User's Manual

VMware Converter 3

vmware®

User's Manual
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Contents

About This Book 7

1 Introduction 9
- Migration with VMware Converter 9
  - VMware Converter Editions 10
- Cloning and System Reconfiguration of Physical Machines 11
  - Hot and Cold Cloning 11
  - Local and Remote Cloning 11
  - Cloning Modes 14
- Migrating Existing Virtual Machines and System Images 15
  - Converting Virtual Machines 15
  - Configuring Virtual Machines 15
  - Converting and Exporting Virtual Appliances 15
- Managing Tasks 15
- New in Converter 3.0.3 16

2 System Requirements 17
- Application Requirements 17
- Memory Requirements for Cold Cloning 18
- Virtual Machine and System Image Requirements 19
- Restoring VCB Images in Converter 20
- Supported Destinations 21
- Configuring Permissions for VirtualCenter Users 21
- Level of Internationalization Support 21
- How Converting Affects Settings 22
- Changes to Virtual Hardware 22
- TCP/IP Port Requirements 23
- Remote Hot Cloning Troubleshooting Tips 23
  - Common Requirements for Windows Operating Systems 23

3 Installing and Uninstalling 25
- Installing Converter 25
- Uninstalling, Modifying, or Repairing 26
- Installing Converter to Run in Install-Less Mode 27
- Adding or Changing an Enterprise License 27
- Performing a Scripted Install 27

4 Converting Machines 29
- Selecting a Conversion Procedure 29
  - Converting in Install-Less Mode 30
  - Creating a Separate Disk for Each Volume 30
  - Virtual Appliance Overview 30
- Start the Wizard for a Conversion 32
- Select a Source 32
  - Select a Physical Machine Source 32
  - Select a VMware Infrastructure Virtual Machine Source 33

Select a Virtual Appliance Source 34
Select a Standalone Virtual Machine or Backup Image Source 35
Choose a Destination for the New Virtual Machine 36
Choose an ESX Server Managed by VirtualCenter Destination 36
Choose an ESX Server Virtual Machine Destination 37
Choose an OVF Virtual Appliance Destination 38
Choose a Standalone Virtual Machine Destination 39
Choose a Workstation Virtual Machine Destination 40
Customize a New Virtual Machine's Guest Operating System 40
Install VMware Tools 41
Customize the Identity of the New Virtual Machine 41
Remove System Restore Checkpoints 42
Complete the Conversion Task Creation 42

5 Using the Converter Boot CD for Local Cold Cloning 45
Cold Cloning and the Converter Boot CD 45
Start the Wizard for a Conversion 45
Select Source Data 46
Choosing a Destination for a New Virtual Machine 47
Unsupported Clusters 47
Choose a VirtualCenter Server Virtual Machine Destination 47
Choose an ESX Server Virtual Machine Destination 48
Choose a Standalone Virtual Machine Destination 48
Customize a New Virtual Machine's Guest Operating System 49
Install VMware Tools 49
Customize the Identity of the New Virtual Machine 50
Remove System Restore Checkpoints 51
Complete the Convert Task Creation 51
Using peTool to Modify the Converter Boot CD 52

6 Configuring VMware Virtual Machines 55
Starting Configuration 55
Select a VMware Infrastructure Virtual Machine as Source 55
Select a Standalone Virtual Machine as the Source 56
Customizing a New Virtual Machine's Guest Operating System 56
Complete the Configuration 58

7 Managing Tasks 59
Multiple Tasks 59
Task View 59
Task List 59
Toolbar 60
Details View 61
Summary Tab 61
Task Progress Tab 61
Starting and Canceling Tasks 61
Force a Queued Task to Run 62
Cancel a Task 62
Delete a Task 62
Looking at Progress and the Logs 62
View a Task's Progress 62
Export and View the Log 63
Editing Tasks 63
Edit a Task 63

Edit a Failed Task 64
Managing How Tasks Run 64
Control the Number of Tasks Running Concurrently 64
Change the Run Order 64
Change the Number of Tasks Displayed in the Task List 65
Change Which Tasks Are Displayed in the Task List 65

Appendix: Migration with p2vTool Command-Line Interface 67
Using the Experimental p2vTool Command-Line Interface 67
Syntax and Options 67
Source Machines and Destination Machines 69
Restoring VCB Images 69
Migration XML Input File Examples 70
-q [--query] Option XML Output File Example 74
VCB Restore XML Input File Examples 75
OVF XML Output File Examples 76

Glossary 79

Index 85

About This Book

This book, the *VMware Converter User's Manual*, provides information about installing and using VMware™ Converter.

Intended Audience

This book is intended for anyone who needs to install, upgrade, or use VMware Converter. VMware Converter users typically include people who do software development and testing or work with multiple operating systems or computing environments: software developers, QA engineers, trainers, salespeople who run demos, and anyone who wants to create virtual machines. Another set of users includes anyone who needs to non-intrusively copy and transform physical systems into VMware virtual machines, either locally or remotely.

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1 Introduction

VMware Converter provides a scalable solution to migrate physical to virtual and virtual to virtual machines. Converter is optimized for mass migrations, but is equally effective for single-machine conversions. Converter imports virtual machines faster, with fewer manual steps required, and fewer source hardware limitations than other methods. With its ability to hot clone, Converter can convert a virtual machine with no downtime on its source physical machine.

Converter combines and expands the functionality available in VMware P2V Assistant and Virtual Machine Importer. It eases interoperability among VMware hosted products (VMware Workstation, VMware ACE, VMware Fusion, VMware Server, and VMware Player), VMware VirtualCenter- managed ESX Server 3.x and 2.5.x, and unmanaged VMware ESX Server 3.x, and VMware ESX Server 3i Installable and VMware ESX Server 3i Embedded. It also restores VMware Consolidated Backup (VCB) images into VMware virtual machines.

This chapter includes the following sections:

- "Migration with VMware Converter" on page 9
- "Cloning and System Reconfiguration of Physical Machines" on page 11
- "Migrating Existing Virtual Machines and System Images" on page 15
- "Managing Tasks" on page 15
- "New in Converter 3.0.3" on page 16

Migration with VMware Converter

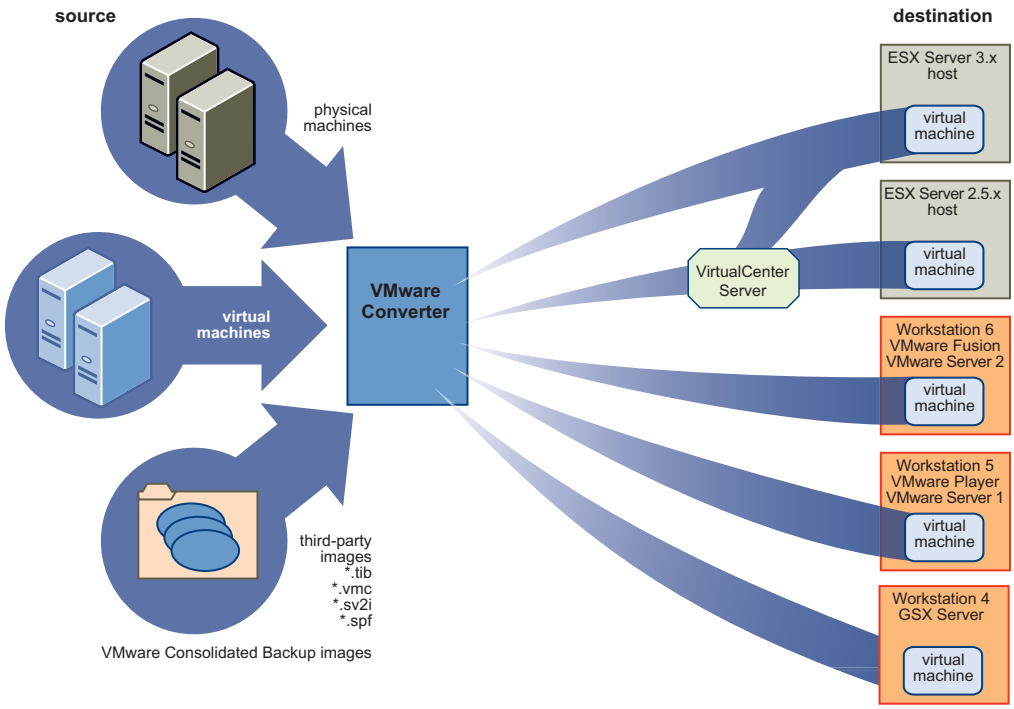
With VMware Converter, you convert virtual machines from different source formats into one of several VMware product destinations. Use the application to accomplish the following tasks:

- Convert physical machines for use across different VMware product formats.
- Convert virtual machines for use across different VMware product formats.
- Move virtual machines across different VMware product platforms.
- Import and export of virtual appliances from a local file system or download them from a URL
- Create VMware virtual machines from VCB images.
- Create VMware virtual machines from third-party formats.
- Reduce the time needed to populate new virtual machine environments.
- Migrate legacy servers to new hardware with no need to reinstall operating systems or application software.
- Perform migrations across heterogeneous hardware.
- Proactively readjust disk sizes, types, and partitions to maximize utilization of storage resources.

- Place volumes on separate disks and migrate the disks across independent datastores.
- Start and manage multiple concurrent migrations.
- View audit trails.

Figure 1-1 illustrates how VMware Converter creates and migrates VMware ready virtual machines from a broad range of sources.

Figure 1-1. VMware Converter Source and Destination Machines



VMware Converter Editions

VMware Converter comes in two editions, Starter and Enterprise.

Table 1-1. Starter and Enterprise Editions Features

	VMware Converter Starter	VMware Converter Enterprise
Environment	Designed for single migrations to VMware products such as VMware Infrastructure 3, VMware Player, VMware Workstation, and VMware Server.	Designed for multiple concurrent migrations to VMware Infrastructure 3 and hosted products.
License	Free download.	Licensed as a part of a support and subscription contract with the VMware VirtualCenter server.
Cloning	Local hot cloning to hosted products (Workstation, VMware Player, GSX Server, VMware Server) and ESX Server. Remote hot cloning to hosted products only.	Local hot cloning to hosted products and ESX Server. Remote hot cloning to hosted products and ESX Server. Local cold cloning (VMware Converter Boot CD) to hosted products and ESX Server.
Job Management	Single migration at a time. Set up and schedule a conversion.	Multiple, concurrent migrations. Set up and schedule a conversion.

Cloning and System Reconfiguration of Physical Machines

Cloning is the process of creating a cloned disk, where the cloned disk is a virtual disk that is an exact copy of the source physical disk. This involves copying the data on a physical source machine's hard disk and transferring that data to a target virtual disk (the new cloned disk).

System reconfiguration is the process of adjusting the migrated operating system to enable it to function on virtual hardware. This adjustment is performed on the target virtual disk after cloning and enables the target virtual disk to function as a bootable system disk in a virtual machine.

Converter creates a new VMware virtual machine based on a source physical machine. The migration process is nondestructive, so you can continue to use the original source machine. However, to run a converted VMware virtual machine on the same network as the source physical machine, you must modify the network name and IP address on one of the machines, so the physical and virtual machines can coexist.

NOTE You cannot move OEM media between physical machines. The license is attached to the server when purchased from the OEM and cannot be reassigned. Only retail and volume Licenses can be reassigned to new physical servers. If you migrate an OEM image, you need a Windows Server Enterprise or Datacenter Edition license on the ESX Server to run multiple virtual machines.

Hot and Cold Cloning

Converter supports hot cloning and cold cloning. *Hot cloning*, also called live cloning or online cloning, entails cloning the source machine while it is running its operating system. *Cold cloning*, also called offline cloning, entails cloning the source machine when it is not running its operating system. In cold cloning, the user reboots the source machine from a CD that has its own operating system, from which the VMware Converter application runs. Cold cloning leaves no footprint on the source machine.

NOTE When hot cloning dual boot systems, you can clone only the default operating system to which `boot.ini` points. To clone the nondefault operating system, change `boot.ini` to point to the other operating system and reboot. After you are booted into the other operating system, you can install Converter and hot clone it.

Local and Remote Cloning

For *local cloning,* migration is performed with Converter running on the source machine. With *remote cloning*, the source machine can be accessed without having to physically touch it, as long as it is running.

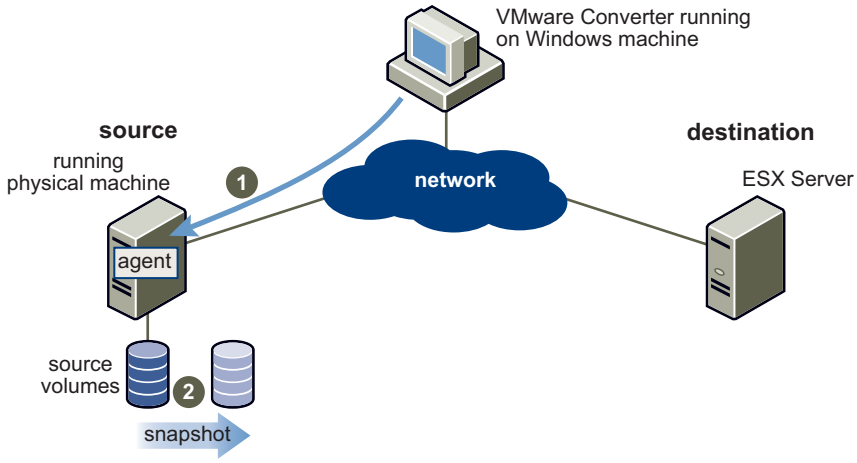
Remote Hot Cloning Workflow

The following workflow is an example of *hot* cloning, in which the physical machine being cloned experiences no downtime. You use the Converter wizard to set up a migration task and VMware Converter automatically performs all of the cloning tasks.

Remote Hot Cloning of a Physical Machine

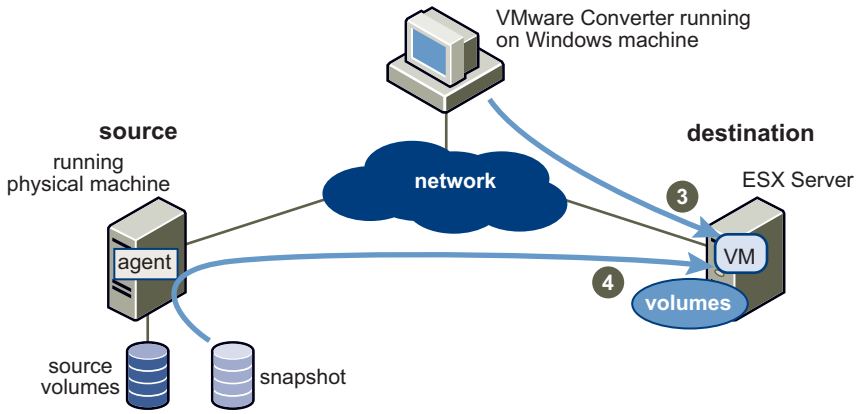
1 Converter prepares the source machine for a conversion.

Converter installs the agent on the source machine and the agent takes a snapshot of the source volumes.



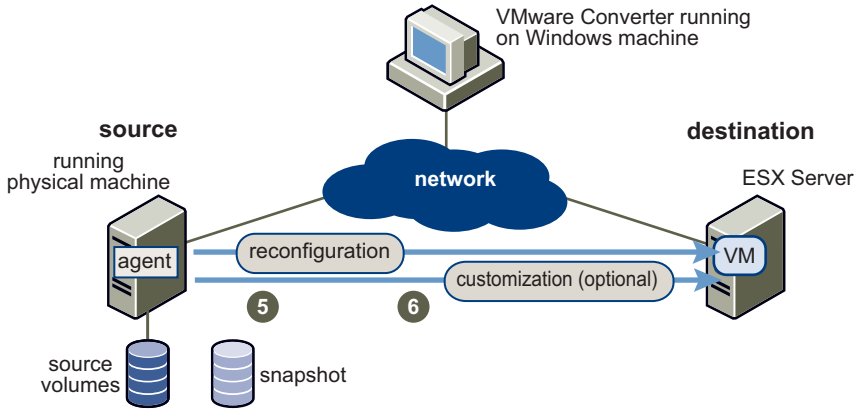
2 Converter prepares the virtual machine on the destination machine.

Converter creates a virtual machine on the destination machine and the agent copies volumes from the source machine to the destination machine.

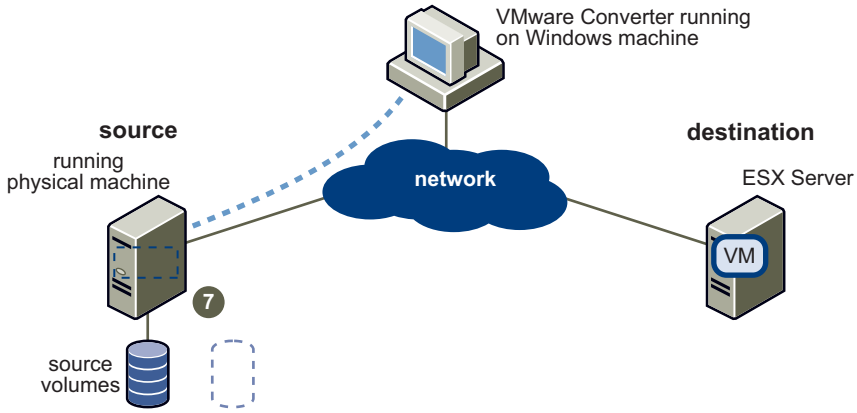


3 Converter completes the conversion process.

The agent installs the required drivers to allow the operating system to boot in a virtual machine and personalizes the virtual machine (for example, changing the IP information).



4 Converter removes all traces from the source machine.



The virtual machine is ready to run on the destination machine.

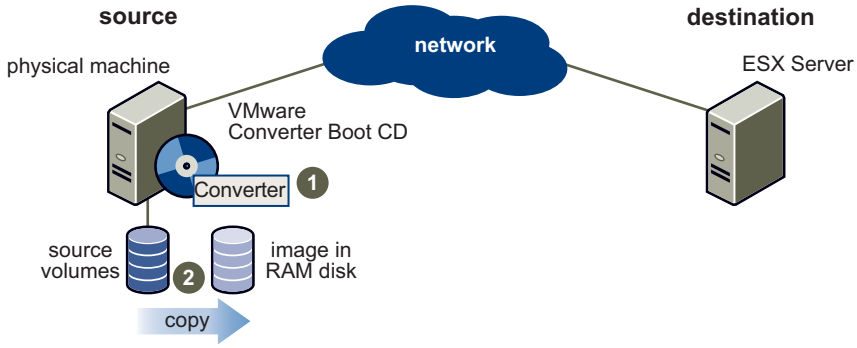
Local Cold Cloning Workflow

The following workflow is an example of *cold* cloning, in which you clone the source machine when it is not running its operating system. You set up a migration by using the Converter wizard available on the Converter Boot CD. After you boot the Converter Boot CD and use the application on it to direct the course of the migration, Converter automatically performs all of the cloning tasks until rebooting the source machine to return to its original operating system.

