

VMware[®] ESX Server 3i

Dell Solution Guide



Notes, Notices, and Cautions



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



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

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Introduction

Dell PowerEdge servers enabled with VMware ESX Server 3i represent the next generation of servers designed specifically for virtualization. Through its close partnership with VMware, Dell is able to offer qualified VMware-based virtualization solutions optimized for today's active data centers.

With its hardware-like footprint, VMware ESX Server 3i offers a standards-based management solution designed for reduced deployment time, centralized management, and increased security. When coupled with energy efficient Dell PowerEdge servers, you can also take advantage of reduced power and cooling needs, the latest in CPU technologies, reduced server downtime, and greater reliability.

This guide will help you understand the differences between ESX Server 3i and ESX Server 3 versions of VMware's Virtual Infrastructure 3 (VI3) products as they are deployed on Dell servers, how to deploy, manage, license, and support your solution, and Dell's deployment best practices. A deployment best practices checklist is also provided (see "Appendix A: Deployment Best Practices Check List" on page 26).



NOTE: Although this guide will help you use your ESX Server 3i enabled PowerEdge server, you are also encouraged to review the information provided by VMware (www.vmware.com).

VMware ESX Server 3i Features

Ease of Deployment

VMware ESX Server 3i is sold as an OEM product pre-installed on Dell servers. Because ESX Server 3i is pre-installed, your server can be deployed within minutes by simply connecting a keyboard, monitor, and mouse, and by enabling basic Ethernet-based connectivity for management traffic; there is no need to configure local storage, install ESX from CD, or configure the server via the service console. With server data center deployments often handled by several technicians and engineers through a formal deployment process, eliminating these steps may save time and simplify IT deployment flows.

Integrated Management and Health Monitoring

Tightly integrated with the Dell PowerEdge platforms, VMware ESX Server 3i uses the standards-based Common Interface Model (CIM) to monitor (graphically) the PowerEdge server on which it is running and provide up-to-date system health information. This information is available for one or more servers within the Virtual Infrastructure Client (VI Client) and includes the following data: internal storage array, physical and logical drive health, and analog system parameters, such as cooling fan speeds and system board ambient temperature readings. The ESX Server 3i kernel also supports SNMP alerting, a widely adopted management protocol. SNMP support allows you to integrate your PowerEdge systems into your existing management infrastructure.

In addition, VMware's software is now able to take advantage of power monitoring capabilities offered by Dell PowerEdge servers. You can monitor instantaneous power usage and input voltages, as well as cumulative power, max current and max power usage since last reset.

For more information about systems management with VMware ESX Server 3i on Dell PowerEdge servers, and a comprehensive management guide greatly expanding on the architecture, out-of-band management, and baseboard management controller (BMC) capabilities of this solution, please visit www.dell.com/vmware.

Enhanced security

With a service console based on a hardened Linux® distribution, ESX Server software already helps provide a secure virtualization environment.

ESX Server 3i further enhances security by eliminating the service console altogether, which simplifies the process of securing the IT infrastructure by reducing the number of open network ports and preventing other programs that can compromise security from being installed.

Reduced Patch Management

Removal of the service console in ESX Server 3i simplifies patch management, reducing VMware support costs, simplifying IT processes and maintenance scheduling, and improving host security.

Improved Reliability

Hard drives represent one of the greatest sources of hardware failures in data center environments. Shared storage arrays (fibre channel or iSCSI) are better suited for virtual machine (VM) and data storage than local hard drives, providing higher levels of performance and increased single point of failure recovery. Additionally, solid-state, internal storage is easier to configure than other hard drive-less solutions, such as Boot-from-SAN. Because shared storage arrays are required to take advantage of ESX Server 3i enterprise and standard-level features, Dynamic Resource Scheduling (DRS) and High-Availability (HA), server local hard drives are not needed.

Rapid Deployment and Provisioning

Dell offers VMware ESX Server 3i pre-installed direct from the Dell factory, enabling greatly simplified data center deployment and provisioning. For the first time, VMware users have the ability to go from box to rack to processing workloads in minutes.

Dell Supported Configurations

Server	PowerEdge R805
Processors	Two Dual/Quad Core AMD Opteron 2200/2300
Memory (Min/Max)	8 GB/128 GB
Storage Adapters for Internal Disks	PERC 6/i Integrated; SAS 6/iR Integrated
Storage Adapter for External Disks	SAS 5/E PERC 6/E
Fibre Channel HBA (required for SAN connectivity only)	All supported Fibre Channel HBAs
Networking	Four integrated network ports, All supported peripheral NICs
Dell Remote Access Controller (DRAC)	DRAC 5 (required)
Internal Storage	Up to two 2.5" SAS/SATA disks

<p>External Storage:</p> <p>iSCSI based</p> <p>direct attached (VMotion not supported)</p>	<p>EqualLogic PS5000E, PS5000X, and PS5000VX; PowerVault MD3000i and NX1950</p> <p>PowerVault MD3000</p>
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For full support details, consult VMware’s complete Hardware Compatibility List (HCL) at www.vmware.com/resources/guides.html.

To ensure processor compatibility across several servers, consult the Dell VMotion compatibility guide at www.dell.com/vmware.

VMware Infrastructure Architecture

VMware Infrastructure consists of the following components (see Figure 1).

