SWsoft, Inc.

Virtuozzo™ for Windows

Installation Guide

Version 3.5.1

SWsoft

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Preface

In This Chapter

About This Guide

This guide provides exhaustive information on the process of installing, configuring, and deploying your Virtuozzo for Windows system including the pre-requisites and the stages you shall pass.

Who Should Read This Guide

The primary audience for this book is anyone interested in installing and putting Virtuozzo 3.5.1 for Windows in operation on their computers. To perform the installation operations described in the guide, no more than basic Windows system administration habits is required.

Organization of This Guide

Chapter 2, Preparing for Virtuozzo Installation, explains the fundamentals of planning your Virtuozzo system, describes hardware and software requirements your system should meet, and sketches out the steps required to successfully install Virtuozzo 3.5.1 for Windows.

Chapter 3, Installing and Configuring Virtuozzo on Hardware Node, familiarizes you with the way to install and configure Virtuozzo on the Hardware Node. It also informs you of the ways to remove the current Virtuozzo installation from your computer.

Chapter 4, Installing Virtuozzo Management Console, contains instructions on how to install and put into operation Virtuozzo Management Console (VZMC) - a remote tool with graphical interface for managing your Hardware Nodes and Virtual Private Servers residing on them.

Chapter 5, Setting VZCC/VZPP to Work, provides information on how to set up Virtuozzo Control Center and Virtuozzo Power Panels - tools for managing a particular Hardware Node and/or individual Virtual Private Servers with the help of a standard Web browser.

Chapter 6, Setting Up Monitor Node, shows you the way to set up and configure the Monitor Node to keep track of the resources consumption on your Hardware Nodes and the state of the Nodes themselves.

Documentation Conventions

Before you start using this guide, it is important to understand the documentation conventions used in it. For information on specialized terms used in the documentation, see the Glossary at the end of this document.

Typographical Conventions

The following kinds of formatting in the text identify special information.

Formatting convention	Type of Information	Example
`Preformatted`	On-screen computer output in your command-line sessions; source code in XML, C++, or other programming languages.	`Saved parameters for VPS 101`
`Preformatted Bold`	What you type, as contrasted with on-screen computer output.	**`C:\Documents and Settings\Administrator> vzlist`**
`Monospace`	The names of commands, files, and directories.	Use `vzctl start` to start a VPS.
`Monospace Italics`	Designates a command line placeholder, which is to be replaced with a real name or value.	To destroy a VPS, type `vzctl destroy` *`VPSID`*.

Special Bold	All elements of the graphical user interface (GUI): menu items, menu options, menu buttons, etc.	Go to the QoS tab.
	Titles of chapters, sections, and subsections.	Read the Basic Administration chapter.
Italics	Used to emphasize the importance of a point or to introduce a term.	*Host Operating System* is an operating system installed on the Hardware Node.
CAPITALS	Names of keys on the keyboard.	SHIFT, CTRL, ALT
KEY+KEY	Key combinations for which the user must press and hold down one key and then press another.	CTRL+P, ALT+F4

Prompts in Command Examples

Command line examples throughout this guide presume that you are using the standard Windows command line that can be launched by entering cmd in the standard Windows Run dialog window. Inasmuch as you are supposed to work with Virtuozzo with an administrator's privileges, the commands presented in this guide are prepended with the following command line prompt: C:\Documents and Settings\Administrator>.

General Conventions

Be aware of the following conventions used in this book.

- Chapters in this guide are divided into sections, which, in turn, are subdivided into subsections. For example, Documentation Conventions is a section, and General Conventions is a subsection.
- When following steps or using examples, be sure to type double-quotes (") and single-quotes (') exactly as shown.

Feedback

If you spot a typo in this guide, or if you have thought of a way to make this guide better, we would love to hear from you!

If you have a suggestion for improving the documentation (or any other relevant comments), try to be as specific as possible when formulating it. If you have found an error, please include the chapter/section/subsection name and some of the surrounding text so we can find it easily.

Please submit a report by e-mail to userdocs@swsoft.com.

C H A P T E R   2

Preparing for Virtuozzo Installation

This chapter familiarizes you with the basics of planning your Virtuozzo system, describes hardware and software requirements your system should meet, and sketches out the stages you should pass to successfully install Virtuozzo 3.5.1 for Windows on your computer.

In This Chapter

Planning Your Virtuozzo System

Before installing the product, you should carefully plan the structure of your Virtuozzo network and the role(s) the individual computers are to perform in it. This will help you avoid many problems related to the Virtuozzo support maintenance and successfully solve the problems, if they appear.

The principal roles of computers in a Virtuozzo network are the following:

1 Hardware Node. It is a computer with the Virtuozzo software installed that houses a certain number of Virtual Private Servers.

2 VZMC workstation. It is a computer running a Windows OS with Virtuozzo Management Console (VZMC) installed. It may be located virtually everywhere on the Internet and serves for the remote administration of your Hardware Nodes.

3 VZCC client. It is a computer providing you with the ability to manage a particular Hardware Node and all Virtual Private Servers residing on it with the help of a standard Web browser on any platform. The only requirement this computer should meet is to be able to connect to the Hardware Node and run a Web browser supported by Virtuozzo.

4 Backup Node. It is a computer running the Virtuozzo software and used to store the Virtual Private Servers backups on its hard disk(s).

5 Monitor Node. It is a computer running a Windows OS that allows you to keep track of the resources consumption on your Hardware Nodes and the state of the Nodes themselves.

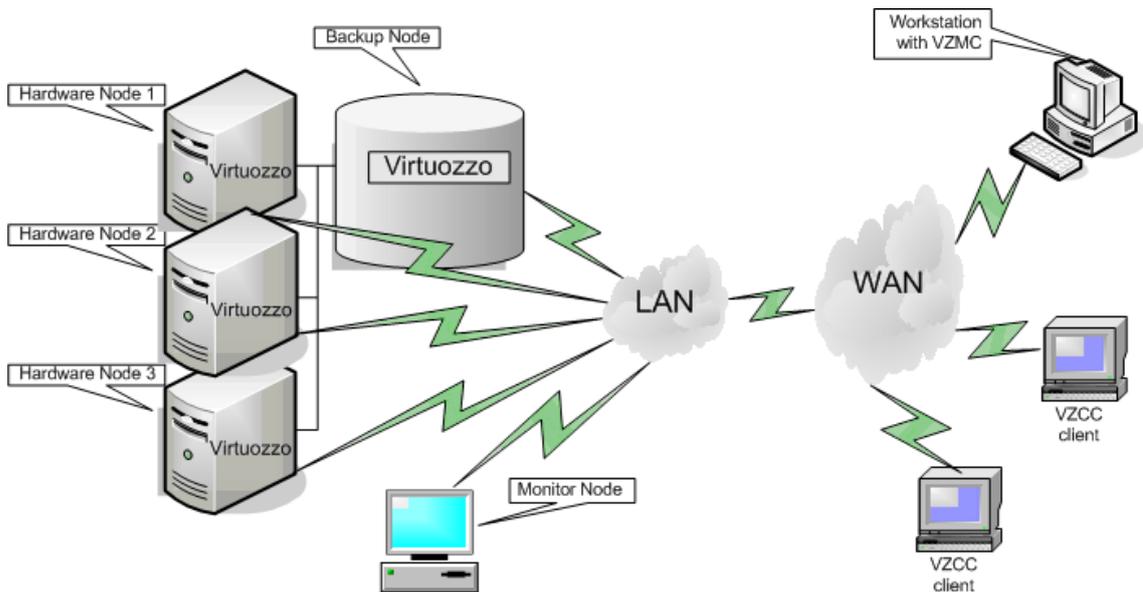Graphically, a typical Virtuozzo system may be represented as follows:

Figure 1: Virtuozzo System Configuration Scheme

This picture shows the configuration with a network consisting of a number of Hardware Nodes and two computers performing the functions of the Backup Node and the Monitor Node, respectively. As a rule, you are supposed to have several Virtuozzo-based physical servers; however, you may have only one dedicated server to effectively use Virtuozzo. All the Hardware Nodes have separate Virtuozzo licenses loaded to them and host a number of Virtual Private Severs. All VPSs residing on the Hardware Nodes can be migrated from one Node to another with near-zero downtime; so, you can easily move all VPSs from a Node in case of its upgrading or for any other purpose. It is recommended to keep all the Hardware Nodes in one subnet. In this case you will be able to transparently migrate VPSs from one Node to another without having to modify the VPSs IP addresses or the HN routing tables.

The Backup Node is a Node intended for storing the backups of all your Virtual Private Servers. Generally, any Hardware Node can be assigned an additional role of the Backup Node. However, we recommend that you set up a dedicated Backup Node (which is shown in the picture above). The Backup Node shall run Virtuozzo and have high-capacity hard drives to be able to store the VPSs backups on them. If you plan to use a dedicated Node for storing the VPS backups only, you do not have to install a Virtuozzo license on this Node.

The Monitor Node has a standard network interface, periodically checks up the state of the Hardware Nodes registered for being monitored, and sends alerts to you if a Node is down, up again, or a critical parameter is violated. No special requirements are set for the Monitor Node – it just has to be able to run a standard Windows system.

Apart from the aforementioned computers, you can make use of the following computers to remotely manage the Hardware Node(s) and Virtual Private Servers:

- A computer with VZMC installed. A VZMC workstation allows you to control multiple Hardware Nodes, to manage all their Virtual Private Servers, and to monitor the system.
- A computer where Virtuozzo Control Center is launched in a standard Web browser, which enables you to perform all the main operations on a particular Hardware Node and inside its Virtual Private Servers.

The picture above shows only one of the possible configurations you may choose while planning your Virtuozzo network. You can hold to this scheme or work out your own one and build your own Virtuozzo system. You may, as a matter of fact, assign all the roles (except for the Monitor Node) to one and the same Hardware Node, although you are not recommended to. The only requirement that you should fulfill while planning any Virtuozzo network is to make sure that all the Nodes running Virtuozzo are accessible from the other participating computers.

Installation Requirements

After deciding on the structure of your Virtuozzo system, please make sure that all the Hardware Nodes where you are planning to deploy Virtuozzo for Windows meet the following system and network requirements.

System Requirements

The hardware and software requirements for a standard Virtuozzo installation are the following:

1 Virtuozzo should be installed on a dedicated server running a fresh installation of Windows Server 2003 (English, German, French, Spanish, or Japanese Standard or Enterprise Edition).

Notes: 1. Although you may install Virtuozzo on computers running both Windows Server 2003 and Windows Server 2003 Service Pack 1, you are strongly recommended to upgrade your Windows Server 2003 installation to Service Pack 1 before installing Virtuozzo. This will allow you to avoid the necessity to manually upgrade all your Virtual Private Servers while changing from Windows Server 2003 to Windows Server 2003 Service Pack 1 in future.

2. Virtuozzo 3.5.1 can be installed on the following versions of Windows Server 2003 R2:
    -32-bit: English, Japanese, and German;
    -64-bit: English and Japanese.

Detailed information on how to prepare your Hardware Node to create Virtual Private Servers running Windows Server 2003 R2 is provided in the **Preparing Virtuozzo to Create VPS With Windows Server 2003 R2** subsection (on page 33).

3. If you are going to install the 64-bit version of Virtuozzo, you should make sure that your computer is running Windows Server 2003 x64 Edition (English or Japanese). In all other respects, installing and configuring the Virtuozzo version for both the 32-bit processors and the 64-bit processors are the same. For more information on the Virtuozzo 64-bit version, please turn to the **Virtuozzo 3.5.1 for 64-bit Processors** subsection of the **Virtuozzo Philosophy** chapter in the **Virtuozzo 3.5.1 for Windows User's Guide**.

4. If you are planning to use the Virtuozzo 64-bit version on your computer and to create Virtual Private Servers running German, Spanish, French, Simplified Chinese, or Traditional Chinese versions of Windows Server 2003 x64 Editions, you should first install the English version of Windows Server 2003 x64 Edition and then perform a number of additional steps described in the **Preparing Virtuozzo 64-bit for Creating Localized VPSs** subsection (on page 32).

2 No Windows Server 2003 updates from the Windows Update Web site should be installed on your computer before installing Virtuozzo. Detailed information on the process of updating your Windows Server 2003 OS after the Virtuozzo installation is provided in the **Updating Hardware Node Software** section of the **Managing Hardware Node** chapter in the **Virtuozzo 3.5.1 for Windows User's Guide**.

3 The directory where the Windows Server 2003 OS is installed should be `C:\WINDOWS\`.

4 The Windows Server 2003 OS installed on the Hardware Node must be activated.

5 The Windows Server 2003 distribution kit should not be patched, i.e. all the binaries inside the distribution kit should be in their original state as they are supplied by Microsoft Corporation.

In all other respects, there are no strict hardware or software requirements to the Hardware Node; if Windows Server 2003 is running on the given computer, Virtuozzo can be installed on it. The amount of hard disk space and memory present on the Hardware Node will determine the number and performance of VPSs you will be able to create and simultaneously run on the given Node. For example, to painlessly run as many as 10 Virtual Private Servers, each one having disk quota of 500 Mb, the Hardware Node should have at least 8 Gb of free disk space (calculated after the host Windows system is installed) and 1 Gb of memory. The amount of disk space needed augments together with the increase in VPS disk quota limits.

Network Requirements

The network pre-requisites enlisted in this subsection will help you avoid delays and problems with making Virtuozzo for Windows 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 Virtual Private Server you will be creating on the Node. The total number of addresses should be no less than the planned number of VPSs.

Note: The addresses to be assigned to Virtual Private Servers (including the Service VPS) 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 VPS. The VPS IP addresses are automatically assigned by Virtuozzo to the virtual adapters of the corresponding VPSs; so, you only have to specify what IP address is to be applied to what VPS.

Besides, if you are going to use Virtuozzo tools (VZMC and VZCC/VZPP) for managing your Hardware Nodes and Virtual Private Servers residing on them and/or to keep track of the resources consumption on your Node(s) by means of the Monitor Node or thru a Web browser, you may have to open the following ports in your firewall:

- 22: this port should be opened inside the Service VPS and is needed to be able to establish an SSH connection to the Service VPS from the computer where VZMC is installed;
- 4643: this port should be opened inside the Service VPS and is needed to be able to connect to the Service VPS and other VPSs on the Node thru VZCC/VZPP.
- 3141: this port should be opened on the Hardware Node and is needed to be able to view the information on the current HN resources consumption on the Monitor Node or thru a standard Web browser.
- 3389: this port should be opened on the Hardware Node and is needed to connect to your Virtual Private Servers be means of the standard Windows Remote Desktop Connection (RDP) application.
- 8049: this port should be opened on the Hardware Node and is needed to check the information on the current state of the Hardware Node thru a standard Web browser.

Virtuozzo Installation Overview

The Virtuozzo installation shall consist of the following major steps:

1 Installing and activating a licensed Windows Server 2003 operating system on your computer.

2 Upgrading your Windows Server 2003 installation to Windows Server 2003 Service Pack 1. This step is optional, though recommended.

3 Installing the Virtuozzo 3.5.1 for Windows basic pack on the Hardware Node.

4 Performing a number of necessary preliminary steps with the help of the **Virtuozzo for Windows Configuration** wizard. These steps include installing a number of application templates on the Hardware Node, installing the Windows 2003 Server OS template on and copying additional Windows components to the Node, and creating the Service VPS, which is responsible for accepting connections to the given Virtuozzo system from the outside. You are also supposed to install a Virtuozzo license on the Hardware Node on this step to start using Virtuozzo on your computer.

