HP ProLiant Essentials Virtualization Management Software

User Guide

Consisting of HP ProLiant Essentials Virtual Machine Management Pack and HP ProLiant Essentials Server Migration Pack

hp

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Contents

About this guide

This user guide provides step-by-step instructions for installing and using HP ProLiant Essentials Virtualization Management Software, which includes:

- HP ProLiant Essentials Virtual Machine Management Pack
- HP ProLiant Essentials Server Migration Pack

Where to go for additional help

In addition to this guide, the following information sources are available.

For additional information about ProLiant Essentials Virtualization Management Software, refer to:

- http://www.hp.com/go/vmmanage
- *HP ProLiant Essentials Virtualization Management Software Quick Setup Poster*
- *HP ProLiant Essentials Virtualization Management Software Support Matrix*

For additional information about HP Systems Insight Manager, refer to:

- http://www.hp.com/go/hpsim
- *HP Systems Insight Manager Installation and User Guide*
- *HP Systems Insight Manager Help Guide*

Telephone numbers

For the name of your nearest HP authorized reseller:

- In the United States, refer to http://www.hp.com/service_locator
- In other locations, refer to http://www.hp.com

For HP technical support:

- In North America:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website at http://www.hp.com.
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, refer to the HP website at http://www.hp.com/support.

Introduction

HP ProLiant Essentials Virtualization Management Software includes the:

- HP ProLiant Essentials Virtual Machine Management Pack
- HP ProLiant Essentials Server Migration Pack

Virtual Machine Management Pack

The Virtual Machine Management Pack adds virtual machine management capability within HP System Insight Manager (HP SIM) 5.0 or later. The Virtual Machine Management Pack provides the following benefits:

- Integration with the HP SIM console to manage the virtual machine environment
- Simplified deployment and operation of virtual machines with Microsoft® Virtual Server 2005 and VMware®
- Reduced cost and complexity in server consolidation projects
- Faster response times to changing business demands

The Virtual Machine Management Pack provides tracking, monitoring, and control functions for organizing an effective virtualized environment. HP leverages key industry alliances to provide best-in-class management capability across most contemporary virtualization software platforms and industry-standard servers.

Server Migration Pack

The Server Migration Pack extends the functionality of the Virtual Machine Management Pack by simplifying the server consolidation process. The Server Migration Pack provides the following migration capabilities:

- Physical-to-virtual (P2V) migration—Migrates a physical machine to a virtual machine guest within a Microsoft Virtual Server 2005 or VMware virtual machine host
- Virtual-to-virtual (V2V) migration—Migrates a virtual machine guest between different virtualization layers, including Microsoft Virtual Server 2005, VMware ESX Server®, and VMware GSX Server®
- Virtual-to-physical (V2P) migration—Migrates a virtual machine guest within a Microsoft Virtual Server 2005 or VMware virtual machine host to a physical machine

Infrastructure

The virtualization management software is integrated completely within HP SIM to provide ease of use, installation, and maintenance. All requirements and practices for proper operation of HP SIM must be observed for Virtual Machine Management Pack and Server Migration Pack. For detailed information about requirements for and using HP SIM, refer to the *HP Systems Insight Manager Installation and User Guide.*

The virtualization management software includes the following components, which are installed and set up during the software installation:

- The Virtual Machine Management (VMM) Pack —Resides on the HP SIM Central Management Server (CMS) and provides access to the virtual machine monitoring and control functions, accessible locally or remotely using industry-standard web browsers.
- The Virtual Machine Management (VMM) Agent—Distributed to managed virtual machine hosts from the HP SIM toolbar.
- The Server Migration Pack (SMP)—Resides on the HP SIM CMS and provides migration functionality.
- The Server Migration Pack Agent—Distributed to managed physical machines to perform migration operations.

HP Systems Insight Manager console integration

The Virtual Machine Management Pack and Server Migration Pack install and run on the HP SIM CMS. With the installation of the Virtual Machine Management Pack and Server Migration Pack, the HP SIM console is enhanced with the virtual machine column, which displays the status of virtual machine hosts and guests. The virtual machine column is shown circled in the following figure.
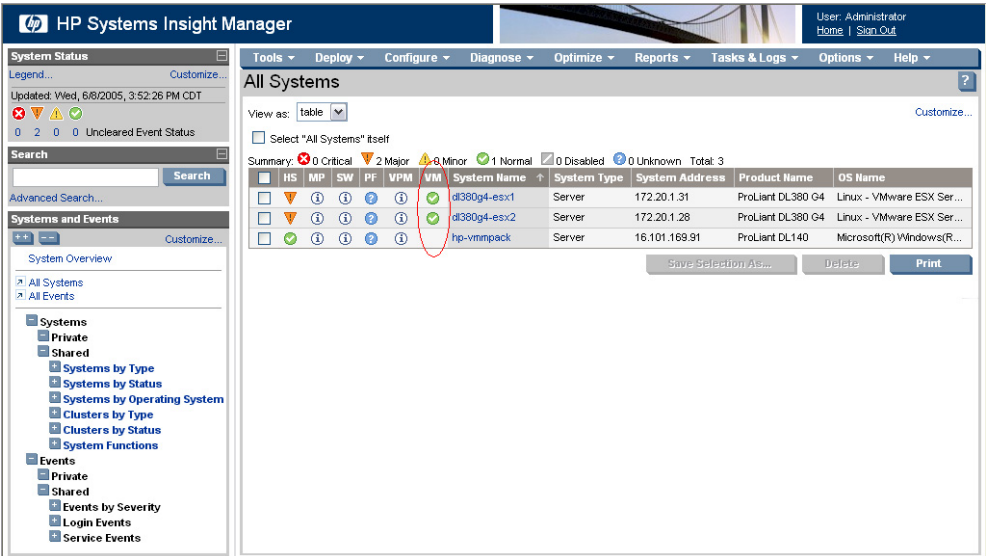
The association between virtual machine hosts and guests is displayed in the systems list. Click the **System Name** entry to view additional details about the respective virtual machine hosts and guests.

The status of the virtual machine hosts and guests is depicted using the color-coded icons listed in the following tables.

Table 1 Virtual machine host icons

Icon	Status
✅	The virtual machine host is licensed and is currently communicating with Virtual Machine Management Pack.
❌	The virtual machine host is licensed but is not currently communicating with Virtual Machine Management Pack.
❓	The VMM agent is installed on the server, but the server is not a virtual machine host.
ⓘ	The VMM agent is installed on the virtual machine host, but the host is not licensed.
No icon	The VMM agent is not installed on this server.

Table 2 Virtual machine guest icons

Icon	Status
✅	The virtual machine guest is associated with a licensed virtual machine host, and the guest is started.
⚠️	The virtual machine guest is associated with a licensed virtual machine host, but the host is not communicating with Virtual Machine Management Pack.
🔻	The virtual machine guest is in a state requiring user attention.
▱	The virtual machine guest is associated with a licensed virtual machine host, but the guest is not started.
ⓘ	The virtual machine guest is not associated with a licensed virtual machine host.

Click any of the icons to display additional information for the system.

Requirements

This section lists the hardware and software required for each component in the Virtual Machine Management Pack and Server Migration Pack environment. A Virtual Machine Management Pack and Server Migration Pack environment consists of:

- HP SIM Microsoft Windows®-based CMS
- Virtual machine hosts
- Virtual machine guests

HP SIM CMS

The HP SIM CMS must meet the following requirements to successfully install and use the Virtual Machine Management Pack and Server Migration Pack. For specific hardware and software requirements for HP SIM, refer to the *HP Systems Insight Manager Installation and User Guide*.

Table 3 HP SIM CMS requirements

Component	Requirement
Software	- HP SIM 5.0 or later - Open SSH installed and configured - Windows Management Instrumentation (WMI) installed and configured on the HP SIM CMS
IMPORTANT: To ensure that OpenSSH is installed and configured correctly, refer to *Secure Shell (SSH) in HP Systems Insight Manager* located on the Management CD.	
Hardware	250 MB of available disk space on the HP SIM CMS for both the Virtual Machine Management Pack and Server Migration Pack
Database	If Oracle® is used as the primary HP SIM database, an Oracle database must be created manually with a customized database name and the same user account as HP SIM

For browser support information for viewing the HP SIM console from a remote location, refer to the *HP Systems Insight Manager Installation and User Guide* located at: http://www.hp.com/go/hpsim.

Be sure to have the following items available before beginning the Virtual Machine Management Pack installation:

- HP SIM credentials with administrative rights
- If SQL is used in the primary HP SIM database, SQL database credentials
- If Oracle® is used as the primary HP SIM database, an Oracle database created manually with a customized database name and the same user account as HP SIM

Virtual machine host

The following table lists the requirements for virtual machine hosts.

Table 4 Virtual machine host requirements

Component	Requirement
Virtualization technology*	Microsoft Virtual Server 2005
	VMware ESX Server
	VMware GSX Server (installed on a Windows system only)
Available disk space	65 MB for VMM agent (100 MB during installation)
Software	HP Server Management Agents from the latest HP ProLiant Support Pack available at **http://www.hp.com/support/files** (recommended for ProLiant servers)

* For specific software versions, refer to the *HP ProLiant Essentials Virtualization Management Software Support Matrix.*

NOTE: To use VMware VMotion® Technology with VMware ESX Server hosts, ensure you have VMware VirtualCenter setup and configured properly. Refer to the VMware documentation for further information.

Virtual machine guest

For supported operating systems on virtual machine guests, refer to the website of the virtualization technology installed on the virtual machine host.

- For Microsoft Virtual Server 2005, refer to **http://www.microsoft.com**.
- For VMware, refer to **http://www.vmware.com**.

NOTE: For improved management of Microsoft Windows NT®, install the WMI CORE on the virtual machine guest. Refer to **http://www.microsoft.com/downloads**.

Installation and configuration

This section provides detailed information required to successfully install and configure Virtual Machine Management Pack and Server Migration Pack.

These instructions assume that all hardware and software requirements have been met. Refer to the "Requirements" section of this guide to ensure that all requirements have been met before attempting to install the Virtual Machine Management Pack and Server Migration Pack.

Virtualization Management Software installation

IMPORTANT: You must have administrative rights in HP SIM to install Virtual Machine Management Pack and Server Migration Pack.

Installing from the Management CD

The Virtual Machine Management Pack and Server Migration Pack can be installed at the same time as HP SIM 5.0 or installed separately.

To install Virtual Machine Management Pack and Server Migration Pack with HP SIM 5.0 or later:

1. Insert the Management CD into the CD-ROM drive of the HP SIM CMS.
2. Read the license agreement. If you agree to the terms of the license agreement, click **Agree** to continue.
3. If HP SIM 5.0 is not already installed, click **Install** located under HP Systems Insight Manager. Select **Typical** or **Custom.**
   - If **Typical** is selected, the Virtualization Management Software is automatically installed.
   - If **Custom** is selected, be sure that the Virtualization Management Software checkbox is selected.
4. If HP SIM 5.0 is already installed, click **Install** located under HP ProLiant Essentials Virtualization Management Software.
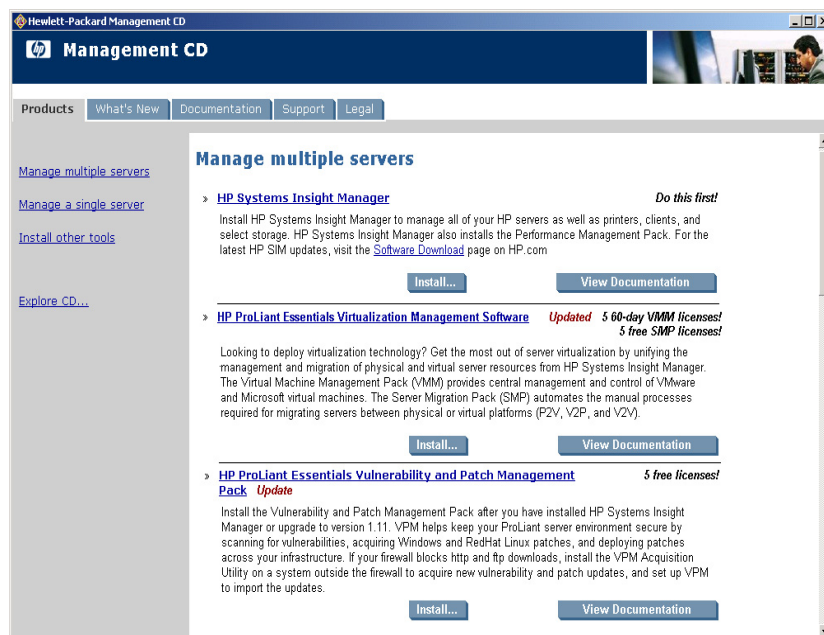
IMPORTANT: The Virtualization Management Software installation requires both HP SIM and database services to be running. During installation, the HP SIM service is restarted.

IMPORTANT: The Virtualization Management Software installation retains the database if the vmm_dbv2 database already exists to maintain database persistence over installation of 2.0. You can manually remove vmm_db_v2 if necessary.

5. At the ProLiant Essentials Virtualization Management Software welcome screen, click **Next.**

6. Enter the service account credentials, and click **Next.**
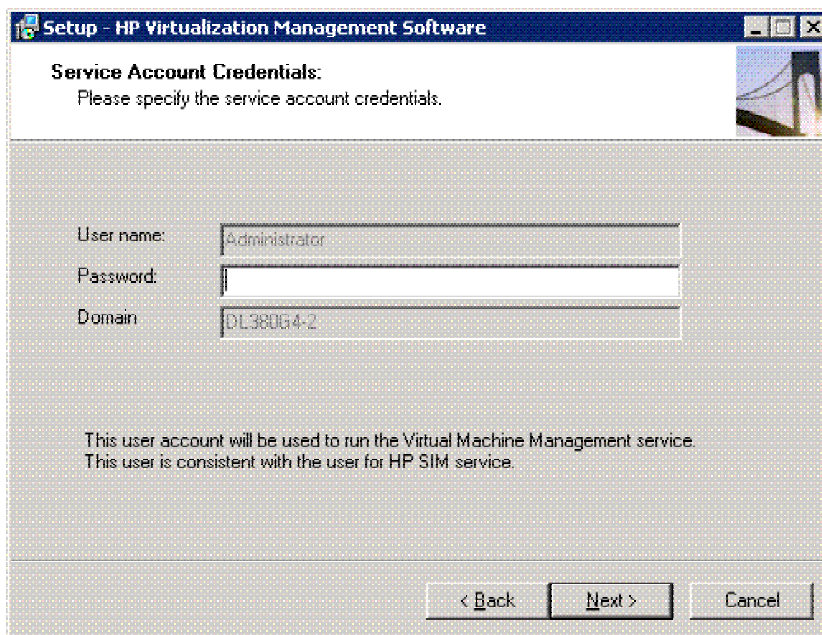
7. If Oracle is used as your HP SIM primary database, enter your user name and password, Oracle database name, and .jar file location, and click **Next.**

📝 NOTE: The specified database must be empty. If the database is not empty, either click **Yes** to skip the database installation and use a SQL database, or click **No** to specify a different database name.

