

Parallels Virtuozzo Containers 4.6 for Windows

Getting Started Guide

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Introduction

In This Chapter

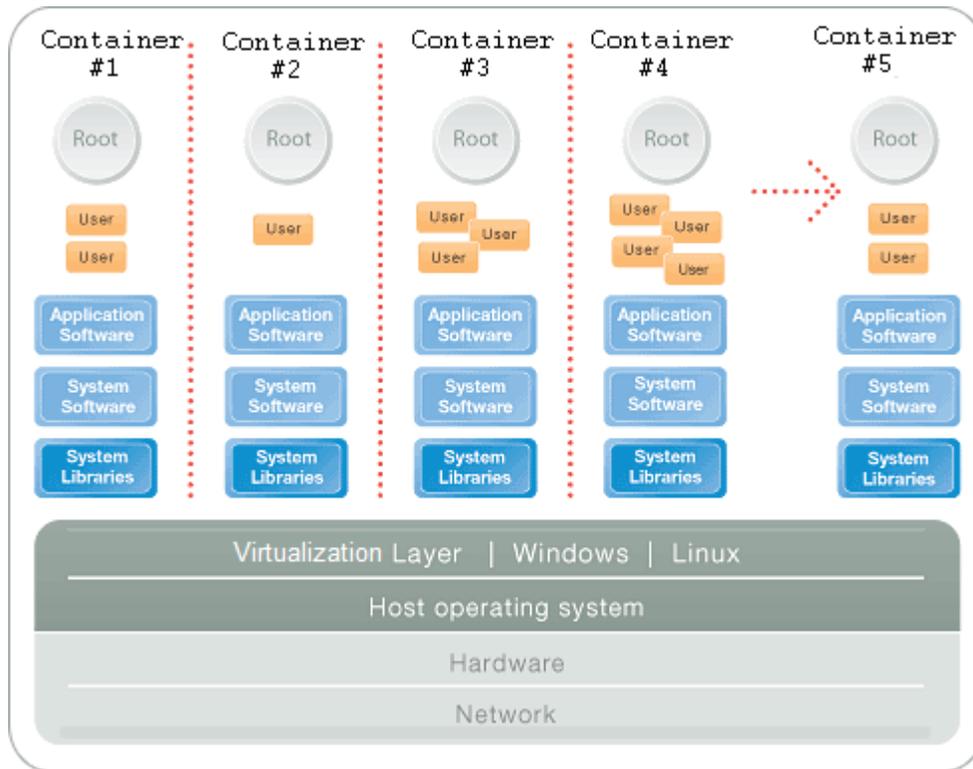
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About Parallels Virtuozzo Containers 4.6

Parallels Virtuozzo Containers 4.6 is a patented OS virtualization solution. It creates isolated partitions or Containers on a single physical server and OS instance to utilize hardware, software, data center and management effort with maximum efficiency. The basic Parallels Virtuozzo Containers capabilities are:

- **Intelligent Partitioning**—Division of a server into as many as hundreds of Containers with full server functionality.
- **Complete Isolation**—Containers are secure and have full functional, fault and performance isolation.
- **Dynamic Resource Allocation**—CPU, memory, network, disk and I/O can be changed without rebooting.
- **Mass Management**—Suite of tools and templates for automated, multi-Container and multi-server administration.

The diagram below represents a typical model of the Parallels Virtuozzo Containers system structure:



The Parallels Virtuozzo Containers OS virtualization model is streamlined for the best performance, management, and efficiency. At the base resides a standard Host operating system which can be either Windows or Linux. Next is the virtualization layer with a proprietary file system and a kernel service abstraction layer that ensure the isolation and security of resources between different Containers. The virtualization layer makes each Container appear as a standalone server. Finally, the Container itself houses the application or workload.

The Parallels Virtuozzo Containers OS virtualization solution has the highest efficiency and manageability making it the best solution for organizations concerned with containing the IT infrastructure and maximizing the resource utilization. The Parallels Virtuozzo Containers complete set of management tools and unique architecture makes it the perfect solution for easily maintaining, monitoring, and managing virtualized server resources for consolidation and business continuity configurations.

About This Guide

The *Getting Started With Parallels Virtuozzo Containers 4.6* guide will help you install and run Parallels Virtuozzo Containers 4.6 on your server. You will also learn the basics of working with Containers - how to create a Container, start/stop it, install additional software in it, and the like.

Organization of This Guide

The guide is organized in the following way:

- **Chapter 1, Introduction**, provides an overview of available information sources shipped with Parallels Virtuozzo Containers 4.6, introduces the main Parallels Virtuozzo Containers notions, and enumerates the requirements to be fulfilled to successfully install Parallels Virtuozzo Containers on your server.
- **Chapter 2, Installation in a Nutshell**, is a quick reference list sketching out the steps required to successfully install Parallels Virtuozzo Containers 4.6.
- **Chapter 3, Parallels Virtuozzo Containers 4.6 Installation**, furnishes you with detailed information on how to install Parallels Virtuozzo Containers 4.6 on your server including the installation and configuration of both the Host operating system and Parallels Virtuozzo Containers software itself.
- **Chapter 4, Parallels Virtuozzo Containers Tools**, contains brief instructions on how to start working in Parallels Management Console and Parallels Virtual Automation—tools to efficiently manage Hardware Nodes and their Containers.
- **Chapter 5, Container Management With Parallels Virtual Automation**, describes the process of managing Containers with Parallels Virtual Automation. You will learn how to create new Containers, start and stop them, manage files and folders in Containers, and so on.
- **Chapter 6, Container Management With Parallels Management Console**, familiarizes you with the way to perform the main operations on Containers: create new Containers, start and stop them, manage applications, and so on.

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.
<i>Italics</i>	Titles of chapters, sections, and subsections.	Read the Basic Administration chapter.
	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 <i>OS templates</i> . To remove a Container, type <code>vzctl delete <i>ctid</i></code> .
Monospace	The names of commands, files, and directories.	Use <code>vzctl start</code> to start a Container.
Preformatted	On-screen computer output in your command-line sessions; source code in XML, C++, or other programming languages.	<code>Saved parameters for Container 101</code>

Monospace Bold	What you type, as contrasted with on-screen computer output.	<code>C:\vzlist -a</code>
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 guides that can help you use the product more effectively:

- *Parallels Virtuozzo Containers 4.6 Installation Guide*. This guide provides exhaustive information on the process of installing, configuring, and deploying your Parallels Virtuozzo Containers system. Unlike this guide, it contains a more detailed description of all the operations needed to install and set Parallels Virtuozzo Containers 4.6 to work including planning the structure of your Parallels Virtuozzo Containers network, performing the Parallels Virtuozzo Containers unattended installation, etc. Besides, it does not include the description of any Container-related operations.
- *Parallels Virtuozzo Containers 4.6 User's Guide*. This guide provides comprehensive information on Parallels Virtuozzo Containers 4.6 covering the necessary theoretical conceptions as well as all practical aspects of working with Parallels Virtuozzo Containers. However, it does not deal with the process of installing and configuring your Parallels Virtuozzo Containers system.
- *Parallels Virtuozzo Containers 4.6 Templates Management Guide*. This guide is meant to provide complete information on Parallels Virtuozzo Containers templates, an exclusive Parallels technology allowing you to efficiently deploy standard Windows applications inside your Containers and to greatly save the Hardware Node resources (physical memory, disk space, etc.).
- *Parallels Virtuozzo Containers 4.6 Reference Guide*. This guide is a complete reference on all Parallels Virtuozzo Containers configuration files and Hardware Node command-line utilities.
- *Deploying Microsoft Clusters in Parallels-Based Systems*. This document provides information on creating Microsoft failover and Network Load Balancing clusters in Parallels Virtuozzo Containers-based systems.
- *Parallels Management Console Help*. This help system provides detailed information on Parallels Management Console—a graphical user interface tool for managing Hardware Nodes and their Containers.
- *Parallels Virtual Automation Administrator's Guide*. This help system shows you how to work with Parallels Virtual Automation, a tool providing you with the ability to manage Hardware Nodes and their Containers with the help of a standard Web browser on any platform.
- *Parallels Power Panel User's Guide*. This help system deals with Parallels Power Panel, a means for administering individual Containers through a common Web browser on any platform.

The guides are available at <http://sp.parallels.com/download/pvc46> and <http://sp.parallels.com/products/pva46/resources>.

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://sp.parallels.com/en/support/usersdoc/>).

Parallels Virtuozzo Containers Notions

In order to avoid any misunderstandings while following the instructions in the guide, please become acquainted with the main Parallels Virtuozzo Containers definitions:

- *Parallels Virtuozzo Containers* is a complete server automation and virtualization solution allowing you to create multiple isolated Containers on a single physical server to share hardware, licenses, and management effort with maximum efficiency.
- *Container* is 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 Hardware Node and one OS kernel. However, they are isolated from each other. Container is a kind of ‘sandbox’ for processes and users.
- *Hardware Node (Node, Container 0)* is a server where the Parallels Virtuozzo Containers software is installed for hosting Containers.
- *Host Operating System (or Host OS)* is an operating system installed on the Hardware Node.
- *Parallels Virtuozzo Containers license* is a special license that you need to install on the Hardware Node to start using Parallels Virtuozzo Containers and Parallels tools (*Parallels Management Console*, *Parallels Virtual Automation*, and *Parallels Power Panel*). Every Hardware Node must have its own Parallels Virtuozzo Containers license installed.
- *Parallels Virtuozzo Containers template* is a set of program files that make up a complete OS or application and that are installed on the Host operating system in such a way as to be usable by any Container on the Hardware Node and to allow Containers to efficiently share OS and application resources.
- *Parallels Management Console* is a Parallels Virtuozzo Containers management and monitoring tool with graphical user interface. Parallels Management Console is cross-platform and runs on both Microsoft Windows and Linux workstations.
- *Parallels Virtual Automation (former Parallels Infrastructure Manager)* is a tool designed for managing Hardware Nodes and Containers with the help of a standard Web browser on any platform.

Installation Requirements

System Requirements

This subsection focuses on the hardware and software requirements for Parallels Virtuozzo Containers 4.6.

Hardware Compatibility

Parallels Virtuozzo Containers does not have any special hardware requirements for servers. If Windows Server 2003, Windows Server 2008, or Windows Server 2008 R2 can run on a given server, Parallels Virtuozzo Containers can be installed on it as well. The number and performance of Containers you can create and simultaneously run on a server depends on its hard disk space and memory capacity.

Memory Dump Requirements

In problem situations, you may need a complete or kernel memory dump file for debugging purposes (for instructions on how to generate one, see the *Parallels Virtuozzo Containers User's Guide*). The hardware requirements for ensuring integrity and validity of memory dump files are the following:

- The paging file size must be 1.5 times larger than the amount of RAM used by the Node.
- The paging file must be located on the system drive (C: by default).
- After the paging file is set, the remaining free space on a Node's system drive must be at least 1.5 times the RAM.
- If a remote server controller is used (e.g. Dell DRAC or HP iLO), its Node reboot timeout must be long enough for a complete or kernel memory dump file to be created fully. Otherwise, a dump file may become truncated and unreadable.

Note: If a Node's system drive does not meet the above requirements, limit the amount of RAM available to the Node to 16GB or less. To do that, add the `/MAXMEM=16384` option to the `boot.ini` file (for instructions, see <http://support.microsoft.com/kb/108393>). Then reboot the Node and recheck the configuration against the requirements.

