Parallels Server 5 Bare Metal

Getting Started Guide

Contents

Introduction

Parallels Server 5 Bare Metal is a virtualization solution that allows you to run virtual machines and Containers on a single server.

In This Chapter

About Parallels Server 5 Bare Metal

Parallels Server 5 Bare Metal allows you to simultaneously run Parallels virtual machines and Containers on a single server. With Parallels Server Bare Metal, you can efficiently use your server's hardware resources by sharing them among multiple virtual machines and Containers.

Parallels Server Bare Metal is installed directly on the server hardware and does not need any operating system for its functioning. Once it is installed, Parallels Server Bare Metal allows you to create virtual machines and Containers and manage them using the following tools:

- **Command-line interface (CLI)**. The command-line interface comprises a set of Parallels command-line utilities that you can use to manage virtual machines and Containers both locally and remotely.
- **Parallels Management Console**. Parallels Management Console is a remote management tool for Parallels Server Bare Metal with a graphical user interface. You can use this tool to manage servers and Parallels virtual machines residing on them.

   Note: In this version of Parallels Server Bare Metal, you cannot use Parallels Management Console to create and manage Parallels Containers.

Graphically, a server with the Parallels Server Bare Metal software installed can be represented as follows:
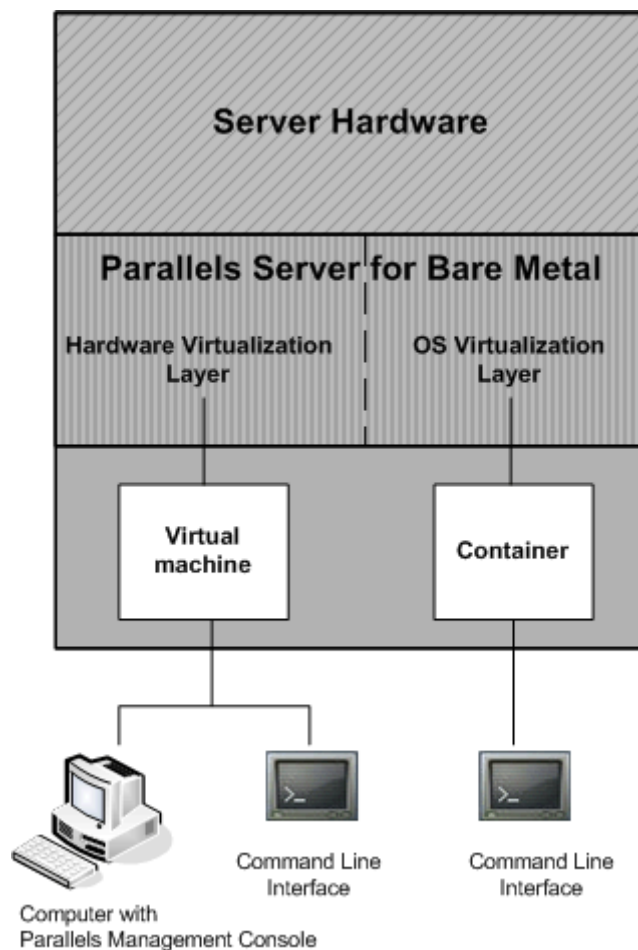
About This Guide

The *Getting Started With Parallels Server 5 Bare Metal* guide provides information on installing and deploying Parallels Server Bare Metal on your server, including the pre-requisites and the stages you shall pass.

The guide is mainly aimed at users familiar with one Parallels product (either Parallels Server 3.0 or Parallels Virtuozzo Containers 4.0) and wishing to deploy the other product on their servers. It may also be of interest to anyone looking for ways to familiarize oneself with both Parallels virtualization technologies - hardware and OS virtualization - and to explore their potentials.

Organization of This Guide

This guide is organized in the following way:

- **Chapter 1, Introduction**, gives an overview of the Parallels Server Bare Metal product and this guide.
- **Chapter 2, Installing Parallels Server 5 Bare Metal**, describes the hardware and software requirements your server must meet to successfully install Parallels Server Bare Metal. It also provides detailed information on how to install Parallels Server Bare Metal.
- **Chapter 3, Starting to Work in Parallels Server 5 Bare Metal**, provides instructions on how to start working in Parallels Server Bare Metal using both Parallels command line utilities and Parallels Management Console.
- **Chapter 4, Performing Basic Operations in Parallels Server 5 Bare Metal**, familiarizes you with the way to perform the main operations on your virtual machines and Containers: create new virtual machines and Containers, start and stop them, adjust their configuration, etc.

Documentation Conventions

Before you start using this guide, it is important to understand the documentation conventions used in it.

The table below presents the existing formatting conventions.

Formatting convention	Type of Information	Example
Special Bold	Items you must select, such as menu options, command buttons, or items in a list.	Go to the **Resources** tab.
	Titles of chapters, sections, and subsections.	Read the **Basic Administration** chapter.

Italics	Used to emphasize the importance of a point, to introduce a term or to designate a command-line placeholder, which is to be replaced with a real name or value.	These are the so-called *EZ templates*. To destroy a Container, type `vzctl destroy ctid`.
`Monospace`	The names of commands, files, and directories.	Use `vzctl start` to start a Container.
`Preformatted`	On-screen computer output in your command-line sessions; source code in XML, C++, or other programming languages.	`Saved parameters for Container 101`
`Monospace Bold`	What you type, as contrasted with on-screen computer output.	**`# rpm –V virtuozzo-release`**
Key+Key	Key combinations for which the user must press and hold down one key and then press another.	Ctrl+P, Alt+F4

Besides the formatting conventions, you should also know about the document organization convention applied to Parallels documents: chapters in all guides are divided into sections, which, in their turn, are subdivided into subsections. For example, About This Guide is a section, and Documentation Conventions is a subsection.

Getting Help

In addition to this guide, there are a number of other resources available for Parallels Server Bare Metal which can help you use the product more effectively. These resources include:

Manuals:

- *Parallels Server 5 Bare Metal Installation Guide*. This guide provides detailed information on installing Parallels Server Bare Metal on your server, including the pre-requisites and the stages you shall pass.

- *Parallels Server 5 Bare Metal User's Guide*. This guide provides comprehensive information on Parallels Server Bare Metal covering the necessary theoretical conceptions as well as all practical aspects of working with the product. However, it does not deal with the process of installing and configuring your system.

- *Parallels Server 5 Bare Metal Templates Management Guide*. This guide is meant to provide complete information on Parallels templates - an exclusive Parallels technology allowing you to efficiently deploy standard Linux applications inside your Containers and to greatly save the server resources (physical memory, disk space, etc.).

- *Parallels Command Line Reference Guide*. This guide is a complete reference on all Parallels Server Bare Metal configuration files and command line utilities.

- *Deploying Clusters in Parallels-Based Systems*. This guide describes the process of creating Parallels failover and GFS clusters using the Red Hat Cluster Suite (RHCS) software.

Help systems:

- *Getting Started with Parallels Management Console*. This help system provides information on how to start working in Parallels Management Console. You will learn how to install this application on your computer, connect to a server running Parallels Server Bare Metal, and perform the basic operations on your virtual machines.

- *Parallels Management Console User's Guide*. This help system provides detailed information on Parallels Management Console - a graphical user interface tool for managing servers and their virtual machines.

Feedback

If you spot a typo in this guide, or if you have an opinion about how to make this guide more helpful, you can share your comments and suggestions with us by completing the Documentation Feedback form on our website (http://www.parallels.com/en/support/usersdoc/).

Key Terms

To avoid any misunderstandings while following the instructions in the guide, please become acquainted with the main Parallels Server Bare Metal definitions:

Container. A virtual private server, which is functionally identical to an isolated standalone computer, with its own IP addresses, processes, files, its own users database, its own configuration files, its own applications, system libraries, and so on. Containers share one physical server and one operating system (OS) kernel. However, they are isolated from each other. Container is a kind of 'sandbox' for processes and users.

Guest operating system (Guest OS). An operating system installed inside a virtual machine and Container. It can be any of the supported Windows or Linux operating systems.

Parallels Management Console. A Parallels Server Bare Metal management and monitoring tool with graphical user interface. Parallels Management Console is cross–platform and can run on Microsoft Windows, Linux, and Mac computers.

Parallels Server. A hardware virtualization solution that enables you to efficiently use your physical server's hardware resources by sharing them between multiple virtual machines created on the server.

Parallels Server Bare Metal license. A special license that you must install on the physical server to be able to start using Parallels Server Bare Metal. Every physical server must have its own license installed.