8. Select to configure the VMware VirtualCenter settings now or at a later time. If configuring settings now, enter your VMware VirtualCenter user name, password, and service address. Click **Next.**

9. If upgrading, select either **Upgrade Agents Later** or **Upgrade Agents Now.**
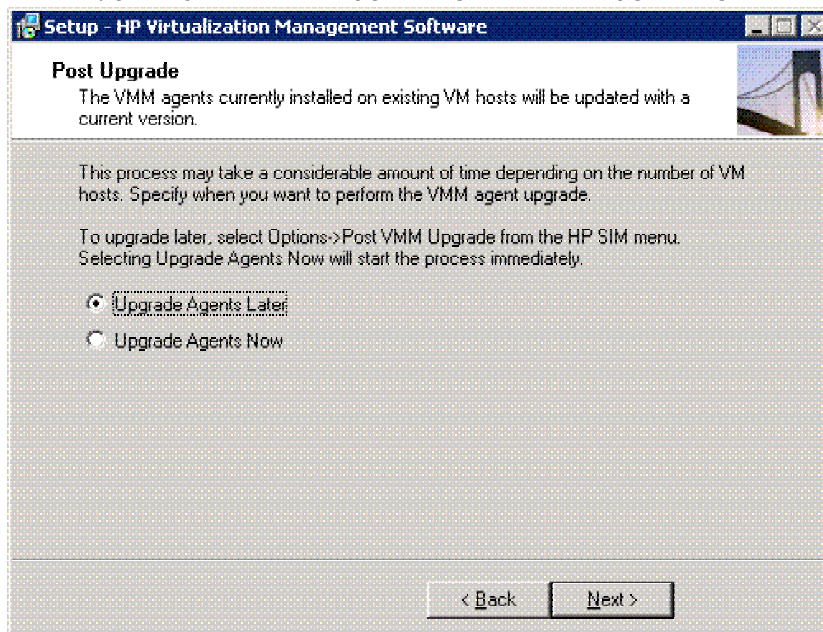
10. Click **Finish** when the ProLiant Essentials Virtualization Management Software installation completes. No reboot is required.
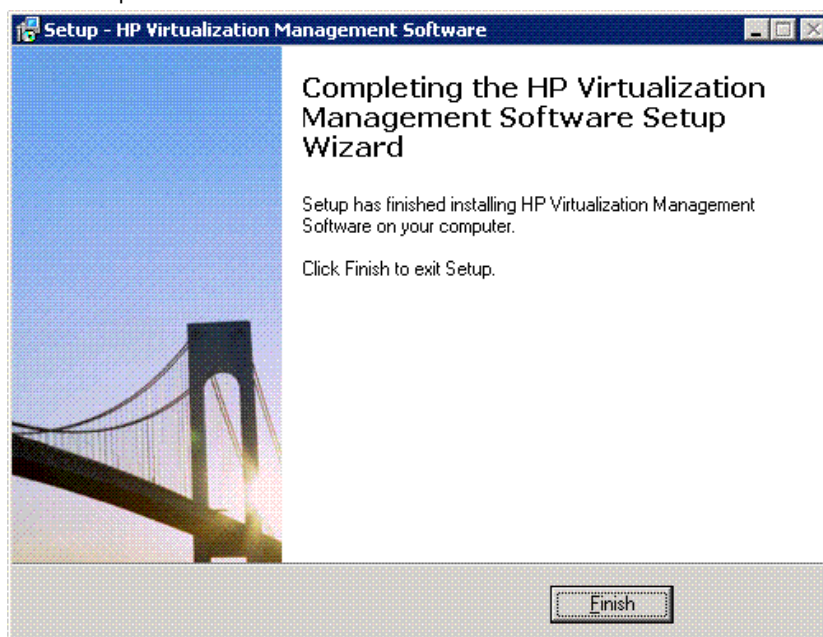
Installing from the Web

1. Download ProLiant Essentials Virtualization Management Software from **http://www.hp.com/go/vmmanage**.
2. Double-click the downloaded executable file to start the installation.
3. Follow the on-screen instructions, entering your user-specific information when prompted.

Installation locations

The following table lists the default installation locations for the ProLiant Essentials Virtualization Management Software.

📝 **NOTE:** The Virtualization Management Software is always installed under the same installation directory as HP SIM.

Table 5 **Default installation locations**

Component	Default installation location
ProLiant Essentials Virtualization Management software	C:/Program Files/HP/HP Virtualization Management Software
HP SIM	C:/Program Files/HP/Systems Insight Manger

Setting up the virtual machine host

Perform the procedures in the following sections before attempting to use the Virtual Machine Management Pack and Server Migration Pack.

📝 **IMPORTANT:** These configuration steps **must** be performed before attempting to use the Virtual Machine Management Pack or Server Migration Pack.

Performing an HP SIM discovery

1. Log in to HP SIM from an account with administrator privileges.
2. Select **Options>Protocol Settings>Global Protocol Settings,** and configure the default Web Based Enterprise Management settings with appropriate credentials to enable access to target systems. If some target systems use individual protocol settings, select **Options>Protocol Settings>System Protocol Settings** to configure settings for individual systems.
3. Perform an HP SIM discovery of virtual machine hosts and guests to allow the Virtual Machine Management Pack to access target systems in the network.

📝 **NOTE:** For information about performing basic HP SIM tasks, refer to the *HP Systems Insight Manager Installation and User Guide*.

Installing OpenSSH

OpenSSH provides secure communications between the virtual machine host and the CMS by encrypting online traffic to eliminate network-level attacks. You must install OpenSSH on Windows hosts before the Virtual Machine Management agent can be deployed from the CMS.

📝 **IMPORTANT:** Be sure the system has been rebooted after an installation of HP SIM.

1. Log in to HP SIM from an account with administrator privileges.
2. Select **Deploy>Deploy Drivers, Firmware, and Agents>Install OpenSSH.**
3. Click the HP SIM help icon (?) and follow the on-screen instructions to complete the installation.

Configuring OpenSSH

To check if OpenSSH is installed in the machine, perform the following:

1. From All System page of HP SIM console, click on the system name link of the machine that you want to check. This will take you to the System page identity tab.
2. After expanding the product description, the management protocols will show the following "SSH: SSH-2.0-OpenSSH_xx.1p1". Where xx is the version number.

If OpenSSH is already installed, it must be configured on both Windows and Linux virtual machine hosts. Configure OpenSSH using the `MxAgentConfig` command. From the command prompt, enter:

```
mxagentconfigure –r –n <host IP address>

mxagentconfig –a –n <hostname> -u <username> -p <password>
```

For more information about the `MxAgentConfig` command, go to the HP SIM online help and search for keywords "Getting Started – Using Command Line Interface Commands."

Deploying the VMM agent

IMPORTANT: OpenSSH must be configured properly and running on both the HP SIM CMS and the selected target virtual machine hosts to deploy the VMM agent.

1. Log in to HP SIM from an account with administrator privileges.
2. Select **Deploy>Deploy Drivers, Firmware and Agents>Install VMM Agent,** and select either **Linux** or **Windows.**
3. Select the target virtual machine hosts by selecting the checkbox next to the appropriate systems.
4. Click **Apply.**
5. If necessary, click **Add Targets** to add targets or click **Remove Targets** to remove targets, and then click **Next.**
6. Click **Run Now** to deploy the VMM agent immediately, or click **Schedule** to deploy the VMM agent to selected Virtual Machine Hosts at a later time.
7. View task results in the HP SIM task logs.

Deploying the SMP agent

IMPORTANT: P2V migrations can be performed only on Microsoft Windows physical machines. Virtual machine hosts cannot be migrated into a virtual machine.

1. Log in to HP SIM from an account with administrator privileges.
2. Select **Deploy>Deploy Drivers, Firmware and Agents>Install SMP Agent.**
3. Select the physical machine by selecting the checkbox next to the appropriate systems.
4. Click **Apply.**
5. Verify that the correct target hosts appear in the list. If necessary, click **Add Targets** to add targets, or click **Remove Targets** to remove targets, and then click **Next.**
6. Select to install the SMP agent using either **SMP deploy** (recommended) or **OpenSSH.** Click **Run Now** to deploy the SMP agent immediately.

Post-installation configuration tasks

Perform the following procedures if:

- You performed a typical installation
- You selected to perform these tasks later while performing a custom installation

Upgrading the VMM agent

IMPORTANT: A Virtual Machine Management Pack upgrade temporarily unregisters the VMM agent. This process deletes all associated information from the database, including all HP SIM associations and scheduled task data.

The menu item to upgrade the VMM agent is available only after a Virtual Machine Management Pack upgrade.

1. Select **Options>Virtualization Management>Post VMM Upgrade.**
2. Click **Run Now** to deploy the agent immediately, or click **Schedule** to deploy the agent at a designated time.

Configuring VMware VirtualCenter

To configure the VMware VirtualCenter, select
Options>Virtualization Management>Security>VMware VirtualCenter Settings.

IMPORTANT: This is required for Live Move which uses VMware VMotion Technology.

Setting up virtual machine guests

HP recommends that you install Microsoft Virtual Server Additions or VMware Tools on virtual machine guests.

NOTE: Microsoft Virtual Server Additions and VMware Tools are also required to perform certain Microsoft Virtual Server 2005 and VMware tasks.

Installing Microsoft Virtual Server Additions

NOTE: Be sure the virtual machine guests are started before installing software.

1. Open the Microsoft Virtual Server 2005 Administration website.
2. Select **Configure** in the Virtual Machines field of the Microsoft Virtual Server 2005 Administration homepage. A list of virtual machines guests displays.
3. Select the appropriate virtual machine guests. The virtual machine guest configuration details display.
4. Click **Install Virtual Machine Additions.**
5. Select the **Install Virtual Machine Additions** checkbox, and click **OK.**

For additional information, refer to **http://www.microsoft.com**.

Installing VMware tools

Both VMware ESX Server and VMware GSX Server tools can be installed on VMware virtual machine guests from the VMware Management Interface.

IMPORTANT: Be sure the virtual machine guests are started before installing software.

1. Access the VMware interface at **http://www.vmware.com**.
2. Log in to the VMware Management Interface.
3. Select the appropriate virtual machine guest, and open the remote console.
4. From the selected virtual machine console, right-click the selected virtual machine guest.
5. Select **Install VMware Tools.**

For additional information, refer to **http://www.vmware.com/support/**.

Licensing

IMPORTANT: You must have HP SIM administrative rights to add or deploy license keys.

Adding licenses

1. From the console toolbar, select **Deploy>License Manager>Manage Keys.**
2. Click **Add Key** to enter one or more new key strings, and click **OK.**

Virtual Machine Management Pack licensing

This section provides information about licensing servers for use with the Virtual Machine Management Pack. One license is required for each system managed by the Virtual Machine Management Pack.

Free licenses

Five fully functional, 60-day trial licenses are provided with the Virtual Machine Management Pack for evaluation purposes. These licenses are available after the Virtual Machine Management Pack is installed and can be applied to systems from the HP SIM License Manager. For more information or to purchase more licenses refer to **http://www.hp.com/go/vmmanage**.

Licensing preparation

Before licensing servers for the Virtual Machine Management Pack, verify that the servers have a supported operating system.

For more information about discovering and updating the server list in HP SIM, refer to the *HP Systems Insight Manager Installation and User Guide.* For information about supported operating systems, refer to the *HP ProLiant Essentials Virtualization Management Software Support Matrix.*

Licensing options

The following options are available for purchasing licenses:

- ProLiant Essentials Virtual Machine Management Pack Single-Server License—For use with a single server, this option contains one kit with a unique license activation key and documentation.
- ProLiant Essentials Virtual Machine Management Pack Flexible-Quantity License—For use with multiple servers, this option can be used to purchase multiple licenses with a single activation key. The quantity ordered of this part number is the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit is delivered with the activation key and documentation.
- ProLiant Essentials Virtual Machine Management Pack Tracking License—For use with signed and implemented activation key Agreements only, this option entitles the deployment of additional product licenses under the terms of the existing activation key agreement.

For additional information or to purchase licenses, refer to **http://www.hp.com/go/vmmanage**.

Applying licenses to virtual machine hosts

IMPORTANT: After a license is applied to a specific server, the license cannot be removed or transferred to another server.

IMPORTANT: If a demo license key is used, it will be overridden by any purchased licenses.

1. From the console toolbar, select **Deploy>License Manager>Deploy Keys.**
2. Select the target virtual machine hosts to license by selecting the checkbox next to the systems.
3. Click **Apply.**
4. Verify that the correct target hosts appear in the list. If it is necessary, click **Add Targets** to add targets or click **Remove Targets** to remove targets, and then click **Next.**
5. Select the appropriate Virtual Machine Management Pack license to apply to the selected target host by selecting the checkbox next to the license.
6. Click **Run Now** to deploy the license.

After a few moments the status icon changes to normal. If the icon does not change after a period of time, select **Options>Discovery** from the HP SIM console.

Server Migration Pack licensing

This section provides information about Server Migration Pack licensing. One license is required for each successful P2V, V2V, or V2P migration. Server Migration Pack licenses, unlike other ProLiant Essentials licenses, do not have to be deployed to servers. Server Migration Pack licenses are consumed when Server Migration Pack migrations are performed.

Free licenses

Five fully functional licenses are provided with the Server Migration Pack for evaluation purposes. These licenses are available after the Server Migration Pack is installed.

Licensing requirements

- A P2V, V2V, or V2P migration can only be performed if at least one Server Migration Pack license is available.
- In a P2V migration, the target virtual machine host involved must be licensed and managed by the Virtual Machine Management Pack.
- In a V2V migration, both the source and target virtual machine hosts must be licensed and managed by the Virtual Machine Management Pack.
- In a V2P migration, the source virtual machine host must be licensed and managed by the Virtual Machine Management Pack.