You may also need to install additional TS CAL (Terminal Service Client Access License) licenses on the Hardware Node to access your Virtual Private Servers by using the technology of Windows Server 2003 Terminal Services (i.e. via RDP/MS TSC). The default Windows Server 2003 installation permits you to have only 2 (two) RDP sessions per Hardware Node opened at the same time. This may result in the following limitations:

- If there are two RDP sessions opened simultaneously for any VPSs, you will not be able to establish an RDP connection to a third Virtual Private Server, the Service VPS, or the Hardware Node itself.

- If you are simultaneously connected to the Hardware Node and the Service VPS via RDP, you will not be able to establish an RDP connection to any Virtual Private Server residing on the Node.

Thus, to avoid possible Terminal Server licensing issues, we recommend that you install an additional TS CAL license for each Virtual Private Server you are going to create on the Hardware Node.

Besides, to facilitate managing your Hardware Nodes and Virtual Private Servers and to keep track of the resource consumption on your Nodes, you may want to additionally perform the following operations:

- Install Virtuozzo Management Console (VZMC) - a graphical tool for administering Virtuozzo and performing main administrative tasks on Hardware Nodes and in the VPS context - and register the needed Hardware Node(s).

- Set Virtuozzo Control Center (VZCC) and Virtuozzo Power Panels (VZPP) to work. These tools are intended for managing a particular Hardware Node and/or individual Virtual Private Servers residing on it with the help of a standard Web browser.

- Set up the Monitor Node allowing you to get information on the current HN resources consumption and determine the state of the Node itself.

All these steps are described below in the guide.

Note: If you have not uploaded a Virtuozzo license while configuring Virtuozzo (i.e. while running the **Virtuozzo for Windows Configuration** wizard), you can install it later either by using a graphical interface (VZMC or VZCC) or by means of the `vzlicload` utility. Detailed information on how to upload Virtuozzo licenses to your Node is provided in the **Managing Virtuozzo Licenses** section of the **Managing Hardware Node** chapter in the **Virtuozzo 3.5.1 for Windows User's Guide**.

Installation Checklist

We provide this checklist for your convenience. It contains the steps required to install Virtuozzo 3.5.1 for Windows successfully. Mark checkboxes as you finish the corresponding steps.

Installing Windows OS

❑ Install a fresh version of Windows Server 2003 on your computer.

❑ Activate your Windows Server 2003 installation.

❑ Optional, though recommended. Upgrade your Windows Server 2003 installation to Windows Server 2003 Service Pack 1.

Important! Please do not download any Windows Server 2003 updates (except for Service Pack 1) from the Windows Update Web site and install them on your computer before installing the Virtuozzo software. All the necessary Windows updates will be AUTOMATICALLY downloaded and deployed to your Node after the Virtuozzo installation.

Installing Virtuozzo	Express Installation	Standard Installation
❑ Install the Virtuozzo 3.5.1 for Windows basic pack on your computer by executing the Virtuozzo installation file.	auto	auto
❑ Update the current Virtuozzo for Windows installation by running the **Virtuozzo for Windows Update** wizard.	auto	auto
❑ Configure the Virtuozzo for Windows installation by running the **Virtuozzo for Windows Configuration** wizard.	auto	manual
❑ Install an additional TS CAL license on the Hardware Node for each VPS to be created on the Node, if needed.	auto	auto

Note: The 'auto' and 'manual' designations in the **Express Installation** and **Standard Installation** columns are used to indicate whether the corresponding operation will be automatically performed by Virtuozzo or you should manually initiate its execution depending on the Virtuozzo installation type you choose.

If you are going to use VZMC and/or VZCC/VZPP to manage your Hardware Nodes and Virtual Private Servers and to keep track of the resource consumption on your Nodes, you should additionally perform the following operations:

Installing Virtuozzo Management Console

❑ Install Virtuozzo Management Console.

❑ Launch VZMC and install a valid VZMC license.

❑ Register all the Hardware Nodes with Virtuozzo for Windows installed.

Configuring Virtuozzo Control Center

❑   Log in to Virtuozzo Control Center.

❑   Install a VZCC license.

❑   Set up the HN mail relay server.

Setting Up Monitor Node

❑   Prepare the Hardware Node to collect information on its resources usage and to send this information to the Monitor Node.

❑   Prepare the Monitor Node for receiving messages from the Hardware Node.

❑   Prepare the Monitor Node for sending alerts.

CHAPTER 3

Installing and Configuring Virtuozzo on Hardware Node

The given chapter provides information on how to install and configure Virtuozzo 3.5.1 on your Hardware Node. It also informs you of the way to remove the current Virtuozzo installation from your computer.

In This Chapter

Installing Virtuozzo Software

To install Virtuozzo 3.5.1 for Windows on any given Hardware Node, launch the **Virtuozzo Installation Wizard** by double-clicking the `virtuozzo_<language_name>.exe` installation file where `<language_name>` denotes the language of the Windows Server 2003 OS under which Virtuozzo is to be run (e.g. `virtuozzo_en.exe` to install Virtuozzo on systems running the English version of Windows Server 2003). The installation program will greet you with the following screen:
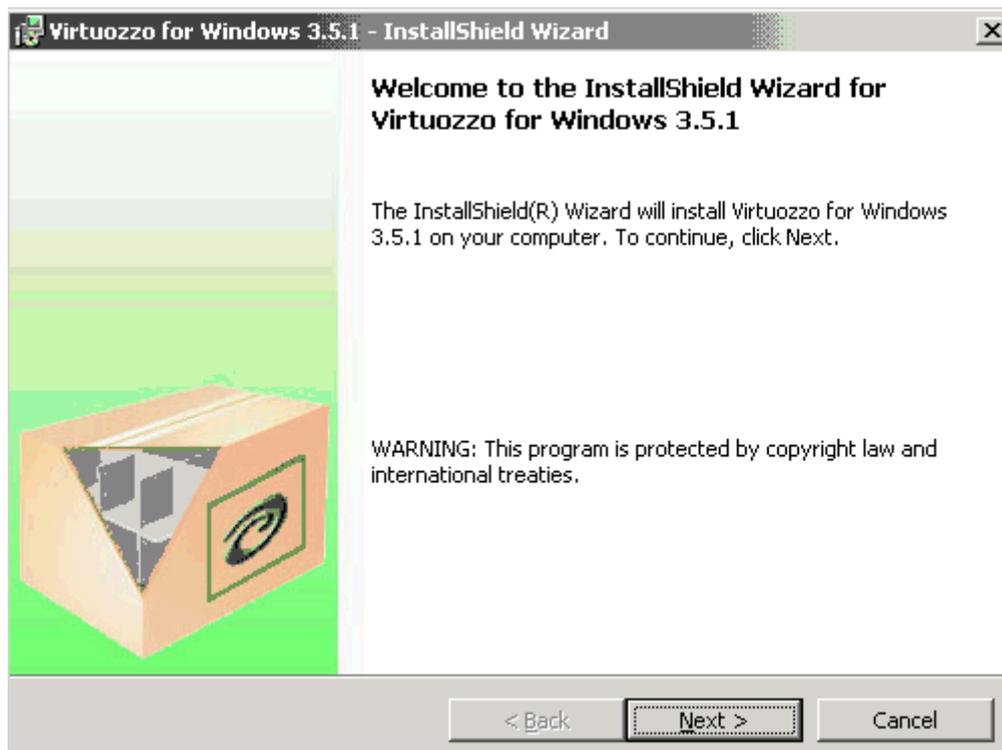
Figure 2: Installing Virtuozzo - Welcome to InstallShield Wizard

Pressing the **Next** button will display the SWsoft end user license agreement that you must accept to be able to install Virtuozzo. 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:
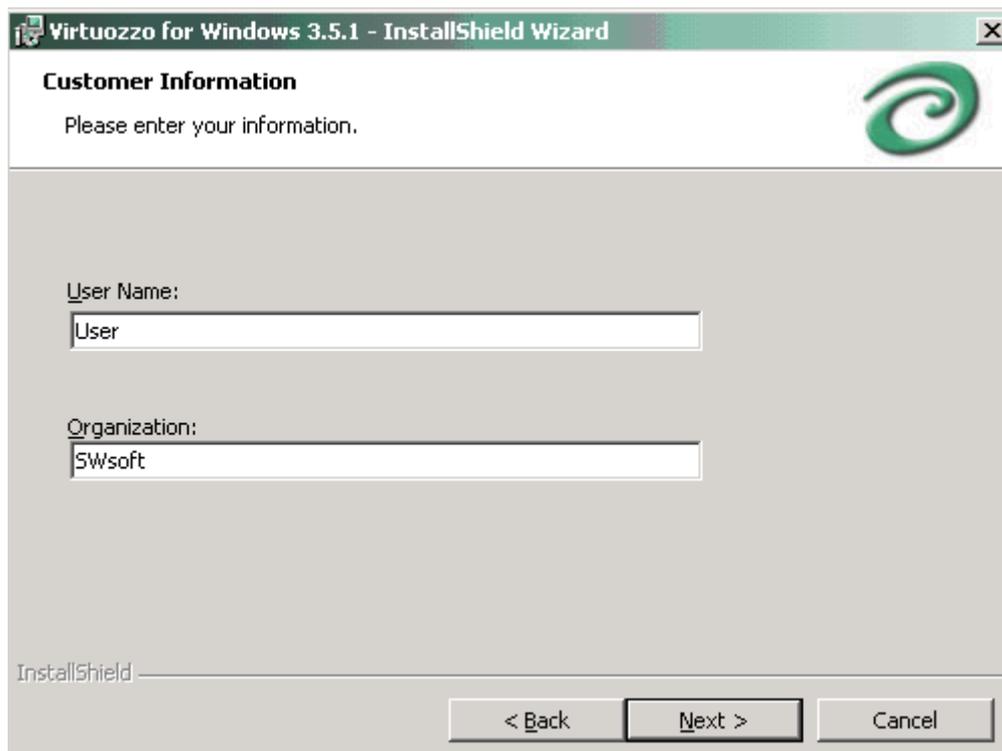
Figure 3: Installing Virtuozzo - Entering User's Information

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

On the next screen, you should specify the location for Virtuozzo program files and the folders for keeping all VPS data and Virtuozzo backups:

Figure 4: Installing Virtuozzo - Specifying Destination Folders

The three directories specified on the given step of the wizard mean the following:

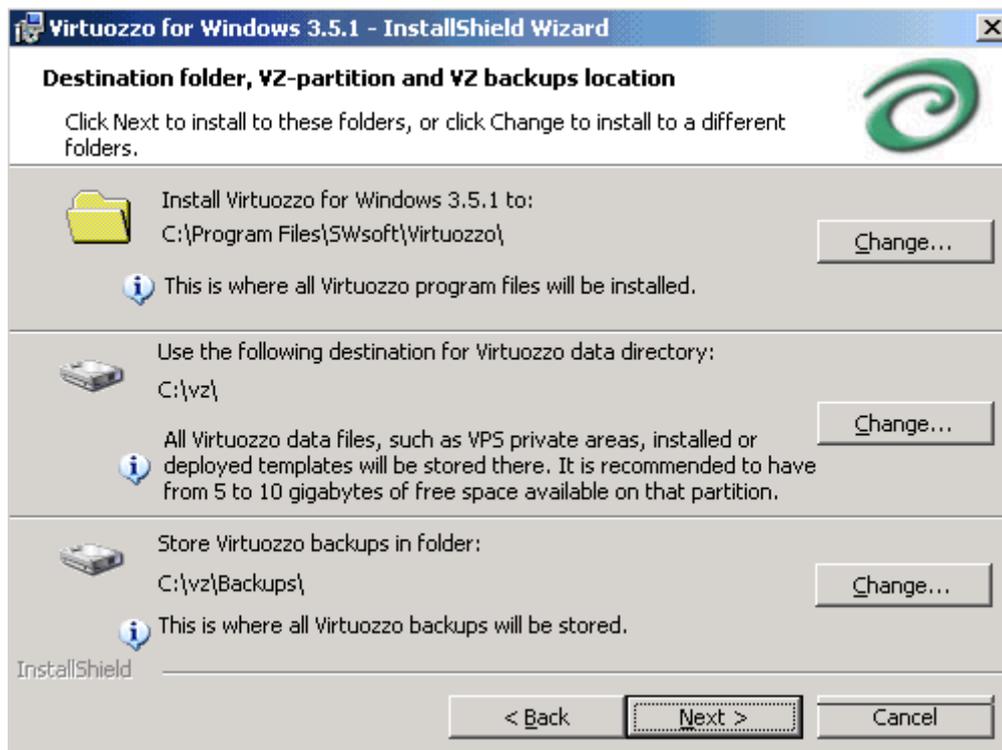- The first directory with the default path of `C:\Program Files\SWsoft\Virtuozzo\` contains all Virtuozzo program files including drivers, scripts, services, etc. specific for Virtuozzo. You can specify another path for the directory by clicking the **Change** button and selecting the desired path. Keep in mind that if Virtuozzo is uninstalled from your computer, this directory will be removed.

- The second directory is meant for storing all the data used by the Virtual Private Servers 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 directory by clicking the **Change** button and selecting the desired path. While defining a path for this directory, you should take care of the following:

  - This directory cannot be a mount point, i.e. you cannot mount external disk partitions to this directory.

  - This directory cannot be a network share, i.e. it cannot be located on a computer network drive.

  - The hard disk partition where this directory will be located should have no less than 10 Gb of free disk space.

  As distinct from the previous directory, this directory remains intact if Virtuozzo is uninstalled from your computer.

- The third directory is destined for keeping all VPS backups created on the Node

  - by using the `vzexport` Virtuozzo backup utility (see **Reference** in the **Virtuozzo 3.5.1 for Windows User's Guide** for the description of this utility);

  - by using the `vzbackup` Virtuozzo utility (consult **Reference** in the **Virtuozzo 3.5.1 for Windows User's Guide** for detailed information on this utility),or

  - by means of VZMC and VZCC/VZPP if there is no default Backup Node or this Hardware Node is to serve as one. In the latter case, this directory will be used to store the VPS backups from all Hardware Nodes registered in VZMC. Detailed information on the way to manage VPS backups in VZMC and VZCC/VZPP is provided in the **Operations on Virtual Private Servers** chapter of the **Virtuozzo 3.5.1 for Windows User's Guide** and VZCC/VZPP online help, respectively.

