# HP ProLiant Essentials Server Migration Pack 1.10

## Product Brief

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Introduction

Virtualization is the representation of hardware through software. This representation, in which multiple guest operating systems run concurrently on a single hardware machine, increases system utilization, and reduces cost and complexity in server consolidation projects. In addition, virtualization provides you with the flexibility to respond to changing business demands.

Two types of migration tasks play key roles in the virtualization process:

- Physical-to-virtual (P2V) migration enables migration of a physical machine to a virtual machine running on Microsoft® Virtual Server 2005, VMware ESX Server, or VMware GSX Server.
- Virtual-to-virtual (V2V) migration enables migration of a virtual machine guest between virtualization layers, including Microsoft Virtual Server 2005, VMware ESX Server, and VMware GSX Server.

Overview

The HP ProLiant Essentials Server Migration Pack (SMP) extends the functionality of the HP ProLiant Essentials Virtual Machine Management Pack (VMM) to provide integrated P2V and V2V migrations. The Server Migration Pack enables you to simplify the server consolidation process, thereby freeing you to focus on other priorities.

**Figure 1.** Physical servers consolidated into a virtual machine host setup (P2V)

The Server Migration Pack is a companion product that works in conjunction with the Virtual Machine Management Pack 1.10 or later. The Virtual Machine Management Pack, in turn, adds virtual machine management capability within HP Systems Insight Manager (HP SIM) 4.2 Service Pack 1 or later. The Virtual Machine Management Pack provides tracking, monitoring, and control functions for organizing an effective virtualized environment.

**IMPORTANT:** The Server Migration Pack will only migrate a physical machine or virtual machine to virtual machine hosts that are licensed and managed by the Virtual Machine Management Pack.
Benefits

The Server Migration Pack provides central management and control of P2V and V2V migrations. Among its benefits, the Server Migration Pack provides:

**Simplified server consolidation processes**

SMP wizards provide simple, easy-to-follow processes for performing P2V and V2V migrations. This simplified process reduces time needed to perform migration tasks.

**Integration with HP SIM and the Virtual Machine Management Pack**

Integration with HP SIM provides you a “single pane of glass” view that includes the auto discovery of the virtual machines, coupled with the Virtual Machine Management Pack’s best-in-class host server resource monitoring and metrics to enable the migration process.

**Workload management**

As with the Virtual Machine Management Pack, IT administrators can use the Server Migration Pack to easily move virtual machine guests between host servers to optimize workloads of host server resources.

These benefits provide you with simplified management and operation of multiple virtual machine environments, reduced administration cost and complexity, and faster response times.
Technology summary

Migration allows for the movement of workloads from physical or virtual servers to other virtual host servers. The Server Migration Pack ensures the following operations in the virtual environment during a P2V or a V2V migration process:

- Image transfer
- Boot environment adaptation
- Injection of Microsoft Windows® operating system drivers

P2V migration supports the migration of basic disks and dynamic disks that have simple (non-extended) volumes. A dynamic disk can contain simple volumes, spanned volumes, striped volumes (for example, RAID 0), mirrored volumes (for example, RAID 1), and striped with parity volumes (for example, RAID 5).

During the image transfer, the Server Migration Pack:

- Creates virtual target disks with matching partition signatures
- Optimizes the copy of known file system types (only used sectors are copied)
- Copies unknown file system types sector for sector

**NOTE:** The Server Migration Pack creates target virtual disks with matching partition signatures. The target virtual disks are created with a virtual disk size rounded up to the next gigabyte. For example, if your source disk is 9.8 GB, the Server Migration Pack creates a 10-GB virtual sized disk.

**NOTE:** For Microsoft Virtual Server and VMware GSX Server, the Server Migration Pack creates dynamically expanding disks that expand up to the virtual size when sectors are actually used. Meanwhile, for VMware ESX Server, the Server Migration Pack creates fixed disks.

**NOTE:** The Server Migration Pack uses HP ProLiant Essential products licensing. One license is used for each server migration.
Server Migration Pack console

From the HP SIM toolbar, select **Tools>Integrated Consoles>Server Migration Pack** to access the Server Migration Pack console. The home page of this console, shown in the following figure, is your starting point to perform P2V and V2V migrations.