Licensing options

The following options are available for purchasing licenses:

- Consumption-based license—Allows a designated number migrations using the Server Migration Pack. One license is consumed for each successful server migration.
- Time-based license—Allows unlimited migrations using the Server Migration Pack for a designated period. While the license is in effect, one available Server Migration license appears in the HP SIM License Manager regardless of the number of migrations performed.

NOTE: When multiple license types are available, the time-based licenses are consumed before the consumption-based licenses.

Using the Virtual Machine Management Pack

The Virtual Machine Management Pack provides central management and control for virtual machines with Microsoft Virtual Server 2005, VMware GSX Server, or VMware ESX Server. The Virtual Machine Management Pack is fully integrated with HP SIM.

The Virtual Machine Management Pack also detects virtual machine status changes initiated by other supported virtualization technology consoles. These status changes are indicated by the System Status icons on the HP SIM System page. To access the System page, click a virtual machine host or guest in the HP SIM console.
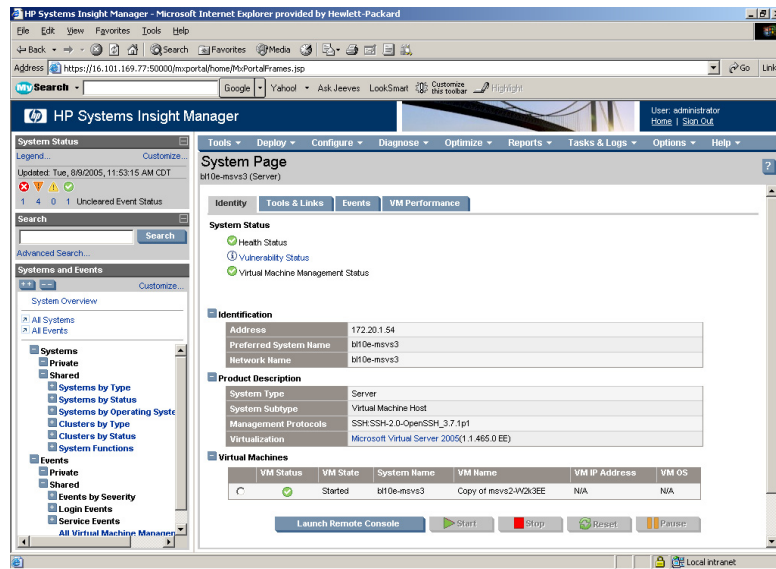
The left frame of the HP SIM console displays a node navigational tree. The tree is populated with a list of the virtual machine hosts and their virtual machine guests under the **Systems>Shared>Systems by type** directory.

To display all virtual machine hosts and guests managed by the Virtual Machine Management Pack in the HP SIM console, expand the **Systems>Shared>Systems by Type** directory in the left pane. Click **All Virtual Machine Hosts** or **All Virtual Machines.**

Virtual machine host

After clicking a virtual machine host in the HP SIM console, click the **Identity** tab to display the following information for the host.
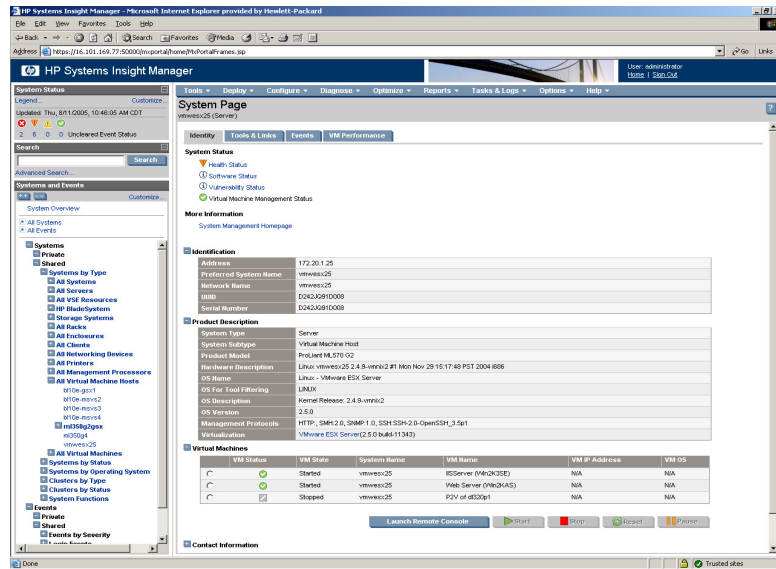
- Virtual Machine—The virtual machine status, virtual machine state, system name, virtual machine name, IP address, and virtual machine operating system.
- Identification—The address, preferred system name, and network name.
- Product Description
  - System type—The type of system on which the software is running.
  - System subtype—Identifies a virtual machine host or guest.
  - Hardware description—Details of the physical system on which the software is running.
  - OS name—The operating system used.
  - OS for tool filtering—The type of operating system being used for filtering.
  - OS Description—The level of operating system being used.
  - OS Version—The version of the operating system.
  - Management Protocols—States the protocols being used for tool filtering.
  - Virtualization—The type of virtualization software installed. This also links to the remote console.
- Virtual machine—The virtual machine status, system name, virtual machine name, IP address and virtual machine operating system.

From this page, you can launch the remote console, and start, stop, reset and pause virtual machines.

NOTE: Depending on the host configuration, additional details might display.

Virtual machine guest

After clicking a virtual machine guest in the HP SIM console, click the **Identity** tab to display the following configuration information for the host or guest.
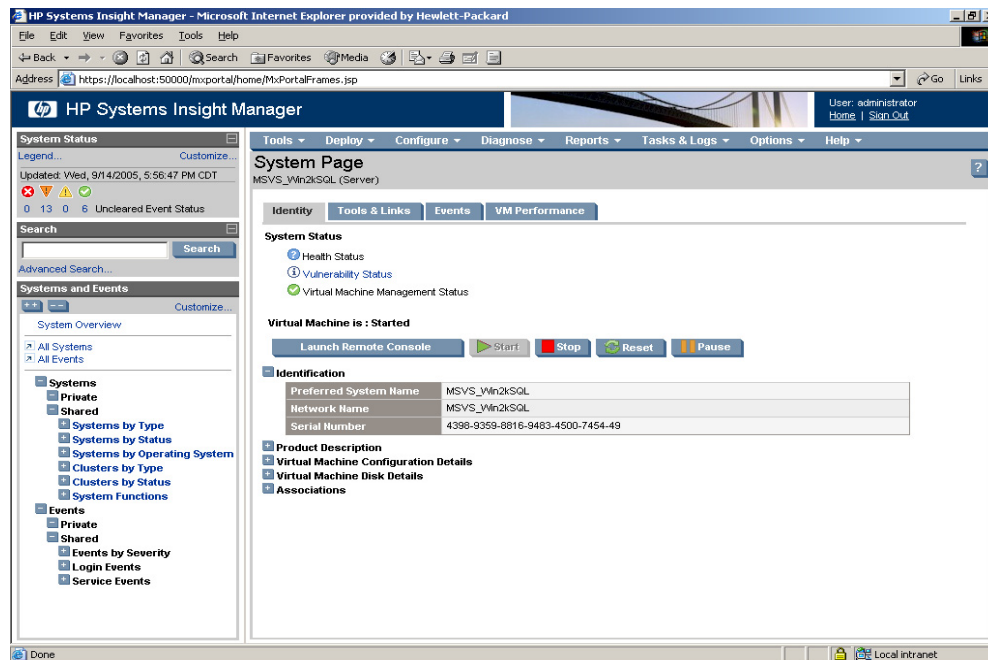
- System status—The health and virtual machine status is depicted using color-coded icons
- Virtual machine controls—Virtual machine status is listed, and the controls enable you to launch remote console, and start, stop, reset and pause virtual machines
- Identification—The address, preferred system name, and network name are displayed.
- Product description
  - System type—The type of system on which the software is running.
  - System subtype—Identifies a virtual machine host or guest.
  - Hardware description—Details of the physical system on which the software is running.
  - OS name—The operating system used.
  - OS for tool filtering—The type of operating system being used for filtering.
  - OS description—The level of operating system being used.
  - OS version—The version of the operating system.
  - Management protocols—States the protocols being used for tool filtering.
- Virtual machine configuration details
  - Virtual machine host—The system name of the virtual machine host.
  - Virtualization—The virtualization technology installed on the virtual machine host.
  - Configuration file—The name and location of the configuration file.
  - Configuration folder—The name and location of the configuration folder.
  - Memory—The memory on the virtual machine host.
  - Virtual disk—The type of virtual disk.
  - CD/DVD RM—Details about the drive.
  - Floppy drive—Identity of the floppy drive.
  - Network card—Details about the network card.
  - Total file size—The total file size of the virtual machine host.
- Virtual machine disk details

Completed events involving the selected host or guest can be displayed by clicking the **Events** tab. For more information, refer to the "Viewing virtual machine events" section in this guide.

Using the Virtual Machine Management Pack tools and controls

Various tasks can be performed using the Virtual Machine Management Pack controls, available from the HP SIM host or virtual machine System page, as described in the following sections. You must have administrative rights to perform Virtual Machine Management Pack tasks.

The following Virtual Machine Management Pack tasks appear on the HP SIM host or guest System page. By using these tasks, licensed virtual machine guests can be started, resumed, shut down, stopped, paused, reset, and restarted.

Icons	Function
▶	Start/resume
■	Shutdown/stop
❚❚	Pause
↻	Reset/restart

In addition, the following tasks can be initiated from the HP SIM toolbar:

- Copying a virtual machine guest
- Moving a virtual machine guest
- Creating a virtual machine guest template
- Deploying a virtual machine guest template
- Creating a virtual machine guest backup
- Restoring a virtual machine guest backup
- Recovering virtual machines of a failed host
- Setting alternate virtual machine hosts
- Launching the remote console
- Restarting VMM agent
- Setting the performance threshold
- Registering a virtual machine host
- Unregistering a virtual machine host

Starting or resuming a virtual machine guest

📝 **NOTE:** A virtual machine guest can only be started or resumed if it is currently stopped, shut down, or paused.

1. Click the virtual machine or virtual machine guest to go to the HP SIM Systems page.
2. Click the **Start/Resume** icon (▶).
3. Verify the target system and click **OK** when prompted.

If the virtual machine guest is currently stopped or paused, the guest is started or resumed. If the virtual machine guest is currently suspended to disk (only possible with Microsoft Virtual Server 2005), selecting **Resume Virtual Machine Guest** restores the virtual machine guest to the previous state and powers on the virtual machine guest.

When the power-on process is complete, the status is updated to Normal (●). The Start icon is disabled, and the Shutdown/Stop, Pause, and Reset icons are enabled.

If a virtual machine guest becomes stuck during the start process, the Virtual Machine Management Pack displays "User Interaction" and the status is updated to Major (▼).

Shutting down or stopping a virtual machine guest

📝 **NOTE:** A virtual machine guest can only be shut down if it is currently powered on and either the Microsoft Virtual Server Additions or the VMware Tools are installed on the virtual machine guest.

1. Click the virtual machine or the virtual machine guest to go to the HP SIM System Page.
2. Click the **Shutdown/Stop icon** (■).
3. Verify the target system and click **OK** when prompted.
4. Select **Stop VM** or **Shut down VM** when prompted. Selecting **Stop VM** powers off the virtual machine guest immediately without saving the current state. Selecting **Shut down VM** shuts down the virtual machine operating system and then powers off the virtual machine guest.

⚠️ **CAUTION:** Unsaved data is lost if you select **Stop VM.**

The virtual machine status is updated to Disabled (▨). The Stop, Pause, and Reset icons are disabled, and the Start icon is enabled.

Pausing a virtual machine guest

📝 **NOTE:** A virtual machine guest can only be paused if it is currently powered on and running.

1. Click the virtual machine or the virtual machine guest to go to the HP SIM systems page.
2. Click the **Pause** icon (▮▮).
3. Verify the target system and click **OK** when prompted.

For Microsoft Virtual Server 2005 virtual machine guests, select **Suspend to disk** or **Pause VM** when prompted. Selecting **Suspend to disk** saves the current state and releases the virtual machine host memory used by the virtual machine. Selecting **Pause VM** suspends the virtual machine execution but retains the virtual machine state in the virtual machine host memory.

The virtual machine status is updated to Disabled (▨). The Stop, Pause, and Reset icons are disabled, and the Start icon is enabled.

Resetting or restarting a virtual machine guest

1. Click the virtual machine or the virtual machine guest to go to the HP SIM systems page.
2. Click the **Reset/Restart** icon (⟳).
3. Verify the target system and click **OK** when prompted.

Selecting **Reset** powers off and then powers on the virtual machine guest. Selecting **Restart** shuts down the virtual machine operating system and then powers off and powers on the virtual machine guest.

⚠️ **CAUTION:** Unsaved data is lost if you select **Reset.**

When the reset or restart is complete, the virtual machine status is updated to Normal (✓). The Start icon is disabled, and the Shutdown/Stop, Pause, and Reset icons are enabled.

Copying a virtual machine guest

IMPORTANT: A virtual machine guest must be stopped before copying. Only one virtual machine guest can be copied at a time.

Virtual machine guests can be copied from an existing virtual machine host to a new host when the same virtualization technology exists on both the source and target host servers. Moving a virtual machine guest to a virtual machine host with a different virtualization technology constitutes a V2V migration. To perform a V2V migration, refer to the "Virtual-to-virtual migrations" section in this guide.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine guest to be copied.
2. Select **Deploy>Virtual Machine>Copy Virtual Machine.**
3. Verify the target system, and click **Next.** Virtual machine source information is displayed.
4. Select the target virtual machine host from the list of authorized licensed hosts and click **Next.**
5. Review the resources of all available hosts, and select an appropriate target virtual machine host, and click **Next.**
6. Specify a name for the target virtual machine guest being copied or accept the default selection, and specify the target path for the virtual machine guest and the disk. The target folder must be empty.

IMPORTANT: Microsoft requires that each virtual machine guest have a unique virtual machine name. If virtual machine disks or configuration files already exist with the designated name, an error will occur and the copy operation will fail.

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files.

7. Click **Next.**
8. Confirm the displayed details of the copy operation, and click **Confirm.**

When the copy is complete, the new virtual machine guest is registered to the target virtual machine host. The virtual machine status guest status is Disabled ( ). Start the copied virtual machine guest using the Virtual Machine Management Pack, as necessary.

NOTE: The virtual network connections on the new virtual machine guest might have to be manually reconfigured, and the host name of the copied guest might have to be changed.

