

VMware ESX 4 on
Dell PowerEdge Systems
Deployment Guide



Notes and Cautions



NOTE: A NOTE indicates important information that helps you make better use of your computer.



CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

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Introduction

This document is a companion guide to the VMware ESX 4 guides.

This document helps you to deploy ESX 4 on Dell PowerEdge systems and provides specific information on recommended configurations, best practices, and additional resources.



NOTE: For information on deploying ESXi 4, see *VMware ESXi 4 on Dell PowerEdge Systems Deployment Guide* at support.dell.com/manuals.

VMware License Offerings

Dell offers the following VMware editions:

- vSphere Essentials Plus
- vSphere Standard
- vSphere Enterprise
- vSphere Enterprise Plus
- vCenter Server
- vSphere Standard Acceleration Kit (8 sockets)
- vSphere Enterprise Acceleration Kit (6 sockets)
- vSphere Enterprise Plus Acceleration Kit (6 sockets)



NOTE: The latest releases to include both ESX and ESXi hypervisor architectures are vSphere 4.1 and its subsequent update and patch releases. Future major releases of vSphere will include only the ESXi architecture. It is recommended that you consider a plan for migrating to ESXi starting with this release.



NOTE: vSphere Essentials Plus is an all-inclusive package that includes licenses for three physical systems, each system with up to two processors. It also includes VMware vCenter Server to centrally manage the systems. vSphere Essentials Plus edition is supported only on two-socket systems. The additional licenses must still be deployed on approved systems for Dell support.

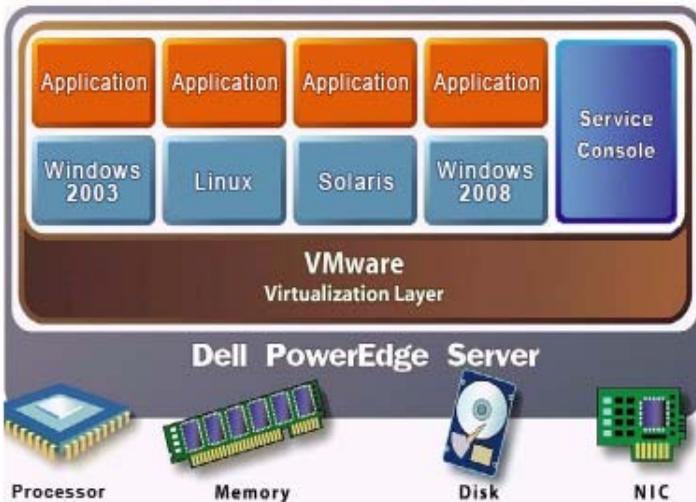


NOTE: vSphere Acceleration Kits are packages of vSphere licenses plus a vCenter Server Standard license for initial deployments. All the licenses provided are on the same VMware contract and Dell support contract. The additional licenses must be deployed on approved systems for Dell support.