Software Compatibility

This version of Parallels Virtuozzo Containers 4.6 can be installed on servers running Windows Server 2003, Windows Server 2008, or Windows Server 2008 R2 operating system.

x64 versions of Windows Server 2008 R2 SP1:

- Windows Server 2008 R2 SP1, Datacenter Edition (US English, German, Japanese, Russian)
- Windows Server 2008 R2 SP1, Enterprise Edition (US English, German, Japanese)
- Windows Server 2008 R2 SP1, Standard Edition (US English, German)

x64 versions of Windows Server 2008 R2:

- Windows Server 2008 R2, Datacenter Edition (US English, German, French, Italian, Japanese, Korean, Polish, Russian, Simplified Chinese, Spanish)
- Windows Server 2008 R2, Enterprise Edition (US English, German, French, Italian, Japanese, Korean, Polish, Russian, Simplified Chinese, Spanish)
- Windows Server 2008 R2, Standard Edition (US English, German, French, Italian, Japanese, Korean, Polish, Russian, Simplified Chinese, Spanish)

x86 full versions of Windows Server 2008 with or without Hyper-V:

- Windows Server 2008 with Service Pack 1 or Service Pack 2, Enterprise Edition (US English)
- Windows Server 2008 with Service Pack 1 or Service Pack 2, Standard Edition (US English)
- Windows Server 2008 with Service Pack 1 or Service Pack 2, Datacenter Edition (US English)
- Windows Server 2008 with Service Pack 2, Enterprise Edition (French, German, Japan, Italian, Korean, Spanish, Russian, and Simplified Chinese)
- Windows Server 2008 with Service Pack 2, Standard Edition (French, German, Japan, Italian, Korean, Spanish, Russian, and Simplified Chinese)
- Windows Server 2008 with Service Pack 2, Datacenter Edition (French, German, Japan, Italian, Korean, Spanish, Russian, and Simplified Chinese)

x86 full versions of Windows Server 2008 without Hyper-V:

- Windows Server 2008 with Service Pack 1, Datacenter Edition (German and Simplified Chinese)

x86 versions of Windows Server 2003:

- Standard or Enterprise Edition of Windows Server 2003 Service Pack 1 with or without R2: US English, German, French, Korean, Spanish, Traditional Chinese, Simplified Chinese, or Japanese
- Standard or Enterprise Edition of Windows Server 2003 Service Pack 2 with or without R2: US English, German, French, Italian, Korean, Russian, Spanish, Traditional Chinese, Simplified Chinese, or Japanese
- Standard or Enterprise Edition of Windows Server 2003 Service Pack 2 (Russian)
- Datacenter Edition of Windows Server 2003 Service Pack 1 with or without R2 (US English)
- Datacenter Edition of Windows Server 2003 Service Pack 2 with or without R2 (US English)

x64 full versions of Windows Server 2008 with or without Hyper-V:

- Windows Server 2008 with Service Pack 1 or Service Pack 2, Enterprise Edition (US English)
- Windows Server 2008 with Service Pack 1 or Service Pack 2, Standard Edition (US English)
- Windows Server 2008 with Service Pack 1 or Service Pack 2, Datacenter Edition (US English)

- Windows Server 2008 with Service Pack 2, Enterprise Edition (French, Japanese, Italian, Korean, Spanish, Russian, and Simplified Chinese)

- Windows Server 2008 with Service Pack 2, Standard Edition (French, German, Japanese, Italian, Korean, Spanish, Russian, and Simplified Chinese)

- Windows Server 2008 with Service Pack 2, Datacenter Edition (French, German, Japanese, Italian, Korean, Spanish, Russian, and Simplified Chinese)

x64 full versions of Windows Server 2008 without Hyper-V:

- Windows Server 2008 with Service Pack 1, Datacenter Edition (German and Simplified Chinese)

x64 versions of Windows Server 2003:

- Standard or Enterprise Edition of Windows Server 2003 x64 Service Pack 1 with or without R2 (US English or Japanese)

- Standard or Enterprise Edition of Windows Server 2003 x64 Service Pack 2 with or without R2 (US English, French, German, Japanese, Italian, Korean, Simplified Chinese, Spanish, or Traditional Chinese)

- Standard or Enterprise Edition of Windows Server 2003 x64 Service Pack 2 (Russian)

- Datacenter Edition of Windows Server 2003 x64 Service Pack 1 with or without R2 (US English)

- Datacenter Edition of Windows Server 2003 x64 Service Pack 2 with or without R2 (US English)

- Datacenter Edition of Windows Server 2003 x64 with Service Pack 2 (Japanese)

Before installing Parallels Virtuozzo Containers, make sure of the following:

- The Windows Server OS installation is activated.
- The Windows Server distribution kit is not patched, i.e. all the binaries inside the distribution kit are in their original state as they are supplied by Microsoft Corporation.

Notes:

1. During the Parallels Virtuozzo Containers installation, you may be presented with a warning message informing you that some Windows Server updates installed on your server are not compatible with Parallels Virtuozzo Containers 4.6. In this case you need to uninstall these updates from the server (e.g., using the **Add/Remove Programs** tool in Control Panel) and start the Parallels Virtuozzo Containers installation anew. You will be able to install all the necessary Windows Server updates on your Hardware Node after the Parallels Virtuozzo Containers installation.

2. After installing Parallels Virtuozzo Containers 4.6 on servers with Windows Server 2003, do not remove any of the standard Windows components from the Hardware Node (e.g., Internet Information Services). Deleting an installed component might cause the corresponding application inside your Containers to malfunction. You can disable the unnecessary Windows components on the Node instead.

Network Requirements

The network pre-requisites enlisted in this subsection will help you avoid delays and problems with getting Parallels Virtuozzo Containers up and running. You should take care in advance of the following:

- Local Area Network (LAN) for the Hardware Node.
- Internet connection for the Hardware Node.
- A valid IP address for the Hardware Node as well as other IP parameters (default gateway, network mask, DNS and WINS configuration).
- At least one valid IP address for each ordinary Container you will be creating on the Node. The total number of addresses should be no less than the planned number of Containers.

Note: The addresses to be assigned to Containers should differ from those of the Hardware Node, i.e. any existing IP address of the Hardware Node network interface cards must not be assigned to any Container. The Container IP addresses are automatically assigned by Parallels Virtuozzo Containers to the virtual adapters of the corresponding Containers; so, you only have to specify what IP address is to be applied to what Container.

Installation in a Nutshell

To install Parallels Virtuozzo Containers 4.6, follow these steps. To know more of a particular step, see the next chapter.

- 1** Download the `vzinstall46` file from the Parallels web site to the server where you wish to install Parallels Virtuozzo Containers and run it there.
- 2** The Welcome to Parallels Virtuozzo Containers Autoinstall window:
Click Next.
- 3** The Installation Type window:
Click Next.
- 4** The Download Information window:
Click Download.
- 5** The Ready to Install window:
Insert the CD with the same Windows Server distribution kit as the one installed on your server, and click Next.
- 6** The License Agreement window:
Read the Parallels end user license agreement, select the I accept the terms in the license agreement radio button, and click Next.
- 7** The Customer Experience Program window.
Select Yes, I want to participate, and click Next to join the Parallels Customer Experience Program.

Note: If you join the program, Parallels will periodically collect the information about your 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.

- 8** The User Information window:
Enter the necessary information in the User Name and Organization fields, and click Next.
- 9** The Locations of Parallels Virtuozzo Containers Data and Program Files window:
Click Install.
- 10** Parallels Virtual Automation Installation window.
Select the Create a Container and install PVA Management Node in it check box, and click Next.
- 11** The PVA Management Node Configuration window.
Enter a hostname, an IP address, and a DNS server address in the fields provided, and click Next. The hostname and IP address must be unique within your network.
- 12** The Configuring PVA Management window.

Type in a password in the fields provided, and click **Next**. The specified password must meet the Windows complexity policy.

13 The Container Services Configuration window:

Click **Next**.

14 The License Installation window:

Enter the Parallels Virtuozzo Containers product key number, and click **Next**.

15 The InstallShield Wizard Completed window:

Click **Finish**.

Parallels Virtuozzo Containers 4.6 Installation

The current chapter provides exhaustive information on the process of planning, installing, configuring, and deploying your Parallels Virtuozzo Containers system including the pre-requisites and the stages you shall pass.

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Parallels Virtuozzo Containers Installation Overview

The process of installing Parallels Virtuozzo Containers includes the following major steps:

- 1 Installing and activating a licensed Windows Server operating system on the server. The list of supported versions of Microsoft Windows Server is given in the **Software Compatibility** subsection.
- 2 Installing the Parallels Virtuozzo Containers basic pack on the server.

Besides, to facilitate managing your servers with Parallels Virtuozzo Containers (known as Hardware Nodes or Nodes) and Containers and to keep track of the resource consumption on your Nodes, you may want to additionally perform the following operations:

- Install Parallels Management Console—a graphical tool for administering Parallels Virtuozzo Containers and performing main administrative tasks on Hardware Nodes and in the Container context—and register the needed Hardware Nodes.
- Set Parallels Virtual Automation and Parallels Power Panel to work. These tools are intended for managing Hardware Nodes and Containers residing on it with the help of a standard Web browser.

All these steps are described below in the guide.

Obtaining Parallels Virtuozzo Containers

You can use one of the following ways to obtain Parallels Virtuozzo Containers 4.6:

- Get a CD or DVD from Parallels.
- Download the appropriate zip archive containing the Parallels Virtuozzo Containers installation files from the Parallels web site to your server.
- Use the `vzautoinstall46.exe` utility to download the Parallels Virtuozzo Containers distribution to your server and install it there, if necessary. In this case you should download the `vzautoinstall46.exe` file from the Parallels web site to your server and run it there. When executed, the utility launches the **Parallels Virtuozzo Containers Autoinstall** wizard which will ask you about the Parallels Virtuozzo Containers components you wish to download and, after gathering the necessary information, start the downloading process. You can also make the `vzautoinstall46.exe` utility initiate the **Parallels Virtuozzo Containers Installation** wizard right after the Parallels Virtuozzo Containers components downloading and help you install Parallels Virtuozzo Containers 4.6 on your server.

Installing Parallels Virtuozzo Containers

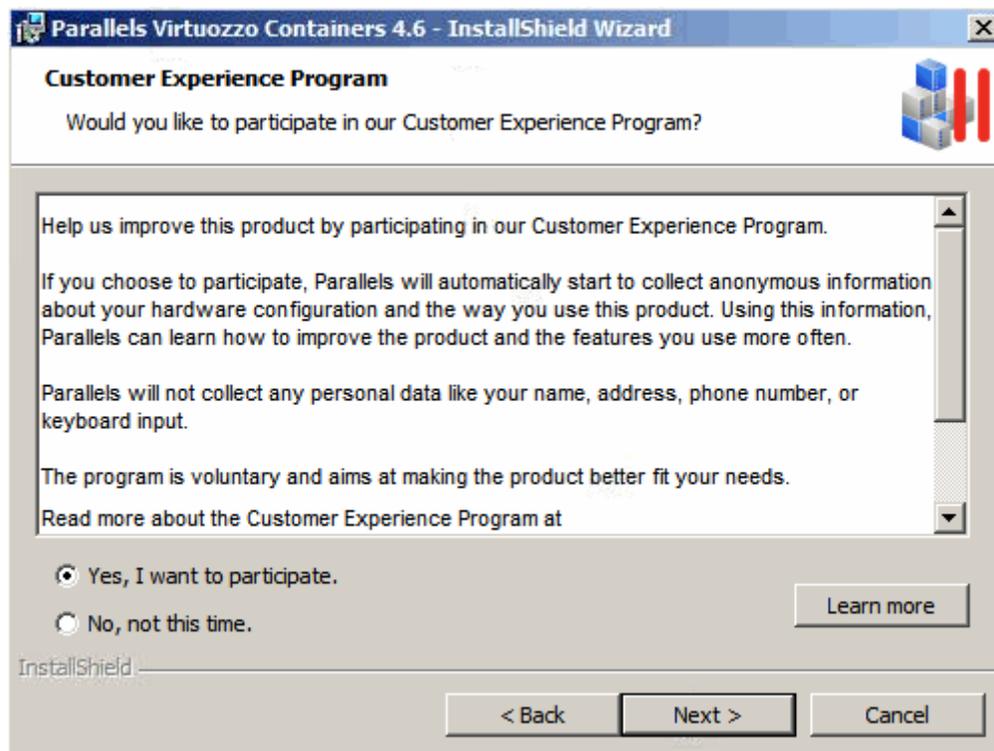
To install Parallels Virtuozzo Containers 4.6, launch the **Parallels Virtuozzo Containers Installation** wizard by double-clicking the Parallels Virtuozzo Containers installation file. In the **Choose Setup Language** dialog, choose the user interface language of the **Parallels Virtuozzo Containers Installation** wizard (which is set to English by default), according to your preferences. To do this, select any of the supported languages on the drop-down list, and click **OK**. The installation program will greet you with the following window.

Note: The **Welcome** screen is skipped if you use the `vzautoinstall46.exe` utility in the 'Download and install' mode to automatically download and install Parallels Virtuozzo Containers on your server.



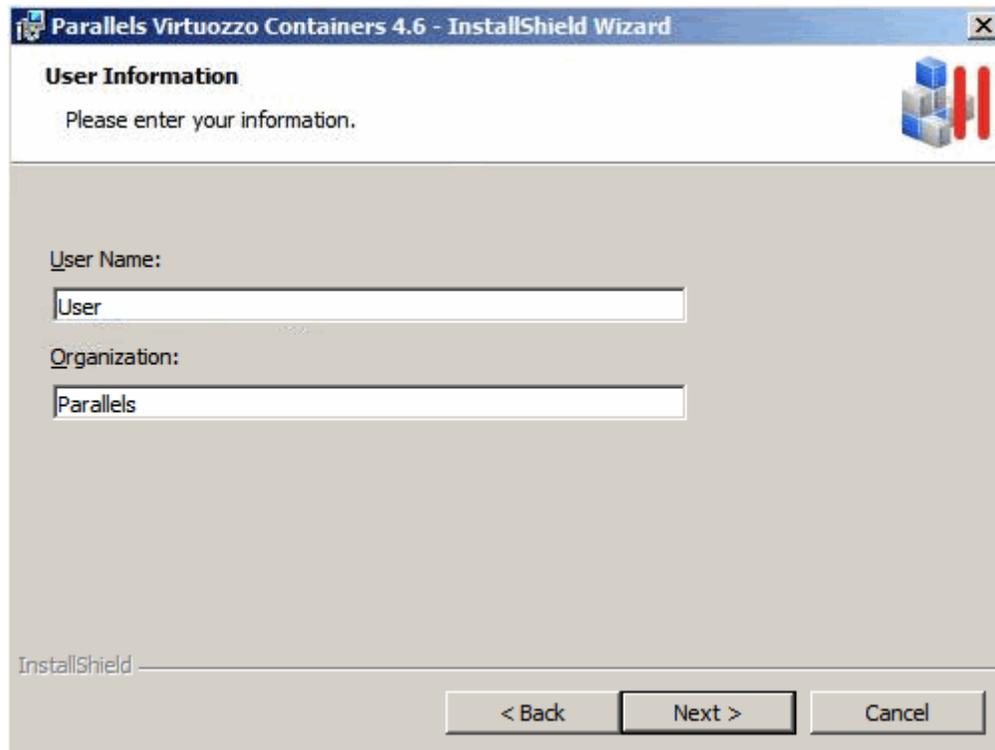
Clicking the **Next** button will display the Parallels end user license agreement that you must accept to be able to install Parallels Virtuozzo Containers. Use either the PgDn key or the down arrow on your keyboard to read all the text of the agreement.