**Figure 2.** Server Migration Pack console
Upload Binaries Screen

The Server Migration Pack automatically uploads binary files for migration tasks. You can access the Upload Binaries screen from the Server Migration Pack console. If the required operating system binary files are not uploaded within the HP SIM Central Management Server (CMS), the Upload Binaries screen is displayed at the appropriate time during the P2V or V2V migration processes. To access the Upload Binaries screen from the Server Migration Pack console, click **upload the required driver and OS binaries.**

If additional files are necessary, load these files from your original Windows or VMware media before beginning your migration tasks or during the migration process when the screen illustrated in **Figure 3** appears. Also, if Microsoft iSCSI Initiator 1.06 is not installed on the CMS, download and install the initiator from [http://go.microsoft.com/?linkid=663997](http://go.microsoft.com/?linkid=663997). The Server Migration Pack requires Microsoft iSCSI Initiator for P2V and V2V migration tasks. The following table shows the binary files that are preinstalled by operating system.

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Operating system binary file status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows NT 4.0</td>
<td>(Optional) Verify that all the binaries are available. By default they are available within the Server Migration Pack application.</td>
</tr>
<tr>
<td>Windows 2000</td>
<td>No action required.</td>
</tr>
<tr>
<td>Windows 2003</td>
<td>No action required.</td>
</tr>
<tr>
<td>Windows XP</td>
<td>Requires upload of SCSI drivers in case of migration to VMware target virtual machine host.</td>
</tr>
</tbody>
</table>
The following figure shows the Server Migration Pack Upload Binaries screen.

**Figure 3.** Server Migration Pack Upload Binaries screen

In this example, if performing a migration that includes Microsoft Windows XP, you must upload the *vmscsi.sys* file. Meanwhile, the binaries required for performing a Windows NT 4.0 Service Pack migration are available.

**IMPORTANT:** In most cases, you will not need to access the Upload Binaries screen because the appropriate binary files for Windows NT 4.0, Windows 2000, and Windows 2003 will have been preinstalled. However, if you are performing a migration of a server running the Windows XP operating system, you must upload the *vmscsi.sys* driver from the VMware distribution CD.
Physical-to-virtual (P2V) migrations

The Server Migration Pack enables you to perform P2V migrations from a P2V wizard, which is accessible from the SMP console by clicking **P2V migration wizard**. P2V migration supports x86 servers running Microsoft Windows operating systems, including Windows NT 4.0, Windows 2000, and Windows 2003. For a list of supported physical machine operating systems for P2V migrations, refer to the **HP ProLiant Essentials Virtual Machine Management Pack and Server Migration Pack Support Matrix**.

**IMPORTANT:** The source physical machine device must be a server running a Microsoft Windows operating system and cannot be a virtual machine host.

**IMPORTANT:** The HP SIM CMS cannot have any virtualization software, such as Microsoft Virtual Server 2005 or VMware GSX Server, installed and running for this migration.

The following figure displays the P2V wizard, which will guide you through the steps to perform a P2V migration.

---

**Figure 4.** Server Migration Pack P2V wizard

<table>
<thead>
<tr>
<th>Select</th>
<th>System Name</th>
<th>System Address</th>
<th>Operating System</th>
<th>Model</th>
<th>Status</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>vegas</td>
<td>176.60.4.102</td>
<td>Microsoft Windows Server 2003 Standard Edition</td>
<td>ProLiant DL380 G3</td>
<td>Device not impacted for P2V</td>
<td></td>
</tr>
<tr>
<td>✔️</td>
<td>d380web0316e</td>
<td>176.60.4.103</td>
<td>Microsoft Windows Server 2003</td>
<td>H/A</td>
<td>Device is ready for P2V</td>
<td>Failed Device</td>
</tr>
<tr>
<td></td>
<td>pi9903</td>
<td>176.60.4.208</td>
<td>Microsoft Windows 2000</td>
<td>ProLiant XT3</td>
<td>Device is prepared for P2V</td>
<td>Stop Agent</td>
</tr>
<tr>
<td></td>
<td>n300Gsl</td>
<td>176.60.4.275</td>
<td>Microsoft Windows Server 2003, Enterprise Edition</td>
<td>ProLiant ML350 G4</td>
<td>SMP Agent not running</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n300host</td>
<td>176.60.4.279</td>
<td>Microsoft Windows Server 2003 Enterprise Edition</td>
<td>ProLiant ML350 G4</td>
<td>Device not impacted for P2V</td>
<td></td>
</tr>
</tbody>
</table>
The following table lists the P2V migration wizard column names and descriptions.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Name</td>
<td>The network identification name of the physical server</td>
</tr>
<tr>
<td>System Address</td>
<td>The network IP address of the physical server</td>
</tr>
<tr>
<td>Operating System</td>
<td>The operating system running on the physical server</td>
</tr>
<tr>
<td>Model</td>
<td>The product name of the physical server</td>
</tr>
<tr>
<td>State</td>
<td>The P2V migration state of the physical server</td>
</tr>
</tbody>
</table>