Moving a virtual machine guest

The following are move types for VMware ESX Server:

- Move – The virtual disk will be copied to the host. The virtual machine must be stopped for this move operation type.
- SAN Move – The virtual disk will not be copied to the target host. The Target Host will access the virtual disks using SAN connectivity. The virtual machine must be stopped for this move operation type.
- Live Move – The powered on virtual machine will be moved using VMware Vmotion Technology.

IMPORTANT: A Microsoft Virtual Server 2005 or VMware GSX Server virtual machine guest must be stopped before moving. Only one virtual machine guest can be moved at a time.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine guest to be moved.
2. Select **Deploy>Virtual Machine>Move Virtual Machine** from the HP SIM toolbar.
3. If the selected host is a VMware ESX Server host that is currently running, a Live Move for VMware ESX Server using VMware Vmotion Technology is performed. Verify the source machine and click **Next.**

IMPORTANT: To perform a Live Move, VMware VirtualCenter settings must be configured. Refer to the "Configuring VMware VirtualCenter" section.

4. If a VMware ESX Server virtual machine is stopped, SAN Move or Move is displayed in the Move Type column. If the target host is in a SAN, a SAN move is performed. If not, a regular move is performed. Select the target virtual machine from the list of authorized licensed hosts, and click **Next.**
5. Specify a name for the target virtual machine guest being moved or accept the default selection, and specify the target path for the virtual machine guest and the disk. The target folder must be empty.

IMPORTANT: Microsoft requires that each virtual machine guest have a unique virtual machine name. If virtual machine disks or configuration files already exist with the designated name, an error will occur and the move operation will fail.

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files.

6. Click **Next.**
7. Confirm the displayed details of the move operation, and click **Run Now.**

When the move is complete, the new virtual machine guest is registered to the target virtual machine host. The virtual machine guest status is Disabled ( ). Start the moved virtual machine guest using the Virtual Machine Management Pack, as necessary.

NOTE: The Virtual Machine Management Pack does not delete virtual machine guest files after a move.

NOTE: The virtual network connections on the moved virtual machine guest might have to be manually reconfigured.

Creating a virtual machine guest template

IMPORTANT: A virtual machine guest must be stopped before it can be used to create a template. You must have administrative rights to create a template.

A template is an image of a complete virtual machine guest, including the operating system, configuration, and all relevant virtual machine disk information needed to create and register a new virtual machine on a host with the same virtualization technology. Any existing virtual machine guest on a licensed host can be used to create a template.

NOTE: A template does not contain the serial number (UUID) and MAC address of the virtual machine guest used to create the template.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine guest from which to create a template.
2. Select **Deploy>Virtual Machine>Templates>Create Virtual Machine Template.**
3. Verify the target system and click **Next.**
4. Review the resources of the available hosts, select an appropriate target virtual machine host where the template will be stored, and click **Next.**

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files

5. Enter a name for the template or accept the default selection, and enter a description, if desired. Click **Next.** A list of licensed virtual machine hosts appears.
6. Select which disks you want to include in the template. The operating system and boot disks must be selected.
7. Specify the target path for the virtual machine template, and click **Next.** The target folder must be empty.
8. Click **Next.**
9. Confirm the displayed details of the operation, and click **Run Now.**

Deploying a virtual machine guest template

The Virtual Machine Management Pack enables you to deploy a previously created virtual machine template to create a new virtual machine guest. A virtual machine template is an image of a complete virtual machine operating system, configuration, and all relevant virtual disk information needed to create and register a new virtual machine on a virtual machine host with the same virtualization technology.

NOTE: A template does not contain the serial number (UUID) and MAC address of the virtual machine guest used to create the template.

1. On the HP SIM All Systems page, select the checkbox next to the virtual machine host on which the template to be deployed is located.
2. Select **Deploy>Virtual Machine>Templates>Deploy Virtual machine Template** from the HP SIM toolbar.
3. Verify the source virtual machine host, and click **Next.**
4. Select a template from the list of available templates and click **Next.**
5. Select the target virtual machine host where the template will be deployed, and click **Next.**
6. Select the target virtual machine host directory location, and then click **Next.** The target folder must be empty.
7. Specify the name of the virtual machine guest, memory size, and target file as necessary, and click **Next.**

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files.

8. Confirm the details and then click **Schedule** or **Run Now.**

Creating a virtual machine guest backup

IMPORTANT: If a backup is performed on a virtual machine guest that is currently running, the guest is suspended and then restarted after the backup is complete. Performing a backup requires administrative rights.

The Virtual Machine Management Pack enables you to perform an immediate backup of a virtual machine guest, schedule a single backup, or schedule a recurring backup on a daily or weekly basis.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine guest to backup.
2. Select **Deploy>Virtual Machine>Backups>Create Virtual Machine Backup** from the HP SIM toolbar.
3. Verify the target system, and click **Next.**
4. Verify the source virtual machine details, review the resources of the available virtual machine hosts, select the host to be used as the backup repository, and click **Next.**
5. Select the target repository, and click **Next.**

NOTE: The target repository must be on the same virtualization layer.

6. Specify where the backup files will be placed on the virtual machine host, and click **Next.**
   - For a VMware GSX Server or Microsoft Virtual Server 2005 virtual machine:
     - If the virtual machine is powered on, the guest is suspended for the duration of the backup and resumed after the backup is completed. By default, the backup data is compressed.
   - For VMware ESX Server virtual machine that is powered on, select to:
     - Perform the backup while the virtual machine is running. This is referred to as a hot backup. Disk changes during the backup operation are written to a log and applied when the backup completes.
     - Pause the virtual machine for the duration of the backup operation and resume processing when the backup completes. By default, the backup is compressed
7. Select to delete older backups or to retain the maximum number of backups.
8. Click **Next.**
9. Confirm the backup details, and click **Schedule** or **Run Now.**

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files.

NOTE: If there are other operations currently in progress, such as a copy, a backup is not performed immediately. The backup is automatically queued to run after any pending operations are complete.

NOTE: If a virtual machine host is unregistered or no longer managed by the Virtual Machine Management Pack, the backup information for the virtual machine guests associated with that host is permanently removed. The backup files, including disk files, are retained in the designated location and can be manually deleted, if necessary.

Restoring a virtual machine guest backup

The Virtual Machine Management Pack enables you to restore a virtual machine guest using a previously created backup.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine host where the backup is located.
2. Select **Deploy>Virtual Machine>Backups>Restore Virtual machine** from **Backup** from the HP SIM toolbar.
3. Verify the source virtual machine host, and click **Next.**
4. Select the backup image to be used to restore a virtual machine, and click **Next.**
5. Select the virtual machine host where the backup is to be deployed. From the list of authorized licensed hosts.
6. Select a location for the configuration file and virtual machine drives on the designated host, and click **Next.**
7. Verify the restore details, and click **Run Now** to restore the backup immediately.

IMPORTANT: Verify that adequate available disk space exists on the target virtual machine host to accommodate the total transport volume, consisting of several disks and configuration files.

If the virtual machine guest being restored already exists on the selected host, the existing virtual machine guest is stopped and unregistered. All files on the existing guest are overwritten with the backup files, and the guest is registered again.

To configure a virtual machine to be accessible from a different virtual machine host in case of failure.

Recovering virtual machines of a failed host

IMPORTANT: Before recovering virtual machines of failed hosts, the alternate virtual machine hosts must have been set. Refer to the "Setting alternate virtual machine hosts (VMware ESX Server only)" section for information.

Recover virtual machines of a failed host to move all enabled virtual machines from a specified failed host to their defined recovery servers.

1. In the HP SIM All Systems page, select the checkbox next to the failed VMware ESX Server virtual machine host.
2. Select **Deploy>Virtual Machine>recover virtual machines of Failed Hosts** from the HP SIM toolbar.
3. Click **Run Now.**

Setting alternate virtual machine hosts (VMware ESX Server only)

IMPORTANT: All virtual disks for the virtual machine must be stored on a SAN-based VMware file system.

IMPORTANT: The failover host must have access to the VMware file system where the virtual machine's virtual disks are stored.

Specifying an alternate virtual machine host for a virtual machine allows a recovery server to be specified for one or more virtual machines.

1. In the HP SIM All Systems page, select the checkbox next to the VMware ESX Server virtual machine.
2. Select **Configure>Virtualization Management>Set Alternate Virtual Machine Host** from the HP SIM toolbar.
3. Verify the source virtual machine and click **Next.**
4. Select the recovery hosts from the list of authorized licensed hosts, and click **Run Now.**

Launching the remote console

IMPORTANT: Microsoft Virtual Server 2005 remote console is only supported with Microsoft Internet Explorer browsers.

IMPORTANT: The VMware Management Interface must be installed on VMware GSX Server virtual machine hosts to launch the remote console.

IMPORTANT: If you are launching a remote console from a VMware host, the VMware Remote Console application must be installed on the system from which you are launching the remote console.

1. From the HP SIM All Systems page, click either the virtual machine host or the virtual machine guest to go to the HP SIM System page.
2. Click **Launch Remote Console.**

Restarting the VMM agent

It might become necessary to restart the VMM agent on the virtual machine host in various situations, including:

- The virtualization technology was installed on the host after the VMM agent was installed.
- The virtual machine guest information becomes inaccessible from the Virtual Machine Management Pack.

To restart the VMM agent:

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine host.
2. Select **Configure>Virtualization Management>Restart VMM agent** from the HP SIM toolbar.
3. Verify the virtual machine host, and click **Next.**

The status of the task can be monitored by viewing the Task Result screen.

Setting the performance threshold

Set the performance threshold for either virtual machine guest or virtual machine hosts to trigger an HP SIM event. If a designated threshold is reached, a major ( ) icon is displayed and an event is generated in HP SIM.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine guest or virtual machine host.
2. Select **Configure>Virtualization Management>Set Performance Threshold** from the HP SIM toolbar.
3. Verify the virtual machine guest or virtual machine host, and click **Next.**
4. Select to either set or remove the performance threshold. If set is selected, enter the appropriate values:
   - Processor utilization threshold (percent) is the percentage value defined for processor threshold.
   - Threshold evaluation interval (minutes) is the duration value defined to average the processor threshold.
5. Click **Run Now.**

Performance information

These sections list information displayed on the Performance tab of the System page for virtual machine hosts and guests. Use the performance information to determine virtual machine host capacity and virtual machine workload characteristics. Use the threshold function to create alerts and log messages based on user-selectable performance values.

Virtual machine host

After clicking a virtual machine host in the HP SIM console, click the **Performance** tab to display the performance information for the host. Activity for the most recent 1, 5, 15, 30, or 60 minutes can be displayed. If the amount of time requested exceeds the amount available, all available information is reported.

Virtual machine host performance

The following performance information is provided for VMware ESX Server, VMware GSX Server, and Microsoft Virtual Server 2005 hosts, except where noted.

- Processor utilization (*x* cpus)—The processor utilization on the host, including utilization by the virtual machines. The number of processor cores or threads on the virtual machine host is reported as *x* cpus.
- Virtual machine processor utilization—The processor consumption by all of the virtual machines on this host. Processor resources consumed by a virtual machine before powering off the virtual machine are not included.
- Reserved capacity (All running virtual machines)—The sum of the Reserved System Capacity values for all virtual machines currently powered on (Microsoft Virtual Server 2005 only).
- CPU min (All running virtual machines)—The sum of the CPU Min values for all virtual machines currently powered on divided by the resources available on the host (VMware ESX Server only).
- Memory utilization—The total amount of memory currently in use on the host. The utilization bar indicates the memory utilization as a percentage of the physical memory configured.
- Virtual machine memory—The total amount of memory currently in use by virtual machines executing on the host. Memory consumed by a virtual machine before powering off the virtual machine is not included. The utilization bar indicates the virtual machine memory as a percentage of the physical memory configured (Microsoft Virtual Server 2005 and VMware ESX Server).
- Network throughput—Network traffic transmitted and received on this host. Virtual machine network throughput is included for VMware ESX Server. The utilization bar is always filled completely.
- Network transmit throughput—Network traffic transmitted by this host. Virtual machine network transmission throughput is included for VMware ESX Server. The utilization bar represents the "transmission" percentage of the network throughput.
- Network receive throughput—Network traffic received by this host. Virtual machine network receive throughput is included for VMware ESX Server. The utilization bar represents the "receive" percentage of the network throughput.
- Storage throughput—Storage read and written by this host and all virtual machines on the host. This utilization bar is always completely filled.
- Storage read throughput—Storage read by this host and all virtual machines on the host. The utilization bar represents the read percentage of storage throughput.
- Storage write throughput—Storage written by this host and all virtual machines on the host. The utilization bar represents the write percentage of storage throughput.

Virtual machine performance

The value averages displayed in this section are relative to the duration of the virtual machine host activity. Resources consumed by a virtual machine before powering off the virtual machine are not included.

- CPU—The CPU percentage consumed by the virtual machine relative to the total processor capacity of the virtual machine host.
- vCPU—The CPU percentage consumed by the virtual machine relative to its resource allocation.
- Memory—Physical host memory consumed by the virtual machine (VMware ESX Server and Microsoft Virtual Server 2005).
- Network—Network throughput for the virtual machine. The utilization bar indicates the virtual machine network throughput as a percentage of the total network throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Storage—Storage throughput for the virtual machine. The utilization bar indicates the virtual machine storage throughout as a percentage of the total storage throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).

Threshold settings—A virtual machine host-specific threshold can be evaluated

- Threshold interval—The number of minutes of utilization data that must be available before the threshold is evaluated.
- Threshold value—The maximum utilization value that will provide a normal status.
- Measured interval—The number of minutes of utilization data averaged to calculate the measured value.
- Measured value—The average utilization over the most recent measured interval.
- State—The current state of this threshold. The state can be:
  - Unknown, indicating that the number of utilization samples available is less than the threshold interval.
  - Normal, indicating that sufficient utilization samples are available, and the measured value is less than or equal to the threshold value.
  - Exceeded, indicating that sufficient utilization samples are available, and the measured value is greater than the threshold value.

Virtual machine guest

After clicking a virtual machine guest in the HP SIM console, click the **Performance** tab to display performance information for the guest. Select the appropriate time frame at the top of the screen for which to display information.

