



VMware* vSphere* Installation Guide for ESXi* 4.0 Installable

Intel® Modular Server Compute Module
S5520VI

SAMPLE RECIPE - ABRIDGED CONTENT



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Hardware Components

Quantity	Item	Manufacturer	Model
1	Intel® Modular Server	Intel	MFSYS35 or MFSYS25
1-6	Intel® Server Compute Module	Intel	MFS5520VI
4 GB or more	Memory modules	Any supported	
2	Intel® Xeon® processors	Intel	
2 -14 2.5" 1 - 6 3.5" Chassis	Hard drives	Any supported	
2-4	Power supply	Intel	AXXPSU
1-2	SAS storage module	Intel	AXXSCM3S
1-2	Internal Ethernet switch module	Intel	AXXSW1GB
1 (Optional)	Dual port 1 Gb Ethernet module	Intel	

Table 1 - Hardware Components

Software Components

Quantity	Version	Manufacturer	Comment
1	VMware* ESXi 3.5 u4	VMware*	

Table 2 - Hardware Components

Welcome

This guide contains detailed information on how to install VMware* ESXi* 3.5 on pre-certified platforms listed in the Supported Hardware section. This guide is intended for experienced Windows* or Linux* system Administrators installing VMware ESXi 3.5 and configuring virtualization for the first time by using VMware* Infrastructure* 3. Specifically, it is intended for users who:

- Do not have the VMware* ESXi* 3.5 software installed.
- Do not have the VMware* Infrastructure* (VI) Client or the VMware* VirtualCenter Server* installed.

This guide describes VMware ESXi 3.5 and VirtualCenter and provides instructions to set up and configure a host, including the following tasks:

- Install VMware ESXi and add the host to your network.
- Deploy the VI Client and connect to a single VMware ESXi host.
- Deploy and run a virtual machine.
- Deploy VMware Infrastructure with the VirtualCenter Server to manage multiple hosts.

About VMware* Infrastructure*

VMware* Infrastructure* (VI) is a suite of applications that uses virtualization to:

- Run multiple operating systems on a single physical machine simultaneously.
- Reclaim idle resources and balance workloads across multiple physical machines.
- Work around hardware failures and scheduled maintenance.

VMware* Infrastructure* Components

Familiarity with the components that make up a VMware Infrastructure environment helps with the understanding of the setup process and, ultimately, the process of running virtual machines using VMware VirtualCenter*. VMware Infrastructure includes the following components:

- **The VMware* Infrastructure* Client** – The VI Client is the interface to the VirtualCenter Server* and hosts. It also provides console access to virtual machines.
- **The VMware* VirtualCenter Server*** – The VirtualCenter Server unifies resources from individual hosts so the resources are shared among virtual machines in the entire datacenter by assigning virtual machines to the hosts, and by assigning resources to the virtual machines within a given host based on the policies set by the system Administrator. The VirtualCenter Server allows the use of advanced VMware Infrastructure features such as VMware Distributed Resource Scheduler* (DRS), VMware High Availability* (HA), and VMware VMotion*.
- **Datacenter** – A datacenter is a structure where hosts and their associated virtual machines are added to the VirtualCenter inventory.
- **Host** – A host is a computer that uses the VMware* ESXi* 3.5 virtualization software to run virtual machines. Hosts provide CPU and memory resources, access to storage, and network connectivity for virtual machines that reside on them. A host is necessary before following the steps in this manual.
- **Virtual Machine** – A virtual machine is a software computer that, like a physical computer, runs an operating system and applications. Multiple virtual machines can run on the same host at the same time. Virtual machines managed by the VirtualCenter Server can also run on a cluster of hosts.