Figure 1. VMware Infrastructure Components Using Dell PowerEdge Systems and Storage Systems

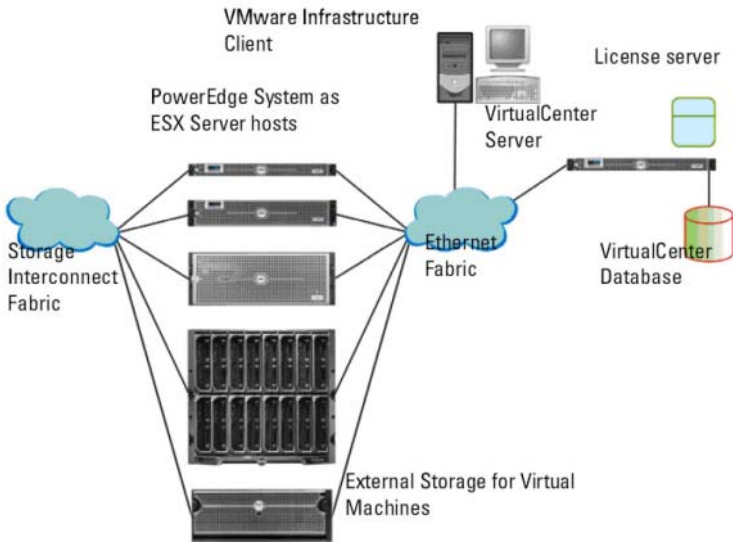


Diagram Components:

- ESX Server — allows multiple operating systems to run simultaneously on a single PowerEdge system.
- VirtualCenter Server — manages multiple ESX Servers and runs on Windows Server 2003. VirtualCenter is optional and is required for advanced management capabilities such as VMotion, DRS, and HA.
- VirtualCenter Database — stores all of the configuration data about a VMware Infrastructure. It is recommended that you use a professional database such as Microsoft SQL Server™ or Oracle™ for the VirtualCenter database.
- License Server — authorizes ESX Server hosts and the VirtualCenter server per the purchased license keys and licensing agreement. It is recommended to install the license server on the VirtualCenter host. This can also reside on a separate host. License server is required when using a centralized licensing model, but is not required for host-based licensing. For more information on the different licensing configurations, see the

Installation Guide and *Upgrade Guide* for ESX Server 3 under VMware Infrastructure 3 on the VMware documentation website at www.vmware.com/support/pubs.

- VMware Infrastructure Client - installs on a system running a supported Windows operating system and is the primary tool to manage an ESX Server host by directly connecting to it or through the VirtualCenter server.
- Virtual Machine Storage — stores virtual machine configuration and virtual disk files. This can be either an internal storage local to the ESX Server or an external storage that can be shared by multiple ESX Servers. Advanced features such as VMotion, DRS, and HA require that the virtual machine's disk and configuration files are stored on external shared storage.
- VMware Infrastructure Web Access — a web interface for managing virtual machines and accessing remote consoles.

Guidelines

Before deploying VMware Infrastructure, follow the guidelines below:

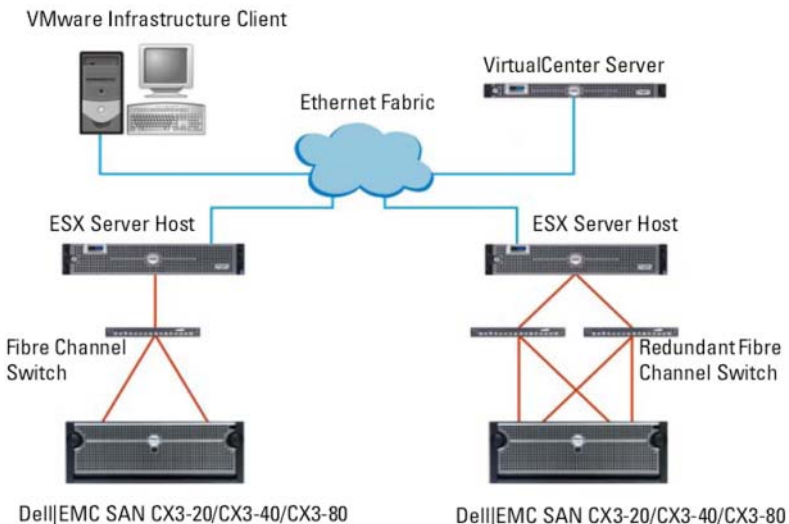
- Determine the licensing mode that will best suit the deployment environment and design the licensing infrastructure accordingly.
- Determine the type of storage (local SCSI/SAS/SATA, iSCSI, or Fibre Channel SAN) for hosting virtual machines that will best suit the deployment environment and design your storage infrastructure accordingly.
- Determine the number of logical unit numbers (LUNs), size of the LUNs, RAID level of the LUNs, and the number of storage groups.
- Determine the number of virtual machines that will run on the ESX Servers and their corresponding workloads.
- Size the resource requirements for the virtual machines, such as the microprocessor requirements, memory size, and networking. For more information on general sizing and scaling studies, see the documentation available on the Dell and VMware Alliance website at www.dell.com/vmware→Resources→White Papers. For articles on performance and sizing, see the VMware documentation website at www.vmware.com/support/pubs.

- Gather the required network information, such as IP addresses, network masks, and gateway addresses.
- If you are using DRS or the HA feature, determine the hosts that will be a part of such a cluster and allocate shared storage accordingly.
- Determine the appropriate networking configuration for management, virtual machines, and iSCSI (optional). Virtual local area networks (VLANs) can be used to efficiently isolate traffic.

Dell-Supported VMware Infrastructure 3.5 Configurations

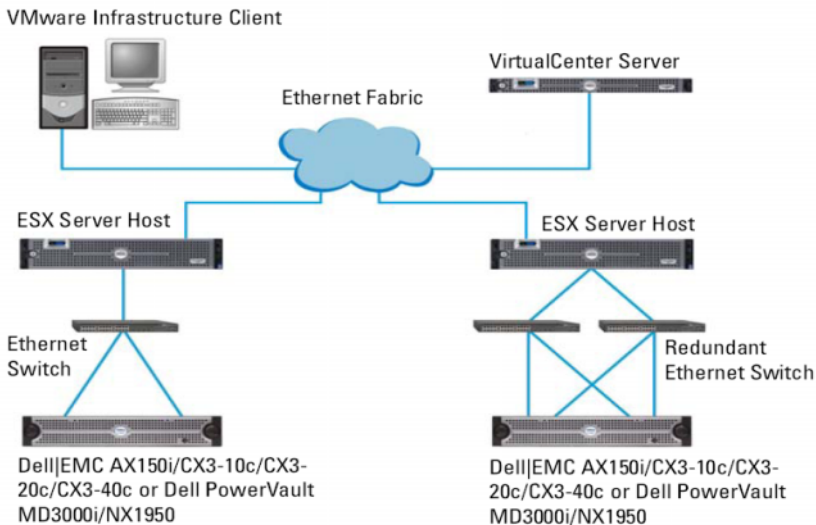
If you use Fibre Channel storage, you can have a single Fibre Channel HBA connected to a Fibre Channel switch that in turn provides paths to both storage processors (SPs) on the Fibre Channel storage unit (see Figure 2). To provide maximum protection against a single failure at the HBA, Fibre Channel switch, or SP level, it is recommended that you use two Fibre Channel HBAs on the ESX Server host connected to separate Fibre Channel switches that provide redundant paths to SPs on the storage unit.