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

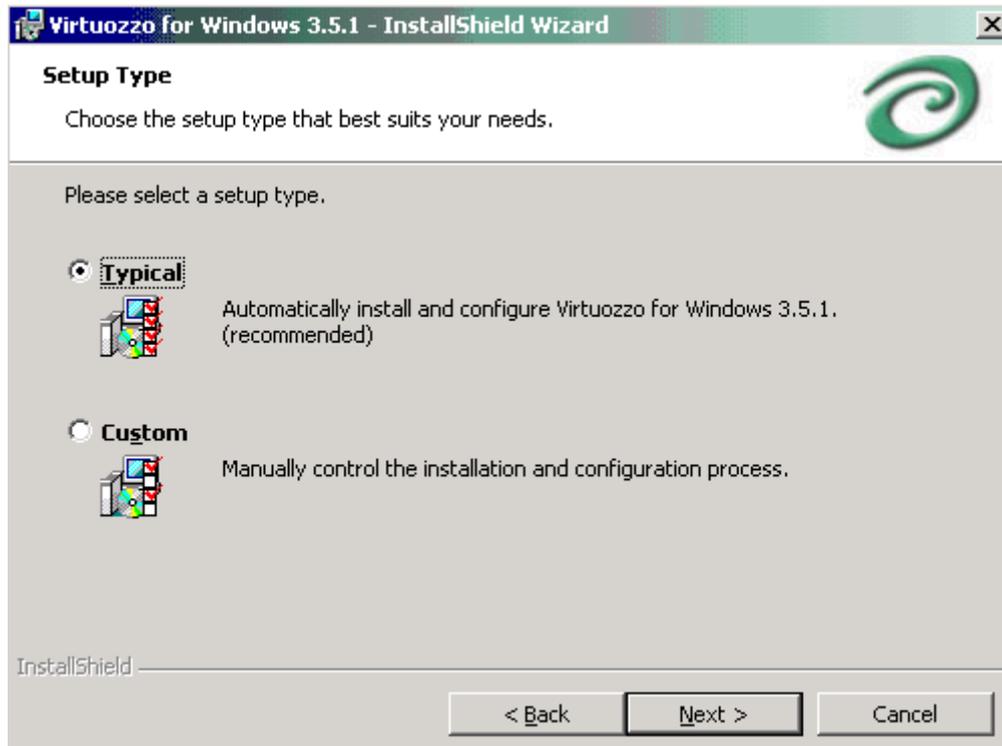After you have made decision on all the folders, click Next to display the Setup Type window:

Figure 5: Installing Virtuozzo - Choosing Setup Type

In this window, you are supposed to choose the Virtuozzo installation type:

- Typical: select this radio button to automatically install and configure Virtuozzo components. This is the simplest type of installation where most setup and configuration steps are automated and performed by the Virtuozzo installation and configuration wizards themselves. This type is recommended for most administrators who has no experience with Virtuozzo and/or is installing the Virtuozzo software for the first time.

- Custom: select this radio button to manually control and/or complete all the steps of the installation and configurations wizards. This is a more complex installation type recommended for advanced administrators only.

Depending on the installation type chosen, your further Virtuozzo installation steps will differ from each other. These steps are described in the following subsections in detail.

Express Virtuozzo Installation

If you have selected the Typical radio button and clicked Next in the Setup Type window, you will be presented with the Ready to Install the Program screen. This screen allows you to change your installation settings (e.g. the location for Virtuozzo program files) made on the previous steps of the wizard by clicking the Back button and making the necessary changes. Pressing the Install button on this screen starts installing and configuring Virtuozzo onto your computer.

During the Virtuozzo installation and configuration, the following operations are performed:

1   The necessary Virtuozzo program files are automatically installed on your computer.

2 Your Virtuozzo installation is updated to the latest version. This is done by means of the **Virtuozzo Update Wizard** which is automatically launched during the Virtuozzo installation. In this wizard, you should do one of the following:

- If your Hardware Node does not use a proxy server, i.e. it is directly connected to the Internet, just click **Next** on the **Welcome to the Virtuozzo Update Wizard** screen to start updating your Virtuozzo software.

- If you wish to use the proxy settings of your Internet Explorer or of an external proxy server to connect to the Internet, click on the **Proxy Settings** button on the **Welcome to the Virtuozzo Update Wizard** screen to display the **Enter Proxy Settings** window:
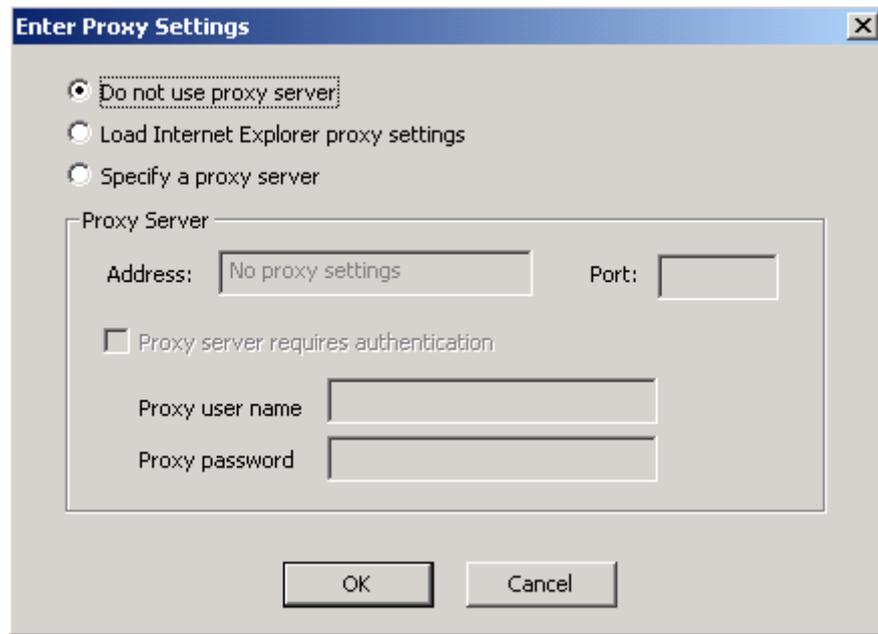

Figure 6: Installing Virtuozzo - Specifying Proxy Parameters

In this window, you can:

a Select the **Load Internet Explorer proxy settings** radio button to use your Internet Explorer proxy settings to connect to the Virtuozzo updating center.

b Select the **Specify a proxy server** radio button and specify the IP address and the port of the proxy servers to be used to connect to the Virtuozzo updating center in the **Address** and **Port** fields, respectively.

c If your proxy server is password-protected (i.e. you use a special user name and password to log in to the proxy server), you should also select the **Proxy server requires authentication** checkbox and specify the corresponding credentials in the **Proxy user name** and **Proxy password** fields.

Detailed information on how to update your Virtuozzo software by using the **Virtuozzo Update Wizard** is provided in the **Managing Hardware Node Software** chapter of the **Virtuozzo 3.5.1 for Windows User's Guide**.

3 Virtuozzo Management Console is automatically installed on your Hardware Node. VZMC is a graphical user interface client that allows you to remotely manage a multitude of Virtuozzo Hardware Nodes and their Virtual Private Servers.

4 The **Virtuozzo Express Configuration Wizard** is automatically launched:

Figure 7: Installing Virtuozzo - Specifying Service VPS Credentials

This wizard will help you complete the remainder steps needed to configure your Virtuozzo installation. The only thing the wizard will ask you before continuing with the Virtuozzo configuration is to specify the user password for the vzagent0 user in the fields provided. You will need to enter these user name and password every time you connect to the Hardware Node by means of VZMC and VZCC. The **Hide typing** checkbox allows you to choose the variant of the password writing:

- When the checkbox is selected, all symbols entered in the **Password** and **Confirm Password** fields are displayed as asterisks.

- When the checkbox is cleared, all symbols entered in the **Password** and **Confirm Password** fields are shown as they are in reality.

5 A number of application templates are automatically installed on the Hardware Node. These applications are needed to perform certain tasks in the Service VPS context or inside regular Virtual Private Servers.

6 The Windows Server 2003 template is automatically installed on the Hardware Node. The Windows 2003 OS template is needed to create Virtual Private Servers on its basis in future.

Note: If you are planning to create Virtual Private Servers running either German, Spanish, French, Simplified Chinese, and Traditional Chinese versions of Windows Server 2003 x64 Editions or English, German, and Japanese versions of Windows Server 2003 R2, you should perform a number of additional steps described in the **Preparing Virtuozzo 64-bit for Creating Localized VPSs** (on page 32) and Preparing Virtuozzo to **Create VPSs With Windows Server 2003 R2** (on page 33) subsections, respectively.

7 Additional Windows Server 2003 components necessary for running Virtuozzo on your Hardware Node are installed. While adding Windows components, the wizard will ask you to provide a path to the Windows Server 2003 distribution files (either by inserting a CD with the Windows Server 2003 distribution kit or by clicking on the OK button in the displayed window and specifying the path to the distribution files).

> **Note**: While adding the necessary Windows components, you must use the same Windows Server 2003 distribution kit as is installed on your Node.

8 The Service VPS is automatically created. You should create the Service VPS on every Node you are going to manage with the help of VZMC (Virtuozzo Management Console) or VZCC (Virtuozzo Control Center). The created Service VPS is assigned a private IP address by Virtuozzo. However, this IP address can have access/be accessed to/from other computers on the global network due to Network Address Translation (NAT) and port mapping settings configured by Virtuozzo in a special way during the Service VPS creation.

> **Note:** The Service VPS IP address will be configured in such a way as to access/be accessible to/from the outer world provided your Hardware Node has at least one valid public IP address assigned to it.

9 A Virtuozzo license is uploaded to the Hardware Node. On this step of the Virtuozzo configuration, you have to specify the path to your Virtuozzo license file by using the Browse button in the displayed window.

After Virtuozzo has been successfully installed and configured on your computer, the InstallShield Wizard Completed window is displayed where you should click on the Finish button to exit the wizard.

Custom Virtuozzo Installation

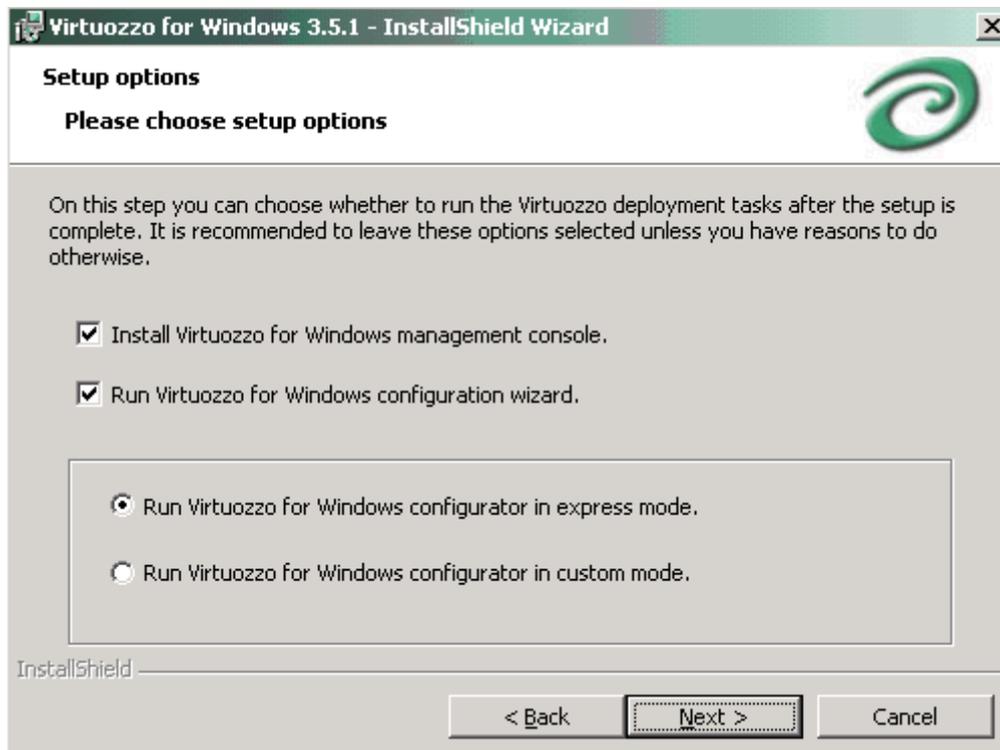Selecting the Custom radio button and clicking Next on the Setup Type screen displays the following window:

Figure 8: Installing Virtuozzo - Choosing Setup Options

This window allows you to specify the following options:

- Select the Install Virtuozzo for Windows management console checkbox to automatically install Virtuozzo Management Console (VZMC) on your Node during the Virtuozzo installation. VZMC is a graphical user interface client that allows you to remotely manage a multitude of Virtuozzo Hardware Nodes and their Virtual Private Servers.

- Select the Run Virtuozzo for Windows configuration wizard checkbox to automatically launch the Virtuozzo Configuration Wizard right after the Virtuozzo installation. Otherwise, you will have to manually launch the wizard by clicking Programs --> SWsoft --> Virtuozzo --> Virtuozzo Configuration Wizard on the Windows Start menu after Virtuozzo is successfully installed on your computer. This wizard allows your to perform a number of configuration steps necessary to make Virtuozzo fully functional. If this checkbox is selected, you are also supposed to choose one of the following options:

- **Run Virtuozzo for Windows configurator in express mode**: in this case the Virtuozzo installation and configuration will be the same as described in the **Express Virtuozzo Installation** subsection (on page 22), i.e. most of the steps will be automatically completed by the installation and configuration wizard. You only have to set the password for the vzagent0 user to manage your Hardware Node and its VPSs by means of VZMC and/or VZCC, to specify the proxy settings to connect to the Virtuozzo updating center, to provide a path to the Windows Server 2003 distribution files, and to define the path to your Virtuozzo license file. Please consult the aforementioned subsection to get detailed information on these steps. After you click **Next** in the **Setup Options** window, you will be presented with the **Ready to Install the Program** screen. This screen allows you to change your Virtuozzo installation settings made on the previous steps of the wizard by clicking the **Back** button and making the necessary changes. Pressing the **Install** button on this screen starts installing and configuring Virtuozzo onto your computer. After Virtuozzo has been successfully installed and configured on your computer, the **InstallShield Wizard Completed** window is displayed where you should click on the **Finish** button to exit the **Virtuozzo Installation Wizard**.

- **Run Virtuozzo for Windows configurator in custom mode**: in this case you are to manually control the processes of installing and configuring Virtuozzo on your computer. Moreover, you will have to manually specify most of the Virtuozzo configuration parameters (e.g. the Service VPS IP address).

    After you click **Next**, you will be presented with the **Ready to Install the Program** screen. This screen allows you to change your Virtuozzo installation settings made on the previous steps of the wizard by clicking the **Back** button and making the necessary changes. Pressing the **Install** button on this screen starts installing Virtuozzo onto your computer. During the installation, the **Virtuozzo Update Wizard** will be automatically launched helping you update the Virtuozzo software to the latest version. Please see the **Express Virtuozzo Installation** subsection (on page 22) for more information on how to work with the wizard.

    After Virtuozzo has been successfully installed on your computer, the **InstallShield Wizard Completed** window is displayed where you are supposed to select the **Launch Virtuozzo Configuration Wizard** checkbox to launch the **Virtuozzo Configuration Wizard** right after the **Virtuozzo Installation Wizard** exits. Detailed information on how to manually run and complete the **Virtuozzo Configuration Wizard** is provided in the next subsection.

Running Virtuozzo Configuration Wizard

You are supposed to manually control the process of configuring your Virtuozzo installation in the following cases:

- You selected the Run Virtuozzo for Windows configuration wizard checkbox and the Run Virtuozzo for Windows configurator in custom mode radio button in the Setup Options window. In this case the Virtuozzo for Windows Configuration wizard is automatically launched after you have successfully installed Virtuozzo on your computer, selected the Launch Virtuozzo Configuration Wizard checkbox in the InstallShield Wizard Completed window, and clicked on the Finish button to exit the Virtuozzo Installation Wizard.

