## SIEMENS

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## SIMATIC

# SIMATIC Virtualization as a Service

**Operating Manual** 

#### Legal information

#### Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

#### Â

indicates that death or severe personal injury will result if proper precautions are not taken.

#### 

indicates that death or severe personal injury may result if proper precautions are not taken.

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indicates that minor personal injury can result if proper precautions are not taken.

#### NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

#### **Qualified Personnel**

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

## Preface

#### Purpose of the manual

This document supports you in commissioning and configuring the virtualization system.

#### Core content

The following core issues are covered in this document:

- What is SIMATIC Virtualization as a Service?
- Which services are included?
- How is the virtualization system commissioned?
- How is the virtualization system configured in a PCS 7 environment?
- How can the virtualization system be extended?
- How does remote log in work on virtual machines (VMs)?
- How is the data backed up?

#### Required basic knowledge

General knowledge in the area of automation engineering and process control engineering is required to understand this documentation.

#### Validity

This document is valid for the following components of the "SIMATIC Virtualization as a Service V1.0" virtualization system:

- SIMATIC PCS 7 V8.0 SP1
- VMware vSphere 5.1
- HP Proliant DL380P GEN8
- HP T510 ThinClient

Preface

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# 1

## Introduction

## 1.1 Introduction to virtualization

Virtualization is a method of dividing up physical hardware resources on one computer into several logical (virtual) environments.



As a result of the virtualization the operating system and user software on a computer is detached from its hardware and provided in the form of a virtual machine (VM). A virtual machine refers to software that depicts a real computer and can itself execute applications. Virtual machines have virtual hardware (e.g. graphics card, CPU, memory (RAM), network cards, and hard disks on SCSI or IDE controllers) and standardized virtual device drivers.

Several virtual machines can be implemented separately from each other on a real, physical computer (host system). Isolation prevents conflicts from software dependencies and offers the opportunity to start and stop virtual machines independently of each other. If there is a crash only the relevant virtual machine is affected.

The physical computer (host system) can also be upgraded without affecting or modifying the virtual machines.

#### 1.2 Description

SIMATIC Virtualization as a Service is a pre-configured immediately usable virtualization system for realizing efficient automation solutions for SIMATIC PCS 7 systems.

#### 1.2.1 The virtualization system

The virtualization system is comprised of software and hardware components that are ideally matched to each other and thus offer high performance. They include:

- Hardware
  - Virtualization server (HP ProLiant DL380P GEN8)
  - Thin client (HP t510 Thin Client)
- Software
  - VMware vSphere Hypervisor
  - VMware vSphere Client
  - Virtual machines with the Microsoft Windows operating system and SIMATIC PCS 7 V8.0 SP1

The virtualization system can be extended easily and efficiently using pre-configured templates and is therefore scalable to various system sizes. A highly available system with redundant OS servers can be implemented by connecting another virtualization server with the relevant PCS 7 software.



#### 1.2.2 Service

With the purchase of "SIMATIC Virtualization as a Service" the following product groups are supported as part of the "Product service & support" module:

- SIMATIC PCS 7 V8.0 SP1
- Hardware platform: HP ProLiant DL380P GEN8
- Virtualization software: VMware vSphere Standard 5.1
- HP ThinClient T510

The support is provided by a contact from Siemens Industry. The service and support package offers advice and support for quickly resolved tasks (up to 2 hrs per case) by telephone, support request, or fax. For requests that last longer than 2 hours Siemens will submit a quotation for "extended support". The number of cases is not limited.

You can send your support requests via the Siemens Industry Online Portal (https://support.automation.siemens.com).

#### 1.3 Function principle

A hypervisor is installed on a high-performance server (HP Proliant DL380P GEN8) as an additional software layer that manages the hardware resources and is dynamically distributed across the virtual machines.

The central management, configuration, and maintenance of the virtual machines and the virtualization server is undertaken via a management console and using the "VMware vSphere Client" software. You can use the following hardware as a management console:

- The supplied thin client if this is equipped with a Windows operating system. In this case the thin client must be connected with the management bus.
- Any computer that meets the requirements for the "VMware vSphere Client 5.1" software. For additional information refer to <u>http://kb.vmware.com/selfservice/microsites/search.do?language=en\_US&cmd=displayK</u> <u>C&externalId=2005083</u>.

The virtual machines are equipped with SIMATIC PCS 7 installations and pre-configured depending on the automation task (e.g. engineering station, OS server, OS client, and web server). The access to the virtual machines is provided via the "VMware vSphere Client" software or a remote connection. The remote access by RDP is only permitted for virtual PCS 7 OS clients and takes place via the thin client.

The communication between the virtual machines takes place via the communication buses (management, terminal, redundancy buses) planned for this purpose.

The communication between the virtual machines and the available automation systems takes place via the plant bus.

The following figure shows schematically a configuration of the virtualization system for which an additional computer is used as a management console. The thin clients are used to operate and observe the virtual PCS 7 OS clients.



A highly available configuration can be realized via a second virtualization server. The virtual redundant OS servers require the redundancy bus for the synchronization.

### 1.4 Advantages

SIMATIC Virtualization as a Service offers the following advantages:

- Solution from a single source
  - Life cycle services from a single source for all supplied hardware and software components
  - Perfectly matched software and hardware components
  - Quick and safe integration of the system using pre-finished, configured, and tested components
- Reduction in costs
  - Reduction in life cycle costs by increasing energy efficiency
  - Reduction in investment and operating costs
  - Savings through the use of energy-saving and low-cost thin clients for operating and observing the process
- Higher performance
  - Optimal use and utilization of the hardware resources supplied
- Increased flexibility and system availability
  - Cost-effective and quick expansion of system components using ready-to-run templates
  - Simple transfer of a virtual machine to a new hardware environment
  - Lower cost for system modernization
- Reduction in time required for maintenance and support
  - Reduction in the administrative costs by merging several systems onto one virtualization server
  - Reduced maintenance costs and times using centralized administration
- Increasing security
  - More security using remote access with centralized rights management and reduced attack options for thin clients
  - Simple system management and extended support in cooperation with SIMATIC remote services

## 1.5 Scope of delivery

#### 1.5.1 Hardware and software components

The system components supplied may vary:

- Selected host system
- Number of thin clients ordered
- Number and type of ordered virtual machines
- Link for delivery approval.

#### Hardware

The following variants of hardware components may be supplied:

Term	Host system/configuration	Number	Comment
HP ProLiant DL380p Gen8 8 (Technical data and hardware configuration depending on ordered host system)	<ul> <li>6Cx1P HP Host:</li> <li>HP DL380p Gen8 Intel Xeon E5-2630 (2.3 GHz/6-core/15 MB/95 W) FIO</li> <li>Processor Kit</li> </ul>	1	Virtualization server
	<ul> <li>24 GB (3x8 GB) Dual Rank PC3L</li> <li>10600R (DDR-1333)</li> <li>1.2 TB 6G SAS 15K (2.5 inch) RAID 5</li> <li>2x Ethernet 1 GB 4-port</li> <li>2x Power Supply Kit</li> <li>iLo Advanced</li> </ul>		
	<ul> <li>6Cx2P HP Host</li> <li>HP DL380p Gen8 Intel Xeon E5-2630 (2x2.3 GHz/6-core/15 MB/95 W) FIO</li> <li>Processor Kit</li> <li>48 GB (6x8 GB) Dual Rank PC3L</li> </ul>	-	
	<ul> <li>10600R (DDR-1333)</li> <li>1.8 TB 6G SAS 15K (2.5 inch) RAID 5</li> <li>2x Ethernet 1 GB 4-port</li> <li>2x Power Supply Kit</li> <li>iLo Advanced</li> </ul>		

Term	Host system/configuration	Number	Comment
	8Cx1P HP Host:		
	<ul> <li>HP DL380p Gen8 Intel Xeon E5-2660 (2.2 GHz/8-core/15 MB/95 W) FIO</li> </ul>		
	Processor Kit		
	• 32 GB (4x8 GB) Dual Rank PC3L		
	• 10600R (DDR-1333)		
	• 1.5 TB 6G SAS 15K (2.5 inch) RAID 5		
	2x Ethernet 1 GB 4-port		
	2x Power Supply Kit		
	iLo Advanced		
	8Cx2P HP Host		
	<ul> <li>HP DL380p Gen8 Intel Xeon E5-2680 (2.7 GHz/8-core/15 MB/95 W) FIO</li> </ul>		
	Processor Kit		
	• 64 GB (8x8 GB) Dual Rank PC3L		
	• 10600R (DDR-1333)		
	• 4.7 TB 6G SAS 15K (2.5 inch) RAID 5		
	3x Ethernet 1 GB 4-port		
	2x Power Supply Kit		
	iLo Advanced		
HP t510 Flexible Thin Client	You can find information on the HP t510 Flexible Thin Client under <u>http://h18004.www1.hp.com/products/quickspecs/1</u> 4256_div/14256_div.pdf	1	Thin client

#### VMware Software

The following VMware software is supplied:

Term	Host system	Number	Comment
VMware vSphere 5.1 Standard for 1 Processor	6Cx1P HP Host, 8Cx1P HP Host	1	VMware Hypervisor incl. licenses
	6Cx2P HP Host, 8Cx2P HP Host	2	

#### Virtual machines with SIMATIC PCS 7

The following variants of virtual machines may be supplied:

• SIMATIC PCS 7 V8.0 SP1 ES/OS-Client

Term	Number	Comment
Microsoft Windows Server 2008 R2 Standard x64 Embedded System	1	Operating system incl. licenses
SIMATIC PCS 7 V8.0 SP1 ES/OS-Client	1	SIMATIC PCS 7 excl. licenses

#### • SIMATIC PCS 7 V8.0 SP1 OS-Server

Term	Number	Comment
Microsoft Windows Server 2008 R2 Standard x64 Embedded System	1	Operating system incl. licenses
SIMATIC PCS 7 V8.0 SP1 OS-Server	1	SIMATIC PCS 7 excl. licenses