Figure 2. VMware Infrastructure Configurations with Dell PowerEdge Systems and Dell EMC Fibre Channel SAN



For a cost-effective solution, you can opt for an iSCSI SAN environment (see Figure 3). It is recommended that you use two iSCSI initiators on the ESX Server host connected to two separate Ethernet switches that provide redundant paths to SPs on the storage unit.

Figure 3. VMware Infrastructure Configurations with Dell PowerEdge Systems and iSCSI SAN



Solution Deployment


First Boot Experience (Simple Setup)

The following procedure describes how to perform the basic setup of your server and assumes that you have already connected a keyboard, monitor, and mouse, and that you have connected the first onboard NIC to your management network. The network should have a valid DHCP server and should be the same network you plan to use when you install the required management software on a second machine. Ensure the infrastructure between the two systems is working correctly prior to working with your server and the VMware management software.

If the system is currently set to boot to another operating system, such as Linux or Windows, use the information in "Appendix B: Enabling and Disabling the VMware ESX Server 3i Software" on page 28 to set ESX as the primary boot operating system.

To set up your server:

- 1 Power on your server.
- 2 Press <F11> at boot and select the internal storage device as the one-time boot device (located under Hard Drives in the menu).

 **NOTE:** If you ordered VMware ESX Server 3i as the primary operating system, the boot order of the system is already set to boot the VMware software.

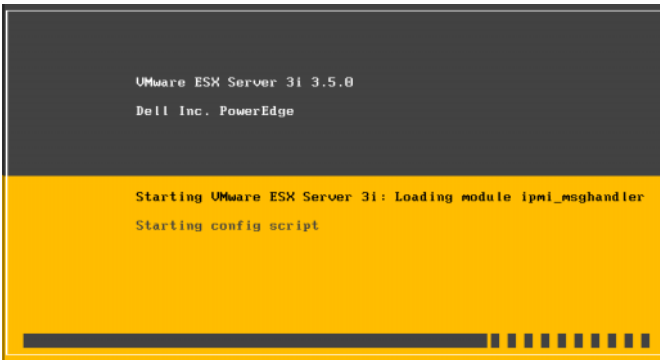
In the first phase of booting, the software loads the compressed ESX modules into memory and a simple progress bar is displayed.

Figure 4. VMware ESX Server 3i Loading Modules



In the second phase, the modules are expanded and executed from memory. As they are loaded, the module names briefly display on the screen (Direct Console User Interface or DCUI).

Figure 5. VMware ESX Server 3i Executing Modules



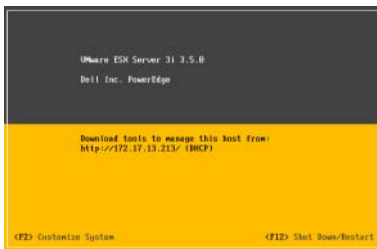
Once all ESX modules have expanded and executed, the server is ready to begin servicing workloads as illustrated in Figure 6. If there is a DHCP server or DHCP proxy configured on your network subnet, the ESX server displays the address acquired by the DHCP server. Proceed to "Management Software Installation" on page 17 to install the Virtual Infrastructure Client.

If a warning is displayed (see Figure 7), the ESX Server 3i host was unable to obtain an IP address from your DHCP server. The next section explains how to configure this setting.



NOTE: By default, ESX Server 3i does not have a password. Dell strongly recommends setting a keyboard language and server password. The next section provides information on configuring these settings.

Figure 6. VMware ESX Server 3i Running (with DHCP) **Figure 7. VMware ESX Server 3i Running (with DHCP, no address)**



Configuring the ESX Server 3i Software

The following section describes how to edit the ESX server host settings via the DCUI. The DCUI can be used to:

- Configure keyboard language
- Set/modify DCUI Password
- Configure/test/reset Management Services
- Enable/disable Lock Down Mode
- View Dell Support information
- View ESX system logs
- Restart ESX Management Services
- Reset customized settings

Configure Keyboard Language

The DCUI supports keyboard languages/styles English (default), French, German, Japanese, and Russian.

Dell strongly recommends setting the keyboard language *before* setting the ESX password. Setting the password and then changing the keyboard language may result in loss of the ability to log in to the DCUI again. If this should happen, you may need to reimage your internal storage device further resulting in the loss of your settings. Please contact Dell support if you find yourself in this situation.

To set the keyboard language:

- 1 At the main ESX Server 3i host screen (see Figure 6 or Figure 7), press <F2> to enter the configuration screen.
- 2 Scroll down to **Configure Keyboard**, and then press <Enter>.
- 3 Select your keyboard language, then press the <ESC> key several times to log out of the DCUI.

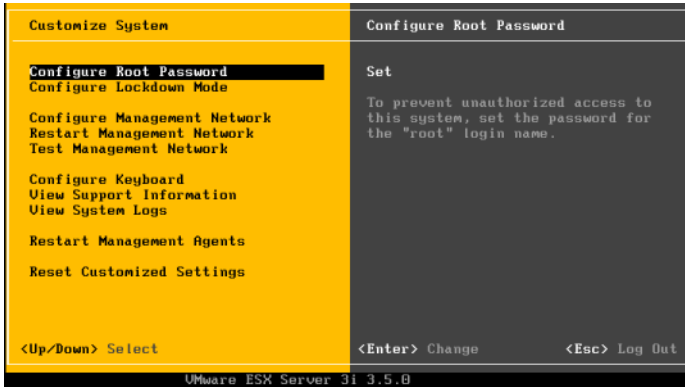
Password Configuration

The DCUI supports the configuration of a password to control access to the ESX host settings; Dell strongly recommends setting a password to ensure only authorized persons gain access to your ESX host.

