

Installation Guide

Lab Manager 2.5.1



VMware Lab Manager Installation Guide

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Contents

About This Book	5
1 Introduction to the Lab Manager Installation	9
Lab Manager Components	9
High-Level View of the Installation Process	11
Using Lab Manager with VirtualCenter Management Server	11
Enabling High Availability for the Lab Manager Server	12
2 Installation Requirements	13
General Requirements	13
System Requirements: Lab Manager Server and Managed Server	15
Configuring IIS and ASP.NET on Lab Manager Server	18
Client User Machine Requirements	19
Storage Requirements	20
Media Storage	20
Virtual Machine Storage (Datastore)	20
VMFS Datastore	21
NFS Datastore	21
Using Hardware and Software-Initiated iSCSI Storage	22
Network Requirements	22
Configuring Routing	23
Configuring Domains and Permissions	23
Configuring Firewall Settings	23
Using Port 514 for Windows Firewall	24
Gathering Network Information for Installation	24
IP Addresses for Virtual Machines	25

3	Installing Lab Manager	27
	Reviewing the Installation Flow	27
	Setting Up Managed Server Systems	28
	Prerequisites for Managed Server Systems	28
	Verifying the Setup of the ESX Server System	29
	Setting up the VMkernel Network for NFS Storage	29
	Installing the Managed Server Agent Software on ESX Server	30
	Setting Up the Lab Manager Server System	31
	Prerequisites for Lab Manager Server	32
	Security Recommendations	32
	Installing or Customizing the SSL Certificate	32
	Modifying Security Policies	34
	Configuring Internet Explorer on Lab Manager Server	34
	Installing the Lab Manager Server Software	34
	Verifying the ASP.NET Version	35
	Initializing and Configuring Lab Manager	36
	Static IP and DHCP Networking	38
	Checking the Sample Template and Configuration	38
	Configuring NFS Servers	39
	Adding NFS Virtual Machine Storage	40
	Adding and Synchronizing NFS Media Storage	40
	Uninstalling Lab Manager	42
	Uninstalling Lab Manager Server	42
	Uninstalling Managed Server Agent Software	43
4	Upgrading Lab Manager	45
	Backing Up the Lab Manager Database	45
	Uninstalling the Program Files for Lab Manager Server	46
	Installing the Managed Server and Lab Manager Server Software	46
	Restoring the Lab Manager Database	47
	Appendix: Troubleshooting the Installation	49
	Error 1720: Windows Installer Package	49
	Microsoft SQL Desktop Engine (MSDE) Installation Fails	50
	Transfer of Managed Server Agent Software to ESX Server Machine Fails	51
	Error 1603: Required Services for Installing Lab Manager	51
	Index	53

About This Book

This manual, the *VMware Lab Manager Installation Guide*, describes installation, configuration, and upgrade tasks for Lab Manager.

Intended Audience

This book is intended for experienced developers and testers of software applications. This document assumes the user has some familiarity with these topics:

- Virtual machine technology
- Basic concepts of distributed, multitiered systems
- Current development and testing practices
- Windows and Linux operating systems

Document Feedback

VMware welcomes your suggestions for improving our documentation. If you have comments, send your feedback to:

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Conventions

Table 1 illustrates the typographic conventions used in this manual.

Table 1. Conventions Used in This Manual

Style	Elements
Blue (online only)	Links, cross-references, and email addresses
Black boldface	User interface elements such as button names and menu items
Monospace	Commands, filenames, directories, and paths
Monospace bold	User input
<i>Italic</i>	Document titles, glossary terms, and occasional emphasis
<Name>	Variable and parameter names

Technical Support and Education Resources

The following sections describe the technical support resources available to you.

Self-Service Support

Use the VMware Technology Network (VMTN) for self-help tools and technical information:

- Product information – <http://www.vmware.com/products/>
- Technology information – <http://www.vmware.com/communities/content/>
- Documentation – <http://www.vmware.com/support/pubs>
- VMTN Knowledge Base – <http://www.vmware.com/support/kb>
- Discussion forums – <http://www.vmware.com/community>
- User groups – <http://www.vmware.com/vcommunity/usergroups.html>

For more information about the VMware Technology Network, go to:

<http://www.vmtn.net>

Online and Telephone Support

Use online support to submit technical support requests, view your product and contract information, and register your products. Go to <http://www.vmware.com/support>.

Customers with appropriate support contracts should use telephone support for the fastest response on priority 1 issues. Go to http://www.vmware.com/support/phone_support.html.

Support Offerings

Find out how VMware support offerings can help meet your business needs. Go to <http://www.vmware.com/support/services>.

VMware Education Services

VMware courses offer extensive hands-on labs, case study examples, and course materials designed to be used as on-the-job reference tools. For more information about VMware Education Services, go to <http://mylearn1.vmware.com/mgreg/index.cfm>.

Introduction to the Lab Manager Installation

1

VMware Lab Manager provides a robust solution to manage virtual machines in the test lab infrastructure. You can capture a complex and running software environment and share it instantly across your organization. See the *VMware Lab Manager User's Guide* for a full overview of the product.

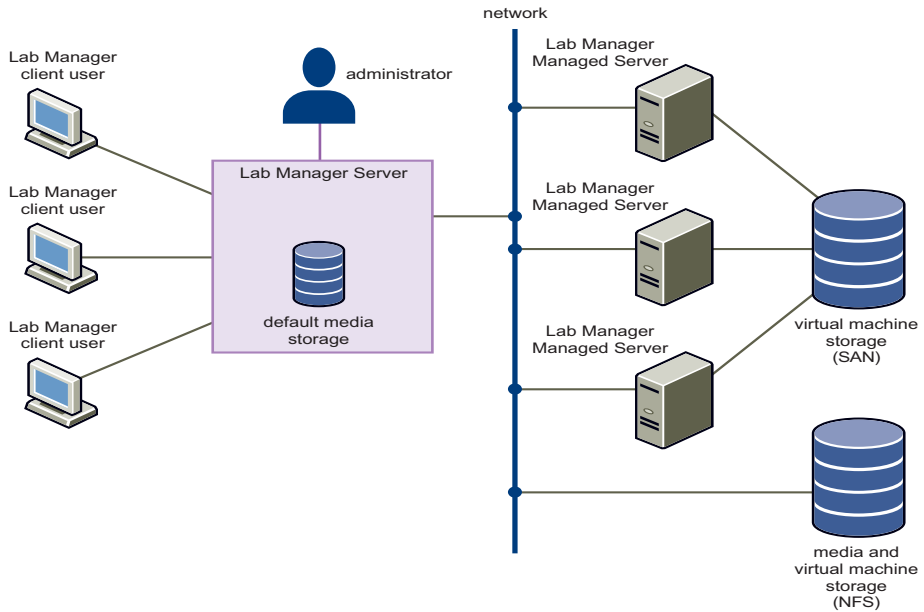
This chapter covers these topics:

- [“Lab Manager Components”](#) on page 9
- [“High-Level View of the Installation Process”](#) on page 11
- [“Using Lab Manager with VirtualCenter Management Server”](#) on page 11

Lab Manager Components

“Lab Manager servers” collectively refers to the Lab Manager Server system, Managed Server systems, and storage servers. [Figure 1-1](#) illustrates the components of Lab Manager.

Figure 1-1. Lab Manager Components



Lab Manager Server – A server that provides Web and SOAP interfaces to interact with Lab Manager. The Lab Manager Server system manages and deploys configurations against a pool of Managed Server systems.

