVD-ROM drive can access may also be changed.

- If the CD/DVD-ROM drive is enabled, you can select the Connect at startup check box to start the guest OS with the CD/DVD disc inserted.

Emulation:

- If you have a physical CD/DVD-ROM on your computer, you can use it in the virtual machine. In this case, select the Use real CD/DVD-ROM check box, the name of the physical CD/DVD-ROM (for example, D:) will be shown in the CD/DVD-ROM drives drop-down menu and available for selection.

  Note: To be able to connect the virtual machine CD/DVD-ROM drive to a real CD/DVD-ROM drive, you should have system privileges to access the real device. Otherwise the real CD/DVD-ROM drive will not appear in the list of available devices even though it is installed on your computer.

- If you want to use a CD/DVD image (e.g., the .iso file), select the Use image file flag. As you select it, another field where you can enter the CD/DVD image file name appears below. Specify the path to your CD/DVD image file or click the Browse button and locate the CD/DVD image file.

Attachment Options:

- Choose the IDE channel to connect to CD/DVD-ROM image in the Connect to list. If you want the CD/DVD-ROM to be the startup drive select *IDE 0:1* in the list.

  Note that if you set two startup drives at once - hard disk (IDE 0:0) and CD/DVD-ROM (IDE 0:1) - the guest OS will try to boot according to the sequence set on the Booting Options (page 96) tab of the General Options.

Network Adapter Options

In the current version of Parallels Desktop a RTL8029 (NE2000 compatible PCI card) network adapter is supported.

In a Linux guest OS, to be able to access an external network in the virtual machine, a ne2k-pci driver should be loaded into the Linux kernel. It is included by default, however if you are going to recompile the kernel remember to select the ne2k-pci component. In a FreeBSD guest OS you need to have the if_ed.ko module loaded.
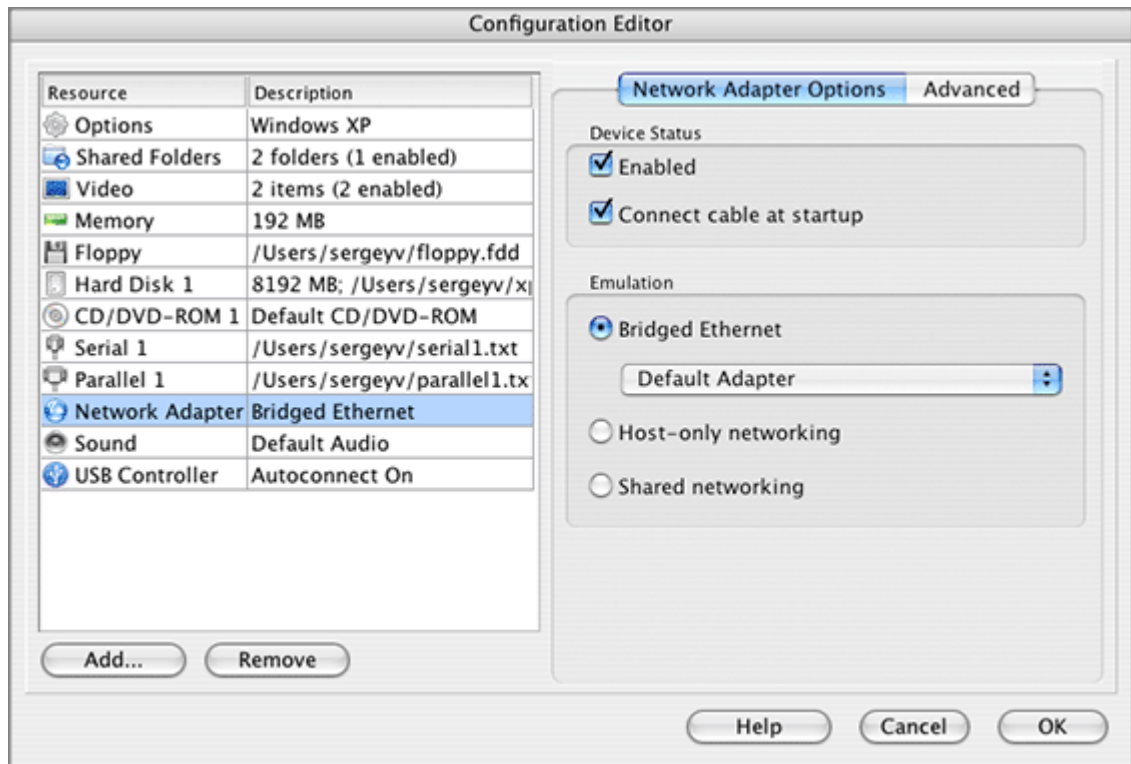
Device Status:

- If you wish to temporarily disable network support in the virtual machine without deleting the network adapter from configuration, deselect the Enabled check box. When the Enabled check box is selected, the options and fields for configuring the network become active.

- If network adapter is enabled, you can select Connect at startup check box to start the guest OS with network adapter connected.

Emulation:

In the Emulation group, you can select the type of network adapter to be used in your guest OS.

- Bridged Ethernet networking is intended to access local network and Internet using physical Ethernet adapter of your computer. A virtual machine is treated as a separate computer and should be configured the same way as a real one.

    If you select the Bridged Ethernet radio button, the drop-down list below will show a list of all physical network adapters available on your computer. Choose one of them to connect to your virtual adapter. See Bridged Ethernet Networking (page 117) to learn more about this type of networking.

- Select **Host-only networking** if you don't want your virtual machine to be accessible from outside your Mac, or network interfaces of your Mac are off. When you set this option, your virtual machine will be connected to Mac and other virtual machines, but will be disconnected from Internet. Creating Host-Only Network (page 118) topic discusses how to configure a host-only network.

- Select **Shared networking** if you want to provide Network Address Translation (NAT) feature to your virtual machine. See Shared Networking (NAT) (page 119) to learn how to configure this type of networking.

Advanced
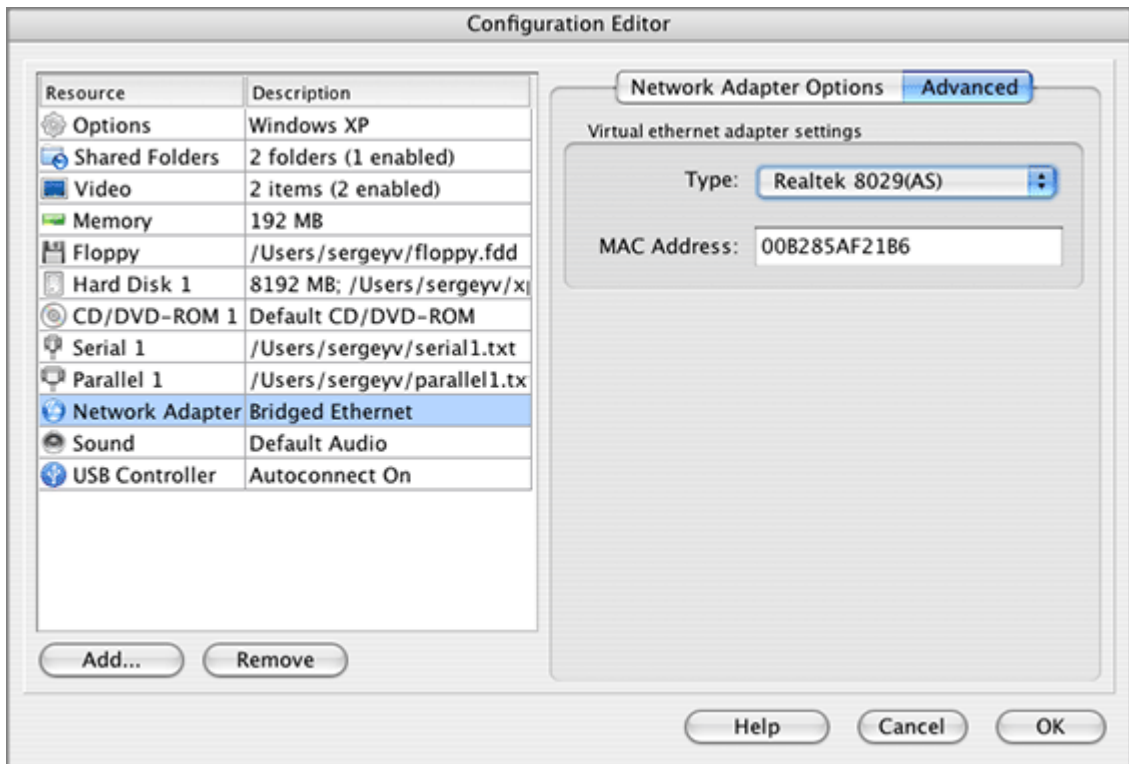
- This tab allows you to specify a network driver to be used in your guest OS. In the current version of Parallels Desktop a RTL8029 driver for the Ethernet adapter is supported. It is already selected in the **Type** field.

  You can find native Realtek RTL8029 drivers for many different guest OSes in the Parallels Tools (page 63) pack shipped together with the Parallels Desktop.

  In Windows 2000/XP/2003 guest operating systems you can improve network performance by installing a specially developed PRLETH driver that can be found in the Parallels Tools pack.

- A **MAC address** is generated automatically but can be changed manually. If you decide to change it, please make sure that the number is unique inside your network.

Serial Port Options

Parallels Desktop allows up to four serial ports to be connected to a virtual machine.
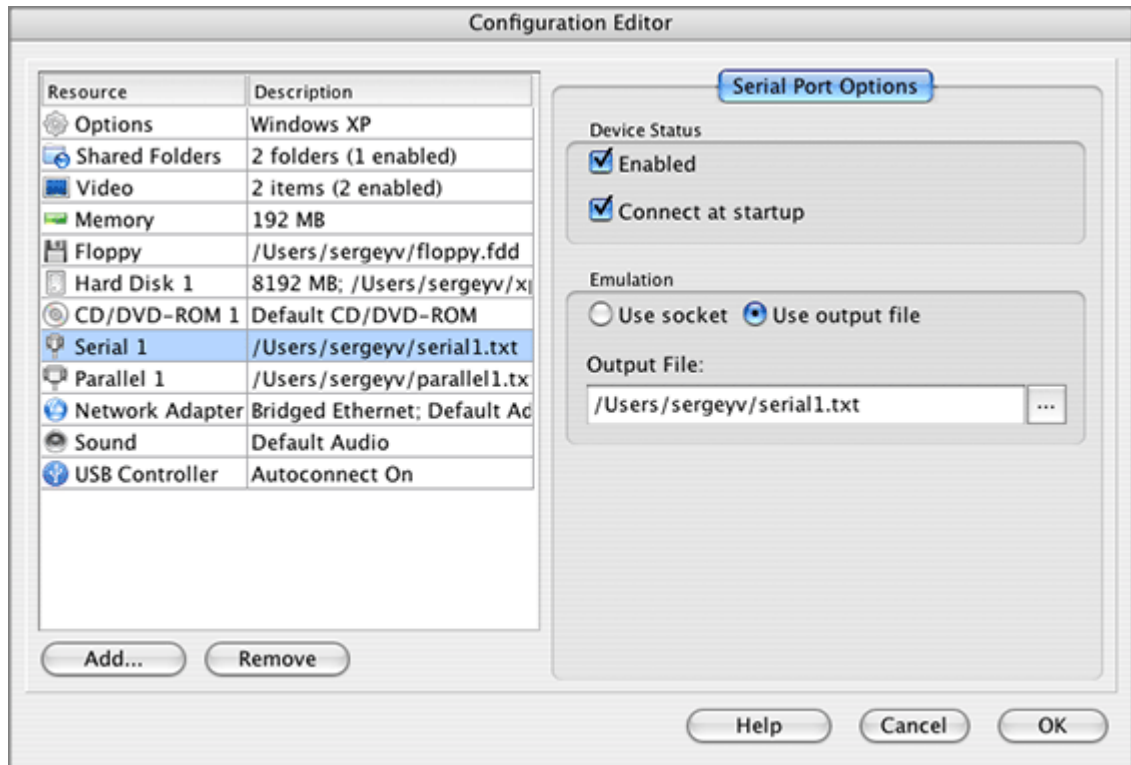
Device Status:

- If you wish to temporarily disable operations with a serial port without deleting it from configuration, deselect the Enabled check box.

  Note: If you start the operating system with the serial port disabled, it can not be connected/disconnected while the VM is running.

- If you have enabled the port, you can select the Connect at startup check box to start the guest OS with this port connected.

Emulation:

Parallels Desktop suggests two methods of serial port emulation:

- using socket technology (Use socket option).

  If you have selected Use socket, the Socket Name field appears containing a default socket name. Use it or type a new name that should subject to the following rules. The name should begin with /tmp/, i.e. it should be in the form /tmp/<socket>. If a name doesn't subject to the rule, then after virtual machine is started you will get the error message: "Com Port <number>: Unable to open <port name> device".

  In the second field select a role at this end of the socket.

- using an output file (Use output file option).

  You can attach the existing file using the Browse button or create a new one. The new file is created in the virtual machine folder.

Parallel Port Options

Parallels Desktop allows up to three parallel ports to be connected to a virtual machine.
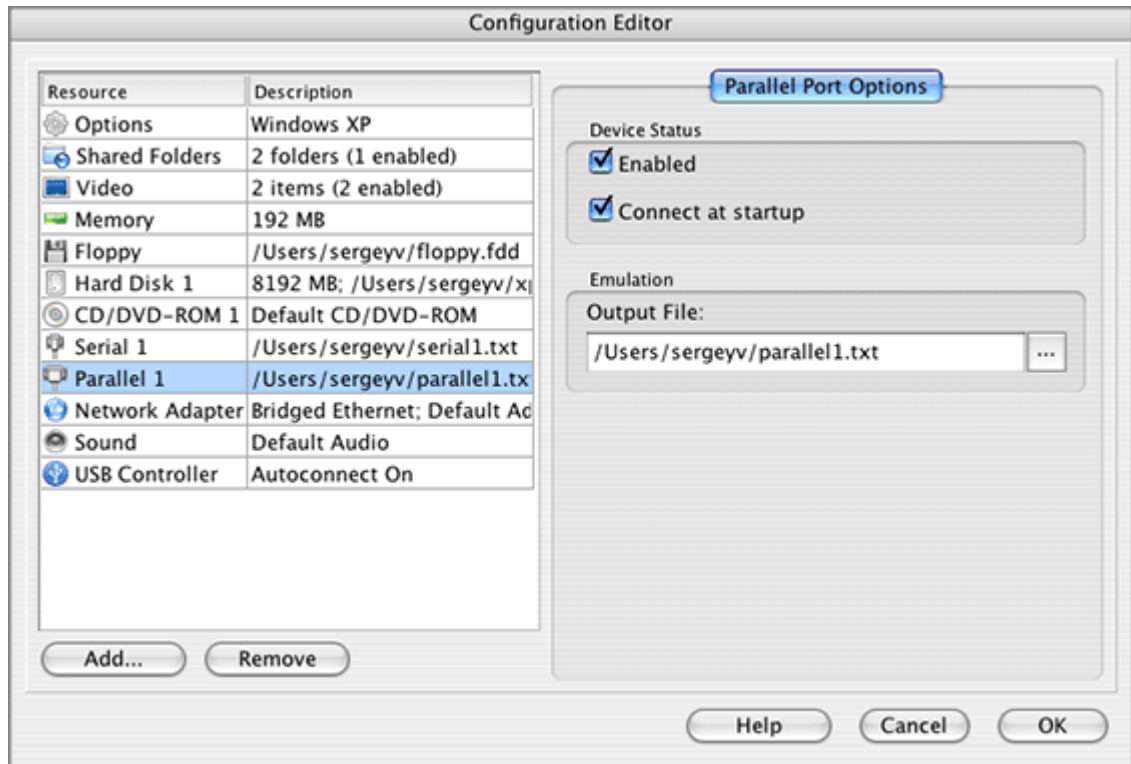
Device Status:

- If you wish to temporarily disable operations with a parallel port without deleting it from configuration, deselect the Enabled check box. If the parallel port is enabled, it can be connected/disconnected while the VM is running.

  Note: If you start the operating system with the parallel port disabled, you cannot change this option when the virtual machine is running.

- If you have enabled a port, you can select the Connect at startup check box to start the guest OS with this port connected.

Emulation:

The current version of Parallels Desktop suggests only one method of parallel port emulation:

- using an output file (Use output file option).

  You can attach the existing file using the Browse button or create a new one. The new file is created in the virtual machine folder.

Sound Options
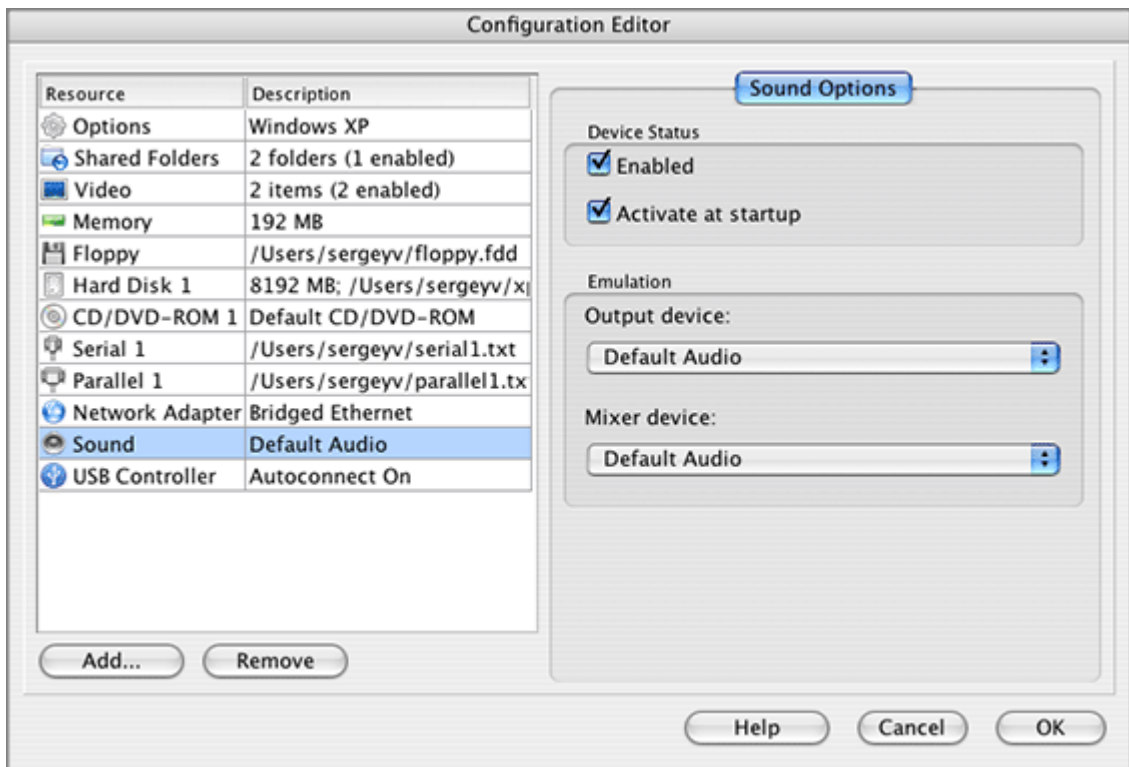
Parallels Desktop virtualizes the Realtek AC'97 compatible sound card.

Device status:

- Enable option allows/prohibits using the sound device in the virtual machine. If the sound device is enabled, it can be connected/disconnected while the VM is running. However if you wish to temporarily disable operations with a sound device without deleting it from configuration, deselect the Enabled check box.

  Note: If you start the operating system with the sound device disabled, you cannot change this option when the virtual machine is running.

- To start the guest OS with the sound device activated, select the Activate sound at startup check box.

Emulation:

- After the sound is enabled, the Output Device field appears containing a list with the *Default Audio* and *Null Device* items. As a rule we recommend to select the *Default Audio* device. *Null Device* is the choice for situations when you don't want to produce sound while the sound card is required by the guest OS'es applications.

- The same situation occurs with the Mixer Device. As a rule we recommend to select the *Default Audio* device. *Null Device* is the choice for situations when you don't want to produce sound while the sound card is required by the guest OS'es applications.

  Note. If you are not satisfied with the quality of sound produced, a special AC'97 sound driver (page 64) is available for Windows 95/98/ME/NT/2000 guest OSes and for OS/2 and eComStation guest OSes. You can install it instead of standard one.

USB Options
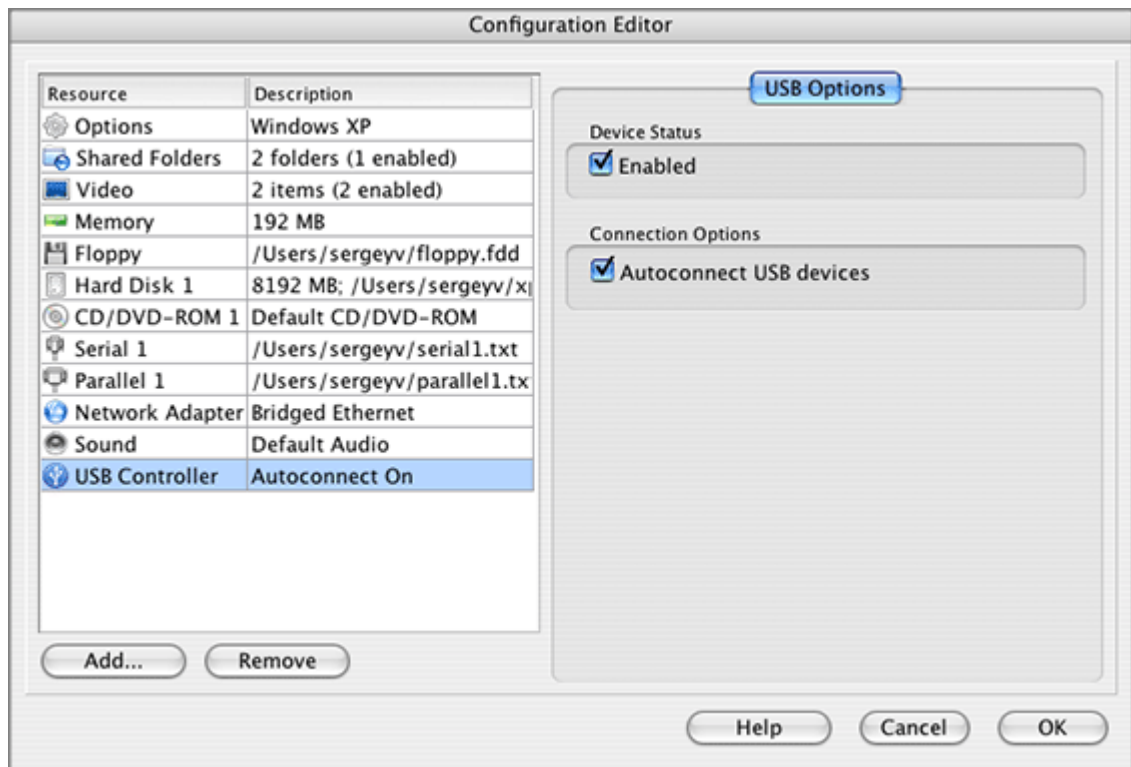
Device Status:

- **Enable** option allows/prohibits using USB devices in the virtual machine. If the USB is enabled, USB devices can be connected/disconnected to the virtual machine while it is running. However if you wish to temporarily disable USB operations without deleting it from configuration, deselect the **Enabled** check box.

  Note: If you start the operating system with the USB disabled, you cannot change this option when the virtual machine is running.

Connection Options:

- **Autoconnect USB devices**. Select this option if you want the running virtual machine to capture new USB devices connected to your Mac. New device are captured if there is no more than one USB device currently active.

Adding New Devices to Virtual Machines

Virtual machine technology allows adding new devices to a virtual machine to be the same as connecting new devices to a real computer. Virtual machine configuration can include the following devices:

- up to four IDE devices - virtual hard disks and CD/DVD-ROM drives;
- a floppy drive;
- a network adapter;
- up to four serial ports;
- up to three parallel ports;
- a sound device;
- a USB controller.

New devices are added using the **Add Hardware Wizard**. Devices of any type (except hard disks) can be connected to a real drive as well as to virtual media. In addition, if you add a floppy drive, a new blank `.fdd` image can be created at the same time and connected to the drive. When adding a virtual hard disk you may choose between connecting an existing hard disk image and creating a new one.

Note: To be able to connect any virtual device to a real one, you should have system privileges to access the real device. Otherwise the real device will not appear in the list of available devices even though it is installed on your computer.

To add a new device to the virtual machine do the following:

1 Open the virtual machine to which you want to add new device, then select **Edit Configuration** in the **File** menu or click [Edit] on the command button panel to open Configuration Editor.

2 In the lower left part of the **Configuration Editor** window click the **Add** button.

3 The Add Hardware Wizard greets you with the Welcome to Add Hardware Wizard screen. Click Next.

4 On the Select hardware screen you should choose the device you want to add to your machine.

The Available Hardware list contains devices available for adding. If the VM configuration already includes the maximum allowed number of a particular device type, this device type will not appear in the Available Hardware list. For instance, only one floppy drive is allowed.

The wizard allows you to add only one device at a time.

On this screen you may prefer to add devices immediately without specifying its options, in order to save time. (You may set options later in the Configuration Editor). To do so, click the Add Instantly button after selecting the desired device. The new device is added immediately with standard options, and some of them are not set at all (for example, the instant hard disk has a size of zero).

To set the options of the device being added click the Next button.

5 Follow the wizard screens to configure the new device. You should select the device type, the media it is connected to, and the options specific to the device and media type. All of them are described under the Editing Virtual Machine Configuration (page 94) section. The final options screen contains the Finish button.

Removing Devices

Most virtual machine devices can be removed from the configuration. Memory and those elements of the virtual machine configuration that are not devices but rather collections of settings can not be removed. These elements are: Options, Shared Folders, and Video.

Note. Any device, except memory, can be disabled in the Configuration Editor (page 94) without removing it from configuration. Uncheck the Enabled check box of the desired device.

To remove a device:

1 Open the virtual machine from which you want to remove a device, then open the Configuration Editor by selecting File->Edit Configuration in the menu or click

     on the command button panel.

2 Select the device you want to delete in the left part of the Configuration Editor window. Note that options, shared folders, video, and memory list entries can not be deleted.

3 Click the Remove button.

Networking in a Virtual Machine

In general, Parallels Desktop allows three types of networking in virtual machine, Bridged Ethernet, Host-only networking, and Shared Networking (NAT). This section describes all these types of networking and ways of configuring them.

Bridged Ethernet Networking

Bridged Ethernet networking allows virtual machines to access a physical network, such as a Local Area Network and/or Internet. You should have an Ethernet adapter installed in your Mac.

To access a LAN and Internet, configure the virtual machine:

▪ in virtual machine Network Adapter Options (page 108) select Bridged Ethernet type of networking in the Emulation group and choose the proper network adapter in the list,

▪ configure network options in the guest operating system.

If you encounter problems when using Bridged Ethernet mode or you do not want to use Bridged Ethernet networking because of security considerations, consider Host-Only Networking with Internet Sharing.