#### • SIMATIC PCS 7 V8.0 SP1 OS-Client

Term	Number	Comment
Microsoft Windows Server 2008 R2 Standard x64 Embedded System	1	Operating system incl. licenses
SIMATIC PCS 7 V8.0 SP1 OS-Client	1	SIMATIC PCS 7 excl. licenses

#### • SIMATIC PCS 7 V8.0 SP1 Web Server

Term	Number	Comment
Microsoft Windows Server 2008 R2 Standard x64 Embedded System	1	Operating system incl. licenses
SIMATIC PCS 7 V8.0 SP1 Web Server	1	SIMATIC PCS 7 excl. licenses

#### Data backup hardware

The following data backup hardware is supplied:

Term	Number
USB hard disk, 500 GB memory	1

The USB hard disk contains the following data:

Data	Description
Licenses & agreements	VMware software license key
	SIMATIC Virtualization as a Service - Service agreement
Product documentation	"SIMATIC Virtualization as a Service" manual
Backup of host system configuration	Hypervisor (VMware vSphere ESXi)
	Networks
Open Source Code	HP Thin Client
	VMware
Open Source software report	• PDF
Backup of virtual machines	Backing up the delivery status of the ordered virtual machines as OVF files
SIMATIC software	Update: SIMATIC PCS 7 V8.0 SP1 Update 1
Backup of MAC addresses of supplied virtual machines	List of MAC addresses of ordered virtual machines

#### 1.5.2 Services

A service agreement for at least 2 years is supplied as standard. You can find detailed information on the services it includes in the supplied service agreement.

Introduction

1.5 Scope of delivery

## Commissioning

#### 2.1 Preparation

#### 2.1.1 Unpack and check delivery unit

Please particularly note the following points when unpacking:

- We recommend that you do not throw away the original packaging. Store this for any new transport.
- Store the documents provided. They are required for initial commissioning and are part of the product.
- Check the packaging and contents for visible transport damage.
- Ensure that the delivery is complete (see section "Items Supplied").
- If you find transport damage or discrepancies please inform your sales contact.

Also observe the device-specific information and safety instructions from the manufacturer:

• HP ProLiant DL380p Gen 8-Server http://h20565.www2.hp.com/portal/site/hpsc/public/psi/manualsResults/?sp4ts.oid=5177957

#### • HP t510 Flexible Thin Client

(http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType=Sup portManual&lang=de&cc=de&docIndexId=65042&taskId=135&prodTypeId=12454&prodSeri esId=5226831)

#### 2.1.2 Assemble devices

You will find information and safety instructions for assembling the devices supplied in the manufacturer's product documentation:

- HP ProLiant DL380p Gen 8-Server (<u>http://h20565.www2.hp.com/portal/site/hpsc/public/psi/manualsResults/?sp4ts.oid=5177</u> 957)
- HP t510 Flexible Thin Client (http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType= SupportManual&lang=de&cc=de&docIndexId=65042&taskId=135&prodTypeId=12454&pr odSeriesId=5226831)

#### 2.1.3 Additional components required

To commission the virtualization system, in addition to the delivery unit, the following components are required:

- Hardware
  - Optional: PC for use as a management console. Any PC that meets the requirements for the "VMware vSphere Client 5.1" software can be used as a management console. For additional information refer to <u>http://kb.vmware.com/selfservice/microsites/search.do?language=en\_US&cmd=displa</u> <u>yKC&externalId=2005083</u>. Alternatively the supplied thin client can be used as the management console if it is equipped with a Windows operating system.
  - Optional: Switches depending on system configuration; you can find information on the switches for the SCALANCE product range at <a href="http://www.automation.siemens.com">http://www.automation.siemens.com</a>
  - Monitor for operating the virtualization server and thin client. Note the manufacturer's information.
- Software

The SIMATIC PCS 7 components pre-installed on the virtual machines must be licensed. The scope and type of the required licenses depend on the PCS 7 options and the number of virtual machines. You can find information on licensing SIMATIC PCS 7 at <a href="http://www.siemens.com/simatic-pcs7">http://www.siemens.com/simatic-pcs7</a>.

## 2.2 Connecting the hardware components

#### 2.2.1 Overview of the hardware components

The following figure shows the hardware components schematically and their network connections:



#### Commissioning

2.5 Thin client configuration

#### 2.2.2 Description of the network connections

The virtualization server has 8 ports. Each port is assigned to one of the following bus systems:

- Terminal bus
- Plant bus
- Redundancy bus
- Management bus

The following figure shows the assignment of the bus systems to the ports on the virtualization server:



#### Note

The redundancy bus is required if an additional virtualization server is used to set up a redundant OS server pair. With a simple system configuration with one virtualization server, the redundancy bus is not required.

The assignment of the bus systems to the ports on the virtualization server is displayed in the "Configuration" tab in the "VMware vSphere Client" software:

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OSC05		
OSC06	View: vSphere Standard Switch	
OSC08 Health Status	Networking	
OSC7 Processors		
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The virtual machines use virtual network cards. The network connections are configured as follows:

Information on the configuration of the network connections of the virtual machines can be found in section "Setting the network connections (Page 47)".

#### 2.2.3 Connect the virtualization server and management console

#### Introduction

The virtualization server and management console are linked via the management bus. You can connect the following hardware as a management console:

- The supplied thin client if this is equipped with a Windows operating system.
- A computer that meets the requirements for the "VMware vSphere Client 5.1" software.

#### Procedure

To connect the virtualization server and management console, follow these steps:

1. Insert the bus connection plug on the network cable into the following port on the virtualization server:

Virtualization Server



- 2. Connect the virtualization server and management console via the relevant interface on the management console.
- 3. If you want the management bus to be redundant connect a second network cable to the following port on the virtualization server and connect it (e.g. via a switch) to the management bus.

	Management bus (redundant)
	Virtualization Server
0000	

#### 2.2.4 Connecting the thin client

#### Introduction

If the thin client is used exclusively to operate and observe the virtual PCS 7 OS client this is connected with the virtualization server via the terminal bus. In contrast when being used as the management console the thin client must be connected with the management bus.

#### Procedure

To connect the thin client supplied, follow these steps:

1. Insert the bus connection plug on the network cable into the following port on the virtualization server:

Virtualization Server



2. Connect the virtualization server and thin client with the terminal bus. Use the following interface on the thin client to do so:



3. If you want the terminal bus to be redundant connect a second network cable to the following port on the virtualization server and connect it (e.g. via a switch) to the terminal bus:



#### 2.2.5 Connection of automation systems

#### Introduction

Automation systems are connected with the virtualization server via the plant bus.

#### Procedure

To connect an automation system, follow these steps:

1. Insert the bus connection plug on the network cable into the following port on the virtualization server:

Virtualization Server



2. Connect the automation system.

Observe the information and safety instructions on the relevant automation system in the documentation. You can find information on the Siemens automation systems at https://support.automation.siemens.com.

3. If you want the plant bus to be redundant connect a second network cable to the following port on the virtualization server and connect it (e.g. via a switch) to the plant bus.



#### 2.2.6 Connect a second virtualization server for redundant virtual OS servers

#### Introduction

When operating a redundant OS server pair that is distributed over two virtualization servers, the redundancy bus must be connected.

#### Procedure

To connect a virtualization server to the redundancy bus, follow these steps:

1. Insert the bus connection plug on the network cable into the following port on the virtualization server:

Virtualization Server



- Redundancy bus
- 2. Connect the virtualization server with the network cable on the redundancy bus.

3. If you want the redundancy bus to be double, connect a second network cable to the following port on the virtualization server and connect it (e.g. via a switch) to the redundancy bus:



#### 2.3 Configuring the virtualization server

#### Introduction

The virtualization server (HP ProLiant DL380p Gen8) is supplied with a password and a preconfigured IP address. The password and IP address must be modified for each user. The data set on the virtualization server must be noted and treated in confidence. It is required for additional configuration steps.

#### Note

Also observe the device-specific information and safety instructions from the manufacturer:

- HP ProLiant DL380p Gen 8-Server (<u>http://h20565.www2.hp.com/portal/site/hpsc/public/psi/manualsResults/?sp4ts.oid=5177</u> 957)
- HP Integrated Lights-Out 4 (iLO 4) (<u>http://h20565.www2.hp.com/portal/site/hpsc/public/psi/manualsResults/?sp4ts.oid=5219</u> 994)

#### Commissioning

2.5 Thin client configuration

#### Requirements

The following requirements must be met:

- The virtualization server is assembled and commissioned according to the manufacturer's regulations.
- A monitor and keyboard are connected on the virtualization server.

#### Procedure

follow these steps to configure the virtualization server:

1. Switch the virtualization server on via the mains/standby switch.

The server's start-up application is displayed.



2. Press the F2 button.

The dialog for logging in to the virtualization server is opened.

- 3. Enter the following log in data:
  - Login Name: root
  - Password: Siemens1234

Authentication Req	uired
Enter an authorize localhost	d login name and password for
Configured Keyboar	
Login Name: Password:	[ root]
	<pre><enter> 0K <esc> Cancel</esc></enter></pre>

4. Press Enter.

The options for modifying the system characteristics of the virtualization server are displayed.

5. Navigate to the "Configure password" entry and press Enter.

#### Note

Use the <Arrow down> and <Arrow up> buttons to navigate between the individual entries.



The password change dialog opens.

6. Enter the default password "Siemens1234" for the virtualization server in the "Old Password" line.



7. Enter a new password for the virtualization server into the "New Password" and "Confirm Password" lines.



8. Press Enter to save the change.

#### Note

Using the "Esc" button you can reject the changes and leave the dialog.



#### 9. Navigate to the "Configure Management Network" entry and press Enter.

The options to change the network settings are displayed.

