

Novell Virtualization Technology

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GUEST OPERATING SYSTEM GUIDE

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About This Documentation

1

This chapter contains the following sections:

- ◆ [Section 1.1, “Intended Audience,” on page 7](#)
- ◆ [Section 1.2, “Documentation Feedback,” on page 7](#)
- ◆ [Section 1.3, “Additional Documentation,” on page 7](#)
- ◆ [Section 1.4, “Documentation Updates,” on page 7](#)
- ◆ [Section 1.5, “Technical Support and Education,” on page 8](#)

1.1 Intended Audience

This documentation is intended for computer users who need to set up and manage virtual machines hosted on a virtualization host server. It is intended to aid the experienced NetWare, Windows, or Linux system administrator who is already somewhat familiar with virtualization technology and data center operations.

1.2 Documentation Feedback

We are always looking for specific ways to improve the documentation. If you have a suggestion, please click the Add Comment link below or on the appropriate page (online version only). We are very grateful to be notified of documentation errors.

We also value hearing about tasks and topics that you think should be documented. If you identify a task you think should be included in the documentation, use the Add Comment link on the appropriate page and send us the information. (You could even send us the instructions for accomplishing the task!) We thank you in advance.

1.3 Additional Documentation

In addition to this guide, the following documentation might be helpful:

- ◆ Virtualization Technology Guide
- ◆ SUSE Linux Enterprise Server documentation
- ◆ Open Enterprise Server documentation
- ◆ Vendor documentation for Windows operating systems--See Microsoft Web site
- ◆ Vendor documentation for RedHat operating systems--See RedHat Web site
- ◆ Vendor documentation for Solaris operating systems--See Sun Microsystems Web site

1.4 Documentation Updates

This documentation is new and replaces any previous documentation about guest operating systems. Updates to the documentation will be made in the appropriate chapter and noted in an appendix at the end of the guide.

1.5 Technical Support and Education

Novell Technical Service offers three different service level agreements for customers running on YES certified system configurations, certified by the VM Server layer and the VM layer. Certified computer hardware and solution stacks are listed in YES Certification Bulletins available at [Novell YES CERTIFIED Program page \(http://developer.novell.com/devnet/yes/\)](http://developer.novell.com/devnet/yes/).

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- ◆ Novell technology information
- ◆ Novell product documentation
- ◆ Novell discussion forums
- ◆ User groups

Education classes can also be an effective way to quickly learn how to get the most out of this technology.

NetWare Virtual Machines

2

In Novell® Open Enterprise Server (OES) 2, the NetWare® operating system has been modified to run in paravirtual mode on a Xen virtual machine.

NOTE: Running OES 2 NetWare (NetWare 6.5 SP7) or earlier versions of NetWare 6.5 in fully virtualized mode on a Xen-based host server is not supported.

This section documents the system requirements, installation instructions, upgrade and migration instructions, and issues associated with setting up NetWare on a Xen-based virtual machine.

- ◆ [Section 2.1, “Introduction,” on page 9](#)
- ◆ [Section 2.2, “Supported Configurations and Features,” on page 10](#)
- ◆ [Section 2.3, “System Requirements,” on page 10](#)
- ◆ [Section 2.4, “Installation Methods,” on page 11](#)
- ◆ [Section 2.5, “Prerequisites,” on page 11](#)
- ◆ [Section 2.6, “NetWare Virtual Machines in the Tree,” on page 12](#)
- ◆ [Section 2.7, “Disabling the Alt+Esc Shortcut on the Host,” on page 12](#)
- ◆ [Section 2.8, “Installing Virtualized NetWare,” on page 12](#)
- ◆ [Section 2.9, “Managing NetWare on a Virtual Machine,” on page 19](#)

2.1 Introduction

There are many reasons to install NetWare on virtual machines, such as:

- ◆ Incorporating an OES 2 NetWare server into a production environment without committing additional hardware resources.
- ◆ Isolating Novell iFolder®, iPrint, GroupWise®, or other applications to a single virtual server without committing additional hardware resources.
- ◆ Extending the useful life of NetWare services by running them on a Linux host server, thereby taking advantage of the widespread industry support for Linux hardware drivers.

To simplify the process of installing virtualization software, the SLES 10 SP1 software includes *Xen Virtual Machine Host Server* as a primary server function that you can select when installing SLES 10 SP1 as a virtualization host server.

Selecting this pattern installs the Xen host server software, which enables the server to boot the Xen version of the SLES 10 SP1 operating system kernel. It also installs utilities for preparing and creating virtual machines.

After the host server is up and running, you can then create a virtual machine and install OES 2 NetWare as a guest operating system by following the instructions in this section.

2.2 Supported Configurations and Features

The following information pertains to NetWare 6.5 SP7 running as a guest operating system on a virtual machine.

- ◆ NetWare 6.5 SP7 is the only version of NetWare supported as a guest operating system. No other versions of NetWare are supported on a virtual machine.
- ◆ NetWare 6.5 SP7 is supported in paravirtual mode only. No current or previous versions of NetWare are supported in full virtualization mode.
- ◆ Supports the graphical paravirtualized frame buffer and the text-based console interface.
- ◆ Supports running on 32-bit, 32-bit PAE, and 64-bit hypervisors. Runs in 32-bit PAE compatibility mode on 64-bit platforms.
- ◆ Supports up to 16 block devices.
- ◆ Supports up to 32 virtual CPUs.
- ◆ Supports the pause and resume features.
- ◆ Supports the `xm` shutdown command.
- ◆ Supports the shutdown command in Virtual Machine Manager.
- ◆ Supports allocated memory from 512MB to 8GB.
- ◆ Supports VCPU overcommitment, pinning, and capping.
- ◆ Supports NetWare installations using a response file.
- ◆ Does not support VCPU hotplug.
- ◆ Does not support network or block device hotplug.
- ◆ Does not support virtual memory resizing.
- ◆ Does not support direct access to physical devices.
- ◆ Does not support save, restore, or migrate commands.
- ◆ Does not support some debugging features of Novell Remote Manager.

2.3 System Requirements

To create an OES 2 NetWare virtual machine, you need the following:

- ◆ A computer running SUSE Linux Enterprise Server 10 SP1 and virtual machine host software.
- ◆ Enough memory on the host computer for the host operating system and for each guest operating system you plan to run concurrently.

For example, if you are installing one OES 2 NetWare virtual machine, you need a minimum of 1 GB of memory: 512 MB for the host server and 512 MB for the OES 2 NetWare virtual machine. For better performance, you should allocate as much memory as possible (1 GB of RAM or more) for each NetWare virtual machine.

- ◆ Enough disk space on the host server for the creating and running the virtual machines.

The default disk space for an OES 2 NetWare virtual machine is 10 GB. You might need more or less space depending on what you will be using the virtual server for.

For specific OES 2 NetWare system requirements, see “[Meet Hardware and Software Requirements](#)” in the *OES 2: NetWare Installation Guide*.

