



# Virtuozzo Automator 6.1

Getting Started Guide

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# Contents

<b>Introduction .....</b>	<b>4</b>
Getting Help.....	4
<b>Installing Virtuozzo Automator.....</b>	<b>6</b>
Virtuozzo Automator Infrastructure.....	6
System Requirements .....	11
Hardware Requirements.....	11
Software Requirements .....	12
Installing on Server Bare Metal.....	13
Installing on Windows.....	14
Installing on Linux.....	15
<b>Virtuozzo Automator Basics.....</b>	<b>17</b>
Getting Started.....	17
Interface Overview.....	18
<b>Managing Physical Servers.....</b>	<b>20</b>
Registering Physical Servers.....	21
Logging in to Physical Servers .....	22
Backing Up and Restoring the Master Server .....	23
Monitoring Physical Server Resources .....	23
Rebooting Physical Server .....	24
Managing Virtuozzo Licenses .....	25
<b>Managing Virtual Environments .....</b>	<b>26</b>
Creating Virtual Environments .....	26
Creating Virtual Machines .....	27
Creating Containers.....	28
Starting and Stopping Virtual Environments.....	29
Logging into Virtual Environments.....	30
Logging in to Virtual Machines.....	30
Logging in to Containers .....	31
Deleting Virtual Environments .....	32
<b>Index .....</b>	<b>33</b>

## CHAPTER 1

# Introduction

Virtuozzo Automator is a flexible and easy-to-use administration tool designed for managing physical servers with Virtuozzo Containers or Server Bare Metal software. With Virtuozzo Automator, you can create groups of physical servers and perform both collective and individual administration operations on these groups. Moreover, you can manage the virtual environments residing on the registered physical servers: their productivity and resources, system tasks and processes, configuration, and much more. To work with the registered physical servers and their virtual environments, you will need a standard Web browser running on any platform.

This guide is aimed at a wide range of users who are new to Virtuozzo Automator or just want to make sure they are doing everything right.

You can read more about Virtuozzo Automator and its functionality in *Virtuozzo Automator Administrator's Guide*.

### In This Chapter

Getting Help..... 4

## Getting Help

Virtuozzo Automator offers several options for accessing necessary information:

### Virtuozzo Automator Documentation

- *Virtuozzo Automator Administrator's Guide*. Contains extensive information about Virtuozzo Automator, its usage, and troubleshooting. To access the PDF version of the document, go to the **Support** link in the left pane and then click the **Downloads** pane. You can download any document of the Virtuozzo Automator documentation bundle from the Virtuozzo website.
- *Virtuozzo Automator Installation Guides for Linux/Bare Metal and Windows*. Contain extensive information on system requirements for physical computers as well as instructions on how to install Virtuozzo Automator on such computers.
- *Getting Started With Virtuozzo Automator*. Contains the basic information how to install, launch, and manage Virtuozzo Automator.
- *Virtuozzo Power Panel User's Guide*. Contains extensive information about Virtuozzo Power Panel.

- *Virtuozzo Automator Agent XML API Reference*. A complete reference on all Virtuozzo Automator configuration files and physical server command-line utilities.

The documentation is available for download at <https://virtuozzo.com/>.

## **Virtuozzo Knowledgebase**

Visit <http://kb.virtuozzo.com/> for helpful articles on Virtuozzo Automator, Virtuozzo Containers, Server Bare Metal, and Virtuozzo.

## CHAPTER 2

# Installing Virtuozzo Automator

Installing Virtuozzo Automator components is a quick and easy procedure that comprises basic steps: starting Virtuozzo Automator installer, configuring installation options, selecting the Virtuozzo Automator components to be installed.

Virtuozzo Automator components can be installed either via the Virtuozzo Automator autoinstaller or from the Virtuozzo Automator installation archives that you should download on your physical servers. This guide contains instructions on how to install Virtuozzo Automator via the autoinstaller. If you choose to install from the archives, please, turn to the *Virtuozzo Automator Installation Guide for Windows* and *Virtuozzo Automator Installation Guides for Linux and Bare Metal*.

### In This Chapter

Virtuozzo Automator Infrastructure .....	6
System Requirements .....	11
Installing on Server Bare Metal .....	13
Installing on Windows .....	14
Installing on Linux .....	15

## Virtuozzo Automator Infrastructure

With Virtuozzo Automator, you can easily deploy an effectively functioning virtual infrastructure that can help you to significantly reduce your costs in terms of time and resources. While Virtuozzo software virtualization products enable you to create complex formations of virtual environments, you may find it hard to manage these formations using different management tools. However, with Virtuozzo Automator you can handle this challenging task with ease. Since Virtuozzo Automator supports the whole set of the Virtuozzo products, you can use it with any of its virtualization solutions, be it Virtuozzo Containers or Virtuozzo virtual machines.

Before you start installing Virtuozzo Automator, you should learn about its components and their role in the management process. Virtuozzo Automator consists of several components and an auxiliary tool. The main Virtuozzo Automator components are:

Component	Where to Install	Description
<b>VA Management Server</b>	On any clean physical server without any software virtualization technology, or on a Container.*	This component ensures the communication between the slave physical servers and their virtual environments.
	The physical server with VA Management Server component	<b>VA Control Center</b> It is a part of the VA Management Server

	installed is called <i>Master Server</i> .	<p>component and is always installed together with it. Thus, you are able to interact with the remote physical servers and have means to observe your virtual infrastructure.</p> <p>It is the VA front-end that you see in the browser window after logging in to Virtuozzo Automator. When talking about the Virtuozzo Automator interface, we are actually talking about the Control Center interface.</p>
<b>VA Agent for Server Bare Metal</b>	<p>On a dedicated physical server that has Server Bare Metal installed.</p> <p>Such server is also called a <i>Slave Server</i>.</p>	The component ensures the interaction between this physical server, the Master Server and your client computer. Without this component, a physical server cannot be registered in Master Server.
<b>VA Agent for Virtuozzo</b>	<p>On a dedicated physical server that has either of the following software installed:</p> <ul style="list-style-type: none"> <li>• Virtuozzo Containers for Linux, or</li> <li>• Virtuozzo Containers for Windows.</li> </ul> <p>Such server is also called a <i>Slave Server</i>.</p>	This component ensures the interaction between this physical server, the Master Server and your client physical computer. Without this component, a physical server cannot be registered in Master Server.
<b>SNMP</b>	On a dedicated physical server that has Virtuozzo Containers for Windows/Linux installed. Such server is also called a <i>Slave Server</i> .	The VA Agent for Virtuozzo on Windows physical servers includes the SNMP protocol distributive that is installed alongside with the Agent. On Linux physical servers, SNMP should be installed separately before the Agent component installation.
<b>Virtuozzo Power Panel</b>	On a dedicated physical server together with the VA Agent component (VA Agent for Virtuozzo).	<p>An auxiliary tool designed for managing a single virtual machine or a single Container. It can be installed only together with the VA Agent component.</p> <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p><b>Note:</b> During the Virtuozzo Power Panel installation, an auxiliary Service Container 1 is created. It ensures proper Virtuozzo Power Panel functioning.</p> </div> <p><b>SOAP</b></p> <p>The Soap Agent part is installed alongside with the Power Panel component. Rejecting Power Panel installation, you will not be able to manage virtual environments via SOAP.</p>