10.Navigate to the "IP Configuration" entry and press Enter.



The dialog to modify the IP address is opened.

11.Enter the desired IP address.



12.Enter the desired subnet mask.

IP Configuration					
This host can obtain network settings automa includes a DHCP server. If it does not, the specified:					
( ) Use dynamic IP address and network configuration (o) Set static IP address and network configuration:					
IP Address	[ 192.168.126.50 ]				
Subnet Mask	[ 255.255.255.0 ]				
Default Gateway	[0.0.0.0]]				
<pre>CUp/Down&gt; Select (Space&gt; Mark Selected</pre>	<pre> K Kesc&gt; Cancel K Kesc&gt; Cancel K Kesc&gt; Cancel Kesc&gt; Cancel Kesc&gt; Kesc&gt; Cancel Kesc&gt; K</pre>				

13.Press Enter to save the change.

A summary of the settings is shown under the "IP Configuration" entry.



14.Press the <Esc> button to reach the initial dialog.

15.Press <Esc> again to log off from the system.

#### 2.4 Configuration of the management console

#### Introduction

If you use a computer as a management console you must install the "VMware vSphere Client 5.1" software on it.

You configure and manage the virtual machines that are pre-installed with the PCS 7 components and available on the virtualization server using the "VMware vSphere Client" software.

If you want to use the supplied thin client as the management console, it is not necessary to execute the steps described in this section. The "VMware vSphere Client 5.1" software is pre-installed on the supplied thin clients with the Windows operating system. Thin clients with the HP ThinPro operating system cannot be used as management consoles.

#### Commissioning

2.5 Thin client configuration

#### Requirements

The following requirements must be met:

- The management console is operational.
- The installation application for the "VMware vSphere Client 5.1" software is available. You can find the installation application at <u>https://www.vmware.com</u>.

#### Procedure

To install the "VMware vSphere Client" software, follow these steps:

- 1. Start the management console.
- 2. Start the installation application of the "VMware vSphere Client" software.
- 3. Select the desired installation language.

VMware	vSphere Client 5.1 - InstallShield Wizard	×
ٹ	Select the language for the installation from the choices below.	
	English (United States)	]

- 4. Click "Next" in the first dialog.
- 5. Note the patent agreements and click "Next".

6.	Agree	to	the	license	agreement	and	click	"Next".

🖓 VMware vSphere Client 5.1	×				
License Agreement					
Please read the following license agreement carefully.					
	•				
VMWARE END USER LICENSE AGREEMENT					
PLEASE NOTE THAT THE TERMS OF THIS END USER LICENSE AGREEMENT SHALL GOVERN YOUR USE OF THE SOFTWARE, REGARDLESS OF ANY TERMS THAT MAY APPEAR DURING THE					
INSTALLATION OF THE SOFTWARE.					
IMPORTANT-READ CAREFULLY: BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE, YOU (THE INDIVIDUAL OR LEGAL ENTITY)	•				
I agree to the terms in the license agreement					
C I do not agree to the terms in the license agreement					
InstallShield					
< Back Next > Cancel					

7. Enter the installation path and click "Next".

🔀 VMware vSphere Client 5.1	×
Destination Folder	
Select the folder in which to install the product.	
Install vSphere Client to:	
C:\Program Files (x86)\VMware\Infrastructure\	Change
InstallShield	
< Back Next >	Cancel

8. Click the "Install" button.

🙀 VMware vSphere Client 5.1	×
Ready to Install the Program The wizard is ready to begin installation.	
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back. Clic exit the wizard.	k Cancel to
InstallShield	
< Back Install	Cancel

The installation is started. The successful implementation of the installation is confirmed by a notification.

9. Click "Finish" to complete the installation.
# 2.5 Thin client configuration

# 2.5.1 Thin clients with Windows operating system

#### Introduction

When commissioning the thin client, configure the thin client to your requirements with the aid of the "HP Easy Tools" configuration wizard.

#### Requirements

The following requirements must be met:

- The thin client is assembled and commissioned according to the manufacturer's regulations.
- The thin client is connected with the management bus (for use as a management console) or with the terminal bus (for use as an operating and observation station).
- A monitor, keyboard, and mouse are connected to the thin client.

#### Procedure

To configure the thin client, follow these steps:

1. Switch on the thin client.

The thin client is started in the restricted user mode. To configure the thin client, you must switch to the administrator mode.

- 2. Log into the thin client as administrator. To do so use the following log in data:
  - User name: Administrator
  - Password: Administrator

2.5 Thin client configuration

3. Start the "HP Easy Tools" configuration wizard via the "Start > Control Panel > HP Easy Tools" command.

The configuration wizard opens.



- 4. In the left navigation area click on the "Easy Config" button.
- 5. Use the "Next" button to navigate to the individual configuration options and make the desired settings.

Detailed information on the configuration options can be found in the manufacturer's "HP Easy Tools"

(http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType= SupportManual&lang=de&cc=de&docIndexId=65042&taskId=135&prodTypeId=12454&pr odSeriesId=5226831) administrator manual.

6. Click "Exit" in the "Thank You" section to close the configuration wizard.

7. To save the configuration settings right click on the "lock" icon in the Windows task bar and select the "Commit EWF(C)" command:



# NOTICE

If you do not explicitly save the configuration settings these are lost when the thin client starts next.

- 8. Switch to the thin client's user mode. The default log in data are:
  - User name: User
  - Password: User

# 2.5.2 Thin clients with HP ThinPro operating system

#### Introduction

When commissioning the thin client for the first time, the "HP Easy Tools" wizard is started automatically. Use this wizard to configure the thin client to your requirements.

## Requirements

The following requirements must be met:

- The thin client is assembled and commissioned according to the manufacturer's regulations.
- The thin client is connected with the terminal bus.
- A monitor, keyboard, and mouse are connected to the thin client.

#### Commissioning

2.5 Thin client configuration

## Procedure

To configure the thin client, follow these steps:

1. Switch on the thin client.

The configuration wizard starts.

1.	Easy	Tools				×
Easy Tools	5		Lar	nguage 🚽	About	Exit
Welcome				(i) Inform	nation	
Easy Update Updates	Welcome			<b>Easy Tools</b> The index on to:	the left enat	oles you
Options Easy Config	Welcome to HP Easy To			<ol> <li>Update the image and ins</li> <li>Configure t</li> </ol>	stall software	2.
Regional	help you create a com use on this and other l			3. Deploy the	nstalled on i configuratio	t. n you
Management Peripherals	Please select the langu	lage you wish to use:				
Connections Summary	Deutsch Español	English		<ul> <li>Sections the viewed will be check mark.</li> </ul>		
Easy Deploy	日本語	正體中文	)	Sections th modified will I green check r	oe marked b	
Capture Deploy	简体中文	한국어	)			
Security						
Thank You		Next 🤅			2.	5.1.1636

- 2. Select a language for executing the wizard.
- 3. In the left navigation area click on the "Easy Config" button.
- 4. Use the "Next" button to navigate to the individual configuration options and make the desired settings.

Detailed information on the configuration options can be found in the manufacturer's "HP Easy Tools"

(http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType= SupportManual&lang=en&cc=de&docIndexId=65042&taskId=135&prodTypeId=12454&pr odSeriesId=5226831) administrator manual.

5. Click "Exit" in the "Thank You" section to complete the configuration of the thin client.

# Configuration of the virtual machines

# 3.1 Start the "VMware vSphere Client" application

#### Introduction

In this section, you will learn how to start the "VMware vSphere Client" application and how to access the virtual machines that are available on the virtualization server.

#### Requirements

The following requirements must be met:

- The virtualization server and management console are operational.
- The password and IP address for the virtualization server have been set and are available.

See section "Configuring the virtualization server (Page 27)".

- The server and management console are linked via the management bus.
- The "VMware vSphere Client" application is installed on the management console.

## Procedure

To start a virtual machine, follow these steps:

- 1. Start the management console.
- 2. Double-click the desktop icon for the "VMware vSphere Client" software or select "Start > All Programs > VMware > VMware vSphere Client".



3. Enter the log in data for the virtualization server.

(See the section "Configuring the virtualization server (Page 27)".

🛃 VMware vSphere Client	: ×
vmvvare <sup>.</sup> VMware vSphere <sup></sup> Client	
	le host, enter the IP address or host name. , enter the IP address or name of a
IP address / Name:	
User name:	
Password:	
	Use Windows session credentials
	Login Close Help

The "VMware vSphere Client" application is opened. The virtual machines available on the virtualization server are displayed in the left-hand navigation area.



# 3.2 Start the virtual machines

#### Introduction

When you start one of the virtual machines for the first time after commissioning an installation setup executes automatically. The setup installs SIMATIC PCS 7 depending on the automation task of the virtual machine (e.g. engineering station, OS server, OS client). The setup must be executed for each virtual machine.

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is started on the management console.
- The connection to the virtualization server is established and the available virtual machines are displayed in the left-hand navigation area of the "VMware vSphere Client" application.

#### Procedure

To start a virtual machine and execute installation setup, follow these steps:

1. Select the virtual machine and click the "Power On" button.



The virtual machine starts.

Click the "Launch Virtual Machine Console" button to open the virtual machine in a separate window.

🛃 19	2.168.1	26.50 -	vSphere	Client				
File	Edit Vie	ew Inv	entory A	dministra	ition Plu	ug-ins He	lp	
			Home 🏼 👌	Inv	entory	▶ 🗊 In	ventory	
	00		g 🔯	<b>A</b>	1	9	• 🃀	22

The virtual machine is displayed. The installation setup opens.

3. Select the language for the installation setup.

S Installation of 05-Server				×
Computer name	OSSERVER01			
Select language	O Deutsch	English	C Français	
	Version: SIMATIC PC	CS 7 V8.0 SP1		
	Save settings and	d reboot		

- 4. Enter the computer name for the virtual machine in the "Computer name" field.
- 5. Select the desired language to install SIMATIC PCS 7.