Lab Manager Managed Server – A server running VMware ESX Server and the Managed Server software. The Lab Manager Server system uses the Managed Server system to deploy configurations and their virtual machines. You can have multiple Managed Server systems.

Lab Manager storage server – Storage for virtual machines (for example, an ESX Server SAN or NFS server) and storage for media (CD, DVD, and floppy images). You can have multiple storage servers.

Lab Manager client user – Clients who can use the Lab Manager Web console and the Lab Manager SOAP API. You can access the Lab Manager Web console with Internet Explorer (IE) or Firefox.

High-Level View of the Installation Process

The installation process takes about 20 minutes and involves the high-level tasks described in [Table 1-1](#).

Table 1-1. Installation Tasks

Preparing to install Lab Manager	Prepare your target system and make sure it meets all software and hardware requirements.
Creating Managed Server systems	Set up the Managed Server systems. You must set up at least one Managed Server system before setting up the Lab Manager Server system.
Creating the Lab Manager Server system	Set up the Lab Manager Server system.
Initializing and configuring Lab Manager	Set up these items in the Web Initialization wizard: <ul style="list-style-type: none"> ■ Network parameters ■ Connection between the Managed Server and Lab Manager Server components ■ Storage servers ■ Administrator account ■ Supportlink
Configuring NFS Storage	If you use NFS storage for media or virtual machines, complete the required configuration tasks and add the storage to the Lab Manager Web console.

Using Lab Manager with VirtualCenter Management Server

You can use VMware VirtualCenter Management Server (VirtualCenter Server) to monitor ESX Server systems managed by Lab Manager. However, all VirtualCenter Server actions that register or unregister Lab Manager virtual machines (including those triggered by VMware HA and VMware VMotion™) can cause errors in Lab Manager.

VMware recommends managing ESX Server systems with Lab Manager or VirtualCenter Server, but not both. Avoid installing Lab Manager on the same system as VirtualCenter Server to avoid performance complications. For more information on VirtualCenter Server, see the VMware Infrastructure 3 documentation.

Enabling High Availability for the Lab Manager Server

To take advantage of VMware HA, VMware DRS, or VMware VMotion, install the Lab Manager Server component on a virtual machine rather than a physical system.

2

Installation Requirements

Review the recommendations and requirements for your Lab Manager components and network. This chapter covers these topics:

- [“General Requirements”](#) on page 13
- [“System Requirements: Lab Manager Server and Managed Server”](#) on page 15
- [“Client User Machine Requirements”](#) on page 19
- [“Storage Requirements”](#) on page 20
- [“Network Requirements”](#) on page 22

General Requirements

Review this high-level checklist to make sure you have everything you need for the Lab Manager environment.

Lab Manager Server system requirements:

- Microsoft Windows Server 2003 (Enterprise Edition SP1 or above or Standard Edition SP1 or above) with the specifications detailed in [“System Requirements: Lab Manager Server and Managed Server”](#) on page 15.
You might want to install Lab Manager Server software in a virtual machine. See [“Enabling High Availability for the Lab Manager Server”](#) on page 12.
- Lab Manager license key for a single Lab Manager Server system. You can attach Managed Server systems to a single Lab Manager Server system.
- `VMware-labmanager-server-2.5.1-<build number>.exe` to install the Lab Manager Server software.

Managed Server system requirements:

- One or more VMware ESX Server 3.0.1 or 3.0.2 machines with the specifications detailed in “[System Requirements: Lab Manager Server and Managed Server](#)” on page 15. You can mix these versions in a Lab Manager environment.
- Lab Manager VMware-labmanager-agent-esx-2.5.1-<build number>.bin to install the Lab Manager Managed Server software.

Client user machine requirements:

- For general requirements, see “[Client User Machine Requirements](#)” on page 19.
- For complete details on Web browser and client operating system support, see the *VMware Lab Manager User’s Guide*.

Storage server requirements:

- NFS or SMB storage for media files
 - VMware Virtual Machine File System (VMFS) or NFS storage for virtual machines
- See “[Storage Requirements](#)” on page 20.

Networking requirements:

NOTE Requirements depend on whether you use a static IP pool or DHCP networking. For details, see “[Network Requirements](#)” on page 22.

- Pool of unused IP addresses
- Gateway
- Subnet mask
- DNS server
- (Optional) Secondary DNS server

Guest operating system requirements:

For details on guest operating system support, see the *VMware Lab Manager User’s Guide*.

System Requirements: Lab Manager Server and Managed Server

Review the system requirements for the Lab Manager Server and Managed Server components. The Managed Server component requires you to check the ESX Server hardware compatibility list at this link:

http://www.vmware.com/support/pubs/vi_pubs.html

Table 2-1. System Requirements

System Component	Lab Manager Server	Managed Server
Operating system and framework	<ul style="list-style-type: none"> ■ Microsoft Windows Server 2003 (Enterprise Edition SP1 or above or Standard Edition SP1 or above). Support for localized versions in U.S. English, British English, Australian English, French, German, Italian, and Japanese. ■ Microsoft .NET Framework 2.0 ■ Internet Information Server (IIS) and ASP.NET version 2.0.50727 enabled. See “Configuring IIS and ASP.NET on Lab Manager Server” on page 18. 	<ul style="list-style-type: none"> ■ VMware Infrastructure 3 (ESX Server 3.0.1 or 3.0.2). You can mix these versions in the Lab Manager environment. ■ For requirements specific to ESX Server, see the VMware Infrastructure 3 documentation.
CPU speed	<ul style="list-style-type: none"> ■ 550MHz minimum ■ (Recommended) 1GHz or faster 	<ul style="list-style-type: none"> ■ 1500MHz minimum

Table 2-1. System Requirements (Continued)

System Component	Lab Manager Server	Managed Server
Processor	<ul style="list-style-type: none"> ■ Pentium III, Pentium 4, Xeon, Opteron, or Athlon processor (32-bit only) 	<ul style="list-style-type: none"> ■ Any CPU compatible with ESX Server. ■ If you do not have a homogenous CPU setup across Managed Server systems, ESX Server prevents you from deploying “suspended” virtual machines on one Managed Server to another Managed Server that is not compatible with the virtual machine CPU. (Discard the suspended state to resolve the issue.) For details on virtual machines in a suspended state, see the <i>VMware Lab Manager User’s Guide</i>. ■ To review hardware requirements for 64-bit guest operating system support, see the <i>VMware Infrastructure 3 Installation and Upgrade Guide</i>.
Hard disk	<ul style="list-style-type: none"> ■ 40GB minimum ■ (Recommended) 200GB or more ■ (Recommended) RAID 0 or RAID 5 for highest performance 	<ul style="list-style-type: none"> ■ (Recommended) SAN storage. Minimum requirement is a local SCSI drive with a supported SCSI adapter. Does not allow you to share virtual machines across systems. ■ Fiber Channel and software and hardware-initiated iSCSI adapters. See “Virtual Machine Storage (Datastore)” on page 20. ■ 500MB minimum available in the /var partition. ■ 120MB available in the /usr partition. <p>For more details on SAN requirements, see the VMware Infrastructure 3 documentation.</p>

Table 2-1. System Requirements (Continued)

System Component	Lab Manager Server	Managed Server
Memory	<ul style="list-style-type: none"> ■ 512MB minimum ■ (Recommended) 1GB or more 	<ul style="list-style-type: none"> ■ 1GB minimum ■ (Recommended) 2GB or more ■ 2GB or more swap space for ESX ■ In general, add 30MB of overhead space to the total RAM of all virtual machines you expect to run. <p>For example, to run five Windows virtual machines that each use 512MB of RAM, perform this calculation (values are approximate):</p> $(5 \times 512) + (30 \times 5) = 2.5\text{GB} + 150 = 2.65\text{GB RAM (Total)}$ <p>In other words:</p> <p>The number of virtual machines multiplied by the virtual machine memory added to the overhead space multiplied by number of virtual machines.</p>
Network	<ul style="list-style-type: none"> ■ At least one Ethernet card (unbound/ not teamed) ■ (Recommended) Gigabit Ethernet ■ Machine cannot run on a Windows domain controller. ■ Machine resides outside of a Windows domain. (VMware offers experimental support for placing the Lab Manager Server system in a domain. Group policies might affect installation and operation.) 	<ul style="list-style-type: none"> ■ One or more Ethernet controllers. ■ For best performance and security, use separate Ethernet controllers for the ESX service console and virtual machines.

