Cisco UCS C-Series Integrated Management Controller GUI Configuration Guide for C3X60 Servers

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

CONTENTS

Preface

This preface includes the following sections:

Audience

This guide is intended primarily for data center administrators with responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in **this font**. Main titles such as window, dialog box, and wizard titles appear in **this font**.
Document titles	Document titles appear in *this font*.
TUI elements	In a Text-based User Interface, text the system displays appears in `this font`.
System output	Terminal sessions and information that the system displays appear in `this font`.

Text Type	Indication
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Cisco UCS Documentation

Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: http://www.cisco.com/go/unifiedcomputing/b-series-doc.

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: http://www.cisco.com/go/unifiedcomputing/c-series-doc.

For information on supported firmware versions and supported UCS Manager versions for the rack servers that are integrated with the UCS Manager for management, refer to Release Bundle Contents for Cisco UCS Software.

Other Documentation Resources

Follow Cisco UCS Docs on Twitter to receive document update notifications.

CHAPTER 1

Overview

This chapter includes the following sections:

Overview of the Cisco UCS C-Series Rack-Mount Server

The Cisco UCS C3260 is a modular, dense storage server with dual M3 or M4 server nodes, optimized for large datasets used in environments such as big data, cloud, object storage, and content delivery.

The UCS C3260 chassis is a modular architecture consisting of the following modules:

- Base chassis: contains four redundant, hot-pluggable power supplies, eight redundant, hot-pluggable fans, and a rail kit.
- Server Node: one or two M3 or M4 server nodes, each with two CPUs, 128, 256, or 512 GB of DIMM memory, and a pass-through controller or a RAID card with a 1 GB or 4 GB cache.
- System I/O Controller (SIOC): one or two System I/O Controllers, each of which includes an integrated 1300-series virtual interface capability.
- Optional Drive Expansion Node: Large Form Factor (LFF) 3.5-inch drives in a choice of capacities.
- Hard Drives: Up to 56 top-loading Large Form Factor (LFF) HDDs of 4TB, 6TB, 8TB and 10TB capacities.
- Solid State Drives: Optionally up to 28 solid-state disks (SSDs) of 400GB, 800 GB, 1.6TB, and 3.2 TB capacities.
- Solid-State Boot Drives: up to two SSDs per M3 or M4 server node.
- I/O Expander: provides two PCIe expansion slots and accommodates up to two NVMe SSDs.

The enterprise-class UCS C3260 storage server extends the capabilities of Cisco's Unified Computing System portfolio in a 4U form factor that delivers the best combination of performance, flexibility, and efficiency gains.

Note An M3 Server Node has Intel E5-2600 V2 CPUs and DDR-3 DIMMs. An M4 Server Node has Intel E5-2600 v4 CPUs and DDR-4 DIMMs

Overview of the Server Software

The Cisco UCS C-Series Rack-Mount Server ships with the Cisco IMC firmware.

Cisco IMC Firmware

Cisco IMC is a separate management module built into the motherboard. A dedicated ARM-based processor, separate from the main server CPU, runs the Cisco IMC firmware. The system ships with a running version of the Cisco IMC firmware. You can update the Cisco IMC firmware, but no initial installation is needed.

Server OS

The Cisco UCS C-Series rack servers support operating systems such as Windows, Linux, Oracle and so on. For more information on supported operating systems, see the *Hardware and Software Interoperability for Standalone C-series servers* at http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html. You can use Cisco IMC to install an OS on the server using the KVM console and vMedia.

Note You can access the available OS installation documentation from the *Cisco UCS C-Series Servers Documentation Roadmap* at http://www.cisco.com/go/unifiedcomputing/c-series-doc.

Cisco Integrated Management Controller

The Cisco IMC is the management service for the C-Series servers. Cisco IMC runs within the server.

Note The Cisco IMC management service is used only when the server is operating in Standalone Mode. If your C-Series server is integrated into a UCS system, you must manage it using UCS Manager. For information about using UCS Manager, see the configuration guides listed in the *Cisco UCS B-Series Servers Documentation Roadmap* at http://www.cisco.com/go/unifiedcomputing/b-series-doc.

Management Interfaces

You can use a web-based GUI or SSH-based CLI or an XML-based API to access, configure, administer, and monitor the server. Almost all tasks can be performed in either interface, and the results of tasks performed in one interface are displayed in another. However, you cannot do the following:

- Use Cisco IMC GUI to invoke Cisco IMC CLI

- View a command that has been invoked through Cisco IMC CLI in Cisco IMC GUI
- Generate Cisco IMC CLI output from Cisco IMC GUI

Tasks You Can Perform in Cisco IMC

You can use Cisco IMC to perform the following chassis management tasks:

- Power on, power off, power cycle, reset and shut down the server
- Toggle the locator LED
- Configure the server boot order
- View server properties and sensors
- Manage remote presence
- Create and manage local user accounts, and enable remote user authentication through Active Directory
- Configure network-related settings, including NIC properties, IPv4, VLANs, and network security
- Configure communication services, including HTTP, SSH, IPMI Over LAN, and SNMP.
- Manage certificates
- Configure platform event filters
- Update Cisco IMC firmware
- Monitor faults, alarms, and server status
- Set time zone and view local time
- Install and activate Cisco IMC firmware
- Install and activate BIOS firmware
- Install and activate CMC firmware

You can use Cisco IMC to perform the following server management tasks:

- Manage remote presence
- Create and manage local user accounts, and enable remote user authentication through Active Directory
- Configure network-related settings, including NIC properties, IPv4, VLANs, and network security
- Configure communication services, including HTTP, SSH, IPMI Over LAN, and SNMP.
- Manage certificates
- Configure platform event filters
- Update Cisco IMC firmware
- Monitor faults, alarms, and server status
- Set time zone and view local time

No Operating System or Application Provisioning or Management

Cisco IMC provisions servers, and as a result, exists below the operating system on a server. Therefore, you cannot use it to provision or manage operating systems or applications on servers. For example, you cannot do the following:

- Deploy an OS, such as Windows or Linux
- Deploy patches for software, such as an OS or an application
- Install base software components, such as anti-virus software, monitoring agents, or backup clients
- Install software applications, such as databases, application server software, or web servers
- Perform operator actions, including restarting an Oracle database, restarting printer queues, or handling non-Cisco IMC user accounts
- Configure or manage external storage on the SAN or NAS storage

Overview of the Cisco IMC User Interface

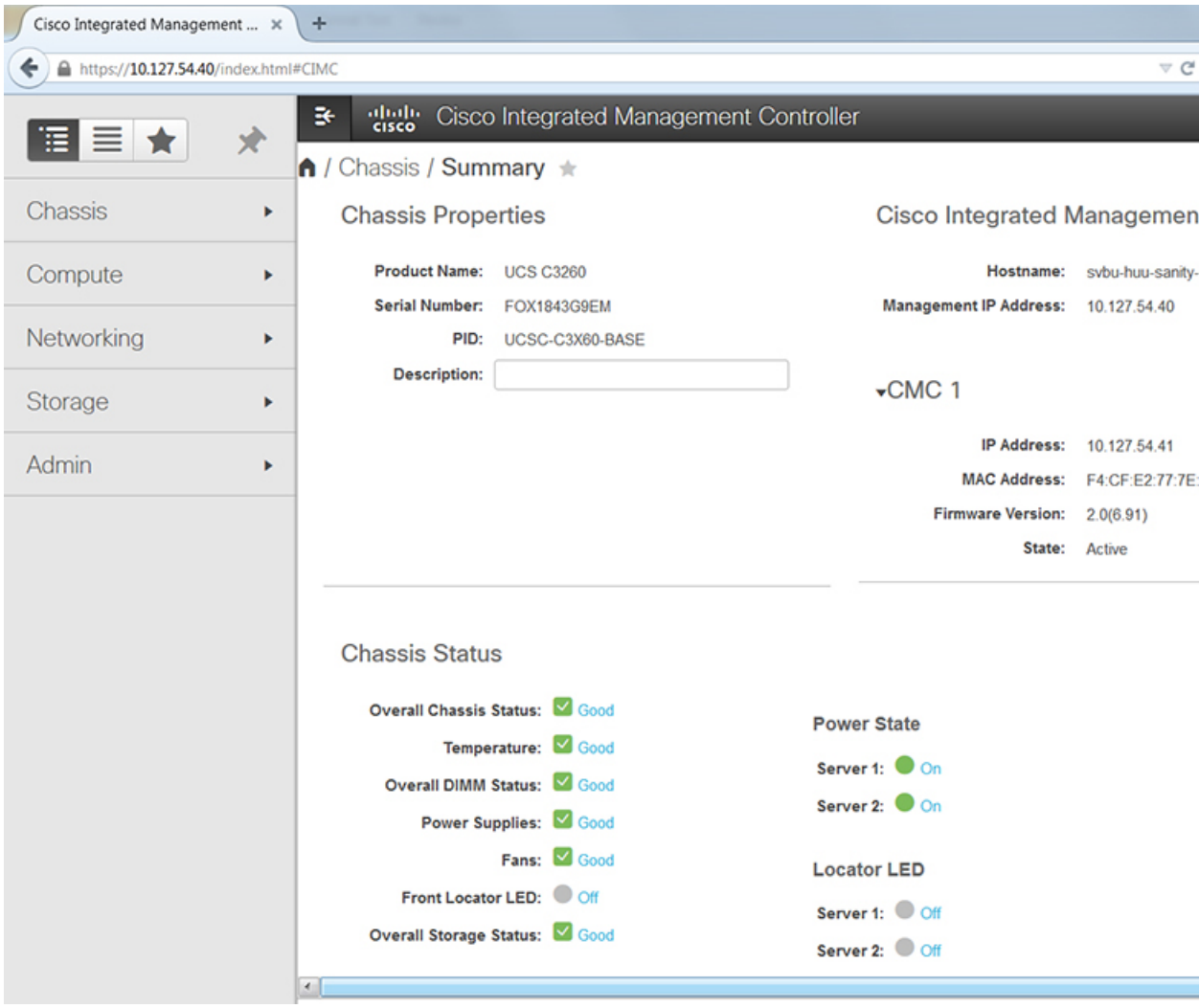
The Cisco IMC user interface is a web-based management interface for Cisco C-Series servers. The web user interface is developed using HTML5 with the eXtensible Widget Framework (XWT) framework. You can launch the user interface and manage the server from any remote host that meets the following minimum requirements:

- Sun JRE 1.8.0_45 or Sun JRE 1.8.0_51
- HTTP and HTTPS enabled
- Adobe Flash Player 10 or later

Note In case you lose or forget the password that you use to log in to Cisco IMC, see the password recovery instructions in the Cisco UCS C-Series server installation and service guide for your server. This guide is available from the *Cisco UCS C-Series Servers Documentation Roadmap* at http://www.cisco.com/go/unifiedcomputing/c-series-doc.

Cisco IMC Home Page

When you first log into Cisco IMC GUI, the user interface looks similar to the following illustration:



Navigation and Work Panes

The Cisco Integrated Management Controller GUI comprises the **Navigation** pane on the left hand side of the screen and the **Work** pane on the right hand side of the screen. Clicking links on the **Server**, **Chassis**, **Compute**, **Networking**, **Storage** or **Admin** menu in the **Navigation** pane displays the associated tabs in the **Work** pane on the right.

The **Navigation** pane header displays action buttons that allow you to view the navigation map of the entire GUI, view the index, or select a favorite work pane to go to, directly. The **Pin** icon prevents the **Navigation** pane from sliding in once the **Work** pane displays.

The **Favorite** icon is a star shaped button which allows you to make any specific work pane in the application as your favorite. To do this, navigate to the work pane of your choice and click the **Favorite** icon. To access this work pane directly from anywhere else in the application, click the **Favorite** icon again.

The GUI header displays information about the overall status of the chassis and user login information.

The GUI header also displays the total number of faults (indicated in green or red), with a **Bell** icon next to it. However, clicking this icon displays the summary of only the critical and major faults of various components. To view all the faults, click the **View All** button to display the **Fault Summary** pane.

The **Navigation** pane has the following menus:

- **Chassis** Menu
- **Compute** Menu
- **Networking** Menu
- **Storage** Menu
- **Admin** Menu

Chassis Menu

Each node in the **Chassis** menu leads to one or more tabs that display in the **Work** pane. These tabs provides access to the following information:

Chassis Menu Node Name	Work Pane Tabs Provide Information About...
Summary	Chassis properties, Chassis status, Cisco IMC firmware version, Management IP address, and IP addresses of CMC 1 and CMC 2.
Inventory	Servers, power supplies, Cisco VIC adapters, and Dynamic Storage management information.
Sensors	Power supply, fan, temperature, voltage, current, and LED readings.
Faults and Logs	Fault summary, fault history, system event log, Cisco IMC logs, and logging controls.

Compute Menu

The **Compute** menu contains information about the server, and the following information is displayed in the **Work** pane.

Compute Menu Node Name	Work Pane Tabs Provide Information About...
General	Server properties, product name, serial number, product ID, UUID, BIOS version, hostname, Cisco IMC firmware version, IP address, and MAC address and description.
Inventory	Installed CPUs, memory cards, PCI adapters, Cisco VIC adapters, vNICs, storage information and trusted platform module (TPM).
Sensors	Temperature, voltage, LEDs, and storage sensor readings.
Remote Management	KVM, virtual media, and Serial over LAN settings.

Compute Menu Node Name	Work Pane Tabs Provide Information About...
BIOS	The installed BIOS firmware version and the server boot order.
Troubleshooting	Bootstrap processing, Crash recording, and a player to view the last saved bootstrap process.
Power Policies	Power restore policy settings.

Networking Menu

Each node in the **Networking** menu leads to one or more tabs that display in the **Work** pane. These tabs provides access to the following information:

Networking Menu Node Name	Work Pane Tabs Provide Information About...
General	Adapter card properties, firmware, external ethernet interfaces, and actions to export or import configurations, and reset status.
vNICs	Host ethernet interfaces information such as name, CDN, MAC address, MTU and individual vNIC properties.
VM FEXs	Virtual FEXs information such as name, MTU, CoS, VLAN and more.
vHBAs	Host fibre channel interfaces information such as name, WWPN, WWNN, boot, uplink, port profile, channel number, and individual vHBA properties.

Storage Menu

Each node in the **Storage** menu corresponds to the LSI MegaRAID controllers or Host Bus Adapters (HBA) that are installed in theCisco UCS C-Series Rack-Mount Servers. Each node leads to one or more tabs that display in the **Work** pane and provide information about the installed controllers.

Storage Menu Node Name	Work Pane Tabs Provide Information About...
Controller Info	General information about the selected LSI MegaRAID controller or HBA.
Physical Drive Info	General drive information, identification information, and drive statusl
Virtual Drive Info	General drive information, RAID information, and physical drive information.
Battery Backup Unit	Backup battery information for the selected MegaRAID controller.
Storage Log	Storage messages.

Admin Menu

Each node in the **Admin** menu leads to one or more tabs that display in the **Work** pane. These tabs provides access to the following information:

Admin Menu Node Name	Work Pane Tabs Provide Information About...
User Management	Locally-defined user accounts, Active Directory settings, and current user session information.
Network	NIC, IPv4, IPv6, VLAN, and LOM properties, along with network security settings.
Communication Services	HTTP, SSH, XML API, IPMI over LAN, and SNMP settings.
Certificate Management	Security certificate information and management.
Firmware Management	Cisco IMC and BIOS firmware information and management.
Utilities	Technical support data collection, system configuration import and export options, and restore factory defaults settings.

Toolbar

The toolbar displays above the **Work** pane.

Button Name	Description
Refresh	Refreshes the current page.
Host Power	Launches the **Server Power Management** pop-up window.
Launch KVM Console	Launches the **Launch KVM** pop-up window.
Ping	Launches the **Ping Details** pop-up window.
Reboot	Enables you to reboot BMC 1, BMC 2, CMC 1 and CMC 2 depending on the option you choose from the drop-down menu.
Locator LED	Launches the **Locator LED** pop-up window.

Cisco Integrated Management Controller Online Help Overview

The GUI for the Cisco Integrated Management Controller (Cisco IMC) software is divided into two main sections, a **Navigation** pane on the left and a **Work** pane on the right.

This help system describes the fields on each Cisco IMC GUI page and in each dialog box.

To access the page help, do one of the following:

- In a particular tab in the Cisco IMC GUI, click the **Help** icon in the toolbar above the **Work** pane.
- In a dialog box, click the **Help** button in that dialog box.

Note For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: http://www.cisco.com/go/unifiedcomputing/c-series-doc.

Logging into Cisco IMC

Before You Begin

If not installed, install Adobe Flash Player 10 or later on your local machine.

Procedure

Step 1 In your web browser, type or select the web link for Cisco IMC.

Step 2 If a security dialog box displays, do the following:

a) (Optional) Check the check box to accept all content from Cisco.

b) Click **Yes** to accept the certificate and continue.

Step 3 In the log in window, enter your username and password.

Tip When logging in for the first time to an unconfigured system, use **admin** as the username and **password** as the password.

The following situations occur when you login to the Web UI for the first time:

- You cannot perform any operation until you change default admin credentials on the Cisco IMC Web UI.
- You cannot close or cancel the password change pop-up window and opening it in a tab or refreshing the browser page will continue to display the pop-up window. This pop-up window appears when you login after a factory reset.
- You cannot choose the word 'password' as your new password. If this creates problems for any scripts you may be running, you could change it to password by logging back into the user management options, but this is ENTIRELY at your own risk. It is not recommended by Cisco.

Step 4 Click **Log In**.

Logging out of Cisco IMC

Procedure

Step 1 In the upper right of Cisco IMC, click **Log Out**.
Logging out returns you to the Cisco IMC log in page.

Step 2 (Optional) Log back in or close your web browser.

CHAPTER 2

Installing the Server OS

This chapter includes the following sections:

OS Installation Methods

C-Series servers support several operating systems. Regardless of the OS being installed, you can install it on your server using one of the following tools:

- KVM console
- PXE installation server

KVM Console

The KVM console is an interface accessible from Cisco IMC that emulates a direct keyboard, video, and mouse (KVM) connection to the server. The KVM console allows you to connect to the server from a remote location.

Instead of using CD/DVD or floppy drives physically connected to the server, the KVM console uses virtual media, which are actual disk drives or disk image files that are mapped to virtual CD/DVD or floppy drives. You can map any of the following to a virtual drive:

- CD/DVD or floppy drive on your computer
- Disk image files (ISO or IMG files) on your computer
- USB flash drive on your computer
- CD/DVD or floppy drive on the network
- Disk image files (ISO or IMG files) on the network

- USB flash drive on the network

You can use the KVM console to install an OS on the server.

Note To configure the KVM console successfully for the Cisco UCS C3260 server, you need to configure IP addresses for the Cisco IMC, CMC, and BMC components. You can configure the IP addresses for these components using the CLI interface or Web UI. For the CLI, use the command **scope network**, or view the setting using **scope <chassis/server1/2><cmc/bmc><network>**.

To configure IP addresses for network components on the web interface, see the steps described in the section **Configuring Network-Related Settings**.

Note When launching the KVM Console from Internet Explorer 6 SP1 on Windows Server 2003, the browser will report that it cannot download a required file. If this occurs, click the browser Tools menu and select Internet Options. Click the Advanced tab and, in the Security section, uncheck the checkbox for "Do not save encrypted pages to disk." Launch the KVM Console again.

Installing an OS Using the KVM Console

Note This procedure describes only the basic installation steps. Detailed guides for installing Linux, VMware, and Windows can be found at this URL: http://www.cisco.com/en/US/products/ps10493/products_installation_and_configuration_guides_list.html.

Before You Begin

- Locate the OS installation disk or disk image file.
- You must log in as a user with admin privileges to install an OS.

Procedure

Step 1 Load the OS installation disk into your CD/DVD drive, or copy the disk image files to your computer.

Step 2 If Cisco IMC is not open, log in.

Step 3 In the **Navigation** pane, click the **Compute** menu.

Step 4 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 5 In the **Server** pane, click the **Remote Management** tab.

Step 6 In the **Remote Management** pane, click the **Virtual KVM** tab.

Step 7 In the **Actions** area, click **Launch KVM Console**.
The **KVM Console** opens in a separate window.

Step 8 From the KVM console, click the **VM** tab.

Step 9 In the **VM** tab, map the virtual media using either of the following methods:

- Check the **Mapped** check box for the CD/DVD drive containing the OS installation disk.
- Click **Add Image**, navigate to and select the OS installation disk image, click **Open** to mount the disk image, and then check the **Mapped** check box for the mounted disk image.

Note You must keep the **VM** tab open during the OS installation process. Closing the tab unmaps all virtual media.

Step 10 Reboot the server and select the virtual CD/DVD drive as the boot device.
When the server reboots, it begins the installation process from the virtual CD/DVD drive. Refer to the installation guide for the OS being installed to guide you through the rest of the installation process.

What to Do Next

After the OS installation is complete, reset the virtual media boot order to its original setting.

PXE Installation Servers

A Preboot Execution Environment (PXE) installation server allows a client to boot and install an OS from a remote location. To use this method, a PXE environment must be configured and available on your VLAN, typically a dedicated provisioning VLAN. Additionally, the server must be set to boot from the network. When the server boots, it sends a PXE request across the network. The PXE installation server acknowledges the request, and starts a sequence of events that installs the OS on the server.

PXE servers can use installation disks, disk images, or scripts to install an OS. Proprietary disk images can also be used to install an OS, additional components, or applications.

Note PXE installation is an efficient method for installing an OS on a large number of servers. However, considering that this method requires setting up a PXE environment, it might be easier to use another installation method.

Installing an OS Using a PXE Installation Server

Before You Begin

- Verify that the server can be reached over a VLAN.
- You must log in as a user with admin privileges to install an OS.

Procedure

Step 1 Set the boot order to **PXE** first.

Step 2 Reboot the server.

If a PXE install server is available on the VLAN, the installation process begins when the server reboots. PXE installations are typically automated and require no additional user input. Refer to the installation guide for the OS being installed to guide you through the rest of the installation process.

What to Do Next

After the OS installation is complete, reset the LAN boot order to its original setting.

Booting an Operating System from a USB Port

All Cisco UCS C-series servers support booting an operating system from any USB port on the server. However, there are a few guidelines that you must keep in mind, prior to booting an OS from a USB port.

- To maintain the boot order configuration, it is recommended that you use an internal USB port for booting an OS.
- The USB port must be enabled prior to booting an OS from it.

  By default, the USB ports are enabled. If you have disabled a USB port, you must enable it prior to booting an OS from it. For information on enabling a disabled USB ports, see topic *Enabling or Disabling the Internal USB Port* in the server-specific installation and service guide available at the following link:

  http://www.cisco.com/en/US/products/ps10493/prod_installation_guides_list.html.
- After you boot the OS from the USB port, you must set the second-level boot order so that the server boots from that USB source every time.

CHAPTER 3

Managing Chassis and Dynamic Storage

This chapter includes the following sections:

Chassis Summary

Viewing Chassis Summary

By default when you log on to the Cisco UCS C-Series rack-mount server, the **Summary** pane of the Chassis is displayed in the Web UI. You can also view the Chassis summary when in another tab or working area, by completing the following steps:

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Summary**.

Step 3 In the **Chassis Properties** area of the **Chassis Summary** pane, review the following information:

Name	Description
Product Name field	The model name of the chassis.
Serial Number field	The serial number for the chassis.
PID field	The product ID.
Description field	A user-defined description for the server.

Step 4 In the **Cisco IMC Information** area of the **Chassis Summary** pane, review the following information:

Name	Description
Hostname field	A user-defined hostname for the Cisco IMC. By default, the hostname appears in CXXX-YYYYYY format, where XXX is the model number and YYYYYY is the serial number of the server.
Management IP Address field	The management IP address for the Cisco IMC.
Timezone field	Displays the chosen time zone.
Select Timezone button	Allows you to select a time zone. In the **Select Timezone** pop-up screen, mouse over the map and click on the location to select your time zone or choose your time zone from the **Timezone** drop-down menu.
Current Time field	The current date and time according to the Cisco IMC clock. **Note** Cisco IMC gets the current date and time from the server BIOS when the NTP is disabled. When NTP is enabled, BIOS and Cisco IMC gets the current time and date from the NTP server. To change this information, reboot the server and press F2 when prompted to access the BIOS configuration menu. Then change the date or time using the options on the main BIOS configuration tab.
Local Time field	The local time of the region according to the chosen time zone. You can set your local time by clicking on the calendar icon and choosing the local time on it

Step 5 In the **CMC 1** and **CMC 2** area of the **Chassis Summary** pane, review the following information:

Name	Description
IP Address field	The IP address for CMC.
MAC Address field	The MAC address assigned to the active network interface.
Firmware Version field	The current CMC firmware version.
State field	State of the server. This can be one of the following: • **Active—**CMC is active. • **Standby—**CMC is in standby mode.

Step 6 In the **Chassis Status** area of the **Chassis Summary** pane, review the following information:

Name	Description
Overall Chassis Status field	The overall status of the chassis. This can be one of the following: • **Good** • **Moderate Fault** • **Severe Fault**
Temperature field	The temperature status. This can be one of the following: • **Good** • **Fault** • **Severe Fault** You can click the link in this field to view more temperature information.
Overall DIMM Status field	The overall status of the memory modules. This can be one of the following: • **Good** • **Fault** • **Severe Fault** You can click the link in this field to view detailed status information.
Power Supplies field	The overall status of the power supplies. This can be one of the following: • **Good** • **Fault** • **Severe Fault** You can click the link in this field to view detailed status information.
Fans field	The overall status of the power supplies. This can be one of the following: • **Good** • **Fault** • **Severe Fault** You can click the link in this field to view detailed status information.
Front Locator LED field	Whether the front panel locator LED on the chassis is on or off. **Note** This option is available only on some UCS C-Series servers.

Name	Description
Overall Storage Status field	The overall status of all controllers. This can be one of the following: • **Good** • **Moderate Fault** • **Severe Fault**
Power Status field	• **Server 1—**Whether server 1 is powered on or off. • **Server 2—**Whether server 2 is powered on or off.
Locator LED field	• **Server 1—**Whether locator LED on server 1 is on or off. • **Server 2—**Whether locator LED on server 2 is on or off.

Chassis Inventory

Viewing the Details of the Servers on the Chassis

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** work pane, the **Servers** tab displays by default. Review the high level details of the server on the chassis:

Name	Description
Name column	The model name of the server.
PID column	Product ID.
UUID column	The UUID assigned to the server.
SysSerialNum column	Serial Number of the server.
Number of Cores column	The number of cores in the CPU.

Name	Description
Memory column	Total memory available.
Power State column	The current power state.

Viewing Power Supply Properties

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** work pane, click the **Power Supplies** tab and review the following information for each power supply:

Name	Description
Device ID column	The identifier for the power supply unit.
Status column	The status of the power supply unit.
Input column	The input into the power supply, in watts.
Max Output column	The maximum output from the power supply, in watts.
FW Version column	The firmware version for the power supply.
Product ID column	The product identifier for the power supply assigned by the vendor.

Viewing Cisco VIC Adapter Properties

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** work pane, click the **Cisco VIC Adapters** tab and review the following high level information:

Name	Description
Slot Number column	The PCI slot in which the adapter is installed.
Serial Number column	The serial number for the adapter.
Product ID column	The product ID for the adapter.
Cisco IMC Enabled column	Whether the adapter is able to manage Cisco IMC. This functionality depends on the type of adapter installed and how it is configured. For details, see the hardware installation guide for the type of server you are using.
Description column	Description of the adapter.

Dynamic Storage

Dynamic Storage Support

Effective with this release, The Cisco UCS C-Series rack-mount servers support dynamic storage of Serial Attached SCSI (SAS) drives in the Cisco Management Controller (CMC). This dynamic storage support is provided by the SAS fabric manager located in the CMC.

The fabric manager interacts with the PMC SAS expanders over an Out-of-Band ethernet connection. SAS Expanders allow you to maximize the storage capability of an SAS controller card. Using these expanders, you can employ SAS controllers support up to 60 hard drives. In CMC, an active SIOC configures the expander zoning, where you can assign the drives to the server nodes through the Web UI, command line interface or Cisco UCS Manager. The standby CMC is updated with the current state, so during a CMC fail-over standby, the CMC can take over the zoning responsibilities. Once the drives are visible to a particular server node, you can manage these using RAID controller.

Note The SAS controller support 56 hard disk drives (HDD) by default. There is also a provision to to replace Server node 2 with an additional four HDDs on Server 2. In that case the total number of HDDs shown in the Zoning page is 60. However, CMC would not support zoning for the additional HDDs 57, 58, 59, 60.

The SAS fabric manager provides an API library for other processes to configure and monitor the expanders and drives. Configuration of the fabric involves zoning the drives, updating the firmware for expanders and drives.

Dynamic Storage supports the following options:

- Assigning physical disks to server 1 and server 2

- Chassis Wide Hot Spare (supported only on RAID controllers)
- Shared mode (supported only in HBAs)
- Unassigning physical disks

Viewing SAS Expander Properties

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** working area, click the **Dynamic Storage** tab.

Step 4 In the **SAS Expander** tab, review the following high level details for SAS Expanders:

Name	Description
ID column	The product ID of the expander.
Name column	The name of the expander.
Firmware Version column	The firmware version the expander uses.
Secondary Firmware Version column	The secondary firmware version of the expander.
Hardware Revision column	The hardware version of the expander.
SAS Address column	The SAS address of the expander.
Server Up Link Speed column	Up link speed received with the LSI RAID Controller. **Note** This is available only on some C-Series servers. **Note** You can view up to four speed levels for Server 1 and 2 respectively using the **Filter** icon on the top right hand corner of the **SAS Expander** table. Select the Tick mark next to the speed filter to view the individual speed in the table.

Assigning Physical Drives to Servers

You can assign a physical drive to Server 1 or Server 2, or both, based on your requirements. On the Web UI the **Chassis Front View** area displays the physical drives available on the chassis. You can choose a physical drive individually or an entire row of physical drives by checking the checkbox against the drives.

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** working area, click the **Zoning** tab.
The Chassis Front View is displayed.

Step 4 In the **Chassis Front View** working area, select an individual server or a row of servers.

Step 5 Click the **Assign to Server 1** or **Assign to Server 2** link.

Step 6 Click **OK**.

Step 7 To assign the physical drive or drives to both servers, click the **Share** link.
A prompt appears informing that the physical drives would be assigned to both servers.

Step 8 Click **OK** to confirm.
Note Shared mode is supported only for HBAs.

What to Do Next

Move a physical drive as chassis wide hot spare, share, or unassign servers.

Moving Physical Drives as Chassis Wide Hot Spare

You can move the selected physical drive as a chassis wide hot spare. On the Web UI the **Chassis Front View** area displays the physical drives available on the chassis. You can choose a physical drive individually or an entire row of physical drives by checking the checkbox against the drives.

Note Chassis wide hot spare is supported only in Mezz RAID controllers (RAID Controller for UCS C3X60 storage). This option is unavailable if the chassis has an HBA card.

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** working area, click the **Zoning** tab.
The Chassis Front View is displayed.

Step 4 In the **Chassis Front View** working area, select an individual server or a row of servers.

Step 5 Click the **Chassis Wide Hot Spare** link.

Step 6 Click **OK**.

What to Do Next

Assign more physical drives to servers, share, or unassign servers.

Unassigning Physical Drives

You can unassign a physical drive (remove association with) from Server 1 or Server 2, or both, based on your requirements. On the Web UI the **Chassis Front View** area displays the physical drives available on the chassis. You can choose a physical drive individually or an entire row of physical drives by checking the checkbox against the drives.

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Inventory**.

Step 3 In the **Inventory** working area, click the **Zoning** tab.
The Chassis Front View is displayed.

Step 4 In the **Chassis Front View** working area, select an individual server or a row of servers.

Step 5 Click the **Unassign** link.

Step 6 Click **OK**.

CHAPTER 4

Managing the Server

This chapter includes the following sections:

Managing the Server Boot Order

Server Boot Order

Using Cisco IMC, you can configure the order in which the server attempts to boot from available boot device types. In the legacy boot order configuration, Cisco IMC allows you to reorder the device types but not the devices within the device types. With the precision boot order configuration, you can have a linear ordering of the devices. In the web UI or CLI you can change the boot order and boot mode, add multiple devices under each device types, rearrange the boot order, set parameters for each device type.

When you change the boot order configuration, Cisco IMC sends the configured boot order to BIOS the next time that server is rebooted. To implement the new boot order, reboot the server after you make the configuration change. The new boot order takes effect on any subsequent reboot. The configured boot order remains until the configuration is changed again in Cisco IMC or in the BIOS setup.

Note The actual boot order differs from the configured boot order if either of the following conditions occur:

- BIOS encounters issues while trying to boot using the configured boot order.
- A user changes the boot order directly through BIOS.
- BIOS appends devices that are seen by the host but are not configured from the user.

Note When you create a new policy using the configure boot order feature, BIOS tries to map this new policy to the devices in the system. It displays the actual device name and the policy name to which it is mapped in the **Actual Boot Order** area. If BIOS cannot map any device to a particular policy in Cisco IMC, the actual device name is stated as **NonPolicyTarget** in the **Actual Boot Order** area.

Note When you upgrade Cisco IMC to the latest version 2.0(x) for the first time, the legacy boot order is migrated to the precision boot order. During this process, previous boot order configuration is erased and all device types configured before updating to 2.0 version are converted to corresponding precision boot device types and some dummy devices are created for the same device types. you can view these devices in the **Configured Boot Order** area in the web UI. To view these devices in the CLI, enter **show boot-device** command. During this the server's actual boot order is retained and it can be viewed under actual boot order option in web UI and CLI.

When you downgrade Cisco IMC prior to 2.0(x) verison the server's last legacy boot order is retained, and the same can be viewed under **Actual Boot Order** area. For example:

- If you configured the server in a legacy boot order in 2.0(x) version, upon downgrade a legacy boot order configuration is retained.
- If you configured the server in a precision boot order in 2.0(x), upon downgrade the last configured legacy boot order is retained.

Important

- C3260 M4 servers support both Legacy and Precision Boot order configuration through Web UI and CLI.
- Boot order configuration prior to 2.0(x) is referred as legacy boot order. If your running version is 2.0(x), then you cannot configure legacy boot order through web UI, but you can configure through CLI and XML API. In the CLI, you can configure it by using **set boot-order HDD,PXE** command. Even though, you can configure legacy boot order through CLI or XML API, in the web UI this configured boot order is not displayed.
- Legacy and precision boot order features are mutually exclusive. You can configure either legacy or precision boot order. If you configure legacy boot order, it disables all the precision boot devices configured. If you configure precision boot order, then it erases legacy boot order configuration.

Configuring the Precision Boot Order

Before You Begin

You must log in as a user with admin privileges to configure server the boot order.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 On the **Server** tab, click **BIOS**.
The BIOS page appears.

Step 4 In the **Actions** area, click **Configure Boot Order**.
A dialog box with boot order instructions appears.

Step 5 Review the instructions, and then click **OK**.
The **Configure Boot Order** dialog box is displayed.