Parallels Virtuozzo Containers for Linux. An operating system virtualization solution allowing you to create multiple isolated Containers on a single physical server to share hardware, licenses, and management effort with maximum efficiency.

Parallels server. A server where the Parallels Server Bare Metal software is installed for hosting Parallels virtual machines and Containers.

Virtual machine (VM). A computer emulated by Parallels Server Bare Metal. Like a Container, a virtual machine is functionally identical to an isolated standalone computer, with its own IP addresses, processes, files, its own users database, its own configuration files, its own applications, system libraries, and so on. However, as distinct from Containers, virtual machines run their own operating systems rather than share one operating system kernel.

Installing Parallels Server 5 Bare Metal

The current chapter provides comprehensive information on the process of installing Parallels Server 5 Bare Metal on your server, including the pre-requisites and the stages you shall pass.

In This Chapter

Installation Requirements

Before installing Parallels Server Bare Metal on your server, make sure that it meets the requirements listed in this section.

Hardware Compatibility

Parallels Server Bare Metal can be installed on a physical server that meets the following hardware requirements:

- Platform:

  X86 or x86-64 platform with Intel VT-x or AMD-V hardware virtualization support.

- CPU:

  1.5 GHz or higher processor (a 64-bit processor is required for launching 64-bit guest operating systems).

- Memory:

  2 GB or more RAM.

- Hard disk:

  10 GB or more for the root partition that will keep Parallels Server Bare Metal files.

  Around 2 GB for the swap partition.

  30 GB or more for the /vz partition that will keep virtual machines and Containers files.

- Network:

  Ethernet network adapter.

  Valid IP address.

- Other hardware:

  DVD-ROM drive.

The actual number of virtual machines and Containers you can run on a physical server and their performance depend on the resources they require. In general, the more resources your physical server has, the more virtual machines and Containers you can run and the higher is their performance.

Software Compatibility

Parallels Server Bare Metal is installed on a bare-metal server and does not need any operating system for its functioning.

Network Requirements

To connect to the physical server with Parallels Server Bare Metal (for example, to manage it using Parallels Management Console), you need to establish a network connection (wireless or wired) between this server and the remote computer. So, you must have a valid IP address for the physical server as well as other IP parameters (default gateway, network mask, DNS configuration).

Obtaining Parallels Server 5 Bare Metal Distribution Set

You can use one of the following ways to obtain the Parallels Server 5 Bare Metal distribution set:

- Download the ISO image of Parallels Server 5 Bare Metal from the Parallels web site to your computer. If you use this way of getting the Parallels Server Bare Metal distribution set, you will need to burn the downloaded ISO image to a DVD before starting the installation.
- Contact a Parallels sales representative and get a DVD with Parallels Server 5 Bare Metal.

Installation in a Nutshell

To install Parallels Server 5 Bare Metal, follow the steps below. To know more about a particular step, see the next section.

1 Switch on the server where you want to install Parallels Server Bare Metal.

2 Configure the server to boot from the CD/DVD-ROM drive.

3 Insert the DVD with the Parallels Server Bare Metal distribution set into the server's CD/DVD-ROM drive, and restart the server.

4 When the server boots, press Enter to continue with the installation.

5 Click Next to accept the Parallels end user license agreement, and in the displayed window, click Agree to confirm your decision.

6 In the Customer Experience Program window, click Next, and in the displayed dialog, click Agree to join the Parallels Customer Experience Program.

Note: If you join the program, Parallels will periodically collect the information about your physical server and virtual machines and Containers configuration and use it to make the product better fit your needs. No private information like your name, e-mail address, phone number, and keyboard input will be collected.

7 Enter the Parallels Server Bare Metal license, and click Next.

8 Select the Remove all partitions on selected drives and create a default layout radio button, click Next, and in the displayed window, click Yes to confirm your decision.

Note: Selecting this option and clicking Next will remove all data on the selected drives.

9 In the Network Configuration window, click Next to accept the default network settings.

10 Set your time settings, and click Next.

11 Enter the password for the root account, and click Install.

12 Click Reboot to restart the server.

Installing Parallels Server 5 Bare Metal

You can install Parallels Server Bare Metal in one of the following modes:

- graphical mode
- text mode

This section familiarizes you with the way of installing Parallels Server Bare Metal in graphical mode. If you want to install the product using text mode, refer to the Installing Parallels Server Bare Metal in Text Mode section in the *Parallels Server Bare Metal 4 Installation Guide*.

To install Parallels Server Bare Metal in graphical mode, do the following:

1 Switch on the server where you want to install Parallels Server Bare Metal.

2 Configure the server to boot from the CD/DVD-ROM drive.

3 Insert a DVD containing the Parallels Server Bare Metal distribution set into the server's CD/DVD-ROM drive and restart the server.

4 After the server boots, the installation starts automatically. Press Enter to continue with the installation.

> **Note**: If your physical server does not support hardware virtualization, you will see a warning message. You can continue with the Parallels Server Bare Metal installation, but in this case you will not be able to run Parallels virtual machines on the server.

5 Accept the Parallels end user license agreement by clicking Next, and in the displayed window, clicking Agree.

6 After accepting the license agreement, you are asked to join the Parallels Customer Experience Program. If you choose to participate in the program (select Agree, and press Enter), Parallels will periodically collect the information about your physical server and Containers configuration and use it to make the product better fit your needs. No private information like your name, e-mail address, phone number, and keyboard input will be collected.

7 On the next screen, you will be asked to enter the Parallels Server Bare Metal license. Every physical server must have its own license installed. Licenses are issued by Parallels and needed to start using Parallels Server Bare Metal. Type the product key for Parallels Server Bare Metal in the field provided, and click Next.

You can also proceed without entering the product key and install the license after the Parallels Server Bare Metal installation. However, if you skip this step, you will not be able to automatically install Parallels Virtual Automation and its components once the Parallels Server Bare Metal installation is complete. For more information on installing Parallels Virtual Automation, see Step 12.

Note: If your license does not support using the Parallels Virtual Automation application, the options for installing this application will be grayed out in the installer and you will not be able to select them. In this case, you must first upgrade the license and then install the Parallels Virtual Automation application manually. For more information, see Installing Parallels Virtual Automation Manually (p. 32).

8   In the Partitioning window, choose the way of partitioning your server:

- Select the Remove all partitions on selected drives and create default layout radio button to create the default layout on the server, which includes creating the following partitions:

Partition	Description
/	The root partition containing all Parallels Server Bare Metal files.
/vz	The partition intended to host all Containers and virtual machines data.
swap	The paging partition for Parallels Server Bare Metal.

If you do not feel comfortable with partitioning your server, we recommend that you select this option and let the installer automatically partition your system.

Note: After you select this option and click Next, you will be presented with a message warning you that all data on the selected drives will be removed. To confirm your decision and proceed with the installation, click Yes.

- Select the Create custom layout radio button to manually partition your disk drive. Detailed information on how you can do it is given in the Creating Custom Layout section of the *Parallels Server Bare Metal 4 Installation Guide*.

9 On the next screen, configure the network settings on the server.
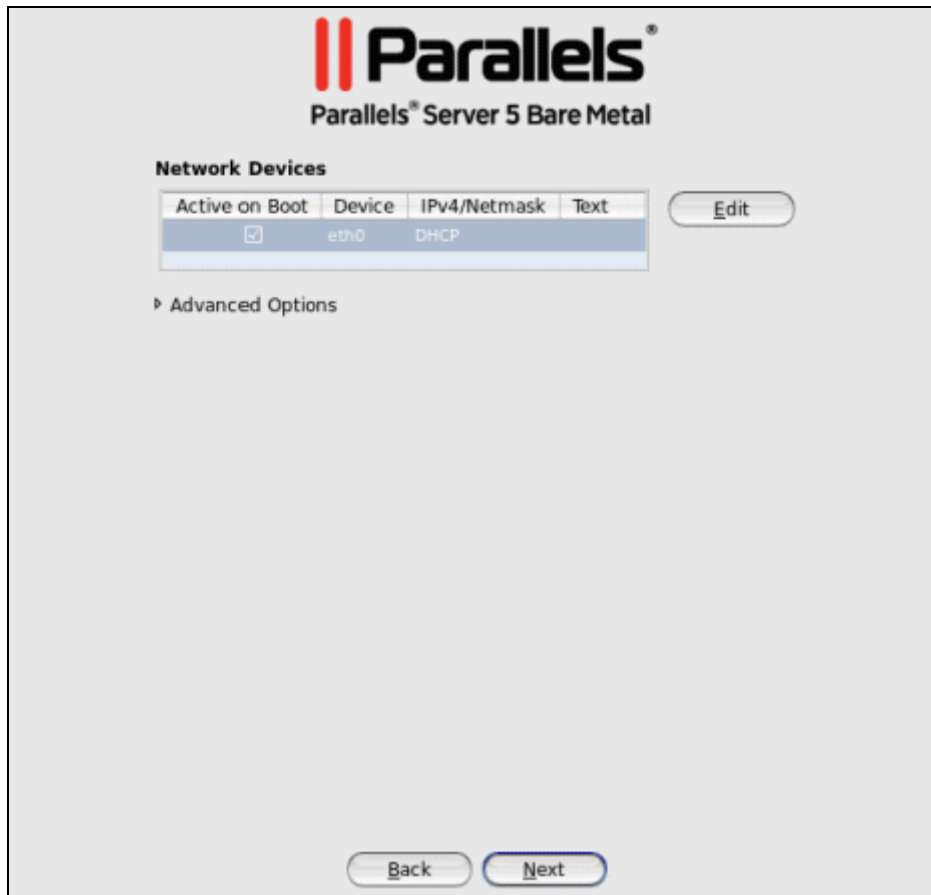
You can do one of the following:

- Accept the network settings offered by the Parallels Server Bare Metal installer by default. View the default settings in the Network Devices table, and if you are satisfied with them, click Next to proceed with the installation.

- Manually configure the network configuration settings. If you wish to configure some of the default network settings, select the network device to be configured, and click Edit. In the Edit Interface window, make sure the Enable IPv4 support check box is selected, select the Manual configuration radio button, type the IP address and network mask to be assigned to the network devices in the fields provided, and click OK.

- Specify a hostname for the Parallels server. By default, the server is configured to receive a hostname through DHCP. To specify a custom hostname for the server, click Advanced Options, select the manually radio button, and type the desired hostname in the provided field.

Note: If you have several network adapters installed, they all will be listed in the Network Devices table. To edit the properties of a network adapter, select the check box next to its name in the table, and click the Edit button.

10 Next, specify your time settings. To set your time zone, you can either select the nearest city to your physical location on the drop-down menu or click on the interactive map to zoom in to the needed place. You can also select the System clock uses UTC check box to set your system to UTC (Universal Time Coordinated), which makes it automatically switch between normal and daylight savings time.

11 On the next screen, enter the password for the root account.

You will need to log in to the physical server as `root` to be able to manage Parallels virtual machines and Containers. After providing the password and confirming it, click **Install** to start installing Parallels Server Bare Metal on your server.

12 Once the installation is complete, the **Congratulations** window appears.
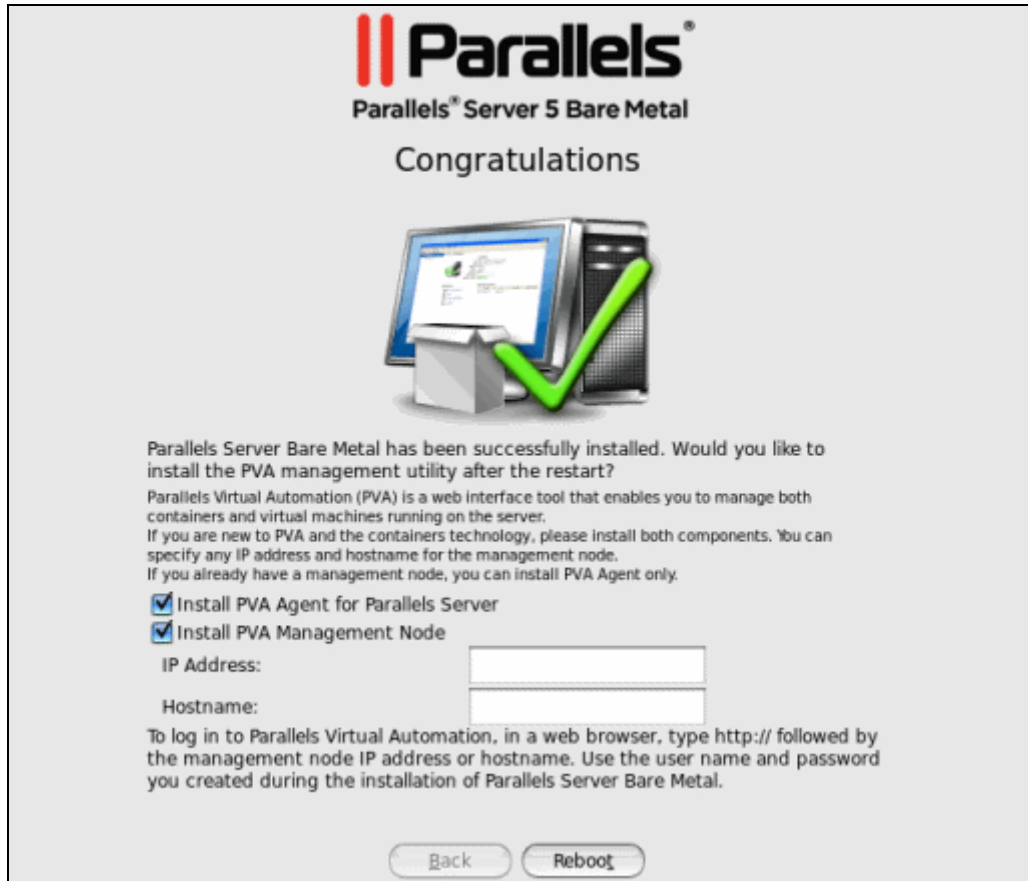
In this window, do the following:

- Remove the installation DVD from the server's CD/DVD-ROM drive, clear the **Install PVA Agent for Parallels Server** and **Install PVA Management Node** check boxes, and click **Reboot** to restart the server and complete the installation.

- Leave the **Install PVA Agent for Parallels Server** and **Install PVA Management Node** check boxes selected to set up the Parallels Virtual Automation application and its components on the server. Using Parallels Virtual Automation, you can connect to the Parallels server and manage your virtual machines and Containers with your favorite browser.

  If you select the check boxes, you need to specify a valid IP address in the **IP Address** field for a special Management Node and can also set its hostname in the **Hostname** field. Once the installation is complete, you can log in to Parallels Virtual Automation by opening `http://IP_address_or_hostname` in the browser and using the `root` user name and the password you specified in the previous step.

  When the check boxes are selected, the Parallels Server Bare Metal installer performs the following operations after restarting the server:

a Downloads the installation packages for Parallels Virtual Automation from the Parallels web site to the server. Notice that the download process may take some time, depending on the speed of your Internet connection.

b Installs Parallels Virtual Automation and its components on the server and inside a specially created Container. The installation is automatically initiated once the installation packages are downloaded to the server and runs without your interaction.

  When you are ready, remove the installation DVD from the server's CD/DVD-ROM drive, and click **Reboot** to restart the server.

Notes:

1. You must have an active Internet connection to download the Parallels Virtual Automation installation packages.

2. You can use Parallels Virtual Automation to manage Parallels servers only if your license allows you to do so. If the license does not support using Parallels Virtual Automation, the **Install PVA Agent for Parallels Server** and **Install PVA Management Node** options will be grayed out and you will not be able to select them. In this case, you must first upgrade your license and then install the Parallels Virtual Automation application manually. For more information, see **Installing Parallels Virtual Automation Manually** (p. 32).

3. For more information on setting up and using Parallels Virtual Automation, refer to **Using Parallels Virtual Automation** (p. 29).