Table 2-1. System Requirements (Continued)

System Component	Lab Manager Server	Managed Server
CD drive	<ul style="list-style-type: none"> ■ CD/DVD drive 	
Notes and recommendations	<ul style="list-style-type: none"> ■ (Recommended) SSL certificate ■ System clock is in sync with the clocks on the storage servers. This synchronization prevents unnecessary delays during garbage collection (automatic removal of unused virtual machine images). 	<ul style="list-style-type: none"> ■ When reviewing the ESX Server hardware compatibility list, keep in mind the need for compatible network cards and storage systems. ■ Accessing, configuring, or manipulating the underlying virtualization technology is prohibited to avoid system problems. ■ Number of virtual machines varies depending on the number of virtual machines you run at a time. As a starting point, estimate 5–10 virtual machines per Managed Server system. Increase this range if the applications are not CPU-intensive and some performance degradation is acceptable.

Configuring IIS and ASP.NET on Lab Manager Server

You must have IIS and ASP.NET version 2.0.50727 installed and enabled on the Lab Manager Server system. (See [“System Requirements: Lab Manager Server and Managed Server”](#) on page 15.) Though IIS and ASP.NET come with Windows Server 2003, these programs might not be installed at the same time as Windows Server 2003. You also must have Microsoft .NET Framework 2.0 installed.

During the installation procedure, you might need to put the Windows Server 2003 boot disk into the CD or DVD drive of the server.

To install Internet Information Server (IIS) and ASP.NET

- 1 Choose **Start > Settings > Control Panel > Add or Remove Programs**.
- 2 In the left pane of the Add or Remove Programs dialog box, click the **Add/Remove Windows Components** icon.
- 3 In the Windows Components wizard, select the **Application Server** component.
- 4 Click **Details**.

- 5 Select the **ASP.NET** and **Internet Information Services (IIS)** options.
- 6 Click **OK** and **Next** to install the components.

To verify you installed ASP.NET version 2.0.50727

- 1 Choose **Start > Control Panel > Administrative Tools > Internet Information Services (IIS) Manager**.
- 2 On the left pane, expand the entry for the local computer and select **Web Service Extensions**.
- 3 Make sure you can see ASP.NET v2.0.50727 with an **Allowed** status.

If the status is **Prohibited**, right-click **ASP.NET v2.0.50727** and choose **Allow** from the menu.

For more information, see the Microsoft Web site:

<http://office.microsoft.com/en-us/winsharepointadmin/HA100598511033.aspx>

Client User Machine Requirements

NOTE For information on Web browser and client operating system support, see the *VMware Lab Manager User's Guide*.

Review the requirements for client user machines. These are the machines where a client opens a browser to access the Lab Manager Web console.

- Ensure the machines have routable access to the Lab Manager Server system, Managed Server systems, and storage servers.
- Enable these browser options (accessible by choosing **Internet Options** in the **Tools** menu, and clicking **Custom Level** in the **Security** tab) in IE:
 - **Download signed ActiveX controls**
 - **Run ActiveX controls and plug-ins**
 - **Allow META REFRESH**
 - **Active scripting**
 - **Allow paste operations via script**
- Enable the **Play animations in web pages** option in IE (accessible by choosing **Internet Options** in the **Tools** menu, and clicking the **Advanced** tab).

- Disable the **Enhanced Internet Explorer Security Configuration** option (accessible from the Control Panel by clicking **Add or Remove Programs** and clicking **Add/Remove Windows Components**) for Windows 2003.
- Verify that the system clock is in sync with the Lab Manager Server system, storage servers, and Managed Server systems.
- Review the display requirements:
 - 1024 x 768 or higher resolution monitor for users without administrative privileges.
 - 1280 x 1024 or higher resolution monitor for administrators.

Storage Requirements

This section covers details of media storage and virtual machine storage (datastore).

Media Storage

Lab Manager provides a default repository for media (CD, DVD, and floppy images) on the Lab Manager Server system. You can add extra storage servers for media. The Lab Manager Web console allows you to synchronize a media library with the files in media storage servers.

Review the requirements for media storage:

- Media storage must support SMB or NFS format. VMware recommends using NFS servers for additional media storage. The SMB or NFS storage must be accessible from all Managed Server systems. For more information on NFS media storage, see [“Configuring NFS Servers”](#) on page 39.
- (SMB only) You cannot have concurrent access to a Windows machine using multiple accounts with different credentials. If you want to have multiple storage server shares on one server, use the same account (user name and password) for access. Enter the user name and password for the share when attaching it to Lab Manager.

Virtual Machine Storage (Datastore)

The datastore is the storage location for virtual machines in ESX Server systems. Lab Manager can use VMFS or NFS datastores. VMware recommends the use of VMFS datastores for virtual machine storage and only supports VMFS3 partitions.

VMFS Datastore

The initialization process for Lab Manager ([page 36](#)) prompts you to select the VMFS devices you want the Managed Server system to use for storage. Review the requirements and recommendations for the VMFS datastore:

- (Recommended) A small number of large SAN VMFS partitions rather than a large number of small partitions.
- The lifecycle of a virtual machine involves transitions from templates to configurations to library configurations and more. The operations form a “chain” of changes that takes up disk space. These growing chains cannot span multiple datastores and must have enough space within a single datastore.
- A VMFS datastore is configured in the ESX Server system.

You must set up VMFS partitions outside of Lab Manager through the Virtual Infrastructure Client (VI Client). This client is an interface packaged with ESX Server that allows users to connect remotely to ESX Server systems from any Windows PC. Use VI Client to add or edit disk volumes and partitions. When you later attach the Managed Server system in the Lab Manager Web console, you can specify the VMFS disk volumes for the Managed Server system.

See the VMware Infrastructure 3 documentation for steps using the VI Client.

NFS Datastore

You can configure NFS datastores in the Lab Manager Web console after the initialization phase (see [“Initializing and Configuring Lab Manager”](#) on page 36).



CAUTION Do not set up NFS datastores through the VI Client on the ESX Server system. Unlike VMFS datastores, NFS datastores created through the VI Client are not recognized by Lab Manager. Such datastores conflict with the creation of NFS datastores through the Lab Manager Web console.

Review the requirements for the NFS datastore:

- The NFS server must be accessible in read-write mode by all Managed Server systems.
- The NFS server must allow read-write access for the “root” system account.

Using Hardware and Software-Initiated iSCSI Storage

Refer to the VMware Infrastructure 3 online library documentation at <http://pubs.vmware.com/vi301> to set up iSCSI storage.