\* The VA Management Server component cannot be installed directly on a Server Bare Metal physical server due to the virtualization software already installed on this server. The workaround solution is to create a Container on the PSBM physical server and to launch the VA installation there. A Container is free from any virtualization technologies, so you can easily install VA Management Server on it. To ensure a successful installation, the Container should be created on the basis of the **ve-vswap.2048MB.conf-sample** template.

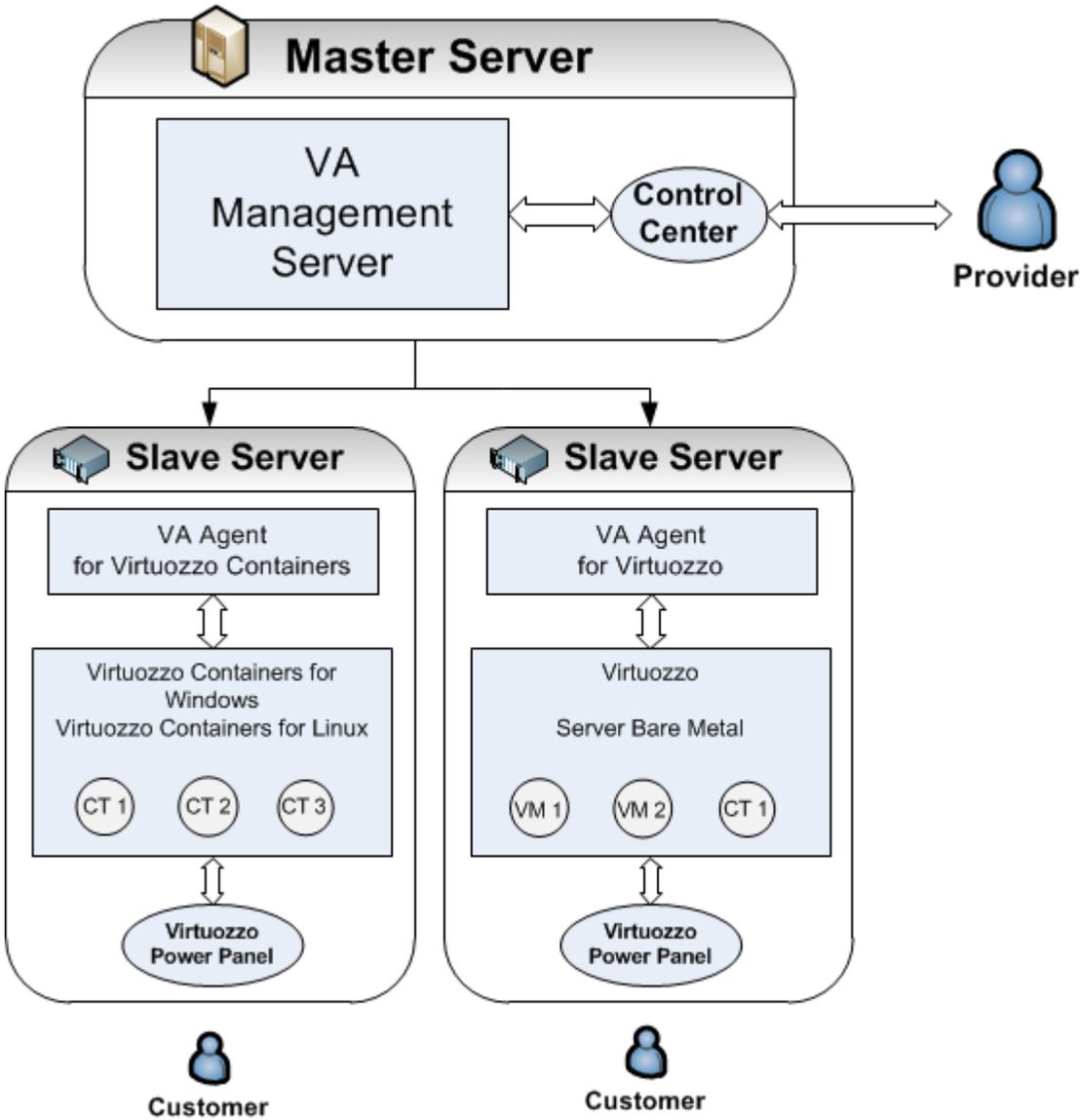
The VA Management Server component cannot be as well installed on a dedicated Linux or Windows-based physical server. However, creating a virtual environment on this physical server allows you to launch the VA Management Server component installation inside it. Create a Container on Linux or Windows server, and a virtual machine with any OS.

For instructions on creating Containers, refer to the *Virtuozzo Containers for Linux User Guide* or *Virtuozzo Containers for Windows User Guide*.

For instructions on creating virtual machines, refer to the Server Bare Metal documentation.

### **Planning Your Virtuozzo Automator Management System**

Please pay attention to the following scheme. This is an example of a possible Virtuozzo Automator management system. Of course, your management system may vary from the scheme below but nevertheless it will help you to understand the Virtuozzo Automator basics more clearly.



So, let us analyze the Virtuozzo Automator management system displayed on the scheme. It consists of:

**Master Server**

Master Server is a physical server where all other subordinate physical servers are registered. On this physical server, VA Management Server component should be installed.

**Note:** The VA Management Server component is always installed together with the VA Control Center component.

What physical server can be used as a Master Server?

- A clean physical server with Linux or Windows operating system. This server should have no Virtuozzo virtualization software installed. The VA Management Server component is installed directly on the physical server.
- A Linux or Windows-based physical server running Virtuozzo Containers or a Windows-based physical server running Virtuozzo Containers for Windows. As such physical server already has a software virtualization technology installed, you cannot install VA Management Server component directly on it. First, you should create a Container by means of Virtuozzo Containers software and then install the VA component inside the Container. In this case, the physical server can act as a Master Server and a Slave Server at the same time.
- A bare-metal physical server running Server Bare Metal. This case is much alike the previous one. First, you should create a Container and then install the VA Management Server component into it. The physical server also can act as a Master Server and a Slave Server at the same time.