ESX Architecture Overview

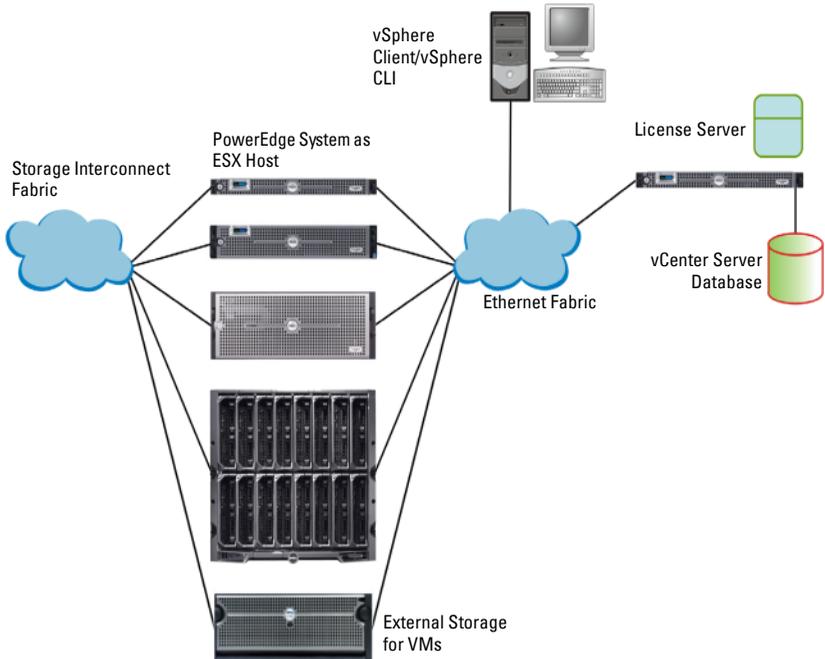
ESX allows multiple operating systems to run simultaneously in virtual environments on a single physical system. These virtual environments, referred to as virtual machines (VMs), can be created and managed faster than conventional systems. The VMs do not interact directly with the physical hardware. Each of these VMs runs in a resource-isolated, secure environment and can include Microsoft Windows, Linux, Novell NetWare, and Solaris operating systems with their associated applications.

Figure 1. ESX 4 Architecture



vSphere 4 Architecture Overview

Figure 2. vSphere Components



vSphere infrastructure consists of the following components:

- **ESX** — Allows multiple operating systems to run simultaneously on a single system.
- **vCenter Server** — Runs on Windows-based operating systems and monitors and manages VMs and copies of ESX. With vCenter Server, you can create, start, stop, and migrate VMs across the entire physical data center. vCenter Server is optional and is required for advanced management capabilities such as VMware VMotion, Distributed Resource Scheduling (DRS), and High Availability (HA).

- **vCenter Server Database** — Stores all the configuration data about vSphere. It is recommended that you use a production database such as Microsoft SQL Server or Oracle for the vCenter Server database.
- **License Server** — Authorizes ESX hosts and vCenter Server as per the purchased license keys and licensing agreement. It is recommended to install the license server on the vCenter Server host. This can also reside on a separate host.



NOTE: A license sever is not required for ESX 4 hosts. However, if vCenter Server manages the ESX 3.0.x or ESX/ESXi 3.5 hosts, you require a license server.

- **vSphere Client** — Manages an ESX host by directly connecting to it or through the vCenter Server. It is installed on a system running a supported Windows operating system.
- **VM DataStore** — Stores VMs configuration and virtual disk files. The VM storage can either be an internal storage local to ESX or an external storage that can be shared by multiple copies of ESX. Advanced features such as VMotion, HA, and DRS require that the disk and configuration files are stored on VMs external shared storage.
- **vSphere CLI** — Performs many operations that you can also perform using the ESX 4 service console. vSphere CLI commands are especially useful for an ESXi 4 host because it does not include a service console. vSphere CLI commands can be used in scripts that run on ESXi 4 and ESX 4 hosts located remotely.

Supported Configurations

This section provides information about currently shipping systems only.



NOTE: For a complete list of Dell-supported systems, see *VMware ESX/ESXi 4 on Dell PowerEdge Systems and Storage Compatibility Matrix* at support.dell.com/manuals.



NOTE: SAS/SATA drives mentioned under Table 1, Table 2, and Table 3 also include SSDs.

Table 1 lists the currently shipping modular-based Dell PowerEdge systems that support ESX.