Local Cold Cloning of a Physical Machine

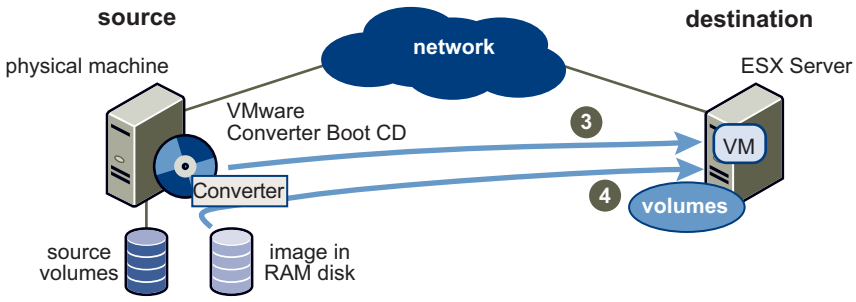
1 Converter prepares the source machine image.

Boot the source machine from the VMware Converter Boot CD and use Converter to define and start the migration. Converter copies the source volumes into a RAM disk.



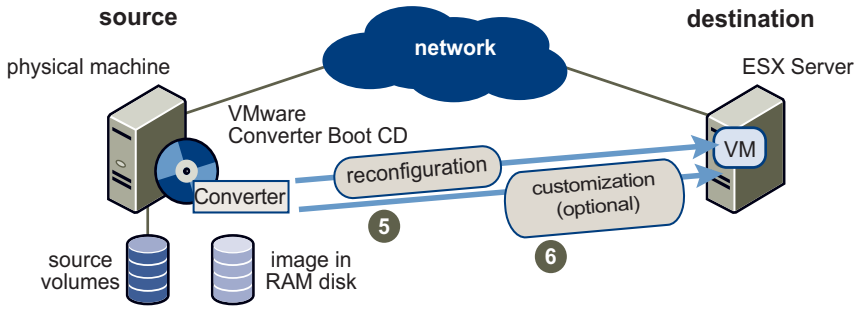
2 Converter prepares the virtual machine on the destination machine.

Converter creates a virtual machine on the destination machine and copies volumes from the source machine to the destination machine.



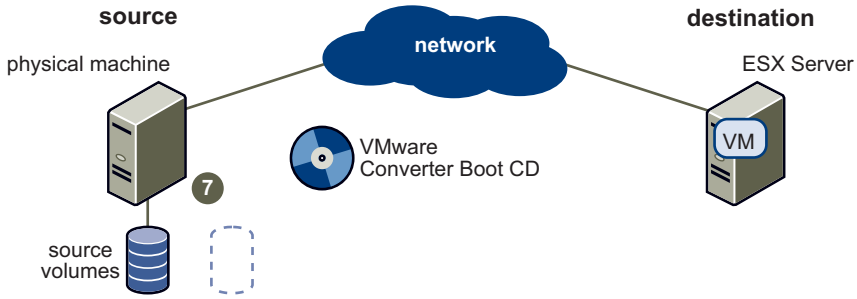
3 Converter completes the conversion process.

Converter installs the required drivers to allow the operating system to boot in a virtual machine and personalizes the virtual machine (for example, changing the IP information).



4 Converter cleans up.

Remove the Boot CD and reboot the source physical machine to return it to its own operating system.



The virtual machine is ready to run on the destination machine

Cloning Modes

Converter implements two cloning modes: disk-based cloning and volume-based cloning.

Volume-Based Cloning

Converter supports volume-based cloning for hot and cold cloning and for importation of existing virtual machines.

In volume-based cloning, all volumes in the destination virtual machine are basic volumes, regardless of the type in the corresponding source volume. File-level or block-level volume-based cloning is performed, depending on your size selections:

- **Volume-based file-level cloning** – Performed when any size smaller than the original is selected.
- **Volume-based block-level cloning** – Performed when the volume size is maintained or extended.

Depending on the cloning mode, some types of source volumes might not be supported as follows:

- Cold cloning (Converter Boot CD) supports all types of dynamic volumes, but doesn't support Windows NT 4 fault-tolerant volumes. Windows NT 4 with mirrored volumes is supported.
- Virtual machine importing supports basic volumes and all types of dynamic volumes except RAID. It doesn't support Windows NT 4 fault-tolerant volumes. Windows NT 4 with mirrored volumes is supported. Only master boot record (MBR) disks are supported. GUID partition table (GPT) disks are not supported.
- Hot cloning supports all types of source volumes recognized by Windows, except Windows NT 4 fault-tolerant volumes. Windows NT 4 with mirrored volumes is supported.

Disk-Based Cloning

Converter supports disk-based cloning for cold cloning and for importation of existing virtual machines. Disk-based cloning transfers all sectors from all disks, preserving all volume metadata. The destination virtual machine receives the same volumes, of the same type as those of the source virtual machine. Disk-based cloning supports all types of basic and dynamic disks.

Migrating Existing Virtual Machines and System Images

With Converter, you can move virtual machines between hosted products (products that run as applications on physical machines with operating systems) and managed products (bare-metal VMware products that provide a thin software layer (the hypervisor) that enables them to run directly on the physical machine).

Converting Virtual Machines

Converter lets you move VMware virtual machines between Workstation, VMware Player, VMware ACE, VMware Fusion, ESX Server, ESX Server 3i Embedded, ESX Server 3i Installable, GSX Server, and VMware Server. It also imports virtual machines from Microsoft Virtual Server and Virtual PC.

Configuring Virtual Machines

For VMware virtual machines whose disks are populated by restoring from a backup of a physical host or by some other direct means of copying, Converter prepares the image to run on VMware virtual hardware.

Converting and Exporting Virtual Appliances

Converter supports converting and exporting virtual appliances stored in Open Virtual Machine Format (OVF and OVA). You can import a virtual appliance to run in an existing ESX Server or Workstation virtual machine, or you can export an existing VMware virtual machine to an OVF virtual appliance to share over the network.

Managing Tasks

Converter provides a task manager to manage migrations for a single conversion or for multiple, concurrent conversions. After you create a task by using the Converter wizard to set up how you want to import a machine, use the Task View of the manager to do the following:

- Start or stop a conversion.
- Change the run order.
- Force a queued task to run.
- Control the number of jobs running simultaneously.
- Filter the view of what tasks are displayed.
- Edit a task.
- View a task's progress.
- Cancel a task.
- Edit and restart a failed task.
- Delete a task.
- View an audit trail.

New in Converter 3.0.3

This release supports the following:

- Microsoft Vista 32-bit and 64-bit operating systems
- Virtual appliances in OVF version 0.9
- Migration of volumes across independent datastores

System Requirements 2

This chapter describes the requirements to be fulfilled before operating Converter and describes the compatibilities and interoperabilities among the systems on which and with which it works.

The chapter includes the following sections:

- "Application Requirements" on page 17
- "Memory Requirements for Cold Cloning" on page 18
- "Virtual Machine and System Image Requirements" on page 19
- "Restoring VCB Images in Converter" on page 20
- "Supported Destinations" on page 21
- "Configuring Permissions for VirtualCenter Users" on page 21
- "Level of Internationalization Support" on page 21
- "How Converting Affects Settings" on page 22
- "Changes to Virtual Hardware" on page 22
- "TCP/IP Port Requirements" on page 23
- "Remote Hot Cloning Troubleshooting Tips" on page 23

Application Requirements

Converter and its agent run on the following Microsoft Windows operating systems:

- Windows NT SP6+ (with Internet Explorer 5 or higher)
- Windows 2000
- Windows 2003 32-bit and 64-bit
- Windows XP Professional 32-bit and 64-bit
- Windows Vista 32-bit and 64-bit

Converter can run in virtual machines that use the listed operating systems as guest operating systems.

The VMware Converter Boot CD runs on its own copy of Windows Preinstallation Environment (WinPE).

NOTE Although Converter operates on Windows only, after the migration, you can transfer the virtual machine to the VMware supported host platform of your choice.

To configure virtual machines on Windows 2000 and Windows NT, the operating system must be Windows 2000 or Windows NT, as shown in Table 2-1. Although Converter allows conversion of a source image with a later operating system version when running on these systems, (for example, conversion of a Windows XP source to a Windows 2000 host), Converter cannot reconfigure the images. Similarly, when exporting to an OVF virtual appliance, Converter cannot reconfigure the source image.

Table 2-1. Operating System Compatibility

	Compatible OS on the System Running Converter				
Source Machine OS	**Windows NT Server**	**Windows 2000**	**Windows XP**	**Windows 2003**	**Windows Vista**
Windows NT Server	X	X	X	X	X
Windows 2000		X	X	X	X
Windows XP			X	X	X
Windows 2003			X	X	X
Windows Vista			X	X	X

Converter has the following space requirements for installation:

Installation Component	Value
Installer size	30.1MB
Installed files	65MB
Minimum boot drive requirement (if installed on boot drive)	120MB
Minimum boot drive requirement (if installed on another drive)	105MB

Memory Requirements for Cold Cloning

For cold cloning with the Converter Boot CD, the source physical machine must have at least 264MB of memory. VMware recommends 364MB of memory. Table 2-2 shows the limitations placed on cold cloning if you use less than the recommended memory requirement.

Table 2-2. Boot CD Cold Cloning Memory Requirements

Source Physical Machine Memory	Converter Boot CD
Less than 264MB	Cannot perform a cold clone.
Greater than or equal to 264MB but less than 296MB	Can perform a cold clone, but cannot use a RAM disk.
Greater than or equal to 296MB but less than 364MB	Can perform a cold clone with a RAM disk, although using network share is suggested. The RAM disk size is memory minus 264MB.
Greater than or equal to 364MB	Can perform a cold clone with a RAM disk. The RAM disk size is memory minus 264MB, up to a limit of 124MB.

For a cold clone, the VMware Converter Boot CD can be started from, and clone, machines with storage controllers and network adapters that Microsoft lists as supported in Windows 2003. With this requirement met, Converter can clone machines running operating systems noted in the Application Requirements section.

Virtual Machine and System Image Requirements

Converter can convert the following virtual machine types:

- Workstation 6.x, Workstation 5.x, and Workstation 4.x
- VMware Fusion 1.x
- ESX Server 3.x
- ESX Server 3i version 3.5 Installable and ESX Server 3i version 3.5 Embedded
- ESX Server 2.5.x (if the server is managed with VirtualCenter 2.x)
- GSX Server 3.x
- VMware Server 1.x,
- VirtualCenter 2.x
- Microsoft Virtual PC version 7 and later
- Any version of Microsoft Virtual Server

Converter can convert the following virtual machine types to OVF or OVA virtual appliances:

- ESX Server or a virtual machine that is managed by VirtualCenter
- Workstation

Converter can convert the following system image types:

- VCB
- Acronis True Image 9
- Symantec Backup Exec System Recovery (formerly LiveState Recovery) 6.5 and 7.0, LiveState Recovery 3.0 and 6.0, and Norton Ghost version 9.0, 10.0, and 12.0 (`.sv2i` files)
- StorageCraft ShadowProtect

Requirements:

- Virtual machines must be powered off before you convert them. You cannot convert suspended virtual machines.
- Virtual machines from Macintosh versions of Virtual PC are not supported.
- The operating system on the source Virtual PC or Virtual Server virtual machine must be a Windows guest operating system supported by the intended VMware platform (for example, Workstation 5 or 6). See the *Guest Operating System Installation Guide* for a list of supported operating systems.

  Converter supports Virtual PC and Virtual Server virtual machines with most Windows operating systems earlier than Windows NT 4.0 and with non-Windows operating systems (for example, Linux and DOS) for cloning only. Converter does not support configuring for these systems.
- Converter can convert ShadowProtect and Backup Exec System Recovery images, with the following limitations:
  - Dynamic disks are not supported.
  - All images for the backup of a machine must be in a single folder with no other images placed there.
  - For volume-based cloning, all volumes in the disk up to the active and system volumes must be backed up. For example, if a disk has four partitions, 1–4, with partition 2 as the active volume and partition 3 as the system volume, the backup must include 1 through 3.
  - For incremental images, up to 16 incremental backups are supported.
  - Images of systems with logical drives are not supported if the logical drive is also a system or active volume (ShadowProtect only).

Restoring VCB Images in Converter

VCB enables you to back up entire ESX Server virtual machines, storing the backup by using Workstation disks, a `.vmx` file, and a catalog file. Converter can restore VCB images into ESX Servers, and convert them into VMware standalone virtual machines.

Converter supports restoring VCB images of any guest operating system type. For the operating systems listed in "Application Requirements" on page 17, Converter enables you to select and resize volumes and customize the identity for the restored virtual machine. For all other guest operating systems, Converter supports only restoring the disks.

Converter does not maintain the .nvram file, nor the VMware log files. Only disks are preserved.

Converter does not read the original location settings from the catalog file. To restore to the same location, find information such as datastore, host name, folder name, and resource pool in the catalog file and enter it in the Conversion wizard. In addition, Converter does not read the original display name from the catalog file. If you want to use the same name and don't remember it, you can look it up in the catalog file. You can read the catalog file as a plain text file.

Information Not Preserved When Using Converter for Managed Product Destinations

When restoring images for managed product destinations (ESX Servers, for example), Converter does not preserve certain hardware backing information from the original image, but rather substitutes default settings. These are the affected areas:

- **CD-ROM** – Defaults to device type: host device.
- **Floppy** – Defaults to device type: host device.
- **Network adapters** – Defaults to the list of network adapters in the GUI. The MAC address is not preserved. It is regenerated by the destination host.
- **Serial port** – Defaults to physical serial port on destination host machine.
- **Parallel port** – Defaults to physical parallel port on destination host machine.

When restoring images, the Converter GUI does not preserve certain other virtual machine properties from the original image, but substitutes default settings. The affected areas are

- **UUID** – The virtual machine's BIOS and location, identified by `uuid.bios` and `uuid.location`, are not preserved, but regenerated by the host machine.
- **Disk resource allocation** – Defaults to the values available on the host when the virtual machine is created.

Information Not Preserved for Hosted Product Destinations

When importing a VCB image to a hosted product destination (Workstation, for example), Converter cannot guarantee that virtual machine properties can be preserved. This is because Converter handles this as a normal migration, not a restore.

For more information about VCB images, see the *Virtual Machine Backup Guide*.

Supported Destinations

Converter can create virtual machines that are compatible with the following:

- Workstation 6.x, Workstation 5.x, and Workstation 4.x
- VMware Fusion 1.x
- VMware ACE 2.x and VMware ACE 1.x
- VMware Player 2.x and VMware Player 1.x
- ESX Server 3.x
- ESX Server 3i Installable and ESX Server 3i Embedded
- ESX Server 2.5.x (support only by importing through a VirtualCenter 2.x server that manages ESX Server)
- GSX Server 3.x
- VMware Server 1.x
- VirtualCenter 2.x
- OVF and OVA virtual appliances

NOTE Workstation 4 virtual machines are compatible with VMware GSX Server 3.0, ESX Server 2.x, and ACE 1.x.

Configuring Permissions for VirtualCenter Users

To convert virtual machines to VirtualCenter with Converter, you must have the following VirtualCenter permissions set at the datacenter level:

- **Datastore** > **Browse Datastore**
- **Virtual Machine** > **Inventory and Virtual Machine** > **Configuration**
- **Virtual Machine** > **Interaction** > **Power On** (needed only if you choose to power on the target virtual machine after conversion)
- **Virtual Machine** > **Provisioning** > **Allow Disk Access**
- **Resource** > **Assign Virtual Machine To Resource Pool**

For more information about setting permissions, see the *VMware Infrastructure 3 Quick Start Guide.*

Level of Internationalization Support

Converter is not fully internationalization compliant. Certain migrations have some requirements for using English ASCII in various entries, as shown in Table 2-3.

Table 2-3. Internationalization Compliance in GUI Data Entry

Source	Destination	Internationalization Limits
Physical machine (local or remote clone, hot or cold clone)	ESX Server or VirtualCenter virtual machine	English ASCII destination virtual machine name
	Standalone virtual machine	English ASCII virtual machine name English ASCII destination path
Standalone virtual machine	ESX Server or VirtualCenter virtual machine	English ASCII destination virtual machine name
	Standalone virtual machine	English ASCII destination path English ASCII destination virtual machine name

Table 2-3. Internationalization Compliance in GUI Data Entry (Continued)

Source	Destination	Internationalization Limits
ESX Server or VirtualCenter virtual machine	ESX Server or VirtualCenter virtual machine	English ASCII destination virtual machine name
	Standalone virtual machine	English ASCII destination path English ASCII destination virtual machine name

Standalone virtual machines include VMware Workstation, VCB, Acronis True Image 9, Microsoft Virtual PC and Virtual Server, and Symantec Backup Exec Server Recovery (formerly LiveState Recovery) 6.5 and 7.0, LiveState Recovery 3.0 and 6.0, and Norton Ghost 9, 10, and 12 (.sv2i only) images.

NOTE In Converter, Sysprep and hot fix paths are limited to English ASCII characters.

How Converting Affects Settings

The VMware virtual machine created by the Converter contains an exact copy of the disk state from your source physical machine, virtual machine, or system image, with the exception of some hardware-dependent drivers (and sometimes the mapped drive letters). The following settings from the source computer remain identical:

- Operating system configuration (computer name, security ID, user accounts, profiles, preferences, and so forth)
- Applications and data files
- Each disk partition's volume serial number

Because the target and the source virtual machines or system images have the same identities (name, SID, and so on), running both on the same network can result in conflicts. To redeploy the source virtual machine or system image, ensure that you do not run both the source and target images or virtual machines on the same network at the same time.

For example, if you use Converter to test the viability of running a Virtual PC virtual machine as a VMware virtual machine without first decommissioning the original Virtual PC machine, you must resolve the duplicate ID problem. You can resolve this problem by using the optional customization step in the Converter wizard.

Changes to Virtual Hardware

Most migrated applications function correctly in the VMware virtual machine because their configuration and data files have the same location as the source virtual machine. However, applications might not work if they depend on specific characteristics of the underlying hardware such as the serial number or the device manufacturer.

When troubleshooting after virtual machine migration, be aware that the following hardware changes might occur:

- CPU model and serial numbers (if activated) can be different after the migration. They correspond to the physical computer hosting the VMware virtual machine.
- Ethernet adapter can be different (AMD PCNet or VMXnet) with a different MAC address. Each interface IP address must be individually reconfigured.
- Graphics card can be different (VMware SVGA card).
- The number of disks and partitions remains the same, but each disk device can have a different model and different manufacturer strings.

- Primary disk controllers can be different from the source machine's controllers.
- Applications might not work if they depend on devices that are not available from within a virtual machine.

TCP/IP Port Requirements

Table 2-4 lists the ports Converter uses in the conversion process.

Table 2-4. Converter Port Requirements

Communication Path	Port
Converter application to remote physical machine	445, 139
Converter application to a VirtualCenter server	443
Converter application to ESX Server 3.x	443
Physical machine to a VirtualCenter server	443
Physical machine to ESX Server 3.x	443, 902

Remote Hot Cloning Troubleshooting Tips

The following information can help you avoid issues related to permissions and network access when performing hot cloning.

Common Requirements for Windows Operating Systems

To ensure successful remote hot cloning of Windows platforms, make the following checks on the source machine before you launch the application:

- Ensure that Simple File Sharing is turned off.
- Ensure that file and printer sharing is not blocked by Windows Firewall.

Turning off Simple File Sharing on Windows Platforms

To control permissions for individual users, you must turn off Simple File Sharing. However, turning Simple File Sharing off does not turn off the Shared Documents feature. Use the Simple File Sharing UI, located in the folder's properties, to configure both share and file permissions.