### Slave Server

A Slave Server is a dedicated physical server that has one of the Virtuozzo software virtual technologies installed. On this physical server, VA Agent for Virtuozzo should be installed depending on the software virtualization technology the server already has. For example, a bare metal computer with Server Bare Metal software allows you to install both VA Agents, thus to have Containers and virtual machines on one and the same physical server.

A Slave Server should also have the Power Panel component installed. This ensures that a customer can manage the private virtual environment residing on the hosting physical server.

**Note:** VA Agent component is installed by default together with the VA Power Panel component.

What physical server can be used as a Slave Server?

- a Linux-based physical server running Virtuozzo Containers for Linux 4.7;
- a Windows-based physical server running Virtuozzo Containers for Windows 4.6 or Virtuozzo Containers for Windows 6.0.
- a bare metal physical server running Server Bare Metal 5.0 or Virtuozzo 6.0.

**Note:** After you install all the necessary components on the physical servers, you should register your slave servers on Master Server. Registering a slave server is a management operation. You can learn about management operations from the *Virtuozzo Automator Administration Guide*.

### Client Computer

Any computer can serve as a client provided that it has a stable network connection and a Web browser supported by Virtuozzo Automator. A customer's computer does not need any VA components to be installed. The connection between the customer's computer and the VA Slave Server's virtual environments is provided by the Virtuozzo Power Panel installed on the Slave server.

**Note:** Virtuozzo Power Panel allows working with a single private computer and does not provide access to the whole Slave Server or VA management system.

## System Requirements

In most cases, there are no special requirements for the physical servers on which you want to install Virtuozzo Automator components. However, we strongly recommend you to read the following information carefully, so that you can ensure a successful installation of the product.

### Hardware Requirements

If a Windows-based, Linux-based, or Server Bare Metal computer serves as a Master Server, there are no special requirements for it. However, you can use the following list of the basic hardware requirements as a checklist:

- Intel Celeron, Pentium III, Pentium 4, Xeon, or AMD Athlon CPU;
- at least 1 GB of RAM;
- hard drive with at least 15 GB of free disk space;
- network card.

If a Windows-based, Linux-based, or Server Bare Metal computer serves as a Slave Server where virtual environments will be stored and managed, then Virtuozzo Automator will call for more complex hardware. The general considerations regarding the configuration of your physical servers could be as follows:

- CPUs. The more virtual environments you plan to run simultaneously, the more CPUs you need.
- Memory. The more memory you have, the more virtual environments you can run. The exact figure depends on the number and nature of applications you are planning to run in your virtual environments.
- Disk space. Each virtual environment occupies 40–150 MB of hard disk space for system files in addition to the user data inside the virtual environment (for example, website content). You should consider it when planning disk partitioning and the number of virtual environments to run.
- Intel VT-x or AMD-V hardware virtualization technology support (for Server Bare Metal virtual machines management).

For the detailed and more concrete information on the requirements for the physical computer, see *Server Bare Metal Administration Guide*, *Virtuozzo Containers for Linux* and *Virtuozzo Containers for Windows User Guides*.

## Software Requirements

### Software Requirements for VA Client Computers

A client computer should have one of the supported Web-browser clients:

- Internet Explorer 9.x, 10.x, 11.x,
- Firefox 26.x or newer,
- Safari 5.x or newer,
- Chrome 31.x and newer.

**Note:** Although other browsers will most likely work, only those listed above have been extensively tested for compatibility with Virtuozzo Automator.

### Software Requirements for VA Slave Servers

 If a Windows or Linux-based computer serves as a Slave Server where virtual environments will be stored and managed, then Virtuozzo Automator will call for more complex requirements, as the creation and management of Containers demand more complex software resources. So, in choosing an appropriate Windows or Linux-based computer, you should be guided by the system requirements for Virtuozzo Containers and Server Bare Metal. For detailed information on the requirements, see installation guides for these products.

Any physical server that will be managed via VA should have a virtualization technology installed: Virtuozzo Containers software for Linux or Windows, Server Bare Metal for a bare metal computer.

### Software Requirements for VA Master Servers

 If a Windows-based computer serves as a Master Server, it should be free from any software virtualization technology and can have one of the following operating systems:

- Windows Server 2008 R2 SP1,
- Windows Server 2012.

 If a Linux-based computer serves as a Master Server, it should be a physical server without any software virtualization technology running x64 or x86 versions of

- CentOS 5.x or 6.x,
- RHEL 5.x or 6.x.

If a Server Bare Metal computer serves as a Master Server, it should have a Container created by means of the Virtuozzo Containers product. This Container will be used as the hosting computer for the VA Management Server component.

A Linux or Windows-based computer may also serve as a Master Server even they it have a software virtualization product installed (Virtuozzo Containers). In this case, you should create a Container and start the VA Management Server component installation there. The Linux Container should be created on the basis of the **ve-vswap.2048MB.conf-sample** template, whereas a Windows Container needs no special sample to be created.

**Notes:**

1. At the moment, Virtuozzo Automator doesn't support Security Enhanced (SE) Linux, so make sure its working mode is set to *Permissive* before trying to install the product. To set the SE Linux mode to *Permissive*, enter the following command: `/usr/bin/setenforce Permissive`.

2. The software requirements above serve as additional requirements and are true for the proper functioning of Virtuozzo Automator only. Correct work of virtual environments is guaranteed by adhering to the system requirements of the products listed above.

## Installing on Server Bare Metal

You can install Virtuozzo Automator on your Server Bare Metal physical server using the autoinstaller. The autoinstaller scans the physical server and offers to download and to install only those Virtuozzo Automator components that can be installed on this server. Thus, the autoinstaller saves the downloading time and the disk space.

The installation procedure consists of the following steps:

- 1 Download autoinstaller to the physical server where you are going to install Virtuozzo Automator.
- 2 Go down to the directory, where the autoinstaller is stored.
- 3 Start the autoinstaller by executing the following command:

```
# ./autoinstaller_file_name
```

In the above command, `autoinstaller_file_name` stands for the name of the autoinstaller file.

- 4 In the **Welcome to va-setup** window, click **Configure** to specify the Internet repository information and the local download directory to which you want to upload the files. After you have specified the necessary information, click **OK** and then **Next** to proceed with the installation.
- 5 In the **Choose installation type** window, choose the installation type. By default, you are offered to install
  - VA Agent for Virtuozzo components;
  - VA Power Panel component.

**Note:** Installing Power Panel component is optional, whereas installing both VA Agents is obligatory.

- SNMP component. This component can be installed on the physical server only if the `net-snmp` package version 5.1.1-3 or newer is present on the server.