Table 1. Modular-Based PowerEdge Systems

PowerEdge M820 Configuration	
Processor	Intel Xeon processor E5-4600 product family
Minimum Memory	4 GB
Internal Storage	Up to four 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PowerEdge RAID Controller (PERC) H310, PERC H710, and PERC H710P
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	BCM 57810S bNDC, Intel X520 bNDC, Qlogic QMD8262-k bNDC, and supported peripheral NICs
Remote Access	Integrated Dell Remote Access Controller (iDRAC)7

Table 1. Modular-Based PowerEdge Systems (continued)

PowerEdge M620 Configuration	
Processor	Intel Xeon E5-2600 product family
Minimum Memory	4 GB
Internal Storage	Up to two 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	BCM 57810S bNDC, Intel X520 bNDC, Qlogic QMD8262-k bNDC, and supported peripheral NICs
Remote Access	iDRAC 7
PowerEdge M520 Configuration	
Processor	Intel Xeon E5-2400 product family
Minimum Memory	4 GB
Internal Storage	Up to two 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PowerEdge RAID Controller (PERC) H310 Mini Blade, PERC H710 Mini Blade, and PERC H710P Mini Blade
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 1. Modular-Based PowerEdge Systems (continued)

PowerEdge M420 Configuration	
Processor	Intel Xeon E5-2400 product family
Minimum Memory	4 GB
Internal Storage	Up to two 1.8 inch uSATA SSD drive
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310 adapter
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7
PowerEdge M915 Configuration	
Processor	AMD Opteron 6100/6200 series
Minimum Memory	4 GB
Internal Storage	Two 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Four 1 GbE or 10 GbE integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6

Table 1. Modular-Based PowerEdge Systems (continued)

PowerEdge M910 Configuration	
Processor	Intel Xeon 6500 series, Intel Xeon 7500 series, or Intel Xeon E7-2800/4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Two 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6
PowerEdge M710HD Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Four 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Embedded
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported daughter cards
Networking	Four 1 GbE or two 10 GbE integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6

Table 1. Modular-Based PowerEdge Systems (continued)

PowerEdge M710 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Four 2.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, Cost-Effective RAID Controller (CERC) 6/i Modular, PERC 6/i Integrated, PERC H200 Modular, and PERC H700 Modular
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported daughter cards
Networking	Four integrated network ports and all supported NIC daughter cards
Remote Access	iDRAC6
PowerEdge M610x Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Two 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disk Storage Adapter	PERC H800 Adapter
Fibre Channel HBA	All supported daughter cards
Networking	Two integrated network ports and all supported NIC daughter cards
Remote Access	iDRAC6

Table 1. Modular-Based PowerEdge Systems (continued)

PowerEdge M610 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Two 2.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, CERC 6/i Modular, PERC H200 Modular, and PERC H700 Modular
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	All supported daughter cards
Networking	Two integrated network ports and all supported NIC daughter cards
Remote Access	iDRAC6

Table 2 lists the currently shipping rack-based Dell PowerEdge systems that support ESX.

Table 2. Rack-Based PowerEdge Systems

PowerEdge R820 Configuration	
Processor	Intel Xeon E5-4600 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disk Storage Adapter	PERC H810, 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC and supported peripheral NICs
Remote Access	iDRAC 7

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R720 Configuration	
Processor	Intel Xeon E5-2600 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5 inch or eight 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disk Storage Adapter	PERC H810, 6Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC, and supported peripheral NICs
Remote Access	iDRAC 7
PowerEdge R720xd Configuration	
Processor	Intel Xeon E5-2600 product family
Minimum Memory	4 GB
Internal Storage	Up to twenty six 2.5 inch or twelve 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disk Storage Adapter	PERC H810, 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC, and supported peripheral NICs
Remote Access	iDRAC 7