2.4 Installation Methods

The OES 2 NetWare installation media must appear to the virtual machine as a local disk. The guest operating system can be installed from the host's physical DVD reader attached to the virtual machine, an ISO image file copied to the host desktop, or mounted as a local drive in the host's file system.

2.5 Prerequisites

Before creating an OES 2 NetWare virtual machine, you need to do the following:

- ❑ Plan for optimal configuration of the host server on your network.

To ensure that optimal resources are available to the virtual machine processes, the host server should be dedicated to running the Xen virtualization software. You should not run additional OES services, including eDirectory™, on the host server. It is recommended that you add the host server to an existing eDirectory tree, but do not configure it to hold a master replica.

- ❑ Obtain a static IP address for each virtual server that you want to create. OES 2 does not support dynamically-assigned IP addresses for servers.
- ❑ If you want to use a response file to perform a “silent” (unattended) installation of NetWare, you can create the response file ahead of time and copy it to a directory on the host server or make it available in an installation source directory. For more information about creating NetWare response files, see “[NetWare Response File Reference](#)” in the *OES 2: NetWare Installation Guide*.
- ❑ If you want to run the host server installation from a network installation source, set up an installation server for OES 2 Linux software including the SLES 10 SP1 media and the OES 2 Linux add-on CD. For procedures on creating the installation sources, see “[Setting Up the Server Holding the Installation Sources](#)” in the *SUSE Linux Enterprise Server 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/sles_admin/data/sec_deployment_remoteinst_instserver.html#sec_deployment_remoteinst_instserver)

When creating the installation source for the SLES 10 SP1 host server, you need the following media:

Table 2-1 OES 2 Linux ISO Images and CD/DVD Labels for 32-bit Installation

ISO Image File	CD Label	Download Required
OES2-i386-Beta4.iso	<i>Novell Open Enterprise Server 2 CD</i>	Yes
SLES-10-SP1-CD-i386-RC5-CD1.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD1</i>	Yes
SLES-10-SP1-CD-i386-RC5-CD2.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD2</i>	Yes
SLES-10-SP1-CD-i386-RC5-CD3.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD3</i>	Yes
SLES-10-SP1-CD-i386-RC5-CD4.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD4</i>	Yes
SLES-10-SP1-DVD-i386-RC5-DVD1.iso	<i>SUSE Linux Enterprise Server 10 SP1 DVD</i>	Optional

Table 2-2 OES 2 Linux ISO Images and CDDVD Labels for 64-bit Installation

ISO Image File	CD Label	Download Required
OES2-x86_64-Beta4.iso	<i>Novell Open Enterprise Server 2 CD</i>	Yes
SLES-10-SP1-CD-x86_64-RC5-CD1.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD1</i>	Yes
SLES-10-SP1-CD-x86_64-RC5-CD2.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD2</i>	Yes
SLES-10-SP1-CD-x86_64-RC5-CD3.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD3</i>	Yes
SLES-10-SP1-CD-x86_64-RC5-CD4.iso	<i>SUSE Linux Enterprise Server 10 SP1 CD4</i>	Yes
SLES-10-SP1-DVD-x86_64-RC5-DVD1.iso	<i>SUSE Linux Enterprise Server 10 SP1 DVD</i>	Optional

2.6 NetWare Virtual Machines in the Tree

You can place a NetWare virtual machine in an existing tree or as the first server in a new tree. However, the performance of virtualized NetWare might not be at the same level as physical NetWare. In a large tree, it may be preferable to add your NetWare virtual machine to an existing tree located on a physical NetWare server.

Because virtualized servers might be started and stopped more often than they would normally be on physical servers, we recommend that the master replica (usually the first server in a tree) be placed on a system that is running at all times. For more information about Master Replicas, see [Replicas \(http://www.novell.com/documentation/edir88/index.html\)](http://www.novell.com/documentation/edir88/index.html) in the [Edirectory \(http://www.novell.com/documentation/edir88/index.html\)](http://www.novell.com/documentation/edir88/index.html) documentation.

2.7 Disabling the Alt+Esc Shortcut on the Host

The Alt+Esc key sequence is used on the NetWare server to switch between console screens. In SLES 10, it is used to move between open windows. To avoid conflicts when running virtualized NetWare on a SLES 10 host, you should disable the Alt+Esc shortcut for the SLES 10 server.

- 1 Click *Computer > Control Center* to open the Control Center.
- 2 Click *Personal > Shortcuts*.
- 3 Under the *Window Management* category, click *Move between windows immediately*, then press the Backspace key to disable the shortcut.
- 4 Click *Close*.
- 5 Close the Control Center.

2.8 Installing Virtualized NetWare

This section provides the instructions for installing OES 2 NetWare as a guest OS.

- ♦ [Section 2.8.1, “Downloading the NetWare ISO and Preparing the License Files,” on page 13](#)
- ♦ [Section 2.8.2, “Creating a Response File for an Unattended NetWare Installation,” on page 13](#)
- ♦ [Section 2.8.3, “Creating a NetWare Virtual Machine and Installing Virtualized NetWare,” on page 15](#)

2.8.1 Downloading the NetWare ISO and Preparing the License Files

For this release, you must install NetWare from the DVD `.iso` file copied to the server's hard drive. If you intend to perform an unattended installation of NetWare, you must extract the required license files from the `.iso` file as well.

- 1 Using the Firefox* browser, access the OES 2 beta Web site (see your beta instructions for access information) and download the `NW65SP7_OVL_DVD.iso` file to your local hard drive.

Make a note of the `.iso` file's location.

- 2 After the file downloads, click *Open* in the Firefox download dialog box.
- 3 Sort the list of files by *Location* and scroll to `/LICENSE`.
- 4 Select the `.NFK` and `.NLF` files, right-click them, and select *Extract*.
- 5 Specify where you want the files placed, then click *Extract*.
- 6 Click *Computer > Home Folder* and browse to the location where the license files were extracted.
- 7 Move the files out of the `LICENSE` folder, then delete the `LICENSE` folder.
- 8 Note where the license files are located. You need to create the response file in this same location.

If you want to create a response file to do a “silent” (unattended) installation of NetWare, continue with [Section 2.8.2, “Creating a Response File for an Unattended NetWare Installation,” on page 13](#). Otherwise, skip to [Section 2.8.3, “Creating a NetWare Virtual Machine and Installing Virtualized NetWare,” on page 15](#).

2.8.2 Creating a Response File for an Unattended NetWare Installation

OES 2 includes a YaST-based NetWare Response File Utility that asks you for information about the NetWare server you want to install. Basically, you answer the same questions as you would during a physical NetWare installation. When the time comes to run the NetWare Install program, the installation reads your responses from the file and proceeds without required any further intervention.

For more detailed information about creating a response file, see “[Using the NetWare Response File Utility in YaST](#)” in the *OES 2: NetWare Installation Guide*.