After you have selected the I accept the terms in the license agreement radio button and clicked **Next** on the License Agreement screen, the Customer Experience Program window appears.



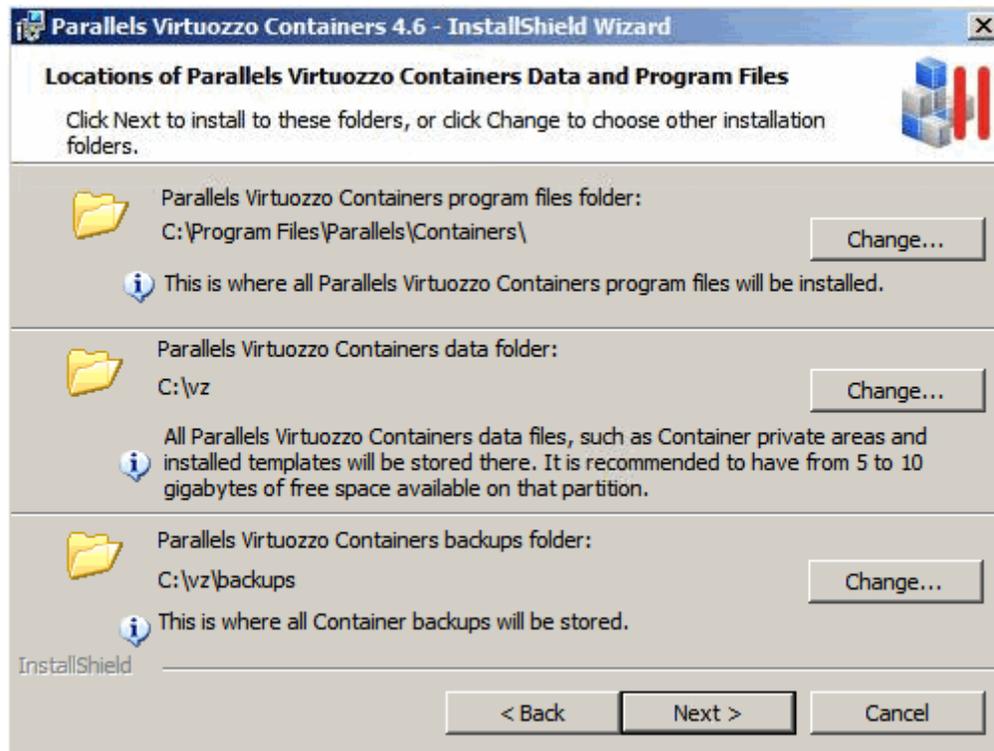
This window allows you to join the Parallels Customer Experience Program. If you choose to participate in the program (select **Yes, I want to participate** and click **Next**), Parallels will periodically collect the information about your physical server and Containers configuration and use it to make the product better fit your needs. No private information like your name, e-mail address, phone number, and keyboard input will be collected. For more details about the Customer Experience Program, click the **Learn more** button, or read the **Configuring your Participation in Customer Experience Program** section in the *Parallels Virtuozzo Containers 4.6 User's Guide*.

In the **User Information** window, you are asked to specify your personal information.



Enter the necessary information in the fields provided, and click Next.

On the next screen, specify the location for Parallels Virtuozzo Containers program files and the folders for keeping all Container data and backups.



The three folders specified in the given step of the wizard mean the following:

- The first folder with the default path of `C:\Program Files\Parallels\Containers` contains all Parallels Virtuozzo Containers program files including drivers, scripts, services, etc. specific for Parallels Virtuozzo Containers. You can specify another path for the folder by clicking the **Change** button and selecting the desired path. Keep in mind that if Parallels Virtuozzo Containers is uninstalled from your server, this folder will be also removed.
- The second folder is meant for storing all the data used by the Containers that you will be creating on the Node: private areas, installed templates, patches, logs, etc. By default, the `C:\vz` path is used. You can specify another path for the folder by clicking the **Change** button and selecting the desired path. While defining a path for this folder, keep in mind the following:
 - This folder cannot be a mount point, i.e. you cannot mount external disk partitions to this folder.
 - This folder cannot be a network share, i.e. it cannot be located on a server network drive.
 - The hard disk partition where this folder will be located should have no less than 10 Gb of free disk space.

Unlike the previous folder, this folder remains intact if Parallels Virtuozzo Containers is uninstalled from your server.

- The third folder is destined for keeping all Container backups created on the Node
 - by using the `vzabackup` utility (consult the *Parallels Virtuozzo Containers 4.6 Reference Guide* for detailed information on this utility) or
 - by means of Parallels Management Console and Parallels Virtual Automation/Parallels Power Panel if there is no default Backup Node or this Hardware Node is to serve as one. In the latter case, this folder will be used to store the Container backups from all Hardware Nodes registered in

Parallels Management Console/Parallels Virtual Automation. Detailed information on the way to manage Container backups in Management Console and Parallels Virtual Automation/Parallels Power Panel is provided in the **Operations on Containers** chapter of the *Parallels Virtuozzo Containers 4.6 User's Guide* and Parallels Virtual Automation/Parallels Power Panel online help, respectively.

The folder has the default path of `C:\vz\Backups`. You can specify another path for the folder by clicking the **Change** button and selecting the desired path. While defining the backup folder, make sure that it has sufficient disk space for housing multiple Container backups.

After you have specified the necessary folders, click **Next**. The Parallels Virtual Automation Installation window appears.



This window allows you to install Parallels Virtual Automation and its components on the Hardware Node. Using Parallels Virtual Automation, you can connect to the Parallels server and manage Containers with your favorite browser. In this window, you can do the following:

- **Install PVA Agent on the server.** Leave this option selected to install a special agent on the Hardware Node. This agent ensures the interaction between the Node, the Master Server (see below), and Parallels Virtual Automation. Without the agent installed, you will not be able to connect to your Node using Parallels Virtual Automation.
- **Create a Container and install PVA Management Node in it.** Choose this option to automatically create a special Container on the Node and install the PVA Management Node component in it. Once the PVA Management Node component is installed, the Container starts acting as the Master Server, ensuring the communication between the Hardware Node and the Containers hosted on it. You can register more than one Node with the Master Server. If you select this check box, you will go through a

number of additional steps to specify the parameters for the Master Server. These steps are described in the **Installing Parallels Virtual Automation Automatically** section (p. 28).

If you already have a Master Server in your network, clear the **Create a Container and install PVA Management Node** in it check box. You will be able to register your Node with this Master Server.

Notes:

1. To download and install Parallels Virtual Automation and its components, your server must be connected to the Internet.
 2. You can skip this step and install Parallels Virtual Automation and its components later. For information on how you can do it, see **Installing Parallels Virtual Automation Manually** (p. 30).
-

The **Ready to Install the Program** screen allows you to change your installation settings by clicking the **Back** button and making the necessary changes. Clicking the **Install** button on this screen starts the installation process. During the Parallels Virtuozzo Containers installation and configuration, the following operations are performed:

Note: If you use the `vzautoinstall46.exe` utility in the 'Download and install' mode, the **Ready to Install the Program** screen is skipped and the Parallels Virtuozzo Containers installation is initiated after clicking the **Install** button in the **Locations of Parallels Virtuozzo Containers Data and Program Files** window.

- 1 The necessary Parallels Virtuozzo Containers program files are installed on your server.
- 2 The Parallels web site is checked for available Parallels Virtuozzo Containers updates. If any updates are found, you will be presented with the **Recommended Updates** window listing the detected updates. To download and install any of the listed updates, select their names and click **Next**.

If your server fails to connect to the Parallels web site, you will be presented with the **Select Update Folder** window.

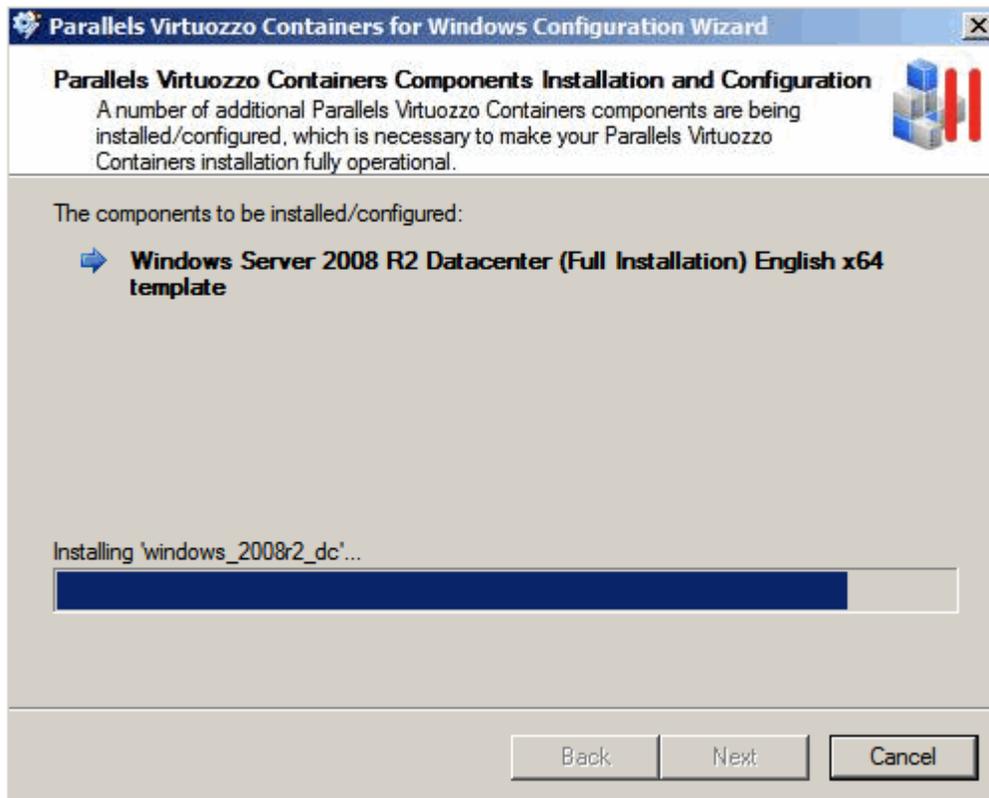


In this window, you can do the following:

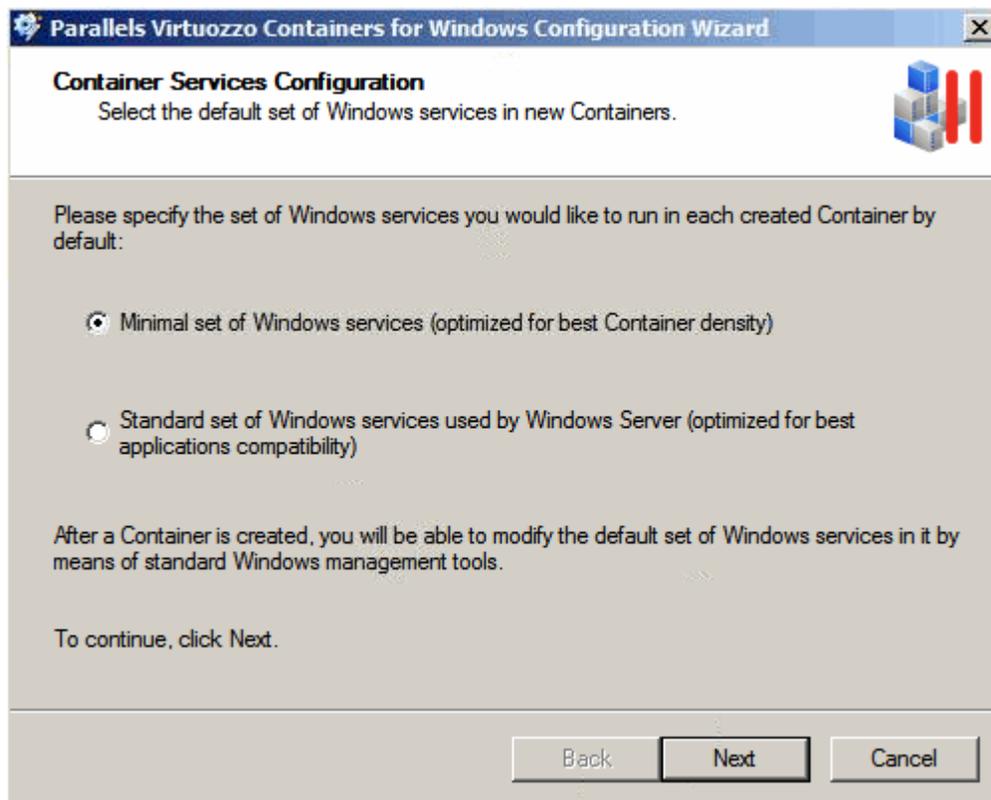
- Specify the path to a folder storing the latest Parallels Virtuozzo Containers updates. You can manually type the path in the provided field using one of the indicated formats or click the ... button and navigate to the folder. When you are ready, click OK.
 - Configure your proxy server settings to connect to the Parallels web site by using the **Proxy Settings** button and adjusting the necessary parameters. When you are ready, click OK.
 - Click the **Ignore** or **Cancel** button to skip the step of installing updates and continue with the Parallels Virtuozzo Containers installation.
- 3** The Parallels Virtuozzo Containers tools are installed on the Hardware Node. These tools include Parallels Management Console, Parallels Virtual Automation, and Parallels Power Panel and are intended to facilitate your working with the Parallels Virtuozzo Containers software. Parallels Virtual Automation and Parallels Power Panel are installed only if you select the corresponding options in the **Parallels Virtual Automation Installation** window.
- 4** Additional Windows Server components are added to your Host OS. The components installed on this step of the wizard represent standard Windows applications and are necessary to provide Containers you will create on the Hardware Node with the corresponding functionality. While adding Windows components, the wizard will ask you to provide a path to the Windows Server distribution files (either by inserting a CD with the Windows Server distribution kit or by clicking on the OK button in the displayed window and specifying the path to the distribution files).

