VMware vSphere 5 On Dell PowerEdge Systems

Deployment Guide

Notes, cautions, and warnings

(i) **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.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Rev. A18

Contents

Introduction

This document helps you to deploy VMware ESXi 5 on Dell systems and provides specific information about recommended configurations, best practices, and additional resources.

(i) **NOTE: VMware vSphere 5 does not include the ESX classic edition.**

Dell offers the following VMware editions:

- vSphere Essentials Plus
- vSphere Standard
- vSphere Enterprise (two and four CPU offerings only)
- vSphere Enterprise Plus (two and four CPU offerings only)
- VMware vCenter Server
- VMware Virtual SAN

(i) **NOTE: The vSphere 5.0 Single Server Edition licence offered by Dell has been discontinued from vSphere 5.0 Update 2 onwards.**

(i) **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. Additional licenses must still be deployed on approved systems for Dell support.**

(i) **NOTE: With the release of vSphere 5, all Partner Activation Codes shipped with current systems are for vSphere 5 licensing. If you have an active vSphere subscription, you can downgrade or upgrade vSphere, as you choose. To get your downgrade keys, register your Partner Activation Code and login to vmware.com/accounts. Go to Manage Product Licenses > vSphere v5 on the license administration portal.**

(i) **NOTE: VMware Virtual SAN is licensed independently per socket, per server. To use it, the server will also require vSphere licensing (per socket, per server) and a vCenter Server license will be needed in the environment.**

Topics:

vSphere 5 architecture overview

vSphere infrastructure consists of the following components:

ESXi	Allows multiple operating systems to run simultaneously on a single system.
vCenter Server	Monitors and manages the management application of VMs and copies of ESXi. With a vCenter server, you can create,start, stop, and migrate VMs across the entire physical data center. vCenter server is optional, but it 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 a VMware infrastructure environment. Dell recommends you to use a production database such as Microsoft SQL Server or Oracle for the vCenter Server database.
vSphere Web Client	Shares the functionality of the core administrative interface starting from ESXi 5.1, with the vSphere client. vSphere client can be launched from Internet Explorer or Mozilla Firefox, without requiring a specific client installation.
vSphere Client	Requires an ESXi host to manage, by directly connecting to it or through vCenter Server. It can be installed on a system running a supported Windows OS. vSphere Web Client can replace the vSphere Client for future releases. The vSphere Web Client enables you to connect to a vCenter Server system to manage an ESXi host or multiple hosts through a browser.

Virtual Machine DataStore   Stores VM configuration and virtual disk files. The VM storage can either be internal local storage to the ESXi or external storage. Multiple ESXi system share VM storage. Advanced features such as HA and DRS require that the hard disk drive and configuration files are stored on the external shared storage.
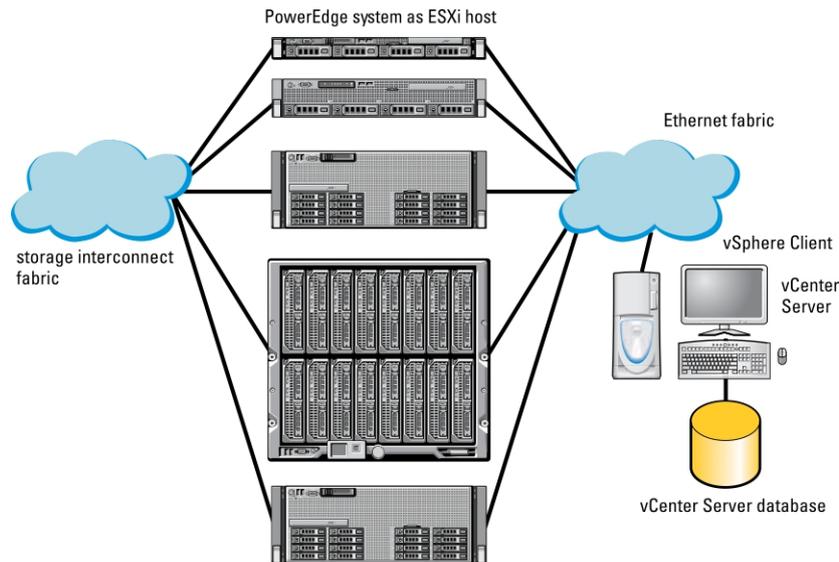
Figure 1. vSphere components

ESXi architecture overview

ESXi is a bare-metal enterprise class hypervisor that can be pre-installed on Dell PowerEdge systems. With the reduced footprint of the hypervisor, ESXi is integrated with PowerEdge systems by using embedded Secure Digital (SD) card. Integrated virtualization by VMware offers:

- Ease of deployment
- Integrated hardware monitoring
- Enhanced security
- Reduced patch management
- Improved reliability
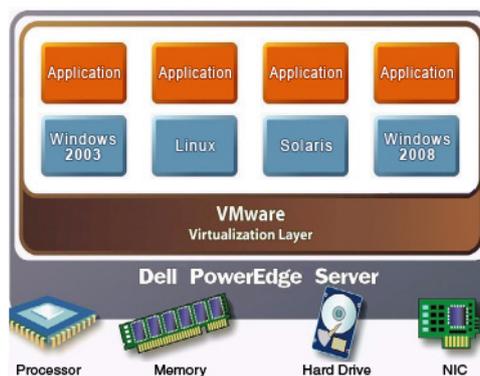
Figure 2. ESXi 5 architecture

Virtual SAN installation

For more information about VMware documentation for VSAN installation, see the *VMware Virtual SAN Production Information Guide* at **dell.com/virtualizationsolutions**.

Installing vSphere 5

ⓘ **NOTE: If you have ordered VMware ESXi with your PowerEdge system, the PowerEdge system comes preinstalled on the system. The ESXi installer media is required only for the recovery of a corrupted image or reinstallation.**

Topics:

- Downloading the ESXi installer media
- Installing, Enabling and Disabling ESXi
- Downloading the patches and updates for ESXi
- Creating the vCenter Server installation media
- Installing vCenter Server
- Installing vSphere Web Client
- Installing vSphere Client

Downloading the ESXi installer media

You can download the Dell-customized ESXi installer image from **dell.com/support/drivers**. To create the ESXi installer media, complete the following task:

1. Click **Get drivers and downloads**.

   For more information, see Downloading drivers and firmware.
2. Select your operating system as **ESXi** and download the ISO image.

Important information for the Dell-customized ESXi image

- The Dell-customized ESXi installer ISO image content does not include Dell OpenManage Server Administrator. For detailed instructions to install and use Dell OpenManage Server Administrator, see the Dell OpenManage documentation at **dell.com/openmanagemanuals**.
- The files that Dell creates or modifies as part of customization are:

  - **etc/vmware/oem.xml**
  - **etc/vmware/support**

  ⓘ **NOTE: The list of files appended, modified, or customized by Dell may change during a later release.**

  ⓘ **NOTE: Dell-customized ESXi image may contain additional or VMware-I/O Vendor Program (IOVP) certified updated drivers. For more information, refer to Important Information section of Dell customized ESXi image at dell.com/virtualizationsolutions .**

- If required, Dell may update the customized ISO for a critical patch impacting Dell to include VMware patches or bug fixes for Dell hardware.
- Dell OpenManage vSphere Installation Bundle (VIB) can be installed on ESXi systems, where ESXi is installed using either the Dell Customized ESXi image or the ESXi image provided by VMware.

Installing, Enabling and Disabling ESXi

ⓘ **NOTE: Only trained service technicians must perform any installation that requires removal of the system cover. See the safety document that is shipped with your system for complete information about safety precautions, working inside the system, and protecting against electrostatic discharge.**

ⓘ **NOTE: For important regulatory information, see dell.com/regulatory_compliance.**

ⓘ **NOTE:** If you have not ordered order ESXi with your system, you can order the Internal Dual SD Module kit at www.dell.com and download the ESXi Installation media from dell.com/support. For information about creating your ESXi media, see the Downloading the ESXi installer media section in this document.

ⓘ **NOTE:** If you have ordered the ESXi separately and your PowerEdge system is not preinstalled with the software, to complete the installation procedure see the Installing ESXi on Flash Media section in this document.