Table 2-5 shows the Simple File Sharing behavior for specific Windows operating systems.

Table 2-5. Simple File Sharing Behavior

Operating System	File Sharing
Windows XP Professional operating systems joined to a work group	Simple File Sharing UI is turned on by default.
Windows XP Professional operating systems joined to a domain	Uses the classic file sharing and security interface only.

To turn off Simple File Sharing in Windows XP Professional

1 Choose **Start** > **Settings** > **Control Panel** > **Folder Options**.

2 In the Folder Options page, click the **View** tab and deselect **Use Simple File Sharing (Recommended)**.

For additional information about turning simple file sharing on or off, see the Microsoft TechNet Web site.

Ensure that File and Printer Sharing is not Blocked by Windows Firewall

If Converter fails to connect to a remote Windows XP machine and issues a `bad username/password` error message, ensure that file and printer sharing is not blocked by Windows Firewall.

To check the Windows Firewall blocks

1 Choose **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Local Security Policy**.

2 On the Local Security Settings page, select **Network access: Sharing and Security model for local accounts.**

3 Make sure that **Classic – local users authenticate as themselves** is selected.

For troubleshooting information about file and printer sharing, see the Microsoft TechNet Web site.

Installing and Uninstalling 3

This chapter describes the basic steps for installing and uninstalling Converter, for both the Starter and Enterprise editions.

This chapter includes the following sections:

- "Installing Converter" on page 25
- "Uninstalling, Modifying, or Repairing" on page 26
- "Installing Converter to Run in Install-Less Mode" on page 27
- "Adding or Changing an Enterprise License" on page 27
- "Performing a Scripted Install" on page 27

Installing Converter

You can install Converter onto a physical machine or virtual machine. The typical setup installs both Converter and its Converter agent. However, you can choose a custom installation to install one or the other component by itself.

To install Converter

1 Make sure the Converter system requirements are met.

See "System Requirements" on page 17.

2 Download the latest version of Converter from the VMware Web site.

3 Navigate to the folder that contains the installer file you downloaded and double-click the `VMware-converter-3.x.x-<xxxxx>.exe` file.

In this example, <xxxxx> is the name of the build. This file is on the application CD or in the local directory to which you downloaded the installer.

A Preparing to Install dialog box appears momentarily and the Converter Installation wizard opens with a Welcome page.

4 Click **Next**.

5 In the End-User License Agreement page, click **I accept the terms in the License Agreement** and click **Next**.

6 Select the location folder for Converter in the Destination Folder page and click **Next**.

The default location is `C:\Program Files\VMware\VMware Converter`. To install in another location, click **Change** and browse for the new location.

7 Select a **Typical** installation or **Custom** installation and click **Next**.

8 In the Custom Setup page, choose which components to install, either **Converter Manager** or **Converter Agent** or both, and click **Next**.

If you install both components, you can manage the import of physical or virtual machines to any authorized location.

Installing Converter Agent prepares the local physical machine for import. When used with the Converter Manager, it also enables the importation of the full range of machine types.

If you install only Converter Manager, you can use that machine to import only remote physical machines.

If you install only Converter Manager on a machine running Windows 2000 or Windows NT, the Custom Setup page in the installer warns you to reboot the system. However, this is unnecessary. You can ignore the warning.

9 On the Ready to Install the Program page, click **Install**.

Messages appear that indicate the progress of the installation.

If you click **Cancel** during the installation, the installed files are rolled back and the operating system is returned to its original state.

10 Choose whether to run Converter now.

The **Run VMware Converter now** check box is selected by default. To finish installation but not launch the application at this time, deselect the check box before clicking **Finish**.

If your system is running Windows 2000 or Windows NT and Converter agent is installed, you must restart your system before you can use Converter.

11 Click **Finish**.

Uninstalling, Modifying, or Repairing

In addition to using the Microsoft Windows Add or Remove Programs utility from the control page to uninstall Converter, you can use the VMware Converter installer wizard.

The installer wizard has the additional capability to allow you to modify or repair VMware Converter.

To uninstall, modify, or repair

1 To start the VMware Converter installer, go to the folder that contains the installer file and double-click the `VMware-converter-3.x.x-<xxxxx>.exe` file.

In this example, `<xxxxx>` is the name of the build. This file is on the Application CD or in the local directory to which you downloaded the installer.

The Converter installation wizard opens with a Welcome page.

2 Click **Next**.

3 In the Program Maintenance page, select **Modify**, **Repair**, or **Remove.**

- Select **Modify** to change the installed components of VMware Converter.

  This takes you to the Custom Setup page of the wizard where you can make changes. See "To install Converter" on page 25.

- Select **Repair** to have the wizard verify and reinstall any damaged components of the Converter.

  The Custom Setup or the Ready to Repair page appears without any mention of file deletion.

- Select **Remove** to uninstall VMware Converter.

  On the Ready to Remove page, you can remove all related files and registry entries created by VMware Converter and remove the license file for the Enterprise edition, if you have it.

4 Click **Next**.

When the wizard finishes removing or repairing the Converter, you might have to restart your system before you can use VMware Converter. If so, a dialog box appears.

Installing Converter to Run in Install-Less Mode

You can convert a running remote physical machine without having Converter installed on the machine from which you direct the migration. This is called "install-less mode." For this you have Converter Manager on a network share, mount it from the system from which you direct the migration, and run the executable file from there.

See "Converting in Install-Less Mode" on page 30.

Adding or Changing an Enterprise License

To use the Enterprise edition of Converter, you must add your license, which is with the support and subscription contract for the VirtualCenter Server.

To add an Enterprise license

1 Start the VMware Converter application.

2 In the main menu, choose **Administration** > **Licensing Information**.

3 Click **Add License** in the License Information dialog box.

4 In the browser, find and select the license file and click **Open**.

If the license is valid, the License Information dialog box shows the expiration date for the license.

5 Click **Close**.

To change an Enterprise license

1 Start the VMware Converter application.

2 Choose **Administration** > **Licensing Information** in the main menu.

3 Click **Change License** in the License Information dialog box.

4 In the browser, find and select the license file and click **Open**.

If the license is valid, the License Information dialog box shows the expiration date for the license.

5 Click **Close**.

Performing a Scripted Install

To perform a push install, install Converter by using the Deployment console. Two Converter jobs, "distribute P2V Installer" and "uninstall p2v," are set up as tasks under `Job:System Jobs:Config Jobs`.

Using **distribute p2v installer** starts `VMware-converter-3.x.x-<xxxxx>.exe` (where <xxxxx> is the name of the build). Use the options listed in Table 3-1.

Table 3-1. Scripted Install Command-Line Options

Option	Action
`INSTALLDIR=[path]`	Path to the installer.
`ADDLOCAL=[feature(,feature. . .)]`	Installs the listed features. For Converter, the options are `P2VGUI`, `P2VAgent`, and `ALL` (case sensitive).
`REBOOT=\"REALLYSUPPRESS\"`	If a reboot is required, it is suppressed.
`/qn`	Quiet, no UI.
`/q`	Quiet, with progress information, no user interaction.

Table 3-1. Scripted Install Command-Line Options (Continued)

Option	Action
`PROPERTY=[property value]`	Sets the value of property to `property value`.
`REMOTEINSTALL=1`	Prevents the installer from being upgraded.
`msiexec /quiet/uninstall {[uninstall key]}`	Uninstalls Converter, using the uninstall key for Converter found in the registry. To find the uninstall key, in RegEdit, use the path `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\ CurrentVersion\Uninstall`, choose the top key in the list and use the down arrow until the right pane shows the information for VMware Converter.
`msiexec ?`	Lists MSI commands.

Converting Machines 4

This chapter describes how to create a Converter task to convert physical machines, virtual machines, virtual appliances, and system images from a variety of sources into a variety of destinations using local and remote hot cloning.

This chapter includes the following sections:

- "Selecting a Conversion Procedure" on page 29
- "Start the Wizard for a Conversion" on page 32
- "Select a Source" on page 32
- "Choose a Destination for the New Virtual Machine" on page 36
- "Customize a New Virtual Machine's Guest Operating System" on page 40
- "Complete the Conversion Task Creation" on page 42

Selecting a Conversion Procedure

The procedure for your conversion can vary, depending on your virtual machine source and destination choices. The approach you take for creating your virtual machine is determined by the following factors:

- **The type of source you are converting** – A physical computer, a VMware Infrastructure virtual machine (ESX Server), a virtual appliance, or a standalone virtual machine.
- **The type of destination you are converting to** – ESX Server, ESX Server managed by VirtualCenter, a virtual appliance, or a VMware standalone virtual machine.

Standalone virtual machines include machines, such as Workstation, VMware Server, VCB, Acronis True Image 9, Microsoft Virtual PC and Virtual Server, Symantec Backup Exec Server Recovery (formerly LiveState Recovery) 6.5 and 7.0, LiveState Recovery 3.0 and 6.0, and Norton Ghost 9, 10, and 12 (.sv2i only) images.

The following types of disk conversion are available, depending on your source and destination machines:

- **Convert all disks and maintain size** – Choose this option to convert all disks unchanged. This is the only choice if the virtual machine you are converting has a Linux guest operating system.
- **Select volumes and resize to save or add space** – Choose this option to specify a specific size.
- **Create a separate disk for each volume** – Choose this option to create a separate disk for each volume. (The active and system volumes are not separated if they reside on the same disk.) Then you can migrate disks across independent datastores.

When you export a virtual appliance, you must select all disks for a conversion and maintain the size of all the disks on the target machine.

Converting in Install-Less Mode

Install-less mode entails converting a running remote physical computer without installing the VMware Converter manager onto the machine from which you are initiating the migration. To run in install-less mode, temporarily install the Converter Manager on a machine and copy the files in the install directory to a network share. After this you can mount the network share from another machine and run the executable without having to install it on that particular machine.

After starting the Converter Manager from the mounted network share, follow the procedures for converting a remote physical computer as source.

Creating a Separate Disk for Each Volume

To ease storage management, Converter provides the option on the Source Data page to migrate all volumes except the active and system volumes to separate disks. Converting individual volumes to corresponding virtual disks and placing the individual disks across separate datastores gives you more direct control over storage limitations.

The option to create a separate disk for each volume is available for all sources, except OVF source images. The destination can be a VMware Infrastructure (ESX Server or ESX Server managed by VirtualCenter) or a hosted destination (Workstation). For hosted destinations, all disks are stored in the same location.

If you select **Create a separate disk for each volume,** on the Advanced Datastore page the new disks are displayed in the order in which the volumes on the Source Data page are displayed. The active and system disks are always listed first and can be on the same or on different disks, depending on their original configuration. To verify the new disk to which a volume is assigned, compare the new size for each volume on the Source Data page with the disk size on the Datastore page.

To migrate volumes across independent datastores on VMware Infrastructure virtual machines

1 On the Source Data page, select the volumes to convert and specify their size.

2 Select **Create a separate disk for each volume** and click **Next.**

3 Type the IP address of the VirtualCenter server or the host where you want to store your virtual machine.

4 Log in as administrator, enter your administrator password, and click **Next**.

5 Type a name for the new machine, select the folder location for the new machine, and click **Next**.

6 On the Host or Cluster page, select a host, cluster, or resource pool from which the virtual machine is to run and click **Next**.

7 On the Advanced Datastore page, select the appropriate datastore for storing each disk and click **Next.**

Virtual Appliance Overview

Converter supports installing and creating virtual appliances stored in OVF version 0.9. An appliance is a preconfigured virtual machine that typically includes a preinstalled guest operating system and other software. Importing virtual appliances allows you to add preconfigured virtual machines to your VirtualCenter, ESX Server, or Workstation inventory.

Importing a virtual appliance is similar to deploying a virtual machine from a template. However, you can import a virtual appliance from any local file system accessible from the source machine or from a remote Web server. Local file systems can include local disks (such as C:), removable media (such as CDs or USB key chain drives), and shared network drives.

OVF is not a bootable format. Therefore, you cannot boot the file in a virtualization platform in its current state. You must import the appliance to either a hosted or managed destination to boot it.

In addition to importing virtual appliances with Converter, you can also import OVF virtual appliances to ESX Server or a VirtualCenter server by using VI client 2.5.

Every OVF virtual appliance contains an .ovf file with metadata that describes the virtual appliance. An OVF virtual appliance can be packaged as an .ova file where the .ova file is a tarred file that contains all the files in the OVF virtual appliance.

Importing Virtual Appliances

You can import virtual appliances to ESX Server or ESX Server managed by VirtualCenter or to Workstation standalone images.

- If you select a virtual appliance to install from a URL, the files are downloaded through HTTP then cloned to their eventual destination.
- If license agreements are packaged with the appliance, the End User License Agreement (EULA) page appears.
- Importing a single .ova file provides a way to download the virtual appliance in a single tarred file and is recommended for physical media distribution.
- URL downloads are supported for virtual appliances that contain files less than 2GB.
- For all virtual appliances, the `.ovf` file is first parsed before the rest of the package to identify the remaining files in the package and to ensure that the package can be imported. If the package cannot be imported, the download process stops.

Creating Virtual Appliances

When you create a virtual appliance during the export process, you can include the following information in the virtual appliance:

- Converter generates default metadata for the .ovf file that provides information about the virtual appliance. You can edit the existing metadata.
- When you create a virtual appliance during the export process, you can determine which licenses to include.
- Converter provides the option to create a manifest file, which is a text file that contains a SHAI digest of each of the files in the OVF package.
- Converter provides the additional option to package the OVF virtual appliance as an .ova file.
- You cannot perform reconfiguration or customization when you create an OVF virtual appliance. However, when you import a virtual appliance to a destination (either hosted or managed), reconfiguration is performed on the target virtual machine.

Unsupported Scenarios

The following scenarios are not supported:

- Selecting a subset of the volumes or resizing the volumes. You must select all volumes for an import and maintain the size of all the volumes on the target machine.
- Exporting from OVF to OVF. That is, when both source and destination are virtual appliances.
- Exporting physical machines or third-party backup images or virtual machine images to a virtual appliance.
- Exporting Windows 2000 virtual machines with scsiport.sys driver version 5.0.2195.7017 to a virtual appliance
- Exporting Windows NT 4 SMP virtual machines to a virtual appliance

Although Converter does not support the previous scenarios, in each case you can use Converter to first convert the source machine to a VMware virtual machine, then convert that machine to a virtual appliance.

Start the Wizard for a Conversion

To start the Conversion wizard, launch the VMware Converter application, click **Convert Machine** in the application menu, and click **Next.**

The Source page introduces the Table of Contents pane, displaying the three-step conversion process: "Step 1: Source," "Step 2: Destination," "Step 3: Customization."

The **Log Info** button on each wizard page extends the page to show the temporary Converter log files. Retrieve the log files as soon as needed. See "Export and View the Log" on page 63.

Select a Source

After you start the wizard, choose one of the following source machine types:

- **Physical computer** – Any computer on a network.
- **VMware Infrastructure Virtual Machine** – ESX Server or ESX Server managed by VirtualCenter.
- **Virtual Appliance** – An `.ovf` or `.ova` virtual appliance.
- **Other** – A standalone virtual machine or backup image, such as Workstation, VCB images, or third-party virtual machines or disk images.

Select a Physical Machine Source

Use this procedure if your source system is a local or remote physical computer. This procedure is also applicable if you are running in "install-less mode" and your source system is a remote physical computer.

If the machine is local, the Converter agent must be installed on it. You are prompted before starting the conversion.

To select the source physical computer and choose the disks to convert

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **Physical Computer** from the drop-down menu and click **Next**.

3 On the Source Login page, choose an action that corresponds to your machine type and click **Next**.

Machine Type	Action
Remote	Click **A remote machine** and type the name or IP address of the machine (or choose a machine from the drop-down menu). Type the DOMAIN\user name and password for the machine.
Local	Click **This local machine**. The authorization is set to the current user in this case and cannot be changed.

4 On the Source Data page, deselect any volumes you do not want to convert.

For hot cloning a physical computer, Converter enables volume-based cloning only. If you deselect the system volume or active volume, a warning appears before you go to the next page.

5 When performing volume-based cloning, select **Ignore page file and hibernation file** to exclude these files.

Because these files are not copied to the destination virtual machine, the machine is created with more free space. You can choose not to ignore these files.

6 Specify the volume size for each volume in the **New Disk Space** drop-down menus and click **Next**.

Option	Description
Maintain Size	Keeps the original size volume.
Min Size	Converts just the used portion from the volume, with a small amount of space added.
<Type Size in GB>	Enter a specific size in gigabytes.
<Type Size in MB>	Enter a specific size in megabytes.

7 (Optional) To convert individual volumes to corresponding virtual disks, select **Create a separate disk for each volume**.

Select a VMware Infrastructure Virtual Machine Source

Use this procedure if your source system is a virtual machine from ESX Server or ESX Server managed by VirtualCenter.

To select the source VMware Infrastructure virtual machine and choose the disks to convert

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **VMware Infrastructure Virtual Machine** in the drop-down menu and click **Next**.

3 On the Source Login page, specify the ESX Server or ESX Server managed by VirtualCenter containing the virtual machine you want to convert and enter your user name and password.

The **ESX /VC Server** drop-down menu is populated with the identifiers or locations of the last 10 systems accessed. Enter a new identifier.

Server	Action
ESX Server	Choose the virtual machine you want to convert from the list of those found on the ESX Server machine you accessed.
ESX Server managed by VirtualCenter	Specify the source for your virtual machine in the VirtualCenter virtual machine inventory browser and click **Next**. In the **View** drop-down menu, search the browser through one of two views of the inventory: the default **Hosts & Clusters** view or the **Virtual Machines & Templates** view.

4 (Optional) To convert all disks unchanged, make sure that **Convert all disks and maintain size** is selected on the Source Data page and click **Next**.

Convert all disks and maintain size is the only choice if the virtual machine you are converting has a Linux guest operating system. Page file and hibernation file are ignored during cloning.

Otherwise, click **Select volumes and resize to save or add space**.

5 Deselect any volumes you do not want to convert.

If you deselect the system volume or active volume, a warning appears before you go to the next page.

6 Specify the volume size for each volume in the **New Disk Space** drop-down menu and click **Next**.

Option	Description
Maintain Size	Keeps the original size volume.
Min Size	Converts just the used portion from the volume, with a small amount of space added.
<Type Size in GB>	Enter a specific size in gigabytes.
<Type Size in MB>	Enter a specific size in megabytes.

7 (Optional) To convert individual volumes to corresponding virtual disks, select **Create a separate disk for each volume**.

Select a Virtual Appliance Source

You can import a virtual appliance to a VMware Infrastructure virtual machine or a standalone virtual machine, such as Workstation 6.x.

To import a virtual appliance

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **Virtual Appliance** from the drop-down menu and click **Next**.

3 Navigate to the .ovf or .ova virtual appliance location.

Field	Action
File system	Browse for the source virtual machine or image, select the file, and click **Open**. You can use the **Files of type** field to filter the displayed files by file extension.
URL	Enter the URL of the virtual appliance you want to convert, or view the VMware Virtual Appliance Marketplace for the latest virtual appliances.

4 Click **Next**.

5 On the Source Data page, click **Next**.

By default, **Convert all disks and maintain size** is selected**.** You must maintain the source data in its original form.