C H A P T E R 3

Starting to Work in Parallels Server 5 Bare Metal

After you restart the Parallels server, you will see a screen providing instructions on how to start working in Parallels Server 5 Bare Metal.
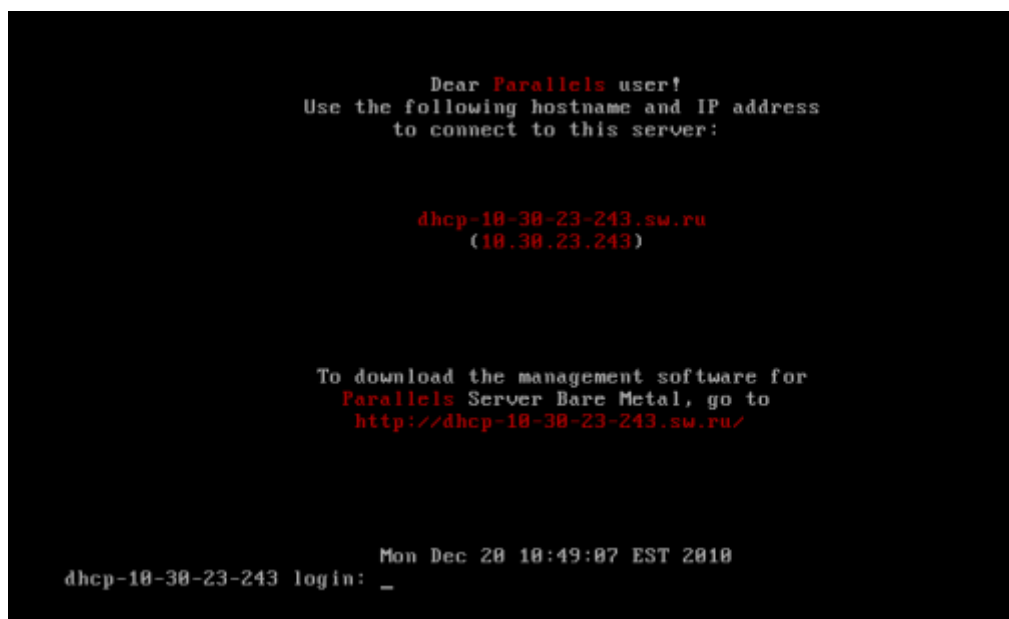
You can manage Parallels Server Bare Metal using these tools:

- Parallels command line utilities
- Parallels Management Console
- Parallels Virtual Automation

Detailed information on both tools is given in the following sections.

In This Chapter
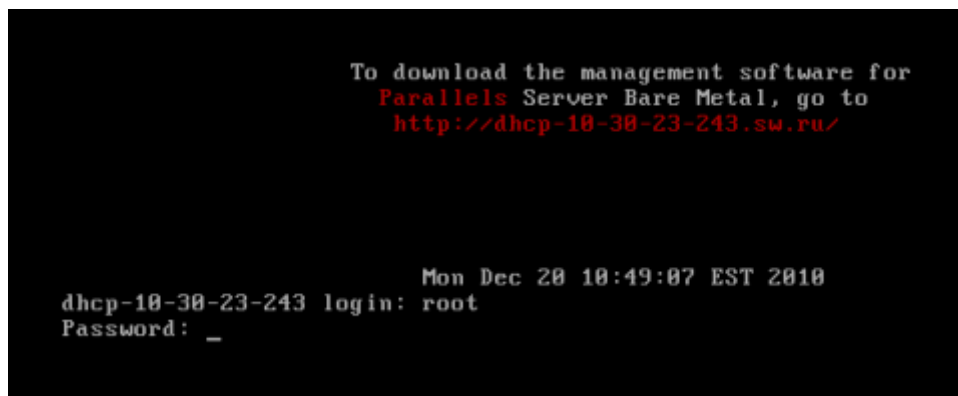
Using CLI

Parallels Server Bare Metal provides a set of utilities that allow you to manage Parallels virtual machines and Containers both locally and remotely.

Connecting to Parallels Server Bare Metal Locally

To manage your virtual machines and Containers locally, i.e. from the same server where Parallels Server Bare Metal is installed, log in to the server by typing the `root` username and the password you provided when installing Parallels Server Bare Metal at the bottom of the welcome screen.

After you have successfully logged in to the server, you will see a command prompt and can start creating and managing your Parallels virtual machines and Containers using Parallels command line utilities.

Connecting to Parallels Server Bare Metal Remotely

To connect to Parallels Server Bare Metal remotely, use the IP address or hostname indicated on the server's screen. For example, you can use a Secure Shell client to connect to your Parallels server. When logging in to the server, use the `root` user name and the password you provided when installing Parallels Server Bare Metal.

Using Parallels Management Console

If you prefer working with GUI tools, you can set up Parallels Management Console to remotely connect to Parallels Server Bare Metal. However, this tool is intended for managing Parallels virtual machines only. So, if you need to create a Container or perform any operation on it, you should use the corresponding Parallels command line utilities.

To set up Parallels Management Console:

1   Make sure that the computer where you are going to install Parallels Management Console meets the necessary system requirements.

2   Download the Parallels Management Console installation file.

3   Install Parallels Management Console.

4   Launch Parallels Management Console and connect to the server with Parallels Server Bare Metal.

All these operations are explained in the following subsections in detail.

Checking System Requirements

Parallels Management Console can be installed on any computer that meets the following requirements:

Hardware Configuration

- Intel-powered Mac with Core™ Duo or Core™ Solo processor or a PC with 700+ MHz Intel-compatible x86 or x64 processor
- 1 GB of RAM
- 100 MB of hard disk space for Parallels Management Console installation files
- Ethernet or WiFi network adapter

Compatible Operating Systems

Ubuntu 7.04 (x86, x64)	CentOS 4.x (x86, x64)
Ubuntu 7.10 (x86, x64)	CentOS 5.0 (x86, x64)
Ubuntu 8.04 (x86, x64)	CentOS 5.1 (x86, x64)
Ubuntu 8.10 (x86, x64)	SUSE Linux Enterprise Server 10 with Service Pack 1 (x86, x64)
Ubuntu 10.10 (x86, x64)	SUSE 10 (x86, x64)
Fedora 9 (x86, x64)	SUSE 11 (x86, x64)
Fedora 10 (x86, x64)	Windows 7 (x86, x64)
Debian 4.0 (x86, x64)	Windows Server 2003 R2 Standard Edition with Service Pack 2 (x86, x64)
Mandriva 2007 (x86, x64)	Windows Server 2003 Enterprise Edition SP2, R2 (x86, x64)
Mandriva 2008 (x86, x64)	Windows 2003 Home Server (x86, x64)
Red Hat Enterprise Linux WS4 (x86, x64)	Windows XP Professional Edition with Service Pack 2 and 3 (x86, x64)
Red Hat Enterprise Linux AS4 (x86, x64)	Windows Vista Ultimate (x86, x64)
Red Hat Enterprise Linux ES4 (x86, x64)	Mac OS X v10.5 Leopard or Server Leopard
Red Hat Enterprise Linux 5 (x86, x64)	Mac OS X v10.6 Snow Leopard or Server Snow Leopard

Downloading Parallels Management Console

After checking the installation requirements, you should obtain the Parallels Management Console installation file. To do this:

1   Ensure that the server with Parallels Server Bare Metal can be accessed over the network.

2   On a computer connected to the network, open your favorite browser and type the IP address or hostname of the Parallels server running Parallels Server Bare Metal. You will be presented with the following window:

3   Under **Download Parallels Management Console**, click the link corresponding to your system architecture:

- **For Windows**. Click this link to download the Parallels Management Console installation file for installing on Windows computers.

- **For Linux**. Click this link to download the Parallels Management Console installation file for installing on Linux computers.

- **For Mac**. Click this link to download the Parallels Management Console installation file for installing on Mac computers.

4   Download the file.

5   If you wish to install Parallels Management Computer on another computer, transfer the file to that computer.

Installing Parallels Management Console

The process of installing Parallels Management Console differs depending on the operating system installed on your computer.

Installing on Windows Computers

1 Locate the Parallels Management Console installation file, and double-click it to launch the Parallels Management Console Setup wizard.

2 In the Welcome window, click Next.

3 In the License Agreement window, carefully read the end user license agreement for Parallels products. If you agree with the terms of the license agreement, select I accept the terms in the license agreement, and click Next. If you want to print the text of the license agreement for your records, click Print.

> **Note:** You must accept the license agreement to proceed with the installation.