S Installation of OS-Server				×
Computer name	OSSERVER01			
Select language	C Deutsch	English	O Français	
Ve	ersion: SIMATIC P	CS 7 V80 SP1		
			(	
	Save settings an	d reboot		

6. Click the "Save settings and reboot" button.

The virtual machine restarts. After the restart the installation of the SIMATIC PCS 7 components is started automatically.

Setup	
🕝 .Net Updater	•
🚫 Install Script Engine V11	Γ
OPC Core Components V3.0	
OPC .NET API Redistributables	Installing
OVBA Redistribution Kit	
VBA Redistribution Kit English	
OVC++ 2005 SP1 Redistributable	
👝 SQL Server 2008 R2 SP1 - (WinCC)	
Automation License Manager V5.2	
WinCC V7.2 Runtime	
WinCC V7.2 Configuration	
WinCC V7.2 APC	r
WinCC V7.2 OPC-Server	
Second Se	
PCS 7 Basis Faceplates V8.0 SP1	
PCS 7 Advanced Faceplates V8.0 SP1	
SFC Visualization V8.0 SP1	
SIMATIC NET PC-Software V8.2 SP2	
SIMATIC NET PC-Software V8.2 SP2 OPCUASDK	
SIMATIC NET PC-Software V8.2 SP2 Documentation	
PCS 7 System Docu RT V8.0 SP1 Upd1	
Maintenance Addon	
	Cancel

7. Wait until the installation process is complete.

After the installation the computer restarts automatically.

8. Repeat steps 1 to 7 for each virtual machine.

#### Note

You can also install other SIMATIC PCS 7 components on the virtual machines. The complete installation package is available on the data drive of the virtualization server.

# 3.3 Setting the network connections

#### Introduction

Depending on the automation task the individual virtual machines have the following network connections:

- PCS 7 ES/OS-Client
  - Terminal bus
  - Plant bus
  - Management bus
- PCS 7 OS-Server
  - Terminal bus
  - Plant bus
  - Redundancy bus
  - Management bus
- PCS 7 OS-Client
  - Terminal bus
  - Management bus
- PCS 7 Web Server
  - Terminal bus
  - Management bus

So that the communication between the individual virtual machines can be implemented an IP address must be set for each network connection. The configuration of the network connections must be implemented individually for each virtual machine and network connection.

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is started on the management console.
- The installation of the SIMATIC software was conducted without errors on all virtual machines (see section "Start the virtual machines (Page 43)").

## Procedure

To set the network connections, follow these steps:

- 1. Start the virtual machine.
- Open the network connections via "Start > Control panel > Network and Internet > Network Connections".

3. Select one of the network connections (e.g. terminal bus) and open the "Properties" dialog via the context menu.

Retwork Connections			
Control Pane	l + Network	and Internet 👻 Network Connections 👻	- 🐼
File Edit View Tools A	dvanced H	elp	
Organize 🔻 Disable this netw	ork device	Diagnose this connection Rename this connection	»
Name *	Status	Device Name C	onnectivity
🖗 Managementbus	Netzwerk	Intel(R) PRO/1000 MT Network Co N	o Internet a
🖣 Terminalbus	Netzwerk	Intel(R) PRO/1000 MT Network Co N	o Internet a
😵 Disable <b>Status</b> Diagnose			
🚱 Bridge Connections			
Create Shortcut			
😚 Rename			

4. Select the "Internet Protocol Version 4 (TCP/IPv4)" element and click the "Properties" button.

🖞 Terminalbus Properties	X
Networking Sharing	
Connect using:	
Intel(R) PRO/1000 MT Network Connection	1
, Configure	1
This connection uses the following items:	1
Client for Microsoft Networks   QoS Packet Scheduler   Silver   Silver   PROFINET IO RT-Protocol V2.0   Intermet Protocol Version 6 (TCP/IPv6)   Intermet Protocol Version 4 (TCP/IPv4)	
Install         Uninstall         Properties           Description         Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	
OK Cancel	

5. Activate the "Use the following IP address" option and enter the desired IP address.

#### Note

Assign the IP addresses corresponding to your plant configuration. Select the same number range, e.g.:

- 192.168.1.11
- 192.168.1.12
- 192.168.1.13
- 192.168.1.14

ernet Protocol Version 4 (TCP/IPv	4) Prope	rties		?
eneral				
You can get IP settings assigned autom this capability. Otherwise, you need to for the appropriate IP settings.				
C Obtain an IP address automatical	у			
• Use the following IP address:				
IP address:		- 22		
Subnet mask:		10	•	
Default gateway:		12		
C Obtain DNS server address autom	atically			
Use the following DNS server add	resses:			
Preferred DNS server:				
Alternate DNS server:	•	-2	•	
Validate settings upon exit			Advan	ced
		ОК		Cancel

- 6. Confirm the changes with "OK".
- 7. Repeat steps 3 to 6 for each network connection for the virtual machine currently open.
- 8. Configure the network connections of all available virtual machines as per Steps 1 to 7.

#### Note

Further information can be found in the "PCS 7 PC Configuration and Authorization" (http://support.automation.siemens.com/WW/view/en/68157327) manual.

# 3.4 Using SOFTNET-IE

#### Introduction

The "SOFTNET-IE S7 REDCONNECT VM V8.2" software offers the option of realizing a highly available connection to an automation system in the virtual environment. The "SOFTNET-IE S7 REDCONNECT VM V8.2" software is part of the "SIMATIC NET V8.2" software package. You can find information on the installation in the "PG/PC - Industrial Ethernet / PROFIBUS SIMATIC NET PC Software V8.2 (http://support.automation.siemens.com/WW/view/en/61630923)" manual.

#### Requirements

The following requirements must be met:

- The license package for highly available connections (MLFB: 6GK1704-0HB08-2AA0) is available. One license package per virtual machine is required.
- CPU firmware version is V6.0.0 or higher

#### **Configuration in SIMATIC PCS 7**

Configuring the highly available connection takes place in SIMATIC PCS 7 with the "NetPro" engineering tool. You can find detailed information about configuration in the "PCS 7 Engineering System" (<u>http://support.automation.siemens.com/WW/view/en/57270203</u>) manual.

\*\*NetPro - [57Pro410\_Prj (Network) -- D:\Projects\S7Pro410\S7Pr\_Prj] 😅 🖩 🐘 🎒 Pa 🗈 🏜 🏜 🔗 🔗 🚯 射 ! 💦 . SIMATIC PC-Station(2) SIMATIC PC-Station(1) SIMATIC PC-Station( WinCC BATCH Appl. Applik (Stby. ation BATCH RC App Applik likati ation on RC App likati on (st WinCC BATCH Appl. Applik Client ation RC App likati on Cli Applik ation Ethernet(1) Industrial Ethernet Partner Type SIMATIC H-Statio... S7 connection fault-tolerant Local ID Partner ID Active connection p Subnet Ethernet(1) [IE] §7-Verbindung\_1 Yes Properties - fault-tolerant S7 co × General Status Information Local Connection End Point Connection identification Configured dynamic connection Local ID: S7-Verbindung\_1 Establish an active connection VFD Name E Send operating mode messages WinCC Appl. Connection Path Local Partner SIMATIC PC-Station(1)/ WinCC Appl. SIMATIC H-Station(1)/ CPU 410-5H (R0/S3) End Point Interface: IE Allgemeir PN-IO (R0/S5) -Local interface IE Allgemein IE Allgemein Address 192.168.0.1 192.168.0.1 Partner interface PN-IO (R0/S5) PN-IO-1 (R1/S5) Address 192.168.0.2 192.168.0.3 Subnet Ethernet(1) Ethernet(1) [x 100 ms] Monitoring time Address Details... Redundancy Enable max. CP redundancy (with 4 connection paths) ОK Cancel Help

"IE General" must be set as the communication interface for configuring the highly available connection in the virtual environment. The following figure shows a sample configuration:

# 3.5 Activating the automatic start of the virtual machines

#### Introduction

The virtual machines can be set such that they are executed automatically after the system starts.

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is started on the management console.
- The connection to the virtualization server is established and the available virtual machines are displayed in the left-hand navigation area of the "VMware vSphere Client" application.

#### Procedure

To activate the automatic execution of a virtual machine, follow these steps:

- 1. Click the "Configuration" tab on the "VMware vSphere Client" application.
- 2. In the "Software" area click on "Virtual Machine Startup/Shutdown".

Hardware	Virtual Ma	hine Startup and Sh	utdown				Properties
Health Status	Start and	Stop Virtual Machines	with the sys	tem Er	abled		
Processors		artup Delay			seconds)		
Memory	Default S	nutdown Delay		30	seconds)		
Storage	Startup Or	der					
Networking	Order Virt	ual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay	
	ManualSta	rtup					
Storage Adapters	- B	TYP3_PC57805P1	Disabled	30 seconds	Shut do	30 seconds	
Network Adapters		TYP2_PC57805P1	Disabled	30 seconds	Shut do	30 seconds	
Advanced Settings	B	TYP1_PCS780SP1	Disabled	30 seconds	Shut do	30 seconds	
Power Management	- B	TYP2_PC57805P1	Disabled	30 seconds	Shut do	30 seconds	
Software	🗗	TYP2_PCS780SP1	Disabled	30 seconds	Shut do	30 seconds	
Licensed Features							
Time Configuration							
DNS and Routing							
Authentication Services							
<ul> <li>Virtual Machine Startup/Shutdown</li> </ul>							
Virtual Machine Swapfile Location							
Security Profile							
Host Cache Configuration							
System Resource Allocation							
Agent VM Settings							
Advanced Settings							

The available virtual machines are displayed in the "Startup order" area.