6 On the Destination page, click **Next** to go to the Destination Type page.

7 Choose a destination for your virtual appliance from the drop-down menu and click **Next**.

8 Enter the destination virtual machine information.

Virtual Machine Type	Action
VMware Infrastructure virtual machine	Specify the server and login credentials.
Standalone virtual machine	Specify the virtual machine name and location. The name can be 80 characters long, is case sensitive, and must be unique within the virtual machine folder. It can contain alphanumeric characters and the underscore (_) and hyphen (-).

9 Click **Next**.

10 Choose how you want to distribute the files in the virtual appliance package.

11 Click **Next** to view the Ready to Complete page.

12 Click Finish to start the task creation.

Select a Standalone Virtual Machine or Backup Image Source

Use this procedure if your source system is a local or remote standalone virtual machine or virtual appliance. For example, you can select a virtual machine from VMware Workstation (`.vmx` or `.vmtn`), VMware Fusion, VMware Server, VMware GSX Server, a Microsoft Virtual PC, Microsoft Virtual Server (**.vmc**), or a Symantec Backup Exec System Recovery (`.sv2i`), LiveState Recovery, Norton Ghost (`.sv2i` only), or StorageCraft ShadowProtect (`.spf`) image.

To select a source standalone virtual machine and choose the disks to convert

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **Other** in the drop-down menu and click **Next**.

3 Browse for the source virtual machine or image.

4 In the **File name** field, select the configuration file for the machine you want to convert and open the file.

You can use the **Files of type** field to filter the displayed files by file extension.

If the source virtual machine is Windows NT SMP, Converter might require files from service packs or hot fixes. In this case, the New Virtual Machine Reconfiguration page appears.

The wizard shows which files it requires. The **Next** button remains disabled until every item has a check beside it.

If you are running Converter on a system running Microsoft Windows 2000 or later, and you are converting a Microsoft Windows NT 4.0 virtual machine or image, a warning message advises that the conversion process will upgrade any NTFS partitions in the resulting virtual machine to a newer version of the NTFS file system. To avoid upgrading your file system, click **No** in the dialog box and click **Cancel** in the wizard page to end the conversion. Run the Converter from a computer running Windows NT to convert the virtual machine or image.

5 In the **File** column, select the configuration file, insert the media containing that file, and click **Have Disk.**

If the file is on your system or network, click **Have Disk** and browse to select the file.

Converter reads the file and puts a check mark in the row if successful.

Repeat this step for each required file, and when finished, click **Next**.

If the source virtual machine is not password-protected, the wizard presents the Source Data page. If the source virtual machine is password-protected, the Virtual Machine Login page appears. Type the password and click **Next**.

6 Deselect any volumes you do not want to convert.

If you deselect the system volume or active volume, a warning appears before you go to the next page. The following options are available:

Option	Description
Convert all disks without changing them. Page file and hibernation file are ignored during cloning.	Make sure **Convert all disks and maintain size** is selected on the Source Data page and click **Next**.
Create a linked clone.	Select **Convert all disks and maintain size.**
Convert disks when the virtual machine you are converting has a Linux guest OS.	Select **Convert all disks**.
Resize the volumes.	Click **Select volumes and resize to save or add space**.
Convert individual volumes to corresponding disks.	Select **Create a separate disk for each volume**. For additional information, see "Creating a Separate Disk for Each Volume" on page 30.

7 Specify the volume size for each volume in the **New Disk Space** drop-down menu and click **Next**.

Option	Description
Maintain Size	Keeps the original size volume.
Min Size	Converts just the used portion from the volume, with a small amount of space added.
<Type Size in GB>	Enter a specific size in gigabytes.
<Type Size in MB>	Enter a specific size in megabytes.

Choose a Destination for the New Virtual Machine

You can convert your source machine to the following destinations:

- ESX Server managed by VirtualCenter virtual machine
- ESX Server virtual machine
- OVF virtual appliance
- Standalone virtual machine
- Workstation virtual machine

If you are converting your virtual machine to run in ESX Server managed by VirtualCenter, and you want to have a cluster as the destination, the cluster's VMware DRS settings must be set to manual. Converter does not support, as destinations, clusters in which the DRS is set to partially or fully automated.

Choose an ESX Server Managed by VirtualCenter Destination

Use this procedure if you are converting the virtual machine to run in ESX Server managed by VirtualCenter.

To select an ESX Server managed by VirtualCenter destination for a converted virtual machine

1 Click **Next** on the Destination page to move to the Destination Type page.

2 Select **VMware Infrastructure Virtual Machine** from the drop-down menu and click **Next**.

3 On the Destination Login page, log in to the VirtualCenter server destination and follow these steps:

   a Choose the destination server in the drop-down menu or type the name of the server if it is not listed.

   b Type your user name and the password for the destination server.

   c Click **Next**.

4 On the Virtual Machine Name and Folder page, assign a name to the virtual machine.

5 In the Virtual Machine Inventory Location pane, choose a folder in the VirtualCenter inventory.

   The VirtualCenter inventory might contain multiple hosts, clusters, and datacenters.

6 Click **Next**.

7 On the Host & Cluster page, specify the resources for the converted virtual machine, as follows:

   a Select the host, cluster, or resource pool within a host or cluster from which to run the virtual machine.

   b If you select a cluster in manual mode, on the Host page choose the specific host for the virtual machine.

   c Click **Next**.

8 (Optional) To distribute disks over several datastores or to place the virtual machine configuration file and each disk on a separate datastore, do the following:

   a Click **Advanced** to see the list of disks and the virtual machine configuration file.

   b Choose the datastore for each disk and file from the drop-down menus.

      If insufficient space is available, an error message appears stating the required amount.

9 On the Networks page, map the virtual machine's network adapters to a VirtualCenter network and click **Next**.

   The **Networks** panel displays the networks available at the destination location in drop-down menus. The number of adapters to map can be set in a drop-down menu as well.

Choose an ESX Server Virtual Machine Destination

Use this procedure if you are converting the virtual machine to run in ESX Server.

To select an ESX Server destination for a converted virtual machine

1 Click **Next** on the Destination page to move to the Destination Type page.

2 Select **VMware Infrastructure Virtual Machine** from the drop-down menu.

3 Click **Next**.

4 On the Destination Login page, log in to the ESX Server destination, as follows:

   a Type the name of the server or choose a destination server in the drop-down menu.

   b Type your user name and the password for the destination server.

   c Click **Next**.

5 On the Virtual Machine Name page, enter the name you want to assign to the virtual machine.

   If a virtual machine with the same name exists for ESX Server, VMware Converter displays a warning message and asks you to select another name.

6 Click **Next**.

7 On the Host page, choose the specific host for the virtual machine (cluster in manual mode only) and click **Next**.

8 Specify the datastore for the virtual machine's configuration files and disks and click **Next**.

   All datastores and their available space appear in this panel. You must choose a datastore or datastores large enough to contain the selected disks.

9 (Optional) To distribute disks over several datastores or to place the virtual machine configuration file and each disk on a separate datastore, follow these steps:

   a Click **Advanced** to see the list of disks and the virtual machine configuration file.

   b Choose the datastore for each disk and file from the drop-down menus.

      If insufficient space is available, an error message appears stating the required amount.

10 On the Networks page, map the virtual machine's network adapters to a VirtualCenter network and click **Next**.

11 The **Networks** panel displays the networks available at the destination location in drop-down menus.

   The number of adapters to map can be set in a drop-down menu as well.

Choose an OVF Virtual Appliance Destination

You can export a virtual machine to an OVF virtual appliance to make it available to other users to import into their inventory.

To export a virtual appliance

1 Start the VMware Converter application, click **Convert Machine** in the application menu, and click **Next.**

2 On the Source page, click **Next** to go to the Source Type page.

3 Choose a source machine from the drop-down menu on the Source Type page.

Do not choose a virtual appliance or a physical machine.

4 On the Source Data page, ensure that **Convert all disks and maintain size** is selected and click **Next**.

5 On the Destination page, click **Next** to move to the Destination Type page.

6 Select **Virtual Appliance** from the drop-down menu and click **next**.

7 Enter the virtual appliance name and browse for a location.

The location can be local or a remote machine path shared over the network.

You can create OVF packages containing monolithic compressed .vmdk files only. The files can exist in the same folder or can be contained in a single tarred .ova file.

8 Enter the details of your virtual appliance. Click **Advanced** to edit the details.

a Click the check box next to the information to include in your OVF or OVA package.

You can include the product name, URL, version, vendor, vendor URL, and any annotations.

b Click the triangle next to a selection to expand it and click Edit to edit the information.

9 By default, Converter creates a network for you called VMNetwork. If you want to create your own networks, on the Advanced metadata details page, create and edit the networks available for your virtual appliance for later mapping.

10 Browse to a license location to display for the End User License Agreement.

You can select from zero to multiple licenses. Click the up or down arrows to change the order in which the licenses are listed.

11 On the File Options page, view the files included in your virtual appliance package and choose a distribution format.

You can choose either a **Single File (.ova)** or **Folder of Files**.

You can choose to **Create a Manifest File** to create a text file that contains a SHAI digest of each of the files in the OVF package.

12 On the Networks page, configure the networks for your virtual appliance.

Select the number of network adapters to connect from the drop-down menu.

You can map a Network Adapter to a Destination Network of your choice.

13 Click **Next** to verify the options for your virtual appliance.

14 Click **Finish** to start the task creation.

Choose a Standalone Virtual Machine Destination

Use this procedure if you are converting the virtual machine to run in Workstation, VMware Fusion, VMware Player, VMware Server, VMware ACE, or GSX Server.

To select a standalone virtual machine destination for a converted virtual machine

1 Click **Next** on the Destination page to move to the Destination Type page.

2 Select **Other Virtual Machine** from the drop-down menu and click **Next**.

3 In the Virtual Machine Name and Location page, type a name for the converted virtual machine and browse to enter the destination location.

If the source is a remote physical computer, a **Connect As** button appears. Specify a network-mountable location accessible to both the source machine and the machine running the Converter application.

4 Select a type of virtual machine to create.

The virtual machine you select must work with one of these VMware product groups:

- Workstation 6.x, VMware Fusion 1.x, VMware Player 2.x, VMware ACE 2.x
- Workstation 5x, VMware Server 1.x, VMware Player 1.x
- Workstation 4.5.x, ACE 1.x, GSX Server 3.x

5 Click **Next**.

6 In the drop-down menu, select a cloning option for the new virtual machine.

Choose the way the converter creates the clone, depending on the type of source and destination:

- **Create a full clone –** Creates a VMware virtual machine with no dependencies on the original virtual machine or system image. To allocate all the disk space for this clone, click the **Allocate all disk space now for better performance** button. If you click **Allow virtual disk files to expand**, the virtual disk's files start small and grow as needed, until they reach the size of the source disks from which they were cloned.

  To support virtual disks on FAT file systems, select **Split disk into 2 GB files**.

  The **Allocate all disk space now for better performance** option creates a disk file that can be larger than the used space of the source. For example, the source disk might be a 16GB disk of which only 2GB is used for the file, but converting the file with the **Allocate** option creates a 16GB disk. Take this into account when you look at free space before you convert.

- **Create a linked clone –** Creates a VMware virtual machine that shares the virtual disk of the source virtual machine or system image.

  Linked clones are useful for proof-of-concept on non-VMware image, such as `.sv2i` and `.vmc`.

  For linked clones, the virtual machine created by the Converter is corrupted if the source is modified after the conversion. This is true for linked clones converted from Virtual PC and Virtual Server machines and from LiveState images. In the case of Virtual PC and Virtual Server source virtual machines, the act of powering the source virtual machines on in Virtual PC or Virtual Server modifies them, and corrupts the linked clones.

7 Click **Next**.

8 In the Destination Name and Location page, assign a name to the virtual machine.

The name can be 80 characters long, is case sensitive, and must be unique within the virtual machine folder. It can contain alphanumeric characters and the underscore (_) and hyphen (-).

9 Browse or type the path of the location where you want to create the VMware virtual machine and click **Next**.

10 On the Networks page, map the virtual machine's network adapters to a bridged, host-only, or NAT network and click **Next**.

Choose a Workstation Virtual Machine Destination

Use this procedure if you are performing a Workstation-to-Workstation conversion.

To select a Workstation destination for your converted virtual machine

1 On the Destination page, click **Next** to move to the Destination Type page.

2 Select **Other Virtual Machine** from the drop-down menu and click **Next**.

3 On the Virtual Machine Name and Location page, type a name for the converted virtual machine and browse to enter the destination location.

If the source is a remote physical computer, a **Connect As** button appears. Specify a network-mountable location accessible to both the source machine and the machine running the Converter application.

4 Select a type of virtual machine to create.

The virtual machine you select must work with one of these VMware product groups:

- Workstation 6.x, VMware Fusion 1.x, VMware Player 2.x, VMware ACE 2.x
- Workstation 5x, VMware Server 1.x, VMware Player 1.x
- Workstation 4.5.x, ACE 1.x, GSX Server 3.x

5 Click **Next**.

6 In the drop-down menu, select **Import and convert (full clone)**, if available.

Depending on the type of source and destination, you might have options in how you allocate disk space for the new virtual machine:

- To allocate all the disk space for this clone, click the **Allocate all disk space now for better performance** button. This option gives somewhat better performance for your virtual machine. If you click **Allow virtual disk files to expand**, the virtual disk's files start small and grow as needed, until they reach the size of the source disks from which they were cloned.
- To support virtual disks on FAT file systems, ensure that the **Split disk into 2 GB files** check box is selected.

7 Click **Next**.

8 On the Destination Name and Location page, type the name you want to assign to the virtual machine.

The name can be 80 characters long, is case sensitive, and must be unique within the virtual machine folder. It can contain alphanumeric characters and the underscore (_) and hyphen (-).

9 Browse or type the path of the location where you want to create the VMware virtual machine and click **Next**.

10 On the Networks page, map the virtual machine's network adapters to a bridged, host-only, or NAT network and click **Next**.

Customize a New Virtual Machine's Guest Operating System

On the Conversion wizard Customization page, you can choose to install VMware Tools, customize a guest operating system, remove System Restore checkpoints, or any combination of these options, depending on the guest operating system.

Converter does not support customization for Windows NT.

To skip the options on the Customization page and go to the Ready to Complete page

1 Ensure that all check boxes are deselected and click **Next.**

2 Continue with "Compete the Convert Task Creation" on page 41.

Install VMware Tools

Installing VMware Tools is applicable only for ESX Server, VirtualCenter, Workstation 6, VMware Fusion 1, VMware Player 2, and ACE 2 destinations.

1 On the Customization page, ensure that **Install VMware Tools** is selected.

2 Click **Next** or select **Customize the identity of the virtual machine** to continue with customization.

Customize the Identity of the New Virtual Machine

Use this procedure to customize the identity of the new virtual machine.

You can customize the following fields:

- Change the computer information for identifying a virtual machine on a network.
- Enter server license information.
- Change the time zone for a virtual machine.
- Modify the properties for each network interface.

To customize the identity of a new virtual machine

1 On the Customization page, select **Customize the identity of the new virtual machine** and click **Next**.

The table of contents expands to show the topics in this section of installation.

2 On the Computer Information page, customize any of these fields:

- **Computer Name** – A unique name to identify the virtual machine on the network. Valid characters include A-Z, a-z, 0-9, and the hyphen. Underscore is nonstandard, but Converter permits its use. The computer name cannot have more than 63 characters or consist only of numerals.
- **Owner Name** – Valid characters include all printable characters. A 63-character limit applies.
- **Organization** – Valid characters include all printable characters. A 63-character limit applies.
- **Generate New Security ID (SID)** – Select to generate a new security identifier. By default, the security ID is preselected for Windows Vista systems.
- **Location of Sysprep Files** – If the application determined this location, the text edit box shows it. If this field is blank, you must specify a valid location before going to the next panel. This action does not apply to Windows Vista systems.

3 Click **Next**.

4 On the Windows License page, enter the Windows licensing information for this virtual machine, if necessary, and click **Next**.

You can leave the **Product ID** field blank and move to the next page.

The **Include Server License Information** check box applies only to Microsoft Windows 2000 Server and Microsoft Windows 2003 Server operating systems. The **Server License Mode** buttons are disabled if the check box is not selected. This action does not apply to Windows Vista systems.

5 Choose a time zone from the drop-down menu on the Time Zone page and click **Next**.

If network interfaces need to be set, the Network Interface Settings page appears.

6 (Optional) To customize your network adapter settings, choose the adapter on the Network Interface Setting page and click **Customize**.

The **Reset All** button is enabled if you modify one or more network adapters. Click this button to return all settings for all adapters to the default.

By default, every network adapter obtains the IP address and DNS server address from the Dynamic Host Configuration Protocol (DHCP). If you prefer to use the default settings, click **Next**.

7 (Optional) On the Network Properties dialog box, modify the properties of any network adapters.

Field	Description
General	Use this tab only to manually enter the IP address and DNS server address.
DNS	Specify the DNS connections by entering DNS suffixes. ■ For each DNS suffix you enter, click **Add**. ■ If you are entering multiple DNS suffixes, use **Move Up** and **Move Down** to specify the order in which a virtual machine is to use the connections.
WINS	Specify the primary and secondary WINS addresses by typing the IP addresses in the entry boxes.

8 Click **OK** to return to the Network Interface Setting page and click **Next**.

9 On the Workgroup or Domain page, select how the virtual machine participates in a network.

- **Workgroup** – Valid characters include A-Z, a-z, 0-9, space, and the hyphen. Maximum length is 15 characters.
- **Windows Server Domain** – The text box must have a value. Valid characters include A-Z, a-z, 0-9, space, period (dot), and the hyphen. Each label delineated by a dot can be 63 characters long, and the entire text string can be up to 254 characters long. A user name and password are required.

10 Click **Next.**

Remove System Restore Checkpoints

VMware recommends that you remove all System Restore checkpoints, regardless of the cloning mode, unless you want the target virtual machine to be a replica of the source system. Removing all System Restore checkpoints prevents the target machine from reverting to a preconversion state. Restoring a checkpoint in the target virtual machine that was created before cloning the source machine can damage the system and cause the target virtual machine to become unbootable.

To remove System Restore checkpoints for Windows Vista, Windows XP, and Windows 2003

On the Customization page, select **Remove all system restore checkpoints**.

System Restore is enabled on Windows Vista and Windows XP systems by default. For Windows Vista, if you are doing volume-based file-level cloning, System Restore checkpoints are automatically removed from the target virtual machine, regardless of the check box. If you are doing disk-based cloning or volume-level block-based cloning, deselecting the check box instructs Converter to keep the System Restore check points in the target virtual machine.

For more information about cloning modes, see "Cloning Modes" on page 14.

Complete the Conversion Task Creation

The final page in the Conversion wizard is the Ready to Complete page. Click **Finish** to close the wizard and display the Task View with the conversion job in the task list. You can view the progress in the **Task Progress** tab. Users of the Enterprise and Starter editions of Converter can return to a queued job and edit the settings. See Chapter 7, "Managing Tasks," on page 59. Starter edition users can convert only one machine at a time.