4 In the Destination Folder window, specify the folder where you want to install Parallels Management Console, and click Next. By default, Parallels Management Console is installed to C:\Program Files\Parallels\Parallels Management Console.
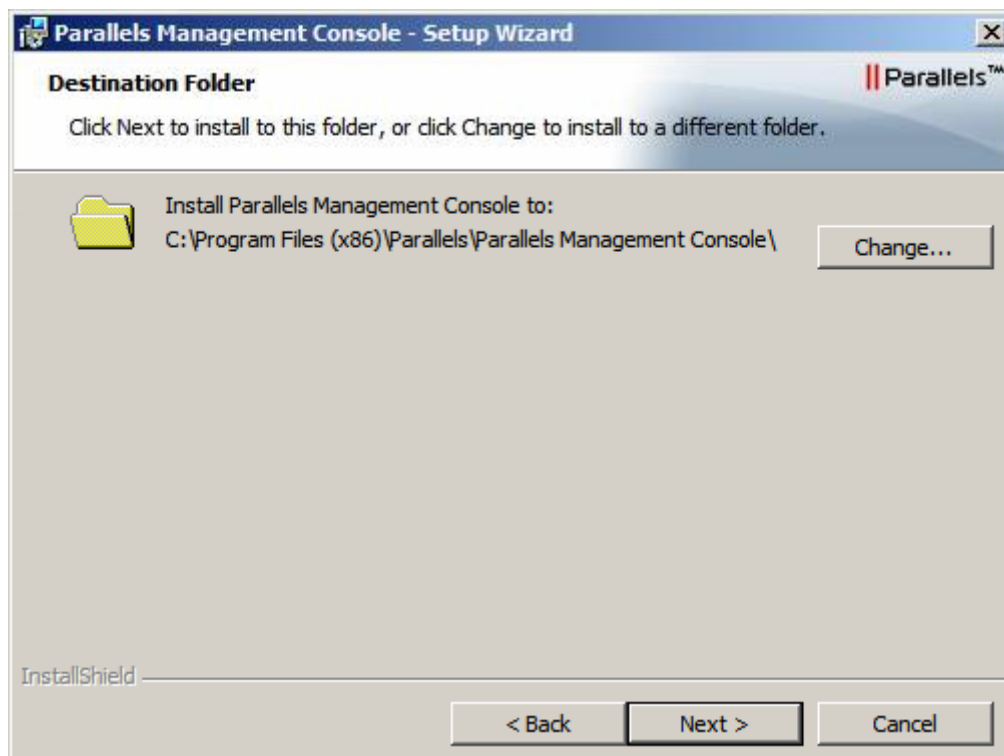
5   In the **Ready to Install the Program,** click **Install** to start installing Parallels Management Console. You can view the installation progress in the **Setup Status** window.

6   Once the installation is complete, click **Finish** to exit the wizard.

Installing on Linux Computers

1   Locate the installation package and launch the `parallels-management-console-4.0.XXXX.XXXXX.run` file to run the Parallels Management Console Installer. You can also run this file in terminal.

2   Confirm your wish to install Parallels Management Console by clicking **Run** when prompted.

Wait until the process of uncompressing Parallels Management Console is complete and the Installer launches.

3   In the **Welcome** window, select **Next.**

4   In the **License Agreement** window, carefully read the end user license agreement. If you agree with the terms of the license agreement, select **I accept the terms in the license agreement** and click **Next.** If you want to print the text of the license agreement for your records, click **Print.**

Note: You must accept the license agreement to proceed with the installation.

5   In the **Installation Completed** window, click **Exit** to quit the Installer.

6   By default, Parallels Management Console is installed to `/usr/lib/parallels-management-console`. To launch Parallels Management Console, start a terminal and execute `pmc-standalone`.

Installing on Mac Computers

1   Locate and open the Parallels Management Console DMG package.

2   Drag the **Parallels Management Console** icon to the **Applications** folder. The recommended installation path for Parallels Management Console is `/Applications/Parallels Management Console`.

3   Wait while the files are being transferred to the **Applications** folder.

Connecting to Parallels Server Bare Metal

Now that you have installed Parallels Management Console, you can connect to the server where Parallels Server Bare Metal is installed. Do the following:

1 Launch Parallels Management Console:

- On Mac OS X, open the `/Applications/Parallels` folder and launch the **Parallels Management Console** application.

- On Windows, click **Start** > **All Programs** > **Parallels** > **Parallels Management Console** > **Parallels Management Console**.

- On Linux, start a terminal and execute `pmc-standalone`.

2 In the Parallels Management Console main window, click **Connect to Parallels Server**.

3 In the **Parallels Server Login** dialog, specify the parameters to be used to log in to the Parallels server:

- In the **Server** list, type the IP address or hostname of the Parallels server.

- In the **User Name** field, type `root`. You must use the root account to log in to the Parallels server.

- In the **Password** field, type the password for the root user. Use the password you specified when installing Parallels Server Bare Metal on the server.

If you want Parallels Management Console to remember your login and password, select the **Save Password** option. With this option selected, you do not need to specify the root credentials each time you connect to the server.
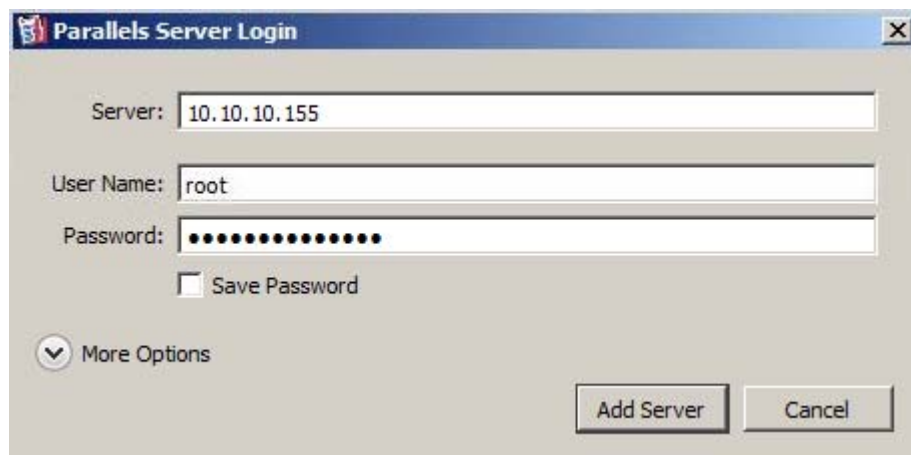
**4** Click **Add Server** to establish connection to the Parallels server.

After the server has been successfully registered in Parallels Management Console, it appears in the left menu of the Parallels Management Console main window. For further information on using Parallels Management Console, refer to the *Parallels Management Console User's Guide*.

Using Parallels Virtual Automation

Parallels Virtual Automation is a flexible and easy-to-use administration tool for managing servers with Parallels Server Bare Metal and virtual machines and Containers residing on these servers. Once you set up Parallels Virtual Automation, you can use it to connect to your Parallel servers with a standard web browser on any platform. Parallels Virtual Automation includes the following components:

- *PVA Management Server* (or *Master Server* or *Management Node*). This is a physical server that ensures the communication between the server running Parallels Server Bare Metal (known as *Slave Server*) and the Parallels Virtual Automation application. The Master Server keeps a database with the information about all registered Slave Servers.

- *Control Center*. This is a front-end to the Parallels Virtual Automation application. You see Control Center in the browser window when you log it to the Slave Server using Parallels Virtual Automation.

- *PVA Agent*. This is a special agent installed on a Slave Server and ensuring the interaction between the Slave Server, the Master Server, and your client computer (i.e. the computer you use to connect to the Slave Server). Without this component, a server cannot be registered in Management Server.

- *Slave Server*. This is a physical server running the Parallels Server Bare Metal software and hosting a number of virtual machines and Containers. You use Control Center to log in to the Slave Server and manage your virtual machines and Containers.

- *Parallels Power Panel*. This is a tool installed on the Slave Server and used for managing particular virtual machines and Containers.

Graphically, a typical system with Parallels Virtual Automation can be represented as follows.
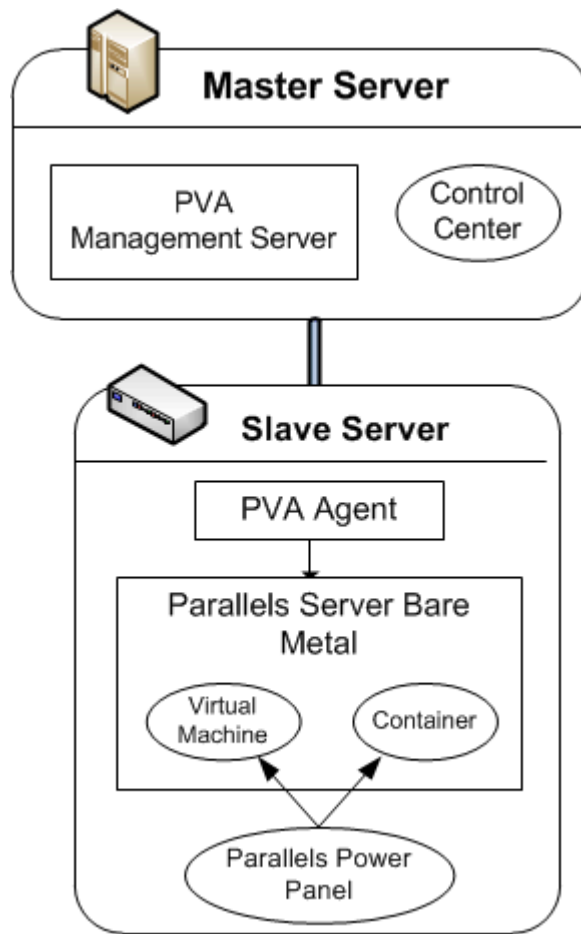
Setting Up Parallels Virtual Automation

Parallels Virtual Automation is automatically set up on your server during the Parallels Server Bare Metal installation, provided you select the Install PVA Agent for Parallels Server and Install PVA Management Node options in the Congratulations window of the Parallels Server Bare Metal installer. During the setup procedure, the installer performs the following operations:

- Installs the PVA Agent component, including Parallels Power Panel, on the server. After that, the server starts acting as the Slave Server.

