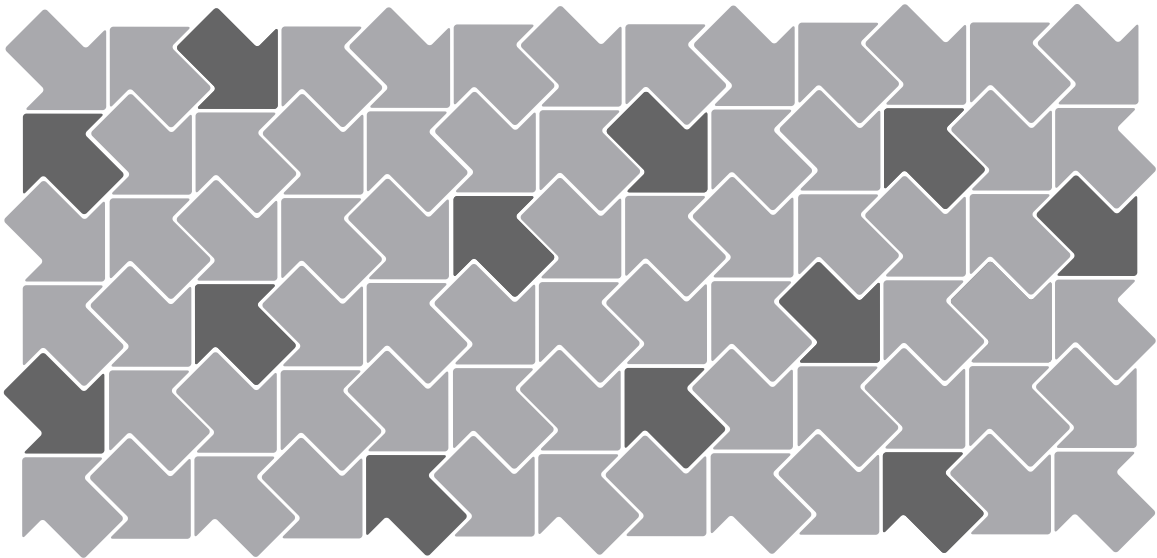


# Quick Start Guide

ESX Server 3.0 and VirtualCenter 2.0



Quick Start Guide  
Revision: 20060615  
Item: VI-ENG-Q206-211

You can find the most up-to-date technical documentation at:

<http://www.vmware.com/support/pubs>

The VMware Web site also provides the latest product updates.

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# Preface

This preface describes the contents of the *Quick Start Guide* and provides pointers to technical and educational resources.

This preface contains the following topics:

- [“About This Book”](#) on page viii
- [“Intended Audience”](#) on page viii
- [“Document Feedback”](#) on page viii
- [“VMware Infrastructure Documentation”](#) on page viii
- [“Conventions and Abbreviations”](#) on page ix
- [“Technical Support and Education Resources”](#) on page x

## About This Book

This manual, the *Quick Start Guide*, provides an introduction to VMware Infrastructure for new users. It walks you through the steps required to install VMware VirtualCenter and ESX Server, to perform basic configuration, and to create a working virtual machine. It provides a brief introduction to basic administration tasks and provides pointers to more detailed information in other manuals.

This manual covers much of the same material as the *Evaluator's Guide*. The *Evaluator's Guide* is written for system administrators who are evaluating VMware Infrastructure 3 for purchase. As such, it covers topics such as networking and storage configuration in greater detail than the *Quick Start Guide*. It also provides an introduction to advanced features such as VMware DRS, VMware HA, and VMotion.

## Intended Audience

This manual is intended for new users of VMware VirtualCenter and ESX Server. The information is targeted at experienced Windows or Linux system administrators who are familiar with datacenter operations.

## Document Feedback

If you have comments about this documentation, submit your feedback to:

[docfeedback@vmware.com](mailto:docfeedback@vmware.com)

## VMware Infrastructure Documentation

The VMware Infrastructure documentation consists of the combined VirtualCenter and ESX Server documentation set.

You can access the books in the VMware Infrastructure document set at:

<http://www.vmware.com/support/pubs>



## Conventions and Abbreviations

This manual uses the style conventions listed in [Table P-1](#).

**Table P-1.** Type Conventions

Style	Purpose
Monospace	Used for commands, filenames, directories, paths.
<b>Monospace bold</b>	Apply to indicate user input.
<b>Bold</b>	Use for these terms: Interface objects, keys, buttons Items of highlighted interest Glossary terms
<i>Italic</i>	Used for book titles.
< name >	Angle brackets indicate variable and parameter names.

## Abbreviations Used in Graphics

The graphics in this manual use the abbreviations listed in [Table P-2](#).

**Table P-2.** Abbreviations

Abbreviation	Description
VC	VirtualCenter
VI	Virtual Infrastructure Client
server	VirtualCenter Server
database	VirtualCenter database
host <i>n</i>	VirtualCenter managed hosts
VM#	virtual machines on a managed host
user#	user with access permissions
dsk#	storage disk for the managed host
datastore	storage for the managed host
SAN	storage area network type datastore shared between managed hosts
tmpl <i>t</i>	template

## Technical Support and Education Resources

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

- [“Self-Service Support”](#)
- [“Online and Telephone Support”](#)
- [“Support Offerings”](#)
- [“VMware Education Services”](#)

### Self-Service Support

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

- Product Information – <http://www.vmware.com/products/>
- Technology Information – <http://www.vmware.com/vcommunity/technology>
- Documentation – <http://www.vmware.com/support/pubs>
- 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>.

For customers with appropriate support contracts, use telephone support for the fastest response on priority 1 issues. Go to [http://www.vmware.com/support/phone\\_support.html](http://www.vmware.com/support/phone_support.html).

### Support Offerings

Find out how VMware's support offerings can help you 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>.



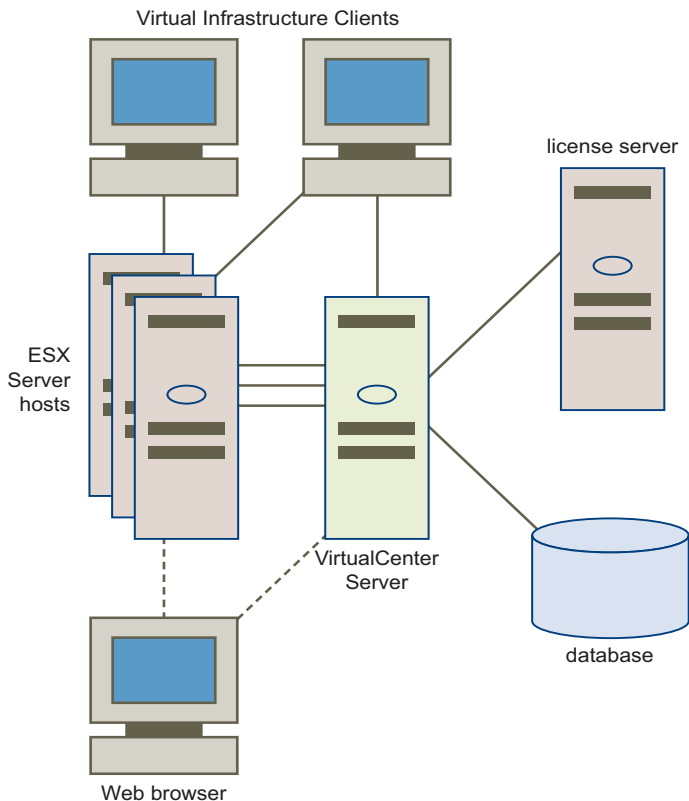
# CHAPTER 1 Introduction to VMware Infrastructure

This chapter introduces the components that are installed as part of an ESX Server and VirtualCenter installation and provides an overview of the prerequisites for successful installation. It contains the following sections:

- [“VMware Infrastructure at a Glance”](#) on page 1
- [“System Requirements”](#) on page 3
- [“Installation Prerequisites”](#) on page 5

## VMware Infrastructure at a Glance

[Figure 1-1](#) illustrates the six basic components of VMware Infrastructure.



**Figure 1-1.** VMware VirtualCenter Server Managing Several ESX Server Hosts

One VirtualCenter Server manages multiple VMware ESX Server hosts.

The major components are:

- **ESX Server host** – ESX Server provides a virtualization layer that abstracts the processor, memory, storage, and networking resources of the physical host into multiple virtual machines.

See [“Installing ESX Server”](#) on page 22.

- **VirtualCenter Server** – This server installs on a Windows machine to centrally manage your VMware ESX Server hosts. The VirtualCenter Server allows the use

of advanced VMware Infrastructure features such as VMware DRS, VMware HA, and VMotion.

A VMware SDK Web service is automatically installed with VirtualCenter Server. See [“Installing VirtualCenter Server”](#) on page 17.

- **Virtual Infrastructure (VI) Client** – The VI Client installs on a Windows machine and is the primary user interface to virtual infrastructure. The VI Client has two functions:
  - A **console** to operate virtual machines.
  - An **administration interface** into VirtualCenter Servers and ESX Server hosts.

The VI Client is downloadable from VirtualCenter Server and ESX Server hosts. See [“Installing the Virtual Infrastructure Client”](#) on page 20.

- **Web browser** – A browser allows you to download the VI Client from the VirtualCenter Server or ESX Server hosts. When you have appropriate logon credentials, a browser also lets you perform limited management of your VirtualCenter Server and ESX Server hosts using the VI Web Access user interface.
- **License server** – This server installs on a Windows system to authorize VirtualCenter Servers and ESX Server hosts appropriately for your licensing agreement. Administrators make changes to software licenses using the VI Client.
- **Database** – The VirtualCenter Server uses a database to organize all the configuration data for the VMware Infrastructure environment. While VMware recommends a professional database for production environments, the bundled MSDE database allows you to set up a VirtualCenter Server for demonstration purposes. See [“Preparing the VirtualCenter Server Database”](#) on page 11.

## System Requirements

This section briefly describes the hardware and software requirements for installing VMware VirtualCenter and ESX Server. For a more detailed description of hardware requirements, see Chapter 2, “System Requirements,” in the *Installation and Upgrade Guide*.

### VirtualCenter Server Requirements

VirtualCenter Server requires a computer with the following specifications:

- Windows 2000 Server SP4 with Update Rollup 1, Windows 2003, or Windows XP Professional installed
- 2.0GHz or faster Intel or AMD x86 processor

- 2GB or more of RAM
- A minimum of 560MB disk storage (2GB recommended)

If you plan to install your VirtualCenter database on the same computer as VirtualCenter Server, additional storage and processor capacity might be required.

## License Server Requirements

VMware recommends installing the license server software on the same computer as the VirtualCenter Server. The license server requires a computer with the following minimum specifications:

- Windows 2000 Server SP4, Windows 2003, or Windows XP Professional installed
- 266MHz or faster Intel or AMD x86 processor
- 256MB RAM minimum, 512MB recommended
- 25MB free disk space required for basic installation
- 10/100 Ethernet adapter (Gigabit recommended)

## VirtualCenter Database Requirements

VirtualCenter supports the following databases:

- Microsoft SQL Server 2000 (SP 4 only)
- Oracle 9iR2, 10gR1 (versions 10.1.0.3 and higher only), and 10gR2
- Microsoft MSDE (not supported for production environments)

Each database requires some configuration adjustments in addition to the basic installation.

---

**NOTE** If you do not have database administrator (DBA) privileges in your organization, you need assistance from your DBA. See [“Preparing the VirtualCenter Server Database”](#) on page 11 for more information on the VirtualCenter database configuration.

---

## Virtual Infrastructure Client Requirements

The VI Client requires a computer with the following specifications:

- Windows 2000 Pro SP4, Windows 2000 Server SP4, Windows XP Professional, or Windows 2003 (except 64-bit) installed.
- .NET framework 1.1 installed (included with VI Client installer).



- 266MHz or faster Intel or AMD x86 processor.
- 256MB RAM minimum, 512MB recommended.
- 150MB free disk space required for basic installation. Additional storage is required if virtual machine templates are to be saved locally.
- 10/100 Ethernet adapter (Gigabit recommended).

## ESX Server Requirements

ESX Server requires a computer with the following specifications:

- At least two processors of one of the following types:
  - 1500MHz Intel Xeon and later, or AMD Opteron (32-bit mode)
  - 1500MHz Intel Viiv or AMD A64 x2 dual-core processors
- 1GB RAM minimum
- One or more Ethernet controllers
- A SCSI disk, Fibre Channel LUN, or RAID LUN with unpartitioned space

## Installation Prerequisites

This section describes additional prerequisites for VMware Infrastructure installation.

### VirtualCenter Prerequisites

Make sure that you have the following before installing VirtualCenter Server:

- Logon credentials for an account with administrator privileges on the computer on which you intend to install VirtualCenter Server.
- The IP address and host name of the computer on which you intend to install VirtualCenter Server.
- A license file containing your purchased VirtualCenter licenses. See [“Redeeming Licenses”](#) on page 10 for more information on obtaining license files.
- If you do not intend to use the MSDE demonstration database, obtain database logon credentials and other information from your database administrator. See [“Preparing the VirtualCenter Server Database”](#) on page 11.
- If you do not intend to install a license server on the same machine as your VirtualCenter Server installation, have the IP address or host name and TCP/IP port information for the license server.