If Windows discovers new hardware and asks you to reboot, select **No** so that customization settings are applied. If you customized the new virtual machine, after it is powered on, you must wait for it to automatically reboot twice before the customization settings are applied and you can safely log in. Customization settings are not applied to your virtual machine if you manually restart it.

To complete the task creation if the destination machine is an ESX Server machine

1 Review the summary of the settings for the new virtual machine.

2 (Optional) To have the new virtual machine powered on after the conversion is complete, select **Power on the new Virtual Machine after creation**.

To complete a task creation if a source machine is remote

1 Review the summary of the settings for the new virtual machine and click **Finish**.

2 When you see the Warning: Reboot Source Machine dialog box, click **Yes** to reboot the machine.

If the source machine is remote, you must reboot it to remove the Converter agent installed on it.

To complete task creation in all other cases

Review the summary of the settings for the new virtual machine and click **Finish**.

Using the Converter Boot CD for Local Cold Cloning

5

This chapter describes how to cold-clone a local physical machine to a variety of destinations. Cold cloning requires the VMware Converter Boot CD, which is available in the Enterprise edition only.

This chapter includes the following sections:

- "Cold Cloning and the Converter Boot CD" on page 45
- "Start the Wizard for a Conversion" on page 45
- "Select Source Data" on page 46
- "Choosing a Destination for a New Virtual Machine" on page 47
- "Customize a New Virtual Machine's Guest Operating System" on page 49
- "Complete the Convert Task Creation" on page 51
- "Using peTool to Modify the Converter Boot CD" on page 52

Cold Cloning and the Converter Boot CD

Cold cloning, also called offline cloning, entails cloning the source machine when it is not running its operating system. In cold cloning, you reboot the source machine from a CD that has its own operating system (WinPE) and includes the standalone VMware Converter Enterprise application. Cold cloning leaves no footprint on the source machine.

Start the Wizard for a Conversion

Use this procedure to start the Converter Conversion wizard from the VMware Converter Boot CD.

To boot off the CD, set options, and start the application

1 Insert the Converter Boot CD in the source machine and restart the computer.

2 Within 10 seconds, press any key to boot into the operating system on the CD.

3 (Optional) In the Network Configuration dialog box, change the location for the temporary files, including the logs.

By default, temporary files are stored in RAM disk. After the VMware Converter application is launched, you cannot modify the temporary files directory.

4 (Optional) In the **Advanced** tab in the Network Configuration dialog box, set a value for the Speed & Duplex property of each network adapter.

The VMware Converter application launches.

To specify a static IP address or map network drives

1 On the main menu, choose **Administration > Network Configuration**.

2 Click the appropriate button on the **Network Properties** tab to enter the static addresses and click **Apply**.

3 Click the **Network Drives** tab and map the drives to the network share.

4 Click **Connect**.

If necessary, enter the DOMAIN\user name and password to connect to a specific network share and click **OK**.

5 Click **OK** to return to the application.

To start the wizard

1 Click **Convert Machine**.

2 Click **Next**.

The Source page introduces the **Table of Contents** pane, displaying the three-step conversion process: "Step 1: Source," "Step 2: Destination," "Step 3: Customization."

Select Source Data

Choose which of the source machine's volumes to convert and specify their size in the new virtual machine. You can also convert all disks unchanged.

To choose the disks or volumes to convert

1 On the Source page, click **Next** to move to the Source Data page.

2 Specify whether to change or maintain the converted disks.

To convert all disks unchanged, make sure that **Import all disks and maintain size** is selected on the Source Data page and click **Next**. This is the only choice if the virtual machine you are converting has a Linux guest operating system.

To resize the converted disks, click **Select volumes and resize to save or add space**.

a Deselect any volumes that are not to be converted.

b Specify the volume size for each volume in the **New Disk Space** drop-down menu and click **Next**.

Option	Description
Maintain Size	Keeps the original size volume.
Min Size	Converts just the used portion from the volume, with a small amount of space added.
<Type Size in GB>	Enter a specific size in gigabytes.
<Type Size in MB>	Enter a specific size in megabytes.

Entering a value less than the minimum size results in a warning message.

Choosing a Destination for a New Virtual Machine

Your destination virtual machine can be one of two categories:

- **ESX Server** – See "Choose a VirtualCenter Server Virtual Machine Destination" on page 47
- **Workstation** – See "Choose a Standalone Virtual Machine Destination" on page 48

Unsupported Clusters

If you are converting your virtual machine to run in ESX Server managed by VirtualCenter, and you want to have a cluster as the destination, the cluster's VMware DRS settings must be set to manual. Converter does not support as destinations clusters in which the DRS is set to partially automated or fully automated.

Choose a VirtualCenter Server Virtual Machine Destination

Use this procedure if you are converting the virtual machine to run in ESX Server managed by VirtualCenter.

To select the destination for a converted virtual machine

1 Click **Next** on the Destination page to move to the Destination Type page.

2 Select **VMware Infrastructure Virtual Machine** from the drop-down menu and click **Next**.

3 On the Destination Login page, log in to the VirtualCenter server destination and follow these steps:

   a Choose the destination server in the drop-down menu or type the name of the server if it is not listed.

   b Type your user name and the password for the destination server.

   c Click **Next**.

4 On the Virtual Machine Name and Folder page, assign a name to the virtual machine.

5 In the Virtual Machine Inventory Location pane, choose a folder in the VirtualCenter inventory.

   The VirtualCenter inventory might contain multiple hosts, clusters, and datacenters.

6 Click **Next**.

7 On the Host or Cluster page, specify the resources for the converted virtual machine, as follows:

   a Select the host, cluster (for VirtualCenter servers only), or resource pool within a host or cluster from which to run the virtual machine.

   b If you select a cluster in manual mode, on the Host page choose the specific host for the virtual machine.

   c Click **Next**.

8 (Optional) To distribute disks over several datastores or to place the virtual machine configuration file and each disk on a separate datastore, do the following:

   a Click **Advanced** to see the list of disks and the virtual machine configuration file.

   b Choose the datastore for each disk and file from the drop-down menus.

      If insufficient space is available, an error message appears stating the required amount.

9 On the Networks page, map the virtual machine's network adapters to a VirtualCenter network and click **Next**.

   The **Networks** panel displays the networks available at the destination location in drop-down menus. The number of adapters to map can be set in a drop-down menu as well.

Continue with "Customize a New Virtual Machine's Guest Operating System" on page 49.

Choose an ESX Server Virtual Machine Destination

Use this procedure if you are converting the virtual machine to run in ESX Server.

To select the destination for a converted virtual machine

1 Click **Next** on the Destination page to move to the Destination Type page.

2 Select **VMware Infrastructure Virtual Machine** from the drop-down menu.

3 Click **Next**.

4 On the Destination Login page, log in to the ESX Server or VirtualCenter server destination, as follows:

   a Choose the destination server in the drop-down menu or type the name of the server if it is not listed.

   b Type your user name and the password for the destination server.

   c Click **Next**.

5 On the Virtual Machine Name page, enter the name you want to assign to the virtual machine.

   If a virtual machine with the same name exists for ESX Server, VMware Converter displays a warning message and asks you to select another name.

6 Click **Next**.

7 On the Host page, choose the specific host for the virtual machine (cluster in manual mode only) and click **Next**.

8 Specify the datastore for the virtual machine's configuration files and disks and click **Next**.

   All datastores and their available space appear in this panel. You must choose a datastore or datastores large enough to contain the selected disks.

9 (Optional) To distribute disks over several datastores or to place the virtual machine configuration file and each disk on a separate datastore, follow these steps:

   a Click **Advanced** to see the list of disks and the virtual machine configuration file.

   b Choose the datastore for each disk and file from the drop-down menus.

      If insufficient space is available, an error message appears stating the required amount.

10 On the Networks page, map the virtual machine's network adapters to a VirtualCenter network and click **Next**.

11 The **Networks** panel displays the networks available at the destination location in drop-down menus.

   The number of adapters to map can be set in a drop-down menu as well.

Continue with "Customize a New Virtual Machine's Guest Operating System" on page 49.

Choose a Standalone Virtual Machine Destination

Use this procedure if you are converting the virtual machine to run in Workstation 4.x, 5.x, or 6.x, VMware Fusion, VMware Player, VMware Server, VMware ACE 1 or 2, or GSX Server.

To select a destination for a converted virtual machine

1 On the Destination page, click **Next** to move to the Destination Type page.

2 Click the **VMware standalone virtual machine** button and click **Next**.

3 On the VM Name & Location page, type a name for the converted virtual machine and browse to enter the destination location.

4 Select a type of virtual machine to create:

- Workstation 6.x, VMware Fusion 1.x, VMware Player 2.x, VMware ACE 2.x
- Workstation 5x, VMware Server, VMware Player
- Workstation 4.x, VMware ACE 1.x, GSX Server 3.x.

5 Click **Next**.

6 Select the conversion options for a full clone, if available.

Depending on the type of source and destination, you might have options in how you allocate disk space for the new virtual machine:

- To allocate all the disk space for this clone, click the **Allocate all disk space now for better performance** button. This option gives somewhat better performance for your virtual machine. If you click the other button, the virtual disk's files start small and grow as needed, until they reach the size of the source disks from which they were cloned.

  The **Allocate all disk space now for better performance** option creates a disk file that can be larger than the used space of the source. For example, the source disk might be a 16GB disk of which only 2GB is used for the file, but converting the file with the **Allocate** option creates a 16GB disk. Take this into account when you look at free space before you convert.

- To support virtual disks on FAT file systems, ensure that the **Split disk into 2 GB files** check box has been selected.

7 Click **Next**.

8 On the Destination Name and Location page, assign a name to the virtual machine.

The name can be 80 characters long, is case sensitive, and be unique within the virtual machine folder. It can contain alphanumeric characters and the underscore (_) and hyphen (-).

9 Browse or type the path of the location where you want to create the VMware virtual machine and click **Next**.

10 On the Networks page, map the virtual machine's network adapters to a bridged, host-only, or NAT network and click **Next**.

Customize a New Virtual Machine's Guest Operating System

On the Conversion wizard Customization page, you can choose to install VMware Tools, customize a guest operating system, remove System Restore checkpoints, or any combination of these options, depending on the guest operating system.

Converter does not support customization for Windows NT.

To skip the options on the Customization page and go to the Ready to Complete page

1 Ensure that all check boxes are deselected and click **Next.**

2 Continue with "Compete the Convert Task Creation" on page 41.

Install VMware Tools

Installing VMware Tools is applicable only for ESX Server, VirtualCenter, Workstation 6, VMware Fusion 1, VMware Player 2, and ACE 2 destinations.

1 On the Customization page, ensure that **Install VMware Tools** is selected.

2 Click **Next** or select **Customize the identity of the virtual machine** to continue with customization.

Customize the Identity of the New Virtual Machine

Use this procedure to customize the identity of the new virtual machine.

You can customize the following fields:

- Change the computer information for identifying a virtual machine on a network.
- Enter server license information.
- Change the time zone for a virtual machine.
- Modify the properties for each network interface.

To customize the identity of a new virtual machine

1 On the Customization page, select **Customize the identity of the new virtual machine** and click **Next**.

The table of contents expands to show the topics in this section of installation.

2 On the Computer Information page, customize any of these fields:

- **Computer Name** – A unique name to identify the virtual machine on the network. Valid characters include A-Z, a-z, 0-9, and the hyphen. Underscore is nonstandard, but Converter permits its use. The computer name cannot have more than 63 characters or consist only of numerals.
- **Owner Name** – Valid characters include all printable characters. A 63-character limit applies.
- **Organization** – Valid characters include all printable characters. A 63-character limit applies.
- **Generate New Security ID (SID)** – Select to generate a new security identifier. By default, the security ID is preselected for Windows Vista systems.
- **Location of Sysprep Files** – If the application determined this location, the text edit box shows it. If this field is blank, you must specify a valid location before going to the next panel. This action does not apply to Windows Vista systems.

3 Click **Next**.

4 On the Windows License page, enter the Windows licensing information for this virtual machine, if necessary, and click **Next**.

You can leave the **Product ID** field blank and move to the next page.

The **Include Server License Information** check box applies only to Microsoft Windows 2000 Server and Microsoft Windows 2003 Server operating systems. The **Server License Mode** buttons are disabled if the check box is not selected. This action does not apply to Windows Vista systems.

5 Choose a time zone from the drop-down menu on the Time Zone page and click **Next**.

If network interfaces need to be set, the Network Interface Settings page appears.

6 (Optional) To customize your network adapter settings, choose the adapter on the Network Interface Setting page and click **Customize**.

The **Reset All** button is enabled if you modify one or more network adapters. Click this button to return all settings for all adapters to the default.

By default, every network adapter obtains the IP address and DNS server address from the Dynamic Host Configuration Protocol (DHCP). If you prefer to use the default settings, click **Next**.

7 (Optional) On the Network Properties dialog box, modify the properties of any network adapters.

Field	Description
General	Use this tab only to manually enter the IP address and DNS server address.
DNS	Specify the DNS connections by entering DNS suffixes. ■ For each DNS suffix you enter, click **Add**. ■ If you are entering multiple DNS suffixes, use **Move Up** and **Move Down** to specify the order in which a virtual machine is to use the connections.
WINS	Specify the primary and secondary WINS addresses by typing the IP addresses in the entry boxes.

8 Click **OK** to return to the Network Interface Setting page and click **Next**.

9 On the Workgroup or Domain page, select how the virtual machine participates in a network.

- **Workgroup** – Valid characters include A-Z, a-z, 0-9, space, and the hyphen. Maximum length is 15 characters.
- **Windows Server Domain** – The text box must have a value. Valid characters include A-Z, a-z, 0-9, space, period (dot), and the hyphen. Each label delineated by a dot can be 63 characters long, and the entire text string can be up to 254 characters long. A user name and password are required.

10 Click **Next.**

Remove System Restore Checkpoints

VMware recommends that you remove all System Restore checkpoints, regardless of the cloning mode, unless you want the target virtual machine to be a replica of the source system. Removing all System Restore checkpoints prevents the target machine from reverting to a preconversion state. Restoring a checkpoint in the target virtual machine that was created before cloning the source machine can damage the system and cause the target virtual machine to become unbootable.

To remove System Restore checkpoints for Windows Vista, Windows XP, and Windows 2003

On the Customization page, select **Remove all system restore checkpoints**.

System Restore is enabled on Windows Vista and Windows XP systems by default. For Windows Vista, if you are doing volume-based file-level cloning, System Restore checkpoints are automatically removed from the target virtual machine, regardless of the check box. If you are doing disk-based cloning or volume-level block-based cloning, deselecting the check box instructs Converter to keep the System Restore check points in the target virtual machine.

For more information about cloning modes, see "Cloning Modes" on page 14.

Complete the Convert Task Creation

The final page in the Conversion wizard is the Ready to Complete page. Click **Finish** to close the wizard and display the Task View with the conversion job in the task list. You can view the progress in the **Task Progress** tab. You can return to a queued job and edit the settings. Because Boot CD does not support concurrent conversions, you can convert only one machine at a time.

If Windows discovers new hardware and asks you to reboot, select **No** so that customization settings are applied. If you customized the new virtual machine, after it is powered on, you must wait for it to automatically reboot twice before the customization settings are applied and you can safely log in. Customization settings are not applied to your virtual machine if you manually restart it.

To complete the task creation if the destination machine is an ESX Server machine

1 Review the summary of the settings for the new virtual machine.

2 (Optional) To have the new virtual machine powered on after the conversion is complete, select **Power on the new Virtual Machine after creation**.

To complete task creation in all other cases

Review the summary of the settings for the new virtual machine and click **Finish**.

Using peTool to Modify the Converter Boot CD

VMware provides peTool as a custom tool for adding Windows drivers to the Converter Boot CD ISO image, along with other modifications. Using peTool, you can add storage device drivers and network device drivers. To add a new network driver to the ISO image, use the following command:

```
petool –i <Conv_boot_cd.iso> –n <driver_folder_path>
```

You can add executable binaries and VNC packages and perform the other actions listed in Table 5-1.

Table 5-1. peTool Options

Option	Action
`–h [––help]`	Produces help messages
`–i [––image]`	Specifies image file. Specifies the WinPE CD image to be modified. An example: `–i c:\coldclone.iso`. The original of the ISO image is saved with a `.bak` extension. In this example, it would be saved as `coldclone.bak`.
`–b [––binary]`	Adds binary files. For adding executable binaries. Must be followed by one or more full paths and names of binary files. The binary file is copied to the `\Programs` directory.
`–B [––start_binary]`	Adds binary files and automatically start. Similar to `–b`, except that the added binaries execute when WinPE boots up the system.
`–v [––vnc]`	Adds VNC package. Specifies a VNC package to be added. It is followed by an executable binary with the VNC package you want to start up (`%<relative_path&filename>`, the same format as described in **`–P`**), and, optionally, followed by a `%<predefined_VNC_password>`. For example, `–v c:\RealVNC%vnc4.exe%123`. This copies the VNC package at `c:\RealVNC` and starts the `vnc4.exe` under the `RealVNC` directory after boot up. The password for VNC is `123`. If you set this option, the firewall is turned off, and the "press any key to boot from CD" option during bootup is removed.
`–p [––package]`	Adds software packages. This must be followed by one or more full paths and names of software packages. The packages are copied to the `\Programs` directory.
`–P [––start_package]`	Adds software packages and start. Specifies an executable binary, inside the package, that you want to start after boot up. The format is `–P <software_package_directory>%<relative_path&filename>`. For example, if the package you add is inside a directory called `c:\RealVNC` and the executable binary you want to start up is `vnc4.exe` under the `RealVNC` directory, specify `–P c:\RealVNC%vnc4.exe`.
`–f [––disable_firewall]`	Disables firewall. Disables the firewall after WinPE boots up.

Table 5-1. peTool Options (Continued)

Option	Action
`-d [--storage_driver]`	Adds storage device drivers. Must be followed by one or more full directory paths that contain the target device drivers. The original Converter Boot CD ISO image does not contain these drivers. Use this option to specify the drivers from ones you already have.
`-n [--network_driver]`	Adds network device drivers. Must be followed by one or more full directory paths that contain the target device drivers.
`-t [--tmp]`	Specifies a temporary directory. Specifies the temporary directory for peTool. If the directory does not exist, peTool creates it. Without this option specified, peTool chooses the default temp file indicated by Windows.

Configuring VMware Virtual Machines 6

Follow the procedures in this chapter if you have VMware virtual machines whose disks were populated by restoring from a backup of a physical host or by some other direct means of copying a virtual machine's disks. Configuring such machines with Converter enables them to boot in VMware products.

OVF images cannot be configured.

This chapter includes the following sections:

- "Starting Configuration" on page 55
- "Customizing a New Virtual Machine's Guest Operating System" on page 56
- "Complete the Configuration" on page 58

Starting Configuration

A configuration source cannot be a physical machine. You can configure files only from a VMware standalone virtual machine or from an ESX Server or VirtualCenter virtual machine.

To start the Configuration Wizard

1 Start the VMware Converter application.

2 Click **Configure Machine** in the application menu.

3 Click **Next.**

Select a VMware Infrastructure Virtual Machine as Source

Use this procedure if your source system is a VMware ESX Server or VirtualCenter server machine.

To select a source ESX Server virtual machine to configure

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **VMware Infrastructure Virtual machine** from the drop-down menu and click **Next**.

