

Lab Manager Installation and Upgrade Guide

vCenter Lab Manager 4.0

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About This Book

The *Lab Manager Installation and Upgrade Guide* includes installation, upgrade, and configuration tasks for VMware® vCenter™ Lab Manager.

Intended Audience

This guide is intended for VMware vSphere™ administrators and current vCenter Lab Manager and vCenter Stage Manager administrators.

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Introducing Lab Manager and the Installation Process

1

VMware vCenter Lab Manager is an application that provides a rapid provisioning portal and image library management system to automate the setup and teardown of multimachine software configurations and manage service transition activities. Lab Manager leverages VMware vSphere and VMware vCenter to provide virtual infrastructure resources to multiple teams, projects, and geographies from a central location.

Using Lab Manager, you can create a shared virtual machine library that stores commonly used configurations and provide users with self-service access to these configurations for application development, testing, support, training, software demonstrations, and more. Lab Manager system administrators control access rights, storage quotas, and deployment policies.

See the *Lab Manager User's Guide* for a full overview of the product.

This chapter includes these topics:

- [“Lab Manager Components”](#) on page 7
- [“Overview of Lab Manager Installation Process”](#) on page 8

Lab Manager Components

Lab Manager requires VMware vSphere. VMware ESX™ and ESXi hosts provide the memory and CPU resources to run Lab Manager virtual machines. Lab Manager manages the ESX/ESXi hosts through a VMware vCenter Server system and the Lab Manager agent installed on those hosts. ESX/ESXi hosts continue to function even if the vCenter Server system becomes unreachable (for example, the network connection is severed).

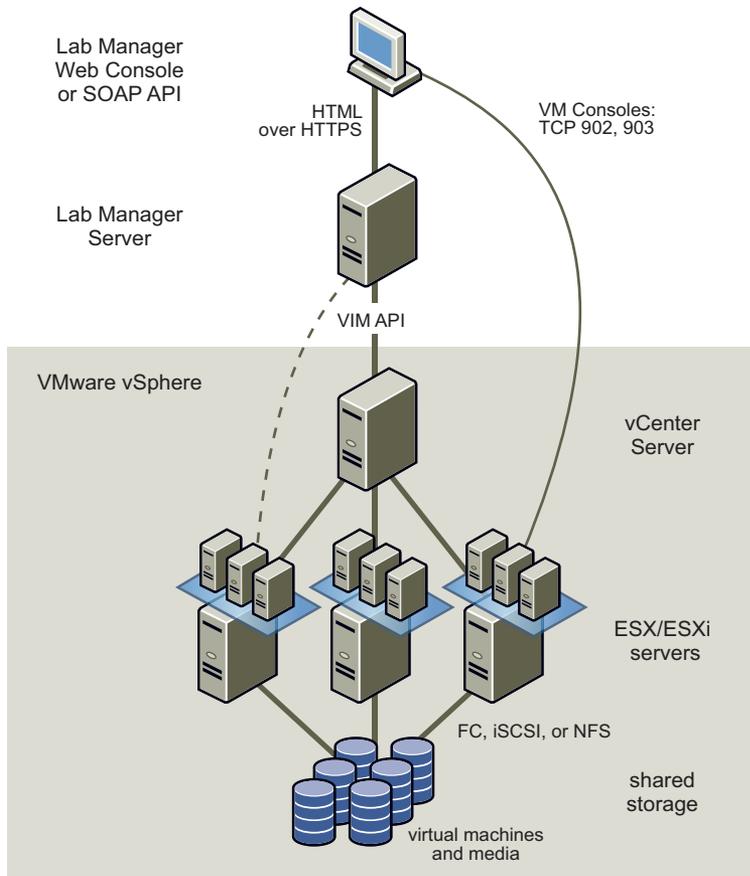
vSphere datastores provide shared storage for Lab Manager virtual machines and media files (for installing guest operating systems and applications).

Users can access the Lab Manager server through Web and SOAP interfaces:

- Use Microsoft Internet Explorer or Mozilla Firefox to access the Lab Manager Web console to interact with the Lab Manager server using the user interface.
- Use the Lab Manager SOAP API to access the Lab Manager server programmatically. The SOAP API allows easy integration with build management systems and automated testing tools. For more information, see the *Lab Manager SOAP API Guide*.

Figure 1-1 illustrates the components of Lab Manager and how it works with VMware vSphere.

Figure 1-1. Lab Manager Components



Overview of Lab Manager Installation Process

The installation process involves the tasks described in [Table 1-1](#).

Table 1-1. Installation Tasks and Descriptions

Task	Description
Set up vSphere 4.0	Set up ESX/ESXi 3.5 or 4.0 hosts and vCenter 4.0. VMware recommends that you set up at least two ESX/ESXi hosts before setting up the Lab Manager server.
Prepare to install Lab Manager	Prepare your target system and make sure that it meets all software and hardware requirements.
Create the Lab Manager server	Install the Lab Manager server software.
Initialize and configure Lab Manager	Configure resources, networking, and other areas using the Initialization wizard.
Back up the password encryption key	Back up the key that affects passwords for vCenter Server, ESX/ESXi hosts, and the SMTP server.

Installation Requirements and Recommendations

2

To use Lab Manager, your system must meet certain requirements. This chapter includes these topics:

- “vSphere 4.0 Requirements and Recommendations” on page 9
- “Datastore Requirements and Recommendations” on page 11
- “Lab Manager Server Requirements and Recommendations” on page 11
- “Credential Requirements for Connecting to vCenter Server from Lab Manager” on page 14
- “Web Console Access Requirements” on page 16
- “Network Requirements” on page 16
- “Security Requirements and Recommendations” on page 18

vSphere 4.0 Requirements and Recommendations

Lab Manager supports vSphere 4.0 Standard, Advanced, Enterprise, and Enterprise Plus editions.

To support the Lab Manager host spanning feature, you must have an Enterprise Plus license.

Lab Manager requires:

- Two or more ESX/ESXi 4.0 servers from the ESX/ESXi hardware compatibility list

Lab Manager supports ESX/ESXi 3.5 hosts, ESX/ESXi 4.0 hosts, or a mix of 3.5 and 4.0 hosts. You cannot mix ESX versions within a cluster.

You can use the hosts to create clusters and resource pools, but all the hosts must belong to a single datacenter.