- 1 Open YaST and click *Open Enterprise Server > NetWare Response File Utility*.
- 2 On the Select Install Type page, leave the install type set for *Virtual*. Do not change any other options. Click *Next*.
- 3 Click *Destination Address*, specify a valid NetWare server name for the virtualized NetWare server and the IP address you want the virtualized server to use.

The IP address must be unique on the subnet just as it would be for a physical NetWare installation.

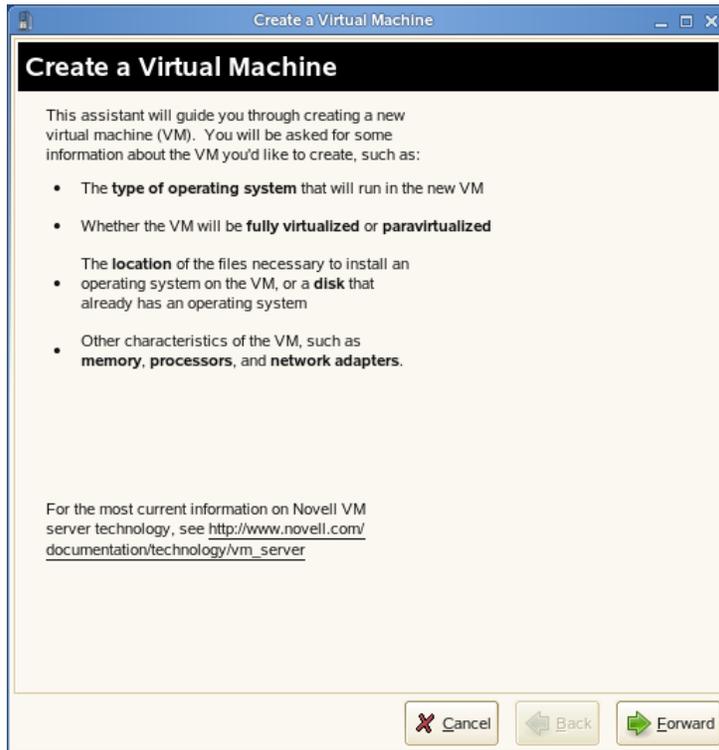
- 4 Click *Next*.
- 5 Click *Destination eDirectory*.

- 6** Specify the name of the OES 2 tree and a context for this server object.
- 7** In the *Replica Server IP Address* field, specify the IP address of the OES 2 eDirectory server.
- 8** In the *User Information* section, specify the admin information for the tree, then click *Next*.
- 9** Click *License*, specify the eDirectory container where you want the NetWare license files stored, then click *Next*.
- 10** Click *Protocols*.
- 11** Specify the *Subnet Mask* and *Gateway* information for the subnet and click *Next*.
- 12** Click *Language > Next*.
- 13** Click *SLP Configuration > Next*.
If your tree has more than three servers, specify the valid SLP information before continuing.
- 14** Click *DNS Configuration*, specify the DNS information, then click *Next*.
- 15** Click *Time Zone Configuration*, select your time zone options, then click *Next*.
- 16** Click *Time Sync Configuration*.
- 17** Leave the protocol set to TimeSync (do not select NTPv3), select *Use TIMESYNC Configured Sources*, and specify the same time synchronization source as your eDirectory server uses, select *NTP* if applicable, then click *Next*.
- 18** Click *Install Settings > Next*.
- 19** Click *Storage Configuration > Next*.
- 20** Click *Pattern Selection*, select the preconfigured server pattern you want installed, then click *Next*.
- 21** If you select *Customized NetWare Server* in the previous step, click *Product Selection*, select the services you want installed, and click *Next*.
- 22** Click *NMAS Configuration > Next > Next*.
- 23** (Conditional) Depending on what products you selected for the server, click the headings and enter the required information until all the configuration options have been completed for the response file.
- 24** On the Save Response File page, specify a response filename, then browse to the directory where you stored your NetWare license files. The field should show a path that ends with a forward slash (/).
- 25** If you want the VM Manager to launch automatically after you exit the Response File Generator, select *Launch VM Manager*.
- 26** Specify the location of the Installation Source. In this case, browse to the DVD `.iso` file that you copied to the local server.
- 27** Click *Next*.
- 28** If you chose to automatically launch VM Manager in [Step 25](#) above, click *Forward* and skip to [Step 5 on page 17](#). Otherwise, continue with [Section 2.8.3, “Creating a NetWare Virtual Machine and Installing Virtualized NetWare,” on page 15](#).

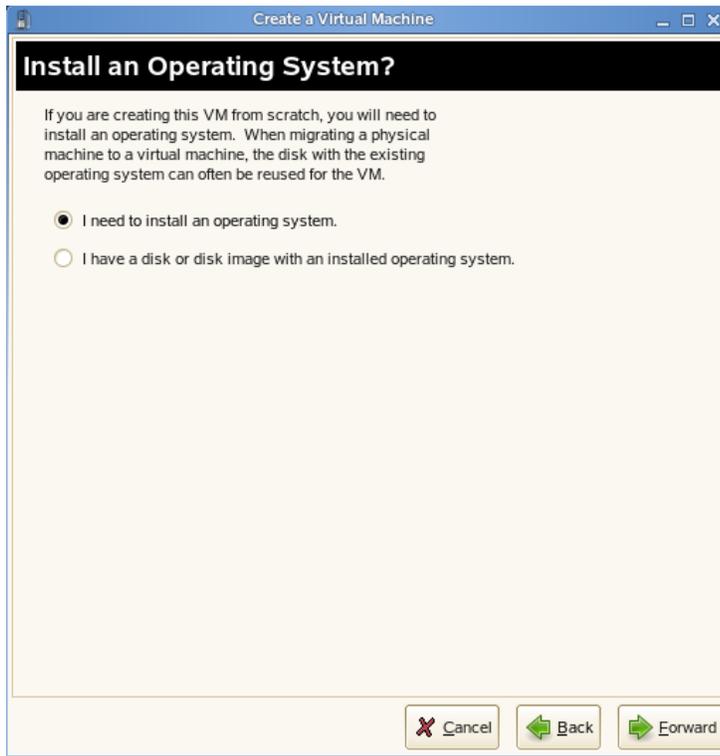
2.8.3 Creating a NetWare Virtual Machine and Installing Virtualized NetWare

Follow these steps to create a NetWare VM and install virtualized NetWare.