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R620 Configuration	
Processor	Intel Xeon E5-2600 product family
Minimum Memory	4 GB
Internal Storage	Up to ten 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disk Storage Adapter	PERC H810, 6Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC, and supported peripheral NICs
Remote Access	iDRAC 7
PowerEdge R520 Configuration	
Processor	Intel Xeon E5-2400 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 3.5 inch or 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disk Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R420 Configuration	
Processor	Intel Xeon E5-2400 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 2.5 inch or four 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disk Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7
PowerEdge R320 Configuration	
Processor	Intel Xeon E5-2400 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 2.5 inch or four 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disk Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R910 Configuration	
Processor	Intel Xeon 7500 series or Intel Xeon E7-4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R815 Configuration	
Processor	AMD Opteron 6100/6200 series
Minimum Memory	8 GB
Internal Storage	Up to six 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disk Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R810 Configuration	
Processor	Intel Xeon 6500 series, Intel Xeon 7500 series or Intel Xeon E7-2800/4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Up to six 2.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R715 Configuration	
Processor	AMD Opteron 6100/6200 series
Minimum Memory	8 GB
Internal Storage	Up to six 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R710 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Eight 2.5 inch or six 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R610 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Six 2.5 inch SAS/SATA disks
Internal Storage Adapter	PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R515 Configuration	
Processors	AMD Opteron 4100/4200 series
Minimum Memory	2 GB
Internal Storage	Up to twelve 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disk Storage Adapter	PERC H800, 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R510 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	2 GB
Internal Storage	Up to twelve 3.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated NOTE: An x12 backplane supports only PERC H200 and PERC H700 cards.
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R415 Configuration	
Processors	AMD Opteron 4100/4200 series
Minimum Memory	2 GB
Internal Storage	Four 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disk Storage Adapter	PERC H800 and 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R410 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	2 GB
Internal Storage	Four 3.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 2. Rack-Based PowerEdge Systems (continued)

PowerEdge R310 Configuration	
Processor	Intel Xeon 3400 series or Intel Core i3 series
Minimum Memory	2 GB
Internal Storage	Up to four 3.5 inch or 2.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR Integrated, PERC H200, and PERC H700
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge R210 II Configuration	
Processor	Intel Xeon E3-1200 product family or Intel Core i3 series
Minimum Memory	2 GB
Internal Storage	Two 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200
External Disk Storage Adapter	PERC H800
Fibre Channel HBA	Not applicable
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Table 3 lists the currently shipping tower-based Dell PowerEdge systems that support ESX.

Table 3. Tower-Based PowerEdge Systems

PowerEdge T710 Configuration	
Processors	Intel Xeon 5500/5600 series
Minimum Memory	2 GB
Internal Storage	Up to sixteen 2.5 inch or upto eight 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge T620 Configuration	
Processor	Intel Xeon E5-2600 series
Minimum Memory	4 GB
Internal Storage	Up to twenty four 2.5 inch or twelve 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disk Storage Adapter	PERC H810, 6Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 3. Tower-Based PowerEdge Systems (continued)

PowerEdge T610 Configuration	
Processors	Intel Xeon 5500/5600 series
Minimum Memory	4 GB
Internal Storage	Eight 2.5 inch or 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC 6/i Integrated, SAS 6/iR Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge T420 Configuration	
Processor	Intel Xeon E5-2400 Product Family
Minimum Memory	2 GB
Internal Storage	Up to sixteen 2.5 inch or eight 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P and PERC H310 adapters
External Disk Storage Adapter	PERC H810 adapter
Fibre Channel HBA	All Supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 3. Tower-Based PowerEdge Systems (continued)

PowerEdge T410 Configuration	
Processor	Intel Xeon 5500/5600 series
Minimum Memory	2 GB
Internal Storage	Six 3.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR, PERC 6/i, PERC H200, and PERC H700
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	Not applicable
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge T320 Configuration	
Processor	Intel Xeon E5-2400 Product Family
Minimum Memory	2 GB
Internal Storage	Up to sixteen 2.5 inch or eight 3.5 inch SAS/SATA disks
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P and PERC H310 adapters
External Disk Storage Adapter	PERC H810 adapter
Fibre Channel HBA	All Supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC 7

Table 3. Tower-Based PowerEdge Systems (continued)