From the wizard, select a source physical machine from the list of HP SIM-managed servers and click **Next**. You can sort the list in both ascending and descending order in the System Name, System Address, Operating System, Model, and State columns. The sorted column is highlighted, and the sort order can be identified by the direction of the arrow on the sorted column heading.

If your managed system, such as Dell or IBM, does not display in the list, you can add it to the list by specifying the full Domain Name Space (DNS) or system IP address in the provided text box and clicking **Inspect only**. This process will validate if the device is supported for P2V migration. After the device has been successfully inspected and is available for P2V migration, select it and click **Next** to continue with the P2V migration wizard.

Click **Refresh Device List** to reload the system information from HP SIM and update the systems state in the list. Manually added devices can be deleted from the list by selecting the devices and clicking **Delete**.

The following table lists the states and their descriptions.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No State</td>
<td>Device not inspected for P2V</td>
</tr>
<tr>
<td>Normal</td>
<td>SMP agent not running</td>
</tr>
<tr>
<td>Not Available</td>
<td>Device not available for the Server Migration Pack</td>
</tr>
<tr>
<td>Installing</td>
<td>Deploying SMP agent to the device</td>
</tr>
<tr>
<td>Prepared</td>
<td>Device is prepared for P2V</td>
</tr>
<tr>
<td>Migrating</td>
<td>P2V in progress</td>
</tr>
<tr>
<td>Ready</td>
<td>Device ready for P2V</td>
</tr>
</tbody>
</table>
After selecting a source machine, the wizard guides you to select the appropriate mode to deploy the SMP agent. The SMP agent is remotely deployed using one of the following methods from within the P2V wizard:

- **OpenSSH**: This method is applicable only to the servers in the P2V wizard device list that are managed by HP SIM and have OpenSSH installed.

- **Deploy SMP**: This method is available for devices that are managed by HP SIM and for servers that are manually added in the Server Migration Pack P2V wizard by specifying the DNS name or IP address. This mode of deployment is the faster of the two and takes 1 to 3 minutes. This mode of deployment requires administrative system-level login credentials of the source physical machine.

The SMP agent is deployed remotely to the source physical machine. After the installation is complete, the SMP agent runs and establishes communication between the source physical machine and the CMS.

The wizard guides you to review the source machine details and select the target virtual machine host from the list of available VMM-managed virtual machine hosts.

After you select the target virtual machine host, the wizard guides you to select the target path where the disk files will be copied on the target virtual machine host and specify a unique target virtual machine guest name. Optionally, you can reconfigure the memory allocation for the migrated virtual machine guest.

Confirm the migration details, and begin the migration.
P2V migration notes

- One SMP license is used after each P2V migration.
- The migrated virtual machine guest will have a new BIOS serial number and Media Access Center (MAC) address after each P2V migration. The new BIOS serial number and MAC address are generated when the migrated virtual machine guest is registered to the target virtual machine host and is powered on.
- The migrated virtual machine guest is automatically registered to the target virtual machine host after a P2V migration and can be powered on from the Virtual Machine Management Pack console.
- You must set the host name for the migrated virtual machine guest so that no conflicts arise in the network. Duplicate ID in the network can be resolved by setting a unique name for the migrated virtual machine and by using additional tools such as Windows sysprep.
- The migrated virtual machine guest contains a dynamically expanding virtual disk in case of a Microsoft Virtual Server or VMware GSX Server target virtualization layer.
- The migrated virtual machine guest contains a fixed disk in the case of a VMware ESX Server target virtualization layer.
- The Server Migration Pack creates virtual target disks with matching partition signatures. The target virtual disks are created with a virtual size rounded up to the next gigabyte. For example, if your source disk is 9.8 GB, the Server Migration Pack creates a 10-GB virtual sized disk.
- The SMP agent on the source physical machines is not removed automatically at the end of migration. You can delete the SMP agent folder $hp_smpagent$ after the migration process is complete.
- Migration operations are queued if the selected target virtual machine hosts are currently involved in other migration tasks.
- During the P2V migration process, all the source data is migrated to the target virtual machine guest.
- In the event of a failed P2V migration, the migrated disks are left behind in the target virtual machine host. Locate the disk files using Windows Explorer, and manually delete those migrated disks.
Virtual-to-virtual (V2V) migrations

Along with P2V migrations, the Server Migration Pack provides functionality for V2V migrations. This is done through the V2V wizard, which is accessible from the SMP console by clicking **V2V migration wizard**. The following figure displays the V2V wizard, which guides you through the steps to perform a V2V migration.