Step 6 In the **Configure Boot Order** dialog box, update the following properties:

Name	Description
Add Boot Device table	The server boot options. You can add one or more of the following boot device and set parameters of the selected device: • **Add Local HDD** • **Add PXE Boot** • **Add SAN Boot** • **Add iSCSI Boot** • **Add SD Card** **Note** This option is available only on some UCS C-Series servers. • **Add USB** • **Add Virtual Media** • **Add PCHStorage** • **Add UEFISHELL**
Enable/Disable button	The visibility of a device by BIOS. The state can be one of the following: • **Enabled—** The device is visible to BIOS in a boot order configuration. • **Disabled—** The device is not visible to BIOS in a boot order configuration.

Name	Description
Modify button	Modifies the attributes of the selected devices.
Delete button	Deletes the selected bootable device from the **Boot Order** table.
Clone button	Copies an existing device setting to a new device.
Re-Apply button	Reapplies the boot order configuration to BIOS when the last configured boot order source displays as BIOS.
Move Up button	Moves the selected device type to a higher priority in the **Boot Order** table.
Move Down button	Moves the selected device type to a lower priority in the **Boot Order** table.
Boot Order table	Displays the device types from which this server can boot, in the order in which the boot is attempted.
Save Changes button	Saves the changes to the configured boot order or reapplies a previously configured boot order. Cisco IMC sends the configured boot order to BIOS the next time that server is rebooted.
Reset Values button	Resets the values of the configured boot order.
Close button	Closes the dialog box without saving any changes or reapplying the existing configuration. If you choose this option, the actual boot order does not change the next time that server is rebooted.

Step 7 Click **Save Changes**.
Additional device types might be appended to the actual boot order, depending on what devices you have connected to your server.

What to Do Next

Reboot the server to boot with your new boot order.

Managing a Boot Device

Before You Begin

You must log in as a user with admin privileges to add device type to the server boot order.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Action** area, click **Configure Boot Order**.
A dialog box with boot order instructions appears.

Step 5 Review the instructions, and then click **OK**.
The **Configure Boot Order** dialog box is displayed.

Step 6 In the **Configure Boot Order** dialog box, from the **Add Boot Device** table, choose the device that you want add to the boot order.
To add the local HDD device, click **Add Local HDD**, and update the following parameters:

Name	Description
Name field	The name of the device. **Note** Once created, you cannot rename the device.
State drop-down list	The visibility of the device by BIOS. This can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Slot field	The slot in which the device is installed. Enter a value within the range 1 - 255, or M.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the PXE device, click **Add PXE**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.

Name	Description
State drop-down list	The visibility of the device by BIOS. The state can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Slot field	The slot in which the device is installed. Enter a value within the range 1 - 255.
Port field	The port of the slot in which the device is present. Enter a number between 0 and 255.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the SAN boot device, click **Add SAN**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
State drop-down list	The visibility of the device by BIOS. The state can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Slot field	The slot in which the device is installed. Enter a value between 1 and 255.

Name	Description
LUN field	Logical unit in a slot where the device is present. Enter a number between 0 and 255.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the iSCSI boot device, click **Add iSCSI**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
State drop-down list	The visibility of the device by BIOS. The state can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Slot field	The slot in which the device is installed. Enter a value between 1 and 255, or L.
Port field	The port of the slot in which the device is present. Enter a number between 0 and 255. **Note** In case of a VIC card, use a vNIC instance instead of the port number.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the SD card, click **Add SD Card**, and update the following parameters:

Note This option is available only on some UCS C-Series servers.

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
State drop-down list	The visibility of the device by BIOS. This can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the USB device, click **Add USB**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
Sub Type drop-down list	The subdevice type under a certain device type. This can be one of the following: • **CD** • **FDD** • **HDD**
State drop-down list	The visibility of the device by BIOS. This can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Add Device button	Adds the device to the **Boot Order** table.

Name	Description
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the virtual media, click **Virtual Media**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
Sub Type drop-down list	The subdevice type under a certain device type. This could be any one of the following: • **KVM Mapped DVD** • **Cisco IMC Mapped DVD** • **KVM Mapped HDD** • **Cisco IMC Mapped HDD** • **KVM Mapped FDD**
State drop-down list	The visibility of the device by BIOS. The state can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Add button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the PCH storage device, click **PCH Storage**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.

Name	Description
State drop-down list	The visibility of the device by BIOS. This can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
LUN field	Logical unit in a slot where the device is present. • Enter a number between 0 and 255 • SATA in AHCI mode—Enter a value between 1 and 10 • SATA in SWRAID mode—Enter 0 for SATA , and enter 1 for SATA **Note** SATA mode is available only on some UCS C-Series servers.
Add Device button	Adds the device to the **Boot Order** table.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

To add the UEFI shell device, click **Add UEFI Shell**, and update the following parameters:

Name	Description
Name field	The name of the device. This name cannot be changed after the device has been created.
State drop-down list	The visibility of the device by BIOS. The state can be one of the following: • **Enabled—**The device is visible to BIOS in a boot order configuration. • **Disabled—**The device is not visible to BIOS in a boot order configuration.
Order field	The order of the device in the available list of devices. Enter between 1 and n, where n is the number of devices.
Add Device button	Adds the device to the **Boot Order** table.

Name	Description
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

Overview to UEFI Secure Boot

You can use Unified Extensible Firmware Interface (UEFI) secure boot to ensure that all the EFI drivers, EFI applications, option ROM or operating systems prior to loading and execution are signed and verified for authenticity and integrity, before you load and execute the operating system. You can enable this option using either web UI or CLI. When you enable UEFI secure boot mode, the boot mode is set to UEFI mode and you cannot modify the configured boot mode until the UEFI boot mode is disabled.

Note If you enable UEFI secure boot on a nonsupported OS, on the next reboot, you cannot boot from that particular OS. If you try to boot from the previous OS, an error is reported and recorded the under system software event in the web UI. You must disable the UEFI secure boot option using Cisco IMC to boot from your previous OS.

Important Also, if you use an unsupported adapter, an error log event in Cisco IMC SEL is recorded. The error messages is displayed that says:

System Software event: Post sensor, System Firmware error. EFI Load Image Security Violation. [0x5302] was asserted .

UEFI secure boot is supported on the following components:

Components	Types
Supported OS	• Windows Server 2012 • Windows Server 2012 R2
QLogic PCI adapters	• 8362 dual port adapter • 2672 dual port adapter
Fusion-io	

Components	Types
LSI	• LSI MegaRAID SAS 9240-8i • LSI MegaRAID SAS 9220-8i • LSI MegaRAID SAS 9265CV-8i • LSI MegaRAID SAS 9285CV-8e • LSI MegaRAID SAS 9285CV-8e • LSI MegaRAID SAS 9266-8i • LSI SAS2008-8i mezz • LSI Nytro card • RAID controller for UCS C3X60 Storage (SLOT-MEZZ) • Host Bus Adapter (HBA)

Enabling UEFI Secure Boot

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **BIOS Properties** area of the **Configure Boot Order** tab, check **UEFI Secure Boot** checkbox.

Note If checked, the boot mode is set to UEFI secure boot. You cannot modify the **Configure Boot Mode** until UEFI secure boot option is disabled.

If you enable UEFI secure boot on a nonsupported OS, on the next reboot, you cannot boot from that particular OS. If you try to boot from the previous OS, an error is reported and recorded under the system software event in the web UI. You must disable the UEFI secure boot option by using Cisco IMC to boot from your previous OS.

Step 5 Click **Save Changes**.

What to Do Next

Reboot the server to have your configuration boot mode settings take place.

Disabling UEFI Secure Boot

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **BIOS Properties** area, uncheck the **UEFI Secure Boot** check box.

Step 5 Click **Save Changes**.

What to Do Next

Reboot the server to have your configuration boot mode settings take place.

Viewing the Actual Server Boot Order

The actual server boot order is the boot order actually used by BIOS when the server last booted. The actual boot order can differ from the boot order configured in Cisco IMC.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **BIOS** tab, click the **Configure Boot Order** tab.
This area displays the boot order devices configured through Cisco IMC as well as the actual boot order used by the server BIOS.

The **Configured Boot Devices** section displays the boot order (**Basic** or **Advanced**) configured through Cisco IMC. If this configuration changes, Cisco IMC sends this boot order to BIOS the next time that server boots. The Basic configuration allows you to specify only the device type. The Advanced configuration allows you to configure the device with specific parameters such as slot, port and LUN.

To change the configured boot order, or to restore the previously configured boot order, administrators can click the **Configure Boot Order** button. To have these changes take effect immediately, reboot the server. You can verify the new boot order by refreshing the **BIOS** tab.

Note This information is only sent to BIOS the next time the server boots. Cisco IMC does not send the boot order information to BIOS again until the configuration changes.

The **Actual Boot Devices** section displays the boot order actually used by BIOS when the server last booted. The actual boot order will differ from the configured boot order if either of the following conditions occur:

- The BIOS encounters issues while trying to boot using the configured boot order.
- A user changes the boot order directly through the BIOS. To override any manual changes, you can change the configured boot order through Cisco IMC and reboot the server.

Note When you create a new policy using the configured boot order, BIOS tries to map this new policy to the device or devices present in the system. It displays the actual device name and the policy name to which it is mapped under the **Actual Boot Order** area. If BIOS cannot map any device found to a particular policy in Cisco IMC, then the actual device name is stated as **NonPolicyTarget** under the **Actual Boot Order** area.

Configuring Power Policies

Configuring the Power Restore Policy

The power restore policy determines how power is restored to the server after a chassis power loss.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Power Policies** tab.

Step 4 In the **Power Restore Policy** area, update the following fields:

Name	Description
Power Restore Policy drop-down list	The action to be taken when chassis power is restored after an unexpected power loss. This can be one of the following: • **Power Off—**The server remains off until it is manually restarted. • **Power On—**The server is allowed to boot up normally when power is restored. The server can restart immediately or, optionally, after a fixed or random delay. • **Restore Last State—**The server restarts and the system attempts to restore any processes that were running before power was lost.
Power Delay Type drop-down list	If the selected policy is **Power On**, the restart can be delayed with this option. This can be one of the following: • **fixed—**The server restarts after a fixed delay. • **random—**The server restarts after a random delay. **Note** This option is available only for some C-Series servers.

Name	Description
Power Delay Value field	If a fixed delay is selected, once chassis power is restored and the Cisco IMC has finished rebooting, the system waits for the specified number of seconds before restarting the server. Enter an integer between 0 and 240. **Note** This option is available only for some C-Series servers.

Step 5 Click **Save Changes**.

Power Characterization

The chassis power characterization range is calculated and derived from individual server node power characterization status, and from the power requirements of all the unmanageable components of the chassis.

This range varies for each configuration, so you need to run the power characterization every time a configuration changes.

To help you use the power characterization range appropriately for the different power profiles, the system represents the chassis' minimum power as auto profile minimum and custom profile minimum. However, custom power profile minimum is the actual minimum power requirement of the current chassis configuration. For more information see the section Run Power Characterization.

Running Power Characterization

You can run power characterization only on some Cisco UCS C-Series servers.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Power Cap Configuration** tab, click the **Run Power Characterization** link.
A confirmation box appears that says the host is going to be either powered on or rebooted depending on the current power state. Review the message and click **OK** to close the dialog box.

You can verify the progress of the power characterization in the **Status** field. The status can be one of the following:

- **Not Run on One Server—** When the power characterization status is **Not Run** on any one server node.
- **Not Run—** When the power characterization status is **Not Run** on both the server nodes.

- **Failed on One Server—** When the power characterization status is **Failed** on any one server.
- **Completed Successfully—**When the power characterization status is **Completed Successfully** on both the server nodes.
- **Running—** When the power characterization status is **Running** on any one of the server nodes.
- **Failed—** When the power characterization status is **Failed** on both the server nodes.

After power characterization action is performed, the platform power limit range is populated under the **Recommended Power Cap** area as a minimum and maximum power in watts.

Power Profiles

Note Power Management is available only on some C-series servers.

Power capping determines how server power consumption is actively managed. When you enable power capping option, the system monitors power consumption and maintains the power below the allocated power limit. If the server cannot maintain the power limit or cannot bring the platform power back to the specified power limit within the correction time, power capping performs actions that you specify in the Action field under the Power Profile area.

You can configure multiple profiles with the following combinations: automatic and thermal profiles; and custom and thermal profiles. These profiles are configured by using either the web user interface, command line interface, or XML API. In the web UI, the profiles are listed under the Power Capping area. In the CLI, the profiles are configured when you enter the **power-cap-config** command. You can configure the following power profiles for power capping feature:

- Automatic Power Limiting Profile
- Custom Power Limiting Profile
- Thermal Power Limiting Profile

Automatic power limiting profile sets the power limit of the individual server boards based on server priority selected by you, or as detected by the system, based on the server utilization sensor (which is known as manual or dynamic priority selection). The limiting values are calculated within the manageable chassis power budget and applied to the individual server, and the priority server is allocated with its maximum power limiting value, while the other server with the remaining of the manageable power budget. Power limiting occurs at each server board platform level that affects the overall chassis power consumption.

Custom power limiting profile allows you to set an individual server board's power limit from the Web UI or command line interface within the chassis power budget. In this scenario you can specify an individual server power limit.

Thermal power profile allows you to enable thermal failure power capping, which means you can set a specific platform temperature threshold and it sets P (min-x) as the power limit to be applied on the temperature threshold.

Resetting Power Profiles to Default

This option is available only on some Cisco UCS C-Series servers.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Power Cap Configuration** tab, click the **Reset Profiles to Default** link.

Note This action resets all the power profile settings to factory default values and disables power capping.

Configuring the Power Capping Settings

You can enable power characterization only on some Cisco UCS C-Series servers.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Chassis Power Characterization Details** area, review the following information:

Name	Description
Chassis Power Characterization Status field	Displays the progress of the power characterization. This can be one of the following: • **Not Run on One Server—** When the power characterization status is **Not Run** on any one server node. • **Not Run—** When the power characterization status is **Not Run** on both the server nodes. • **Failed on One Server—** When the power characterization status is **Failed** on any one server. • **Completed Successfully—**When the power characterization status is **Completed Successfully** on both the server nodes. • **Running—** When the power characterization status is **Running** on any one of the server nodes. • **Failed—** When the power characterization status is **Failed** on both the server nodes.
Chassis Power Characterization Range	It is composed of the following: • **Auto Profile Minimum—** The minimum value to be used for the user allocated chassis power to enable **Auto Profile**. **Note** The **Auto Profile Minimum** option is available only when both server nodes are present. • **Custom Profile Minimum—** The minimum value to be used for the user allocated chassis power to enable **Custom Profile** • **Maximum—** Maximum value for both Auto and Custom profiles.
Server Power Details	When you move the mouse over the Help icon, the server power details are displayed in a table.

Step 5 In the **Power Capping and Profiles Configuration** area, complete the following fields:

Name	Description
Enable Power Capping check box	If checked, this enables the power capping capability of the system, and allows you to select and set the parameters for individual power capping profiles. **Note** If disabled, you cannot configure or modify individual power capping profiles in the **Power Profiles** area.
User Allocated Chassis Power field	Power budget that you allocate to a chassis, in watts.
Chassis Manageable Power field	Maximum power that a chassis can manage, in watts. It is a part of the User Allocated Chassis power that is manageable.

Step 6 Click **Save Changes**.

What to Do Next

Configure the individual power profiles.

Configuring Auto Power Profile

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Auto** tab complete the following fields:

Name	Description
Enable Profile check box	If checked, enables the power profile for editing.
Allow Throttle check box	If checked, it forces the processor to use more aggressive power management mechanisms such as CPU throttling states (T-states) and memory bandwidth throttling to maintain the power limit, in addition to the regular internal mechanisms.

Name	Description
Priority Selection drop-down list	This can be one of the following: • **Manual—** When you manually assign priority to a server node. It could be either server 1 or server 2. • **Dynamic—** CMC dynamically decides to assign priority to a server node based on server utilization. The server that is utilized more at any given time is selected as a priority server.
Correction Time field	The time in seconds in which the platform power should be brought back to the specified power limit before taking the action specified in the **Action** field. The valid range is 1 to 600 seconds.
Priority Server drop-down list	Select an option to manually assign priority to a server. This can be one of the following: • **Server 1** • **Server 2** **Note** This option is available when you select **Manual** from the **Priority Selection** drop-down list.
Exception Action drop-down list	The action to be performed if the specified power limit is not maintained within the correction time. • **Alert—**Logs the event to the Cisco IMC SEL. • **Alert and Shutdown—**Logs the event to the Cisco IMC SEL, and gracefully shuts down the host.
Power Limit field **Server 1** **Server 2**	Displays the power cap limit assigned to server 1 and server 2 in auto profile.

Step 5 In the **Suspend Period** area, click the **Configure** link to set the time period in which the power capping profile is not active.

What to Do Next

Configure the custom power profile.

Configuring Custom Power Profile

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Custom** tab, complete the following fields:

Name	Description
Component field	Component for which you want to enable the **Custom Power** profile.
Enabled check box	If checked, enables the power profile for editing.
Power Limit field	Enter a value in the range suggested by the tooltip.
Exception Action drop-down list	The action to be performed if the specified power limit is not maintained within the correction time. • **Alert—**Logs the event to the Cisco IMC SEL. • **Alert and Shutdown—**Logs the event to the Cisco IMC SEL, and gracefully shuts down the host.
Correction Time field	The time in seconds in which the platform power should be brought back to the specified power limit before taking the action specified in the **Action** field. The valid range is 1 to 600 seconds.
Allow Throttling field	Forces the processor to use more aggressive power management mechanisms such as, CPU the throttling states (T-states) and memory bandwidth throttling to maintain the power limit, in addition to the regular internal mechanisms.
Suspend Period field	Allows you to suspend power capping for a chosen period of time.

What to Do Next

Configure the thermal power profile.

Configuring Thermal Power Profile

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Cap Configuration** tab.

Step 4 In the **Thermal** tab, complete the following fields:

Name	Description
Component field	Component for which you want to enable the **Thermal Power** profile.
Enabled field	Enables the power profile for editing.
Temperature field	Enter a temperature value crossing which the thermal profile should be applied. The valid range is 1 to 40.
Power Limit field	Displays the power cap limit that is minimum for the given server.

Viewing Power Monitoring Summary

This option is available only on some Cisco UCS C-Series servers.

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Monitoring** tab.

Step 4 In the **Power Monitoring Summary** area, review the following information about the chassis:
The following tables display the power consumed by the chassis and its components since the last time it was rebooted.

Name	Description
Monitoring Period	The time duration of the monitored chassis' power consumption since the last time Cisco IMC rebooted or powered on. The monitoring period is displayed in Day HH:MM:SS format.
Current	The power currently being used by the chassis in watts.
Minimum	The minimum number of watts consumed by the chassis since the last time it was rebooted.
Maximum	The maximum number of watts consumed by the chassis since the last time it was rebooted.
Average	The average amount of power consumed by the chassis in watts over the defined period of time.

Step 5 In the **Power Monitoring Summary** area, review the following information about the servers:

Name	Description
Monitoring Period	The duration of the monitored server's power consumption since it was last rebooted or powered on. The monitoring period is displayed in Day HH:MM:SS format.
Platform Power Summary	
Current	The power currently being used by the server, CPU, and memory in watts.
Minimum	The minimum number of watts consumed by the server, CPU, and memory during the monitored period.
Maximum	The maximum number of watts consumed by the server, CPU, and memory during the monitored period.
Average	The average amount of power consumed by the server, CPU, and memory in watts during the monitored period.
CPU Power Summary	
Current	The power currently being used by the CPU in watts.
Minimum	The minimum number of watts consumed by the CPU since the last time it was rebooted.
Maximum	The maximum number of watts consumed by the CPU since the last time it was rebooted.

Name	Description
Average	The average amount of power consumed by the server, CPU, and memory in watts over the defined period of time.
Memory Power Summary	
Current	The power currently being used by the memory, in watts.
Minimum	The minimum number of watts consumed by the memory since the last time it was rebooted.
Maximum	The maximum number of watts consumed by the memory since the last time it was rebooted.
Average	The average amount of power consumed by the memory in watts over the defined period of time.

Step 6 In the **Chart Properties** area, review and update the chart, component, and view the power consumption details.

Name	Description
Component drop-down list	The component for which you want to view the power consumption over the selected duration. This can be one of the following: • **Chassis** • **Server 1** • **Server 2**
Domain drop-down list	Allows you to view a server's domain specific information. This can be one of the following: • **All** • **Platform** • **CPU** • **Memory** **Note** This option is available only if you select **Server 1** or **Server 2** from the **Component** drop-down list.

Name	Description
Chart drop-down list	Allows you to collect the trends of power consumption from every server for the selected duration. This can be one of the following: • **Last One Hour—** Plots the chart for the last hour. • **Last One Day—**Plots the chart for the last one day. • **Last One Week—**Plots the chart for the last one week.
Plot button	Displays the power consumed by the selected component for the selected duration.
Chart/Table View (Appears on mouse-over)	Select to view power monitoring summary in either **Chart** or **Table** view.
Chart Type (Appears on mouse-over)	Select the type of chart you wish to view. This could be one of the following: • Column Chart— Power monitoring data appears as a column. • Line Chart— Power monitoring data appears in lines.
Current check box	If checked, the chart displays the current power consumed by the selected component for the selected duration.
Average check box	If checked, the plot displays the average amount of power consumed by the selected component for the selected duration.
Maximum check box	If checked, the plot displays the maximum number of watts consumed by the selected component for the selected duration.
Minimum check box	If checked, the plot displays the minimum number of watts consumed by the selected component for the selected duration.

Configuring the Chart Properties

Procedure

Step 1 In the **Navigation** tab, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click the **Power Management** tab.

Step 3 On the **Work** pane, click the **Power Monitoring** tab.

Step 4 In the **Chart Properties** area, click the **Chart Settings** icon to configure the following fields:

Name	Description
Show Range Filter check box	If checked, displays the range filter content.
Show X Axis Labels check box	If checked, displays the X Axis labels for the power monitoring summary.
Show Y Axis Labels check box	If checked, displays the Y Axis labels for the power monitoring summary.
Show Markers check box	If checked, displays the markers for the X and Y axis data.
Y-Axis Interval Value field (1 - 1020)	Select the interval value in wattage. Default value is 20.

The power reading chart plots power consumption values of different components for the selected duration. These power consumption values are captured from the time that the host is powered on. When a power profile is enabled, the power limit is plotted in the chart as a red line. This plot can be used to determine the power consumption trend of the system. To view the configured power limit values of a particular domain, move the mouse over these trend lines.

Note These trend lines are not displayed if the profile is disabled on the **Power Cap Configuration** tab.

Step 5 Click **Save Changes**.

Downloading Power Statistics and Server Utilization Data

This option is available only on some Cisco UCS C-Series servers.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** tab.

Step 2 In the **Chassis** tab, click **Power Management**.

Step 3 On the **Work** pane, click the **Power Monitoring** tab.

Step 4 In the **Power Monitoring** tab, click **Download Power Statistics and Server Utilization Data**.
The files are downloaded to your local download folder.

Note If the file size of the already downloaded statistics file is less than 256 KB, then when you download, another set of files is downloaded, one for the power statistics and the other for host server utilization. If the size of the existing files exceeds 256 KB, then the next set of files overwrites the existing ones.

Configuring DIMM Blacklisting

DIMM Black Listing

In Cisco IMC, the state of the Dual In-line Memory Module (DIMM) is based on SEL event records. A DIMM is marked bad if the BIOS encounters a non-correctable memory error or correctable memory error with 16000 error counts during memory test execution during BIOS post. If a DIMM is marked bad, it is considered a non-functional device.

If you enable DIMM blacklisting, Cisco IMC monitors the memory test execution messages and blacklists any DIMM that encounters memory errors at any given point of time in the DIMM SPD data. This allows the host to map out those DIMMs.

DIMMs are mapped out or blacklisted only when Uncorrectable errors occur. When a DIMM gets blacklisted, other DIMMs in the same channel are ignored or disabled, which means that the DIMM is no longer considered bad.

Note DIMMs do not get mapped out or blacklisted for 16000 Correctable errors.

Enabling DIMM Black Listing

Before You Begin

- You must be logged in as an administrator.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **Memory** pane's **DIMM Black Listing** area, click the **Enable DIMM Black List** check box.

Configuring BIOS Settings

Configuring Main BIOS Settings

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Actions** area, click **Configure BIOS**.

Step 5 In the **Configure BIOS Parameters** dialog box, click the **Main** tab.

Step 6 Specify whether the server should be rebooted after you save your changes.
If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

Note If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

Step 7 In the **Main** tab, choose whether you want **TPM Support** to be enabled or disabled, and update the BIOS settings fields with the following options:

Name	Description
Save button	Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.
Reset button	Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
Restore Defaults button	Sets the BIOS parameters on all three tabs to their default settings.

Important The buttons in this dialog box affect all BIOS parameters on all available tabs, not just the parameters on the tab that you are viewing.

Configuring Advanced BIOS Settings

Note Depending on your installed hardware, some configuration options described in this topic may not appear.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Actions** area, click **Configure BIOS**.

Step 5 In the **Configure BIOS Parameters** dialog box, click the **Advanced** tab.

Step 6 Specify whether the server should be rebooted after you save your changes.
If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

Note If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

Step 7 In the **Advanced** tab's **Processor Configuration** area, update the following fields.

Name	Description
Intel Hyper-Threading Technology	Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following: • **Disabled—**The processor does not permit hyperthreading. • **Enabled—**The processor allows for the parallel execution of multiple threads. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Name	Description
Number of Enabled Cores	Allows you to disable one or more of the physical cores on the server. This can be one of the following: • **All—**Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores. • **1** through ***n*—**Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Execute Disable	Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following: • **Disabled—**The processor does not classify memory areas. • **Enabled—**The processor classifies memory areas. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Intel VT	Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following: • **Disabled—**The processor does not permit virtualization. • **Enabled—**The processor allows multiple operating systems in independent partitions. **Note** If you change this option, you must power cycle the server before the setting takes effect.
Intel VT-d	Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following: • **Disabled—**The processor does not use virtualization technology. • **Enabled—**The processor uses virtualization technology.

Name	Description
Intel VT-d Coherency Support	Whether the processor supports Intel VT-d Coherency. This can be one of the following: • **Disabled—**The processor does not support coherency. • **Enabled—**The processor uses VT-d Coherency as required.
Intel VT-d ATS Support	Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following: • **Disabled—**The processor does not support ATS. • **Enabled—**The processor uses VT-d ATS as required.
CPU Performance	Sets the CPU performance profile for the server. The performance profile consists of the following options: • DCU Streamer Prefetcher • DCU IP Prefetcher • Hardware Prefetcher • Adjacent Cache-Line Prefetch This can be one of the following: • **Enterprise—**All options are enabled. • **High Throughput—**Only the DCU IP Prefetcher is enabled. The rest of the options are disabled. • **HPC—**All options are enabled. This setting is also known as high performance computing. • **Custom—**All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.
Hardware Prefetcher	Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following: • **Disabled—**The hardware prefetcher is not used. • **Enabled—**The processor uses the hardware prefetcher when cache issues are detected.

Name	Description
Adjacent Cache Line Prefetcher	Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following: • **Disabled—**The processor only fetches the required line. • **Enabled—** The processor fetches both the required line and its paired line.
DCU Streamer Prefetch	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines. • **Enabled—**The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.
DCU IP Prefetcher	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not preload any cache data. • **Enabled—**The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.
Direct Cache Access Support	Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following: • **Disabled—**Data from I/O devices is not placed directly into the processor cache. • **Enabled—**Data from I/O devices is placed directly into the processor cache.

Name	Description
Power Technology	Enables you to configure the CPU power management settings for the following options: • Enhanced Intel Speedstep Technology • Intel Turbo Boost Technology • Processor Power State C6 Power Technology can be one of the following: • **Custom—**The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters. • **Disabled—**The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored. • **Energy Efficient—**The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.
Enhanced Intel Speedstep Technology	Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following: • **Disabled—**The processor never dynamically adjusts its voltage or frequency. • **Enabled—**The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power. We recommend that you contact your operating system vendor to make sure the operating system supports this feature. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.

Name	Description
Intel Turbo Boost Technology	Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following: • **Disabled—**The processor does not increase its frequency automatically. • **Enabled—**The processor utilizes Turbo Boost Technology if required. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor Power State C6	Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following: • **Disabled—**The BIOS does not send the C6 report. • **Enabled—**The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor Power State C1 Enhanced	Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following: • **Disabled—**The CPU continues to run at its maximum frequency in C1 state. • **Enabled—**The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.
Frequency Floor Override	Whether the CPU is allowed to drop below the maximum non-turbo frequency when idle. This can be one of the following: • **Disabled—** The CPU can drop below the maximum non-turbo frequency when idle. This option decreases power consumption but may reduce system performance. • **Enabled—** The CPU cannot drop below the maximum non-turbo frequency when idle. This option improves system performance but may increase power consumption.

Name	Description
P-STATE Coordination	Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification. • **HW_ALL—**The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package). • **SW_ALL—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors. • **SW_ANY—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Energy Performance	Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following: • **Balanced Energy** • **Balanced Performance** • **Energy Efficient** • **Performance**

Step 8 In the **Memory Configuration** area, update the following fields.

Name	Description
Select Memory RAS	How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following: • **Maximum Performance—**System performance is optimized. • **Mirroring—**System reliability is optimized by using half the system memory as backup. • **Lockstep—**If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.
DRAM Clock Throttling	Allows you to tune the system settings between the memory bandwidth and power consumption. This can be one of the following: • **Balanced—** DRAM clock throttling is reduced, providing a balance between performance and power. • **Performance—**DRAM clock throttling is disabled, providing increased memory bandwidth at the cost of additional power. • **Energy Efficient—**DRAM clock throttling is increased to improve energy efficiency.
NUMA	Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following: • **Disabled—**The BIOS does not support NUMA. • **Enabled—**The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.

Name	Description
Low Voltage DDR Mode	Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following: • **Power Saving Mode—**The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low. • **Performance Mode—**The system prioritizes high frequency operations over low voltage operations.
DRAM Refresh rate	Allows you to set the rate at which the DRAM cells are refreshed. This can be one of the following: • **1x—**DRAM cells are refreshed every 64ms. • **2x—**DRAM cells are refreshed every 32ms. • **3x—**DRAM cells are refreshed every 21ms. • **4x—**DRAM cells are refreshed every 16ms. • **Auto—**DRAM cells refresh rate is automatically chosen by the BIOS based on the system configuration. This is the recommended setting for this parameter.
Channel Interleaving	Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some channel interleaving is used. • **2 Way** • **3 Way** • **4 Way—**The maximum amount of channel interleaving is used.

Name	Description
Rank Interleaving	Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some rank interleaving is used. • **2 Way** • **4 Way** • **8 Way—**The maximum amount of rank interleaving is used.
Patrol Scrub	Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following: • **Disabled—**The system checks for memory ECC errors only when the CPU reads or writes a memory address. • **Enabled—**The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.
Demand Scrub	Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following: • **Disabled—** Single bit memory errors are not corrected. • **Enabled—** Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.

Name	Description
Altitude	The approximate number of meters above sea level at which the physical server is installed. This can be one of the following: • **Auto—**The CPU determines the physical elevation. • **300 M—**The server is approximately 300 meters above sea level. • **900 M—**The server is approximately 900 meters above sea level. • **1500 M—**The server is approximately 1500 meters above sea level. • **3000 M—**The server is approximately 3000 meters above sea level.

Step 9 In the **QPI Configuration** area, update the following fields.

Name	Description
QPI Link Frequency Select	The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following: • **Auto—**The CPU determines the QPI link frequency. • **6.4 GT/s** • **7.2 GT/s** • **8.0 GT/s**

Step 10 In the **SATA Configuration** area, update the following fields.

Name	Description
SATA Mode	Mode of operation of Serial Advanced Technology Attachment (SATA) Solid State Drives (SSD). • **Disabled—** All SATA ports is disabled, and drivers are not enumerated. • **AHCI Mode—**The default mode. Drives operate according to newer standard of Advance Host Controller Interface(AHCI).

Step 11 In the **USB Configuration** area, update the following fields.

Name	Description
Legacy USB Support	Whether the system supports legacy USB devices. This can be one of the following: • **Disabled—**USB devices are only available to EFI applications. • **Enabled—**Legacy USB support is always available. • **Auto—**Disables legacy USB support if no USB devices are connected.
Port 60/64 Emulation	Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following: • **Disabled—**60h/64 emulation is not supported. • **Enabled—**60h/64 emulation is supported. You should select this option if you are using a non-USB aware operating system on the server.
All USB Devices	Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following: • **Disabled—**All USB devices are disabled. • **Enabled—**All USB devices are enabled.
USB Port: Rear	Whether the rear panel USB devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system. • **Enabled—**Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.
USB Port: Internal	Whether the internal USB devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system. • **Enabled—**Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.
USB Port: KVM	Whether the KVM ports are enabled or disabled. This can be one of the following: • **Disabled—**Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window. • **Enabled—**Enables the KVM keyboard and/or mouse devices.

Name	Description
USB Port: vMedia	Whether the virtual media devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the vMedia devices. • **Enabled—**Enables the vMedia devices.

Step 12 In the **PCI Configuration** area, update the following fields.

Name	Description
PCI ROM CLP	PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled. • **Enabled—** Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately. • **Disabled—**The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.
ASPM Support	Allows you to set the level of ASPM (Active Power State Management) support in the BIOS. This can be one of the following: • **Disabled—**ASPM support is disabled in the BIOS. • **Force L0s—**Force all links to L0 standby (L0s) state. • **Auto—**The CPU determines the power state.

Step 13 In the **Serial Configuration** area, update the following fields.

Name	Description
Out-of-Band Mgmt Port	Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following: • **Disabled—**Configures the COM port 0 as a general purpose port for use with the Windows Operating System. • **Enabled—**Configures the COM port 0 as a remote management port for Windows Emergency Management services.

Name	Description
Console Redirection	Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following: • **Disabled—**No console redirection occurs during POST. • **COM 0—**Enables console redirection on COM port 0 during POST. • **COM 1—**Enables console redirection on COM port 1 during POST.
Terminal Type	What type of character formatting is used for console redirection. This can be one of the following: • **PC-ANSI—**The PC-ANSI terminal font is used. • **VT100—**A supported vt100 video terminal and its character set are used. • **VT100+—**A supported vt100-plus video terminal and its character set are used. • **VT-UTF8—**A video terminal with the UTF-8 character set is used. **Note** This setting must match the setting on the remote terminal application.
Bits per second	What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following: • **9600—**A 9,600 BAUD rate is used. • **19200—**A 19,200 BAUD rate is used. • **38400—**A 38,400 BAUD rate is used. • **57600—**A 57,600 BAUD rate is used. • **115200—**A 115,200 BAUD rate is used. **Note** This setting must match the setting on the remote terminal application.

Name	Description
Flow Control	Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following: • **None—**No flow control is used. • **Hardware RTS/CTS—**RTS/CTS is used for flow control. **Note** This setting must match the setting on the remote terminal application.
Putty KeyPad	Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following: • **VT100—**The function keys generate ESC OP through ESC O[. • **LINUX—**Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E. • **XTERMR6—**Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate **ESC OP** through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals. • **SCO—**The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{. • **ESCN—**The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~. • **VT400—**The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.
Redirection After BIOS POST	Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following: • **Always Enable—**BIOS Legacy console redirection is active during the OS boot and run time. • **Bootloader—**BIOS Legacy console redirection is disabled before giving control to the OS boot loader.