- The TCP/IP ports on which the VirtualCenter Web server (default is 80) and the VirtualCenter Web service (default is 443) will communicate. Use the default ports unless these conflict with other applications running in your environment.

## **ESX Server Prerequisites**

Make sure that you have the following before installing ESX Server:

- An IP address and host name for the computer on which you intend to install ESX Server.
- A root password for the ESX Server host, to be provided during installation.
- The VLAN ID for your network, if needed.

# CHAPTER 2 Installing VMware Infrastructure Components

This chapter provides an overview of how to install VMware Infrastructure components, and contains the following sections:

- [“Licensing”](#) on page 7
- [“Installing VirtualCenter”](#) on page 11
- [“Installing ESX Server”](#) on page 22

## Licensing

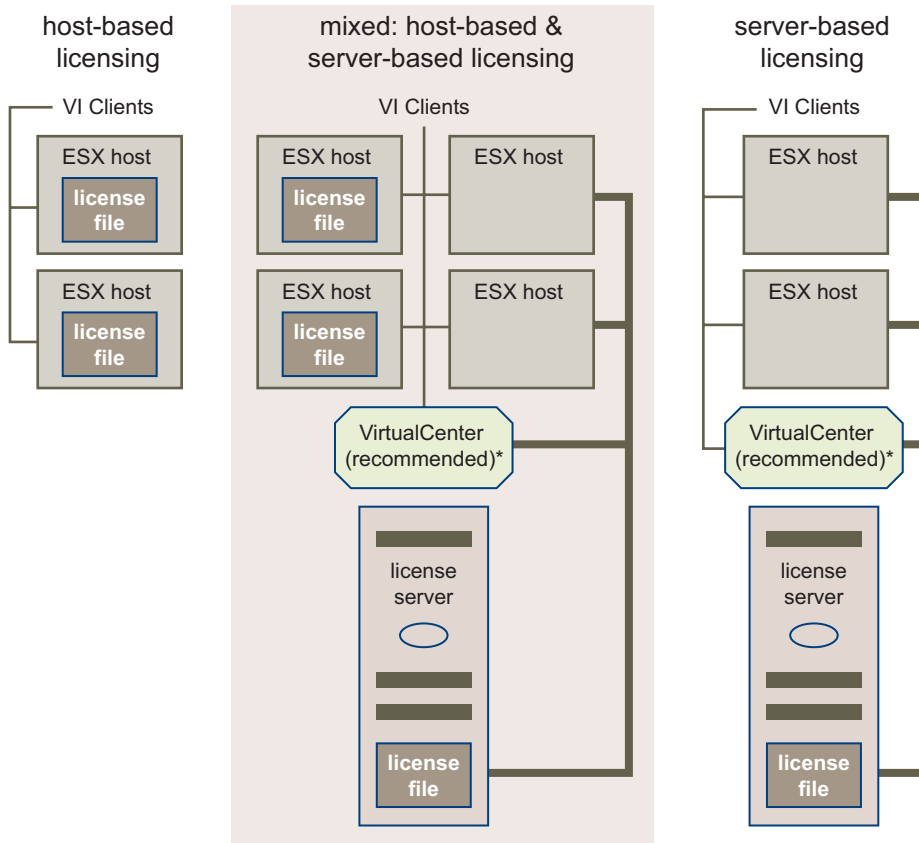
Before installing VMware Infrastructure components, decide whether you want to use host-based or license server-based licensing. Use your license activation code to redeem and download your software licenses.

### Host-Based and License Server-Based Licensing Modes

License files are enabled in two modes: license server-based and host-based. In host-based licensing mode, the license files are stored on individual ESX Server hosts. In license server-based licensing mode, a single license file is stored centrally on a license server, which makes these licenses available to one or more hosts. You can run a mixed environment employing both host-based and license server-based licensing.

VirtualCenter and features that require VirtualCenter, such as VMotion, must be licensed in license server-based mode. ESX Server-specific features can be licensed in either license server-based or host-based mode.

[Figure 2-1](#) illustrates the three types of license environments.



\* Some features, such as VMotion and VMware HA, require VirtualCenter.

**Figure 2-1.** License File Locations in Host-Based, Mixed, and License Server-Based Environments

### License Server-Based Licensing

License server-based licensing simplifies license management in large, dynamic environments. The VMware license server administers the licenses. With license server-based licensing, you maintain all your VirtualCenter Management Servers and all ESX Server hosts from one console.

License server-based licensing is based on industry-standard FlexNet mechanisms. With license server-based licensing, a license server manages a license pool, which is a central repository holding your entire licensed entitlement. When a host requires a particular licensed functionality, the license key for that entitlement is temporarily

checked out from the license pool. Unused license keys are released to the pool, becoming available again to any host.

License server-based licensing has the following advantages:

- You administer all licensing from a single location.
- New licenses are allocated and reallocated using any combination of ESX Server form factors. For example, you can use the same 32-processor license for sixteen 2-processor hosts, eight 4-processor hosts, four 8-processor hosts, two 16-processor hosts, or any combination totaling 32 processors.
- Ongoing license management is simplified by allowing licenses to be assigned and reassigned on an as-needed basis. Assignment changes as the needs of an environment change, such as when hosts are added or removed or premium features like VMotion, DRS, or HA are transferred among hosts.
- During periods of license server unavailability, VirtualCenter Servers and ESX Server hosts using license server-based licenses are unaffected for a 14-day grace period, relying on cached licensing configurations, even across reboots. However, license configurations cannot be modified while the license server is unavailable. See the *Installation and Upgrade Guide* for details on how license server unavailability affects licensed functions.

VMware recommends using the license server-based licensing mode for most environments.

## Host-Based Licensing

The host-based licensing mode is similar to the licensing mode of earlier versions of ESX Server. With host-based licensing, your total entitlement for purchased features is divided on a per-machine basis, split among separate license files residing on ESX Server hosts and the VirtualCenter Server.

With host-based licensing, when someone activates a licensed feature, a key for that entitlement must reside in the license file on that host. With host-based licensing, you maintain separate license files on each ESX Server host. Distribution of unused licenses is not automatic, and there is no dependence on an external connection for licensing. Host-based license files are placed directly on individual ESX Server hosts and replace the serial numbers used by previous versions of ESX Server version 2.x.

---

**NOTE** Host-based files have the benefit of requiring no license server to be installed for ESX Server host-only environments.

---

In a VirtualCenter and license server environment with host-based licensing, you can modify ESX Server host licenses during periods of license server unavailability. For

example, with host-based licensing you can manually move VMware Consolidated Backup license keys between hosts without a license server connection.

## Redeeming Licenses

When you purchase VMware Infrastructure, you receive a license activation code from VMware by email. After receiving this activation code, you can use it to redeem your licenses.

### To obtain license files

- 1 Follow the instructions in the email containing your license activation code access the Web-based license activation portal.
- 2 Click **Generate New Licenses** to generate a new license file.
- 3 Select **License Server-Based** to generate a license server-based license file. Select **Host-Based** to generate a host-based license file. Click **Submit**.
- 4 Select the check box next to each purchased product for which you want to obtain licenses. Enter the number of CPU licenses you want to generate, and click **Generate**.
- 5 Review your license selections, and click **Confirm** to generate the license file.
- 6 When you have generated your license file, you have three options:
  - Choose **Save** to save the license to a text file on the computer from which you are accessing the Web form.
  - Enter an email address, and click **Send** to send the license file by email.
  - Copy the license file displayed on the page, and paste it into a text editor to save it as a file.
- 7 Click **Home** to return to the home page of the application and generate more license files, or close your Web browser to finish.

## Where to Go from Here

At this point, you have:

- Decided whether to use license server-based or host-based licensing for your VMware Infrastructure installation. This *Quick Start Guide* describes only the default license server-based installation with the license server installed on the same machine as VirtualCenter Server. For information on setting up other licensing configurations, refer to the *Installation and Upgrade Guide*.

- Redeemed and downloaded your license file in preparation for installation. To use this license file, you must install a license server as described in [“Installing VirtualCenter Server”](#) on page 17. Configure the license for your ESX Server hosts as described in [“To select the license type for the host”](#) on page 36.

Continue with the next section, [“Installing VirtualCenter,”](#) to install VirtualCenter Server and the license server.

## Installing VirtualCenter

Installation of VirtualCenter includes the following steps:

- Configuring a database for use with VirtualCenter Server.
- Installing VirtualCenter Server and the license server.
- Installing the Virtual Infrastructure (VI Client) on any computers that you will use to manage your VirtualCenter Server installation.

## Preparing the VirtualCenter Server Database

VMware VirtualCenter Server requires a database to store and organize server data. VirtualCenter version 2 server supports Oracle, SQL Server, and Microsoft MSDE.

The VirtualCenter Management Server requires administration credentials (ID and password) to logon to an Oracle or SQL database. Contact your DBA for these credentials, or install the demonstration MSDE database for product testing.

---

**NOTE** MSDE is not supported for production environments. It is intended to be used only for test and evaluations. You must use an Oracle or SQL Server database to receive enterprise support.

---

## Configuring Your VirtualCenter Database

To support the VirtualCenter Database, you must create a database instance and configure it to ensure that all VirtualCenter database tables are placed in the database instance. This section describes these procedures for each database type:

- [“Configuring an Oracle 9i or 10g Connection to Work Locally”](#) on page 12
- [“Configuring an Oracle 9i or 10g Connection to Work Remotely”](#) on page 12
- [“Configuring a SQL Server ODBC Connection”](#) on page 13
- [“Configuring Microsoft SQL Server Desktop Engine \(MSDE\)”](#) on page 16

### Configuring an Oracle 9i or 10g Connection to Work Locally

To use an Oracle database as your VirtualCenter database and have VirtualCenter access the database locally, use the following procedure.

#### To prepare an Oracle database to work locally with VirtualCenter

- 1 From the Oracle database machine, install and prepare Oracle:
  - a Install Oracle 8i, Oracle 9i, or Oracle 10g, and create a database (VirtualCenter).  
  
Download Oracle ODBC from the Oracle Web site.  
  
Install the Oracle ODBC corresponding driver through the Oracle Universal Installer (directions are provided with the driver).
  - b Increase the number of open cursors for the database. Add the entry `open_cursors = 300` to the `C:\Oracle\ADMIN\VPX\pfile\init.ora` file.
- 2 Connect Oracle locally:
  - a Create a new tablespace specifically for VirtualCenter using the following SQL statement:  
  

```
CREATE TABLESPACE vpx DATAFILE 'C:\Oracle\ORADATA\VPX\vpdx.dat' SIZE 500M;
```
  - b Create a user, such as `vpxAdmin`, for accessing this tablespace through ODBC:  
  

```
CREATE USER vpxAdmin IDENTIFIED BY vpxadmin DEFAULT TABLESPACE vpx;
```
  - c Give that user `CONNECT` and `DBA` privileges:  
  

```
GRANT CONNECT, DBA to vpxAdmin;
```
  - d Create an ODBC connection to the database. The following are example settings:  
  

```
Data Source Name: VMware VirtualCenter
TNS Service Name: VPX
User Id: vpxAdmin
```

### Configuring an Oracle 9i or 10g Connection to Work Remotely

To use an Oracle database as your VirtualCenter database and have VirtualCenter access the database remotely, first set up the database as described in [“Configuring an Oracle 9i or 10g Connection to Work Locally”](#) on page 12. Then use the following procedure.



### To prepare an Oracle database to work remotely with VirtualCenter

- 1 Install the Oracle client on the VirtualCenter Server machine.
- 2 Connect to Oracle remotely:
  - a Download and install the ODBC driver.
  - b Edit the `tnsnames.ora` file located at Ora9I or 10g, as appropriate.

`C:\Oracle\Ora9I\NETWORK\ADMIN`

In this example, xx is 9I or 10g.

- c Use the Net8 Configuration Assistant to add the following entry:

```
VPX =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS=(PROTOCOL=TCP)(HOST=vpxd-Oracle)(PORT=1521))
)
(CONNECT_DATA =
(SERVICE_NAME = VPX)
)
)
HOST =
```

In this example, `HOST` is the managed host to which the client needs to connect.

### Configuring a SQL Server ODBC Connection

When you install VirtualCenter Server, you have the option to establish a connection with a SQL Server database. The following procedure describes how to configure a SQL Server ODBC connection. If you use the SQL Server authentication method, supply the same user name, password, and ODBC system DSN in the wizard that you used to configure the ODBC.

Refer to your Microsoft SQL ODBC documentation for specific instructions regarding configuring the SQL Server ODBC connection.

---

**NOTE** Microsoft Windows NT authentication is not supported with SQL Server.

---

### To prepare a SQL Server database to work with VirtualCenter

- 1 On your Microsoft SQL Server, perform the following:
  - a Create a SQL Server database using Enterprise Manager on the SQL Server.
  - b Create a SQL Server database user with database operator (DBO) rights.