Virtual machines and virtual machine templates created with Lab Manager 3.x or Stage Manager 1.x use virtual machine version 4. You can create, run, and edit these virtual machines and virtual machine templates on ESX/ESXi 3.5 and 4. When you create a new virtual machine or virtual machine template with Lab Manager 4.0, you can specify virtual machine version 4 or virtual machine version 7. Virtual machine version 7 is not compatible with ESX/ESXi 3.5.

- One vCenter 4.0 server

For all vSphere 4.0 requirements, see the vSphere 4.0 documentation set and ESX/ESXi hardware compatibility lists available on the VMware Web site, <http://www.vmware.com>.

Lab Manager supports VMware vSphere capabilities such as VMware VMotion™, VMware Distributed Resource Scheduler (DRS), and VMware High Availability (HA). These are distributed services that enable efficient and automated resource management and high virtual machine availability. Lab Manager does not support VMware Fault Tolerance (FT) or vSphere linked clones. FT is disabled for all virtual machines managed by Lab Manager.

ESX/ESXi Server Recommendations

To achieve the best possible performance from your Lab Manager server system, VMware recommends specific configuration settings for ESX/ESXi hosts.

- Use the same host CPU across all hosts in the Lab Manager environment.

CPU homogeneity makes virtual machines more mobile for Lab Manager deployment and allows Lab Manager to derive benefits from features such as VMotion, DRS, and HA.

In addition, if you do not have a homogenous CPU setup across hosts, you might not be able to redeploy suspended virtual machines or virtual machines with saved state. These virtual machines require a host that is compatible with the CPU of the original host on which the virtual machine was deployed.

- To take advantage of virtual machine migration, make sure that all hosts have more CPUs than the number of virtual CPUs on a typical virtual machine in Lab Manager.
- Use clusters with the same hardware to gain the greatest benefits from HA, DRS, and VMotion.
- Use storage area network (SAN) storage.

The minimum requirement is a local SCSI drive with a supported SCSI adapter, but this hardware setup does not allow you to share virtual machines across systems.

- Use shared storage. A larger number of hosts with shared storage allows Lab Manager to take advantage of vSphere 4.0 capabilities. If you store virtual machine files on local (not shared) storage, you can only deploy the virtual machines on the local ESX/ESXi host.
- Have a minimum of 500MB available in the /var partition.
- Have 120MB available in the /usr partition.
- Group multiple physical NICs together.

Grouping allows the NIC team to increase performance by distributing the traffic across those physical network adapters and to provide passive failover in the event of hardware failure or network outage.

For best performance and security, use different virtual switches for the ESX service console and virtual machine port groups.

- Set up the VMkernel network for NFS virtual machine and media datastores and for using VMotion and DRS. For more information, see the vSphere documentation.

For best performance, use different virtual switches for the VMkernel port group and virtual machine port groups.

- Configure ESXi host logging to send system logs to a datastore or remote host.

By default, ESXi hosts do not save system logs to persistent storage and the logs are not preserved across reboots. For information about how to configure logging, see the VMware vSphere documentation.

vCenter Server Recommendations

- VMware recommends allocating at least 1GB of RAM to vCenter Server. Lab Manager generates more activity within vCenter Server than the daily interaction between vCenter Server and the vSphere Client.
- Install vCenter Server software on a virtual machine. See the technical white paper, *Running vCenter in a Virtual Machine*, in the Technical Resources section of the VMware Web site.

Datastore Requirements and Recommendations

Virtual machines and media files can reside on VMFS and NFS datastores. For more information about datastores and media stores, see the *Lab Manager User's Guide*. VMware recommends shared storage (NFS, iSCSI, or FibreChannel). VMware also recommends using a small number of large SAN VMFS partitions rather than a large number of small partitions.

To use a datastore for media, you must configure it as a media store in Lab Manager. You can use the same datastore for media and virtual machine storage, as long as you use different directories.

To enable a datastore for media and add it as a Lab Manager media store, see the *Lab Manager User's Guide*.

A VMFS datastore has the following requirements:

- The datastore must have enough space for the chain of delta disks generated from virtual machine operations. The chain cannot span multiple datastores.

For various changes, Lab Manager freezes the original delta disk and creates a new one. The chain length indicates how scattered the virtual machine image is across the directories of a datastore.

For information about chains and delta disks, see the *Lab Manager User's Guide*.

- A VMFS datastore must be configured in the ESX/ESXi system.

You must set up VMFS partitions outside of Lab Manager through vCenter. For more information, see the vSphere 4.0 documentation.

An NFS datastore has the following requirements:

- The NFS server must be accessible in read-write mode by all ESX/ESXi hosts.
- The NFS server must allow read-write access for the root system account.
- An NFS datastore must be configured in the ESX/ESXi system.

Lab Manager Server Requirements and Recommendations

The Lab Manager server must meet specific requirements.

Operating System and Framework

- Microsoft Windows Server 2003 32-bit Enterprise Edition (Service Pack 1 or later) or Standard Edition (Service Pack 1 or later)

Lab Manager supports English (United States), English (Australia), English (United Kingdom), French (France), German (Germany), Italian (Italy), and Japanese regional settings.

- Lab Manager 4.0.3 supports Microsoft Windows Server 2008 (32-bit).
- Internet Information Services (IIS) 6.0

See [“Install IIS on the Lab Manager Server for Windows 2003”](#) on page 13.

- Microsoft .NET Framework 2.0 (Service Pack 1 or later)

You must install IIS before you install .NET Framework. See [“Check the Version of an Existing .NET Framework Installation”](#) on page 13 and [“Install the .NET Framework on the Lab Manager Server”](#) on page 14.

CPU Speed

- 550MHz minimum
- (Recommended) 1GHz or faster

Processor

Pentium III, Pentium 4, Xeon, Opteron, or Athlon processor

Hard Disk

- 40GB minimum
- (Recommended) RAID 1 or RAID 5 for fault tolerance benefits, or RAID 0+1 for fault tolerance and performance benefits

Memory

- 512MB minimum
- (Recommended) 2GB or more

Network

- At least one unbound Ethernet card
Its NIC must be physically connected to the network (no wireless cards) and have a static IP address.
- (Recommended) Gigabit Ethernet
- Machine cannot run as a Windows domain controller
- Fully qualified domain name (FQDN)

Certain features of Lab Manager require an FQDN. This requirement does not mean that the Lab Manager server resides in a domain.