Step 14 In the **LOM and PCIe Slots Configuration** area, update the following fields.

Name	Description
CDN Support for VIC	Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following: • **Disabled—** CDN support for VIC cards is disabled. • **Enabled—** CDN support is enabled for VIC cards. **Note** CDN support for VIC cards work with Windows 2012 or the latest OS only.
All PCIe Slots OptionROM	Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following: • **Disabled—**The Option ROM for all PCIe slots are not available. • **Enabled—**The Option ROMs for all the PCIe slots are available. • **UEFI Only—**The Opiton ROMs for slot ***n*** are available for UEFI only. • **Legacy Only—**The Option ROM for slot ***n*** are available for legacy only.
PCIe Slot:*n* OptionROM	Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following: • **Disabled—**The Option ROM for slot ***n*** is not available. • **Enabled—**The Option ROM for slot ***n*** is available. • **UEFI Only—**The Option ROM for slot ***n*** is available for UEFI only. • **Legacy Only—**The Option ROM for slot ***n*** is available for legacy only.
PCIe Mezzanine OptionROM	Whether the PCIe mezzanine slot expansion ROM is available to the server. This can be one of the following: • **Disabled—** The Option ROM for slot ***M*** is not available. • **Enabled—** The Option ROM for slot ***M*** is available. • **UEFI Only—**The Option ROM for slot ***M*** is available for UEFI only. • **Legacy Only—**The expansion slot for slot ***M*** is available for legacy only.

Name	Description
SIOC1 Link Speed	System IO Controller 1 (SIOC1) add-on slot 1 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.
SIOC2 Link Speed	System IO Controller 2 (SIOC2) add-on slot 2 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.
Mezz Link Speed **set PcieSlotMLinkSpeed**	Mezz link speed. This can be one of the following: • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—**The default link speed. Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.

Step 15 After you updated the fields, perform the following actions:

Name	Description
Save button	Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.
Reset button	Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
Restore Defaults button	Sets the BIOS parameters on all three tabs to their default settings.

Configuring Server Management BIOS Settings

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 Specify whether the server should be rebooted after you save your changes.
If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

Note If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

Step 5 In the Server Management pane, update the following fields:

Name	Description
FRB-2 Timer	Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following: • **Disabled—**The FRB2 timer is not used. • **Enabled—**The FRB2 timer is started during POST and used to recover the system if necessary.
OS Watchdog Timer	Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following: • **Disabled—**The watchdog timer is not used to track how long the server takes to boot. • **Enabled—**The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the **OS Boot Watchdog Timer Timeout** field, the Cisco IMC logs an error and takes the action specified in the **OS Boot Watchdog Policy** field.

Name	Description
OS Watchdog Timer Timeout	If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following: • **5 Minutes—**The OS watchdog timer expires 5 minutes after it begins to boot. • **10 Minutes—**The OS watchdog timer expires 10 minutes after it begins to boot. • **15 Minutes—**The OS watchdog timer expires 15 minutes after it begins to boot. • **20 Minutes—**The OS watchdog timer expires 20 minutes after it begins to boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.
OS Watchdog Timer Policy	What action the system takes if the watchdog timer expires. This can be one of the following: • **Do Nothing—**The server takes no action if the watchdog timer expires during OS boot. • **Power Down—**The server is powered off if the watchdog timer expires during OS boot. • **Reset—**The server is reset if the watchdog timer expires during OS boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.

Step 6 Complete your action with the following options:

Name	Description
Save button	Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.
Reset button	Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
Restore Defaults button	Sets the BIOS parameters on all three tabs to their default settings.

Entering BIOS Setup

Before You Begin

- The server must be powered on.
- You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Actions** area, click **Enter BIOS Setup**.

Step 5 Click **Enable**.
Enables enter BIOS setup. On restart, the server enters the BIOS setup.

Clearing the BIOS CMOS

Before You Begin

- The server must be powered on.
- You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Actions** area, click **Clear BIOS CMOS**.

Step 5 Click **OK** to confirm.
Clears the BIOS CMOS.

Restoring BIOS Manufacturing Custom Settings

Before You Begin

- The server must be powered on.

- You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **BIOS** tab.

Step 4 In the **Actions** area, click **Restore Manufacturing Custom Settings**.

Step 5 Click **OK** to confirm.

Uploading a PID Catalog

Before You Begin

You must log in as a user with admin privileges to upload a PID catalog.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 On the **Admin** tab, click **Utilities**.

Step 3 In the **Work** pane, click the **Upload PID Catalog** link.
The **Upload PID Catalog** dialog box appears.

Depending on the location of the catalog file, choose one of the options.

Step 4 In the **Upload PID Catalog from Local File** dialog box, click **Browse** and use the **Choose File to Upload** dialog box to select the catalog file that you want to upload.

Name	Description
File field	The PID catalog file that you want to upload.
Browse button	Opens a dialog box that allows you to navigate to the appropriate file.

Step 5 In the **Upload PID Catalog from Remote Server** dialog box, complete the following fields:

Name	Description
Upload PID Catalog from Remote Server drop-down list	The remote server type. This can be one of the following: • **TFTP** • **FTP** • **SFTP** • **SCP** • **HTTP**
Server IP/Hostname field	The IP address or hostname of the server on which the PID catalog information is available. Depending on the setting in the Upload PID Catalog from drop-down list, the name of the field may vary.
Path and Filename field	The path and filename of the catalog file on the remote server.
Username field	Username of the remote server.
Password field	Password of the remote server.
Upload button	Uploads the selected PID catalog. **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Cancel button	Closes the wizard without making any changes to the firmware versions stored on the server.

Activating a PID Catalog

Before You Begin

You must log in as a user with admin privileges to activate a PID catalog.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 On the **Admin** tab, click **Utilities**.

Step 3 In the **Work** pane, click the **Activate PID Catalog** link.
The **Activate PID Catalog** dialog box appears. Complete the following fields:

Name	Description
Server check box	Allows you to select the server or servers for which you want to activate the PID Catalog.
Activate button	Opens up a dialog box asking if you want to activate the PID Catalog for the selected server or servers. Click **OK** to activate.
Cancel button	Closes the dialog box without applying the changes.

Note The **Activate PID Catalog** link is greyed out when you log on to the system for the first time. It gets activated once you upload a PID catalog to the server. After you upload a PID file, the link remains active and you can activate the PID multiple times.

CHAPTER 5

Viewing Server Properties

This chapter includes the following sections:

Viewing Server Properties

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server Properties** area of the **General** pane, review the following information:

Name	Description
Product Name field	The model name of the server.
Serial Number field	The serial number for the server.
PID field	The product ID.
UUID field	The UUID assigned to the server.

Name	Description
BIOS Version field	The version of the BIOS running on the server.
Hostname field	A user-defined hostname for the Cisco IMC. By default, the hostname appears in CXXX-YYYYYY format, where XXX is the model number and YYYYYY is the serial number of the server.
IP Address field	The IP address for the Cisco IMC.
MAC Address field	The MAC address assigned to the active network interface to the Cisco IMC.
Firmware Version field	The current Cisco IMC firmware version.
Description field	A user-defined description for the server.

Viewing CPU Properties

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **Inventory** pane's **CPU** tab, review the following information for each CPU:

Name	Description
Socket Name field	The socket in which the CPU is installed.
Vendor field	The vendor for the CPU.
Status field	The status of the CPU.
Family field	The family to which this CPU belongs.
Speed field	The CPU speed, in megahertz.
Version field	The CPU version.
Number of Cores field	The number of cores in the CPU.
Signature field	The signature information for the CPU.

Name	Description
Number of Threads field	The maximum number of threads that the CPU can process concurrently.

Viewing Memory Properties

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **Memory** tab's **Memory Summary** area, review the following summary information about memory:

Name	Description
Memory Speed field	The memory speed, in megahertz.
Failed Memory field	The amount of memory that is currently failing, in megabytes.
Total Memory field	The total amount of memory available on the server if all DIMMs are fully functional.
Ignored Memory field	The amount of memory currently not available for use, in megabytes.
Effective Memory field	The actual amount of memory currently available to the server.
Number of Ignored DIMMs field	The number of DIMMs that the server cannot access.
Redundant Memory field	The amount of memory used for redundant storage.
Number of Failed DIMMs field	The number of DIMMs that have failed and cannot be used.
Memory RAS Possible field	Details about the RAS memory configuration that the server supports.

Name	Description
Memory Configuration field	The current memory configuration. This can be one of the following: • **Maximum Performance—**The system automatically optimizes the memory performance. • **Mirroring—**The server maintains two identical copies of the data in memory. This option effectively halves the available memory on the server, as one half is automatically reserved for mirrored copy. • **Lockstep—**If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance.
DIMM location diagram	Displays the DIMM or memory layout for the current server.

Step 5 In the **DIMM Black Listing** area, view the overall status of a DIMM and also enable DIMM black listing.

Name	Description
Overall DIMM Status field	The overall status of a DIMM. This can be one of the following: • **Good—**The DIMM status is available. • **Severe Fault—** The DIMM status when uncorrectable ECC errors are present.
Enable DIMM Black List checkbox	Check this option to enable DIMM black listing.

Step 6 In the **Memory Details** table, review the following detailed information about each DIMM:

Tip Click a column header to sort the table rows, according to the entries in that column.

Name	Description
Name column	The name of the DIMM slot in which the memory module is installed.
Capacity column	The size of the DIMM.
Channel Speed column	The clock speed of the memory channel, in megahertz.
Memory Type column	The type of memory channel.
Memory Type Detail column	The type of memory used in the device.
Bank Locator column	The location of the DIMM within the memory bank.

Name	Description
Manufacturer column	The vendor ID of the manufacturer. This can be one of the following: • **0x2C00—**Micron Technology, Inc. • **0x5105—**Qimonda AG i. In. • **0x802C—**Micron Technology, Inc. • **0x80AD—**Hynix Semiconductor Inc. • **0x80CE—**Samsung Electronics, Inc. • **0x8551—**Qimonda AG i. In. • **0xAD00—**Hynix Semiconductor Inc. • **0xCE00—**Samsung Electronics, Inc.
Serial Number column	The serial number of the DIMM.
Asset Tag column	The asset tag associated with the DIMM, if any.
Part Number column	The part number for the DIMM assigned by the vendor.
Visibility column	Whether the DIMM is available to the server.
Operability column	Whether the DIMM is currently operating correctly.
Data Width column	The amount of data the DIMM supports, in bits.

Viewing PCI Adapter Properties

Before You Begin

The server must be powered on, or the properties will not display.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **PCI Adapters** tab's **PCI Adapters** area, review the following information for the installed PCI adapters:

Name	Description
Slot ID column	The slot in which the adapter resides.
Product Name column	The name of the adapter.
Firmware Version column	The firmware versions of the adapters. **Note** The firmware versions are displayed only for adapters that provide versions through the standard UEFI interface. For example, Intel LOM and Emulex Adapters.
Vendor ID column	The adapter ID assigned by the vendor.
Sub Vendor ID column	The secondary adapter ID assigned by the vendor.
Device ID column	The device ID assigned by the vendor.
Sub Device ID column	The secondary device ID assigned by the vendor.

Viewing vNICs Properties

Before You Begin

The server must be powered on, or the properties will not display.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **vNICs** tab's **vNICs** area, review the following information:

Name	Description
Name column	The name of the virtual NIC.
CDN column	The Consistent Device Name (CDN) that you can assign to the ethernet vNICs on the VIC cards. Assigning a specific CDN to a device helps in identifying it on the host OS. **Note** This feature works only when the **CDN Support for VIC** token is enabled in the BIOS.
MAC Address column	The MAC address for the vNIC.

Name	Description
MTU column	The maximum transmission unit, or packet size, that this vNIC accepts.
usNIC column	The number of usNICs configured on each vNIC device.
Uplink Port column	The uplink port associated with the vNIC. All traffic for this vNIC goes through this uplink port.
CoS column	The Class of Service assigned to the vNIC.
VLAN column	The VLAN associated with the vNIC.
VLAN Mode column	The mode for the associated VLAN.
iSCSI Boot column	Whether iSCSI boot is enabled for this vNIC.
PXE Boot column	Whether PXE boot is enabled for this vNIC.
Channel column	The channel associated with the vNIC, if any. **Note** VNTAG mode is required for this option.
Port Profile column	The port profile associated with the vNIC, if any. **Note** VNTAG mode is required for this option.
Uplink Failover column	Whether traffic on this vNIC will fail over to a secondary interface if the primary interface fails. **Note** VNTAG mode is required for this option.

Viewing Storage Properties

Before You Begin

The server must be powered on, or the properties will not display.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **Storage** tab's **Storage** area, review the following information:

Name	Description
Controller field	PCIe slot in which the controller drive is located.
PCI Slot field	The name of the PCIe slot in which the controller drive is located.
Product Name field	Name of the controller.
Serial Number field	The serial number of the storage controller.
Firmware Package Build field	The active firmware package version number.
Product ID field	Product ID of the controller.
Battery Status field	Status of the battery.
Cache Memory Size field	The size of the cache memory, in megabytes.
Health field	The health of the controller.
Details field	Link to the details of the controller.

Viewing TPM Properties

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Inventory** tab.

Step 4 In the **TPM** pane, review the following information:

Name	Description
Version column	The TPM version. This field displays **NA** if the TPM version details are not available.

Name	Description
Presence column	Presence of the TPM module on the host server. • **Equipped—**The TPM is present on the host server. • **Empty—**The TPM does not exist on the host server.
Model column	The model number of the TPM. This field displays **NA** if the TPM does not exist on the host server.
Enabled Status column	Whether or not the TPM is enabled. • **Enabled—**The TPM is enabled. • **Disabled—**The TPM is disabled. • **Unknown—**The TPM does not exist on the host server.
Vendor column	The name of the TPM vendor. This field displays **NA** if the TPM does not exist on the host server.
Active Status column	Activation status of the TPM. • **Activated—**The TPM is activated. • **Deactivated—**The TPM is deactivated. • **Unknown—**The TPM does not exist on the host server.
Serial column	The serial number of the TPM. This field displays **NA** if the TPM does not exist on the host server.
Ownership column	The ownership status of TPM. • **Owned—**The TPM is owned. • **Unowned—**The TPM is unowned. • **Unknown—**The TPM does not exist on the host server.
Revision column	Revision number of the TPM. This field displays **NA** if the TPM does not exist on the host server.

Viewing a PID Catalog

Procedure

Step 1 In the **Navigation** pane, click the **Compute** tab.

Step 2 In the **Compute** tab, click **Server 1** and **Server 2**.

Step 3 In the **Server** pane, click the **PID Catalog** tab.

Step 4 In the **Summary** area, review the following summary information about the PID catalog:

Name	Description
Upload Status field	The download status of the PID catalog. It can be any of the following: • Download in Progress • Download Successful • Download Error - TFTP File Not Found • Download Error - Connection Failed • Download Error - Access Denied • Download Error - File Not Found • Download Error - Download Failed • Activation Successful • Error - Unknown • N/A
Activation Status field	The activation status of the PID catalog.
Current Activated version field	The activated version of the PID catalog.

Step 5 In the **CPU** table, review the following information about CPU:

Name	Description
Socket field	The socket in which the CPU is installed.
Product ID field	The product ID for the CPU.
Model field	The model number of the CPU

Step 6 In the **Memory** table, review the following information about memory:

Name	Description
Name field	The name of the memory slot.
Product ID field	The product ID for the memory slot assigned by the vendor.
Vendor ID field	The ID assigned by the vendor.
Capacity field	The size of the memory.
Speed (MHz) field	The memory speed, in megahertz.

Step 7 In the **PCI Adapters** table, review the following information about PCI adapter:

Name	Description
Slot column	The slot in which the adapter resides.
Product ID column	The product ID for the adapter.
Vendor ID column	The adapter ID assigned by the vendor.
Sub Vendor ID column	The secondary adapter ID assigned by the vendor.
Device ID column	The device ID assigned by the vendor.
Sub Device ID column	The secondary device ID assigned by the vendor.

Step 8 In the **HDD** table, review the following information about HDD:

Name	Description
Disk field	The disk of the hard drive.
Product ID field	The product ID for the hard drive.
Controller field	The system-defined name of the selected Cisco Flexible Flash controller. This name cannot be changed.
Vendor field	The vendor for the hard drive.
Model field	The model of the hard drive.

CHAPTER 6

Viewing Sensors

This chapter includes the following sections:

Viewing Server Sensors

Viewing Temperature Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Server** pane, click the **Sensors** tab.

Step 3 In the **Temperature** tab's **Temperature Sensors** area, view the following statistics for the server:

Name	Description
Sensor Name column	The name of the sensor.
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**

Name	Description
Temperature column	The current temperature, in Celsius and Fahrenheit.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Viewing Voltage Sensors

Before You Begin

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Server** pane, click the **Sensors** tab.

Step 3 In the **Voltage** tab's **Voltage Sensors** area, review the following server statistics:

Name	Description
Sensor Name column	The name of the sensor.
Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Voltage column	The current voltage, in volts.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.

Name	Description
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

What to Do Next

Viewing LED Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Server** pane, click the **Sensors** tab.

Step 3 In the **LED** tab's **LED Sensors** area, view the following LED-related statistics for the server:

Name	Description
Sensor Name column	The name of the sensor.
LED State column	Whether the LED is on, blinking, or off.
LED Color column	The current color of the LED. For details about what the colors mean, see the hardware installation guide for the type of server you are using.

Viewing Storage Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Storage** tab's **Storage Sensors** area, view the following storage-related statistics for the server:

Name	Description
Name column	The name of the storage device.

Name	Description
Status column	A brief description of the storage device status.

Viewing Chassis Sensors

Viewing Power Supply Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **Power Supply** tab.

Step 4 Review the following sensor properties for power supply:

Properties Area

Name	Description
Redundancy Status field	The power supply redundancy status.

Threshold Sensors Area

Name	Description
Sensor Name column	The name of the sensor
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Reading column	The current power usage, in watts.
Warning Threshold Min column	The minimum warning threshold.

Name	Description
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Discrete Sensors Area

Name	Description
Sensor Name column	The name of the sensor.
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Reading column	The basic state of the sensor.

Viewing Fan Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **Fan** tab.

Step 4 Review the following fan sensor properties:

Name	Description
Sensor Name column	The name of the sensor

Name	Description
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Speed (RPMS) column	The fan speed in RPM.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Viewing Temperature Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **Temperature** tab.

Step 4 Review the following temperature sensor properties:

Name	Description
Sensor Name column	The name of the sensor

Name	Description
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Temperature column	The current temperature, in Celsius.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Viewing Voltage Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **Voltage** tab.

Step 4 Review the following voltage sensor properties:

Name	Description
Sensor Name column	The name of the sensor

Name	Description
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Voltage (V) column	The current voltage, in Volts.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Viewing Current Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **Current** tab.

Step 4 Review the following current sensor properties:

Name	Description
Sensor Name column	The name of the sensor

Name	Description
Sensor Status column	The status of the sensor. This can be one of the following: • **Unknown** • **Informational** • **Normal** • **Warning** • **Critical** • **Non-Recoverable**
Temperature (C) column	The current temperature, in Celsius.
Warning Threshold Min column	The minimum warning threshold.
Warning Threshold Max column	The maximum warning threshold.
Critical Threshold Min column	The minimum critical threshold.
Critical Threshold Max column	The maximum critical threshold.

Viewing LED Sensors

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Sensors**.

Step 3 In the **Sensors** working area, click the **LEDs** tab.

Step 4 Review the following LED sensor properties:

Name	Description
Sensor Name column	The name of the sensor
LED Status column	Whether the LED is on, blinking, or off.
LED Color column	The current color of the LED. For details about what the colors mean, see the hardware installation guide for the type of server you are using.

CHAPTER 7

Managing Remote Presence

This chapter includes the following sections:

Configuring Serial Over LAN

Serial over LAN enables the input and output of the serial port of a managed system to be redirected over IP. Configure and use serial over LAN on your server when you want to reach the host console with Cisco IMC.

Before You Begin

You must log in as a user with admin privileges to configure serial over LAN.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Remote Management** tab.

Step 4 In the **Remote Presence** pane, click the **Serial over LAN** tab.

Step 5 In the **Serial over LAN Properties** area, update the following properties:

Name	Description
Enabled check box	If checked, Serial over LAN (SoL) is enabled on this server.

Name	Description
Baud Rate drop-down list	The baud rate the system uses for SoL communication. This can be one of the following: • **9600 bps** • **19.2 kbps** • **38.4 kbps** • **57.6 kbps** • **115.2 kbps**
Com Port drop-down list	The serial port through which the system routes SoL communication. **Note** This field is only available on some C-Series servers. If it is not available, the server always uses COM port 0 for SoL communication. You can select one of the following: • **com0—**SoL communication is routed through COM port 0, an externally accessible serial port that supports either a physical RJ45 connection to an external device or a virtual SoL connection to a network device. If you select this option, the system enables SoL and disables the RJ45 connection, which means that the server can no longer support an external serial device. • **com1—**SoL communication is routed through COM port 1, an internal port accessible only through SoL. If you select this option, you can use SoL on COM port 1 and the physical RJ45 connection on COM port 0. **Note** Changing the Com Port setting disconnects any existing SoL sessions.

Step 6 Click **Save Changes**.

Configuring Virtual Media

Before You Begin

You must log in as a user with admin privileges to configure virtual media.

Procedure

Step 1 In the **Navigation** pane, click the **Server** tab.

Step 2 On the **Server** tab, click **Remote Presence**.

Step 3 In the **Remote Presence** pane, click the **Virtual Media** tab.

Step 4 In the **Virtual Media Properties** area, update the following properties:

Name	Description
Enabled check box	If checked, virtual media is enabled. **Note** If you clear this check box, all virtual media devices are automatically detached from the host.
Active Sessions field	The number of virtual media sessions that are currently running.
Enable Virtual Media Encryption check box	If checked, all virtual media communications are encrypted.
Low Power USB enabled check box	If checked, low power USB is enabled. If the low power USB is enabled, after mapping the ISO and rebooting the host, the virtual drives appear on the boot selection menu.

Step 5 Click **Save Changes**.

Creating a Cisco IMC Mapped vMedia Volume

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Remote Management** tab.

Step 4 In the **Remote Management** tab, click the **Virtual Media** tab

Step 5 In the **Remote Presence** pane, click the **Virtual Media** tab.

Step 6 In the Current Mappings area, click **Add New Mapping**.

Step 7 In the **Add New Mapping** dialog box, update the following fields:

Name	Description
Volume field	The identity of the image mounted for mapping.

Name	Description
Mount Type drop-down list	The type of mapping. This can be one of the following: **Note** Ensure that the communication port of the mount type that you choose is enabled on the switch. For example, when you are using CIFS as your mount type, ensure port 445 (which is its communication port) is enabled on the switch. Similarly, enable ports 80 for HTTP, 443 for HTTPS and 2049 for NFS when you use them. • **NFS—**Network File System. • **CIFS—**Common Internet File System. • **WWW(HTTP/HTTPS)—**HTTP-based or HTTPS-based system. **Note** Before mounting the virtual media, Cisco IMC tries to verify reachability to the end server by pinging the server.
Remote Share field	The URL of the image to be mapped. The format depends on the selected **Mount Type**: • **NFS—**Use serverip:/share. • **CIFS—**Use //serverip/share. • **WWW(HTTP/HTTPS)—**Use http[s]://serverip/share.
Remote File field	The name and location of the .iso or .img file in the remote share.

Name	Description
Mount Options field	

Name	Description
	Industry-standard mount options entered in a comma separated list. The options vary depending on the selected **Mount Type**. If you are using **NFS**, leave the field blank or enter one or more of the following: • ro • rw • nolock • noexec • soft • port=VALUE • timeo=VALUE • retry=VALUE If you are using **CIFS**, leave the field blank or enter one or more of the following: • soft • nounix • noserverino • guest • username=VALUE—ignored if guest is entered. • password=VALUE—ignored if guest is entered. • sec=VALUE The protocol to use for authentication when communicating with the remote server. Depending on the configuration of CIFS share, **VALUE** could be one of the following: ◦ **None**—No authentication is used ◦ **Ntlm**—NT LAN Manager (NTLM) security protocol. Use this option only with Windows 2008 R2 and Windows 2012 R2. ◦ **Ntlmi**—NTLMi security protocol. Use this option only when you enable Digital Signing in the CIFS Windows server. ◦ **Ntlmssp**—NT LAN Manager Security Support Provider (NTLMSSP) protocol. Use this option only with Windows 2008 R2 and Windows 2012 R2. ◦ **Ntlmsspi**—NTLMSSPi protocol. Use this option only when you enable Digital Signing in the CIFS Windows server.

Name	Description
	◦ **Ntlmv2—**NTLMv2 security protocol. Use this option only with Samba Linux. ◦ **Ntlmv2i—**NTLMv2i security protocol. Use this option only with Samba Linux. If you are using **WWW(HTTP/HTTPS)**, leave the field blank or enter the following: • noauto **Note** Before mounting the virtual media, Cisco IMC tries to verify reachability to the end server by pinging the server. • username=VALUE • password=VALUE
User Name field	The username for the specified **Mount Type**, if required.
Password field	The password for the selected username, if required.

Step 8 Click **Save**.

Viewing Cisco IMC-Mapped vMedia Volume Properties

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Remote Management** tab.

Step 4 In the **Remote Management** tab, click the **Virtual Media** tab

Step 5 Select a row from the **Current Mappings** table.

Step 6 Click **Properties** and review the following information:

Name	Description
Add New Mapping button	Opens a dialog box that allows you to add a new image.

Name	Description
Properties button	Opens a dialog box that allows you to view or change the properties for the selected image.
Unmap button	Unmaps the mounted vMedia.
Last Mapping Status	The status of the last mapping attempted.
Volume column	The identity of the image.
Mount Type drop-down list	The type of mapping.
Remote Share field	The URL of the image.
Remote File field	The exact file location of the image.
Status field	The current status of the map. This can be one of the following: • **OK—**The mapping is successful. • **In Progress—**The mapping is in progress. • **Stale—**Cisco IMC displays a text string with the reason why the mapping is stale. • **Error—**Cisco IMC displays a text string with the reason for the error.

Removing a Cisco IMC-Mapped vMedia Volume

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Remote Management** tab.

Step 4 In the **Remote Management** tab, click the **Virtual Media** tab

Step 5 Select a row from the **Current Mappings** table.

Step 6 Click **Unmap**.

KVM Console

The KVM console is an interface accessible from Cisco IMC that emulates a direct keyboard, video, and mouse (KVM) connection to the server. The KVM console allows you to connect to the server from a remote location.

Instead of using CD/DVD or floppy drives physically connected to the server, the KVM console uses virtual media, which are actual disk drives or disk image files that are mapped to virtual CD/DVD or floppy drives. You can map any of the following to a virtual drive:

- CD/DVD or floppy drive on your computer
- Disk image files (ISO or IMG files) on your computer
- USB flash drive on your computer
- CD/DVD or floppy drive on the network
- Disk image files (ISO or IMG files) on the network
- USB flash drive on the network

You can use the KVM console to install an OS on the server.

Note To configure the KVM console successfully for the Cisco UCS C3260 server, you need to configure IP addresses for the Cisco IMC, CMC, and BMC components. You can configure the IP addresses for these components using the CLI interface or Web UI. For the CLI, use the command **scope network**, or view the setting using **scope <chassis/server1/2><cmc/bmc><network>**.

To configure IP addresses for network components on the web interface, see the steps described in the section **Configuring Network-Related Settings**.

Note When launching the KVM Console from Internet Explorer 6 SP1 on Windows Server 2003, the browser will report that it cannot download a required file. If this occurs, click the browser Tools menu and select Internet Options. Click the Advanced tab and, in the Security section, uncheck the checkbox for "Do not save encrypted pages to disk." Launch the KVM Console again.

Configuring the Virtual KVM

Before You Begin

You must log in as a user with admin privileges to configure the virtual KVM.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.

Step 3 In the **Server** pane, click the **Remote Management** tab.

Step 4 In the **Remote Management** pane, click the **Virtual KVM** tab.

Step 5 On the **Virtual KVM** tab, complete the following fields:

Name	Description
Enabled check box	If checked, the virtual KVM is enabled. **Note** The virtual media viewer is accessed through the KVM. If you disable the KVM console, Cisco IMC also disables access to all virtual media devices attached to the host.
Max Sessions drop-down list	The maximum number of concurrent KVM sessions allowed. You can select any number between 1 and 4.
Active Sessions field	The number of KVM sessions running on the server.
Remote Port field	The port used for KVM communication.
Enable Video Encryption check box	If checked, the server encrypts all video information sent through the KVM.
Enable Local Server Video check box	If checked, the KVM session is also displayed on any monitor attached to the server.

Step 6 Click **Save Changes**.

Enabling the Virtual KVM

Before You Begin

You must log in as a user with admin privileges to enable the virtual KVM.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.
Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.
Step 3 In the **Server** pane, click the **Remote Management** tab.
Step 4 In the **Remote Management** pane, click the **Virtual KVM** tab.
Step 5 On the **Virtual KVM** tab, check the **Enabled** check box.
Step 6 Click **Save Changes**.

Disabling the Virtual KVM

Before You Begin

You must log in as a user with admin privileges to disable the virtual KVM.

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.
Step 2 In the **Compute** menu, click **Server 1** or **Server 2**.
Step 3 In the **Server** pane, click the **Remote Management** tab.
Step 4 In the **Remote Management** pane, click the **Virtual KVM** tab.
Step 5 On the **Virtual KVM** tab, uncheck the **Enabled** check box.
Step 6 Click **Save Changes**.

CHAPTER 8

Managing User Accounts

This chapter includes the following sections:

Configuring Local Users

The Cisco IMC now implements a strong password policy wherein you are required to follow guidelines and set a strong password when you first log on to the server for the first time. The **Local User** tab displays a **Disable Strong Password** button which allows you to disable the strong password policy and set a password of your choice by ignoring the guidelines. Once you disable the strong password, an **Enable Strong Password** button is displayed. By default, the strong password policy is enabled.

Before You Begin

You must log in as a user with admin privileges to configure or modify local user accounts.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click the **Local User** tab.

Step 4 To configure or modify a local user account, click a row in the Local User Management pane and click **Modify User**.

Step 5 In the **Modify User Details** dialog box, update the following properties:

Name	Description
ID field	The unique identifier for the user.
Enabled check box	If checked, the user is enabled on the Cisco IMC.

Name	Description
Username field	The username for the user. Enter between 1 and 16 characters.
Role field	The role assigned to the user. This can be one of the following: • **read-only—**A user with this role can view information but cannot make any changes. • **user—**A user with this role can perform the following tasks: ◦ View all information ◦ Manage the power control options such as power on, power cycle, and power off ◦ Launch the KVM console and virtual media ◦ Clear all logs ◦ Toggle the locator LED ◦ Set time zone ◦ Ping • **admin—**A user with this role can perform all actions available through the GUI, CLI, and IPMI.
Change Password check box	If checked, when you save the changes the password for this user will be changed. You must check this box if this is a new user name.

Name	Description
New Password field	The password for this user name. When you move the mouse over the help icon beside the field, the following guidelines to set the password are displayed: • The password must have a minimum of 8 and a maximum of 14 characters. • The password must not contain the User's Name. • The password must contain characters from three of the following four categories: ◦ English uppercase characters (A through Z). ◦ English lowercase characters (a through z). ◦ Base 10 digits (0 through 9). ◦ Non-alphabetic characters (!, @, #, $, %, ^, &, *, -, _, , =, "). These rules are meant to define a strong password for the user, for security reasons. However, if you want to set a password of your choice ignoring these guidelines, click the **Disable Strong Password** button on the **Local Users** tab. While setting a password when the strong password option is disabled, you can use between 1- 20 characters.
Confirm New Password field	The password repeated for confirmation purposes.

Step 6 Enter password information.

Step 7 Click **Save Changes**.

LDAP Servers

Cisco IMC supports directory services that organize information in a directory, and manage access to this information. Cisco IMC supports Lightweight Directory Access Protocol (LDAP), which stores and maintains directory information in a network. In addition, Cisco IMC supports Microsoft Active Directory (AD). Active Directory is a technology that provides a variety of network services including LDAP-like directory services, Kerberos-based authentication, and DNS-based naming. The Cisco IMC utilizes the Kerberos-based authentication service of LDAP.

When LDAP is enabled in the Cisco IMC, user authentication and role authorization is performed by the LDAP server for user accounts not found in the local user database. The LDAP user authentication format is username@domain.com.

By checking the Enable Encryption check box in the **LDAP Settings** area, you can require the server to encrypt data sent to the LDAP server.

Configuring the LDAP Server

The Cisco IMC can be configured to use LDAP for user authentication and authorization. To use LDAP, configure users with an attribute that holds the user role and locale information for the Cisco IMC. You can use an existing LDAP attribute that is mapped to the Cisco IMC user roles and locales or you can modify the LDAP schema to add a new custom attribute, such as the CiscoAVPair attribute, which has an attribute ID of 1.3.6.1.4.1.9.287247.1.

Important For more information about altering the schema, see the article at http://technet.microsoft.com/en-us/library/bb727064.aspx.

Note This example creates a custom attribute named CiscoAVPair, but you can also use an existing LDAP attribute that is mapped to the Cisco IMC user roles and locales.

The following steps must be performed on the LDAP server.

Procedure

Step 1 Ensure that the LDAP schema snap-in is installed.

Step 2 Using the schema snap-in, add a new attribute with the following properties:

Properties	Value
Common Name	CiscoAVPair
LDAP Display Name	CiscoAVPair
Unique X500 Object ID	1.3.6.1.4.1.9.287247.1
Description	CiscoAVPair
Syntax	Case Sensitive String

Step 3 Add the CiscoAVPair attribute to the user class using the snap-in:

a) Expand the **Classes** node in the left pane and type U to select the user class.
b) Click the **Attributes** tab and click **Add**.
c) Type C to select the CiscoAVPair attribute.
d) Click **OK**.

Step 4 Add the following user role values to the CiscoAVPair attribute, for the users that you want to have access to Cisco IMC:

Role	CiscoAVPair Attribute Value
admin	shell:roles="admin"

Role	CiscoAVPair Attribute Value
user	shell:roles="user"
read-only	shell:roles="read-only"

Note For more information about adding values to attributes, see the article at http://technet.microsoft.com/en-us/library/bb727064.aspx.

What to Do Next

Use the Cisco IMC to configure the LDAP server.

Configuring LDAP Settings and Group Authorization in Cisco IMC

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click **LDAP**.

Step 4 In the **LDAP Settings** area, update the following properties:

Name	Description
Enable LDAP check box	If checked, user authentication and role authorization is performed first by the LDAP server, followed by user accounts that are not found in the local user database.
Base DN field	Base Distinguished Name. This field describes where to load users and groups from. It must be in the dc=domain,dc=com format for Active Directory servers.
Domain field	The IPv4 domain that all users must be in. This field is required unless you specify at least one Global Catalog server address.
Enable Encryption check box	If checked, the server encrypts all information it sends to the LDAP server.