Creating a Host-Only Network

Parallels Desktop provides a virtual network accessible only to the primary operating system and virtual machines running on it. The primary operating system is attached to this network through the Parallels Host-Guest adapter installed along with Parallels Desktop. For a virtual machine to join a host-only network, the guest network adapter should be set to host-only networking. IP addresses for the primary operating system and virtual machines may be:

- dynamic (assigned by Parallels DHCP server running on host-only network);
- static (assigned manually).

Configuring Network with Dynamic IPs

IP addresses for machines in a host-only network are provided by Parallels DHCP server that is started automatically whenever you launch Parallels Desktop. DHCP server is installed along with Parallels Desktop.

Configure network with dynamic IPs in the following way:

1 Open Configuration Editor for the virtual machine and on the Network Adapter Options (page 108) tab select the Host-only networking parameter.

2 Select Parallels Desktop->Preferences in the menu. Specify a range of IP addresses to be assigned to the virtual machines on the DHCP (page 80) tab.

Configuring Network with Static IPs

To configure host-only network with static IP addresses you have to manually assign them to the primary operating system and to each virtual machine in which you want to include on the network.

The virtual machine should be configured as follows:

1 Open the Configuration Editor for the virtual machine and on the Network Adapter Options (page 108) tab select the Host-only networking parameter.

2 Start the virtual machine and specify the IP address by standard means for the guest operating system installed on it.

Configuring a static IP address for the primary operating system:

1 Open System Preferences.

2 In the Internet & Network section, click the Network icon.

3 In the Network screen, select *Parallels Host-Guest Adapter* in the Show drop-down list.

4 Open the TCP/IP tab of the Network screen.

5 In the TCP/IP tab:

in the Configure IPv4 option select *Manually*,

specify the IP Address and Subnet Mask.

6 Click the Apply Now button and close the Network screen.

Shared Networking (NAT)

If you encounter one of the following:

- you want to access the Internet in a virtual machine but do not want to use Bridged Ethernet networking because of security considerations,
- you have problems with Bridged Ethernet mode,
- your computer accesses the Internet via a modem or another non-Ethernet device,

you may prefer using Shared Networking (NAT) mode in a virtual machine. In this mode your virtual machine can access the Internet while being inaccessible from outside of your host computer.

In order to provide shared networking support Parallels NAT adapter is installed along with Parallels Desktop. Mac OS X is attached to this network through this adapter. IP addresses for the virtual machines and Mac are provided by Parallels DHCP server connected with the Parallels NAT adapter.

Configuring Shared Networking (NAT) for a Virtual Machine

To configure Shared Networking (NAT):

1 Open Configuration Editor for the virtual machine and on the Network Adapter Options (page 108) tab select the Shared networking parameter.

2 Select Parallels Desktop->Preferences->DHCP in the Parallels Desktop menu. In the DHCP (page 80) tab, specify a range of IP addresses to be assigned to the virtual machines and your primary OS in the DHCP Scope for Shared Networking group. This scope of addresses should be different from the one specified for host-only networking.

Note that the range of addresses on the DHCP tab affects all virtual machines working in the Shared Networking (NAT) mode.

Selecting and Opening a Virtual Machine

When you launch Parallels Desktop, the last used virtual machine is opened by default. This option is controlled by the **Load recently used VM at startup** setting on the Common tab (page 77) of the **Preferences** window. You may turn this option off, to start Parallels Desktop with the **Startup Options** dialog, which is discussed in the separate topic Startup Options Dialog (page 121), or with blank virtual machine. In these cases the last used virtual machine can be opened via the recently used list.

There are other ways to open virtual machines as well:

- List of recently used virtual machines;
- Browsing the hard disk for a configuration;
- Open a virtual machine in a new window.

Opening Recently Used Virtual Machines
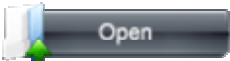
The **Open Recent** list in the **File** menu displays the names of the six most recently used virtual machines. Use this method to open a virtual machine you recently worked with.

If the required virtual machine is not shown in the recently used list, you may find it browsing the hard disk for its configuration file manually.
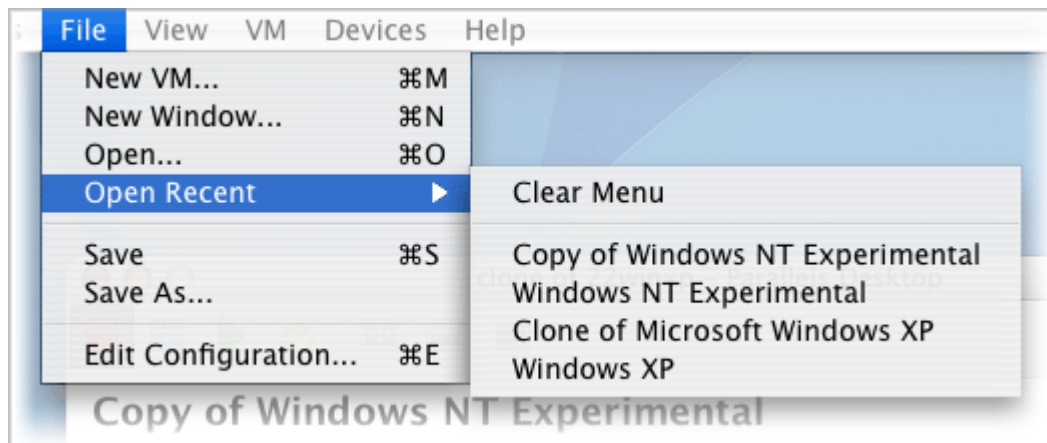
Browsing Hard Disk for a Configuration

To select a virtual machine that is not represented in the recently used list, you should perform the following operations:

1 Click the ![Open] icon on the Command Button panel at the bottom of the Parallel Desktop window or select **Open** in the **File** menu.

2   Browse for a desired configuration file and click OK. After the configuration file is opened, its file name appears in the Parallels Desktop title bar; virtual machine name and full configuration file name with path are displayed on the property page (page 29).

Opening a Virtual Machine in a New Window

You may open an additional instance of Parallels Desktop using the menu. To do this:

▪   Select the New Window command in the File menu.

Since the last used virtual machine is blocked by the Parallels Desktop instance where you issue this command, a new window is opened either with the Startup Options (page 121) dialog (if the Show startup dialog option is selected on in the Common tab of the Preferences window), or with a blank virtual machine.

Startup Options Dialog

This dialog is sometimes displayed upon Parallels Desktop startup in order to assist in easily opening a virtual machine or proceeding to creation of a new one. The first time you launch Parallels Desktop this dialog is opened automatically.

Please select a virtual machine you wish to work with. You may either choose one of recently used virtual machines or create a new one.

VM Path: s/clown/Library/Parallels/winxp.18/winxp.18.pvs   Browse...

Recently Used Virtual Machines:

Microsoft Windows XP
Red Hat Linux
Microsoft Windows XP
Microsoft Windows Vista
Microsoft Windows XP
Microsoft Windows XP

☑ Load recently used VM at startup   ☑ Show startup dialog

Install a New OS...   Cancel   Open

Opening Recently Used Virtual Machines

To open one of the recently used virtual machines:

1 Select the name of the machine in the Recently Used Virtual Machines list. The VM Path will show the respective configuration file.

2 Click Open.

The list of the recently used virtual machines is empty if you launch Parallels Desktop for the first time.

Browsing Hard Disk for a Configuration

To open an existing virtual machine that is not in the recently used list:

▪ Click Browse button and locate the desired configuration file.

Creating a New Virtual Machine

To create new virtual machine:

▪ Click the Install a New OS button and follow the New OS Installation Assistant (page 38).

Also, you may close this dialog by clicking the Cancel button; a blank virtual machine will be opened and you may start creating a new virtual machine manually.

What to Open on Parallels Desktop Startup

The Load recently used VM at startup and Show startup dialog options control what happens when Parallels Desktop is started. The same options are in the Common tab (page 77) of Preferences window and are described in the respective topic. Whenever you check/uncheck these options in one of these screens, they are automatically changed in the second one.

Opening a Virtual Machine When Another VM Is Running

When a virtual machine is running, you can not open another instance of Parallels Desktop through the dock and Finder. If you want to open another virtual machine use menu commands:

▪ use Open Recent menu item to open one of the recently used virtual machines. See Opening Recently Used Virtual Machines in the Selecting and Opening a Virtual Machine (page 120) topic.

▪ use New Window menu item to open any virtual machine located anywhere on your disk(s). See Opening a Virtual Machine in a New Window in the Selecting and Opening a Virtual Machine (page 120) topic.

Using Shared Folders

Shared folders are folders in your Mac file system that are visible to the guest OS also. These folders are used for exchanging files between the primary OS and a virtual machine or between several virtual machines.

In the primary OS shared folders appear as usual folders, while in guest OS they are objects of the network neighborhood.

Using shared folders is possible for the following guest OSes:

- Window 2000/XP/2003/Vista.

Setting Up a Shared Folder

Setting Up a shared folder requires two steps:

1 Adding a shared folder(s) in your virtual machine configuration.

2 Installing Parallels Tools in your guest OS.

See below for detailed instructions.

Adding a Shared Folder

1 Open the virtual machine configuration, click the button to open the Configuration Editor.

2 In the Configuration Editor, select the Shared Folders tab (see the Shared Folders (page 99) topic). Select the Enable shared folders option.

3 In the Shared Folders tab, click the [+] button to open the Shared Folder Properties screen.

4 In the Shared Folder Properties screen:

specify a name for the folder which will appear in your guest OS in the Name field;

specify a folder in your Mac OS X file system that will be shared in the Path field;

if you want to restrict writing to this folder from inside the guest OS, select the Read Only check box. You will be able to save files to this folder in the primary OS only;

make sure the Enabled check box is selected;

and click OK.
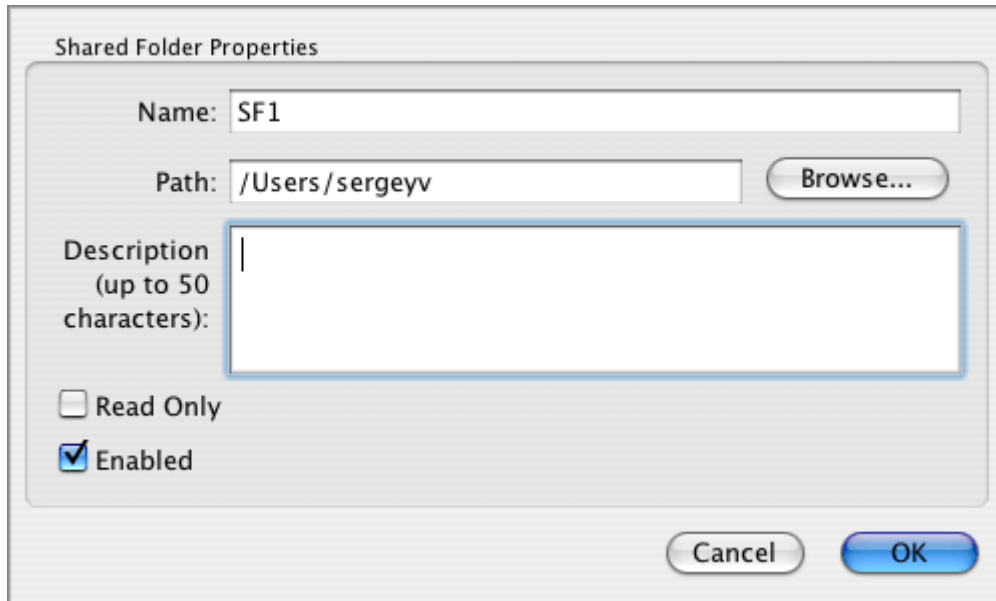
5   Click OK in the Configuration Editor.

6   Click to save the virtual machine configuration.

If you have not installed the Parallels Tools in a virtual machine, proceed to the Installing Parallels Tools in the Guest OS subtopic. If you have them installed:

▪ power on your virtual machine and view shared folders in your guest OS.

Installing Parallels Tools in Guest OS

Parallels Tools includes the Shared Folders tool which is necessary for a guest OS to view the shared folders. See a full description of this tool in the Parallels Tools Overview (page 64).

Installation of Parallels Tools is performed just after you have created a new virtual machine and installed a guest OS in it. See Installing Parallels Tools (page 63) for detailed descriptions on how to do so in a particular guest OS. We recommend that you perform the *typical* installation, but if you perform a *custom* installation make sure the Shared Folders tool is selected.

Viewing Shared Folder in Guest OS

There are two ways to view the contents of the shared folders in the guest OS.

Easy Way

Shared Folders Options (page 163) tab in **Parallels Tools Center** contains the **Place shortcut on the desktop** option. If it is selected viewing contents of shared folders is simple:

▪ Click the **Parallels Shared Folders** icon on the desktop of a running virtual machine.

General Way

1 In the virtual machine, open Windows **Explorer**.

2 In Explorer, select **My Networks Places->Entire Network** and find the **Parallels Shared Folders**.

3 Click the **Parallels Shared Folders** to view the list of shared folders available in your virtual machine.

Note. When working with a shared folder inside a virtual machine, keep in mind that the ability to save files into this folder depends on its **Read Only** setting.

Using USB Devices in a Virtual Machine

The current version of Parallels Desktop emulates the 2-port USB 1.1 controller. This means that up to two USB peripherals can be connected to a virtual machine simultaneously. This number does not include a keyboard, mouse, and USB microphone that will be connected in any case.

Parallels Desktop lets you connect USB devices to virtual machines automatically. See the USB Options (page 113) section to learn how to turn this option on. And see the Connecting USB Devices (page 155) section to learn how to connect a USB device to a virtual machine both automatically and manually.

Custom Screen Resolutions

Virtual machine, like a real computer, allows to change the resolution of its monitor. You may use standard screen resolutions, such as 640x480, 800x600, etc, but with virtual machine you have one more degree of freedom - non-standard screen resolutions. Use them if you want the virtual machine monitor to occupy a certain part of your computer monitor.

Procedure of defining custom resolution is different in different guest OSes.

In Windows Guest OSes

Parallels Desktop allows you to define up to 10 different resolutions for a Windows virtual machine and change them when running the guest OS. Note that these resolutions should be no less than 800x600.

Adding a Screen Resolution

1   Open the virtual machine configuration you want to add a resolution to, click the

   Edit   button to open the **Configuration Editor**.

2   In the **Configuration Editor**, select **Video** in the **Resource** list.

3   In the **Screen Resolutions** tab (see Video (Screen Resolutions) (page 100)), make sure the **Enable custom screen resolutions** option is selected.

4   Click the **Add** button to open the **Resolution Properties** dialog.

5   In the **Resolution Properties** dialog:

   set the desired resolution options in the **Width, pixels** and **Height, pixels** fields;

   select the **Enabled** check box if you want this resolution to be available for selection in the guest OS;

   click **OK**.
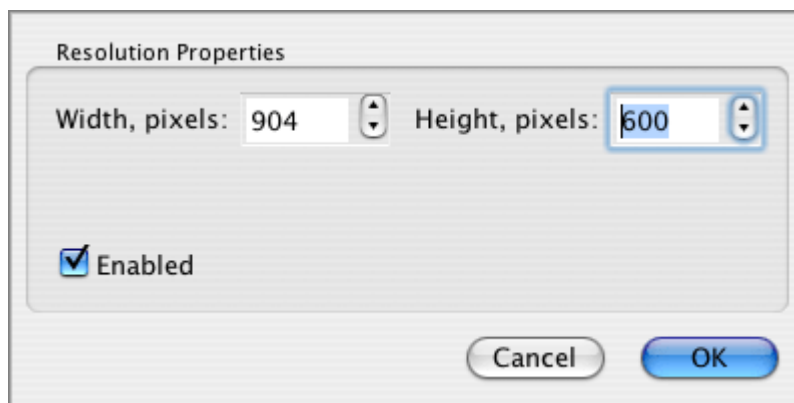
6   Click **OK** in the **Configuration Editor**.

7   Click   Save   to save the virtual machine configuration.

Changing Screen Resolution for a Virtual Machine

To change screen resolution:

- Power on your virtual machine.

- Select the preferred resolution as it is usually done in your guest OS. The guest OS will propose for selection all the resolutions available in the Video (Screen Resolutions) (page 100) tab for which the **Enabled** option is selected.

If you have defined a non-typical resolution and do not see it in the list of available resolutions in the running guest OS, this means that your guest OS can not use this resolution.

In Linux Guest OSes

To run a Linux virtual machine with a non-standard resolution do the following:

1 In a terminal, generate xorg.conf modeline by executing

```
gtf <width> <height> <refresh>
```

Note. For LCD monitors, used in notebooks, the refresh should not to be more than 60.

The output string may look for example as follows:

```
Modeline "1440x900_60.00"   106.47   1440 1520 1672 1904   900
901 904 932  -HSync +Vsync
```

"1440x900_60.00" is the mode name; 1440 is width, 900 is height, and 60 is refresh of the new mode that were given to the gtf.

2 Open xorg.conf and paste the output of gtf to "Monitor" section. Monitor section should look approximately as follows:

```
Section "Monitor"

    Identifier "monitor1"

    VendorName "Generic"

    ModelName "1024x768 @ 70 Hz"

    HorizSync 31.5-57.0

    VertRefresh 50-70


    # TV fullscreen mode or DVD fullscreen output.

    # 768x576 @ 79 Hz, 50 kHz hsync

    ModeLine "768x576"       50.00   768   832   846  1000    576
590   595   630


    # 768x576 @ 100 Hz, 61.6 kHz hsync

    ModeLine "768x576"       63.07   768   800   960  1024    576
578  590  616

    Modeline "1440x900_60.00"   106.47   1440 1520 1672 1904
900 901 904

932  -HSync +Vsync

EndSection
```

3 In xorg.conf, locate the section "Screen", subsection "Display", and string that begins with the "Modes" keyword. It contains modes list. Insert name of the new mode in the beginning of the modes list.

Note. Make sure, that "Depth" property of the subsection "Display" equals to "DefaultDepth" value defined in section "Screen".

4 If you use Mac computer of ordinary size, just restart X Server.

5 If you use MacBook or MacBook Pro, you have to take one more step. In the `"Device"` section change the driver from `"fbdev"` to `"vesa"`. Now, save the changes and restart your virtual machine.

Using Mouse in a Virtual Machine

How to Configure Mac to Use the Right Mouse Key

By default, right button of Mac mouse is configured to perform the same functions as the left button (if your mouse has the right button at all). This is not likely to be comfortable in Windows guest OSes. You may configure your mouse in such a way that its right button will perform its specific functions:

1 Go to the Apple System menu, select System Preferences, and in the Hardware section click Keyboard&Mouse.

2 In the Keyboard&Mouse dialog, open the Mouse tab and set for the right button Secondary Button function.
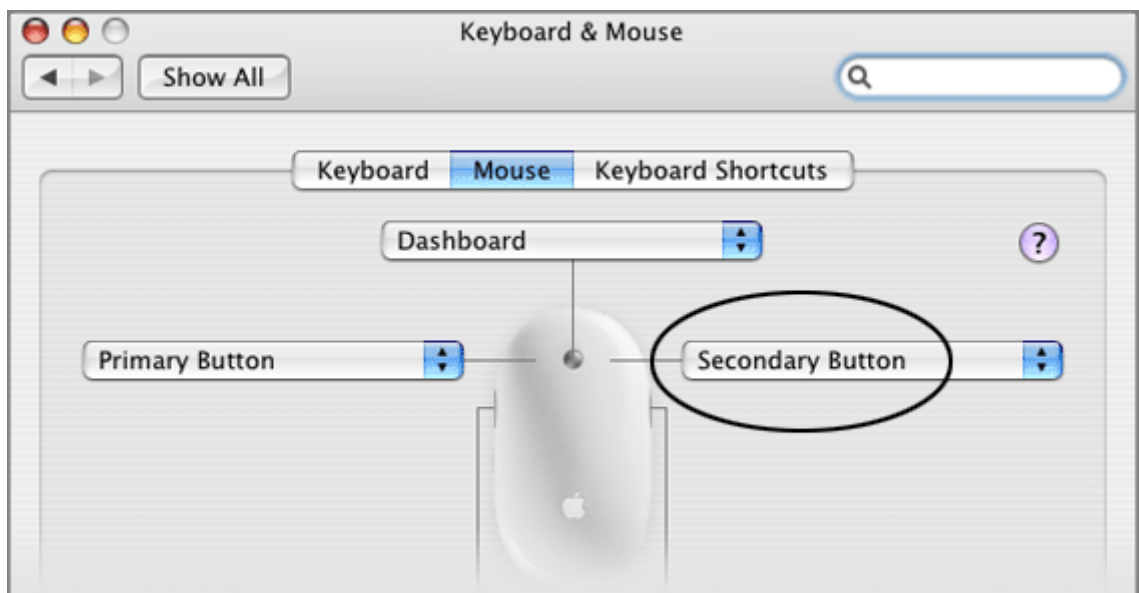
How to Right-Click If Mouse Does Not Have the Right Key

If your mouse does not have the right key, you probably use the `Ctrl+click` combination instead. Parallels Desktop gives you the option of using the `Ctrl+click` combination for standard selection operation and proposes other ways to perform a right-click in virtual machine. Do one of the following:

▪ Press a key combination plus mouse click simultaneously.

By default `Ctrl+Shift+click the mouse key` is defined. You may set other keys on the Preferences -> Hot Keys (page 85) tab.

- Click with delay.

  You have to click and hold the mouse button until the context menu is displayed. Preferred delay is specified on the slider on the Preferences -> Hot Keys (page 85) tab.

  By default this method is disabled and is to be enabled manually on the Preferences -> Hot Keys (page 85) tab.

On MacBook and MacBook Pro your may also use one more method:

- Click the small Enter key that is to the right of the space bar and Apple key on your keyboard. In Windows guest OSes Enter key on Mac keyboard is an analog of Menu key on Windows keyboard.

Keyboard Shortcuts in a Virtual Machine

How to Press F1-F12 and Others Function Keys in MacBook and MacBook Pro

To press `F1-F12` in your virtual machine please press `Fn+(F1-F12)` key combination instead.

If you want to press `Ctrl+Alt+Del` key combination in a virtual machine, use one of the following techniques (see also Shutting Down and Resetting a Virtual Machine (page 149)):

- select **VM->Send Key->Ctrl+Alt+Del** in menu,
- press `Ctrl+Option(Alt)+Del` while the keyboard is captured inside a virtual machine window.

If you want `F1-F12` keys to be recognized as they are do the following:

1 Go to the Apple **System** menu->**System Preferences**->**Keyboard & Mouse** in the **Hardware** section.
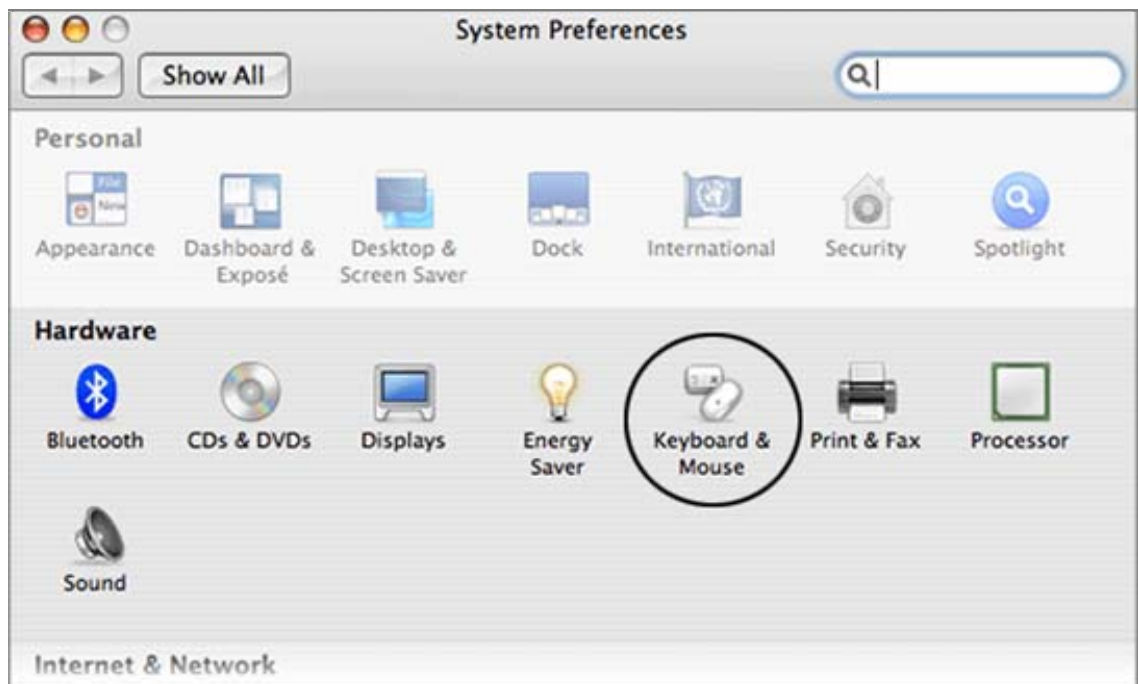
2 In the **Keyboard&Mouse** window, select **Keyboard** tab and check option **Use F1-F12 keys to control software features.**
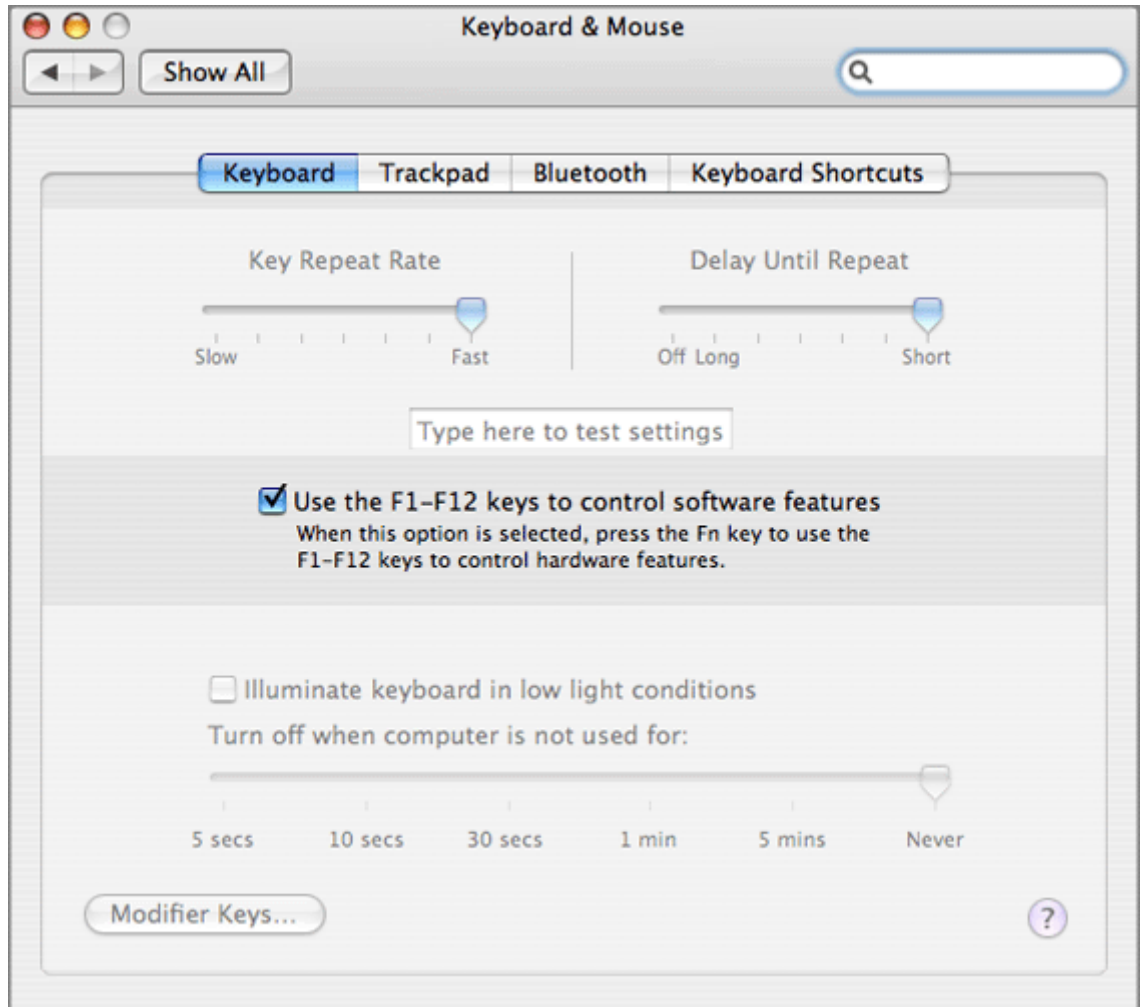
Using Mac System Keyboard Shortcuts in a Virtual Machine