**Figure 5.** Server Migration Pack V2V wizard

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM System Name</td>
<td>The network identification name of the virtual machine guest</td>
</tr>
<tr>
<td>VM System Address</td>
<td>The network IP address of the virtual machine guest</td>
</tr>
<tr>
<td>VM Name</td>
<td>The virtual machine name identified by virtual machine host</td>
</tr>
<tr>
<td>VM Host Name</td>
<td>The network identification name of the virtual machine host</td>
</tr>
<tr>
<td>VM Size</td>
<td>The size of the virtual machine guest including the virtual machine</td>
</tr>
<tr>
<td>Virtualization Layer</td>
<td>The virtualization technology running on the virtual machine host</td>
</tr>
</tbody>
</table>

The following table lists the V2V migration wizard column names and descriptions.

The list can be sorted by both ascending and descending order by the VM System Name, VM System Address, VM Name, VM Host name, VM Size, and Virtualization Layer columns. The sorted column is highlighted, and the sort order can be identified by the direction of the arrow on the sorted column heading.
IMPORTANT: In cases for which the target virtualization layer does not support the source virtual machine configuration feature, a warning message appears during the migration and the migration continues with the default setting.

IMPORTANT: V2V migration supports migration of virtual machines having at least one virtual disk with a proper operating system attached. An empty virtual machine without any virtual disks cannot be migrated.

The wizard guides you to review and confirm the guest operating system running on the selected source virtual machine, and then to select the target virtual machine host to which the migrated virtual machine guest will be migrated. The target virtual machine host must have adequate storage and performance reserves to host the migrated virtual machine guest. If the required Windows drivers and binaries are not available, you will be prompted to upload binary files. This process is similar to the upload binaries process described in the P2V migration section of this paper.

The wizard guides you to specify a unique name for the migrated virtual machine guest.

Confirm the migration details, and begin the migration.

**V2V migration notes**
- One SMP license is used after each V2V migration.
- Migration operations are queued if the selected virtual machine hosts are currently involved in other tasks.
- The migrated virtual machine guest will have a new BIOS serial number and MAC address after each V2V migration. The new BIOS serial number and MAC address are generated when the migrated virtual machine guest is registered to the target virtual machine host and is powered on.
- The migrated virtual machine guest is automatically registered to the target virtual machine host after each V2V migration, and can be powered on from the Virtual Machine Management Pack console.
- The Server Migration Pack creates virtual target disks with matching partition signatures. The target virtual disks are created with a virtual size rounded up to the next gigabyte. For example, if your source disk is 9.8 GB, the Server Migration Pack creates a 10-GB virtual sized disk.
- During the V2V migration process, all the source data is migrated to the target virtual machine guest.
- In the event of a failed V2V migration, the migrated disks are left behind in the target virtual machine host. Locate the disk files using Windows Explorer, and manually delete those migrated disks.

**Post-migration configuration tasks**
With both P2V and V2V migrations, post-migration configuration tasks must be performed on the migrated virtual machine guests. The migrated virtual machine guest is automatically registered to the target virtual machine host and is accessible from the Virtual Machine Management Pack console.

Upon completing a migration, open the target virtual machine host virtualization management interface (Remote Console) to configure the network connections for the migrated virtual machine guest. Specific configuration steps vary, depending on the virtualization layer used. Power on the migrated virtual machine guest, modify the system host name, and set the IP address in case of a static IP address configuration. The migrated virtual machine guest automatically detects new hardware and installs the required drivers. When prompted for reboot, click Yes to restart the virtual machine guest.
Tracking your migrations

P2V and V2V migrations can be monitored in real time or at a later time from the Running Task Log and Event Log screens. These screens provide you current information about migrations in progress, as well as completed migrations.

Running Task Log screen

The Server Migration Pack Running Task Log displays the migrations in progress. Current running migration tasks are displayed in a table that enables you to view the status, progress, and time remaining for each migration. The running migrations can be stopped if required.