The relationships among the basic components of VMware* Infrastructure* is depicted in the following figure:

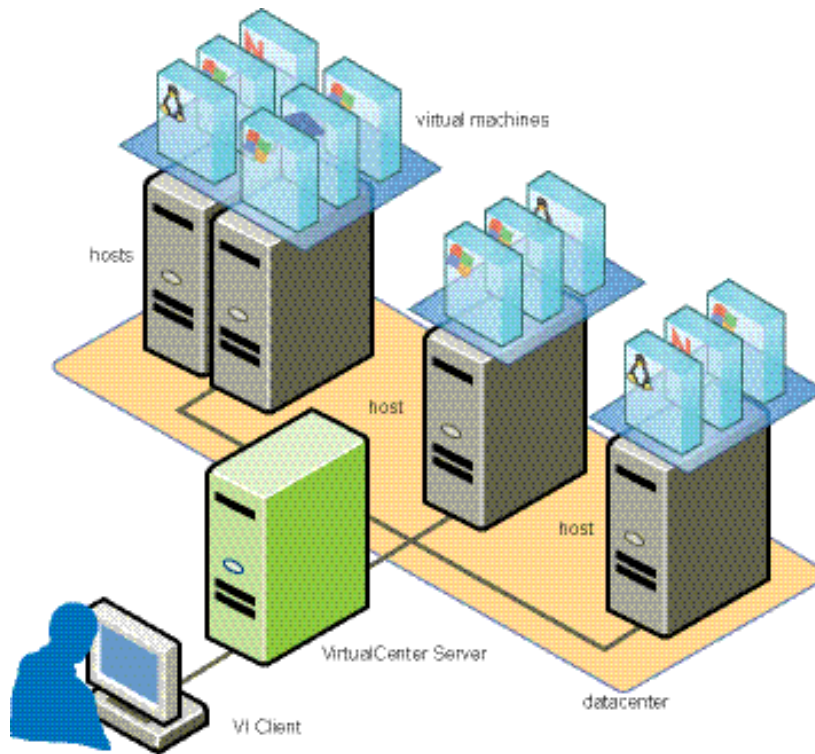


Figure 1 - VMware Infrastructure Components

Managing Hosts

There are two primary methods for managing hosts:

- **Single-host management** – Use the VMware* Infrastructure* (VI) Client to connect to a single ESXi* host and manage virtual machines and their resources. When the VI Client connects to an ESXi host, the VI Client displays the options appropriate to single-host management.
- **Multiple-host management** – Use the VI Client to connect to a VMware* VirtualCenter Server* and manage many virtual machines and their resources distributed over multiple ESXi hosts. When connected to a VirtualCenter Server, the VI Client displays the options available to the VMware Infrastructure environment and for managing multiple hosts.

Deploying a VirtualCenter Server provides many advantages over deploying a single, standalone ESXi host. Table 3 illustrates some of the key advantages and compares multiple-host management with VirtualCenter versus single-host management.

Feature	VirtualCenter Server	ESXi Server
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Feature	VirtualCenter Server	ESXi Server
Scale of deployment	Multiple hosts	Single host
Capacity planning	Built-in	Available separately
Server Consolidation wizard	Built-in	Available separately
Instant server provisioning	Available with templates and cloning	Not available
Zero-downtime maintenance	Possible with VMotion*	Not available
Load balancing	Possible with VMware* DRS	Not available
Failover	Possible with VMware* HA	Not available
Power savings	Possible with VMware* Distributed Power Management (DPM)	Not available
Centralized access control	Available with Active Directory Integration	Not available

Table 3 – Comparison of Multiple and Single Host Management

VMware* VirtualCenter* and ESXi* Licensing Overview

This section describes the licensing models available with VMware* ESXi* 3.5 and VMware* VirtualCenter*. For additional information, refer to the *VMware ESXi 3.5 Installable Setup Guide* available on the VMware website.

Licensing Terminology

The following terms are part of the license redemption and configuration process:

- **License activation code** – A license activation code (LAC) is a unique code associated with one or more VMware* products purchased. The code is obtained after an order is processed or when the product is purchased from an authorized VMware reseller, where a partner activation code is provided.
- **Partner activation code** – A partner activation code is a unique code that identifies orders placed through VMware* partners. If VMware Infrastructure* 3 is purchased from an authorized VMware reseller, use the code provided at the time of purchase to register it on the designated VMware store account.
- **License activation portal** – The license activation portal is a self-service Web portal used to redeem license activation codes and download license files for VMware* Infrastructure* 3.
- **Partner activation portal** – A partner activation portal is a self-service Web portal used to register a purchase made from an authorized VMware* reseller to a VMware store account. To do this, enter the partner activation code into the portal and download the license files from the license activation portal.