Mac keyboards have a set of system keys, and problems may result when using these keys in a virtual machine. For instance, the F9 - F12 keys are reserved for Dashboard & Expose operation, whereas F11 can be handy in Windows Internet Explorer for full screen mode. To be able to use this Mac shortcuts with a virtual machine keyboard, do the following:

1 Go to the Apple System menu, open System Preferences, and click Universal Access in the System section.

2   In the Universal Access window select Enable access for assistive devices option.
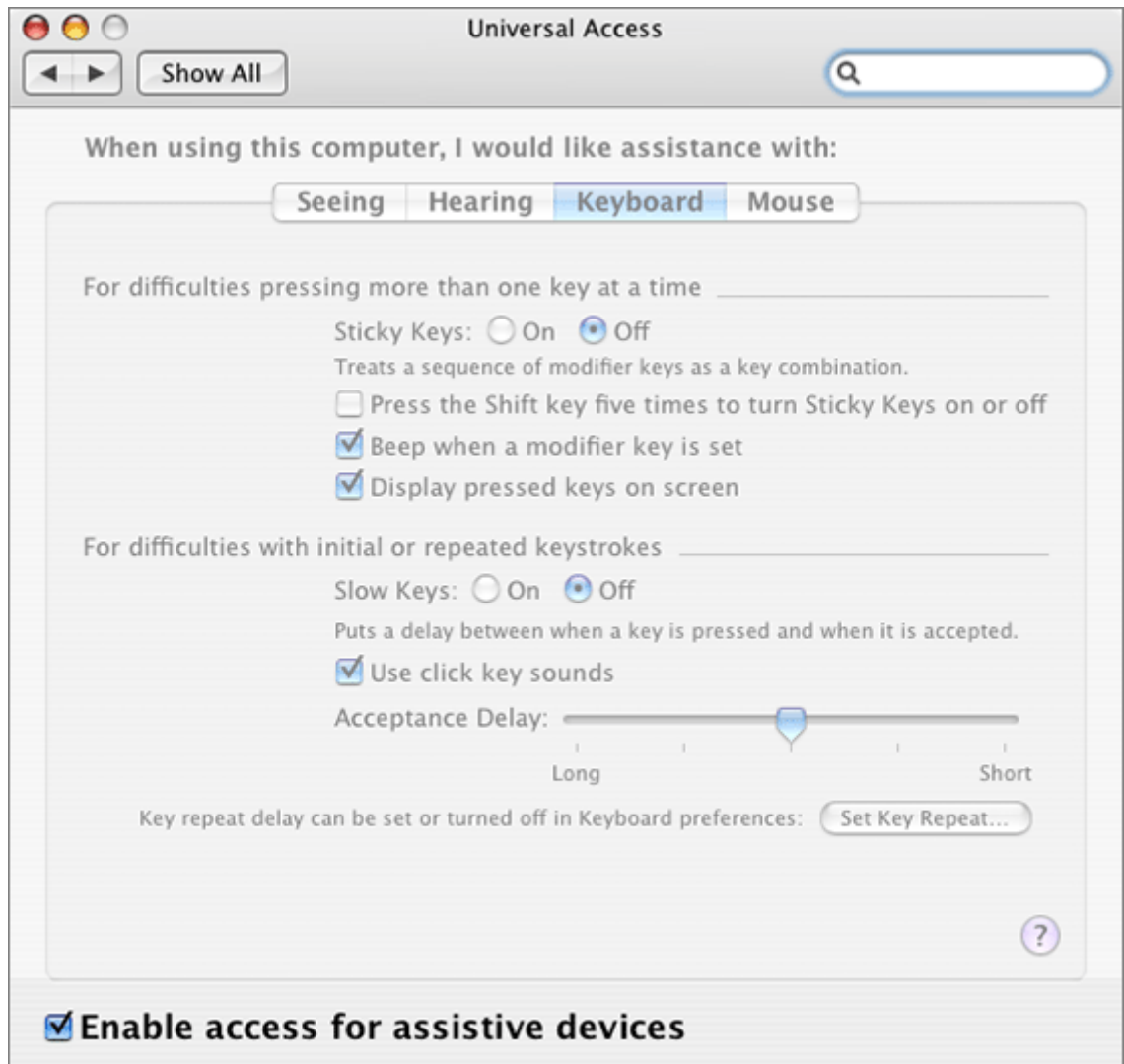
Multi-User Access to a Virtual Machine

By default Parallels Desktop puts a new virtual machine to the private folder of the user created it. This folder is specified in the Preferences/Common screen (see the Common (page 77) topic) and while the virtual machine is stored in that folder, nobody except you can run this virtual machine.

If you want to provide an access to a virtual machine to other users:

1   Copy all the components of the virtual machine, in particularly:

- virtual machine folder,

- configuration file (.pvs),

- hard disk image(s) (.hdd),

- saved state file (.sav) (if any),

- CD/DVD image file (.iso) (if any),

- floppy disk image file (.fdd) (if any),

- serial and parallel port output files (.txt) (if any)

  to the User/Shared folder of your Mac.

2 Set proper access rights to all of the copied files and the virtual machine folder. For this:

- right-click on a file and select Get Info item in the context menu,

- in the Info screen, click Ownership & Permission to open that part of the screen,

- for the You can option set Read & Write,

- click Details,

- for the Other option select Read & Write.

Making Copy of a Virtual Machine

A complete copy of a virtual machine can be created using the **Clone Virtual Machine Wizard**. A new configuration file and new hard disk drive(s) are made. The clone includes as many hard drives as there are connected to an original machine. By default the Wizard puts new files into a new directory, but you may prefer to store them in an existing one. Copies of virtual hard disks are always placed in the same folder with the copy of the configuration file.

Auxiliary devices of the new virtual machine are connected to the same drives or disk images as the source devices. If source CD/DVD-ROM drive is connected to an `.iso` CD/DVD disc image file, this connection is restored in the new machine. The same goes for the floppy drive. However output files of serial/parallel ports, if used, are not transferred from the original VM. In the clone, they are started from scratch.

If a network adapter is included in the original configuration, a new MAC address is generated for the new adapter.

A virtual machine to be copied should be opened and meet the following conditions:

- The guest OS is not running. If it is running, the menu item that starts the wizard is disabled.
- The virtual machine is not opened by another instance of Parallels Desktop.
- It is not a blank virtual machine. Blank virtual machines can not be copied.

To make a clone of a virtual machine:

1   Open the virtual machine you want to make copy of.

2 Select Clone VM in the VM menu. The Clone VM Wizard starts. Click Next.
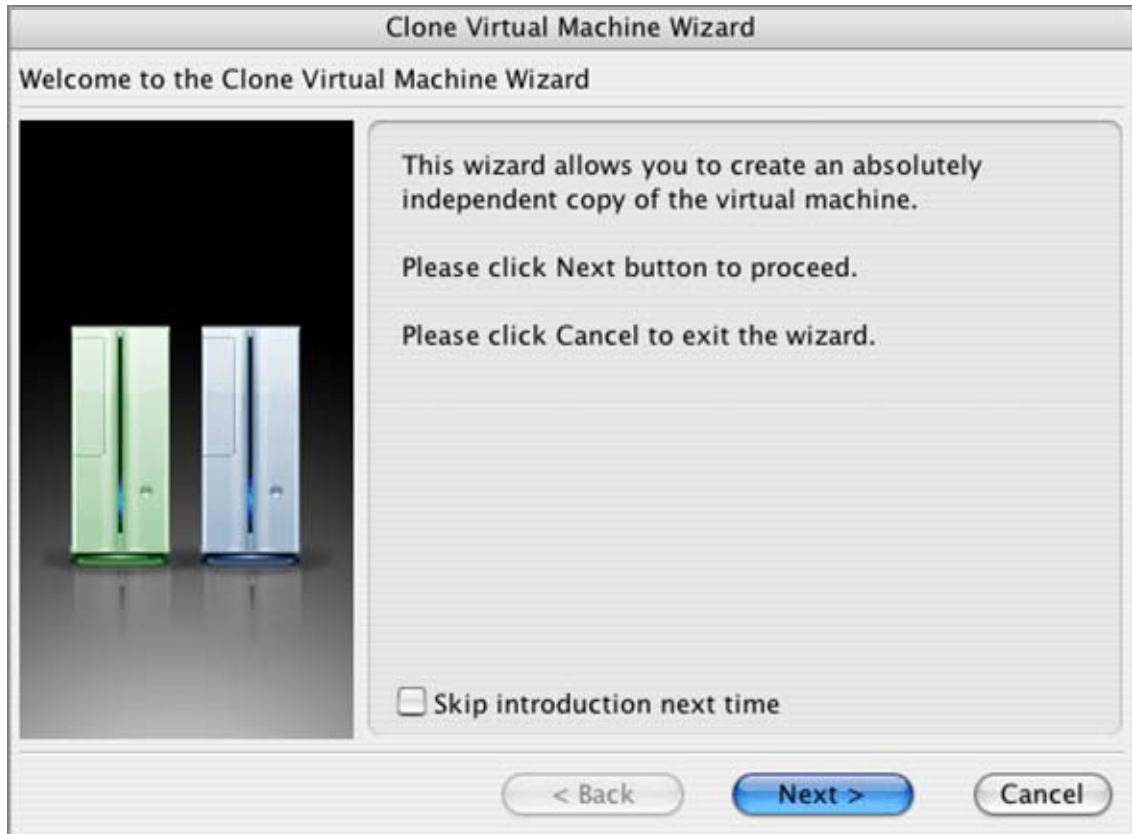
3 In the next step, Specify new virtual machine name and location, you have to specify a name for the clone and a path for storing its configuration file. The name and path suggested by the wizard are made by adding "Clone of" at the beginning of the original virtual machine name and path. You can modify both of them. Remember that a virtual machine name should be no longer than 50 characters.

If you select the Open virtual machine in new window automatically option, after the new configuration is created it will be opened in a new Parallels Desktop window. Click Finish to start copying the machine.

If the directory for storing the virtual machine configuration file does not exist, the confirmation for its creation may be asked: "Directory <directory name> does not exist. Do you want to be created automatically?" Click Yes. A new directory will be created.

4 While the virtual machine is being copied, the Copying in progress screen indicates the current state of the process. If everything is OK, the Wizard informs you that copying has been performed and a new machine is ready. Click Exit to close the Wizard.
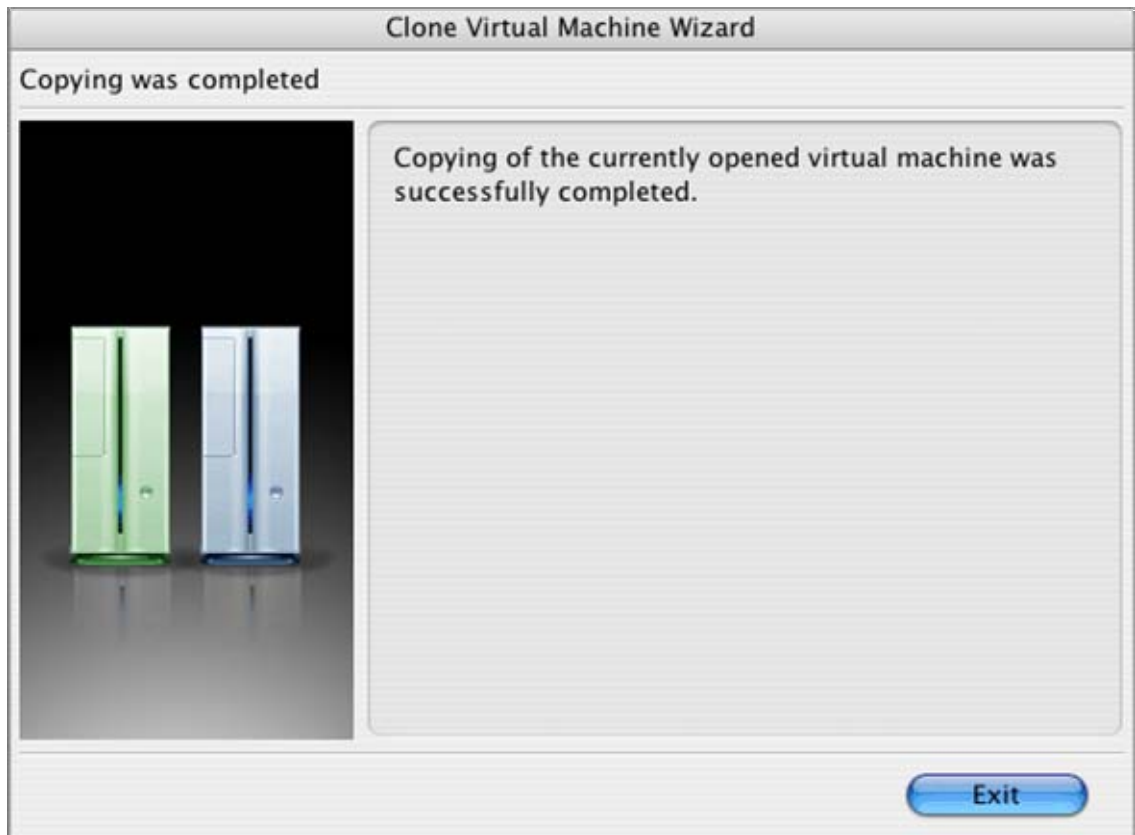
A new instance of Parallels Desktop is opened with the new virtual machine loaded, if you have selected the corresponding option on the Specify new virtual machine name and location screen.

About Parallels Desktop Screen

The upper part of the **About Parallels Desktop** screen provides information on the number of the build you are using, the full name of the vendor and link to its site, and copyright and trademark information as well.

Licensing Information

- indicates your type of activation and to whom this copy is licensed.

Support Information

- contains the contact information of the Parallels technical support group.

Buy Online and/or Evaluate buttons

- are provided if you have a trial activation or did not activate your copy at all. If you have activated the program with a permanent activation key, none of these buttons will be displayed. See Activating Parallels Desktop (page 18) for a detailed description of the processes of receiving a key and activating.

More Info button

- opens the screen with details of your license and set of indicators.

More Information

License Status:
This is an active copy of Parallels Desktop

User Name:	User Name
Company Name:	Company Name
Product ID:	00005-00000066-FFFF
Validity period:	Not limited
Primary OS(es):	Windows, Linux, Mac OS X
Terminal Services:	Windows, Linux

Virtual Machine Features:

Virtualization Mode:	Off
Remote Session:	Off

OK
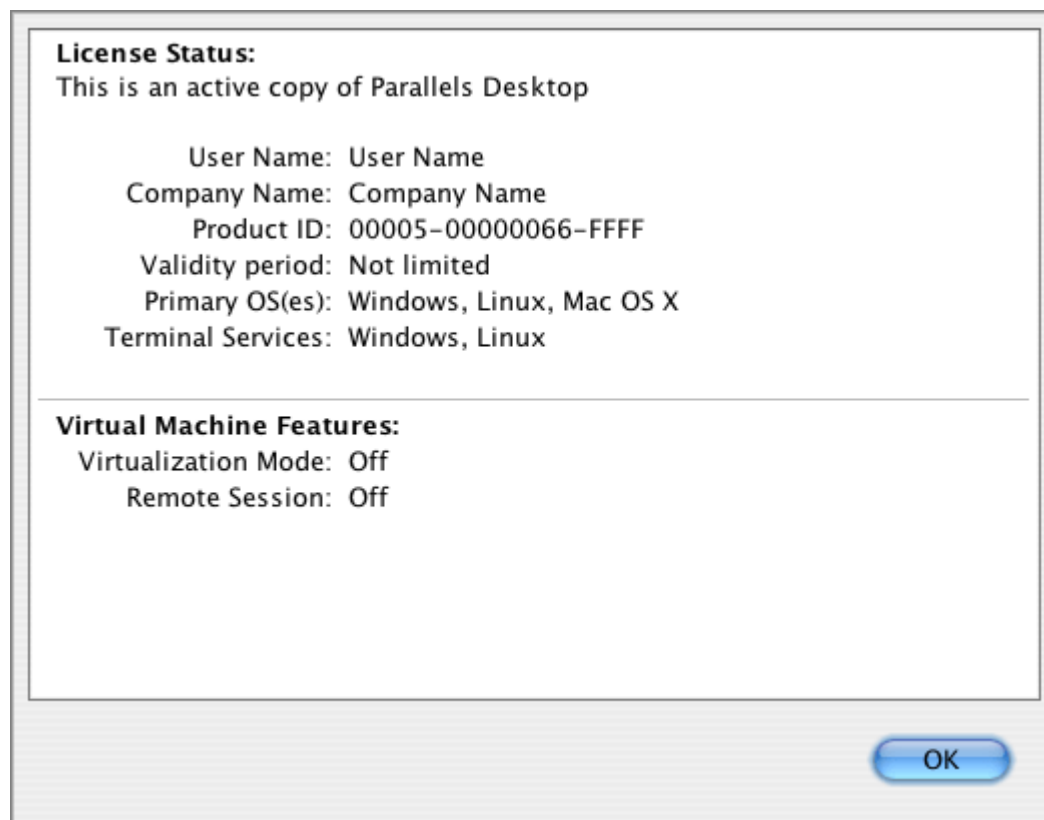
License Status:

- **User Name** and **Company Name** contain information about your name and the name of your company that you entered in the **Activate Product** window.

- **Product ID** displays the identification number of your copy of Parallels Desktop as well as the following information: the version of the Parallels Desktop, license number, and the abilities covered by your license that are displayed in the **Primary OSes** and **Terminal Services** fields.

- **Validity period** shows the date until your license is valid.

- **Primary OSes** indicates which primary operating systems are allowed by your license.

- **Terminal Services** displays which primary operating systems are able to access Parallels Desktop remotely.

> **Note**: The same license information is displayed in the **Activate Product** window. See Activating Parallels Desktop (page 18).

Virtual Machine Features:

This group contains indicators that are active only when the guest OS is running. Otherwise they are off.

- **Virtualization Mode** shows *Intel VT-x* if you work on an Intel VT-enabled processor and Virtualization Technology is activated through the virtual machine configuration setting available on the VM Flags (page 97) tab of the **General Options**. See Intel Virtualization Technology (VT-x) Support (page 8) for a full description of VT-x.

  If you are running without Virtualization Technology, the virtualization mode indicates the acceleration level. All guest OSes, besides Windows NT/2000/XP/2003, run in *Software mode 0*. Windows NT/2000/XP/2003 starts with *Software mode 0*, then switch to *Software mode 1* and *Software mode 2* in case the **Acceleration Level** setting (on the VM Flags (page 97) tab of the **General Options**) is set to *High*.

- **Remote Session** indicates if Parallels Desktop is executed on a remote server.

Deleting a Virtual Machine

Virtual machines can be deleted manually, however we recommend doing it using the Delete VM Wizard that detects all the files that make up the virtual machine and are connected to it.

The Wizard helps remove the following virtual machine components and associated files:

- configuration file,
- virtual hard disk drives connected to the virtual machine,
- CD/DVD disc .iso images connected to the virtual machine (if any),
- floppy disk image (.fdd or other) connected to the virtual machine (if any),
- output files of serial and parallel ports (if any),
- home directory where virtual machine files are stored.

The Wizard can delete a currently opened virtual machine that meets the following conditions:

- Its guest OS is not running. If it is running, the menu item that starts the wizard is disabled.
- The virtual machine is not opened by another instance of Parallels Desktop.
- The virtual machine is not blank.

To delete a virtual machine:

1 Open the desired virtual machine.

2 Select Delete VM in VM menu. The Welcome to the Delete Virtual Machine Wizard screen is opened. Click Next.

3 The Wizard detects all files related to the virtual machine and presents them on the Review files to be deleted screen. Each device/file is displayed in a separate string, i.e. if two hard disks are connected to the virtual machine, there will be two hard disk strings on the screen. The full path is displayed for each component.

The configuration file, virtual hard disk, output files of serial and parallel ports, and the home directory are pre-selected for deleting while connected CD-ROM `.iso` images and floppy `.fdd` (or other) images are not, because they can be useful for other virtual machines. If you do not consider them to be useful, mark them for deletion on this screen. Note that virtual hard disks can also be attached to other virtual machines.
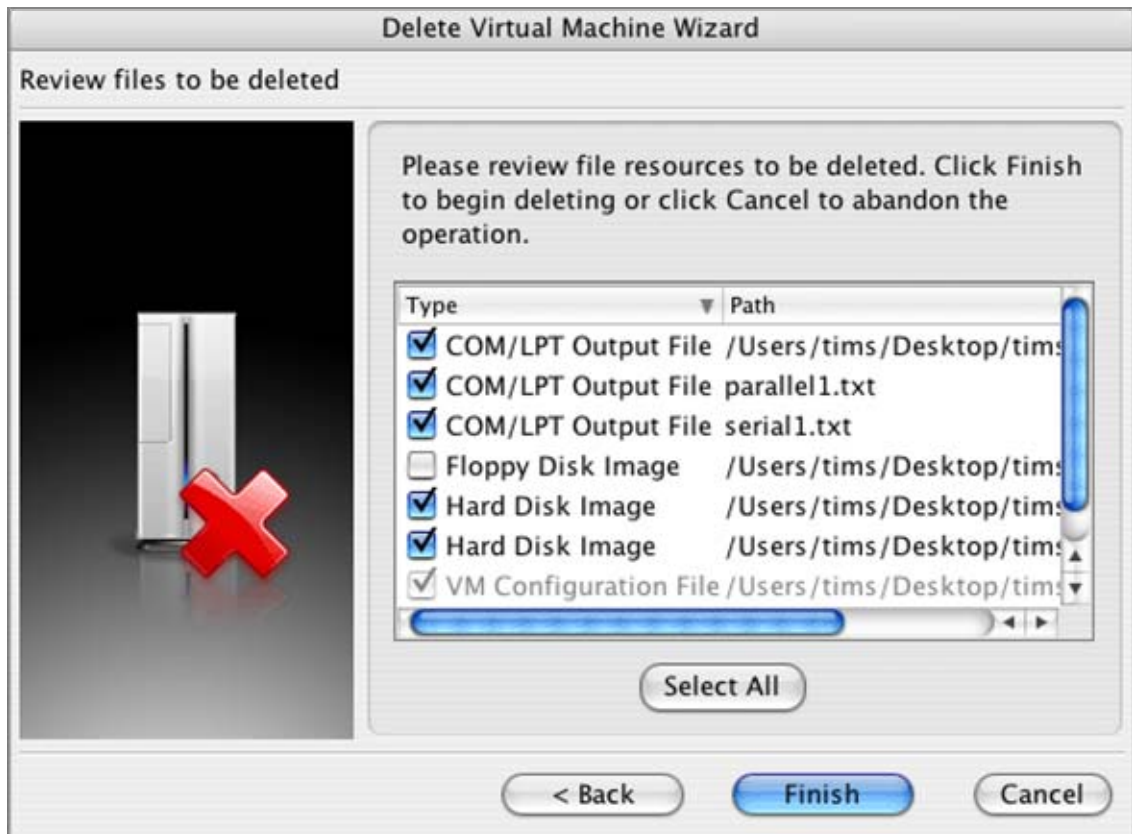
Review selected files, check those that should be deleted and click Finish when you are ready.

4 The virtual machine wizard removes the selected files from your hard disk. If everything is OK the final wizard screen will appear:

The virtual machine is considered to be successfully deleted if all the selected components or all selected components except the home directory (if it was chosen for deleting) have been removed. If the home directory contains any files it will not be deleted.

Click Exit to close the wizard.

After the virtual machine is deleted, a blank VM is opened in the Parallels Desktop screen. The deleted machine disappears from the list of recently used configurations in the File menu.

C H A P T E R 6

Running a Virtual Machine

This chapter provides information on handling a virtual machine while the guest operating system is executed.

In This Chapter

Overview

When you start a virtual machine, its console is opened and acts as the display of a real computer (refer to Console View (page 31)). Your next step is to capture your keyboard and mouse in the virtual machine screen; after doing so you are able to work with the virtual machine in the same way you would with a standalone computer.

Parallels Desktop controls such as the toolbar and the menu allow you to manage virtual machine behavior when running the machine in windowed mode. You may also run the virtual machine in fullscreen mode, where Parallels Desktop controls and the primary operating system are not visible.

While working in windowed mode, Parallels Desktop controls let you to do the following:

▪ start, turn off, and reset the virtual machine,

▪ switch between the virtual machine and your Mac,

▪ suspend the virtual machine,

▪ connect and disconnect devices, and change data types accessed by them,

▪ temporarily disable separate Parallels Tools (if you have them installed),

▪ expand the virtual machine console to fullscreen mode.

The Configuration Editor is inaccessible while the virtual machine is running.

Starting a Virtual Machine

To start a virtual machine:

1   Start Parallels Desktop. See Start Parallels Desktop (on page 18).

2   Open a virtual machine configuration. See Selecting and Opening a Virtual Machine (page 120).

3   Do one of the following:

- Click the Power On Virtual Machine button on the Parallels Desktop toolbar,
- Select Power On in the VM menu.

The virtual machine will be switched on, its console will be opened in the Parallels Desktop window, and you can see the boot process of the guest OS.

If you don't see the toolbar in the Parallels Desktop window, see the Toolbar section of the Main Window (page 27) topic to learn how to make it visible.

Note that the virtual machine can be powered on only if you have a registered copy of Parallels Desktop, regardless of whether it is of permanent or trial status. If your copy is not registered, the "This copy of Parallels Desktop is currently not active" warning appears. This warning displays your current activation status and prompts you to activate your copy of the product. Depending on whether you had previously received a trial activation key, warning text contains one or two links prompting you to get a trial or permanent key. See Activating Parallels Desktop (page 18) for a detailed description of the processes of receiving a key and activating.