Name	Description
Enable Binding CA Certificate check box	If checked, allows you to bind the LDAP CA certificate.
Timeout (0 - 180) seconds	The number of seconds the Cisco IMC waits until the LDAP search operation times out. If the search operation times out, Cisco IMC tries to connect to the next server listed on this tab, if one is available. **Note** The value you specify for this field could impact the overall time.

Note If you checked the **Enable Encryption** and the **Enable Binding CA Certificate** check boxes, enter the fully qualified domain name (FQDN) of the LDAP server in the **LDAP Server** field. To resolve the FQDN of the LDAP server, configure the preferred DNS of Cisco IMC network with the appropriate DNS IP address.

Step 5 In the **Configure LDAP Servers** area, update the following properties:

Name	Description
Pre-Configure LDAP Servers radio button	If checked, the Active Directory uses the pre-configured LDAP servers.
LDAP Servers fields	
Server	The IP address of the 6 LDAP servers. If you are using Active Directory for LDAP, then servers 1, 2 and 3 are domain controllers, while servers 4, 5 and 6 are Global Catalogs. If you are not Active Directory for LDAP, then you can configure a maximum of 6 LDAP servers. **Note** You can provide the IP address of the host name as well.
Port	The port numbers for the servers. If you are using Active Directory for LDAP, then for servers 1, 2 and 3, which are domain controllers, the default port number is 389. For servers 4, 5 and 6, which are Global Catalogs, the default port number is 3268. LDAPS communication occurs over the TCP 636 port. LDAPS communication to a global catalog server occurs over TCP 3269 port.
Use DNS to Configure LDAP Servers radio button	If checked, you can use DNS to configure access to the LDAP servers.

Name	Description
DNS Parameters fields	
Source	Specifies how to obtain the domain name used for the DNS SRV request. It can be one of the following: • **Extracted—**specifies using domain name extracted-domain from the login ID • **Configured—**specifies using the configured-search domain. • **Configured-Extracted—**specifies using the domain name extracted from the login ID than the configured-search domain.
Domain to Search	A configured domain name that acts as a source for a DNS query. This field is disabled if the source is specified as **Extracted**.
Forest to Search	A configured forest name that acts as a source for a DNS query. This field is disabled if the source is specified as **Extracted**.

Step 6 In the **Binding Parameters** area, update the following properties:

Name	Description
Method	It can be one of the following: • **Anonymous—**requires NULL username and password. If this option is selected and the LDAP server is configured for Anonymous logins, then the user can gain access. • **Configured Credentials—**requires a known set of credentials to be specified for the initial bind process. If the initial bind process succeeds, then the distinguished name (DN) of the user name is queried and re-used for the re-binding process. If the re-binding process fails, then the user is denied access. • **Login Credentials—**requires the user credentials. If the bind process fails, the user is denied access. By default, the **Login Credentials** option is selected.
Binding DN	The distinguished name (DN) of the user. This field is editable only if you have selected **Configured Credentials** option as the binding method.
Password	The password of the user. This field is editable only if you have selected **Configured Credentials** option as the binding method.

Step 7 In the **Search Parameters** area, update the following fields:

Name	Description
Filter Attribute	This field must match the configured attribute in the schema on the LDAP server. By default, this field displays **sAMAccountName**.
Group Attribute	This field must match the configured attribute in the schema on the LDAP server. By default, this field displays **memberOf**.

Name	Description
Attribute	An LDAP attribute that contains the role and locale information for the user. This property is always a name-value pair. The system queries the user record for the value that matches this attribute name. The LDAP attribute can use an existing LDAP attribute that is mapped to the Cisco IMC user roles and locales, or can modify the schema such that a new LDAP attribute can be created. For example, **CiscoAvPair**. **Note** If you do not specify this property, the user cannot login. Although the object is located on the LDAP server, it should be an exact match of the attribute that is specified in this field.
Nested Group Search Depth (1-128)	Parameter to search for an LDAP group nested within another defined group in an LDAP group map. The parameter defines the depth of a nested group search.

Step 8 (Optional) In the **Group Authorization** area, update the following properties:

Name	Description
LDAP Group Authorization check box	If checked, user authentication is also done on the group level for LDAP users that are not found in the local user database. If you check this box, Cisco IMC enables the **Configure Group** button.
Group Name column	The name of the group in the LDAP server database that is authorized to access the server.
Group Domain column	The LDAP server domain the group must reside in.

Name	Description
Role column	The role assigned to all users in this LDAP server group. This can be one of the following: • **read-only—**A user with this role can view information but cannot make any changes. • **user—**A user with this role can perform the following tasks: ◦ View all information ◦ Manage the power control options such as power on, power cycle, and power off ◦ Launch the KVM console and virtual media ◦ Clear all logs ◦ Toggle the locator LED ◦ Set time zone ◦ Ping • **admin—**A user with this role can perform all actions available through the GUI, CLI, and IPMI.
Configure button	Configures an active directory group.
Delete button	Deletes an existing LDAP group.

Step 9 Click **Save Changes**.

LDAP Certificates Overview

Cisco C-series servers allow an LDAP client to validate a directory server certificate against an installed CA certificate or chained CA certificate during an LDAP binding step. This feature is introduced in the event where anyone can duplicate a directory server for user authentication and cause a security breach due to the inability to enter a trusted point or chained certificate into the Cisco IMC for remote user authentication.

An LDAP client needs a new configuration option to validate the directory server certificate during the encrypted TLS/SSL communication.

Viewing LDAP CA Certificate Status

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click the **LDAP** tab.

Step 4 In the **Certificate Status** area, view the following fields:

Name	Description
Download Status	This field displays the status of the LDAP CA certificate download.
Export Status	This field displays the status of the LDAP CA certificate export.

Exporting an LDAP CA Certificate

Before You Begin

You must log in as a user with admin privileges to perform this action.

You should have downloaded a signed LDAP CA Certificate before you can export it.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click the **LDAP** tab.

Step 4 Click the **Export LDAP CA Certificate** link.
The **Export LDAP CA Certificate** dialog box appears.

Name	Description
Export to Remote Location	Selecting this option allows you to choose the certificate from a remote location and export it. Enter the following details: • ◦ **TFTP Server** ◦ **FTP Server** ◦ **SFTP Server** ◦ **SCP Server** ◦ **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to. • **Server IP/Hostname** field — The IP address or hostname of the server on which the LDAP CA certificate file should be exported. Depending on the setting in the **Download Certificate from** drop-down list, the name of the field may vary. • **Path and Filename** field — The path and filename Cisco IMC should use when downloading the certificate from the remote server. • **Username** field — The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP. • **Password** field — The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.
Export to Local Desktop	Selecting this option allows you to choose the certificate stored on a drive that is local to the computer and export it.

Step 5 Click **Export Certificate**.

Downloading an LDAP CA Certificate

Before You Begin

- You must log in as a user with admin privileges to perform this action.
- You must enable Binding CA Certificate to perform this action.

Note Only CA certificates or chained CA certificates must be used in Cisco IMC. By default, CA certificate is in .cer format. If it is a chained CA certificate, then it needs to be converted to .cer format before downloading it to Cisco IMC.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click the **LDAP** tab.

Step 4 Click the **Download LDAP CA Certificate** link.
The **Download LDAP CA Certificate** dialog box appears.

Name	Description
Download from remote location radio button	Selecting this option allows you to choose the certificate from a remote location and download it. Enter the following details: • ◦ **TFTP Server** ◦ **FTP Server** ◦ **SFTP Server** ◦ **SCP Server** ◦ **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to. • **Server IP/Hostname** field — The IP address or hostname of the server on which the LDAP CA certificate file should be stored. Depending on the setting in the **Download Certificate from** drop-down list, the name of the field may vary. • **Path and Filename** field — The path and filename Cisco IMC should use when downloading the file to the remote server. • **Username** field — The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP. • **Password** field — The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.
Download through browser client radio button	Selecting this option allows you to navigate to the certificate stored on a drive that is local to the computer running the Cisco IMC GUI. When you select this option, Cisco IMC GUI displays a **Browse** button that lets you navigate to the file you want to import.
Paste Certificate content radio button	Selecting this option allows you to copy the entire content of the signed certificate and paste it in the **Paste certificate content** text field. **Note** Ensure the certificate is signed before uploading.
Download Certificate button	Allows you to download the certificate to the server.

Testing LDAP Binding

Before You Begin

You must log in as a user with admin privileges to perform this action.

Note If you checked the **Enable Encryption** and the **Enable Binding CA Certificate** check boxes, enter the fully qualified domain name (FQDN) of the LDAP server in the LDAP Server field. To resolve the FQDN of the LDAP server, configure the preferred DNS of Cisco IMC network with the appropriate DNS IP address.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.

Step 2 In the **Admin** menu, click **User Management**.

Step 3 In the **User Management** pane, click the **LDAP** tab.

Step 4 Click the **Test LDAP Binding** link.
The **Test LDAP CA Certificate Binding** dialog box appears.

Name	Description
Username field	Enter the user name.
Password field	Enter the corresponding password.

Step 5 Click **Test**.

Deleting an LDAP CA Certificate

Before You Begin

You must log in as a user with admin privileges to perform this action.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** tab.
Step 2 In the **Admin** menu, click **User Management**.
Step 3 In the **User Management** pane, click the **LDAP** tab.
Step 4 Click the **Delete LDAP CA Certificate** link and click **OK** to confirm.

Viewing User Sessions

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.
Step 2 In the **Admin** menu, click **User Management**.
Step 3 In the **User Management** pane, click **Session Management**.
Step 4 In the **Sessions** pane, view the following information about current user sessions:

Name	Description
Terminate Session button	If your user account is assigned the **admin** user role, this option enables you to force the associated user session to end. **Note** You cannot terminate your current session from this tab.
Session ID column	The unique identifier for the session.
User name column	The username for the user.
IP Address column	The IP address from which the user accessed the server. If this is a serial connection, it displays **N/A**.
Type column	The type of session the user chose to access the server. This can be one of the following: • **webgui—** indicates the user is connected to the server using the web UI. • **CLI—** indicates the user is connected to the server using CLI. • **serial—** indicates the user is connected to the server using the serial port.

CHAPTER 9

Configuring Chassis Related Settings

This chapter includes the following sections:

Managing Server Power

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Summary**.

Step 3 In the toolbar above the work pane, click the **Host Power** link.

Step 4 In the **Server Power Management** dialog box, review the following information and select the relevant radio buttons (highlighted radio buttons indicate the current power state of the server or servers) to manage power for server 1 or server 2.

Actions	Description
Power ON radio button	Powers on the chosen server.
Power Off radio button	Powers off the chosen server, even if tasks are running on that server. **Important** If any firmware or BIOS updates are in progress, do not power off or reset the server until those tasks are complete.

Actions	Description
Power Cycle radio button	Powers off and powers on chosen server.
Hard Reset radio button	Reboots the chosen server.
Shut Down radio button	Shuts down the chosen server if the operating system supports that feature.

Pinging a Hostname/IP Address from the Web UI

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the toolbar above the work pane, click the **Ping** icon.

Step 2 In the **Ping Details** dialog box, update the following fields:

Actions	Description
***Hostname/IP Address** field	Hostname or IP address you want to reach out to.
***Number of Retries** field	The maximum number of retries allowed to ping the IP address. The default value is 3. The valid range is from 1 to 10.
***Timeout** field	The maximum response time for a pinging activity. The default value is 10 seconds. The valid range is from 1 to 20 seconds.
***Component** drop-down list	The controller that you can ping. This can be one of the following: • **CMC 1** • **CMC 2** • **BMC 1** • **BMC 2**
Ping Status field	Displays results of the pinging activity.
Details button	Displays details of the pinging activity.

Actions	Description
Ping button	Pings the IP address.
Cancel button	Closes the dialog box without pinging.

Step 3 Click **Ping**.

Toggling the Locator LEDs

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Summary**.

Step 3 In the toolbar above the work pane, click the **Locator LED** link.

Step 4 In the **Locator LED** dialog box, update the following information:

Action	Description
Turn On Server 1 Locator LED button	Turns on the locator LED of the server 1 module.
Turn On Server 2 Locator LED button	Turns on the locator LED of the server 2 module.
Turn On Front Locator LED button	Turns on the locator LED on the front panel of the chassis.

Depending on your actions, the LED indicator in the **Chassis Status** area lights up and the physical locator LED on the server turns on or off and blinks.

Selecting a Time Zone

Before You Begin

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Summary**.

Step 3 In the **Cisco Integrated Management Controller (Cisco IMC) Information** area, click **Select Timezone**. **Select Timezone** screen appears.

Step 4 In the **Select Timezone** pop-up screen, mouse over the map and click on the location to select your time zone or choose your time zone from the **Timezone** drop-down menu.

Step 5 Click **Save**.

CHAPTER 10

Configuring Network-Related Settings

This chapter includes the following sections:

Server NIC Configuration

Server NICs

NIC Mode

The NIC mode setting determines which ports can reach the Cisco IMC. The following network mode options are available, depending on your platform:

- **Dedicated—**The management port that is used to access the Cisco IMC.
- **Cisco Card—**Any port on the adapter card that can be used to access the Cisco IMC. The Cisco adapter card has to be installed in a slot with Network the Communications Services Interface protocol support (NCSI).

NIC Redundancy

The following NIC redundancy options are available, depending on the selected NIC mode and your platform:

- **active-active—**If supported, all ports that are associated with the configured NIC mode operate simultaneously. This feature increases throughput and provides multiple paths to the Cisco IMC.
- **active-standby—**If a port that is associated with the configured NIC mode fails, traffic fails over to one of the other ports associated with the NIC mode.

Note If you choose this option, make sure that all ports associated with the configured NIC mode are connected to the same subnet to ensure that traffic is secure regardless of which port is used.

The available redundancy modes vary depending on the selected network mode and your platform. For the available modes, see the *Hardware Installation Guide* (HIG) for the type of server you are using. The C-Series HIGs are available at the following URL: http://www.cisco.com/en/US/products/ps10493/prod_installation_guides_list.html

Configuring Server NICs

Configure a server NIC when you want to set the NIC mode and NIC redundancy.

Before You Begin

You must log in as a user with admin privileges to configure the NIC.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **NIC Properties** area, update the following properties:

Name	Description Cisco IMC
NIC Mode drop-down list	The ports that can be used to access Cisco IMC. This can be one of the following: • **Dedicated—**The management port that is used to access the Cisco IMC. • **Cisco Card—**Any port on the adapter card that can be used to access Cisco IMC. The Cisco adapter card has to be installed in a slot with Network the Communications Services Interface protocol support (NCSI).

Name	Description Cisco IMC
SIOC Slot	Displays the Cisco IMC network mode. Based on the card present in the System IO Controller (SIOC1), network mode could be either 1 or 2. **Note** This option is available only on some UCS C-Series servers.
NIC Redundancy drop-down list	The available NIC redundancy options depend on the selected NIC mode and the model of the server that you are using. If you do not see a particular option, it is not available for the selected mode or server model. This can be one of the following: • **active-active—**If supported, all ports that are associated with the configured NIC mode operate simultaneously. This feature increases throughput and provides multiple paths to Cisco IMC. • **active-standby—**If a port that is associated with the configured NIC mode fails, traffic fails over to one of the other ports associated with the NIC mode. **Note** If you choose this option, make sure that all ports associated with the configured NIC mode are connected to the same subnet to ensure that traffic is secure regardless of which port is used.
MAC Address field	The MAC address of the Cisco IMC network interface that is selected in the **NIC Mode** field.

Step 4 Click **Save Changes**.

Common Properties Configuration

Overview to Common Properties Configuration

Hostname

The Dynamic Host Configuration Protocol (DHCP) enhancement is available with the addition of the hostname to the DHCP packet, which can either be interpreted or displayed at the DHCP server side. The hostname, which is now added to the options field of the DHCP packet, sent in the DHCP DISCOVER packet that was initially sent to the DHCP server.

The default hostname of the server is changed from ucs-c2XX to CXXX-YYYYYY, where XXX is the model number and YYYYYY is the serial number of the server. This unique string acts as a client identifier, allows

you to track and map the IP addresses that are leased out to Cisco IMC from the DHCP server. The default serial number is provided by the manufacturer as a sticker or label on the server to help you identify the server.

Dynamic DNS

Dynamic DNS (DDNS) is used to add or update the resource records on the DNS server from Cisco IMC. You can enable Dynamic DNS by using either the web UI or CLI. When you enable the DDNS option, the DDNS service records the current hostname, domain name, and the management IP address and updates the resource records in the DNS server from Cisco IMC.

Note The DDNS server deletes the prior resource records (if any) and adds the new resource records to the DNS server if any one of the following DNS configuration is changed:

- Hostname
- Domain name in the LDAP settings
- When DDNS and DHCP are enabled, if the DHCP gets a new IP address or DNS IP or domain name due to a change in a network or a subnet.
- When DHCP is disabled and if you set the static IP address by using CLI or web UI.
- When you enter the **dns-use-dhcp** command.

Dynamic DNS Update Domain— You can specify the domain. The domain could be either main domain or any sub-domain. This domain name is appended to the hostname of the Cisco IMC for the DDNS update.

Configuring Common Properties

Use common properties to describe your server.

Before You Begin

You must log in as a user with admin privileges to configure common properties.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **Common Properties** area, update the following properties:

a) In the **Management Hostname** field, enter the name of the host.
By default, the hostname appears in CXXX-YYYYYY format, where XXX is the model number and YYYYYY is the serial number of the server.

Note If DHCP is enabled, the DHCP DISCOVER packet sent out will also carry the Cisco IMC hostname in it.

b) Check the **Dynamic DNS** check box.

c) In the **Dynamic DNS Update Domain** field, enter the domain name.

Step 4 Click **Save Changes**.

Configuring IPv4

Before You Begin

You must log in as a user with admin privileges to configure IPv4.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **IPv4 Properties** area, update the following properties:

Name	Description
Enable IPv4 check box	If checked, IPv4 is enabled.
Use DHCP check box	If checked, Cisco IMC uses DHCP.
Management IP Address field	The management IP address. An external virtual IP address that helps manage the CMCs and BMCs.
Subnet Mask field	The subnet mask for the IP address.
Gateway field	The gateway for the IP address.
Obtain DNS Server Addresses from DHCP check box	If checked, Cisco IMC retrieves the DNS server addresses from DHCP.
Preferred DNS Server field	The IP address of the primary DNS server.
Alternate DNS Server field	The IP address of the secondary DNS server.

Step 4 Click **Save Changes**.

Configuring IPv6

Before You Begin

You must log in as a user with admin privileges to configure IPv6.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **IPv6 Properties** area, update the following properties:

Name	Description
Enable IPv6 check box	If checked, IPv6 is enabled.
Use DHCP check box	If checked, the Cisco IMC uses DHCP. **Note** Only stateful DHCP is supported.
Management IP Address field	Management IPv6 address. **Note** Only global unicast addresses are supported.
Prefix Length field	The prefix length for the IPv6 address. Enter a value within the range 1 to 127. The default value is 64.
Gateway field	The gateway for the IPv6 address. **Note** Only global unicast addresses are supported.
Obtain DNS Server Addresses from DHCP check box	If checked, the Cisco IMC retrieves the DNS server addresses from DHCP. **Note** You can use this option only when the **Use DHCP** option is enabled.
Preferred DNS Server field	The IPv6 address of the primary DNS server.
Alternate DNS Server field	The IPv6 address of the secondary DNS server.
Link Local Address field	The link local address for the IPv6 address.

Step 4 Click **Save Changes**.

Connecting to a VLAN

Before You Begin

You must be logged in as admin to connect to a VLAN.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **VLAN Properties** area, update the following properties:

Name	Description
Enable VLAN check box	If checked, the Cisco IMC is connected to a virtual LAN. **Note** You can configure a VLAN or a port profile, but you cannot use both. If you want to use a port profile, make sure that this check box is not checked.
VLAN ID field	The VLAN ID.
Priority field	The priority of this system on the VLAN.

Step 4 Click **Save Changes**.

Connecting to a Port Profile

Before You Begin

You must be logged in as admin to connect to a port profile.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **Port Properties** area, update the following properties:

Name	Description
Auto Negotiation check box	Using this option, you can either set the network port speed and duplex values for the switch, or allow the system to automatically derive the values from the switch. This option is available for dedicated mode only. • If checked, the network port speed and duplex settings are ignored by the system and Cisco IMC retains the speed at which the switch is configured. • If unchecked, you can configure the network port speed and duplex values.
Admin Mode Area	**Network Port Speed** field The network speed of the port. This can be one of the following: • 10 Mbps • 100 Mbps • 1 Gbps The default value is 100 Mbps. In the **Dedicated** mode, if you disable **Auto Negotiation**, you can configure the network speed and duplex values. **Note** • Before changing the port speed, ensure that the switch you connected to has the same port speed. • Network port speed of 1 Gbps is unavailable on the C220 and C240 M3, and C22 and C24 M3 servers. **Duplex** drop-down list The duplex mode for the Cisco IMC management port. This can be one of the following: • **Half** • **Full** By default, the duplex mode is set to **Full**.

Name	Description
Operation Mode Area	Displays the operation network port speed and duplex values. If you checked the **Auto Negotiation** check box, the network port speed and duplex details of the switch are displayed. If unchecked, the network port speed and duplex values that you set at the **Admin Mode** are displayed.

Step 4 Click **Save Changes**.

Configuring Individual Settings

Before You Begin

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the Individual Settings area, review and update the following fields for **CMC 1**, **CMC 2**, **BMC 1** and **BMC 2** in their respective areas:

Name	Description
Hostname field	The user-defined hostname. By default, the hostname appears in CXXX-YYYYYY format, where XXX is the model number and YYYYYY is the serial number of the server.
MAC Address field	The MAC address of the component.
IPv4 Address field	The IPv4 address of the component.
IPv6 Address field	The IPv6 address of the component.
Link Local Address field	The link local address for the component's IPv6 address.

Step 4 Click **Save Changes**.

What to Do Next

Network Security Configuration

Network Security

The Cisco IMC uses IP blocking as network security. IP blocking prevents the connection between a server or website and certain IP addresses or ranges of addresses. IP blocking effectively bans undesired connections from those computers to a website, mail server, or other Internet servers.

IP banning is commonly used to protect against denial of service (DoS) attacks. Cisco IMC bans IP addresses by setting up an IP blocking fail count.

Configuring Network Security

Configure network security if you want to set up an IP blocking fail count.

Before You Begin

You must log in as a user with admin privileges to configure network security.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Networking** pane, click **Network Security**.

Step 3 In the **IP Blocking Properties** area, update the following properties:

Name	Description
Enable IP Blocking check box	Check this box to enable IP blocking.
IP Blocking Fail Count field	The number of times a user can attempt to log in unsuccessfully before the system locks that user out for a specified length of time. The number of unsuccessful login attempts must occur within the time frame specified in the **IP Blocking Fail Window** field. Enter an integer between 3 and 10.
IP Blocking Fail Window field	The length of time, in seconds, in which the unsuccessful login attempts must occur in order for the user to be locked out. Enter an integer between 60 and 120.
IP Blocking Penalty Time field	The number of seconds the user remains locked out if they exceed the maximum number of login attempts within the specified time window. Enter an integer between 300 and 900.

Step 4 Click **Save Changes**.

Network Time Protocol Settings

Network Time Protocol Service Setting

By default, when Cisco IMC is reset, it synchronizes the time with the host. With the introduction of the NTP service, you can configure Cisco IMC to synchronize the time with an NTP server. The NTP server does not run in Cisco IMC by default. You must enable and configure the NTP service by specifying the IP/DNS address of at least one server or a maximum of four servers that function as NTP servers or time source servers. When you enable the NTP service, Cisco IMC synchronizes the time with the configured NTP server. The NTP service can be modified only through Cisco IMC.

Note To enable the NTP service, it is preferable to specify the IP address of a server rather than the DNS address.

Configuring Network Time Protocol Settings

Configuring NTP disables the IPMI **Set SEL time** command.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Networking**.

Step 3 In the **Networking** pane, click **NTP Setting**.

Step 4 In the **NTP Settings** area, update the following properties:

Name	Description
Enable NTP	Check this box to enable the NTP service.
Server 1	The IP/DNS address of one of the four servers that act as an NTP server or the time source server.
Server 2	The IP/DNS address of one of the four servers that act as an NTP server or the time source server.
Server 3	The IP/DNS address of one of the four servers that act as an NTP server or the time source server.

Name	Description
Server 4	The IP/DNS address of one of the four servers that act as an NTP server or the time source server.
Status message	Indicates whether or not the server is able to synchronize its time with the remote NTP server. This can be one of the following: • **synchronized to NTP server (RefID) at stratum 7—** When the NTP service is enabled and multiple or individual IPv4 or IPv6 based NTP servers are added. • **unsynchronized —** When the NTP service is enabled and an unknown or unreachable server is added. • **NTP service disabled —** When the NTP service is disabled. **Note** If you move the mouse over the help icon, a pop-up is displayed that explains what Stratum stands for.

Step 5 Click **Save Changes**.

CHAPTER 11

Managing Network Adapters

This chapter includes the following sections:

Viewing Network Adapter Properties

Before You Begin

- The server must be powered on, or the properties will not display.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Networking** menu, click **Adapter Card 1** or **Adapter Card 2**.

Step 3 In the **Adapter Card Properties** area, review the following information:

Name	Description
PCI Slot field	The PCI slot in which the adapter is installed.
Vendor field	The vendor for the adapter.

Name	Description
Product Name field	The product name for the adapter.
Product ID field	The product ID for the adapter.
Serial Number field	The serial number for the adapter.
Version ID field	The version ID for the adapter.
Hardware Revision field	The hardware revision for the adapter.
Cisco IMC Management Enabled field	If this field displays **yes**, then the adapter is functioning in Cisco Card Mode and passing Cisco IMC management traffic through to the server Cisco IMC.
Configuration Pending field	If this field displays **yes**, the adapter configuration has changed in Cisco IMC but these changes have not been communicated to the host operating system. To activate the changes, an administrator must reboot the adapter.
ISCSI Boot Capable field	Whether iSCSI boot is supported on the adapter.
CDN Capable field	Whether CDN is supported on the adapter.
usNIC Capable field	Whether the adapter and the firmware running on the adapter support the usNIC.
Description field	A user-defined description for the adapter. You can enter between 1 and 63 characters.
Enable FIP Mode check box	If checked, then FCoE Initialization Protocol (FIP) mode is enabled. FIP mode ensures that the adapter is compatible with current FCoE standards. **Note** We recommend that you use this option only when explicitly directed to do so by a technical support representative.
Enable LLDP check box	If checked, then Link Layer Discovery Protocol (LLDP) enables all the Data Center Bridging Capability Exchange protocol (DCBX) functionality, which includes FCoE, priority based flow control. By default, LLDP option is enabled. **Note** We recommend that you do not disable LLDP option, as it disables all the DCBX functionality. **Note** This option is available only on some UCS C-Series servers.

Name	Description
Enable VNTAG Mode check box	If VNTAG mode is enabled: • vNICs and vHBAs can be assigned to a specific channel. • vNICs and vHBAs can be associated to a port profile. • vNICs can fail over to another vNIC if there are communication problems.
Port-0 drop-down list	This can be one of the following: • **40 Gbps** • **4 x 10 Gbps** • **Auto—** For Cisco UCS VIC 13xx (or later generation) adapter series, the **Auto** value allows the adapter to determine the speed of the port based on the transceiver module inserted into the port. **Note** On adapters that support 40 Gbps speed, **Auto** is the default option. **Note** You need to choose 40 Gbps as the port speed if you are using a 40 Gbps switch.
Port-1 drop-down list	This can be one of the following: • **40 Gbps** • **4 x 10 Gbps** • **Auto—** For Cisco UCS VIC 13xx (or later generation) adapter series, the **Auto** value allows the adapter to determine the speed of the port based on the transceiver module inserted into the port. **Note** On adapters that support 40 Gbps speed, **Auto** is the default option. **Note** You need to choose 40 Gbps as the port speed if you are using a 40 Gbps switch.
Training Link - 0 check box	If checked, link training for port-0 is enabled. **Note** Is supported only if port speed of 40 Gbps on port-0 is selected.
Training Link - 1 check box	If checked, link training for port-1 is enabled. **Note** Is supported only if port speed of 40 Gbps on port-1 is selected.

Step 4 In the **Firmware** area, review the following information:

Name	Description
Running Version field	The firmware version that is currently active.
Backup Version field	The alternate firmware version installed on the adapter, if any. The backup version is not currently running. To activate it, administrators can click **Activate Firmware** in the **Actions** area. **Note** When you install new firmware on the adapter, any existing backup version is deleted and the new firmware becomes the backup version. You must manually activate the new firmware if you want the adapter to run the new version.
Startup Version field	The firmware version that will become active the next time the adapter is rebooted.
Bootloader Version field	The bootloader version associated with the adapter card.
Status field	The status of the last firmware activation that was performed on this adapter. **Note** The status is reset each time the adapter is rebooted.

Step 5 In the **External Ethernet Interfaces** area, review the following information:

Name	Description
ID column	The uplink port ID.
MAC Address column	The MAC address of the uplink port.
Link State column	The current operational state of the uplink port. This can be one of the following: • **Fault** • **Link Up** • **Link Down** • **SFP ID Error** • **SFP Not Installed** • **SFP Security Check Failed** • **Unsupported SFP**
Encap column	The mode in which adapter operates. This can be one of the following: • **CE—**Classical Ethernet mode. • **NIV—**Network Interface Virtualization mode.

Name	Description
Admin Speed column	The data transfer rate for the port. This can be one of the following: • **40 Gbps** • **4 x 10 Gbps** **Note** You need to choose 40 Gbps as the port speed if you are using a 40 Gbps switch.
Operating Speed column	The operating rate for the port. This can be one of the following: • **40 Gbps** • **4 x 10 Gbps** **Note** You need to choose 40 Gbps as the port speed if you are using a 40 Gbps switch.
Training Link column	Indicates if link training is enabled on the port.
Connector Present column	Indicated whether or not the connector is present. This can be one of the following: • **Yes—**Connector is present. • **No—**Connector not present. **Note** This option is only available for some adapter cards.
Connector Supported column	Indicates whether or not the connector is supported by Cisco. This can be one of the following: • **Yes—**The connector is supported by Cisco. • **No—**The connector is not supported by Cisco. If the connector is not supported then the link will not be up. **Note** This option is only available for some adapter cards.
Connector Type column	The type of the connector. **Note** This option is only available for some adapter cards.
Connector Vendor column	The vendor for the connector. **Note** This option is only available for some adapter cards.
Connector Part Number column	The part number of the connector. **Note** This option is only available for some adapter cards.

Name	Description
Connector Part Revision column	The part revision number of the connector. **Note** This option is only available for some adapter cards.

Viewing Storage Adapter Properties

Before You Begin

- The server must be powered on.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 In the **(Server 1) RAID controller for UCS C3X60 Storage Servers** area, the **Controller Info** tab displays by default.

Step 3 In the **Work** pane's **Health/Status** area, review the following information:

Name	Description
Composite Health field	The combined health of the controller, the attached drives, and the battery backup unit. This can be one of the following: • **Good** • **Moderate Fault** • **Severe Fault** • **N/A**
Controller Status field	The current status of the controller. This can be one of the following: • **Optimal —** The controller is functioning properly. • **Failed —** The controller is not functioning. • **Unresponsive —** The controller is down.
RAID Chip Temperature field	Temperature of the controller in degree centigrade.

Name	Description
TTY Log Status field	The current status of the TTY log download. This can be one of the following: • **Not Downloaded** • **In Progress** • **Complete**

Step 4 In the **Firmware Versions** area, review the following information:

Name	Description
Product Name field	The name of the MegaRAID controller.
Serial Number field	The serial number of the MegaRAID controller.
Firmware Package Build field	The active firmware package version number. For the firmware component version numbers, see the **Running Firmware Images** area.

Step 5 In the **PCI Info** area, review the following information:

Name	Description
PCI Slot field	The name of the PCIe slot in which the controller is located.
Vendor ID field	The PCI vendor ID, in hexadecimal.
Device ID field	The PCI device ID, in hexadecimal.
SubVendor ID field	The PCI subvendor ID, in hexadecimal.
SubDevice ID field	The PCI subdevice ID, in hexadecimal.

Step 6 In the **Manufacturing Data** area, review the following information:

Name	Description
Manufactured Date field	The date the MegaRAID card was manufactured, in the format yyy-mm-dd.
Revision No field	The board revision number, if any.

Step 7 In the **Boot Drive** area, review the following information:

Name	Description
Boot Drive field	The number of the boot drive.
Boot Drive is PD field	If this field displays **true**, the boot drive is a physical drive.

Step 8 In the **Running Firmware Images** area, review the following information:

Name	Description
BIOS Version field	The BIOS option PROM version number.
Firmware Version field	The active firmware version number.
Preboot CLI Version field	The pre-boot CLI version number.
WebBIOS Version field	The Web BIOS version number.
NVDATA Version field	The non-volatile data (NVDATA) version number.
Boot Block Version field	The boot block version number.
Boot Version field	The firmware boot loader version number on the LSI controller.

Step 9 In the **Startup Firmware Images** area, review the following information:

Name	Description
Startup BIOS Version field	The BIOS option PROM version that will become active when the host server reboots, if different from the current version.
Startup Firmware Version field	The firmware version that will become active when the host server reboots, if different from the current version.
Startup Preboot CLI Version field	The pre-boot CLI version that will become active when the host server reboots, if different from the current version.
Startup WebBIOS Version field	The Web BIOS version that will become active when the host server reboots, if different from the current version.

Name	Description
Startup NVDATA Version field	The non-volatile data version that will become active when the host server reboots, if different from the current version.
Startup Boot Block Version field	The boot block version that will become active when the host server reboots, if different from the current version.
Startup Boot Version field	The firmware boot loader version that will become active when the host server reboots, if different from the current version.

Step 10 In the **Virtual Drive Count** area, review the following information:

Name	Description
Virtual Drive Count field	The number of virtual drives configured on the controller.
Degraded Drive Count field	The number of virtual drives in a degraded state on the controller.
Offline Drive Count field	The number of virtual drives that have failed on the controller.

Step 11 In the **Physical Drive Count** area, review the following information:

Name	Description
Disk Present Count field	The number of physical drives present on the controller.
Degraded Disk Count field	The number of physical drives in a degraded state on the controller.
Failed Disk Count field	The number of physical drives that have failed on the controller.

Step 12 In the **Settings** area, review the following information:

Name	Description
Predictive Fail Poll Interval field	The number of seconds between predictive failure polls. During each poll, the controller examines the Self-Monitoring Analysis and Reporting Technology (SMART) data on all physical drives to determine if any is about to fail.
Rebuild Rate field	The rate at which the controller rebuilds degraded RAID volumes. This rate is shown as a percentage of the total bandwidth available.
Patrol Read Rate field	The rate at which the controller performs a background read of the physical drives looking for inconsistent data. This rate is shown as a percentage of the total bandwidth available.
Consistency Check Rate field	The rate at which the controller scans the virtual drives looking for redundant data inconsistencies and fixing them. This rate is shown as a percentage of the total bandwidth available.
Reconstruction Rate field	The rate at which virtual drives are reconstructed when the capacity or RAID level needs to be changed. This rate is shown as a percentage of the total bandwidth available.
Cache Flush Interval field	The number of seconds waits before flushing the cache memory to the physical drives.
Max Drives To Spin Up At Once field	The number of drives that can be spun up simultaneously after the server is powered on.
Delay Among Spinup Groups field	The number of seconds to wait before the controller spins up the next set of drives.