3. Click on "Properties".

Hardware	Virtual Mac	hine Startup and Sh	utdown				Properties.
Health Status	Start and	Stop Virtual Machines	with the sys	tem Er	abled		
Processors	Default St	artup Delay		30	) seconds		
	Default Sh	utdown Delay		30	) seconds		
Memory	Startup Ore	ler					
Storage	Order Virt	ual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay	
Networking	ManualSta	rtup			1		
Storage Adapters	R	TYP3 PC57805P1	Disabled	30 seconds	Shut do	30 seconds	
Network Adapters		- TYP2 PCS7805P1	Disabled	30 seconds	Shut do	30 seconds	
Advanced Settings		TYP1 PCS7805P1		30 seconds		30 seconds	
Power Management				30 seconds	Shut do	30 seconds	
Software	1 🍯	TYP2_PCS780SP1	Disabled	30 seconds	Shut do	30 seconds	
Licensed Features	1						
Time Configuration							
DNS and Routing							
Authentication Services							
<ul> <li>Virtual Machine Startup/Shutdown</li> </ul>							
Virtual Machine Swapfile Location							
Security Profile							
Host Cache Configuration							
System Resource Allocation							
Agent VM Settings							
Advanced Settings							

The "Virtual Machine Startup and Shutdown" dialog is opened.

- 4. Activate the "Allow virtual machines to start and stop automatically with the system" option box.
- 5. Set the delay for starting and stopping the virtual machines.

/irtual Machine Sta	artup and Shut	down					×
System Settings							
Allow virtual machi	ines to start and s	stop automat	tically with the sys	tem			
Default Startup Dela	ау —			Default Sł	hutdown Delay —		
For each virtual mad	hine, delay startu	ip for:		For each	virtual machine, d	delay shutdown for:	
120 second	ls			120	seconds		
	diately if the VMw	are Tools sta	art	Shutdov	vn Action:	Guest Shutdown	•
Startup Order	d virtual machines	when the s	ystem starts. Durir	ng shutdown,	they will be stopp	ped in the opposite orde	r.
Order   Virtual Ma	achine	Startup	Startup Delay	Shutdown	Shutdown Dela		
Order Virtual Ma		Startup	Startup Delay	Shutdown	Shutdown Dela	ay 🔺	Maya Lia
Order Virtual Ma Automatic Startu Any Order		Startup	Startup Delay	Shutdown	Shutdown Dela	ау <mark></mark>	Move Up
Automatic Startu		Startup	Startup Delay	Shutdown	Shutdown Dela	ay	Move Up Move Down
Automatic Startu Any Order Manual Startup			Startup Delay		Shutdown Dela	ay 🔺	Move Down
Automatic Startu Any Order Manual Startup TYP2	<b>P</b> 2_PCS780SP1			Shut do	1	зу	
Automatic Startu Any Order Manual Startup TYP2 TYP1 TYP1	<b>P</b>	Disabled	30 seconds	Shut do Shut do	30 seconds	ау	Move Down
Automatic Startu Any Order Manual Startup TYP2 TYP1 TYP1	PCS780SP1	Disabled Disabled	30 seconds 30 seconds	Shut do Shut do	30 seconds 30 seconds	ay	Move Down
Automatic Startu Any Order Manual Startup TYP2 TYP1 TYP1	PCS780SP1	Disabled Disabled	30 seconds 30 seconds	Shut do Shut do	30 seconds 30 seconds	ау	Move Down
Automatic Startu Any Order Manual Startup TYP2 TYP1 TYP1	PCS780SP1	Disabled Disabled	30 seconds 30 seconds	Shut do Shut do	30 seconds 30 seconds		Move Down

- 6. In the "Manual Startup" area select the virtual machine for which you want to activate the automatic start.
- 7. Move the virtual machine to the "Automatic Startup" area using the "Move Up" button.

🛃 Virtual M	Iachi	ne Startup and Shut	down						×
System	Setti	ngs							
Allow v	/irtual	machines to start and s	top automa	tically with the sys	tem				
-Default S	Startu	p Delay			Default Shutdown Delay				
For each	virtu	al machine, delay startu	ip for:		For each virtual machine, delay shutdown for:				
120	s	econds			120 seconds				
Cor	ntinue	immediately if the VMw	are Tools sta	art	Shutdov	wn Action:	Gue	est Shutdown	<b>-</b>
	the sp	r ecified virtual machines ual Machine						e opposite order	
		Jal Machine Startup	Startup	Startup Delay	Shutdown	Shutdown Dela	Y	-	
Autom Any Or		startup							Move Up
Manua		rtup							Move Down
	Ð	TYP3_PC57805P1	Disabled	120 seconds	Shut do	120 seconds			Edit
	Ð	TYP2_PCS780SP1	Disabled	120 seconds		120 seconds			Luitin
	Ð	TYP1_PCS780SP1	Disabled	120 seconds		120 seconds			
	F	TYP2 PCS780SP1	Disabled	120 seconds	Shut do	120 seconds		<b>-</b>	
						0		Cancel	Help
							·		

The virtual machine is positioned in the "Automatic Startup" area.

			stop automa	tically with the sys				
Default Startup Delay					Default Shutdown Delay			
For each virtual machine, delay startup for:				For each virtual machine, delay shutdown for:				
120	se	conds			120	seconds		
Con	tinue ir	nmediately if the VMw	are Tools sta	art	Shutdow	n Action:	Guest Shutdown	•
	he spe	cified virtual machines	when the s	ystem starts. Duri		they will be stopped Shutdown Delay	in the opposite orde	er. ]
wer on t	he spe Virtua	al Machine		-			l in the opposite orde	]
wer on t Order	he spe Virtua	al Machine	Startup	-	Shutdown		in the opposite orde	er.
wer on t Order Autom	Virtua atic St	al Machine A <b>rtup</b>	Startup	Startup Delay	Shutdown	Shutdown Delay	I in the opposite orde	Move Up
wer on t Order Autom	Virtua tic St	al Machine a <b>rtup</b> TYP3_PCS780SP1	Startup	Startup Delay	Shutdown	Shutdown Delay	I in the opposite orde	Move Up
wer on t Order Autom 1 Any Or	Virtua atic St der Start	al Machine a <b>rtup</b> TYP3_PCS780SP1	Startup Enabled	Startup Delay	Shutdown	Shutdown Delay	I in the opposite orde	Move Up
wer on t Order Autom 1 Any Or	Virtua atic St der IStart	al Machine artup TYP3_PC57805P1 up	Startup Enabled Disabled	Startup Delay 120 seconds	Shutdown Shut do	Shutdown Delay	in the opposite orde	Move Up

- 8. Repeat steps 4 and 5 for all virtual machines for which you want to activate the automatic start. You can change the start order using the "Move Up" and "Move Down" buttons.
- 9. Click "OK" to save the changes.

# 3.6 Licensing the SIMATIC software

For licensing the SIMATIC components that are installed on the virtual machines, the licenses must be transferred from a license USB stick to the virtual machines so that these are available for the SIMATIC License Manager (ALM). To do so, execute the following steps:

- Configuration of the connections between a license USB stick and the virtual machines
- Transfer the licenses using the SIMATIC License Manager (ALM)

## 3.6.1 Connecting USB devices

### Introduction

To transfer the license to a virtual machine the use of USB devices must be configured for each virtual machine.

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is started on the management console.
- The license USB stick for licensing the SIMATIC components is connected to the management console.

#### Procedure

To connect a USB device with a virtual machine, follow these steps:

- 1. Start the virtual machine.
- Click on the USB icon in the toolbar of the virtual machine and select the "Connect to USB device" command.

File	View	VM									
			6	1	13	<b>&gt;</b>	2			_	
1								Connect to USB device	•	R	Power Quotient Removable Disk

- 3. Select the USB device that contains the necessary SIMATIC licenses.
- 4. Repeat steps 1 to 3 for all available virtual machines.

Configuration of the virtual machines

3.7 Creating and managing PCS 7 projects

# 3.6.2 Transfer the SIMATIC licenses

#### Introduction

The transfer of SIMATIC licenses from a license USB stick to a drive on a virtual machine takes place with the aid of the SIMATIC Automation License Manager (ALM). The SIMATIC Automation License Manager is pre-installed on all virtual machines.

#### Requirement

The following requirements must be met:

- The "VMware vSphere Client" application is started on the management console.
- The license USB stick for licensing the SIMATIC components is connected to the management console.
- The connection to USB devices is configured on the virtual machines (See section "Connecting USB devices (Page 55)")

#### Procedure

To transfer the licenses to the drive, follow these steps:

- 1. Start one of the virtual machines.
- 2. Start the SIMATIC Automation License Manager via the following desktop icon:



The SIMATIC Automation License Manager is opened.

3. Transfer all required licenses to the drive on the virtual machine.

Information on transferring licenses is found in the "SIMATIC Automation License Manager" (http://support.automation.siemens.com/WW/view/en/56956174) manual.

4. Repeat steps 1 to 3 for all available virtual machines.

# 3.7 Creating and managing PCS 7 projects

Projecting and configuring PCS 7 projects is conducted in the same way as for traditional systems. You will find detailed information on this in the following documentation "PCS 7 V8.0 SP 1 Manual Collection"

(http://support.automation.siemens.com/WW/view/en/71178283).

Configuration of the virtual machines

3.7 Creating and managing PCS 7 projects

Access to the virtual machines

# 4.1 Access to virtual PCS 7 ES, PCS 7 OS server, and PCS 7 web server

#### Introduction

Access to the virtual PCS 7 ES, PCS 7 OS server, and PCS 7 web server is provided via the "VMware vSphere Client" software. Access using RDP is not permitted.

#### Requirements

The following requirements must be met:

- The virtual machines are configured. (See section "Configuration of the virtual machines (Page 41)".)
- The virtual machine that you want to access is activated.
- The "VMware vSphere Client" software is started.

#### Procedure

To access a virtual machine, follow these steps:

1. Select the virtual machine that you want to access.



2. Click the "Launch Virtual Machine Console" button to display the virtual machine.



The virtual machine is shown in a separate window.