Capturing and Releasing the Keyboard and the Mouse

This section explains how to capture and release input devices (like your mouse and keyboard) inside a virtual machine.

When you power on a virtual machine, either during installation or normal operation, you will need to capture the computer's input devices in the virtual machine to interact with it exactly as if you were using a standalone computer. Since each virtual machine is independent, it will not "see" the primary OS, and consequently, you will not be able to access Parallels Desktop's menu and toolbar from inside the virtual machine without manually releasing your input devices to the primary OS.

To lock the keyboard and mouse in a virtual machine screen, do one of the following:

- Point the mouse cursor to the Parallels Desktop client window and click somewhere inside the virtual machine screen. When the mouse is captured, it does not move out of the Parallels Desktop window.
- Select Capture Input in the VM menu.
- Press Command+I on your keyboard.

To release the keyboard and mouse to your primary OS:

- Press the hot key combination designated for releasing the keyboard/mouse (the default combination is Ctrl+Option(Alt)).

The keyboard and mouse will be released immediately. Now you will be able to manage your virtual machines using the Parallels Desktop controls, manage your primary operating system, or capture the keyboard and the mouse in another virtual machine.

The default hot key combination for releasing keyboard/mouse can be changed in the Hot Key Combinations (page 85) tab of the Preferences window.

Note. You can free the mouse and the keyboard from the virtual machine screen without pressing the hot key combination if you install Parallels Tools. See the Parallels Tools Overview (page 64) to learn if this package is available for your guest operating system.

Switching a Virtual Machine to Fullscreen Mode

To make working inside a virtual machine more comfortable, you can run a guest operating system in fullscreen mode. When running a virtual machine in fullscreen mode, the guest OS screen occupies the whole monitor of your computer; the primary OS and its applications as well as the Parallels Desktop menu, toolbar, and status bar are hidden.

Note: You can start a virtual machine in fullscreen mode if the Switch to fullscreen mode automatically option is set in the VM Flags (page 97) tab of the General Options.

If you want to switch to fullscreen while running a guest OS, do one of the following:

- click the Fullscreen Mode toolbar button,
- select View -> Fullscreen in the menu,
- press the appropriate hot key combination on your keyboard (Option(Alt)+Enter by default, unless you have defined other hot key).

To return to windowed mode:

- press any of the hot key combinations defined (Ctrl+Option(Alt) or Option(Alt)+Enter by default).

Hot key combinations are defined in the Hot Key Combinations (page 85) tab of the Preferences window.

You may adjust the animation that is displayed when switching to fullscreen mode and the size of the virtual machine window. See User Interface Preferences (page 82) for more info.

Shutting Down and Resetting a Virtual Machine

A virtual machine can be shut down and reset in the same way as a typical computer. If a guest operating system is normally closed using some internal command (such as **Shut Down** in Windows), it is STRONGLY RECOMMENDED to shut down the machine this way to ensure safety of your data. If only you are unable to stop the guest OS this way, you may use the Parallels Desktop controls.

Mandatory Stopping a Virtual Machine

To mandatory stop a virtual machine, do one of the following:

- Click the **Power Off Virtual Machine** button during guest OS execution.
- Select **VM -> Power Off** in menu.

The virtual machine will be stopped immediately.

Resetting a Virtual Machine

To reset a virtual machine, do one of the following :

- Click the **Reset Virtual Machine** button on the Parallels Desktop toolbar.
- Select **Reset** in the **VM** menu.
- Select **VM->Send Key->Ctrl+Alt+Del** in menu.
- Press `Ctrl+Option(Alt)+Del` while the keyboard is captured inside a virtual machine window.

   Note. MacBook and MacBook Pro users may need to press `Ctrl+Option(Alt)+Fn+Del` exactly in this order.

Pausing Virtual Machine

When a virtual machine is paused, the guest OS is stopped and the virtual machine process is removed from the CPU processes list. Guest operating system execution can be continued at any time.

Pausing the guest OS is recommended if you want to leave the virtual machine for a short period of time. If you want to leave it for an extended period, and especially if you need to restart your primary OS, it is best to suspend of the VM. See Suspending/Resuming Virtual Machine (page 150).

To pause a virtual machine:

▪ Select Pause in the VM menu.

When a virtual machine is in pause mode its console is darkened.

To continue running the virtual machine do one of the following:

▪ Click the Power On Virtual Machine [image] button on the toolbar.
▪ Select Continue in the VM menu.

Suspending/Resuming Virtual Machine

The state of the running virtual machine, and all of its applications, can be saved in order to continue working with the guest OS at a later time. This is called **suspending** of the virtual machine. When suspending, the virtual machine state is saved to the hard disk in a `.sav` file. After saving, you may return to the saved virtual machine at any time and continue running the guest OS from the point where you stopped.

Suspending a Virtual Machine

To suspend a virtual machine:

1 During guest OS execution do one of the following:

▪ Click the Suspend Virtual Machine [image] button,
▪ Select VM -> Suspend in menu.

2 Progress of saving is displayed in the Please wait while virtual machine is suspending screen. When finished, the virtual machine property page is displayed.

Note. After the virtual machine is suspended, its configuration can not be changed. If you begin editing, despite the warning, the `.sav` file will be deleted and you will not be able to resume the virtual machine.

Resuming a Suspended Virtual Machine

To resume a suspended virtual machine:

1   Open the virtual machine configuration in the typical way.

2   Do one of the following:

- Click the **Power On Virtual Machine** button,

- Select **VM -> Power On** in menu.

3   Wait until the guest OS state is resumed. Progress is displayed in the **Please wait while virtual machine is resuming** screen.

After the virtual machine has been resumed, its `.sav` file is deleted.

Working with Devices When Running a Virtual Machine

Despite the fact that Configuration Editor (page 94) cannot be accessed while a virtual machine is running, you can connect and disconnect additional devices and even choose the media type they access. The following virtual devices can be connected/disconnected to the running virtual machine:

- CD/DVD-ROMs;
- Floppy drive;
- Network adapter;
- Parallel ports;
- Serial ports;
- Sound device;
- USB device.

To connect/disconnect any device, it should be enabled in the virtual machine configuration. If you have disabled some device, you should stop the virtual machine first, then enable the device in the Configuration Editor. After that you may restart the virtual machine; the device can be connected/disconnected in a runtime environment.

Additionally, you can change the type of media the CD/DVD-ROM and floppy drives access.

USB Devices

If you start the virtual machine with the USB controller enabled, you may connect various real USB peripherals to the virtual machine. The USB controller itself can not be connected or disconnected.

Connecting a CD/DVD-ROM Drive

If you start a guest operating system with the CD/DVD-ROM drive enabled you can connect/disconnect it and change the media it accesses while running the guest OS.

Note: If the guest OS was started with the CD/DVD-ROM drive disabled, you should shut down the guest OS first, then enable CD/DVD-ROM in the Configuration Editor (select the Enabled check box in the CD/DVD-ROM Options (page 106) tab) and restart the guest OS.

All commands to control the CD/DVD-ROM during guest OS execution can be found in the Parallels Desktop Devices menu.

If you have several CD/DVD-ROM drives connected to your virtual machine, in the Devices menu they are numbered according the order of their appearance. The first CD/DVD-ROM will be CD/DVD-ROM 1, the second will be CD/DVD-ROM 2, and so on.

To disable all CD/DVD-ROM operations while running the guest OS click CD/DVD-ROM --> Disconnect in the Parallels Desktop Devices menu.

To reconnect the CD/DVD-ROM again select CD/DVD-ROM --> Connect command in the Devices menu.

Data type accessed by the CD/DVD-ROM drive can be switched from a real CD/DVD-ROM to an image file and vice versa. Use CD/DVD-ROM --> Connect to and CD/DVD-ROM --> Connect image commands of the Parallels Desktop Devices menu.

Note: There is another way to perform all the actions described above. Right-click the CD/DVD-ROM icon on the status bar (page 32) to display the CD/DVD-ROM context menu and select the appropriate command.

Connecting a Floppy Drive

If you start a guest operating system with the floppy drive enabled, you may connect/disconnect it and change its options while running the guest OS. Parallels Desktop allows you to connect/disconnect the floppy drive and change the media the floppy drive accesses.

Note: If the guest OS is started with the floppy drive disabled, you should shut down the guest OS first, then enable the floppy in the Configuration Editor (select the Enabled check box in the Floppy Options (page 102) tab) and restart the guest OS.

To connect or disconnect the floppy drive to/from a virtual machine:

▪ Select Floppy --> Connect or Floppy --> Disconnect in the Devices menu.

To change the image file accessed by the virtual floppy:

▪ Use Floppy --> Connect image command in the Devices menu.

Note: There is another way to perform all the actions described above. Right-click the floppy drive icon on the status bar (page 32) to display the floppy drive context menu and select the appropriate command.

Connecting a Network Adapter

If a network adapter is enabled in your virtual machine configuration, you can connect/disconnect it when running the guest OS.

Note: If the guest OS is started with the network adapter disabled, you should shut down the guest OS first, then enable the network adapter in the Configuration Editor (select the Enabled check box in the Network Adapter Options (page 108) tab) and restart the guest OS.

To connect or disconnect the network adapter, do the following:

- select the Parallels Desktop Devices menu,
- select the Network menu item,
- then select the Connect/Disconnect command to connect or disconnect network adapter respectively.

Note: There is another way to connect/disconnect the network adapter. Right-click the network adapter icon 🔵 on the status bar (page 32) to display the context menu and select the appropriate command.

Connecting Serial/Parallel Ports

If a parallel/serial port is enabled in your virtual machine configuration, you can connect/disconnect the port while running the guest OS.

Note: If the guest OS is started with the parallel/serial port disabled, you should shut down the guest OS first, then enable the serial or parallel port in the Configuration Editor (select the Enabled check box in the Serial Port Options (page 110) tab or Parallel Port Options (page 111) tab) and restart the guest OS.

To connect or disconnect the serial or parallel port, do the following:

- select the Parallels Desktop Devices menu,
- select COM (from 1 to 4 depending on how many serial ports are enabled) or LPT (from 1 to 3 depending on how many parallel ports are enabled),
- then select the Connect/Disconnect command.

Note: There is another way to connect/disconnect the port. Right-click the serial (🖥) or parallel (🖥) port icon on the status bar (page 32) to display the context menu, and select the appropriate command.

Connecting a Sound Device

If a sound device is enabled in your virtual machine configuration, you can connect/disconnectit while running the guest OS.

Note: If the guest OS is started with the sound device disabled, you should shut down the guest OS first, then enable the sound device in the Configuration Editor (select the Enabled check box in the Sound Options (page 112) tab) and restart the guest OS.

To connect or disconnect the sound device, you should do the following:

- select Devices in the Parallels Desktop menu,
- select the Sound menu item,
- select Activate to connect the sound device (or select Mute to disconnect).

Note: There is another way to connect/disconnect the sound device. Right-click the sound device icon on the status bar (page 32) to display the context menu and select the appropriate command.

Connecting USB Devices

If the USB controller is enabled in the virtual machine configuration, you can connect/disconnect USB peripherals to the running virtual machine. Please refer to Using USB Devices in a Virtual Machine (page 125) for general information.

Parallels Desktop automatically detects all the USB devices connected to your Mac and displays them under the Devices->USB menu item and in the context menu for the USB controller ( ) in the status bar. Those devices that are currently connected to the virtual machine are checked. You can not use a USB device in Mac OS while it is being used by the virtual machine.

Note that a USB microphone is connected to a virtual machine in a specific way.

Note: If the guest OS is started with the USB controller disabled, you should shut down the guest OS first, then enable the USB controller in the Configuration Editor (select the Enabled check box in the USB Options (page 113) tab) and restart the guest OS.

Autoconnect

If the Autoconnect USB devices option in the USB Options (page 113) tab is turned on and only one or no USB devices are currently active, you can connect an additional USB device to your virtual machine. Do the following:

- simply plug in a USB device to your Mac.

If you connect an additional USB peripheral to your Mac while virtual machine already uses two USB devices (not counting keyboard, mouse, or microphone), nothing will happen. You will able to activate the newly connected device manually after deactivating any of the currently active USB devices. See the next subtopic to learn more on this.

Manual Connect

To connect a USB device to the virtual machine:

- Plug in a USB device to your Mac.
- Click the USB controller icon in the status bar (or select Devices->USB in the Parallels Desktop menu) to display the list of all the USB devices connected to your Mac. In the list, make sure that no more than one USB device is currently active. If there are two devices checked, disconnect one of them by clicking it.
- Click the desired USB device in the list to connect it.

Connecting a Microphone

Parallels Desktop does not treat a USB microphone as a USB device despite it appears in the list of USB devices connected to your Mac (in the Devices->USB menu item and in the context menu for the USB controller ( )). To connect a USB microphone use standard means for connecting a microphone in your guest OS.

Parallels Tools Center

Note. Parallels Tools Center is available in Windows guest OSes only.

Parallels Desktop allows you to control the status of Parallels Tools in all of the Windows guest OSes for which tools are provided (see Parallels Tools Overview (page 64) for tools descriptions and availability table). The Parallels Tools Center, which is installed along with Parallels Tools, allows you to:

- check the status of various tools;
- temporarily disable and enable each tool separately (for those tools that can be stopped without violating guest OS execution);
- configure specific tool parameters (for those tools that have them).

The Parallels Tools Center is organized as a collection of tabs, each of which contains settings for an individual tool. In each guest OS, the Parallels Tools Center contains tabs only for those tools that you have installed in your guest OS.

Parallels Tools Center is started automatically upon guest OS startup; its icon is placed into the guest OS system tray.

Installing Parallels Tools Center

Parallels Tools Center is installed along with Parallels Tools. Refer to the Installing Parallels Tools (page 63) section for detailed instructions.

Upgrading

If you have a virtual machine created by a previous version of Parallels Desktop with Parallels Tools installed, you need to upgrade this package. See Upgrading Parallels Tools (page 73).

Opening Parallels Tools Center

To open Parallels Tools Center:

- click its icon [icon] in guest OS system tray.

Restarting Parallels Tools Center

To restart Parallels Tools Center after disabling:

- Locate the `ParallelsToolsCenter.exe` file in the folder where you have installed the Parallels Tools and launch it.

  If you installed the Parallels Tools into the default folder, this file resides in the following path:

  `C:/Program                          Files/Parallels/Parallels Tools/ParallelsToolsCenter.exe.`

Clipboard Synchronization Tool Options
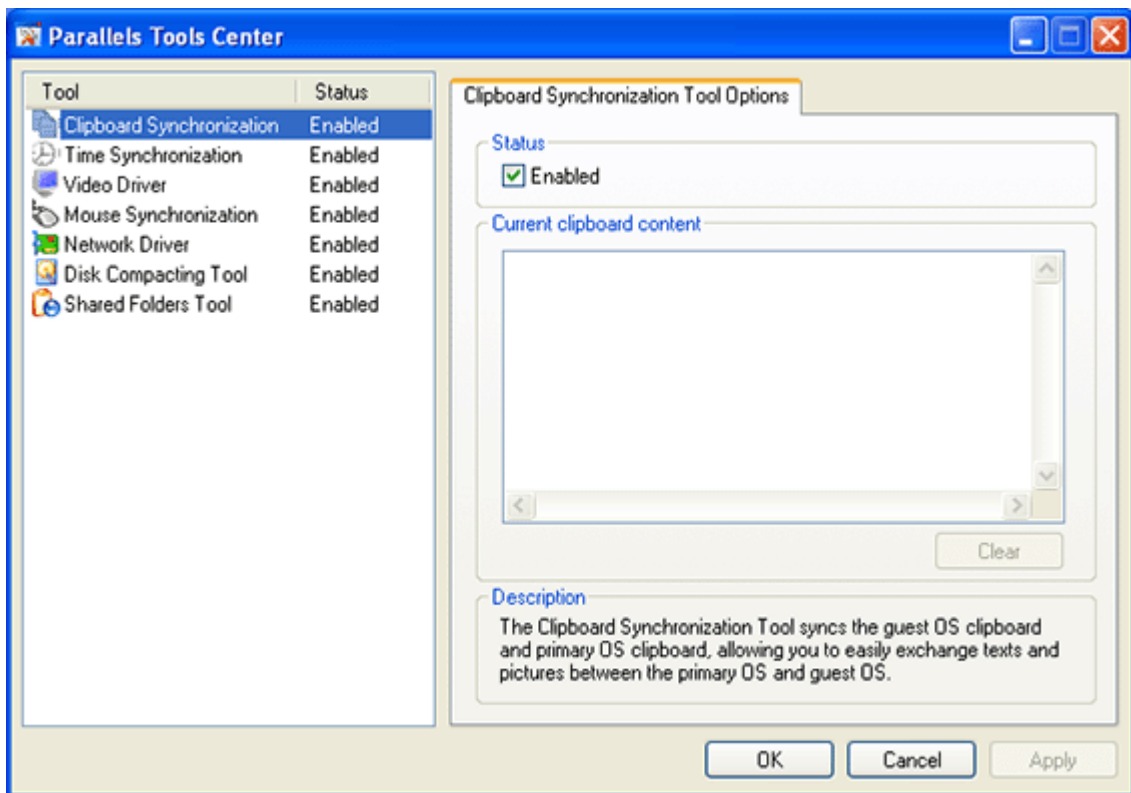
Status:

- **Enabled** shows the current status of the Clipboard Synchronization Tool. To temporarily disable this tool, deselect this check box. You can enable the Clipboard Synchronization Tool by selecting this check box later.

Current clipboard content:

- This field displays the current clipboard contents that can be scrolled.
- The Clear button empties the clipboard contents.

Description:

- Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Activating changes:

After you have made the desired changes on the tab, do one of the following:

- Click the Apply button to activate changes.

Click the OK button to activate changes and hide the Parallels Tools Center.

Time Synchronization Tool Options
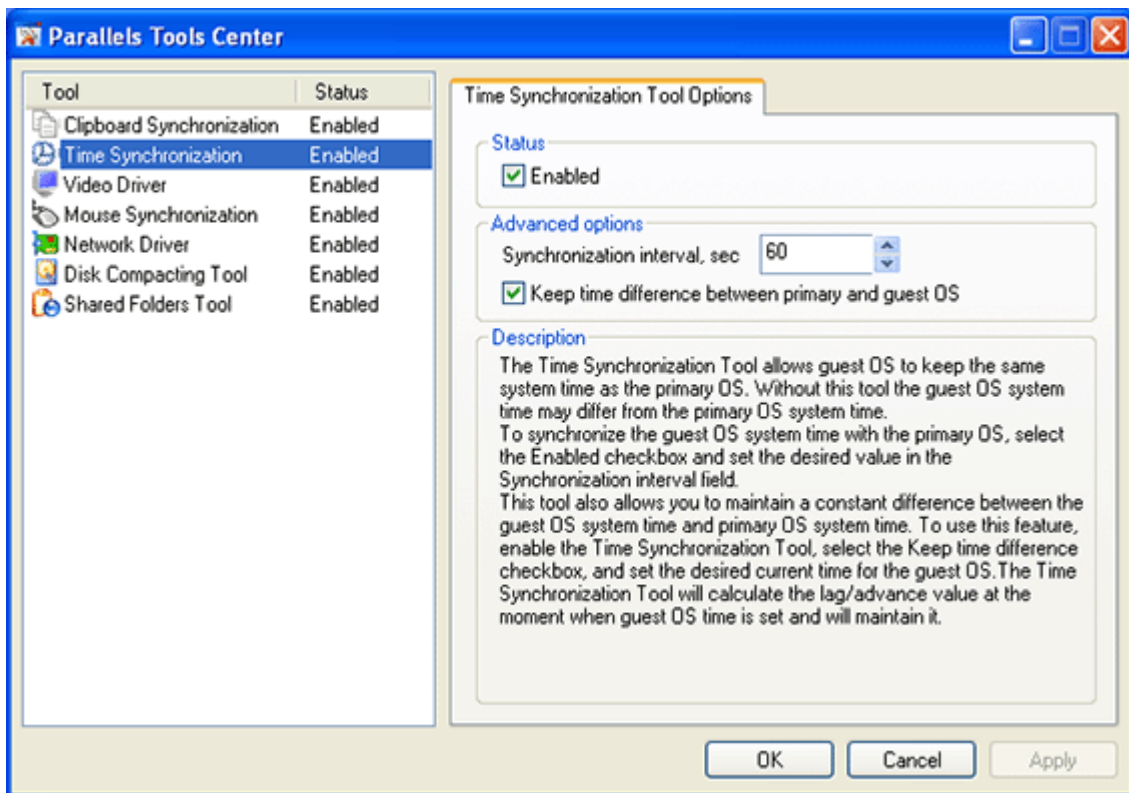
Status:

- **Enabled** check box shows the current status of the Time Synchronization Tool. To temporarily disable this tool, deselect this check box. You can enable the Time Synchronization Tool by selecting this check box later.

Note: Before starting the Time Synchronization Tool, please stop all other time synchronization services in order to avoid potential conflicts.

Advanced options:

- **Synchronization interval, sec.** contains the period of time between two synchronization operations. Use scroll buttons in the field to set the desired value or simply enter it into the field. The interval value should be from 10 to 3600 seconds.

  To synchronize the guest OS system time with the primary OS:

  1. select this check box,

  2. set the desired value of the synchronization interval in the **Synchronization Interval** field.

- **Keep time difference between primary and guest OS** check box allows you to maintain a constant difference between the guest OS system time and primary OS system time.

  To use this feature:

  1. select the **Enabled** check box,

  2. select the **Keep Time Difference** option,

  3. in the guest OS, set the desired current time.

The Time Synchronization Tool will calculate the lag/advance value at the moment when the guest OS time is set and will maintain it.

Description:

- Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Activating changes:

After you have made the desired changes on the tab, do the following:

- Click the Apply button to activate changes.

Click the OK button to activate changes and hide the Parallels Tools Center.

Video Driver Options
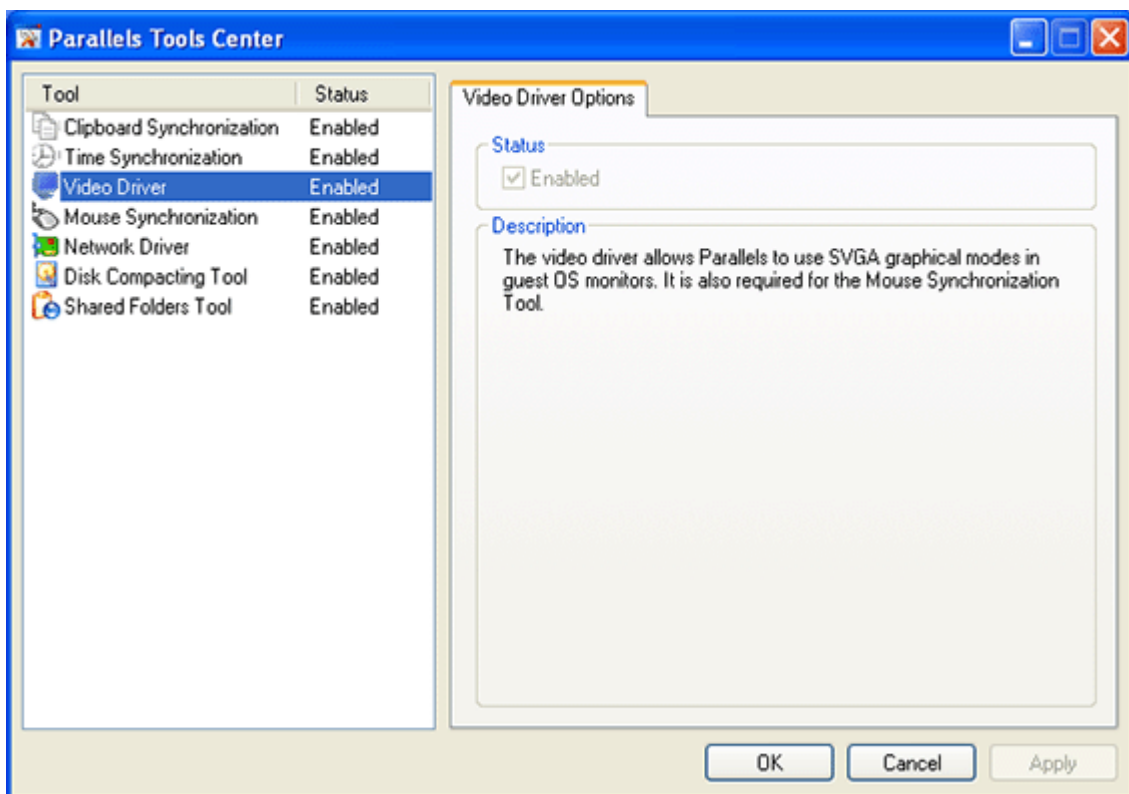
Status:

- Enabled check box shows the tool's current status but is inaccessible for editing.

Description:

- Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Mouse Synchronization Tool Options
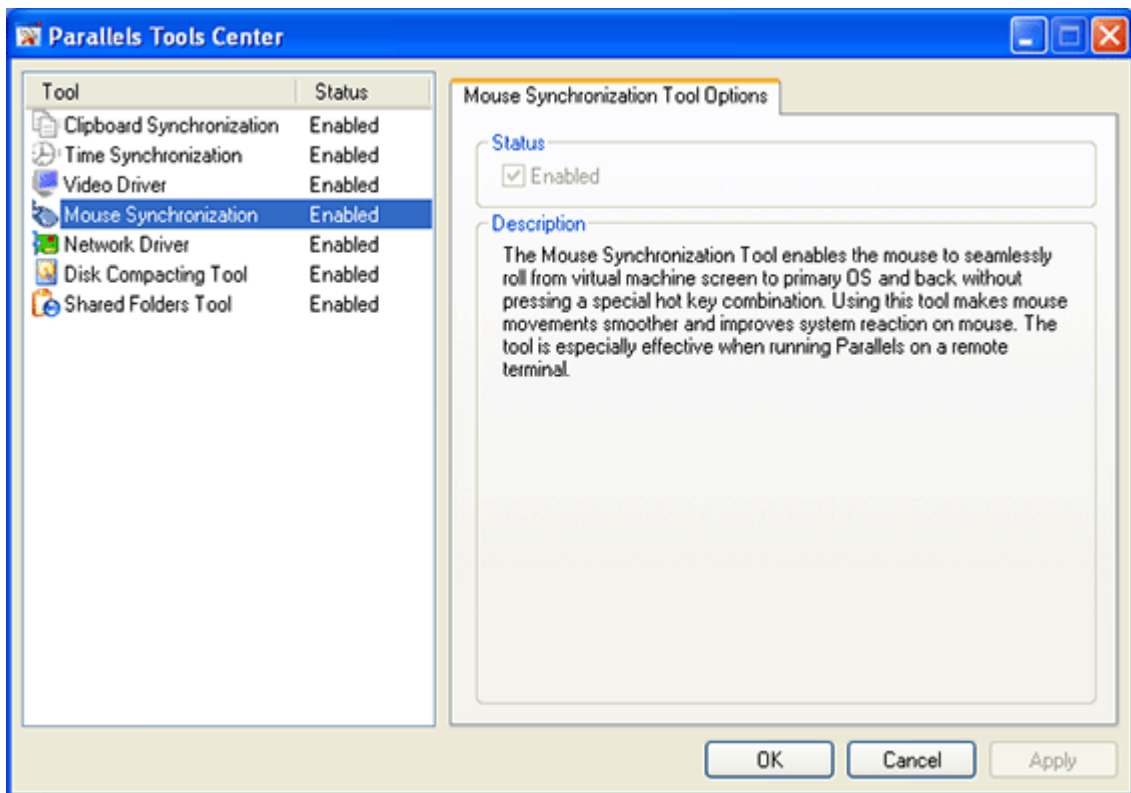
Status:

▪ **Enabled** check box shows the tool's current status but is inaccessible for editing.