Virtual machine performance

- Virtual processor utilization (vCPU)—The CPU percentage consumed by the virtual machine relative to the resource allocation. The "Host Processor Utilization on 1 CPU" value is reported for VMware GSX Server.
- Host processor utilization on x CPUs—The CPU percentage consumed by the virtual machine relative to the number of physical processors (x) on which the virtual machine can execute.
- Host processor utilization on all CPUs—The CPU consumed by this virtual machine, relative to the total virtual machine host processors.
- Memory utilization—The physical host memory used by this virtual machine. The utilization bar indicates the virtual machine memory utilization as a percentage of the physical memory configured on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Network throughput—The network traffic transmitted and received by this virtual machine. The utilization bar indicates the virtual machine network throughput as a percentage of the total network throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Network transmit throughput—The network traffic transmitted by this virtual machine. The utilization bar indicates the virtual machine Network Transmit Throughput as a percentage of the total network throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Network receive throughput—The network traffic received by this virtual machine. The utilization bar indicates the virtual machine network receive throughput as a percentage of the total network throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Storage throughput—The storage read and written by this virtual machine. The utilization bar indicates the virtual machine storage throughput as a percentage of the total storage throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).
- Storage read throughput—The storage read by this virtual machine. The utilization bar indicates the virtual machine storage read throughput as a percentage of the total storage throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).

- Storage write throughput—The storage written by this virtual machine. The utilization bar indicates the virtual machine storage write throughput as a percentage of the total storage throughput on the virtual machine host (VMware ESX Server and Microsoft Virtual Server 2005).

Resource allocation

The bars indicate the virtual machine allocation relative to the capacity available on the virtual machine host.
- VMware ESX Server virtual machines.
  - CPU min—The cpu.min value reported by VMware ESX Server.
  - CPU max—The cpu.max value reported by VMware ESX Server.
  - CPU shares—The cpu.shares value reported by VMware ESX Server.
- Microsoft Virtual Server 2005 virtual machine.
  - Reserved capacity—The reserved system capacity value reported by Microsoft Virtual Server 2005 relative to one CPU.
  - Maximum capacity—The maximum system capacity value reported by Microsoft Virtual Server 2005 relative to one CPU.
  - Relative weight—The relative weight value reported by Microsoft Virtual Server 2005.

Threshold settings—A virtual machine-specific threshold can be evaluated

- Threshold interval—The number of minutes of utilization data that must be available before the threshold is evaluated
- Threshold value—The maximum utilization value that will provide a normal status
- Measured interval—The number of minutes of utilization data that was averaged when calculating the measured value
- Measured value—The average utilization over the most recent measured interval minutes
- State—The current state of this threshold which can be:
  - Unknown, indicating that the number of utilization samples available is less than the threshold interval.
  - Normal, indicating that sufficient utilization samples are available and the measured value is less than or equal to the threshold value.
  - Exceeded, indicating that sufficient utilization samples are available and the measured value is greater than the threshold value.

Using the Server Migration Pack

📝 **IMPORTANT:** Virtual machine hosts involved in a migration using the Server Migration Pack must be licensed and managed by the Virtual Machine Management Pack. Physical machines involved in a P2V migration do not require a Virtual Machine Management Pack license.

📝 **NOTE:** When using advanced cloning functions for migration, such as skipping a partition or its contents, the Windows drive letters might need to be reassigned.

Physical-to-virtual migrations

A P2V migration allows a source physical machine to be migrated to a virtual machine guest within a Microsoft Virtual Server 2005 or VMware virtual machine host. P2V migration supports most IA-32 Windows servers.

Preparing for a P2V migration

The following sections list prerequisites for a P2V migration.

Source physical machine prerequisites

1. Complete any pending reboots and software installations on the source physical machine before initiating a P2V migration to prevent interrupting the migration process.
2. Temporarily disable any antivirus software auto-scans on the source physical machine to prevent interrupting the migration process. The antivirus software can be re-enabled after the migration.
3. Run chkdsk and disk defragmenter on the source physical machine before initiating a P2V migration operation to verify that the disks are not corrupted.
4. Verify that the source physical machine does not contain dynamic disks with spanned, striped, mirrored, RAID 5, or extended simple volumes. These disk types must be converted to a basic disk or a simple dynamic disk before performing the migration.
5. Verify that all the hard drives on the source physical machine are correctly initialized (disk signature written). If Microsoft Windows NT 4.0 is installed, verify initialization by selecting **Computer Management>Disk Administration.** If Windows 2000 or Windows 2003 is installed, verify initialization by selecting **Computer Management>Disk Management.** Verify that the latest hard drive configuration is saved.
6. Verify that all partitions on the source physical machine have a valid file system and are in a healthy state.
7. To ensure a successful migration and to prevent possible application corruption, disable all applications and background services on the source machine. After the migrated machine has synchronized with the new hardware and is assigned a unique network identity, appropriate applications can be manually re-enabled and configured for the new environment.
8. Temporarily disable HP Management Agents on the source physical machine.
9. Be sure that the source physical machine is a physical server running an English version of a Windows operating system. The source physical machine must not be a virtual machine host or virtual machine guest.
10. Be sure that the VMM agent is not installed on the source physical machine.
11. Verify that a Windows NT boot loader (ntldr) is installed.
12. During P2V migration, the SMP agent initiates an operating system reboot on the source physical machine. Verify that the operating system is on the first boot order. If not, manually change the boot order by editing the [system drive]\boot.ini file or by using the bootcfg.exe tool. The Server Migration Pack supports migration of source physical machines that have operating systems installed on the primary drive (Hard Disk0) and the primary drive loaded first in the boot order.
13. Record the drive letter or mount point to disk-partition mapping for dynamic disk partitions before performing the P2V migration. Any simple (non-extended) dynamic disk partitions are converted to basic disk partitions. The mapped drive letters might have to be manually reassigned after migration.
14. Be sure that the SMP agent is installed on the source physical machine.

HP SIM CMS prerequisites

1. Verify that Microsoft iSCSI Initiator 2.0, required for primary mass storage driver injection, is installed and running on the HP SIM CMS. If iSCSI Initiator is not installed, download and install it from http://www.microsoft.com.
2. Valid Server Migration Pack license keys are required on the HP SIM CMS. Verify adequate licenses exist by selecting **Deploy>License Manager>Manage Keys.**
3. Verify that no virtualization software is installed on the HP SIM CMS.
4. The Server Migration Pack requires operating system-specific device drivers for migrating Windows-based machines between Microsoft Virtual Server 2005 and VMware virtual infrastructure. Select **Options>Virtual Management>Upload Drivers,** and ensure that all the necessary device drivers have been loaded onto the HP SIM CMS. If additional files are necessary, load these files from your original Windows or VMware media.

NOTE: Migration of the Windows XP operating system to a VMware platform requires vmscsi.sys drivers to be installed from VMware media.

5. Temporarily disable any antivirus software auto-scans on the HP SIM CMS to prevent interrupting the migration process. The antivirus software can be re-enabled after the migration.
6. Disable all the Windows network drive mappings to the source physical machine in the HP SIM CMS.
7. Ensure that the HP SIM CMS Windows operating systems version is greater than or equal to the source physical machine Windows operating system version.
8. The target virtual machine host requires a valid Virtual Machine Management Pack license and must be managed by the Virtual Machine Management Pack.

Target virtual machine host prerequisites

1. Verify that the target virtual machine host has sufficient system resources, including CPU, memory, and disk space to host the migrated virtual machine guest.
2. Temporarily disable any antivirus software auto-scans on the target virtual machine host to prevent interrupting the migration process. The antivirus software can be re-enabled after the migration.

Performing a P2V migration

1. In the HP SIM All Systems page, select the checkbox next to the physical machine on which the SMP agent is installed.
2. Select **Deploy>Virtual Machine>P2V** from the HP SIM toolbar.
3. Verify the source physical machine, and click **Next.**
4. Select the target virtual machine host from list of authorized, licensed virtual machine hosts.
5. Select the physical disk partitions to be migrated to the virtual machine host.
6. Enter the unique virtual machine name and memory location for the target virtual machine guest.

NOTE: The default target virtual disk size is the minimum size.

7. Confirm the details of the migration task, and click **Run Now** to execute the migration immediately.

The migrated virtual machine guest is automatically registered to the target virtual machine host and is accessible from the Virtual Machine Management Pack.

Post-migration tasks

Network configuration might have to be performed on the migrated virtual machine guest after completing a P2V migration. If so, complete the following procedures.

1. Access the target virtual machine host remote console to configure the network connections for the migrated virtual machine guest.

   For Microsoft Virtual Server 2005:

   a. Select the migrated virtual machine guest from the Microsoft Virtual Server 2005 Management Interface, and select **Edit Configuration>Network Adapters.**

   b. Attach a virtual network adapter, and click **OK.**

   For VMware ESX Server:

   a. Select the migrated virtual machine guest from the VMware ESX Server Management Interface, and click **Configure Hardware.**

   b. Click the **Add Device** link, attach the virtual network adapter, and click **OK.**

   For VMware GSX Server:

   a. Select the migrated virtual machine guest from the VMware GSX Server Management Interface, and click **Edit VM Settings.**

   b. Click the **Hardware** tab, and click **Network.**

   c. Attach the virtual network adapter, and click **OK.**

2. Power on the migrated virtual machine guest.

3. Modify the system host name.

4. Set the IP address for a static IP address configuration.

5. If applicable, reassign drive letters of dynamic disk partitions using the disk manager to correspond with the original state. The virtual machine guest automatically detects new hardware and installs the required drivers.

6. When prompted to reboot, click **Yes** to restart the virtual machine guest.

   IMPORTANT: The mouse and keyboard might not be immediately active on the migrated virtual machine guest. Wait until all required drivers are automatically installed by the guest operating system and reboot the migrated virtual machine guest when prompted.

Virtual-to-virtual migrations

A V2V migration enables migration of a Windows virtual machine guest between virtualization layers, including Microsoft Virtual Server 2005, VMware ESX Server, and VMware GSX Server. V2V migrations do not unregister or remove the virtual machine guest from the source virtual machine host.

Preparing for a V2V migration

The following sections list prerequisites for a V2V migration.

Source virtual machine prerequisites

1. Verify that the source virtual machine host is licensed and managed by the Virtual Machine Management Pack.

2. Verify that the VMM agent is installed on the source virtual machine. For information about installing the VMM agent, refer to the "Deploying the VMM agent" section in this guide.

3. Verify that the source virtual machine guest is powered down or suspended. The source virtual machine guest can be powered down or suspended using the Virtual Machine Management Pack.

4. The Server Migration Pack will not move, copy, or migrate virtual machine guests with the following disk types. Verify these disk types do not exist on the source virtual machine.

Table 6 Unsupported disk types

Disk type	Virtualization product
Linked disk	Microsoft Virtual Server 2005
Differencing disk	
Physical (RAW) disk	VMware ESX Server
	VMware GSX Server

5. Manually preconfigure a source virtual machine with boot loaders or managers other than the Windows NT boot loader.
6. Record the drive letters or mount points of all partitions in the source virtual machine guest. Any simple (non-extended) dynamic disk partitions are converted to basic disk partitions. The mapped drive letters might have to be manually re-assigned after migration.
7. Verify that all partitions of the source virtual machine guest have a valid file system and are in a healthy state.
8. Migrating a VMware GSX Server virtual machine guest with an IDE disk type to a VMware ESX Server virtual machine host requires VMware tools to be installed on the source virtual machine host. To install VMware tools, refer to the "Installing VMware tools" section in this guide.

HP SIM CMS prerequisites

1. Verify that the Microsoft iSCSI initiator 2.0, required for primary mass storage driver injection, is installed and running on the HP SIM CMS. If the iSCSI initiator is not installed, download and install it from http://www.microsoft.com.
2. Temporarily disable any antivirus software auto-scans on the HP SIM CMS to prevent interrupting the migration process. The antivirus software can be re-enabled after the migration.
3. Verify that no virtualization software is installed on the HP SIM CMS.
4. Valid Server Migration Pack migration license keys are required on the HP SIM CMS. Verify adequate licenses exist by selecting **Deploy>License Manager>Manage Keys.**
5. The Server Migration Pack requires operating system-specific device drivers for migrating Windows-based machines between Microsoft Virtual Server 2005 and VMware virtual infrastructure. Select **Options> Virtual Management>Upload Drivers,** and ensure that all the necessary device drivers have been loaded onto the HP SIM CMS. If additional files are necessary, load these files from your original Windows or VMware media.

Target virtual machine host prerequisites

Verify that the target virtual machine host has sufficient system resources, including CPU, memory, disk space, and network bandwidth to host the migrated virtual machine guest.

Performing V2V migrations

⚠ CAUTION: Virtual disk data is not retained during a V2V migration. HP recommends backing up virtual disk files before performing a V2V migration.

📝 IMPORTANT: The source virtual machine must be stopped.

1. In the HP SIM All Systems page, select the checkbox next to the virtual machine to be migrated.
2. Select **Deploy>Virtual Machine>V2V** from the HP SIM toolbar.
3. Verify the source virtual machine, and click **Next.**
4. Confirm the guest operating system for driver injection during conversion. Select a target virtual machine hosts from the lists of authorized licensed systems, and click **Next.**
5. Enter a unique virtual machine name, and enter the appropriate location for the target virtual machine. For VMware ESX Server, select the destination volume, and click **Next.**

📝 IMPORTANT: A warning message appears if the specified virtual machine guest name already exists on the selected virtual machine host.

📝 IMPORTANT: An error message appears if there is not adequate free disk space to contain the virtual machine guest files.

📝 IMPORTANT: The target virtual machine name cannot contain any special characters. Valid characters include a–z, A–Z, 0–9, underscores (_), dashes (-), and spaces.

6. Confirm the details of the migration task, and click **Run Now** to execute the migration immediately.

📝 IMPORTANT: In the event of a failed migration, the migrated disks must be manually deleted.

The migrated virtual machine guest is automatically registered to the target virtual machine host and is accessible from the Virtual Machine Management Pack.

Post-migration tasks

Perform the following tasks on the migrated virtual machine guest after completing a V2V migration.

1. Access the target virtual machine host remote console to configure the network connections for the migrated virtual machine guest.
   For Microsoft Virtual Server 2005:
   a. Select the migrated virtual machine guest from the Microsoft Virtual Server Management Interface, and select **Edit Configuration>Network Adapters.**
   b. Attach a virtual network adapter, and click **OK.**
   For VMware ESX Server:
   a. Select the migrated virtual machine guest from the VMware ESX Server Management Interface, and click **Configure Hardware.**
   b. Click the **Add Device** link, attach the virtual network adapter, and click **OK.**
   For VMware GSX Server:
   a. Select the migrated virtual machine guest from the VMware GSX Server Management Interface, and click **Edit VM Settings.**
   b. Click the **Hardware** tab, and click **Network.**
   c. Attach the virtual network adapter and click **OK.**
2. Power on the migrated virtual machine guest.
3. Modify the system host name.
4. Set the IP address for a static IP address configuration.
5. When prompted for reboot, click **Yes** to restart the virtual machine guest.