# 4.2 Access to virtual PCS 7 OS clients

You have the following options for accessing virtual PCS 7 OS clients:

- Access via the "VMware vSphere Client" software Access is provided from the thin client (Windows operating system) or the management console and is recommended for configuring, maintaining, and managing the virtual PCS 7 OS clients. The procedure is the same as in section "Access to virtual PCS 7 ES, PCS 7 OS server, and PCS 7 web server (Page 59)".
- Access via an RDP connection Access is from the thin client and is recommended for operating and observing the virtual PCS 7 OS clients.

# 4.2.1 Creating a remote desktop connection (RDP)

## Introduction

You create and configure an RDP connection on the thin client for remote access to a virtual PCS 7 OS client.

# Requirements

The following requirements must be met:

- The virtual PCS 7 OS client that you want to access is configured and activated. (See section "Configuration of the virtual machines (Page 41)".)
- The thin client is switched on.

## Procedure (Windows operating system)

In order to set up remote access on a PCS 7 OS client, follow these steps:

- 1. Enter the search term "Remote Desktop Connection" in the search field in the Windows start menu.
- 2. Execute the "Remote Desktop Connection" application as administrator.

Programs(1)	
💀 Remote Desktop Connection	
Control Panel (2)	Open
	Open file location
RemoteApp and Desktop Connection	👽 Run as administrator
🐯 Set up a new connection with Remol	Scan with OfficeScan Client
	Pin to Taskbar
	Pin to Start Menu
	Scan with OfficeScan Client
	Open with
	Restore previous versions
	Send to 🔸
	Cut
	Сору
	Delete
	Properties
$\wp$ See more results	
Remote Desktop Connection	Log off
<b>Start</b>	

The application dialog opens.

3. Click the "Options" button.

🔩 Remote D	esktop Connection	_ 🗆 🗵				
<b>N</b>	Remote Desktop Connection					
Computer:	Example: computer.fabrikam.com					
User name:	None specified					
The computer name field is blank. Enter a full remote computer name.						
💽 <u>O</u> ptions	Connect	Help				

- 4. Enter the following network data for the connection:
  - Computer: <IP address of the virtual OS client> : <Port:3389> (e.g. 192.168.126.131:3389)
  - User name: Username for logging in to the PCS 7 OS client

🔩 Remote I	Desktop Connectio	n .		
<b>N</b>	Remote De Connect			
General D ⊤Logon set	iisplay │ Local Resourc	ces Programs Expe	erience   Adv	anced
	Enter the name of the	remote computer.		
	Computer: Exam	ple: computer.fabrikar	n.com	•
	User name:			
	The computer name f name.	ield is blank. Enter a fi	ull remote con	nputer
∟ ⊢ Connectio	n settings			
	Save the current con saved connection.	nection settings to an	RDP file or op	pen a
	Save	Save As	Open.	
Options	]	Con	inect	Help

5. Click the "Save As" button and save the connection.

Ensure that the access to the connection is possible for all desired users after quitting the administrator mode.

- 6. Select the "Display" tab and set the display properties for the connection.
- 7. Select the "Local Resources" tab and set the desired settings for playing the acoustic signals.

5 Remote De	esktop Connection
	Remote Desktop Connection
General Dis	
- Keyboard -	Apply Windows key combinations: Only when using the full screen Example: ALT+TAB
Local devic	es and resources Choose the devices and resources that you want to use in your remote session.   Printers  Clipboard  More
Options	Connect Help

#### Note

Via the "Settings" button in the "Remote audio" area you can set the device on which the acoustic signals are played for messages and alarms from the PCS 7 notification system.

- 8. Activate the desired options under the "Programs", "Experience", and "Advanced" tab.
- 9. Click the "Connect" button to establish the connection to the PCS 7 OS client.

10.To save the settings right click on the "lock" icon in the Windows task bar and select the "Commit EWF(C)" command:



# NOTICE

If you do not explicitly save the configuration settings, these are lost when the thin client starts next.

11.Switch to the thin client's user mode.

# Procedure (HP ThinPro operating system)

In order to set up remote access on a PCS 7 OS client, follow these steps:

1. Switch on the administrator mode for the thin client.



2. Open the "ThinPro Control Center" application.

🔄 ThinPro Control Center
🔑 Administrator/User Mode Switch
📌 Logout
💭 Reboot
O Poweroff
(h)

The application dialog opens.

3. Click on "Connections" in the left navigation area of the dialog.

<b>(p</b> )	T	hinPro Control	Center (Administrat	ive Mod	e)				
(IIP)	Conn	ections							
	Connect	🕱 Disconnect	General Settings	+ Add	р Сору	n Delete	Edit	March Street Str	
	CONNECTIC	N NAME			$\Delta$	TYPE		STATUS	
hp	L 🗌 New	RDP				RDP	7	inactive	
Connections									
Control Panel									
System Information									

4. Add a new connection.

(i)	ThinPro Control Center (Administrative Mode)	
(III)	Connections	
	Connect Disconnect General Settings	
	CONNECTION NAME STATUS	
hp	New RDP New	e
Connections	🎯 Custom	
Control <u>P</u> anel		
System Information		

The "RDP7 Connection Manager" dialog is opened.

- 5. Enter the following network data for the connection:
  - Name: Name of connection, e.g. OSClient1
  - Address: IP address of the virtual OS client
  - Port: 3389
  - Username: Username for logging in to the PCS 7 OS client
  - Password: Password for logging in to the PCS 7 OS client

<b>ø</b>	RDP7 Connection Manager			×
过 Ne	etwork		h	)
Name:	OSClient1			
Address:	192.168.126.131	Port:	3389	÷
Username:	Siemens			
Password:	•••••			
Domain:				
Allow S	Smartcard Login			
	5			
	Previous Next Fini	ish	Cancel	

6. Click "Next".

- **RDP7** Connection Manager đ Window Mode Standard Desktop **Hide Window Decoration** full Window Size Fixed Size Percentage Size Width % Height Previous Next Finish Cancel
- 7. Set the desired display properties for the connection and click on the "Next" button.

8. Activate the desired options and click "Next".

<b>ø</b>	RDP7	Connection Mar	nager	
<b>i</b>	Options			hp
<ul> <li>Ena</li> <li>Ena</li> <li>Fore</li> </ul>	ble motion en ble data com ble encryptio ce bitmap up ach to admin	pression m dates		
Hostnam	e to send: Previous	Next	Finish	Cancel

9. Set the desired settings for playing the acoustic signals and click on the "Next" button.

#### Note

Via the "Remote computer sound" option you can set the device on which the acoustic signals are played for messages and alarms from the PCS 7 notification system.

n RDP7 Connection	Manager 💶 🗆 🗙
Local Resources	lip)
Remote computer sound Bring to this computer 🗸	
Devices mapping Enable port mapping Enable printer mapping	
Previous	Finish Cancel

10.Set the desired settings for the speed of the connection and user interface.



- **RDP7** Connection Manager Advanced Fallback Connection: Auto start priority: 0 Auto reconnect: 2 Wait for network before connecting: r Show icon on desktop: Allow the user to launch this connection: 🗹 Allow the user to edit this connection: Previous Finish Cancel Next
- 11.Set the desired options for activating and deactivating the connection.

12.Click "Finish" to create the new connection.

The connection is created and displayed in the "ThinPro Control Center" dialog.

13.Click the connection and click the "Connect" button to establish the connection to the virtual PCS 7 OS client.

Ø	ThinPro Control Center (Administrative Mode)								
	Conn	ections							
	Connect	🔀 Disconnect	📄 General Settings	H Add	D Copy	<b>i Se</b> lete	<b>Edit</b>	🍇 User View	
	CONNECTIO				$\Delta$	TYPE		STATUS	
hp	M OSClient1				RDP7 inact				
Connections									
Control Panel									
System Information									

# 4.2.2 Log off and separate the connection

## Introduction

The remote connection is logged off and separated from the relevant virtual machine (e.g. PCS 7 ES, PCS 7 OS client).

## Requirements

- The following requirements must be met:
- The virtual machine is switched on.
- There is a remote connection

## Procedure

To disconnect a remote connection, follow these steps:

1. In the start menu of the virtual machine click on "Log off > Disconnect".


# Switch off and start the whole system

## 5.1 Start the whole virtualization system

After the initial commissioning and configuration, you can start the virtualization system as follows:

- 1. Switch on the virtualization server. Please note the manufacturer's information and safety instructions.
- Switch on the thin client. Please note the manufacturer's information and safety instructions.
- 3. Switch on the management console.
- 4. Start the "VMware vSphere Client" software on the management console.

You can find information on this in section "Start the "VMware vSphere Client" application (Page 41)".

 Close the maintenance mode on the virtualization server if this is activated. Select the virtualization server in the "VMware vSphere Client" software and select the "Exit Maintenance Mode" command in the context menu.

🛃 19	🛃 192.168.126.50 - vSphere Client							
File	Edit	View	In	vento	ry Admin	istration P	lug-in	is Help
-	Ð			Home	• ⊳ 🛃	Inventory	Þ	Inventory
đ	C	-						
- 2	193	2.168	.126	.50 (n	naintenan	ce mode)	loc	alhost localdom
	Ð	OSC		函				Ctrl+N
	e A	OSC OSC		Ċ	New Res	ource Pool.		Ctrl+O
	<ul> <li>□□ 05000</li> <li>□□ 05000</li> <li>□□ 05000</li> <li>□□ 05000</li> <li>□□ 05000</li> <li>□□ 05000</li> </ul>			Exit Main	itenance Mo	de		
				Rescan f	or Datastor	es		
	Ð	OSS	01		Add Perr	nission		Ctrl+P
				0	Shut Dov	wn		
			b	Reboot				
					Report S	ummary		
					Report P	erformance		
					Open in l	New Window	v	Ctrl+Alt+N

6. Start the desired virtual machines.

You can find information on this in section "Start the virtual machines (Page 43)".