Description:

▪ Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Network Driver Options
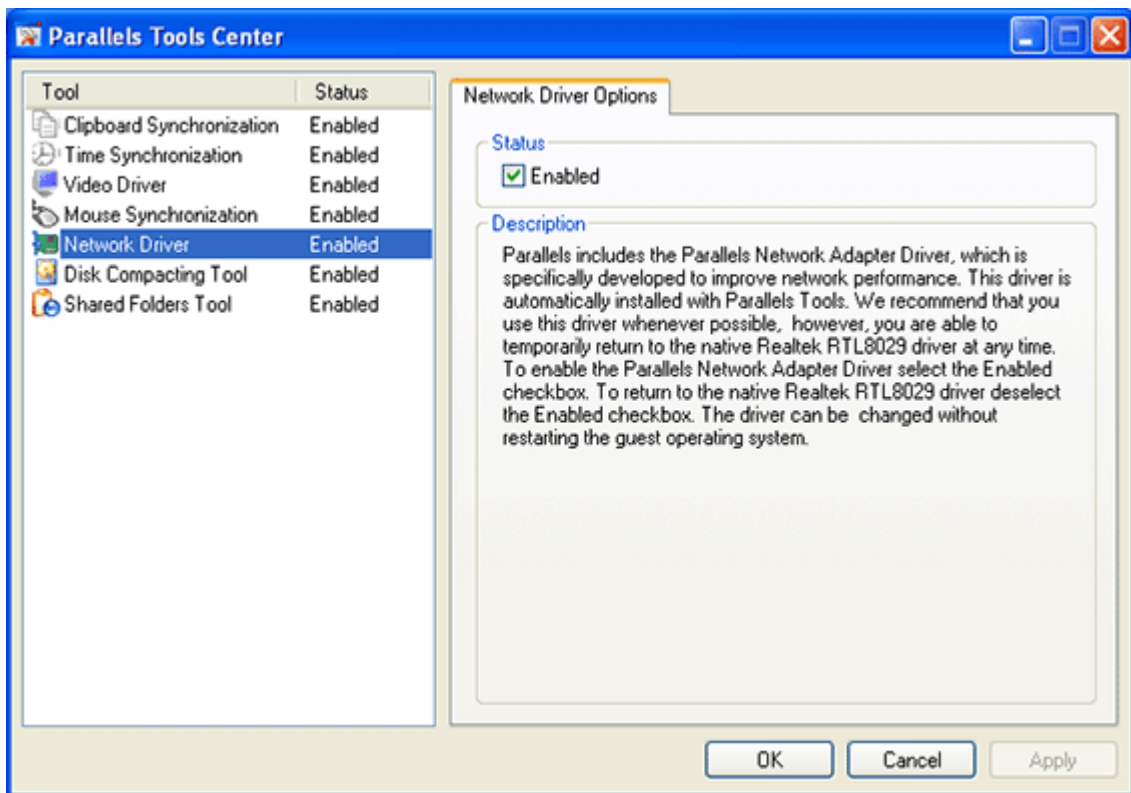
Status:

- **Enabled** check box shows the current status of the Parallels Network Adapter Driver. If this check box is selected, it means the Parallels Network Adapter Driver is active. We recommend that you use this driver whenever possible, however, you are able to temporarily return to the native Realtek RTL8029 driver at any time.

  To enable the Parallels Network Adapter Driver select the **Enabled** check box. To return to the native Realtek RTL8029 driver deselect the **Enabled** check box. Drivers can be changed without restarting the guest operating system, however your network connection may be temporarily lost.

Description:

- Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Activating changes:

After you have made the desired changes on the tab, do one of the following:

- Click the **Apply** button to activate changes.

Click the **OK** button to activate changes and hide the Parallels Tools Center.

Disk Compacting Tool Options
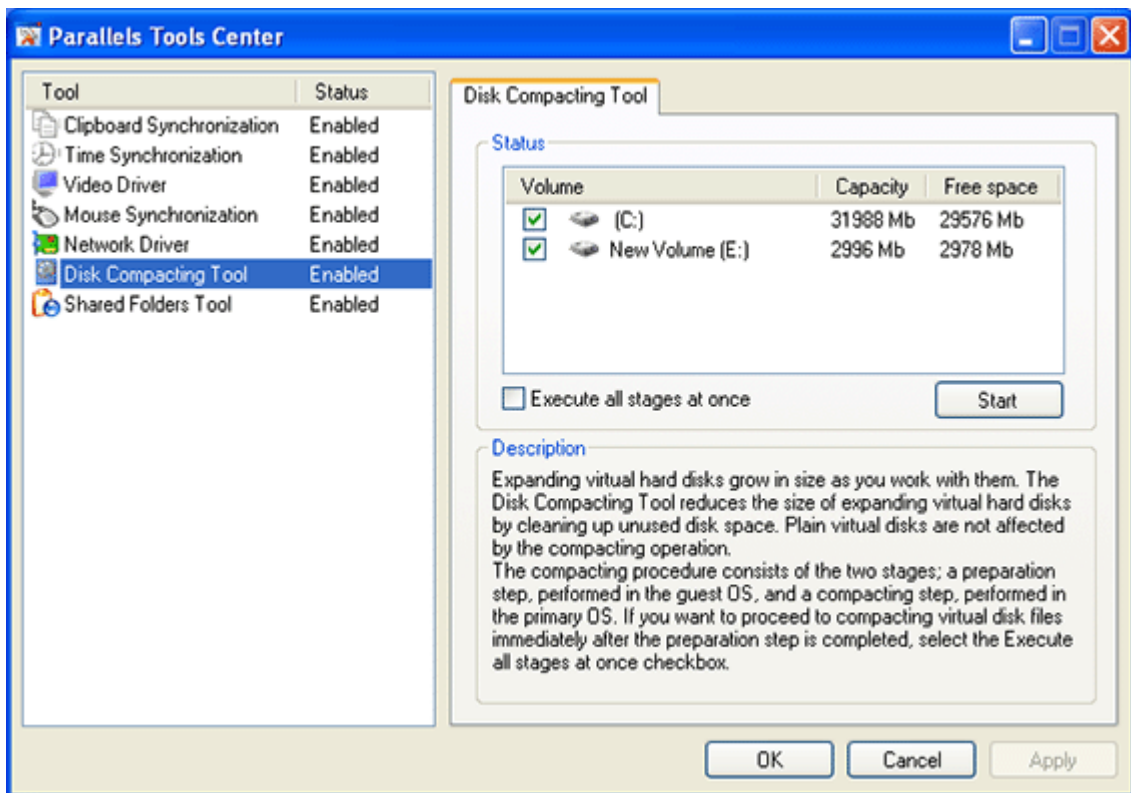
Status:

- The table displays the list of volumes located on the expanding virtual hard disks connected to your virtual machine and formatted to Windows file systems. Volumes formatted to other file systems are not displayed even though they may be physically located on the expanding virtual hard disks. In the table you can select the volumes to be processed by the Disk Compacting Tool.

- **Execute all stages at once**. Select this check box if you want to perform both stages of the compacting process at once. See the description of the two stages of the compacting process in the **Compacting Procedure** of the Compacting Virtual Disk (page 164) topic.

- **Start** button starts the process of preparing the virtual hard disks for compacting.

Description:

- Displays the short description of the tool. See the complete description and guidelines in the Compacting Virtual Disk (page 164) topic.

Shared Folders Options
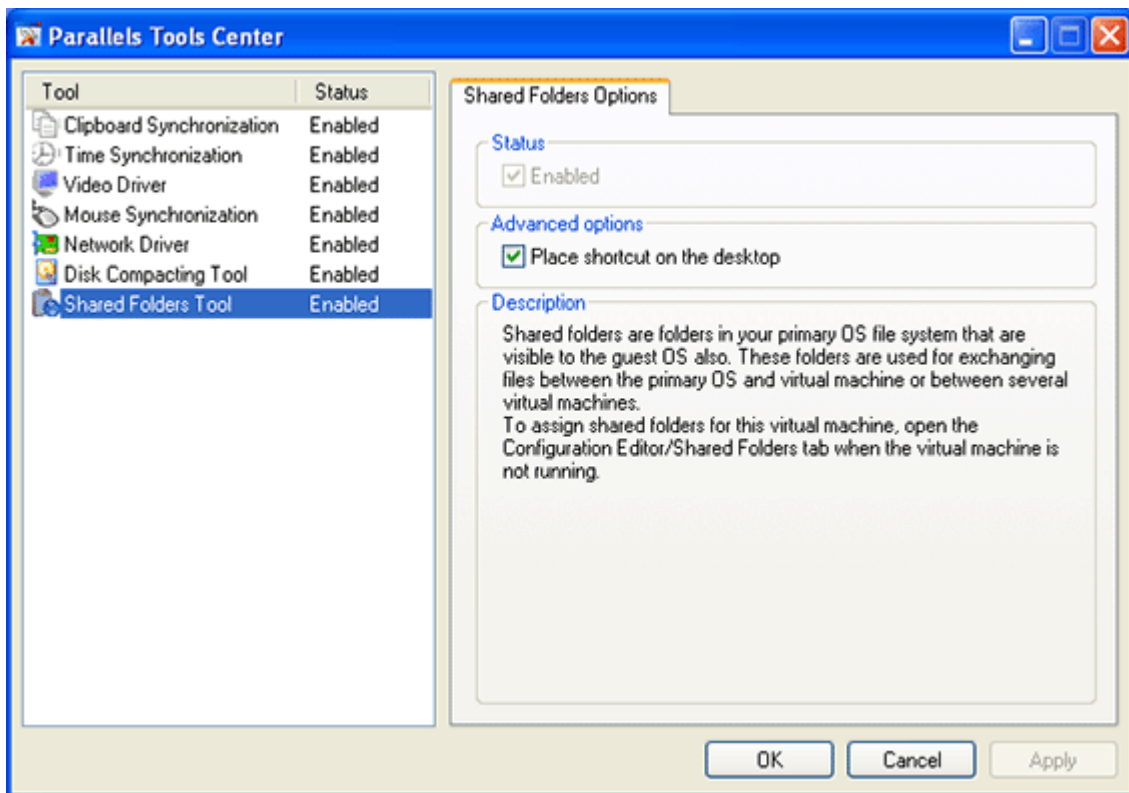
Status:

- **Enabled** check box shows the tool's current status but is inaccessible for editing.

Advanced Options:

- **Place shortcut on the desktop** option controls the presence of the Parallels Tools Center shortcut on the guest OS desktop.

Description:

- Displays the short description of the tool. For a complete description see the Parallels Tools Overview (page 64).

Compacting Virtual Disk

What Is the Disk Compacting Tool?

Expanding virtual disks grow in size as you work with them. Besides applications and their data, every disk accumulates temporary files. The Disk Compacting Tool, included in Parallels Desktop, cleans up the unused disk space occupied by temporary files, thus reducing the size of expanding virtual hard disks. We recommend that you use Disk Compacting Tool from time to time to save space on the host hard disk.

The Disk Compacting Tool processes the following partitions:

▪ volumes located on the expanding virtual hard disks and formatted to Windows file systems (FAT 16, FAT 32, and NTFS).

Note. The Disk Compacting Tool does NOT process: 1) volumes located on expanding virtual hard disks but formatted to file systems other than Windows, 2) plain virtual disks.

Besides the Disk Compacting Tool, Parallels Desktop includes another tool for maintaining virtual hard disks: the powerful **Parallels Compressor**. Parallels Compressor not only reduces the disk size, but allows you to keep your disks effective in many other ways. For information on this tool refer to the Using Parallels Compressor (page 169) chapter.

Compacting Procedure

In general the compacting procedure consists of two stages that can be performed separately:

1 A preparation step, performed in the guest OS, when an unused disk space is marked.

This step can be performed only in those guest OSes where the Parallels Tools Center can be installed, i.e. in Windows 95/98/NT/ME/2000/XP/2003 guest OSes. See Installing Parallels Tools (page 63) for guidelines on installing the Parallels Tools package.

2 A compacting step, performed in the primary OS, when the unused space is removed.

This step can be performed in two ways:

▪ Immediately after the preparation step is completed.

All of the selected expanding virtual disks are compacted in one operation.

This option is available in those guest OSes where the preparation step can be performed, i.e. in Windows 95/98/NT/ME/2000/XP/2003 guest OSes.

▪ When the virtual machine is powered off.

Compacting is launched for each expanding virtual disk one-by-one.

This option is available in all guest OSes.

How to Compact Expanding Virtual Disks

To compact disks in Windows 95/98/NT/ME/2000/XP/2003 guest OSes:

1 In the running virtual machine, open the **Parallels Tools Center**. See the Parallels Tools Center (page 156) topic to learn how to do so.

2   In the Parallels Tools Center, open the Disk Compacting Tool tab.

3   In the Disk Compacting Tool Options (page 162) tab, a table in the Status group displays the list of volumes that can be compacted. Select the volumes you want.

If you want to proceed to compacting immediately after the preparation step is completed, select the Execute all stages at once check box.

Click the Start button to begin preparing disks.

4   During the preparation step the Preparing for compacting. Please wait... message is displayed.

5   If you have selected the Execute all stages at once check box:

When the disks are ready for compacting, the Disk Compacting Tool pauses virtual machine execution and starts compacting. The Compacting virtual hard disk box is displayed.

When the process is finished, you are informed that the "`Process of compacting of virtual hard disk(s) has been successfully completed`". Click OK to continue working with the virtual machine.

6   If you have NOT selected the Execute all stages at once check box:

When the disks are ready for compacting, you are informed that "`You are able either start compacting right now or do it when the virtual machine is powered off`".

If you select to start compacting, the Disk Compacting Tool performs compacting as described in step 5.

If you select to put compacting off, you may continue working with the virtual machine. See the subtopic below to learn how to start compacting later.

To compact expanding virtual disks in any guest OS:

▪   When the virtual machine is powered off, click the Compact button on the Advanced tab of the Hard Disk Options for each expanding-type virtual disk. While compacting is performed, the Compacting virtual hard disk box is displayed. When the process is finished, you are informed that the "`Process of compacting of virtual hard disk(s) has been successfully completed`".

Setup a Printer in a Virtual Machine

There are three principal methods of configuring printing in a virtual machine:

▪   Setup a network printer.

We recommend that you use this method since it provides the most stable work.

▪   Setup a USB printer.

▪   Setup a printer via Apple's Bonjour Printer Wizard.

This method is available in Windows guest OSes only.

Configuring a virtual machine for either method of printing is described below.

Setting Up a Network Printer

Before installing a network printer in a guest OS make sure that your primary OS and the virtual machine meet the following requirements:

- Networking in your primary operating system is configured.
- Virtual machine configuration includes the network adapter which is connected to a real network adapter of your computer. See the Network Adapter Options (page 108) of your virtual machine; make sure that the **Enabled** and the **Connect at startup** options are selected in the **Device Status** group. In the **Emulation** group the **Bridged Ethernet** option should be selected and the real network interface should be chosen in the **Network Adapters** list.
- Networking in the guest OS is configured.
- User account from which you will setup the printer has permission to access the network printer.

In a Linux or FreeBSD Guest Operating System

Make sure that the following components are installed in your guest Linux or FreeBSD system:

- Common UNIX Printing System (CUPS). Installation instructions can be found at CUPS site http://cups.org/documentation.php;
- Samba service. Installation instructions can be found at Samba site http://us4.samba.org/samba/docs/man/Samba-HOWTO-Collection/install.html;
- A Web browser, since we consider controlling CUPS via web interface;
- Also you have to know the `root` password.

To add a network printer in a Linux or FreeBSD guest OS:

1 Start your Linux or FreeBSD guest operating system.

2 Start Common UNIX Printing System.

In a terminal, issue the command:

```
/etc/init.d/cups start
```

3 Start a Web browser and open either the IP address of your virtual machine or `http://127.0.0.1:631`.

4 Select **Printers** in menu. Click the **Add printer** button below the list of available printers (if any).

5 You are asked for the `root` password. Enter it to be able to proceed.

6 In the **Add New Printer** screen enter the information for easy identification of the printer: an informative printer name, location, and description.

7 In the **Device for <Printer Name>** screen select the *Windows Printer via Samba.*

8 In the **Device URI for <Printer Name>** screen specify the path to the network printer in the following format:

```
smb://<computer name>/<printer name>
```

9 In the Model/Driver for <Printer Name> screen select the model of your printer.

10 CUPS performs installation. If installation is successful, the "`Printer <name> has been added successfully`" message is displayed.

In a Windows Guest Operating System

To add a network printer in a Windows guest OS:

▪ Start the Windows guest operating system and log in the proper account.

▪ Open Windows Start menu, select Settings and then the Printers and Faxes (or simply Printers) item.

▪ Open the Add Printer Wizard:

  In Windows 95/98/NT/ME/2000/2003 double-click the Add printer icon.

  In Windows XP click the Add a printer link.

▪ In the Add Printer Wizard:

  In Windows 2000/XP/2003:

  - click Next in the wizard's first screen,

  - in the Local or Network Printer screen, click A network printer, or a printer attached to another computer.

  In Windows 98/ME:

  - click Next in the wizard's first screen,

  - the wizard's next screen asks: How is this printer attached to your computer? Click the Network printer option.

  In Windows 95/NT:

  - click Network printer/server.

▪ Continue an ordinary network printer installation.

Setting Up a USB Printer

To setup a USB printer:

1 Open the virtual machine configuration in the Configuration Editor (page 94), and make sure that the configuration includes a USB controller; if necessary add it.

2 Open the USB Options (page 113), and make sure that the Enabled option is selected. Select the Autoconnect at startup if you want the printer to be automatically captured by the virtual machine.

3 Save the virtual machine configuration (see Saving Virtual Machine Configuration (page 94)) and start the guest operating system.

4 Connect the USB printer as a normal USB device. See the Connecting USB Devices (page 155) topic.

5 Install the native driver for the printer in the guest OS.

Setting Up a Printer via Bonjour

Note. This method of configuring a printer is only available in Windows guest OSes.

To setup a printer using the Bonjour Printer Wizard:

1 Start your Windows virtual machine and log in.

2 In the virtual machine, download the Bonjour for Windows installation package from the Apple site http://www.apple.com/macosx/features/bonjour/.

3 Install Bonjour for Windows by launching the BonjourSetup.exe file from the folder where place it was downloaded.

4 Start the Bonjour Printer Wizard either by clicking its icon on the desktop or by selecting Start -> Programs -> Bonjour -> Bonjour Printer Wizard.

5 Follow the installation steps until the Install Bonjour Printer screen appears.

6 In the Install Bonjour Printer screen, select Generic in the Manufacturer list and then Generic / Postscript in the Model list. This step is the same for any printer model you have.

7 Follow the rest of installation steps.

C H A P T E R 7

Using Parallels Compressor

Parallels Compressor™ is a new, easy-to-use Parallels tool which will help you keep your virtual machines efficient for many purposes.

Parallels Compressor allows users to:

- effectively clean up disk space in a virtual machine
- significantly reduce the size of virtual hard disks
- efficiently use the real hard disk resources
- easily share smaller virtual disks by burning them to CD/DVDs or moving them over a network.

In This Chapter

How Does Parallels Compressor Process a Virtual Machine?

Compressor processes a virtual machine in the following way:

- Deletes unneccessary files on the current system.
- Defragments virtual disks of all formats and cleans up unused space.
- Compacts expanding disks.

The actions performed on your particular virtual machine depend upon the running mode: *automatic* or *manual*:

- In *automatic* mode Parallels Compressor compresses only the current system disk performing the pre-defined set of actions. If this disk is plain, it will not be compacted.
- In *manual* mode you are able to choose disks to compress and actions to perform.

More about running modes and other Compressor properties can be found in the Options of Parallels Compressor (page 182) section.

Steps of the Compression Procedure

Parallels Compressor is designed to perform the most efficient compression of a virtual machine, including compacting of virtual disks that can significantly increase the ratio of useful data in your virtual machine. The procedure consists of two steps:

- a preparatory step performed in the guest operating system (deleting of temporary and unnecessary files, cleaning up of unused disk space); and
- a compacting step (reducing virtual disk size) performed in the primary operating system.

Requirements for the Guest Operating System

To run Parallels Compressor your virtual machine should have one of the following guest operating systems installed:

- Windows Vista
- Windows Server 2003 Standard Edition SP0, SP1
- Windows Server 2003 Enterprise Edition SP0, SP1
- Windows Server 2003 Web Edition SP0, SP1
- Windows Server 2003 Small Business Edition SP0, SP1
- Windows XP Professional Edition SP2
- Windows XP Home Edition SP2
- Windows 2000 Professional SP4
- Windows 2000 Server SP4
- Windows 2000 Advanced Server SP4

In other guest operating systems we recommend using the Disk Compacting Tool (page 164).

How to Run Parallels Compressor

Before Starting Parallels Compressor

Before starting Parallels Compressor perform the following steps:

1 Back up your virtual machine by cloning it or by copying its hard disk files to a safe location.

This enables you to restore your VM in case you do not like the results of the compression, as this operation is irreversible.

Note. The result of virtual machine compression is irreversible. Before starting Parallels Compressor please back up your virtual machine.

2 Make sure your virtual machine configuration includes the CD/DVD-ROM drive.

If it does not:

- power off the virtual machine,
- open the Configuration Editor (page 94),
- add a CD/DVD-ROM drive into the configuration if it is not included. Refer to Adding New Devices to Virtual Machine (page 114) for details,
- on the CD/DVD-ROM Options (page 106) tab make sure that the Enabled check box is selected.

How to Start Parallels Compressor

To start Parallels Compressor:

1   Power on the virtual machine you want to compress.

2   Log in to the guest operating system as a user with administrator rights.

> **Note**. To run Parallels Compressor in a virtual machine you must have administrator rights in the guest operating system.

3   Select **VM** -> **Run Parallels Compressor** in the menu.

Running Parallels Compressor

Parallels Compressor has the following running modes:

- *automatic* (page 183), the default mode. In this mode Compressor uses the default compression options.

- *manual* (page 183), Parallels Compressor runs as a wizard which helps you select the options of virtual machine compression.

When you start Parallels Compressor, the ISO file with Compressor is connected to the virtual CD/DVD-ROM and displays the dialog box with a time indicator. The time indicator shows the time remaining until Parallels Compressor will run in automatic mode (timeout is about 10 seconds).
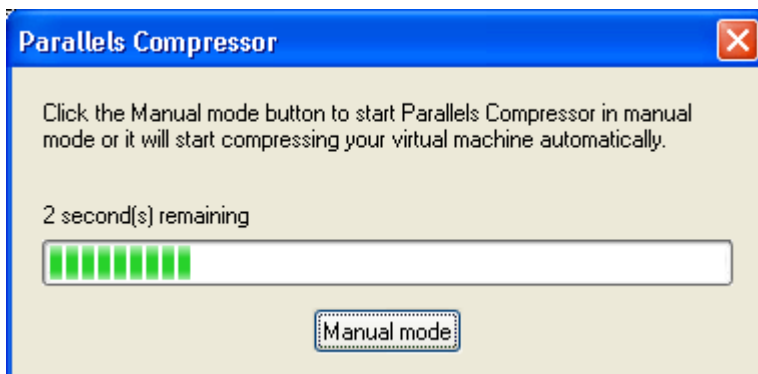
To run Parallels Compressor:

- in *automatic* mode, don't do anything, just wait until the timeout expires. Detailed information about running Compressor in this mode is given in the Compression in Automatic Mode (page 174) topic.

- in *manual* mode, press the ESC key or click the **Manual Mode** button on the dialog box before the timeout expires. Detailed information about running Compressor in this mode is given in the Parallels Compressor Wizard (page 177) topic.

After Compressing Is Finished

When Parallels Compressor finishes its work, it disconnects the ISO with Parallels Compressor from the virtual machine and restores the previously existed connection. If the connection is not restored automatically:

- select **VM / Cancel Parallels Compressor** in the menu.

Note. Do not perform this command when Parallels Compressor is running. If the ISO file is disconnected during the process, the virtual machine may behave unpredictably.

Also refer to Further Reducing Disk Size (page 186) to get an idea of what else you can do to compress virtual hard disks.

Compression in Automatic Mode

In *automatic* mode Compressor uses the following default options:

- only one virtual system disk is being processed (if the virtual machine has several system disks, the current system disk will be compressed);

- compression is performed at the High level (page 185), and all compression tasks will be executed, except for Clean up Drivers Cache, which will be skipped.

Note. During the process, Compressor displays several dialog boxes. Although they are used for information purposes, you can click Cancel at any time to stop Compressor or click the Help button to get necessary information.