An FQDN starts with the computer name followed by the Domain Name System (DNS) suffix (for example, `computer_name.mydomain.com`). VMware recommends that you avoid using an IP address because complications might arise at a later time if you change that address. For example, changing the IP address requires regenerating the certificate because the certificate depends on this FQDN.

CD or DVD Drive

For the Lab Manager server, you might need a CD or DVD drive to access the Windows Server 2003 CD-ROM while configuring IIS and Microsoft .NET Framework. See [“Install IIS on the Lab Manager Server for Windows 2003”](#) on page 13.

System Clock

Ensure that the system clocks are in sync with the clocks on all machines involved in the Lab Manager deployment (Lab Manager server, vCenter system, ESX/ESXi hosts, client machines accessing the Web console, file servers, and so on). This synchronization allows support staff to quickly pinpoint issues in logs.

See “Installing and Configuring NTP on VMware ESX Server” in the VMware knowledge base.

Lab Manager Server Recommendations

- Install Lab Manager server software on a virtual machine.
- Do not install the Lab Manager server software on a physical or virtual machine that contains vCenter Server software. If you have Lab Manager server and vCenter Server software installed in separate virtual machines, these virtual machines can reside on the same ESX/ESXi host.
- If the Lab Manager server runs in a virtual machine on an ESX/ESXi host under Lab Manager control, certain operations affect all virtual machines, such as **Undeploy all VMs** and **Redeploy all VMs**. These operations do not affect virtual machines on the same ESX/ESXi host that are outside of Lab Manager control.

For information about these operations, see the *Lab Manager User's Guide*.

Install IIS on the Lab Manager Server for Windows 2003

You must have IIS installed and enabled on the Lab Manager server. Install IIS before you install Microsoft .NET Framework 2.0.

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

To install IIS

- 1 Select **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.
The Windows Components wizard starts.
- 3 Select **Application Server**.
- 4 Click **Details**.
- 5 Select **Internet Information Services (IIS)**.
- 6 Click **OK** and then click **Next** to install the components.

Install IIS 7.0 on the Lab Manager Server for Microsoft Windows Server 2008

You can install IIS 7.0 on the Lab Manager Server.

To install IIS 7.0

- 1 Click **Start > Administrative Tools > Server Manager**.
- 2 In the navigation pane, select **Roles**.
- 3 Add roles and select **Web Server (IIS)**.
- 4 Verify that these features are installed.
 - Static Content
 - Default Document
 - HTTP Errors
 - HTTP Redirect
 - Static Content Compression
 - IIS 6 Metabase Compatibility.
 - IIS 6 Management Console
 - IIS 6 WMI Compatibility
- 5 In **Select Role Services**, click **Next**.
- 6 In the **Confirm Installations** selection pane, click **Install**.
- 7 Click **Close**.

Check the Version of an Existing .NET Framework Installation

If you already have .NET Framework installed, verify the version.

To verify the version of an existing .NET Framework installation

- 1 Select **Start > Control Panel > Add or Remove Programs**.
- 2 Click the **Microsoft .NET Framework 2.0 Service Pack 1** program and click the link for support information.

If you do not see version 2.1.21022 or higher listed for the .NET Framework, install it.

Install the .NET Framework on the Lab Manager Server

Install IIS before you install the Microsoft .NET Framework 2.0.

To install .NET Framework

- 1 Open the Microsoft Web site.
- 2 Search for .NET Framework.
For example, to search for the Service Pack 1 download, enter **.NET 2.0 SP1 download x86** in the Search field.
- 3 Download and install .NET Framework.

Credential Requirements for Connecting to vCenter Server from Lab Manager

To set up a connection with vCenter Server, Lab Manager requires a user who is assigned a role in vCenter with at least the privileges listed in [Table 2-1](#). You can assign Windows users or vCenter users to this role. The user must have these permissions for the entire vCenter Server system. When you assign the permissions, make sure to select the **Propagate to Child Objects** check box.

If you set up the connection with a user assigned the Administrator role in vCenter, the user has the proper credentials.

Lab Manager requires the user to have certain permissions on objects. If the user changes to another vCenter role with fewer privileges, Lab Manager operations are hindered. For example, assigning the user to the No access role for an object, such as a resource pool, blocks the visibility of this object in a Lab Manager environment. For information about roles and setting object permissions, see VMware vSphere documentation.

The privileges in [Table 2-1](#) appear in the Edit Role dialog box of the vSphere Client.

Table 2-1. Required Privileges for Connecting to vCenter Server

vSphere Client Privilege Category	Required Privileges
Datastore	<ul style="list-style-type: none"> ■ Allocate space ■ Browse datastore ■ Low level file operations
Distributed virtual port group	<ul style="list-style-type: none"> ■ Create ■ Delete ■ Modify
Distributed Virtual Switch	<ul style="list-style-type: none"> ■ Host operation ■ Modify
Folder	<ul style="list-style-type: none"> ■ Create folder ■ Delete folder ■ Move folder ■ Rename folder

Table 2-1. Required Privileges for Connecting to vCenter Server (Continued)

vSphere Client Privilege Category	Required Privileges
Global	<ul style="list-style-type: none"> ■ Diagnostics ■ Disable methods ■ Enable methods ■ Licenses ■ Manage custom attributes ■ Set custom attribute
Host	<ul style="list-style-type: none"> ■ Configuration <ul style="list-style-type: none"> ■ Maintenance ■ Network configuration ■ Storage partition configuration ■ System Management ■ Inventory <ul style="list-style-type: none"> ■ Modify cluster ■ Local operations <ul style="list-style-type: none"> ■ Add host to vCenter
Network	<ul style="list-style-type: none"> ■ Assign network
Resource	<ul style="list-style-type: none"> ■ Assign virtual machine to resource pool ■ Migrate ■ Relocate
Virtual Machine	<ul style="list-style-type: none"> ■ Configuration <ul style="list-style-type: none"> ■ Add existing disk ■ Add new disk ■ Add or remove device ■ Advanced ■ Change CPU count ■ Change resource ■ Extend virtual disk ■ Memory ■ Modify device settings ■ Remove disk ■ Rename ■ Settings ■ Upgrade virtual hardware ■ Interaction <ul style="list-style-type: none"> ■ Configure CD media ■ Console interaction ■ Device connection ■ Power Off ■ Power On ■ Reset ■ Suspend ■ VMware Tools install ■ Configure floppy media ■ Inventory <ul style="list-style-type: none"> ■ Create from existing ■ Register ■ Unregister ■ Provisioning <ul style="list-style-type: none"> ■ Mark as template ■ Mark as virtual machine ■ Deploy template ■ Clone virtual machine

Web Console Access Requirements

To use a browser to access the Lab Manager Web console, the machine must have the following requirements:

- Microsoft Internet Explorer or Mozilla Firefox.
- For information about which Web browsers are supported on which client operating systems, see the appendix section of the *Lab Manager User's Guide*.
- Routable access to the Lab Manager server and ESX/ESXi hosts
 - 1024 x 768 or higher resolution monitor

Set Internet Explorer Options

To access the Lab Manager Web console using Microsoft Internet Explorer, you must set some options in the browser.