Name	Description
Physical Drive Coercion Mode field	Whether the controller rounds the size of physical drives down to a round number. This can be one of the following: • **None—**The controller does not do any rounding. • **128 MB—**Drive sizes are rounded down to the closest multiple of 128 MB. • **1GB—**Drive sizes are rounded down to the closest multiple of 1GB.
Cluster Mode field	If this field displays **true**, the drives on this controller are shared with controllers on other servers.
Battery Warning field	If this field displays **true**, missing battery warnings are disabled.
ECC Bucket Leak Rate field	The error correcting code (ECC) single-bit error bucket leak rate, in minutes. With ECC, the controller increments an error counter when it encounters a single bit error while reading from a physical drive. The controller decrements the error counter each time the number of minutes defined in this field passes. If the error counter reaches a system-defined maximum, the controller sends an event message to the system.
Expose Enclosure Devices field	If this field displays **true**, enclosure devices are visible to the host drivers.
Maintain PD Fail History field	If this field displays **true**, the controller remembers which physical drives were determined to be bad across server reboots.
Enable Copyback on SMART field	If this field displays **true**, the controller copies the contents of the drive to a spare drive if Self-Monitoring Analysis and Reporting Technology (SMART) reports an error.
Enable Copyback to SSD on SMART Error field	If this field displays **true**, the controller copies the contents of an SSD card to a spare card if SMART reports an error.
Native Command Queuing field	If this field displays true, Native Command Queuing (NCQ) is disabled.

Name	Description
JBOD field	If this field displays **true**, JBOD is enabled.
Enable Spin Down of Unconfigured Drives field	If this field displays **true**, the controller spins down unconfigured drives.
Enable SSD Patrol Read field	If this field displays **true**, the controller performs patrol reads on SSD cards.
Auto Enhanced Import field	If this field displays **true**, foreign configurations are automatically imported when the controller boots.

Step 13 In the **Capabilities** area, review the following information:

Name	Description
RAID Levels Supported field	The RAID levels supported by the controller. This can be one or more of the following: • **Raid 0—**Simple striping. • **Raid 1—**Simple mirroring. • **Raid 5—**Striping with parity. • **Raid 1E—**Integrated offset strip mirroring • **Raid 6—**Striping with two parity drives. • **Raid 10—**Spanned mirroring. • **Raid 50—**Spanned striping with parity. • **Raid 60—**Spanned striping with two parity drives. • **Raid srl-03—**Spanned secondary RAID level • **Raid 00—**Spanned striping. • **Raid 1e-rlq0—**Integrated adjacent strip mirroring with no span. • **Raid 1e0-rlq0—**Integrated adjacent strip mirroring with span.

Step 14 In the **HW Configuration** area, review the following information:

Name	Description
SAS Address field	A MegaRAID controller can have up to 16 serial-attached SCSI (SAS) addresses. This field displays the first 8 SAS addresses, if they are in use.

Name	Description
BBU Present field	If this field displays **true**, the battery backup unit is present.
NVRAM Present field	If this field displays **true**, the NVRAM is present.
NVRAM Size field	The size of the NVRAM, in kilobytes.
Serial Debugger Present field	If this field displays **true**, a serial debugger is attached to the RAID card.
Memory Present field	If this field displays **true**, memory is present.
Flash Present field	If this field displays **true**, flash memory is present.
Flash Size field	The size of the flash memory, in megabytes.
Memory Size field	The size of the memory, in megabytes.
Cache Memory Size field	The size of the cache memory, in megabytes.
Number of Backend Ports field	The number of SATA or SAS ports on the controller.

Step 15 In the **Error Counters** area, review the following information:

Name	Description
Memory Correctable Errors field	The number of correctable errors in the controller memory.
Memory Uncorrectable Errors field	The number of uncorrectable errors in the controller memory.

Managing vHBAs

Guidelines for Managing vHBAs

When managing vHBAs, consider the following guidelines and restrictions:

- The Cisco UCS P81E Virtual Interface Card and Cisco UCS VIC 1225 Virtual Interface Card provide two vHBAs (fc0 and fc1). You can create up to 16 additional vHBAs on these adapter cards.

Note If Network Interface Virtualization (NIV) mode is enabled for the adapter, you must assign a channel number to a vHBA when you create it.

- When using the Cisco UCS P81E Virtual Interface Card or Cisco UCS VIC 1225 Virtual Interface Card in an FCoE application, you must associate the vHBA with the FCoE VLAN. Follow the instructions in the **Modifying vHBA Properties** section to assign the VLAN.
- After making configuration changes, you must reboot the host for settings to take effect.

Viewing vHBA Properties

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **vHBAs** pane, click **fc0** or **fc1**.

Step 4 In the **General** area of vHBA Properties, review the information in the following fields:

Name	Description
Name field	The name of the virtual HBA. This name cannot be changed after the vHBA has been created.
Target WWNN field	The WWNN associated with the vHBA. To let the system generate the WWNN, select **AUTO**. To specify a WWNN, click the second radio button and enter the WWNN in the corresponding field.
Target WWPN field	The WWPN associated with the vHBA. To let the system generate the WWPN, select **AUTO**. To specify a WWPN, click the second radio button and enter the WWPN in the corresponding field.
FC SAN Boot check box	If checked, the vHBA can be used to perform a SAN boot.
Enable Persistent LUN Binding check box	If checked, any LUN ID associations are retained in memory until they are manually cleared.
Uplink Port field	The uplink port associated with the vHBA. **Note** This value cannot be changed for the system-defined vHBAs fc0 and fc1.

Name	Description
MAC Address field	The MAC address associated with the vHBA. To let the system generate the MAC address, select **AUTO**. To specify an address, click the second radio button and enter the MAC address in the corresponding field.
Default VLAN field	If there is no default VLAN for this vHBA, click **NONE**. Otherwise, click the second radio button and enter a VLAN ID between 1 and 4094 in the field.
Class of Service drop-down list	The CoS for the vHBA. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
Rate Limit field	The data rate limit for traffic on this vHBA, in Mbps. If you want this vHBA to have an unlimited data rate, select **OFF**. Otherwise, click the second radio button and enter an integer between 1 and 10,000. **Note** This option cannot be used in VNTAG mode.
PCIe Device Order field	The order in which this vHBA will be used. To let the system set the order, select **ANY**. To specify an order, select the second radio button and enter an integer between 0 and 17.
EDTOV field	The error detect timeout value (EDTOV), which is the number of milliseconds to wait before the system assumes that an error has occurred. Enter an integer between 1,000 and 100,000. The default is 2,000 milliseconds.
RATOV field	The resource allocation timeout value (RATOV), which is the number of milliseconds to wait before the system assumes that a resource cannot be properly allocated. Enter an integer between 5,000 and 100,000. The default is 10,000 milliseconds.
Max Data Field Size field	The maximum size of the Fibre Channel frame payload bytes that the vHBA supports. Enter an integer between 256 and 2112.

Name	Description
Channel Number field	The channel number that will be assigned to this vHBA. Enter an integer between 1 and 1,000. **Note** VNTAG mode is required for this option.
Port Profile drop-down list	The port profile that should be associated with the vHBA, if any. This field displays the port profiles defined on the switch to which this server is connected. **Note** VNTAG mode is required for this option.

Step 5 In the **Error Recovery** area, review the information in the following fields:

Name	Description
Enable FCP Error Recovery check box	If checked, the system uses FCP Sequence Level Error Recovery protocol (FC-TAPE).
Link Down Timeout field	The number of milliseconds the uplink port should be offline before it informs the system that the uplink port is down and fabric connectivity has been lost. Enter an integer between 0 and 240,000.
Port Down I/O Retries field	The number of times an I/O request to a port is returned because the port is busy before the system decides the port is unavailable. Enter an integer between 0 and 255.
Port Down Timeout field	The number of milliseconds a remote Fibre Channel port should be offline before informing the SCSI upper layer that the port is unavailable. Enter an integer between 0 and 240,000.

Step 6 In the **Fibre Channel Interrupt** area, review the information in the following fields:

Name	Description
Interrupt Mode drop-down list	The preferred driver interrupt mode. This can be one of the following: • **MSIx—**Message Signaled Interrupts (MSI) with the optional extension. This is the recommended option. • **MSI—**MSI only. • **INTx—**PCI INTx interrupts.

Step 7 In the **Fibre Channel Port** area, review the information in the following fields:

Name	Description
I/O Throttle Count field	The number of I/O operations that can be pending in the vHBA at one time. Enter an integer between 1 and 1,024.
LUNs per Target field	The maximum number of LUNs that the driver will export. This is usually an operating system platform limitation. Enter an integer between 1 and 1,024. The recommended value is 1024.

Step 8 In the **Fibre Channel Port FLOGI** area, review the information in the following fields:

Name	Description
FLOGI Retries field	The number of times that the system tries to log in to the fabric after the first failure. To specify an unlimited number of retries, select the **INFINITE** radio button. Otherwise select the second radio button and enter an integer into the corresponding field.
FLOGI Timeout field	The number of milliseconds that the system waits before it tries to log in again. Enter an integer between 1,000 and 255,000.

Step 9 In the **Fibre Channel Port PLOGI** area, review the information in the following fields:

Name	Description
PLOGI Retries field	The number of times that the system tries to log in to a port after the first failure. Enter an integer between 0 and 255.
PLOGI Timeout field	The number of milliseconds that the system waits before it tries to log in again. Enter an integer between 1,000 and 255,000.

Step 10 In the **SCSI I/O** area, review the information in the following fields:

Name	Description
CDB Transmit Queue Count field	The number of SCSI I/O queue resources the system should allocate. Enter an integer between 1 and 8.

Name	Description
CDB Transmit Queue Ring Size field	The number of descriptors in each SCSI I/O queue. Enter an integer between 64 and 512.

Step 11 In the **Receive/Transmit Queues** area, review the information in the following fields:

Name	Description
FC Work Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 128.
FC Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 128.

Modifying vHBA Properties

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **vHBAs** pane, click **fc0** or **fc1**.

Step 4 In the **General** area, update the following fields:

Name	Description
Name field	The name of the virtual HBA. This name cannot be changed after the vHBA has been created.
Target WWNN field	The WWNN associated with the vHBA. To let the system generate the WWNN, select **AUTO**. To specify a WWNN, click the second radio button and enter the WWNN in the corresponding field.
Target WWPN field	The WWPN associated with the vHBA. To let the system generate the WWPN, select **AUTO**. To specify a WWPN, click the second radio button and enter the WWPN in the corresponding field.
FC SAN Boot check box	If checked, the vHBA can be used to perform a SAN boot.

Name	Description
Enable Persistent LUN Binding check box	If checked, any LUN ID associations are retained in memory until they are manually cleared.
Uplink Port field	The uplink port associated with the vHBA. **Note** This value cannot be changed for the system-defined vHBAs fc0 and fc1.
MAC Address field	The MAC address associated with the vHBA. To let the system generate the MAC address, select **AUTO**. To specify an address, click the second radio button and enter the MAC address in the corresponding field.
Default VLAN field	If there is no default VLAN for this vHBA, click **NONE**. Otherwise, click the second radio button and enter a VLAN ID between 1 and 4094 in the field.
Class of Service drop-down list	The CoS for the vHBA. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
Rate Limit field	The data rate limit for traffic on this vHBA, in Mbps. If you want this vHBA to have an unlimited data rate, select **OFF**. Otherwise, click the second radio button and enter an integer between 1 and 10,000. **Note** This option cannot be used in VNTAG mode.
PCIe Device Order field	The order in which this vHBA will be used. To let the system set the order, select **ANY**. To specify an order, select the second radio button and enter an integer between 0 and 17.
EDTOV field	The error detect timeout value (EDTOV), which is the number of milliseconds to wait before the system assumes that an error has occurred. Enter an integer between 1,000 and 100,000. The default is 2,000 milliseconds.
RATOV field	The resource allocation timeout value (RATOV), which is the number of milliseconds to wait before the system assumes that a resource cannot be properly allocated. Enter an integer between 5,000 and 100,000. The default is 10,000 milliseconds.

Name	Description
Max Data Field Size field	The maximum size of the Fibre Channel frame payload bytes that the vHBA supports. Enter an integer between 256 and 2112.
Channel Number field	The channel number that will be assigned to this vHBA. Enter an integer between 1 and 1,000. **Note** VNTAG mode is required for this option.
Port Profile drop-down list	The port profile that should be associated with the vHBA, if any. This field displays the port profiles defined on the switch to which this server is connected. **Note** VNTAG mode is required for this option.

Step 5 In the **Error Recovery** area, update the following fields:

Name	Description
Enable FCP Error Recovery check box	If checked, the system uses FCP Sequence Level Error Recovery protocol (FC-TAPE).
Link Down Timeout field	The number of milliseconds the uplink port should be offline before it informs the system that the uplink port is down and fabric connectivity has been lost. Enter an integer between 0 and 240,000.
Port Down I/O Retries field	The number of times an I/O request to a port is returned because the port is busy before the system decides the port is unavailable. Enter an integer between 0 and 255.
Port Down Timeout field	The number of milliseconds a remote Fibre Channel port should be offline before informing the SCSI upper layer that the port is unavailable. Enter an integer between 0 and 240,000.

Step 6 In the **Fibre Channel Interrupt** area, update the following fields:

Name	Description
Interrupt Mode drop-down list	The preferred driver interrupt mode. This can be one of the following: • **MSIx—**Message Signaled Interrupts (MSI) with the optional extension. This is the recommended option. • **MSI—**MSI only. • **INTx—**PCI INTx interrupts.

Step 7 In the **Fibre Channel Port** area, update the following fields:

Name	Description
I/O Throttle Count field	The number of I/O operations that can be pending in the vHBA at one time. Enter an integer between 1 and 1,024.
LUNs per Target field	The maximum number of LUNs that the driver will export. This is usually an operating system platform limitation. Enter an integer between 1 and 1,024. The recommended value is 1024.

Step 8 In the **Fibre Channel Port FLOGI** area, update the following fields:

Name	Description
FLOGI Retries field	The number of times that the system tries to log in to the fabric after the first failure. To specify an unlimited number of retries, select the **INFINITE** radio button. Otherwise select the second radio button and enter an integer into the corresponding field.
FLOGI Timeout field	The number of milliseconds that the system waits before it tries to log in again. Enter an integer between 1,000 and 255,000.

Step 9 In the **Fibre Channel Port PLOGI** area, update the following fields:

Name	Description
PLOGI Retries field	The number of times that the system tries to log in to a port after the first failure. Enter an integer between 0 and 255.

Name	Description
PLOGI Timeout field	The number of milliseconds that the system waits before it tries to log in again. Enter an integer between 1,000 and 255,000.

Step 10 In the **SCSI I/O** area, update the following fields:

Name	Description
CDB Transmit Queue Count field	The number of SCSI I/O queue resources the system should allocate. Enter an integer between 1 and 8.
CDB Transmit Queue Ring Size field	The number of descriptors in each SCSI I/O queue. Enter an integer between 64 and 512.

Step 11 In the **Receive/Transmit Queues** area, update the following fields:

Name	Description
FC Work Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 128.
FC Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 128.

Step 12 Click **Save Changes**.

Creating a vHBA

The adapter provides two permanent vHBAs. If NIV mode is enabled, you can create up to 16 additional vHBAs.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **Host Fibre Channel Interfaces** area, choose one of these actions:

- To create a vHBA using default configuration settings, click **Add vHBA**.

- To create a vHBA using the same configuration settings as an existing vHBA, select that vHBA and click **Clone vHBA**.

The **Add vHBA** dialog box appears.

Step 4 In the **Add vHBA** dialog box, enter a name for the vHBA in the **Name** entry box.

Step 5 Click **Add vHBA**.

What to Do Next

- Reboot the server to create the vHBA.
- If configuration changes are required, configure the new vHBA as described in Modifying vHBA Properties, on page 160.

Deleting a vHBA

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **Host Fibre Channel Interfaces** area, select a vHBA or vHBAs from the table.

Note You cannot delete either of the two default vHBAs, **fc0** or **fc1**.

Step 4 Click **Delete vHBAs** and click **OK** to confirm.

vHBA Boot Table

In the vHBA boot table, you can specify up to four LUNs from which the server can boot.

Creating a Boot Table Entry

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the Fibre Channel Interfaces area, scroll down to the **Boot Table** area.

Step 4 Click the **Add Boot Entry** button to open the **Add Boot Entry** dialog box.

Step 5 In the **Add Boot Entry** dialog box, review the following information and perform the actions specified:

Name	Description
Target WWPN field	The World Wide Port Name (WWPN) that corresponds to the location of the boot image. Enter the WWPN in the format hh:hh:hh:hh:hh:hh:hh:hh.
LUN ID field	The LUN ID that corresponds to the location of the boot image. Enter an ID between 0 and 255.
Add Boot Entry button	Adds the specified location to the boot table.
Reset Values button	Clears the values currently entered in the fields.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

Deleting a Boot Table Entry

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the Fibre Channel Interfaces area, scroll down to the **Boot Table** area.

Step 4 In the **Boot Table** area, click the entry to be deleted.

Step 5 Click **Delete Boot Entry** and click **OK** to confirm.

vHBA Persistent Binding

Persistent binding ensures that the system-assigned mapping of Fibre Channel targets is maintained after a reboot.

Viewing Persistent Bindings

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **vHBAs** pane, click **fc0** or **fc1**.

Step 4 In the **Persistent Bindings** dialog box, review the following information:

Name	Description
Index column	The unique identifier for the binding.
Target WWPN column	The target World Wide Port Name with which the binding is associated.
Host WWPN column	The host World Wide Port Name with which the binding is associated.
Bus ID column	The bus ID with which the binding is associated.
Target ID column	The target ID on the host system with which the binding is associated.
Rebuild Persistent Bindings button	Clears all unused bindings and resets the ones that are in use.
Close button	Closes the dialog box and saves your changes.

Step 5 Click **Close**.

Rebuilding Persistent Bindings

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vHBAs** tab.

Step 3 In the **vHBAs** pane, click **fc0** or **fc1**.

Step 4 In the Fibre Channel Interfaces area, scroll down to the **Persistent Bindings** area.

Step 5 Click the **Rebuild Persistent Bindings** button.

Step 6 Click **OK** to confirm.

Managing vNICs

Guidelines for Managing vNICs

When managing vNICs, consider the following guidelines and restrictions:

- The Cisco UCS P81E Virtual Interface Card and Cisco UCS VIC 1225 Virtual Interface Card provide two default vNICs (eth0 and eth1). You can create up to 16 additional vNICs on these adapter cards.

  Note If Network Interface Virtualization (NIV) mode is enabled for the adapter, you must assign a channel number to a vNIC when you create it.

- After making configuration changes, you must reboot the host for settings to take effect.

Cisco C-series servers use Remote Direct Memory Access (RDMA) over Converged Ethernet (RoCE) for packet transfers. RoCE defines the mechanism of performing RDMA over ethernet, based on the similar mechanism of RDMA over Infiniband. However, RoCE, with its performance oriented characteristics, delivers a superior performance compared to traditional network socket implementation because of the lower latency, lower CPU utilization and higher utilization of network bandwidth. RoCE meets the requirement of moving large amount of data across networks very efficiently.

The RoCE firmware requires the following configuration parameters provided by Cisco UCS Manager for better vNIC performance:

- Queue Pairs
- Memory Regions
- Resource Groups

Viewing vNIC Properties

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **vNICs** pane, click **eth0** or **eth1**.

Step 4 In the **Ethernet Interfaces** pane's **vNIC Properties** area, review the information in the following fields:

Name	Description
Name field	The name for the virtual NIC. This name cannot be changed after the vNIC has been created.

Name	Description
CDN field	The Consistent Device Name (CDN) that you can assign to the ethernet vNICs on the VIC cards. Assigning a specific CDN to a device helps in identifying it on the host OS. **Note** This feature works only when the **CDN Support for VIC** token is enabled in the BIOS.
MTU field	The maximum transmission unit, or packet size, that this vNIC accepts. Enter an integer between 1500 and 9000.
Uplink Port drop-down list	The uplink port associated with this vNIC. All traffic for this vNIC goes through this uplink port.
MAC Address field	The MAC address associated with the vNIC. To let the adapter select an available MAC address from its internal pool, select **Auto**. To specify an address, click the second radio button and enter the MAC address in the corresponding field.
Class of Service drop-down list	The class of service to associate with traffic from this vNIC. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
Trust Host CoS check box	Check this box if you want the vNIC to use the class of service provided by the host operating system.
PCI Order field	The order in which this vNIC will be used. To let the system set the order, select **Any**. To specify an order, select the second radio button and enter an integer between 0 and 17.
Default VLAN field	If there is no default VLAN for this vNIC, click **NONE**. Otherwise, click the second radio button and enter a VLAN ID between 1 and 4094 in the field. **Note** This option cannot be used in VNTAG mode.
VLAN Mode drop-down list	If you want to use VLAN trunking, select **TRUNK**. Otherwise, select **ACCESS**. When the VLAN is set to **ACCESS** mode, any frame received from the specified default VLAN (1-4094) that is received from the switch with a TAG removes that TAG when it is sent to the host OS through the vNIC. **Note** This option cannot be used in VNTAG mode.

Name	Description
Rate Limit field	If you want this vNIC to have an unlimited data rate, select OFF. Otherwise, click the second radio button and enter a rate limit in the associated field. Enter an integer between 1 and 10,000 Mbps or 40,000 Mbps depending on the adapter card you choose. **Note** This option cannot be used in VNTAG mode.
Enable PXE Boot check box	Check this box if the vNIC can be used to perform a PXE boot.
Channel Number field	Select the channel number that will be assigned to this vNIC. **Note** VNTAG mode is required for this option.
Port Profile drop-down list	Select the port profile that should be associated with the vNIC. This field displays the port profiles defined on the switch to which this server is connected. **Note** VNTAG mode is required for this option.
Enable Uplink Failover check box	Check this box if traffic on this vNIC should fail over to the secondary interface if there are communication problems. **Note** VNTAG mode is required for this option.
Enable VMQ check box	Check this box to enable Virtual Machine Queue (VMQ). **Note** Ensure that VMQ is not enabled when SR-IOV or netflow option is enabled on the adapter. This option is available only on some Cisco UCS C-Series servers.
Enable aRFS check box	Check this box to enable Accelerated Receive Flow steering (aRFS). This option is available only on some Cisco UCS C-Series servers.
Enable NVGRE check box	Check this box to enable Network Virtualization using Generic Routing Encapsulation. • This option is available only on some Cisco UCS C-Series servers. • This option is available only on C-Series servers with Cisco VIC 1385 cards.
Enable VXLAN check box	Check this box to enable Virtual Extensible LAN. • This option is available only on some Cisco UCS C-Series servers. • This option is available only on C-Series servers with Cisco VIC 1385 cards.

Name	Description
Failback Timeout field	After a vNIC has started using its secondary interface, this setting controls how long the primary interface must be available before the system resumes using the primary interface for the vNIC. Enter a number of seconds between 0 and 600. **Note** VNTAG mode is required for this option.

Step 5 In the **Ethernet Interrupt** area, review the information in the following fields:

Name	Description
Interrupt Count field	The number of interrupt resources to allocate. In general, this value should be equal to the number of completion queue resources. Enter an integer between 1 and 514.
Coalescing Time field	The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent. Enter an integer between 1 and 65535. To turn off interrupt coalescing, enter 0 (zero) in this field.
Coalescing Type drop-down list	This can be one of the following: • **MIN—**The system waits for the time specified in the **Coalescing Time** field before sending another interrupt event. • **IDLE—**The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the **Coalescing Time** field.
Interrupt Mode drop-down list	The preferred driver interrupt mode. This can be one of the following: • **MSI-X—**Message Signaled Interrupts (MSI) with the optional extension. This is the recommended option. • **MSI—**MSI only. • **INTx—**PCI INTx interrupts.

Step 6 In the **Ethernet Receive Queue** area, review the information in the following fields:

Name	Description
Receive Queue Count field	The number of receive queue resources to allocate. Enter an integer between 1 and 256.

Name	Description
Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 4096.

Step 7 In the **Ethernet Transmit Queue** area, review the information in the following fields:

Name	Description
Transmit Queue Count field	The number of transmit queue resources to allocate. Enter an integer between 1 and 256.
Transmit Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 4096.

Step 8 In the **Completion Queue** area, review the information in the following fields:

Name	Description
Completion Queue Count field	The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 512.
Completion Queue Ring Size field	The number of descriptors in each completion queue. This value cannot be changed.

Step 9 In the **TCP Offload** area, review the information in the following fields:

Name	Description
Enable TCP Segmentation Offload check box	If checked, the CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate. If cleared, the CPU segments large packets. **Note** This option is also known as Large Send Offload (LSO).
Enable TCP Rx Offload Checksum Validation check box	If checked, the CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. If cleared, the CPU validates all packet checksums.

Name	Description
Enable TCP Tx Offload Checksum Generation check box	If checked, the CPU sends all packets to the hardware so that the checksum can be calculated. This option may reduce CPU overhead. If cleared, the CPU calculates all packet checksums.
Enable Large Receive check box	If checked, the hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput. If cleared, the CPU processes all large packets.

Step 10 In the **Receive Side Scaling** area, review the information in the following fields:

Name	Description
Enable TCP Receive Side Scaling check box	Receive Side Scaling (RSS) distributes network receive processing across multiple CPUs in multiprocessor systems. If checked, network receive processing is shared across processors whenever possible. If cleared, network receive processing is always handled by a single processor even if additional processors are available.
Enable IPv4 RSS check box	If checked, RSS is enabled on IPv4 networks.
Enable TCP-IPv4 RSS check box	If checked, RSS is enabled for TCP transmissions across IPv4 networks.
Enable IPv6 RSS check box	If checked, RSS is enabled on IPv6 networks.
Enable TCP-IPv6 RSS check box	If checked, RSS is enabled for TCP transmissions across IPv6 networks.
Enable IPv6 Extension RSS check box	If checked, RSS is enabled for IPv6 extensions.
Enable TCP-IPv6 Extension RSS check box	If checked, RSS is enabled for TCP transmissions across IPv6 networks.

Modifying vNIC Properties

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **vNICs** pane, click **eth0** or **eth1**.

Step 4 In the **Ethernet Interfaces** pane's **vNIC Properties** area, update the following fields:

Name	Description
Name field	The name for the virtual NIC. This name cannot be changed after the vNIC has been created.
CDN field	The Consistent Device Name (CDN) that you can assign to the ethernet vNICs on the VIC cards. Assigning a specific CDN to a device helps in identifying it on the host OS. **Note** This feature works only when the **CDN Support for VIC** token is enabled in the BIOS.
MTU field	The maximum transmission unit, or packet size, that this vNIC accepts. Enter an integer between 1500 and 9000.
Uplink Port drop-down list	The uplink port associated with this vNIC. All traffic for this vNIC goes through this uplink port.
MAC Address field	The MAC address associated with the vNIC. To let the adapter select an available MAC address from its internal pool, select **Auto**. To specify an address, click the second radio button and enter the MAC address in the corresponding field.
Class of Service drop-down list	The class of service to associate with traffic from this vNIC. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
Trust Host CoS check box	Check this box if you want the vNIC to use the class of service provided by the host operating system.
PCI Order field	The order in which this vNIC will be used. To let the system set the order, select **Any**. To specify an order, select the second radio button and enter an integer between 0 and 17.

Name	Description
Default VLAN field	If there is no default VLAN for this vNIC, click **NONE**. Otherwise, click the second radio button and enter a VLAN ID between 1 and 4094 in the field. **Note** This option cannot be used in VNTAG mode.
VLAN Mode drop-down list	If you want to use VLAN trunking, select **TRUNK**. Otherwise, select **ACCESS**. When the VLAN is set to **ACCESS** mode, any frame received from the specified default VLAN (1-4094) that is received from the switch with a TAG removes that TAG when it is sent to the host OS through the vNIC. **Note** This option cannot be used in VNTAG mode.
Rate Limit field	If you want this vNIC to have an unlimited data rate, select OFF. Otherwise, click the second radio button and enter a rate limit in the associated field. Enter an integer between 1 and 10,000 Mbps or 40,000 Mbps depending on the adapter card you choose. **Note** This option cannot be used in VNTAG mode.
Enable PXE Boot check box	Check this box if the vNIC can be used to perform a PXE boot.
Channel Number field	Select the channel number that will be assigned to this vNIC. **Note** VNTAG mode is required for this option.
Port Profile drop-down list	Select the port profile that should be associated with the vNIC. This field displays the port profiles defined on the switch to which this server is connected. **Note** VNTAG mode is required for this option.
Enable Uplink Failover check box	Check this box if traffic on this vNIC should fail over to the secondary interface if there are communication problems. **Note** VNTAG mode is required for this option.
Enable VMQ check box	Check this box to enable Virtual Machine Queue (VMQ). **Note** Ensure that VMQ is not enabled when SR-IOV or netflow option is enabled on the adapter. This option is available only on some Cisco UCS C-Series servers.
Enable aRFS check box	Check this box to enable Accelerated Receive Flow steering (aRFS). This option is available only on some Cisco UCS C-Series servers.

Name	Description
Enable NVGRE check box	Check this box to enable Network Virtualization using Generic Routing Encapsulation. • This option is available only on some Cisco UCS C-Series servers. • This option is available only on C-Series servers with Cisco VIC 1385 cards.
Enable VXLAN check box	Check this box to enable Virtual Extensible LAN. • This option is available only on some Cisco UCS C-Series servers. • This option is available only on C-Series servers with Cisco VIC 1385 cards.
Failback Timeout field	After a vNIC has started using its secondary interface, this setting controls how long the primary interface must be available before the system resumes using the primary interface for the vNIC. Enter a number of seconds between 0 and 600. **Note** VNTAG mode is required for this option.

Step 5 In the **Ethernet Interrupt** area, update the following fields:

Name	Description
Interrupt Count field	The number of interrupt resources to allocate. In general, this value should be equal to the number of completion queue resources. Enter an integer between 1 and 514.
Coalescing Time field	The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent. Enter an integer between 1 and 65535. To turn off interrupt coalescing, enter 0 (zero) in this field.
Coalescing Type drop-down list	This can be one of the following: • **MIN—**The system waits for the time specified in the **Coalescing Time** field before sending another interrupt event. • **IDLE—**The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the **Coalescing Time** field.

Name	Description
Interrupt Mode drop-down list	The preferred driver interrupt mode. This can be one of the following: • **MSI-X—**Message Signaled Interrupts (MSI) with the optional extension. This is the recommended option. • **MSI—**MSI only. • **INTx—**PCI INTx interrupts.

Step 6 In the **Ethernet Receive Queue** area, update the following fields:

Name	Description
Receive Queue Count field	The number of receive queue resources to allocate. Enter an integer between 1 and 256.
Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 4096.

Step 7 In the **Ethernet Transmit Queue** area, update the following fields:

Name	Description
Transmit Queue Count field	The number of transmit queue resources to allocate. Enter an integer between 1 and 256.
Transmit Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 4096.

Step 8 In the **Completion Queue** area, update the following fields:

Name	Description
Completion Queue Count field	The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 512.
Completion Queue Ring Size field	The number of descriptors in each completion queue. This value cannot be changed.

Step 9 In the **TCP Offload** area, update the following fields:

Name	Description
Enable TCP Segmentation Offload check box	If checked, the CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate. If cleared, the CPU segments large packets. **Note** This option is also known as Large Send Offload (LSO).
Enable TCP Rx Offload Checksum Validation check box	If checked, the CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. If cleared, the CPU validates all packet checksums.
Enable TCP Tx Offload Checksum Generation check box	If checked, the CPU sends all packets to the hardware so that the checksum can be calculated. This option may reduce CPU overhead. If cleared, the CPU calculates all packet checksums.
Enable Large Receive check box	If checked, the hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput. If cleared, the CPU processes all large packets.

Step 10 In the **Receive Side Scaling** area, update the following fields:

Name	Description
Enable TCP Receive Side Scaling check box	Receive Side Scaling (RSS) distributes network receive processing across multiple CPUs in multiprocessor systems. If checked, network receive processing is shared across processors whenever possible. If cleared, network receive processing is always handled by a single processor even if additional processors are available.
Enable IPv4 RSS check box	If checked, RSS is enabled on IPv4 networks.
Enable TCP-IPv4 RSS check box	If checked, RSS is enabled for TCP transmissions across IPv4 networks.
Enable IPv6 RSS check box	If checked, RSS is enabled on IPv6 networks.
Enable TCP-IPv6 RSS check box	If checked, RSS is enabled for TCP transmissions across IPv6 networks.
Enable IPv6 Extension RSS check box	If checked, RSS is enabled for IPv6 extensions.
Enable TCP-IPv6 Extension RSS check box	If checked, RSS is enabled for TCP transmissions across IPv6 networks.

Step 11 Click **Save Changes**.

Creating a vNIC

The adapter provides two permanent vNICs. You can create up to 16 additional vNICs.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **Host Ethernet Interfaces** area, choose one of these actions:

- To create a vNIC using default configuration settings, click **Add vNIC**.
- To create a vNIC using the same configuration settings as an existing vNIC, select that vNIC and click **Clone vNIC**.

The **Add vNIC** dialog box appears.

Step 4 In the **Add vNIC** dialog box, enter a name for the vNIC in the **Name** entry box.

Step 5 (Optional) In the **Add vNIC** dialog box, enter a channel number for the vNIC in the **Channel Number** entry box.

Note If NIV is enabled on the adapter, you must assign a channel number for the vNIC when you create it.

Step 6 Click **Add vNIC**.

What to Do Next

If configuration changes are required, configure the new vNIC as described in Modifying vNIC Properties, on page 174.

Deleting a vNIC

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **Host Ethernet Interfaces** area, select a vNIC from the table.

Note You cannot delete either of the two default vNICs, **eth0** or **eth1**.

Step 4 Click **Delete vNIC** and click **OK** to confirm.

Managing Cisco usNIC

Overview of Cisco usNIC

The Cisco user-space NIC (Cisco usNIC) feature improves the performance of software applications that run on the Cisco UCS servers in your data center by bypassing the kernel when sending and receiving networking packets. The applications interact directly with a Cisco UCS VIC second generation or later generation adapter, such as the , which improves the networking performance of your high-performance computing cluster. To benefit from Cisco usNIC, your applications must use the Message Passing Interface (MPI) instead of sockets or other communication APIs.