PowerEdge T310 Configuration	
Processor	Intel Xeon 3400 series or Intel Core i3 series
Minimum Memory	2 GB
Internal Storage	Four 3.5 inch SAS/SATA disks
Internal Storage Adapter	SAS 6/iR, PERC 6/i, PERC H200, and PERC H700
External Disk Storage Adapter	SAS 5/E, PERC 6/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA	Not applicable
Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise
PowerEdge T110 II Configuration	
Processor	Intel Xeon E3-1200 product family or Intel Core i3 series
Minimum Memory	2 GB
Internal Storage	Four 3.5 inch SAS/SATA disks
Internal Storage Adapter	PERC H200
External Disk Storage Adapter	Not applicable
Fibre Channel HBA	Not applicable
Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Important Information

- Intel Xeon 3400 series-based systems (PowerEdge T110, PowerEdge R210, PowerEdge T310, and PowerEdge R310) running ESX version higher than ESX 4.0 Update 1 may crash with a purple screen when the **Power Management** option is set to **Active Power Controller** in the BIOS. To avoid this issue, ensure that the minimum required BIOS version on your system is:
 - 1.3.4 for PowerEdge T110
 - 1.3.4 for PowerEdge R210
 - 1.3.6 for PowerEdge T310
 - 1.1.5 for PowerEdge R310
- On some systems, under heavy networking and processor loads, one or more uplink adapters (physical network adapters) may stop functioning. Communication fails between the corresponding Port Group(s) and the external network. This leads to the probable failure of the VM, VMkernel, or Management Network traffic configured for that Port Group. To resolve the issue, download the VMware patch **ESX400-201002001** from downloads.vmware.com. For more information, see kb.vmware.com/kb/1017458.
- When ESX is installed on a PowerEdge R815 system, the keyboard and mouse do not function if you connect them to the top USB port on the back panel of the system. To resolve the issue, do not use the top USB port on the back panel of the system. Alternatively, you may use iDRAC vKVM to install ESX.
- On a PowerEdge R815 system, iDRAC vKVM I/O devices such as the keyboard and mouse may not respond after the system boots into ESX. To resolve the issue, download the VMware patch **ESX400-201003001.zip** from downloads.vmware.com. For more information, see kb.vmware.com/kb/1013176.
- You cannot automatically pre-activate the Microsoft Windows Server 2008 operating system installed on VMs by using the product activation code in the Dell OEM installation media. You must use the virtual product key to activate the guest operating system. For more information, see the whitepaper *Dell OEM Windows Server 2008 Installation on Virtual Machines Using Dell OEM Media* at dell.com.

- For information on Qlogic CNA driver, see **Drivers and Tools** under the vSphere 4 section at downloads.vmware.com.
- Dell systems shipped with Core i3 series processors support only Unregistered Dual In-Line Memory Module (UDIMM).
- On Non-Uniform Memory Access (NUMA) enabled systems installed with ESX, it is recommended that you populate all processor nodes with similar memory modules to enable balanced distribution of memory across nodes. You may face performance degradation issues or ESX may fail to boot with unbalanced memory distribution across nodes.

The following error message may be displayed:

```
The BIOS reports that NUMA node X has no memory.
This problem is either caused by a bad BIOS or a
very unbalanced distribution of memory modules.
```

 **NOTE:** For more information about NUMA, see VMware knowledge base articles: kb.vmware.com/kb/1003690 and kb.vmware.com/kb/1570. Also see, VMware's Resource Management Guide for ESX 4 at vmware.com/support/pubs/.

- Storage Logical Unit Numbers (LUNs) (on local system) are supported only with PERC-based RAID configurations.
- Dell PowerVault NX1950 is supported only as an iSCSI storage device. It is not supported as a network attached storage (NAS) device.
- PowerVault MD1000 and PowerVault MD1120 storage arrays provide external storage to a single ESX host or to a maximum of two hosts in a split configuration.
- PowerVault MD1000 and PowerVault MD1120 storage arrays do not support features that require shared storage among ESX hosts, such as VMotion, HA, and DRS.
- PowerVault MD3000 supports HA and VMotion.
- ESX supports a maximum virtual disk size of 2 TB. Simple RAID groups (0, 1, 5, and 6) can be split into multiple virtual disks.