To set Internet Explorer options

- 1 In an Internet Explorer browser window, select **Tools > Internet Options**.
- 2 In the **Security** tab, click **Custom Level**.
- 3 Enable the following options and click **OK**.
 - **Download signed ActiveX controls**
 - **Run ActiveX controls and plug-ins**
 - **Allow META REFRESH**
 - **Active scripting**
 - **Allow paste operations via script**
- 4 Click the **Advanced** tab.
- 5 Select the **Play animations in web pages** check box and click **OK**.
- 6 If you are using Internet Explorer on a Windows 2003 computer, open the Control Panel and click **Add or Remove Programs**.
- 7 Click **Add/Remove Windows Components**.
- 8 Disable the **Internet Explorer Enhanced Security Configuration** option.

Network Requirements

The Lab Manager server system includes many network components that need to communicate with each other.

Configuring Routing

Lab Manager has the following network connectivity requirements:

- Lab Manager client machines accessing the Web console must have routable access to the Lab Manager server and ESX/ESXi hosts. If these servers are behind a firewall and not directly accessible, you can use a virtual private network (VPN). See [“Configuring Firewall Settings”](#) on page 17.
- The connection from Lab Manager to vCenter must be a direct HTTPS connection without a proxy server.
- Do not use a Network Address Translation (NAT) device between the Lab Manager server and ESX/ESXi hosts. The device breaks the communication between the Lab Manager server and the agent Lab Manager installs on each ESX/ESXi host.
- The Lab Manager server is not required to reside on the same subnet as the ESX/ESXi hosts.
- The Lab Manager server requires a static IP address.

- The Lab Manager server and ESX/ESXi hosts need access to the media storage but are not required to reside on the same subnet.
- ESX/ESXi hosts need access to NFS virtual machine storage.

Configuring Domains and Permissions

Because the Lab Manager server and ESX/ESXi hosts must mount shares for virtual machine import and export operations, these systems require matching DNS and DNS suffix information.

Configuring Firewall Settings

Lab Manager communicates between its servers and clients through network ports. ESX/ESXi software sets up default ports. For more information, see the vSphere 4.0 documentation.

For information about configuring communication between vCenter components, see the vSphere 4.0 *Quick Start Guide*.

To ensure successful communication, make sure that the ports listed in [Table 2-2](#) are not blocked by a firewall.

Table 2-2. Lab Manager Network Port Requirements

Systems	Network Ports
Client browser to access Lab Manager server	TCP port 443
Client browser to access ESX/ESXi hosts	TCP ports 902 and 903
Lab Manager server and ESX/ESXi hosts to access SMB share (import and export operations only)	TCP ports 139 and 445, UDP ports 137 and 138
ESX/ESXi hosts to access NFS media datastores or NFS virtual machine datastores	TCP port 2049
Lab Manager server to access Lab Manager agent on ESX/ESXi hosts	TCP port 5212
Lab Manager server to access ESX/ESXi host agent on ESX/ESXi hosts	TCP port 443
Lab Manager server to access the vCenter Server system	TCP port 443
Lab Manager server to communicate with virtual router on some ESX/ESXi hosts (for fenced configurations)	TCP port 514
Lab Manager server to access LDAP Server	TCP port 389 for LDAP, TCP port 636 for LDAPS

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

Gathering Network Information for Installation

Before you begin the installation, gather the following information about your network if you plan on using static IP addressing:

- Block of unused IP addresses
- IP address for the primary and (optional) secondary DNS server
- Subnet mask
- IP address for the network gateway
- Lab Manager server DNS suffix

IP Addresses for Virtual Machines

Reserve a range of IP addresses for virtual machines on each physical network that Lab Manager will use. This range is in addition to the IP addresses required for each Lab Manager server and ESX/ESXi host. IP addresses for virtual machines are allocated from the pool of IP addresses that 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.

For a minimum environment, you need at least 100 IP addresses. You can always add more addresses later. For a large installation, VMware recommends allocating at least 200 IP addresses.

[Table 2-3](#) provides examples of the network information for a single physical network using a static IP pool.

Table 2-3. 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

Security Requirements and Recommendations

The default security policy settings for the Lab Manager server operating system support Lab Manager operations. If you manipulated security policies to support a high-security environment, you must modify the policy settings to support Lab Manager.

VMware recommends installing an SSL certificate from a trusted certification authority that validates the identity of the Lab Manager server. If you do not install an SSL certificate, VMware generates one, but SSL security warnings appear in the browser. You can also generate your own custom SSL certificate.

Set Windows Security Policies

The server on which you install Lab Manager must have specific security policy settings.

To set Windows security policies

- 1 On the desktop of the target Lab Manager server, select **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**.
- 8 Select **Send NTLM response only**.
- 9 Click **OK**.

Generate a Custom SSL Certificate

You can use OpenSSL to generate a custom SSL certificate with the domain name or IP address for accessing the Lab Manager server. VMware recommends generating the custom certificate on the Lab Manager server.

To use OpenSSL to generate a custom SSL certificate

- 1 Download and install OpenSSL on the Lab Manager server.
- 2 Create a file named `OpenSSLVMware.cfg` in a working directory. The following example is what a file might look like:

```
# 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
0.organizationName    = VMware, Inc.
organizationalUnitName = VMware, Inc.
commonName            = machine1
emailAddress           = support@vmware.com
```

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

```
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>
```

- 6 Remove all outdated certificates from IIS and import the new `.pfx` file into IIS.

Microsoft IIS documentation has instructions on removing and importing certificates.