5.2 Shut down the whole virtualization system

# 5.2 Shut down the whole virtualization system

To close the whole virtualization system, follow these steps:

1. Deactivate all PCS 7 projects that are in process operation (runtime).

You can find information on this in the "WinCC V7.2: Working with WinCC" (http://support.automation.siemens.com/WW/view/en/73506085) manual.

2. Close all virtual machines.

To do so select the desired virtual machine and click on the "Shut down the guest" button in the "VMware vSphere Client" application toolbar.

🛃 19	🛃 192.168.126.50 - vSphere Client									
File	Edit Vi	ew In	iventor	y Adı	ministra	ition P	lug-ins	Help		
			Home	₽ 6	F Inv	entory	۵	Inve	ntory	
			G	0		13	2	<b>P</b>		12

- 3. End the virtualization server via the "VMware vSphere Client" application.
  - Select the virtualization server and select the "Enter Maintenance Mode" command in the context menu.

🛃 192	.168.	126.50 - vSphere Client	
File E	Edit	View Inventory Administration P	lug-ins H
		🟠 Home 🕨 🚮 Inventory	Þ 🗊 1
	192.	168.126.50	localho
	Ð	New Virtual Machine Ctrl	+N
	C	New Resource Pool Ctrl	+0
	2	Enter Maintenance Mode	
		Rescan for Datastores	
		Add Permission Ctr	I+P
	0	Shut Down	
	b	Reboot	
		Report Summary	
		Report Performance	
		Open in New Window Ctrl+Alt	:+N

5.2 Shut down the whole virtualization system

- Confirm the switch to the maintenance mode.



#### Note

Ensure that the maintenance mode of the virtualization server is not ended automatically when closing down. After restarting the virtualization server, the maintenance mode must be ended manually. Select the virtualization server in the "VMware vSphere Client" software and select the "Exit Maintenance Mode" command in the context menu.

 Select the virtualization server and select the "Shut Down" command in the context menu.



#### 5.2 Shut down the whole virtualization system

- Enter a reason for closing the virtualization server and click on the "OK" button.



 In the following dialog click on the "No" button to end the "VMware vSphere Client" software.

Connectio	on Failure	×
8	The vSphere Client needs to close since the "192.168.126.50" server is shutting down. Do you want to return to the login dialog? Click No to exit the vSphere Client.	
	Yes No	

- 4. Switch off the management console.
- 5. Switch off the thin client. Please note the manufacturer's information and safety instructions.

# Data backup and restoring the delivery status

# 6.1 Backing up the virtual machines

#### Introduction

You can back up the working status of a virtual machine by exporting an OVF template. You export the OVF template with the aid of the "VMware vSphere Client" application.

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is opened.
- The process operation of the PCS 7 projects is ended (runtime is deactivated).
- The virtual machines that you want to back up are switched off.

You can find information on this in section "Shut down the whole virtualization system (Page 74)".

#### Procedure

To back up a virtual machine, follow these steps:

- 1. Select the virtual machine for which you want to back up the working status in the "VMware vSphere Client" application.
- 2. Select the "File >Export > Export OVF Template" command in the menu bar.

The "Export OVF Template" dialog box opens.

- 3. In the "Name" field, type a name for the backup file.
- 4. In the "Directory" field, enter the desired storage location for the backup file.
- 5. Select the "Folder of files (OVF)" option in the drop-down list in the "Format" area.
- 6. In the "Description" field, enter a description for the virtual machine.
- 7. Click "OK".

The virtual machine is exported as an OVF file.

# 6.2 Restoring the delivery status of the virtual machines

To restore the delivery status of the virtual machines do the following:

· Remove existing virtual machines from the hard disk of the virtualization server

#### NOTICE

#### Remove the virtual machines

Note that when deleting the virtual machines, all data on the virtual machines is irrevocably deleted.

Restore delivery status of the virtual machines by importing OVF templates.

### 6.2.1 Remove the virtual machines

#### Procedure

To delete a virtual machine, follow these steps:

- 1. Open the "VMware vSphere Client" application.
- 2. Select the desired virtual machine and the "Delete from Disk" command in the context menu.



The virtual machine is deleted.

Data backup and restoring the delivery status

6.3 Restoring the delivery status of the virtualization server

## 6.2.2 Restore delivery status of the virtual machines by importing OVF templates

#### Requirements

The following requirements must be met:

- The "VMware vSphere Client" application is opened.
- The virtual machines that are restored are removed from the hard disk of the virtualization server.
- The USB hard disk supplied with the backup data and the MAC addresses to restore the virtual machines is at hand.

See the section titled "Scope of delivery (Page 12)" for more information.

#### Procedure

To restore the delivery status of a virtual machine, follow these steps:

- 1. Connect the supplied USB hard disk to the management console.
- In the "VMware vSphere Client" application menu bar select the "File > Deploy OVF Template" command.

File	Edit	View	Inventory	Administra
	New	1		+
	Dep	loy OVI	F Template	
	Exp	ort		•
1	Rep	ort		•
	Brov	vse VA	Marketplace	·
	Prin	t Maps		Þ
	Exit			

The "Deploy OVF Template" dialog opens.

3. Click the "Browse" button and select the OVF template for the desired virtual machine.

🛃 Deploy OVF Template		
Source Select the source location.		
Source OVF Template Details Name and Location Disk Format Ready to Complete	Deploy from a file or URL  E:[TYP1_PCS780SP1_V2.0[TYP1_PCS780SP1_V2.0.ovf  Prowse  Enter a URL to download and install the OVF package from the Internet, or specify a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.	
Help	< Back Next >	Cancel //

4. Click "Next".

- \_ 🗆 🗵 🛃 Deploy OVF Template **OVF Template Details** Verify OVF template details. Source **OVF Template Details** TYP1\_PCS780SP1\_V2.0 Product: Name and Location Disk Format Version: Network Mapping Ready to Complete Vendor: Publisher: No certificate present Download size: 16.8 GB 26.0 GB (thin provisioned) 150.0 GB (thick provisioned) Size on disk: Description: Help < Back Next > Cancel
- 5. Check the properties of the OVF template and click "Next".

6. Enter a name for the virtual machine and click "Next".

🛃 Deploy OVF Template		
Name and Location Specify a name and location	on for the deployed template	
Source OVF Template Details Name and Location Disk Format Network Mapping Ready to Complete	Name: The name can contain up to 80 characters and it must be unique within the inventory folder.	
Help	< Back Next >	Cancel

7. Make the settings for the hard disk format and click "Next".

🛃 Deploy OVF Template									
Disk Format	ant to store the virtual disks?								
Source	1								
OVF Template Details	Datastore:	datastore 1							
Name and Location Disk Format	Available space (GB):	145.7							
Network Mapping									
Ready to Complete	C								
	<ul> <li>Thick Provision Lazy Ze</li> <li>Thick Provision Eager Z</li> </ul>								
	Thick Provision Eager 2     O Thin Provision	eroed							
	S THILFIONSION								
Help			< Back Next >	Cancel					
				/					

8. Check the network assignment and click "Nex
--

🛃 Deploy OVF Template			
Network Mapping What networks should th	e deployed template use?		
Source OVF Template Details Name and Location Disk Format Network Mapping Ready to Complete	Map the networks used in this OVF Source Networks Terminalbus Managementbus Description: The Terminalbus network	template to networks in your inventory           Destination Networks           Terminalbus           Managementbus	
Help		< Back Next >	Cancel

- \_ 🗆 🗵 🛃 Deploy OVF Template **Ready to Complete** Are these the options you want to use? Source When you click Finish, the deployment task will be started. OVF Template Details Name and Location Deployment settings: Disk Format OVF file: E:\TYP1\_PC5780SP1\_V2.0\TYP1\_PC5780SP1\_V2.0.ovf Network Mapping Download size: 17,5 GB **Ready to Complete** Size on disk: 250,0 GB TYP1\_PC57805P1\_V2.0 Name: Host/Cluster: localhost. Datastore: datastore1 Disk provisioning: Thin Provision "Terminalbus" to "Terminalbus" Network Mapping: Network Mapping: "Managementbus" to "Managementbus" Power on after deployment Help < Back Finish Cancel
- 9. Check the import settings and click "Finish".

The OVF template for the selected virtual machine is imported.

The successful execution is confirmed by a message.

10.Select the imported virtual machine in the "VMware vSphere Client" application and select the "Edit settings" command in the shortcut menu.



11.Select the "Network adapter" property in the "Hardware" tab.

PCS780SP1_1 - Virtual Mac	hine Properties	
Hardware Options Resources		Virtual Machine Version: 8
	Add Remove Summary 4096 MB 1 Video card Restricted LSI Logic SAS Virtual Disk Virtual Disk CD/DVD drive 1 Terminalbus	Virtual Machine Version: 8  Device Status  Connected  Connect at power on  Adapter Type Current adapter: E1000  MAC Address  O0:50:56:  Automatic  DirectPath I/O
Network adapter 2 USB controller	Managementbus Present	Status: Not supported () Network Connection Network label: Terminalbus
Help		OK Cancel

12.Activate the "Manual" option in the "MAC address" area of the dialog.

13.Enter the MAC address of the virtual machine. The MAC addresses are listed on the supplied USB hard disk (see section "Scope of delivery (Page 12)").