Note: You must use the same Windows Server distribution kit as the one installed on your Hardware Node.

- 5** A number of additional Parallels Virtuozzo Containers components are installed on the Hardware Node. For example, the Windows Server OS template is installed during this step. This OS template is needed to create Containers on its basis.



Once the Parallels Virtuozzo Containers program files are installed, the Container Services Configuration windows appears. In this window, you can choose the set of Windows Server system services to be launched inside newly created Containers on their startup.



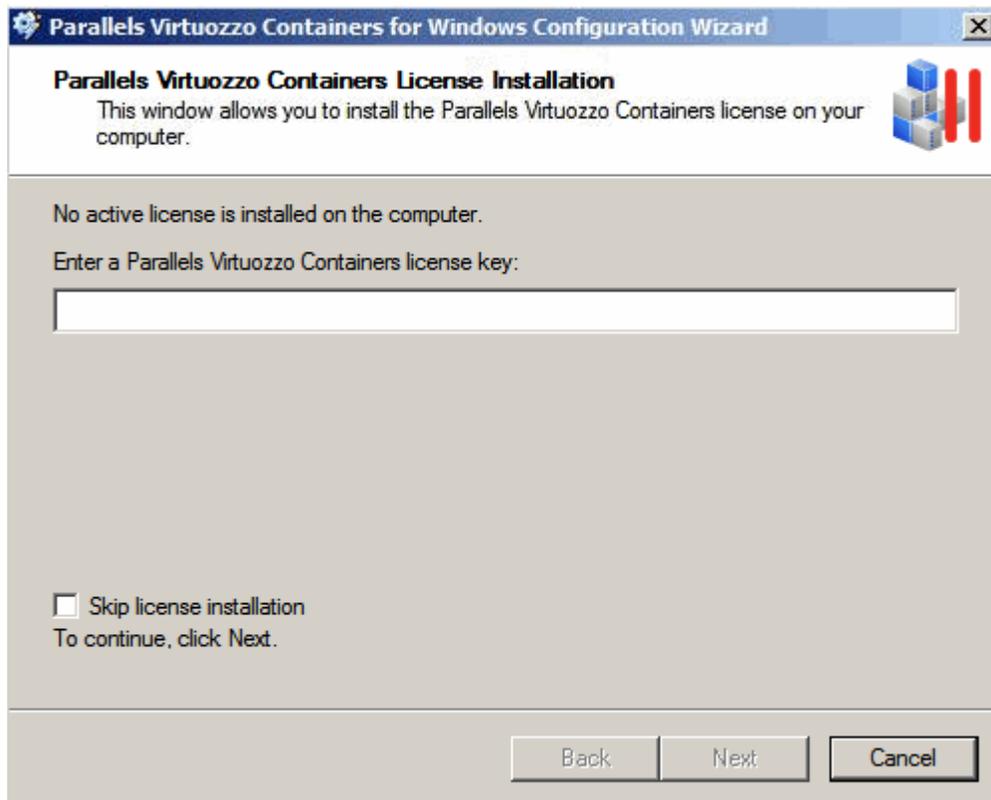
You can choose between the two system services sets:

- Select the **Standard set of Windows services used by Windows Server** radio button to automatically launch the standard set of Windows Server system services inside each newly created Container on its startup. The standard system services set includes the same services that would be launched inside any other standalone computer after installing Windows Server onto it.
- Leave the **Minimal set of Windows services** radio button selected to have the minimal set of Windows Server services running inside Containers after their startup. The minimal system services set differs from the standard one in the following:
 - It has the startup type of the *Print Spooler*; *Remote Registry*; *DNS Client* services set to manual.
 - The startup type of the *TCP/IP NetBIOS Helper*, *Computer Browser*, *Server* services in the minimal set corresponds to that of the version of Windows Server installed inside a Container, while in the standard set these services are always set to the automatic startup type.

As a result of these differences, the minimal set allows you to simultaneously run more Containers on the Hardware Node; however, you have to manually start the aforementioned services each time you need them inside this or that Container.

Note: After a Container has been created, you can configure the set of Windows system services to be run inside this Container on its startup using standard Windows Server tools (e.g. the Services snap-in or the `Sc . exe` command line tool).

In the last step of the wizard, you will be asked to install a valid Parallels Virtuozzo Containers license on the Hardware Node.



Every Hardware Node must have its own Parallels Virtuozzo Containers license installed. Licenses are issued by Parallels and needed to start using Parallels Virtuozzo Containers on your server. Although you can complete some tasks on the Hardware Node without having a license, you are not allowed to perform the majority of operations (e.g. start Containers) until you upload a valid Parallels Virtuozzo Containers license to the Node. In this window you can do one of the following:

- Install a Parallels Virtuozzo Containers license by enter the license key obtained from Parallels in the field provided and clicking **Next**.
- Skip the step of the Parallels Virtuozzo Containers license installation by selecting the **Skip license installation** check box and clicking **Next**. You will be able to install the license later on using the Parallels Virtuozzo Containers Configuration wizard (to launch the wizard, select **Programs > Parallels > Parallels Virtuozzo Containers > Parallels Virtuozzo Containers Configuration Wizard** on the Windows Start menu), Parallels Management Console, Parallels Virtual Automation, or the `vzlicload` utility.

After Parallels Virtuozzo Containers has been successfully installed and configured, the **InstallShield Wizard Completed** window is displayed. Click the **Finish** button to exit the wizard.

Installing Parallels Virtual Automation Automatically

The Parallels Virtual Automation application and its components are automatically installed during the Parallels Virtuozzo Containers installation if you choose the following options in the **Parallels Virtual Automation Installation** window:

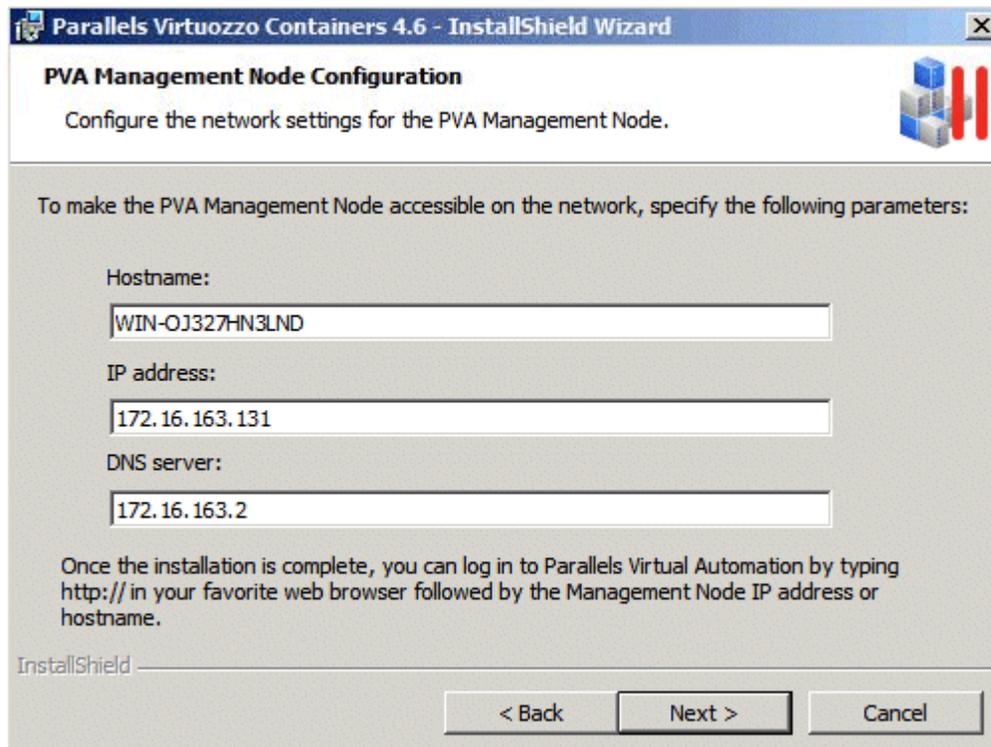
- **Install PVA Agent on the server.** Choose this option to install a special agent on the Hardware Node. This agent ensures the interaction between your Node, the Master Server, and Parallels Virtual Automation. Without the agent installed, you will not be able to connect to your Node using Parallels Virtual Automation.
- **Create a Container and install PVA Management Node in it.** Choose this option to automatically create a special Container on your Node and install the PVA Management Node component in it. Once the PVA Management Node component is installed, the Container starts acting as the Master Server, ensuring the communication between the Hardware Node and the Containers hosted on it. You can register more than one Node with the Master Server. If you select this check box, you will go through a number of additional steps to specify the parameters for the Master Server. These steps are described below.

Notes:

1. To download and install Parallels Virtual Automation and its components, your server must be connected to the Internet.
 2. If you already have a Master Server in your network, clear the **Create a Container and install PVA Management Node in it** check box. You will be able to register your Node with this Master Server.
-

If you choose to set up the Master Server, you will need to complete these additional steps:

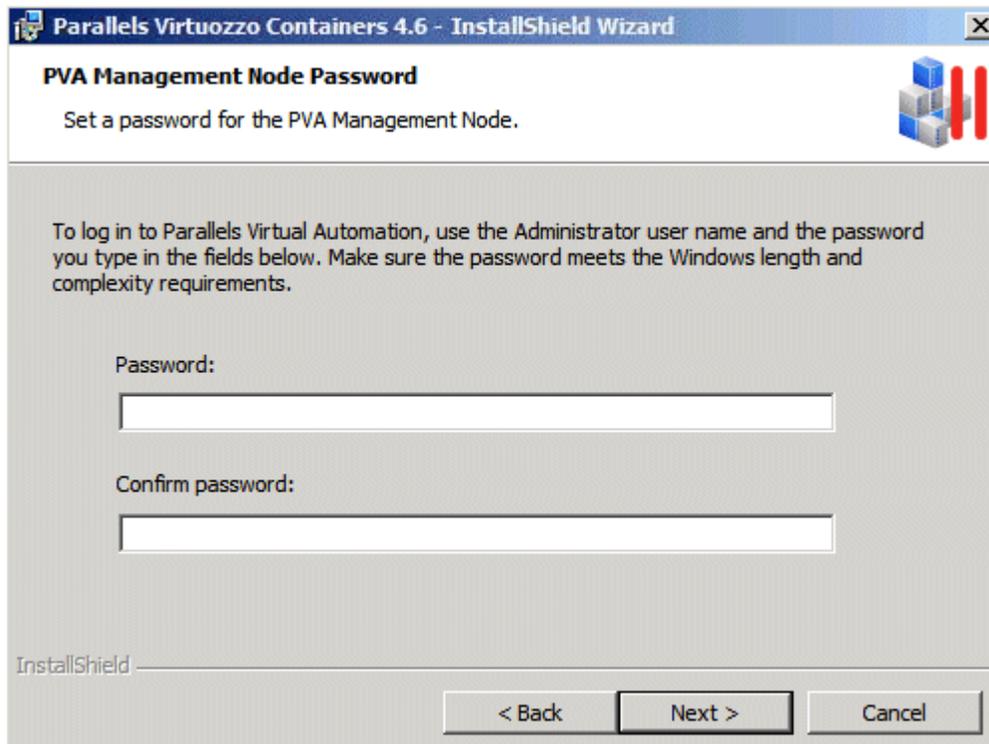
- 1** Specify the network parameters to connect to the Master Server.