- Creates a special Container on the server and installs the PVA Management Server and Control Center components inside the Container. Once the Container is created and the components are installed, the Container starts acting as the Master Server.

The last point needs further explanation. The PVA Management Server and Control Center components cannot be installed directly on a server with Parallels Server Bare Metal. Instead, a special Container is automatically created during the Parallels Server Bare Metal installation where these components are installed. The Container is created with the following configuration:

- The Container is based on the `centos-5-x86_64` EZ OS template and `slm.1024MB` configuration sample file.

- The amount of disk space inside the Container is set to 10 GB.

- The root account is automatically created inside the Container. The root password is automatically set to that you specify during the Parallels Server Bare Metal installation for logging in to the server.

- The Container can be accessed by the IP address and hostname you provide in the Congratulations window of the Parallels Server Bare Metal installer.

- The Container uses the same DNS server you specify for the Parallels server during the Parallels Server Bare Metal installation.

Installing Parallels Virtual Automation Manually

During the Parallels Server Bare Metal installation, the Parallels Virtual Automation application is not installed on the server in the following cases:

- You skipped the step of installing the license.

- Your license does not allow you to use Parallels Virtual Automation.

- You had no Internet connection when installing Parallels Server Bare Metal or the connection got broken for some reason.

Later on, if you make up your mind to use Parallels Virtual Automation for managing Parallels servers and their virtual machines and Containers, you can install this application manually by doing the following:

1 Obtain the appropriate license from Parallels. This step is required only if your license does not support using Parallels Virtual Automation.

2 Install the license on the server using Parallels Management Console or the `vzlicload` utility. For information on installing licenses using these tools, see the *Parallels Management Console User's Guide* and *Parallels Server 5 Bare Metal User's Guide*, respectively.

3 Once the license is installed, create the `pva_opt.cfg` file, open it for editing, and specify the following options:

- `PVA_AGENT=1` if you want to install the PVA Agent components or `PVA_AGENT=0` if you do not want to.

- `PVA_MN=1` if you want to install the PVA Management Server and Control Center components or `PVA_MN=0` if you do not want to.

- `PASSWD="XXXXXX"` where `XXXXXX` is the password of the root user on the Parallels server (you set this password during the Parallels Server Bare Metal installation). This option is mandatory if you choose to install PVA Management Server and Control Center components.

- `PVA_IP="X.X.X.X"` where `X.X.X.X` is the IP address to be assigned to the Management Node. You will then use this IP address to log in to the Management Node. This option is mandatory if you choose to install PVA Management Server and Control Center components.

- `PVA_HOSTNAME="hostname"` where `hostname` is the hostname to be assigned to the Management Node. This option is mandatory if you choose to install PVA Management Server and Control Center components

4 Make sure the Parallels server is connected to the Internet.

5 In a terminal, change to the directory where the `pva_opt.cfg` file is located, and run this command:

```
# /usr/libexec/pva-setup.sh pva_opt.cfg
```

Connecting to a Server

To connect to a server using Parallels Virtual Automation, do the following:

1   On any computer, open your favorite web browser.

2   Make sure that the computer can access the server with Parallels Server Bare Metal over the network.

3   Type the IP address or hostname of the Container acting as the Master Server in the browser window (e.g. `http://123.124.125.126`).

4   Use the root credentials to log in to the Container (i.e. the root user name and the password you entered during the Parallels Server Bare Metal installation).

Note: For more information on using Parallels Virtual Automation for managing servers with Parallels Server Bare Metal, refer to the *Parallels Virtual Automation 4.5 User's Guide* (available at http://www.parallels.com/products/pva45/resources/).

Performing Basic Operations in Parallels Server 5 Bare Metal

This chapter outlines the basic day-to-day operations that you are likely to perform with Parallels virtual machines and Containers in Parallels Server Bare Metal.

In This Chapter

Creating a Virtual Machine and Container

This section explains how to create a new Parallels virtual machine and Container. The options you should pass to this command differ depending on whether you want to create a virtual machine or Container.

Creating a Container

To create a Container, you can use the `pctl create` command. This command requires the following parameters:

Argument	Description
Container ID	A numeric ID associated with a Container (101, 403, and so on). The Container ID should be an integer greater than 100 and unique for a given Parallels server.
OS template name	The name of the OS template to base your Container on. Parallels Server Bare Metal is shipped with a number of ready-to-use OS templates. To find out the names of the available templates, use the `vzpkg list -O` command.
	For the list of operating systems you can run in your virtual machines and Containers, see Supported Guest Operating Systems (p. 37).
Configuration file	The name of the sample configuration file that will be used for setting all the Container resource control parameters. The sample configuration files are residing in the `/etc/vz/conf` directory on the physical server and have names with the following mask: `ve-<configname>.conf-sample`. The most commonly used sample is the `ve-basic.conf-sample` file. This sample file has resource control parameters suitable for most Containers.

Thus, for example, you can create a new Container by executing the following command:

```
# pctl create 101 --ostemplate fedora-core-9-x86 --config basic
Creating Container private area (fedora-core-9-x86)
...
Container private area was created
```

In this case Parallels Server Bare Metal will create a Container with ID 101, the Fedora 9 OS installed inside, and the configuration parameters taken from the `ve-basic.conf-sample` sample configuration file.

Note: For more information on options you can pass to `pctl create` when creating Containers, see the *Parallels Command Line Reference Guide*.

Creating a Virtual Machine

The process of creating a new virtual machine includes the following steps:

1 Creating a virtual machine configuration. To create a virtual machine configuration, you can use either the `pctl create` command or Parallels Management Console.

2 Installing an operating system in the virtual machine. This operation can be performed using Parallels Management Console only.

3 Installing Parallels Tools in the virtual machine, a set of special utilities that facilitate your work with virtual machines. This operation can be performed using Parallels Management Console only.

Note: For detailed information on completing steps 2 and 3, consult the *Parallels Management Console User's Guide*.

The example below shows you how to create a new virtual machine configuration using `pctl create`:

```
# pctl create MyVM --distribution win-2008 --location /vz/VMs
Creating the virtual machine...
Generate the VM configuration for win-2008.
The VM has been successfully created.
```

This will create a virtual machine with the name of MyVM, adjust its configuration for installing the Windows Server 2008 operating system in it, and place all virtual-machine-related files in the /vz/VMs directory. Now you can use Parallels Management Console to install Windows Server 2008 OS and Parallels Tools in this virtual machine.

Note: For more information on options you can pass to `pctl create` when creating virtual machines, see the *Parallels Command Line Reference Guide*.

Supported Guest Operating Systems

Listed below are the operating systems that you can run in your virtual machines and Containers:

Operating System	Virtual Machine	Container
Windows		
Windows 7 with Service Pack 1 (x86, x64)	+	-
Windows Server 2008 R2 with Service Pack 1 (x64)	+	-
Windows Server 2003 R2 with Service Pack 2 (x86, x64)	+	-
Windows Vista with Service Pack 2 (x86, x64)	+	-
Windows XP Professional with Service Pack 2 (x64) and with Service Pack 3 (x86)	+	-
Windows 2000 with Service Pack 4 (x86)	+	-
Linux		
Red Hat Enterprise Linux 6 (x86, x64)	+	+
Red Hat Enterprise Linux 5.6 (x86, x64)	+	+
Red Hat Enterprise Linux 4.8 (x86, x64)	+	+
Fedora 14 (x86, x64)	+	+
Fedora 13 (x86, x64)	-	+
CentOS 5.6 (x86, x64)	+	+
CentOS 4.8 (x86, x64)	+	+
SUSE Linux Enterprise Server 11 with Service Pack 1 (x86, x64)	+	+
SUSE Linux Enterprise Server 10 (x86, x64)	-	+
SUSE Linux Enterprise Server 9 (x86, x64)	-	+
openSUSE 11.3 (x86, x64)	+	-
openSUSE 11.2 (x86, x64)	-	+
openSUSE 11.1 (x86, x64)	-	+
Debian GNU/Linux 6.0 (x86, x64)	+	+
Debian GNU/Linux 5.0 (x86, x64)	+	+
Ubuntu Linux 10.10 (x86, x64)	+	+
Ubuntu Linux 10.04 (x86, x64)	+	+
Ubuntu Linux 9.10 (x86, x64)	-	+
Ubuntu Linux 8.04 (x86, x64)	-	+
BSD		
FreeBSD 8.1 (x86, x64)	+	-

FreeBSD 7.3 (x86, x64)	+	-
Oracle		
Oracle Enterprise Linux 5.5 (x86, x64)	+	-
Oracle Enterprise Linux 5.6 (x86, x64)	-	+

Performing Initial Configuration

Before starting your newly created virtual machine and Container, you first need to configure it. This section describes the main configuration steps for virtual machines and Containers.