USB key or SD memory card installation

ⓘ **NOTE:** For more information about supported configurations of PowerEdge systems with the USB key or the SD memory card, see the *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at dell.com/virtualizationsolutions.

ⓘ **NOTE:** For instructions to install the internal USB key or the SD memory card on the system board for supported PowerEdge systems, see the system-specific Owner's Manual or Information Update at dell.com/support/home.

Overview – Dell NUMA Fault Resilient Memory

⚠ **CAUTION: Do NOT attempt to enable Fault Resilient Memory (FRM) on vSphere versions earlier than VMware ESXi 5.5 U2, or with other hypervisors. Up to 25% of system memory may be consumed to provide the FRM zone.**

NUMA FRM is a new memory operating mode available on the BIOS settings of high-end Dell's 13th generation of PowerEdge systems with at least two or four processors. This mode establishes an area of memory that is fault-resilient on all CPUs, providing the same protection to the hypervisor against uncorrectable memory errors that would affect it, as well as maintaining NUMA memory functionality and performance.

Enabling Dell NUMA Fault Resilient Memory

The following conditions must be fulfilled before you enable NUMA FRM:

- ESXi 5.5 U2 must be deployed on any of the following Dell PowerEdge systems:
  - M630
  - R730
  - R730XD
  - R630
  - FC630
- The BIOS version on your system must be 1.2.1 or later for Dell's 13th generation of PowerEdge systems that supports VMware ESXi 5.5 U2 or later under ESXi 5.5.x..
- The memory modules must be populated on the memory channels to support **Mirror Mode**. For more information, see your system Owner's Manual at **dell.com/poweredgemanuals**.
- You need vSphere Enterprise or Enterprise Plus licensing to enable the VMware Reliable Memory technology.

Complete the following steps to enable FRM on your system:

1. Turn on your system.
   The Dell logo is displayed.
2. Press F2 to open the **System Setup** page
3. Use the up- and down-arrow keys to select the **System BIOS** option, and then select **Memory Settings** .
4. Select **NUMA Fault Resilient Mode** for **Memory Operating Mode**.

   ⚠ **CAUTION: Dell recommends that you do not modify other settings unless you are familiar with the settings. Modifying settings could cause your system to fail to boot or function properly.**
5. Press Enter, and follow the on-screen procedure to save these changes.
6. Restart your system.

   ⓘ **NOTE: No further configuration changes are required for ESXi to make use of the reliable memory region.**

Overview — Dell Fault Resilient Memory

⚠️ **CAUTION: Do not attempt to enable Fault Resilient Memory (FRM) on vSphere versions earlier than VMware ESXi 5.5. Up to 25% of system memory may be consumed to provide the FRM zone in 12th generation of PowerEdge systems and 12.5% of system memory may be consumed to provide FRM zone in 13th generation of PowerEdge Systems.**

FRM is a Memory Operating mode available on the BIOS settings of few Dell's 12th generation of PowerEdge systems and later. This mode establishes an area of memory that is fault resilient and protects the hypervisor against usually uncorrectable memory errors. Systems with ESXi that supports the FRM feature can load the operating system kernel to maximize system availability and/or critical applications or services. VMWare ESXi version 5.5 update 2 and later supports FRM through its Reliable Memory (ReM) technology.

Enabling Dell Fault Resilient Memory

The following conditions must be fulfilled before you enable FRM:

- ESXi 5.5 must be deployed on one the following Dell PowerEdge systems:
  - FC630
  - M630
  - M620
  - R920
  - R820
  - R7910
  - R730
  - R730XD
  - R720
  - R720XD
  - R630
  - R620
  - R530
  - R430
  - T630
  - T620
  - T430
- The BIOS version on your system must be 1.0.4 or later for Dell's 13th generation and 2.0.19 or later for Dell's 12th generation of PowerEdge systems.
- The memory modules must be populated on the memory channels to support **Mirror Mode**. For more information, see your system Owner's Manual at **dell.com/poweredgemanuals**.
- You need vSphere Enterprise or Enterprise Plus licensing to enable the VMware Reliable Memory technology.

To enable FRM on your system, complete the following procedure:

1. Turn on your system.
   The Dell logo is displayed.
2. Press F2 to open the **System Setup** page.
3. Use the up- and down-arrow keys to select the **System BIOS** option, and then select **Memory Settings** .
4. Select **Dell Fault Resilient Mode** for **Memory Operating Mode**

   ⚠️ **CAUTION: Dell recommends that you do not modify other settings unless you are familiar with the settings. Modifying settings could cause your system to fail to boot or function properly.**

5. Press Enter, and follow the on-screen procedure to save these changes
6. Restart your system.

   ⓘ **NOTE: No further configuration changes are required for ESXi to make use of the reliable memory region.**

Installing ESXi on flash media

After installing the USB key or SD card in your system, locate the ESXi installer media that you had created in Downloading The ESXi Installer Media.

To install ESXi on the flash media, complete the following steps:

1. Turn on the system.

   ⓘ **NOTE: Before installing ESXi, you must enable the flash storage device. For more information, see Enabling Or Disabling Flash Storage Device.**

2. Insert the ESXi installer media into the optical drive.
3. Restart the system.
4. When the Dell logo is displayed, press F11 immediately.
5. At the **Boot Menu**, use the up- and down-arrow keys to select the optical drive and press Enter.
   The installer environment starts. When the installer image loads, the system is ready to begin the flash storage imaging process.

   ⚠️ **CAUTION: Step 6 deletes all data on your USB or SD storage device.**

6. On the **Select a Disk** page, select the USB or SD storage device on which you want to install ESXi and press Enter.
7. Type the root password and press F11 to start the installation.
8. When the installation process is complete, press Enter to restart the system.
9. When the Dell logo is displayed, press F11 immediately.
10. At the **Boot Menu**, use the up-and down-arrow keys to select the internal USB or SD storage device, and then press Enter.
    The system boots and starts ESXi.
11. To enable recurring boot, see Configuring boot sequence to ESXi.
12. Set the correct licensing mode.

    For more information, see Licensing Information.

Installing ESXi on the hard disk drive

To install ESXi on the hard disk drive, complete the following task:

1. Turn on the system.
2. Insert the ESXi installer media that you created earlier into the optical drive.
   See Downloading The ESXi Installer Media.
3. When the Dell logo is displayed, press F11 immediately.
4. At the **Boot Menu**, use the up- and down-arrow keys to select the optical drive and press Enter.
   When the installer image loads, the system is ready to begin the installation process.

   ⚠️ **CAUTION: Step 5 deletes all data on the selected hard disk drive.**

5. On the **Select a Disk** page, select the hard disk drive on which you want to install ESXi and press Enter.
6. Enter the root password and press Enter to reboot the system.
7. When the installation process is complete, press Enter to reboot the system.
   The system restarts and starts ESXi.
8. Set the correct licensing mode.

   For more information, see Licensing Information.

Enabling or Disabling flash storage device

ESXi installs on an internal flash storage device.

1. Turn on the system.
2. When the Dell logo is displayed, press F2 immediately to open the **System Setup** page.

   ⓘ **NOTE: If you hold down a key on the keyboard for extended period of time, it may result in a keyboard failure. To avoid possible keyboard failure, press and release F2 at even intervals until the System Setup page is displayed.**

   If the OS logo is displayed instead of the **System Setup** page, wait until the operating system finishes loading. Turn off the system and try again.

3. Use the up- and down-arrow keys to highlight **Integrated Devices**, and then press Enter.
4. To enable the Flash Storage device:

   a) Select **SD Card** or **Internal USB Port**, depending upon the device that is valid for your system.
   b) Use the right- and left-arrow keys to enable the device.

   To disable the Flash Storage device:

a) Restart ESXi and access **System Setup**.

b) Select **SD Card** or **Internal USB Port**, depending upon which device is valid for your system.

c) Use the right- and left arrow keys to disable the device.

> ⚠️ **CAUTION: Booting into an operating system other than ESXi, without disabling the flash media results in data loss.**

5. Press Enter to save your selection.
6. Press Esc.
7. Select **Save Changes and Exit**.
8. Press Enter to exit the **System Setup** screen.
9. Reboot the system.
10. To complete the process, follow the task in the topic Configuring one-time boot to ESXi or Configuring boot sequence to ESXi.