In the PVA Management Node Configuration window, type in the following information for the Master Server:

- **Management Node Hostname.** A unique hostname for the Container. Once the installation is complete, you can log in to Parallels Virtual Automation by opening `http://hostname` in the browser and using the user name and password you will specify in the next step.
- **Management Node IP Address.** A valid IP address for the Container. The IP address must be unique within your network. Once the installation is complete, you can log in to Parallels Virtual Automation by opening `http://IP_address` in the browser and using the user name and password you will specify in the next step.
- **Management Node DNS Server.** One or more DNS servers to be used by the Container. If you do not know what address to type in this field, use the DNS server currently used by your Hardware Node.

2 Set the password to log in to the Master Server.



Once the installation is complete, you can log in to Parallels Virtual Automation using the hostname or IP address you assigned to the Container in the previous step, the Administrator user name, and the password you set in this step.

Notes:

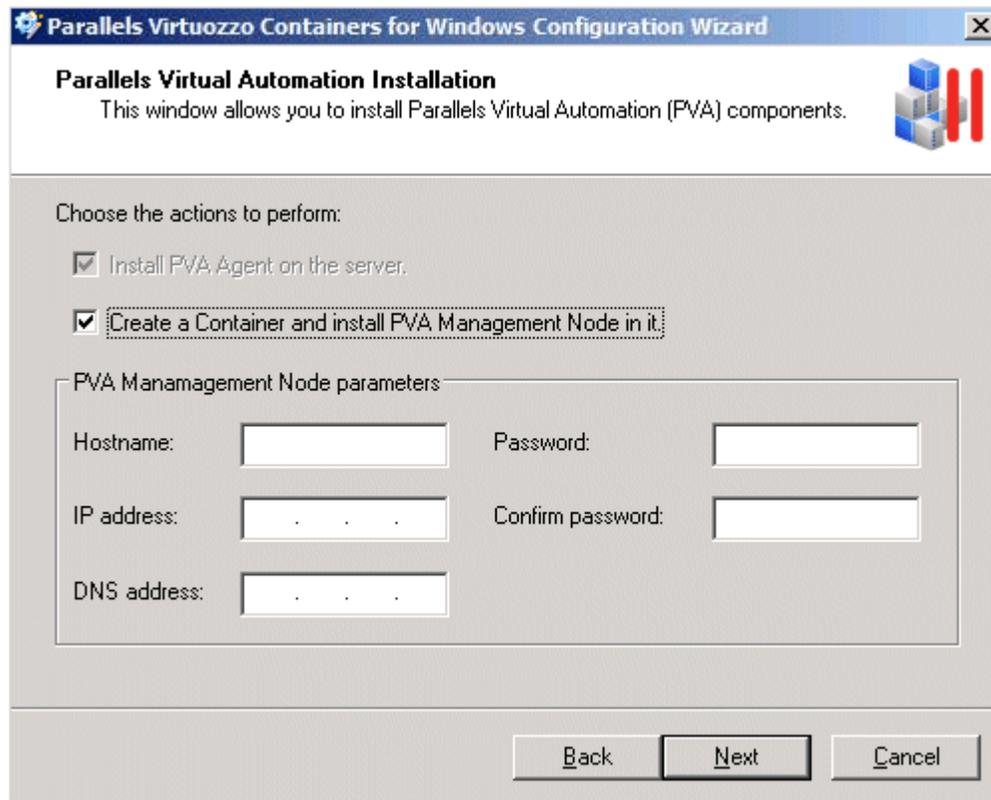
1. When choosing a password, make sure that it meets the Windows complexity policy. Otherwise, the installation will fail.
 2. For more information on using Parallels Virtual Automation to manage Hardware Nodes and Containers, see [Container Management With Parallels Virtual Automation](#) (p. 40).
-

Installing Parallels Virtual Automation Manually

Sometimes, the Parallels Virtual Automation application and its components are not installed on the Hardware Node during the Parallels Virtuozzo Containers installation. For example, this may be the case if you had no Internet connection when installing Parallels Virtuozzo Containers or the connection got broken for some reason.

At any time, you can install Parallels Virtual Automation or any of its components manually using the Parallels Virtuozzo Containers Configuration wizard:

- 1 Choose **Start > Programs > Parallels > Parallels Virtuozzo Containers > Parallels Virtuozzo Containers Configuration Wizard** to launch the wizard.
- 2 Click **Next** several times until the **Parallels Virtual Automation Installation** window appears.



- 3 Select the options for installing the PVA agent and Management Node components.
- 4 Specify the parameters for the Master Server, and follow the on-screen instructions to finish the wizard. For more information on Master Server parameters, see [Installing Parallels Virtual Automation Automatically](#) (p. 28).

Performing Postinstallation Tasks

After you have installed Parallels Virtuozzo Containers 4.6, perform the following tasks:

- 1 Install the latest Parallels Virtuozzo Containers updates.
- 2 Install a specific Windows hotfix on systems running Windows Server 2008 R2 and Windows Server 2008 R2 Service Pack 1.

Both tasks are described below in detail.

Checking for Updates

To make sure your Parallels Virtuozzo Containers installation is up to date:

- 1 Launch the **Parallels Virtuozzo Containers Update** wizard by clicking **Programs > Parallels > Parallels Virtuozzo Containers > Parallels Virtuozzo Containers Update Wizard** on the Windows Start menu.

- 2 Follow the on-screen instructions to check for and install the available updates. For details on using the Parallels Virtuozzo Containers Update wizard, see the **Keeping your Parallels Virtuozzo Containers System Up To Date** chapter in the *Parallels Virtuozzo Containers 4.6 User's Guide*.

Installing the Hotfix

If your server is running Windows Server 2008 R2 or Windows Server 2008 R2 Service Pack 1, download and install the hotfix <http://support.microsoft.com/kb/2707576> before starting to use Parallels Virtuozzo Containers.

Parallels Virtuozzo Containers Tools

In Parallels Virtuozzo Containers, you can use the following tools for managing servers running Parallels Virtuozzo Containers:

- *Parallels Virtual Automation* (formerly Parallels Infrastructure Manager). The comprehensive management solution that streamlines operations and reduces complexity of managing Hardware Nodes and Containers. Through self-service and automation, it allows administrators to lower costs and efficiently manage their infrastructure from anywhere using their favorite web browsers.
- *Parallels Management Console*. The remote management tool for Parallels Virtuozzo Containers with graphical user interface that allows administrators to manage Hardware Nodes and Containers.

The following sections provide information on how to prepare these Parallels tools for working in Parallels-based systems.

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Setting Up Parallels Virtual Automation

Parallels Virtual Automation is a tool providing you with the ability to manage Hardware Nodes and Containers with the help of a standard Web browser on any platform.

Logging In to Parallels Virtual Automation

To log in to Parallels Virtual Automation, launch a Web browser compatible with Parallels Virtual Automation. The list of currently supported Web browsers is given below:

- Internet Explorer 6.0 and above
- Firefox 2.x and 3.x
- Safari 3.x

Chances are that you will also be able to use other browsers, but Parallels Virtuozzo Containers has not been extensively tested with them.

To start managing your Hardware Node with Parallels Virtual Automation:

- 1 On the Master Server or any other computer, open your favorite Web browser and log in to Parallels Virtual Automation by typing the Master Server IP address or hostname and TCP port 4648 in the address bar. The resulting line may look like the following: `https://10.50.120.70:4648`.

When logging in from the Master Server, replace the IP address with `localhost`.

- 2 When the browser displays the login window, type the user name and password for the Master Server, and click the **Login** button.

Notes:

1. For information on installing Parallels Virtual Automation, see [Installing Parallels Virtual Automation Manually](#) (p. 30).

2. For more information on using Parallels Virtual Automation to manage Containers, see the [Container Management With Parallels Virtual Automation](#) chapter (p. 40).

Registering Hardware Nodes

To register a physical server in Parallels Virtual Automation, do the following:

- 1 Enter the server's IP address into the **Server Address** field in the **Connection to Physical Server** section.
- 2 Specify the Administrator credentials for the server in the **Administrative Login to Hardware Node** section.
- 3 Click the **Register** button to register the server.

You can register several physical servers with the same Master Server.

Setting Up Parallels Management Console

Parallels Management Console is a graphical user interface client that allows you to remotely manage a multitude of Hardware Nodes and their Containers.

Installing Parallels Management Console

Parallels Management Console is automatically installed on your Node during the Parallels Virtuozzo Containers installation. You can launch it by clicking **Programs > Parallels > Parallels Management Console** on the Windows Start menu.

If you want to use Management Console on a dedicated computer for the remote administration of your Hardware Nodes, you should manually install the Parallels Management Console software on this computer. To install Parallels Management Console on any workstation, launch the Parallels Management Console installation file. To get this file, follow this link: <http://sp.parallels.com/download/pvc46/>.

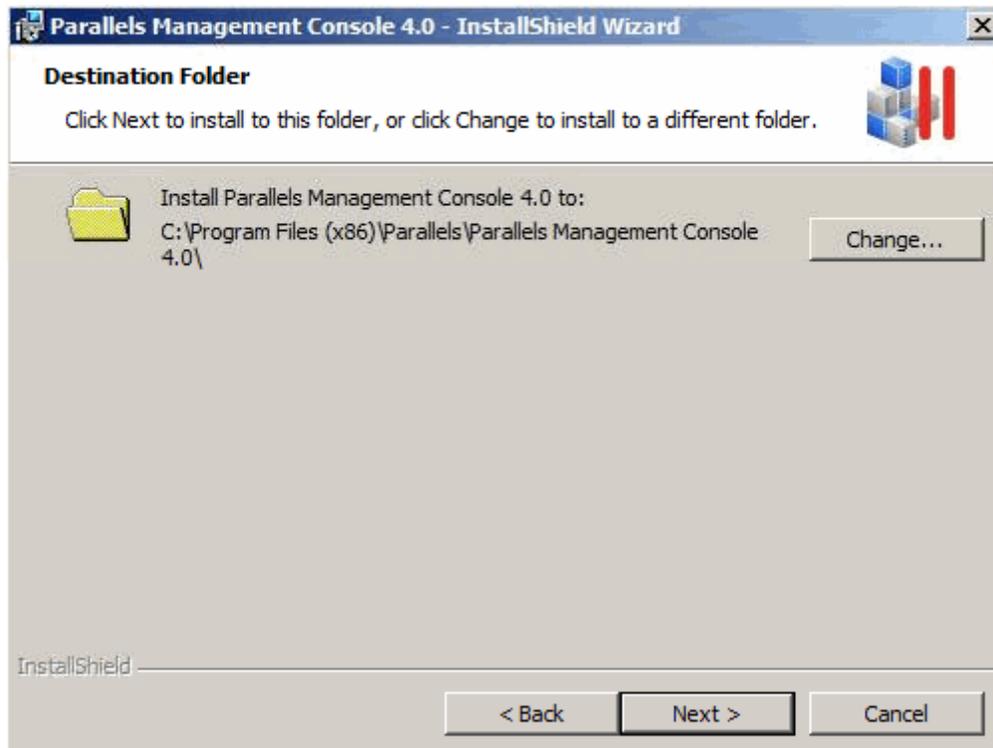
Once you have the installation file, copy it to the computer where you want to install Management Console, and execute it there. The Parallels Management Console InstallShield wizard will greet you with the Welcome screen.



Clicking the **Next** button will display the Parallels end user license agreement that you must accept to be able to install Parallels Management Console on the computer. Use either the PgDn key or the down arrow on your keyboard to read all the text of the agreement.

After you have selected the **I accept the terms in the license agreement** radio button and clicked **Next** on the **License Agreement** screen, the **Customer Information** window is displayed. Enter your name and organization in the fields provided, and click **Next**.

On the next screen, you are asked to specify the location for the Parallels Management Console installation files.



You can leave the folder offered by default or use the **Change** button to choose another folder.

After clicking the **Next** button, the **Ready to Install Program** screen appears. This window allows you to return to the previous steps of the wizard by clicking the **Back** button and modify the corresponding parameters. If you are satisfied with the settings made, click **Next** to start installing Parallels Management Console onto your computer. After a while, the **InstallShieldWizard Completed** window is displayed indicating that the installation process has successfully completed. In this window, you can do one of the following:

- Select the **Launch Parallels Management Console 4.0** check box, and click the **Finish** button to exit the wizard and to automatically launch Parallels Management Console after the wizard closing.
- Click the **Finish** button to exit the wizard. You can manually start Management Console by selecting **Programs > Parallels > Parallels Management Console** on the Windows **Start** menu or double-clicking the Parallels Management Console shortcut on your desktop.