To access the Running Task Log from the Server Migration Pack console, click SMP Running Task Log.

When a particular migration task is completed, it is logged on the Server Migration Pack Event Log. The following information is displayed for each running task.

- Status
- Description
- Progress
- Time remaining
- Cancel

The following figure shows the Server Migration Pack Running Task Log.

Figure 6. Server Migration Pack Running Task Log
**Event Log**

The Server Migration Pack Event Log displays the migrations that have been completed. Completed migration tasks are displayed in a table that enable you to sort by time, category, user, host, virtual machine host, and any message summaries of the performed migration. The sorted column is highlighted, and the sort order can be identified by the direction of the arrow on the sorted column heading. To access the Event Task Log from the Server Migration Pack console, click SMP Event Task Log.

The following table is displayed for each event.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Color-coded icons indicating if an event completed successfully or failed</td>
</tr>
<tr>
<td>Time</td>
<td>When the event started</td>
</tr>
<tr>
<td>Category</td>
<td>The classification of the event</td>
</tr>
<tr>
<td>User</td>
<td>Who initiated the event</td>
</tr>
<tr>
<td>Host</td>
<td>The virtual machine host included in the event</td>
</tr>
<tr>
<td>VM</td>
<td>The virtual machine guest included in the event</td>
</tr>
<tr>
<td>Message</td>
<td>A brief description of the event and the result</td>
</tr>
</tbody>
</table>

To filter the Event Log, select from the drop-down list. The Event Log can be filtered to display:

- All events
- Only errors
- Only errors and warnings
- Only today’s events

**NOTE:** To see a detailed description of Server Migration Pack error messages, refer to the HP ProLiant Essentials Server Migration Pack User Guide or the Server Migration Pack online help.

To delete events from the Event Log, select the checkbox next to the appropriate events and click **Delete selected events.**

To refresh the event list, click **Reload Events.**

To close this Event Log and return to the Server Migration Pack console, click **Finish.**
The following figure shows the Server Migration Pack Event Log.

**Figure 7.** Server Migration Pack Event Log
Integration with HP ProLiant Essential products

A key Server Migration Pack differentiator is its integration with other HP ProLiant Essential products, including the Virtual Machine Management Pack and HP SIM.

Integration with the HP ProLiant Essentials Virtual Machine Management Pack

The Virtual Machine Management Pack enables you to start, resume, shut down, stop, pause, reset, restart, move, and copy virtual machine guests.

The Virtual Machine Management Pack includes the following components, all of which are installed and set up during Virtual Machine Management Pack installation:

- Virtual Machine Management Service—This service resides on the HP SIM server and controls the internal functions of the Virtual Machine Management Pack.
- Virtual Machine Management console—As the user interface for the Virtual Machine Management Pack, the console provides access to the virtual machine monitoring and control functions. The GUI can be accessed locally or remotely using industry-standard Web browsers.
- Virtual Machine Management Agent—This agent is provided with the Virtual Machine Management Pack installation and distributed to managed virtual machine hosts from HP SIM.
Select **Tools>Integrated Consoles>Virtual Machine Management Pack** from the HP SIM toolbar to access the Virtual Machine Management Pack console. The home page of this console, shown in the following figure, presents information about each virtual machine host being managed.

**Figure 8. Virtual Machine Management Pack console**

Performance metrics listed in the right frame are as follows:

- **% Free CPU**—The amount of total processor resources available on the virtual machine hosts. These resources can be allocated to additional virtual machine guests. This percentage is collected from the system. In cases where there is 100% free CPU, no processor cycles are in use. Free CPU is the number of free processor cycles, measured in MHz or GHz, on the virtual machine host. Free CPU is calculated as:

  \[(\text{physical processor quantity} \times \text{physical processor speed}) \times (100% - \text{Total CPU Busy%})\]

- **Free Memory**—The amount of virtual machine host physical memory that is not used. Free memory can be allocated to additional virtual machine guests.

- **Free Storage**—The amount of virtual machine host disk capacity that is not in use.

From this console, select the virtual machine host in the left frame to display information about the selected virtual machine hosts as well as its associated virtual machine guests in the right frame.