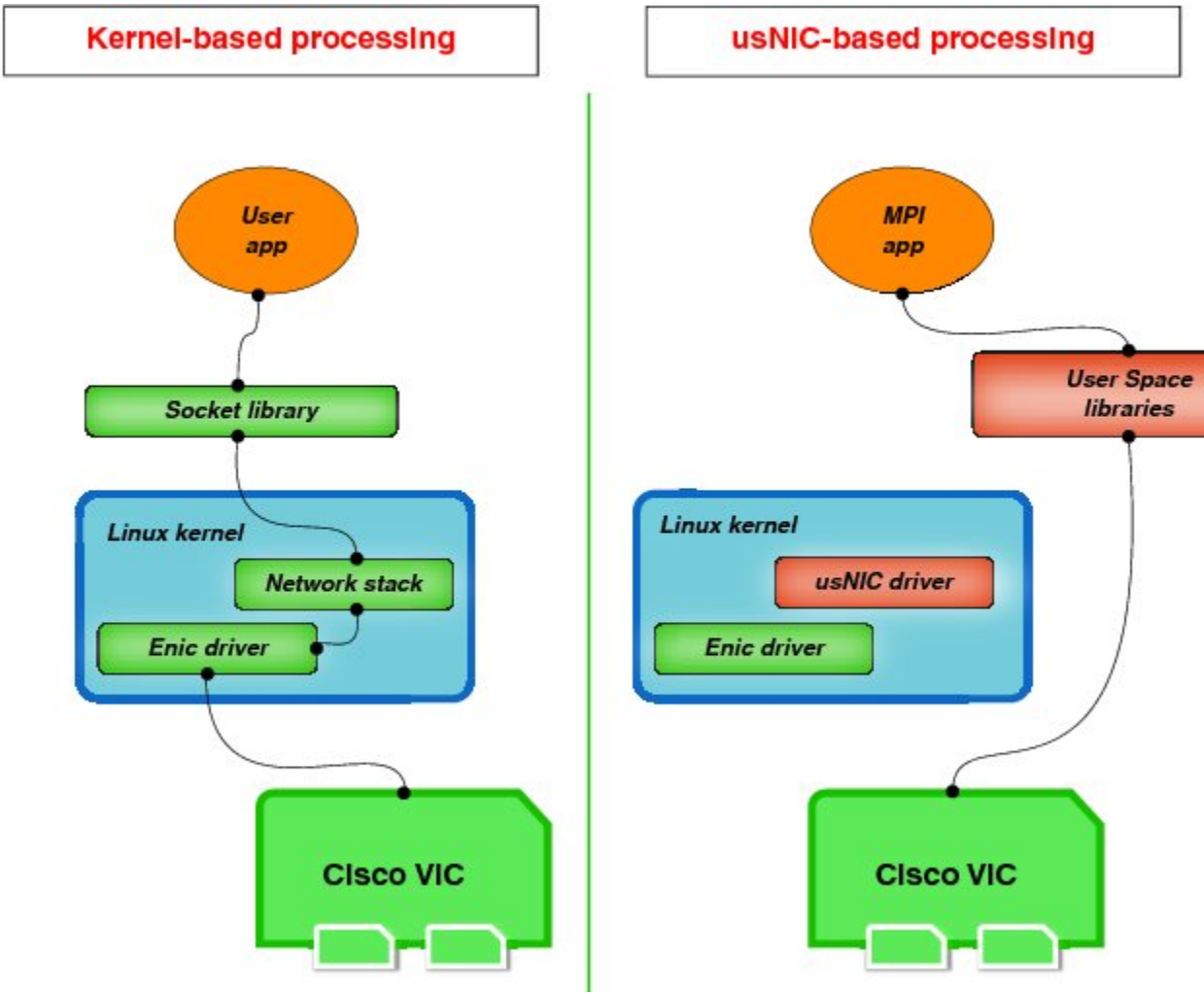
Cisco usNIC offers the following benefits for your MPI applications:

- Provides a low-latency and high-throughput communication transport.
- Employs the standard and application-independent Ethernet protocol.
- Takes advantage of lowlatency forwarding, Unified Fabric, and integrated management support in the following Cisco data center platforms:
  - Cisco UCS server
  - Cisco UCS VIC second generation or later generation adapter
  - 10 or 40GbE networks

Standard Ethernet applications use user-space socket libraries, which invoke the networking stack in the Linux kernel. The networking stack then uses the Cisco eNIC driver to communicate with the Cisco VIC hardware.

The following figure shows the contrast between a regular software application and an MPI application that uses Cisco usNIC.

Figure 1: Kernel-Based Network Communication versus Cisco usNIC-Based Communication



Viewing and Configuring Cisco usNIC using the Cisco IMC GUI

Before You Begin

You must log in to the Cisco IMC GUI with administrator privileges to perform this task. Click Play on this video to watch how to configure Cisco usNIC in CIMC.

Procedure

Step 1 Log into the Cisco IMC GUI.
For more information about how to log into Cisco IMC, see Cisco UCS C-Series Servers Integrated Management Controller GUI Configuration Guide.

Step 2 In the **Navigation** pane, click the **Networking** menu.

Step 3 In the **Adapter Card** pane, click the **vNICs** tab.

Step 4 In the **vNICs** pane, click **eth0** or **eth1**.

Step 5 In the **Ethernet Interfaces** area, select the **usNIC** area.

Step 6 In the **Properties** area, review and update the following fields:

Name	Description
Name	The name for the vNIC that is the parent of the usNIC. **Note** This field is read-only.
usNIC field	The number of usNICs assigned to the specific vNIC. Enter an integer between 0 and 225. To assign additional usNICs to a specified vNIC, enter value higher than the existing value. To delete usNICs from a specified vNIC, enter value smaller than the existing value. To delete all the usNICs assigned to a vNIC, enter zero.
Transmit Queue Count field	The number of transmit queue resources to allocate. Enter an integer between 1 and 256.
Receive Queue Count field	The number of receive queue resources to allocate. Enter an integer between 1 and 256.
Completion Queue Count field	The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 512.
Transmit Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 4096.
Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 4096.
Interrupt Count field	The number of interrupt resources to allocate. In general, this value should be equal to the number of completion queue resources. Enter an integer between 1 and 514.

Name	Description
Interrupt Coalescing Type drop-down list	This can be one of the following: • **MIN—**The system waits for the time specified in the **Coalescing Time** field before sending another interrupt event. • **IDLE—**The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the **Coalescing Time** field.
Interrupt Coalescing Timer Time field	The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent. Enter an integer between 1 and 65535. To turn off interrupt coalescing, enter 0 (zero) in this field.
Class of Service field	The class of service to associate with traffic from this usNIC. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
TCP Segment Offload check box	If checked, the CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate. If cleared, the CPU segments large packets. **Note** This option is also known as Large Send Offload (LSO).
Large Receive check box	If checked, the hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput. If cleared, the CPU processes all large packets.
TCP Tx Checksum check box	If checked, the CPU sends all packets to the hardware so that the checksum can be calculated. This option may reduce CPU overhead. If cleared, the CPU calculates all packet checksums.
TCP Rx Checksum check box	If checked, the CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. If cleared, the CPU validates all packet checksums.

Step 7 Click **Save Changes**.
The changes take effect upon the next server reboot.

Viewing usNIC Properties

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **vNICs** pane, click **eth0** or **eth1**.

Step 4 In the **Host Ethernet Interfaces** pane's **usNIC Properties** area, review the information in the following fields:

Name	Description
Name	The name for the vNIC that is the parent of the usNIC. **Note** This field is read-only.
usNIC field	The number of usNICs assigned to the specific vNIC. Enter an integer between 0 and 225. To assign additional usNICs to a specified vNIC, enter value higher than the existing value. To delete usNICs from a specified vNIC, enter value smaller than the existing value. To delete all the usNICs assigned to a vNIC, enter zero.
Transmit Queue Count field	The number of transmit queue resources to allocate. Enter an integer between 1 and 256.
Receive Queue Count field	The number of receive queue resources to allocate. Enter an integer between 1 and 256.
Completion Queue Count field	The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 512.
Transmit Queue Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 4096.

Name	Description
Receive Queue Ring Size field	The number of descriptors in each receive queue. Enter an integer between 64 and 4096.
Interrupt Count field	The number of interrupt resources to allocate. In general, this value should be equal to the number of completion queue resources. Enter an integer between 1 and 514.
Interrupt Coalescing Type drop-down list	This can be one of the following: • **MIN—**The system waits for the time specified in the **Coalescing Time** field before sending another interrupt event. • **IDLE—**The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the **Coalescing Time** field.
Interrupt Coalescing Timer Time field	The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent. Enter an integer between 1 and 65535. To turn off interrupt coalescing, enter 0 (zero) in this field.
Class of Service field	The class of service to associate with traffic from this usNIC. Select an integer between 0 and 6, with 0 being lowest priority and 6 being the highest priority. **Note** This option cannot be used in VNTAG mode.
TCP Segment Offload check box	If checked, the CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate. If cleared, the CPU segments large packets. **Note** This option is also known as Large Send Offload (LSO).
Large Receive check box	If checked, the hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput. If cleared, the CPU processes all large packets.

Name	Description
TCP Tx Checksum check box	If checked, the CPU sends all packets to the hardware so that the checksum can be calculated. This option may reduce CPU overhead. If cleared, the CPU calculates all packet checksums.
TCP Rx Checksum check box	If checked, the CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. If cleared, the CPU validates all packet checksums.

Configuring iSCSI Boot Capability

Configuring iSCSI Boot Capability for vNICs

When the rack-servers are configured in a standalone mode, and when the VIC adapters are directly attached to the Nexus 5000 and Nexus 6000 family of switches, you can configure these VIC adapters to boot the servers remotely from iSCSI storage targets. You can configure Ethernet vNICs to enable a rack server to load the host OS image from remote iSCSI target devices.

To configure the iSCSI boot capability on a vNIC:

- You must log in with admin privileges to perform this task.
- To configure a vNIC to boot a server remotely from an iSCSI storage target, you must enable the PXE boot option on the vNIC.

Note You can configure a maximum of 2 iSCSI vNICs for each host.

Configuring iSCSI Boot Capability on a vNIC

You can configure a maximum of 2 iSCSI vNICs for each host.

Before You Begin

- To configure a vNIC to boot a server remotely from an iSCSI storage target, you must enable the PXE boot option on the vNIC.
- You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 In the **Adapter Card** pane, click the **vNICs** tab.

Step 3 In the **vNICs** pane, click **eth0** or **eth1**.

Step 4 In the **Ethernet Interfaces** area, select the **iSCSI Boot Properties** area.

Step 5 In the **General Area**, update the following fields:

Name	Description
Name field	The name of the vNIC.
DHCP Network check box	Whether DHCP Network is enabled for the vNIC. If enabled, the initiator network configuration is obtained from the DHCP server.
DHCP iSCSI check box	Whether DHCP iSCSI is enabled for the vNIC. If enabled and the DHCP ID is set, the initiator IQN and target information are obtained from the DHCP server. **Note** If DHCP iSCSI is enabled without a DHCP ID, only the target information is obtained.
DHCP ID field	The vendor identifier string used by the adapter to obtain the initiator IQN and target information from the DHCP server. Enter a string up to 64 characters.
DHCP Timeout field	The number of seconds to wait before the initiator assumes that the DHCP server is unavailable. Enter an integer between 60 and 300 (default: 60 seconds)
Link Timeout field	The number of seconds to wait before the initiator assumes that the link is unavailable. Enter an integer between 0 and 255 (default: 15 seconds)
LUN Busy Retry Count field	The number of times to retry the connection in case of a failure during iSCSI LUN discovery. Enter an integer between 0 and 255. The default is 15.
IP Version field	The IP version to use during iSCSI boot.

Step 6 In the **Initiator Area**, update the following fields:

Name	Description
Name field	A regular expression that defines the name of the iSCSI initiator. You can enter any alphanumeric string as well as the following special characters: • . (period) • : (colon) • - (dash) **Note** The name is in the IQN format.
IP Address field	The IP address of the iSCSI initiator.
Subnet Mask field	The subnet mask for the iSCSI initiator.
Gateway field	The default gateway.
Primary DNS field	The primary DNS server address.
Secondary DNS field	The secondary DNS server address.
TCP Timeout field	The number of seconds to wait before the initiator assumes that TCP is unavailable. Enter an integer between 0 and 255 (default: 15 seconds)
CHAP Name field	The Challenge-Handshake Authentication Protocol (CHAP) name of the initiator.
CHAP Secret field	The Challenge-Handshake Authentication Protocol (CHAP) shared secret of the initiator.

Step 7 In the **Primary Target Area**, update the following fields:

Name	Description
Name field	The name of the primary target in the IQN format.
IP Address field	The IP address of the target.
TCP Port field	The TCP port associated with the target.
Boot LUN field	The Boot LUN associated with the target.
CHAP Name field	The Challenge-Handshake Authentication Protocol (CHAP) name of the initiator.

Name	Description
CHAP Secret field	The Challenge-Handshake Authentication Protocol (CHAP) shared secret of the initiator.

Step 8 In the **Secondary Target Area**, update the following fields:

Name	Description
Name field	The name of the secondary target in the IQN format.
IP Address field	The IP address of the target.
TCP Port field	The TCP port associated with the target.
Boot LUN field	The Boot LUN associated with the target.
CHAP Name field	The Challenge-Handshake Authentication Protocol (CHAP) name of the initiator.
CHAP Secret field	The Challenge-Handshake Authentication Protocol (CHAP) shared secret of the initiator.

Name	Description
Configure ISCSI button	Configures iSCSI boot on the selected vNIC.
Unconfigure ISCSI button	Removes the configuration from the selected vNIC.
Reset Values button	Restores the values for the vNIC to the settings that were in effect when this dialog box was first opened.
Cancel button	Closes the dialog box without making any changes.

Step 9 Click **Save Changes**.

Removing iSCSI Boot Configuration from a vNIC

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.
Step 2 In the **Adapter Card** pane, click the **vNICs** tab.
Step 3 In the **vNICs** pane, click **eth0** or **eth1**.
Step 4 In the **Ethernet Interfaces** area, select the **iSCSI Boot Properties** area.
Step 5 Click the **Unconfigure ISCSI** button at the bottom of the area.

Managing VM FEX

Virtual Machine Fabric Extender

Cisco Virtual Machine Fabric Extender (VM FEX) extends the (prestandard) IEEE 802.1Qbh port extender architecture to virtual machines. In this architecture, each VM interface is provided with a virtual Peripheral Component Interconnect Express (PCIe) device and a virtual port on a switch.

For this release, VM FEX supports the following cards and Operating systems:

Cards - Cisco UCS 1225 Virtual Interface Card

Operating Systems:

- VMware ESXi 5.1 Update 2
- VMware ESXi 5.5

VM FEX is not supported on Microsoft Hyper-V and Red Hat KVM for this release.

Viewing Virtual FEX Properties

Before You Begin

- The server must be powered on, or the properties will not display.
- A supported Virtual Interface Card (VIC) must be installed in the chassis and the server must be powered on.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.
Step 2 In the **Adapter Card** pane, click the **VM FEXs** tab.
Step 3 In the **Virtual FEXs** area, review the following information:

Name	Description
Name column	The name of the VM FEX.
MTU column	The maximum transmission unit, or packet size, that this VM FEX accepts.
CoS column	If enabled, the VM FEX uses the class of service provided by the host operating system.
VLAN column	The VLAN associated with the VM FEX.
VLAN Mode column	The mode for the associated VLAN.
Uplink Failover column	If VNTAG mode is enabled for the adapter, this column displays whether traffic on this VM FEX will fail over to a secondary interface if the primary interface fails.

Step 4 In the Virtual FEXs area, select a VM FEX from the table.

Step 5 Click **Properties** to open the **VM FEX Properties** dialog box for the selected VM FEX.

Step 6 In the **General Properties** area, review the information in the following fields:

Name	Description
Name field	The name of the VM FEX.
MTU field	The maximum transmission unit, or packet size, that this VM FEX accepts.
Uplink Port field	The uplink port associated with this VM FEX.
Trust Host CoS field	If enabled, the VM FEX uses the class of service provided by the host operating system.
PCI Order field	The order in which this VM FEX will be used, if any.
Default VLAN field	The VLAN associated with the VM FEX.
Rate Limit field	The data rate limit associated with this VM FEX, if any.
PXE Boot field	Whether PXE boot is enabled or disabled for this VM FEX.

Step 7 In the **Ethernet Interrupt** area, review the information in the following fields:

Name	Description
Interrupt Count field	The number of interrupt resources allocated to this VM FEX.

Name	Description
Coalescing Time field	The time Cisco IMC waits between interrupts or the idle period that must be encountered before an interrupt is sent.
Coalescing Type field	This can be one of the following: • **MIN—**The system waits for the time specified in the **Coalescing Time** field before sending another interrupt event. • **IDLE—**The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the **Coalescing Time** field.
Interrupt Mode field	The preferred driver interrupt mode. This can be one of the following: • **MSIx—**Message Signaled Interrupts (MSI) with the optional extension. • **MSI—**MSI only. • **INTx—**PCI INTx interrupts.

Step 8 In the **Ethernet Receive Queue** area, review the information in the following fields:

Name	Description
Receive Queue Count field	The number of receive queue resources allocated to this VM FEX.
Receive Queue Ring Size field	The number of descriptors in each receive queue.

Step 9 In the **Ethernet Transmit Queue** area, review the information in the following fields:

Name	Description
Transmit Queue Count field	The number of transmit queue resources allocated to this VM FEX.
Transmit Queue Ring Size field	The number of descriptors in each transmit queue.

Step 10 In the **Completion Queue** area, review the information in the following fields:

Name	Description
Completion Queue Count field	The number of completion queue resources allocated to this VM FEX.
Completion Queue Ring Size field	The number of descriptors in each completion queue.

Step 11 In the **TCP Offload** area, review the information in the following fields:

Name	Description
Enable TCP Segmentation Offload field	If enabled, the CPU sends large TCP packets to the hardware to be segmented. If disabled, the CPU segments large packets. **Note** This option is also known as Large Send Offload (LSO).
Enable TCP Rx Offload Checksum Validation field	If enabled, the CPU sends all packet checksums to the hardware for validation. If disabled, the CPU validates all packet checksums.
Enable TCP Tx Offload Checksum Generation field	If enabled, the CPU sends all packets to the hardware so that the checksum can be calculated. If disabled, the CPU calculates all packet checksums.
Enable Large Receive field	If enabled, the hardware reassembles all segmented packets before sending them to the CPU. If disabled, the CPU processes all large packets.

Step 12 In the **Receive Side Scaling** area, review the information in the following fields:

Name	Description
Enable TCP Receive Side Scaling field	Receive Side Scaling (RSS) distributes network receive processing across multiple CPUs in multiprocessor systems. If enabled, network receive processing is shared across processors whenever possible. If disabled, network receive processing is always handled by a single processor even if additional processors are available.
Enable IPv4 RSS field	If enabled, RSS is enabled on IPv4 networks.
Enable TCP-IPv4 RSS field	If enabled, RSS is enabled for TCP transmissions across IPv4 networks.
Enable IPv6 RSS field	If enabled, RSS is enabled on IPv6 networks.
Enable TCP-IPv6 RSS field	If enabled, RSS is enabled for TCP transmissions across IPv6 networks.
Enable IPv6 Extension RSS field	If enabled, RSS is enabled for IPv6 extensions.
Enable TCP-IPv6 Extension RSS field	If enabled, RSS is enabled for TCP transmissions across IPv6 networks.

Managing Storage Adapters

Creating Virtual Drive from Unused Physical Drives

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** tab, click the **Server 1** tab (RAID controller for UCS 3x60 Storage servers (SLOT-MEZZ)) .

Step 3 In the **Actions** area, click **Create Virtual Drive from Unused Physical Drives**.
The **Create Virtual Drive from Unused Physical Drives** dialog box displays.

Step 4 In the **Create Virtual Drive from Unused Physical Drives** dialog box, select the RAID level for the new virtual drives:
This can be one of the following:

- **Raid 0—**Simple striping.
- **Raid 1—**Simple mirroring.
- **Raid 5—**Striping with parity.
- **Raid 6—**Striping with two parity drives.
- **Raid 10—**Spanned mirroring.
- **Raid 50—**Spanned striping with parity.
- **Raid 60—**Spanned striping with two parity drives.

Step 5 In the **Create Drive Groups** area, choose one or more physical drives to include in the group.
Use the >> button to add the drives to the **Drive Groups** table. Use the << button to remove physical drives from the drive group.

Note The size of the smallest physical drive in the drive group defines the maximum size used for all the physical drives. To ensure maximum use of space for all physical drives, it is recommended that the size of all the drives in the drive group are similar.

Note Cisco IMC manages only RAID controllers and not HBAs attached to the server.

Step 6 In the **Virtual Drive Properties** area, update the following properties:

Name	Description
Virtual Drive Name field	The name of the new virtual drive you want to create.
Read Policy drop-down list	The read-ahead cache mode.
Cache Policy drop-down list	The cache policy used for buffering reads.

Name	Description
Strip Size drop-down list	The size of each strip, in KB.
Write Policy drop-down list	This can be one of the following • **Write Through—** Data is written through the cache and to the physical drives. Performance is improved, because subsequent reads of that data can be satisfied from the cache. • **Write Back—** Data is stored in the cache, and is only written to the physical drives when space in the cache is needed. Virtual drives requesting this policy fall back to **Write Through** caching when the BBU cannot guarantee the safety of the cache in the event of a power failure. • **Write Back Bad BBU—**With this policy, write caching remains **Write Back** even if the battery backup unit is defective or discharged.
Disk Cache Policy drop-down list	This can be one of the following • **Unchanged—** The disk cache policy is unchanged. • **Enabled—** Allows IO caching on the disk. • **Disabled—** Disallows disk caching.
Access Policy drop-down list	This can be one of the following • **Read Write—** Enables host to perform read-write on the VD. • **Read Only—** Host can only read from the VD. • **Blocked—** Host can neither read nor write to the VD.
Size field	The size of the virtual drive you want to create. Enter a value and select one of the following units: • MB • GB • TB

Step 7 Click the **Generate XML API Request** button to generate an API request.

Step 8 Click **Close**.

Step 9 Click **Create Virtual Drive**.

Creating Virtual Drive from an Existing Drive Group

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** tab, click the **Server 1** tab with the appropriate LSI MegaRAID controller.

Step 3 In the **Actions** area, click **Create Virtual Drive from an Existing Virtual Drive Group**.
The **Create Virtual Drive from an Existing Virtual Drive Group** dialog box displays.

Step 4 In the **Create Virtual Drive from an Existing Virtual Drive Group** dialog box, select the virtual drive whose drive group you want to use to create a new virtual drive.

Step 5 In the **Virtual Drive Properties** area, update the following properties:

Name	Description
Virtual Drive Name field	The name of the new virtual drive you want to create.
Read Policy drop-down list	The read-ahead cache mode.
Cache Policy drop-down list	The cache policy used for buffering reads.
Strip Size drop-down list	The size of each strip, in KB.
Write Policy drop-down list	This can be one of the following • **Write Through—** Data is written through the cache and to the physical drives. Performance is improved, because subsequent reads of that data can be satisfied from the cache. • **Write Back—** Data is stored in the cache, and is only written to the physical drives when space in the cache is needed. Virtual drives requesting this policy fall back to **Write Through** caching when the BBU cannot guarantee the safety of the cache in the event of a power failure. • **Write Back Bad BBU—**With this policy, write caching remains **Write Back** even if the battery backup unit is defective or discharged.
Disk Cache Policy drop-down list	This can be one of the following • **Unchanged—** The disk cache policy is unchanged. • **Enabled—** Allows IO caching on the disk. • **Disabled—** Disallows disk caching.

Name	Description
Access Policy drop-down list	This can be one of the following • **Read Write—** Enables host to perform read-write on the VD. • **Read Only—** Host can only read from the VD. • **Blocked—** Host can neither read nor write to the VD.
Size field	The size of the virtual drive you want to create. Enter a value and select one of the following units: • MB • GB • TB

Step 6 Click the **Generate XML API Request** button to generate an API request.

Step 7 Click **Close**.

Step 8 Click **Create Virtual Drive**.

Setting a Virtual Drive to Transport Ready State

You can move a virtual drive from one MegaRAID controller to another using the **Set Transport Ready** feature. This allows all the pending IOs of the virtual drive to complete their activities, hide the virtual drive from the operating system, flush cache, pause all the background operations, and save the current progress in disk data format, allowing you to move the drive. When you move a virtual drive, all other drives belonging to the same drive group inherit the same change as the moved drive.

When the last configured physical drive on the group is removed from the current controller, the drive group becomes foreign and all foreign configuration rules apply to the group. However, the Transport Ready feature does not change any foreign configuration behavior.

You can also clear a virtual drive from the Transport Ready state. This makes the virtual drive available to the operating systems.

Following restrictions apply to a transport ready virtual drive:

- Only a maximum of 16 transport ready drive groups are currently supported.
- This feature is not supported on high availability.
- A virtual drive cannot be set as transport ready under these conditions:
  - When a virtual drive of a drive group is being reconstructed
  - When a virtual drive of a drive group contains a pinned cache

- When a virtual drive of a drive group is marked as cacheable or associated with a cachecade virtual drive
- If a virtual drive is a cachecade virtual drive
- If a virtual drive is offline
- If a virtual drive is a bootable virtual drive

Setting a Virtual Drive as Transport Ready

Before You Begin

- You must log in with admin privileges to perform this task.
- The virtual drive must be in optimal state to enable transport ready.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the appropriate LSI MegaRAID or HBA Controller.

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, choose the drive that you want set as transport ready.

Step 5 In the **Actions** area, click **Set Transport Ready**.
The **Set Transport Ready** dialog box displays.

Step 6 Update the following properties in the dialog box:

Name	Description
Initialize Type drop-down list	Allows you to select the initialization type using which you can set the selected virtual drive as transport ready. This can be one of the following: • **Exlude All—** Excludes all the dedicated hot spare drives. • **Include All—** Includes any exclusively available or shared dedicated hot spare drives. • **Include Dedicated Hot Spare Drive—** Includes exclusive dedicated hot spare drives.
Set Transport Ready button	Sets the selected virtual drive as transport ready.
Cancel button	Cancels the action.

Note When you set a virtual drive to transport ready all the physical drives associated with it are displayed as **Ready to Remove**.

Clearing a Virtual Drive from Transport Ready State

Before You Begin

- You must log in with admin privileges to perform this task.
- The virtual drive must be transport ready.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the appropriate LSI MegaRAID or HBA controller.

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, choose the drive to set as transport ready.

Step 5 In the **Actions** area, click **Clear Transport Ready**.
This reverts the selected transport ready virtual drive to its original optimal state.

Importing Foreign Configuration

When one or more physical drives that have previously been configured with a different controller are inserted into a server, they are identified as foreign configurations. You can import these foreign configurations to a controller.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 In the **(Server 1) RAID controller for UCS C3X60 Storage Servers** area, the **Controller Info** tab displays by default.

Step 3 In the **Actions** area, click **Import Foreign Config**.

Step 4 Click **OK** to confirm.

Clearing Foreign Configuration

Important This task clears all foreign configuration on the controller. Also, all configuration information from all physical drives hosting foreign configuration is deleted. This action cannot be reverted.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 In the **(Server 1) RAID controller for UCS C3X60 Storage Servers** area, the **Controller Info** tab displays by default.

Step 3 In the **Actions** area, click **Clear Foreign Config**.

Step 4 Click **OK** to confirm.

Clearing a Boot Drive

Important This task clears the boot drive configuration on the controller. This action cannot be reverted.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 In the **(Server 1) RAID controller for UCS C3X60 Storage Servers** area, the **Controller Info** tab displays by default.

Step 3 In the **Actions** area, click **Clear Boot Drive**.

Step 4 Click **OK** to confirm.

Enabling JBOD Mode

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.
Step 2 On the **Storage** tab, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.
Step 3 In the **Work** pane, click the **Physical Drive Info** tab.
Step 4 In the **Physical Drives** area, select an unconfigured good drive.
Step 5 In the **Actions** area, click **Enable JBOD**.
Step 6 Click **Ok** to confirm.

Disabling a JBOD

Note This option is available only on some UCS C-Series servers.

Before You Begin

JBOD option must be enabled for the selected controller.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.
Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.
Step 3 On the **Work** pane, click **Physical Drive Info** tab.
Step 4 In the **Physical Drives** area, select a JBOD drive.
Step 5 In the **Actions** area, click **Disable JBOD**.
Step 6 Click **Ok** to confirm.

Retrieving TTY Logs for a Controller

This task retrieves the TTY logs for the controller and places it in the `/var/log` location. This ensures that this log data is available when Technical Support Data is requested.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 In the **(Server 1) RAID controller for UCS C3X60 Storage Servers** area, the **Controller Info** tab displays by default.

Step 3 In the **Actions** area, click **Get TTY Log**.

Step 4 Click **OK** to confirm.

Important Retrieving TTY logs for a controller could take up to 2-4 minutes. Until this process is complete, do not initiate exporting technical support data.

Preparing a Drive for Removal

Note You can perform this task only on physical drives that display the **Unconfigured Good** status.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select the drive you want to remove.

Step 5 In the **Actions** area, click **Prepare for Removal**.

Step 6 Click **OK** to confirm.

Undo Preparing a Drive for Removal

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select a drive with a status of **Ready to Remove**.

Step 5 In the **Actions** area, click **Undo Prepare for Removal**.

Step 6 Click **OK** to confirm.

Making a Dedicated Hot Spare

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** tab.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select an unconfigured good drive you want to make a dedicated hot spare.

Step 5 In the **Actions** area, click **Make Dedicated Hot Spare**.
The **Make Dedicated Hot Spare** dialog box displays.

Step 6 In the **Virtual Drive Details** area, update the following properties:

Name	Description
Virtual Drive Number drop-down list	Select the virtual drive to which you want to dedicate the physical drive as hot spare.
Virtual Drive Name field	The name of the selected virtual drive.
Make Dedicated Hot Spare button	Creates the dedicated hot spare.
Cancel button	Closes the dialog box without saving any changes made while the dialog box was open.

Step 7 Click **Make Dedicated Hot Spare** to confirm.

Making a Global Hot Spare

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** tab.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select an unconfigured good drive you want to make a global hot spare.

Step 5 In the **Actions** area, click **Make Global Hot Spare**.

Removing a Drive from Hot Spare Pools

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** tab, click the appropriate LSI MegaRAID controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select the global or dedicated hot spare you want to remove from the hot spare pools.

Step 5 In the **Actions** area, click **Remove From Hot Spare Pools**.

Toggling Physical Drive Status

Before You Begin

- You must log in with admin privileges to perform this task.
- The controller must support the JBOD mode and the JBOD mode must be enabled.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** tab.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select the drive you want to set as unconfigured good.

Step 5 In the **Actions** area, click **Set State as Unconfigured Good**.

Step 6 Click **OK** to confirm that the JBOD mode be disabled.
The **Set State as JBOD** option is enabled.

Step 7 To enable the JBOD mode for the physical drive, click **Set State as JBOD**.

Step 8 Click **OK** to confirm.
The **Set State as Unconfigured Good** option is enabled.

Setting a Physical Drive as a Controller Boot Drive

Before You Begin

- You must log in with admin privileges to perform this task.
- The controller must support the JBOD mode and the JBOD mode must be enabled.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Physical Drive Info** tab.

Step 4 In the **Physical Drives** area, select the drive you want to set as boot drive for the controller.

Step 5 In the **Actions** area, click **Set as Boot Drive**.

Step 6 Click **OK** to confirm.

Initializing a Virtual Drive

All data on a virtual drive is lost when you initialize the drive. Before you run an initialization, back up any data on the virtual drive that you want to save.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, choose the drive that you want to initialize.

Step 5 In the **Actions** area, click **Initialize**.
The **Initialize Virtual Drive** dialog box displays.

Step 6 Choose the type of initialization you want to use for the virtual drive.
This can be one of the following:

- **Fast Initialize—**This option allows you to start writing data to the virtual drive immediately.
- **Full Initialize—**A complete initialization is done on the new configuration. You cannot write data to the new virtual drive until the initialization is complete.

Step 7 Click **Initialize VD** to initialize the drive, or **Cancel** to close the dialog box without making any changes.

Step 8 To view the status of the task running on the drive, in the **Operations** area, click **Refresh**.
The following details are displayed:

Name	Description
Operation	Name of the operation that is in progress on the drive.
Progress in %	Progress of the operation, in percentage complete.
Elapsed Time in secs	The number of seconds that have elapsed since the operation began.

Set as Boot Drive

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, choose the drive from which the controller must boot.

Step 5 In the **Actions** area, click **Set as Boot Drive**.

Step 6 Click **OK** to confirm.

Editing a Virtual Drive

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, click **Edit Virtual Drive**.

Step 5 Review the instructions, and then click **OK**.
The **Edit Virtual Drive** dialog box displays before prompting you to take a backup of your data.

Step 6 From the **Select RAID Level to migrate** drop-down list, choose a RAID level.
See the following table for RAID migration criteria:

Name	Description
Select RAID Level to migrate drop-down list	Select the RAID level to which you want to migrate. Migrations are allowed for the following RAID levels: • **RAID 0** to **RAID 1** • **RAID 0** to **RAID 5** • **RAID 0** to **RAID 6** • **RAID 1** to **RAID 0** • **RAID 1** to **RAID 5** • **RAID 1** to **RAID 6** • **RAID 5** to **RAID 0** • **RAID 6** to **RAID 0** • **RAID 6** to **RAID 5** When you are migrating from one raid level to another, the data arms of the new RAID level should be equal to or greater than the existing one. In case of RAID 6, the data arms will be number of drives minus two, as RAID 6 has double distributed parity. For example, when you create RAID 6 with eight drives, the number of data arms will be 8 – 2 = 6. In this case, if you are migrating from RAID 6 to RAID 0, RAID 0 must have a minimum of six drives. If you select lesser number of drives then **Edit** or **Save** button will be disabled. If you are adding, you can migrate to RAID 0 as you will not be deleting any drives. **Note** RAID level migration is not supported in the following cases: • When there are multiple virtual drives in a RAID group. • With a combination of SSD/HDD RAID groups.

Step 7 From the **Write Policy** drop-down list in the **Virtual Drive Properties** area, choose one of the following:

- **Write Through—** Data is written through the cache and to the physical drives. Performance is improved, because subsequent reads of that data can be satisfied from the cache.
- **Write Back—** Data is stored in the cache, and is only written to the physical drives when space in the cache is needed. Virtual drives requesting this policy fall back to **Write Through** caching when the BBU cannot guarantee the safety of the cache in the event of a power failure.
- **Write Back Bad BBU—**With this policy, write caching remains **Write Back** even if the battery backup unit is defective or discharged.

Step 8 Click **Save Changes**.

Deleting a Virtual Drive

Important This task deletes a virtual drive, including the drives that run the booted operating system. So back up any data that you want to retain before you delete a virtual drive.

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, select the virtual drive you want to delete.

Step 5 In the **Actions** area, click **Delete Virtual Drive**.

Step 6 Click **OK** to confirm.

Hiding a Virtual Drive

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab (RAID controller for UCS C3X60 Storage Servers (SLOT-MEZZ)).

Step 3 On the **Work** pane, click the **Virtual Drive Info** tab.

Step 4 In the **Virtual Drives** area, select the virtual drive you want to hide.

Step 5 In the **Actions** area, click **Hide Drive**.

Step 6 Click **OK** to confirm.

Starting Learn Cycles for a Battery Backup Unit

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click the **Battery Backup Unit** tab.