- You cleared the Run Virtuozzo for Windows configuration wizard checkbox in the Setup Options window. In this case after Virtuozzo has been successfully installed on your computer, you can invoke the Virtuozzo for Windows Configuration wizard by selecting Programs --> SWsoft --> Virtuozzo --> Virtuozzo Configuration Wizard on the Windows Start menu.

The Virtuozzo configuration includes five major steps:

- Installing a number of application templates on the Hardware Node;
- Installing the Windows Server 2003 template on the Hardware Node;
- Installing additional Windows Server 2003 components necessary for running Virtuozzo on the Hardware Node;
- Creating the Service VPS, and
- Uploading a Virtuozzo license to the Hardware Node.

The three steps of installing application templates, installing the Windows Server 2003 OS template, and copying additional Windows Server 2003 components to your Host OS should precede the creation of the Service VPS.

After invoking the wizard, you will be presented with the Welcome to the Virtuozzo Configuration Wizard window where you should click Next to start configuring Virtuozzo on your computer. In the Application Templates Installation window, you are supposed to install the following applications on the Hardware Node:

- openssh (Secure Shell to remotely log in to VPSs);
- msde2000 (Micrsoft SQL Server Desktop Engine);
- vzagentve (Virtuozzo Agent for a regular VPS);
- vzagentsve (Virtuozzo Agent for the Service VPS).

You will need these applications to perform certain tasks in the Service VPS context or inside regular VPSs. For example, the vzagentve application allows Virtual Private Servers to be managed thru the Service VPS by means of VZMC or VZCC, which, however, is possible only on condition that vzagentsve is installed inside the Service VPS.

On the next step of the Virtuozzo for Windows Configuration wizard, you will be asked to install the Windows 2003 OS template on the Hardware Node:
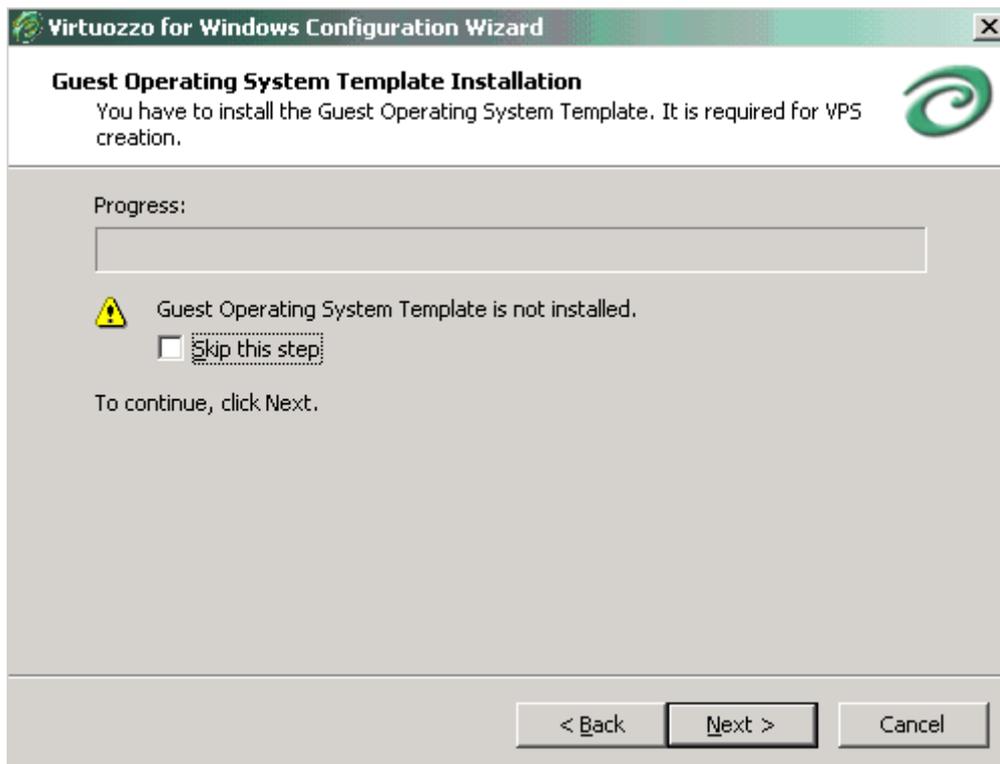
Figure 9: Configuring Virtuozzo - Installing OS Template

The Windows 2003 OS template is needed to create Virtual Private Servers on its basis in future. The Windows 2003 OS template is shipped with Virtuozzo; just press Next to start the installation. The OS template installation may take a rather long run. The progress is displayed in the Progress bar.

Note: If you are planning to create Virtual Private Servers running either German, Spanish, French, Simplified Chinese, and Traditional Chinese versions of Windows Server 2003 x64 Editions or English, German, and Japanese versions of Windows Server 2003 R2, you should perform a number of additional steps described in the Preparing Virtuozzo 64-bit for Creating Localized VPSs (on page 32) and Preparing Virtuozzo to Create VPSs With Windows Server 2003 R2 (on page 33) subsections, respectively.

In the Windows Components Installation window, you will be prompted to add certain Windows components to your Host OS. These components are necessary to make the installed Windows Server 2003 OS template fully operational, i.e. to be able to create Virtual Private Servers on its basis. Press Next to start adding components to the Host OS. During the installation, you will be presented with the window asking you to insert a CD with the Windows Server 2003 distribution kit into your CD-ROM drive. Alternatively, you can click on the OK button and provide a path to the Windows Server 2003 distribution files.

Note: While adding the necessary Windows components, you must use the same Windows Server 2003 distribution kit as is installed on your Node.

After that, the wizard asks you to define the parameters for creating the Service VPS:
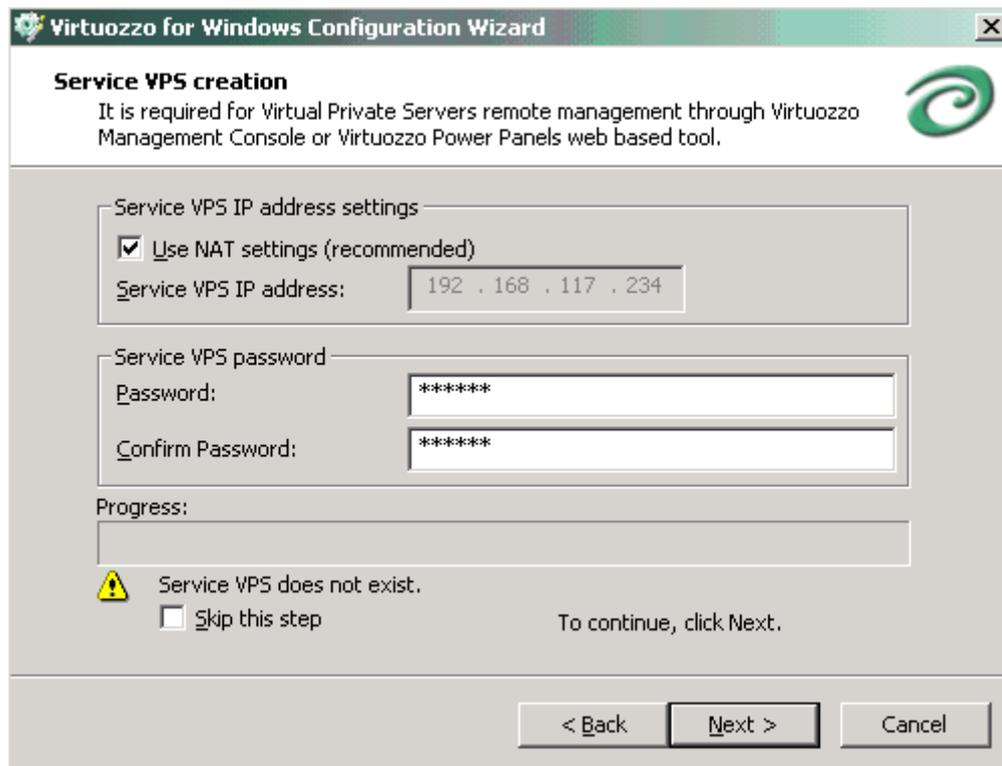
Figure 10: Configuring Virtuozzo - Creating Service VPS

You should create the Service VPS on every Node you are going to manage with the help of VZMC (Virtuozzo Management Console), VZCC (Virtuozzo Control Center), or VZPP (Virtuozzo Power Panels).

On the displayed screen, specify the Service VPS IP address and type the user password for the vzagent0 user in the fields provided. You will need to provide this IP address, user name, and password when connecting to the Hardware Node by means of VZMC and VZCC. While setting the Service VPS IP address, you can do one of the following:

▪ Select the Use NAT settings checkbox to let Virtuozzo automatically assign a private IP address to the Service VPS. This private IP address will have access/be accessed to/from the Internet due to Network Address Translation (NAT) and port mapping settings configured by Virtuozzo in a special way during the Service VPS creation.

Note: The Service VPS IP address will be configured in such a way as to access/be accessible to/from the outer world provided your Hardware Node has at least one valid public IP address assigned to it.

▪ Clear the Use NAT settings checkbox to manually specify the IP address of the Service VPS. While specifying the IP address of the Service VPS make sure that it is different from that of the Hardware Node and all the other VPSs. You should specify an unoccupied IP address from your pool of IP addresses, and Virtuozzo will automatically assign it to the virtual adapter of the Service VPS. Please ascertain that the Service VPS IP address can be accessed from public networks, for example, from the computer where VZMC is to be installed. To make the Service VPS accessible from external networks, you should configure routing to it via the IP address of the Hardware Node where this Service VPS resides. Routing should be set on every computer you wish to have access to the Service VPS.

Pressing the Next button starts the process of the Service VPS creation. Virtuozzo will create the Service VPS, start it, and add the required applications to it.

Finally, you will be prompted to upload a valid Virtuozzo license to the Hardware Node to start using Virtuozzo on your computer:
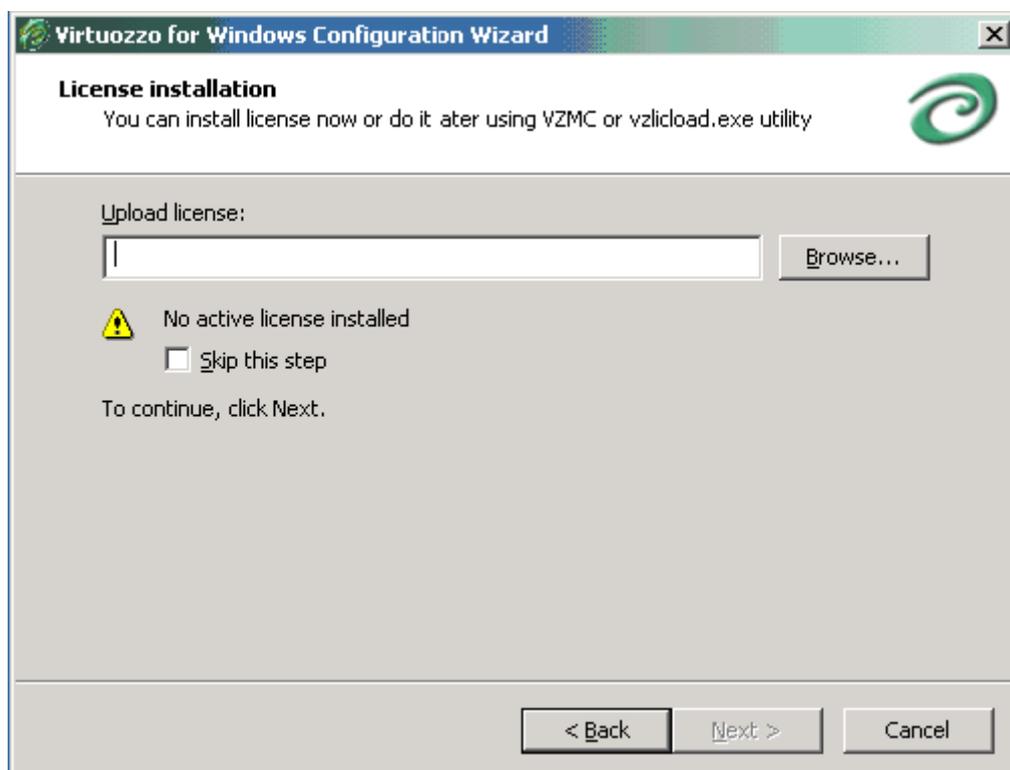

Figure 11: Configuring Virtuozzo - Uploading Virtuozzo License

Every Hardware Node should have its own Virtuozzo license installed. Licenses are issued by SWsoft and needed to start using Virtuozzo on your computer. Although you can complete some tasks on the Hardware Node without having a Virtuozzo license (e.g. store VPS backups on this Node), you are not allowed to perform the majority of operations until you upload a valid Virtuozzo license to the Node (e.g. all VPS-related operations including the VPS creation). To install a Virtuozzo license on your Node, click on the Browse button and specify the path to your license file.

Note: You can skip the step of uploading a Virtuozzo license to your Node and install it later by means of VZMC, VZCC, or the vzlicload utility. Detailed information on how to install Virtuozzo licenses by using these tools is provided in the Managing Hardware Node and Reference chapters of the Virtuozzo 3.5.1 for Windows User's Guide, respectively.

Now you can connect to the Service VPS as the `vzagent0` user by means of the VZMC and/or VZCC client programs and start managing the Hardware Node over the Virtuozzo Agent protocol.

Preparing Virtuozzo 64-bit to Create Localized VPSs

If you are going to use the Virtuozzo 64-bit version on your computer and planning to create Virtual Private Servers which are to run German, Spanish, French, Simplified Chinese, or Traditional Chinese versions of Windows Server 2003 x64 Edition, you should complete a number of additional steps after you have successfully installed the English version of Windows Server 2003 x64 Edition. These steps include:

- Installing the Multilingual User Interface pack (MUI) on the English version of Windows Server 2003 x64 Edition. The MUI pack allows the user interface language of your English 64-bit version of Windows to be changed according to your preferences to one of the following languages: German, Spanish, French, Simplified Chinese, or Traditional Chinese. For detailed information on how you can install the Windows Server 2003 x64 MUI on your computer and configure the system post setup, please visit the Microsoft web site under http://www.microsoft.com/globaldev/reference/win2k/setup/default.mspx.

  Note: MUI packs are add-ons to the English version of Windows Server 2003 x64 Edition and should not be installed on localized versions of Windows Server 2003 x64 Edition.

- Adding the corresponding Virtuozzo operating system MUI template shipped with Virtuozzo to the Hardware Node. For example, to install the French template, you should execute the `Virtuozzo Operating System MUI Template (French version).exe` file. After the MUI template is added to the Node, it can be viewed by using Virtuozzo Management Console (VZMC), Virtuozzo Console Center (VZCC), or the `vzpkgls` Virtuozzo utility. The corresponding names are:

  - `w2k3_fr` for the French MUI template;

  - `w2k3_de` for the German MUI template;

  - `w2k3_sp` for the Spanish MUI template;

  - `w2k3_sc` for the Simplified Chinese MUI template;

  - `w2k3_tc` for the Traditional Chinese MUI template.

After you have successfully installed the corresponding MUI pack and Virtuozzo OS MUI template on your Hardware Node, you can start creating Virtual Private Servers based on the corresponding MUI template. Detailed information on how to create new VPSs on your Node is provided in the Operations on Virtual Private Servers chapter of the Virtuozzo 3.5.1 for Windows User's Guide.