To set the password:

- 1 After boot, your server will show the main ESX Server 3i host screen (see Figure 6 or Figure 7). From here, press <F2> to enter the main DCUI configuration screen (see Figure 8).

Figure 8. Main DCUI Configuration Screen



- 2 Select “Configure Root Password” and then press Enter. By default, the old password field will be grayed out and the first new password field selected. Enter the new password twice. If the password is accepted, you will be back to the main DCUI screen. The new password is now set, press <ESC> to log out.

Configure, Test, Reset of Management Network Services

The VMware ESX Server 3i kernel supports IPv4 and IEEE 802.1Q (VLAN tagging) for all management network connections; configuration of these parameters including IP address, gateway, subnet mask, host name, and DNS servers happens through the DCUI. Virtual machine network connections additionally support IPv6. All virtual machine network configuration is performed from the VMware management software. VM networks configuration from the DCUI is not supported.

- 1 After boot, the server will show the main ESX Server 3i host screen (Figure 6 or Figure 7). From here, press <F2> to enter the main DCUI configuration screen (see Figure 8).

- 2 Scroll down to “Configure Management Network” in the main DCUI customization screen (see Figure 9), and press Enter to display the main Management network configuration screen (see Figure 10).

Figure 9. Network Summary Screen

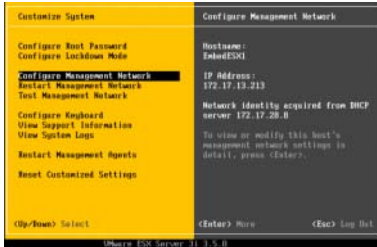
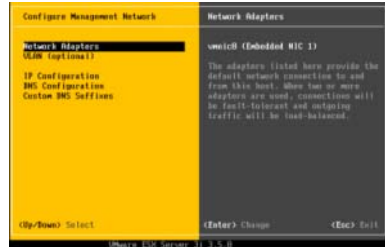


Figure 10. Main Network Configuration Screen



Additional Setup Steps

Dell recommends the following steps:

- 1 Backup your configuration using the procedures outlined in Appendix E: Configuration Backup and Restore Procedures.

Management Software Installation

Beyond the basic configuration of management connectivity, VMware requires a second Windows management station for configuration and day-to-day management. The ESX 3i server can be managed by directly connecting the server through VMware Infrastructure Client or by adding the server to VMware VirtualCenter. VMware VirtualCenter provides many-to-many management of more than one ESX server.

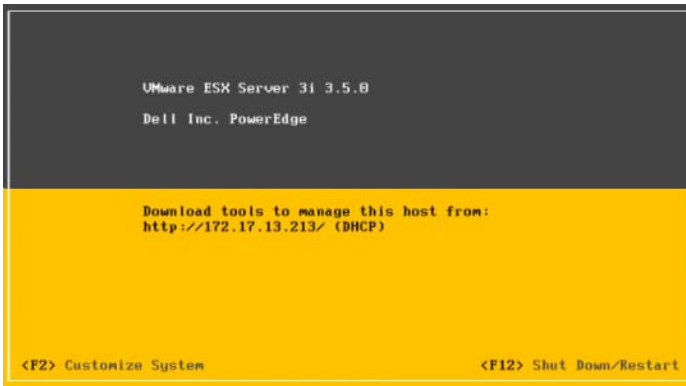
VMware Infrastructure Client is available free of charge with the ESX Server 3i (and ESX Server 3) products. VirtualCenter is available for purchase from Dell. VMware has also included a 60-day trial version of VirtualCenter on the VMware ESX Server 3i Companion CD that shipped with your server.

Configuring the many-to-many management software, VMware VirtualCenter, is beyond the scope of this document, but a complete getting started guide and instruction manual can be found in VMware’s documentation.

Install Virtual Infrastructure Client (VI Client)

- 1 Download the VI Client directly from your ESX Server 3i host. Point the web browser of your Windows management server to the IP address of your ESX Server 3i host. The IP address of your server is displayed on the main screen of your server (see Figure 11).

Figure 11. Main Console Screen



- The browser will display a webpage (see Figure 12). Click on the “Download VMware Infrastructure client” link and install the download.

Figure 12. Download VI Client Screen

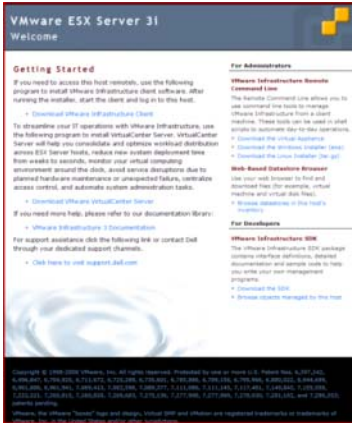


Figure 13. VMware Infrastructure Client Login Screen



- Once complete, launch the VMware Infrastructure Client by specifying the IP address of your ESX Server 3i host, a user name of ‘root’ (default), and the password you specified in the DCUI earlier in this section or blank (no password) if you did not specify one.
- You will receive a certificate warning you 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. Click ‘Ignore’ to proceed past the warning; optionally, you may elect to always ignore this warning by clicking the “Always Ignore” check box.

Solution Licensing

Licensing Methods

VMware ESX Server 3i offers four methods for licensing your host. These methods provide the flexibility needed to serve large and small organizations, as well as the capability to test drive the enterprise-level features of ESX Server 3i for a limited period of time. These methods are:

Evaluation Licensing

When operating without a purchased license, your system will have an evaluation license allowing 60 days of enterprise-level feature usage. At the end of the 60-day period, the system will continue to function, but the enterprise-level features will disable allowing only basic one-to-one (VI Client) host management. If you would like to continue using these features, please contact Dell to purchase a license. The procedure below will help you install your new license code once received.