Supported vSphere 4 Configuration Solutions

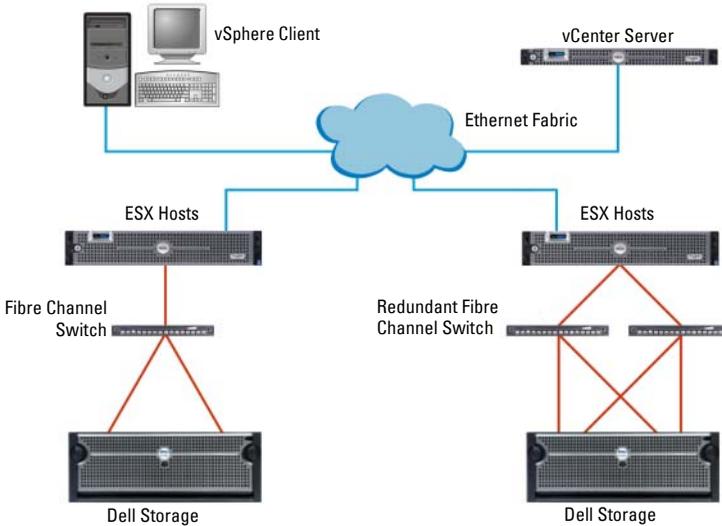
This section discusses the vSphere 4 configurations with Dell PowerEdge systems using Fibre Channel SAN and iSCSI SAN.

Configuring ESX 4 Using Dell Fibre Channel SAN

Figure 3 shows a vSphere 4 configuration using Fibre Channel SAN. If you use Fibre Channel storage, you can have a single Fibre Channel HBA connected to a Fibre Channel switch that provides paths to both storage processors (SPs) on the Fibre Channel storage system.

It is recommended that you use two Fibre Channel HBAs on the ESX host connected to separate Fibre Channel switches. The Fibre Channel switches provide redundant paths to the SPs on the storage unit. This provides maximum protection against a single failure at the HBA, Fibre Channel switch, or SP level.

Figure 3. Configuring vSphere 4 Using Dell Fibre Channel SAN



Fibre Channel Environment Setup With ESX

To setup a Dell storage:

- 1 Install and set up the Dell Fibre Channel storage system.
 - 2 Configure zoning at the Fibre Channel switch level.
 - 3 Create RAID groups.
 - 4 Create and bind LUNs to RAID groups.
-  **NOTE:** When you create the LUNs, select **Auto Assign** to assign the LUN to the SP. This is highly recommended for better load balancing.
- 5 Use Naviagent to register the servers (hosts) connected to the SAN.
 - 6 Create storage groups and assign ESXs and LUNs to each of them.

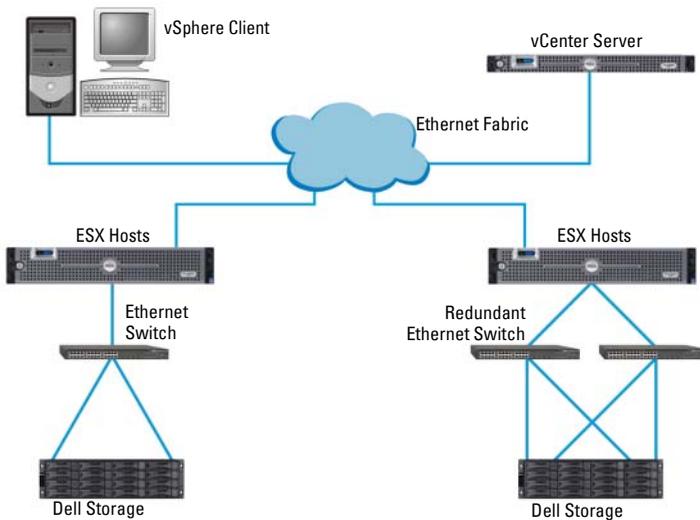
For more information about SAN environment configuration, see the *Fibre Channel SAN Configuration Guide* for ESX 4 and vCenter Server 4 under **VMware vSphere 4** at vmware.com/support/pubs.