I	Mac_Data.txt - Notepad 📃 🗖	×
l	=ile Edit Format View Help	
	TYP1PCS780SP1_V1.0.2: Network connection: 'Terminalbus'   MAC: '00:50:56:82:71:cc' Network connection: 'Plantbus'   MAC: '00:50:56:82:14:e3' Network connection: 'Managementbus'   MAC: '00:50:56:82:82:83'	4
	TYP2PCS780SP1_V1.0.2: Network connection: 'Terminalbus'   MAC: '00:50:56:82:72:4f' Network connection: 'Plantbus'   MAC: '00:50:56:82:be:28' Network connection: 'Redundancybus'   MAC: '00:50:56:82:a3:d4' Network connection: 'Managementbus'   MAC: '00:50:56:82:31:c5'	
	TYP5_PC57805P1_1: Network connection: 'Terminalbus'   MAC: '00:50:56:82:90:b7' Network connection: 'Managementbus'   MAC: '00:50:56:82:55:b6'ss	5
	TYP2PCS780SP1_V1.0.2_PCS7_INSTALLED: Network connection: 'Terminalbus'   MAC: '00:50:56:82:51:d3' Network connection: 'Plantbus'   MAC: '00:50:56:82:47:51' Network connection: 'Redundancybus'   MAC: '00:50:56:82:e3:db' Network connection: 'Managementbus'   MAC: '00:50:56:82:10:fc'	
	TYP1PCS780SP1_V1.0.2_PCS7_INSTALLED: Network connection: 'Terminalbus'   MAC: '00:50:56:82:aa:e1' Network connection: 'Plantbus'   MAC: '00:50:56:82:50:59' Network connection: 'Managementbus'   MAC: '00:50:56:82:26:d9'	

# 6.3 Restoring the delivery status of the virtualization server

To restore the delivery status of the virtualization server do the following:

Installation of the "VMware vSphere ESXi 5.1" software on the virtualization server

#### NOTICE

#### New installation of the virtualization server

Please note that on installation of the "VMware vSphere ESXi" software, all data and settings on the virtualization server are irrevocably deleted.

- · Setting the IP address and network adapter of the virtualization server
- Import additional configuration data

## 6.3.1 Installing the "VMware vSphere ESXi" software

#### Introduction

By installing the "VMware vSphere ESXi" software all data on the virtualization server is deleted and a new hypervisor is installed (see section "Function principle (Page 9)").

#### Requirements

The following requirements must be met:

- The virtualization server is assembled and commissioned according to the manufacturer's regulations.
- A monitor, keyboard, and mouse are connected to the virtualization server.
- The supplied CD with the installation of the "VMware vSphere ESXi 5.1" software is available (see section "Scope of delivery (Page 12)").

#### Procedure

To install the "VMware vSphere ESXi" software and set the virtualization server, follow these steps:

- 1. Switch the virtualization server on via the mains/standby switch. The server's start-up application is displayed.
- 2. Insert the installation CD for the "VMware vSphere ESXi 5.1" software into the CD drive of the virtualization server.
- 3. Open the boot menu via the F11 button

4. Make the setting to start from the CD device.

ŀ	HP-ESXi-5.1.0-sta	ndard-iso Boot	Menu
HP-ESXi-5.1 Boot from 1	1.0-standard-iso local disk	Installer	
	Press [Tab] t Automatic boot	o edit options in 5 seconds.	

5. Select the target drive for installing the SD memory card for the virtualization server and press Enter.

Select a Disk to Install or Upgrade				
* Contains a VMFS partition				
Storage Device	Capacity			
Local: HP iLO LUN 00 Media 1 (mpx.vmhba32:C0:T0:L0) Remote: *HP LOGICAL VOLUME (naa.600508b1001ca67d5cbea)	3.74 GiB 1.36 TiB			
L (Esc) Cancel (F1) Details (F5) Refresh (Enter) C	ontinue			

6. Select a keyboard type.

7. Enter a password for access to the virtualization server.

#### Note

The data set on the virtualization server must be noted and treated in confidence. It is required for additional configuration steps.

- 8. Press Enter to start the installation.
- After completing the installation remove the installation CD from the CD drive of the virtualization server.
- 10.Press Enter to restart the virtualization server.

### 6.3.2 Configuration of the IP address and network adapter

#### Introduction

After installing the "VMware vSphere ESXi 5.1" software you set the IP address and network adapter of the virtualization server.

#### Requirement

The following requirements must be met:

- The virtualization server is assembled and commissioned according to the manufacturer's regulations.
- The "VMware vSphere ESXi 5.1" software is installed.

#### Procedure

Proceed as follows to configure the virtualization server:

1. Switch the virtualization server on via the mains/standby switch. The server's start-up application is displayed.



2. Press the F2 button.

The dialog for logging in to the virtualization server is opened.

- 3. Enter the following log in data:
  - Login Name: root
  - Password: See section "Installing the "VMware vSphere ESXi" software (Page 89)".

Authentication Required		
Enter an authorized login name and password for localhost		
Configured Keyboard (Germ		
Login Name: Eroot Password: E		
	<pre><enter> OK <esc> Cance1</esc></enter></pre>	

4. Press Enter.

The options for configuring the system properties of the virtualization server are displayed.

5. Navigate to the "Configure Management Network" entry and press Enter.

#### Note

Use the <Arrow down> and <Arrow up> buttons to navigate between the individual entries.



The options to change the network settings are displayed.

- Configure Monagement Network
   IP Configuration

   Network Adopters VLM Coptional)
   IP Address: 192.168.126.50 Subnet Mosk: 255.255.05 Definition DNS Suffixes

   Description DNS Suffixes
   In is host can obtain an IP address and other networking parameters automatically if your network advinistrator for the appropriate settings.

   Cup/Dom/ Select
   Kenter > Change
- 6. Navigate to the "IP Configuration" entry and press Enter.

The dialog to modify the IP address is opened.

7. Enter the desired IP address.

IP Configuration This host can obtain network settings automatically if your network includes a DHCP server. If it does not, the following settings must be			
specified: ( ) Use dynamic IP address and network configuration (o) Set static IP address and network configuration:			
<mark>IP Address</mark> Subnet Mask Default Gateway	[ 192.168.126.50 ]       ]         [ 255.255.255.0 ]       ]         [ 0.0.0.0 ]       ]		
<pre><up down=""> Select <space> Mark Selected</space></up></pre>	<pre> <b> K</b> K K K K K K K K K K K K K K K K K</pre>		

#### 8. Enter the desired subnet mask.



9. Press Enter to save the change.

#### Note

Using the "Esc" button you can reject the changes and leave the dialog.

A summary of the settings is shown under the "IP Configuration" entry.

Configure Management Network	IP Configuration
Network Adapters VLAN (optional)	Manual IP Address: 192.168.126.50
IP Configuration IPv6 Configuration DNS Configuration	Subnet Mask: 255.255.255.0 Default Gateнay: Not set
Custon DNŠ Suffixes	This host can obtain an IP address and other networking parameters automatically if your network includes a DHCP server. If not, ask your network administrator for the appropriate settings.
КUp/Down> Select	Kenter≻ Change Kesc> Ex

10.Press the <Esc> button to reach the "Configure Management Network" initial dialog.

11.Navigate to the "Network Adapters" entry and press Enter.

12.Select the "vmnic0" and "vmnic7" interfaces.

Network Adapters				
Select the adapters for this host's default management network connection. Use two or more adapters for fault-tolerance and load-balancing.				
[X] vmnic0 [ ] vmnic1 [ ] vmnic2 [ ] vmnic3 [ ] vmnic4 [ ] vmnic5 [ ] vmnic6 [X] vmnic7 [ ] vmnic8 [ ] vmnic9	NIC Port 1 (:67:14:ef:a4) NIC Port 2 (:67:14:ef:a5) NIC Port 3 (:67:14:ef:a6) NIC Port 4 (:67:14:ef:a7) PCI-E Slot 2 (d:87:9c:74) N/A (ac:16:2d:87:9c:75) N/A (ac:16:2d:87:9c:76) N/A (ac:16:2d:87:9c:77) PCI-E Slot 3 (d:87:99:24) N/A (ac:16:2d:87:99:25)	Disconnected Disconnected Disconnected Disconnected Disconnected Disconnected Disconnected		
		<pre></pre>		

13.Press Enter to save the settings.

14.Press the <Esc> button to reach the "System Customization" dialog.

15.Press the <Esc> button to activate the configuration.

## 6.3.3 Import additional configuration data

#### Introduction

On the supplied USB hard disk you will find additional configuration data (incl. licenses, network settings) that you can transfer to the virtualization server with the aid of the "VMware vSphere Command-Line Interface" software.

#### Requirements

- The following requirements must be met:
- The instructions described in the sections "Installing the "VMware vSphere ESXi" software (Page 89)" and "Configuration of the IP address and network adapter (Page 91)" have been executed.
- The supplied USB hard disk is available.
- The installation application of the "VMware vSphere Command-Line Interface 5.1 Update 1" software is available.

You can find the installation application at http://www.vmware.com/support/developer/vcli/.

#### Procedure

In order to transfer the configuration data on the supplied USB hard disk to the virtualization server, proceed as follows:

1. Install the "VMware vSphere Command-Line Interface 5.1 Update 1" software on the management console.

Additional information on this is provided in the manufacturer's documentation (http://www.vmware.com/support/developer/vcli/).

- 2. Connect the supplied USB hard disk to the management console.
- 3. Open the Windows command line.
- 4. Enter the path to the installation folder for the "VMware vSphere Command-Line Interface V5.1 Update1" software.



5. Enter the following command:

```
vicfg-cfgbackup --server <server_ip> -l <device> :\
<backup>.tgz
```

- <server\_ip>: IP address of the virtualization server (see section "Configuration of the IP address and network adapter (Page 91)")
- <device>: Drive for the supplied USB hard disk



6. Press Enter.

- 7. Enter the following data:
  - User name: root
  - Password: Password for the virtualization server (see section "Installing the "VMware vSphere ESXi" software (Page 89)").

```
C:\windows\system32\cmd.exe
C:\Program Files (x86)\UMware\UMware vSphere CLI\bin>vicfg-cfgbackup.pl --server
192.168.126.51 -1 D:\ESXi_BACKUP_51.tgz
Enter username: root
Enter password:
```

8. Press Enter.

The configuration data is transferred to the virtualization server.

9. Restart the virtualization server.