📝 IMPORTANT: The mouse and keyboard might not be immediately active on the migrated virtual machine guest. Wait until all required drivers are automatically installed by the guest operating system and reboot the migrated virtual machine guest when prompted.

Virtual-to-physical migrations

A V2P migration enables migration of a virtual machine guest to a physical server.

Prerequisites for V2P migrations

The following sections list prerequisites for a V2P migration.

Source virtual machine host prerequisites

1. Verify that source virtual machine host is licensed and managed by the Virtual Machine Management Pack.
2. Verify that the source virtual machine guest is powered down or suspended. The source virtual machine guest can be powered down or suspended using the Virtual Machine Management Pack VM controls.
3. Because the Server Migration Pack will not move, copy, or migrate virtual machine guests with the following disk types, verify these disk types do not exist on the source virtual machine.

Table 7 Unsupported disk types

Disk type	Virtualization product
Linked disk	Microsoft Virtual Server 2005
Differencing disk	
Physical (RAW) disk	VMware ESX Server
	VMware GSX Server

4. Record the drive letters or mount points of all partitions in the source virtual machine guest. Any simple (non-extended) dynamic disk partitions are converted to basic disk partitions. The mapped drive letters might have to be manually re-assigned after migration.
5. Verify that all partitions of the source virtual machine guest have a valid file system and are in a healthy state.

HP SIM CMS prerequisites

1. The Server Migration Pack requires operating system-specific device drivers for migrating Windows-based machines between Microsoft Virtual Server 2005 and VMware virtual infrastructure. Select **Options>Virtual Management>Upload Drivers,** and ensure that all the necessary device drivers have been loaded onto the HP SIM CMS. If additional files are necessary, load these files from your original Windows or VMware media.
2. Temporarily disable any antivirus software auto-scans on the HP SIM CMS to prevent interrupting the migration process. The antivirus software can be re-enabled after the migration.
3. Valid Server Migration Pack migration license keys are required on the HP SIM CMS. Verify adequate licenses exist by selecting **Deploy>License Manager>Manage Keys.**

Target physical machine prerequisites

1. Insert the Server Migration Pack Boot CD into the CD-ROM drive of the target physical machine, and boot the system from the CD.
2. Read the license agreement. If you agree to the terms of the license agreement, click **Agree** to continue. The server details are detected and displayed.
3. Click **Launch Setup** to configure the hardware. The Setup Hardware Configuration Wizard page appears. This page provides information about the boot controller and the boot controller disk size.
4. If necessary, click **Array Configuration Utility** to configure an array controller, or click **Reboot to ORCA** and press the **F8** key when prompted to access the Option ROM Configuration for Arrays utility. Otherwise, click **Next** to proceed. The Setup Wizard Physical Server IP Address page appears.
5. If you plan to use the IP address displayed, click **Next** to proceed. To use a different IP address, click **Set a New IP Address.** Complete the appropriate fields to assign a new IP address, and click **Next** to proceed.
6. When the SMP agent has been activated, the IP address appears. Record the IP address for reference when performing the V2P migration process.

Performing V2P migrations

1. In the HP SIM All Systems page, select the checkbox next to a stopped virtual machine from the HP SIM console.
2. Select **Deploy>Virtual Machine>V2P** from the HP SIM toolbar.
3. Verify the source virtual machine, and click **Next.**
4. Confirm the guest operating system, enter the physical machine IP address, and click **Next.**
5. Confirm the details of the migration task, and click **Run Now** to execute the migration immediately.

Post-migration tasks

Perform the following tasks on the physical machine after completing a V2P migration.

1. Remove the Server Migration Pack Boot CD from the CD-ROM drive of the physical machine, and reboot the system.
2. At the boot options menu, do not change the default selection, HP SIM WIN Conversion ProLiant Windows.
3. At each of the Welcome to the Found New Hardware wizard screens, click **Cancel.**
4. When prompted to reboot the system at the System Settings Change window, click **No.**
5. Install the latest HP ProLiant Support Pack, which includes ProLiant optimized drivers, utilities, and management agents.

NOTE: To successfully install the ProLiant Support Pack, SNMP service must be installed. To install SNMP service, refer to your operating system documentation.

Install the ProLiant Support Pack either from the SmartStart CD included with your server or by accessing **http://h18000.www1.hp.com/products/servers/management/psp/index.html** and clicking **Download.**

Viewing virtual machine events

To view all events related to the Virtual Machine Management Pack and Server Migration Pack, expand the
Events>Shared directory in the left pane of the HP SIM console. Expand either the **All Virtual Machine Management Events** or **All Server Migration Events.**
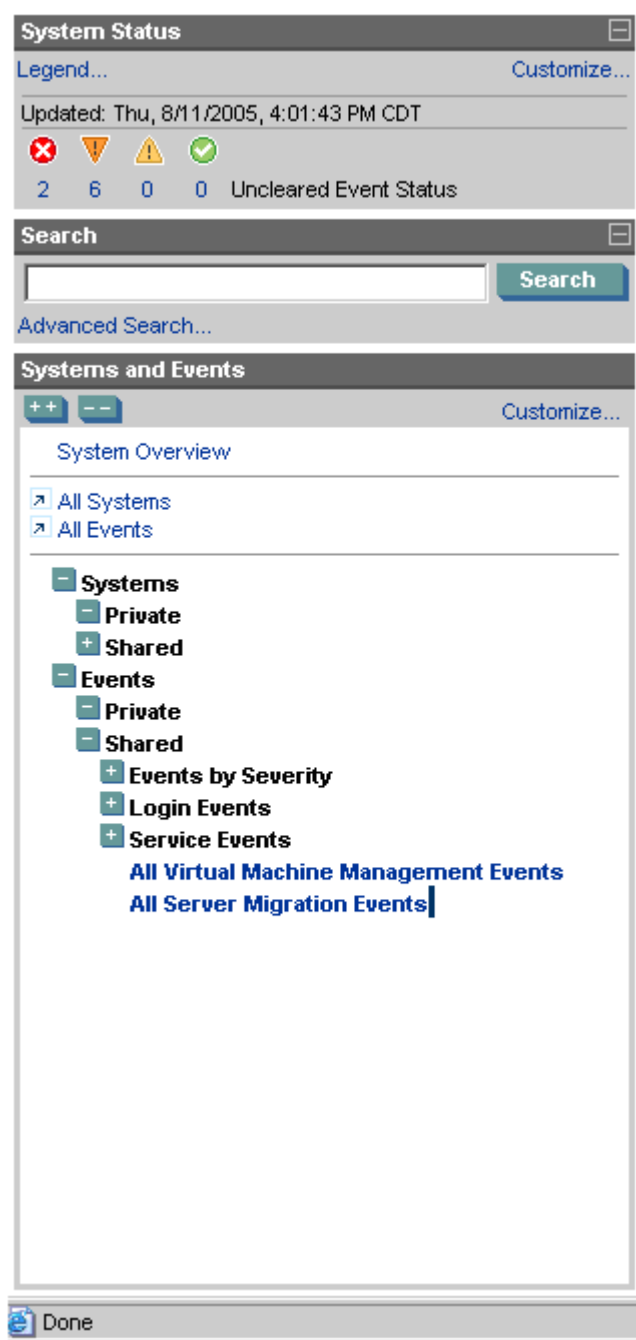
Event can be viewed for a particular virtual machine host or guest by clicking the host or guest in the HP SIM console,
and clicking the **Events** tab. Click the **Event Type** entry to view details about a specific event. To view all completed
HP SIM events, click **Tasks & Logs>View Task Results** from the HP SIM toolbar. To view all HP SIM scheduled tasks,
select **Tasks & Logs>View All Scheduled Tasks.**

Troubleshooting

This section identifies and provides solutions for commonly encountered issues, as well as answers to frequently asked questions. The following topics are included:

- Installation
  - Virtualization Management Software cannot be installed on a virtual machine
  - In an environment using multiple HP SIM CMSs, Virtual Machine Management Pack can only be installed on one CMS
  - "Systems Insight Manager or database service is not started properly. Installation fails to proceed. Uninstall manually when HP SIM and Database services are running properly"
  - Uninstalling Virtual Machine Management Pack and Server Migration Pack
  - Some menus are not displayed in the tool bars.
  - Uninstalling using the Virtual Machine Management Pack uninstaller shortcut menu
  - Uninstalling using Add or Remove Program
  - Uninstalling with HP SIM
  - Uninstalling the Virtual Machine Management Agent
  - Installation/uninstallation seems stuck after a warning message
- Configuration
  - Virtual Machine Management Pack/Server Migration Pack menu items are not removed from the HP SIM toolbar with Virtual Machine Management Pack/Server Migration Pack uninstallation
  - Virtual Machine Management Pack might not detect virtual machines located on mapped network drives
  - Configuring Virtual Machine Management Pack and Server Migration Pack with a firewall
  - Microsoft DNS server might not map the host name to DHCP generated IP addresses
- VMM/SMP agent
  - The VMM agent installation fails
  - VMM agent registration fails on VMware ESX Server virtual machine host
  - VMM agent registration fails on virtual machine host configured with multiple IP addresses
  - The VMM agent registration must be re-registered if the IP address or name of the virtual machine host is changed
- The Virtual Machine Management Pack
  - Virtual machine host and guests do not appear in Virtual Machine Management Pack
  - The Virtual Machine Management Pack does not display the system name, system IP address, and operating system
  - Critical status is displayed for a virtual machine host in the Virtual Machine Management Pack
  - A blank page appears when launching the Virtual Machine Management Pack from HP SIM
  - Virtual machine status is not updated
  - Virtual machine guest information becomes inaccessible from Virtual Machine Management Pack
  - A virtual machine host appears in Virtual Machine Management Pack multiple times
  - The Virtual Machine Management Pack displays "No Virtualization Layer Available for this Host"
  - VMM host does not use demo key
- Virtual Machine Management Pack functions
  - Using a virtual machine host not managed by the Virtual Machine Management Pack as a template/backup repository
  - "HTTP Error: 500 Internal Server Error" appears during a Virtual Machine Management Pack move or copy operation
  - The Virtual Machine Management Pack cannot move virtual machines with certain disk types
  - Virtual machine files are not deleted after a move
  - Virtual machine devices might not be available after a copy or move
  - A shutdown or restart operation fails or does not complete
  - Launching the remote console from the Virtual Machine Management Pack might fail
- P2V, V2V migration wizard
  - Blank page displays when launching from HP SIM

- V2V migration wizard is blank
- "Communication has been lost with the SMP Service" message displays
- P2V migration wizard displays "N/A" in System Name, Operating System, and Model columns
- Server is not displayed on the P2V wizard Select source physical machine screen
- Virtual machine guest is not displayed on the V2V Select Source VM screen
- P2V, V2V, and V2P migration functions
  - P2V migration does not start after confirmation. Event log continuously displays "Operation Migration waiting for connection to source"
  - "Unable to connect to the source physical server" error message displays in P2V migration wizard
  - Queued migrations fail
  - Chkdsk fails to check an NTFS volume in a migrated virtual machine guest when using Windows NT 4.0 operating system
  - Drive letters are not the same in the migrated virtual machine guest after migration
  - The Server Migration Pack cannot perform V2V migration on virtual machine guests with certain disk types
- HP SIM console integration
  - The HP SIM console does not identify a server as a virtual machine host
  - The HP SIM console does not discover a virtual machine host or guest
  - The HP SIM console identifies a virtual machine guest as an Unknown or Unmanaged device
  - Linux virtual machine guest association is not displayed in the HP SIM console
- Additional resources

Installation

Virtualization Management Software cannot be installed on a virtual machine

Virtualization is a technique that is frequently used to consolidate several separate servers with low utilization into separately booted partitions with the goal of achieving higher utilization of the whole. HP SIM has significant CPU, memory, storage, and network requirements. The addition of the Virtual Machine Management Pack increases the system requirements and resource utilization. Installing and running the Virtual Machine Management Pack on virtual machines is not supported because workload and traffic on other virtual machines can prevent Virtual Machine Management Pack from functioning properly. Other partitions could also be prevented from meeting performance or response requirements.

In an environment using multiple HP SIM CMSs, Virtualization Management Software can only be installed on one CMS

HP SIM manages devices by polling them periodically, receiving traps, and dynamically connecting to run tasks, such as software updates or scripts. A device can be polled by one or more instances of HP SIM. Virtual Machine Management Pack requires a more persistent connection be maintained with the virtual machine host and the virtual machine guests. Multiple instances of the Virtual Machine Management Pack cannot be used to control the same set of hosts and guests. HP SIM and the Virtual Machine Management Pack are multi-user capable, so multiple instances are not required to provide concurrent access to the HP SIM and the Virtual Machine Management Pack.

"Systems Insight Manager or database service is not started properly. Installation fails to proceed. Uninstall manually when HP SIM and Database services are running properly"

HP Virtualization Management Software installation and uninstallation require HP SIM and database service to be running. To fix the problem

1. Click **Start>Control Panel>Administrative Tools>Services.**
2. Be sure the HP SIM service has been started.
3. Select the Database system. Be sure the Database service is started.
4. Open Internet Explorer and enter `http://CMS name or IP:280`. Be sure that the HP SIM console displays.
5. Use any uninstallation method. Refer to "Uninstalling Virtualization Management Software" troubleshooting to uninstall HP Virtualization Management Software.

Some menus are not displayed in the toolbars

After installation, all the menus related to Virtual Machine Management Pack and Server Migration Pack are not displayed in the toolbar. To fix the problem:

1. Open the HPVS.log file under the installation drive. Check if you have a message like "Fail to add…" or before to the message "Complete SIM integration task."
2. If so, go to [HPVS installation path]\bin and run SIMtask.bat under the command prompt.
3. If the installer does not detect a previous version of VMM installed, post VMM upgrade menu will not be displayed.
4. Some menus have a required filter. Verify that the menu exists by running mxtool from a command prompt.

Uninstalling Virtualization Management Software

The Virtualization Management Software is automatically uninstalled if HP SIM is uninstalled. To manually uninstall the Virtualization Management Software, use any of the following methods.