**IMPORTANT:** These lists can be sorted both ascending and descending order on VMM status, host name, system address, operating system, virtualization, % free CPU, free memory, and free storage. To identify likely target virtual machine hosts, sort the % Free CPU column in descending order.
Integration with HP Systems Insight Manager

A key differentiator for the Server Migration Pack is its integration with HP SIM. The Server Migration Pack installs and runs on the HP SIM CMS.

The Server Migration Pack is fully integrated with HP SIM and enables all operations required for P2V or V2V migrations to be accessed from the HP SIM console. HP SIM and the ProLiant Essentials management software provide a complete tool set for server consolidation projects. Using HP SIM and the HP ProLiant Essentials Performance Management Pack, you can easily identify underutilized servers in the data center that are candidates for consolidation. After these systems are identified, HP SIM and the Server Migration Pack provide an easy-to-use P2V migration capability.

The virtual machine host and guest status information is displayed in the VM column, shown circled in the following figure.

In this figure, systems ml350g3-w2k3, ntvm1, and printervm are operating in a normal condition, as evidenced by the normal (ıc) icon displayed in the Hardware Status (HW) column in the right frame. Meanwhile, systems dl560g1-wk3ee and ml350g3-2 have potential issues, as evidenced by the major (ı) icon displayed in the HW column.

HP SIM integration enables you to identify issues in both your physical servers and the virtual environment. The Virtual Machine Management Pack grants you the control needed to manipulate your servers to ensure optimal efficiency.
Usage scenarios

Performing either a P2V or V2V migration with the Server Migration Pack requires an initial setup. After the Server Migration Pack is installed and configured, you can perform P2V and V2V migrations. The following scenarios provide a high-level overview of the migration process.

Setting up the Server Migration Pack

Setting up the Server Migration Pack is similar to setting up the Virtual Machine Management Pack or other HP ProLiant Essentials products because the Server Migration Pack is on the HP Management CD.

Installing from the HP Management CD

To install the Server Migration Pack, insert the HP Management CD into the CD-ROM of the HP SIM CMS. An autorun menu appears. Read the license agreement displayed. If you agree to the terms of the license agreement, click Agree to continue. From the autorun, click the Products tab and click Install located under Server Migration Pack. Enter the HP SIM account credentials, and click Next. Click Finished when the Server Migration Pack installation completes. The Server Migration Pack installation does not require a reboot.

Installing from the download website

You can also download the Server Migration Pack from the download website. To perform this procedure, unzip the download file into a temporary directory on the HP SIM CMS, and double-click hpsmp.exe. Complete the installation by following the on-screen instructions, entering your user-specific information when prompted.

Configuring the Server Migration Pack

To configure the Server Migration Pack to perform P2V or V2V migrations, log in to the HP SIM CMS from an account with administrator privileges, and select Tools>Integrated Consoles>Server Migration Pack.

Scenario 1 discusses targeting servers for consolidation to virtual machine hosts with available resources.

Scenario 2 discusses virtual machine conversion projects, and the migration of a virtual machine guest from one virtual machine host to another.
Scenario 1: P2V migration

This scenario covers P2V migration using the Server Migration Pack. In the following scenario, the Server Migration Pack will be used to migrate workloads from physical servers into the virtual environment. This migration has been planned where multiple workloads based on individual servers will take advantage of newer, faster hardware. This example demonstrates how the Server Migration Pack is used to plan, perform, and assess the migration.

Planning the P2V migration by selecting a physical source machine to migrate

To identify source physical machines for migration, use HP SIM to display the server list. The following figure shows the HP SIM console listing the potential physical servers for migration to a virtual environment with newer, faster hardware. For this example, source physical machine inst-pl-5500 is selected for migration.
Performing the P2V migration by selecting a target virtual machine host

To take advantage of this virtualization environment, you must migrate source physical machine instp5500 to a virtual machine host with sufficient resources available.

To perform the P2V migration, select **Tools>Integrated Consoles>Server Migration Pack** to access the Server Migration Pack console. Click **P2V migration wizard** to access the wizard, shown in the following figure. This figure shows page 1 of the wizard with the source physical machine instp5500 selected for migration. Click **Next**.

Figure 11. Select source physical machine in P2V migration wizard

Follow the wizard-directed steps to step 4, and select a target virtual machine host. You can determine likely target virtual machine hosts by selecting the Free CPU % column and sorting in descending order.

**IMPORTANT:** HP recommends that the target virtual machine host have sufficient system resources to host the migrated virtual machine guest.
The following figure shows page 4 of the P2V migration wizard with target virtual machine host esxdl580g2 selected. The source physical machine inst-pl5500 information is also included on this page for easy reference. Click **Next**.