3 Type or choose the ESX Server containing the virtual machine to be configured.

The **Server** drop-down menu is populated with the identifiers or locations of systems that were logged in to previously. You can type a new identifier.

4 Select a virtual machine to configure from the list of those found on the ESX Server machine you logged in to and click **Next.**

To select a source VirtualCenter Server virtual machine to configure

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **VMware Infrastructure Virtual machine** from the drop-down menu and click **Next**.

3 Type or choose the VirtualCenter server containing the virtual machine to be configured.

The **Server** drop-down menu is populated with the identifiers or locations of systems that were logged in to previously. You can type a new identifier.

4 Specify the source for your virtual machine in the VirtualCenter virtual machine inventory browser, and click **Next**.

You can search the browser through one of two views of the inventory, the default **Hosts & Clusters** view or the **Virtual Machines & Templates** view, in the **View** drop-down menu.

Select a Standalone Virtual Machine as the Source

Use this procedure if your source system is a standalone VMware virtual machine (that is, one that is a virtual machine from VMware Workstation 4.x, 5.x, or 6.x, VMware Server, or VMware GSX Server).

To select the source standalone virtual machine to configure

1 On the Source page, click **Next** to go to the Source Type page.

2 Select **Other** from the drop-down menu and click **Next**.

3 Browse for the source virtual machine or image, select the file, and click **Open**.

The file type choices are limited to VMware Workstation Files (`*.vmx`).

4 Click **Next**.

If the source virtual machine you select is password protected, the Virtual Machine Login page appears.

5 Type the password and click **Next**.

If the source virtual machine is not password protected, the wizard skips this page and displays the Customization page.

Customizing a New Virtual Machine's Guest Operating System

On the Configure Wizard Customization page, you can customize the identity of the configured virtual machine and remove System Restore checkpoints.

This procedure is applicable only to ESX Server, VirtualCenter, Workstation 6, VMware Fusion 1, VMware Player 2, and Ace 2 destinations.

You can customize the following information:

- Computer information that identifies the virtual machine on a network
- Server license
- Virtual machine time zone
- Network interface properties
- Workgroup and Windows Server Domain

To customize a configured virtual machine

1 On the Customization page, select **Customize the identity of the virtual machine** and click **Next**.

2 On the Computer Information page, customize any of these fields:

- **Computer Name** – A unique name to identify the virtual machine on the network. Valid characters include A-Z, a-z, 0-9, and the hyphen. Underscore is nonstandard, but Converter permits its use. The Computer Name cannot have more than 63 characters and cannot consist only of numerals.
- **Owner Name** – Valid characters include all printable characters. A 63-character limit applies.
- **Organization** – Valid characters include all printable characters. A 63-character limit applies.

- **Generate New Security ID (SID)** – Select to generate a new security identifier.
- **Location of Sysprep Files** – If the application determined this location, the text edit box shows it. If this field is blank, you must specify a valid location before going to the next panel.

3 Click **Next**.

4 On the Windows License page, enter the Windows licensing information for this virtual machine, if necessary, and click **Next**.

You can leave the **Product ID** field blank and move to the next page.

The **Include Server License Information** check box applies only to Microsoft Windows 2000 Server and Microsoft Windows 2003 Server operating systems, and the **Server License Mode** radio buttons are disabled if the check box is not selected. This action does not apply to Windows Vista systems.

5 On the Time Zone page, choose a time zone from the drop-down menu and click **Next**.

If network interfaces need to be set, the Network Interface Settings page appears.

6 (Optional) To customize your network adapter settings, choose the adapter on the Network Interface Setting page and click **Customize**.

The **Reset All** button is enabled if you modify one or more network adapters. Click this button to return all settings for all adapters to the default.

By default, every network adapter obtains the IP address and DNS server address from the Dynamic Host Configuration Protocol (DHCP). If you prefer to use the default settings, click **Next**.

7 (Optional) On the Network Properties dialog box, modify the properties of any network adapters.

Field	Description
General	Use this tab only to manually enter the IP address and DNS server address.
DNS	Specify the DNS connections by entering DNS suffixes. ■ For each DNS suffix you enter, click **Add**. ■ If you are entering multiple DNS suffixes, use **Move Up** and **Move Down** to specify the order in which a virtual machine is to use the connections.
WINS	Specify the primary and secondary WINS addresses by typing the IP addresses in the entry boxes.

8 Click **OK** to return to the Network Interface Setting page and click **Next**.

9 On the Workgroup or Domain page, select how the virtual machine participates in a network.

- **Workgroup** – Valid characters include A-Z, a-z, 0-9, space, and the hyphen. Maximum length is 15 characters.
- **Windows Server Domain** – The text box must have a value. Valid characters include A-Z, a-z, 0-9, space, period (dot), and the hyphen. Each label delineated by a dot can be 63 characters long, and the whole text string can be up to 254 characters long. A user name and password are also required.

10 Click **Next**.

To remove System Restore checkpoints

On the Customization page of the Configuration wizard, select **Remove all system restore checkpoints**.

VMware recommends that you remove all System Restore checkpoints from the target virtual machine. Removing System Restore checkpoints prevents the target machine from reverting to a preconversion state. Restoring a checkpoint in the target virtual machine can damage the system and cause the target virtual machine to become unbootable.

Complete the Configuration

The final page in the Configure wizard is the Ready to Complete page. Click **Finish** to close the wizard and display the Task View with the conversion task in the task list. You can view the progress in the **Task Progress** tab. You can also return to a queued task and edit the settings. See Chapter 7, "Managing Tasks," on page 59.

If Windows discovers new hardware and asks you to reboot, click **No** so that customization settings are applied. If you customized the new virtual machine, after it is powered on, you must wait for it to automatically reboot twice before the customization settings are applied and you can safely log on. Customization settings are not applied to your virtual machine if you manually restart it.

To complete the conversion for an ESX Server machine

1 Review the summary of the settings for the new virtual machine.

2 (Optional) To have the new virtual machine powered on after the conversion is completed, select **Power on the new Virtual Machine after creation**.

To complete the task if the source machine is remote

1 Review the summary of the settings for the new virtual machine and click **Finish**.

2 When you see the Warning: Reboot Source Machine dialog box, click **Yes** to reboot the machine.

You must reboot the machine to remove the Converter agent installed on it.

To complete the conversion for all other cases

Review the summary of the settings for the new virtual machine and click **Finish**.

Managing Tasks 7

Converter provides a task manager for managing migrations and configurations. This can be for a single conversion or for multiple, concurrent migrations in the Enterprise edition. After you create a task using the Converter wizard to set up how you want to convert or configure a machine, you can use the Task View of Converter manager to manage the order of tasks, to limit the number of concurrent tasks, to edit the tasks, to look at the progress of a task, and more.

This chapter includes the following sections:

- "Multiple Tasks" on page 59
- "Task View" on page 59
- "Details View" on page 61
- "Looking at Progress and the Logs" on page 62
- "Editing Tasks" on page 63
- "Managing How Tasks Run" on page 64

Multiple Tasks

The Enterprise edition of Converter can run unlimited multiple concurrent conversions, but you can limit the number. While tasks are running, you can continue to add new tasks to the queue, edit unstarted or canceled tasks, and fix failed tasks.

Task View

The upper half of the task manager window is the Task View. It includes the task list, containing information about the various tasks, and the toolbar, with which you can start the wizards and manage the tasks in the list.

Task List

The task list presents the following information:

- **ID** – Unique system-generated identifier for the task.
- **Description** – Brief explanation of the task, based on how you set it up in the converter wizard. "Convert a physical machine" is an example.
- **Source** – IP address, location, or other descriptor of the source machine or image.
- **Destination** – IP address, location, or other descriptor of the converted virtual machine.
- **Progress** – Percentage of completion that a task has attained.

- **Status** – State of the task. Five possible states exist:
  - **In Progress** (Running) – In the process of converting or configuring a machine.
  - **Queued #<>** – The task is queued to run as soon as possible, initially based on ID number and maximum number of concurrent tasks allowed. The position in the waiting queue is indicated after the #.
  - **Failed** – The task was unsuccessful due to some error.
  - **Completed** – The task was successful.
  - **Canceled** – The running or queued task was canceled by the user of the system.
- **Start Time** – Date and time when the task started running.
- **End Time** – Date and time when the task completed, canceled, or failed.

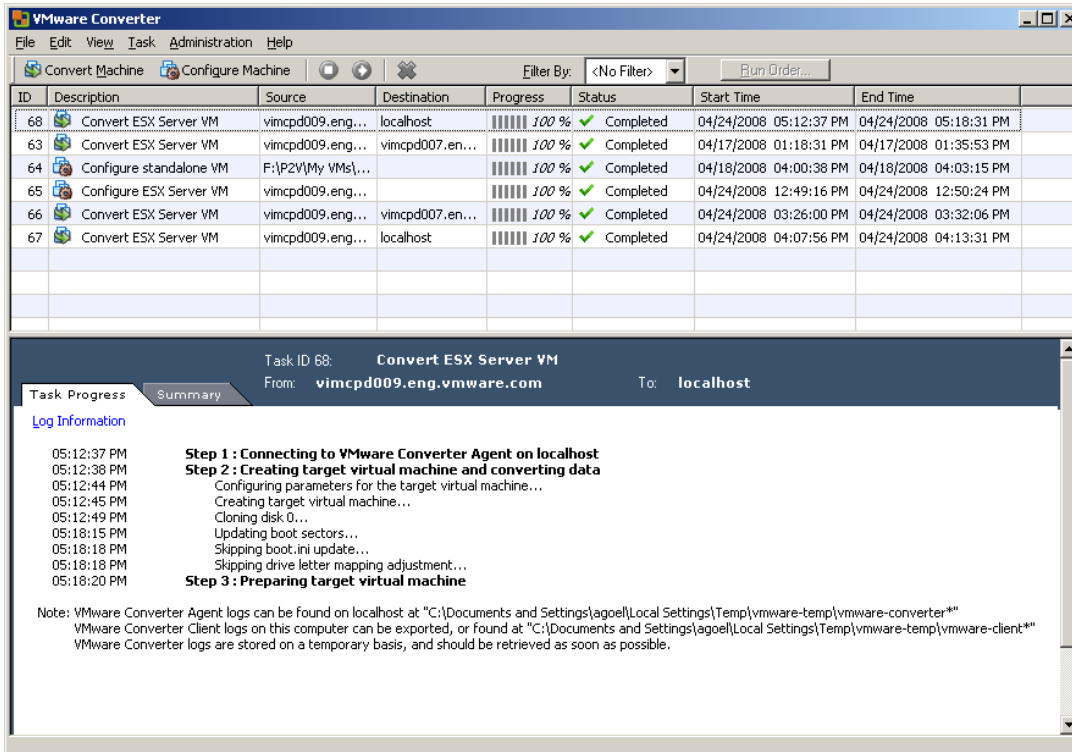
Click any of the headers in the task list to sort the list by that attribute.

Toolbar

The toolbar contains the following commands and buttons for you to use:

- **Convert Machine** – Click to invoke the Conversion wizard. See Chapter 4, "Converting Machines," on page 29.
- **Configure Machine** – Click to invoke the Configure wizard. See Chapter 6, "Configuring VMware Virtual Machines," on page 55.
- **Cancel Task** ( ) – See "Cancel a Task" on page 62.
- **Start Task** ( ) – See "Starting and Canceling Tasks" on page 61.
- **Delete Task** ( ) – See "Delete a Task" on page 62.
- **Filter By** – See "Change the Number of Tasks Displayed in the Task List" on page 65.
- **Run Order** – See "Change the Run Order" on page 64.

Figure 7-1. Task View and the Details View of the Converter Task Manager



Details View

When you select a task in the task list of the Task View, you can see details of that particular task in the Details View in the lower half of the screen. The Details View has two tabs: **Summary** and **Task Progress**.

Summary Tab

The **Summary** tab appears by default when you select a task in the task list. It shows a summary of the options and details pertaining to the selected task, as configured in the wizard. The information falls into three categories: Source system information, destination system information (not used in "Configure Machine" tasks), and destination customization.

An **Edit** link appears in the upper-left corner of the **Summary** tab. Use it to reopen the Convert Machine or Configure Machine wizard to make modifications to the task. This link is available only if the task's status is queued, failed, or canceled. See "Edit a Task" on page 63.

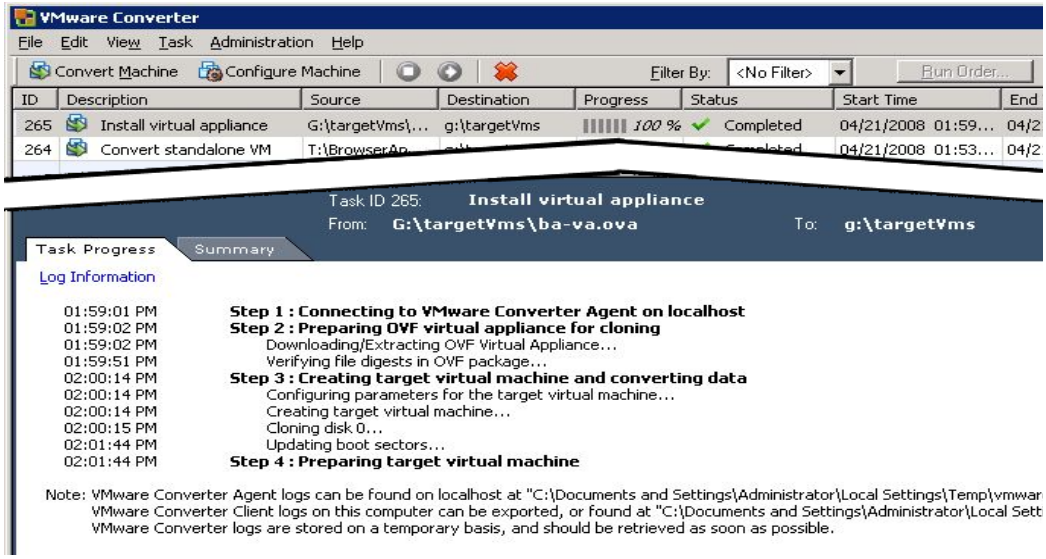
Task Progress Tab

The **Task Progress** tab displays the steps involved in the conversion for that task and the status of each step. For a task that is running, the tab shows which step is currently in progress and the time the step started. The percentage of completion for the task and an estimate of time remaining appears in the task list.

When the task is finished, or stops running because it is canceled, the system displays a note with information on where to find the logs for the task. Another source for the same information is the **Log Information** link at the top of the tab.

Converter does not store the task progress information beyond the current session. If you close the application and restart it, the **Task Progress** tab displays **[Information Unavailable]** for previously finished tasks, and does not contain a **Log Information** link.

Figure 7-2. Completed Task



Starting and Canceling Tasks

If no other tasks are in queue, a task starts immediately after finishing the steps in the Conversion wizard. If other tasks are in queue, a task is put at the end of the queue and can run as soon as it is able. In some cases that can be immediately, depending on the setting of the number of tasks that can run concurrently. See "Control the Number of Tasks Running Concurrently" on page 64.

For more information about changing the run order for a task, see "Change the Run Order" on page 64. For more information about forcing a queued task to run, see "Force a Queued Task to Run" on page 62.

Force a Queued Task to Run

To override the order of the queued tasks, or to override any limit on the number of tasks that can be run concurrently, you can force a queued task to run from the toolbar.

For Starter edition users, you can force only the first task to run.

To force a task to run

Choose the task in the task list of the Task View and click the **Start Task** button ().

Cancel a Task

You can cancel a task in the queue or one in progress. After a task is canceled, it loses its place in the queue, displaying "- - -" for the Start Time in the task list and the time of cancellation in the End Time column.

Canceling a task in progress does not "suspend" it. Canceling a task backs it out of the conversion and reverts the source machine to its original state. To continue the task later, you can edit the task, but you must restart from the beginning. See "Edit a Task" on page 63.

To cancel a task

1 Choose a task in the task list of the Task View.

Shift-click or control-click to choose more than one task.

2 Click the **Cancel** button ().

Delete a Task

The delete command removes a task from the task list. The command works on any task except for one in progress. A running task must be canceled before it can be deleted.

It is also possible to clear all tasks from history, except for those currently running.

To delete a specific task

1 Choose the task in the task list of the Task View.

Shift-click or control-click to choose more than one task.

2 Click the delete button ().

To clear all tasks from history

1 Choose **Administration > Clear All Tasks** in the main menu.

2 Click **Yes**.

Looking at Progress and the Logs

Converter displays the progress of tasks in the Task View and the Details View.

If problems arise that cause the task to fail, you can review information in the logs. Also, when you try to edit a failed task, the Edit wizard shows the problem areas. See "Edit a Failed Task" on page 64.

View a Task's Progress

Although you can get a general sense of a task's progress by looking at its row in the task list of the Task View, you can get a more complete picture by viewing the Task Progress tab in the Details View.

To view a task's progress in the Details View

Choose the row in the task table for the task you want to view.

The **Task Progress** tab for that tasks appears in the Details View. See "Task Progress Tab" on page 61.

Export and View the Log

You must export the log text file to read it or to send a copy to VMware technical support.

To export a copy of a log file

1 Choose **File > Export Logs** in the main menu.

2 Select a location and save the log text files in the Export Logs dialog box.

3 Open the log file with a text editor.

UFAD and Client Log File Locations

The following paths describe the location of the recommended logs for you to view and send to VMware support, if necessary.

UFAD logs are located in the following directories:

- `Windows NT - %WINDIR%\vmware-temp\vmware-converter*`
- `All other systems - %WINDIR%\Temp\vmware-temp\vmware-converter*`

Client logs are located in `%TEMP%\vmware-temp\vmware-client*.`

Send these files to support using **File > Export Logs**. For Converter Boot CD, map a network drive using the network configuration tool and use **File > Export Logs**. See Chapter 5, "Using the Converter Boot CD for Local Cold Cloning," on page 45.

These are also the file locations on the remote machine if you are running a remote hot clone. To send these logs from a remote machine to VMware support, you must manually compress and send them.

Editing Tasks

You can edit tasks with a queued, completed, failed, or canceled status.

Edit a Task

As long as a task is not in progress you can use the Edit wizard to change conversion settings. After you edit a task, it goes to the end of the queue. To move the task up the queue, use the **Run Order** button in the toolbar. See "Change the Run Order" on page 64.

To edit a queued or canceled task from the Summary tab

1 Choose a row in the task list.

The **Task Progress** tab for that task appears in the Details view.

2 Click the **Summary** tab.

3 Click the **Edit** link to start the Converter Edit wizard.

4 Select the page link that contains the information or settings to edit.

Repeat as necessary.

For minor edits, you need deal with the specific pages only, and not the unaffected ones. However, in the case of edits in which you change the source or destination, Converter resets all the remaining pages in the procedure to their defaults. You must go through each remaining page to complete the conversion task creation.

5 Click **Finish**.

Edit a Failed Task

Editing a failed task has a few differences from editing a queued or canceled task.

To edit a failed task

1 Choose a row in the task table.

The **Task Progress** tab for that task appears in the Details view.

2 Click the **Summary** tab.

3 Click the **Edit** link in the **Task Progress** tab to start the Converter Edit wizard.

For places in which problems occur, the table of contents displays warning icons beside the page name, which appears in red. The Edit wizard takes you directly to the first page with a problem. All links beyond the first error are disabled until you resolve the problem.