Preparing Virtuozzo to Create VPSs With Windows Server 2003 R2

Virtuozzo 3.5.1 supports Windows Server 2003 R2 extending the Windows Server 2003 operating system and providing a number of additional enhancements in comparison with its predecessor: simplified branch server management, improved identity and access management, more efficient storage management, etc. Currently, you can create Virtual Private Servers running the following versions of Windows Server 2003 R2:

- 32-bit: English, Japanese, and German;
- 64-bit: English and Japanese.

However, before starting to create VPSs with Windows Server 2003 R2, you should install the corresponding R2 operating system template shipped with Virtuozzo on the Hardware Node (e.g. the `w2k3_r2` and `w2k3de_r2` templates for the English and German 32-bit versions of Windows Server 2003 R2, respectively). Please keep in mind that R2 OS templates can be installed and used only on Hardware Nodes running one of the aforementioned Windows Server 2003 R2 versions.

Note: You can create Virtual Private Servers on the Hardware Node running Windows Server 2003 R2 without installing the R2 OS template on this Node. However, in this case your VPSs will lack all the benefits and improvements provided in Windows Server 2003 R2.

Thus, to be able to create VPSs which are to run the English 32-bit version of Windows Server 2003 R2, you should:

- Make sure that the English 32-bit version of Windows Server 2003 R2 is installed on the Hardware Node;
- Execute the `Virtuozzo Operating System Windows Server 2003 R2 Template (English version).exe` to install the English R2 OS template on the Hardware Node.

After you have successfully installed the English R2 template on the Hardware Node, you can start creating Virtual Private Servers on its basis. Detailed information on how to create new VPSs on your Node is provided in the Operations on Virtual Private Servers chapter of the Virtuozzo 3.5.1 for Windows User's Guide.

Updating to Virtuozzo 3.5.1

Virtuozzo 3.5.1 was designed to allow for an easy update from both Virtuozzo 3.0 and Virtuozzo 3.5. All you have to do to start updating your Virtuozzo installation is to execute the `virtuozzo_<language_name>.exe` installation file where `<language_name>` denotes the language of the Windows Server 2003 OS under which Virtuozzo is to be run (e.g. `virtuozzo_en.exe` to update Virtuozzo on systems running the English version of Windows Server 2003).

Note: As with any major changes to the hard disk, it is recommended that you back up your system before beginning an update.

During the Virtuozzo update, you will have to complete the same steps as those described in the **Installing Virtuozzo Software** section (on page 18) for installing Virtuozzo 3.5.1 on a fresh Windows Server 2003 operating system: accept the SWsoft end user license agreement, provide your personal information, etc. Please consult this section for detailed information on the Virtuozzo 3.5.1 installation procedure. However, there are a number of peculiarities that should be taken into account while updating your Virtuozzo installation:

- During the Virtuozzo update, all Virtual Private Servers (including the Service VPS) on the Hardware Node will be stopped for the time needed to update your Virtuozzo installation. Upon the update completion, the corresponding VPSs will be started again.

- While specifying the location for Virtuozzo program files and the folders for keeping all VPS data and Virtuozzo backups, you are allowed to specify the location for Virtuozzo program files only:
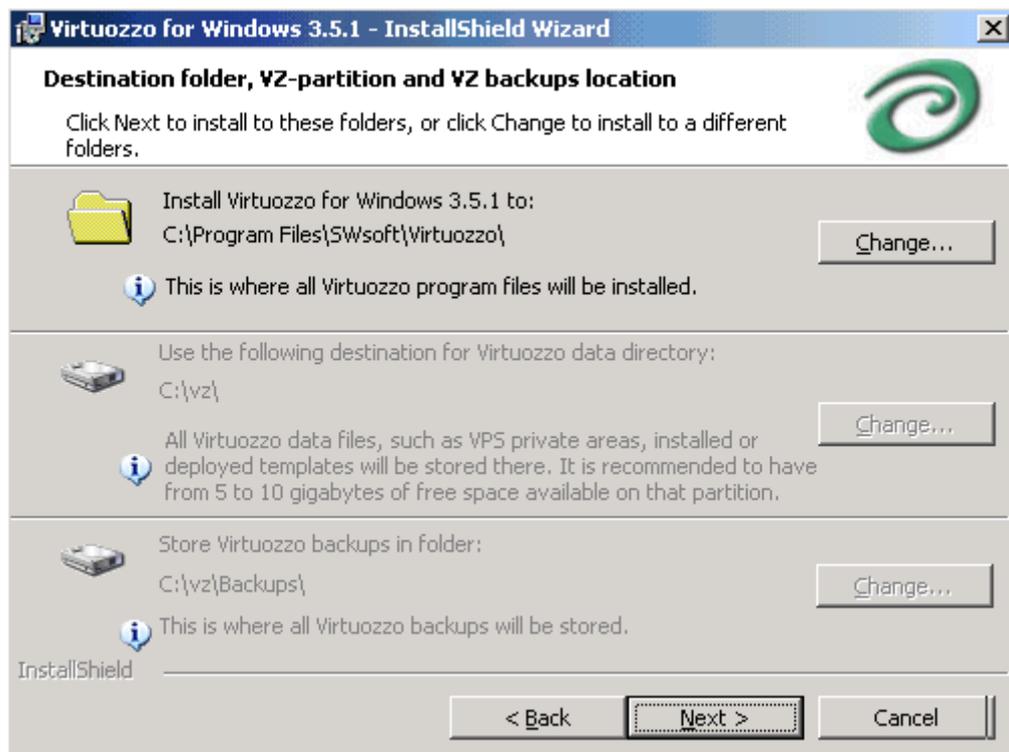

Figure 12: Upgrading Virtuozzo - Choosing Destination Folders

During the Virtuozzo upgrade, all the folders will be updated in accordance with the Virtuozzo 3.5.1 state. However, no changes will be made to any of your Virtual Private Servers and their backups, i.e., upon the update completion, you will find them in the same state as they were at the update beginning.

- While updating to Virtuozzo 3.5.1, you will be asked to restart your system. Just click OK in the **Virtuozzo upgrade** window. After the system is successfully rebooted, the **Virtuozzo Installation Wizard** will automatically continue updating Virtuozzo 3.5.1 on your Hardware Node.

- On the last step of the **Virtuozzo Configuration Wizard,** you will be asked to replace your current Virtuozzo license with a new one. While deciding on installing a new Virtuozzo license, please take into account the following:

    - You do not have to replace your current license if it is still valid.

    - You can keep the current license even if it has already expired. However, in this case you should install a new Virtuozzo license by means of VZMC, VZCC, or by using the `vzlicload` Virtuozzo utility later on to start working with Virtuozzo 3.5.1.

In all other respects, the process of updating to Virtuozzo 3.5.1 is the same as is shown in the **Installing Virtuozzo Software** section (on page 18).

Uninstalling Virtuozzo

If you are going to uninstall Virtuozzo from your computer, you should first stop all Virtual Private Servers on the Node. When no VPS is running on your Node, you may choose one of the following ways to uninstall the Virtuozzo software:

1   Using **Add or Remove Programs** in Control Panel:

- Choose **Settings --> Control Panel** on the Windows **Start** menu;

- In the displayed window, double-click on the **Add or Remove Programs** item to open the **Add or Remove Programs** window helping you manage programs and their components on your computer;

- Select the **Virtuozzo for Windows 3.5.1** entry in a list of programs currently installed on your Node and click **Remove**;

- Follow the on-screen instructions.

During the Virtuozzo uninstallation, all Virtuozzo program files, which are stored in the `C:\Program Files\SWsoft\Virtuozzo\` directory by default, are removed from your computer. At the same time, the two directories with the default paths of `C:\vz\` and `C:\vz\Backups\` meant for keeping the VPSs private data (private areas, installed templates, patches, logs, etc.) and VPSs backups, respectively, remain intact.

If you decide to reinstall Virtuozzo later on, you will be able to start the VPSs that have remained on the Node.

2   Launching the Virtuozzo installer:

- Double-click the `virtuozzo_<language_name>.exe` file to launch the Virtuozzo installation program and, in the displayed window, press the **Next** button;

- In the **Program Maintenance** window, select the **Remove** checkbox and click **Next**;

- In the **Remove the Program** window, you can do one of the following:

a Select the **Remove Virtuozzo data folder** checkbox and click **Next** to remove both the Virtuozzo program files, which are stored in the `C:\Program Files\SWsoft\Virtuozzo\` directory by default, and the two directories with the default paths of `C:\vz\` and `C:\vz\Backups\` meant for keeping the VPSs private data (private areas, installed templates, patches, logs, etc.) and VPSs backups, respectively.

b Click **Next** without selecting the **Remove Virtuozzo data folder** checkbox to remove the Virtuozzo program files only. By default, they are stored in the `C:\Program Files\SWsoft\Virtuozzo\` directory. In this case you will be able to start the VPSs that have remained on the Node, if you decide to reinstall Virtuozzo later on.

C H A P T E R 4

Installing Virtuozzo Management Console

Virtuozzo Management Console (VZMC) is a graphical user interface client that allows you to remotely manage a multitude of Virtuozzo Hardware Nodes and their Virtual Private Servers.

VZMC should have been automatically installed on your Node during the Virtuozzo installation in the following cases:

- You selected the Typical radio button in the Setup Type window, i.e. all installation and configuration steps were automatically performed by the Virtuozzo installation and configuration wizards.
- You selected the Custom radio button in the Setup Type window and on the next screen - the Install Virtuozzo for Windows management console checkbox.

If Virtuozzo Management Console has been already installed on your Hardware Node, you can launch it by clicking Programs --> SWsoft --> VZMC Pro --> Virtuozzo Management Console on the Windows Start menu. In this case you can skip the Installing Graphical Client section where the process of the VZMC installation is described and start with the Installing VZMC License section. Otherwise, you should read the next section to learn how to manually install Virtuozzo Management Console on the Hardware Node or on any other computer on a TCP/IP network.

In This Chapter

Installing Graphical Client

The Virtuozzo Management Console is recommended to be installed on a workstation for the remote administration of the existing Hardware Nodes. However, you may also install VZMC on one of the existing Hardware Nodes running Virtuozzo. To install VZMC, launch the SETUP_VZMC_ADMIN_PRO.EXE file. The VZMC InstallShield Wizard will greet you with the following screen:
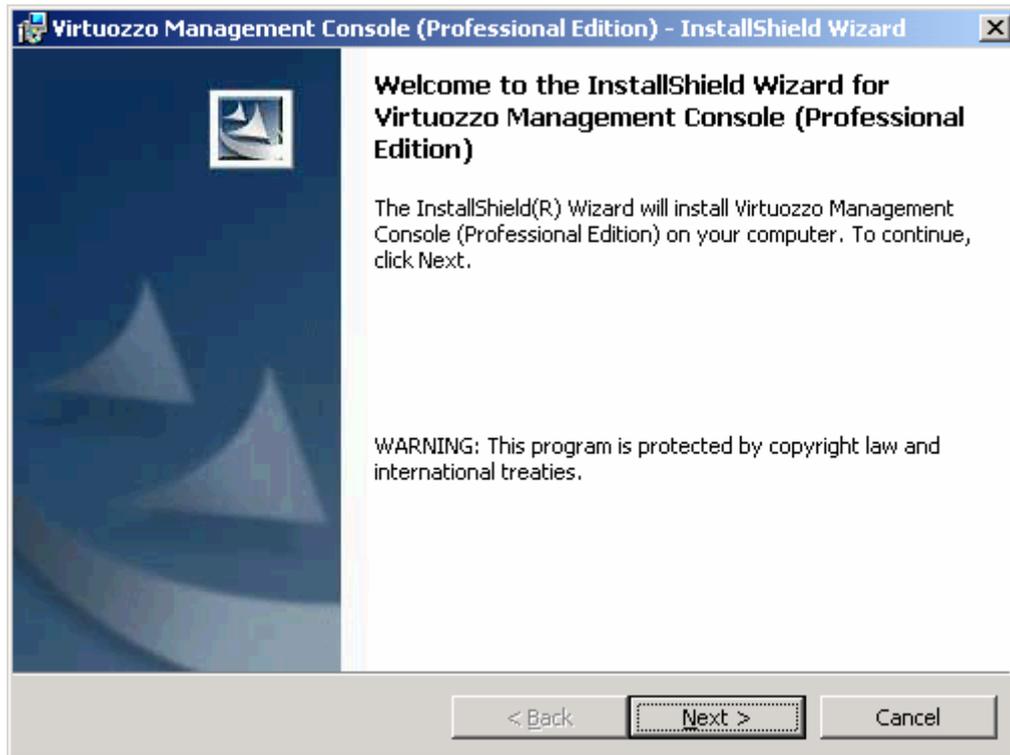

Figure 13: Installing VZMC - Welcome to InstallShieldWizard

Pressing the Next button will display the SWsoft end user license agreement that you must accept to be able to install VZMC 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.

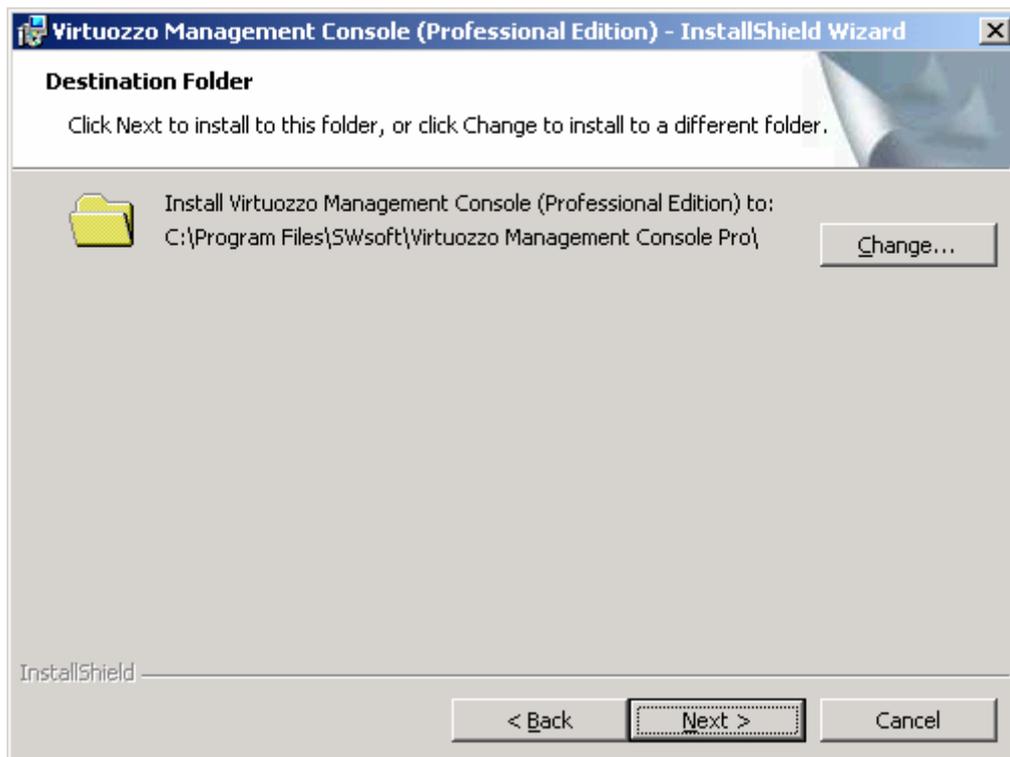On the next screen, you should specify the location of the directory where VZMC is to be installed:

Figure 14: Installing VZMC - Choosing Destination Folder

The Change button allows you to choose another folder for the VZMC installation than the default one. Pressing the Next button starts installing VZMC onto your computer. After a while, the InstallShieldWizard Completed window is displayed indicating that the installation process has successfully completed. Click the Finish button to exit the wizard.