**Figure 12.** Select target virtual machine host screen in P2V migration wizard

Follow the remaining wizard-directed steps to complete the migration.

**IMPORTANT:** When you select the target path where the disk files will be copied on the target virtual machine host, you must specify a unique target name. Also, you have the option of modifying memory size for the migrated virtual machine guest. For Microsoft Virtual Server and VMware GSX Server target virtual machine hosts, an empty folder is required. For VMware ESX Server target virtual machine hosts, migrated virtual disk files can be copied within different partitions.

Perform the necessary post-migration configuration tasks after completing the migration.
Validating the P2V migration by verifying the migrated virtual machine guest

Upon completion of the post-migration tasks, verify the migration by reviewing the association tree in the left panel of the Virtual Machine Management Pack host console. To perform this step from HP SIM, select Tools>Integrated Resources>Virtual Machine Management Pack, and then select the virtual machine host to which the source physical machine was migrated.

Verify that the migrated virtual machine guest is on the virtual machine host. This virtual machine guest is a clone of the source physical machine. This virtual machine guest will be automatically registered to the target virtual machine host and in a powered off state. This virtual machine guest can be powered on from the Virtual Machine Management Pack console. The following figure shows virtual machine host esxdl580g2 with virtual machine guest P2V of pl5500.

Figure 13. Virtual machine host esxdl580g2 with virtual machine guest P2V of pl5500

Now your source physical machine has been migrated to a virtual environment and can be retired.
Scenario 2: V2V migration

This scenario covers V2V migration in the Server Migration Pack. In this scenario, a particular virtual machine is moving from a development or test environment into a production environment. In this particular scenario, the recommended option is to migrate the virtual machine guest from a host server running Microsoft Virtual Server to a host server running VMware GSX Server.

Planning the V2V migration by selecting a source virtual machine guest

**IMPORTANT:** The Server Migration Pack will not migrate virtual machine guests with the disk types listed in the following table.

<table>
<thead>
<tr>
<th>Disk type</th>
<th>Virtualization product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linked disk</td>
<td>Microsoft Virtual Server</td>
</tr>
<tr>
<td>Differencing disk</td>
<td>VMware ESX Server</td>
</tr>
<tr>
<td>Physical (RAW) disk</td>
<td>VMware GSX Server</td>
</tr>
</tbody>
</table>

To identify the source virtual machine guests for migration, access the Virtual Machine Management Pack console to display the virtual machine hosts. For more information on each individual host, review the performance data on the Virtual Machine Management Pack host console.

The following figure shows the Virtual Machine Management Pack host console of virtual machine host WG5-MSVS on Microsoft Virtual Server operating at 87% utilization capacity.
Performing the V2V migration by selecting a target virtual machine host

To optimize the WG5-MSVS workload, migrate a virtual machine guest from the WG5-MSVS5 source virtual machine host to a target virtual machine host.

**IMPORTANT:** The target virtual machine host must have adequate storage capacity and performance reserves to host the migrated virtual machine guest.

**IMPORTANT:** V2V migration requires that the source virtual machine guest be stopped or in a disabled state. The source virtual machine guest is available for migration only if it is stopped. The source virtual machine guest can be stopped from the Virtual Machine Management Pack console.

To perform the V2V migration, select **Tools>Integrated Consoles>Server Migration Pack** to access the Server Migration Pack console. Select **V2V migration wizard** to access the wizard, shown in the following figure. This figure shows page 1 of the wizard with the virtual machine guest Win2kProf on virtual machine host WG5-MSVS selected for migration.

Figure 15. Select source virtual machine guest screen in V2V migration wizard

Follow the wizard-directed steps to step 3, and select a target virtual machine host. You can determine likely target virtual machine hosts by selecting the Free CPU % column and sorting in descending order.
The following figure shows page 3 of the V2V migration wizard with target virtual machine host wg-gsx selected. Click Next.

Figure 16. Select target virtual machine host screen in V2V migration wizard

Follow the remaining wizard-directed steps to complete the migration.

IMPORTANT: When you select the unique name for the migrated virtual machine guest, create or select a folder with adequate storage capacity to store that guest. The target folder must be empty. The target folder is the location that contains the migrated virtual machine configuration file and virtual disks in the case of VMware GSX Server and Microsoft Virtual Server. This folder contains only the migrated virtual machine configuration file in the case of VMware ESX Server. The target path for SCSI 0:0 is the location that contains the migrated virtual disk files for the VMware ESX Server.