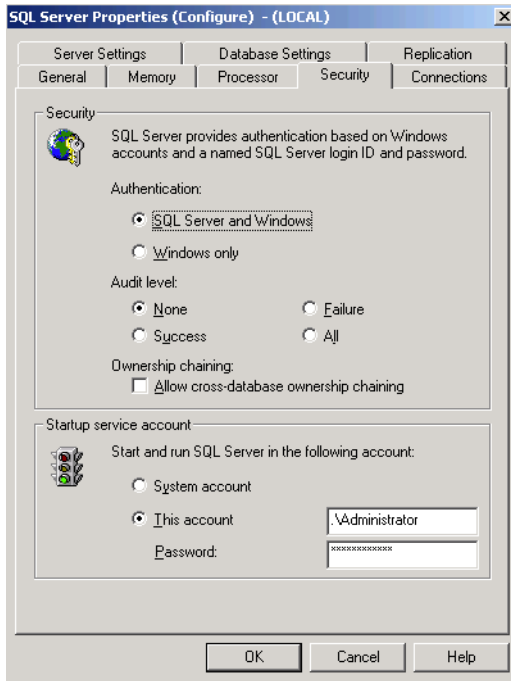
You defined the default database for the DBO user in [Step a](#).

- 2 On your VirtualCenter Server, choose **Settings > Control Panel > Administrative Tools > Data Sources (ODBC)**.
- 3 Select the **System DSN** tab.
- 4 To modify an existing SQL Server ODBC connection:
  - a Select the SQL Server ODBC DSN you want to modify.
  - b Select the appropriate ODBC connection from the **System Data Source** list. Click **Configure**.
  - c Proceed with [Step 6](#).
- 5 To create a new SQL Server ODBC connection:
  - a Select **Create New Data Source**, and click **Add**.
  - b Select **New Data Source to SQL Server**, and click **Finish**.
- 6 Type an ODBC DSN name in the **Name** field.  
For example, type VMware VirtualCenter.
- 7 (Optional) Type an ODBC DSN description in the **Description** field.
- 8 Choose the DSN server name from the **server** drop-down menu.  
Type the SQL Server machine name in the text field if you cannot find it in the drop-down menu.
- 9 Configure the SQL Server authentication page, and click **Next**.
- 10 Select one of the authentication methods:
  - If you are using local SQL Server, select **Windows NT authentication**.
  - If you are using remote SQL Server, select **SQL Server authentication**. You can also choose **Windows NT authentication**.

---

**NOTE** The authentication option you choose for a remote SQL Server must match the local SQL Server.

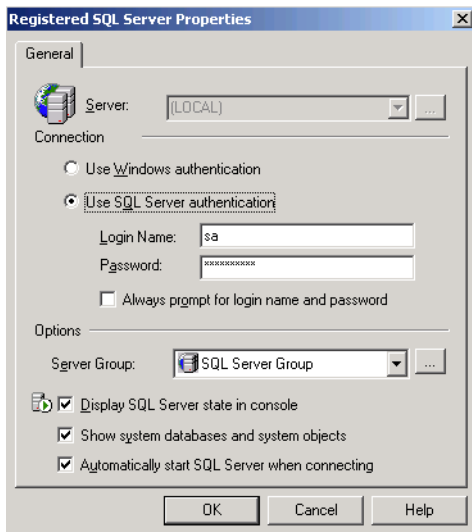
---



### To identify the authentication type

- a Open SQL Server Enterprise Manager.
- b Click the **Properties** tab to view Properties.
- c Check the mode.

The mode indicates either Windows NT or SQL Server authentication type.



- 11 Type your SQL Server login name and password.  
Ask your database administrator for this information.
- 12 Configure the default database, and click **Next**.
- 13 Select a database from the **Change the default database to** menu, and click **Next**.
- 14 Click **Finish**.
- 15 From the **ODBC Microsoft SQL Server Setup** menu, select **Test Data Source**.  
If the test data source is acceptable, click **OK**. If it is not acceptable, return and reconfigure any incorrect items.
- 16 To close the ODBC Data Source Administrator, click **Close**.

### Configuring Microsoft SQL Server Desktop Engine (MSDE)

The MSDE database package is installed and configured when you select MSDE as your database during VirtualCenter installation or upgrade. See “[Installing VirtualCenter Server](#)” on page 17. No additional configuration is required.

MSDE is compatible with Microsoft SQL Server, supports up to 25 concurrent users, and is freely downloadable from Microsoft. Documentation is also available from Microsoft at the following Web site:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=413744d1-a0bc-479f-bafa-e4b278eb9147&DisplayLang=en>

---

**NOTE** VMware does not support MSDE for production use. MSDE is meant to be used only for test and evaluations. MSDE replaces Microsoft Access (used in earlier versions of VirtualCenter) as the low-end demonstration database.

---

## Installing VirtualCenter Server

Before installing VirtualCenter Server software, do the following:

- Ensure that your hardware meets “[System Requirements](#)” on page 3.
- Create a VirtualCenter database. See “[Preparing the VirtualCenter Server Database](#)” on page 11. If you have not previously configured a database, you cannot install VirtualCenter Server.
- Assign a license server IP address or machine name to be used by VirtualCenter Server. If you do not have license server information prepared, you can install VirtualCenter Server using the default values provided.
- Save your license file on the VirtualCenter Server installer machine.

### To install VirtualCenter Server

- 1 As Administrator on the Windows system, insert the installation CD. When the VMware VirtualCenter Install menu is displayed, click **VirtualCenter Management Server**.
- 2 If the VMware VirtualCenter Install menu is not displayed, double-click the autorun.exe icon and click **VirtualCenter Management Server**.

A splash screen appears. The VirtualCenter Server installer prepares to install the components.

---

**NOTE** If a dialog box appears with **Modify**, **Repair**, or **Remove**, the installer has detected a previous VirtualCenter installation. Refer to the *Installation and Upgrade Guide* for information on upgrading VirtualCenter.

---

- 3 Install Microsoft .NET Framework version 1.1.

If you do not have Microsoft .NET Framework version 1.1 on your machine, a prompt appears to ask if you want to install it. Click **Yes**.

The VirtualCenter Server installer installs Microsoft .NET Framework version 1.1. If you have an older version, the VirtualCenter installer upgrades your version to version 1.1.

For more information on .NET Framework 1.1, see [msdn.microsoft.com/netframework/technologyinfo/](http://msdn.microsoft.com/netframework/technologyinfo/).

The Welcome page appears.

- 4 Verify that you are installing VirtualCenter Server, and click **Next**.

The license agreement appears.

- 5 Select **I accept the terms in the license agreement**, and click **Next**.

The Customer Information page appears.

- 6 Type your user name and company name, and click **Next**.

The Destination Folder page appears.

- 7 Accept the default folder, or click **Browse** to select the folder in which you want to install VirtualCenter Server, and click **Next**.

The Setup Type page appears.

- 8 Select the type of setup:

- **Typical** – Select this option for a quick installation using the default settings.
- **Custom** – Select this option to configure all details of your installation.

The VMware VirtualCenter Database page appears.

- 9 Select the option corresponding with the database you previously configured in “[Preparing the VirtualCenter Server Database](#)” on page 11, and click **Next**.

If you did not select MSDE, the Database Information page appears. If you selected MSDE, continue with [Step 11](#).

---

**NOTE** If you have not previously configured a supported database, you must install a MSDE database. Otherwise, the VirtualCenter installer cannot continue.

---

- 10 Enter your database connection information:

- a Type the data source name (DSN) associated with your database.

This must be a system DSN.

- b Type the user name associated with the data source name.

- c Type the password associated with the user name, and click **Next**.

If your connection fails, a warning appears: “The ‘<DSN\_Name>’ DSN does not exist or is not a system DSN. VirtualCenter accepts only system DSNs. Use

the 'ODBC DSN Setup' button to start the ODBC Data Source Administrator to define it."

Click **OK** and re-enter your database connection information until you can continue. If you have trouble, see "[Preparing the VirtualCenter Server Database](#)" on page 11.

- 11 Install a license server on the VirtualCenter Server machine.

You must have a license file saved on this machine.

- a Select **Install a local VMware License Server**, and click **Next**.
- b The Licensing Info page is displayed. Type the location of your saved license file, or click **Browse** to locate this file.

Click **Next** to continue.

The VirtualCenter Web Service page appears.

- 12 Configure the VirtualCenter SDK Web Service.

This dialog box configures the Web service for the VMware software development kit (SDK). Do not confuse this Web service with the VirtualCenter Server Web server, which provides client downloads and administrative functionality. You will configure the VirtualCenter Server Web server in the next step.

- a Enter a Web Service https port. The default is 443.
- b Enter a Web Service http port. The default is 80.
- c Enter a VirtualCenter diagnostic port. The default is 8083.
- d Enter a VirtualCenter port (the port that VirtualCenter uses to communicate with the VI Client). The default is 902.
- e Enter a VirtualCenter heartbeat port. The default is 902.
- f Select the check box if you want to maintain compatibility with the older SDK Web interface.
- g Click **Next**.

The VMware VirtualCenter Web Server page appears.

- 13 Configure the VirtualCenter Web server.
  - a Verify the TCP/IP port on which you want the Web server to communicate.

---

**NOTE** The default http port setting of 80 can create a conflict if other Web server software that uses port 80, such as Microsoft IIS, runs on the same computer as VirtualCenter Server. If you must run other Web server software on the same computer, change the default port setting for VirtualCenter Server.

---

- b Select the appropriate check box if you want the Web server to start each time Windows starts.
  - c Select the appropriate check box if you want to start the Web server now.
  - d Click **Next** when you have completed Web server configuration.
- 14 Click **Install** to begin the installation.

Installation might take a few minutes. Multiple progress bars appear during VMware VirtualCenter Server installation.

- 15 Click **Finish** to complete the VirtualCenter Server installation.

## Installing the Virtual Infrastructure Client

This section describes how to install a Virtual Infrastructure (VI) Client. Install the VI Client on a Windows-based system that you will use to manage your VirtualCenter Server installation.

You can install the VI Client on any number of Windows machines. Your licensing agreement does not regulate the number of VI Clients installed.

### To install a VI Client on a Windows host

- 1 As Administrator on the Windows system, run the VI Client installer from the CD or download it.
  - **From a CD** – Click **Virtual Infrastructure Client** on the VMware VirtualCenter Install menu.

Continue with [Step 3](#).

- **From a download** – follow these steps:
  - a Open a Web browser to the URL of a VirtualCenter version 2 server or ESX Server 3.0 host.
  - b Click the link **Download the Virtual Infrastructure Client**.



- c Save the file on your hard drive as `VMware-viclient.exe`.
- d In Windows Explorer, double-click the `VMware-viclient.exe` file.

A splash screen appears. The VirtualCenter VI Client installer prepares to install the components.

- 2 Install Microsoft .NET Framework version 1.1.

If you do not have Microsoft .NET Framework 1.1 on your machine, a prompt appears to ask if you want to install it. Click **Yes**.

The VirtualCenter Client installer installs Microsoft .NET Framework 1.1 on your machine. If you have an older version, the VirtualCenter installer upgrades your version to version 1.1.

For more information on .NET Framework 1.1, see [msdn.microsoft.com/netframework/technologyinfo/](http://msdn.microsoft.com/netframework/technologyinfo/).

The Welcome page appears.

- 3 Verify that you are installing the VI Client, and click **Next**.

The license agreement appears.

- 4 Select **I accept the terms in the license agreement**, and click **Next**.

The Customer Information page appears.

- 5 Type your user name and company name, and click **Next**.

The Destination Folder page appears.

- 6 Accept the default folder, or click **Browse** to select a folder in which to install the VI Client, and click **Next**.

The Ready to Install the Program page appears.

- 7 Click **Install** to begin the installation.

A progress dialog box appears. Installation might take a few minutes.

- 8 Click **Finish** to complete the VI Client installation.

## Configuring Communication Between VirtualCenter Components

The VirtualCenter Server must be able to send data to every VirtualCenter managed host and receive data from each VirtualCenter client. If you have firewalls between

your VMware Infrastructure components, open the ports listed in [Table 2-1](#) to enable communication.

**Table 2-1.** Ports for VMware Infrastructure Communication

Components	Ports	Traffic Type
VirtualCenter Server to VI Client	902	TCP
VirtualCenter Server to Web Access Client	443	TCP
VirtualCenter Server to ESX Server host	902	UDP
VirtualCenter Server to License Server	27000 and 27010	TCP

---

**NOTE** [Table 2-1](#) lists the default ports for communication between VMware Infrastructure components. For more information on changing port configurations, refer to the *Server Configuration Guide*.

---

## Where to Go from Here

At this point, you have:

- Selected and configured a database for use with VirtualCenter Server as described in [“Preparing the VirtualCenter Server Database”](#) on page 11.
- Installed VirtualCenter Server and a license server as described in [“Installing VirtualCenter Server”](#) on page 17.
- Installed the VI Client as described in [“Installing the Virtual Infrastructure Client”](#) on page 20.
- Configured your firewalls for communication between VMware Infrastructure components as described in [“Configuring Communication Between VirtualCenter Components”](#) on page 21.

Continue with the next section, [“Installing ESX Server,”](#) to install ESX Server.