1   Compressor displays the Execution in progress dialog box that informs you what tasks are being executed.
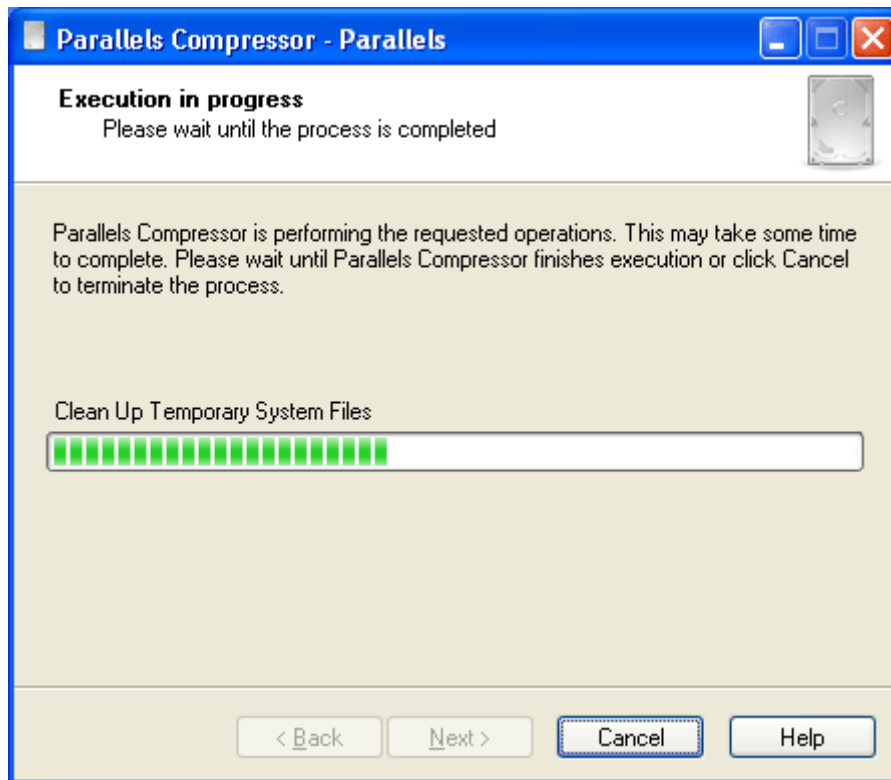
2 The next screen states that Compressor is going to restart the virtual machine.
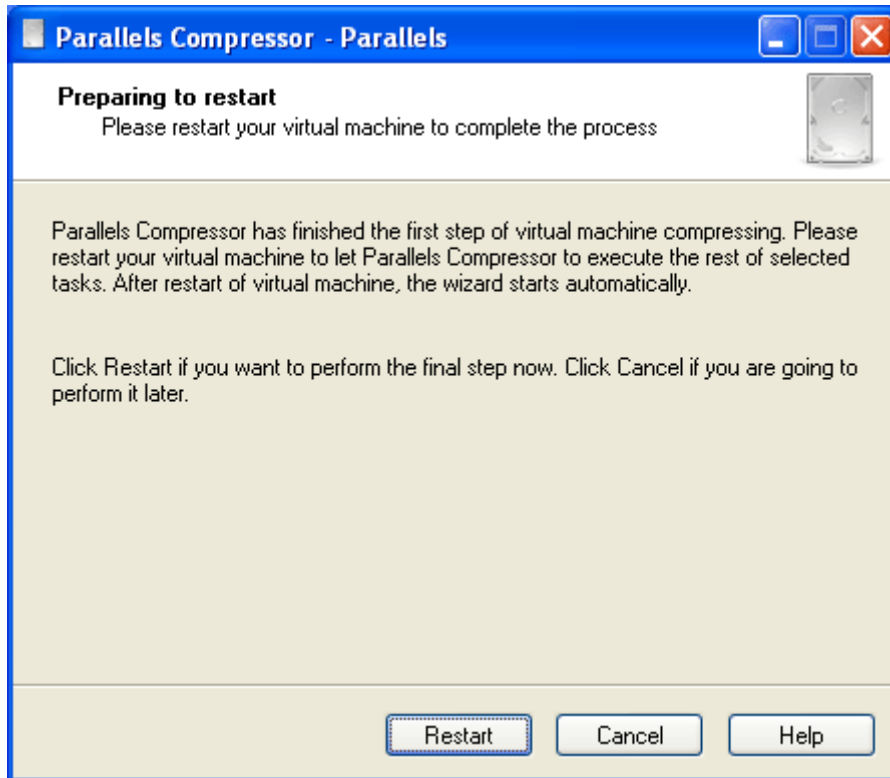
3 Compressor restarts the virtual machine.

4 After the restart, it displays the dialog box with the time indicator which shows the time remaining until Compressor will continue the execution of compression tasks.
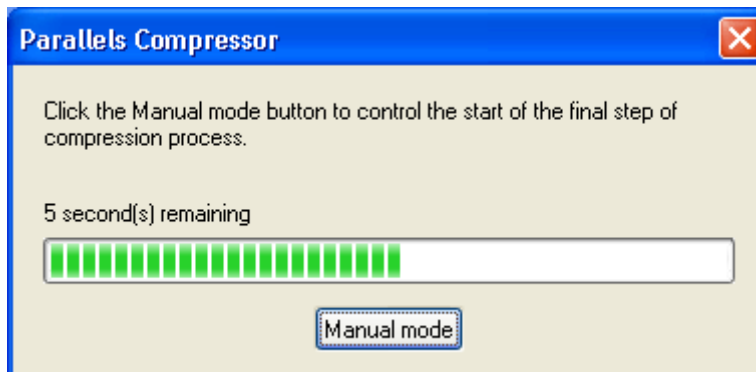
If you click the Manual mode button before the timeout expires, you can postpone the execution of the remaining tasks. In this case you will see the dialog box shown below. Click Next at any time to let Compressor continue the compression.
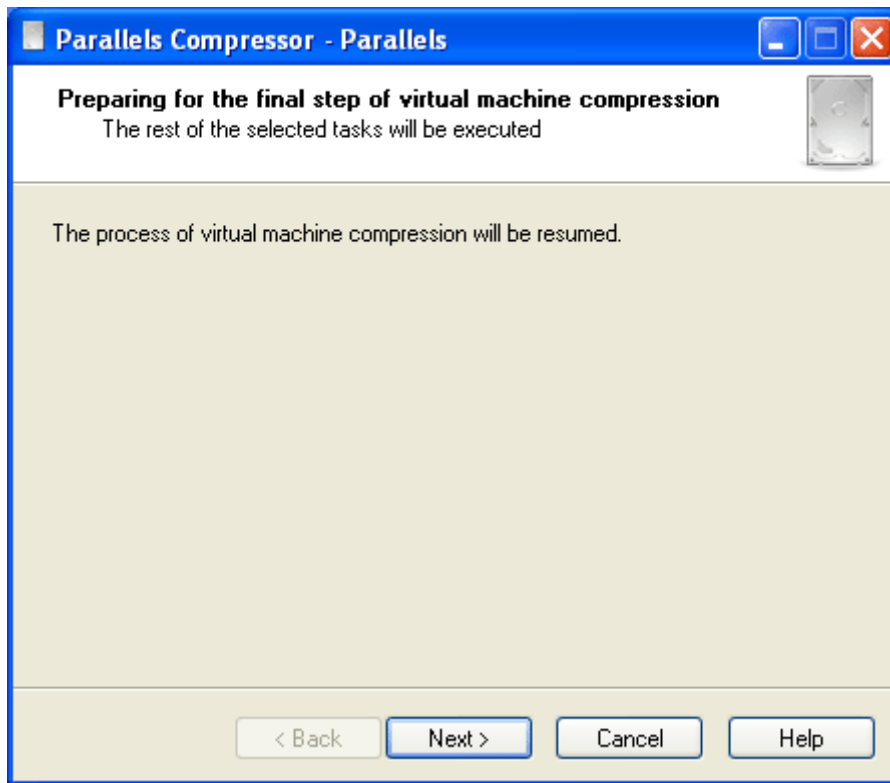
5 Compressor resumes the execution of the compression tasks and informs you of the tasks currently being performed in the Execution in progress dialog box.

6 When Compressor successfully finishes its work, you will see the following dialog box.
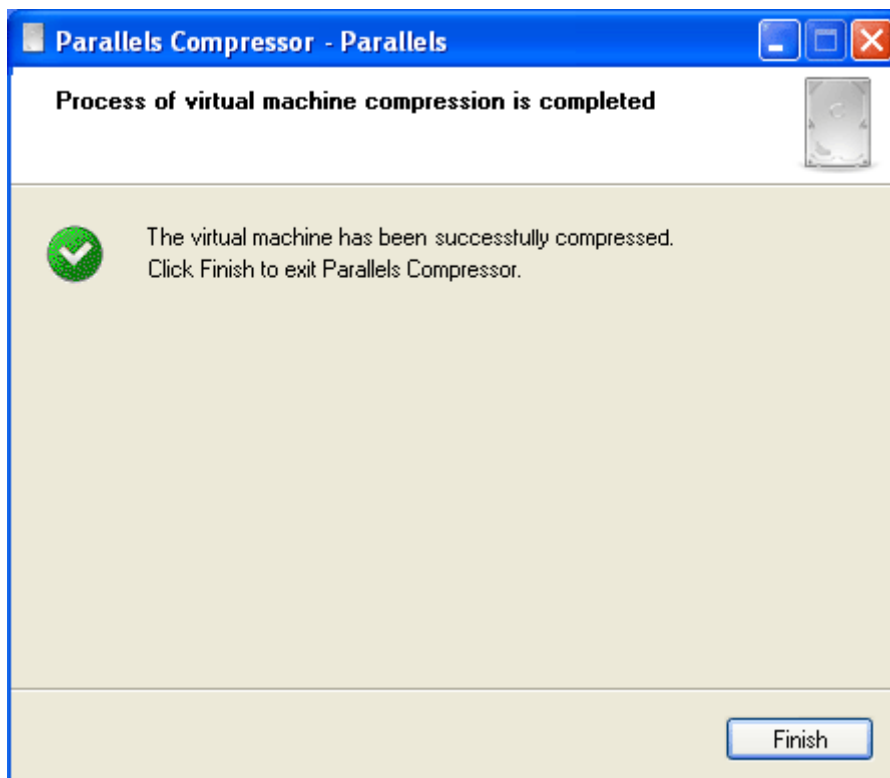
Click **Finish** to exit Parallels Compressor.

Parallels Compressor Wizard

In *manual* mode, Compressor starts as a wizard.

1   The wizard displays the **Welcome** screen.
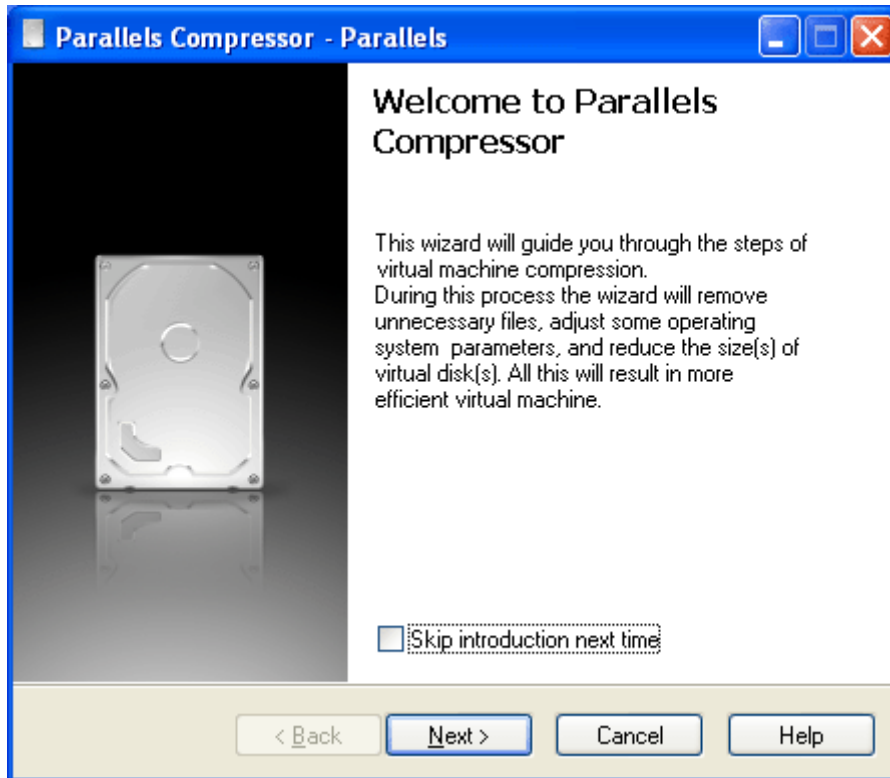
If you'd like to skip the **Welcome** screen next time you run the wizard, select the **Skip introduction next time** check box. Click **Next** to continue.

2 **Choose mode of virtual machine compression**. At this step, the wizard detects the type of the guest operating system. The wizard prompts you to choose between **Express** and **Advanced** compression (page 183).
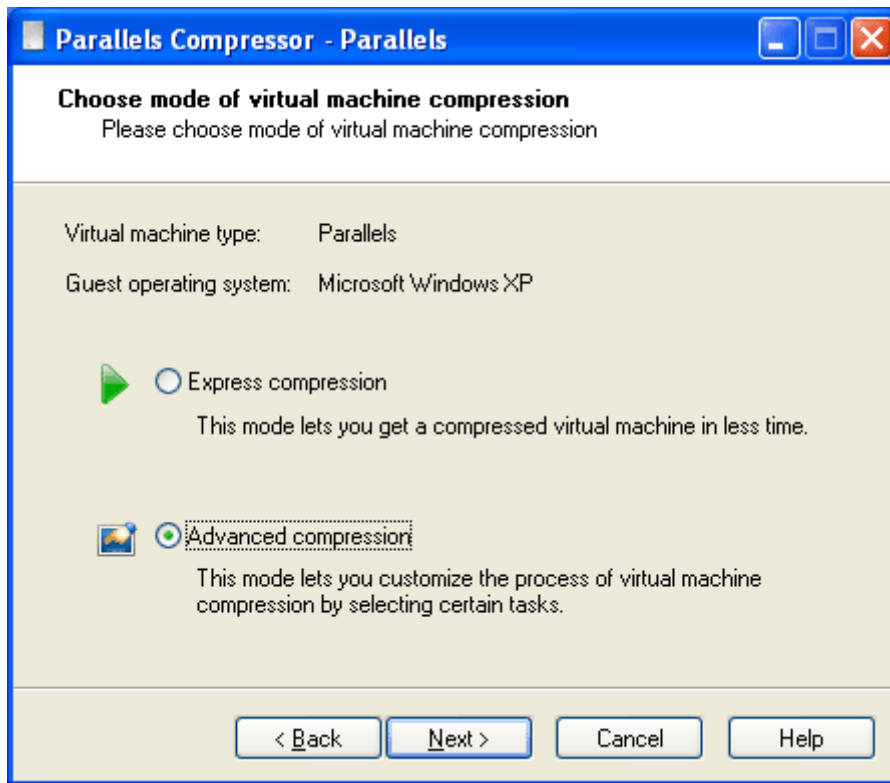
If you choose **Express** compression, the wizard will use the default compression options.

If you choose **Advanced** compression, you will be able to select certain options of compression.

3 **Select Logical Disk(s)**. The wizard determines what hard disks are available in your virtual machine. Please read the Selecting Logical Disks for Compression (page 184) topic if you are not sure what disk formats are supported.

Use check boxes to select a disk or disks.
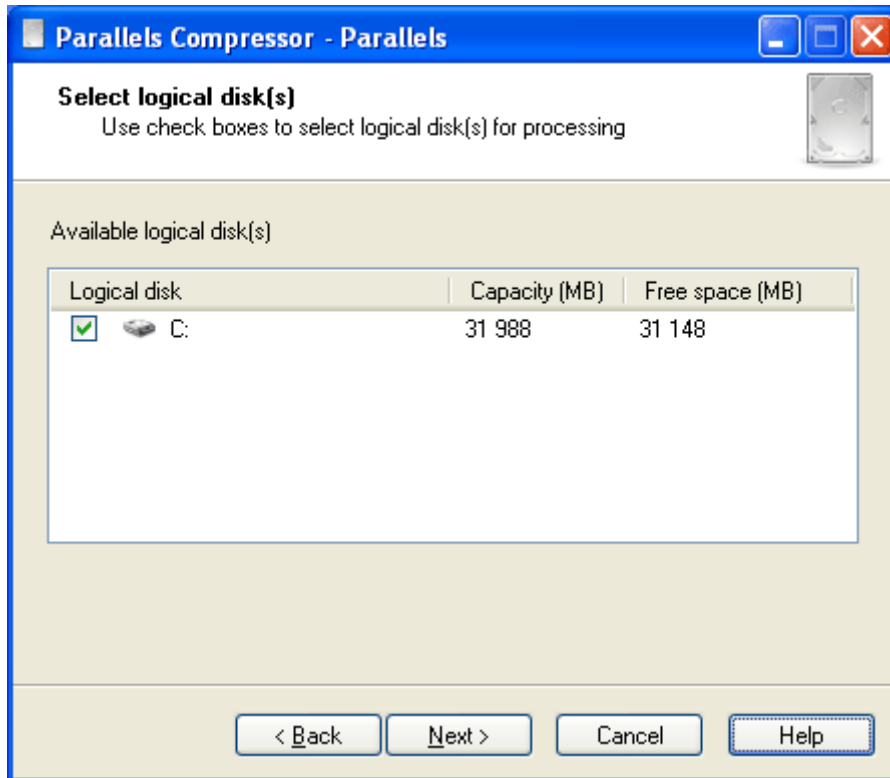
Click **Next**. If you selected **Express** compression (page 183) in the **Step 3**, skip **Step 4** and **Step 5**.

4 **Choose Compression Level.**
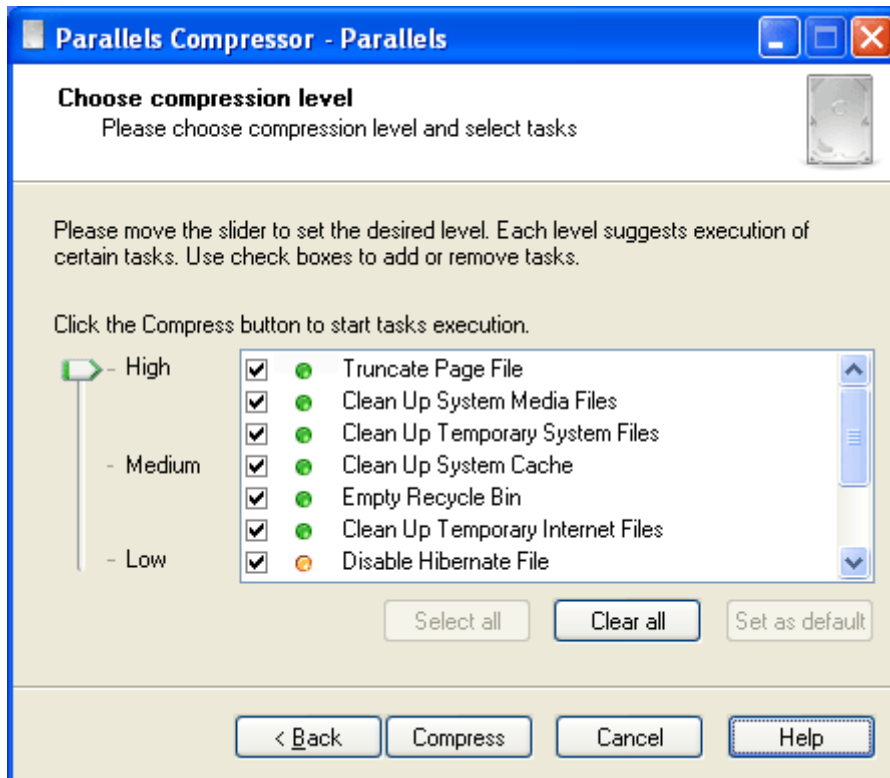
The wizard prompts you to choose the Compression level (page 185). There are three levels: *High, Medium, Low.*

To choose the level, place the cursor over the level slider and smoothly move the slider to the desired level or just click the levels consecutively starting from *High* until the slider reaches the desired level.

For each level certain tasks (page 185) are suggested, but you can select check boxes for tasks you want to be executed and clear the check boxes for tasks you don't want to be executed. You can also click the Select all button to select all tasks or click Clear all to clear all check boxes. Click Set as default to restore the default selection of tasks for the chosen level.

The check box for the Compact virtual disk task is always disabled.

Click the Compress button. The wizard starts execution of the selected tasks, and you can see the progress of the operation.

If you cleared the check box for the Truncate page file option, the wizard skips Step 5 and Step 6.

5 Preparing to restart. Depending on the tasks you have selected on the previous step, the wizard may require to restart the computer.
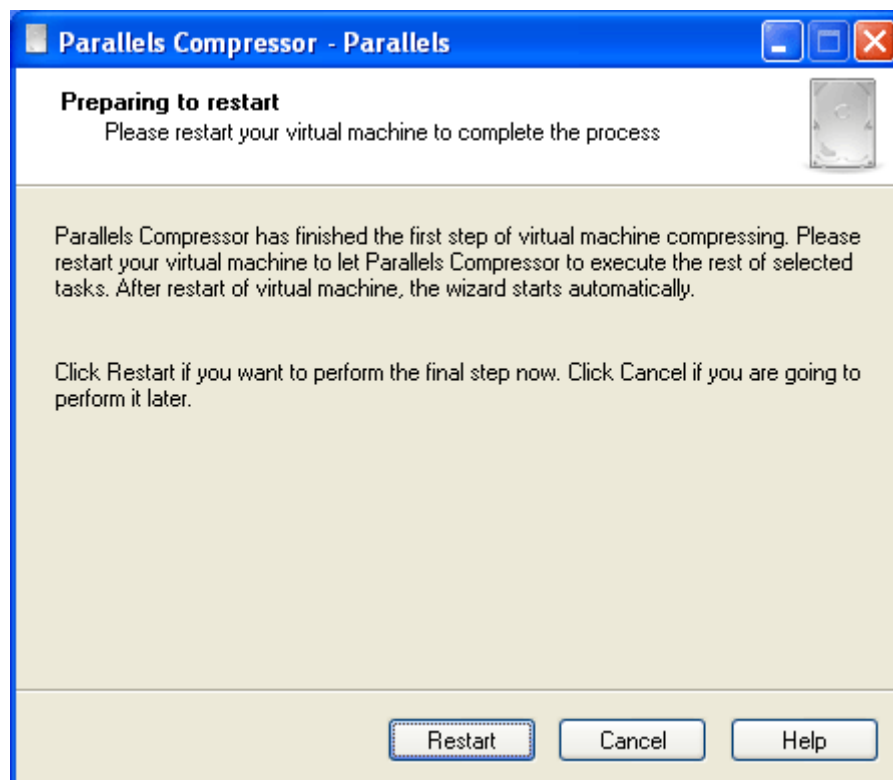
Click Next to restart your virtual machine.

If you click Cancel, the process of virtual machine compression will be resumed automatically the next time you start your virtual machine.

6 When the restart is completed, the wizard is ready to resume the execution of tasks. Click Next.
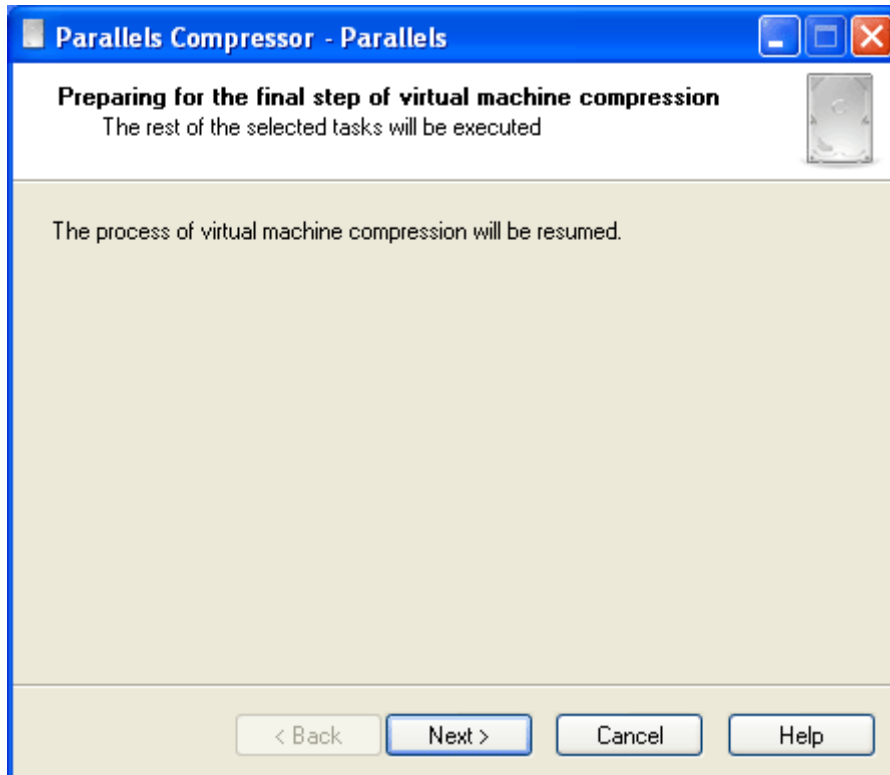
7 On the wizard's next dialog box, you can see the progress of operations. If you have chosen Express compression, the wizard performs the disk compacting without prompting you to confirm this operation.

8 Disks compacting is the final step of compression.
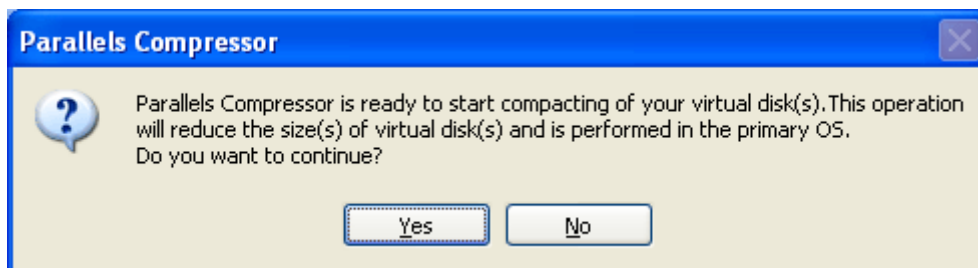
Click Yes to perform the operation. Click No to skip disk compacting.

The compacting of the selected virtual disk will not be performed if a selected disk is in plain format. For more information please refer to the Selecting Logical Disks for Compression (page 184) topic.

9   Now, compression of the virtual machine is completed.
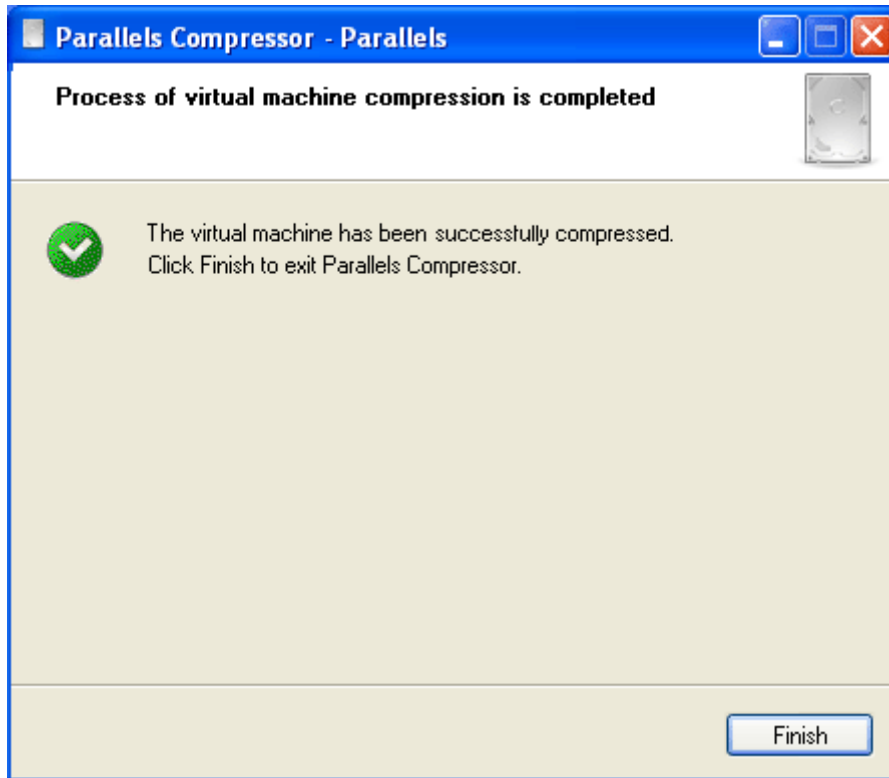
Your virtual machine is compressed, and its expanding disks are significantly reduced in size.

Click **Finish** to exit Parallels Compressor.

Options of Parallels Compressor

This Section describes in detail all the options of Parallels Compressor available in *manual* mode.