Step 4 From the **Actions** pane, click **Start Learn Cycle**.
A dialog prompts you to confirm the task.

Step 5 Click **OK**.

Viewing Storage Controller Logs

Before You Begin

You must log in with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Storage** menu.

Step 2 On the **Storage** menu, click the **Server 1** tab with the appropriate LSI MegaRAID Controller.

Step 3 On the **Work** pane, click **Storage Log** tab and review the following information:

Name	Description
Time column	The date and time the event occurred.

Name	Description
Severity column	The event severity. This can be one of the following: • Emergency • Alert • Critical • Error • Warning • Notice • Informational • Debug
Description column	A description of the event.

Backing Up and Restoring the Adapter Configuration

Exporting the Adapter Configuration

The adapter configuration can be exported as an XML file to a remote server which can be one of the following:

- TFTP
- FTP
- SFTP
- SCP
- HTTP

Before You Begin

Obtain the remote server IP address.

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 Click the **Adapter Card** tab.
The **General** tab appears.

Step 3 In the **Actions** area of the **General** tab, click **Export Configuration**.
The **Export Adapter Configuration** dialog box opens.

Step 4 In the **Export Adapter Configuration** dialog box, update the following fields:

Name	Description
Export to drop-down list	The remote server type. This can be one of the following: • **TFTP Server** • **FTP Server** • **SFTP Server** • **SCP Server** • **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Server IP/Hostname field	The IPv4 or IPv6 address, or hostname of the server to which the adapter configuration file will be exported. Depending on the setting in the **Export to** drop-down list, the name of the field may vary.
Path and Filename field	The path and filename Cisco IMC should use when exporting the file to the remote server.
Username	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP.
Password	The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.

Step 5 Click **Export Configuration**.

Importing the Adapter Configuration

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 Click the **Adapter Card** tab.

The **General** tab appears.

Step 3 In the **Actions** area of the **General** tab, click **Import Configuration**.
The **Import Adapter Configuration** dialog box opens.

Step 4 In the **Import Adapter Configuration** dialog box, update the following fields:

Name	Description
Import from drop-down list	The remote server type. This can be one of the following: • **TFTP Server** • **FTP Server** • **SFTP Server** • **SCP Server** • **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Server IP/Hostname field	The IPv4 or IPv6 address, or hostname of the server on which the adapter configuration file resides. Depending on the setting in the **Import from** drop-down list, the name of the field may vary.
Path and Filename field	The path and filename of the configuration file on the remote server.
Username	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP.
Password	The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.

Step 5 Click **Import Configuration**.
The adapter downloads the configuration file from the specified path on the TFTP server at the specified IP address. The configuration will be installed during the next server reboot.

What to Do Next

Reboot the server to apply the imported configuration.

Restoring Adapter Defaults

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 Click the **Adapter Card** tab.
The **General** tab appears.

Step 3 In the **Actions** area of the **General** tab, click **Reset To Defaults** and click **OK** to confirm.
Note Resetting the adapter to default settings sets the port speed to 4 X 10 Gbps. Choose 40 Gbps as the port speed only if you are using a 40 Gbps switch.

Resetting the Adapter

Procedure

Step 1 In the **Navigation** pane, click the **Networking** menu.

Step 2 Click the **Adapter Card** tab.
The **General** tab appears.

Step 3 In the **Actions** area of the **General** tab, click **Reset** and click **Yes** to confirm.
Note Resetting the adapter also resets the host and requires a reformat.

CHAPTER 12

Configuring Communication Services

This chapter includes the following sections:

Configuring HTTP

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **HTTP Properties** area, update the following properties:

Name	Description
HTTP/S Enabled check box	Whether HTTP and HTTPS are enabled on the Cisco IMC.
Redirect HTTP to HTTPS Enabled check box	If enabled, all attempts to communicate via HTTP are redirected to the equivalent HTTPS address. We strongly recommend that you enable this option if you enable HTTP.
HTTP Port field	The port to use for HTTP communication. The default is 80.
HTTPS Port field	The port to use for HTTPS communication. The default is 443

Name	Description
Session Timeout field	The number of seconds to wait between HTTP requests before the Cisco IMC times out and terminates the session. Enter an integer between 60 and 10,800. The default is 1,800 seconds.
Max Sessions field	The maximum number of concurrent HTTP and HTTPS sessions allowed on the Cisco IMC. This value may not be changed.
Active Sessions field	The number of HTTP and HTTPS sessions currently running on the Cisco IMC.

Step 4 Click **Save Changes**.

Configuring SSH

Before You Begin

You must log in as a user with admin privileges to configure SSH.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **SSH Properties** area, update the following properties:

Name	Description
SSH Enabled check box	Whether SSH is enabled on the Cisco IMC.
SSH Port field	The port to use for secure shell access. The default is 22.
SSH Timeout field	The number of seconds to wait before the system considers an SSH request to have timed out. Enter an integer between 60 and 10,800. The default is 1,800 seconds.
Max Sessions field	The maximum number of concurrent SSH sessions allowed on the Cisco IMC. This value may not be changed.
Active Sessions field	The number of SSH sessions currently running on the Cisco IMC.

Step 4 Click **Save Changes**.

Configuring XML API

XML API for Cisco IMC

The Cisco Cisco IMC XML application programming interface (API) is a programmatic interface to Cisco IMC for a C-Series Rack-Mount Server. The API accepts XML documents through HTTP or HTTPS.

For detailed information about the XML API, see *Cisco UCS Rack-Mount Servers Cisco IMC XML API Programmer's Guide*.

Enabling the XML API

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **XML API Properties** area, update the following properties:

Name	Description
XML API Enabled check box	Whether API access is allowed on this server.
Max Sessions field	The maximum number of concurrent API sessions allowed on the Cisco IMC. This value may not be changed.
Active Sessions field	The number of API sessions currently running on the Cisco IMC.

Step 4 Click **Save Changes**.

Configuring IPMI

IPMI Over LAN

Intelligent Platform Management Interface (IPMI) defines the protocols for interfacing with a service processor embedded in a server platform. This service processor is called a Baseboard Management Controller (BMC) and resides on the server motherboard. The BMC links to a main processor and other on-board elements using a simple serial bus.

During normal operations, IPMI lets a server operating system obtain information about system health and control system hardware. For example, IPMI enables the monitoring of sensors, such as temperature, fan speeds and voltages, for proactive problem detection. If server temperature rises above specified levels, the server operating system can direct the BMC to increase fan speed or reduce processor speed to address the problem.

Configuring IPMI over LAN

Configure IPMI over LAN when you want to manage the Cisco IMC with IPMI messages.

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **IPMI over LAN Properties** area, update the following properties for BMC 1, BMC 2, CMC 1, or CMC 2:

Name	Description
Enabled check box	Whether IPMI access is allowed on this server.

Name	Description
Privilege Level Limit drop-down list	The highest privilege level that can be assigned to an IPMI session on this server. This can be one of the following: • **read-only**—IPMI users can view information but cannot make any changes. If you select this option, IPMI users with the "Administrator", "Operator", or "User" user roles can only create read-only IPMI sessions, regardless of their other IPMI privileges. • **user**—IPMI users can perform some functions but cannot perform administrative tasks. If you select this option, IPMI users with the "Administrator" or "Operator" user role can create user and read-only sessions on this server. • **admin**—IPMI users can perform all available actions. If you select this option, IPMI users with the "Administrator" user role can create admin, user, and read-only sessions on this server.
Encryption Key field	The IPMI encryption key to use for IPMI communications.
Randomize button	Enables you to change the IPMI encryption key to a random value.

Step 4 Click **Save Changes**.

Configuring SNMP

SNMP

The Cisco UCS C-Series Rack-Mount Servers support the Simple Network Management Protocol (SNMP) for viewing server configuration and status and for sending fault and alert information by SNMP traps. For information on Management Information Base (MIB) files supported by Cisco IMC, see the *MIB Quick Reference for Cisco UCS* at this URL: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/mib/b-series/b_UCS_MIBRef.html.

Configuring SNMP Properties

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **Communications Services** pane, click the **SNMP** tab.

Step 4 In the **SNMP Properties** area, update the following properties:

Name	Description
SNMP Enabled check box	Whether this server sends SNMP traps to the designated host. **Note** After you check this check box, you need to click **Save Changes** before you can configure SNMP users or traps.
SNMP Port field	The port on which Cisco IMC SNMP agent runs. Enter an SNMP port number within the range 1 to 65535. The default port number is 161. **Note** The port numbers that are reserved for system calls, such as 22,23,80,123,443,623,389,636,3268,3269 and 2068, cannot be used as an SNMP port.
Access Community String field	The default SNMP v1 or v2c community name Cisco IMC includes on any SNMP get operations. Enter a string up to 18 characters.
SNMP Community Access drop-down list	This can be one of the following: • **Disabled —** This option blocks access to the information in the inventory tables. • **Limited —** This option provides partial access to read the information in the inventory tables. • **Full —** This option provides full access to read the information in the inventory tables. **Note** SNMP Community Access is applicable only for SNMP v1 and v2c users.
Trap Community String field	The name of the SNMP community group used for sending SNMP trap to other devices. Enter a string up to 18 characters. **Note** This field is visible only for SNMP v1 and v2c users. SNMP v3 users need to use SNMP v3 credentials.
System Contact field	The system contact person responsible for the SNMP implementation. Enter a string up to 64 characters, such as an email address or a name and telephone number.
System Location field	The location of the host on which the SNMP agent (server) runs. Enter a string up to 64 characters.

Name	Description
SNMP Input Engine ID field	User-defined unique identification of the static engine.
SNMP Engine ID field	Unique string to identify the device for administration purpose. This is generated from the SNMP Input Engine ID if it is already defined, else it is derived from the BMC serial number.

Step 5 Click **Save Changes**.

What to Do Next

Configure SNMP trap settings.

Configuring SNMP Trap Settings

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **Communications Services** pane, click the **SNMP** tab.

Step 4 Click on **Trap Destinations** tab.

Step 5 In the **Trap Destinations** area, you can perform one of the following:

- Select an existing user from the table and click **Modify Trap**.
- Click **Add Trap** to create a new user.

Note If the fields are not highlighted, select **Enabled**.

Step 6 In the **Trap Details** dialog box, complete the following fields:

Name	Description
ID field	The trap destination ID. This value cannot be modified.
Enabled drop-down list	If checked, then this trap is active on the server.

Name	Description
Version drop-down list	The SNMP version and model used for the trap. This can be one of the following: • **V2** • **V3**
Trap Type drop-down list	The type of trap to send. This can be one of the following: • **Trap**: If this option is chosen, the trap will be sent to the destination but you do not receive any notifications. • **Inform**: You can choose this option only for V2 users. If chosen, you will receive a notification when a trap is received at the destination.
User drop-down list	The drop-down list displays all available users, select a user from the list.
Trap Destination Address field	Address to which the SNMP trap information is sent. You can set an IPv4 or IPv6 address or a domain name as the trap destination.
Port	The port the server uses to communicate with the trap destination. Enter a trap destination port number within the range 1 to 65535.

Step 7 Click **Save Changes**.

Step 8 If you want to delete a trap destination, select the row and click **Delete**.
Click **OK** in the delete confirmation prompt.

Sending a Test SNMP Trap Message

Before You Begin

You must log in as a user with admin privileges to perform this task.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **Communication Services** pane, click **SNMP**.

Step 4 In the **Trap Destinations** area, select the row of the desired SNMP trap destination.

Step 5 Click **Send SNMP Test Trap**.

An SNMP test trap message is sent to the trap destination.

Note The trap must be configured and enabled in order to send a test message.

Managing SNMP Users

Before You Begin

- You must log in as a user with admin privileges to perform this task.
- SNMP must be enabled.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **Communications Services** pane, click the **SNMP** tab.

Step 4 In the **User Settings** area, update the following properties:

Name	Description
Add User button	Click an available row in the table then click this button to add a new SNMP user.
Modify User button	Select the user you want to change in the table then click this button to modify the selected SNMP user.
Delete User button	Select the user you want to delete in the table then click this button to delete the selected SNMP user.
ID column	The system-assigned identifier for the SNMP user.
Name column	The SNMP user name.
Auth Type column	The user authentication type.
Privacy Type column	The user privacy type.

Step 5 Click **Save Changes**.

Configuring SNMP Users

Before You Begin

- You must log in as a user with admin privileges to perform this task.
- SNMP must be enabled.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Communication Services**.

Step 3 In the **Communications Services** pane, click the **SNMP** tab.

Step 4 In the **User Settings** area, perform one of the following actions:

- Select an existing user from the table and click **Modify User**.
- Select a row in the **Users** area and click **Add User** to create a new user.

Step 5 In the **SNMP User Details** dialog box, update the following properties:

Name	Description
ID field	The unique identifier for the user. This field cannot be changed.
Name field	The SNMP username. Enter between 1 and 31 characters or spaces. **Note** Cisco IMC automatically trims leading or trailing spaces.
Security Level drop-down list	The security level for this user. This can be one of the following: • **no auth, no priv—**The user does not require an authorization or privacy password. • **auth, no priv—**The user requires an authorization password but not a privacy password. If you select this option, Cisco IMC enables the Auth fields described below. • **auth, priv—**The user requires both an authorization password and a privacy password. If you select this option, Cisco IMC enables the Auth and Privacy fields.
Auth Type radio button	The authorization type. This can be one of the following: • **MD5** • **SHA**

Name	Description
Auth Password field	The authorization password for this SNMP user. Enter between 8 and 64 characters or spaces. **Note** Cisco IMC automatically trims leading or trailing spaces.
Confirm Auth Password field	The authorization password again for confirmation purposes.
Privacy Type radio button	The privacy type. This can be one of the following: • **DES** • **AES**
Privacy Password field	The privacy password for this SNMP user. Enter between 8 and 64 characters or spaces. **Note** Cisco IMC automatically trims leading or trailing spaces.
Confirm Privacy Password field	The authorization password again for confirmation purposes.

Step 6 Click **Save Changes**.

Step 7 If you want to delete a user, select the user and click **Delete User**.
Click **OK** in the delete confirmation prompt.

CHAPTER 13

Managing Certificates

This chapter includes the following sections:

Managing the Server Certificate

You can generate a certificate signing request (CSR) to obtain a new certificate, and you can upload the new certificate to the Cisco IMC to replace the current server certificate. The server certificate may be signed either by a public Certificate Authority (CA), such as Verisign, or by your own certificate authority. The generated certificate key length is 2048 bits.

Note Before performing any of the following tasks in this chapter, ensure that the Cisco IMC time is set to the current time.

Procedure

Step 1 Generate the CSR from the Cisco IMC.

Step 2 Submit the CSR file to a certificate authority that will issue and sign your certificate. If your organization generates its own self-signed certificates, you can use the CSR file to generate a self-signed certificate.

Step 3 Upload the new certificate to the Cisco IMC.

Note The uploaded certificate must be created from a CSR generated by the Cisco IMC. Do not upload a certificate that was not created by this method.

Generating a Certificate Signing Request

Before You Begin

- You must log in as a user with admin privileges to configure certificates.
- Ensure that the Cisco IMC time is set to the current time.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Certificate Management**.

Step 3 In the **Actions** area, click the **Generate New Certificate Signing Request** link.
The **Generate New Certificate Signing Request** dialog box appears.

Step 4 In the **Generate New Certificate Signing Request** dialog box, update the following properties:

Name	Description
Common Name field	The fully qualified name of the Cisco IMC. By default the CN of the servers appears in CXXX-YYYYYY format, where XXX is the model number and YYYYYY is the serial number of the server. When you upgrade to latest version, CN is retained as is.
Organization Name field	The organization requesting the certificate.
Organization Unit field	The organizational unit.
Locality field	The city or town in which the company requesting the certificate is headquartered.
State Name field	The state or province in which the company requesting the certificate is headquartered.
Country Code drop-down list	The country in which the company resides.
Email field	The email contact at the company.
Self Signed Certificate check box	Generates a Self Signed Certificate. **Warning** After successful certificate generation, the Cisco IMC Web GUI restarts. Communication with the management controller may be lost momentarily and you will need to re-login. **Note** If enabled, CSR is generated, signed and uploaded automatically.

Note If Self-signed certificate is enabled, ignore steps 5 and 6.

Step 5 Click **Generate CSR**.
The **Opening csr.txt** dialog box appears.

Step 6 Perform any one of the following steps to manage the CSR file, csr.txt:

a) Click **Open With** to view csr.txt.
b) Click **Save File** and then click **OK** to save csr.txt to your local machine.

What to Do Next

- Submit the CSR file to a certificate authority that will issue and sign your certificate. If your organization generates its own self-signed certificates, you can use the CSR file to generate a self-signed certificate.
- Ensure that the certificate is of type **Server**.

Creating a Self-Signed Certificate

As an alternative to using a public Certificate Authority (CA) to generate and sign a server certificate, you can operate your own CA and sign your own certificates. This section shows commands for creating a CA and generating a server certificate using the OpenSSL certificate server running on Linux. For detailed information about OpenSSL, see http://www.openssl.org.

Note These commands are to be entered on a Linux server with the OpenSSL package, not in the Cisco IMC.

Before You Begin

- Obtain and install a certificate server software package on a server within your organization.
- Ensure that the Cisco IMC time is set to the current time.

Procedure

	Command or Action	Purpose
Step 1	**openssl genrsa -out** *CA_keyfilename keysize* **Example:** `# openssl genrsa -out ca.key 2048`	This command generates an RSA private key that will be used by the CA. **Note** To allow the CA to access the key without user input, do not use the -des3 option for this command. The specified file name contains an RSA key of the specified key size.
Step 2	**openssl req -new -x509 -days** *numdays* **-key** *CA_keyfilename* **-out** *CA_certfilename*	This command generates a new self-signed certificate for the CA using the specified key. The certificate is valid for the specified period. The command prompts the user for additional certificate information.

	Command or Action	Purpose
	Example: `# openssl req -new -x509 -days 365 -key ca.key -out ca.crt`	The certificate server is an active CA.
Step 3	**echo "nsCertType = server" > openssl.conf** **Example:** `# echo "nsCertType = server" > openssl.conf`	This command adds a line to the OpenSSL configuration file to designate the certificate as a server-only certificate. This designation is a defense against a man-in-the-middle attack, in which an authorized client attempts to impersonate the server. The OpenSSL configuration file openssl.conf contains the statement "nsCertType = server".
Step 4	**openssl x509 -req -days** *numdays* **-in** *CSR_filename* **-CA** *CA_certfilename* **-set_serial 04 -CAkey** *CA_keyfilename* **-out** *server_certfilename* **-extfile openssl.conf** **Example:** `# openssl x509 -req -days 365 -in csr.txt -CA ca.crt -set_serial 04 -CAkey ca.key -out myserver05.crt -extfile openssl.conf`	This command directs the CA to use your CSR file to generate a server certificate. Your server certificate is contained in the output file.
Step 5	**openssl x509 -noout -text -purpose -in <cert file>** **Example:** `openssl x509 -noout -text -purpose -in <cert file>`	Verifies if the generated certificate is of type **Server**. **Note** If the values of the fields **Server SSL** and **Netscape SSL** server are not yes, ensure that openssl.conf is configured to generate certificates of type server.
Step 6	If the generated certificate does not have the correct validity dates, ensure the Cisco IMC time is set to the current time, and regenerate the certificate by repeating steps 1 through 5.	(Optional) Certificate with the correct validity dates is created.

This example shows how to create a CA and to generate a server certificate signed by the new CA. These commands are entered on a Linux server running OpenSSL.

```
# /usr/bin/openssl genrsa -out ca.key 2048
Generating RSA private key, 2048 bit long modulus
.............++++++
.....++++++
e is 65537 (0x10001)
# /usr/bin/openssl req -new -x509 -days 365 -key ca.key -out ca.crt
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a
DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
```

```
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [GB]:US
State or Province Name (full name) [Berkshire]:California
Locality Name (eg, city) [Newbury]:San Jose
Organization Name (eg, company) [My Company Ltd]:Example Incorporated
Organizational Unit Name (eg, section) []:Unit A
Common Name (eg, your name or your server's hostname) []:example.com
Email Address []:admin@example.com
# echo "nsCertType = server" > openssl.conf
# /usr/bin/openssl x509 -req -days 365 -in csr.txt -CA ca.crt -set_serial 01 -CAkey ca.key -out server.crt
-extfile openssl.conf
Signature ok
subject=/C=US/ST=California/L=San Jose/O=Example Inc./OU=Unit
A/CN=example.com/emailAddress=john@example.com
Getting CA Private Key
#
```

What to Do Next

Upload the new certificate to the Cisco IMC.

Creating a Self-Signed Certificate Using Windows

Before You Begin

- You must log in as a user with admin privileges to configure certificates.
- Ensure that the Cisco IMC time is set to the current time.

Procedure

Step 1 Open **IIS Manager** and navigate to the level you want to manage.

Step 2 In the **Features** area, double-click **Server Certificate**.

Step 3 In the **Action** pane, click **Create Self-Signed Certificate**.

Step 4 On the **Create Self-Signed Certificate** window, enter name for the certificate in the **Specify a friendly name for the certificate** field.

Step 5 Click **Ok**.

Step 6 (Optional) If the generated certificate does not have the correct validity dates, ensure the Cisco IMC time is set to the current time, and regenerate the certificate by repeating steps 1 through 5.
Certificate with the correct validity dates is created.

Uploading a Server Certificate

You can either browse and select the certificate to be uploaded to the server or copy the entire content of the signed certificate and paste it in the **Paste certificate content** text field and upload it.

Before You Begin

- You must log in as a user with admin privileges to upload a certificate.
- The certificate file to be uploaded must reside on a locally accessible file system.
- Ensure that the generated certificate is of type server.

Note You must first generate a CSR using the Cisco IMC Certificate Management menu, and you must use that CSR to obtain the certificate for uploading. Do not upload a certificate that was not obtained by this method.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Certificate Management**.

Step 3 In the **Actions** area, click **Upload Server Certificate**.
The **Upload Certificate** dialog box appears.

Step 4 In the **Upload Certificate** dialog box, update the following properties:

Name	Description
File field	The certificate file you want to upload.
Browse button	Opens a dialog box that allows you to navigate to the appropriate certificate file.
Paste Certificate content radio button	Opens a dialog box that allows you to copy the entire content of the signed certificate and paste it in the **Paste certificate content** text field. **Note** Ensure the certificate is signed before uploading.
Upload Certificate button	Allows you to upload the certificate.

Step 5 Click **Upload Certificate**.

CHAPTER 14

Managing Firmware

This chapter includes the following sections:

Cisco IMC Firmware

You can manage the following firmware components from a single page in the web UI:

- Adapter firmware —The main operating firmware, consisting of an active and a backup image, can be installed from different interfaces such as:
  - Host Upgrade Utility (HUU)
  - Web UI — Local and remote protocols
  - PMCLI —Remote protocols
  - XML API — Remote protocols

  You can upload a firmware image from either a local file system or a TFTP server.
- Bootloader firmware—The bootloader firmware cannot be installed from the Cisco IMC. You can install this firmware using the Host Upgrade Utility.

Firmware for the following individual components can be updated:

- BMC
- BIOS
- CMC

- SAS Expander
- Adapter

Firmware for the Hard Disk Drive (HDD) can also be installed from the same interfaces as the adapter firmware mentioned above.

Viewing Firmware Components

Procedure

Step 1 In the **Admin** menu, click **Firmware Management**.

Step 2 In the **General** tab's **Firmware Management** area, review the following information:

Name	Description
Update button	Opens a dialog box that allows you to install a firmware image file that is available to your local machine or on a remote server.
Activate button	Opens a dialog box that allows you to select which available firmware version you would like to activate on the server. **Important** If any firmware or BIOS updates are in progress, do not activate new firmware until those tasks complete.
Component column	The components in the chassis on a server. This can be one of the following: • BMC1 • BMC2 • BIOS1 • BIOS2 • CMC1 • CMC2 • SASEXP1 • SASEXP2 • (Server 1) Cisco RAID controller for UCS C3X60 Storage Servers • (Server 2) Cisco RAID controller for UCS C3X60 Storage Servers • Adapter-1 • Adapter-2

Name	Description
Running Version column	The firmware version of the component that is currently active.
Backup Version column	The alternate firmware version installed on the server, if any. The backup version is not currently running. To activate it, click **Activate**. **Note** When you install new firmware, any existing backup version is deleted and the new firmware becomes the backup version. You must manually activate the new firmware if you want the server to run the new version.
Bootloader Version column	The bootloader version associated with the boot-loader software of the component.
Status column	The status of the firmware activation on this server.
Progress in % column	The progress of the operation, in percentage.

What to Do Next

Update or activate firmware components.

Viewing the HDD Firmware

Procedure

Step 1 In the **Admin** menu, click **Firmware Management**.

Step 2 In the **Firmware Management** pane, click **HDD**.

Step 3 In the **HDD** tab's **HDD Firmware Management** area, review the following information:

Name	Description
Update button	Opens a dialog box that allows you to install a firmware image file that is available to your local machine or on a remote server.
Slot Number column	The slot in which the physical drive is present.
Vendor column	The vendor of the physical drive.
Product ID column	The product ID of the physical drive.

Name	Description
Product Rev Label column	The product revision number of the physical drive, if any.
Health column	The health of the physical drive.
Update Stage column	The status of the firmware activation of the physical drive.
Progress (%) column	The progress of the operation, in percentage.

What to Do Next

Update or activate HDD firmware.

Updating the Firmware

You can install the firmware package from a local disk or from a remote server, depending on the component you choose from the **Firmware Management** area. After you confirm the installation, BMC replaces the firmware version in the component's backup memory slot with the selected version.

Procedure

Step 1 In the **Admin** menu, click **Firmware Management**.

Step 2 In the **General** tab's **Firmware Management** area, review the following information:

Name	Description
Component column	The components in the chassis on a server. This can be one of the following: • BMC1 • BMC2 • BIOS1 • BIOS2 • CMC1 • CMC2 • SASEXP1 • SASEXP2 • (Server 1) Cisco RAID controller for UCS C3X60 Storage Servers • (Server 2) Cisco RAID controller for UCS C3X60 Storage Servers • Adapter-1 • Adapter-2
Running Version column	The firmware version of the component that is currently active.
Backup Version column	The alternate firmware version installed on the server, if any. The backup version is not currently running. To activate it, click **Activate**. **Note** When you install new firmware, any existing backup version is deleted and the new firmware becomes the backup version. You must manually activate the new firmware if you want the server to run the new version.
Bootloader Version column	The bootloader version associated with the boot-loader software of the component.
Status column	The status of the firmware activation on this server.
Progress in % column	The progress of the operation, in percentage.

Step 3 Select a component from the **Component** column and click **Update**.
The **Update Firmware** dialog box appears.

Step 4 Review the following information in the dialog box:

Name	Description
Install Firmware through Browser Client checkbox	If the firmware package resides on a local machine, click this radio button.
Install Firmware through Remote Server checkbox	If the firmware package resides on a remote server, click this radio button and complete the required fields.

Step 5 Click **Install Firmware** to begin download and installation.

What to Do Next

Activate firmware.

Activating the Firmware

Procedure

Step 1 In the **Admin** menu, click **Firmware Management**.

Step 2 In the **General** tab's **Firmware Management** area, review the following information:

Name	Description
Component column	The components in the chassis on a server. This can be one of the following: • BMC1 • BMC2 • BIOS1 • BIOS2 • CMC1 • CMC2 • SASEXP1 • SASEXP2 • (Server 1) Cisco RAID controller for UCS C3X60 Storage Servers • (Server 2) Cisco RAID controller for UCS C3X60 Storage Servers • Adapter-1 • Adapter-2
Running Version column	The firmware version of the component that is currently active.
Backup Version column	The alternate firmware version installed on the server, if any. The backup version is not currently running. To activate it, click **Activate**. **Note** When you install new firmware, any existing backup version is deleted and the new firmware becomes the backup version. You must manually activate the new firmware if you want the server to run the new version.
Bootloader Version column	The bootloader version associated with the boot-loader software of the component.
Status column	The status of the firmware activation on this server.
Progress in % column	The progress of the operation, in percentage.

Step 3 Select a component from the **Component** column and click **Activate Firmware**.
Depending on the component you choose, the activation process begins.

Important While the activation is in progress, do not:

- Reset, power off, or shut down the server
- Reboot or reset BMC
- Activate any other firmware
- Export technical support or configuration data

What to Do Next

Activate firmware.

Updating the HDD Firmware

Procedure

Step 1 In the **Admin** menu, click **Firmware Management**.

Step 2 In the **Firmware Management** pane, click **HDD**.

Step 3 In the **HDD** tab's **HDD Firmware Management** area, review the following information:

Name	Description
Update button	Opens a dialog box that allows you to install a firmware image file that is available to your local machine or on a remote server.
Slot Number column	The slot in which the physical drive is present.
Vendor column	The vendor of the physical drive.
Product ID column	The product ID of the physical drive.
Product Rev Label column	The product revision number of the physical drive, if any.
Health column	The health of the physical drive.
Update Stage column	The status of the firmware activation of the physical drive.
Progress (%) column	The progress of the operation, in percentage.

Step 4 Select a slot number from the **Slot Number** column and click **Update**.

The **Update Firmware** dialog box appears.

Step 5 Review the following information in the dialog box:

Name	Description
Install HDD Firmware through Browser Client checkbox	If the firmware package resides on a local machine, click this radio button.
Install HDD Firmware through Remote Server checkbox	If the firmware package resides on a remote server, click this radio button and complete the required fields.

Step 6 Click **Install Firmware** to begin download and installation.

What to Do Next

Activate HDD firmware.

CHAPTER 15

Viewing Faults and Logs

This chapter includes the following sections:

Faults Summary

Viewing the Fault Summary

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Faults Summary** tab, review the following information:

Table 1: Actions Area

Name	Description
Total	Displays the total number of rows in the Fault Entries table.
Column drop-down list	Allows you to choose the columns you wish to be displayed.

Name	Description
Show drop-down list	Customize the way you want to view fault entries using filters. These can be: • **Quick Filter** - Default view. • **Advanced Filter** - Filter options to display the fault entries based on one or more criteria. Using the matching rule, you can view entries matching all the rules or any one combination of rules you specified in the **Filter** fields. Click **Go** to view the entries matching the filter criteria that you set. Click the **Save** icon to save the filter criteria that you set. This becomes a user-defined filter which you can use later. **Note** The user-defined filter appears in the **Manage Preset Filters** dialog box. • **All** - Displays all entries • **Manage Preset Filters** - Displays user-defined filters. You can edit or remove the user-defined filter from this dialog box. • **List of pre-defined filters** - Displays the system-defined filters. **Note** You can use the **Filter** icon to hide or unhide the filter fields.

Table 2: Fault Entries Area

Name	Description
Time	The time when the fault occurred.
Severity	This can be one of the following: • **Cleared** - A fault or condition was cleared. • **Critical** • **Info** • **Major** • **Minor** • **Warning**
Code	The unique identifier assigned to the fault.

Name	Description
DN	The distinguished name (DN) is a hierarchical representation of the device endpoint and its instance on the server.
Probable Cause	The unique identifier associated with the event that caused the fault.
Description	More information about the fault. It also includes a proposed solution.

Fault History

Viewing Faults History

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Faults History** tab, review the following information

Table 3: Actions Area

Name	Description
Total	Displays the total number of rows in the Fault History table.
Column drop-down list	Allows you to choose the columns you wish to be displayed.

Name	Description
Show drop-down list	Customize the way you want to view fault history entries using filters. These can be: • **Quick Filter** - Default view. • **Advanced Filter** - Filter options to display the entries based on one or more criteria. Using the matching rule, you can view entries matching all the rules or any one combination of rules you specified in the **Filter** fields. Click **Go** to view the entries matching the filter criteria that you set. Click the **Save** icon to save the filter criteria that you set. This becomes a user-defined filter which you can use later. **Note** The user-defined filter appears in the **Manage Preset Filters** dialog box. • **All** - Displays all entries • **Manage Preset Filters** - Displays user-defined filters. You can edit or remove the user-defined filter from this dialog box. • **List of pre-defined filters** - Displays the system-defined filters. **Note** You can use the **Filter** icon to hide or unhide the filter fields.

Table 4: Faults History Area

Name	Description
Time	The time when the fault occurred.

Name	Description
Severity	This can be one of the following: • **Emergency** • **Alert** • **Critical** • **Error** • **Warning** • **Notice** • **Informational** • **Debug**
Source	The software module that logged the event.
Probable Cause	The unique identifier associated with the event that caused the fault.
Description	More information about the fault. It also includes a proposed solution.

What to Do Next

Cisco IMC Log

Viewing the Cisco IMC Log

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Cisco IMC Log** tab, review the following information:

Table 5: Actions Area

Name	Description
Clear Log button	Clears all log files. **Note** This option is only available if your user ID is assigned the **admin** or **user** user role.
Total	Displays the total number of rows in the Cisco IMC Log table.
Column drop-down list	Allows you to choose the columns you wish to be displayed.
Show drop-down list	Customize the way you want to view Cisco IMC log entries using filters. These can be: • **Quick Filter** - Default view. • **Advanced Filter** - Filter options to display the log entries based on one or more criteria. Using the matching rule, you can view entries matching all the rules or any one combination of rules you specified in the **Filter** fields. Click **Go** to view the entries matching the filter criteria that you set. Click the **Save** icon to save the filter criteria that you set. This becomes a user-defined filter which you can use later. **Note** The user-defined filter appears in the **Manage Preset Filters** dialog box. • **All** - Displays all entries • **Manage Preset Filters** - Displays user-defined filters. You can edit or remove the user-defined filter from this dialog box. • **List of pre-defined filters** - Displays the system-defined filters. **Note** You can use the **Filter** icon to hide or unhide the filter fields.

Table 6: Cisco IMC Log Table

Name	Description
Time column	The date and time the event occurred.

Name	Description
Severity column	The event severity. This can be one of the following: • **Emergency** • **Alert** • **Critical** • **Error** • **Warning** • **Notice** • **Informational** • **Debug**
Source column	The software module that logged the event.
Description column	A description of the event.

System Event Log

Viewing System Event Logs

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 On the **System Event Log** tab, review the following information:

Table 7: Actions Area

Name	Description
Clear Log button	Clears all events from the log file. **Note** This option is only available if your user ID is assigned the **admin** or **user** user role.
Chassis drop-down list	Select a chassis or a server to view its logs.

Name	Description
Total	Displays the total number of rows in the System Event Log table.
Column drop-down list	Allows you to choose the columns you wish to be displayed.
Show drop-down list	Customize the way you want to view events using filters. These can be: • **Quick Filter** - Default view. • **Advanced Filter** - Filter options to display the events based on one or more criteria. Using the matching rule, you can view entries matching all the rules or any one combination of rules you specified in the **Filter** fields. Click **Go** to view the entries matching the filter criteria that you set. Click the **Save** icon to save the filter criteria that you set. This becomes a user-defined filter which you can use later. **Note** The user-defined filter appears in the **Manage Preset Filters** dialog box. • **All** - Displays all entries • **Manage Preset Filters** - Displays user-defined filters. You can edit or remove the user-defined filter from this dialog box. • **List of pre-defined filters** - Displays the system-defined filters. **Note** You can use the **Filter** icon to hide or unhide the filter fields.