Configuring one-time boot to ESXi

1. Turn on your system.
   The Dell logo is displayed.
2. Press F11 to enter the one-time boot menu option.
   The menu entry changes to **Entering Boot Menu**, confirming your selection.
3. The boot menu displays several boot options. Using the up- and down-arrow keys, select **Hard Drive C:**.
4. Use the right-arrow key to select **SD Card** or **Internal USB Port**.
5. Press <Enter> to boot to the internal secure digital (SD) card or USB port.

Configuring boot sequence to ESXi

Complete the following steps to boot your system to ESXi. After the internal flash device port is enabled, your system continues to boot to ESXi.

1. Turn on your system.
   The Dell logo is displayed.
2. Press F2 to launch the **Setup** menu.
   After you complete the system boot, the system BIOS configuration menu is displayed.
3. Using the up- and down-arrow keys, select **Hard Disk Boot Sequence**, and then select **SD Card: Multi Card**.
4. Press the hyphen key (-) to move the SD card or internal USB port up in the order.

> ⚠️ **CAUTION: Dell recommends that you do not modify other settings unless you are familiar with the settings. Modifying settings could cause your system to fail to boot or function properly.**

5. Press Enter, and follow the on-screen procedure to save these changes.
6. Restart your system.

Downloading the patches and updates for ESXi

> ⓘ **NOTE: To install any patches or updates for ESXi, ensure that you follow the instructions given in this section.**

> ⓘ **NOTE: Check for the latest patch and update releases for your ESXi version regularly and even after you installing ESXi. For certain hardware configurations, VMware may list certain patches or updates as required on its hardware compatibility list at vmware.com/resources/compatibility/search.php.**

To check for and install the latest ESXi patch:

1. Go to **vmware.com/patchmgr/download.portal**.
2. Select **ESXi (Embedded and Installable)** from the **Product** drop-down menu.
3. Select the version of your software from the **Version** drop-down menu.
4. Click the calendar icon to enter the **Release Date** of the patch or select the **Release Date** by clicking the calendar icon.
5. Select **All Classifications** from the **Classifications** drop-down menu.
6. Select **Search**.

   The **Download Patches** page displays a list of all the patches that match the details you specified.

7. Select the required patch and click **Download Now** to download the zip file.
8. Install the patch using any of the update tools provided by VMware such as **esxcli** or **vCenter Update Manager**.

(i) **NOTE: For more information on patch management, see vmware.com/support/pubs/.**

Creating the vCenter Server installation media

1. Go to **vmware.com/download**.
2. Click the **VMware vSphere 5** download link.
3. Use your VMware store account credentials to log in to the download portal.
4. Follow the on-screen instructions to download the vCenter Server software.
5. Use a blank media to burn the ISO image.

You have now created your vCenter Server installation media.

Installing vCenter Server

Install and use vCenter Server to centrally manage your vSphere environment and to use all the features of vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition.

1. Insert the vCenter Server media into the optical drive.
2. Follow the on-screen instructions.

(i) **NOTE: If the installation program does not start automatically, browse to the vCenter Server media directory and locate autorun.exe. Double-click autorun.exe and follow the on-screen instructions.**

Installing vSphere Web Client

1. In the vCenter Server software installer directory, double-click the `autorun.exe` file to start the installer.
2. Select **VMware vSphere Web Client (Server)** and click **Install**.
3. Follow the wizard prompts to complete the installation.
   When the vSphere Web Client installation is completed, a browser opens.
4. Register one or more vCenter Servers on the vSphere Web Client Administration Application page in the browser.

Installing vSphere Client

1. Point the web browser of your Windows management system to the IP address of your ESXi server host to download vSphere Client. The IP address of your system is displayed on the main screen of your system. The browser displays a webpage.
2. Click on the **Download VMware vSphere Client** link and install the client software.

   (i) **NOTE: Ensure that the system is connected to the Internet.**

3. After the download is complete, launch the VMware vSphere Client by completing the task:
   a) Specify the IP address of your ESXi Server host.
   b) Specify a username `root` (default).
   c) Provide the password you specified in the topic Configuring The Password.

   (i) **NOTE: If you did not specify a password, leave the password field blank.**

   You receive a warning that the SSL certificate is not trusted and communication cannot be secured. You receive this notification because your host does not have a public key from VMware.
4. Click **Ignore** to proceed.

   To ignore this warning always, select the **Always Ignore** option.

Deploying vSphere 5

Important information

- Dell recommends that you use the latest BIOS versions listed at **Dell.com/support** for Dell PowerEdge servers.
- Dell's 13th generation of PowerEdge system supports ESXi installation on Non-RAID Logical unit number (LUN) or passthrough Hard disk drive (HDDs) or Solid state disk (SSDs).
- Dell's 13th generation of PowerEdge system supports ESXi installation on an On-board SATA controller in Non-RAID mode.
- On Dell's 12th generation of PowerEdge systems having Intel Xeon E5-2600 processor series, with ESXi 5.0 and later updates, Dell recommends to upgrade BIOS version 1.2.6 or later.

  ⓘ **NOTE: BIOS version 1.2.6 contains a critical fix for the issue, which can result in a Purple Screen.**

- With the introduction of vSphere v5.1, vRAM licensing and entitlement requirements have been removed, along with core or memory counts. The only licensing consideration for vSphere is per physical socket.
- Dell PowerEdge systems shipped with BCM 5709 LOMs (with iSCSI offload enabled through the hardware key) support iSCSI Boot Firmware Table (iBFT).
- PowerEdge systems shipped with Intel Xeon 5600 series processor and later versions support Intel Trusted Execution Technology (TXT) with the latest shipping BIOS.
- You cannot automatically pre-activate the Microsoft Windows Server 2008 and later versions operating system installed on virtual machines by using the product activation code in the Dell OEM installation media. You must use a virtual product key to activate the guest operating system. For more information, see the white paper, *Dell OEM Windows Server 2008 Installation on Virtual Machines Using Dell OEM Media* at **dell.com**.
- The ESXi image preinstalled on your PowerEdge system may not contain all the drivers required for peripherals. Additional drivers need to be installed to enable certain add-on peripherals. You can download the drivers from **downloads.vmware.com**.
- ESXi supports VD created with software RAID.
- vSphere 5 supports booting ESXi hosts in Unified Extensible Firmware Interface (UEFI) mode. With UEFI, systems can be booted with ESXi from local hard drives, CD/DVD drives, or USB media. Booting over the network requires the legacy BIOS firmware and is not available with UEFI.
- On Non-Uniform Memory Access (NUMA) enabled systems installed with ESXi, it is recommended that you populate all processor nodes with similar memory to enable balanced distribution of memory across nodes. With unbalanced memory distribution across nodes, you may face performance degradation issues or ESXi may fail to boot.

  ⓘ **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 vSphere 5 at vmware.com/support/pubs/.**

- ESXi 5.5 requires a minimum system memory of 4 GB on all supported systems. However, on some Dell PowerEdge systems with 4 GB, all the available memory is not allocated to the ESXi installer. This may result in an installation failure. Ensure more than 4 GB RAM is installed. For optimal memory configuration on Dell PowerEdge servers refer Server owners manual.
- To enable the Virtualization Technology (VT) feature, select System Setup, and then Processor.

  ⓘ **NOTE: To run 64-bit virtual machines on Intel processor-based servers, the VT feature is required to be enabled.**

Topics:

Best practices for deploying ESXi

1. Rack and connect your PowerEdge system.
2. Turn off your system.
3. Connect your ESXi management network to the first onboard network adapter.
4. Connect your virtual machine network to the second onboard network adapter.

5. Optionally, connect your iSCSI-based network connection to the third onboard network adapter (if applicable).

    (i) **NOTE: For systems with only two onboard network adapters, Dell recommends to add a supported network adapter.**

6. Turn on your system.

7. To enter the system setup, press F2 when you turn on the system.

    For more information, see the documentation that ships with your system.