## Installing ESX Server

The VMware ESX Server version 3 installation includes the following components:

- VMware ESX Server – Software to manage and serve virtual machines.
- VMware Web Access – Software to allow Web browser access to the ESX Server host.

## Preparing for Installation

Two installers are available for installing VMware ESX Server software:

- **Graphical installer** – This is a graphical, mouse-based installation program to install or upgrade ESX Server. This is the recommended installation method. This *Quick Start Guide* describes how to install ESX Server using the graphical installer.
- **Text-mode installer** – This is a text-based interface to install or upgrade ESX Server. Choose this installation method if your video controller, keyboard, or mouse do not function properly using the graphical installer. This *Quick Start Guide* does not describe how to install ESX Server using the text installer. For more information on using the text installer, see the *Installation and Upgrade Guide*.

### Using ILO, DRAC, and RSA II

If you use ILO or DRAC to install ESX Server, exercise care when using the Virtual CD feature. You might encounter corruption problems if you use this installation method with systems under load. If you must use this method to install ESX Server, run the Media Test provided by the ESX Server Installer.

Do not use the Virtual CD feature with RSA II to install ESX Server.

### Installation on IDE or SATA Drives

The installer displays a warning if you attempt to install ESX Server software on an IDE drive or a SATA drive in ATA emulation mode. It is possible to install and boot ESX Server software on an IDE drive. However, VMFS, the filesystem on which virtual machines are stored, is not supported on IDE or SATA. An ESX Server host must have SCSI storage, NAS, or a SAN on which to store virtual machines.

- See “[ESX Server Requirements](#)” on page 5 for complete hardware requirements.
- See the *Installation and Upgrade Guide* for a description of partitioning requirements.

### LUN Requirements

Although ESX Server supports up to 256 LUNs for operation, the installer supports a maximum of 128 iSCSI or SAN LUNs. If you have more than 128 LUNs, connect them after the installation is complete.

The minimum supported LUN capacity for VMFS3 is 1200MB.

An ESX Server host supports only the first 256 LUNs loaded at boot time. Your boot volume must be encountered in the first 256 LUNs, or the ESX Server host can hang at startup. If you have a controller loading 256 LUNs before the boot volume, you must reduce the number of LUNs on that controller to 256 or less.

If you have not yet installed ESX Server software, you can arrange PCI controller cards to determine the desired LUN order.

---

**NOTE** VMware recommends that you do not rearrange drive controllers among PCI slots after you have installed ESX Server software.

---

If you want an ESX Server host to boot from a SAN, allocate an entire LUN to each ESX Server host.

See the *SAN Configuration Guide* for more information on configuring an ESX Server host to boot from a SAN.

ESX Server software does not support booting from a shared LUN. If you install ESX Server software onto a shared LUN, you might overwrite the data on the shared LUN.

---

**NOTE** You must determine the status of your available LUNs. The installer cannot determine if a LUN is shared.

---

Before beginning the installation, zone and mask all SAN LUNs away from your server, except those intended for its use.

## Installing ESX Server

This section describes how to install the ESX Server software on your server machine using the graphical mode of the installer and default partitioning options. For information on configuring partition options, or using the text mode of the installer, refer to the *Installation and Upgrade Guide*.

### To install ESX Server

- 1 Verify that the network cable is plugged into the Ethernet adapter that you are using for the service console.

The ESX Server installer needs a live network connection to properly detect certain network settings, such as machine name under DHCP.

- 2 Power on the machine with the VMware ESX Server CD in the CD drive.

The ESX Server begins its boot process until the mode selection page appears.



If this page does not appear:

- a Reboot the machine.
  - b Press the key required to enter your machine's BIOS Setup page.  
This key is often F1, F2, or F10.
  - c Set the CD drive as the first boot device.
  - d Reboot the machine.
- 3 Press **Enter** to start the graphical installer.
- A series of installation messages scroll past until the CD Media Test page appears.
- 4 Click **Test** to have the installer inspect the installation CD media for errors.
    - If you click **Skip**, continue with [Step 5](#).
    - If you click **Test**, a progress bar appears. The CD media is being tested for errors. When testing is complete, a Media Check Result dialog box appears. Click **OK**.
- The Welcome page appears.
- 5 Click **Next**.
- The Select Keyboard page appears.
- 6 Select your keyboard language from the list, and click **Next**.
- The Mouse Configuration page appears.

- 7 Select your mouse.

---

**NOTE** Mouse configuration is not a critical setting. After ESX Server is installed, the setting is ignored, since the X Window System is not supported from the service console.

---

Here are some helpful mouse identification hints:

- If the connector is round, your mouse is a PS/2 or a bus mouse.
- If the connector is trapezoidal with nine holes, it is a serial mouse.
- If the connector is a flat rectangle with a slot, it is a USB mouse.

**Try to find an exact match** – If you cannot find an exact match, choose a mouse type that is compatible with yours. Otherwise, choose the appropriate generic mouse type.

**Three-button mouse emulation** – During the installation, selecting this box enables you to use middle-mouse button functionality by clicking both mouse buttons at once.

When you have selected your mouse, click **Next**.

- 8 Select the type of installation.

The Select Installation Type dialog box appears only if the installer detects a previous ESX Server installation.

- **Install** – For a clean installation preserving no ESX Server configuration data, select **Install** and click **Next**.
- **Upgrade** – If you are upgrading, refer to the *Installation and Upgrade Guide*. Do not continue with this procedure.

- 9 Accept the VMware license agreement by selecting **I accept the terms of the license agreement**. Click **Next**.

If any drives or LUNs (SCSI or Fibre Channel) are uninitialized, a warning dialog box appears.

If you do not have data on the drive, click **OK** to allow partitioning to occur. You must initialize a drive to use it during installation.

The Partitioning Options page appears.

- 10 Click **Recommended** to configure default partitions for you, based on the capacity of the hard drive.
  - a Select a volume on which to install ESX Server software.

- b Deselect **Keep virtual machines and the VMFS**.
- c Select **Recommended partitioning**, and click **Next**.  
A warning dialog box appears.
- d Click **Yes** to continue with your partitioning selection.
- e You have the option to change the automatic partitioning settings:
  - **New** – Select a disk and click this button to create a new partition.
  - **Edit** – Select a partition and click this button to change an existing partition.
  - **Delete** – Select a partition and click this button to remove an existing partition.
  - **Reset** – Click this button to restore the default partitioning scheme.

11 Select how the ESX Server will boot:

- **From a drive (install on the MBR of the drive)** – Use this option for most installations.

This drive must match the first boot device set in the host BIOS. If these settings do not match, the host cannot boot into the ESX Server software. See also [Step 10](#).

---

**NOTE** To boot an ESX Server host from a SAN, choose a SAN-based LUN from the drop-down menu.

---

- **From a partition** – Use this option for legacy hardware that stores BIOS information in the MBR.

Do not select an optical drive as the location for the boot loader.

12 Configure boot options:

- **General kernel parameters** – To add default options to the boot command, enter them into the kernel parameters field. Any options you enter are passed to the ESX Server kernel every time it boots.
- **Force LBA32** – Use this option to exceed the 1024 cylinder limit for the /boot partition. If you have a system that supports the LBA32 extension for booting operating systems above the 1024 cylinder limit, and you want to place your /boot partition above cylinder 1024, select this option. This is usually needed only for legacy hardware.

---

**NOTE** The installer might provide the entry `hda=ide-scsi` for CDR, CDRW, and DVD burning drives. If this parameter is provided by the installer, do not change it.

---

- 13 Click **Next** to continue the installation.
- 14 Configure the network settings.
  - a Select the network interface for use by the ESX Server console. If you are using the text installer, click **OK** to proceed.

---

**NOTE** Virtual machine network traffic shares this network adapter until you configure a virtual switch for another network adapter. You can configure other network adapters at a later time from the Virtual Infrastructure Client.

---

- b Configure the ESX Server host network IP address. If you are using the text installer, click **OK** to proceed.

VMware recommends that you use a static IP address to simplify client access. If you do not have the required network configuration information, see your network administrator for assistance.
  - c Enter the ESX Server host name. Type the complete machine name, including the domain where appropriate.

This option is available only if you have opted to use a static IP address.
  - d If your network requires a VLAN ID, enter a VLAN ID.
  - e Select **Create a default network for virtual machines** to create a default port group for virtual machines.

---

**NOTE** If you select **Create a default network for virtual machines**, your virtual machines will share a network adapter with the service console, which is not the recommended configuration for optimum security. If you do not select this option, create a network connection for your virtual machines as described in [“Configuring Network Connections”](#) on page 49.

---

- f Click **Next**.



- 15 Set your time zone by completing the following steps:
  - a Click the **Map** tab to display the map.
  - b Click the city nearest to your location on the map.
  - c Select the check box for using UTC (Coordinated Universal Time) if appropriate.
  - d Click **Next**.

If you prefer, you can use the **Location** tab to set the time zone by selecting a city from a list or use the **UTC Offset** tab to set the time zone as an offset from Greenwich Mean Time (GMT).

- 16 Enter a root password. Type the same password into both fields, and click **Next**.  
The root password must contain at least six characters.
- 17 Confirm your installation configuration, and click **Next**.  
Progress bars appear to show the status of the installation, and a dialog box informs you when the installation is complete.
- 18 Click **Finish** to exit.

## Postinstallation Considerations

For information on postinstallation activities such as installing additional hardware on your ESX Server host, refer to the *Installation and Upgrade Guide*.

## Where to Go from Here

At this point, you have installed ESX Server on a host. You have completed the installation of all the major components of VMware Infrastructure.

Continue with the next chapter to learn how to manage your VMware Infrastructure components.



# CHAPTER 3    **Creating and Managing VMware Infrastructure Components**

This chapter provides an introduction to creating and managing VMware Infrastructure components. It contains the following sections:

- [“Starting the VI Client and Logging On”](#) on page 31
- [“Setting Up a Datacenter”](#) on page 32
- [“Creating a Virtual Machine”](#) on page 38
- [“Configuring Permissions for Users”](#) on page 42
- [“Resource Pools”](#) on page 46
- [“Configuring Network Connections”](#) on page 49
- [“Installing Guest Operating Systems”](#) on page 53
- [“Managing Virtual Machines”](#) on page 54
- [“Tasks and Events”](#) on page 59

## **Starting the VI Client and Logging On**

With the VI Client, you can manage your ESX Server hosts as a group through VirtualCenter or individually by connecting directly to the host. VMware recommends logging on to the VirtualCenter Server. In addition to other functionality, you’ll enjoy an aggregated, datacenter-level view of multiple ESX Server hosts.

When you log in to the VI Client, you can choose between connecting to a VirtualCenter Server, or connecting directly to an ESX Server host:

- If you manage your ESX Server hosts through VirtualCenter Server, the users who can log on to the VirtualCenter Server are users in the Windows domain. When you first log on to the VirtualCenter Server, all users in the Windows Administrators group are assigned VirtualCenter Administrator privileges by default. You, as a VirtualCenter Administrator, need to explicitly grant permissions for all other VirtualCenter users and user groups.

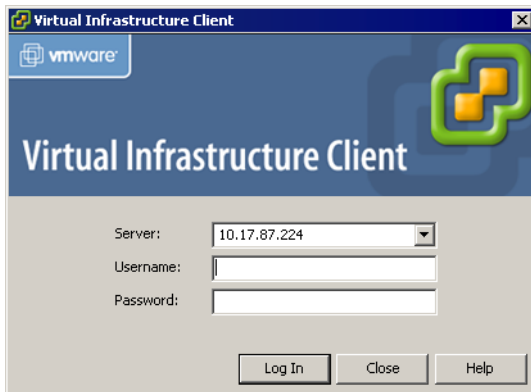
- If you manage your ESX Server hosts individually through a direct connection with the VI Client, the users who can log on to the host are users you explicitly create for the host using the VI Client. When you first log onto the host, you must do so as root. You can then create additional users and user groups, granting permissions as appropriate.

### To start the VI Client and log on

- 1 To launch the VI Client, double-click a shortcut, or choose the application through **Start > Programs > VMware > VMware Virtual Infrastructure Client 2.0**.

The **Virtual Infrastructure Client** logon dialog box appears.

- 2 Type the host name or IP address of a VirtualCenter Server or an ESX Server host, depending on what you want to access.



- 3 To log on to a VirtualCenter Server, enter an appropriate Windows domain user name and password. If this is the first time you are logging on, log on as Windows Administrator so you can set permissions for other users.
- 4 To log on to an individual ESX Server host, enter a user name that will be accepted by the ESX Server host's service console. If this is the first time you are logging on, log on as root and use the password that you entered while installing ESX Server.
- 5 Click **Log In**.

## Setting Up a Datacenter

When you set up a datacenter, you bring one or more ESX Server hosts under VirtualCenter management, create virtual machines, and determine how you want to organize virtual machines and manage resources.