After the installation is complete, you can start VZMC by selecting Programs --> SWsoft --> VZMC Pro --> Virtuozzo Management Console on the Windows Start menu.

Installing VZMC License

The first time you start VZMC, you will be asked to enter the VZMC license number. The VZMC licensing model does not allow concurrent connections to the same Hardware Node from two clients with identical licenses. After you have entered a valid license serial number, you can proceed with the normal course of work.

The VZMC license should be installed on each computer where Virtuozzo Management Console is to be run. It differs from the Virtuozzo license that should be loaded to the Hardware Node. A picture representing these two kinds of licenses is given below:
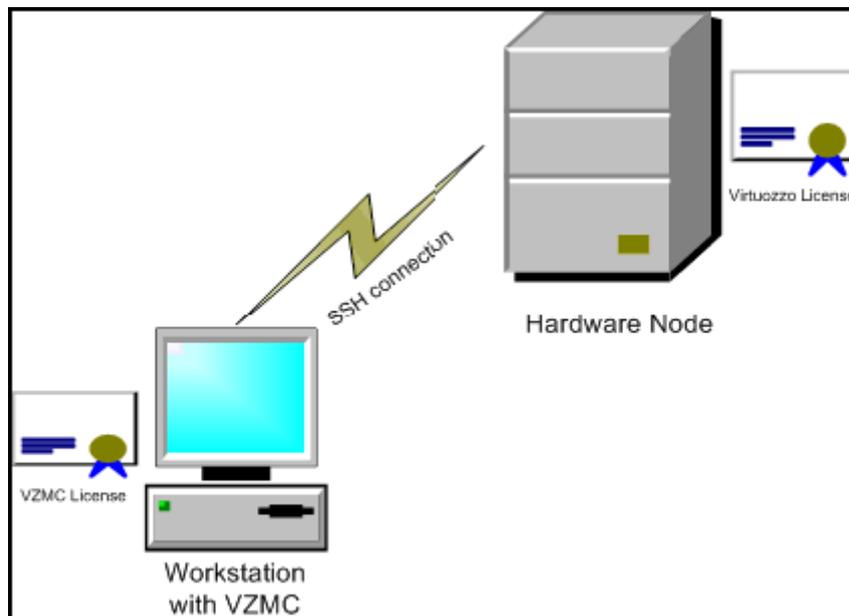

Figure 15: Virtuozzo License vs. VZMC License

VZMC serial numbers can be of two types:

- A serial number allowing the given VZMC client to connect to an unlimited number of Virtuozzo Nodes and to manage Node clusters;
- A serial number allowing the given VZMC client to connect to no more than a pre-defined number of Nodes and not providing the ability of managing Node clusters.

While entering the license serial number, you may be logged in as any user - not necessarily as Administrator. The serial number will be stored in the home directory of the currently logged in user unless you select the Store in the shared storage available for all users radio button in the Virtuozzo Management Console License window to store it in the common directory.
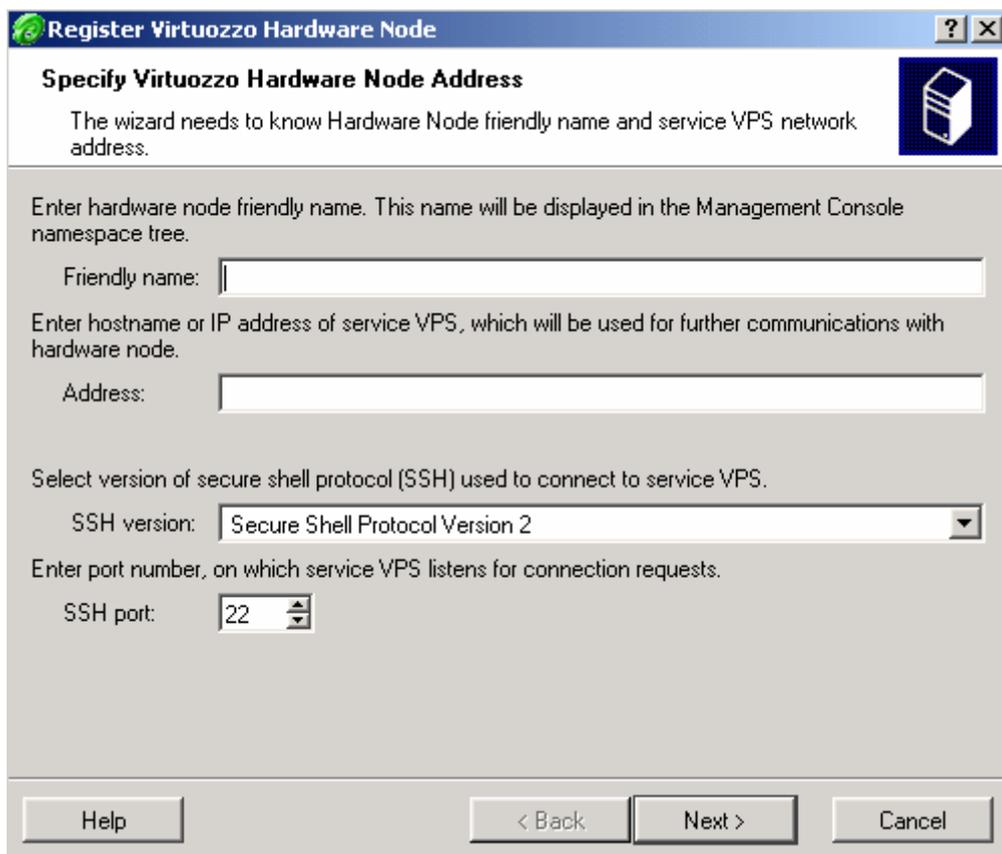
Note: If you have not uploaded a valid Virtuozzo license to the Hardware Node during the Virtuozzo installation and configuration, you will be offered to obtain a trial license by following the corresponding link in the Virtuozzo Management Console License window. Detailed information on Virtuozzo licenses is provided in the Managing Virtuozzo Licenses section of the Managing Hardware Node chapter in the Virtuozzo 3.5.1 for Windows User's Guide.

Registering Hardware Node

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

In case you are running Virtuozzo Management Console on the Hardware Node itself, this Node will be automatically registered in VZMC right after providing a valid VZMC license and clicking OK in the **Virtuozzo Management Console License**. 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 VZMC 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.

In case you are running Virtuozzo Management Console on a remote computer, you should manually register your Hardware Node in VZMC. A special wizard will guide you through the registration process. To start the Node registration wizard, click on the **Register Virtuozzo Hardware Node** link in the right pane of the VZMC main window or select the **Register Hardware Node** item on the **Action** menu. You will be presented with the **Specify Virtuozzo Hardware Node Address** window:

Figure 16: VZMC - Registering Virtuozzo Hardware Node Wizard

In this window, you should specify:

- A friendly name for the Hardware Node which will be displayed in the VZMC left pane and help you easily find your Node among other Hardware Nodes registered in VZMC. You may specify any name you consider suitable for the Node.

- The IP address of the Hardware Node or of the Service VPS. You should have already created the Service VPS during the Virtuozzo configuration. Instead of the IP address, you may enter the hostname of your Hardware Node or Service VPS, respectively.

Note: In case your Service VPS is assigned a private IP address which cannot be accessed from the outer world, you should enter the IP address of the Hardware Node.

You can also choose a version of Secure Shell Protocol (SSH) and change the port number to be used to connect to the Service VPS/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.

After providing the necessary information and clicking Next, the program will try to establish a secure connection to the Service VPS/Hardware Node with default SSH keys. If you are registering the Node for the first time, VZMC will ask you for the password of the vzagent0 user having access to the Service VPS/Hardware Node. Use the password you entered for vzagent0 while configuring your Virtuozzo installation. You also need to provide valid SSH keys to enable SSH access to the Node. You can choose between two possibilities:

- Select the Generate SSH key and store in default location option to generate the corresponding public and secret keys for the supplied vzagent0 user credentials.

- If you already have valid SSH keys stored on your computer, you can select the Use the following SSH keys option and specify the path to the keys.

The Specify Registration Information window displayed after establishing the SSH connection to the Service VPS/Hardware Node allows you to review all the parameters entered on the previous steps of the wizard. You can use the Back button to return to any step and change the corresponding parameter, if needed. Press the Finish button to register the Hardware Node in VZMC.

After your Node has been successfully registered in VZMC, its name is displayed in both parts of the VZMC main window - the tree pane on the left and the view pane on the right.
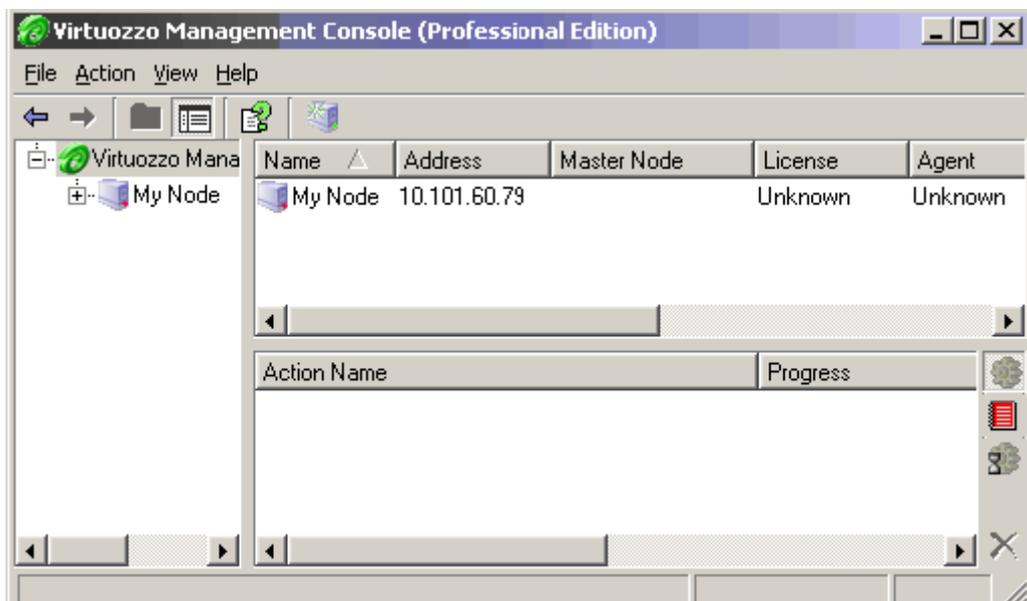

Figure 17: VZMC - Viewing Registered Node

Now you can start creating and managing VPSs on the registered Hardware Node. However, if you did not load a valid Virtuozzo license to the Hardware Node while configuring Virtuozzo by means of the Virtuozzo for Windows Configuration wizard, you will be warned with a message informing you that no active Virtuozzo license has been found on the Node and suggested to do so. Please see the Managing Hardware Node chapter of the Virtuozzo 3.5.1 for Windows User's Guide for the information about uploading licenses.

Updating VZMC

Starting with Virtuozzo 3.5.1, you have the possibility to update your current Virtuozzo Management Console installation to keep it at the most recent version. VZMC can be updated:

- By using the VZMC self-updater:

  - Each time you launch VZMC, it automatically connects to the SWsoft web site and checks if new updates are available for your VZMC version. In the case of finding any, you will be presented with a window like the following:
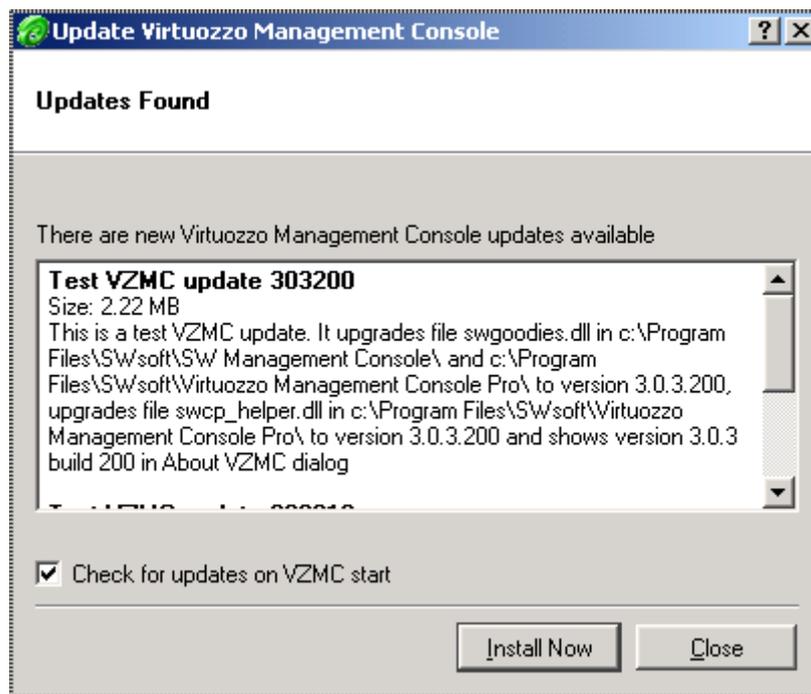

Figure 18: Updating VZMC - VZMC Updater

In this window, you can perform the following operations:

a   Click on the Install Now button to start downloading and installing the VZMC updates listed in the Updates Found window on your computer. After initiating the update procedure, you will be asked to close the VZMC application. Just click OK in the displayed window to proceed with the VZMC update.

b   Clear the Check for updates on VZMC start checkbox to prevent VZMC from checking for available updates in future.

- If VZMC is already running on your computer, you can check for updates by clicking Help and selecting Check for Updates on the drop-down menu. If any updates are available for your VZMC installation, you will be presented with the same window and can perform the same operations as is shown above.

- By using Virtuozzo Update Service (VUS). Virtuozzo Update Service (VUS) is a special Virtuozzo module helping you deploy both the Virtuozzo and VZMC updates (detailed information on how to use VUS to update your current Virtuozzo installation is provided in the **Managing Hardware Node** chapter of the **Virtuozzo User's Guide**). This module is automatically installed:

  - On the Hardware Node - during the Virtuozzo installation. In this case you can check if new updates are available for your VZMC version and install them in the case of finding any by selecting **Programs --> SWsoft --> Virtuozzo --> Virtuozzo Update Wizard** on the Windows **Start** menu and following the instructions of the VUS wizard.

  - On a non-Virtuozzo-based system - during the VZMC installation. In this case you can check if new updates are available for your VZMC version and install them in the case of finding any by selecting **Programs --> SWsoft --> Virtuozzo Update Service --> Virtuozzo Update Wizard** on the Windows **Start** menu and following the instructions of the VUS wizard.

Note: You should provide Internet connectivity for every computer where VZMC is installed to be able to receive VZMC updates.

C H A P T E R   5

Setting VZCC/VZPP to Work

Along with VZMC, you can make use of the following tools intended for managing your computers running Virtuozzo:

▪ Virtuozzo Control Center (VZCC). This tool is designed for Hardware Node administrators and provides you with the ability to manage a particular Hardware Node and all Virtual Private Servers residing on it with the help of a standard Web browser on any platform. Detailed information on VZCC is given in the VZCC online help system shipped with Virtuozzo.