To successfully uninstall Virtualization Management Software, refer to the following guidelines:

*   Close all Virtual Machine Management Pack and Server Migration Pack screens before attempting uninstallation.
*   HP SIM and Microsoft SQL Server must be running to successfully uninstall the Virtual Machine Management Pack and Server Migration Pack.

Uninstalling using the Virtual Machine Management Pack uninstaller shortcut menu

1. Select **Start>Programs>HP ProLiant Essentials Virtualization Management Software>Uninstall Virtualization Management Software.**
2. Click **Yes** when prompted to confirm the uninstallation.

Uninstalling using Add or Remove Programs

1. From the Control Panel, select **Add or Remove Programs.**
2. Select **HP Virtualization Management Software(remove only).**
3. Click **Yes** when prompted to confirm the uninstallation.

Uninstalling with HP SIM

1. Select **Start>Programs>HP Systems Insight Manager>Uninstall Systems Insight Manager.**
2. Click **Yes** when prompted to confirm the uninstallation.

📝 **NOTE:** The HPVS.log under the installation drive captures detailed information about the uninstallation status.

Uninstalling the VMM agent

To uninstall the VMM agent from the Windows virtual machine hosts:

1. From the control panel, select **Add or Remove Programs.**
2. Select **HP VMM Agent (remove only)>Change/Remove.**
3. Click **Yes** when prompted to confirm the uninstallation.

To uninstall the VMM agent from the VMware ESX Server virtual machine hosts, run the following command at the command prompt:

```
rpm –e hpvmmagent
```

Installation/uninstallation seems stuck after a warning message

The first step of installation/uninstallation validates that the HP SIM and database services are running properly. You can check the log file "portinfo.log" under the installation drive for installation and "portinfo.log" under the [VMM installation path]\log\portinfo.log for uninstallation. If port number "50001" has been present in these files, then installation and uninstallation are ready. Otherwise installation/uninstallation waits for a considerable amount of time, and then fails.

Configuration

Virtual Machine Management Pack/Server Migration Pack menu items are not removed from the HP SIM toolbar with Virtual Machine Management Pack/Server Migration Pack uninstallation

📝 **IMPORTANT:** Be sure you can open HP SIM page by entering `http://CMS name:280` in Internet Explorer.

To remove the menu items manually, run the following command from the command prompt at the HP SIM CMS:

```
mxtool -r –t "VMM menu item"
```

where *VMM menu item* is the Virtual Machine Management Pack or Server Migration Pack menu item displayed in the HP SIM toolbar.

The Virtual Machine Management Pack might not detect virtual machines located on mapped network drives

The Virtual Machine Management Pack cannot locate virtual machines stored on mapped network drives if the service does not have access to the network shares.

Configuring the Virtual Machine Management Pack and Server Migration Pack with a firewall

When managing virtual machine hosts behind a firewall, the firewall must be configured to allow Virtual Machine Management Pack and Server Migration Pack traffic through the firewall. The following ports are used:

- Communication between browsers and the VMM/SMP Web Service uses HTTPS over port 50010.
- Communication between the Web Service and the VMM Service/SMP application (both on the HP SIM CMS) uses SSL over port 1124.
- Communication between the VMM Service/SMP application and VMM agent (on virtual machine hosts) uses SSL over ports 1125 and 1126.
- Communication between the SMP application on CMS and SMP agent (on source physical machine) uses SSL over ports 1125 and 1126.
- Communication between the VMM/SMP agents during a move, copy, or V2V migration operation uses SSL over port 1126.
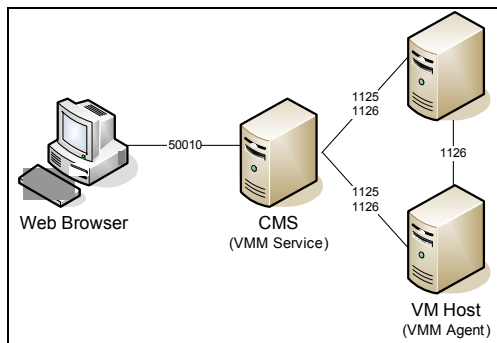
Microsoft DNS Server might not map the host name to DHCP-generated IP addresses

If DHCP is used on the VMware ESX Server host, the Microsoft DNS server might not map the host name to DHCP-generated IP addresses. HP recommends creating static IP address.

VMM/SMP agent

VMM agent installation fails

The VMM agent installation might fail:

- If there is not enough available disk space on the target host server. The VMM agent requires 100 MB of available disk space on the virtual machine host server to successfully install.
- With the `MxAuthentication Failed` message. From the DOS prompt on the HP SIM CMS:

    a. Enter:

    ```
    mxagentconfigure -r -n <Host IP address>
    ```

    b. Enter:

    ```
    mxagentconfig –a -n <hostname> -u <username> -p <password>
    ```

    c. Enter the host name, user name, and password when prompted.
    d. Click **Connect** to verify a successful connection.

VMM agent registration fails on virtual machine host configured with multiple IP addresses

Virtual Machine Management Pack always uses the primary IP address of the virtual machine host to communicate between the CMS and the virtual machine hosts.

If the virtual machine host has more than one IP addresses configured and the primary IP address cannot be reached by the CMS, Virtual Machine Management Pack cannot register and manage the virtual machine host. Refer to the following example:

Virtual machine host "VMHost1" has two IP addresses with the following configuration order:

```
1. 192.168.1.1 (Primary)
2. 172.16.101.30 (Secondary)
```

The CMS has IP address:

```
172.16.101.29
```

The CMS can ping only the secondary network configuration of the virtual machine host. If you attempt to register the virtual machine host from the HP SIM console toolbar or by using the following command:

```
cd /D [VMM installation location]\bin
vmcli -registerAgent vmm://172.16.101.30
```

The following error occurs:

```
Agent registration failed – 170.16.101.30

java.rmi.connect Exception: Connection refused to host: 192.168.1.1;
nested exception is: java.net.connect Exception: Connection time out:
Connect".
```

A connection time-out occurs because the VMM agent registration is attempting to bind itself to the primary IP address of the virtual machine host, which in this case is 192.168.1.1. This IP address cannot be reached by the CMS.

To resolve this issue, re-order the network connections in the virtual machine host and verify that the virtual machine host primary IP address can be pinged from the CMS. Restart the VMM agent service on the virtual machine host and attempt the virtual machine host registration again.

IMPORTANT: If DHCP is used on the VMware ESX Server host, the Microsoft DNS server might not map the host name to DHCP-generated IP addresses. HP recommends creating static IP address.

The virtual machine host must be re-registered if the IP address or name of the virtual machine host is changed

To unregister and re-register the virtual machine host from the HP SIM toolbar menu:

⚠ **CAUTION:** Unregistering a virtual machine host permanently removes all information from the Virtual Machine Management Pack database pertaining to the virtual machine guests located on this host, including backup information.

1. Select **Configure>Virtual Machine Host Registration>Unregister VM Host.**
2. Select the target virtual machine host to unregister by selecting the checkbox next to the system.
3. Click **Apply.**
4. Verify that the correct target host appears in the list, and click **Add Targets** to add targets, or click **Remove Targets** to remove targets and then click **Next.**
5. If it is necessary to reselect the target host, click **Next.**
6. Click **Run Now** to unregister the host immediately.
7. After the host has been unregistered, select **Configure>Virtual Machine Host Registration>Register VM Host.**
8. Repeat steps 2 through 5 to register the host again.

To unregister and re-register the virtual machine host from the command prompt:

1. Enter:

```
cd /D [VMM installation location]\bin
vmcli -unregisterAgent vmm://IP_address
```

where *IP_address* is the IP address of the previous virtual machine host.

2. Enter:

```
cd /D [VMM installation location]\bin
vmcli -registerAgent vmm://IP_address
```

where *IP_address* is the IP address of the new virtual machine host.

SMP agent deployment fails during a P2V migration

The Server Migration Pack Agent might fail during P2V migration because of the following:

- Incorrect user name/password—Verify that you have provided valid credentials with administrative rights for the source physical machine for the SMP agent deployment.
- System type is not supported—Verify that the source physical machine is supported for P2V migration. For more information on supported configurations, refer to the *HP ProLiant Essentials Virtualization Management Software Support Matrix.*

📝 **NOTE:** The CMS server is not a valid source physical machine for P2V migration.

- Authentication failed—If you are using SSH to deploy SMP agent to the source physical machine, verify that you have SSH installed and configured properly. For more information on configuring SSH, refer to the "Configuring OpenSSH" section in this guide.

The Virtual Machine Management Pack

Virtual machine host and guests do not appear in the Virtual Machine Management Pack

- If the virtual machine host and guests were previously accessible from Virtual Machine Management Pack and display an Information icon in the HP SIM console, verify that the host is still licensed. If the host was originally licensed with a demo license, the license might have expired. License the host with a permanent license.
- If the virtualization technology was installed on the host after the VMM agent was installed, select **Configure>Virtualization Management>Restart VMM Agent** from the HP SIM toolbar.

The Virtual Machine Management Pack does not display the system name, system IP address, and operating system

Virtual Machine Management Pack obtains the system name, IP address, and operating system information from HP SIM. If the correct system name, IP address, and operating system name do not appear in the Virtual Machine Management Pack, verify that the virtual machine guest has been discovered by HP SIM. If the guest has not been discovered, perform an Automatic Discovery of the undiscovered virtual machine hosts and guests from the HP SIM console by selecting **Options>Discovery.**

Critical status is displayed for a virtual machine host in the Virtual Machine Management Pack

Critical status might display when a virtual machine host is unavailable. Ping the host to determine if communication is established. If communication does not exist, the virtual machine host no longer exists. To remove the host from the HP SIM toolbar menu:

1. Select **Configure>Virtual Machine Host Registration>Unregister VM Host.**
2. Select the target virtual machine host to unregister by selecting the checkbox next to the system.
3. Click **Apply.**
4. Verify that the correct target host appears in the list. If necessary, click **Add Targets** to add targets, or click **Remove Targets** to remove targets and then click **Next.**
5. Click **Run Now** to unregister the host immediately.

To unregister the virtual machine host from the command prompt, enter the following command:

```
cd /D [VMM installation location]\bin
vmcli -unregisterAgent vmm://IP_address
```

where *IP_address* is the IP address of the virtual machine host.

A blank page appears when launching the Virtual Machine Management Pack from HP SIM

This condition occurs when the CMS name link is not resolved correctly on the network. Record the name used in the browser window. Verify that this name is resolved on the network and is not being affected by any proxy settings in the browser. In addition, be sure to include this link as a trusted site in the Microsoft Internet Explorer browser security settings.

Virtual machine status is not updated

Virtual machine status might not be updated because the Virtual Machine Management Pack cannot communicate with the HP SIM database. Restart the Virtual Machine Management Pack service to correct this issue.

Virtual machine guest information becomes inaccessible from the Virtual Machine Management Pack

Virtual machine guest information might become inaccessible from the Virtual Machine Management Pack after a period. Restart the VMM agent on the virtual machine host, and manually run an Identify Systems event on the virtual machine guests by selecting **Options>Identify Systems.**

A virtual machine host appears in the Virtual Machine Management Pack multiple times

Redeploying the VMM agent to a virtual machine host with multiple IP addresses might register the virtual machine host more than once with different IP addresses. The host appears twice in Virtual Machine Management Pack, one licensed and one unlicensed. Unregister the unlicensed host to resolve.

The Virtual Machine Management Pack displays "No virtualization layer available for this host"

After rebooting the virtual machine host, the Virtual Machine Management Pack might display "No virtualization layer available for this host." To resolve this issue, manually restart the VMM agent from the virtual machine host.

VMM host does not use demo key

- If there is a purchased Virtual Machine Management Pack license key present and a demo Virtual Machine Management Pack license key is added using the HP SIM license manager.
- The virtual machine host is licensed through the **Deploy>License Manager>Deploy Keys** menu in SIM.
- After the system identification process has finished, Virtual Machine Management Pack displays the host as licensed.
- Select **Deploy>License Manager>Manage Keys** and check the status of the Virtual Machine Management Pack license keys, the following is displayed:
  - The Virtual Machine Management Pack demo keys show that they are associated with the host selected, but the seats used value is zero.
  - The purchased Virtual Machine Management Pack license keys show that they are associated with the selected virtual machine host, although they have not been deployed to that host. Also, the seats used counter shows one for this host.

Virtual Machine Management Pack functions

Using a virtual machine host not managed by the Virtual Machine Management Pack as a template/backup repository

The Virtual Machine Management Pack relies on the transport mechanisms in the VMM agent. Therefore, virtual machine transfers can only occur on virtual machine hosts managed by the Virtual Machine Management Pack. To overcome this limitation, map a network drive from a Virtual Machine Management Pack virtual machine host to the unmanaged virtual machine host where you want to store templates or backups.

"HTTP ERROR: 500 Internal Server Error" appears during a Virtual Machine Management Pack move or copy operation

This error can occur when the network is busy during the move or copy operation and can be corrected by refreshing the browser.

The Virtual Machine Management Pack cannot move virtual machines with certain disk types

The Virtual Machine Management Pack does not move or copy virtual machines with the following disk types when installed with the indicated virtualization technology.

Table 8 Non-supported disk types

Disk type	Virtualization technology
Linked disk	Microsoft Virtual Server 2005
Differencing disk	
Physical (RAW) disk	VMware GSX Server
	VMware ESX Server

Virtual machine files are not deleted after a move

The Virtual Machine Management Pack does not delete virtual machine guest files after a move, allowing the virtual machine guest to be restored on the source host, if required.

Virtual machine devices might not be available after a copy or move

If virtual machine devices are not available after a move or copy, manually reconfigure the virtual network connections on the moved or copied virtual machine guest.

A shutdown or restart operation fails or does not complete

Microsoft Virtual Server 2005 Additions or VMware Tools must be installed on virtual machine guests before a shutdown or reset can be successfully performed.

Launching the remote console from Virtual Machine Management Pack might fail

- VMware GSX Server—Verify that the VMware Management Interface software is installed by verifying that the VMware Management Interface directory exists within the VMware installation directory. For information, refer to the VMware Knowledge Base Answer ID 793 at **http://www.vmware.com/support/kb**.

  Also, verify that the VMware GSX Server Web port is 8222, the default port. If not, update the Web port in the Virtual Machine Management Pack configuration setting:

  a. In the C:\Program Files\HP\Virtual Machine Management Pack\bin directory, locate the hpvmm.conf file.

  b. Modify the port number specified in the VMwaregsxport to the default port.

  c. Save the file, and restart Virtual Machine Management Pack services.