When you set up a datacenter, you complete a minimum of three tasks in the following order:

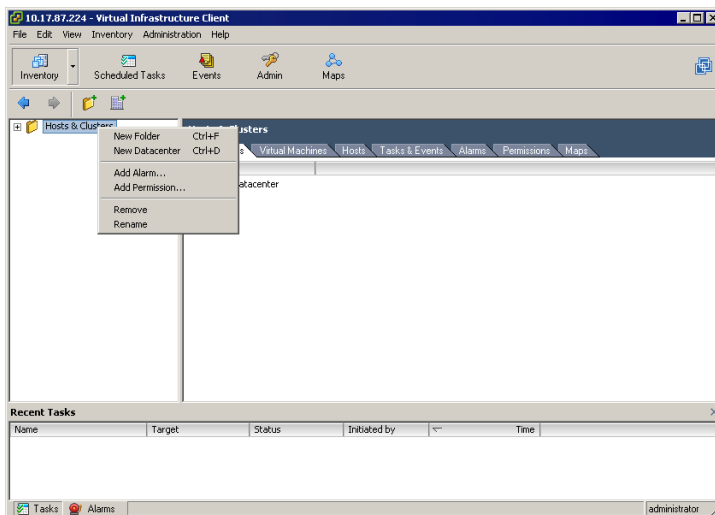
- 1 **Create datacenters.**
- 2 **Bring hosts under VirtualCenter management.**
- 3 **Create virtual machines.**

## Creating a Datacenter

You create datacenters as containers for your hosts, virtual machines, resource pools, and clusters. Use datacenters to create organizational structures so that you can dedicate virtual configurations to specific departments, build isolated virtual environments for testing, or otherwise organize your environment.

### To create a datacenter

- 1 Click **Inventory** in the navigation bar to display the inventory panel.
- 2 Click the arrow to the right of the **Inventory** button.
- 3 Choose **Hosts and Clusters**.
- 4 Right-click the **Hosts & Clusters** folder icon in the inventory panel, and choose **New Datacenter** from the pop-up menu.



A datacenter icon is added to the inventory.

- 5 Type a name for your datacenter.

If you want to further subdivide the datacenter, you can create folders and folder hierarchies for specific host or resource groups. The method for creating folders is similar to the method you used to create your datacenter—just choose **New Folder** instead of **New Datacenter**.

## Bringing a Host Under VirtualCenter Management

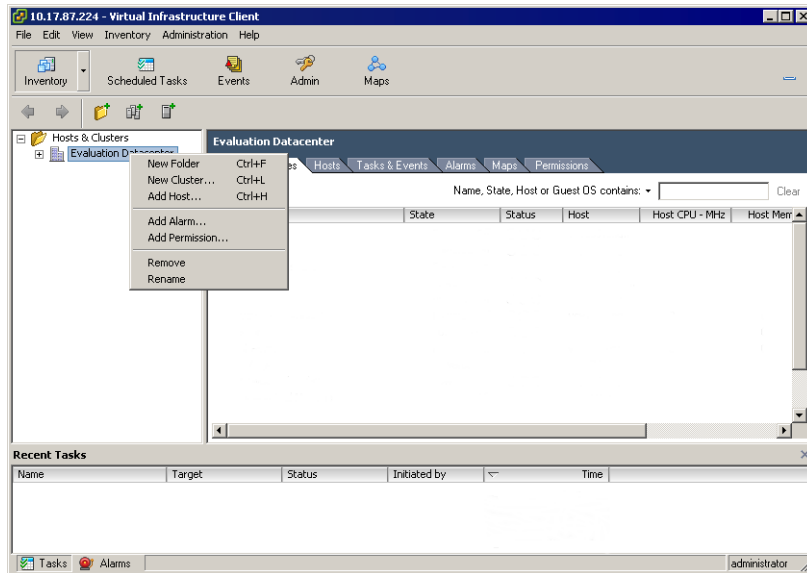
You bring hosts under VirtualCenter to serve as residences for the virtual machines you create. Hosts provide the CPU and memory resources utilized by virtual machines and give virtual machines access to storage and with network connectivity. To bring a host under VirtualCenter management, you complete a minimum of three tasks in the following order:

- 1 **Add the host to the VirtualCenter inventory.**
- 2 **Choose a license type.**
- 3 **Configure permissions for users.**

In a production environment, you might also configure host settings such as CPU, memory, storage, networking, security, and so forth. For information on these tasks, see the *Server Configuration Guide*.

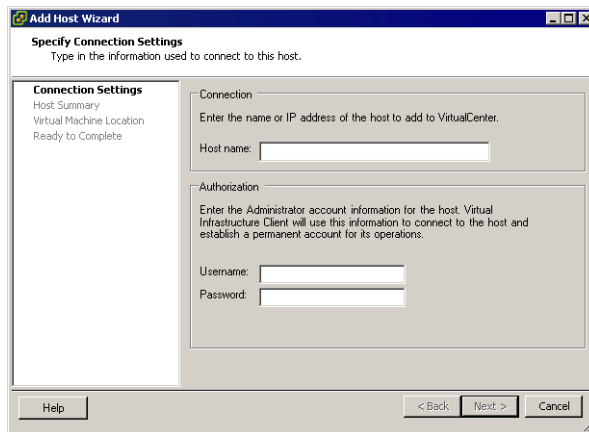
### To add a host to the inventory

- 1 Click **Inventory** in the navigation bar to display the inventory panel.
- 2 Right-click the datacenter you just created, and choose **New Host**. If you created a folder to contain the host, right-click the folder instead, and choose **New Host**.



The **Add Host Wizard** appears.

- 3 Type the **Host Name** of the host on the **Connection Settings** page.



- 4 Type **root** in the **Username** field, and type the root password you chose for the host during ESX Server installation in the **Password** field.
- 5 Click **Next**, and review the information on the **Host Summary** page. Click **Next** again.

- 6 Select a datacenter or a folder from the Virtual Machines and Templates inventory as the location of the host's virtual machines. Click **Next**.
- 7 Review the information on the final page of the **Add Host Wizard**, and click **Finish**.

When you finish the wizard, VirtualCenter Server does the following:

- Searches the network for the host and determines whether the host has any virtual machines.
- Connects the host. If the wizard can't connect the host, it doesn't add the host to the inventory.
- Verifies that the host is not already being managed by another datacenter. If so, VirtualCenter displays a message.

---

**NOTE** If VirtualCenter can connect to the host but for some reason cannot maintain the connection, the host is added in a disconnected state. This occurs, for example, if the host is already being managed by another VirtualCenter Server.

---

- Reads the number of processors on the host and allocates the appropriate number of licenses. The number of processors is stored in the VirtualCenter database and is verified during each host reconnection and VirtualCenter startup.
- Verifies that the host version is supported. If not, VirtualCenter checks to see if the host can be upgraded to a supported version. If the host can be upgraded, the VI Client prompts you to perform an upgrade.

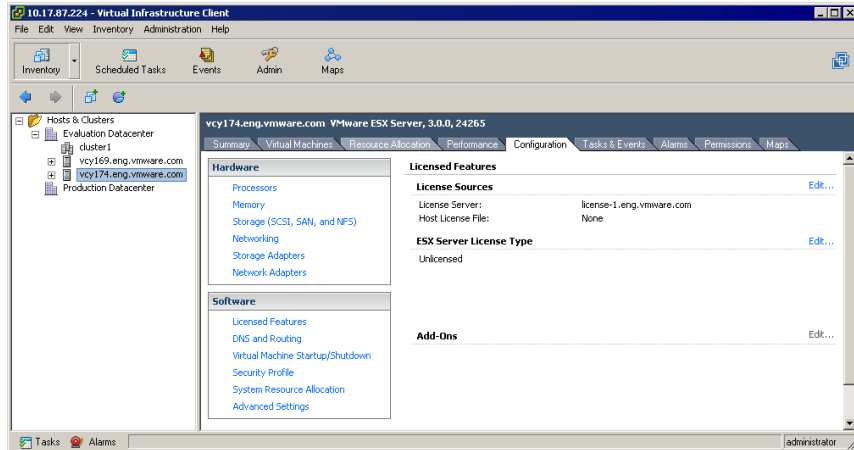
After this sequence completes successfully, the host appears in the VI Client inventory panel.

#### **To select the license type for the host**

- 1 Select the host in the inventory panel, and click the **Configuration** tab.
- 2 Click **License Features**.

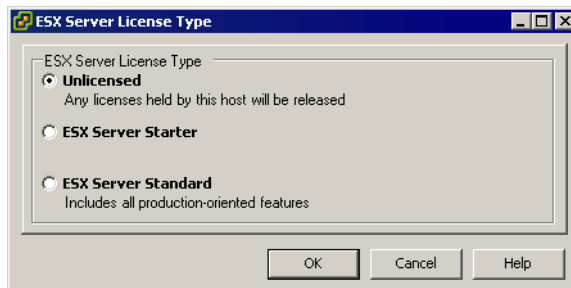
The **Licensed Features** page appears.





- 3 Click **Edit** next to **ESX Server License Type**.

The **ESX Server License Type** dialog box appears.



- 4 Select your license type, and click **OK**.
- 5 Click **Edit** next to **Add Ons**.  
The Add Ons dialog box appears.
- 6 Select any add-on features you have licensed from the list, and click **OK**.

## Where to Go from Here

At this point, you have:

- Created a datacenter in your VirtualCenter Server inventory.
- Added an ESX Server host to your VirtualCenter Server inventory.
- Configured the license type for your ESX Server host.

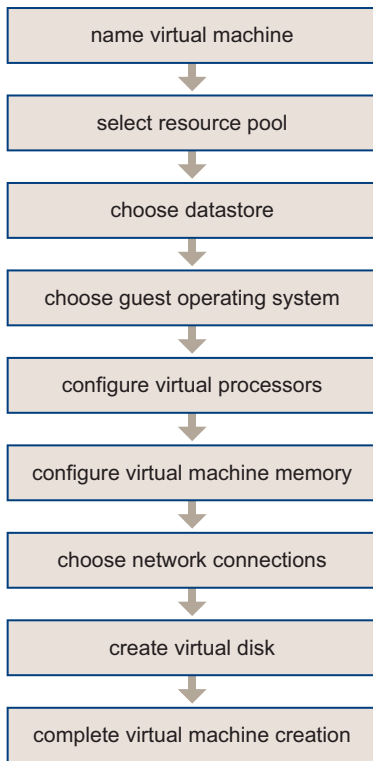
For more information on managing your VirtualCenter Server inventory, see *Basic System Administration*.

Continue with the next section to learn about creating virtual machines.

## Creating a Virtual Machine

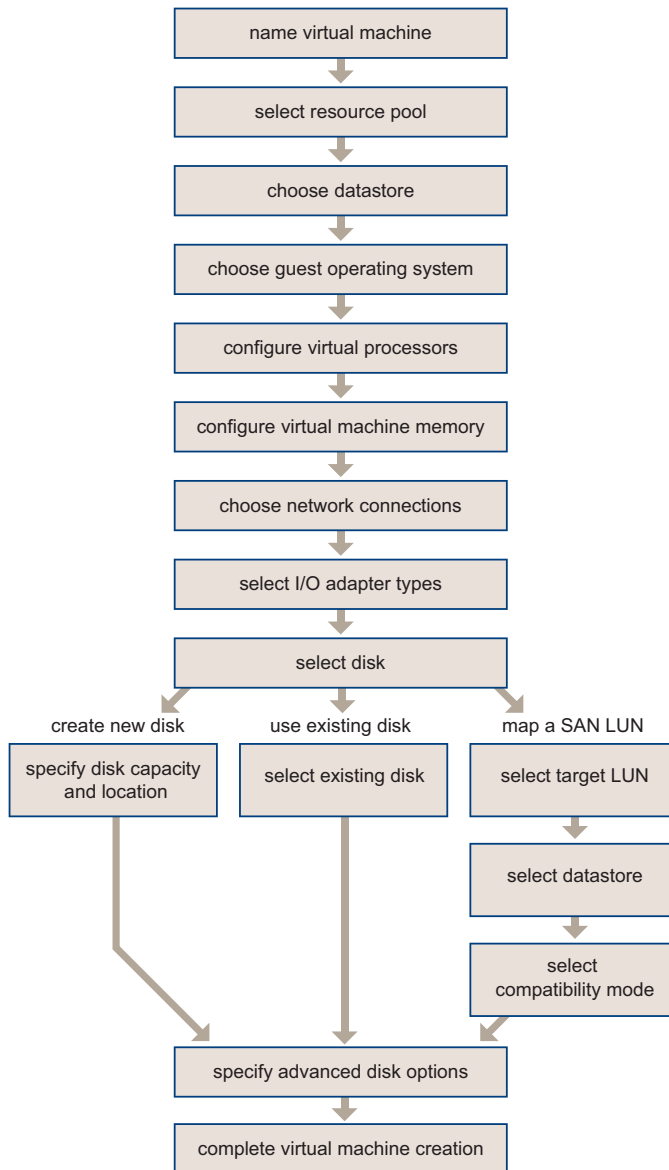
The VI Client provides a simple and flexible user interface from which you can create new virtual machines through manual configuration, from templates, or by cloning existing virtual machines. All virtual machines are created in place using a wizard that guides you through the steps to produce a complete and working virtual machine. The typical path shortens the process by skipping some choices that rarely need changing from their defaults.