4 Select a page link.

5 Edit the information or settings.

6 Repeat as necessary.

7 Click **Finish**.

Managing How Tasks Run

Converter provides a variety of options for how you can view and manage tasks.

Control the Number of Tasks Running Concurrently

In the Enterprise edition of Converter, you can set the number of tasks that can run at a time. The default is Unlimited. However, you can set the maximum to be anywhere from 0 to 255. If you set the maximum to 0, every task that joins the queue must be started manually.

If you are using the Starter edition, the maximum is 1. Running concurrent tasks is not an option.

To set the number of tasks that can run concurrently

1 On the main menu, choose **Administration > Maximum Concurrent Tasks**.

2 In the Maximum Concurrent Tasks dialog box, choose or type a number.

3 Click **OK**.

Change the Run Order

You can change the order of tasks in the queue. When you are in the process of changing the run order, queued tasks do not start running.

To change the run order

1 Click the **Run Order** button in the toolbar.

2 In the Run Order dialog box, choose the task you want to move in the queue, and use the up or down arrow button to change its position.

You can also change a task's position by dragging.

Shift-click or control-click to choose more than one task.

3 Click **OK**.

Change the Number of Tasks Displayed in the Task List

After using Converter for a length of time, the number of tasks archived can grow to be very large. To minimize clutter in the task list you can lower the number of tasks that appear.

Tasks in progress and tasks in queue to run are not affected by this selection. They are always displayed in the task list.

To limit the number of archived tasks displayed in the Task View

1 On the main menu, choose **View > Tasks Displayed**.

2 Choose a level of display, using the **Tasks Displayed** drop-down menu, and click OK.

See also "Delete a Task" on page 62.

Change Which Tasks Are Displayed in the Task List

You can filter tasks in the task list by status.

To filter the tasks displayed in the Task View

1 Choose the **Filter By** drop-down menu in the toolbar.

2 Choose a task type.

You can select more than one status to filter by. In this case, the drop-down menu displays **<Multiple>**.

If you already limited the number of tasks displayed, any filter you choose is applied on top of that subset of tasks.

Appendix: Migration with p2vTool Command-Line Interface

Using the Experimental p2vTool Command-Line Interface

VMware provides p2vTool as a tool for migrating physical and virtual source machines with a command-line interface (CLI). Support for this CLI is experimental. Users cannot file support requests (Sirs) to VMware for p2vTool-related issues.

You need an Enterprise license to use p2vTool to migrate machines. The one exception is restoring a VCB image. In this case, p2vTool can execute the query, verify, import, and postprocess options without a license if it detects that the source is a VCB image.

The XML schema `p2v.xsd` is shipped with the Converter 3.0.2 executable.

This appendix includes the following topics:

- "Syntax and Options" on page 67
- "Source Machines and Destination Machines" on page 69
- "Restoring VCB Images" on page 69
- "Migration XML Input File Examples" on page 70
- "-q [--query] Option XML Output File Example" on page 74
- "VCB Restore XML Input File Examples" on page 75
- "OVF XML Output File Examples" on page 76

Syntax and Options

With p2vTool, you can perform migrations by using either a short or long format. For example, to import a machine described in the XML file `p2v.xml`, type one of the following commands:

- **Short format** – `p2vtool –i –s p2v.xml`
- **Long format** – `p2vTool ––import ––source p2v.xml`

Only one action option, can be specified for each execution or command line, as follows:

- `––query`
- `––verify`
- `––import`
- `––postprocess`

Up to 10 instances of p2vTool can run simultaneously.

You can perform the actions identified by the options listed in Table A-1.

Table A-1. p2vTool Options

Option	Action
`-? [--help]`	Produces help message. Lists the options for the p2vTool command-line interface.
`-q [--query]`	Retrieves source computer information. Returns an XML description of the source machine. Run the `-q` option against any properly formatted input XML file that specifies a source. Running this before importing can help you in setting up the XML file for doing the import. This option requires the `-s` option to identify the source computer. To view the XML output on your monitor, use the `-d` option also. To print it to a file, use the `-o` option. See Example A-5 and Example A-9.
`-v [--verify]`	Verifies that the source computer can be imported to the destination computer. For confirming the availability of the source machine and the availability of the destination machine with sufficient room on it to receive the migrated machine. This option requires the `-s` option to identify an input XML file that specifies a complete import job (do not use it with an input XML file that specifies a postprocess-only job). To view the XML output on your monitor, use the `-d` option also.
`-i [--import]`	Performs a migration. For initiating the migration. This option requires the `-s` option to identify the source computer and the parameters of the operation in the `p2v.xml` file.
`-p [--postprocess]`	Performs postprocessing of the virtual machine. For image customization or reconfiguration parameters of a machine not involved in a migration. (Postprocessing can be done as part of an `-i` migration if postProcessingParams are specified in the input XML file.) This option requires the `-s` option to specify the input XML file to be applied against the source. Postprocessing is not performed when you create OVF virtual appliances. You perform postprocessing on the target virtual machine when you import a virtual appliance to a supported destination. It is not performed on OVF images, including OVF images you create by using the `-i` option.
`-s [--source] arg (=p2v.xml)`	Inputs an XML file. The XML file that defines the migration or the object of the activity started by the action option. See "Migration XML Input File Examples" on page 70 and "VCB Restore XML Input File Examples" on page 75 for examples.
`-o [--output] arg`	Prints output XML to specified file.
`-d [--dump]`	Prints output XML to console.
`-l [--lic]`	Prints the license. Displays information on existing license type, version number, issued date, expiry date, and number of concurrent jobs allowed.
`-n [--newlic] arg`	Changes a license. To add or change an existing license, provide the path of the file containing the license you want to add or use.

NOTE If you do not provide the user name or password for accessing a source or destination machine in the `p2v.xml` file, p2vTool prompts for the name or password to be entered.

Canceling a Task

An ongoing p2vTool task is cancelled if you press Ctrl+C.

Source Machines and Destination Machines

You can use p2vTool with live, hosted, and managed source machines or virtual appliances, and hosted and managed destination machines or virtual appliances.

A live machine can only be a source and has these attributes:

- Can be a physical machine or a virtual machine.
- Performs a live import that avoids having to shut down the source machine.
- Must be powered-on at the time of import.

A hosted machine can be a source or destination and has these attributes:

- Is a flat-file virtual machine, typically from a VMware Workstation product or a supported backup format.
- Must be accessible from the local machine's operating system. (It can be on a network share, but the network share must be mounted before running p2vTool.)
- If used as a source, the virtual machine must be powered off at the time of import.

A managed machine can be a source or destination and has these attributes:

- Virtual machines running on an ESX Server machine.
- The server can be specified as an ESX Server machine or the VirtualCenter server that is managing it.
- If used as a source, the virtual machine must be powered off at the time of the import.

A virtual appliance can be an.ovf file or an .ova file that contains a group of files. You can install a virtual appliance from any local or remote file system accessible from the source machine or from a remote machine path shared over the network.

With p2vTool, you can migrate volumes to separate disks. Set the attribute `separateDisk="true"` in the `volumeCloneInfo` node for each volume you want to place on a separate disk. Do not set this attribute for active or system volumes. See Example A-5, "Importing a Managed Source to a Managed Destination, Explicitly Specifying Optional Parameters," on page 72 and Example A-9, "XML Output for the p2vTool –q [--query] Option," on page 74.

Restoring VCB Images

VCB enables its users to back up entire ESX Server virtual machines, storing the backup using Workstation disks, a `.vmx` file, and a catalog file. The p2vTool can restore VCB images into ESX Server 3.x machines, both standalone and those managed by VirtualCenter, and can also import them to hosted products.

The p2vTool does not preserve certain virtual machine properties unless settings for the attributes that can preserve the properties are included in the input XML file. Preserving these properties is applicable only to a managed product destination. Table A-2 shows the attributes that need attention to preserve these properties. For a VMware hosted product destination, do not set the attributes, because virtual machine properties are not preserved.

Table A-2. Settings to Preserve Properties

Node	Attribute	Settings
ImportParams	keepIdentity	Default is `false`. Set to `true` to preserve the virtual machine identity
	preserveDeviceBackingInfo	Default is `false`. Set to `true` to preserve the device backing information for CD-ROM, floppy, serial port, and parallel port.
NicMappings	preserveNicsInfo	Default is `false`. Set to `true` to use the network adapter information from the source.

Information in the catalog file is not extracted. To restore to the same location, view the original catalog file and include that information in the input XML file.

The p2vTool can import VCB images into standalone hosted products. Attributes cannot be set to preserve properties as shown in Table A-2.

Migration XML Input File Examples

Here are examples of XML input files for the various combinations of sources and destinations in a p2vTool import.

Example A-1. Importing a Live Physical Machine Source to a Managed Destination

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="2.1" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd"
 uninstallAgentOnSuccess="0">
    <source>
        <liveSpec>
            <creds host="a-running-machine.company.com" username="Administrator"
                        password="adminPassword" />
        </liveSpec>
    </source>
    <dest>
        <managedSpec vmName="a-new-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                        prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </dest>
    <importParams targetProductVersion="PRODUCT_MANAGED" />
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-2. Importing a Live Local Machine to a Managed Destination

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <liveSpec />
    </source>
    <dest>
        <managedSpec vmName="a-new-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                        prompted for credentials -->
            <creds host="another-vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </dest>
    <importParams targetProductVersion="PRODUCT_MANAGED" />
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-3. Importing a Managed Source to a Hosted Destination

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <managedSpec vmId="a-virtual-machine">
        <!-- username and password may be omitted, in which case you will be interactively
                       prompted for credentials -->
        <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </source>
    <dest>
        <hostedSpec vmName="a-new-virtual-machine" path="d:\My Virtual Machines" />
    </dest>
    <importParams targetProductVersion="PRODUCT_WS_5X" />
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-4. Importing a Managed Source to a Managed Destination

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <managedSpec vmId="a-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                           prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </source>
    <dest>
        <managedSpec vmName="a-new-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                           prompted for credentials -->
            <creds host="another-vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </dest>
    <importParams targetProductVersion="PRODUCT_MANAGED" />
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-5. Importing a Managed Source to a Managed Destination, Explicitly Specifying Optional Parameters

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <managedSpec vmId="a-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                        prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </source>
    <dest>
        <managedSpec vmName="a-new-virtual-machine" datastore="storage2" folder="my-vms"
                    cluster="vc-cluster-3" host="an-ESX-host-attached-to-dest-vc-server"
                    resourcePool="vc-resource-pool-1">
            <!-- username and password may be omitted, in which case
            you will be interactively prompted for credentials -->
            <creds host="dest-vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </dest>
    <importParams targetProductVersion="PRODUCT_MANAGED" diskType="VMFS" clonePagefile="false">
    <!--The p2vTool -q [--query] option retrieves source information, and its XML output contains
                the volumeID. Link to out put XML -->
        <volumesToClone>
            <volumeCloneInfo volumeId="{computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},1}"
                        resize="true" separateDisk="false" newSize="10000000000" />
            <volumeCloneInfo volumeId="{computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},2}"
                        resize="false" separateDisk="true" >/
        </volumesToClone>
    <diskLocations>
        <diskLocation disk="#storage2" />
        <diskLocation disk="#storage3" />
    </diskLocations>
    </importParams>
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-6. Importing a Hosted Source to a Managed Destination

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <!-- the "password" attribute is only used for encrypted sources such as Symantec's SV2I
                        format and can be omitted for other types of sources -->
        <hostedSpec path="d:\My Virtual Machines\a-virtual-machine\a-virtual-machine.vmx"
                        password="" />
    </source>
    <dest>
        <managedSpec vmName="a-new-virtual-machine">
            <!-- username and password may be omitted, in which case you will be interactively
                        prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </dest>
    <importParams targetProductVersion="PRODUCT_MANAGED" />
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-7. Reconfiguring a Hosted Source

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <!-- the "password" attribute is only used for encrypted sources such as Symantec's SV2I
                        format and can be omitted for other types of sources -->
        <hostedSpec path="d:\My Virtual Machines\a-virtual-machine\a-virtual-machine.vmx"
                        password="" />
    </source>
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

Example A-8. Reconfiguring a Managed Source

```
<?xml version="1.0" encoding="UTF-8" ?>
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <managedSpec vmId="my-vm">
            <!-- username and password may be omitted, in which case you will be interactively
                            prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </source>
    <postProcessingParams>
        <reconfigParams />
    </postProcessingParams>
</p2v>
```

-q [--query] Option XML Output File Example

Example A-9. XML Output for the p2vTool `-q [--query]` Option

```
<?xml version="1.0" encoding="UTF-8"?>
<p2v uninstallAgentOnSuccess="0" version="3.2" xmlns="http://www.vmware.com/v3/sysimage/p2v"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.vmware.com/v3/sysimage/p2v p2vOutput.xsd"
xsi:type="P2VOutput">
    <source>
        <managedSpec vmId="a-virtual-machine">
        <!-- username and password may be omitted, in which case you will be interactively
                    prompted for credentials -->
            <creds host="vc-server" username="Administrator" password="adminPassword" />
        </managedSpec>
    </source>
    <dest>
        <managedSpec datastore="storage2" folder="my-vms"
                    host="an-ESX-host-attached-to-dest-vc-server"
                    resourcePool="vc-resource-pool-1" vmName="a-new-virtual-machine">
            <creds host="vc-server" password="" port="0" username="Administrator"/>
        </managedSpec>
    </dest>
    <sourceInfo>
        <osInfo displayName="Windows XP Professional" edition="Workstation/Professional"
                    guestOsId="winXPProGuest" is64Bit="false" majorVersion="5"
                    minorVersion="1" osFamily="WINDOWS" spLevel="2" vendor="Microsoft"/>
        <disks>
            <diskInfo capacity="400088457216" deviceNumber="0"
                        id="disk={9ba2498e79b590fd75d62d8b65fa945c367c0fea}"/>
            <diskInfo capacity="160041885696" deviceNumber="1"
                        id="disk={5c822bdfe4346fded26a0a0854198ded817c6666}"/>
            <diskInfo capacity="320072933376" deviceNumber="2"
                        id="disk={961925382f53577de35e883c6987f0bc8486d21}"/>
        </disks>
        <volumes>
            <volumeInfo capacity="160039240704" diskDeviceNumber="0" drive="c:"
                        id="attVol={computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},1}"
                        isActiveVolume="true" isFilesystemUnderstood="true"
                        isSystemVolume="true" used="11500454912"/>
            <volumeInfo capacity="160039240704" diskDeviceNumber="1" drive="d:"
                        id="attVol={computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},2}"
                        isActiveVolume="false" isFilesystemUnderstood="true"
                        isSystemVolume="false" used="134157943808"/>
            <volumeInfo capacity="262147866624" diskDeviceNumber="2" drive="f:"
                        id="attVol={computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},3}"
                        isActiveVolume="false" isFilesystemUnderstood="true"
                        isSystemVolume="false" used="122588069888"/>
            <volumeInfo capacity="57922421760" diskDeviceNumber="2" drive="g:"
                        id="attVol={computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},4}"
                        isActiveVolume="false" isFilesystemUnderstood="true"
                        isSystemVolume="false" used="29163381760"/>
            <volumeInfo capacity="240046571520" diskDeviceNumber="0" drive="i:"
                        id="attVol={computer={d7e40f6d3ddd078441daab8676a2ed13d2fe8bd2},5}"
                        isActiveVolume="false" isFilesystemUnderstood="true"
                        isSystemVolume="false" used="74944512"/>
        </volumes>
        <nics>
            <nicInfo network=""/>
            <nicInfo network=""/>
        </nics>
    </sourceInfo>
    <compatibilityReport>
        <compatibility compatibilityWarning="IMPORT_OK_NO_INSTALL_TOOLS"/>
    </compatibilityReport>
</p2v>
```

VCB Restore XML Input File Examples

Here are two examples of XML input files for a p2vTool restore of a Consolidated Backup image to a managed VMware product.

Example A-10. Restoring a VCB Image to an ESX Server 3.x Host Through VirtualCenter

```
<?xml version="1.0" encoding="UTF-8" ?>
<!--
 Restore a VCB image to an ESX 3.x machine through VirtualCenter
-->
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <!-- the "password" attribute is only used for encrypted sources such as the SV2I format
                    and can be omitted or other types of sources -->
        <hostedSpec password="" path="C:\MyVirtualMachine\myvcbimage.vmx" />
    </source>
    <dest>
        <managedSpec datastore="MYVMFS3" folder="" host="my_esx3_host" resourcePool="myrsrpool"
                    vmName="vcbrestore">
            <creds host="myVCServer" password="" port="" username="admin" />
        </managedSpec>
    </dest>
    <!-- The "keepIdentity" optional attribute is used to indicate whether an "identity restore"
                  is attempted. The attribute must be set to true if the VM is to be re-imported
                  after it has been lost (deleted). If the VM is to be re-imported for cloning
                  purpose, the flag must be set to false. The default is false. This attribute
                  only applies to managed destination -->
    <!-- If the "preserveDeviceBackingInfo" optional attribute is set to true, all the device
                  backing information for the VM is restored. This includes reconnecting CDROMs,
                  serial port, parallel port if devices exist. The default is set to false. This
                  attribute only applies to managed destination -->
    <importParams clonePagefile="false" diskType="VMFS" keepIdentity="true"
                  preserveDeviceBackingInfo="false" targetProductVersion="PRODUCT_MANAGED">
        <!-- If the "preserveNicsInfo" attribute is set to true, all network interfaces will be
                    preserved and get reconnected to the original virtual switches if exist.
                    Manually assigned ethernet MAC addresses will be preserved as well. If it
                    is set to false and nicmappings node is empty, all the VM's network
                    interfaces will be stripped off. The default value is false.-->
        <nicMappings preserveNicsInfo="true" />
    </importParams>
    <postProcessingParams installTools="false" powerOnVM="true" />
</p2v>
```

Example A-11. Restoring a VCB Image to an ESX Server 3.x Host Directly

```
<?xml version="1.0" encoding="UTF-8" ?>
<!-- Restore a VCB image to an ESX 3.x machine directly -->
<p2v version="1.0" xmlns="http://www.vmware.com/v2/sysimage/p2v"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.vmware.com/v2/sysimage/p2v p2v.xsd">
    <source>
        <!-- the "password" attribute is only used for encrypted sources such as the SV2I format
                        and can be omitted or other types of sources -->
        <hostedSpec password="" path="F:\VirtualMachine\vbcwin2k3\win2k3ent.vmx" />
    </source>
    <dest>
        <managedSpec datastore="MYVMFS3" folder="" host="" resourcePool="" vmName="vcbrestore">
            <creds host="my_esx3_host" password="" port="" username="root" />
        </managedSpec>
    </dest>
    <!-- The "keepIdentity" optional attribute is used to indicate whether an "identity restore"
                    is attempted. The attribute must be set to true if the VM is to be re-imported
                    after it has been lost (deleted). If the VM is to be re-imported for cloning
                    purpose, the flag must be set to false. The default is false. This attribute
                    only applies to managed destination -->
    <!-- If the "preserveDeviceBackingInfo" optional attribute is set to true, all the device
                    backing information for the VM is restored. This includes reconnecting CDROMs,
                    serial port, parallel port if devices exist. The default is set to false. This
                    attribute only applies to managed destination -->
    <importParams clonePagefile="false" diskType="VMFS" keepIdentity="true"
                    preserveDeviceBackingInfo="false" targetProductVersion="PRODUCT_MANAGED">
        <!-- If the "preserveNicsInfo" attribute is set to true, all network interfaces will be
                        preserved and get reconnected to the original virtual switches if exist.
                        Manually assigned ethernet MAC addresses will be preserved as well. If it
                        is set to false and nicmappings node is empty, all the VM's network
                        interfaces will be stripped off. The default value is false.-->
        <nicMappings preserveNicsInfo="true" />
    </importParams>
    <postProcessingParams installTools="false" powerOnVM="true" />
</p2v>
```

OVF XML Output File Examples

Here are examples of XML output files for a p2v Tool import of an OVF virtual appliance to a Workstation destination and an creation of an OVF package to a Workstation source.