Configuring Network Settings

To make virtual machines and Containers accessible from the network, you need to assign valid IP addresses to them and configure DNS servers. The session below illustrates setting these parameters for the `MyVM` virtual machine and Container 101:

- Assigning IPv4 and IPv6 addresses:

```
# pctl set MyVM --device-set net0 --ipadd 10.0.186.100/24
# pctl set MyVM --device-set net0 --ipadd 1fe80::20c:29ff:fe01:fb07
# pctl set 101 --ipadd 10.0.186.101/24 --save
# pctl set 101 --ipadd fe80::20c:29ff:fe01:fb08 --save
```

  `net0` in the commands above denotes the network card in the `VM` virtual machine to assign the IP address to. You can view all network cards of a virtual machine using the `pctl list VM_name -i` command.

- Setting DNS server addresses:

```
# pctl set MyVM --nameserver 192.168.1.165
# pctl set 101 --nameserver 192.168.1.165 --save
```

When running commands for a Container, you need to use the `--save` flag to save the specified parameters to the Container configuration file. If you omit this option, the applied values will be valid only until the Container shutdown. Omit the `--save` flag when executing commands for a virtual machine; the parameters are automatically saved to the virtual machine configuration file without this flag.

Notes:

1. You can configure the network settings only for virtual machines that have Parallels Tools installed.

2. To assign network masks to Containers operating in the `venet0` networking mode, you must set the USE_VENET_MASK parameter in the `/etc/vz/vz.conf` configuration file to `yes`.

Setting Passwords for Virtual Machines and Containers

In Parallels Server Bare Metal, you can use the `--userpasswd` option of the `pctl set` command to create new accounts in your virtual machines and Containers directly from the Parallels server. The created account can then be used to log in to the virtual machine and Container. The easiest way of doing it is to run this command:

```
# pctl set MyVM --userpasswd user1:2wsx123qwe
```

This command creates the `user1` account in the `MyVM` virtual machine and sets the `2wsx123qwe` password for it. Now you can log in to the `MyVM` virtual machine as `user1` and administer it in the same way you would administer a standalone server: install additional software, add users, set up services, and so on.

The `pctl set` command can also be used to change passwords for existing accounts in your virtual machines and Containers. For example, to change the password for `user1` in the `MyVM` virtual machine to `0pi65jh9`, run this command:

```
# pctl set MyVM --userpasswd user1:0pi65jh9
```

Note: You can use manage user accounts only inside virtual machines that have Parallels Tools installed.

Starting, Stopping, and Querying Status of a Virtual Machine and Container

After a Parallels virtual machine and Container has been created, it can be managed like an ordinary computer.

Starting a Virtual Machine and Container

You can use the `pctl start` command to start your virtual machines and Containers:

- To start Container 101:

```
# pctl start 101
Starting the Container ...
```

- To start a virtual machine with the name of `MyVM`:

```
# pctl start MyVM
Starting the VM ...
```

Stopping a Virtual Machine and Container

The `pctl stop` command is used to stop your virtual machines and Containers:

- To stop Container 101:

```
# pctl stop 101
Stopping the Container ...
```

- To stop a virtual machine with the name of `MyVM`:

```
# pctl stop MyVM
Stopping the VM ...
```

Checking the Status of a Virtual Machine and Container

Depending on whether you want to check the status of a Container or a virtual machine, you can use the following commands:

- `pctl status` to check the Container status:

```
# pctl status 101
VEID 101 exist mounted running
```

- `pctl list` to check the virtual machine status:

```
# pctl list MyVM
stopped 10.12.12.121 MyVM
```

You can also get more detailed information on a virtual machine by specifying the `-i` option after `pctl list`.

Restarting a Virtual Machine and Container

Sometimes, you may need to restart a virtual machine and Container. To do this, use the following commands:

- To restart a Container, use the `pctl restart` command:

```
# pctl restart 101
Stopping Container ...
Container was stopped
```

```
Container is unmounted
Starting Container ...
Container is mounted
Adding IP address(es): 10.0.186.101
Container start in progress...
```

- To restart a virtual machine, use the `pctl reset` command:

```
# pctl reset MyVM
```

Listing Virtual Machines and Containers

To get an overview of the virtual machines and Containers existing on the physical server and to get additional information about them - their IP addresses, hostnames, current resource consumption, and so on - use the `pctl list` command. In the most general case, you may get a list of all virtual machines and Containers by issuing the following command:

```
# pctl list -a
                                     ID   NPROC  STATUS   IP_ADDR      HOSTNAME
                                    101      12  started  10.10.1.101  CT101
{b8cb6d99-1af1-453d-a302-2fddd8f86769}      -  stopped  10.10.100.1  VM_1
```

The `-a` option tells the `pctl list` command to output both running and stopped Containers and virtual machines. By default, only running Containers and virtual machines are shown. The default columns inform you of the Container and virtual machine IDs, the number of running processes inside Containers and virtual machines, their status, IP addresses, and hostnames. This output may be customized as desired by using `pctl list` command line options. For example:

```
# pctl list -a -o name,ctid
NAME                                    ID
-                                      101
My_Vm   {b8cb6d99-1af1-453d-a302-2fddd8f86769}
```

This command displays only the names and IDs of the virtual machines and Containers existing on the physical server. The full list of the `pctl list` command options for Containers and virtual machines is available in the *Parallels Command Line Reference Guide*.

Deleting a Virtual Machine and Container

You can delete a virtual machine and Container that is not needed anymore using the `pctl delete` command. Notice that you cannot delete a running or mounted virtual machine and Container. The example below illustrates deleting Container 101 and the `MyVM` virtual machine:

Deleting Container 101

```
# pctl delete 101
Deleting Container private area: /vz/private/101
Container is currently mounted (unmount first)
# pctl stop 101
Stopping Container...
Container was stopped
Container is unmounted
# pctl delete 101
Deleting Container private area: /vz/private/101
Container private area was deleted
```

Deleting the MyVM virtual machine:

```
# pctl delete MyVM
Deleting the VM...
VM is currently running
# pctl stop MyVM
Stopping the VM...
VM was stopped
# pctl delete MyVM
Deleting the VM...
Container was deleted
```

Running Commands in a Virtual Machine and Container

Parallels Server Bare Metal allows you to execute arbitrary commands inside virtual machines and Containers by running them on the physical server, i.e. without the need to log in to the respective virtual machine and Container. For example, this can be useful in these cases:

- If you do not know the virtual machine and Container login information, but need to run some diagnosis commands to verify that it is operational.
- If network access is absent for a virtual machine and Container.

In both these cases, you can use the `pctl exec` command to run a command inside the respective virtual machine and Container. The session below illustrates the situation when you run the stopped SSH daemon inside a Linux virtual machine with the name of `My_Linux`:

```
# pctl exec My_Linux /etc/init.d/sshd status
sshd is stopped
# pctl exec My_Linux /etc/init.d/sshd start
Starting sshd:[OK]
# pctl exec My_Linux /etc/init.d/sshd status
sshd (pid 26187) is running...
```

Notes:

1. You can use the `pctl exec` command only inside virtual machines that have Parallels Tools installed.

2. The `pctl exec` command is executed inside a virtual machine and Container from the `/` directory rather than from the `/root` one.