Figure 3-1 shows the flow of a typical virtual machine creation.



**Figure 3-1.** Creation of a Virtual Machine Using the Typical Path

Figure 3-2 shows the flow of a custom virtual machine creation.



**Figure 3-2.** Creation of a Virtual Machine Using the Custom Path

After you create a datacenter and add a host (clustered or standalone), you can add virtual machines to clusters or hosts using the New Virtual Machine Wizard. This guide describes the procedure for adding a virtual machine using the typical path. For more

information on creating virtual machines using the custom path, see the *VI Client Online Help*.

### **To create a virtual machine from the VI Client**

- 1 Click **Inventory** in the navigation bar, and expand the inventory as needed.
- 2 In the inventory list, select the managed host or cluster to which you want to add the new virtual machine.
- 3 From the **File** menu, choose **New > Virtual Machine**.  
The Wizard Type page appears.
- 4 Select the configuration type **Typical**, and click **Next**.  
The Name and Folder page appears.
- 5 On the Name and Folder page:
  - a Type a name in the **Virtual Machine Name** field for your virtual machine.  
This name appears in the VI Client inventory. It is also used as the name of the virtual machine's files.
  - b To set the inventory location for your virtual machine, select a folder or the root of a datacenter from the list under **Virtual Machine Inventory Location** list.
  - c Click **Next**.  
If your host or cluster contains resource pools, the Resource Pool page appears.
- 6 Select the resource (a host, cluster, or resource pool) in which you want to run the virtual machine, and click **Next**.  
The Datastore page appears.
- 7 Select a datastore in which to store the virtual machine files, and click **Next**.  
The Guest Operating System page appears.
- 8 On the Guest Operating System page:
  - a Under **Guest Operating System**, select the operating system family (Microsoft Windows, Linux, Novell NetWare, Solaris, or Other).

- b Choose the version from the drop-down menu, and click **Next**.

---

**NOTE** VirtualCenter does not install the guest operating system. The New Virtual Machine Wizard uses this information to select appropriate default values, such as the amount of memory needed. See [“Installing Guest Operating Systems”](#) on page 53 to install guest operating systems.

---

If the host is multiprocessor and the guest operating system supports SMP, the **Virtual CPUs** page appears.

- 9 Choose the number of virtual processors in the virtual machine from the drop-down list, and click **Next**.

The **Memory** page appears.

- 10 Click any of the colored arrows to set the memory size, and click **Next**.

You can also drag the slider or select the number using the up and down arrows.

The **Network** page appears.

- 11 Choose network connections:

- a Select the number of NICs you want to connect to.
- b For each NIC, use the Network pull-down menu to choose one of the port groups that are configured for virtual machine use on the host.  
  
If no virtual machine port groups are configured, a warning dialog box appears, and you cannot configure any virtual network cards.
- c For each NIC that you do not want the virtual network adapter to connect when the virtual machine is powered on, deselect the **Connect at Power On** check box.
- d Click **Next**.

The **Virtual Disk Capacity** page appears.

- 12 Enter the disk size in megabytes (MB) or gigabytes (GB) in the **Disk Size** field, and click **Next**.

The **Ready to Complete** page is displayed.

- 13 Review your choices, and click **Finish**.

## Where to Go from Here

At this point, you have created a virtual machine. For more information about creating virtual machines and adding existing virtual machines to your VirtualCenter Server inventory, see the *Basic System Administration Guide* and the *VI Client Online Help*.

Continue with the next section to learn about permissions.

## Configuring Permissions for Users

Access to VirtualCenter, its administrative functions, and its resources is granted based on permissions assigned to users. For example, one user might have permissions that allow him or her to create virtual machines on the host, and another user might have permissions that allow him or her to power on virtual machines but not create them.

For VirtualCenter, permissions are defined as access roles that consist of a user and the user's assigned role for an object such as a virtual machine or ESX Server host. A role is a predefined set of privileges. VirtualCenter provides two types of default roles—system roles and sample roles. While you cannot change the privileges associated with system roles, you can change sample role privileges. Within each role type, each subsequent role inherits the privileges of the previous role. [Table 3-1](#) contains a list of default roles you can assign to users.

**Table 3-1. Default Roles**

Role	Type	Description
No Access User	system	Users cannot view or change the object. If you set a No Access role for a particular object, users can select the VI Client tabs associated with the no-access object, but the tab displays no content. The No Access role is the default.
Read Only User	system	Users can view the state of the object and details about the object. Users can view all the tab panels in the VI Client except the console tab. All actions through the menus and toolbars are disallowed.
Administrator	system	Users can change privileges for an object. They can add, remove, and set access rights and privileges for all the VirtualCenter users and all the virtual objects in the VMware Infrastructure environment.
Virtual Machine User	sample	Users can perform actions only on the virtual machine level.
Virtual Machine Power User	sample	Users can perform actions on the virtual machine, resource, and scheduled task levels.

**Table 3-1. Default Roles (Continued)**

Role	Type	Description
Resource Pool Administrator	sample	Users can perform actions on the following levels: datastore, host, virtual machine, resource, alarm management, and scheduled task. This role provides resource delegation.
Datacenter Administrator	sample	Users can perform actions on the following levels: global, folder, datacenter, datastore, host, virtual machine, resource, alarm management, and scheduled task.
Virtual Machine Administrator	sample	Users can perform actions on the following levels: global, folder, datacenter, datastore, host, virtual machine, resource, alarm management, scheduled task, and sessions. This role provides additional fine-grained privileges not available for the Datacenter Administrator role.

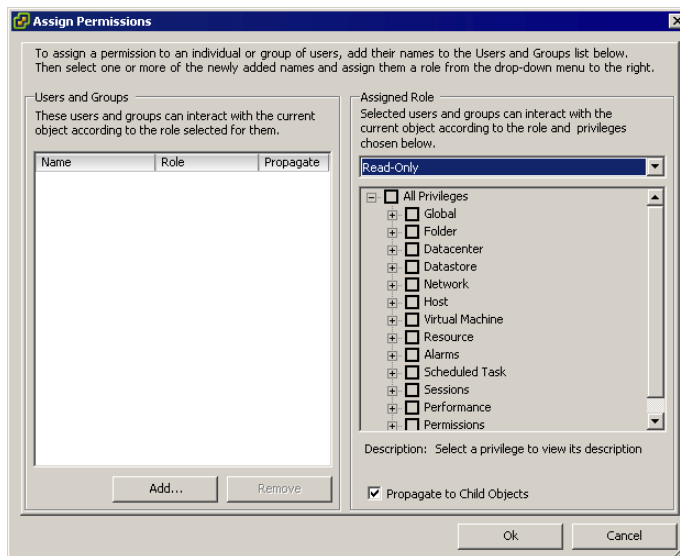
Permissions grant users and user groups the right to perform specific activities and manage VirtualCenter-managed objects such as hosts and virtual machines. For example, to configure memory for an ESX Server host, you must have a permission that grants host configuration privileges.

#### To set up permissions for users or user groups

- 1 Click the **Inventory** button in the navigation bar and expand the inventory as needed.
- 2 Right-click the appropriate object, and choose **Add Permission**.

You can assign permissions to all managed entities, such as folders, datacenters, clusters, resource pools, hosts, and virtual machines.

The **Assign Permissions** dialog box opens.



- 3 Select a role from the **Assigned Role** list.

All privileges granted for the role are marked with a check.

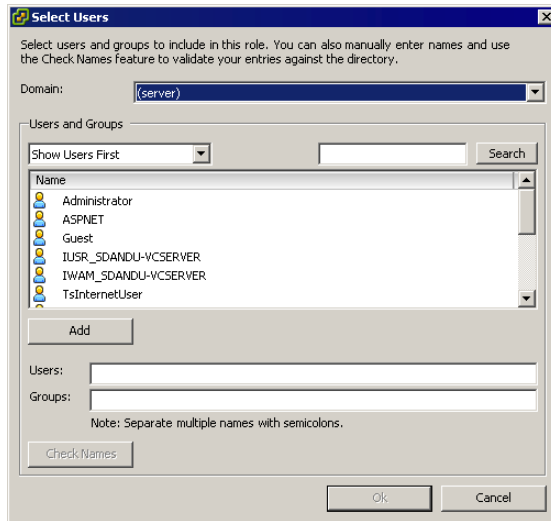
- 4 To apply the role to the object's children, select **Propagate to Child Objects**.

With propagation, the role you select is inherited by all lower-level objects in the hierarchy. For example, if you select the Administrator role for a host, the user associated with the role gains administrator privileges on the host and all the host's virtual machines when the permission is created.

- 5 Click the **Add** button.

The **Select Users** dialog box appears.





- 6 Select the domain that contains the user or user group you want to associate with the role.
- 7 Type a name in the **Search** box, or select a name from the **Name** list.

---

**NOTE** You can use the **Users and Groups** drop-down menu to indicate whether you want to see the **Name** list in alphabetical order, users first, or groups first.

---

- 8 Click **Add** to add the name to the **Users** or **Groups** field. To add more than one name, repeat Steps 6–8.
- 9 Click **OK** when you finish selecting users.

The VI Client closes the **Select User** dialog box and populates the **Users and Groups** list on the **Assign Permissions** dialog box.

- 10 Click **OK**.

The server adds the permission to the list of permissions for the object. The list of permissions references all users and groups who have roles assigned to the object and where in the hierarchy those roles are assigned.

## Where to Go from Here

At this point you have learned how to define permissions for users. For more information on permissions and roles, see *Basic System Administration*.

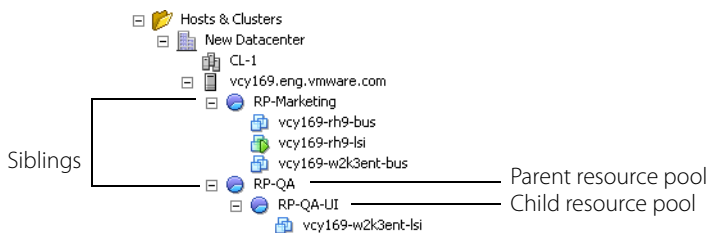
## Resource Pools

You can use resource pools to hierarchically partition available CPU and memory resources.

Each standalone host and each DRS cluster has an (invisible) root resource pool that groups the resources of that host or cluster. The root resource pool is not displayed because the resources of the host (or cluster) and the root resource pool are always the same. If you don't create child resource pools, only the root resource pools exist.

Users can create child resource pools of the root resource pool or of any user-created child resource pool. Each child resource pool owns some of the parent's resources and can, in turn, have a hierarchy of child resource pools to represent successively smaller units of computational capability.

A resource pool can contain child resource pools, virtual machines, or both. This creates a hierarchy of shared resources. The resource pools at a higher level are called parent resource pools, while the resource pools and virtual machines that are at the same level are called siblings.



**Figure 3-3.** Hierarchical Resource Pools

In [Figure 3-3](#), RP-QA is the parent resource pool for RP-QA-UI. RP-Marketing and RP-QA are siblings. The three virtual machines immediately below RP-Marketing are also siblings.

For each resource pool, you can specify reservation, limit, shares, and whether the reservation should be expandable. The resource pool resources are then available to child resource pools and virtual machines.

## Creating Resource Pools

You can create a child resource pool of any host, resource pool, or DRS cluster.

---

**NOTE** If a host has been added to a cluster, you can no longer create child resource pools of that host. You can create child resource pools of the cluster if the cluster is enabled for DRS.

---

When you create a child resource pool, you are prompted for resource pool attribute information. The system uses admission control to make sure you can't allocate resources that aren't available. See the *Resource Management Guide* for more information.

### To create a resource pool

- 1 Select the intended parent, and choose **File > New > New Resource Pool** (or click **New Resource Pool** in the Commands panel of the Summary tab).
- 2 In the New Resource Pool dialog box, provide the following information for your resource pool.

Field	Description
Name	Name of the new resource pool.

#### CPU Resources

Shares	Number of CPU shares the resource pool has with respect to the parent's total. Sibling resource pools share resources according to their relative share values bounded by the reservation and limit. You can choose <b>Low</b> , <b>Normal</b> , or <b>High</b> , or choose <b>Custom</b> to specify a number that assigns a share value.
Reservation	Guaranteed CPU allocation for this resource pool.
Expandable Reservation	Use this check box to indicate that, if virtual machines are powered on in this resource pool, and the reservations of the virtual machines combined are larger than the reservation of the resource pool, the resource pool can use a parent's or ancestor's resources. Default is selected.
Limit	Upper limit for the amount of CPU the host makes available to this resource pool. Default is <b>Unlimited</b> . To specify a limit, deselect the <b>Unlimited</b> check box and type in the number.

#### Memory Resources

Shares	Number of memory shares the resource pool has with respect to the parent's total. Sibling resource pools share resources according to their relative share values bounded by the reservation and limit. You can choose <b>Low</b> , <b>Normal</b> , or <b>High</b> , or choose <b>Custom</b> to specify a number that assigns a share value.
Reservation	Guaranteed memory allocation for this resource pool.