Host-based Licensing (License Code) – Factory default

As shipped from Dell, your system will come pre-activated with a license code entitling you to use the features entitled by the version you purchased. This license will also allow you to try, for 60 days, the enterprise-level features if you did not purchase the enterprise product. At the end of the 60-day period, the system will continue to function at the level your purchased license warrants. You may purchase an upgrade license from Dell if you would like to continue using the trial features. The procedure below will help you install your new license code once received.

Host-based Licensing (License File)

This method allows users to import a VMware-provided license file to enable host-based licensing commonly used by other V13 products; this licensing method enables backward compatibility with other V13 products.

License Server (Centralized Licensing)

This licensing method is for enterprise users who are using HA, DRS, etc. This method is commonly referred to as centralized licensing because the V13 features are licensed on demand from a central location when an ESX host requests them. If a feature license is available when requested, the central

license server grants access to the feature. When no longer needed, the feature license is checked back into the license pool for reuse. Some VIB features are only available via centralized licensing due to their multi-host nature.

Users who purchased standard and enterprise versions of ESX Server 3i will need to convert their host-based license code into a license server license. This procedure is discussed in the Solution Licensing of this document as well as in VMware's ESX Server 3i documentation.

The procedures below will help you retrieve your license code from each server and will familiarize you with how the licensing methods discussed here are reflected in your software. Please consult VMware's documentation for further information about VMware software licensing configuration.

VMware offers two methods to retrieve this code – via the DCUI and via the VI Client. Both methods are discussed below:

To View License Code (from DCUI):

The license code is available from the DCUI along with other support information, (see Figure 14).

- 1** From the main DCUI screen (see Figure 11), press <F2>. Log into your server.
- 2** Scroll down to the "View Support Information" menu; your license code will appear here. Dell strongly recommends recording this code in a safe place.



NOTE: Figure 11 shows the server operating with an evaluation license.

Figure 14. DCUI Support Screen




To Modify Licensing Configuration (from Virtual Infrastructure Client only):

The DCUI will allow read-only access to the current licensing status of your system. To make changes to your licensing configuration, you must log into the server using the VI Client and/or VirtualCenter. The steps below will show you how to make changes. Please consult the VMware ESX Server 3i documentation for VirtualCenter instructions.

- 1 Install the VI Client as discussed in the Install Virtual Infrastructure Client (VI Client) section of this document.
- 2 Log into your ESX Server 3i host, click Configuration → Licensed Features → click Edit (in the top License Source section).

If you purchased the Standard or Enterprise version of ESX Server 3i, enter the address of your license server on the “Use Licensing Server” line only if you have already recorded the existing host-based license code as previously described. If you have not already done so, proceed to the next section to convert your host-based license into a centralized licensing server license. Consult VMware’s documentation to set up your license server.

 **NOTE:** You must use all licensing information in accordance with VMware’s End User Licensing Agreement.

Serial Number Registration and Exchange

To access your software subscription services and/or advanced VMware software features, you must register the serial number of your ESX Server 3i server with VMware. Registration must be completed within 30 days of purchase using VMware registration website, www.vmware.com/code/dell. If you have multiple serial numbers, you can register all the codes to one license administrator or multiple serial numbers with different license administrators.

Image Recovery

If your VMware ESX Server 3i software becomes non-bootable due to a configuration or hardware error, you will need to reimage the internal storage device with a new base image. This process will restore your server to a bootable state, but will not include the per-system licensing activation information that originally shipped with your server, though this may not be a concern if you are using centralized licensing and have already exchanged your host-based license. Dell support will be able to help you with the reimaging process and with any licensing issues. Please contact Dell support via your typical support channels or via support.dell.com.

If you do require a new license from Dell support, but need to have the server up and running as soon as possible, you may take advantage of the onetime 60-day trial of all enterprise-level features including HA and DRS as well as VirtualCenter Server. Dell recommends requesting the license as soon as possible following an image recovery to ensure you have your new host-based license before the 60-day period expires. Typically, this process will take much less than 60-days.

- 1 Find the VMware ESX Server 3i Recovery CD that shipped with your system or download the latest version from support.dell.com as you would download other PowerEdge hardware updates.
- 2 Burn the ISO image if needed; place the CD in the internal or an external CD/DVD drive.
- 3 Remove all USB-based storage devices not present when you received the system. Failure to do so could lead to an error during the image recovery process.

- 4 Turn on the system and press <F11> (one-time boot menu) during the power on system test (POST). The system will display “Entering Boot Menu...” in the upper right corner of the screen and continue with the POST process.
- 5 Once finished with the initial boot, you will see a text menu of all bootable storage devices.



NOTE: If you see any reference to “Virtual Media” in the list, you must follow the procedure in Appendix D: Modifying Remote Access Console Virtual Media Status to disable the Dell Remote Access Console (DRAC) virtual media devices or else you will receive an error during the image recovery process.

Select the optical device where your recovery CD is located. For internal optical drives, you will select the device listed in Figure 15 and press ENTER.

Figure 15. Server Boot Device Menu

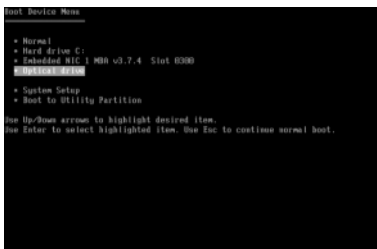


Figure 16. Recovery CD Loading



- 6 The recovery environment will start (see Figure 16). You should expect a delay when the progress bar reaches the far right. Once the recovery environment is completely loaded, the system will be ready to begin the recovery process (see Figure 17). Press ENTER twice to confirm that you want to reimage the internal storage device. Remember, this process will erase all configuration information from your internal solid-state storage. After reimaging, you will need to reconfigure your VMware ESX Server software and import any virtual machines you would like to run on this system.