8. Enable the Virtualization Technology (VT) feature, if available, on the PowerEdge system.

    (i) **NOTE: To run 64 bit virtual machines on Intel processor based servers, the VT feature is required to be enabled.**

9. Set the USB controller to **USB on with BIOS Support**, if available, on the PowerEdge system.

    This setting enables support for USB devices both during and after the ESXi boot process.

10. Set the ESXi keyboard language.

11. Set the ESXi password.

    For more information, see Configuring The Password.

12. Set a static IP address, subnet mask, gateway, and VLAN for the management connection(s) in the Direct Console User Interface (DCUI).

13. Set host name and Domain Name System (DNS) settings.

14. Set DNS suffix(es).

15. Install vSphere Client to manage your system.

16. Replace the Single Server Edition license key with the license key that you have purchased.

vSphere configuration using Dell Fibre Channel SAN

If you use Fibre Channel storage, you can connect a single Fibre Channel Host Bus Adapter (HBA) to a Fibre Channel switch that provides paths to both the storage controllers on the Fibre Channel storage unit. To provide maximum protection against a single failure at the HBA, Fibre Channel switch, or SP level, Dell recommends that you use two Fibre Channel HBAs on the ESXi host connected to separate Fibre Channel switches. The Fibre Channel switches provide redundant paths to the storage controllers on the storage unit. The following figure shows the vSphere configuration using Fibre Channel SAN.
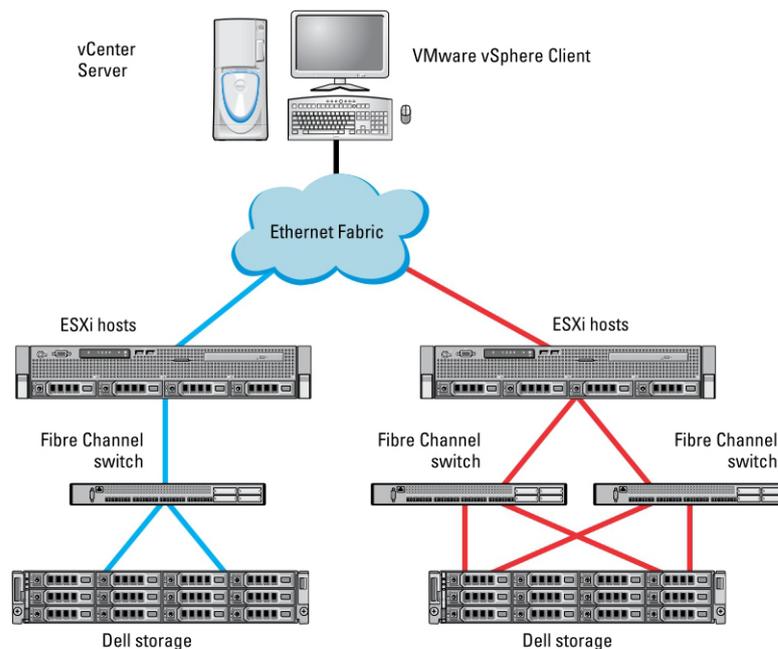
Figure 3. Configuring vSphere using Dell Fibre Channel SAN

vSphere configuration using iSCSI SAN

The iSCSI SAN provides a cost-effective solution. It is recommended to use two iSCSI initiators on the ESXi host connected to two separate ethernet switches to provide redundant paths to the storage controllers on the storage system. The following figure shows a vSphere configuration by using iSCSI SAN.
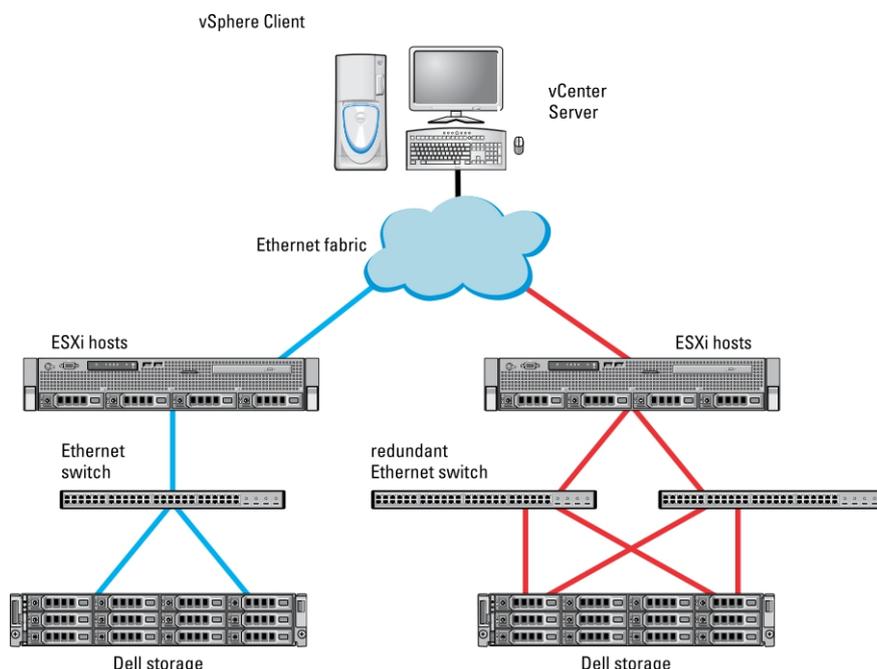
Figure 4. Configuring vSphere with iSCSI SAN

Booting ESXi

This section describes performing the basic setup of your system based on the following assumptions:

- You have already connected a keyboard, monitor, and mouse.
- You have connected the first on-board NIC to your management network.
- The network infrastructure between the two systems is working correctly prior to working with your system and the VMware management software.

To set up your system:

1. Turn on your system.
2. Press F11 at boot and select the internal storage device as the one-time boot device located under Hard Drives in the menu.

   (i) **NOTE: If you order ESXi as the primary operating system, the boot order of the system is already set to boot from ESXi. If system fails to boot to ESXi, set SD card as first boot device in boot sequence.**

   (i) **NOTE: If DHCP server is not configured in the network, valid IP address is not obtained by default.**

Configuring the password

You can use DCUI to change the password for the administrator account. The administrative user name for the ESXi 5 host is `root`.

To change the password:

1. Press F2 in the main ESXi Server host screen that is displayed after your system boots.
   The **Authentication Required** screen is displayed.
2. Select **Configure Password** and then press Enter.
3. Enter the old and new passwords.
   If the password is accepted, the main DCUI screen is displayed. The new password is now set.
4. Press Esc to log out.

Configuring Lockdown mode

Lockdown mode prevents remote personnel from logging in to the ESXi host by using the root login name. By default, lockdown mode is disabled. If you enable lockdown mode and do not configure other local host user accounts to have standalone host access through the vSphere Client, the root user does not have access through the vSphere API and CLI.

(i) **NOTE: When you enable the lockdown, non-VMware VIBs such as Dell OpenManage does not work.**

You can continue to access the host through the direct console or through an authorized and centralized management application, such as vCenter Server.

1. Select **Configure Lockdown Mode** and press Enter.
2. Press Spacebar to select **Enable Lockdown Mode** and press Enter twice.

Managing the management network services

The ESXi 5 kernel supports IPv4, IPv6, and IEEE 802.1Q (VLAN tagging) for all management network connections. Configuration of parameters including IP address, gateway, subnet mask, host name, and DNS systems occurs through the DCUI.

1. Press F2 in the main ESXi host screen that is displayed after your system boots.
   The **Authentication Required** screen is displayed.
2. Type your login credentials and press Enter.
3. Select **Configure Management Network** in the main DCUI customization screen, and press Enter.
   The **Management network configuration** screen is displayed.
4. For the PowerEdge M-series modular systems enabled with FlexAddress:
   a) Ensure that the variable **Net.FollowHardwareMac** is set to **1**.
   b) Use the vSphere Client to connect to the ESXi host.
   c) Navigate to **Configuration** > **Software** > **Advanced Settings** > **Net.**
   d) Set **Net.FollowHardwareMac** to **1** and reboot the ESXi host.
5. Backup your configuration settings using the procedures in the topic Configuration backup and restore procedures.