Installing Lab Manager

Installing Lab Manager involves installing the Lab Manager server software, performing initialization tasks, and logging in to the Lab Manager Web console. This chapter includes these topics:

- [“Install the Lab Manager Server Software”](#) on page 21
- [“Initialize and Configure Lab Manager”](#) on page 22
- [“Backing Up the Password Encryption Key”](#) on page 24
- [“Uninstall Lab Manager”](#) on page 24
- [“Remove SQL Server 2005 Components”](#) on page 25

Install the Lab Manager Server Software

Before you install the Lab Manager server software, make sure that the system meets the requirements outlined in [Chapter 2, “Installation Requirements and Recommendations,”](#) on page 9.

The software installs an instance of Microsoft SQL Server 2005 Express Edition for use with Lab Manager.

To install the Lab Manager Server software

- 1 On the target Lab Manager server, run the `VMware-vCenter-Lab-Manager-4.0.0.<build number>.exe` file.

The installer checks to make sure that your system meets the installation prerequisites. If your system does not meet any of the prerequisites, click the link in the **Message #** column for more information about how to resolve the issue.

- 2 Review the Welcome screen.
- 3 Accept the license agreement.
- 4 Specify whether you want an express or custom installation.
Select **Custom** to change the program files directory for Lab Manager.
- 5 Accept the default VMwareLMWeb and VMwareLMUser passwords, or enter your own passwords.
Lab Manager creates these accounts as part of the installation and generates a random password for them. If your network has a restrictive password policy, enter passwords that meet your policy’s requirements.
- 6 Select the IP address for Lab Manager traffic.
If the server has more than one active NIC with a static IP address, you can choose which one to use.
- 7 If the software cannot detect a fully qualified domain name (FQDN), type one when prompted.
For information on the FQDN, see [“Network”](#) on page 12.
- 8 Select the Web site for Lab Manager or use the default Web site.

- 9 Enter the SSL port number for the Web site.
The default is 443.
- 10 Click **Install**.
- 11 Click **Finish**.

Initialize and Configure Lab Manager

You can configure Lab Manager Web console on any computer with network access to the Lab Manager server. The first time you access the Web console, a security certificate warning might appear. To avoid this warning, use an FQDN or install an SSL certificate. See [“Generate a Custom SSL Certificate”](#) on page 19.

To initialize and configure Lab Manager

- 1 From any machine with network access to the Lab Manager server, open a browser and navigate to `http://<Lab Manager_Server_domain_name_or_IP_address>`.
The Web Initialization wizard starts.
- 2 Select your location.
- 3 Enter a capacity license key.
- 4 Review the overview information.
- 5 Enter the following vCenter information and click **Next**.
 - vCenter Server IP address or host name
 - Port number
The default is 443.
 - User name and password
See [“Credential Requirements for Connecting to vCenter Server from Lab Manager”](#) on page 14.
 - System name for this Lab Manager installation
If you have multiple installations of Lab Manager, each installation must have a unique system name. You cannot change this name at a later time. See [“Choosing a Lab Manager System Name”](#) on page 23.
 - Installation ID
- 6 Select a dedicated resource pool for Lab Manager.
You can select a host or cluster. Optionally, you can change the display name for the resource pool in the Lab Manager environment.
- 7 Select whether to use the same user name and password for all hosts.
If you use the same user name and password for all hosts, enter the user name and password.
If you are using different user names, select the check boxes for hosts to enter individual user names and passwords.
- 8 Select the check boxes for which datastores to enable.
- 9 Set up a host spanning transport network to enable host spanning.
 - a Select **Enable Host Spanning Transport Network**.
 - b Select a vNetwork distributed switch.
 - c (Optional) Type a VLAN identifier.
 - d (Optional) Select **Customize Name** and type a name.

- 10 Set up a default physical network.
 - a Enter a name for the network.
 - b (Optional) Type a description.
 - c (Optional) Type a VLAN identifier.
 - d Select the IP addressing modes for the network.
 - **Static - IP Pool** allows Lab Manager to pull static IP addresses from the IP address pool.
 - **DHCP** allows Lab Manager to pull IP addresses from a DHCP server.
 - **Static - Manual** allows you to specify an IP address.
 See [“Static IP and DHCP Networking”](#) on page 24.
 - e If you chose a static IP addressing mode, provide the following information:
 - Subnet mask, default gateway, primary DNS, secondary DNS (optional), and DNS suffix (optional)
 - IP addresses for the IP pool
Type an IP address or IP address range and click **Add**.
 - Default network fencing policy for the network
For details on Lab Manager fencing, see the *Lab Manager User’s Guide*.
 - f Select the virtual switch to which you want to bind each host or bind to a vNetwork distributed switch.
- 11 Create the first Lab Manager administrator account with a user name, password, and email address.
- 12 Select whether to enable SupportLink, a feature that sends usage data to VMware and improves product support.
If you enable SupportLink, enter a company name and administrator email address.
If you are outside of the U.S. and you enable SupportLink, you must consent to the possible transfer of data outside of the country where the installation takes place.
- 13 Review optional configuration tasks that you might want to perform after logging in to the Web console the first time and click **Finish**.
- 14 When the Web console login page appears, type the user name and password of the Lab Manager administrator account and click **Login**.

Choosing a Lab Manager System Name

If you have multiple installations of Lab Manager, make sure that each installation has a unique system name. This name is used for the following:

- Creating virtual switches and port groups
- Creating the directory to store all virtual machines on each datastore
- Identifying ESX/ESXi hosts under Lab Manager control
- Creating a folder in the **Virtual Machines & Templates** view of vCenter

Static IP and DHCP Networking

You can use static IP or DHCP networking in Lab Manager for each virtual machine NIC.

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

To use a static IP address, you can enter an IP address manually or use the static IP pool. The pool requires you to specify an IP range, DNS suffix, gateway, netmask, and DNS information. You can add as many IP addresses as you want. The static IP pool works with network fencing.

Every virtual machine using the static - IP Pool addressing mode for a NIC connected to a physical network requires an IP address from the IP pool of the physical network. This IP address stays with the virtual machine through the various operations in Lab Manager. When you delete all instances of the virtual machine with this IP address, Lab Manager releases the IP address to the IP pool.

If you deploy a configuration in fenced mode, Lab Manager allocates additional IP addresses from the physical network IP pool-- unless you use the Block Traffic In and Out option-- and assigns them as external IP addresses for each virtual machine in the configuration. You can use the external IP address to access a virtual machine from outside the fenced configuration (for example, from your desktop).