Figure 17. Beginning Recovery Process

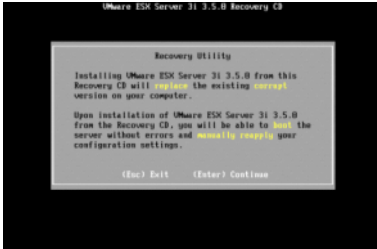


Figure 18. Error, other devices found



NOTE: If you see a fatal error (Figure 18), double check that no other USB-based storage devices are connected to the system and that the virtual media devices present on the DRAC have been disabled, (see Appendix D: Modifying Remote Access Console Virtual Media Status).

- 7 Once the recovery process completes, press ENTER to reboot your server. The server will reboot and launch the VMware ESX Server 3i software. If this does not happen, you will need to reassign order of your boot devices placing the internal storage highest in the boot order list. Consult your server's manual for these steps.
- 8 Set the correct licensing mode as instructed in the Solution Licensing section.

Appendix A: Deployment Best Practices Check List

Use the following Dell deployment best practices checklist to aid the deployment of the VMware ESX Server ESX 3i software.

- Rack (if applicable) and connect your PowerEdge server according to the server deployment guide.

With the server powered off...

- Connect your ESX Server 3i management network to the first onboard network adapter
- Connect your Virtual Machine network to the second onboard network adapter
- (Optional) Connect your iSCSI-based network connection to the third onboard network adapter (if applicable). For systems with only two onboard network adapters, you will need to add a qualified network adapter to your server if your system was not purchased with one.

With the server powered on...

- Press <F2> during boot to the bios setup screen. Consult your system's manual for information specific to these settings.
 - Enable the Virtualization Technology (VT) feature, if available in the PowerEdge system. VT feature is required to run 64-bit virtual machines on Intel platforms.
 - Disable Demand Based Power Management feature, if available in the PowerEdge
 - Set the universal serial bus (USB) controller to USB on with BIOS Support, if available in the PowerEdge system. This enables support for USB devices both during and after the ESX Server boot process.
- Set the ESX server 3i keyboard language (Page 13)
- Set the ESX server 3i server password (Page 13)
- (Optional) Configure redundant VMware management network adapters (Page 25)
- Set a static IP address, subnet mask, gateway, and VLAN for the management connection(s) in the DCUI (Page 26)

- Set host name and DNS server settings (Page 26)
- (Optional) Set DNS Suffix(s) (Page 26)
- Install Virtual Infrastructure Client to manage your server (Page 15)
- Review licensing options (Page 17)
 - Record host-based licensing code, store in safe place (Page 18)

 _____-_____ - _____-_____ - _____
 - (Optional) Convert host-based license code to centralized license code
 - (Optional) Add converted license to centralized license server
 - (Optional) Change licensing mode of ESX Server 3i host to “Use License Server”, enter IP address of central license server (page 19)

Appendix B: Enabling and Disabling the VMware ESX Server 3i Software

Selected systems come preinstalled with VMware ESX Server 3i on internal flash storage. If this software was ordered as the primary OS, the system will automatically boot to it. If the software was ordered as the secondary OS, the system will automatically boot to it and the ESX Server 3i software will be disabled by default. The procedures below will help you modify the boot device and boot order so that you will be able to boot the ESX Server 3i software.

Enable One-Time Boot to ESX Server 3i, v3.5

The following instructions walk you through the process of enabling the VMware ESX Server 3i hypervisor for a one-time boot on your system.


- 1 Turn on your server.
- 2 The Dell Splash Screen appears. When the splash screen appears, press <F11> to enter the one-time boot menu option.
- 3 The menu entry changes to Entering Boot Menu confirming your selection.
- 4 The boot menu displays several boot options. Using the arrows, select Hard Drive C:, then use the right arrow key to select SD Card.
- 5 Press <Enter> to boot to the internal secure digital (SD) card.

Enable Recurring Boot to ESX Server 3i, v3.5

Follow the steps given below to enable the system to always boot your server to ESX Server 3i:

- 1 Turn on your server.
- 2 The Dell Splash Screen appears. Press <F2> to launch the setup menu.
- 3 After you complete the system boot, the system BIOS configuration menu appears.
- 4 Select Hard Disk Boot Sequence, then select SD Card: Multi Card. Press the hyphen key to move the SD Card up in the order.

5 Press <Enter>, then <Esc>, and then <Enter> again to save these changes.

 **NOTICE:** Dell recommends not to modify other settings unless you are familiar with the settings. Modifying settings could cause your system to fail to boot/function properly.

6 Restart your server.

Disable Recurring Boot to ESX Server 3i, v3.5

Repeat the steps for Enable Recurring Boot to ESX Server 3i, v3.5, but use the hyphen key <-> in step 4 to move the Integrated Storage Device to the top of the boot order instead of the SD Card.

Appendix C: Sample Step-by-Step Management Network Configuration

This appendix guides you through a sample management network setup with the following parameters.

- Redundant management NICs (on-board NICs)
- Static address of 172.17.13.211/24 (255.255.255.0) gateway: 172.17.13.1
- Host name of: EmbedESX1.VMwareFarm.lab
- DNS servers: 172.17.28.10 and 172.17.28.252

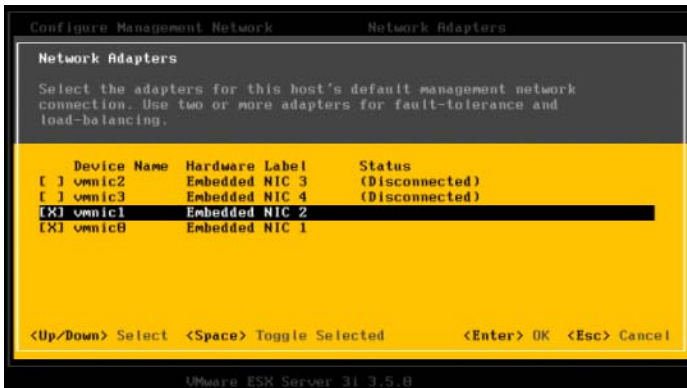
Configure Redundant Management NICs

- 1 With the main management network screen displayed (see Figure 10), scroll and select “Network Adapters”.
- 2 By default, the first LAN-On-Motherboard (LOM) NIC is automatically selected as the management network NIC. This example configures two NICs to help guard against loss of management network connectivity due to NIC failure. Scroll to the second LOM listed (“Embedded NIC 2”) in the list (Figure 19) and press the SPACE bar to select, adding an ‘X’ to the box in front of the NIC. To maximize your redundancy, you may want to select one LOM and one NIC port of an add-on Ethernet card.