▪ Virtuozzo Power Panels (VZPP). This tool provides the most part of the VZCC functionality in respect of managing individual Virtual Private Servers. However, as distinct from VZCC, it does not allow you to manage Hardware Nodes, adjust VPS resources, and has some other restrictions. Therefore, VZPP is primarily regarded as a means for individual VPS customers to manage their personal Virtual Private Servers. Detailed information on all VZPP functionality is provided in the VZPP online help system shipped with Virtuozzo.

In This Chapter

Logging In to VZCC

To log in to VZCC, launch a VZCC-compatible Web browser. A list of Web browsers currently supported by Virtuozzo is given in the **VZCC Overview** subsection of the **Virtuozzo Philosophy** chapter in the **Virtuozzo 3.5.1 for Windows User's Guide**. After you have opened a browser window, you can log in to VZCC in one of the following ways:

1 By using the IP address (or hostname) of the Virtuozzo Service VPS and the TCP port specified in Virtuozzo offline services (by default, this port is 4643). When connecting to the Service VPS, you should enter the user name and password of a Service VPS user (for example, `vzagent0`) who is entitled to manage the given Hardware Node and press **Login**. Let us assume that your Service VPS has the IP address of `192.168.20.1`. In this case you should enter

```
https://192.168.20.1:4643
```

in the address line of your browser and log in with the credentials of a Service VPS user.

2   By using the IP address (or hostname) of any VPS residing on the given Hardware Node and the TCP port specified in Virtuozzo offline services (by default, this port is 4643). If you are connecting to one of your personal VPSs, you should enter the user name and password of a Service VPS user who is entitled to manage the given VPS and press Login. For example, if you have assigned the IP address of 192.168.20.112 to one of your Virtual Private Servers, you can type

```
https://192.168.20.112:4643
```

and provide the credentials of a Service VPS user to log in to VZCC.

Note: Detailed information on Service VPS users and Virtuozzo offline services is provided in the Creating Service VPS Users (on page 49) and Using Offline Management (on page 50) subsections, respectively.

Installing VZCC License

The VZCC licensing model envisages the necessity of having a proper VZCC license loaded on the Hardware Node for this Node to be manageable thru VZCC/VZPP. The first time you log in to VZCC, you should provide a valid VZCC license.

Note: In the current version of Virtuozzo, you do not need to install a VZCC license; a trial VZCC license is already included in the Virtuozzo basic pack.

To install a VZCC license, do the following:

1   Open the license file obtained from SWsoft and copy its contents to the clipboard.

2   Paste the copied contents to the VZCC License field.

3   Click Install.

By default, VZCC licenses are stored in the `C:\vz\root\1\C\Program Files\SWsoft\vzcp\licenses\` directory on the Hardware Node and contain information on whether you can use either Virtuozzo Power Panels (VZPP) or Virtuozzo Control Center (VZCC), or both tools to manage your Hardware Node and Virtual Private Servers residing on it.

After you have successfully installed the VZCC license, you can proceed with the normal course of work.

Managing VZCC/VZPP Access Rights

As the Hardware Node administrator, you can use the credentials of the `vzagent0` user (you specified the password for this user while creating the Service VPS) who has a full administrative access to the Service VPS to manage your Node and all Virtual Private Servers residing on it by means of VZCC. However, you may want to grant the rights to other users to manage certain VPSs only without having access to the remaining Virtual Private Servers on the Node and to the Node itself. There are two ways of achieving this:

- Creating a Service VPS user who would have access to certain Virtual Private Servers by means of VZCC.
- Using the offline management feature for a Virtual Private Server to be directly managed by its administrator from any browser with the help of VZPP.

These two methods are virtually identical as regards the functionality of managing VPSs. Their only difference consists in that the first method allows the VPS administrator to connect to the Service VPS as its user and manage all their personal VPSs without having to log in to each particular VPS. If using the second method, the VPS administrator will have to log in each time when connecting to a new VPS.

Creating Service VPS Users

You can create new users of the Service VPS and allow them to access certain Virtual Private Servers by means of VZCC in Virtuozzo Management Console (VZMC).

To open the table of Service VPS users, select **Personal Edition Manager** --> **Service VPS Users** in the VZMC tree pane below the Hardware Node name. The columns of the users table contain the login name of the user, user ID, group ID, and the description of the user (or comment).

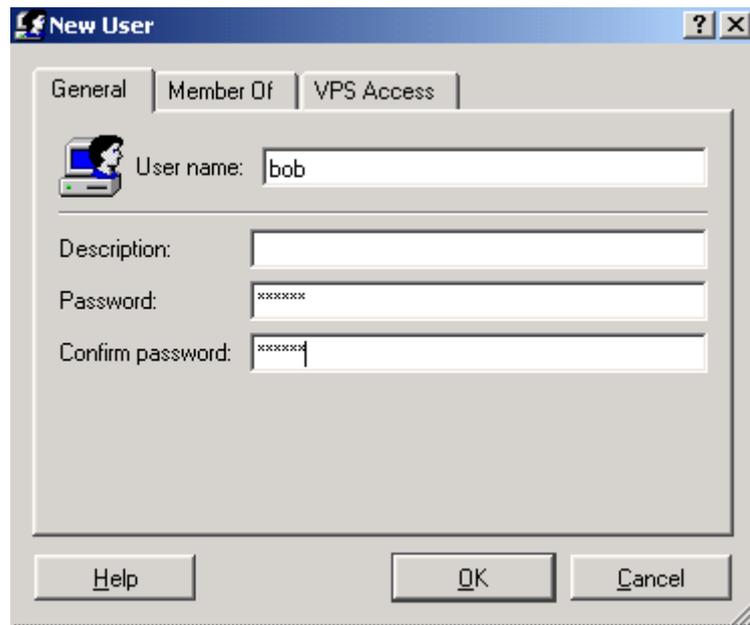Use the **New User** toolbar button to create a new user:

Figure 19: VZMC - User Properties Dialog

In the **New User** window, you can perform the following operations:

- Use the **General** tab to define the general settings like the name and the description of the user and the password to log in to VZCC. User names are often an abbreviation of the user's full name, which makes it easier for the user to remember them.
- Use the **Member Of** tab to add/remove the user to/from any group existing in the Service VPS.
- Use the **VPS Access** tab to specify those Virtual Private Servers that the user will be allowed to manage.

After you have created a new user, you can change the settings for this user by double–clicking on their name or selecting **Properties** on the context menu. To change the password for a user, right-click the user in the table of Service VPS users, select **Set Password** on the menu, then enter the new password in the fields provided.

Note: The Service VPS user differs from the internal VPS administrator and is created in the Service VPS only.

Using Offline Management

Any VPS is created to be managed as a virtual private server by a person who is supposed to be the administrator of this VPS. This may be a hosting service subscriber, a student, a server administrator within an enterprise, or any like user. The Hardware Node administrator should ensure that this person may manage the corresponding VPS with the help of VZPP without compromising the security of the Hardware Node. This can be achieved by enabling the offline management of the given VPS.

When offline management is enabled for a particular Virtual Private Server, this VPS is said to be subscribed to one or more offline services, which means that one or more ports of its IP address are permanently active whatever the VPS state. This is needed to ensure the VPS manageability in its down state. The currently supported services are `vzpp` (for managing Virtual Private Servers by means of Virtuozzo Power Panels) and `plesk` (for managing Virtual Private Servers by means of the Plesk control panel integrated with Virtuozzo Power Panels).

By default, offline management is enabled for all Virtual Private Servers residing on the Node. To start using the offline management feature, it is enough to enter

```
https://<VPS_IP_address_or_hostname>:<TCP_port>
```

in the address line of any browser and to log in as Administrator with the appropriate password (you should have specified this password during the VPS creation) to start to remotely manage the corresponding Virtual Private Server. `<TCP_port>` in the line above denotes the port used by the offline service to access the corresponding VPS. The port numbers for the `vzpp` and `plesk` offline services are 4643 and 8443, respectively.

This way of logging in to a VPS is very handy for VPS administrators because they need to know only the IP address/hostname of their VPS and its Administrator credentials to be able to manage the VPS. No additional information (e.g. the Service VPS IP address) is required.

In case the Plesk control panel application is installed in a Virtual Private Server and this VPS is subscribed to the `plesk` service, the Plesk `admin` account can also be used by the VPS administrator for logging in to Virtuozzo Power Panels. The Plesk control panel is integrated with VZPP is such a way that the **Virtuozzo** menu item on the Plesk menu allows the VPS administrator to access the standard VZPP functionality, whereas all the other menu items on the Plesk menu ensure the standard Plesk functionality.

At any time, you can disable the offline management for one or all VPSs on the Node by means of VZMC:

- To disable the offline management for the given VPS:
  - Select the **Virtual Private Servers** item under the Hardware Node name;
  - Right-click the name of the VPS on the VPS list and select **Properties** on the context menu;
  - Go to the **General** tab;
  - Clear the **Enable offline management** checkbox;
  - Press **OK**.

- To disable the offline management for all Virtual Private Servers residing on the Node at once:

  - Right-click the Hardware Node name and select Tasks --> Manage Offline Services Configuration;

  - In the Offline Services Configuration window, clear the Enable Virtuozzo Power Panels and Control Center services checkbox ;

  - Press OK.

Detailed information on how to manage offline services (e.g. to add a new offline service or to change the port number of an existing offline services) is provided in the Configuring VPS Offline Management section of the Customizing VZCC/VZPP chapter in the Virtuozzo 3.5.1 for Windows User's Guide.

Configuring Mail for VZCC/VZPP

To be able to send e-mail messages from the Hardware Node to external e-mail addresses, you should configure its mail settings. The situations when some data from the Node are to be dispatched may be the following:

- A user is unable to reach their Virtual Private Server(s) thru VZCC/VZPP due to password-related problems and follows the Forgot your password? link on the login page in order to receive a URL at their e-mail address informing the user how to change their password.

- The Hardware Node administrator wishes to obtain a new Virtuozzo or VZCC license from SWsoft, generates a license request in VZCC, and sends it to their SWsoft sales contact.

To start sending information from the Node to external addresses, you should perform the following operations:

1 Specify an IP address of the mail relay server to send e-mail messages thru. You should do it by means of VZMC:

- Click on the Manage Alert Subscription link on the Hardware Node dashboard to display the Manage Alert Templates window;

- On the Configuration tab of the Manage Alert Templates window, enter an IP address to be used as the mail relay server in the E-mail relay IP address field;

- Click OK.

  You can also use VZCC to set your mail relay server:

- On the Hardware Node dashboard, click the Configuration link and, in the displayed window, the Email & Notifications link;

- In the Relay Server IP field, enter the IP address of the mail relay server.

2 Specify the sender's e-mail address. This address will be shown in the From: field of the message sent from the Node. To this effect, you should do the following:

- On the Node, open the `vzcpcon.conf` file for editing (e.g. by using Notepad). It is located in the `C:\vz\private\1\root\Program Files\SWSoft\vzcp\etc\` directory by default; however, you might have specified another path for storing all Virtuozzo data during the Virtuozzo installation.

- Search for the following strings in the file

```
<restore_password>
      <from-email></from-email>
      <signature>Your VPS</signature>
</restore_password>
```

and enter an e-mail address as the value of the `<from-email>` element. Make sure that a valid address is specified; otherwise, your message will not be dispatched to the recipient. While setting the sender's e-mail address, you can choose between two variants:

a You can type an e-mail address in the form of `name@domain_name`, where `name` identifies the sender's ID (e.g. `peter`) and `domain_name` denotes the actual domain where the mail sender resides. In this case the address will be shown in the From: field in exactly the same way as is specified in the `<from-email>` element.

b You can type an e-mail address in the form of `name` only. In this case the address will be displayed in the From: field as `name@Service_VPS_domain_name` where `name` identifies the sender's ID (e.g. `peter`) and `Service_VPS_domain_name` denotes the domain name of your Service VPS. For example, if the Service VPS has a domain name of `svps.your-domain.com` and you specified `peter` as the value of the `<from-email>` element, the From: field in your messages will read: `peter@svps.your-domain.com`.

Notes: 1. While specifying the sender's e-mail address, make sure that the messages from this address can be accepted by the set mail relay server.

2. You can choose the `b.` variant only in case the domain name for the Service VPS is specified.

▪ Save the file and restart `vzcp` for the changes to take effect:

```
C:\Documents and Settings\Administrator>vzctl exec 1 sc stop vzcpd
...
Command 'exec' is successfully finished
C:\Documents and Settings\Administrator>vzctl exec 1 sc start vzcpd
...
Command 'exec' is successfully finished
```

C H A P T E R 6

Setting Up Monitor Node

This section contains instructions for experienced administrators on the way to set up a Monitor Node to keep track of the resources consumption on their Hardware Nodes and the state of the Nodes themselves.

In This Chapter

Overview

A regular monitoring of Hardware Nodes is an important part of their maintaining and administering. It enables you to determine whether the corresponding Node is running or down, to get information on the current HN resources consumption, and to be notified in case anything goes wrong on the Node.

Note: The Monitor Node does not allow you to view the resources consumption of individual Virtual Private Servers. You can check the resources usage of a particular VPS by means of VZMC or VZCC or with the help of the corresponding Virtuozzo utilities.

To start monitoring your Hardware Node(s), you should perform the following operations:

1 Install Windows on a dedicated computer that will act as the Monitor Node. This computer shall meet one requirement: you must be able to install Windows OS (Windows 2000 Server, Windows XP, Windows 2003, etc.) on it. Logging and processing messages from one or several Hardware Nodes requires neither a powerful CPU nor a large amount of RAM. The Monitor Node should be able to communicate with all the monitored Hardware Nodes via network.

2 Prepare the Hardware Node to be able to send information on the resources consumption to the Monitor Node on its request. If you have several Hardware Nodes, repeat this step for each one of them.

3 Configure the Monitor Node to send regular requests to the Hardware Node(s) you have prepared.

4 Prepare the Monitor Node for sending alerts.

The Monitor Node and Hardware Node use the HTTP protocol to communicate with each other. The Monitor Node acts as an HTTP client, i.e. it sends HTTP requests to the Hardware Node at regular intervals and receives the requested data (information on resources consumption) in HTTP responses. The Hardware Node, in turn, operates an HTTP server collecting and storing data on the HN resources usage and sending it to an HTTP client (i.e. to the Monitor Node) on its request.

Preparing Hardware Node

First, you should configure the Hardware Node for it to be able to collect and send information on its resources usage to the Monitor Node.

Virtuozzo 3.5.1 is provided with a special Virtuozzo watchdog module - `vzwatchdog` - that is automatically added to your Node during the Virtuozzo installation. This module is implemented as a standard Windows service constantly running in the background of the Hardware Node and waiting for a request sent by the `vzmon` service from the Monitor Node or generated by means of a Web browser. After receiving such a request, `vzwatchdog` gathers the required information and dispatches it to the requesting side by using the Hypertext Transfer Protocol (HTTP).

Note: To view information on the Hardware Node resource consumption thru a Web browser, type `http://Hardware_Node_IP_Address:3141/vzstatus` in the address line where `Hardware_Node_IP_Address` is the IP address or hostname of the corresponding Node, and `3141` denotes the port number used to connect to the Node.