To find instructions on iSCSI storage

- 1 Open the VMware Infrastructure 3 online library.
- 2 Click the **Search** tab.
- 3 Type:
> **iSCSI**

See the “Configuring Hardware-Initiated iSCSI Storage” and “Configuring Software-Initiated iSCSI Storage” in the Server Configuration Guide section. After setting up iSCSI storage using the VI Client, you must complete the setup in Lab Manager.

To set up iSCSI storage in the Lab Manager Web console (post-installation)

- 1 In the left pane of the console, click **Servers**.
- 2 Move the pointer over the Managed Server name and choose **Properties** from the menu.
- 3 At the bottom of the page, select the appropriate iSCSI storage.
- 4 Click **OK**.

Network Requirements

Network requirements and recommendations are covered in these sections:

- “Configuring Routing” on page 23
- “Configuring Domains and Permissions” on page 23
- “Configuring Firewall Settings” on page 23
- “Gathering Network Information for Installation” on page 24

Configuring Routing

Review the requirements for network connectivity:

- Lab Manager client user machines must have routable access to the Lab Manager Server system, Managed Server systems, and storage servers. If these Lab Manager servers are behind a firewall and not directly accessible, you can use a virtual private network (VPN). See [“Configuring Firewall Settings”](#) on page 23 for more information on configuring network ports for routable access.
- Do not use a Network Address Translation (NAT) device between the Lab Manager Server system and Managed Server systems because .NET remoting will fail.
- The Lab Manager Server system does not need to reside on the same subnet as the Managed Server systems. The Lab Manager Server system requires a static IP address.
- All Managed Server systems must reside on the same subnet.
- The Lab Manager Server system and Managed Server systems need access to the media (SMB or NFS) storage but do not need to reside on the same subnet.
- Managed Server systems need access to the NFS virtual machine storage.

Configuring Domains and Permissions

Because the Lab Manager Server system and Managed Server systems must mount shares, these systems require matching DNS and DNS suffix information.

Configuring Firewall Settings

Lab Manager communicates between its servers and clients through network ports. ESX Server software sets up default ports. See the VMware Infrastructure 3 documentation for details.

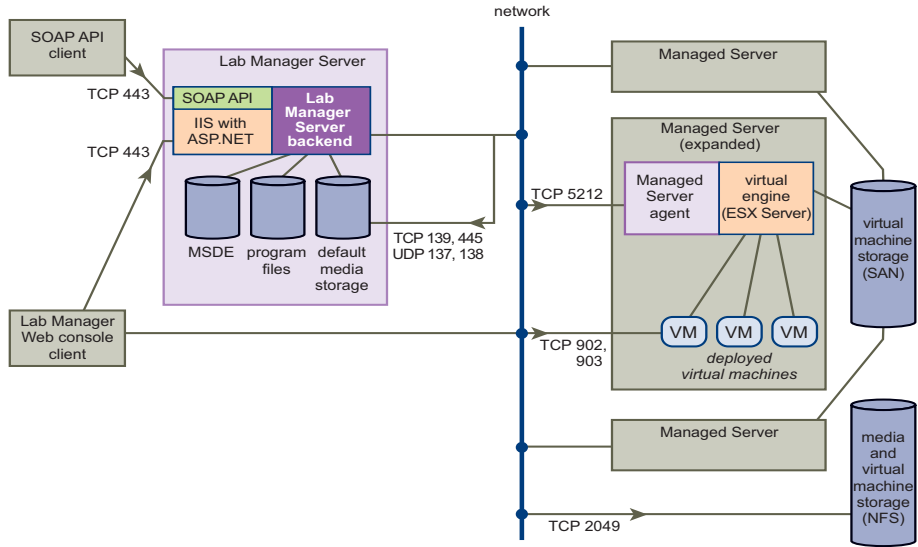
Review the requirements to configure firewalls:

- **Client browser to access Lab Manager Server system** – TCP port 443.
- **Client browser to access Managed Server systems** – TCP ports 902 and 903.
- **Lab Manager Server system and Managed Server systems to access SMB storage server** – TCP ports 139 and 445, UDP ports 137 and 138.

- **Managed Server systems to access additional NFS media storage servers or NFS virtual machine storage servers** – TCP port 2049.
- **Lab Manager Server system to access Managed Server systems** – TCP port 5212.

See [Figure 2-1](#) for an illustration of Lab Manager ports.

Figure 2-1. Detailed View of Lab Manager Components and Ports



During the installation process, ensure that port conflicts do not exist. To determine ports in use, use the `netstat -b` command from the command line to determine the program executable.

Using Port 514 for Windows Firewall

If you use Windows Firewall on the Lab Manager Server system, you must allow access to port 514/tcp. This port affects the Lab Manager fencing technology. Refer to the *VMware Lab Manager User's Guide* for information on fencing.

Gathering Network Information for Installation

Before you begin the installation, gather this information about your network if you do not plan on using DHCP networking (see [“Initializing and Configuring Lab Manager”](#) on page 36). This includes:

- The block of IP addresses the Lab Manager System uses for virtual machines.
- IP addresses for the primary and secondary DNS servers in the network.

- Subnet mask for the network.
- IP address for the network gateway.
- The Lab Manager Server DNS suffix.

Consult your network IT administrator for information.

IP Addresses for Virtual Machines

Reserve a range of IP addresses for virtual machines. This range is in addition to the IP addresses required for each Lab Manager Server, storage server, and Managed Server. IP addresses for virtual machines are allocated from the pool of IP addresses you reserve. The number of virtual machines running and requiring IP addresses varies with the number and complexity of configurations deployed at any one time.

The maximum number of IP addresses you can add at one time is 1024. No limit exists on the number of total addresses you can use.

For a minimum system, you need at least 100 IP addresses. (You can add blocks of addresses later.) For a large installation, VMware recommends allocating 200 or more IP addresses. You need one or two IP addresses for each deployed virtual machine. Base your estimate on current and future needs.

[Table 2-2](#) provides examples of the network information you need for a static IP pool.

Table 2-2. Static IP Pool Information

IP and Network Component	Example
IP address block for virtual machines	10.6.1.10 – 10.6.1.199
Subnet mask for virtual machines	255.255.255.0
Gateway for virtual machines	10.6.1.1
DNS server 1	10.6.1.200
DNS server 2 (optional)	10.6.1.201
DNS suffix	vmware.com

3

Installing Lab Manager

After reviewing the requirements in [Chapter 2](#), install the Managed Server and Lab Manager Server software. This chapter covers these topics:

- [“Reviewing the Installation Flow”](#) on page 27
- [“Setting Up Managed Server Systems”](#) on page 28
- [“Setting Up the Lab Manager Server System”](#) on page 31
- [“Verifying the ASP.NET Version”](#) on page 35
- [“Initializing and Configuring Lab Manager”](#) on page 36
- [“Checking the Sample Template and Configuration”](#) on page 38
- [“Configuring NFS Servers”](#) on page 39
- [“Uninstalling Lab Manager”](#) on page 42

Reviewing the Installation Flow

The installation process involves these high-level steps:

Step 1 Set up the Managed Server systems.

Install the Lab Manager Managed Server software on at least one ESX Server system. You must have access to the Managed Server agent executable (VMware-labmanager-agent-esx-2.5.1-<build number>.bin). See [“Setting Up Managed Server Systems”](#) on page 28.

Step 2 Set up the Lab Manager Server system.

After creating at least one Managed Server system, create the Lab Manager Server system. The Lab Manager Server system controls both the back-end (Managed Server systems) and front-end (Lab Manager Web console). You must have access to the Lab Manager Server executable (VMware-labmanager-server-2.5.1-<build number>.exe). See [“Setting Up the Lab Manager Server System”](#) on page 31.