Perform the necessary post-migration configuration tasks after completing the migration.
Assessing the V2V migration

Upon completion of the migration, verify the association tree in the left panel of the Virtual Machine Management Pack host console. In addition, verify the host performance status. The following figure shows that virtual machine guest Win2KProff has been moved from WG5-MSVS on Microsoft Virtual Server to virtual machine host WG5-MSVS on VMware GSX Server. At the beginning of this example, WG5-MSVS on Microsoft Virtual Server was operating at 87% utilization capacity. The following figure shows that now, thanks to this migration, the WG5-MSVS on Microsoft Virtual Server is now operating at 30% utilization capacity.

Figure 17. WG5-MSVS virtual machine host on Microsoft Virtual Server at 30% capacity

V2V migration from 1P to 4P systems

To take advantage of newer, faster hardware, virtual machine guests can be migrated from a 1P virtual machine host to a 4P virtual machine host using the Server Migration Pack V2V migration wizard. During the migration, the Server Migration Pack does not modify the migrated virtual machine guest configuration. Use the VMware ESX Server management interface to change the virtual machine guest configuration and increase the number of processors.

IMPORTANT: The Server Migration Pack supports VMware ESX Server 2 with VMware Virtual SMP installed. Virtual SMP must be enabled to support 4P.

V2V migration from 4P to 1P systems

If you are performing a V2V migration from a virtual machine configured with 4P to a 1P virtual machine host, after migration, the migrated virtual machine guest configuration contains 1P.
Conclusion

By optimizing all the available server resources, companies save money and resources. The HP ProLiant Essentials Server Migration Pack provides several benefits to make it the best-of-class migration tool:

- **P2V migration**—The Server Migration Pack enables migration of a physical machine to a virtual machine guest within a Microsoft Virtual Server or VMware virtual machine host.
- **V2V migration**—The Server Migration Pack enables migration of a virtual machine guest between virtualization layers such as Microsoft Virtual Server 2005, VMware ESX Server, and VMware GSX Server.
- **Migration task tracking**—The Server Migration Pack provides a Running Task Log and Events Log for real-time monitoring and easy tracking of migration tasks.
- **Heterogeneous virtual environment support**—The Server Migration Pack provides support to Microsoft Virtual Server, VMware ESX Server, and VMware GSX Server virtual environments.

These benefits provide you with a simplified migration process that reduces both complexity and cost.
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 running on the physical host/server.
legacy operating system—An older operating system, often incompatible with up-to-date hardware. Virtual machines allow legacy operating system to run on new hardware.
MAC address—Media Access Control address, a hardware address that uniquely identifies each node of a network.
Microsoft Virtual Server 2005—Microsoft’s host operating system that provides a virtual machine solution.
physical-to-virtual (P2V) migration—Migration of a physical machine to a virtual machine guest within a Microsoft Virtual Server or VMware virtual machine host.
SMP—HP ProLiant Essentials Server Migration Pack.
virtual machine—Essentially a computer within a computer, implemented in software. A virtual machine virtualizes a complete hardware system, from processor to network card, in a self-contained, isolated software environment, enabling the simultaneous operation of otherwise incompatible operating systems. Each operating system runs in its own isolated software partition.
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.
virtualization—The representation of hardware through software. Virtual machines are an example of virtualization, as are virtual memory and virtual disks.
VMware ESX Server—VMware ESX Server product that provides a virtual machine solution.
VMware GSX Server—VMware GSX Server product for Windows- or Linux. This product runs as an application inside a host operating system (Windows or Linux) to provide a virtual machine solution.
For more information

For more information about the Server Migration Pack, refer to:

- HP ProLiant Essentials Server Migration Pack Quick Setup Poster
- HP ProLiant Essentials Server Migration Pack User Guide
- HP ProLiant Essentials Virtual Machine Management Pack and Server Migration Pack Support Matrix

For more information about the Virtual Machine Management Pack, refer to:

- HP ProLiant Essentials Virtual Machine Management Pack Quick Setup Poster
- HP ProLiant Essentials Virtual Machine Management Pack Product Brief

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

- [http://www.hp.com/go/hpsim](http://www.hp.com/go/hpsim)
- HP Systems Insight Manager Help Guide
- HP Systems Insight Manager Installation and User Guide