Note the status of all NICs is listed here. This will help you determine basic connectivity with your upstream switches; however, this status does not imply connectivity at the IP-address level.

Also, note the relationship of the “Device Name” and “Hardware Label”; the device name follows a Linux-kernel numbering schema by starting its numbering at zero while the hardware label corresponds with the numbering on the physical system, starting at one.

Figure 19. Network Adapter Selection Screen



- 3 Press <ESC> to return to the main network configuration screen (Figure 10).

Set Host Name, IP address, Subnet Mask, Default Gateway, and VLAN ID

- 1 With the main management network screen displayed (see Figure 10), scroll and select "VLAN (Optional)".
- 2 Enter your desired management VLAN ID. If you know that you need to use a specific VLAN ID, make sure your network connection/uplink is not already tagging at the local switch. Specifying a VLAN ID in the ESX software and at your network switch will lead to double VLAN ID tagging, which typically leads to a loss of connectivity of your ESX server. If you do not know your VLAN ID, it is best to leave this field blank. Once set, press <ESC> to return to the main network configuration screen.

Figure 20. Configure VLAN ID Setting



Figure 21. Configure IP Settings

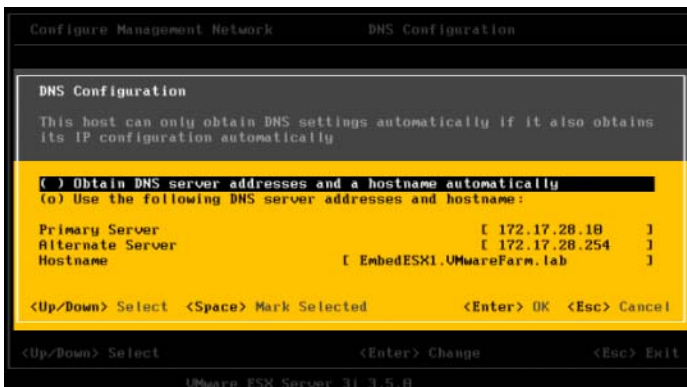


- 3 Next, from the main network configuration screen (Figure 10), select “IP Configuration”.
- 4 Scroll down to “Set static IP address” line, and press SPACE to select. Enter your IP address, subnet mask, and gateway. Press ESC to exit this screen.



NOTE: Although your new settings will be shown on the main network configuration screen, they will NOT take effect until you exit this screen by pressing <ESC> again. You may do this now if your settings are complete; however, most users will need to continue below to enter your network’s DNS settings.

Figure 22. Configure DNS Settings



- 5** From the Configure Management Network screen (see Figure 10), select “DNS Settings”. You will notice the current settings are summarized on the right of the screen; press ENTER to enter the configuration screen (see Figure 22).
- 6** Because you have set an IP address statically, you will not have the option to use DHCP supplied information for the primary and secondary DNS servers. If you decide to use DHCP for the IP address, you will be able to select either option.
- 7** Enter a fully qualified domain name (FQDN) for your host. Press <ESC> to return to the main network configuration screen. You may also enter only a host name in this field, but, if you do, you will need to specify one or more DNS suffixes in the “DNS suffixes” section.
- 8** If you would like to specify a DNS suffix, you may enter it using the last entry on this screen. This should be blank if a FQDN was specified in the previous step.
- 9** With configuration complete, press ENTER to save your settings. Press <ESC> to exit the network setting screen and press “Y” to indicate that you understand saving your modified setting will require the management network to be restarted causing a momentary loss of connectivity to the management network only (VM networks will not be affected).

Appendix D: Modifying Remote Access Console Virtual Media Status

In order to recover the ESX 3i image, the virtual media of the Dell Remote Access Controller must be disabled; internal storage device must be the only USB-based storage device present in the system. If you purchased the Dell Remote Access Controller (DRAC), you will need to disable the virtual devices (floppy and CD/DVD) presented to all operating systems by the DRAC. If you receive a fatal error during recovery (Figure 18), it is most likely because these devices are still active/attached. The following steps will show you how to disable these devices. The process may be reversed to re-enable these devices.

- 1 Boot the server. During POST, press <CTRL>-<E> when you see “Remote Access Configuration Utility” AND “Press <CTRL>-<E> for Remote Setup” on the screen (see Figure 23). This will launch the DRAC configuration utility. Select “Virtual Media Configuration” and press ENTER (see Figure 24).

Figure 23. Server POST Screen

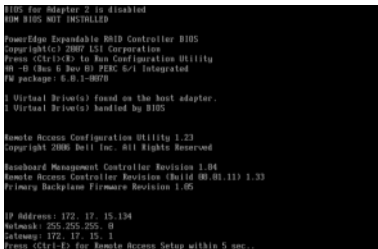
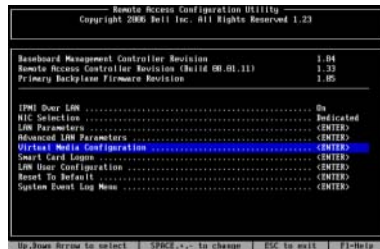