For more information about setting up the Dell storage, see support.dell.com/manuals.

Configuring vSphere 4 Using iSCSI SAN

Figure 4 shows a typical vSphere 4 configuration using iSCSI SAN. The iSCSI SAN provides a cost-effective solution. It is recommended that you use two iSCSI initiators on the ESX host connected to two separate Ethernet switches to provide redundant paths to the storage processors on the storage unit.

Figure 4. Configuring vSphere 4 Using iSCSI SAN



NOTE: For more information on Dell-supported storage arrays on VMware, see *VMware ESX/ESXi 4 on Dell PowerEdge Systems and Storage Compatibility Matrix* at support.dell.com/manuals.

Setting up iSCSI Environment With ESX

Basic steps involved in an iSCSI setup are:

- 1 Configure your software iSCSI initiator on the ESX host.
- 2 Install and configure your Dell-supported iSCSI storage device.
- 3 Create a virtual machine file system (VMFS) datastore on the iSCSI target LUNs.

For more information about the iSCSI SAN environment, see the *iSCSI SAN Configuration Guide* at vmware.com/support/pubs.

Deploying ESX and vCenter

Guidelines for Deploying ESX

This section describes the important guidelines for installing vCenter Server 4 and ESX 4 on PowerEdge systems.

- For upgrade and installation instructions, see the *Upgrade Guide* for ESX 4 under **VMware vSphere** at vmware.com/support/pubs. The guide provides details on different upgrade options and specific steps that need to be followed for a successful upgrade.
- Determine the kind of storage (local SCSI/SAS/SATA, iSCSI, or Fibre Channel SAN) for hosting VMs that best suits the deployment environment and design your storage infrastructure accordingly.
- Determine the number of LUNs, size of LUNs, RAID level of the LUNs, and the number of storage groups.
- Determine the number of VMs that runs on each copy of the ESX software and their corresponding workloads.
- Determine the resource requirements for the VMs, such as the processor requirements, memory size, and networking. For more information on performance, general sizing, and scaling studies, see the documentation at support.dell.com/virtualization and vmware.com/support/pubs.
- Determine the required network information, such as IP addresses, network masks, and gateway addresses. In ESX 4, Service Console and VMkernel network interfaces require unique and valid IP addresses, network masks, and gateway addresses.

- Determine the most appropriate local disk partitioning scheme for ESX. For more information, see "Disk Partitioning for ESX" on page 35.
- If you are using the DRS or HA feature, determine the hosts that are part of such a cluster and allocate shared storage accordingly.
- Determine the appropriate networking configuration for Service Console, VMs, and VMkernel. Virtual local area networks (VLANs) can be used to efficiently isolate traffic.

Installing ESX

Prior to installation, complete the following configuration.

Setting up BIOS

Ensure that the BIOS is configured with the following settings:

- Enable the Virtualization Technology (VT) feature. The VT feature is required to run 64-bit VMs on Intel platforms.
- Set the USB controller to **USB on with BIOS Support**, if available, on the system. This enables support for USB devices both during and after the ESX boot process.

Configuring Boot From SAN

ESX 4 supports **Boot from SAN** with both QLogic and Emulex Fibre Channel adapters. For more information about configuring ESX to boot from SAN, see the *SAN Configuration Guide* under VMware vSphere 4 at vmware.com/support/pubs.

Configuring RAID

Before installing ESX, ensure that the physical disks have the required RAID configurations. Use the appropriate RAID level depending on the number of local physical disks. RAID 0 is not recommended since it does not provide data redundancy. ESX supports a maximum virtual disk size of 2 TB. RAID groups can be split into multiple virtual disks.

Disk Partitioning for ESX

Table 4 lists the recommended disk partitioning for ESX. When installing ESX, choose the **Manual Partitioning** option and follow the guidelines in Table 4 to create the disk partitions.