Configuration backup and restore procedures

ⓘ **NOTE: Dell recommends you to back up your VMware ESXi configuration after you complete the initial setup on a routine schedule that fits your datacenter environment. Backing up your configuration captures the license code (host serial number).**

To back up or restore the configuration information, use the VMware vSphere CLI. The vSphere CLI is available in:

- vSphere CLI package — vSphere CLI package can be installed on either Linux or on Microsoft Windows operating systems.
- vSphere Management Assistant (vMA) — vMA can be deployed on an ESXi host.

Both of these software are available for download from **vmware.com**. For more information on setting up and running the vSphere CLI, see the *VMware vSphere Command-Line Interface Installation and Reference Guide* and *VMware ESXi Embedded and vCenter Server Setup Guide* at **vmware.com/support/pubs**.

The backup and restore steps are given in this section considering that:

- You have already imported the vSphere CLI to a system other than the one you want to back up or restore.
- You have installed the Windows or Linux management Application Programming Interfaces (APIs).

Topics:

- Backing up the configuration of your ESXi host
- Restoring the configuration of your ESXi host

Backing up the configuration of your ESXi host

To back up configuration data of a host:

1. Start the vSphere CLI.
2. Run the `vicfg-cfgbackup` command with the **-s** flag to save the host configuration to the specified backup filename:

```
vicfg-cfgbackup --server< ESXi-host-ip> -- portnumber <port_number> --protocol
<protocol_type> --username root --password root_password [-s <backup-filename>
```

The `-portnumber` and `-protocol` options are optional. If you exclude them, the defaults are port **443** and protocol **HTTPS**.

ⓘ **NOTE: If you do not specify a password in the command line, you are prompted for one when the command executes. For example: `vicfgcfgbackup --server 172.17.13.211 --username root -s backupdate.dat`**

ⓘ **NOTE: If your administrative password includes special characters, such as $ or &, you must include a backslash escape character (\) before each special character.**

Restoring the configuration of your ESXi host

To restore the configuration data of a host:

ⓘ **NOTE: The back up process does not support restoring to later builds. This requirement can be overridden by using the -f option.**

1. Turn off any VM that is running on the host you want to restore.
2. Optionally, restore the host to the ESXi build number used when the backup file was created.
3. Start the vSphere CLI on a host other than the host you want to restore and log in.
4. Run the `vicfg-cfgbackup` command with the **-l** flag to load and restore the backup file to the host.

```
vicfg-cfgbackup --server <ESXi-host-IP> -- portnumber <port_number> --protocol
<protocol_type>-- username <username> --password <password> -l <backup_filename>
```

The **-portnumber** and **-protocol** options are optional. If you exclude them, the defaults are **port 443** and protocol **HTTPS**.

> ⓘ **NOTE: If you do not specify a password in the command line, you are prompted for one when the command executes. For example:** `vicfgcfgbackup --server 172.17.13.211 --username root -l backupdate.dat`

After a successful restore, the system reboots using the new configuration. For complete instructions on back up and restore commands, see *VMware ESXi Embedded and vCenter Server Setup Guide* at **vmware.com/support/pubs**.

Licensing information

This section provides information about the different modes of obtaining license for your Dell PowerEdge system.

(i) **NOTE: ESXi Single Server Edition licence does not support vSphere 5.0 version Update 2 and later .**

(i) **NOTE: For more information about the different editions, go to vmware.com.**

Topics:

ESXi single server edition licensing for vSphere 5.0

The ESXi ordered with your system is pre-installed and activated with the ESXi Single Server edition license key. Note down the license key and store it safely. To retrieve the license key:

1. Log in to the **Direct Console User Interface** (DCUI).
2. Go to **View Support Information** and note down the displayed license key.

   Alternatively, connect to the ESXi system using vSphere Client. Go to **Configuration** > **Software** > **Licensed Features** and record the displayed license key.

   (i) **NOTE: The ESXi 5.0 ordered with your system is pre-installed and activated with the ESXi Single Server edition license. If you ordered the ESXi hypervisor-based vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition, replace the pre-installed ESXi Single Server edition license key with the vSphere Essentials Plus, Standard, Advanced, Enterprise, or Enterprise Plus edition license key.**

   (i) **NOTE: You can choose to evaluate the enterprise-level features during the first 60-day free evaluation period. At the end of the 60-day evaluation period, reassign the recorded ESXi 5.0 Single Server edition license key to enable your system to function in that mode.**

License evaluation

VMware allows a 60-day free evaluation period for all enterprise-level features of vSphere 5. At the end of the evaluation period, your ESXi hypervisor may stop managing all virtual machines in the inventory. To continue managing the virtual machines, upgrade the evaluation license to the vSphere Essentials Plus, Standard, Enterprise, or Enterprise Plus edition license that you purchased.

vSphere licensing

If you order any vSphere license (Essentials Plus, Standard, Enterprise, Enterprise Plus, Virtual SAN, or vCenter Server) with your server, the license certificate is shipped on a media with the server. To use the software and receive the subscription services, register and exchange the Partner Activation Code (PAC) printed on the license certificate for a license key or license activation code. The registration must be completed within 30 days from the date of product purchase. With registration of the licensing or use of the ESXi hypervisor, you are agreeing to the VMware ESXi and/or VMware vCenter Server End User License Agreement (EULA) posted at **vmware.com/ download/eula/**.

For information about product features and licensing methods, go to **vmware.com**.

Administering license keys

You can administer the license key by using vSphere Client to manage the licenses individually on the ESXi system. Alternatively, you can use vCenter Server to manage the licenses centrally.

(i) **NOTE: For more information about administering license keys and VMware software licensing configuration, go to vmware.com/support/pubs.**

(i) **NOTE: If you receive a warning that you are disabling certain features by switching out of evaluation mode, click OK, and then click Yes.**

(i) **NOTE: Use all licensing information according to VMware's End User Licensing Agreement.**

Troubleshooting ESXi

ESXi installation

This section provides troubleshooting steps for common issues encountered during deployment of ESXi.

ESXi does not boot or displays a no OS found message at start up

Check the boot order. The correct storage device may no longer be selected as the first boot device. This can happen if the device has recently been removed due to failure. To correct this issue, ensure that the internal storage drive on which ESXi must be installed is assigned as the first boot device in the hard drive sequence and the hard drive is assigned as the first boot device in the boot sequence.

Purple or pink screen while booting or running your ESXi

This is a sign of a serious misconfiguration or system error, similar to a blue screen for a Windows operating system or kernel panic occurs for a Linux-based system. Contact Dell Support for technical assistance.

Frequently Asked Questions

What is the minimum RAM required to install VMware ESXi on Dell PowerEdge servers?

The minimum RAM required for installing ESXi on Dell PowerEdge servers is 8 GB.

VMware recommends a minimum of 4 GB RAM to install ESXi. However, if you install ESXi on Dell PowerEdge systems with 4 GB RAM, the installation may fail due to insufficient memory. This is because, a part of the RAM is occupied by the BIOS.


```
            Error(s)/Warning(s) Found During System Scan

The system encountered the following error(s).

                            Error(s)

<MEMORY_SIZE ERROR: This host has 3.91 GiB of RAM. 4.00 GiB are
needed>




                    Use the arrow keys to scroll

            (F9) Back        (F11) Reboot
```

Figure 5. VMware ESXi installation failure

Why are network adapters not detected during ESXi installation on PowerEdge servers?

Cause:

This issue occurs due to one of the following reasons:

- The ESXi image does not contain the latest version of network drivers, for Network Daughter Cards (NDCs) or network adapters used in Dell servers.
- PowerEdge server does not have an NDC installed.
- The NDC installed on the PowerEdge server is faulty
- PowerEdge server has an NDC installed, but the NDC setting is disabled in the BIOS/UEFI.