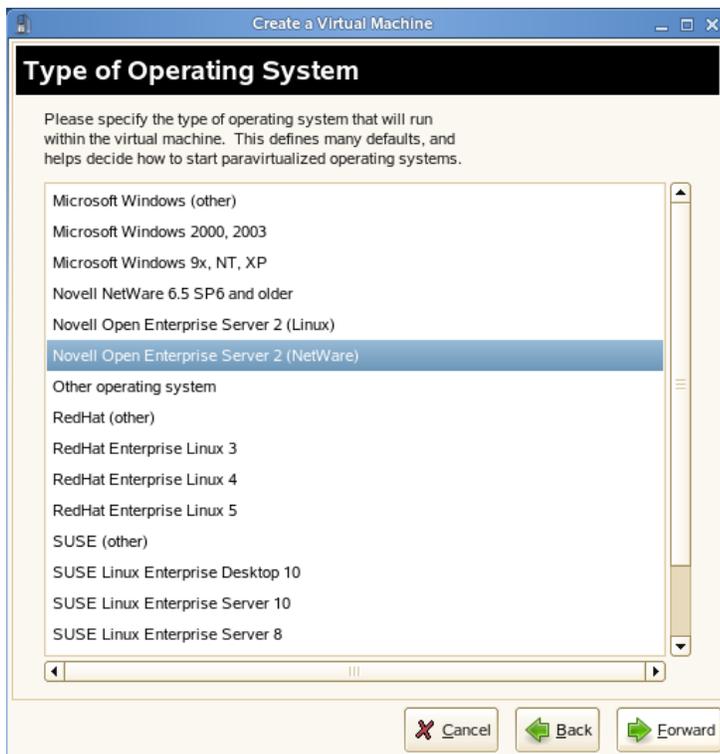
- 1 Open YaST, then click *Virtualization > Create Virtual Machines*.
- 2 Read the Create a Virtual Machine welcome page, then click *Forward*.



3 Select *I need to install an operating system*, then click *Forward*.



4 Select *Novell Open Enterprise Server 2 (NetWare)*, then click *Forward*.



5 The Summary page appears, showing the settings to be used for the virtual machine. Make changes to the virtual machine setup as required for your server.

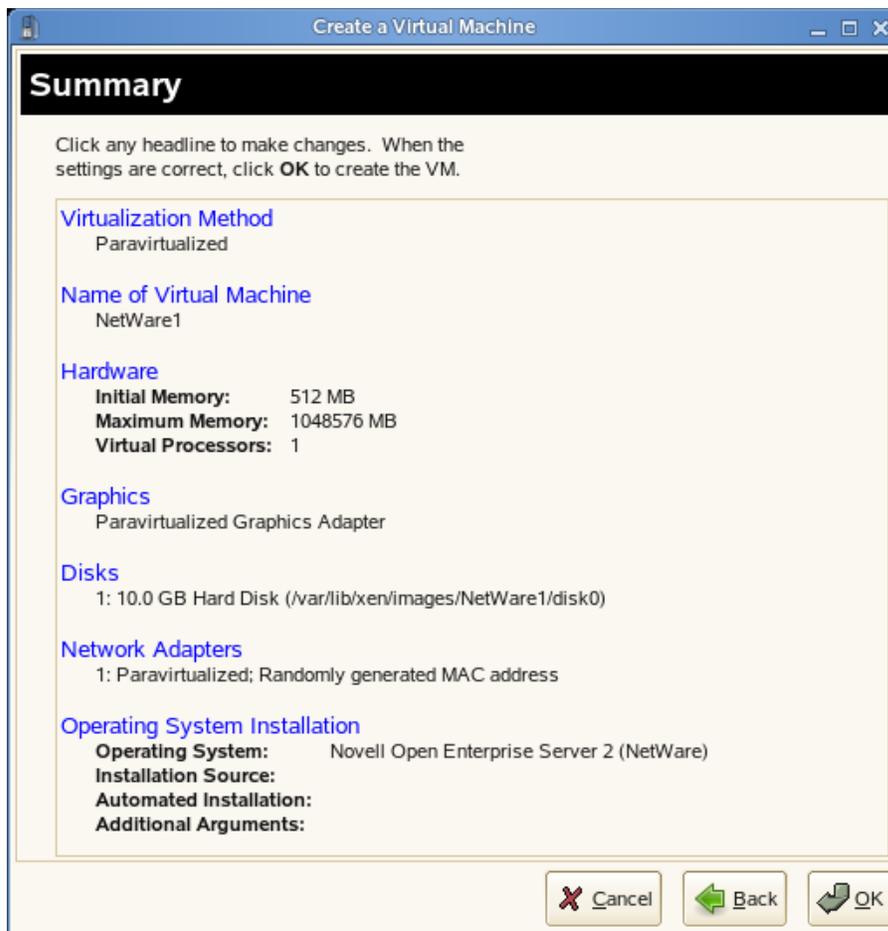
- ◆ Name of Virtual Machine: Specify the name displayed for this virtual machine in the Virtual Machine Manager.
- ◆ Hardware: Change the initial and maximum memory settings and add virtual processors.

NOTE: Do not set the initial memory setting less than the default of 512 MB. For best performance, the number of virtual processors should be less than or equal to the number of physical processors.

- ◆ Disks: Create the virtual disks that the server will have access to. The default setting is a single 10 GB file for disk0.

When you create a virtual disk, make sure you have enough physical disk space on the host server's hard drive to accommodate the maximum size of the virtual disk. If you do not select the sparse file option, a blank file of the selected size is created at the beginning of the virtual machine installation.

- ◆ Network Adapters: Create virtual network adapters for the server. The default setting is a single paravirtualized network adapter.



6 To specify the NetWare 6.5 SP7 DVD .iso file as the installation source:

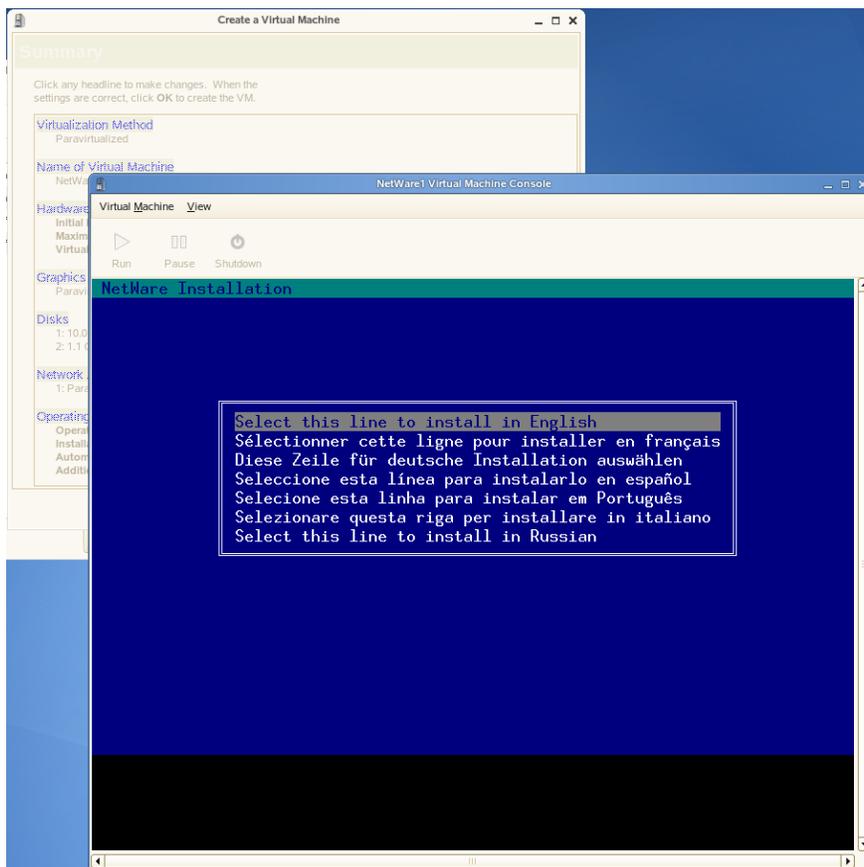
6a Click the *Operating System Installation* heading.