Click **Next** to start the installation. Keep in mind that, by default, the wizard will install both the VA Agents and VA Power Panel components. If you want to deselect VA Power Panel or select the SNMP component, select **Custom installation** and click **Next**. Pass on to the next step.

- 6 After you have selected **Custom installation** and clicked **Next**, you will see the **Choose components to install** window displayed. Choose the component for the installation.
- 7 Click **Next** to start the installation.

For the instructions on how to install Virtuozzo Automator from the installation archive, refer to the *Virtuozzo Automator Installation Guide for Linux and Bare Metal*.

## Installing on Windows

You can install Virtuozzo Automator components on your Windows-based physical server using the autoinstaller. The autoinstaller scans the physical server and offers to download and to install only those Virtuozzo Automator components that can be installed on this server. Thus, the autoinstaller saves the downloading time and the disk space.

The installation procedure consists of the following steps:

- 1 Download autoinstaller to the physical server where you are going to install Virtuozzo Automator components.
- 2 Start the autoinstaller by double-clicking it.
- 3 In the **Welcome** window, click **Configure Settings** to specify the Internet repository information and the local download directory to which you want to upload the Virtuozzo Automator installation files.

When the necessary information is specified, click **Next** to proceed with the installation.

- 4 In the **Choose Setup Type** window, choose the installation type. The components for the default installation may differ. This depends whether the physical server is clean or already has any software virtualization technology installed on it.
  - If the physical server is clean (i.e. has no software virtualization technology installed), you will be offered to install the VA Management Server component by default. Click **Next** to start the installation. If you want to change the destination folder for the Management Server component, choose **Custom installation** and click **Next**.
  - If the physical server has Virtuozzo Containers for Windows installed, you will be offered to install the VA Agent for Virtuozzo component. Keep in mind that, by default, the wizard installs both the VA Agent for Virtuozzo and VA Power Panel components. Additionally, you can select the SNMP component for installation.

If you want to install only VA Agent and Power Panel components, click **Next** to start the installation. If you want to deselect VA Power Panel or select the SNMP component, select

**Custom installation** and click **Next** to specify the components which will be installed. Pass on to the next step.

- 5 After you have selected **Custom installation**, you will see the **Choose components to install** window displayed. You can manually select where the program files will be placed by typing the path in the **Choose destination folder** field.
- 6 Click **Next** to start the installation.

For the instructions on how to install Virtuozzo Automator from the installation archive, refer to the *Virtuozzo Automator Installation Guide*.

## Installing on Linux

You can install Virtuozzo Automator on your Linux-based physical server using the autoinstaller. The autoinstaller scans the physical server and offers to download and to install only those Virtuozzo Automator components that can be installed on this server. Thus, the autoinstaller saves the downloading time and the disk space.

The installation procedure consists of the following steps:

- 1 Download autoinstaller to the physical server where you are going to install Virtuozzo Automator.
- 2 Go down to the directory, where the autoinstaller is stored.
- 3 Start the autoinstaller by executing the following command:

```
# ./autoinstaller_file_name
```

In the above command, `autoinstaller_file_name` stands for the name of the autoinstaller file.

- 4 In the **Welcome to va-setup** window, click **Configure** to specify the Internet repository information and the local download directory to which you want to upload the files. After you have specified the necessary information, click **OK** and then **Next** to proceed with the installation.
- 5 In the **Choose installation Type** window, choose the installation type. The component for the default installation may differ. This depends on whether the physical server is clean or already has any software virtualization technology installed on it.
  - If the physical server is clean (i.e. has no software virtualization technology installed), you will be offered to install the VA Management Server component by default. Click **Next** to start the installation. If you want to change the destination folder for the Management Server component, choose **Custom installation** and click **Next**.
  - If the physical server has Virtuozzo Containers installed, you will be offered to install the VA Agent for Virtuozzo component. Keep in mind that, by default, the wizard will install both the VA Agent for Virtuozzo and VA Power Panel component. Additionally, you can install SNMP component. This component can be installed on the physical server only if the `net-snmp` package version 5.1.1-3 or newer is present on the server. If you want to deselect VA Power

Panel or select SNMP component, select **Custom installation** and click **Next**. Pass on to the next step.

- 6** After you have selected **Custom installation**, you will see the **Choose components to install** window displayed. Choose the component to be installed and, if necessary, change the default destination folder for the components installed.
- 7** Click **Next** to start the installation.

For the instructions on how to install Virtuozzo Automator from the installation archive, refer to the *Virtuozzo Automator Installation Guide*.

# Virtuozzo Automator Basics

The main thing about Virtuozzo Automator you should know before starting to use it, is that Virtuozzo Automator is a Web service that enables you to manage physical servers and the virtual environments residing on them over a network. This means that Virtuozzo Automator is not a conventional application you can launch by opening an EXE or RPM file, but rather a low-level software that enables you to remotely access physical servers and the virtual environments they host via LAN or Internet.

Virtuozzo Automator is an advanced, yet an easy-to-use tool, that couples intuitive interface with extensive functionality. With Virtuozzo Automator, you can manage separate physical servers and each of their virtual environments, organize servers into server groups and administer the resulting units; supervise user accounts and privileges, and much more. For more information about the Virtuozzo Automator features, see *Virtuozzo Automator Administrator's Guide*.

This chapter provides basic information about the Virtuozzo Automator concept and usage.

## In This Chapter

Getting Started.....	17
Interface Overview.....	18

## Getting Started

To start managing your virtual infrastructure with Virtuozzo Automator, do the following:

- 1 Install VA Management Server component on the Master Server, which will provide you with the access to all registered physical servers and virtual environments.

We strongly recommend you to install VA Management Server on a stationary physical server that is maintained, powered on, and connected to the network for long periods. Thus you will secure access to the VA infrastructure at any time and for any administrator.

**Note:** Management Server component is always installed together with Control Center subcomponent, which cannot be disabled.

- 2 Install the VA Agent for Virtuozzo on the physical servers you want to manage. The choice on the VA component depends on the software virtualization product which is already installed on the physical server. After you have installed these components, you can register the physical server in the Master Server.

**Note:** Power Panel is installed together with VA Agents by default, but can be disabled on your wish.

- 3 On the Master Server or any other computer, open the available Web browser and log in to Virtuozzo Automator by typing the Management Server IP address( or hostname) and the open TCP port (default port is 4648) in the address bar. The resulting line may look like as follows:  
`https://10.50.120.70:4648.`

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

**Note:** You can access the Management Server and, therefore, all Virtuozzo Automator functionality from any computer on the network, irrespective whether it has any Virtuozzo Automator components installed or not. The point is that as soon as you connect to the Management Server, you automatically connect to its Control Center and thus can use it remotely.