Resolution:

1. Use the latest available Dell customized ESXi image, which contains drivers for all NDC or network adapters supported on Dell PowerEdge servers.
   - ⓘ **NOTE: For more information about downloading the Dell customized ESXi image, see the Downloading the ESXi installer media section.**
2. Check if the NDC is working correctly.
3. Check if the NDC setting is enabled in BIOS/UEFI.
   - ⓘ **NOTE: For more information about installing and configuring the NDC on a PowerEdge server, see Dell PowerEdge hardware Owner's Manual at dell.com/poweredgemanuals.**

```
                          No Network Adapters

No network adapters were detected. Either no network adapters are physically
connected to the system, or a suitable driver could not be located. A third
party driver may be required.

Ensure that there is at least one network adapter physically connected to
the system before attempting installation. If the problem persists, consult
the VMware Knowledge Base.




                              (Enter) Reboot
```

Figure 6. No network adapter error during ESXi installation

Why are target devices not available in the Disk Selection wizard of ESXi installer?

Cause:

This issue occurs due to one of the following reasons:

1. There is no PowerEdge RAID controller or Internal Dual SD Module (IDSDM) installed on the server.
2. There are no PowerEdge RAID controllers installed in the IDSDM.
3. The drivers for the Storage controllers are not available in the ISO image.
4. In the BIOS configuration utility, IDSDM is disabled.
5. In the BIOS configuration utility, the Integrated RAID controller is disabled.
6. If the Storage controller is set to RAID mode, and virtual disks are not created with the hard drives associated with the controller.

Resolution:

1. Use the latest available Dell customized ESXi image, which contains drivers for all the supported storage controllers on Dell PowerEdge servers.
2. Ensure that the SD card is installed in the IDSDM card before installing the IDSDM card on the server. In the BIOS configuration utility, set IDSDM to **Enable**.

3. In the BIOS configuration utility, ensure that **Integrated RAID Controller** is set to **Enable**.
4. While installing ESXi, ensure that the **USB 3.0** option in the BIOS settings is set to **Disable**.
5. If the Storage controller is set to RAID mode, ensure that the virtual disks are created with the hard drives associated with the controller.
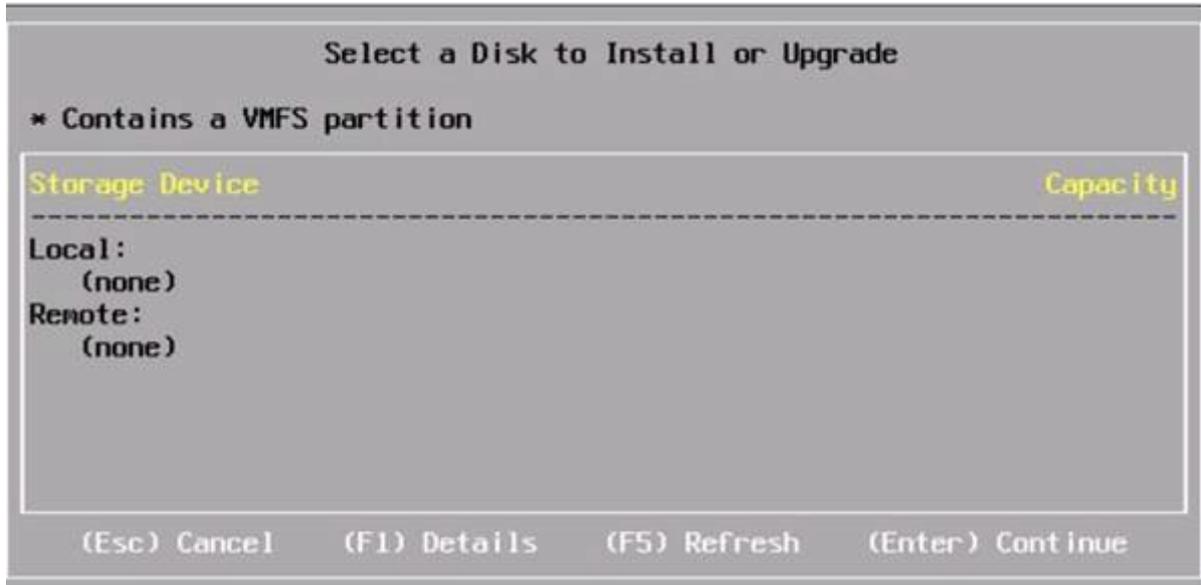

Figure 7. Target devices not displayed

Why does ESXi display the number of processors incorrectly with the Intel Xeon processors in the Dell 13th generation BIOS settings?

Cause:

This issue occurs if the **Snoop mode** option is set to **Cluster on Die** in the **BIOS Memory Settings** screen of a dual processor system.

Resolution:

To display the accurate number of processors, ensure that the **Snoop mode** option is not set to **Cluster on Die** in the **BIOS Memory Settings** screen.

Why are keyboard inputs not received by ESXi installer?

Cause:

This issue occurs because ESXi does not have USB 3.0 drivers. When USB 3.0 option is enabled in the BIOS settings, keyboard inputs are not received by the ESXi installer due to lack of drivers.

Resolution:

1. While installing ESX , ensure that the USB 3.0 option in the BIOS settings is set to **Disable**.
2. Ensure that you use the ESXi version, which carries USB 3.0 enablement.

Supported PowerEdge configurations for vSphere 5.x

For more information about supported Dell PowerEdge systems with VMware ESXi, see *VMware vSphere 5 on Dell PowerEdge and Storage Systems Compatibility Matrix* at **dell.com/virtualizationsolutions**.

The following table lists the currently shipping PowerEdge systems that support ESXi 5.x.

ⓘ **NOTE: SAS/SATA drives mentioned in the following table also include SSDs.**

Topics:

PowerEdge FC830 configuration

Table 1. PowerEdge FC830 configuration

PowerEdge FC830	
Processor	Intel Xeon E5-4600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to four 2.5-inch SAS/SATA SSD/HDD
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730, and PERC H730P
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP bNDC, Broadcom 5720 QP bNDC, Broadcom Dual Port 10 GB and dual Port 1 GB bNDC, Intel X540 QP bNDC, Intel i350 Quad Port bNDC, Emulex QP bNDC , Intel X710 , Intel X520
Remote Access	iDRAC8

PowerEdge FC630 configuration

Table 2. PowerEdge FC630 configuration

PowerEdge FC630	
Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to two 2.5-inch SAS/SATA or up to eight 1.8-inch SSD SAS/SATA
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730, and PERC H730P
External Disks Storage Adapter	PERC H830 and 12 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Broadcom Dual Port 10 GB and dual Port 1 GB rNDC, Intel X540 QP rNDC, Intel i350 Quad Port rNDC, Emulex QP rNDC
Remote Access	iDRAC8

PowerEdge FC430 configuration

Table 3. PowerEdge FC430 configuration

PowerEdge FC430	
Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Two 1.8-inch SSD SAS/SATA
Internal Flash Memory	Supported SD memory card
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP bNDC, Broadcom 5720 QP bNDC, Broadcom Dual Port 10 GB and dual Port 1 GB bNDC, Intel X540

PowerEdge FC430

	QP bNDC, Intel i350 Quad Port bNDC, Emulex QP bNDC , Intel X710 , Intel X520
Remote Access	iDRAC8

PowerEdge M915 configuration

Table 4. PowerEdge M915 configuration

PowerEdge M915	
Processor	AMD Opteron 6100/6200/6300 series
Minimum Memory	4 GB
Internal Storage	Two 2.5-inch SAS/SATA HDDs
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four 1 GbE or 10 GbE integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6

PowerEdge M910 configuration

Table 5. PowerEdge M910 configuration

PowerEdge M910	
Processor	Intel Xeon 6500 series or 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 HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H200 Modular and PERC H700 Modular
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	All supported daughter cards
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6

PowerEdge M830 configuration

Table 6. PowerEdge M830 configuration

PowerEdge M830	
Processor	Intel Xeon E5-4600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to four 2.5-inch SAS/SATA SSD/HDD
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730, and PERC H730P

PowerEdge M830

Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP bNDC, Broadcom 5720 QP bNDC, Broadcom Dual Port 10 GB and dual Port 1 GB bNDC, Intel X540 QP bNDC, Intel i350 Quad Port bNDC, Emulex QP bNDC , Intel X710 , Intel X520
Remote Access	iDRAC8