Step 3 Initialize and configure Lab Manager.

After creating at least one Managed Server system and the Lab Manager Server system, log in to the Lab Manager Web console and perform one-time initialization tasks. These tasks involve the administrator account, licensing, connection of the Managed Server component to the Lab Manager Server system, network parameters, default storage server for media, and product support. See [“Initializing and Configuring Lab Manager”](#) on page 36.

Setting Up Managed Server Systems

Set up the Managed Server component on at least one ESX Server machine before creating the Lab Manager Server component. This process involves installing the Managed Server agent software on your target Managed Server systems. The Managed Server software allows the Lab Manager Server system to control and deploy virtual machines on the Managed Server system.

Review these sections:

- [“Prerequisites for Managed Server Systems”](#) on page 28
- [“Installing the Managed Server Agent Software on ESX Server”](#) on page 30

Prerequisites for Managed Server Systems

In addition to the installation requirements described in [Chapter 2](#), complete these tasks:

- Make sure ESX Server is set up properly for a Managed Server system.
- Set up the VMkernel network for NFS virtual machine or media storage.

Verifying the Setup of the ESX Server System

Use the VI Client packaged with ESX Server to review these prerequisites for your target Managed Server system:

- At least one VMFS partition (local SCSI, iSCSI, or SAN) is attached to the Managed Server system. In the VI Client, navigate to the Storage Management page to add VMFS disk volumes and partitions.
- ESX Server license is configured. See the VMware Infrastructure 3 documentation for details on enabling the license with the VI Client.
- The host name of the ESX Server machine must map to the service console IP address. You must be able to perform forward and reverse DNS lookups of all the ESX Server host names. See the VMware Infrastructure 3 documentation for details on configuring network parameters for the service console.
- At least one virtual switch for virtual machines is attached to an active network interface card (NIC). For details, see the VMware Infrastructure 3 documentation.
- The system clock shows the current date and time. VMware recommends using Network Time Protocol (NTP).

Setting up the VMkernel Network for NFS Storage

Before installing the Managed Server software, use the VI Client to set up the VMkernel network if you plan on using NFS virtual machine storage or NFS media storage. You need an IP address specifically for this process. See the VMware Infrastructure 3 documentation for details on the VI Client.

To set up the VMkernel network

- 1 In the **Configuration** tab of the VI Client, click **Networking** in the **Hardware** section.
- 2 Click the **Properties** link for the switch associated with the appropriate NIC.
- 3 Click the **Add** button.
- 4 Select the **VMkernel** option.
- 5 Enter the required network information.
Make sure to enter the correct gateway for the VMkernel.
- 6 Click **Finish**.

This procedure is required for all Managed Server systems that you attach to Lab Manager. After installing the Managed Server systems and Lab Manager Server system, see [“Configuring NFS Servers”](#) on page 39 and [“Adding and Synchronizing NFS Media Storage”](#) on page 40 to ensure Lab Manager recognizes the contents of the NFS server.

Installing the Managed Server Agent Software on ESX Server

After reviewing the prerequisites and background information, install the Managed Server agent software.

To install the Managed Server agent software

- 1 On the target Managed Server system, log in as root.
- 2 Copy `VMware-labmanager-agent-esx-2.5.1-<build number>.bin` to the target ESX server computer.
 - VMware recommends using the `scp` utility for this task. Windows users can use WinSCP.

For example, you might use this `scp` command to place the file in the `/root` directory:

```
> scp VMware-labmanager-agent-esx-2.5.1-<build number>.bin <user
name>@<server host name or IP address>:/root
```

If you have a choice of transferring the files in binary or ASCII mode, use binary mode.

- To verify the integrity of the software, use the `md5sum` utility on the target ESX Server computer:

```
> md5sum VMware-labmanager-agent-esx-2.5.1-<build number>.bin
```

The correct output appears on the VMware download site.

- 3 To run the installer, type:

```
> sh VMware-labmanager-agent-esx-2.5.1-<build number>.bin
```

This command initiates verifications to ensure the ESX Server machine is in an adequate state for the agent installation.

- 4 Continue or stop the installation based on whether you want NFS media storage:
 - If you did not set up the VMkernel network and you want to store media on NFS storage, do not proceed with the installation. Set up the VMkernel network and start the process of installing the Managed Server agent software again.
 - If you did not set up the VMkernel network and you do not need to store media on NFS storage, proceed with the installation.
- 5 Type a user name and password.

Enter a username/password that you will use to access this server from Lab Manager:

```
> Username [labmanager]:
> Password:
> Confirm password:
```

This account enables communication between the Lab Manager Server system and the Managed Server system and also enables access to the consoles of the hosted virtual machines for the Managed Server system. Use the same user name and password during the Web Initialization wizard (see [“Initializing and Configuring Lab Manager”](#) on page 36) and during the process of adding a Managed Server system using the Lab Manager Web console. For more information on adding a Managed Server system, see the *VMware Lab Manager User’s Guide*.
- 6 If you configured two or more virtual switches using the VI Client, select a network switch for virtual machines.

Setting Up the Lab Manager Server System

After installing the Managed Server systems, set up the Lab Manager Server system. The Lab Manager Server system provides Web and SOAP interfaces to interact with Lab Manager. The Lab Manager Server software installs an instance of Microsoft SQL Server Desktop Engine (MSDE) for use with Lab Manager.

This section covers these topics:

- [“Prerequisites for Lab Manager Server”](#) on page 32
- [“Security Recommendations”](#) on page 32
- [“Configuring Internet Explorer on Lab Manager Server”](#) on page 34
- [“Installing the Lab Manager Server Software”](#) on page 34

Prerequisites for Lab Manager Server

In addition to the installation requirements described in [Chapter 2](#), review these prerequisites for the Lab Manager Server system.

- The target Lab Manager Server system must have a NIC with these requirements:
 - Static IP address
 - Physically connected NIC (no wireless cards)
- You must use a fully qualified domain name (FQDN). Certain features of Lab Manager, such as LiveLink, require an FQDN. This requirement does not mean that the Lab Manager Server system resides in a domain.

An FQDN starts with the computer name followed by the DNS suffix (for example, `computer_name.mydomain.com`). VMware recommends avoiding the use of an IP address because complications might arise at a later time if you need to change that address.

- The system clock shows the current date and time.
- The Lab Manager Server system cannot reside on a machine with Microsoft SQL Server 2005.

Security Recommendations

Review the information on SSL certificates and enabling a high security policy.

For information on port requirements for Windows Firewall, see [“Using Port 514 for Windows Firewall”](#) on page 24.

Installing or Customizing the SSL Certificate

VMware recommends installing an SSL certificate from a trusted certification authority that validates the server identity. Generate the SSL certificate with the domain name or IP address for accessing Lab Manager.

If you do not install the SSL certificate, VMware automatically generates one but SSL security warnings appear in the browser. For more information, see *“Accessing the Lab Manager Console”* in the *VMware Lab Manager User’s Guide*.

You can use OpenSSL to generate a custom SSL certificate with a different name than the one generated by VMware. VMware recommends generating the custom certificate on the Lab Manager Server system.

To generate a custom SSL certificate using OpenSSL

- 1 Download and install OpenSSL on the Lab Manager Server system.
- 2 Create a file named `OpenSSLVMware.cfg` in a working directory.