- 4 When the browser displays the login window, type your user name and password and click the **Login** button. To log in as an administrator, provide the administrative credentials for the operating system installed on the Master Server.
- 5 Now that you have successfully logged in to Virtuozzo Automator, you can deploy your virtual infrastructure by registering the required physical servers and creating virtual environments. The following section, **Interface Overview (p. 18)**, will help you to get accustomed to the Virtuozzo Automator interface, while **Managing Virtual Environments (p. 26)** and **Managing Physical Servers (p. 20)** will familiarize you with the basic management operations.

## Interface Overview

The Virtuozzo Automator interface has been designed to let the physical server administrator quickly perform all possible tasks through an intuitive navigation system.

The main components of the Virtuozzo Automator interface are the following:

- The left menu frame listing and allowing access to all your physical servers and virtual environments. The left menu also allows access to the main types of operations to be performed on them with the help of Virtuozzo Automator.
- The toolbar on top of the right frame enabling you to perform the basic actions on your physical servers and virtual environments. The set of the toolbar buttons varies depending on the type of the object you explore, for example, **Infrastructure**, **Resource Library**, or **Setup** menu items.
- The content part on the right frame displays a summary for the object you select, be it a physical server, a virtual environment, or a template. The content part may consist of several tabs, each containing more detailed object information and links to advanced actions.
- The **Tasks** pane at the bottom of the right frame allowing you to view all the operations recently finished and running at the moment, their start times, the objects they are applied to, their statuses, progress information and other details. The pane is minimized by default. To expand it, click **Tasks** at the bottom of the screen.

The left menu frame contains several menus:

<p><b>Infrastructure</b></p>	<p>Displays the physical structure of your registered physical servers (Virtuozzo Automator infrastructure) in the form of a hierarchical tree with physical servers as its upper levels and the virtual environments hosted on them as lower levels. Using the Infrastructure context menu or toolbar, you can arrange the physical servers into groups, thus making the servers management more convenient.</p> <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p><b>Note:</b> Although you can create and rearrange Server Groups in the <b>Infrastructure</b> menu, each physical server can be located in only one group at a time. If the Server Group arrangement requires adding the same server to two or more different groups, use the <b>Logical View</b> for viewing and managing your servers.</p> </div> <p>Each of the physical servers and virtual environments that make up your Virtuozzo Automator infrastructure displays its name on the Infrastructure-oriented left menu which, if clicked on, leads to its dashboard.</p>
<p><b>Logical View</b></p>	<p>Displays the custom structure of the registered physical servers. The <b>Logical View</b> provides a flexible solution for Server Groups arrangement, as it enables you to add one and the same physical server to several groups or place virtual environments hosted on different servers in one folder.</p>
<p><b>Resource Library</b></p>	<p>Provides quick access to the auxiliary information, such as IP Pools, available virtual environment templates, etc.</p>
<p><b>Management</b></p>	<p>Provides access to the Virtuozzo Automator management tools, such as the <b>Scheduler</b> or the <b>Support</b> error report tool.</p>
<p><b>Setup</b></p>	<p>Provides access to the general configuration information, such as <b>Licensing</b> or <b>Security</b> settings.</p>

By default, the left menu frame displays all available menu items from **Infrastructure** to **Setup**. However, you can change the menu layout by clicking any of the buttons placed on the bottom.

While the actual appearance of the Virtuozzo Automator interface content part on the right frame is dictated by the tag opened at the moment, there are always two main operational levels: the virtual environments level and the physical servers level that determine its overall appearance and the available options. Both levels afford to perform operations on a single virtual environment or physical server, as well as multiple operations. Each time you click on a Datacenter, Room, Cage, or Rack on the left Virtuozzo Automator menu, the right pane loads a screen with the **Summary**, **Physical Servers**, **Virtual Environments**, **Templates**, **Backups**, and **Security** tabs; the **Summary** tab is opened by default.

## CHAPTER 4

# Managing Physical Servers

As soon as you register a physical server in Virtuozzo Automator, you can manage it. To be registered, the physical server should have:

- Virtuozzo virtualization software installed: Virtuozzo Containers for Linux/Windows or Server Bare Metal software.
- VA Agent for Virtuozzo installed. The VA Agent type depends on the virtualization software type.

The Virtuozzo Automator functionality enables you to register and manage a number of physical Servers via VA Control Center, group them under logical units and consolidate their IP addresses into an IP addresses pool.

The servers collectively registered in Virtuozzo Automator are easier to manage because all of them are accessible from any computer when you log to the VA Control Center. For information on registering physical servers, refer to **Registering Physical Servers** (p. 21).

**Note:** VA Control Center is always installed together with VA Management server Component.

When you find out that the number of registered servers (and, consequently, of virtual environments that run on them) has grown, you may consider dividing them into a number of logical units representing certain classes, e.g., servers based on a certain architecture, hosted virtual environments of a particular purpose, etc. The IP addresses of a group of physical servers united into an IP address pool present a more convenient distribution because, when assigning IP addresses to virtual environments, there will be no IP conflicts and you will not have to enter IP addresses manually as they will be selected from the pool.

On the **Physical Servers** screen, you can review the list of physical servers currently registered in Virtuozzo Automator and see the servers details, such as the current operating system, its CPU and memory usage, etc.

**Note:** If this screen is loaded in the **Logical View**, the servers displayed in this table are those which have been added to the **Logical View**, otherwise the servers list is empty. To add a physical server to the **Logical View**, click **Add** on the Virtuozzo Automator toolbar, select **Physical Server** from the menu and choose the server(s) on the screen it opens.

Below, there are several how-to's for basic management operations:

- To manage any of the servers registered in VA, click its name in the leftmost column of the table.

- To display a certain server from a long list of servers, click the **Show Search** link on top of the table, enter the name of the server and click the **Search** link; to have the list of the servers back, click **Reset Results**.
- To stop managing a physical server via VA, select its checkbox and click **Unregister**.
- To add a new server to the list of the physical servers registered in VA, click the **Add** button on the main toolbar.

## In This Chapter

Registering Physical Servers .....	21
Logging in to Physical Servers .....	22
Backing Up and Restoring the Master Server .....	23
Monitoring Physical Server Resources .....	23
Rebooting Physical Server .....	24
Managing Virtuozzo Licenses.....	25

# Registering Physical Servers

You can register in Virtuozzo Automator any Windows, Linux, or Server Bare Metal computer providing there is the necessary virtualization technology installed. The newly registered physical servers will be displayed in the servers list on the **Physical Servers** screen and accessible for all the usual managing and monitoring operations Virtuozzo Automator provides you with.