Table 4. Recommended Disk Partitioning

Mount Point	Type	Recommended Size	Notes
swap	swap	1 GB	This is for the Service Console only and <i>not</i> for ESX.
/boot	ext3	1.1 GB	Holds the boot kernel image.
/	ext3	10 GB	Holds the Service Console and ESX kernel.
/var	ext3	4 GB	Holds the log files.
(none)	vmkcore	110 MB	Holds the core dump file for the VMkernel.
(none)	vmfs3	Remaining	Holds the configuration and disk files for the VMs.

NOTE: It is recommended that you set the root (/) partition size to a minimum of 10 GB.

Post Installation

After installing ESX, connect to the ESX host using vSphere Client and then perform the following steps:

- 1 Name the local VMFS partition to improve usability and enable easy identification.
- 2 Create one or more virtual switches for VMs and VMkernel, and bind the physical adapters accordingly.
VMs for Service Console and VMs are created by default during the ESX installation.

Tips for Configuring VMotion

To use the VMotion feature, follow the guidelines listed below:

- Set up a Gigabit ethernet migration network and a VMkernel port group between all the copies of ESX configured for VMotion.
- Create consistent network labels for each of the network port groups to which VMs are attached.

For information on the VMotion configuration setup, see the VMware documentation at vmware.com/support/pubs.

For information on VMotion compatibility, see the *VMware VMotion and 64-Bit Virtual Machine Support for Dell PowerEdge Systems* at support.dell.com/manuals.

Installing vCenter Server

For information about installing or upgrading vCenter Server, see the *Installation Guide* and *Upgrade Guide* for ESX 4 under **VMware vSphere 4** at vmware.com/support/pubs.

vCenter Server is supported on a limited set of Windows operating systems. For more information, see vmware.com/support/pubs.

Related Information



NOTE: For Dell VMware documentation including systems management for VMware, see support.dell.com/manuals. Navigate to **Software**, select **Virtualization Solutions** and then **VMware Software**.

- For information on downloading ESX and licensing options, see *VMware vSphere 4 on Dell PowerEdge Systems Getting Started Guide* at support.dell.com/manuals.
- For more information about different vSphere editions, see *VMware vSphere Editions Comparison* at vmware.com.
- For a complete list of Dell-supported systems and storage, see *VMware ESX/ESXi 4 on Dell PowerEdge Systems and Storage Compatibility Matrix* at support.dell.com/manuals.
- For known issues, see *VMware vSphere 4 on Dell PowerEdge Systems Release Notes* at support.dell.com/manuals.

- For information on Configuration Maximums, see *Configuration Maximums for VMware vSphere 4* at vmware.com/support/pubs.
- For Dell | EMC-supported storage configurations of ESX and vCenter Server, see *EMC Support Matrix (ESM)* at emc.com/interoperability.
- To ensure processor compatibility across systems for VMotion, see the *VMware VMotion and 64-Bit Virtual Machine Compatibility Matrix for VMware vSphere 4 and Dell PowerEdge Systems* at support.dell.com/manuals.
- For the VMware vSphere 4 documents, technical resources, and knowledge base articles, see vmware.com/support.
- For the *Hardware Compatibility Guides*, see vmware.com/resources/compatibility/search.php.
- For licensing information, see *VMware vSphere on Dell PowerEdge Systems Getting Started Guide* at support.dell.com/manuals.
- For information on ESX, other Dell VMware products, technical publications including white papers, articles, and case studies, see dell.com/vmware.
- For information about shared interrupts in ESX, see the knowledge base article 1290 at vmware.com/support/kb.

Technical Support Websites

- vmware.com/support
- dell.com/support
- dell.com/services for Dell deployment and professional services

Discussion Forums

- vmware.com/communities/content
- dellcommunity.com

Knowledge Base

vmware.com/support/kb

Dell Wiki

delltechcenter.com