Example A-12. Importing an OVF Virtual Appliance to a Workstation Destination

```
<?xml version="1.0" encoding="UTF-8"?>
<p2v version="1.0"
        xmlns="http://www.vmware.com/v3/sysimage/p2v"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="http://www.vmware.com/v3/sysimage/p2v p2v.xsd">
    <source>
        <ovfSpec path="C:\targetVms\bugs\246223\246223.ovf"/>
    </source>
    <dest>
        <hostedSpec vmName="ba" path="T:\target-tests\test"/>
    </dest>
    <importParams targetProductVersion="PRODUCT_WS_6X"/>
    <postProcessingParams>
        <reconfigParams/>
    </postProcessingParams>
</p2v>
```

Example A-13. Creating an OVF Package from a Workstation Source

```
<?xml version="1.0" encoding="UTF-8"?>
<p2v version="1.0"
        xmlns="http://www.vmware.com/v3/sysimage/p2v"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="http://www.vmware.com/v3/sysimage/p2v p2v.xsd">
    <source>
        <hostedSpec path="T:\BrowserAppliance\BrowserAppliance.vmx"/>
    </source>
    <dest>
        <ovfSpec vmName="ovfToolTarget" path="C:\targetVms\p2vTool"/>
    </dest>
    <importParams targetProductVersion="PRODUCT_WS_5X">
        <ovfExportEnvelope ovf_or_ova="ova">
            <ovfProductSection ovfProduct="Vmware Converter"
                ovfProductUrl="www.converter.com"
                ovfVendorUrl="www.vmware.com"
                ovfVendor="VMware Inc"
                ovfVersion="3.0.3"
                ovfFullVersion="3.0.3-beta"
                ovfApplianceUrl="www.converterappliance.com">
            </ovfProductSection>
            <ovfEulaSection
                ovfLicenseInfo="This is the converter license"
        ovfLicense="This is the converter License dora ipsi logan sim">
            </ovfEulaSection>
            <ovfOperatingSystemSection ovfOperatingSystemDescription="This is the Ubuntu guest OS
                        for Browser Appliance.">
            </ovfOperatingSystemSection>
            <ovfAnnotationSection ovfAnnotation="Enter your favorite virtual appliance annotation
                        here">
            </ovfAnnotationSection>
        </ovfExportEnvelope>
        <nicMappings>
            <nicMapping network="VMNetwork"/>
        </nicMappings>
    </importParams>
</p2v>
```

Glossary

B

BIOS (basic input/output system)
Firmware that controls machine startup and manages communication between the CPU and other devices, such as the keyboard, monitor, printers, and disk drives.

bridged networking
In hosted products, a type of network connection between a virtual machine and the host's physical network. With bridged networking, a virtual machine appears to be an additional computer on the same physical Ethernet network as the host. *See also* host-only networking, NAT (network address translation).

C

child
A managed entity grouped by a folder object or another managed entity.

clone
(n.) A duplicate of a virtual machine. (v.) To make a copy of a virtual machine. When a clone is created, VirtualCenter provides an option for customizing the guest operating system of that virtual machine. Hosted products distinguish between full clones and linked clones. *See also* full clone, linked clone.

cold cloning
In VMware Converter, making a copy of a local physical machine while it is running in WinPE from the VMware Converter Boot CD, not from its own operating system. *See also* hot cloning.

concurrent migrations
In VMware Converter, the Task Manager's ability to direct the conversion and migration of multiple virtual machines at the same time.

configuration
See virtual machine configuration.

current virtual machine
(1) A virtual machine of the latest version supported by the product in use.
(2) In hosted products, the virtual machine that has focus in the service console.

customization
The process of applying new characteristic values to a virtual machine as it is being deployed from a template or cloned from another existing virtual machine.

D

datastore
Virtual representations of combinations of underlying physical storage resources in the datacenter. A datastore is the storage location (for example, a physical disk, a RAID, or a SAN) for virtual machine files.

destination
In VMware Converter, the machine to which one imports a virtual machine, whether migrated or converted from a physical machine.

destination virtual machine
In VMware Converter, the migrated virtual machine at its final location.

DHCP (Dynamic Host Configuration Protocol)
A communications protocol that enables dynamic addressing. The software relieves administrators of the task of assigning an IP address to each device that connects to a network.

disk mode
A property of a virtual disk that defines its external behavior (how the virtualization layer treats its data) but is completely invisible to the guest operating system.

DNS (Domain Name System)
An Internet data query service that translates host names into IP addresses. Also called "Domain Name Server" or "Domain Name Service."

E

Ethernet switch
A physical switch that manages network traffic between machines. A switch has multiple ports, each of which can be connected to a machine or to another switch on the network. *See also* VMotion.

EULA (end user license agreement)
The software license that details any restrictions placed on users.

F

full clone
A complete copy of the original virtual machine, including all associated virtual disks. *See also* linked clone.

G

growable disk
A type of virtual disk in which the disk space is not preallocated to its full size. Its files start out small in size and grow as data is written to the disk.

guest operating system
An operating system that runs inside a virtual machine. *See also* host operating system.

H

host
(1) A physical computer capable of running virtual machines. Also called the "host machine" or "host computer." (2) In VMware Converter, the physical computer on which the VMware Converter software is installed.

host agent
Software that, when installed on a virtual machine host, performs actions on behalf of a remote client.

host-based licensing
In ESX Server software, one of two modes for licensing VMware software. License files reside on the host and feature availability is tied strictly to the host in which the file resides. *See also* server-based licensing.

hosted products
VMware products (including Workstation, VMware Player, VMware Server, VMware ACE, and Lab Manager) that run as applications on physical machines with operating systems such as Microsoft Windows or Linux. By comparison, ESX Server is a "bare-metal" product, which provides a thin software layer (the hypervisor) that enables it to run directly on the physical machine.

host-only networking
In hosted products, a type of network connection between a virtual machine and the host. With host-only networking, a virtual machine is connected to the host on a private network, which normally is not visible outside the host. Multiple virtual machines configured with host-only networking on the same host are on the same network. *See also* bridged networking, NAT (network address translation).

host operating system
An operating system that runs on the host machine. *See also* guest operating system.

hot cloning
In VMware Converter, cloning a local or remote physical machine while it is running in its own operating system. *See also* cold cloning.

hot fix
An installable file that resets a user's password, renews an expired virtual machine, or enables a copy-protected virtual machine to run from a new location.

L

license file
A text file determining the license mode and entitlement to licensed features.

license key
An encrypted block of text within a license file, that determines entitlement to one specific licensed feature.

license mode
The method used for licensing VMware software. *See also* host-based licensing, server-based licensing.

linked clone
A copy of the original virtual machine that must have access to the parent virtual machine's virtual disks. The linked clone stores changes to the virtual disks in a separate set of files. *See also* full clone.

local cloning
Making a copy of a virtual machine residing in the system on which VMware Converter is running, or making a copy of the physical machine itself for conversion to a virtual machine. *See also* remote cloning.

LUN (logical unit number)
An identifier for a disk volume in a storage array.

M

managed products
A "bare-metal" VMware product, like ESX Server, that provides a thin software layer (the hypervisor) that enables it to run directly on the physical machine.By comparison, hosted VMware products (including Workstation, VMware Player, VMware Server, VMware ACE, and Lab Manager) are ones that run as applications on physical machines with operating systems such as Microsoft Windows or Linux.

migration
The process of moving a virtual machine between hosts. Unless VMotion is used, the virtual machine must be powered off when you migrate it. *See also* migration with VMotion, migration with VMware Converter.

migration with VMotion
The process of moving a virtual machine that is powered on and has met selected requirements, including the activation of VMotion on both the source and target hosts. When you migrate a virtual machine using VMotion, the operations of the virtual machine can continue without interruption. *See also* migration with VMware Converter.

migration with VMware Converter
The process of moving a virtual machine that is powered off from a local or remote host, while reconfiguring the file format, if necessary, to accommodate the destination machine. *See also* migration with VMotion.

NAT (network address translation)
In hosted networking, a type of network connection that enables you to connect your virtual machines to an external network when you have only one IP network address and that address is used by the host computer. *See also* bridged networking, host-only networking.

NIC (network interface card)
An expansion board that provides a dedicated connection between a computer and a network. Also called a "network adapter."

O

Open Virtual Machine Format (OVF)
A distribution format for virtual appliances that uses existing packaging tools to combine one or more virtual machines together with a standards-based XML wrapper. This format gives the virtualization platform a portable package containing all required installation and configuration parameters for virtual machines, which allows any virtualization platform that implements the standard to correctly install and run virtual machines.

P

physical disk
In hosted products, a hard disk in a virtual machine that is mapped to a physical disk drive or partition on the host machine. *See also* virtual disk.

provisioning
The process of creating a functioning virtual machine by assigning resources such as CPU, memory, and virtual hardware and then deploying a system image.

R

raw disk
See physical disk.

remote cloning
Making a copy of a virtual machine or a physical machine accessed over the network by VMware Converter. *See also* local cloning.

server-based licensing
A mode of licensing VMware software in which all license keys are administered by a license server, which manages a central license pool. Feature entitlement is checked out and returned on demand. *See also* host-based licensing.

source
In VMware Converter, the machine from which one imports or creates a virtual machine.

source virtual machine
In VMware Converter, the virtual machine to be imported, at its original location.

standalone virtual machine
A virtual machine that runs in Workstation, VMware Server, and VMware Player. Source virtual machines from Microsoft Virtual PC, Microsoft Virtual Server, and Symantec Backup Exec System Recovery images are also considered standalones. *See also* source virtual machine.

T

task
A managed object representing the state of a long-running operation.

TCP (Transmission Control Protocol)
A reliable transfer protocol used between two endpoints on a network. TCP is built on top of the Internet Protocol (IP). *See also* TCP/IP (Transmission Control Protocol/Internet Protocol).

TCP/IP (Transmission Control Protocol/Internet Protocol)
A set of protocols, the de facto language of the Internet, designed to enable communication between networks regardless of the computing technologies that they use. TCP connects hosts and provides a reliable exchange of data streams with guaranteed delivery. IP specifies the format of packets and handles addressing.

template
A master image of a virtual machine. This typically includes a specified operating system and a configuration that provides virtual counterparts to hardware components. Optionally, a template can include an installed guest operating system and a set of applications. Setting a virtual machine as a template protects any linked clones or snapshots that depend on the template from being disabled inadvertently. Templates are used by VirtualCenter to create new virtual machines. *See also* linked clone.

V

virtual appliance
A software solution that is composed of one or more virtual machines, is packaged as a unit by an appliance vendor, and is deployed, managed, and maintained as a unit.

virtual disk
A file or set of files that appears as a physical disk drive to a guest operating system. These files can be on the host machine or on a remote file system. *See also* growable disk, physical disk.

virtual hardware
The devices that make up a virtual machine. The virtual hardware includes the virtual disk, removable devices such as the DVD-ROM/CD-ROM and floppy drives, and the virtual Ethernet adapter.

virtual machine
A virtualized x86 PC environment in which a guest operating system and associated application software can run. Multiple virtual machines can operate on the same host system concurrently.

virtual machine configuration
The specification of which virtual devices, such as disks and memory, are present in a virtual machine and how they are mapped to host files and devices. In VMware Converter, VMware virtual machines whose disks have been populated by restoring from a backup or by some other direct means of copying undergo configuration to enable them to boot in VMware products. *See also* virtual machine.

virtual machine configuration file
A .vmx file containing a virtual machine configuration, which is created when you create the virtual machine. It is used to identify and run a specific virtual machine.

virtual memory
An extension of a system's physical memory, enabled by the declaration of a page file.

Virtual SMP
The technology that enables a virtual machine to do symmetric multiprocessing. Virtual SMP enables you to assign two virtual processors to a virtual machine on any host machine that has at least two logical processors.

VMotion
A feature that enables you to move running virtual machines from one ESX Server system to another without interrupting service. It requires licensing on both the source and target hosts. VMotion is activated by the VirtualCenter agent, and the VirtualCenter server centrally coordinates all VMotion activities. *See also* migration with VMotion.

VMware Infrastructure
A software suite, including ESX Server and VirtualCenter, that virtualizes servers, storage, and networking and enables multiple unmodified operating systems and their applications to run independently in virtual machines while sharing physical resources. The suite delivers comprehensive virtualization, management, resource optimization, application availability, and operational automation capabilities. *See also* Ethernet switch.

VMware Tools
A suite of utilities and drivers that enhances the performance and functionality of your guest operating system. Key features of VMware Tools include some or all of the following, depending on your guest operating system: an SVGA driver, a mouse driver, the VMware Tools control panel, and support for such

features as shared folders, drag-and-drop in Windows guests, shrinking virtual disks, time synchronization with the host, VMware Tools scripts, and connecting and disconnecting devices while the virtual machine is running.

Index

A

Acronis True Image **19**
adding an Enterprise license **27**
adding drivers to the Converter Boot CD **52**
Agent, *See* VMware Converter Agent

B

Boot CD
    memory requirements **18**

C

canceling a task **62**
changing an Enterprise license **27**
changing number of tasks displayed **65**
changing the run order **64**
clearing all tasks from history **62**
clones
    full **39**
    linked **39**
cloning
    by edition **10**
    cold, defined **11**
    defined **11**
    disk-based **15**
    hot, defined **11**
    local, defined **11**
    remote, defined **11**
clusters
    not supported as destinations **36**
    specifying for destination **36**, **47**
cold cloning
    defined **11**
    memory requirements **18**
command line interface, p2vTool **67**
completing import task creation **42**, **51**
configuring
    Windows operating systems **18**
controlling number of tasks running **64**
conversion options for a standalone virtual machine **29**, **30**, **32**, **33**, **34**, **36**

D

datastores **37**, **48**
deleting a task **62**
destination
    ESX Server **36**, **47**
    virtual appliances **38**
    Workstation or other standalone **39**, **48**
Details View, the **61**
disk-based cloning **15**
DNS, specifying the connections **42**, **51**, **57**
drivers, adding to the Converter Boot CD **52**
duplicate ID **22**

E

editing
    failed task **64**
    task **63**
Enterprise edition
    adding a license **27**
    changing a license **27**
errors, viewing in the logs **63**
ESX Server
    as destination **36**, **47**
    as source **33**
exporting the log **63**

F

failed task, editing a **64**
FAT file systems **40**, **49**
File and Printer Sharing **24**
filtering tasks displayed **65**
folder, location of application **25**

G

GSX Server support **19**
GUID Partition Table (GPT) disks **14**

H

hot cloning
    defined **11**

I

import options for a standalone virtual machine **39**, **46**
installing VMware Converter **25**
install-less mode **30**
ISO image, modifying with peTools **52**

J

jobs, managing **59**

L

license, adding **27**
live cloning. See hot cloning
local cloning
    defined **11**
log
    exporting and viewing **63**
    location of **32**, **63**
    Log Info button **32**

M

managing jobs with the Task View **15**, **59**
manifest file **31**
Master Boot Record (MBR) disks **14**
maximum number of tasks **64**
memory requirements for Boot CD **18**

N

network, same for source and destination machines **11**

O

offline cloning. See cold cloning
Open Virtual Machine Format, *see* OVF **15**
operating system
    system that Boot CD runs on **17**
OVF
    format for virtual appliances **30**

P

p2vTool
    input XML file examples **70**
    options **67**
    output XML file example **74**
p2vTool output file example, -query option **74**
p2vTool XML input file examples
    migration **70**
ports required for conversion **23**
progress, viewing **62**

R

remote cloning
    defined **11**
    troubleshooting tips **23**
removing System Restore checkpoints **57**
removing VMware Converter **26**
repairing VMware Converter **26**
resources, specifying **36**, **47**

S

settings affected by conversion **22**
ShadowProtect **19**, **35**
Simple File Sharing, turning off **23**
source
    ESX Server **33**
starting the wizard
    to edit a task **63**
Storage Craft ShadowProtect **19**, **35**
Summary Tab, the **61**
system reconfiguration **11**
System Restore checkpoints
    removing **57**
System Restore Checkpoints, removing **42**, **51**
System Restore, removing checkpoints **57**

T

table of contents pane **32**, **46**
task
    completing import creation **42**, **51**
    editing **63**
    editing failed **64**
Task List **59**
task manager
    canceling a task **62**
    changer number of tasks displayed **65**
    changing run order **64**
    clearing all tasks from history **62**
    deleting a task **62**
    Details View **61**
    filtering tasks by status **65**
    number of concurrent tasks **64**
    starting and canceling tasks **61**
    Summary tab **61**
    Task Progress tab **61**
Task Progress tab, the **61**, **62**
Task View, managing migrations with **15**, **59**
tasks
    filtering display of **65**
    maximum concurrent **64**
    run order **64**
TCP/IP ports **23**
toolbar **60**
troubleshooting tips, remote hot cloning **23**

U

unblocking File and Printer Sharing **24**
uninstalling VMware Converter **26**
uses for VMware Converter **9**

V

VCB, *See* VMware Consolidated Backup
Version support **19**
viewing a task's progress **62**
viewing the log **63**
virtual appliances
    browsing for **34**

converting **34**
destination **38**
downloading from URL **34**
overview **30**
selecting as source **34**
virtual disks
on FAT file systems **40**, **49**
virtual hardware
CPU issues **22**
disk device issues **22**
Ethernet adapter issues **22**
graphics card issues **22**
virtual machine
destination on same network as source **11**
supported file types **38**
unsupported conversion scenarios **31**
virtual machines
exporting **38**
unsupported conversion scenarios **31**
Virtual PC support **19**
Virtual Server support **19**
VirtualCenter support **19**
VMware Consolidated Backup **20**
VMware Converter
default location of application folder **25**
installing **25**
removing **26**
repairing **26**
uninstalling **26**
uses **9**
VMware Converter Agent
VMware Converter Boot CD
modifying ISO image **52**
VMware Fusion support **19**
VMware Server support **19**
volume, supported types **14**

W

Windows
cold clone requirements for Boot CD **18**
removing System Restore Checkpoints **42**, **51**
Simple File Sharing **23**
Windows Firewall **24**
Windows Server Domain **42**, **51**
Windows XP
checking Windows Firewall blocks **24**
turning off Simple File Sharing **23**
WINS, specifying the addresses **42**, **51**, **57**
wizard table of contents pane **32**, **46**
Workstation
as destination **39**, **48**
Workstation support **19**