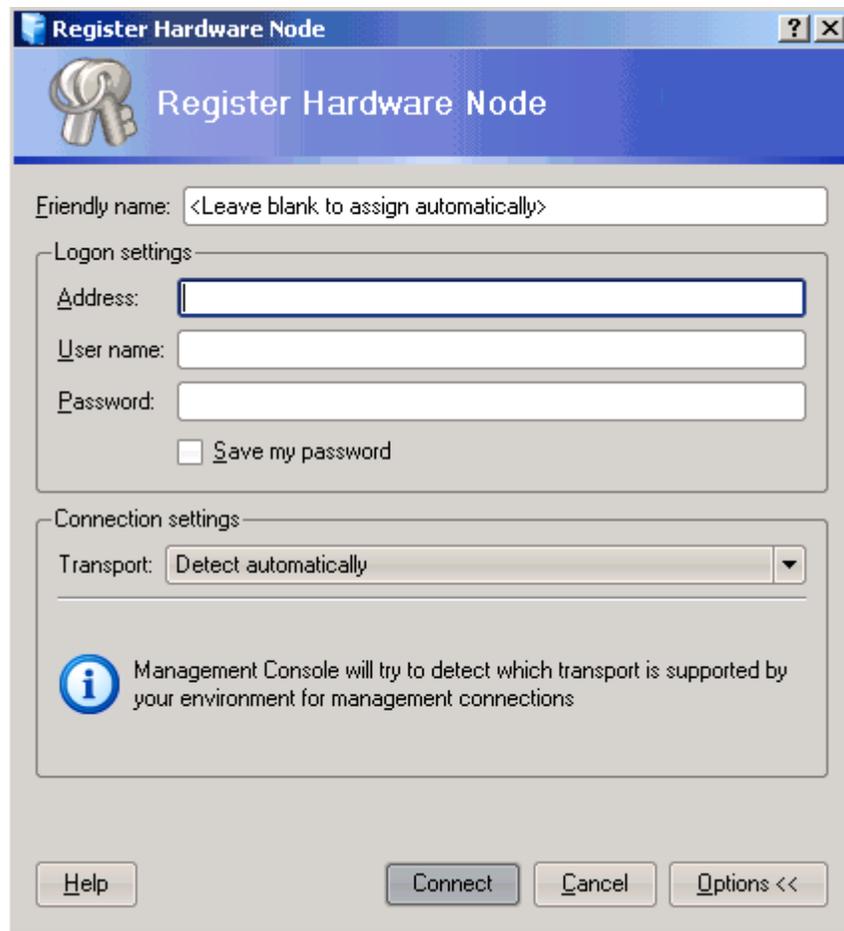
Registering Hardware Node

Before you can manage a Hardware Node by means of Parallels Management Console, you must register it there. Depending on whether you are using Parallels Management Console on your Hardware Node or on a remote computer, the register process will slightly differ:

Note: If you have not yet installed a valid Parallels Virtuozzo Containers license on the Hardware Node, you will be asked to do so by entering the license number in the field provided and clicking the **Submit**

button. For more detailed information on Parallels Virtuozzo Containers licenses, see the *Parallels Virtuozzo Containers 4.6 User's Guide*.

- If you are running Parallels Management Console on the Hardware Node itself, this Node will be automatically registered in Parallels Management Console. The Node will be registered with the name of `Local Server`. You can then change this name by right-clicking the Hardware Node in the Management Console left pane, selecting **Properties** on the context menu, and typing the desired name in the **Name** field on the **General** tab of the displayed window.
- If you are running Parallels Management Console on a remote computer, you should manually register your Hardware Node in Management Console. A special wizard will guide you through the registration process. To start the Node registration wizard, select the **Register Hardware Node** item on the **Action** menu. You will be presented with the **Register New Hardware Node** window.



In this window, you should enter the following information in the fields provided:

- **Friendly name.** A friendly name for the Hardware Node which will be displayed in the Management Console left pane and help you easily find your Node among other Hardware Nodes registered in Parallels Management Console. You may specify any name you consider suitable for the Node. You can also leave this field blank; in this case the hostname assigned to the Hardware Node will be used as its name (e.g., `MyNode.parallels.com`).
- **Address.** The IP address or hostname of the Hardware Node.

- **User name.** The user name to log in to the Hardware Node. Currently, you can log in to Parallels Management Console using the `Administrator` credentials only.
- **Password.** The password of the user specified in the `User name` field. If you are logging in as `Administrator`, please use the password you entered while installing the Windows Server OS on your server.

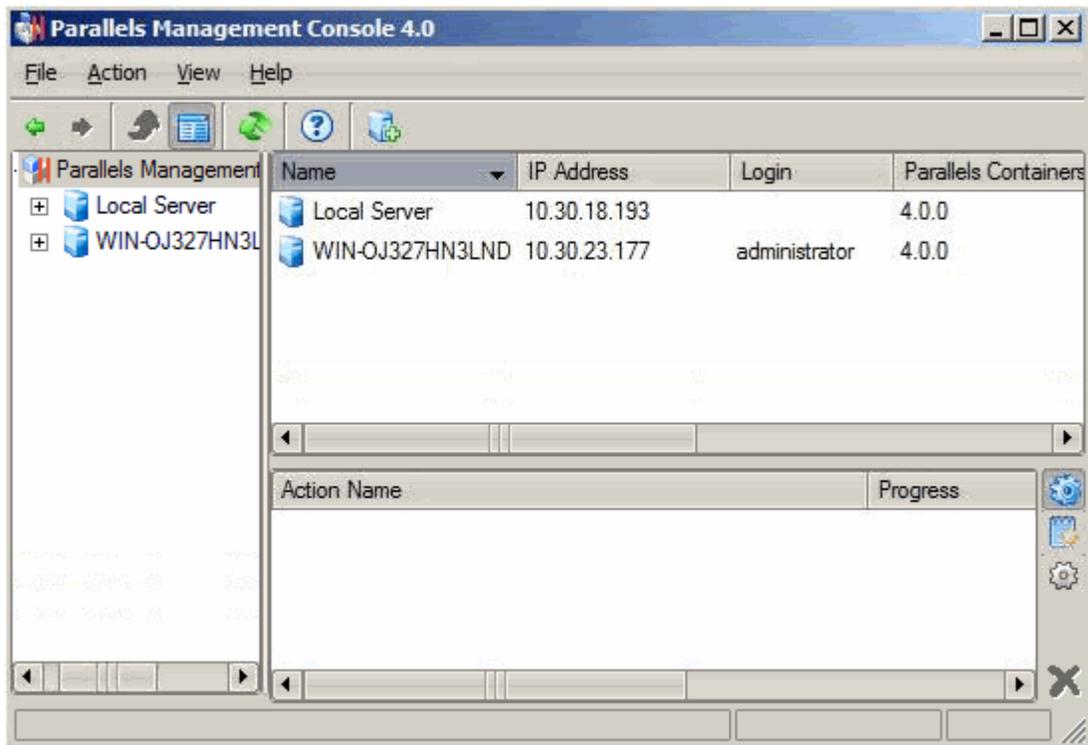
The `Save my password` check box, if selected, permanently saves the provided password on the computer where Parallels Management Console is installed; so, you will not have to enter the password each time when trying to access the Hardware Node anew.

- Under the **Connection settings** group, you can also choose the type of the transport protocol to be used to connect to the Hardware Node:
 - a** `Detect automatically.` Selecting this option lets the wizard automatically select the most appropriate protocol type for you. This option is selected by default.
 - b** `TCP/IP with SSL encryption.` Selecting this option allows you to use the TCP/IP protocol to connect to the Hardware Node while additionally securing your connection using the secure socket layer (SSL) protocol. This protocol type should be chosen if your Hardware Node has Parallels Virtuozzo Containers 4.6 installed on it. You can also change the port number to be used to connect to the Hardware Node via TCP/IP. The default port where the TCP/IP service is listening is 4434; you may modify it if necessary.
 - c** `Secure Socket Shell tunnel.` Selecting this option enables you to connect to the Hardware Node by means of the SSH (Secure Shell Protocol) protocol. This protocol type should be chosen if your Hardware Node is running a Parallels Virtuozzo Containers version earlier than 4.0. You can also choose a version of SSH and change the port number to be used to connect to the Hardware Node via SSH. The default port where the SSH service is listening is 22; you may modify it if necessary. You have an option to use SSH version 1 instead of default SSH version 2; however, we recommend using SSH version 2 because it provides a better security level.

Note: If the **Connection settings** group is hidden, you can display it by clicking the **Options** button at the bottom of the **Register New Hardware Node** screen.

After providing the necessary information and clicking the **Connect** button, the program will try to establish a secure connection to the Hardware Node.

Upon the registration completion, the Hardware Node name is displayed in both parts of the Management Console main window: the tree pane on the left and the view pane on the right.



Now you can start creating and managing Containers on the registered Hardware Node.

CHAPTER 5

Container Management With Parallels Virtual Automation

This chapter describes the basic operations you can perform on Containers using the Parallels Virtual Automation application.

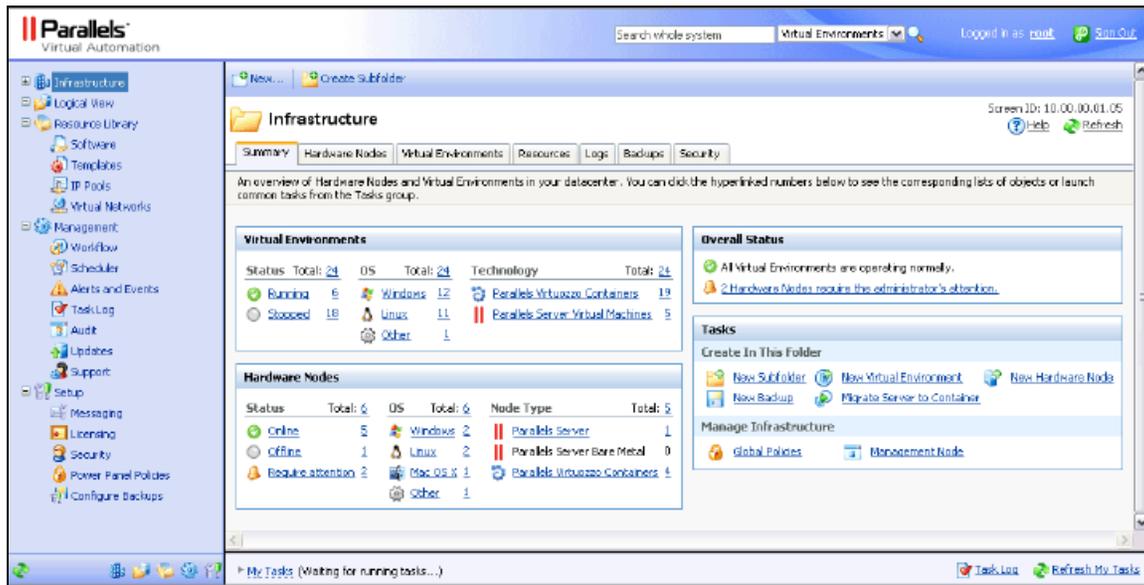
For more information on Parallels Virtual Automation, see its documentation at <http://sp.parallels.com/products/pva46/resources>.

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Interface Overview

The Parallels Virtual Automation interface has been designed to let the physical server administrator quickly perform all possible tasks through an intuitive navigation system. The picture below illustrates the interface layout.



The main components of the Parallels Virtual Automation interface are the following:

- The left menu frame listing and providing access to all physical servers and Containers and the main operations you can perform on them. The left menu contains the following submenus: **Infrastructure**, **Logical View**, **Resource Library**, **Management**, and **Setup**. Each submenu is intended for performing a certain set of tasks.
- The toolbar on top of the right frame enabling you to perform the basic actions on physical servers and Containers. The set of the toolbar buttons can vary depending on the type of the object you explore.
- The content part on the right frame displaying a summary for the object you select: a physical server, a Container, or a template. The content part may consist of several tabs, each containing more detailed information on the object and links to advanced actions.
- The **Tasks** pane at the bottom of the right frame allowing you to view detailed information on operations that have already finished or are running at the moment. For example, you can see the operation start time, its status, the object it is applied to, and other details. This pane is minimized by default. To expand it, click **Tasks** at the bottom of the screen.

Creating Containers

To create a new Container in Parallels Virtual Automation, do the following:

- 1 Click the **New** button, and choose **Virtual Environment** from the drop-down list.
- 2 On the **New Virtual Environments: Begin** screen, select **Parallels Virtuozzo Container**.

As you make the selection, you are prompted for the destination physical server information in the **Hardware Node Selection** section. You can either let Parallels Virtual Automation select the server for you, or specify one manually. When creating a new Container on an automatically selected server, you should also specify the desired operating system for the target physical server.

In the **Virtual Environment Configuration** section, specify the number of Containers to create.

Infrastructure > **New Virtual Environments: Begin** Screen ID: 11.00.00.00.00
Help Upper Level

This is the first step of the Virtual Environment creation wizard. On this screen you can specify the number of Virtual Environments and Virtual Environment Template. Click "Next" to proceed with the creation.