PowerEdge M820 configuration

ⓘ **NOTE: PowerEdge M820 system is a server module of the PowerEdge VRTX system.**

Table 7. PowerEdge M820 configuration

PowerEdge M820	
Processor	Intel Xeon E5-4600 and Xeon E5-4600 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to four 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PowerEdge RAID Controller (PERC) H710, PERC H710P, and PERC H310
External Disks Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57810S bNDC, Intel X520 bNDC, Qlogic QMD8262-k bNDC, and supported peripheral NICs
Remote Access	Integrated Dell Remote Access Controller (iDRAC) 7

PowerEdge M630 configuration

Table 8. PowerEdge M630 configuration

PowerEdge M630	
Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to two 2.5-inch SAS/SATA or up to four 1.8-inch SSD SAS/SATA
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P adapter
External Disks Storage Adapter	PERC H830 and 12 Gbps SAS HBA (Supported only in VRTX)
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Broadcom Dual Port 10Gig and dual Port 1Gig rNDC, Intel X540 QP rNDC, Intel i350 Quad Port rNDC, Emulex QP rNDC
Remote Access	iDRAC8

PowerEdge M620 configuration

ⓘ **NOTE: PowerEdge M620 system is a server module of the PowerEdge VRTX system.**

Table 9. PowerEdge M620 configuration

PowerEdge M620	
Processor	Intel Xeon E5-2600 and Intel Xeon E5-2600 v2 product families
Minimum Memory	4 GB
Internal Storage	Up to two 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	Not applicable
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57810S bNDC, Intel X520 bNDC, Qlogic QMD8262-k bNDC, and supported peripheral NICs
Remote Access	iDRAC7

PowerEdge M520 configuration

(i) **NOTE: PowerEdge M520 system is a server module of the PowerEdge VRTX system.**

Table 10. PowerEdge M520 configuration

PowerEdge M520	
Processor	Intel Xeon E5-2400 and Intel Xeon E5-2400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to two 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310 Mini Blade, PERC H710 Mini Blade, and PERC H710P Mini Blade
External Disks Storage Adapter	Not Applicable
Fibre Channel HBA	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge M420 configuration

Table 11. PowerEdge M420 configuration

PowerEdge M420	
Processor	Intel Xeon E5-2400 and Intel Xeon E5-2400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to two 1.8-inch SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310 adapter
External Disks Storage Adapter	Not Applicable
Fibre Channel HBA	All Supported HBA
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R920 configuration

Table 12. PowerEdge R920 configuration

PowerEdge R920	
Processor	Intel Xeon E7-4800 v2 and Xeon E7-8800 v2 product family
Minimum Memory	8 GB
Internal Storage	Up to twenty-four 2.5-inch SAS/SATA SSD HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H730P
External Disks Storage Adapter	PERC H810 and Dell 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Broadcom 57800S rNDC, Broadcom 57840S, Broadcom 5720 rNDC, Intel x520 rNDC, Intel i350 rNDC, Emulex Ocm14104 rNDC, and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R910 configuration

Table 13. PowerEdge R910 configuration

PowerEdge R910	
Processor	Intel Xeon 7500 series or Intel Xeon E7- 4800/8800 product family
Minimum Memory	4 GB
Internal Storage	Up to 16 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	SAS 6/iR Integrated, PERC 6/i Integrated, PERC H200 Integrated, and PERC H700 Integrated
External Disks Storage Adapter	SAS 5/E, 6 Gbps SAS HBA, and PERC H800
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge R820 configuration

Table 14. PowerEdge R820 configuration

PowerEdge R820	
Processor	Intel Xeon E5-4600 and Xeon E5-4600 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	PERC H810 and 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs

PowerEdge R820

Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC, and supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R815 configuration

Table 15. PowerEdge R815 configuration

PowerEdge R815	
Processor	AMD Opteron 6100/6200/6300 series
Minimum Memory	8 GB
Internal Storage	Up to six 2.5-inch SAS/SATA HDDs
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 (SAN connectivity)	All supported HBAs
Networking	Up to four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge R730 configuration

Table 16. PowerEdge R730 configuration

PowerEdge R730	
Processor	Intel Xeon E5-2600 v3 Product Family
Minimum Memory	8 GB
Internal Storage	Up to sixteen 2.5-inch or eight 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory cards
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Broadcom 57800S QP rNDC or Broadcom 5720 QP rNDC or Broadcom Dual Port 10 GB and dual Port 1 GB rNDC or Intel X540 QP rNDC or Intel i350 Quad Port rNDC or Emulex QP rNDC
Remote Access	iDRAC8

PowerEdge R730xd configuration

Table 17. PowerEdge R730xd configuration

PowerEdge R730xd	
Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to twenty six 2.5-inch or eight 3.5-inch SAS/SATA HDD/SSD and up to eighteen 1.8 inch SAS/SATA SSD HDDs

PowerEdge R730xd

Internal Flash Memory	Supported SD memory cards
Internal Storage Adapter	PERC H330, PERC H730, and PERC H730P
External Disks Storage Adapter	PERC H830 and 12Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Broadcom 57800S QP rNDC or Broadcom 5720 QP rNDC or Broadcom Dual Port 10 GB and dual Port 1 GB rNDC or Intel X540 QP rNDC or Intel i350 Quad Port rNDC or Emulex QP rNDC
Remote Access	iDRAC8

PowerEdge R720 configuration

Table 18. PowerEdge R720 configuration

PowerEdge R720

Processor	Intel Xeon E5-2600 and Intel Xeon E5-2600 v2 product families
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5-inch or eight 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	PERC H810 and 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	iDRAC7

PowerEdge R720xd configuration

Table 19. PowerEdge R720xd configuration

PowerEdge R720xd

Processor	Intel Xeon E5-2600 and Intel Xeon E5-2600 v2 product families
Minimum Memory	4 GB
Internal Storage	Up to twenty six 2.5-inch or twelve 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	PERC H810 and 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	iDRAC7

PowerEdge R715 configuration

Table 20. PowerEdge R715 configuration

PowerEdge R715	
Processor	AMD Opteron 6100/6200/6300 series
Minimum Memory	8 GB
Internal Storage	Up to six 2.5-inch SAS/SATA HDDs
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 (SAN connectivity)	All supported HBAs
Networking	Four integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge R630 configuration

Table 21. PowerEdge R630 configuration

PowerEdge R630	
Processor	Intel E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to ten 2.5-inch SAS/SATA HDD/SSD or twenty-four 1.8 inch SAS/SATA SSD HDDs
Internal Flash Memory	Supported SD memory cards
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Broadcom 57800S QP rNDC or Broadcom 5720 QP rNDC or Broadcom Dual Port 10 GB and dual Port 1 GB rNDC or Intel X540 QP rNDC or Intel i350 Quad Port rNDC or Emulex QP rNDC
Remote Access	iDRAC8

PowerEdge R620 configuration

Table 22. PowerEdge R620 configuration

PowerEdge R620	
Processor	Intel Xeon E5-2600 and Intel Xeon E5-2600 v2 product families
Minimum Memory	4 GB
Internal Storage	Up to ten 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	PERC H810 and 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs

PowerEdge R620

Networking	Broadcom 57800S QP rNDC, Broadcom 5720 QP rNDC, Intel X540 QP rNDC, Intel i350 rNDC, and supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R530 configuration

Table 23. PowerEdge R530 configuration

PowerEdge R530	
Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to eight 3.5-inch SAS/SATA SSD/HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	All supported add-in NIC
Remote Access	iDRAC8

PowerEdge R520 configuration

Table 24. PowerEdge R520 configuration

PowerEdge R520	
Processor	Intel Xeon E5-2400 and Intel Xeon E5-2400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 3.5-inch or eight 2.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disks Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBA
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R515 configuration

Table 25. PowerEdge R515 configuration

PowerEdge R515	
Processor	AMD Opteron 4100/4200/4300 series
Minimum Memory	4 GB
Internal Storage	Up to twelve 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported internal USB memory key
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated
External Disks Storage Adapter	PERC H800 and 6 Gbps SAS HBA