When you undeploy this configuration, Lab Manager releases the external IP addresses. You can control the length of time Lab Manager reserves released external IP addresses before returning them to the IP pool. See "Lab Manager Preferences" in the *Lab Manager User's Guide*.

For fenced configurations (except those using the Block Traffic In and Out option), Lab Manager creates a virtual router that requires two IP addresses. The addresses for a virtual router return to the IP pool when you undeploy the configuration.

Backing Up the Password Encryption Key

Lab Manager creates the `system-infos.bin` file during the installation for password encryption. This file is a key that affects passwords for the vCenter Server, ESX/ESXi hosts, and the SMTP server. To ensure that you do not lose passwords, back up this file located at `%systemdrive%\Documents and Settings\All Users\Application Data\VMware\VMware vCenter Lab Manager\Crypto` for Microsoft Windows 2003 and `%programdata%\Documents and Settings\All Users\Application Data\VMware\VMware vCenter Lab Manager\Crypto` for Windows Server 2008.

Uninstall Lab Manager

Uninstalling Lab Manager involves detaching resource pools, unpreparing the ESX/ESXi hosts, and removing the Lab Manager server software.

To uninstall Lab Manager

- 1 Log in to the Lab Manager Web console.
- 2 In the left pane, click **Resources**.
- 3 In the **Hosts** tab, move the pointer over the host name and select **Unprepare** from the menu.
Repeat this process for each host.
- 4 In the **Resource Pools** tab, move the pointer over the resource pool name and select **Disable** from the menu.
Repeat this process for each resource pool.
- 5 In the **Resource Pools** tab, move the pointer over the resource pool name and select **Detach** from the menu.
Repeat this process for each resource pool.

- 6 Log out of the Lab Manager Web console.
- 7 On the Lab Manager server, select **Start > Control Panel > Add or Remove Programs**.
- 8 Select the **VMware vCenter Lab Manager** program and click **Change**.
- 9 Select **Remove**.
- 10 Select the check box to uninstall Lab Manager and remove user data.



CAUTION If you plan to upgrade or reinstall Lab Manager, do not remove the user data.

- 11 Click **Remove**.
- 12 Click **Finish**.

Remove SQL Server 2005 Components

Some entries for the instance of SQL Server 2005 Express Edition installed with the Lab Manager server software remain after you uninstall the Lab Manager. You can remove these entries.

To remove the SQL Server 2005 components

- 1 On the Lab Manager server, select **Start > Control Panel > Add or Remove Programs**.
- 2 Click **Remove** for the following entries:
 - Microsoft SQL Server 2005 (including the VLM instance if prompted)
 - Microsoft SQL Server Native Client
 - Microsoft SQL Server Setup Support Files (English)
 - Microsoft SQL Server VSS Writer

When you remove the SQL Server components, error messages, such as **Registry enumeration failed**, might appear. These messages do not affect the removal process.

Upgrading to Lab Manager 4.0

You can upgrade to Lab Manager 4.0 from a previous version of Lab Manager or from VMware vCenter Stage Manager. This chapter includes the following topics:

- [“Supported Upgrades”](#) on page 27
- [“Upgrading from Lab Manager 3.x”](#) on page 27
- [“Upgrading from Stage Manager 1.x”](#) on page 29
- [“Upgrading ESX Server”](#) on page 34

Supported Upgrades

You can upgrade from Lab Manager 3.x or Stage Manager 1.x to Lab Manager 4.0. If you are currently using Lab Manager 2.x, you must first upgrade to Lab Manager 3.x before you can upgrade to 4.0. You can check the Lab Manager or Stage Manager version with the About option using the Web console.

[Table 4-1](#) lists the versions of Lab Manager and Stage Manager from which you can upgrade.

Table 4-1. Lab Manager and Stage Manager Versions That Can Upgrade to Lab Manager 4.0

Version	Build Number
Lab Manager 3.0	3.0.0.2056
	3.0.0.2063
Lab Manager 3.0.1	3.0.1.378
Lab Manager 3.0.2	3.0.2.56
Stage Manager 1.0	1.0.0.1561
Stage Manager 1.0.1	1.0.1.1970

Upgrading from Lab Manager 3.x

When upgrading, both the system drive and SQL Server data drive require enough free disk space to store a copy of the original Lab Manager database. You can perform the upgrade to Lab Manager 4.0 on a running Lab Manager 3.x system without any downtime for deployed virtual machine templates and configurations.

Back Up the Lab Manager Database

VMware recommends backing up the Lab Manager 3.x database as a precaution. The backup is only necessary to revert to Lab Manager 3.x before the upgrade is complete. The upgrade process automatically transfers the database contents to the new installation.

You can only restore the database backup in a Lab Manager 3.x environment.

To back up the database

From the command prompt on the Lab Manager 3.x server, use the following 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:\` drive.

Upgrade VirtualCenter Server to vCenter Server 4.0

Upgrade your VirtualCenter Server to vCenter Server 4.0 as described in the *vSphere Upgrade Guide*. This operation requires downtime for the VirtualCenter Server system that you are upgrading.

Install the Lab Manager Server Software

Before you install the Lab Manager server software, make sure that the system meets the requirements outlined in [Chapter 2, "Installation Requirements and Recommendations,"](#) on page 9.

The software installs an instance of Microsoft SQL Server 2005 Express Edition.

To install the Lab Manager Server software

- 1 On the target Lab Manager server, run the `VMware-vCenter-Lab-Manager-4.0.0.<build number>.exe` file.

The installer checks to make sure that your system meets the installation prerequisites. If the system does not meet the prerequisites, click the link in the **Message #** column for more information about how to resolve the issue.

- 2 Review the Welcome screen.

- 3 Accept the license agreement.

- 4 Specify whether you want an express or custom installation.

Select **Custom** to change the program files directory for Lab Manager.

- 5 Accept the default VMwareLMWeb and VMwareLMUser passwords, or enter your own passwords.

Lab Manager creates these accounts as part of the installation and generates a random password for them. If your network has a restrictive password policy, enter passwords that meet your policy's requirements.

- 6 Select the IP address for Lab Manager traffic.

If you have more than one active NIC with a static IP address, you can choose which one to use.

- 7 If the software cannot detect an FQDN, enter one when prompted.