Virtualization Technology Selection

Parallels Virtuozzo Container
Operating System Virtualization

Parallels Server Virtual Machine
Hardware Virtualization (hypervisor)

Hardware Node Selection

Select Hardware Node Automatically
Specify a Platform * -- Select --

Select Hardware Node Manually
Select Node mccp10.qa.sw.ru

Virtual Environment Configuration

Number of Virtual Environments * 1

* Required fields Next Cancel

When you are ready, click Next.

- 3 On the New Containers: Setup screen, specify an arbitrary name for the Container, the OS template to base the Container on, and set the Administrator password to use to log in to the Container.

You can also configure a number of additional settings in the following sections:

- **Advanced Configuration** lists several customization options and advanced functions you can enable.
- **Terminal Services** enables you to define in which Windows TS mode (Remote Desktop for Administration and Terminal Server) the Container will operate and which licenses it will use.
- **Offline Management** enables you to define the services that will be available even when the physical server hosting the Container is down.

Infrastructure > **New Containers: Setup** Screen ID: 03.02.01.02.00
Help Upper Level

On this screen you can set up the configuration of the Container you are creating. Click "Next" to proceed with or "Create" to complete the creation process.

General Configuration

Name *

Description

OS Template/Version * /

Start the Containers After Creation

Administrative Password

Type Password

Retype the password

> **Advanced Configuration**

> **Offline Management**

> **Permissions**

* Required fields

When finished, click **Next** to define the network settings, or click **Create** to apply the default settings and create the Container.

- 4 On the **New Containers: Network Configuration** screen, specify the network parameters for the Container, such as the Container hostname and its IP address. Click **Next**.
- 5 On the **New Containers: Resources Customization** screen, you can adjust the Container advanced settings: CPU, memory, and so on. Since setting up these values is quite a challenging task, you can use the default settings.
- 6 On the **New Containers: Application Selection** screen, specify the applications you want to automatically install in the Container upon its creation. To choose an application, select it in the **Available Applications** list, and click to move it to the **Scheduled for Installation** list.
- 7 On the **Review** screen, check the Container configuration settings, and either click **Back** to go back to the previous steps and change them, or click **Create** to schedule the new Container creation task.
- 8 At this point, you will be redirected to the **Virtual Environments** tab of the **Infrastructure** window. The information bar at the top of the window informs you of the scheduled task and provides the **Details** link to the task progress information.
- 9 After the Container has been successfully created, you can find it in the list of available Containers. If it does not appear, click the **Refresh** button. and check again.

Starting, Stopping, and Restarting Containers

A Container can be started up, restarted, paused, and shut down like an ordinary computer. Depending on the Container state, only those operations are accessible that comply with its current state. For example, a running Container cannot be started for obvious reasons, and so on.

The current state of the Container is available in the **Status** table of the Container dashboard. The history of the status changes can be viewed from the **Logs > Tasks** page of the Container.

In Parallels Virtual Automation, you can use the **Start Virtual Environment**, **Stop Virtual Environment**, and **Restart Virtual Environment** buttons to perform the corresponding actions on Containers.

Deleting Containers

The **Delete** screen allows you to remove those Containers from your physical server that you do not need anymore.

To delete a Container, do the following:

- 1 Go to the **Virtual Environments** tab of the **Infrastructure** window, choose the Container, and click the **Delete** icon.

All Containers scheduled for removing are listed in the **Delete Virtual Environment** section of the **Delete** screen.

- 2 To delete the Container, select the **Yes, I want to delete the Virtual Environment(s)** check box, and click the **Delete** button.

When removing Containers, keep in mind the following:

- Removing a Container means that its private area is completely deleted from the Host OS and all its private files are irrevocably erased from the physical server.
- Deleting a considerable number of Container may take some time.

Logging In to Containers

You can use **Remote Desktop Connection**, a standard Windows application, to connect to a Container by means of the **Remote Desktop Protocol (RDP)**.

Note: The feature is available only for Internet Explorer 6.x and above.

To connect to a Container via RDP, do the following:

- 1 Make sure that the required Container is running. If it is not, start it.
- 2 Open the **Remote Desktop** window by selecting the corresponding option either from the Container's context menu (right-click the Container's name and select **Log In > Remote Desktop**), or from the Container's toolbar (click the **Log In** button, and choose **Remote Desktop**).
- 3 In the **Remote Desktop** window, click the **Login** button to open a Remote Desktop session.
If you are doing this for the first time, your browser may display a security warning asking you to install additional components. Click **Yes**, and wait for the Remote Desktop terminal window to appear.
- 4 In this window, specify the Administrator username and password you set for the Container during its creation, and click **Enter** to connect to the Container.

Managing Application Templates

The **Applications** subtab of the **Container Software** tab allows you to manage applications as follows:

- View the applications added to the Container as application templates as well as their up-to-date status.
- If some of the applications are not up to date (i.e. the updated versions of the corresponding templates or template packages are available on the physical server), update them by clicking the **Update Container Software** button on the toolbar.
- Use the **Manage Applications** button to add or delete application templates.

Using the Manage Applications button

The **Manage Applications** button, when clicked, opens the screen that allows you to manage applications available to the Container. On this page, you can do the following:

- View the applications already installed in the Container. These applications are listed in the **Installed/Scheduled Applications** table in the right part of the page.
- Install new applications into the Container. To add any of the applications from the **Available Applications** table to the Container, select the corresponding check boxes, and click the **>>** button. After that, the applications appear in the **Installed/Scheduled Applications** table in the right part of the page. Clicking the **Submit** button starts the installation process.
- Delete those applications from the Container that are not needed any more. To remove an application, select the check box next to it in the **Installed/Scheduled Applications** table, and click the **<<** button. After that, the application appears in the **Available Applications** table in the left part of the page. Click the **Submit** button to start the deletion process.

Managing Container Files and Folders

For a running Container, you can browse its folder structure, list the files and folders, and perform all essential file operations on the **File Manager** page. Once you open this page, you will see the list of drives existing inside the Container. You can click a drive to view its contents.

The main information on the folder/drive contents is presented in the form of a table.

Column Name	Description
Type	Type of the object: a folder or a file.
Name	Name of the folder/file.
Size	Size of the file.
Modified	Date and time of the last modification of the folder/file.
Actions	Hyperlinks for performing certain operations on the folder/file (see below).

Along with viewing the list of files and folders and their detailed information, you can manage files and folders as follows:

- Create new folders.
- Create new text files.
- Edit existing text files.
- Upload files from your local computer to Containers.
- Download files from Containers to your local computer.
- Copy and move files or folders from within Containers.
- Edit the properties of folders and files.
- Remove files and folders from Containers.

To perform an operation simultaneously on two or more folders or files, select their check boxes. The uppermost check box allows you to select all the files and folders at once.

Container Management With Parallels Management Console

This chapter outlines the major day-to-day operations that you are likely to perform with Containers using Parallels Management Console.

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Creating New Containers

Parallels Management Console uses one wizard to create and initially configure a Container. You can launch the **Create New Containers** wizard by selecting the **Parallels Virtuozzo Containers** item under the corresponding **Hardware Node** name in the Management Console left pane and choosing the **Create Container** option on the **Action** menu.

Name	OS Template	Architecture	Description
ADD5-role	w2k8R2	x86_64	
basic	w2k8R2	x86_64	
exchange-2007	w2k8R2	x86_64	

In this window, do the following:

- Select the Container configuration sample to be used as the basis for the Container creation. Configuration samples determine the main Container parameters, including the templates and resource management parameters. To make your first Container, you can choose the 'basic' configuration sample which is most suitable for creating standard Containers.
- Select the **Assign Container IDs starting from** radio button to manually specify the ID to be assigned to the Container (beginning with 101) or leave the **Assign Container ID automatically** radio button selected to let the wizard automatically assign the first unoccupied ID to the Container.
- Select the **Hostname** radio button to manually set a hostname for the Container or leave the **Assign hostname automatically** radio button selected to let the wizard automatically assign a hostname to the Container.
- Set the **Administrator** password for the Container by typing the desired password in the **Password** and **Confirm password** fields. You will need this password in future to connect to the Container by means of Parallels Power Panel or by using the standard Microsoft Terminal Services Client/Windows Remote Desktop Connection applications.

You can also specify a number of additional parameters on this page (e.g., define an arbitrary name for the Container or provide its description).

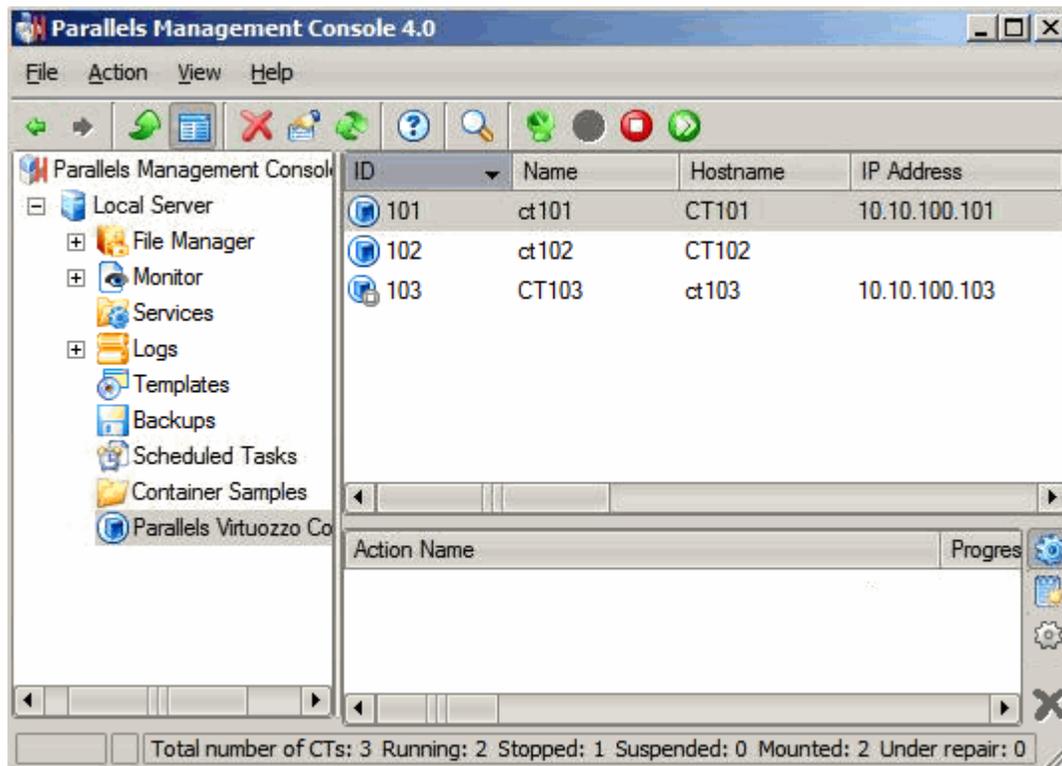
Once you enter all the necessary parameters, click **Next**. On the **Specify Network Settings for Containers(s)** screen, you can specify one or more IP addresses to be assigned to Container. To do this, select `venet0` (which is the name of the default virtual network adapter created for every Container on the Node) in the **Interfaces** table, click the **Properties** button, and set the needed IP addresses on the **IP Settings** tab of the displayed window.

You can click on the **Finish** button in this step of the wizard and create the Container with the configuration parameters specified in the configuration sample you chose in the first step. If you do not rely on any configuration sample, click the **Next** button instead of **Finish**. In this case, you will go through a number of steps of the wizard and set all the parameters of the new Container one by one. However, you can click **Finish** in every of the following steps of the wizard to start creating the Container.

Note: Detailed information on all parameters that can be set and configured during the Container creation is provided in the **Creating New Container** section of the *Parallels Virtuozzo Containers 4.6 User's Guide*.

Listing Containers

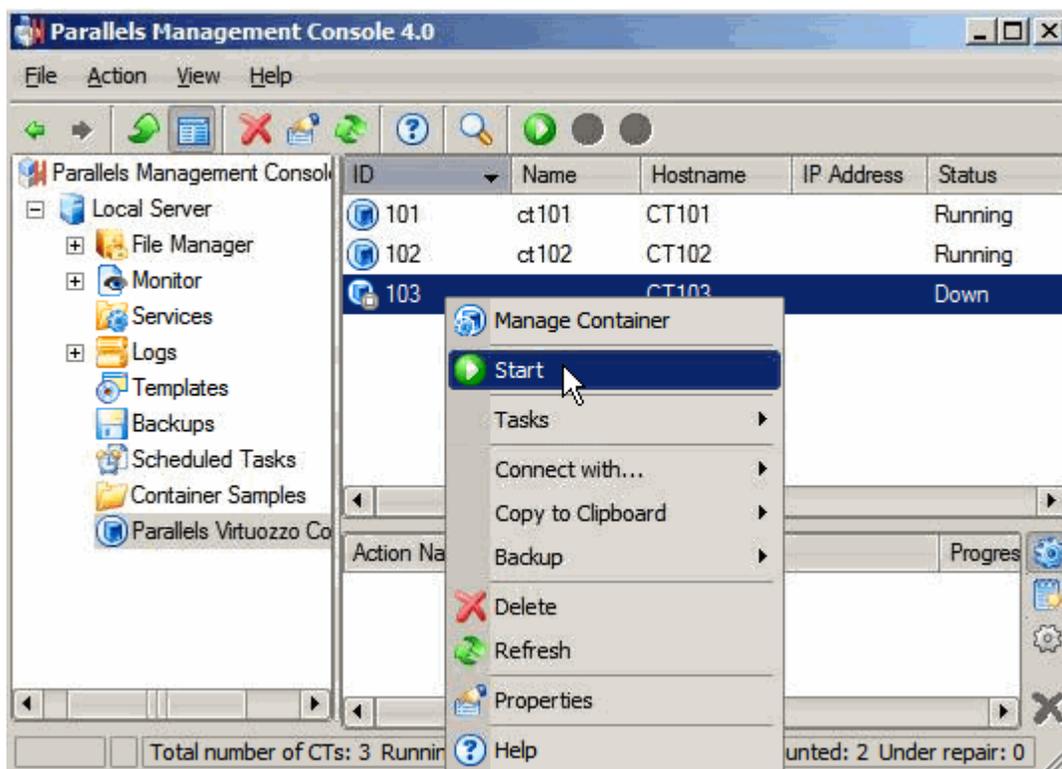
Very often you may want to get an overview of the Containers existing on the given Hardware Node and to get additional information about them: their IP addresses, hostnames, status, etc. In Parallels Management Console, you can display the list of all Containers by clicking the **Parallels Virtuozzo Containers** item.