Field	Description
Expandable Reservation	Use this check box to indicate that more than the specified reservation should be allocated if resources are available in a parent.
Limit	Upper limit for this resource pool's memory allocation. Default is <b>Unlimited</b> . To specify a different limit, deselect the <b>Unlimited</b> check box.

- After you've made all choices, click **OK**.

VirtualCenter creates the resource pool and displays it in the inventory panel.

---

**NOTE** A yellow triangle indicates that a value is not legal because of limitations on total available CPU and memory. You cannot enter values larger than the legal values. For example, if you have a resource pool with a reservation of 10GB, and you created a child resource pool with a reservation of 6GB, you cannot create a second child resource pool with a reservation of 6GB and Type set to **Fixed**. The two child reservations would total more than the parent reservation.

---

## Adding Virtual Machines to Resource Pools

When you create a new virtual machine, the Virtual Machine Wizard allows you to add it to a resource pool as part of the creation process. See [“Creating a Virtual Machine”](#) on page 38. You can also add an already existing virtual machine to a resource pool as described below.

### To add an existing virtual machine to a resource pool

- Select the virtual machine from any location in the inventory.
 

The virtual machine can be associated with a standalone host, a cluster, or a different resource pool.
- Drag the virtual machine (or machines) to the desired resource pool object.
 

When you move a virtual machine to a new resource pool:

  - The virtual machine's reservation and limit do not change.
  - If the virtual machine's shares are high, medium, or low, %Shares adjusts to reflect the total number of shares in use in the new resource pool.

- If the virtual machine has custom shares assigned, the share value is maintained.

---

**NOTE** If the virtual machine would receive a very large percentage of total shares, a warning is displayed.

---

- The information displayed in the Resource Allocation tab about the resource pool's reserved and unreserved CPU and memory resources changes to reflect the reservations associated with the virtual machine (if any).

---

**NOTE** CPU and memory reserved and unreserved change only if the virtual machine is powered on. If the virtual machine has been powered off or suspended, it can be moved, but overall available resources for the resource pool are not affected.

---

If a virtual machine is powered on, and the destination resource pool does not have enough CPU or memory to guarantee the virtual machine's reservation, the move fails because admission control does not allow it. An error dialog box explains the situation. The dialog box compares available and requested resources, so you can consider whether an adjustment would resolve the issue.

## Where to Go from Here

At this point you have:

- Created a resource pool.
- Added an existing virtual machine to a resource pool.

For more information about resource pools, shares, and reservations, refer to *Basic System Administration* and the *Resource Management Guide*. For more information about managing resources using resource pools and VMware DRS, refer to the *Resource Management Guide*.

Continue on to the next section to learn about configuring network connections.

## Configuring Network Connections

Networking for the service console, which runs the management services, is set up by default during the installation of ESX Server.

If you selected the default option to create a port group for virtual machines during ESX Server installation (see [“Installing ESX Server”](#) on page 24), you do not need to configure networking for your virtual machines. However, in this default

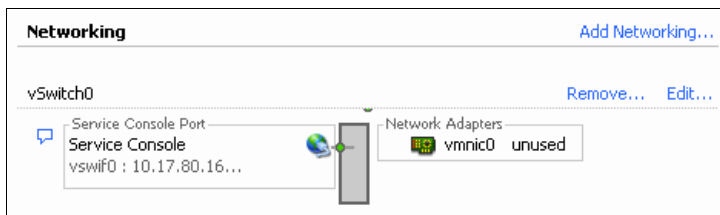
configuration, virtual machine network traffic shares a network adapter with the service console. For security and other reasons, VMware recommends that virtual machine traffic not share a network adapter with the service console. Follow the procedure below to create a new virtual network for your virtual machines. Refer to the *Server Configuration Guide* for more information on network configuration.

If you did not select the default option to create a port group for virtual machines during ESX Server installation, you must create a virtual network for your virtual machines as described below.

### To create or add a virtual network for a virtual machine

- 1 Log on to the VMware VI Client, and select the server from the inventory panel.  
The hardware configuration page for this server appears.
- 2 Click the **Configuration** tab, and click **Networking**.
- 3 On the right side of the screen, click **Add Networking**.

Virtual switches are presented in an overview plus details layout.



- 4 Click **Add Networking** from the **Configuration** tab, or select **Edit** for a vSwitch and click the **Add** button on the **Properties** dialog box.

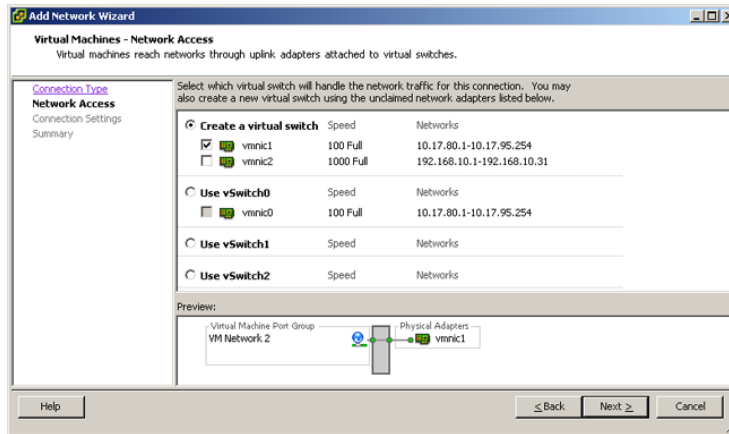
The **Add Networking Wizard** appears.

---

**NOTE** The **Add Networking Wizard** is reused for new ports and port groups.

---

- 5 As a connection type, select **Virtual Machines**, which is the default.  
Selecting **Virtual Machines** lets you add a labeled network to handle virtual machine network traffic.
- 6 Click **Next**.  
The **Network Access** page appears.



Virtual machines reach physical networks through uplink adapters. A vSwitch is able to transfer data to external networks only when one or more network adapters are attached to it. When two or more adapters are attached to a single vSwitch, they are transparently teamed.

7 Select **Create a virtual switch**.

You can create a new vSwitch with or without Ethernet adapters.

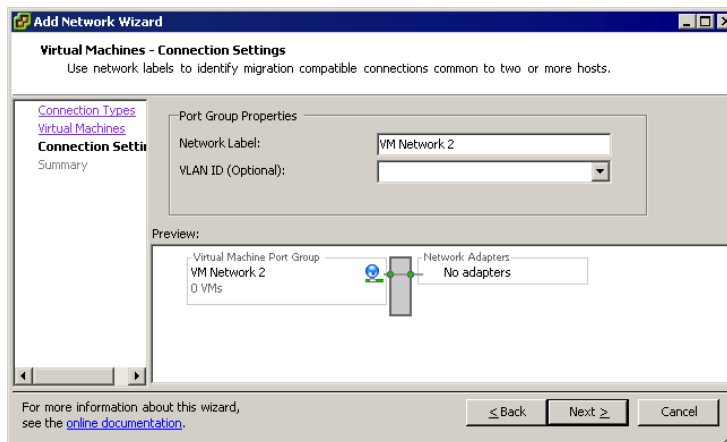
If you create a vSwitch without physical network adapters, all traffic on that vSwitch will be confined to that vSwitch. No other hosts on the physical network or virtual machines on other vSwitches will be able to send or receive traffic over this vSwitch. This might be desirable if you want a group of virtual machines to be able to communicate with each other but not with other hosts or with virtual machines outside the group.

Changes are reflected in the **Preview** pane. Outbound adapters are listed.

8 Click **Next**.

The **Connection Settings** page appears.

9 Under **Port Group Properties**, type a network label that identifies the port group that you are creating.



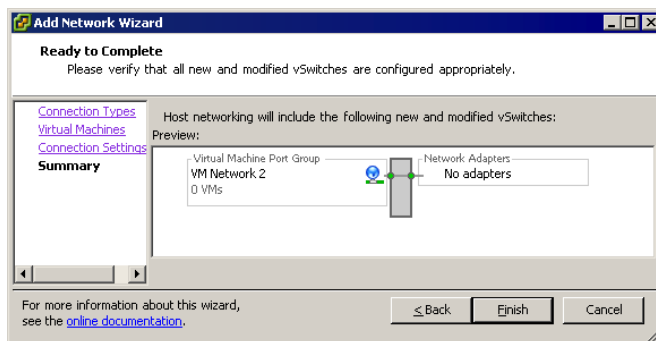
Use network labels to identify migration-compatible connections common to two or more hosts.

- 10 If you are using a VLAN, in the **VLAN ID** field, type a number between 1 and 4095.

If you are unsure what to enter, leave this blank or ask your network administrator.

- 11 Click **Next**.

The **Ready to Complete** page appears.



- 12 After you have determined that the vSwitch is configured correctly, click **Finish**.

---

**NOTE** To enable failover (NIC teaming), bind two or more adapters to the same switch. If one outbound adapter is not operational, network traffic is routed to another adapter attached to the switch.

---



## Where to Go from Here

At this point, you have created a virtual switch for virtual machine network traffic.

For more information on configuring networking, including information on configuring networking for the service console, configuring virtual switches for VMotion, and security recommendations for network configuration, refer to the *Server Configuration Guide*.

Continue with the next section to learn about installing guest operating systems.

## Installing Guest Operating Systems

This section describes the basic steps for installing a guest operating system in a virtual machine. For detailed instructions regarding your particular guest operating system, consult the *Guest Operating System Installation Guide*.

### Basic Installation Steps

To install a guest operating system, you must have a CD-ROM or ISO image containing the installation files.

#### To install a guest operating system

- 1 Log on to VirtualCenter Server using the VI Client.
- 2 In the inventory, select the virtual machine on which you want to install a guest operating system. In the Summary tab, click **Edit Settings**.
- 3 Select CD/DVD Drive 1. Select one of the following options:
  - **Client Device** – Select this option to connect the virtual CD-ROM device to a CD-ROM device on the machine from which you are running the VI Client.
  - **Host Device** – Select this option to connect the virtual CD-ROM device to a device on the ESX Server host machine on which this virtual machine is located. Choose the device from the drop-down menu.
  - **Datastore ISO File** – Select this option to connect the virtual CD-ROM device to an ISO file on a datastore. Click Browse to locate and select the file.
- 4 Click **OK**.
- 5 If you are installing from a CD-ROM, insert the disc into the appropriate drive, depending on what you selected in [Step 3](#).
- 6 Click **Power On** to power on the virtual machine.

- 7 If you selected **Client Device** as your CD/DVD Drive option, click **Virtual CDROM(ide0:0)** in the toolbar, and select the local CD-ROM device to connect to.
- 8 Click the **Console** tab to display the virtual machine console, and follow the installation instructions provided by the operating system vendor.

## VMware Tools

VMware Tools is a suite of utilities that enhances the performance of the virtual machine's guest operating system and improves management of the virtual machine. Installation of VMware Tools in the guest operating system is vital. Although the guest operating system can run without VMware Tools, you lose important functionality and convenience.

### To install VMware Tools in a guest operating system

- 1 From the VI Client, power on your virtual machine, and log on as a user with Administrator privileges.
- 2 In the VI Client inventory list, right-click the virtual machine, and choose **Install VMware Tools** from the drop-down menu.
- 3 Click the **Console** tab to display the virtual machine console.
- 4 Follow the prompts given by the VMware Tools installer.
- 5 Reboot your virtual machine when the installer prompts you to do so.

## Where to Go from Here

At this point, you have:

- Installed a guest operating system on a virtual machine.
- Installed VMware Tools.

For more information on installing guest operating systems and VMware Tools, including instructions specific to your guest operating system, refer to the *Guest Operating System Installation Guide*.

To learn more about managing virtual machines, continue with the next section, [“Managing Virtual Machines.”](#)

## Managing Virtual Machines

This section describes the power states of virtual machines, and how to power them on and off.

## Understanding Virtual Machine Power States

The basic power state options for virtual machines include:

- **Power on** – Powers up the virtual machine and boots the guest operating system if the guest operating system is installed.
- **Power off** – Powers down the virtual machine. The virtual machine does not attempt to shut down the guest operating system gracefully.
- **Suspend** – Pauses the virtual machine activity. All transactions are frozen until you issue a resume command.
- **Resume** – Allows virtual machine activity to continue and releases the suspended state.
- **Reset** – Shuts down the guest operating system and restarts it. If the guest operating system does not support this operation, VMware Tools must be installed.

The following power options perform extra functions in addition to the basic virtual machine power operations. VMware Tools must be installed in the virtual machine to perform these functions.

- **Shut down guest** – Shuts down the guest operating system. If the guest operating system automatically powers off after shutting down, the virtual machine also powers off.
- **Restart guest** – Shuts down and restarts the guest operating system without powering off the virtual machine.

Toolbar power buttons perform as follows:

- **Power off** – Powers off the virtual machine when VMware Tools is not installed or unavailable, or shuts down the guest operating system when VMware Tools is installed and available. A power off operation displays a confirmation dialog box indicating that the guest operating system might not shut down properly.
- **Power on** – Powers on a virtual machine when a virtual machine is stopped, or resumes the virtual machine and runs a script when a virtual machine is suspended and VMware Tools is installed and available. Resumes the virtual machine and does not run a script when VMware Tools is not installed.
- **Suspend** – Suspends the virtual machine without running a script when VMware Tools is not installed, or runs a script and suspends the virtual machine when VMware Tools is installed and available.
- **Reset** – Resets the virtual machine when VMware Tools is not installed, or restarts the guest operating system when VMware Tools is installed and available. A reset

operation displays a confirmation dialog box indicating that the guest operating system is not shut down properly.