Review this sample file:

```
# Conf file that vpx uses to generate SSL certificates.
[ req ]
default_bits           = 1024
default_keyfile        = rui.key
distinguished_name     = req_distinguished_name

#Don't encrypt the key
encrypt_key            = no
prompt                 = no

string_mask = nombstr

[ req_distinguished_name ]
countryName           = US
stateOrProvinceName  = CA
localityName          = CA
o.organizationName    = VMware, Inc.
ou.organizationalUnitName = VMware, Inc.
commonName             = machine1
emailAddress           = support@vmware.com
```

- 3 Store `openssl.exe`, `libeay32.dll`, and `ssleay32.dll` in the working directory.
- 4 From the working directory, change the `commonName` entry in `OpenSSLVMware.cfg` to the machine host name.
- 5 From the command prompt in the working directory, type:

```
openssl req -new -x509 -keyout "OpenSSLVMware.key" -out
           "OpenSSLVMware.crt" -days 730 -config "<working
           directory>\OpenSSLVMware.cfg"
openssl pkcs12 -export -out "OpenSSLVMware.pfx" -in "OpenSSLVMware.crt"
           -inkey "OpenSSLVMware.key" -name OpenSSLVMware -passout
           pass:<password>
```

This process generates a `.pfx` file.

- 6 Remove any outdated certificate from IIS and import the new `.pfx` file into IIS. Microsoft IIS documentation offers instructions on removing and importing certificates.

Modifying Security Policies

To use Lab Manager in a high security environment, you must modify the policy settings.

To modify a high security policy

- 1 On the desktop of the target Lab Manager Server system, choose **Start > All Programs > Administrative Tools > Local Security Policy**.
- 2 In the left pane, navigate to **Security Options** under **Local Policies**.
- 3 In the right pane, double-click **Microsoft network server: Digitally sign communications (always)**.
- 4 Select **Disabled** and click **OK**.
- 5 In the right pane, double-click **Microsoft network server: Digitally sign communications (if client agrees)**.
- 6 Select **Disabled** and click **OK**.
- 7 In the right pane, double-click **Network Security: Lan Manager authentication level Properties**.
- 8 Select **Send NTLM response only**.
- 9 Click **OK**.

Configuring Internet Explorer on Lab Manager Server

Access Lab Manager from your desktop browser or the Microsoft Windows 2003 server. Adjust the IE browser settings for client operation. See [“Client User Machine Requirements”](#) on page 19.

Installing the Lab Manager Server Software

The Lab Manager Server installation involves typical or custom options. Consider a custom installation if you want to put the storage server on a separate disk because of a heavy storage requirements.

To install the Lab Manager Server software

- 1 On the target Lab Manager Server system, launch `VMware-labmanager-server-2.5.1-<build number>.exe`.
- 2 Review the Welcome page of the installation wizard.

- 3 If the software cannot detect a fully qualified domain name (FQDN), enter one when prompted.

For information on FQDN, see “[Prerequisites for Lab Manager Server](#)” on page 32.

- 4 Specify whether you want a **Typical** or **Custom** installation.

You can perform these tasks with a custom installation:

- Change the program files directory.
- Change the repository directory (\VMwareLM). This directory is the default location for media storage.

- 5 Select the IP address for Lab Manager traffic.

This information appears only if you have more than one active NIC with static IP addresses.

- 6 Click **Install**.

NOTE During the MSDE installation, the actual time to complete this process is longer than the estimated time displayed in a message.

Verifying the ASP.NET Version

After installing the Lab Manager Server software, verify that the Lab Manager Web application uses the correct version of ASP.NET.

To verify the ASP.NET version

- 1 Choose **Start > Control Panel > Administrative Tools > Internet Information Services (IIS) Manager**.
- 2 Choose **Web Sites > Default Web Site > LabManager**.
- 3 Right-click **LabManager** and choose **Properties** from the menu.
- 4 In the **Virtual Directory** tab, click the **Configuration** button.
- 5 For the **.asax**, **.ascx**, **.asmx**, and **.aspx** extensions, look at the executable path for each extension and verify that the version is 2.0.50727.
- 6 If you need to change the version, open a command-line prompt and use the `isreset` command.

Initializing and Configuring Lab Manager

After installing the Lab Manager Server software, initialize and configure it using a Web browser. You can perform this task on the Lab Manager Server system or any system with access to the Lab Manager Server system. The initialization process involves the administrator account, licensing, storage servers, network parameters for new virtual machines created in Lab Manager, attachment of a Managed Server system, and support setup.

Lab Manager sends the customer ID to VMware at the beginning and the end of the initialization wizard.

To initialize and configure Lab Manager

- 1 From any machine with network access to the Lab Manager Server system, launch the browser and go to `http://<Lab Manager Server IP address or name>`

You can also launch the same page from the desktop of the Lab Manager Server machine by double-clicking the **VMware Lab Manager** icon.

If you receive SSL warnings, see the *VMware Lab Manager User's Guide*.

- 2 In the Web Initialization wizard, select the location where the installation process is taking place.
- 3 Accept the license agreement.
- 4 Browse and select the file with the license key for the Lab Manager Server.

The wizard presents information on storage servers, network parameters for virtual machines created in Lab Manager, and Managed Server systems. Note that the default server for media storage (`\\<Lab Manager Server IP address>\VMwareLM`) resides on the Lab Manager Server hard disk.

- 5 Specify the details on IP addresses for the network environment:
 - a Select the **DHCP** (dynamic allocation) option, **Static IP Pool** option, or both options. Lab Manager allows you to use a different option for each virtual machine.

The selection determines the choices for IP allocation you will see in the Lab Manager Web console. These choices can be altered after this wizard. See [“Static IP and DHCP Networking”](#) on page 38 for more information on the options.
 - b Select the default IP setting for a new virtual machine.
 - c If you have other installations of Lab Manager on your network, you can edit the installation ID if it conflicts with the ID of another installation.

The installation ID affects the unique MAC addresses required to deploy virtual machines. See the *VMware Lab Manager User’s Guide* for more details.
- 6 Attach one of the Managed Server systems you created to the Lab Manager Server system:
 - a Type a display name and description (optional) for the Managed Server system.
 - b Type the IP address for the Managed Server system.
 - c Type the same user name and password of an account with administrator privileges that you entered in [“Installing the Managed Server Agent Software on ESX Server”](#) on page 30.
- 7 Specify the VMFS and NFS devices you want this Managed Server system to use for virtual machine storage.
 - a If you use VMFS storage, select the VMFS partitions.

This step assumes you set up your SAN using the VI Client for ESX Server. Do not select partitions used in production elsewhere.

If the Managed Server system does not have available VMFS partitions, the wizard prompts you for NFS information.
 - b If you use NFS storage, enter the name and export path.

This step assumes you set up the VMkernel network for NFS storage.

You cannot proceed unless a VMFS partition is available, NFS storage is available, or both options are available. For details on virtual machine storage, see [“Virtual Machine Storage \(Datastore\)”](#) on page 20.

- 8 Create the first Lab Manager administrator account with a user name, password, and email address.
- 9 Choose whether to enable SupportLink, a feature that sends usage data to VMware and improves product support.
- 10 If you are outside of the U.S. and enabling SupportLink, consent to the possible transfer of data outside of the country where the installation takes place.
- 11 Before exiting the wizard, review optional configuration tasks after logging in to the Web console.

See the *VMware Lab Manager User's Guide* for details.

- 12 Type the user name and password of the Lab Manager administrator account you created to log in to the Lab Manager Web console.

Static IP and DHCP Networking

You can use static IP or DHCP networking in Lab Manager on a per-virtual machine basis.