VMware* ESX* Editions

Depending on the edition of VMware* Infrastructure* software purchased, different VMware* ESX* license types may apply. Some editions include limited access to the feature set of VMware ESX 3.5. Certain standard functionality is available only with an optional add-on license, at additional cost. Other editions include full access to the full feature set of VMware ESX 3.5.

Licenses from previous releases of VMware ESX work with VMware ESX 3.5. However, licensing capabilities added to VMware ESX 3.5 editions, e.g., VMware Consolidated Backup* are not supported with previous editions of VMware ESX.

Table 4 displays VMware ESX 3.5 features arranged by edition:

Feature	VMware ESXi	VI Foundation	VI Standard	VI Enterprise
License type	Serial number	Flex license files (centralized or single host)	Flex license files (centralized or single host)	Flex license files (centralized or single host)
VMFS	Yes	Yes	Yes	Yes
Virtual SMP support	Yes	Yes	Yes	Yes
VMware* Consolidated Backup* (VCB)	No	Yes	Yes	Yes
VMware* Update Manager*	No	Yes	Yes	Yes
VMware HA	No	Add-on	Yes	Yes
Server VMotion and Storage VMotion	No	Add-on	Add-on	Yes
VMware* DRS and DPM (Distributed Resource Management and Distributed Power Management)	No	Add-on	Add-on	Yes
Manageable by the VI Client	Yes	Yes	Yes	Yes
Remote CLI access	Restricted	Yes	Yes	Yes
Manageable by VirtualCenter* in production mode	Add-on	Yes	Yes	Yes
Manageable by VirtualCenter* in evaluation mode	Yes	Yes	Yes	Yes
VirtualCenter* Management Agent	No	Yes	Yes	Yes

Table 4 - Edition Features for VMware ESX 3.5 Machines

VMware* VirtualCenter* Server Editions

At least one instance of a VMware* VirtualCenter* license is required for VI Foundation*, VI Standard*, and VI Enterprise* editions. The following VMware VirtualCenter editions are available:

- VMware* **VirtualCenter Foundation*** – Manages up to three ESX hosts. To manage more than three hosts, upgrade to VirtualCenter edition.
- VMware* **VirtualCenter*** – An enterprise-level edition that manages up-to-the-system-maximum number of hosts in combination with VMware Server hosts. For information about system maximums, see [Configuration Maximums for VMware Infrastructure 3](#) in the *VMware ESXi 3.5 Installable Setup Guide* available from the VMware* website.

VirtualCenter editions require flex, centralized license files. The VirtualCenter Foundation edition can be converted to the VirtualCenter edition by adding an appropriate license file and switching the editions. The software does not need to be reinstalled. For information about converting the editions, see [To configure centralized licensing for VirtualCenter](#) in the *VMware ESXi 3.5 Installable Setup Guide* available from the VMware website.

The VirtualCenter Express* edition can be converted to the VirtualCenter Full* edition by adding an appropriate license file and switching the editions. The software does not need to be re-installed. For information on switching between the editions, see “Centralized VMware* Licensing” on page 11.

VMware* VirtualCenter* and ESXi* Licensing Model

The standalone edition of VMware* ESXi* 3.5 performs most operations. To use some advanced operations, you can use the evaluation mode or you can purchase an upgraded license.

VMware* VirtualCenter*, with the exception of the evaluation mode, requires a software license for most operations, such as adding hosts to the VirtualCenter inventory. However, VirtualCenter version 2.5 can be installed, launched, and configured without a software license.

Two modes of licensing are available: single-host and centralized. Both single-host and centralized licenses are based on FLEXnet* mechanisms. A flex license is either served (centralized) or unserved (single host).

Single-Host and Centralized License Types

For single-host licenses, the serial number or license files are stored on individual ESXi hosts. Centralized licenses are stored on a license server, which makes these licenses available to one or more hosts. A mixed environment can be run to employ both single-host and centralized licensing.

VirtualCenter and features that require VirtualCenter, such as VMotion*, must have centralized licensing. VMware ESXi 3.5 specific features can be licensed for either centralized or single-host licensing.