Running Modes

Parallel Compressor has two running modes:

- **Automatic.** Default running mode. In automatic mode, Compressor performs Express Compression (page 183) without prompting the user to confirm operations.
- **Manual.** Compressor runs as a wizard (page 177) which helps you choose various compression options.

Once launched, Compressor displays the dialog box with a time indicator showing the time remaining until Compressor will run in automatic mode.

To run Compressor in **automatic** mode don't do anything, just wait.

To run Compressor in **manual** mode press the ESC key or click the **Manual mode** button before the timeout expires.

Command-line keys for Compressor

The current version of Parallels Compressor has the following keys:

- **/A** - to start the program in automatic running mode;
- **/G <cmdline>** - to start third party defragmentation tool instead of the tool used by Parallels Compressor, <cmdline> stands for the path and name of such tool;

  /H - to open the Help panel with the list of available keys;

- **/S** - to run Compressor in completely non-interactive mode ("silent mode").

Comments to command-line format

- The program name and key are separated by a space.
- If spaces are used in the <cmdline>, enclose the expression in double quotes as follows:

`ParallelsCompressor /G"C:\Program Files\...defrag.exe"`

- There is no space between the key and its parameter as in the example above.

Express and Advanced Modes

When launched in manual mode, Parallels Compressor offers to choose the compression mode for processing a virtual machine:

- **Express** compression. Recommended for all users. In this mode, the compression is performed at the *High* level. That means, all compression tasks (page 185) will be executed except for **Clean up Drivers Cache**, which is skipped by default. During Express compression, only one virtual disk is processed, the current system disk.
- **Advanced** compression. Recommended for advanced users only. In **Advanced** compression mode, the wizard lets you select options: logical disks, desired compression level, and tasks to execute.

Selecting Logical Disks for Compression

A virtual machine may have several virtual disks. In manual (page 183) mode you can select one or more logical disks for compression.

In the Select Logical Disks dialog box, Compressor displays the list of virtual machine's disks in expanding and plain formats.

Please take into account the limitations discussed below.

Virtual machine compression is performed in two steps:

- disk cleaning: removing unnecessary files, disk defragmenting
- disk compacting: reducing the size of a virtual disk file performed in the host operating system

Expanding disks

Both steps can be performed only on a virtual disk in expanding format.

Plain disks

Compressor performs only a disk cleaning step on the selected plain disks, system or not; disk compacting can not be done on plain disks.

Compression Levels

Parallels Compressor supports three levels of compression: *Low*, *Medium*, *High*. Each level suggests the execution of certain tasks. The wizard displays the complete list of such tasks.

The complete list includes the following tasks:

- 🟢 Truncate Page file (recreates the system page file of smaller size);
- 🟢 Clean Up Temporary System Files (deletes temporary files used by the system for acceleration of operations);
- 🟢 Clean Up System Cache (deletes temporary data stored by the system on disk to increase performance);
- 🟢 Empty Recycle Bin (permanently removes previously deleted files from the Recycle Bin);
- 🟢 Clean Up Temporary Internet Files (cleans up the Internet Explorer cache, deletes cookies, history, address bar, temporary files);
- 🟢 Disable Hibernate file (disables hibernate file which stores the virtual machine memory when the virtual machine is turned off);
- 🟢 Compact virtual disk(s) (reduces the size of disk in host (primary) operating system);
- 🟡 Clean Up Temporary Setup Files (deletes installation files used by MS Office and other programs);
- 🟡 Clean Up System Media Files (deletes temporary files used by Media Player);
- 🔴 Clean up Drivers Cache (empties the cache for the most popular drivers. If you are going to install new hardware, clear this check box);
- 🔴 Clean Up System Restore Information (deletes data related to the last successful system loading).

By default, tasks are assigned to the compression level in the following way:

- High level: all tasks on the list (those marked by 🟢, 🟡, 🔴)
- Medium level: all tasks marked by 🟢 and 🟡
- Low level: only tasks marked by 🟢

The desired level of compression can be chosen with the help of a slider which has three positions: *Low*, *Medium*, *High*. For each task on the list there is a check box. When the slider is at the *High* position all tasks are selected. Moving the slider from the *High* to *Medium* position, clears check boxes for tasks marked by 🔴; moving the slider to the *Low* position clears check boxes for tasks marked by 🟡 and leaves selected only those tasks which are suggested for execution at the *Low* level (🟢).

Additionally, with any level chosen, you can add/remove tasks by selecting or clearing corresponding check boxes. To restore the selection of tasks default for the chosen level, click the Set as default button.

Note. The check box for the Compact virtual disk(s) task cannot be cleared; this task is mandatory for each level.

In Express compression (page 183) mode (or in automatic mode) all tasks are executed as suggested by the *High* level, only the Clean up Drivers Cache task is skipped.

Advanced compression (page 183) allows users to select any set of tasks.

Further Reducing the Disk

After you have used Compressor to process your virtual machine, you can reduce the virtual machine's size even further.

If you are going to share the virtual machine hard disk files, then the smaller its disks are, the better. Once Compressor has completed its work, turn off the virtual machine. Running the virtual machine after compression has been completed will increase the size of its system disk file (the system page file increases as the virtual machine is running). As the virtual hard disk is just a file on your computer, you can archive it with WinZip or WinRAR, whatever you prefer. The size can be reduced by 50% or more.

CHAPTER 8

Using Parallels Image Tool

This chapter provides all the information necessary to use Parallels Image Tool. Since a virtual machine operates virtual hard disks which are image files and uses virtual CD/DVDs which are images of real discs, the Parallels Desktop package includes a special tool for creating and supporting images - the Parallels Image Tool, which is automatically installed along with Parallels Desktop.

In This Chapter

Overview

Parallels Image Tool allows you to:

▪ modify existing images of virtual hard disks including conversion of images to other formats (see the Format of The Virtual Disk (page 87) in the **Hard Disk Images** topic),

▪ create ISO images of real CDs or DVDs.

The Image Tool can perform the following operations on hard disk images:

▪ Increase the disk size of a hard disk image.

Both expanding and plain disks can be enlarged. Note that disk size can not be reduced.

▪ Convert a plain hard disk image to an image in expanding format.

The result of the conversion can be saved in the same file as well as in another one.

▪ Convert an expanding hard disk image to an image in a plain format.

The result of the conversion can be saved in the same file as well as in another one.

▪ Defragment an expanding hard disk image.

Parallels Image Tool is designed as a wizard. The wizard guides you through all the steps necessary to perform the required operation on the image. Furthermore, the wizard keeps all your previously selected options between uses in case you often perform the same operation.

How to Start Image Tool

To start the Parallels Image Tool:

1   Click on the Finder.

2   Select Applications.

3   On the list of available applications find the Parallels folder, click to open it.

4   Double-click the Image Tool icon.

Modifying Hard Disk Images

Warning. Before you start modifying an image of a virtual hard disk, please always back it up.

Requirements for Source Disk

The modifying operations require that the source hard disk image should not be in use by a running virtual machine.

Checking Disk Format

When selecting a disk image to modify, make sure that you select the source hard disk image of a proper format.

To check the disk format do the following:

1   Open the configuration of any virtual machine that includes this virtual hard disk.

2   In the Configuration Editor open the Advanced (page 104) tab of the Hard Disk Options

3   You will see the disk format in the Disk format field.

Using the Wizard to Modify an Existing Hard Disk Image

**1**   Start the Parallels Image Tool (page 188). Upon startup, the wizard displays the Welcome screen. If you want to skip this screen next time you run the Image Tool, select the Skip Introduction next time check box.
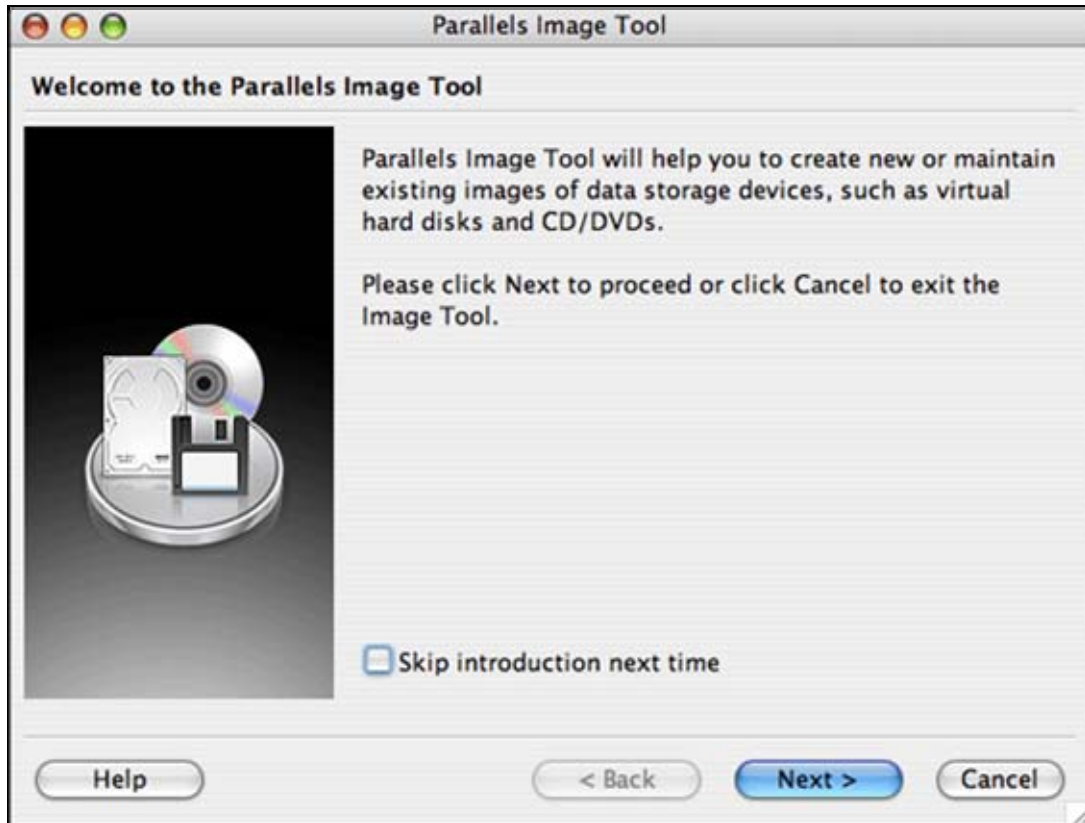
Click Next.

2 On the Choose device type screen select the Hard Disk option and click Next.
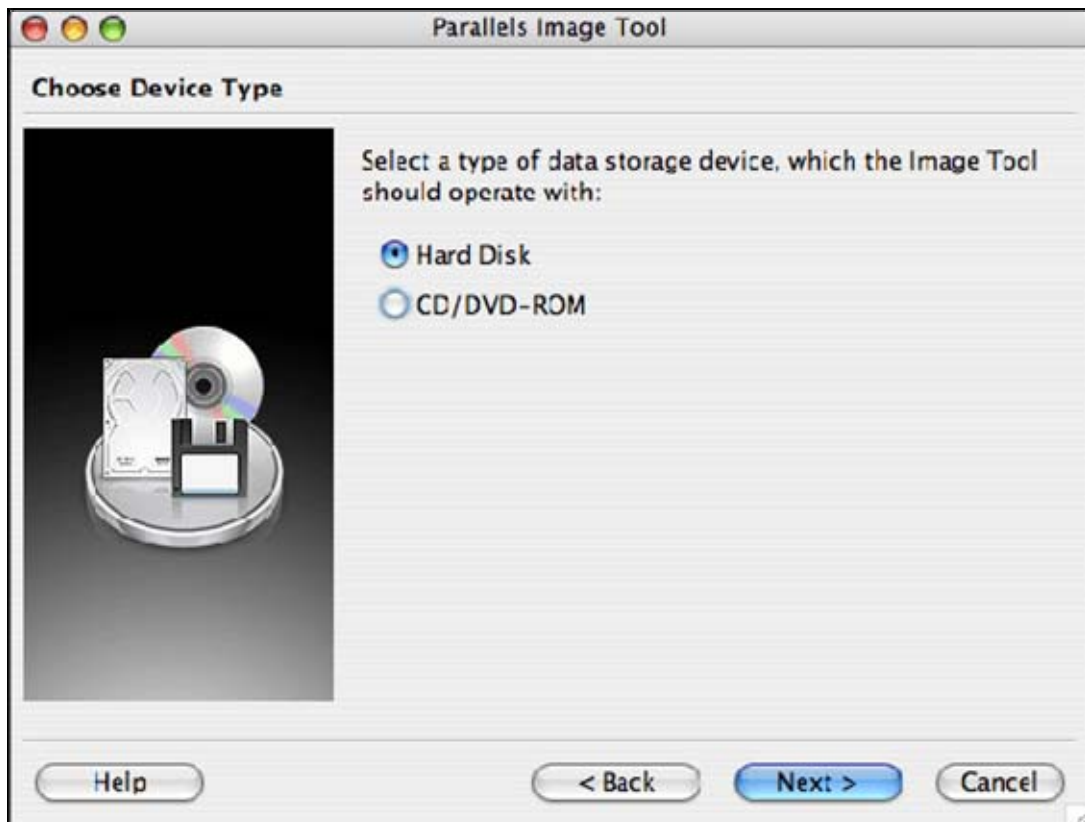
3 On the Hard Disk wizard's screen choose the operation you want to perform on the virtual hard disk.

There are four available operations for virtual disks images:

- Increase the size of the virtual hard disk to make a hard disk image larger,

- Convert plain virtual hard disk into expanding one or create an expanding copy of a plain hard disk image,

- Convert expanding virtual hard disk into plain one or create a plain copy of an expanding hard disk image,

- Defragment expanding virtual hard disk to optimize files arrangement on a virtual disk and to increase disk operation speed.

Choose the operation, then click Next.
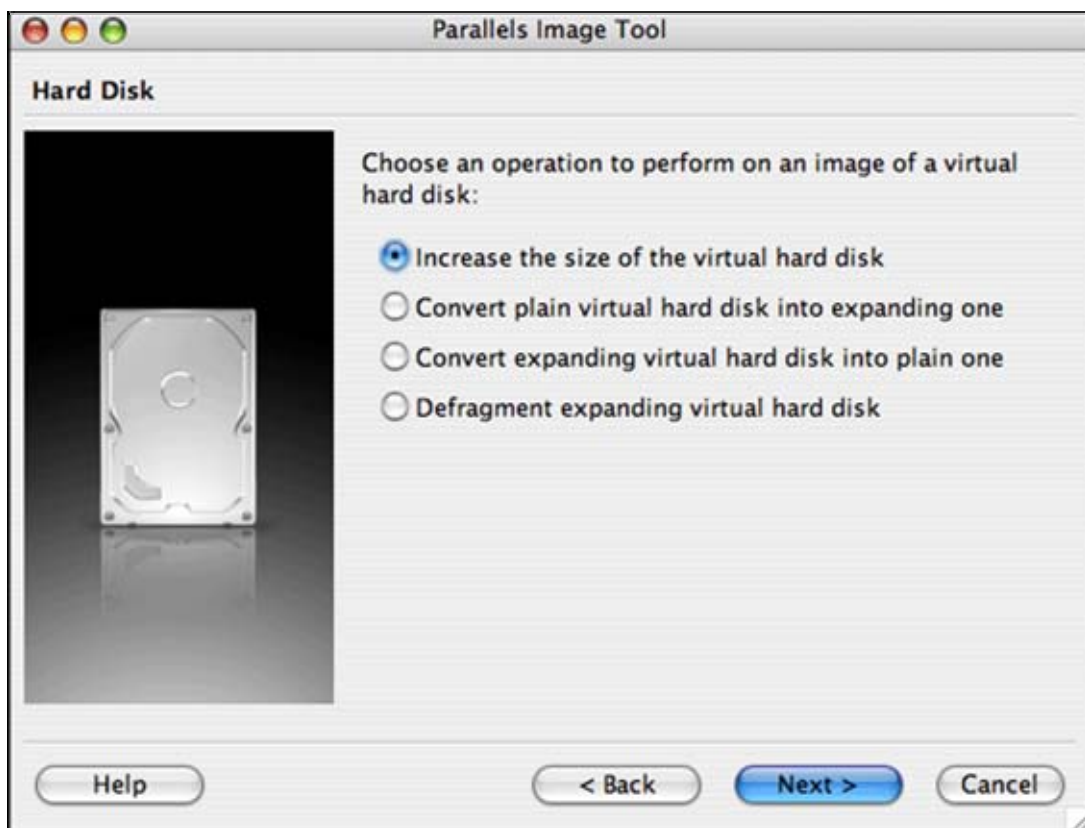
4 Next, you have to specify the options for the selected operation.

On the Increase Size of Virtual Hard Disk screen select the source hard disk image and the new size for the disk. Use the Browse button to locate a file. Use the spinner buttons next to the New Size field to set the required value.

Note. Parallels Image Tool doesn't allow you to decrease the image size.
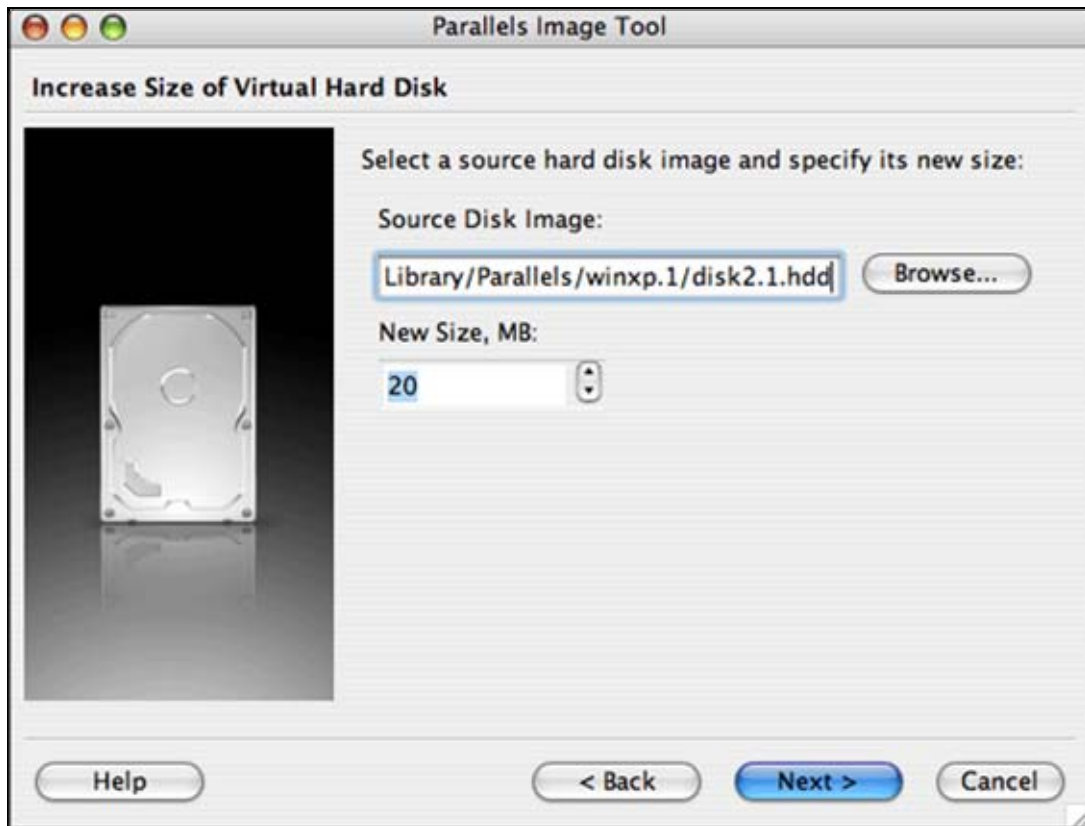
On the Convert Plain Disk to Expanding Disk screen select a source plain disk image using
the Browse button. Once the source file is selected, the same name appears in the Output
Expanding Image field. If you want to save the result of the conversion into a different
existing or a new file, use the Browse button to the left of the field.
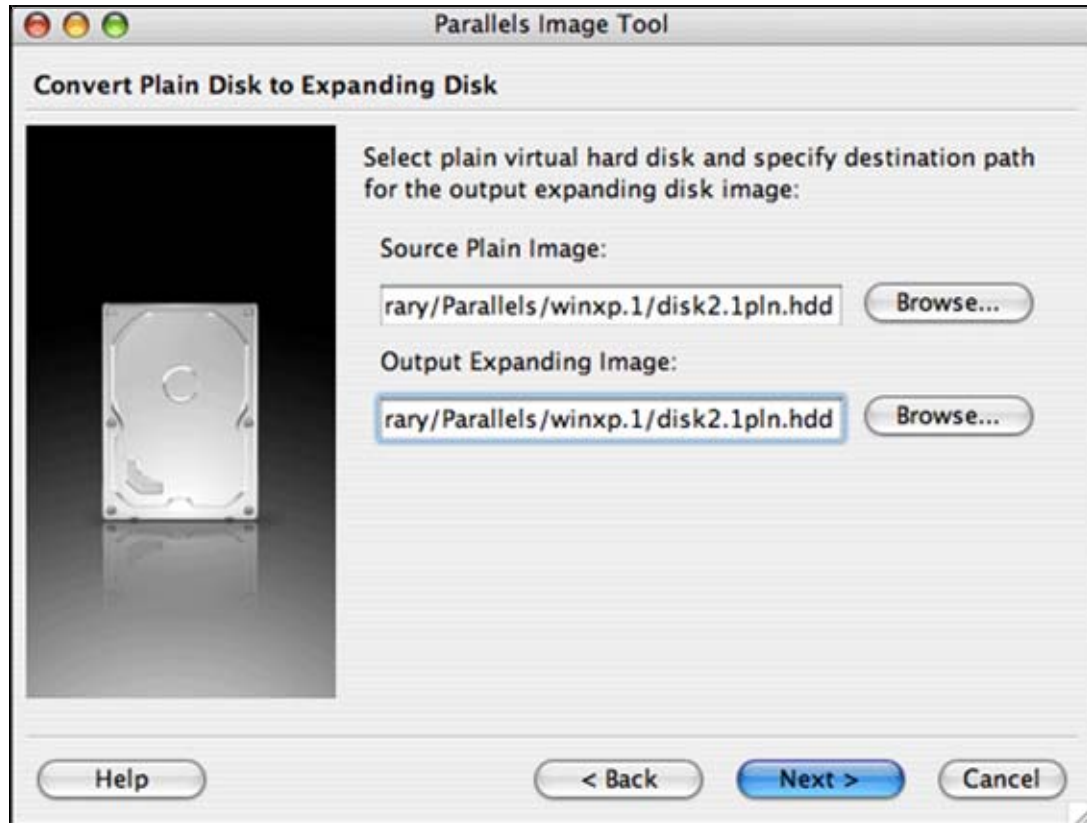
On the Convert Expanding Disk to Plain Disk screen select a source expanding disk image using the Browse button. Once the source file is selected, the same name appears in the Output Plain Image field. If you want to save the result of the conversion into a different existing or a new file, use the Browse button to the left of the field.
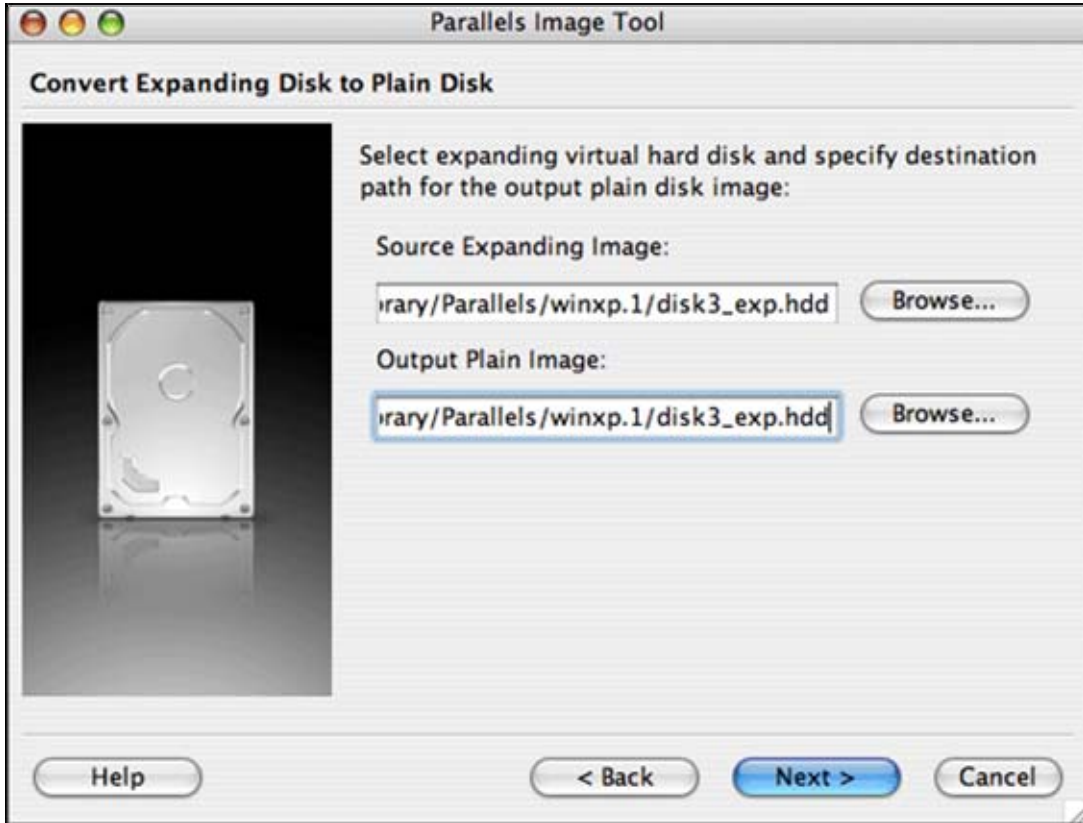
On the Defragment Virtual Hard Disk screen specify the name of a source hard disk image. Use the Browse button to locate the required file.
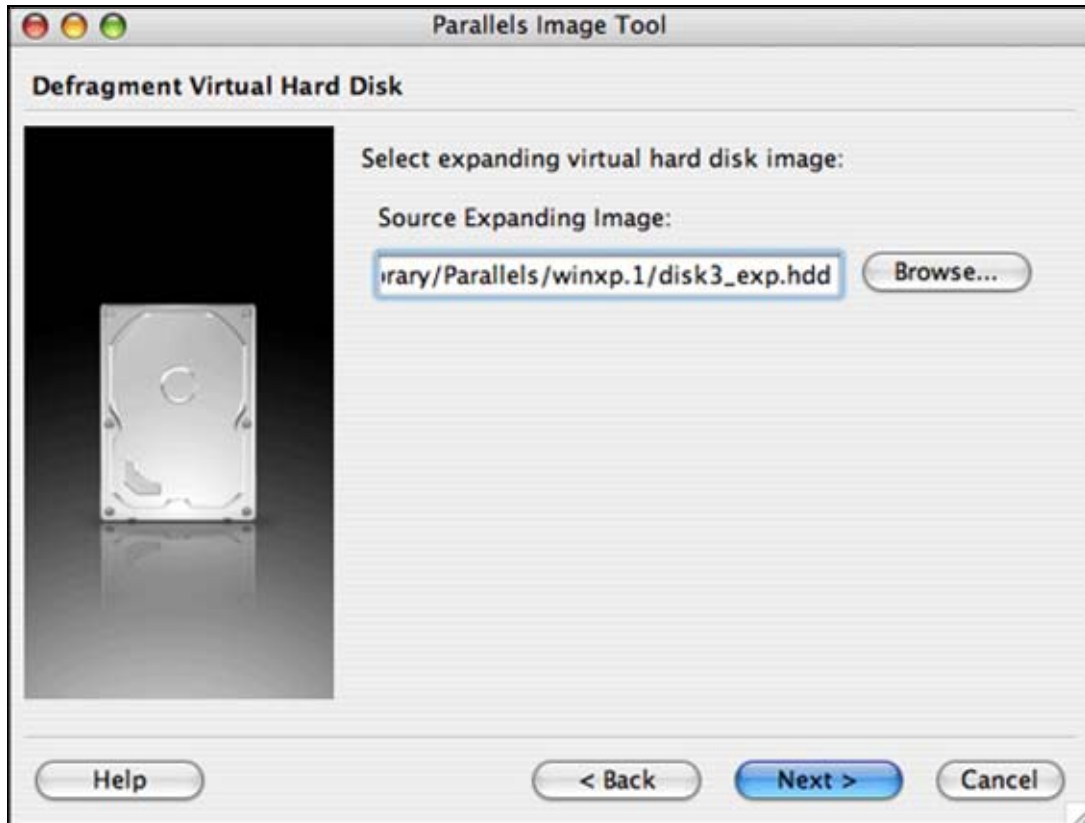
Click Next.