---

**NOTE** The specific form of the power state action can be modified to include guest operating system shutdowns or not and to include running scripts or not.

---

## Manually Powering a Virtual Machine On and Off

Prior to changing any power state on a virtual machine, you must have added the virtual machine to your Virtual Infrastructure environment.

### To manually change the power state of a virtual machine

- 1 Click the **Inventory** button in the navigation bar.
- 2 Expand the inventory as needed, and click the appropriate virtual machine.
- 3 Click the power option from the toolbar, or choose **Inventory > Virtual Machine** from the pull-down menu, the right-click menu, or the Commands window.

If an option is not currently available, it is dimmed and unselectable.

After the power option is selected, Virtual Infrastructure Client displays messages in **Recent Tasks** indicating the transition modes.

## Using Suspend and Resume

The suspend and resume feature is most useful when you want to save the current state of your virtual machine and pick up work later with the virtual machine in the same state.

Once you resume and do additional work in the virtual machine, you cannot return to the state the virtual machine was in at the time you suspended. To preserve the state of the virtual machine so you can return to the same state repeatedly, take a snapshot. Refer to *Basic System Administration* or the *VI Client Online Help* for more information.

The speed of the suspend and resume operations depends on how much data has changed while the virtual machine has been running. In general, the first suspend operation takes a bit longer than later suspend operations do.

When you suspend a virtual machine, a file with a `.vmss` extension is created. This file contains the entire state of the virtual machine. When you resume the virtual machine, its state is restored from the `.vmss` file.

### To suspend a virtual machine

- 1 If your virtual machine is running in full screen mode, return to window mode by pressing the Ctrl-Alt key combination.
- 2 Click **Suspend** on the VI Client toolbar.
- 3 When the VI Client has completed the suspend operation, exit the VI Client.

### To resume a virtual machine that you have suspended

- 1 Start the VI Client, and select a virtual machine that you have suspended.
- 2 Click the **Power On** button on the VMware Virtual Infrastructure Client toolbar, or choose the Power On option from the right-click menu or the Commands window.

---

**NOTE** Any applications you were running at the time you suspended the virtual machine are running, and the content is the same as it was when you suspended the virtual machine.

---

## Editing Virtual Machine Settings

In addition to customizing a virtual machine while you create it, you have the option to edit the virtual machine configuration after you create it.

### To edit an existing virtual machine configuration

- 1 From the VI Client inventory, select the virtual machine you want to customize.
- 2 Power off the virtual machine.  
  
You cannot edit most virtual machine properties if the virtual machine is powered on.
- 3 In the **Summary** tab, click **Edit Settings**.  
  
The Virtual Machine Properties dialog box is displayed.
- 4 Select one of the following tabs according to the settings you want to change:
  - **Hardware** – To edit hardware settings such as memory, CPU, and disk drives.
  - **Options** – To edit power management settings and other options.
  - **Resources** – To edit resource settings for this virtual machine.
- 5 Make changes as needed, and click **OK**.

Refer to the *VI Client Online Help* for more information about configuring virtual machines.

## Adding Hardware and Devices

You can configure additional virtual hardware for your virtual machine as needed. The following hardware devices can be added:

- Serial Port
- Parallel Port
- Floppy Drive
- DVD/CD-ROM Drive
- Ethernet Adapter
- Hard Disk
- SCSI Device

### To add a hardware device

- 1 From the VI Client inventory, select the virtual machine you want to customize.
- 2 Power off the virtual machine.

You cannot edit most virtual machine properties if the virtual machine is powered on.

- 3 In the **Summary** tab, click **Edit Settings**.

The **Virtual Machine Properties** dialog box is displayed.

- 4 Click the **Hardware** tab, and click **Add** to display the Add Hardware Wizard.
- 5 Select the type of device you want to add, and click **Next**.
- 6 Follow the steps in the wizard to add the device.

For additional information on the options for particular device types, see the *VI Client Online Help*.

## Where to Go from Here

At this point, you have:

- Powered on, powered off, suspended, and resumed virtual machines.
- Edited virtual machine settings.
- Added virtual hardware to a virtual machine.

For more information on working with virtual machines, see *Basic System Administration* and the *VI Client Online Help*.

Continue with the next section to learn about other tasks and events.

## Tasks and Events

This section describes how to monitor the status of your virtual infrastructure using tasks and events, how to schedule automated tasks, and how to use alarms.

### To display tasks and events

- 1 Select a datacenter, host, or virtual machine from the VI Client inventory.
- 2 Click the **Tasks & Events** tab.

Notice that you can choose to display either tasks or events by clicking either the **Tasks** or the **Events** button below the line of tabs. You can then select individual tasks or events to see additional information in the **Details** pane at the bottom of the window.

**New Datacenter**

Virtual Machines | Hosts | **Tasks & Events** | Alarms | Permissions | Maps

View: **Tasks** | Events

Show all entries ▾ Name, Target or Status contains: ▾

Name	Target	Status	Reason	Time
Removing Host	vcy031.eng.vmware.com	Completed	Administrator	2/11/2006 11:48:10 AM
Power Off Virtual Machine	vcy174-rh9-lsi	Completed	Administrator	2/11/2006 1:32:19 PM
Power On Virtual Machine	vcy174-rh9-bus	Completed	Administrator	2/11/2006 1:32:39 PM
Create Cluster	New Datacenter	Completed	Administrator	2/11/2006 2:45:21 PM
Power Off Virtual Machine	vcy174-rh9-bus	Completed	Administrator	2/11/2006 3:49:01 PM
Power On Virtual Machine	vcy174-rh9-bus	Completed	Administrator	2/11/2006 3:57:00 PM
Add Host	test cluster	Failed	The host 'vcy174-rh9-lsi' is not available.	2/13/2006 1:58:15 PM
Add Host	test cluster	Failed	The host 'vcy174-rh9-lsi' is not available.	2/13/2006 1:58:51 PM
Create Folder	New Datacenter	Completed	Administrator	2/14/2006 10:36:19 AM
Destroy Folder	New Folder 1	Completed	Administrator	2/14/2006 10:37:24 AM
Power Off Virtual Machine	Node 1	Completed	Administrator	2/14/2006 10:55:56 AM

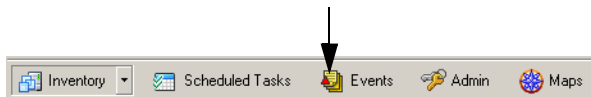
**Task Details**

Name: **Power Off Virtual Machine** Target: [Node 1](#) Reason: **Administrator** Status: **Completed**

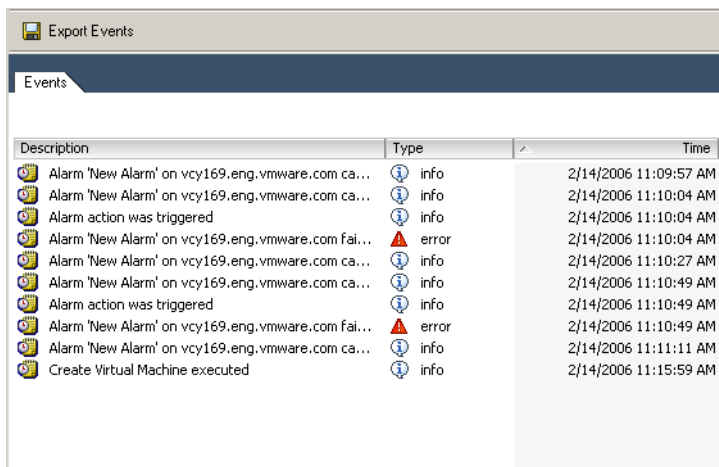
Related Events:

- Node 1 on host vcy169.eng.vmware.com is stopping
- Node 1 on host vcy169.eng.vmware.com is powered off

- 3 To view events only, click **Events** in the navigation bar.



Selecting Events displays alarms or informational messages. You can export them to a file by clicking **Export Events**. See the *VI Client Online Help* for more information.



Description	Type	Time
Alarm 'New Alarm' on vcy169.eng.vmware.com ca...	info	2/14/2006 11:09:57 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com ca...	info	2/14/2006 11:10:04 AM
Alarm action was triggered	info	2/14/2006 11:10:04 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com fai...	error	2/14/2006 11:10:04 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com ca...	info	2/14/2006 11:10:27 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com ca...	info	2/14/2006 11:10:49 AM
Alarm action was triggered	info	2/14/2006 11:10:49 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com fai...	error	2/14/2006 11:10:49 AM
Alarm 'New Alarm' on vcy169.eng.vmware.com ca...	info	2/14/2006 11:11:11 AM
Create Virtual Machine executed	info	2/14/2006 11:15:59 AM

You can create a scheduled task to perform certain actions at designated times.

### To create a scheduled task

- 1 In the VI Client, click the **Scheduled Tasks** button in the navigation bar.  
The **Scheduled Tasks** page is displayed.
- 2 Click the **New** button.  
The **Select a Task to Schedule** dialog box appears.
- 3 Choose a task to schedule from the drop-down list, and click **OK**.
- 4 Follow the remaining steps in the wizard.

For information on configuring particular tasks, refer to the *VI Client Online Help*.

## Alarms

Alarms send notification messages when selected events occur to or on hosts or virtual machines. Alarms indicate the status levels of an object, or collection of objects, in the hierarchy. Alarms can be defined at all hierarchical levels, including folders, datacenters, clusters, resource pools, hosts, and virtual machines.

Alarms are inherited from parent levels and cannot be changed or overridden at a child level. You can add new alarms to any object and contribute to the collection of alarms that are in force at any of its child levels.

When a user creates an alarm, VirtualCenter verifies that the user has permission to perform the actions on the relevant datacenters, hosts, and virtual machines. Once



created, the alarm is performed even if the creating user no longer has permission to create the alarm.

Alarms are applied to either hosts or virtual machines. Each alarm has a triggering event and a notification method.

There are two kinds of alarm triggers:

- **Percentage** – Monitors host CPU, memory, network, and disk usage.  
The triggering options are **Is Above** (percent) and **Is Below** (percent).
- **State** – Monitors host state and virtual machine state.  
The triggering options are **Is** (state) and **Is Not** (state).

### To view alarms

- 1 Select a datacenter, host, or virtual machine from the VI Client inventory.
- 2 Click the **Alarms** tab.
- 3 To view alarms that have been triggered, click the **Triggered Alarms** button.
- 4 To view alarms that have been defined, click the **Definitions** button.

A list of defined alarms is displayed. You can double-click an alarm definition to display the Alarm Settings dialog box and view or edit the alarm settings.

### To define new alarms

- 1 Select a datacenter, host, or virtual machine from the VI Client inventory.
- 2 Click the **Alarms** tab.
- 3 Right-click the panel, and choose **New Alarm** to display the Alarm Settings dialog box.

You can also right-click an object in the inventory pane and choose **Add Alarm**.

If you start from a folder, datacenter, or cluster, the Alarm Settings dialog box displays the option to create an alarm for either a host or a virtual machine. If you start from a resource pool, host, or virtual machine, the **Monitor a Host** or **Monitor a VM** option is preselected and the other option is dimmed.

- 4 In the **General** tab, specify a name for the alarm, the object to be monitored (host or virtual machine), and whether to enable this alarm.

To define the alarm but not make it active, deselect the **Enable** box.

- 5 Click the **Triggers** tab and the **Add** button to add a trigger. Choose the values for the trigger from the **Trigger Type**, **Condition**, **%Warning**, and **%Alert** drop-down lists.  
Repeat this step until you have added all the triggers you want for this alarm.
- 6 Click the **Reporting** tab, and set the Tolerance and Frequency values for the alarm.
- 7 Click the **Actions** tab and click **Add** to define an action that will be taken when the alarm changes state.
  - a Choose the action to perform from the **Action** drop-down menu.
  - b Choose the value for that action from the **Value** drop-down menu.
  - c Select the appropriate check box to determine whether the action is triggered when the alarm changes state.
- 8 Click **OK** to close the dialog box and save your alarm settings.

## Where to Go From Here

At this point, you have:

- Viewed tasks and events.
- Scheduled tasks.
- Created alarms.

For more information on tasks, events, and alarms, refer to *Basic System Administration*.

There are a number of advanced administration tasks not covered by this guide. See the following VMware Infrastructure manuals for more information:

- For more information on security, see the *Server Configuration Guide*.
- For more information on configuring storage, see the *Server Configuration Guide* and the *SAN Configuration Guide*.
- For information on backing up virtual machines, see the *Virtual Machine Backup Guide*.
- For more information on configuring and using VMotion to migrate powered-on virtual machines, refer to the *SAN Configuration Guide*.
- For more information on using VMware DRS to optimize resource use, refer to the *Resource Management Guide*.
- For more information on using VMware HA to maximize virtual machine uptime, refer to the *Resource Management Guide*.

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