To avoid setting up an IP range, use DHCP to pull IP addresses from a DHCP server. DHCP does not work with the Lab Manager fencing technology, a feature which allows multiple users to work with live instances of the same virtual machine configuration on the same network. For details on fencing, see the *VMware Lab Manager User's Guide*.

To use a constant IP address, use the static IP pool. You must specify an IP range, DNS suffix, gateway, netmask, and DNS information. Lab Manager allows you to add a maximum of 1024 IP addresses at a time. There is no limit on the total number of IP addresses you can add. The static IP pool works with the fencing technology.

If you need information about your network, consult your network IT administrator. Lab Manager assigns IP addresses reserved for the new virtual machines.

Checking the Sample Template and Configuration

After logging in to the Lab Manager console, you can view a sample template and configuration in the Lab Manager console. Use these samples to test the system and see how operations occur without the time-consuming process of creating a virtual machine from scratch. For details on templates and configurations, see the *VMware Lab Manager User's Guide*.

To check the sample template and configuration

- 1 In the left pane, click **Workspace** to see the **Sample 1** configuration.
- 2 In the left pane, click **Templates** to see the **ttylinux-4-ESX3(<owner>)** template.

NOTE The Templates page may not be accessible to non-administrator users.

The first time you deploy a template or configuration to view a virtual machine console, you must follow the instructions to install the ActiveX control.

After the ActiveX installation, you can log in to a virtual machine console of the **ttylinux-4-ESX3(<owner>)** template or **Sample 1** configuration as root and use “lab manager” as the password.

Configuring NFS Servers

If you plan on using an NFS server for additional media storage or virtual machine storage, you need to configure it accordingly. You must use different exported shares for media and virtual machine storage, but these shares can reside on the same NFS server.

For additional media storage, configure the NFS server to allow read-only access by all Managed Server systems.

For virtual machine storage, configure the NFS server to allow read-write access by all Managed Server systems, including read-write access by the system “root” account. Virtual machines are stored in a /VM directory under the exported share. You do not have to create this directory yourself.

NOTE Managed Server systems need to access the NFS server using the VMkernel IP address. If you use host-based access control on the NFS server, you must allow access through the VMkernel IP address for all Managed Server systems.

Adding NFS Virtual Machine Storage

If you configured NFS storage for virtual machines, add this storage to the Lab Manager Web console.

To add an NFS virtual machine server

- 1 In the left pane, click **Storage**.
- 2 In the **Virtual Machines** tab, click the **Add NFS Storage** button.
 - a Enter a name for the new server.

The name can only contain alphanumeric characters (a–z, A–Z, 0–9), hyphens, underscores, or periods. The maximum length is 128 characters.
 - b (Optional) If you do not want the storage server immediately available for use, deselect the **Enabled** check box.
 - c Enter a value for **Disk Space Threshold Yellow**.

When available disk space falls below this level, Lab Manager sends an email warning message to the recipients specified in Lab Manager’s Email Alert settings.
 - d Enter a value for **Disk Space Threshold Red**.

When available disk space falls below this level, Lab Manager sends an email alert (more severe than the **Disk Space Threshold Yellow** message) to the recipients specified in Lab Manager’s Email Alert settings.
 - e Specify the NFS export path and click **OK**.

Adding and Synchronizing NFS Media Storage

If you added NFS media storage as described in “[Configuring NFS Servers](#)” on page 39, add the media server to the Lab Manager Web console and synchronize it with the Lab Manager Server system.

To ensure Lab Manager recognizes and syncs up with the contents of the NFS media server. Review these requirements for the CD, DVD, and floppy files:

- CD and DVD files must end with `.iso`.
- Floppy files must end with `.img`, `.vfd`, and `.flp`.

To add an NFS media server

- 1 In the left pane, click **Storage**.
- 2 In the **Media** tab, click the **Add Media Storage** button.
 - a Enter a name for the new server.
The name can only contain alphanumeric characters (a–z, A–Z, 0–9), hyphens, underscores, or periods. The maximum length is 128 characters.
 - b (Optional) If you do not want the storage server immediately available for use, deselect the **Enabled** check box.
 - c Enter a value for **Disk Space Threshold Yellow**.
When available disk space falls below this level, Lab Manager sends an email warning message to the recipients specified in Lab Manager’s Email Alert settings.
 - d Enter a value for **Disk Space Threshold Red**.
When available disk space falls below this level, Lab Manager sends an email alert (more severe than the **Disk Space Threshold Yellow** message) to the recipients specified in Lab Manager’s Email Alert settings.
 - e Select **NFS Storage**, and enter the NFS export path (for example, **<host name or IP address >/export**).
 - f Click **OK**.

To synchronize the Lab Manager Server system with NFS media storage

- 1 In the left pane, click **Media**.
- 2 Click **Synchronize** to make Lab Manager recognize the contents of the NFS server.

NOTE Lab Manager does not provide a way to populate the contents of the NFS server contents as it does for SMB shares. Use your own method of populating the NFS server. If you add new items, use the **Synchronize** button to ensure Lab Manager recognizes the additional items.

Uninstalling Lab Manager

Uninstalling Lab Manager involves uninstalling the Lab Manager Server and Managed Server agent software. Review the requirements for the uninstallation process:

- A system installed with Lab Manager Server software.
- One or more systems installed with the Managed Server agent software.
- The user name and password of the Lab Manager administrator.
- The user name and password of the root user on Managed Server systems.

Uninstalling Lab Manager Server

Remove the Lab Manager Server software before removing the Managed Server software.

To uninstall the Lab Manager Server software

- 1 Log in as administrator to the Lab Manager Server system.
If you want to uninstall program files only, skip to [Step 9](#).
- 2 In the left pane, click **Servers**.
- 3 Move the pointer over each Managed Server system and choose **Disallow Deployments** from the menu.
- 4 Move the pointer over each Managed Server system and choose **Undeploy All VMs** from the menu.
- 5 In the left pane, click **Deployed Machines** and check that the page displays an empty list.
- 6 In the left pane, click **Servers**.
- 7 Move the pointer over each Managed Server system and choose **Remove** from the menu.
- 8 Log out of the Lab Manager Server system.
- 9 From the **Start** menu on the desktop, choose **Add or Remove Programs** in the Control Panel.
- 10 Select the **VMware Lab Manager** program and click the **Change/Remove** button.

- 11 Specify the extent of the uninstallation:
 - Select **Remove program files only** in a partial uninstallation or upgrade process. Proceed to [Step 14](#).
 - Select **Remove everything** in a full uninstallation.
- 12 Click **Yes** to remove all the Lab Manager software.
- 13 Click **Yes** to reset Lab Manager Services and IIS.
- 14 Click **Finish**.

Uninstalling Managed Server Agent Software

After uninstalling the Lab Manager Server software, remove the Managed Server agent software. Make sure all virtual machines that reside on each Managed Server system are undeployed (already taken care of in “[Uninstalling Lab Manager Server](#)” on page 42).

To uninstall the Managed Server agent software

- 1 Log in as root to the ESX Server console.
- 2 Type:
> `uninstall-agent.sh`

4

Upgrading Lab Manager

You can upgrade Lab Manager from version 2.5 only. This chapter covers these topics:

- [“Backing Up the Lab Manager Database”](#) on page 45
- [“Uninstalling the Program Files for Lab Manager Server”](#) on page 46
- [“Installing the Managed Server and Lab Manager Server Software”](#) on page 46
- [“Restoring the Lab Manager Database”](#) on page 47

Backing Up the Lab Manager Database

VMware recommends backing up the Lab Manager 2.5 database as a precaution before upgrading Lab Manager.