PowerEdge R515

Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge R430 configuration

Table 26. PowerEdge R430 configuration

PowerEdge R430

Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8GB
Internal Storage	Up to four 3.5-inch SAS/SATA or up to ten 2.5-inch SATA SSD/HDDs or up to eight 2.5-inch SAS/SATA SSD/HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	All supported add-in NIC
Remote Access	iDRAC8

PowerEdge R420 configuration

Table 27. PowerEdge R420 configuration

PowerEdge R420

Processor	Intel Xeon E5-2400 and Intel Xeon E5-2400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 2.5-inch or four 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disks Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBA
Networking	Two integrated network ports and all supported peripheral NIC daughter cards
Remote Access	iDRAC7

PowerEdge R415 configuration

Table 28. PowerEdge R415 configuration

PowerEdge R415

Processor	AMD Opteron 4100/4200/4300 series
Minimum Memory	4 GB
Internal Storage	Four 3.5-inch SAS/SATA HDDs
Internal Storage Adapter	PERC H200 Integrated and PERC H700 Integrated

PowerEdge R415

External Disks Storage Adapter	PERC H800 and 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge R320 configuration

Table 29. PowerEdge R320 configuration

PowerEdge R320

Processor	Intel Xeon E5-2400, Intel Xeon E5-2400 v2, and Intel Xeon E5-1400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to eight 2.5-inch or four 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disks Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBA
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R220 configuration

Table 30. PowerEdge R220 configuration

PowerEdge R220

Processor	Intel Xeon E3-1200 v3 product family
Minimum Memory	4 GB
Internal Storage	Up to two 2.5-inch or two 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Not applicable
Internal Storage Adapter	PERC H310
External Disks Storage Adapter	PERC H810A and Dell 6 Gbps SAS HBA
Fibre Channel HBA (SAN connectivity)	All supported HBAs
Networking	Broadcom 57800S rNDC, Broadcom 57840S, Broadcom 5720, and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge R210 II configuration

Table 31. PowerEdge R210 II configuration

PowerEdge R210 II

Processor	Intel Xeon E3-1200 product family or Intel Xeon E3-1200 v2 product family or Intel Core i3 series
Minimum Memory	4 GB

PowerEdge R210 II

Internal Storage	Two 3.5-inch SAS/SATA HDDs
Internal Storage Adapter	PERC H200
External Disks Storage Adapter	PERC H800
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

PowerEdge T630 configuration

Table 32. PowerEdge T630 configuration

PowerEdge T630

Processor	Intel E5-2600 v3 product family
Minimum Memory	8 GB
Internal Storage	Up to sixteen 2.5-inch or eighteen 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory cards
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Dual Port 1Gig LOMs
Remote Access	iDRAC8

PowerEdge T620 Configuration

Table 33. PowerEdge T620 Configuration

PowerEdge T620

Processor	Intel Xeon E5-2600 and Intel Xeon E5-2600 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to twenty-four 2.5-inch or twelve 3.5-inch SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H310, PERC H710, and PERC H710P
External Disks Storage Adapter	PERC H810 and 6 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	Two integrated network ports, and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge T430 configuration

Table 34. PowerEdge T430 configuration

PowerEdge T430

Processor	Intel Xeon E5-2600 v3 product family
Minimum Memory	8GB

PowerEdge T430

Internal Storage	Up to eight 3.5-inch SAS/SATA HDD/SSD or up to sixteen 2.5-inch SAS/SATA HDD/SSD
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H330, PERC H730 and PERC H730P
External Disks Storage Adapter	PERC H830 and 12 Gbps SAS HBA
Fibre Channel HBA	All supported HBAs
Networking	All supported add-in NIC
Remote Access	iDRAC8

PowerEdge T420 configuration

Table 35. PowerEdge T420 configuration

PowerEdge T420

Processor	Intel Xeon E5-2400 and Intel Xeon E5-2400 v2 product family
Minimum Memory	2 GB
Internal Storage	Up to sixteen 2.5-inch or eight 3.5-inch hot-plug SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disks Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBA
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge T320 configuration

Table 36. PowerEdge T320 configuration

PowerEdge T320

Processor	Intel Xeon E5-2400, Intel Xeon E5-2400 v2, and Intel Xeon E5-1400 v2 product family
Minimum Memory	4 GB
Internal Storage	Up to sixteen 2.5-inch or eight 3.5-inch hot-plug SAS/SATA HDDs
Internal Flash Memory	Supported SD memory card
Internal Storage Adapter	PERC H710, PERC H710P, and PERC H310
External Disks Storage Adapter	PERC H810
Fibre Channel HBA	All supported HBA
Networking	Two integrated network ports and all supported peripheral NICs
Remote Access	iDRAC7

PowerEdge T110 II configuration

Table 37. PowerEdge T110 II configuration

PowerEdge T110 II	
Processor	Intel Xeon E3-1200 product family or Intel Xeon E3-1200 v2 product family or Intel Core i3 series
Minimum Memory	4 GB
Internal Storage	Four 3.5-inch SAS/SATA HDDs
Internal Storage Adapter	PERC H200
External Disks Storage Adapter	Not applicable
Fibre Channel HBA (SAN connectivity)	Not applicable
Networking	One integrated network port and all supported peripheral NICs
Remote Access	iDRAC6 Enterprise

Getting help

Topics:

- Documentation matrix
- Contacting Dell
- Downloading drivers and firmware

Documentation matrix

The documentation matrix provides information on documents that you can refer to for setting up and managing your system.

Table 38. Documentation matrix

To...	See the...
Install your system into a rack	Rack documentation included with your rack solution
Set up your system and know the system technical specifications	*Getting Started With Your System* that shipped with your system or see **Dell.com/poweredgemanuals**
Install the operating system	Operating system documentation at **Dell.com/operatingsystemmanuals**
Get an overview of the Dell Systems Management offerings	*Dell OpenManage Systems Management Overview Guide* at **Dell.com/openmanagemanuals** > **OpenManage software**
Configure and log in to iDRAC, set up managed and management system, know the iDRAC features, and troubleshoot by using iDRAC	*Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**
Know about the RACADM subcommands and supported RACADM interfaces	*RACADM Command Line Reference Guide* for iDRAC at **Dell.com/idracmanuals**
Launch, enable, and disable Dell Lifecycle Controller, know the features, use and troubleshoot Dell Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at **Dell.com/idracmanuals**
Use Dell Lifecycle Controller Remote Services	*Dell Lifecycle Controller Remote Services Quick Start Guide* at **Dell.com/idracmanuals**
Set up, use, and troubleshoot OpenManage Server Administrator	*Dell OpenManage Server Administrator User's Guide* at **Dell.com/openmanagemanuals** > **OpenManage Server Administrator**
Install, use, and troubleshoot OpenManage Essentials	*Dell OpenManage Essentials User's Guide* at **Dell.com/openmanagemanuals** > **OpenManage Essentials**
Know the features of the storage controller cards, deploy the cards, and manage the storage subsystem	Storage controller documentation at **Dell.com/storagecontrollermanuals**
Check the event and error messages generated by the system firmware and agents that monitor system components	*Dell Event and Error Messages Reference Guide* at **Dell.com/openmanagemanuals** > **OpenManage software**

Contacting Dell

Dell provides several online and telephone-based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer-service issues:

1. Go to **Dell.com/support**.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:

a) Enter your system Service Tag in the **Enter your Service Tag** field.

b) Click **Submit**.

The support page that lists the various support categories is displayed.

4. For general support:

a) Select your product category.

b) Select your product segment.

c) Select your product.

The support page that lists the various support categories is displayed.

5. For contact details of Dell Global Technical Support:

a) Click Global Technical Support.

b) The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Downloading drivers and firmware

Dell recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Ensure that you clear the web browser cache.

1. Go to **Dell.com/support/drivers**.

2. In the **Product Selection** section, enter the Service Tag of your system in the **Service Tag or Express Service Code** field.

ⓘ **NOTE: If you do not have the Service Tag, select Automatically detect my Service Tag to enable the system to automatically detect the service tag, or select your product from the Product Selection page.**

3. Click **Get drivers and downloads**.

The drivers that are applicable to your selection are displayed.

4. Download the drivers that you need to a USB drive, CD, or DVD.