For information on the FQDN, see ["Network"](#) on page 12.

- 8 Select the Web site for Lab Manager or use the default Web site.

- 9 Enter the SSL port number for the Web site.

The default is 443.

- 10 Select the **Migrate the existing database to the latest version** check box.

This selection migrates the Lab Manager 3.x database for use with Lab Manager 4.0.

- 11 Click **Install**.

- 12 Click **Finish**.

Upgrade and Configure Lab Manager

You can upgrade and configure the Lab Manager server from any system with access to the Lab Manager server.

The first time you access the console, a security certificate warning might appear. To avoid this warning, use an FQDN or install an SSL certificate. If you used a custom SSL certificate or an SSL certificate from a trusted certification authority with Lab Manager 3.x, you must re-import the certificate to IIS.

To upgrade and configure Lab Manager

- 1 From any machine with network access to the Lab Manager server, open a browser and navigate to `http://<Lab_Manager_Server_domain_name_or_IP_address>`.

The Upgrade wizard starts.

- 2 Review the introductory information and select **I understand the above requirements**.
- 3 Enter the capacity license key.
- 4 Select the hosts on which you want to install the Lab Manager 4.0 agent.
- 5 (Optional) Enable a host spanning transport network and select a vNetwork distributed switch and VLAN identifier.

Host spanning transport networks enable host spanning for the virtual machine in configurations that use fencing or a virtual network. Host spanning transport networks require a vNetwork distributed switch in vSphere. vNetwork distributed switches require a vSphere Enterprise Plus license.

- 6 Click **Finish**.
- 7 When the Web console login page appears, type the user name and password of the Lab Manager administrator account.

Understanding the Upgrade from Lab Manager 3.x

Lab Manager 4.0 introduces multiple workspaces. Workspaces allow you to subdivide the resources and users of an organization. You can also use workspaces to manage service transition activities. When you upgrade, Lab Manager creates a Main workspace for each organization. That workspace contains all the configurations in the organization.

Users who were assigned the Administrator role in Lab Manager 3.x have the System Administrator role in Lab Manager 4.0. The only change is in the name of the role.

Users who were assigned the Organization Administrator role in Lab Manager 3.x have the Administrator role in the same organization Lab Manager 4.0.

Upgrading from Stage Manager 1.x

When upgrading, both the system drive and SQL Server data drive require enough free disk space to store a copy of the original Stage Manager database.

Undeploy All Stage Manager Virtual Machines

Before you can upgrade to Lab Manager 4.0, you must undeploy all the virtual machines running under Stage Manager 1.x.

To undeploy all virtual machines from all hosts

- 1 From the Stage Manager Web console, select **Resources** and click the **Hosts** tab.
- 2 Move the pointer over a host name and select **Disable**.
- 3 Move the pointer over the same host name and select **Undeploy all VMs**.
- 4 Repeat these steps for each host.

If you are unable to undeploy certain virtual machines, Stage Manager displays an error. Use the **Force Undeploy** command to undeploy the virtual machines from Stage Manager and then use the VI Client to power off and remove each virtual machine from its ESX host.

Back Up the Stage Manager Database

VMware recommends backing up the Stage Manager 1.x database as a precaution. The backup is only necessary to revert to Stage Manager before the upgrade is complete. The upgrade process automatically transfers the database contents to the new installation.

You can only restore the database backup in a Stage Manager 1.x environment.

To back up the database

From the command prompt on the Stage Manager server, use the following sample command or your own backup method.

```
OSQL -S localhost\vsm -E -Q "backup database stagemanager TO DISK='c:\sm_backup.bak'"
```

This sample command creates the sm_backup.bak file on the C:\ drive.

Uninstall the Stage Manager Program Files

Before you can upgrade to Lab Manager 4.0, you must uninstall the program files for the Stage Manager server.

To uninstall Stage Manager

- 1 Log out of the Stage Manager Web console.
- 2 On the Stage Manager server, select **Start > Control Panel > Add or Remove Programs**.
- 3 Select the VMware Stage Manager program and click **Change/Remove**.
- 4 Select **Remove Program Files only**.
This selection preserves the Stage Manager database and virtual machines for use with Lab Manager 4.0.
- 5 Click **Finish**.

Upgrade VirtualCenter Server to vCenter Server 4.0

Upgrade your VirtualCenter Server to vCenter Server 4.0 as described in the *vSphere Upgrade Guide*. This operation requires downtime for the VirtualCenter Server that you are upgrading.

Install the Lab Manager Server Software

Before you install the Lab Manager server software, make sure that the system meets the requirements outlined in [Chapter 2, "Installation Requirements and Recommendations,"](#) on page 9.

The software installs an instance of Microsoft SQL Server 2005 Express Edition for use with Lab Manager.

To install the Lab Manager Server software

- 1 On the target Lab Manager server, run the VMware-vCenter-Lab-Manager-4.0.0.<build number>.exe file.
The installer checks to make sure that your system meets the installation prerequisites. If your system does not meet the prerequisites, click the link in the **Message #** column for more information about how to resolve the issue.
- 2 Review the Welcome screen.
- 3 Accept the license agreement.

- 4 Specify whether you want an express or custom installation.
Select **Custom** to change the program files directory for Lab Manager.
- 5 Accept the default VMwareLMWeb and VMwareLMUser passwords, or enter your own passwords.
Lab Manager creates these accounts as part of the installation and generates a random password for them. If your network has a restrictive password policy, enter passwords that meet your policy's requirements.
- 6 Select the IP address for Lab Manager traffic.
If the server has more than one active NIC with a static IP address, you can choose which one to use.
- 7 If the software cannot detect an FQDN, enter one when prompted.
For information on the FQDN, see ["Network"](#) on page 12.
- 8 Select the Web site for Lab Manager, or use the default Web site.
- 9 Enter the SSL port number for the Web site.
The default is 443.
- 10 Select the **Migrate the existing database to the latest version** check box.
This selection migrates the Stage Manager 1.x database for use with Lab Manager 4.0.
- 11 Click **Install**.
- 12 Click **Finish**.

Upgrade and Configure Lab Manager

You can upgrade and configure the Lab Manager server from any system with access to the Lab Manager server.

The first time you access the console, a security certificate warning might appear. To avoid this warning, use an FQDN or install an SSL certificate. See ["Generate a Custom SSL Certificate"](#) on page 18.