Figure 24. DRAC Configuration Screen



- 2 Toggle the settings so that they show “Detached” and “Disabled”. Press ESC and select “Save and Exit”.

```


Remote Access Configuration Utility
Copyright 2006 Dell Inc. All Rights Reserved 1.23

Baseboard Management Controller Revision          1.04
Remote Access Controller Revision (Build 00.01.11) 1.33
Primary Backplane Firmware Revision             1.05

IPMI Over LAN ..... On
NIC Selection .. Dedicated
LAN Parameters .. Virtual Media ..... Detached <ENTER>
Advanced LAN Par Virtual Flash ..... Disabled <ENTER>
Virtual Media Co <ENTER>
Smart Card Logon ..... <ENTER>
LAN User Configuration ..... <ENTER>
Reset To Default ..... <ENTER>
System Event Log Menu ..... <ENTER>

Up,Down Arrow to select | SPACE,+,- to change | ESC to exit | F1=Help

```

 **NOTE:** To re-enable the virtual floppy and CD device, use the following settings (defaults):

- Virtual Media: Attached
- Virtual Flash: Disabled

Appendix E: Configuration Backup and Restore Procedures

Dell recommends backing up your VMware ESX Server 3i configuration once your complete initial setup and on routinely on a schedule that fits your datacenter environment. Backing up your configuration will capture the license code (host serial number) and will restore this code upon restore. This is important if you ever need to use the recovery CD to restore the ESX 3i image because the server's license code, this code is not stored on the server or recovery media.

To backup or restore the configuration information, you must use the Remote Command Line Interface (RCLI). The RCLI is available in two forms:

- As a virtual appliance virtual machine that is imported to and run from an existing ESX server, VMware Workstation, and VMware Player.
- As a package that is installed to and run from a Windows or Linux machine.

Both of these packages are available for download from the VMware site. For information about setting up and running the RCLI, see the Systems Management with VMware ESX Server 3i software on Dell PowerEdge Servers Guide as well as the VMware ESX Server 3i Setup and VMware ESX Server 3i Configuration guides.

The backup and restore steps below will assume you have already imported the RCLI to a server other than the one you want to backup or restore or you have installed the Windows or Linux management APIs.

Backing up the Configuration of your ESX 3i Host

To back up a host's configuration data:

- 1 Start the RCLI and log in.
- 2 Run the `vicfg-cfgbackup` command with the `-s` flag to save the host configuration to the specified backup filename.

```
vicfg-cfgbackup --server <3i-host-ip> --portnumber <port_number> --  
protocol <protocol_type> --username root --password <root_password>  
[-s <backup-filename> |-l <backup-filename>]
```

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

If you do not specify a password in the command line, you will be prompted for one when the command executes.

EX: vicfg-cfgbackup --server 172.17.13.211 --username root -s backupdate.dat

If you are running the RCLI, the backup file will be placed locally.

Restoring the Configuration of your ESX 3i Host

To restore a host's configuration data:

- 1** Power off any virtual machines that are running on the host you want to restore.
- 2** (Optional) Restore the host to the build number used when the backup file was created. The backup process does not support restoring to later builds; though, this can be overridden this requirement by using the `-f` option. Use at your own risk.
- 3** On a host other than the one you want to restore, start the RCLI, log in.
- 4** Run the vicfg-cfgbackup command with the `-l` flag to load and restore the backup file to the host.

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

If you do not specify a password in the command line, you will be prompted for one when the command executes.

EX: vicfg-cfgbackup --server 172.17.13.211 --username root -l backupdate.dat

Following a successful restore, the system will reboot using the new configuration.

Please consult the VMware ESX Server 3i Setup Guide for complete instructions for these backup and restore commands.

Appendix F: Troubleshooting

This section will provide troubleshooting steps for typical issues.

Symptoms:

- The VMware ESX 3i software will not boot.
- You receive a “No OS found” message on power on.

Resolution:

- Check the boot order – The internal storage device may no longer be selected at the first boot device. This can happen if the device has recently been removed due to failure. To correct this:
 - a Boot the server, press <F2> when prompted in the upper right corner of the screen.
 - b Once in the setup menu, scroll down to “Boot Sequence”, press enter.
 - c Make sure “Hard drive c:” is selected, press “Enter”.
 - d Scroll down to “Hard-Disk Drive Sequence”, press “Enter”
 - e Select “Internal USB...” or “SD Card...”, press “Enter” and <ESC>. Save your settings.

Symptom:

- You would like to remove the VMware ESX Server 3i data (VMFS file system) from your local volumes.

Resolution:

- Consult the VMware ESX Server 3i Setup guide, refer to the “Configuring Storage Behavior” section.

Symptom:

- You experience a purple or pink screen while booting or running your ESX Server 3i System.

Resolution:

- This is a sign of a serious misconfiguration or system error, similar to a “blue screen of death” for a Windows system or a core dump for a Linux-based system.

Contact Dell Support for technical assistance.

Appendix G: Related Documents

- Documents related to this and other Dell/VMware products are located at www.dell.com/vmware.

Support Documents:

- VMware Software Compatibility Matrix for Dell Servers
- VMotion and 64-bit Virtual Machine Compatibility Guide for Dell Servers
- Dell PowerVault NX1950 Configuration Guide for VMware ESX Server
- Dell PowerVault MD3000i Configuration Guide for VMware ESX Server
- VMware Infrastructure 3.5 for Dell PowerEdge Systems Deployment Guide
- VMware Virtual Infrastructure 3.x Software for Dell PowerEdge Servers – Release Notes

Dell Power Solutions Articles

- Dell PowerSolutions Magazine articles related to VMware and Virtualization

Tested and Supported Configurations:

- Dell's Virtualization Reference Architecture Guide

White papers and case studies are also available from this web site.

- Current documentation for Dell-qualified VMware configurations is available on the Dell and VMware Alliance website at www.dell.com/vmware.
- EMC Support Matrix (ESM) on the EMC website at www.emc.com/horizontal/interoperability.
- VMware ESX Server 3.5 and VirtualCenter 2.5 Installation Guide, Administration Guide, Scripting User's Manual, technical resources, and knowledge base are on the VMware documentation website at www.vmware.com/support/pubs.
- Dell-VMware Hardware Compatibility Guides are located on VMware's website, www.vmware.com/resources/guides.html.

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