- 6b Click *Virtual Disk > Add*.
- 6c Browse to the `.iso` file you downloaded to the local file system, then click *Open > OK*.
- 7 (Conditional) If you created a Response File that you want to use for the NetWare installation:
 - 7a Click *Find*, then browse to and select the file you created in [Section 2.8.2, “Creating a Response File for an Unattended NetWare Installation,”](#) on page 13.
 - 7b Click *Open > Apply*.

The Response File’s path and filename should be displayed in the Automated Installation field on the Summary page.

- 8 When you have the virtual machine settings the way you want them, click *OK* to proceed with the creation of the virtual machine and the installation of the virtual NetWare server.

A VNC viewer window appears, displaying the progress of the NetWare install program.



If you specified a response file, the installation uses the information you recorded in the response file. If a required parameter is missing in the response file, you are prompted to enter the desired values during the installation.

If you did not specify a response file, you must enter all of the installation information as you would for a physical NetWare installation. For detailed instructions, see [“Starting the Installation Program”](#) in the *OES 2: NetWare Installation Guide*.

IMPORTANT: Do not close the VNC viewer window while the NetWare install program is running. Doing so prevents the installation from completing properly.

2.9 Managing NetWare on a Virtual Machine

Virtualized NetWare is managed in the same way as if it were running on a physical machine. For information about managing your NetWare server, see the *OES 2: Server Operating System for NetWare Administration Guide*. For additional information about managing NetWare servers in a virtualized environment, see “[Running OES 2 NetWare in a Virtualized Environment](#).”

In this beta release of OES 2, be aware of the following caveats when working at the virtualized NetWare server console:

- ◆ The keypad keys are not currently handled.
- ◆ The F8 key is used by the vncviewer. To use F8 in a NetWare console application, press the key twice.
- ◆ The Alt+Tab and Ctrl+Esc keystrokes might not be passed on to NetWare.

2.9.1 Using the Virtual Machine Manager

Managing a NetWare virtual machine is simplified by using the Virtual Machine Manager utility, which is installed by default when you install the Xen virtualization software.

To start Virtual Machine Manager, open a terminal prompt and enter `virt-manager`.

See “[Managing a Virtualization Environment](#)” for more information.

2.9.2 Using the Command Line

Many NetWare administrators prefer to manage the server by command line. If you want to use the command line, you should be aware of issues related to the following:

- ◆ “[Terminal Size](#)” on page 19
- ◆ “[NetWare Debugger](#)” on page 19
- ◆ “[VNC Viewer](#)” on page 19
- ◆ “[The xm Commands](#)” on page 20

Terminal Size

The terminal window may only display 80x24 characters. If you don’t want to scroll to the command line, you need to resize the terminal.

NetWare Debugger

If pressing Alt+Shift+Shift+Esc doesn’t launch the debugger, you can enter `386debug` at the command line to launch the debugger.

VNC Viewer

In the VNC Viewer, pressing F8 displays a pop-up utility menu. Press F8 twice to pass single F8 to the remote side.

The xm Commands

- ◆ You can also manage the NetWare virtual machine, and all other virtual machines, by using the `xm` command line tools. See “[The xm Command](#)” for more information.
- ◆ To make a break in NetWare from a terminal, enter `xm sysrq x c`, where `x` is the domain ID and `c` is any keyboard character.

This section documents system requirements, installation instructions, configuration options, and issues associated with setting up and managing OES 2 Linux on Xen-based virtual machine. OES 1 Linux information will be added to this section when SLES 9 is supported as a virtual machine.

- ◆ [Section 3.1, “System Requirements,” on page 21](#)
- ◆ [Section 3.2, “Prerequisites,” on page 22](#)
- ◆ [Section 3.3, “Installing an OES 2 Linux Virtual Machine,” on page 22](#)
- ◆ [Section 3.4, “Updating an OES 2 Linux Virtual Machine,” on page 26](#)
- ◆ [Section 3.5, “Managing a Virtual Machine Running OES 2 Linux,” on page 26](#)
- ◆ [Section 3.6, “Advanced Configuration Options,” on page 26](#)

3.1 System Requirements

To create an OES 2 Linux virtual machine, you need the following:

- ◆ A virtual machine host set up on a SLES 10 SP1 or OES 2 Linux server. For setup procedures, see [“Setting Up a Virtual Machine Host”](#) in *Virtualization: Getting Started*.
- ◆ Enough memory available on the host dedicated to installing and running the virtual machine. You need enough memory for the host and enough memory to support each virtual machine that you want to run concurrently on the host server.

For example, if you are installing one OES 2 Linux virtual machine, you need a minimum of 1 GB of memory: 5.12 MB for the host and 5.12 MB for the OES 2 Linux virtual machine.

If you are installing two virtual machines, but the services running on the first virtual machine needed 1 GB and the services running on the second virtual machine require you to have 1.5 GB, you would need 3 GB.

For specific OES 2 Linux requirements, see [“Server Hardware”](#) in the *OES 2: Linux Installation Guide*.

- ◆ Enough disk space on the host for the creating and running the virtual machine.

The default disk space for an OES 2 Linux virtual machine is 4 GB. The space you need is dependent on what you use the virtual server for.

For specific OES 2 Linux requirements, see [“Server Hardware”](#) in the *OES 2: Linux Installation Guide*.

- ◆ If you want to set up Novell Storage Services (NSS) on the virtual machine, note the following:
 - ◆ NSS can recognize physical, logical, or virtual devices up to 2 TB in size (where 1 TB = 2E40 bytes = 1,099,511,627,776 bytes).
 - ◆ In a virtual environment, the devices that you want to use for the NSS file system on the guest operating system cannot exceed the 2 TB limit, even if the host operating system and guest operating system can handle larger devices.
 - ◆ For information, see [“Device Size Limit”](#) in the *OES 2: NSS File System Administration Guide*.

3.2 Prerequisites

Before creating an OES 2 Linux virtual machine, you need the following:

- ♦ If you want to use AutoYaST to specify the Installation settings, create an AutoYaST profile (control) file and download it to a directory on the host machine server or make it available on the network.
- ♦ A static IP address for each virtual server that you want to create.
- ♦ A network installation source for OES 2 Linux software including the SLES 10 SP1 media and the OES 2 Linux add-on CD. For procedures to create the installation sources, see “[Setting Up the Server Holding the Installation Sources](#)” in the *SUSE Linux Enterprise Server 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/sles_admin/data/sec_deployment_remoteinst_instserver.html#sec_deployment_remoteinst_instserver)

When creating the installation source, you need the media listed in the following tables. For the SLES media, you can use the ISOs for the CDs or the DVD.