To upgrade and configure Lab Manager

- 1 From any machine with network access to the Lab Manager server, open a browser and navigate to `http://<Lab_Manager_Server_domain_name_or_IP_address>`.

The Upgrade wizard starts.

- 2 Review the introductory information and select **I understand the above requirements**.
- 3 Enter a capacity license key.
- 4 Select the hosts on which you want to install the Lab Manager 4.0 agent.
- 5 (Optional) Enable a host spanning transport network and select a vNetwork distributed switch and VLAN identifier.

Host spanning transport networks enable host spanning for the virtual machine in configurations that use fencing or a virtual network. Host spanning transport networks require a vNetwork distributed switch in vSphere. vNetwork distributed switches require ESX/ESXi 4.0 and an Enterprise Plus vSphere license.

- 6 Select a virtual switch for each host to bind to or bind to a vNetwork distributed switch.
- 7 Configure the LDAP connection.

This step is only required for upgrades from Stage Manager 1.0.0 installations that were configured for LDAP.

- **Server** – Host name or IP address of the LDAP server.
- **Port** – If the LDAP server is listening on a nondefault port, enter the port number here.

The default port is **389**.

- **Base Distinguished Name** – The base distinguished name, or base DN, identifies the location in the LDAP directory where Lab Manager connects.
VMware recommends connecting at the root, in which case you enter the domain components only, for example: **DC=vmware,DC=com**.
 - **User Name/Password/Confirm Password** – Enter a user name to connect to the LDAP server and enter and confirm the password.
- 8 Click **Test LDAP Upgrade**.
- This step is only required for upgrades from Stage Manager 1.0.0 installations that were configured for LDAP.
- If Lab Manager cannot connect to the LDAP server, modify the connection settings and try again.
 - If Lab Manager can connect to the LDAP server, but cannot find a match for all the LDAP users from Stage Manager, a list of the missing users displays. If these users still exist, you can add them later. See the *Lab Manager User's Guide*.
- 9 Choose whether to enable SupportLink, a feature that sends usage data to VMware and improves product support.
If you enable SupportLink, enter a company name and administrator email address.
If you are outside of the U.S. and you enable SupportLink, you must consent to the possible transfer of data outside of the country where the installation takes place.
- 10 Click **Finish**.
- 11 When the Web console login page appears, type the user name and password of the Lab Manager administrator account.
This is the same account information you used for Stage Manager.

Understanding the Upgrade from Stage Manager 1.x

After the upgrade, Stage Manager 1.x users have access to the same configurations, virtual machine templates, media, and virtual machines. Service templates are not preserved, and Lab Manager has no equivalent.

It is important to understand how Stage Manager 1.x information is mapped to Lab Manager. For more information about Lab Manager features and use, see the *Lab Manager User's Guide*.

Organizations

Organizations include users and resources (resource pools, hosts, datastores, media stores, and physical networks). Resources can be dedicated to an organization or shared among organizations. By assigning users to organizations, you can control which resources they can access.

Stage Manager services are converted to organizations of the same name in Lab Manager. Each organization is assigned the same resources and users as Stage Manager. In addition, during the upgrade, Lab Manager creates a Default organization and assigns all Stage Manager users and resources to this organization.

Workspaces

Stage Manager stages are converted to Lab Manager workspaces using the same name. The configurations in each workspace are shared to all users in the workspace with full control access.

Lab Manager does not preserve the order of the stages when it creates the workspaces, but you can move configurations from one workspace to another to achieve the same effect as promoting and demoting them in Stage Manager.

Each organization in Lab Manager can include a default workspace, which has special characteristics. During the upgrade, Lab Manager sets the first workspace alphabetically as the default workspace.

Configurations

Lifecycle configurations are available in the organization and workspace with names that match their service and stage names in Stage Manager.

Archive configurations are available in the configuration library for the organization whose name matches the service name in Stage Manager.

Users and Groups

All Stage Manager users (LDAP and non-LDAP) are added to the Default organization in Lab Manager. If you selected the LDAP Allowed Groups option in Stage Manager, the upgrade also adds those groups to the Default organization.

In addition, Stage Manager users with access to specific services are added the equivalent organizations in Lab Manager.

Roles and Rights

Stage Manager has only two roles: administrators and users (non-administrators). Each Stage Manager service has service users and service administrators.

Lab Manager includes more built-in roles and allows you to assign rights to these roles (or create custom roles) on a detailed level. The upgrade process maps Stage Manager roles to Lab Manager roles.

Table 4-2. Mapping Users from Stage Manager 1.x to Lab Manager 4.0

Stage Manager 1.x Role	Services Access	Lab Manager 4.0 Role
Administrator	NA	System Administrator
User	User	Application Owner within the organization and its workspaces
User	Administrator	Administrator within the organization and its workspaces

For more information about roles and rights in Lab Manager, see the *Lab Manager User's Guide*. Because the System Administrator role in Lab Manager is powerful, VMware recommends assigning a new role to some users who were administrators in Stage Manager 1.x.

Sharing

Lab Manager allows much greater control over sharing than Stage Manager. The upgrade process sets the sharing properties of Lab Manager objects to mirror how those objects were shared in Stage Manager. You can change the sharing properties at any time.

- Lifecycle configurations are shared with full control access to all users in the workspace.
- Archive configurations are shared with full control access to all users in the organization.
- Virtual machine templates are shared with read access to all users in the system.
- Media files are shared with read access to all users in the system.

Networking

In Lab Manager, physical networks are resources that can be assigned to an organization. The network information you provide in the Upgrade wizard, combined with the network settings information from Stage Manager, is used to create the physical network assigned to the Default organization, as well as all the organizations created from services.

Lab Manager supports multiple physical networks. For information about creating additional physical networks and assigning those networks to organizations and virtual machines, see the *Lab Manager User's Guide*.

Upgrading ESX Server

Lab Manager 4.0 supports versions 3.5 and 4.0 of ESX Server and ESXi Server. You can continue to use the ESX 3.5 hosts that were part of your Lab Manager 3.x or Stage Manager 1.x installation.

To take advantage of new vSphere features, upgrade your ESX hosts to version 4.0. VMware recommends using VMotion to move virtual machines off the ESX host that you want to upgrade. Next, install ESX Server 4.0 on the host. Finally, use VMotion to migrate the virtual machines back onto the host. See the vSphere documentation for more information.

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