- VMware ESX Server—Verify that the VMware ESX Server Web port is 80, the default port. If not, update the Web port in the Virtual Machine Management Pack configuration setting:

  a. In the C:\Program Files\HP\Virtual Machine Management Pack\bin directory, locate the hpvmm.conf file.

  b. Modify the port number specified in the VMware ESX Server port to the default port.

  c. Save the file, and restart Virtual Machine Management Pack services.

- Microsoft Virtual Server 2005—Verify that the Microsoft Virtual server 2005 Web port is 1024, the default port. If not, complete the following steps to update the Microsoft Virtual Server 2005 Web port in the Virtual Machine Management Pack configuration setting.

  a. In the C:\Program Files\HP\Virtual Machine Management Pack\bin directory, locate the hpvmm.conf file.

  b. Modify the port number specified in the MSVSPort to the default port number.

  c. Save the file, and restart Virtual Machine Management Pack services.

NOTE: All virtual machine host port numbers will be changed when the configuration setting is modified.

P2V, V2V, and V2P migration wizard

Blank page displays when launching the Server Migration Pack from HP SIM

This condition occurs when the CMS name link is not resolved correctly on the network. Record the name used in the browser window. Verify that this name is resolved on the network and is not being affected by any proxy settings in the browser. In addition, be sure to include this link as a trusted site in the Internet Explorer browser security settings.

V2V migration wizard is blank

When a Virtual Management Machine-managed virtual machine host stops responding because of insufficient hard disk space in a virtual machine host, the V2V migration wizard might not load. To resolve the issue, free some disk space on the virtual machine host and attempts to reopen the page.

"Communication has been lost with the SMP Service" message appears

This condition might occur when the SMP browser has been idle for at least 15 minutes and has been timed out. To resolve the issue, close the existing SMP screen and launch the utility again from the HP SIM toolbar**.**

P2V migration wizard displays "N/A" in System Name, Operating System, and Model columns

For HP SIM-managed devices, the Server Migration Pack obtains the system name, operating system, and model information from HP SIM. If the correct system name, operating system, and model do not appear in the Server Migration Pack P2V migration wizard, verify that the system has been discovered properly in HP SIM.

The server is not displayed on the P2V wizard. Select Source Physical Machine screen

For P2V migration, the source physical machine must be a server running a Microsoft Windows operating system and cannot be a virtual machine host, virtual machine guest, or the HP SIM CMS. The list in the Select Source Physical Machine screen displays the HP SIM managed servers.

If the server that you want to migrate does not in the list, add the server to the list by specifying the full DNS or system IP address in the provided textbox and clicking **Inspect Only.**

📝 **NOTE:** For manually added servers, you might be required to provide credentials for an administrator account on the source physical machine.

Virtual machine guest is not displayed on the V2V wizard Select Source VM screen

To perform a V2V migration, the Virtual Machine Management Pack must manage the source virtual machine guest. The source virtual machine guest must be stopped and must have at least one virtual disk attached to it. Verify that the virtual disk type is supported for a V2V migration. The virtual machine guest can be stopped from the Virtual Machine Management Pack. For information, refer to the "Shutting down or stopping a virtual machine guest" section in this guide.

P2V, V2V, and V2P migration functions

P2V migration does not start after confirmation. The event log continuously displays "Operation Migration waiting for connection to source"

The P2V migration process, when confirmed, reboots the source physical machine and runs the SMP agent in exclusive mode during the migration process. Rebooting the source physical machine might take a few minutes. If this process takes a long time, verify that the source physical machine is rebooted with the SMP agent running in exclusive mode. The source physical machine might be waiting for user input during the reboot.

If the SMP agent is deployed on an operating system that is not first in the boot order, the SMP agent might fail to boot to the SMP mode. To resolve the issue, change the boot order by editing (system drive)\boot.ini and verifying that the operating system on which the Server Migration Pack is deployed is first in the boot order.

For a complete list of source machine prerequisites, refer to the "Preparing for a P2V migration" section in this guide.

"Unable to connect to the source physical server" error message displays in the P2V migration wizard

A P2V migration always uses the primary IP address of the source physical machine to communicate between the HP SIM CMS and the source physical machine.

If the source physical machine has more than one IP address configured and the primary IP address is unreachable by the HP SIM CMS then, the P2V migration process might fail.

For example, if the source physical machine, machine1, has two IP addresses and the network configuration order is:

- 92.168.1.1 (primary)
- 172.16.101.30 (secondary)

and the CMS has an IP address of 172.16.101.29, the CMS can ping only the secondary network connection of the source physical machine. In this case, the P2V process will be stuck on the SMP agent deployment step of the P2V migration wizard.

The reason for this time-out is that the SMP agent in the source physical machine is attempting to bind itself to the primary IP address of the source physical machine, which in this case is 192.168.1.1 and this IP address is unreachable from the CMS.

To correct this issue:

1. Stop the SMP agent console MS-DOS window on the source physical machine, if running.
2. Re-order the network connections in the source physical machine, and verify that the primary IP address of the physical machine can be pinged from the CMS.
3. Remove the $hp_smpagent$ directory from the physical machine, and start the P2V wizard from the HP SIM toolbar.

Queued migrations fail

P2V and V2V migrations are queued if the virtual machine host involved in the job is already part of another running migration. Therefore, when the queued migration starts, if the target virtual machine host lacks sufficient disk space to contain the migrated virtual machine guest, the migration might fail.

To correct this issue:

1. Remove any unused files to increase the disk space in the target virtual machine host.
2. Restart the migration process after making sufficient disk space on the target virtual machine host.

Chkdsk fails to check an NTFS volume in a migrated virtual machine guest when using the Windows NT 4.0 operating system

During the migration, the Windows NT installation was verified and modified for the virtual hardware by the Server Migration Pack using a higher version of NTFS (the NTFS of the CMS).

To correct this issue:

1. Power down the Windows NT virtual machine.
2. Temporarily attach the Windows NT virtual disk to an existing Windows 2000, Windows XP, or Windows 2003 virtual machine.
3. Check the Windows NT volume using chkdsk of the currently attached virtual machine, and then power down the virtual machine.
4. Detach the Windows NT disk from the virtual machine.

For more information, refer to **http://www.support.microsoft.com**.

Drive letters are not the same in the migrated virtual machine guest after migration

Depending on the operating system, perform the following task:

1. For Windows NT 4.0 systems, select **Programs>Administrative Tools (Common)>Disk Administrator** and verify that the disk administrator has stored a current and active configuration of all disks.

   For Windows 2000, Windows XP, or Windows 2003 systems, select **Control Panel>Administrative Tools>Computer Management>Disk Management** and verify that the disk manager has initialized all disks.
2. Correct the incorrect letter assignment in the migrated virtual machine guest using the appropriate disk administrator or manager.

For more information about P2V post-migration configuration tasks, refer to the "Physical-to-virtual migrations" section in this guide.

The Server Migration Pack cannot perform V2V migrations on virtual machine guests with certain disk types

The Server Migration Pack will not move, copy, or migrate virtual machine guests with the following disk types

Table 9 Unsupported disk types

Disk type	Virtualization product
Linked disk	Microsoft Virtual Server 2005
Differencing disk	
Physical (RAW) disk	VMware ESX Server
	VMware GSX Server

HP SIM console integration

The HP SIM console does not identify a server as a virtual machine host

To verify proper system identification in HP SIM, click the Server Name entry in the HP SIM console, and ensure that VM Host Details appear on the Identity screen.

If HP SIM does not recognize the virtual machine host, manually run an Identify Systems event on the virtual machine guests by selecting **Options>Discovery.**

The HP SIM console does not discover a virtual machine host or guest

1. On a Windows 2003 virtual machine host, select **Services>SNMP Properties.**
2. Click the **Security** tab.
3. Add the HP SIM CMS IP address to the **Accept SNMP Packets from these hosts** field.
4. Enter the user name and password in the Default WBEM Settings field.
5. From the HP SIM console, select **Options>Discovery.**
6. In the Discovery Configuration field, deselect the **Use discovery filters** checkbox, and click **Save.**
7. Perform a discovery of the undiscovered virtual machine hosts and guests.

NOTE: For information about performing basic HP SIM tasks, refer to the *HP Systems Insight Manager Installation and User Guide.*

The HP SIM console identifies a virtual machine guest as an Unknown or Unmanaged device

1. Select **Services** on the virtual machine guest, and verify that WMI service is listed and started.

NOTE: To install WMI on Windows NT virtual machine guests, refer to
http://www.microsoft.com/downloads.

2. From the HP SIM CMS Control Panel, select **Add or Remove Programs,** and verify that Pegasus WMI Mapper 2.0 is installed.
3. Select **Services** on the HP SIM CMS, and verify that Pegasus WMI Mapper service is listed and started.
4. From the HP SIM console, select **Options>Protocol Settings>Global Protocol Settings,** and verify that the correct user name and password are entered.
5. Verify that no virtual machine guest host names begin with the underscore character.
6. Run an Identify Systems event on the virtual machine guests by selecting **Options>Discovery.**

Linux virtual machine guest association is not displayed in the HP SIM console

HP SIM identifies Linux virtual machine hosts system type as Unknown. Therefore, the association between the host and guest cannot be displayed in the HP SIM console.

Additional resources

The *HP ProLiant Servers Troubleshooting Guide* provides simple procedures for resolving common problems, as well as a comprehensive course of action for fault isolation and identification, error message interpretation, issue resolution, and software maintenance.

To obtain the guide, refer to any of the following sources, and then select the *HP ProLiant Servers Troubleshooting Guide.*

- The server-specific Documentation CD.
- The Business Support Center at **http://www.hp.com/support**. You can find the guide by using the navigation features on the HP website.
- The Technical Documentation website at **http://www.docs.hp.com**. Select **Enterprise Servers>Workstations and Systems Hardware** and then the appropriate server.

Glossary

CMS	HP SIM Central Management Server
guest operating system	A reference to a distinct operating system instance running in a virtual machine.
host operating system	A reference to the operating system that is the foundation for a virtual machine.
HP SIM	HP Systems Insight Manager
legacy operating systems	An older operating system, often incompatible with up-to-date hardware. Virtual machines allow legacy operating system to run on new hardware.
Microsoft Virtual Server 2005	Microsoft's host operating system that provides a virtual machine solution.
physical-to-virtual machine (P2V) migration	Migration of a physical machine to a virtual machine guest within a Microsoft Virtual Server 2005 or VMware virtual machine host.
SMP	HP ProLiant Essentials Server Migration Pack
total estimated transport volume	The total volume, consisting of several disks plus configuration files
virtualization	The representation of hardware through software. Virtual machines are an example of virtualization, as are virtual memory and virtual disks.
virtual machine (VM)	The emulation of a complete hardware system from processor to network card in a self-contained, isolated software environment, enabling the simultaneous operation of otherwise incompatible systems.
virtual-to-physical (V2P) migration	Migration of a virtual machine guest to a physical machine.
virtual-to-virtual (V2V) migration	Migration of a virtual machine guest between virtualization layers, including Microsoft Virtual Server 2005, VMware ESX Server, and VMware GSX Server.
VMM	HP ProLiant Essential Virtual Machine Management Pack
VMware ESX Server	VMware's Red Hat Linux-based host operating system that provides a virtual machine solution.
VMware GSX Server	VMware's Windows- or Linux-based host operating system that provides a virtual machine solution.

Index

stopping: a virtual machine guest, 23
system page: accessing, 19; overview, 19
system protocol settings, 14
Systems Insight Manager: accessing target systems, 14; configuration, 14; console integration, 7; discovery, 14, 53; file location, 14; icons, 7; identify systems, 53; requirements, 8
systems page: accessing, 33; overview, 33

T

telephone numbers, 5
The Server Migration Pack. *See* Server Migration Pack
threshold settings, 32
troubleshooting, 41; blank page displays when launching SMP console from HP SIM, 50; chkdsk fails to check an NTFS volume when using Windows NT 4.0, 52; communication lost with SMP message displays in SMP console, 50; drive letters are not the same in virtual machine guest after migration, 52; P2V migration does not start after confirming, 51; P2V migration wizard displays N/A in Systen Name, Operating System, and Model columns, 51; queued up migrations fail, 52; server is not displayed on P2V wizard Select source physical machine screen, 51; SMP agent deployment fails in P2V migration, 47; Unable to connect to source physical server error message

displays, 51; V2V migration wizard is blank, 50; virtual machine guest not displayed on V2V wizard Select Source VM screen, 51; virtual-to-virtual (V2V) migration; disk types not moved or copied by virtualization product, 53

U

uninstalling: Server Migration Pack, 43; Virtual Machine Management Pack, 43; Virtualization Management Software, 43; VMM agent, 44

V

viewing: virtual machine events, 40
virtual machine events: viewing, 40
virtual machine guest, 31; copying, 24, 50; creating, 26; creating template, 26; deploy, 26; discovery, 14, 53; Microsoft Virtual Server Additions installation, 16; moving, 25, 50; pausing, 23; requirements, 9; resetting, 23; restarting, 50; restartting, 23; resuming, 22; setting up, 16; shutting down, 23, 50; starting, 22; stopping, 23; VMware Tools installation, 16
virtual machine guest backup: create, 26; restore, 28
virtual machine host, 30; discovery, 14, 53; icons, 7; licensing, 18; requirements, 9; SMP agent deployment, 15; VMM agent deployment, 15

virtual machine hosts: setting alternate, 28
Virtual Machine Management Pack: accessing system page, 19; configuration, 14; file location, 14; installing, 10; licensing options, 17; licensing overview, 17; overview, 6; troubleshooting, 48; uninstallation, 43; VM column, 7
virtual machine performance, 31
virtual machines of a failed host: recovering, 28
Virtual to Virtual (V2V): migration, 37
virtualization management software, 6
Virtualization Management Software: uninstallation, 43
virtual-to-physical (V2P) migration: overview, 38
virtual-to-virtual: migrations, 35
virtual-to-virtual (V2V) migration: disk types not moved or copied by virtualization product, 53
Virtual-to-Virtual V2V: migration, 35
VM Host performance, 30
VMM agent: deployment, 15, 46; registration, 47; requirements, 9; restarting, 29, 48; troubleshooting, 46; uninstalling, 44; upgrading, 15
vmware: virtual center settings, 16
VMware: requirements, 9; Tools, 16

W

Web Based Enterprise Management credentials, 14
website, 5
Windows Management Instrumentation (WMI), 8, 9