Table 3-1 OES Linux ISO Images and CD Labels for i386

ISO Image File	CD Label
OES2-i386.iso	Novell Open Enterprise Server 2 CD 1
SLES-10-SP1-CD-i386-CD1.iso	SUSE Linux Enterprise Server 10 SP1 CD1
SLES-10-SP1-CD-i386-CD2.iso	SUSE Linux Enterprise Server 10 SP1 CD2
SLES-10-SP1-CD-i386-CD3.iso	SUSE Linux Enterprise Server 10 SP1 CD3
SLES-10-SP1-CD-i386-CD4.iso	SUSE Linux Enterprise Server 10 SP1 CD4
SLES-10-SP1-DVD-i386-DVD1.iso	SUSE Linux Enterprise Server 10 SP1 DVD

Table 3-2 OES Linux ISO Images and CD Labels for 64

ISO Image File	CD Label
OES2-x86_64.iso	Novell Open Enterprise Server 2 CD 1
SLES-10-SP1-CD-x86_64-CD1.iso	SUSE Linux Enterprise Server 10 SP1 CD1
SLES-10-SP1-CD-x86_64-CD2.iso	SUSE Linux Enterprise Server 10 SP1 CD2
SLES-10-SP1-CD-x86_64-CD3.iso	SUSE Linux Enterprise Server 10 SP1 CD3
SLES-10-SP1-CD-x86_64-CD4.iso	SUSE Linux Enterprise Server 10 SP1 CD4
SLES-10-SP1-DVD-x86_64-DVD1.iso	SUSE Linux Enterprise Server 10 SP1 DVD

3.3 Installing an OES 2 Linux Virtual Machine

Creating an OES 2 Linux virtual machine requires you to complete the following major tasks.

- ♦ [Section 3.3.1, “Specifying Options for Creating an OES 2 Linux Virtual Machine,” on page 23](#)

- ♦ [Section 3.3.2, “Completing the OES 2 Linux Virtual Machine Installation,” on page 25](#)

3.3.1 Specifying Options for Creating an OES 2 Linux Virtual Machine

The Create Virtual Machine Wizard helps you through the steps required to create a virtual machine and install the desired operating system.

- 1 Launch the Create Virtual Machine Wizard by using one of the following methods:
 - ♦ From the virtualization host server desktop, click *YaST > Virtualization > Create Virtual Machine*
 - ♦ From within Virtual Machine Manager, click *New*.
 - ♦ At the command line, enter `vm-install`.

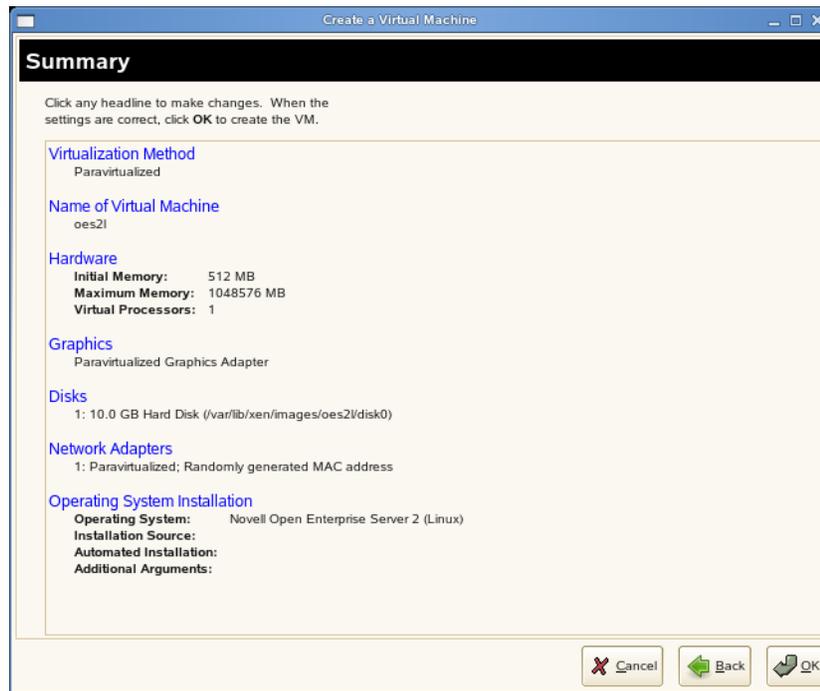
If the wizard does not appear or the `vm-install` command does not work, review the process of installing and starting the virtualization host server. The virtualization software might not be installed properly.

- 2 After specifying that you want to create a virtual machine, click *Forward*.
- 3 Choose between installing an operating system or using a disk or disk image that already has an installed operating system, then click *Forward*.

The option to set up a virtual machine based on an existing disk or disk image is only supported if the existing disk or disk image was originally set up through the Create Virtual Machine Wizard.

- 4 On the Type of Operating System page, select *Novell Open Enterprise Server 2 (Linux)*, then click *Forward*.
- 5 Change the settings on the *Summary* page to meet your configuration requirements.

The following recommendations help you quickly set up a virtual machine running OES 2 Linux. Detailed explanations of these options are available in *Virtualization: Configuration Options and Settings*.



- 5a On the *Virtualization Method* page, select *Full Virtualization* or *Paravirtualization*, then click *Apply*.
- 5b On the *Name Of Virtual Machine* page, specify a name for the virtual machine in the *Name* field, then click *Apply*.
- 5c On the *Hardware* screen:
 - 5c1 Specify the amount of initial and maximum memory for the virtual machine to consume from the available memory.
 - 5c2 Specify the number of processors that you want the virtual machine to use.
 - 5c3 Click *Apply*.
- 5d On the *Graphics* page, select the type of graphic support desired, then click *Apply*.
- 5e On the *Disk* page, specify the block device that you want to create the virtual device on, then click *Apply*. Some options include a partition, a volume, or whether it is file backed.
- 6 On the *Network Adapters* page, view the default setting, edit the default settings, or click *New* and specify the setting for another network board of your choice, then click *Apply*.
- 7 On the *Operating System Installation* page,
 - 7a Specify the URL for the network installation source.

IMPORTANT: In this release, the Xen virtualization software does not support switching physical media during the installation; therefore, you must use a network installation source rather than physical media when installing OES 2 Linux.

7b If you are using an AutoYaST control file to specify the settings for virtual machine operating system, specify the path to the file in the *AutoYaST File* field or click the *Find* button to the right of the field to locate the file on the local host server.

7c If needed, use the *Additional Arguments* field to specify additional install or boot parameters to assist the installation.