You can see that currently Containers with IDs 101, 102, and 103 exist on the Hardware Node. All the Container vital information (its IP addresses, hostname, statuses, and so on) is presented in the Containers table. To facilitate working with Containers, you can sort them by different parameters: their ID, type, hostname, status, IP address, etc. Just click the column with the appropriate name to put Containers in the desired order.

Main Operations on Containers

When a Container is created, it can be started up and shut down like an ordinary server.



To start or stop one or more Containers, select it (them) in the Containers table in the right pane. You can use CTRL+Click to select or deselect a Container, SHIFT+Click to select a range of Containers, CTRL+A to select all Containers. Then click the **Start** or **Stop** button on the toolbar or select **Start** or **Stop** on the Action menu.

Keep in mind that starting or stopping a considerable number of Containers may take time. The progress is displayed in the Parallels Management Console Actions pane.

To delete a running Container, you must first stop it. To delete one or more Containers that have been already stopped, select it (them) in the Containers table in the right pane of the Management Console main window. You can use CTRL+Click to select or deselect a Container, SHIFT+Click to select a range of

Containers, CTRL+A to select all Containers. Then click the **Delete** button on the toolbar or select **Delete** from the **Action** menu.

You can change the parameters of any Container existing on the Hardware Node by right-clicking the name of the corresponding Container and selecting **Properties** on the context menu. In the displayed window, you can choose the **General**, **Network**, **Resources**, **Terminal Server**, **Options**, or **Advanced** tab to view and configure the necessary Container parameters.

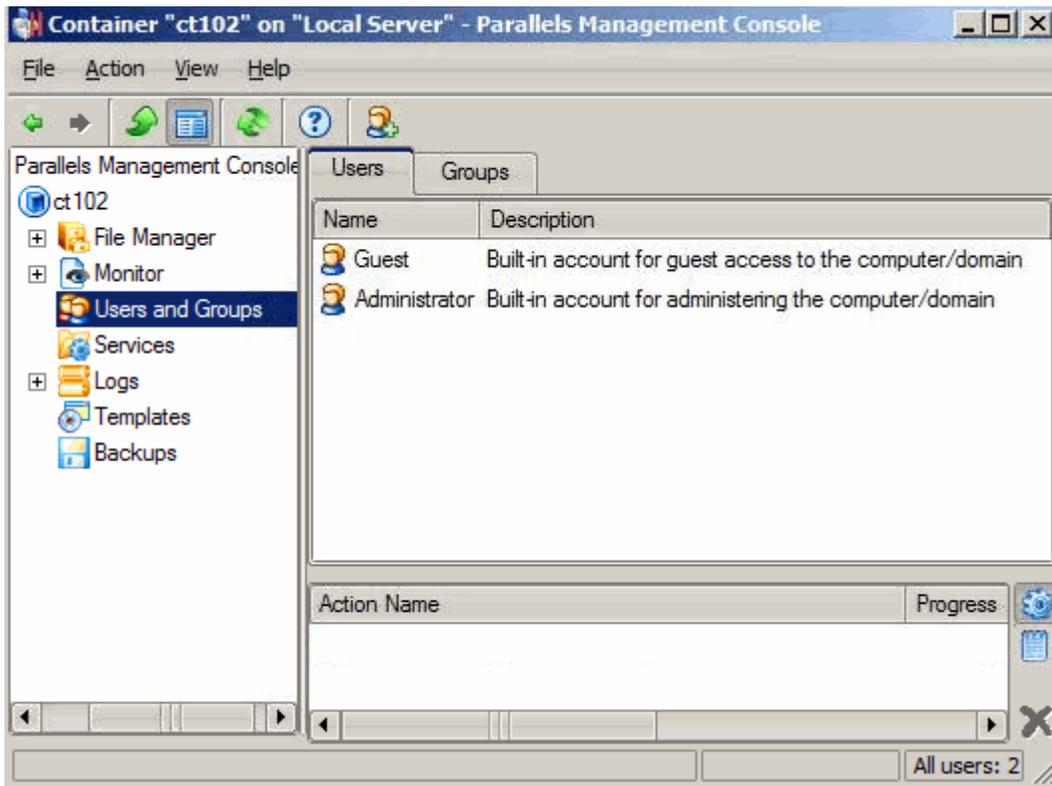
Operations Inside Containers

There are a number of operations that can be performed inside an individual Container only, i.e. by using the Container Manager accessible through selecting the **Parallels Virtuozzo Containers** item in the left pane of the Management Console main window and double-clicking the corresponding Container in the right pane.

Managing Users and Groups

Parallels Management Console allows you to manage users and groups inside Containers with the help of Container Manager. All users and groups are adjustable. You can also add new users and groups.

To manage groups or users inside a Container, open the main tree for this Container, select the **Users and Groups** item, and click either the **Users** or **Groups** tab to view the users or groups currently existing inside the Container, respectively.



To open the group properties dialog, double-click on the group name in the table of groups or select **Properties** on the context menu. To add a new user to the group, click the **Add** button. To remove a user from the group, select the user name, and press the **Remove** button.

To add a new group, click the **New Group** button on the toolbar (note that this button appears only if you are currently working with Container groups). Then enter the group name, and click **OK**.

To delete a group, select its name in the table of groups, and click the **Delete** button on the toolbar or select the **Delete** item on the context menu.

To add a new user, open the list of users and click the **New user** button at the top toolbar. Enter the user login (user name). This is the only mandatory parameter. You may also set the user description and password and add the user to one or more groups (see the **Member Of** tab). Then click **OK**.

To edit an existing user, double-click on the user name in the table of users or use the **Properties** item on the context menu. The user properties dialog is analogous to the **New User** dialog.

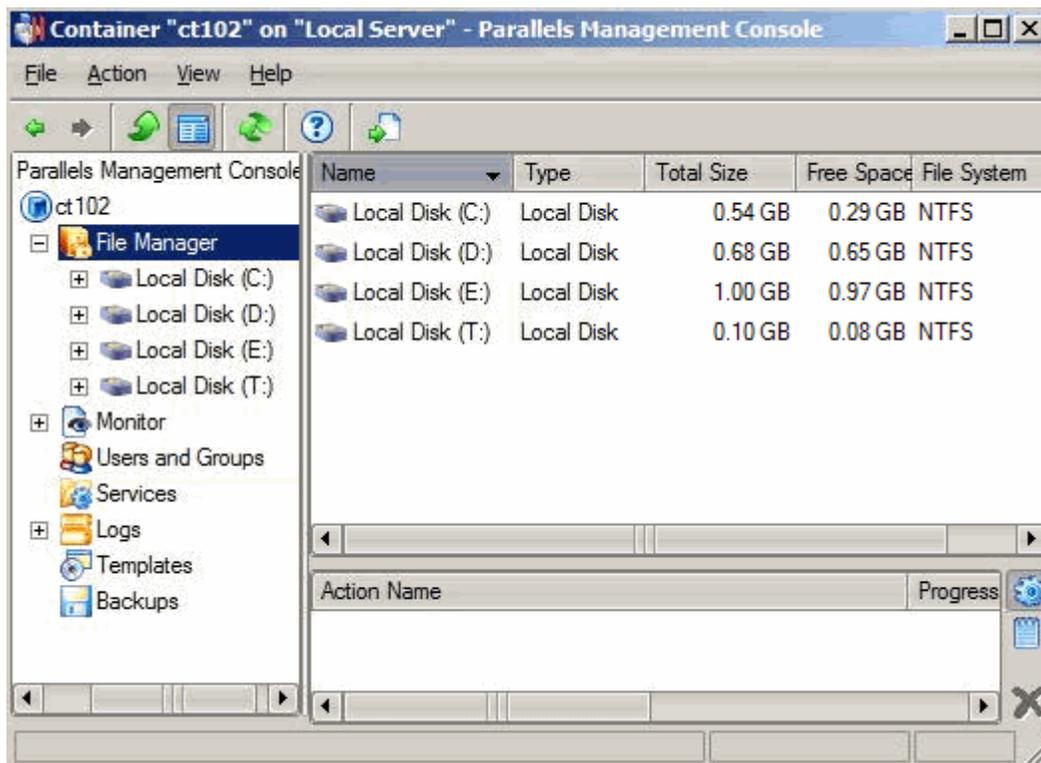
To change the password for a user, right-click the user in the table of users, select **Set Password** on the context menu, then enter the password in the fields provided.

To delete a user, select its name in the table of users and click the **Delete** button at the top toolbar or select the **Delete** option on the context menu.

Note: In the current version of Parallels Virtuozzo Containers, you cannot create Active Directory domain user accounts inside your Container by means of Parallels Management Console. However, you can log in to the Container which acts as a domain controller via RDP and create a domain user like you would do it on any other stand-alone Windows server.

Managing Files

Parallels Management Console allows you to manage files and folders inside Containers by means of the Container Manager window. To open the Container manager window, select the **Parallels Virtuozzo Containers** item in the left pane of the Management Console main window, and double-click the corresponding Container. Notice that the Container should be started in order to view its contents. After you expand the **File Manager** item in the Container main tree, you will see the list of disk drives available inside the Container.



The principles of working with the Container file manager are standard. You can move through the hierarchy of Container drives and folders by double-clicking their names or selecting the necessary drives and folders in the left pane. Use the menu items, toolbar buttons, table view, and context menus to perform the following tasks:

- View the contents of simple text files.
- View the principal information about a file/folder available inside the Container.
- Upload any number of files or whole folders from your local computer (the computer where Management Console is installed) to any folder in the Container.
- Download any number of files from the Container to your local computer.

- Create new folders within the drives of the Container.
- Copy files to another drive/folder of the Container.
- Move files to another drive/folder of the Container.
- Delete Container files/folders.
- Rename Container files/folders.

Parallels Management Console provides a user-intuitive interface for performing all these tasks.

Note: In the current version of Parallels Virtuozzo Containers, you cannot compress files and folders as well as encrypt them inside your Containers.

Installing Additional Software Inside Containers

While installing new applications inside your Containers, you can choose between two possibilities:

- Adding application templates to the Container by means of Parallels Management Console.
- Copying the application distribution files to the Container via RDP, MS TSC, or by using a standard Windows file sharing and then installing the application in a standard way from inside the given Container.

Adding Templates to Containers

Parallels Management Console allows you to add any number of templates to any number of Containers through a single wizard. The templates must have been installed on the Hardware Node beforehand. These are the steps to follow:

- 1 Click **Templates** under the name of the Hardware Node where the needed templates are installed, and then click the **Application Templates** tab.
- 2 Select all the needed templates holding down the CTRL or SHIFT keys where necessary.
- 3 Right-click the selection, and choose **Install Into Containers**.
- 4 Follow the instructions of the wizard.

If you are adding a template to only one Container, you can as well do the following:

- 1 Open the list of Containers in the Management Console main window by selecting the **Parallels Virtuozzo Containers** item in the Hardware Node tree.
- 2 Double-click the name of the Container where you want to add a template or a template update to open the Container Manager.
- 3 Right-click on the **Templates** item in the main tree, and choose **Add Application Template**.
- 4 Follow the instructions of the wizard.

Installing Applications Inside Container

You can install additional software inside Containers in the same way you would do it on any other standalone computer. To do this:

- 1** Connect to the Container where you wish to install an application via Remote Desktop Connection (RDC), MS Terminal Services Client (MS TSC), or by using a standard Windows file sharing.
- 2** Copy the corresponding application distribution to the Container. It may be, for example, such shareware applications as WinRAR (<http://www.rarlab.com/>) or Far Manager (<http://www.farmanager.com/>) or any other application.
- 3** Install the application the way you would do it in a normal Windows system by using the RDP or MS TSC protocols.

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