Besides this, the servers registered in Virtuozzo Automator form a joint physical servers' pool which provides for the following collective actions:

- creating a logical structure of physical servers and the virtual environments residing on them;
- migrating virtual environments between physical servers;
- migrating physical servers to virtual environments;
- copying OS and application templates from one physical server to another;
- making Container templates stored on the Master Server available to other registered physical servers;
- consolidating server IP addresses into a network address range.

Registering a new physical server for management via Virtuozzo Automator is simple, and all it takes is entering the following information on the new server:

- 1** The server's valid IP address that will be used by Virtuozzo Automator components to connect to this server. Enter this IP address to the **Server Address** field in the **Connection to Physical Server** section.
- 2** The administrative login and password to connect to the physical server as the Administrator/root. Specify the credentials in the **Administrative Login to Hardware Node** section.

- 3 Selecting the **Force Registration even if Node is already registered in another Server Group** check box is the option to choose when the physical server you are registering has already been and still is registered in another Server Group and you need it to be registered in your Server Group. If you forcibly register the server, it will be removed from the Server Group it currently belongs to.

Clicking the **Register** button initiates the registering procedure.

## Logging in to Physical Servers

 If you are managing a physical server with the Windows operating system installed, you can use Remote Desktop Connection, a standard Windows application, to connect to the physical server by means of the Remote Desktop Protocol (RDP).

**Note.** The option is available only for Internet Explorer 5.0 or above.

To connect to a physical server via RDP, do the following:

- 1 Open the **Remote Desktop** window by clicking the **Remote Desktop** button on the Server's toolbar.
- 2 In the **Remote Desktop** window, click the **Login** button to open a Remote Desktop session.  
If you are doing this for the first time, your browser may display a security warning asking you to install additional components. Click **Yes** and wait for the Remote Desktop terminal window to appear.
- 3 In this window, specify your user name and password you created for this Physical Server and click **Enter** to get connected to the physical server and start sending commands to the server via Remote Desktop.

 If you are managing a physical server with the Linux operating system installed, you can use the Secure Shell (ssh) application to remotely connect to the Server and work inside its directory tree using standard Linux command line tools.

**Note.** The option is available only for Internet Explorer 5.0 or above.

To connect to a Physical Server by `ssh`, do the following:

- 1 Open the **SSH Connection** window by clicking the **Terminal Login** button on the Server's toolbar.
- 2 In the **SSH Connection** window, specify your user name and password you created for this Physical Server and click **Login** to get connected.

If you are doing this for the first time, your browser may display a security warning asking you to install additional components. Click **Yes** and wait for the `ssh` terminal window to appear, whereupon you get connected to the Server and may start sending commands to it via `ssh`.

## Backing Up and Restoring the Master Server

In the Virtuozzo Automator 6.1 infrastructure, Master Server is a uniting element that ensures successful communication between all Slave physical servers in the system and their virtual environments. It also serves as a storage for management, security and other sorts of data. Just as you make a backup of any physical server or virtual environment in Virtuozzo Automator, you can back up the Master Server and store this backup for the case of emergency.

You can learn how to download the backup script from the Virtuozzo Knowledgebase at <http://kb.virtuozzo.com/en/6830>.

### Backing Up Physical Server

The VA backup script `pvabackup.vbs`, after default download, is stored in the `C:\Program Files\Parallels\Parallels Virtual Automation\Management Server\bin\location`. To back up a Master Server with the help of the VA script, start it with the following parameters:

```
cscript.exe pvabackup.vbs BACKUP c:\mn_backups
```

Where "`c:\mn_backups`" is an automatically generated location for the target backup. The backup name consists of the year, month, day, hour, minute, and second when the backup was made, for example `20091027222544`. To give a backup a specific name, use the script with a concrete backup name:

```
cscript.exe pvabackup.vbs BACKUP c:\mn_backups b1
```

Where "`b1`" stands for the concrete backup name, and the storage location will be `c:\mn_backups b1`.

### Restoring Physical Server

To restore the Master Server, the script should look as follows:

```
cscript.exe pvabackup.vbs RESTORE c:\mn_backups 20091027222544
```

Where `20091027222544` is the name of the target backup you want to restore from.

**Note:** The Master Server will be restored with all the values overwritten from the backup. The changes in the Master Server made after the date of this backup will be lost after the server has been restored.

## Monitoring Physical Server Resources

Virtuozzo Automator enables you to monitor and manage not only the virtual environments operation, but also the physical servers resources. In Virtuozzo Automator, you can view the current resource usage statistics and adjust the values to improve the performance of the physical server, as well as that of the virtual environments it hosts.

The overall CPU, disk and memory-related resources usage of the physical server registered in Virtuozzo Automator are displayed on the physical server Dashboard.

The **Disk Partitions** and **Memory** sections inform you about the respective resources consumption on the physical server.

The information on the **Disk Partitions** size usage in all the host OS partitions or logical disks existing on your physical server is presented in the following tables (corresponding to the number of partitions/logical disks):

Column Name	Description
Mount Point	The name of the partition/logical disk using the resource.
Used	Used amount of disk size in the partition/logical disk
Free	Free amount of disk size in the partition/logical disk.
Total	The total amount of disk size allocated for the partition/logical disk.

The information on the **Memory** usage is displayed in the following way:

Field	Description
Physical memory	The percentage of the current physical server utilization in terms of allocated memory.
Swap Space	The percentage of the current physical server utilization in terms of allocated swap space. The bar is not displayed if swapping is not configured on the physical server.
RAM+Swap	The simple average of the resources above.

If you need to free some of the resources, click the **Resources** tab. You will see which of the virtual environments hosted on the physical server consume the biggest piece of a corresponding resource. Then, depending on how important the operations run on these virtual environments are, you can suspend some of them. A suspended virtual environments stays put, and so its processes and services do, to be later resumed from the checkpoint. Suspending virtual environments is a good method to release the physical server resources for a certain period of time or saving the state of current operations which can be quickly launched again later.

**Note:** Remember, that repairing, restarting and reinstalling a suspended virtual environment can change the saved state of the virtual environments, so these actions are not recommended.

## Rebooting Physical Server

Sometimes you may need to reboot your physical server, for example, if you have installed a new Linux kernel want to start using it.

Before rebooting the server, keep in mind that usually this process takes about 3-5 minutes. During this time, the physical server and all virtual environments residing on it will be unavailable.

To reboot the physical server, you can do one of the following:

- Go to the **Physical Servers** page of the **Infrastructure** window, right-click the server name and select **Reboot** from the context menu.
- Click the server name in the infrastructure tree to open the **Physical Server** page and select **Reboot** from the **Tasks** list.