5 The wizard will display the chosen operation and selected options on the Review Processing Options screen.

Carefully review the settings (operation, source image file, and destination file if present, etc.). If everything is correct, click the Start button to start the desired operation.

6   While the operation is being performed, the **Execution in progress** screen is displayed. After the disk image is created, the **Execution Completed** screen appears. Close the Wizard by clicking the **Exit** button.
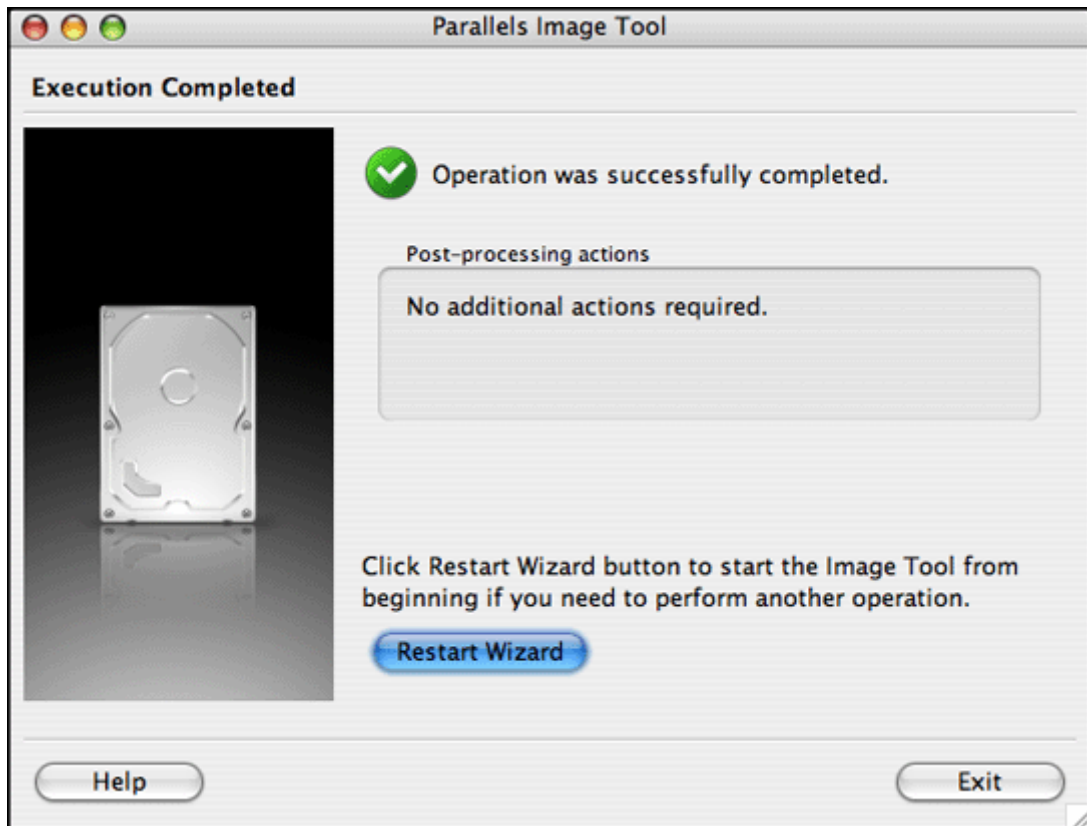
The new disk image is ready and you can connect it to a virtual machine in the Configuration Editor. See Adding New Devices to Virtual Machines (page 114) to learn how to connect to a new hard disk image to a virtual machine, or Hard Disk Options (page 103) to learn how to replace one of the currently connected hard disks with the new one.

Also see the Hard Disk Images (page 86) section for ideas on using hard disk images in Parallels Desktop.

Creating Images of CD/DVD discs

To create an image of a CD/DVD disc follow these steps:

1   Insert the required disc into the CD/DVD-ROM drive of your computer.

2 Start the Parallels Image Tool (page 188). Upon startup, the wizard displays the Welcome screen. If you want to skip this screen next time you run the Image Tool, select the Skip Introduction next time check box. Click Next.
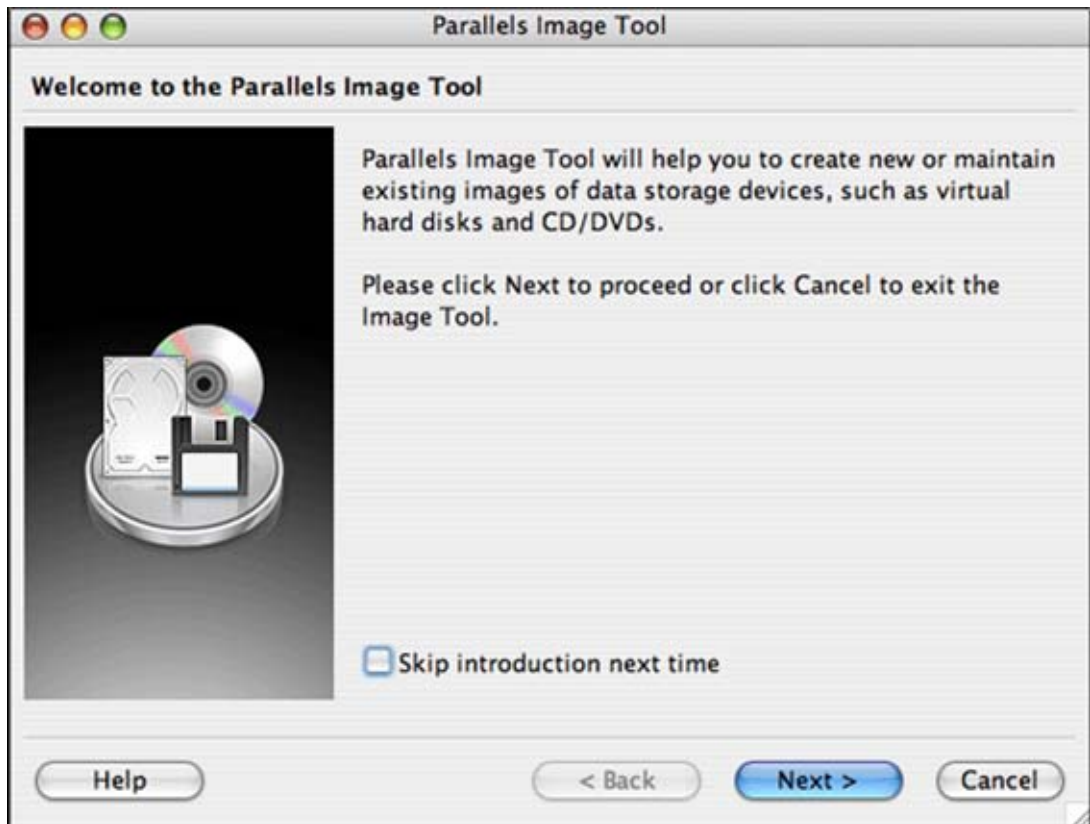
3 On the Choose Device Type screen select the CD/DVD-ROM option and click Next.
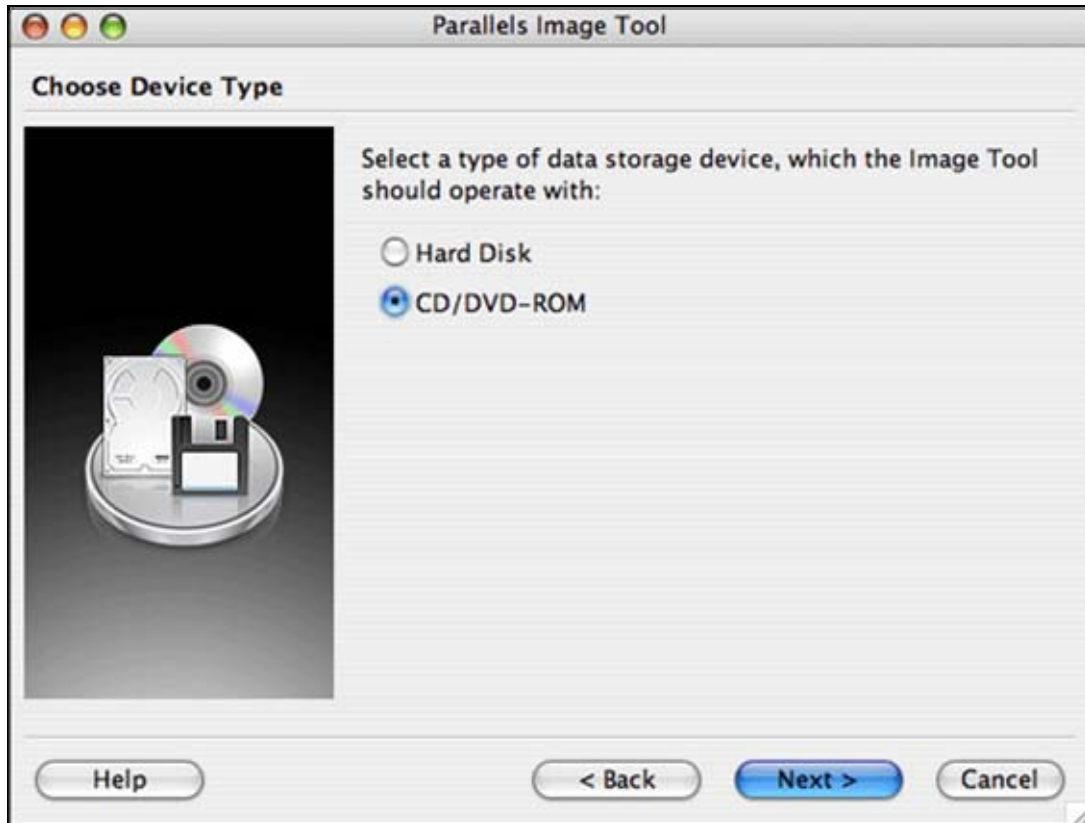
4 The CD/DVD-ROM screen appears with the single operation Create a new ISO image of the CD/DVD disc already selected. Click Next.
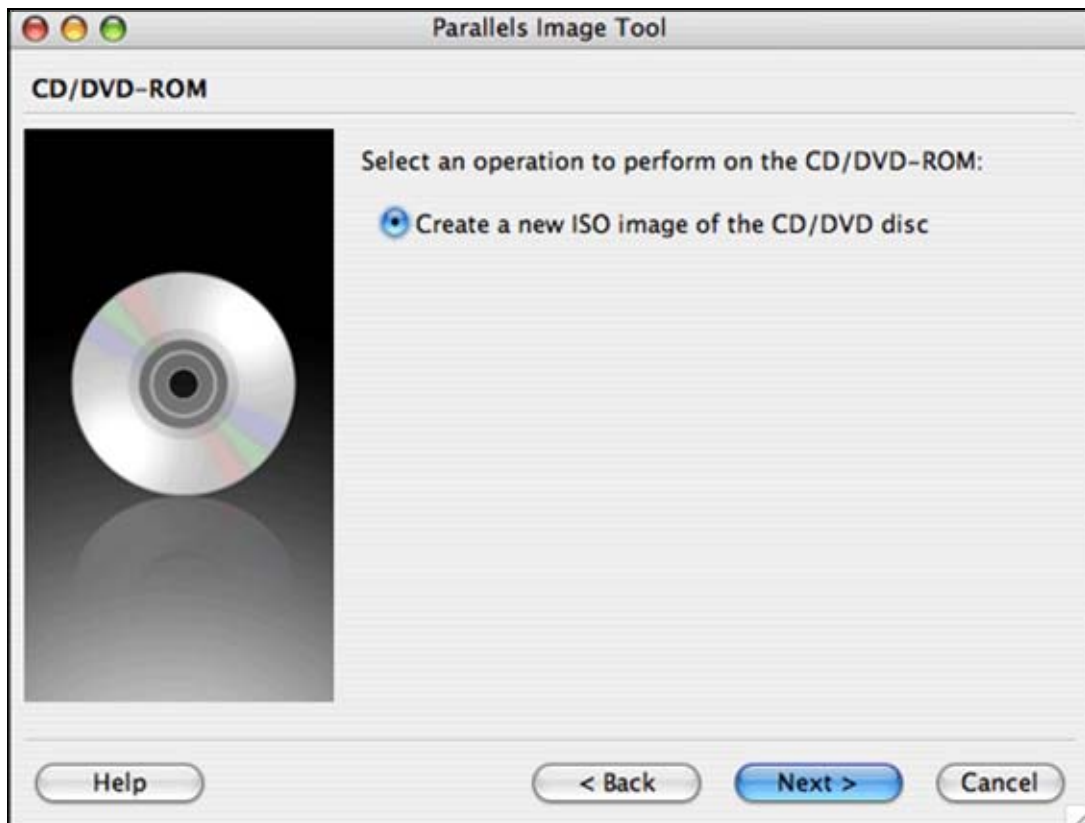
5 On the Create New ISO Image of CD/DVD Disk screen select the source device (CD/DVD-ROM on your Mac), and specify a destination folder and a name of the CD/DVD image file. Use the Browse button to select an existing file or specify a new file. Click Next.
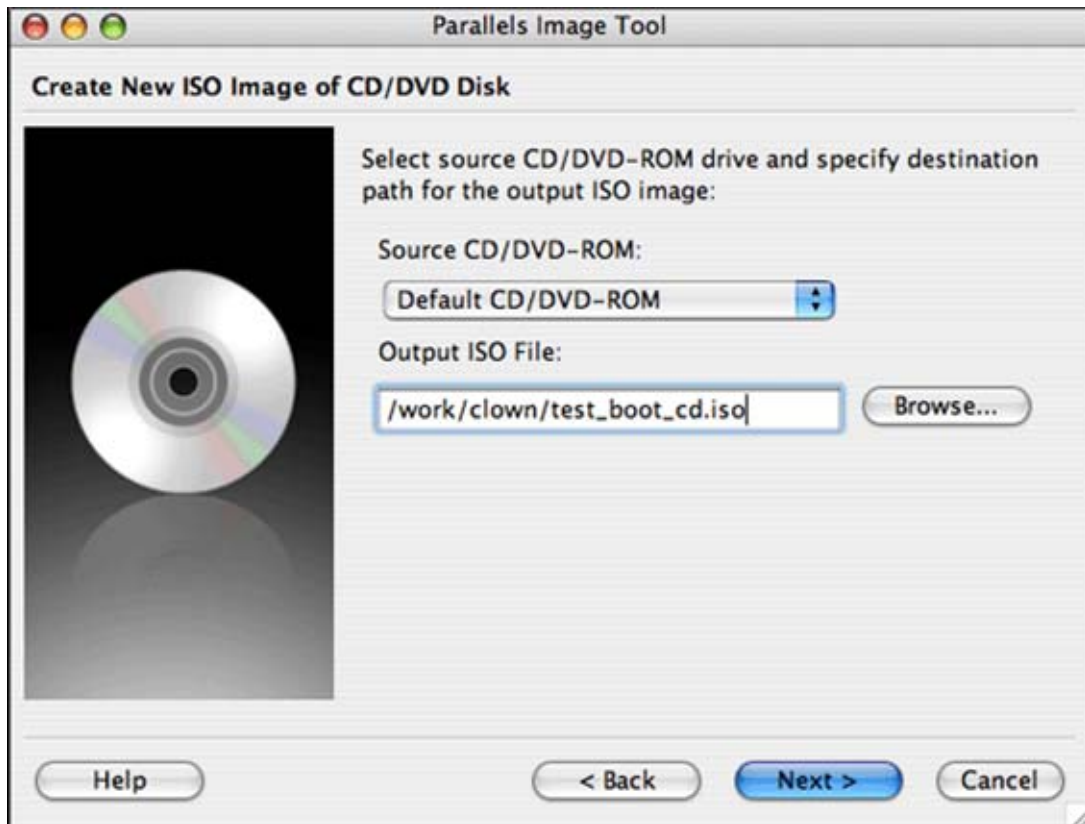
6 The wizard will display the chosen operation and the selected options on the Review Processing Options screen.

Carefully review the settings (operation, source device, and destination file). If everything is correct, click the Start button to begin the operation.

7 While the operation is being performed, the Execution in progress screen is displayed. Wait until the operation is completed.

8 After the disc image is created, the Execution Completed screen appears.
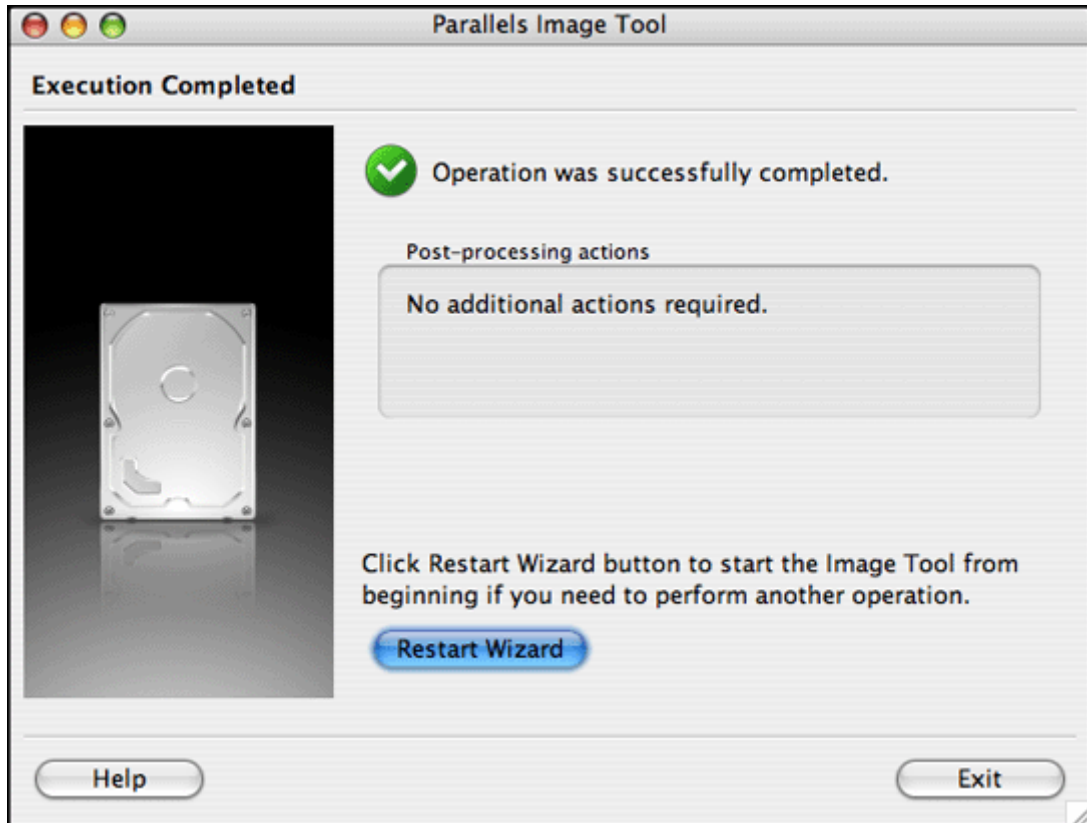
Click the Restart Wizard button to continue if you'd like to process more objects or perform other operations. Click the Exit button to close the wizard.

The disc image is created and placed in the destination folder specified in step 5 and can be connected to a virtual machine CD/DVD-ROM drive. See the CD/DVD-ROM Options (page 106) section to learn how to connect an .iso image to CD/DVD-ROM drive of a virtual machine.

Also see the CD/DVD-ROM Real Disks and Images (page 92) section for ideas of using CD and DVD disc images in Parallels Desktop.

CHAPTER 9

Troubleshooting and Limitations

In This Chapter

Reporting a Problem to the Parallels Team

In order to enhance the quality of Parallels Desktop product, you are able to send feedback to Parallels Software International Inc. in the form of problem reports. In the case of a fatal error inside a virtual machine, Parallels Desktop automatically opens the Report a Problem window proposing user to send a report. You may also decide to send a report on your own if you should ever encounter incorrect system behavior.

Automatically Generated Reports

Fatal errors in a virtual machine lead to the automatic generation of a virtual machine status report which takes a console screenshot and opens the Report a Problem window for a user to decide whether he/she wants to send the report to Parallels Software corporation. The Report a Problem window contains the following elements.
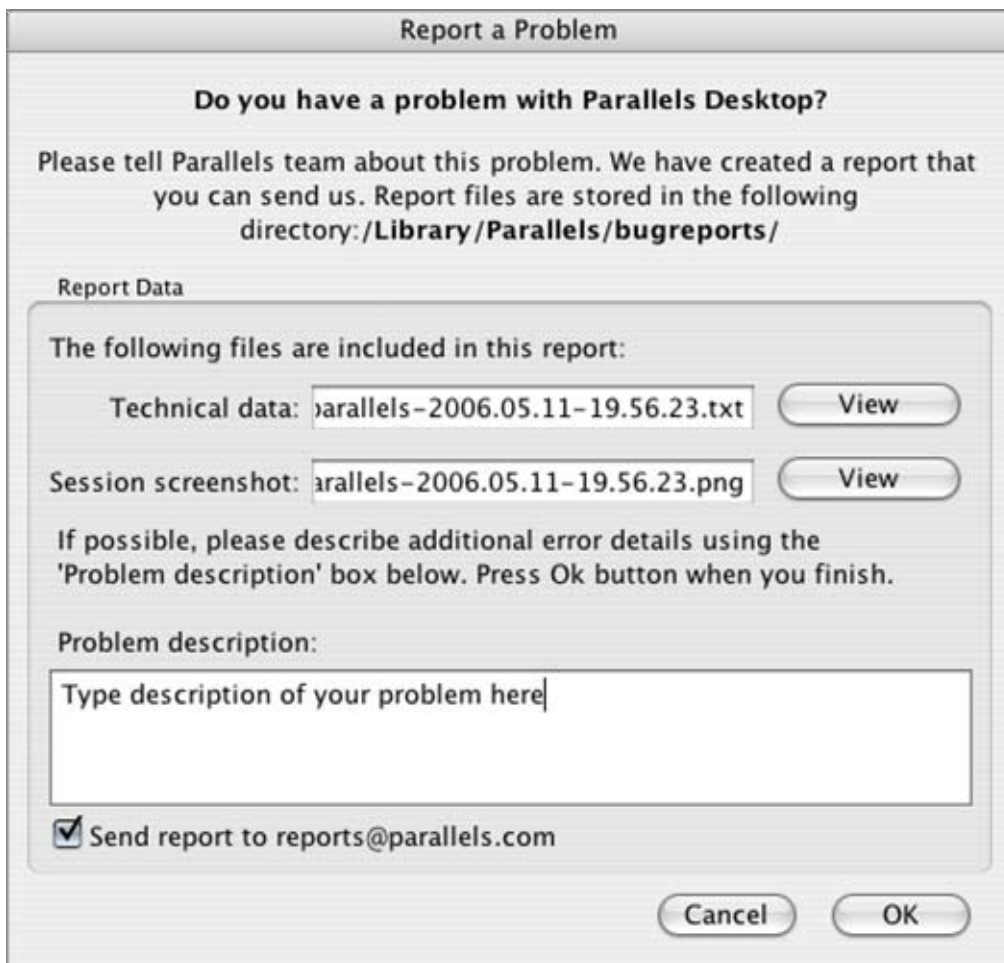
The Technical data field shows the name of the `.txt` status report file that has been generated in accordance with the error. The status report holds information on the product version, your activation data, primary and guest OSes information, processor status, and so on. You can update the data if necessary. Click View to open the report in the text editor.

The Session screenshot field holds the name of the `.jpg` console screenshot that has been made in accordance with the error. To see the screenshot click the View button.

You may add a verbal description of the situation in the Problem description box. The text you enter here is saved in the status report in a separate block when you close the Report a Problem window by clicking OK button.

To send the report to the Parallels corporation:

1   Click the OK button in the Report a Problem window.

2   Launch your e-mail client application, create a new letter and attach the status report and the console screenshot to it. They are located in the following directory:

/Library/Parallels/bugreports/

The format of status report's names and screenshots are the following:

`parallels-yyyy.mm.dd-hh.mm.ss.<txt/png>`

3   Enter the following e-mail address for the recipient:

`reports@parallels.com`

Creating a Report Manually

To create a problem report, select Report a Problem in the Help menu. A report is generated which contains technical data collected at the moment that the Report a problem command was activated. If a guest OS is running, a console screenshot is made.

To send a report, perform the same actions as you would for an automatically generated report.

Installing Ubuntu Linux 6.0.6 Server

To run an Ubuntu Linux 6.0.6 Server in a virtual machine, follow these steps:

1   The virtual machine should have the network adapter included into its' configuration. Network adapter should be set to the Bridged Ethernet mode.

If you use a typical virtual machine, it meets both conditions.

2   Install the Ubuntu Linux 6.0.6 Server package. Do not disconnect the installation CD/DVD or its' image!

3   Make sure that Boot Sequence on the Configuration Editor / Options / Booting Options tab is set to [CD-ROM, Hard Disk, Floppy].

4   Power on the Ubuntu virtual machine. Enter

```
rescue
```

in the prompt.

5 In the Enter rescue mode screen select /dev/discs/disco/part1, then on the same screen, select execute a shell in /dev/discs/disco/part1. Note that these options may have slightly different names.

6 In the next screen click Continue.

7 In the prompt string enter the following command:

```
sudo apt-get install linux-686
```

8 When you are asked if you want to continue, type "y".

9 686 kernel is downloaded and installed. When it is finished, enter

```
exit
```

command.

10 In the Enter rescue mode screen select the last option reboot the system.

11 Disconnect the installation CD/DVD from your virtual machine to boot from hard disk. After booting is finished the virtual machine is ready for work.

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