Figure 2 illustrates the three types of license environments.:

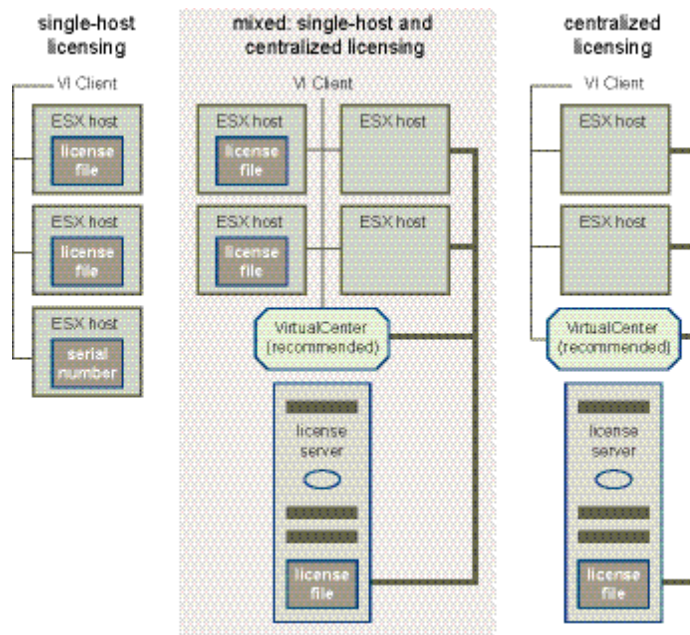


Figure 2 – License File Locations in Single-Host, Mixed, and Centralized Licensing Environments

Centralized VMware* Licensing

Centralized licensing simplifies license management in large, dynamic environments by allowing a VMware* license server to administer licenses. With centralized licensing, VirtualCenter Server and ESXi licenses are maintained from one console.

With centralized licensing, a license server manages a license pool, which is a central repository holding an entire licensed entitlement. When a host requires a particular licensed function, the license for that entitlement is checked out from the license pool. License keys return to the pool when they are no longer in use and are available again to any host.

The advantages of centralized licensing include:

- All licensing administered from a single location.
- New licenses are allocated and reallocated by using any combination of ESXi form factors. For example, the same 32-processor license can be used 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 as needed. 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, although new licenses cannot be issued, existing VMware* VirtualCenter Server* licensed functionality continues to operate indefinitely and existing

VMware* ESXi licensed functionality continues to operate within a 14-day grace period. See [License Server Availability](#) in the VMware *ESXi 3.5 Installable Setup Guide* available from the VMware website. VMware recommends centralized licensing be used for large, changing environments.

Single-Host VMware* Licensing

There are two scenarios for single-host licensing:

- **Host-based serial number** – For the VMware* ESXi* 3.5 standalone edition, each host has a serial number supplied by VMware.
- **Host-based license file** – For all other VMware* ESXi* 3.5 editions – including V13 Foundation*, V13 Standard*, and V13 Enterprise* – each host has a license file.

For host-based license files, the following rules apply:

- The total entitlement for purchased features is divided among separate license files residing on ESXi hosts and the VirtualCenter Server.
- When a licensed feature is activated, the feature for that entitlement must reside in the license file on that host.
- Maintain separate license files on each ESXi host. Distribution of unused licenses is not automatic, and not dependent on an external connection for licensing.

The advantages of host-based license files include:

- Single-host files do not require the installation of a license server for ESXi host-only environments.
- In a VirtualCenter and license server environment, host-based license files allows the modification of ESXi host licenses during periods of license server unavailability.

License Key Functionality

License keys determine specific entitlement to run VMware software. Depending on the ESXi and VirtualCenter features used, purchase such keys based on one of the following criteria:

- **Per-processor basis** – To activate a feature, a host requires a feature license for each of its processors.
- **Per-instance basis** – To activate a single instance of a certain feature, a single license is required regardless of how many processors are used.

Licensed features also differ in their operation based on whether they are ESXi or VirtualCenter features. License ESXi features by using either single-host or centralized licensing; they do not require VirtualCenter or a license server. VirtualCenter features require centralized licensing. ESXi features and VirtualCenter features also differ in their behavior when the license server is not available. See [License Server Availability](#) in the *VMware ESXi 3.5 Installable Setup Guide* available from the VMware website.

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