The information collected and sent by `vzwatchdog` is taken from the Windows Performance Monitor snap-in (accessible by selecting **Programs** -> **Administrative Tools** -> **Performance** on the Windows **Start** menu) and contains actual data about the following resources:

- `Free Nonpaged Pool Bytes`: the size of system nonpaged pool that is currently free on the Node, in bytes;
- `Free Paged Pool Bytes`: the size of system paged pool that is currently free on the Node, in bytes;
- `Free System PTE Bytes`: the size of page table entries that are currently not in use by the system, in bytes;
- `Low Kernel Memory Flag`: the flag corresponding to the `\KernelObjects\LowMemoryCondition` event object in the Windows Performance Monitor snap-in and signaling that the amount of free memory in the system is low;
- `\Memory\Pool Nonpaged Bytes`: the total amount of system nonpaged pool on the Node, in bytes;
- `\Memory\Pool Paged Bytes`: the total amount of system paged pool on the Node, in bytes.

Note: Detailed information on the aforementioned resources is provided in **Help** for the Windows Performance Monitor snap-in, which can be opened by selecting **Programs** -> **Administrative Tools** -> **Performance** on the Windows **Start** menu and clicking the F1 button on your keyboard.

Although you are provided with a predefined set of resource parameters listed above, you can choose what particular parameters from this set are to be monitored on your Hardware Node. This can be done in the Virtuozzo Monitor Configurator launched on the Monitor Node. Detailed information on the Virtuozzo Monitor Configurator and all the operations that can be performed by using it is provided in the next section.

Important! When preparing the Hardware Node, you should make sure that port 3141 used to connect to the Node thru HTTP is opened. Otherwise, you will not be able to collect and send information on the resources usage to the Monitor Node or to view this information thru a Web browser.

Configuring Monitor Node

After you have prepared the Hardware Node(s) for collecting and sending information on its resources usage, you should set up the Monitor Node. As was mentioned above, the Monitor Node can be presented by any dedicated computer running one of the Windows operating systems. You can also assign an additional role of the Monitor Node to any of your Hardware Nodes. However, we recommend that you set up a dedicated Monitor Node.

We assume that you have successfully installed a Windows operating system on the Monitor Node and provided a network connectivity for it.

To set up the Monitor Node in the proper way, you should further complete the following tasks:

1 Install and launch the `vzmon` service - a special Virtuozzo service responsible for monitoring one or several Hardware Nodes.

2 Specify IP addresses or hostnames of the Hardware Nodes you wish to monitor. This will allow the `vzmon` service to address certain Nodes only.

3 Define the limits on those resources that you wish to keep track of. In the case of exceeding any of these limits, the corresponding alert will be sent to the Node administrator.

The vzmon service - implemented as a standard Windows service - is responsible for sending periodical requests to the specified Hardware Nodes, receiving the requested data from these Nodes, comparing the received data with the values set in the registry of the Monitor Node, and notifying the Node administrator in case any resource exceeds its threshold.

Note: If there is no response to the vzmon request from the given Hardware Node, this Node is considered to be down, and a special notification is sent to the Node administrator.

Before making use of vzmon, you should install and start it on the Monitor Node. A special wizard helps you perform all the necessary operations. To invoke the wizard, launch the vzmoninstall.exe file. Follow the instructions of the wizard to complete the installation. After the installation, make sure the vzmon service is running. You can check it by opening Windows Task Manager and clicking on the Processes tab. vzmon should be displayed in the table of processes currently running in your system.

The other operations needed to configure the Monitor Node can be performed with the help of Virtuozzo Monitor Configurator. It is automatically added to your system while installing the vzmon service. To launch the configurator, select Programs --> SWsoft --> Virtuozzo --> Configure Virtuozzo Monitor on the Windows Start menu. You will be presented with the Virtuozzo Monitor Configurator window:
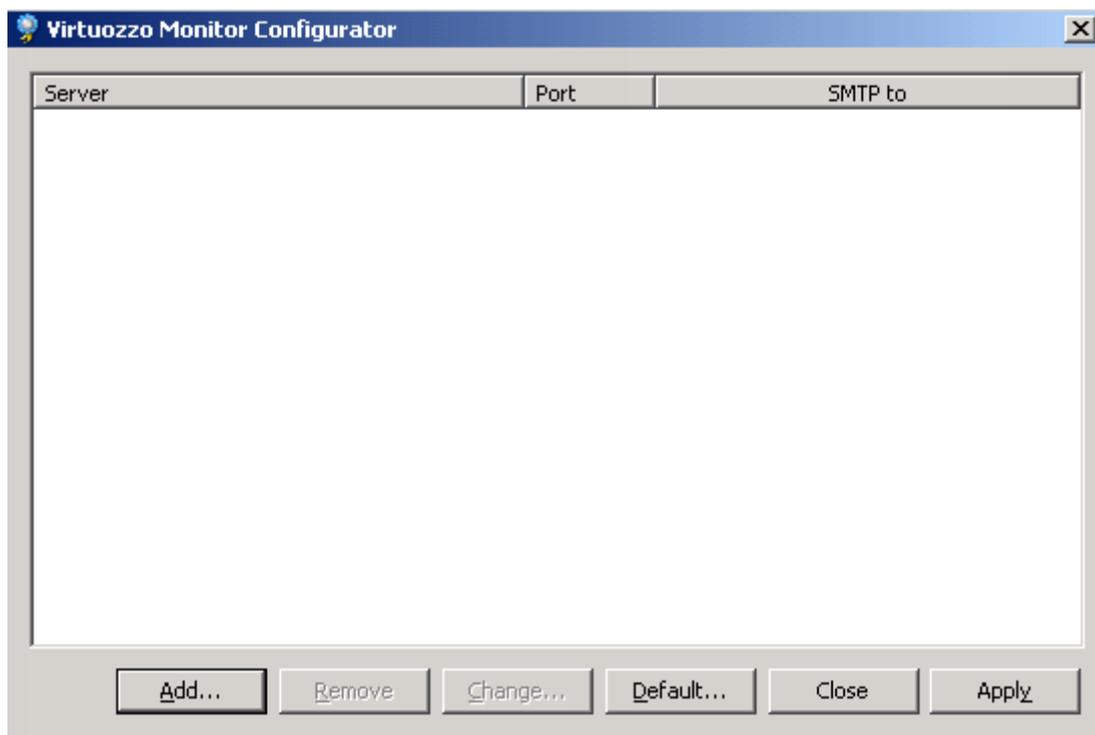
Figure 20: Virtuozzo Monitor Configurator

In this window, you can perform the following operations:

- To add a new Node to be monitored, press the Add button, enter its IP address or hostname in the field provided, and click OK.

- To enable/disable the added Hardware Node for being monitored by the vzmon service, select the checkbox beside its IP address.

- To delete a Node from the list of Hardware Nodes, select the corresponding Node and click on the **Remove** button.

- To adjust the default parameters that will be automatically applied to all Hardware Nodes, click on the **Default** button and make the appropriate changes (see below).

- To redefine any default parameter for the given Hardware Node, select the corresponding Node and click on the **Change** button.

In fact, to start monitoring your Hardware Node, you should specify only the IP address or hostname of the Node. The remaining parameters are predefined and identical for all Nodes registered for monitoring. However, you may wish to adjust these parameters. To this effect, you can either press the **Default** button in the **Virtuozzo Monitor Configurator** window or select the corresponding Hardware Node and click on the **Change** button. In the former case you will change the default (global) parameters to be applied to all Hardware Nodes whereas using the **Change** button allows you to modify the parameters of the selected Node only. If you wish to change the parameters of a particular Node, you should first clear the **Use Default Values** checkbox at the bottom of the window displayed after clicking on the **Change** button.

So, you can modify the following parameters:

- On the **Settings** tab of the **Site Settings** window, you can change:

a `Port`: This port number must be entered to specify which port on the Monitor Node will be used to send HTTP requests on the current resources usage to the Hardware Node.

b `Poll Interval`: The interval at which an HTTP request from the Monitor Node will be sent to the Hardware Node, in seconds.

- On the **Performance Counters** tab of the **Site Settings** window, you can choose the Hardware Node resources you wish to get information on. All resources are listed together with their limits representing their upper and lower values on which lapping over a warning message is sent to you. The units in which the corresponding resources are measured coincide with those specified in the Windows System Monitor snap-in on the Hardware Node. There is a set of predefined parameters that are to be monitored on all registered Nodes by default. However, you can subscribe or unsubscribe any listed parameter for/from being monitored by selecting or clearing its checkbox, respectively.

Note: Each time you run Virtuozzo Monitor Configurator and modify the corresponding parameters, you should press the **Apply** button for the changes to take effect.

Preparing Monitor Node for Sending Alerts

Alerts allow the Monitor Node to act as your assistant notifying you via e-mail each time your Hardware Node is down, or any specified performance threshold is exceeded.

There are four alert types you may receive:

- `Hardware Node is down`. This alert is sent if no response from the Hardware Node has been received on the `vzmon` request.

- `Hardware Node is up`. This alert is sent after the Hardware Node that was considered to be down has started functioning again.

- In case a specified performance threshold was exceeded, you will get the following alert: `<Parameter_Name> value alert: current=<Value> > max=<Value>` where `<Parameter_Name>` is the name of the problem resource, and `<Value>` denotes the resource values obtained from the Hardware Node and set for this resource on the Monitor Node, respectively.

- In case any parameter on the Hardware Node is under the limit specified for this parameter, the following alert is sent: `<Parameter_Name> value alert: current=<Value> < min=<Value>` where `<Parameter_Name>` is the name of the problem resource, and `<Value>` denotes the resource values obtained from the Hardware Node and set for this resource on the Monitor Node, respectively.

To prepare the Monitor Node for sending alerts, you should perform the following operations:

1 On the Monitor Node, select **Programs --> SWsoft --> Virtuozzo --> Configure Virtuozzo Monitor** on the Windows **Start** menu to launch Virtuozzo Monitor Configurator.

2 In the displayed window, click on the **Default** button. The parameters you should configure to start receiving alerts are the following:

- `SMTP Server`: the IP address or hostname of the mail relay server to send notifications thru. This mail relay server should meet one requirement: be able to send notifications to and receive them from the e-mail addresses specified in the `SMTP To` and `SMTP From` fields, respectively.

- `SMTP From`: enter the e-mail address exactly as you wish mail recipients to see it in the `From` line on messages the Monitor Node will send. You may specify any e-mail address you consider suitable. However, if you wish the SWsoft support team to receive your messages and not consider them as spam, please contact the SWsoft support team and inform them of this e-mail address.

- `SMTP To`: your e-mail address or the e-mail address of any person you wish to send alerts to. You can enter several e-mail addresses at once by using commas to separate them. If you wish the SWsoft support team to receive notifications on your problem HN resources, leave vzmon@sw.ru as one of the specified e-mail addresses.

3 Enter the right data in the corresponding fields and click **OK**.

Note: To specify any of the aforementioned parameters for a particular Hardware Node, select this Node and click on the **Change** button in the **Virtuozzo Monitor Configurator** window.

Glossary

Application template is a template used to install a set of applications in *Virtual Private Servers*. See also *Template*.

Hardware Node (or *Node*) is a computer where *Virtuozzo* is installed for hosting *Virtual Private Servers*. Sometimes, it is marked as *VPS 0*.

HN is an abbreviation of *Hardware Node*.

Host Operating System (or *Host OS*) is an operating system installed on the *Hardware Node*.

OS template (or *Operating System template*) is used to create new *Virtual Private Servers*. See also *Template*.

Package set is a synonym for *Template*.

Private area is a part of the file system where *VPS* files that are not shared with other *Virtual Private Servers* are stored.

Service Virtual Private Server is a special secure VPS running *VZAgent* which is responsible for managing all the *Virtual Private Servers* of the given *Hardware Node*. You should use the IP address of the Service VPS to connect to a *Hardware Node* by means of *VZMC* or *VZCC*. The Service VPS is always marked as Virtual Private Server 1.

Service VPS is an abbreviation of *Service Virtual Private Server*.

SSH stands for Secure Shell. It is a protocol for logging on to a remote machine and executing commands on that machine. It provides secure encrypted communications between two untrusted hosts over an insecure network.

TCP (*TCP/IP*) stands for Transmission Control Protocol/Internet Protocol. This suite of communications protocols is used to connect hosts on the Internet.

Template (or *package set*) is a set of original files and registry settings installed on the *Host OS* in such a way as to be usable by any VPS by mounting over *Virtuozzo File System*. There are two types of templates. *OS Templates* are used to create new *Virtual Private Servers*. *Application templates* are used to install an application or a set of applications in *Virtual Private Servers*.

Virtual Environment or *VE* is an obsolete designation of a virtual private server. See *Virtual Private Server*.

Virtual Private Server is a virtual private server, which is functionally identical to an isolated standalone server, with its own IP addresses, processes, files, its own users database, its own configuration files, its own applications, system libraries, and so on. Virtual Private Servers share one *Hardware Node* and one OS kernel. However, they are isolated from each other. Virtual Private Server is a kind of 'sandbox' for processes and users. Virtual Private Server 0 is used to designate the *Hardware Node* itself.

Virtuozzo is a complete server automation and virtualization solution allowing you to create multiple isolated *Virtual Private Servers* on a single physical server to share hardware, licenses, and management effort with maximum efficiency.

Virtuozzo Control Center is a tool designed for managing a particular *Hardware Node* and all *Virtual Private Servers* residing on it with the help of a standard Web browser on any platform.

Virtuozzo File System is a virtual file system for mounting to VPS private areas. VZFS links are seen as real files inside *Virtual Private Servers*.

Virtuozzo license is a special license that you should load to the *Hardware Node* to be able to start using *Virtuozzo*. Every *Hardware Node* shall have its own Virtuozzo license file.

Virtuozzo Management Console is a Virtuozzo management and monitoring tool with graphical user interface. It uses *VZagent Protocol* to control *Hardware Nodes* and their *Virtual Private Servers*.

Virtuozzo Power Panels is a means for administering personal *Virtual Private Servers* with the help of a standard Web browser (Internet Explorer, Mozilla, etc.) on any platform.

VPS is an abbreviation of *Virtual Private Server*.

VPS 0 is used to designate a *Hardware Node* where Virtuozzo is installed.

VZagent is a special software used to tune, monitor, and manage the given *Hardware Node* and all the *Virtual Private Servers* residing on this Node.

VZagent Protocol is an XML–based protocol used to monitor and manage a *Hardware Node*. The `vzagent` software implements this protocol and is a backend for the *Virtuozzo Management Console* and other Virtuozzo utilities.

vzagent0 is the user who has a full administrative access to the *Service VPS*. You will need to provide this user name and password when connecting to a Hardware Node by means of *VZMC* and *VZCC*.

VZCC is an abbreviation of *Virtuozzo Control Center*.

VZCC license is a license loaded to the Hardware Node and needed to activate *VZCC*. You should enter it the first time you log in to VZCC.

VZFS is an abbreviation of *Virtuozzo File System*.

VZMC is an abbreviation of *Virtuozzo Management Console*.

VZMC license is a license installed on each computer where *Virtuozzo Management Console* is to be run and needed to activate *VZMC*. You should enter it the first time you launch VZMC.

VZPP is an abbreviation of *Virtuozzo Power Panels*.

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