For example, if you wanted to specify the parameters for an IP address of 192.35.1.10, a netmask of 255.255.255.0, a gateway of 192.35.1.254 for the virtual server, and use ssh to access installation, you could enter the following parameters in the *Additional Argument* field:

```
hostip=192.35.1.10 netmask=255.255.255.0
gateway=192.35.1.254 usessh=1 sshpassword=password
```

7d Click *Apply*.

8 Click *OK* to start the virtual machine and launch the operating system installation program.

9 Continue with [Section 3.3.2, “Completing the OES 2 Linux Virtual Machine Installation,”](#) on [page 25](#).

3.3.2 Completing the OES 2 Linux Virtual Machine Installation

1 Follow the on-screen prompts using the information contained in the following sections of the *OES 2: Linux Installation Guide*:

1a [Specifying the Installation Mode.](#)

1b [Specifying the Add-On Product Installation Information.](#)

1c [Setting Up the Clock and Time Zone.](#)

1d [Specifying the Installation Settings for the SLES Base and OES Linux Installation.](#)

1e [Specifying Configuration Information.](#)

During the configuration portion of the installation, you might see additional prompts concerning hardware detection of the network cards, DSL, PPPoE DSL, ISDN cards, and modems.

When specifying the time source, note the following:

- ♦ **Paravirtualization:** When configuring an OES 2 Linux virtual machine in the paravirtual mode, you should use a local time source by specifying the IP address of the host server because the virtual machine always synchronizes its time with the host’s time source.

For servers joining a tree, the installation will not let you proceed if you select the *Use Local Clock* option. Instead, specify the IP address of the host server when specifying the time source.

The host computer should be configured to use a reliable, external time source.

- ♦ **Full Virtualization:** When configuring an OES 2 Linux virtual machine in the full virtualization mode, you should use a NTP time source because the virtual machine does not synchronize its clock time with the host computer.

For more information on this configuration issue, see “[Synchronizing Virtual Machine Clock Time](#)” in the *Virtualization: Configuration Options and Settings* guide.

1f [Finishing the Installation.](#)

During the hardware configuration, graphics and sound cards are not recognized when installing OES 2 Linux as a virtual machine.

- 2 Complete the server setup by following the procedures in [Completing Installation or Upgrade Tasks on OES 2 Linux](#) in the *OES 2: Linux Installation Guide*.

3.4 Updating an OES 2 Linux Virtual Machine

Patching or updating an OES 2 Linux virtual machine is essentially the same as updating and OES 2 Linux physical server. For instructions on updating a physical OES 2 Linux server, see “[Updating an OES 2 Linux Server](#)” in the *OES 2: Linux Installation Guide*.

3.5 Managing a Virtual Machine Running OES 2 Linux

Managing a virtual machine running OES 2 Linux is the same as managing virtual machines running other operating systems. For procedures, see “[Managing a Virtualization Environment](#)” in *Virtualization: Getting Started*.

3.6 Advanced Configuration Options

This section includes advanced configuration options that you need to set up these services on an OES 2 Linux virtual machine.

- [Section 3.6.1, “Setting Up an OES 2 Linux Virtual Machine to Use Novell Storage Services \(NSS\),”](#) on page 26
- [Section 3.6.2, “Setting Up an OES 2 Linux Virtual Machine by Using Command Line Parameters and a Script,”](#) on page 26

3.6.1 Setting Up an OES 2 Linux Virtual Machine to Use Novell Storage Services (NSS)

After the virtual machine is set up, you need to perform additional tasks to set up additional Novell Storage Service (NSS) devices. See “[Using NSS in a Virtual Guest Server Environment](#)” in the *OES 2: NSS File System Administration Guide*.

3.6.2 Setting Up an OES 2 Linux Virtual Machine by Using Command Line Parameters and a Script

This information is being developed.

SUSE Linux Virtual Machines

4

This documentation contains the following sections:

- ♦ [Section 4.1, “Supported SUSE Linux Guest Operating Systems,” on page 27](#)
- ♦ [Section 4.2, “SLE Virtual Machines on Host Architectures,” on page 27](#)
- ♦ [Section 4.3, “Updating SLE 10 Virtual Machines to SLE 10 SP1,” on page 28](#)
- ♦ [Section 4.4, “Using the Add-On Products Program,” on page 30](#)

4.1 Supported SUSE Linux Guest Operating Systems

On host computers running SUSE Linux code 10 with Service Pack 1, the following SUSE Linux operating systems are supported as guests.

Operating System	Fully virtual	Paravirtual
SUSE Linux Enterprise Server 10 SP1	Yes	Yes
SUSE Linux Enterprise Server 10		Yes
Open Enterprise Server 2 Linux*	Yes	Yes
Open Enterprise Server 1 Linux*		Yes
SUSE Linux Enterprise Desktop 10 SP1	Yes	Yes
SUSE Linux Enterprise Server 9 SP4	Yes	Yes
SUSE Linux Enterprise Server 9 SP3	Yes	

* For information on OES Linux virtual machines, see [Chapter 3, “OES Linux Virtual Machines,” on page 21](#).

4.2 SLE Virtual Machines on Host Architectures

SUSE Linux operating systems supported as guest operating systems, such as SUSE Linux 10 SP1 or later and SUSE Linux 9 SP3 or later, can be installed as guests on a host that is running any of the following combinations of domain 0 and hypervisor architecture.

Table 4-1 *Virtual Machines and Host Architectures*

Operating System and Virtualization Mode	Hypervisor and Domain 0
SLE (32-bit) - Fully virtual	<ul style="list-style-type: none">◆ 32-bit hypervisor / 32-bit domain 0◆ 32-bit PAE hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 64-bit domain 0
SLE (32-bit) - Paravirtual	<ul style="list-style-type: none">◆ 32-bit hypervisor / 32-bit domain 0
SLE (32-bit PAE) - Fully virtual	<ul style="list-style-type: none">◆ 32-bit PAE hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 64-bit domain 0
SLE (32-bit PAE) - Paravirtual	<ul style="list-style-type: none">◆ 32-bit PAE hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 64-bit domain 0
SLE (64-bit) - Fully virtual	<ul style="list-style-type: none">◆ 64-bit hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 64-bit domain 0
SLE (64-bit) - Paravirtual	<ul style="list-style-type: none">◆ 64-bit hypervisor / 32-bit PAE domain 0◆ 64-bit hypervisor / 64-bit domain 0

4.3 Updating SLE 10 Virtual Machines to SLE 10 SP1

Typically, the guest operating system on a virtual machine can be updated using the same procedures as if it were running on a physical machine; however, SLE 10 virtual machines created on a SLE 10 host need to be updated to SLE 10 SP1 by re-creating the virtual machine from the settings stored in the virtual machine's configuration file.

SLE 10 virtual machines created on a SLE 10 SP1 host do not need to follow these same procedures to be updated to SP1. Additionally, SLE 10 did not support SLE 10 fully virtual machines.