Monitoring Resources

In Parallels Server Bare Metal, you can use the `pstat` utility to monitor system resources in real time. When executed, the utility displays the status and load of the system: its disk, network, CPU, memory, and other parameters. It also provides the list of running virtual machines and Containers together with their resources consumption statistics. For example, you can run the following command on the server to view your current system resources:

```
# pstat -d 5
   5:39pm, up 4 days,  5:33,  2 users, load average: 1.08, 1.11, 1.05
CTNum 2, procs  268: R   1, S  265, D   1, Z   0, T   1, X   0
CPU [ OK ]: CTs   0%, CT0   0%, user   0%, sys   1%, idle  99%, lat(ms)   1/0
Mem [ OK ]: total 7831MB, free 4147MB/0MB (low/high), lat(ms) 1/0
  ZONE0 (DMA): size 9MB, act 0MB, inact 0MB, free 10MB (0/0/0)
  ZONE1 (DMA32): size 3238MB, act 42MB, inact 39MB, free 3118MB (4/5/6)
  ZONE2 (Normal): size 4661MB, act 2730MB, inact 606MB, free 1019MB (6/8/9)
  Mem lat (ms): A0 0, K0 1, U0 0, K1 1, U1 0
  Slab pages: 181MB/181MB (ino 39MB, de 13MB, bh 21MB, pb 40MB)
Swap [ OK ]: tot 2000MB, free 2000MB, in 0.000MB/s, out 0.000MB/s
Net [ OK ]: tot: in  0.027MB/s  233pkt/s, out  0.040MB/s   37pkt/s
             lo: in  0.000MB/s    0pkt/s, out  0.000MB/s    0pkt/s
           eth0: in  0.014MB/s  116pkt/s, out  0.020MB/s   19pkt/s
           sit0: in  0.000MB/s    0pkt/s, out  0.000MB/s    0pkt/s
            br0: in  0.000MB/s    0pkt/s, out  0.000MB/s    0pkt/s
            br1: in  0.013MB/s  116pkt/s, out  0.020MB/s   19pkt/s
Disks [ OK ]: in 0.000MB/s, out 0.000MB/s


ST    %VM      %KM      CPU   FCNT MLAT NAME
OK 0.0/27  0.0/-   0.00/33    0    0 1
OK 0.2/685 0.0/-   0.00/33    0    0 101
OK 0.4/685 0.0/-   0.00/33    0    0 102
OK  27/6.7 0.1/-   0.00/33    0    0 Windows7
```

The command output is updated with the time interval equal to the value specified after the −d (delay) option measured in seconds. In the session above, the statistics displayed is renewed every five seconds. If the −d option is not specified, the default interval equals 1 second.

As you can see, the utility provides real-time information on all main resources subsystems pertaining both to the physical server and to its virtual machines and Containers: the disk, network, CPU, and memory subsystems. You may want to shrink the output of the utility by specifying the −b (brief) option instead of the −v (verbose) one, or to do without any options to use the "normal" mode of displaying.

The following information is displayed by default per each virtual machine or Container:

Column Name	Description
ST	virtual machine or Container status. If there are no failed counters and the latency values are normal, the status is "OK". Otherwise, it is displayed in red as "!!". You can sort virtual machines and Containers by their status to see the problem virtual machines and Containers first.
%VM	Virtual memory usage, in per cent to the total memory. The first number is how much virtual memory is being used, and the second one is the virtual memory barrier.
%KM	Kernel memory usage, in per cent to the normal zone size. The first number is how much kernel memory is being used, and the second one is the kernel memory barrier.

CPU	CPU usage in per cent to all available CPUs. The first number is how much of the CPU power is being used by the virtual machine or Container, and the second one is its guaranteed share judging by the cpuunits parameter. Note that the actual CPU usage may be higher than the guaranteed one.
FCNT	The number of failed counters for all the resource parameters. In the standard mode of displaying, this number represents the increase of failed counters since the previous screen update, whereas in the average mode of displaying, it represents an absolute failed counters sum for the given virtual machine or Container.
MLAT	Maximal scheduling latency for the virtual machine or Container, in ms. This parameter shows the maximal scheduling latency inside the given virtual machine or Container, i.e. for how long (at the utmost) a process inside the virtual machine or Container awaits for the CPU.
NAME	virtual machine or Container name.

The %VM, %KM, and CPU columns provide two values per column separated by a slash for each virtual machine and Container. The first value indicates the real usage of the corresponding parameter by the virtual machine and Container, and the second one – the maximal value allowed for the virtual machine and Container.

For detailed information on options that you can use with the pstat utility, refer to the *Parallels Server Bare Metal Command Linux Guide*.

Migrating Virtual Machines and Containers

Parallels Server Bare Metal provides a special utility - `pmigrate` - allowing you to perform different types of migration.

Migrating a physical server to a virtual machine/Container

The `pmigrate` utility allows you to migrate physical servers to virtual machines and Containers on the physical server running Parallels Server Bare Metal. For example, to move a physical server to the `MyVM` virtual machine, you can execute the following command:

```
# pmigrate h 192.168.1.130 v localhost/MyVM
```

where

- `h` denotes that you are migrating a physical server.
- `192.168.1.130` is the IP address of the physical server to be migrated.
- `v` indicates that the physical server is to be moved to a virtual machine.
- `localhost/MyVM` denotes that the physical server must be migrated to the `MyVM` virtual machine on the local server.

If you want to migrate the same physical server to a Container, just specify `c` instead of `v` and the ID of the resulting Container (e.g. 101) instead of `MyVM`.

Migrating virtual machines and Containers between physical servers

The `pmigrate` utility supports migrating virtual machines and Containers between physical servers running Parallels Server Bare Metal. For example, to migrate a virtual machine with the name of `MyVM` from the server having the IP address of `192.168.1.130` to the local server, run this command:

```
# pmigrate v 192.168.1.130/MyVM v localhost/MyVM
```

Specifying `c` instead of `v` and the Container ID instead of `MyVM` allows you to migrate Containers between physical servers with Parallels Server Bare Metal:

```
# pmigrate c 192.168.1.130/101 c localhost/101
```

Migrating Containers to virtual machines

You can also migrate Containers to virtual machines. The Containers to be migrated can reside on both local and remote physical servers. For example, you can migrate Container 101 residing on the physical server with the IP address of `192.168.1.130` to the `MyVM` virtual machine on the local server as follows:

```
# pmigrate c 192.168.1.130/101 v MyVM
```

In its turn, you can migrate Container 101 from the local server to the `MyVM` virtual machine on the physical server with the IP address of `192.168.1.130` by executing this command:

```
# pmigrate c 101 v 192.168.1.130/MyVM
```

Note: If you are migrating from/to a remote physical server, you will be asked for the `root` credentials to log in to this server.

Managing Virtual Machine and Container Backups

A regular backing up of the existing virtual machines and Containers is essential for any physical server reliability. In Parallels Server Bare Metal, you can use the `pctl backup` and `pctl restore` commands to back up and restore your virtual machines and Containers.

Note: You can also use the `pbackup` and `prestore` utilities to back up and restore your virtual machines and Containers.

Creating a backup

The `pctl backup` command allows you to create virtual machine and Container backups on both local and remote physical servers. You can back up to any server running the Parallels Server Bare Metal software and having sufficient space for storing virtual machine and Container backups. For example, to make a full backup of the `MyVM` virtual machine residing on the local server and save it on the destination physical server with the IP address of `10.10.100.1`, run the following command:

```
# pctl backup MyVM -s root:1qaz2wsx@10.10.100.1
```

`root:1qaz2wsx` before the destination server IP address denotes the root credentials used to log in to this server. If you do not specify these credentials, you will be asked to do so during the command execution.

Restoring a backup

To restore a backup of a virtual machine and Container, you can use the `pctl restore` command. This command supports restoring backups to a local Parallels server only. For example, to restore a backup of the `MyVM` virtual machine stored on the remote server with the IP address of `10.10.100.1`, you can run this command on the local server:

```
# pctl restore MyVM -s root:1qaz2wsx@10.10.100.1
```

If you have two or more backups of the `MyVM` virtual machine, you can use the `pctl backup-list` command to find out the ID assigned to a specific backup:

```
# pctl backup-list -s 10.10.100.1
ID                                 Backup_ID
Node                          Date                   Type
{e3c8be4a-2955-4242-93f6-2fb68a433de1}  {7a5e7605-a467-4e04-9f5f-
6f0078b5f9f5}    dhcp-10.10.100.1.parallels.com  2009-08-21 10:10:32      f
{e3c8be4a-2955-4242-93f6-2fb68a433de1}  {24a3011c-092e-4f21-bb3b-
29ccfe967e92}    dhcp-10.10.100.1.parallels.com  2009-08-21 11:12:35      f
```

You can now indicate the found ID after the `-t` option to tell `pctl backup` to restore a particular backup. For example, to restore the backup that was created first, execute this command:

```
# pctl restore -t {7a5e7605-a467-4e04-9f5f-6f0078b5f9f5} -s
root:1qaz2wsx@10.10.100.1
```

Index