NOTE You can only restore the database backup in a Lab Manager 2.5 environment.

To back up the database

From the command prompt on the Lab Manager Server system, use this sample command or your own backup method:

```
OSQL -S localhost\vlm -E -Q "backup database labmanager TO  
DISK= 'c:\lm_backup.bak'"
```

This sample command creates the `lm_backup.bak` file on the `C:\`.

Uninstalling the Program Files for Lab Manager Server

Upgrading Lab Manager involves uninstalling only the program files for the Lab Manager Server. For instructions on uninstalling program files, see [“Uninstalling Lab Manager”](#) on page 42.

Installing the Managed Server and Lab Manager Server Software

After uninstalling the program files for the Lab Manager Server, install the Managed Server agent and Lab Manager Server software.

To install the Managed Server and Lab Manager Server software

- 1 Install the Managed Server agent software over the existing Managed Server installation:
 - a On the existing Managed Server, log on as root.
 - b Copy `VMware-labmanager-agent-esx-2.5.1-<build number>.bin` to the existing Managed Server system.
 - c To run the installer, type:

```
sh VMware-labmanager-agent-esx-2.5.1-<build number>.bin
```

The software automatically updates the Managed Server agent software.

- 2 Install the Lab Manager Server software using the `VMware-labmanager-server-2.5.1-<build number>.exe` file.

For guidelines, see [“Installing the Lab Manager Server Software”](#) on page 34. When prompted, confirm to complete the upgrade process.

This upgrade installation skips some of the steps for a fresh installation and automatically configures the new software.

- 3 From any machine with network access to the Lab Manager Server system, launch the browser and go to `http://<Lab Manager Server IP address or name>`

You can also launch the same page from the desktop of the Lab Manager Server machine by double-clicking the **VMware Lab Manager** icon.
- 4 Browse and select the file with the GA license key.

You can proceed to use the Lab Manager Web console.

Restoring the Lab Manager Database

If you backed up the Lab Manager 2.5 database and need to restore it, you can only restore it in a Lab Manager 2.5 environment.

To restore the database

- 1 In IIS Manager, stop the **Default Web Site**.
- 2 From the Lab Manager Server desktop, navigate to Windows Services and stop these services:
 - **VMware LM Monitor**
 - **VMware LM SupportLink**
 - **World Wide Web Publishing Service**
- 3 Restore the database from the command prompt. For example:

```
OSQL -S localhost\vlm -E -Q "restore database labmanager FROM  
DISK='c:\lm_backup.bak' with replace"
```

In this example, `lm_backup.bak` is located on the C:\.
- 4 Restart the stopped services and **Default Web Site**.

See the *VMware Lab Manager Release Notes* for more upgrade information.

Appendix: Troubleshooting the Installation

This appendix covers these troubleshooting topics for the Lab Manager installation:

- [“Error 1720: Windows Installer Package”](#) on page 49
- [“Microsoft SQL Desktop Engine \(MSDE\) Installation Fails”](#) on page 50
- [“Transfer of Managed Server Agent Software to ESX Server Machine Fails”](#) on page 51
- [“Error 1603: Required Services for Installing Lab Manager”](#) on page 51

Error 1720: Windows Installer Package

Problem During the installation of Lab Manager Server, you see error 1720:

Error 1720. There is a problem with the Windows Installer package. A script required for the install to complete could not be run

Solution The message indicates a permissions problem in a Visual Basic (VB) script. Make sure you logged in with Administrator privileges. If you already logged in with the correct privileges, contact VMware support. Open the Event Viewer and read the message about the Visual Basic failure.

Microsoft SQL Desktop Engine (MSDE) Installation Fails

Problem During the installation of Lab Manager Server, the MSDE installation fails. Subsequent installation attempts also fail, and a reboot has no effect.

Solution In Notepad, open the {WinDir}\temp\VMware\MSDE2Klog.log file and see if these lines (or similar text) appear:

```
Loading extended custom action library
```

```
C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\{E09B48B5-E141-427A-AB0C-D3605127224A}\sql  
cax.dll  
SOFTWARE\Microsoft\Microsoft SQL Server  
Setup.{E09B48B5-E141-427A-AB0C-D3605127224A}
```

```
Starting custom action InstallSqlRedis
```

The MSDE installer unsuccessfully tries to install Microsoft Data Access Components (MDAC).

To correct the problem of installing MSDE

- 1 Open the Task Manager and check that these processes are inactive:
 - SQLRedis.exe
 - Helper.exe
 - MsiExec.exe
 - Setupre.exe
- 2 Navigate to {WinDir}\temp\vmware and launch Helper.exe.
- 3 Return to the Task Manager and wait for Setupre.exe to appear.
- 4 When the task appears, kill the process.

The MSDE installation can function properly.

Transfer of Managed Server Agent Software to ESX Server Machine Fails

Problem If you download the Managed Server software, copy it to the ESX Server machine, and run the `tar -xvzf` command, this error appears:

```
tar: This does not look like a tar archive
tar: Skipping to next header
tar: Archive contains obsolescent base-64 headers
tar: Error exit delayed from previous errors running installer
```

Solution The message indicates possible corruption of the file. Before installing the Managed Server software, transfer the file to the ESX Server machine using FTP in binary mode. For more information on using binary mode and verifying the integrity of the software, see the steps in [“Installing the Managed Server Agent Software on ESX Server”](#) on page 30.

Error 1603: Required Services for Installing Lab Manager

Problem During the installation of Lab Manager Server, error 1603 appears.

Solution Make sure the IIS Admin, World Wide Web Publishing, and HTTP SSL services are running.

Index

A

- ActiveX
 - installing **39**
- ASP.NET
 - configuring **18**
 - verifying **35**

C

- client users
 - defining **10**
 - machine requirements **19**
- configurations
 - sample in Lab Manager **38**

D

- datastore
 - defining **20**

F

- firewall settings **23**

I

- IIS
 - configuring **18**
- installation
 - flow **27**
 - high-level tasks **11**
 - requirements **13**

K

- knowledge base
 - accessing **6**

L

- Lab Manager
 - components **9**
 - installing **27**
 - introducing **9**
 - uninstalling **42**
 - upgrading **45**
 - using with VirtualCenter Server **11**
- Lab Manager Server
 - adding NFS media storage **40**
 - adding NFS virtual machine storage **40**
 - defining **10**
 - initializing and configuring **36**
 - installing the software **34**
 - prerequisites **32**
 - setting up **31**
 - synchronizing with NFS media storage **40**
 - system requirements **15**
 - verifying ASP.NET versions **35**

M

- Managed Server
 - configuring NFS storage **29, 39**
 - defining **10**
 - installing the agent software **30**
 - prerequisites **28**
 - setting up **28**
 - system requirements **15**

N

network

- configuring domains and permissions **23**
- configuring firewall settings **23**
- configuring routing **23**
- IP addresses for virtual machines **25**
- requirements **22**

R

requirements

- client user machines **19**
- for Lab Manager installation **13**
- general **13**
- IIS and ASP.NET **18**
- media storage **20**
- network **22**
- system **15**
- virtual machine storage **20**

S

security

- recommendations **32**

storage servers

- defining **10**
- requirements **20**

T

technical support resources **6**

templates

- sample in Lab Manager **38**

U

upgrade

- steps for Lab Manager **45**

user groups

- accessing **6**

V

virtual machine consoles

- installing ActiveX. **39**

VMkernel network

- setting up **29**

VMware community forums

- accessing **6**