NOTE: In SLE 10, changing the configuration of a virtual machine by editing its configuration file (`etc/xen/vm/vm_name`) was acceptable. In SLE 10 SP1 and later, editing the configuration file is no longer recommended. Instead, virtual machine configuration changes should be made in Virtual Machine Manager and by editing virtual machine settings stored in the xend database.

To update a SLE 10 virtual machine to SLE 10 SP1, complete the following procedure.

- 1 Make sure the host computer is running the most recent SLE updates. The host computer must be running software that is more recent than the software planned for the virtual machine update.
- 2 Prepare the virtual machine's operating system environment for the update by completing any prerequisite tasks. Making a copy of the entire virtual disk is recommended.
- 3 Shut down the virtual machine you want to update.

- 4 View or print the virtual machine's configuration file located at `etc/xen/vm/vm_name`.
- 5 On the host desktop, use Virtual Machine Manager to create a new virtual machine.
- 6 Choose the selection to install an operating system.
- 7 Specify the settings for the new virtual machine as the same settings specified in the VM's configuration file.

Make sure that the following settings in Virtual Machine Manager match those in the VM's configuration file.

- ♦ Network MAC address
- ♦ Memory size
- ♦ Virtual disk size

- 8 Make sure to select or specify the virtual machine's already-created disk or disk image, for example, `hda`, as the virtual disk.

For example, if the SLE 10 virtual machine was using `/var/lib/xen/images/sles10/disk0` as its disk, the updated virtual machine should specify the same disk.

- 9 Specify the virtual machine operating system installation source as the SLE 10 SP1 installation media.
- 10 In the Operating System Installation section, add the following argument in Additional Arguments.

```
root=/dev/xvda2
```

where `/dev/xvda2` is the path and drive designation for the root partition that contains the virtual machine's boot files.

- 11 Click OK to create the virtual machine and start the SLE 10 SP1 installation program.

A new window displaying the installation program opens on the host desktop.

If the new windows does not display, select the virtual machine in Virtual Machine Manager, and click Open.

- 12 During the installation program, select Update from the Installation Mode screen.
- 13 If you receive a message stating that an error occurred while installing GRUB, click *OK*.
- 14 If you receive a message stating that an error occurred during boot loader installation, click *No*.
- 15 Continue the installation (update) by following the on-screen instructions.

The installation program continues by booting the virtual machine and displaying the rest of the installation in text mode.

After completing the installation program, the virtual machine should now be running SLE 10 SP1 and registered with `xend`.

- 16 Log in to the SLE 10 SP1 virtual machine.
- 17 (Conditional) If you want the SLE 10 SP1 virtual machine to run in GUI mode, complete the following from its command line:
 - 17a Enter `init 3`.
 - 17b Enter `sax2` to configure the GUI environment.
 - 17c Enter `init 5` to restart the GUI.

- 18 Open the virtual machine's `/etc/inittab` file with a text editor.

- 19 Find the section titled

```
# getty-programs for the normal runlevels
```

20 After the line that begins with `1:2345:respawn:/sbin/mingetty`, add the following lines:

```
2:2345:respawn:/sbin/mingetty tty2
3:2345:respawn:/sbin/mingetty tty3
4:2345:respawn:/sbin/mingetty tty4
5:2345:respawn:/sbin/mingetty tty5
6:2345:respawn:/sbin/mingetty tty6
```

21 Save the file and restart the virtual machine's operating system.

If the mouse pointer stops working within the virtual machine, you might need to restart the GUI on the virtual machine host by entering `init 3` then `init 5` on the host's command line.

After completing these instructions, the updated SLE 10 SP1 virtual machine should perform correctly. Configuration changes should be made using Virtual Machine Manager or by modifying xend settings.

4.4 Using the Add-On Products Program

The Add-On Products program is available during the SLE operating system installation and after installation at *YaST* > *Software* > *Add-On Products*. It lets you install additional products that may reside on a separate CD, ISO image file, or installation source.

Because paravirtual machines present removable media, such as a CD inserted in the CD reader, as a non-removable disk device, the Add-On Product program does not recognize inserted CD as valid add-on product media.

To use the Add-On Products program on a paravirtual machine, you must set up the add-on product media as a network installation source or copy the ISO image file to the virtual machine's filesystem.

On fully virtual machines, you can use the Add-On Products program to specify add-on product media as a network installation source, an ISO image file, or as a CD inserted in the host's CD reader.

Windows Virtual Machines

5

This chapter contains the following sections:

- ♦ [Section 5.1, “Supported Windows Guest Operating Systems,” on page 31](#)
- ♦ [Section 5.2, “Domain 0 and Hypervisor Combinations,” on page 31](#)

5.1 Supported Windows Guest Operating Systems

On host computers running SUSE Linux code 10 with Service Pack 1, the following Windows operating systems are supported as guests.

Operating System	Fully Virtual	Paravirtual	Available SUSE Linux Drivers
Windows Vista	Yes		
Windows Server 2003	Yes		Yes
Windows XP	Yes		Yes
Windows 2000 Server	Yes		Yes

5.2 Domain 0 and Hypervisor Combinations

Windows guest operating systems can be installed as guests on a host computer that is running any of the following combinations of domain 0 and hypervisor architecture.

- ♦ Windows Vista (32-bit) Guest Operating System
 - ♦ 32-bit hypervisor / 32-bit domain 0
 - ♦ 32-bit PAE hypervisor / 32-bit PAE domain 0
 - ♦ 64-bit hypervisor / 32-bit PAE domain 0
 - ♦ 64-bit hypervisor / 64-bit domain 0
- ♦ Windows Vista (64-bit) Guest Operating System
 - ♦ 64-bit hypervisor / 32-bit PAE domain 0
 - ♦ 64-bit hypervisor / 64-bit domain 0
- ♦ Windows Server 2003 R2 (32-bit) Guest Operating System
 - ♦ 32-bit hypervisor / 32-bit domain 0
 - ♦ 32-bit PAE hypervisor / 32-bit PAE domain 0
 - ♦ 64-bit hypervisor / 32-bit PAE domain 0

- ◆ 64-bit hypervisor / 64-bit domain 0
- ◆ Windows Server 2003 (64-bit) Guest Operating System
 - ◆ 64-bit hypervisor / 32-bit PAE domain 0
 - ◆ 64-bit hypervisor / 64-bit domain 0
- ◆ Windows 2000 Server Guest Operating System
 - ◆ 32-bit hypervisor / 32-bit domain 0
 - ◆ 32-bit PAE hypervisor / 32-bit PAE domain 0
 - ◆ 64-bit hypervisor / 32-bit PAE domain 0
 - ◆ 64-bit hypervisor / 64-bit domain 0

This chapter contains the following sections:

- ♦ [Section 6.1, “Status,” on page 33](#)
- ♦ [Section 6.2, “Installation Instructions,” on page 33](#)
- ♦ [Section 6.3, “Known Issues,” on page 33](#)

6.1 Status

Supported modes, versions, and architectures

6.2 Installation Instructions

No available content.

6.3 Known Issues

No available content.