## Managing Virtuozzo Licenses

Physical servers running Virtuozzo Containers technology demand Virtuozzo Containers licenses to create and work with Containers. Physical servers running Server Bare Metal technology demand Server Bare Metal license to create and work with virtual machines and Containers.

You do not need to additionally install Virtuozzo Containers license on PSBM physical servers to run Containers on them.

Any of the licenses can be installed either as a key string or as a text file with the help of the **Install License Key** or **Install License File** links, correspondingly. Whereas a license key can be installed directly on the target physical server, the license file first should be uploaded to Virtuozzo Automator and only then it can be installed on the physical server.

A license includes a set of parameters, the full list of which (such as, the number of CPUs, virtual environments, or users your license allows you to have on the physical server) is available on the screen which opens if you click the key number of the license or the license serial number. If any of these parameters has been or will be changed (say, you upgraded your physical server with more CPUs, or want to extend the limit of the virtual environments that the physical server may host), you will need to update your physical server license as well.

You may also want to update the license if the data in the **Status** or **Expiration** columns suggest that you do. For example, if the **Status** column tells you that the license is invalid, or expired, or the expiration date displayed in the **Expiration** column is close, this is a good reason to update it. Finally, you can update your trial license. To update your license, select its checkbox on the list and click **Refresh** on the Virtuozzo Automator toolbar.

The **Licensing** screen contains all necessary information on the Virtuozzo Containers and Server Bare Metal product keys installed on physical servers registered in Virtuozzo Automator.

The **Licenses** table on shows the information on all your licenses:

Column Name	Description
<b>Serial Number</b>	The string of symbols that serves for both activating the license and as an identifier of the license on the physical server.
<b>Key Number</b>	The key number of the license, which identifies the license on the Virtuozzo Key Authentication (KA) server.
<b>Hardware Node</b>	The physical server on which the license is installed.
<b>Status</b>	The status of the license.
<b>Expiration</b>	The expiration date and time of the license.

# Managing Virtual Environments

When you have created the VA infrastructure with all the necessary physical servers, you can pass on to creating and managing virtual environments. This section provides you with the information on creating Containers and virtual machines, as well as on how to log into them via outside applications and how to perform the main management operations.

## In This Chapter

Creating Virtual Environments .....	26
Starting and Stopping Virtual Environments.....	29
Logging into Virtual Environments .....	30
Deleting Virtual Environments.....	32

## Creating Virtual Environments

This section provides basic instructions for creating a virtual environment using Virtuozzo Automator.

You can create either a virtual machine or a Container. The two types belong to different software virtualization technologies and have a number of differences in their configuration settings.

When deciding on the new virtual environment type, you may consider the following points:

- Containers are less resource consuming than virtual machines, as they do not emulate the physical server hardware.
- Virtual machines require a guest OS to be installed after creation, while Containers are created with a guest OS and can be started right away.
- The virtual machine OS, unlike a Container OS, does not depend on the physical server OS. You can choose any operating system you need from the list of supported OSs for the virtual machine.

Each virtual environment configuration you make up during the creation process contains a number of advanced settings that you may skip when learning the basics of Virtuozzo Automator. In case you would want to learn more about the advanced options, you can click the  **Help** button in the upper right-hand corner of the window, or see *Virtuozzo Automator Administrator's Guide*.

## Creating Virtual Machines

Creation of a Virtuozzo virtual machine is quite an easy process, during which you define basic virtual machine settings and create initial configuration that you can edit later from the virtual machine dashboard or with the help of Virtuozzo.

To create a new virtual machine, perform the following actions:

- 1 Click the  **New** button and select **Virtual Environment** from the drop-down list.
- 2 In the **New Virtual Environments: Begin** screen, select the type of virtual environment you want to create: in this case, it will be **Virtuozzo Virtual Machine**.

As you make the selection, you are prompted to define on what physical server the virtual machine will reside in the **Hardware Node Selection** section. You can either let Virtuozzo Automator select the server for you, or specify one on yourself.

In the **Virtual Environment Configuration** section, specify the number of virtual machines to be created and the virtual environment template to be applied to them. The list of templates is built up of the Library templates. If there are none, the list will be empty.

As you finish with the initial settings, click **Next** to proceed to the next screen.

- 3 In the **New Virtual Machines: General Settings** screen, specify the new virtual machine name and the guest operating system type and version. At this point, you can also create a list of users who will be able to manage the new virtual machine and define their administration privileges in the **Permissions** section.

Besides the general settings, you can also adjust the virtual machine working mode and appearance:

- Expand the **Host System Integration** section to set the virtual machine dependencies on the physical server operation, such as the start method (automatic on the server load/reload or manual) or the foreground and background processes relation.

To receive a full description on all sections on this page, refer to the *Virtuozzo Automator Administrator's Guide*.

When finished, click **Next** to define the hardware settings, or click **Create** to apply the default hardware settings and create the virtual machine.

- 4 In the **Hardware Settings** screen, specify the characteristics of the new virtual machine hardware, such as the number of virtual CPUs, the amount of the Physical Server RAM to be used by the virtual machine, and various virtual devices settings. To view and edit the default settings, click the device name in the device panel to the left.

By default, the virtual devices you can set up in this step are the virtual machine hard disk, network adapter and CD/DVD-ROM. However, you can add more devices to the virtual machine configuration by clicking the **Add Device** button at the bottom of the devices panel. From the pop-up list that appears, select the required virtual hardware and click **Add**.

When you are done with the hardware settings, click **Next** to proceed.

- 5 In the **Review** screen, check the virtual machine configuration settings you have specified and either click **Back** to go back to the previous steps and change them, or click **Create** to schedule the new virtual machine creation task.

At this point, you will be redirected to the **Virtual Environments** tab of the **Infrastructure** screen. The information bar at the top of the screen informs you about the scheduled task and provides the **Details** link to the task progress information.

After the virtual machine is created, you can find it in the list of available virtual environments. If it doesn't appear, click the  **Refresh** button and check again.

## Creating Containers

The procedure of Virtuozzo Container creation is a little bit more complicated than that of a Virtuozzo virtual machine, since almost every window contains not only the basic configuration options, but also a number of advanced settings. The good thing about it is that you can easily skip the advanced options or simply use the default parameters that the Virtuozzo Automator team has developed for your convenience. Or you may learn more about these options by clicking the  **Help** button and reading the corresponding help page.

In any case, you can always edit the Container configuration later from the Container dashboard or with the help of Parallel Virtuozzo Container software.

To create a new Container, perform the following actions:

- 1 Click the  **New** button and select **Virtual Environment** from the drop-down list.
- 2 In the **New Virtual Environments: Begin** screen, select the type of virtual environment you want to create: in this case, it will be **Virtuozzo Container**.

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

In the **Virtual Environment Configuration** section, specify the number of Containers to be created and the virtual environment template to be applied to them.

As you finish with the initial settings, click **Next** to proceed to the following screen.

- 3 In the **New Containers: Setup** screen, specify the new Container name and the Virtuozzo OS template to be applied to create a Container.

It is also recommended to specify the administrative password at this point, so that you won't have to do this later. The default username for the administrator of the Containers with the Windows and Linux operating system will be *Administrator* and *root* respectively. Besides setting up the administrator credentials, you can make up a list of users who will be able to manage the Container and define their administration privileges in the **Permissions** section.

In this window, you can also configure a number of advanced settings found in the following sections:

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

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

- 4 In the **New Containers: Network Configuration** screen, provide the connection information that will be used for connecting to the new Container, such as the Container hostname and its IP address. Click **Next**.
- 5 In the **New Containers: Resources Customization** screen, adjust the advanced settings concerning the Container CPU, memory and operating system parameters. Since setting up these values is quite a challenging task, you can use the default settings.

**Note:** If you'd like to learn more about the advanced options, you can click the  **Help** button in the upper right-hand corner of the window, or see *Virtuozzo Automator Administrator's Guide*.

- 6 In the **New Containers: Application Selection** screen, specify the applications you want to automatically install in the Container upon its creation. To select an application, select it in the **Available Applications** list and click  to move it to the **Scheduled for Installation** list, as shown below:
- 7 In the **Review** screen, check the Container configuration settings you have specified and either click **Back** to go back to the previous steps and change them, or click **Create** to schedule the new Container creation task.

At this point, you will be redirected to the **Virtual Environments** tab of the **Infrastructure** window. The information bar at the top of the window informs you about the scheduled task and provides the **Details** link to the task progress information:

After the Container is created, you can find it in the list of available virtual environments. If it doesn't appear, click the  **Refresh** button and check again.

## Starting and Stopping Virtual Environments

A virtual environment can be started up, restarted, paused, and shut down like an ordinary computer. Depending on the virtual environment state, only those operations are accessible that comply with its current state. For example, a running virtual environment cannot be started for obvious reasons, and so on. The following states can be characterized as stable:

Status	Description
Running	The virtual environment is running; therefore, it may be restarted, suspended, pauses or stopped.
Down	The virtual environment is stopped; therefore, it may only be started.
 Repairing	The virtual environment is being repaired. You cannot perform any action on the virtual environment until you click the <b>Finish Repair</b> button.

Besides these states, a virtual environment may be in one of the transitional states: mounting, starting, stopping, etc. When a virtual environment is in a transitional state, you cannot perform any action on it until the operation is finished.

To change the virtual environment state, go the **Virtual Environments** tab of the **Infrastructure** page and click the **Start**, **Stop**, **Pause** or **Restart** button to perform the corresponding action. On clicking one of these buttons, this action is logged.

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

**Note:** Some operations are available either for virtual machines or Containers. For example, you can pause virtual machines only.

## Logging into Virtual Environments

Sometimes you may find it necessary to log in to a virtual environment to monitor or manage it from the inside. The topics in this section explain how you can do this using VA Control Center.

### Logging in to Virtual Machines

You can connect to the virtual machine via Virtual Network Computing (VNC), a graphical desktop sharing system.

To connect to a virtual machine via VNC, do the following:

- 1 Make sure that the required virtual machine is running. If it is not, start it via VA.
- 2 Open the virtual machine **Console** tab by selecting the corresponding option from the virtual machine context menu (right-click the virtual machine name and select **Open Console**), or by clicking **Open Console** in the **Tasks** section of the virtual machine **Summary** tab.

On the **Console** tab, the virtual machine remote display will open automatically.

If you do this for the first time, your browser may display a security warning asking you to install additional components. Click **Yes** and wait for the remote desktop window to appear. In this window, specify your user name and password you created for this virtual machine and click **Enter** to get connected to the virtual machine and start sending commands to it via VNC.

## Logging in to Containers

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

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

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

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

 You can use the Secure Shell (ssh) application to remotely connect to a Linux Container and work with SSH-application via command line utility.

**Note:** The feature is available for all the browsers supported by Virtuozzo Automator.

To connect to a Container by `ssh`, do the following:

- 1 Make sure that the required Container is running. If it is not, start it.
- 2 Open the **SSH Connection** window by selecting the corresponding option either from the Container's context menu (right-click the Container's name and select **Log In -> Terminal Login**), or from the Container's toolbar (click the **Log In** button and select **Terminal Login**).
- 3 In the **SSH Connection** window, specify your user name and password you created for this Container and click **Login** to get connected to the Container.  
If you do this for the first time, your browser may display a security warning asking you to install additional components. Click **Yes** and wait for the `ssh` terminal window to appear, whereupon you get connected to the Container and may start sending commands to it via `ssh`.

## Deleting Virtual Environments

The **Delete** screen allows you to remove those virtual environments from your physical servers that you do not need anymore.

To delete a virtual environment, do the following:

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

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

- 2 To delete the listed virtual environments, select the **Yes, I want to delete the Virtual Environment(s)** check box and click the **Delete** button; otherwise, click **Cancel**.

When removing virtual environment, please, keep in mind the following:

- Removing a virtual environment means that the private area of the virtual environment is completely deleted from the Host OS and all the virtual environment private files are irrevocably erased from the physical server.
- Deleting a considerable number of virtual environments may take a while.

# Index

## B

Backing Up and Restoring the Master Server - 23

## C

Creating Containers - 28  
Creating Virtual Environments - 26  
Creating Virtual Machines - 27

## D

Deleting Virtual Environments - 32

## G

Getting Help - 4  
Getting Started - 17

## H

Hardware Requirements - 11

## I

Installing on Linux - 15  
Installing on Server Bare Metal - 13  
Installing on Windows - 14  
Installing Virtuozzo Automator - 6  
Interface Overview - 18  
Introduction - 4

## L

Logging in to Containers - 31  
Logging in to Physical Servers - 22  
Logging in to Virtual Machines - 30  
Logging into Virtual Environments - 30

## M

Managing Physical Servers - 20  
Managing Virtual Environments - 26  
Managing Virtuozzo Licenses - 25  
Monitoring Physical Server Resources - 23

## R

Rebooting Physical Server - 24  
Registering Physical Servers - 21

## S

Software Requirements - 12  
Starting and Stopping Virtual Environments - 29  
System Requirements - 11

## V

Virtuozzo Automator Basics - 17  
Virtuozzo Automator Infrastructure - 6