Table 8: System Event Log Table

Name	Description
Time column	The date and time the event occurred.
Severity column	The severity field includes both text and a color-coded icon. For the icon, green indicates normal operation, yellow is informational, and warning, critical, and non-recoverable errors are shown in shades of red.
Description column	A description of the event.

Logging Controls

Viewing Logging Controls

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Logging Controls** tab, review the following information:
Remote Logging

Name	Description
Enabled check box	If checked, the Cisco IMC sends log messages to the Syslog server named in the **IP Address** field.
Host Name/IP Address field	The address of the Syslog server on which the Cisco IMC log should be stored. You can set an IPv4 or IPv6 address or a domain name as the remote system address.
Port field	Enter a destination port number of the Syslog server within the range 1 to 65535. The default port number is 514.
Minimum Severity to Report field	Specify the lowest level of messages that will be included in the remote logs. You can select one of the following: • **Emergency** • **Alert** • **Critical** • **Error** • **Warning** • **Notice** • **Informational** • **Debug**

Note The Cisco IMC does not remotely log any messages with a severity below the selected severity. For example, if you select **Error**, then the Cisco IMC remote log contains all messages with the severity **Emergency**, **Alert**, **Critical**, or **Error**. It does not show **Warning**, **Notice**, **Informational**, or **Debug** messages.

Local Logging

This area displays only the **Minimum Severity to Report** drop-down list as shown in the table above. You can specify the lowest level of messages to be included in the local log

What to Do Next

Sending the Cisco IMC Log to a Remote Server

You can configure profiles for one or two remote syslog servers to receive Cisco IMC log entries.

Before You Begin

- The remote syslog server must be configured to receive logs from a remote host.
- The remote syslog server must be configured to receive all types of logs, including authentication-related logs.
- The remote syslog server's firewall must be configured to allow syslog messages to reach the syslog server.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In either of the **Remote Syslog Server** areas, complete the following fields:

Name	Description
Enabled check box	If checked, the Cisco IMC sends log messages to the Syslog server named in the **IP Address** field.
Host Name/IP Address field	The address of the Syslog server on which the Cisco IMC log should be stored. You can set an IPv4 or IPv6 address or a domain name as the remote system address.
Port field	Enter a destination port number of the Syslog server within the range 1 to 65535. The default port number is 514.

Step 4 (Optional) In the **Minimum Severity to Report** drop-down list, specify the lowest level of messages that will be included in the remote logs.
You can select one of the following, in decreasing order of severity:

- **Emergency**
- **Alert**
- **Critical**
- **Error**
- **Warning**
- **Notice**
- **Informational**
- **Debug**

Note Cisco IMC does not remotely log any messages with a severity below the selected severity. For example, if you select **Error**, then the Cisco IMC remote log will contain all messages with the severity Emergency, Alert, Critical, or Error. It will not show Warning, Notice, Informational, or Debug messages.

Step 5 Click **Save Changes**.

Configuring the Cisco IMC Log Threshold

Before You Begin

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Local Logging** area, use the **Minimum Severity to Report** drop-down list to specify the lowest level of messages that will be included in the Cisco IMC log.
You can select one of the following, in decreasing order of severity:

- **Emergency**
- **Alert**
- **Critical**
- **Error**
- **Warning**
- **Notice**
- **Informational**
- **Debug**

Note Cisco IMC does not log any messages with a severity below the selected severity. For example, if you select **Error**, then the Cisco IMC log will contain all messages with the severity Emergency, Alert, Critical, or Error. It will not show Warning, Notice, Informational, or Debug messages.

Sending a Test Cisco IMC Log to a Remote Server

Before You Begin

- The remote syslog server must be configured to receive logs from a remote host.
- The remote syslog server must be configured to receive all types of logs, including authentication-related logs.
- The remote syslog server's firewall must be configured to allow syslog messages to reach the syslog server.

Procedure

Step 1 In the **Navigation** pane, click the **Chassis** menu.

Step 2 In the **Chassis** menu, click **Faults and Logs**.

Step 3 In the **Faults and Logs** pane, click the **Logging Controls** tab.

Step 4 In the **Action** area, click **Send Test Syslog**.
A test Cisco IMC log is sent to the configured remote servers.

CHAPTER 16

Server Utilities

This chapter includes the following sections:

Exporting Technical Support Data

Exporting Technical Support Data to a Remote Server

Perform this task when requested by the Cisco Technical Assistance Center (TAC). This utility creates a summary report containing configuration information, logs and diagnostic data that will help TAC in troubleshooting and resolving a technical issue.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Export Technical Support Data to Remote Server**.

Step 4 In the **Export Technical Support Data** dialog box, complete the following fields:

Name	Description
Select Component checkbox	Check to select a component. This can be one of the following: • **All** • **CMC** • **PEERCMC** • **BMC 1** • **BMC 2** Depending on the component you choose, technical support data for that component is exported. **Note** If you choose **All**, the technical data for all components is exported.
Export Technical Support Data to drop-down list	The remote server type. This can be one of the following: • **TFTP Server** • **FTP Server** • **SFTP Server** • **SCP Server** • **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Server IP/Hostname field	The IP address or hostname of the server on which the support data file should be stored. Depending on the setting in the **Export Technical Support Data to** drop-down list, the name of the field may vary.
Path and Filename field	The path and filename Cisco IMC should use when exporting the file to the remote server. **Note** If the server includes any of the supported network adapter cards, the data file also includes technical support data from the adapter card.
Username	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP.
Password	The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.

Step 5 Click **Export**.

What to Do Next

Provide the generated report file to Cisco TAC.

Downloading Technical Support Data to a Local File

Perform this task when requested by the Cisco Technical Assistance Center (TAC). This utility creates a summary report containing configuration information, logs and diagnostic data that will help TAC in troubleshooting and resolving a technical issue.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Generate Technical Support Data for Local Download**.

Step 4 In the **Download Technical Support Data to Local File** dialog box, complete the following fields:

Name	Description
Generate Technical Support Data radio button	Cisco IMC displays this radio button when there is no technical support data file to download.
Note **Select Component** checkbox	Check to select a component. This can be one of the following: • **All** • **CMC** • **PEERCMC** • **BMC 1** • **BMC 2** Depending on the component you choose, technical support data for that component is downloaded. **Note** If you choose **All**, the technical data for all components is downloaded.
Download to local file radio button	Cisco IMC enables this radio button when a technical support data file is available to download. To download the existing file, select this option and click **Download**. **Note** If the server includes any of the supported network adapter cards, the data file also includes technical support data from the adapter card.

Step 5 Click **Generate** to create the data file. When data collection is complete, click **Download Technical Support Data to Local File** in the **Actions** area to download the file..

What to Do Next

Provide the generated report file to Cisco TAC.

Resetting to Factory Default

On rare occasions, such as an issue with the current running firmware, troubleshooting a server may require you to reset the chassis or BMC to the factory default. When this happens, all user-configurable settings are reset.

This procedure is not part of the normal server maintenance. After you reset the chassis or BMC, you are logged off and must log in again. You may also lose connectivity and may need to reconfigure the network settings. Some of the inventory information may not be available during this transition.

When you reset the BMC to factory settings, the serial number is displayed in the Cisco IMCXXXXXX format, where XXXXXX is the serial number of the server.

Before You Begin

You must log in as a user with admin privileges to reset the chassis or BMC to factory defaults.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Reset to Factory Default**.

Step 4 In the **Reset to Factory Default** dialog box, review the following information:

Actions	Description
Reset to factory Default Setting of drop-down list	Allows you to select the chassis or BMCs for which you want to reset the factory default setting. This can be one of the following: • **Chassis** • **BMC1** • **BMC2**

Step 5 Click **Reset** to reset the selected component to the factory-default settings.
A reboot of Cisco IMC while the host is performing BIOS POST (Power on Self Test) or is in EFI shell powers down the host for a short amount of time. Cisco IMC powers on when it is ready. Upon restart, the network configuration mode is set to **Cisco Card** mode by default.

Exporting and Importing the Cisco IMC Configuration

Exporting and Importing the Cisco IMC Configuration

To perform a backup of the Cisco IMC configuration, you take a snapshot of the system configuration and export the resulting Cisco IMC configuration file to a location on your network. The export operation saves information from the management plane only; it does not back up data on the servers. Sensitive configuration information such as user accounts and the server certificate are not exported.

You can restore an exported Cisco IMC configuration file to the same system or you can import it to another Cisco IMC system, provided that the software version of the importing system is the same as or is configuration-compatible with the software version of the exporting system. When you import a configuration file to another system as a configuration template, you must modify system-specific settings such as IP addresses and host names. An import operation modifies information on the management plane only.

The Cisco IMC configuration file is an XML text file whose structure and elements correspond to the Cisco IMC command modes.

When performing an export or import operation, consider these guidelines:

- You can perform an export or an import while the system is up and running. While an export operation has no impact on the server or network traffic, some modifications caused by an import operation, such as IP address changes, can disrupt traffic or cause a server reboot.
- You cannot execute an export and an import simultaneously.

You can perform an import or an export operation on the following features:

- Cisco IMC version

Note You can only export this information.

- Network settings
- Technical support
- Logging control for local and remote logs
- Power policies
- BIOS - BIOS Parameters

Note Precision boot is not supported.

- Communication services
- Remote presence

- User management - LDAP
- SNMP
- Dynamic Storage Configuration
- Chassis Description

Exporting the Cisco IMC Configuration

Note For security reasons, this operation does not export user accounts or the server certificate.

Before You Begin

Obtain the backup remote server IP address.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Export Configuration**.

Step 4 In the **Export Configuration** dialog box, complete the following fields:

Name	Description
Select Component for export checkbox	Check to select a component. This can be one of the following: • **Chassis** • **BMC 1** • **BMC 2** Depending on the component you choose, the configuration of that component is exported.
Export to a local file radio button	Select this option and click **Export** to save the XML configuration file to a drive that is local to the computer running the Cisco IMC GUI. When you select this option, Cisco IMC GUI displays a **File Download** dialog box that lets you navigate to the location to which the configuration file should be saved.
Export to Remote server radio button	Select this option to save the XML configuration file to a remote server. When you select this option, Cisco IMC GUI displays the remote server fields.

Name	Description
Export to drop-down list	The remote server type. This can be one of the following: • **TFTP Server** • **FTP Server** • **SFTP Server** • **SCP Server** • **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Server IP/Hostname field	The IPv4 or IPv6 address, or hostname of the server to which the configuration file will be exported. Depending on the setting in the **Export to** drop-down list, the name of the field may vary.
Path and Filename field	The path and filename Cisco IMC should use when exporting the file to the remote server.
Username	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP.
Password	The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.
Passphrase	The passphrase that uses the AES256 algorithm to encrypt the LDAP and SNMP v3 user passwords in the exported configuration files. Enter a string of 6 to 127 characters. Do not enter the following characters: %, ^, <, ~, ` This option is available only with CMC export.

Step 5 Click **Export**.

Importing the Cisco IMC Configuration

Before You Begin

If you want to restore the SNMP configuration information when you import the configuration file, make sure that SNMP is disabled on this server before you do the import. If SNMP is enabled when you perform the import, Cisco IMC does not overwrite the current values with those saved in the configuration file.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Import Configuration**.

Step 4 In the **Import Configuration** dialog box, complete the following fields:

Name	Description
Select Component for import checkbox	Check to select a component. This can be one of the following: • **Chassis** • **BMC 1** • **BMC 2** Depending on the component you choose, the configuration of that component is imported.
Import from a local file radio button	Select this option and click **Import** to navigate to the XML configuration file stored on a drive that is local to the computer running the Cisco IMC GUI. When you select this option, Cisco IMC GUI displays a **Browse** button that lets you navigate to the file you want to import.
Import from Remote server radio button	Select this option to import the XML configuration file from a remote server. When you select this option, Cisco IMC GUI displays the remote server fields.

Name	Description
Import from drop-down list	The remote server type. This can be one of the following: • **TFTP Server** • **FTP Server** • **SFTP Server** • **SCP Server** • **HTTP Server** **Note** If you chose SCP or SFTP as the remote server type while performing this action, a pop-up window is displayed with the message *Server (RSA) key fingerprint is <server_finger_print _ID> Do you wish to continue?*. Click Yes or No depending on the authenticity of the server fingerprint. The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.
Server IP/Hostname field	The IPv4 or IPv6 address, or hostname of the server on which the configuration file resides. Depending on the setting in the **Import from** drop-down list, the name of the field may vary.
Path and Filename field	The path and filename of the configuration file on the remote server.
Username	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or HTTP.
Password	The password for the remote server username. This field does not apply if the protocol is TFTP or HTTP.
Passphrase	The passphrase that uses the AES256 algorithm to encrypt the LDAP and SNMP v3 user passwords in the imported configuration files. Enter a string of 6 to 127 characters. Do not enter the following characters: %, ^, <, ~, ` This option is available only with CMC import. **Note** If you edit the encrypted sections in the configuration file and try to import it, the edits will be ignored and the import operation displays a partially successful message.

Step 5 Click **Import**.

Generating Non Maskable Interrupts to the Host

In some situations, the server might hang and not respond to traditional debug mechanisms. By generating a non maskable interrupt (NMI) to the host, you can create and send a crash dump file of the server and use it to debug the server.

Depending on the type of operating system associated with the server, this task might restart the OS.

Before You Begin

- You must log in as a user with admin privileges.
- The server must be powered on.

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Generate NMI to Host**.

Step 4 In the **Generate NMI to Host** dialog box, review the following information:

Actions	Description
Generate NMI to drop-down list	Allows you to select the server for which you want to generate the non maskable interrupt (NMI). This can be one of the following: • **Server 1** • **Server 2**

Step 5 Click **Send**.
This action sends an NMI signal to the host, which might restart the OS.

Adding or Updating the Cisco IMC Banner

You can add or update the Cisco IMC banner by entering important information such as copyright or customized messages. Complete the following steps:

Before You Begin

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, click **Add/Update Cisco IMC Banner**.

Step 4 In the **Add/Update Cisco IMC Banner** dialog box, complete the following fields:

Name	Description
Banner (80 Chars per line. Max 2K Chars.) field	Enter copyright information or messages that you want to display on the login screen, before logging on to the Web UI or the command line interface.
Restart SSH checkbox	When checked, the active SSH sessions are terminated after you click the **Save Banner** button.

Step 5 Click **Save Banner**.

What to Do Next

Viewing Cisco IMC Last Reset Reason

Procedure

Step 1 In the **Navigation** pane, click the **Admin** menu.

Step 2 In the **Admin** menu, click **Utilities**.

Step 3 In the **Actions** area of the **Utilities** pane, view the following information under the **Last Reset Reason** area.

Name	Description
Component field	The component that was last reset.
Status field	The reason why the component was last reset. This can be one of the following: • **watchdog-reset—**The watchdog-timer resets when the Cisco IMC memory reaches full capacity. • **ac-cycle—** PSU power cables are removed (no power input). • **graceful-reboot—** Cisco IMC reboot occurs.

CHAPTER 17

Troubleshooting

This chapter includes the following sections:

Recording the Last Boot Process

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Server** pane, click the **TroubleShooting** tab.

Step 3 In the **Bootstrap Process Recording** area of the **Troubleshooting** tab, check **Enable Recording** check-box. By default, this option is enabled.

Caution This task is for troubleshooting purpose, and might impact Cisco IMC performance if it is enabled all the time.

Step 4 (Optional) If you want to record the boot process until BIOS POST, then check **Stop On BIOS POST** check-box.

Step 5 Click **Save Changes**

Step 6 On the tool bar above the **Work** pane, click **Power On Server**.

Step 7 In the **Actions** area, of the **Bootstrap Process Recording** pane, click **Play Recording**.
A confirmation dialog box with instructions on supported Java version appears.

Step 8 Review the instructions and click **Ok**.
The **DVR Player Controls** dialog box opens. This dialog box plays the recording of the last boot process. If you have enabled **Stop On BIOS POST** option then the system plays the recording process only till BIOS POST.

This recording can be reviewed to analyze the factors that caused the system to reboot.

Step 9 In the **Actions** area of the **Bootstrap Process Recording** area, click **Download Recording**.
Follow the instructions to download.

Note The file is saved in a `.dvc` format to a local drive. You can view this recording using KVM player or an offline player. Every time you choose **Download Recording** option, the last boot process is recorded, it autogenerate the file name, and save it in the path specified earlier.

Step 10 Once the download is complete, you can select the file that you want play the video of the recording, and click **Open**.
A **DVR Player Controls** window opens and plays the video of the selected file.

Recording the Last Crash

Procedure

Step 1 In the **Navigation** pane, click the **Compute** menu.

Step 2 In the **Server** pane, click the **TroubleShooting** tab.

Step 3 In the **Crash Recording** area of the **Troubleshooting** tab, check the **Enable Recording** check-box.

Caution This task is for troubleshooting purpose, and might impact Cisco IMC performance if it is enabled all the time.

Step 4 Click **Save Changes**.
Capture Recording button in the **Actions** area is enabled.

Step 5 (Optional) In the **Actions** area, click **Capture Recording**, to capture the recording of the system that crashed automatically.

Note If you choose this option, it overwrites the existing crash records file. Click **OK** to continue.

Step 6 Click **Play Recording** in the **Actions** area to view the recording of the operations that ran on the server.
A confirmation dialog box with instructions on supported Java version appears.

Step 7 Review the instructions and click **Ok**.
The **DVR Player Controls** dialog box appears. This dialog box plays the recording of the operations that ran on the server in the last few minutes. This recording can be reviewed to analyze the factors that caused system to crash.

Step 8 In the **Actions** area of the **Crash Recording** area, click **Download Recording**.
Follow the instructions to download.

Note The file is saved in a `.dvc` format to a local drive. You can view this recording using KVM player or an offline player. Every time you choose **Download Recording** option, the last crash process is recorded, it autogenerate the file name, and save it in the path specified earlier.

Step 9 Once the download is complete, you can select the file that you want play the video of the recording, and click **Open**.
A **DVR Player Controls** window opens and plays the video of the selected file.

Downloading a DVR Player

Procedure

Step 1 In the **Navigation** pane, click the **Server** tab.

Step 2 On the **Server** tab, click **Troubleshooting**.

Step 3 In the **Player** area of the **Troubleshooting** tab, click **Download Player**.

Step 4 Follow the instructions to download. These files are saved to your local drive as a zipped file in a .tgz file format.
The offline player is stored for Windows, Linux, and MAC.

Step 5 Extract the zip file. The zip file generally gets saved below the bootstrap file, and its name follows the format `offline.tgz`

Step 6 Open the script file that you want to review the video recording.

Note If you want to play the recording for Windows, then ensure that the Java version running on your system and in the script file are the same. If the Windows script file fails to play the recording, then follow these steps:

a) Extract the Windows script file to your desktop.
b) Open the file using notepad.
c) Search for jre, and replace the Java version to match the version running on your system. By default, the Java version is set to jre7.
d) Save the file.
After you update the Java version, you can delete the extracted files from your desktop.

Note Verification of Java version is required only for Windows OS. For Linux and MAC, the Java version is picked automatically.

Step 7 Navigate to the folder in which these files are downloaded and open the script file that you want to play the video recording.
The DVR player is launched, playing the video of the operations that ran on the server.

Playing a Recorded Video Using the DVR Player on the KVM Console

Procedure

Step 1 In the **Navigation** pane, click the **Server** tab.

Step 2 On the **Server** tab, click **Sensors**.

Step 3 In the **Remote Presence** pane, click the **Virtual KVM** tab.

Step 4 In the **Actions** area of the **Virtual KVM** tab, click **Launch KVM Console**.

Note You can also launch KVM console by clicking **Launch KVM Console** button on the toolbar displayed above the **Work** pane.

The **KVM Console** opens in a separate window.

Step 5 On the **KVM Console** window, choose **Tools** > **Recorder /Playback Controls**.
A DVR Player Controls window opens.

Step 6 On the **DVR Player Controls** window, click **Open** button.

Step 7 Choose the file that you want to play the recording, and click **Open**.
The DVR player is launched, playing the video of the operations that ran on the server.

APPENDIX A

BIOS Parameters by Server Model

This appendix contains the following sections:

C3X60 Servers

Main BIOS Parameters for C3260 Servers

Main BIOS Parameters

Name	Description
TPM Support	TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following: • **Disabled**—The server does not use the TPM. • **Enabled**—The server uses the TPM. **Note** We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Advanced BIOS Parameters for C3260 Servers

Processor Configuration Parameters

Name	Description
Intel Hyper-Threading Technology	Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following: • **Disabled—**The processor does not permit hyperthreading. • **Enabled—**The processor allows for the parallel execution of multiple threads. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Number of Enabled Cores	Allows you to disable one or more of the physical cores on the server. This can be one of the following: • **All—**Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores. • **1** through ***n*—**Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Execute Disable	Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following: • **Disabled—**The processor does not classify memory areas. • **Enabled—**The processor classifies memory areas. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Name	Description
Intel VT	Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following: • **Disabled—**The processor does not permit virtualization. • **Enabled—**The processor allows multiple operating systems in independent partitions. **Note** If you change this option, you must power cycle the server before the setting takes effect.
Intel VT-d	Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following: • **Disabled—**The processor does not use virtualization technology. • **Enabled—**The processor uses virtualization technology.
Intel VT-d Coherency Support	Whether the processor supports Intel VT-d Coherency. This can be one of the following: • **Disabled—**The processor does not support coherency. • **Enabled—**The processor uses VT-d Coherency as required.
Intel VT-d ATS Support	Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following: • **Disabled—**The processor does not support ATS. • **Enabled—**The processor uses VT-d ATS as required.

Name	Description
CPU Performance	Sets the CPU performance profile for the server. The performance profile consists of the following options: • DCU Streamer Prefetcher • DCU IP Prefetcher • Hardware Prefetcher • Adjacent Cache-Line Prefetch This can be one of the following: • **Enterprise—**All options are enabled. • **High Throughput—**Only the DCU IP Prefetcher is enabled. The rest of the options are disabled. • **HPC—**All options are enabled. This setting is also known as high performance computing. • **Custom—**All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.
Hardware Prefetcher	Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following: • **Disabled—**The hardware prefetcher is not used. • **Enabled—**The processor uses the hardware prefetcher when cache issues are detected.
Adjacent Cache Line Prefetcher	Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following: • **Disabled—**The processor only fetches the required line. • **Enabled—** The processor fetches both the required line and its paired line.

Name	Description
DCU Streamer Prefetch	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines. • **Enabled—**The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.
DCU IP Prefetcher	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not preload any cache data. • **Enabled—**The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.
Direct Cache Access Support	Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following: • **Disabled—**Data from I/O devices is not placed directly into the processor cache. • **Enabled—**Data from I/O devices is placed directly into the processor cache.

Name	Description
Power Technology	Enables you to configure the CPU power management settings for the following options: • Enhanced Intel Speedstep Technology • Intel Turbo Boost Technology • Processor Power State C6 Power Technology can be one of the following: • **Custom—**The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters. • **Disabled—**The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored. • **Energy Efficient—**The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.
Enhanced Intel Speedstep Technology	Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following: • **Disabled—**The processor never dynamically adjusts its voltage or frequency. • **Enabled—**The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power. We recommend that you contact your operating system vendor to make sure the operating system supports this feature. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.

Name	Description
Intel Turbo Boost Technology	Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following: • **Disabled—**The processor does not increase its frequency automatically. • **Enabled—**The processor utilizes Turbo Boost Technology if required. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor Power State C6	Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following: • **Disabled—**The BIOS does not send the C6 report. • **Enabled—**The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor Power State C1 Enhanced	Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following: • **Disabled—**The CPU continues to run at its maximum frequency in C1 state. • **Enabled—**The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.
Frequency Floor Override	Whether the CPU is allowed to drop below the maximum non-turbo frequency when idle. This can be one of the following: • **Disabled—** The CPU can drop below the maximum non-turbo frequency when idle. This option decreases power consumption but may reduce system performance. • **Enabled—** The CPU cannot drop below the maximum non-turbo frequency when idle. This option improves system performance but may increase power consumption.

Name	Description
P-STATE Coordination	Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification. • **HW_ALL—**The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package). • **SW_ALL—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors. • **SW_ANY—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Energy Performance	Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following: • **Balanced Energy** • **Balanced Performance** • **Energy Efficient** • **Performance**

Memory Configuration Parameters

Name	Description
Select Memory RAS	How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following: • **Maximum Performance—**System performance is optimized. • **Mirroring—**System reliability is optimized by using half the system memory as backup. • **Lockstep—**If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.
DRAM Clock Throttling	Allows you to tune the system settings between the memory bandwidth and power consumption. This can be one of the following: • **Balanced—** DRAM clock throttling is reduced, providing a balance between performance and power. • **Performance—**DRAM clock throttling is disabled, providing increased memory bandwidth at the cost of additional power. • **Energy Efficient—**DRAM clock throttling is increased to improve energy efficiency.
NUMA	Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following: • **Disabled—**The BIOS does not support NUMA. • **Enabled—**The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.

Name	Description
Low Voltage DDR Mode	Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following: • **Power Saving Mode—**The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low. • **Performance Mode—**The system prioritizes high frequency operations over low voltage operations.
DRAM Refresh rate	Allows you to set the rate at which the DRAM cells are refreshed. This can be one of the following: • **1x—**DRAM cells are refreshed every 64ms. • **2x—**DRAM cells are refreshed every 32ms. • **3x—**DRAM cells are refreshed every 21ms. • **4x—**DRAM cells are refreshed every 16ms. • **Auto—**DRAM cells refresh rate is automatically chosen by the BIOS based on the system configuration. This is the recommended setting for this parameter.
Channel Interleaving	Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some channel interleaving is used. • **2 Way** • **3 Way** • **4 Way—**The maximum amount of channel interleaving is used.

Name	Description
Rank Interleaving	Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some rank interleaving is used. • **2 Way** • **4 Way** • **8 Way—**The maximum amount of rank interleaving is used.
Patrol Scrub	Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following: • **Disabled—**The system checks for memory ECC errors only when the CPU reads or writes a memory address. • **Enabled—**The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.
Demand Scrub	Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following: • **Disabled—** Single bit memory errors are not corrected. • **Enabled—** Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.

Name	Description
Altitude	The approximate number of meters above sea level at which the physical server is installed. This can be one of the following: • **Auto—**The CPU determines the physical elevation. • **300 M—**The server is approximately 300 meters above sea level. • **900 M—**The server is approximately 900 meters above sea level. • **1500 M—**The server is approximately 1500 meters above sea level. • **3000 M—**The server is approximately 3000 meters above sea level.

QPI Configuration Parameters

Name	Description
QPI Link Frequency Select	The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following: • **Auto—**The CPU determines the QPI link frequency. • **6.4 GT/s** • **7.2 GT/s** • **8.0 GT/s**

SATA Configuration Parameters

Name	Description
SATA Mode	Mode of operation of Serial Advanced Technology Attachment (SATA) Solid State Drives (SSD). • **Disabled—** All SATA ports is disabled, and drivers are not enumerated. • **AHCI Mode—**The default mode. Drives operate according to newer standard of Advance Host Controller Interface(AHCI).

USB Configuration Parameters

Name	Description
Legacy USB Support	Whether the system supports legacy USB devices. This can be one of the following: • **Disabled—**USB devices are only available to EFI applications. • **Enabled—**Legacy USB support is always available. • **Auto—**Disables legacy USB support if no USB devices are connected.
Port 60/64 Emulation	Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following: • **Disabled—**60h/64 emulation is not supported. • **Enabled—**60h/64 emulation is supported. You should select this option if you are using a non-USB aware operating system on the server.
All USB Devices	Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following: • **Disabled—**All USB devices are disabled. • **Enabled—**All USB devices are enabled.
USB Port: Rear	Whether the rear panel USB devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system. • **Enabled—**Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.
USB Port: Internal	Whether the internal USB devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system. • **Enabled—**Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.

Name	Description
USB Port: KVM	Whether the KVM ports are enabled or disabled. This can be one of the following: • **Disabled—**Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window. • **Enabled—**Enables the KVM keyboard and/or mouse devices.
USB Port: vMedia	Whether the virtual media devices are enabled or disabled. This can be one of the following: • **Disabled—**Disables the vMedia devices. • **Enabled—**Enables the vMedia devices.

PCI Configuration Parameters

Name	Description
PCI ROM CLP	PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled. • **Enabled—** Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately. • **Disabled—**The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.
ASPM Support	Allows you to set the level of ASPM (Active Power State Management) support in the BIOS. This can be one of the following: • **Disabled—**ASPM support is disabled in the BIOS. • **Force L0s—**Force all links to L0 standby (L0s) state. • **Auto—**The CPU determines the power state.

Serial Configuration Parameters

Name	Description
Out-of-Band Mgmt Port	Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following: • **Disabled—**Configures the COM port 0 as a general purpose port for use with the Windows Operating System. • **Enabled—**Configures the COM port 0 as a remote management port for Windows Emergency Management services.
Console Redirection	Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following: • **Disabled—**No console redirection occurs during POST. • **COM 0—**Enables console redirection on COM port 0 during POST. • **COM 1—**Enables console redirection on COM port 1 during POST.
Terminal Type	What type of character formatting is used for console redirection. This can be one of the following: • **PC-ANSI—**The PC-ANSI terminal font is used. • **VT100—**A supported vt100 video terminal and its character set are used. • **VT100+—**A supported vt100-plus video terminal and its character set are used. • **VT-UTF8—**A video terminal with the UTF-8 character set is used. **Note** This setting must match the setting on the remote terminal application.

Name	Description
Bits per second	What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following: • **9600—**A 9,600 BAUD rate is used. • **19200—**A 19,200 BAUD rate is used. • **38400—**A 38,400 BAUD rate is used. • **57600—**A 57,600 BAUD rate is used. • **115200—**A 115,200 BAUD rate is used. **Note** This setting must match the setting on the remote terminal application.
Flow Control	Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following: • **None—**No flow control is used. • **Hardware RTS/CTS—**RTS/CTS is used for flow control. **Note** This setting must match the setting on the remote terminal application.
Putty KeyPad	Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following: • **VT100—**The function keys generate ESC OP through ESC O[. • **LINUX—**Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E. • **XTERMR6—**Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate **ESC OP** through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals. • **SCO—**The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{. • **ESCN—**The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~. • **VT400—**The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.

Name	Description
Redirection After BIOS POST	Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following: • **Always Enable—**BIOS Legacy console redirection is active during the OS boot and run time. • **Bootloader—**BIOS Legacy console redirection is disabled before giving control to the OS boot loader.

LOM and PCIe Slots Configuration Parameters

Name	Description
CDN Support for VIC	Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following: • **Disabled—** CDN support for VIC cards is disabled. • **Enabled—** CDN support is enabled for VIC cards. **Note** CDN support for VIC cards work with Windows 2012 or the latest OS only.
All PCIe Slots OptionROM	Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following: • **Disabled—**The Option ROM for all PCIe slots are not available. • **Enabled—**The Option ROMs for all the PCIe slots are available. • **UEFI Only—**The Opiton ROMs for slot ***n*** are available for UEFI only. • **Legacy Only—**The Option ROM for slot ***n*** are available for legacy only.
PCIe Slot:*n* OptionROM	Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following: • **Disabled—**The Option ROM for slot ***n*** is not available. • **Enabled—**The Option ROM for slot ***n*** is available. • **UEFI Only—**The Option ROM for slot ***n*** is available for UEFI only. • **Legacy Only—**The Option ROM for slot ***n*** is available for legacy only.

Name	Description
PCIe Mezzanine OptionROM	Whether the PCIe mezzanine slot expansion ROM is available to the server. This can be one of the following: • **Disabled—** The Option ROM for slot ***M*** is not available. • **Enabled—** The Option ROM for slot ***M*** is available. • **UEFI Only—**The Option ROM for slot ***M*** is available for UEFI only. • **Legacy Only—**The expansion slot for slot ***M*** is available for legacy only.
SIOC1 Link Speed	System IO Controller 1 (SIOC1) add-on slot 1 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.
SIOC2 Link Speed	System IO Controller 2 (SIOC2) add-on slot 2 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.
Mezz Link Speed **set PcieSlotMLinkSpeed**	Mezz link speed. This can be one of the following: • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—**The default link speed. Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.

Server Management BIOS Parameters for C3260 Servers

Server Management BIOS Parameters

Name	Description
FRB-2 Timer	Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following: • **Disabled—**The FRB2 timer is not used. • **Enabled—**The FRB2 timer is started during POST and used to recover the system if necessary.
OS Watchdog Timer	Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following: • **Disabled—**The watchdog timer is not used to track how long the server takes to boot. • **Enabled—**The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the **OS Boot Watchdog Timer Timeout** field, the Cisco IMC logs an error and takes the action specified in the **OS Boot Watchdog Policy** field.
OS Watchdog Timer Timeout	If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following: • **5 Minutes—**The OS watchdog timer expires 5 minutes after it begins to boot. • **10 Minutes—**The OS watchdog timer expires 10 minutes after it begins to boot. • **15 Minutes—**The OS watchdog timer expires 15 minutes after it begins to boot. • **20 Minutes—**The OS watchdog timer expires 20 minutes after it begins to boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.

Name	Description
OS Watchdog Timer Policy	What action the system takes if the watchdog timer expires. This can be one of the following: • **Do Nothing—**The server takes no action if the watchdog timer expires during OS boot. • **Power Down—**The server is powered off if the watchdog timer expires during OS boot. • **Reset—**The server is reset if the watchdog timer expires during OS boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.

Main BIOS Parameters for C3X60 M4 Servers

Main BIOS Parameters

Name	Description
Reboot Host Immediately checkbox	Upon checking, reboots the host server immediately. You must check the checkbox after saving changes.
TPM Support	TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following: • **Disabled—**The server does not use the TPM. • **Enabled—**The server uses the TPM. **Note** We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Advanced BIOS Parameters for C3X60 M4 Servers

Processor Configuration Parameters

Name	Description
Intel Hyper-Threading Technology	Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following: • **Disabled—**The processor does not permit hyperthreading. • **Enabled—**The processor allows for the parallel execution of multiple threads. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Number of Enabled Cores	Allows you to disable one or more of the physical cores on the server. This can be one of the following: • **All—**Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores. • **1** through ***n*—**Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.
Execute Disable	Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following: • **Disabled—**The processor does not classify memory areas. • **Enabled—**The processor classifies memory areas. We recommend that you contact your operating system vendor to make sure the operating system supports this feature.

Name	Description
Intel VT	Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following: • **Disabled—**The processor does not permit virtualization. • **Enabled—**The processor allows multiple operating systems in independent partitions. **Note** If you change this option, you must power cycle the server before the setting takes effect.
Intel VT-d	Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following: • **Disabled—**The processor does not use virtualization technology. • **Enabled—**The processor uses virtualization technology.
Intel VT-d Interrupt Remapping	Whether the processor supports Intel VT-d Interrupt Remapping. This can be one of the following: • **Disabled—**The processor does not support remapping. • **Enabled—**The processor uses VT-d Interrupt Remapping as required.
Intel VT-d PassThrough DMA	Whether the processor supports Intel VT-d Pass-through DMA. This can be one of the following: • **Disabled—**The processor does not support pass-through DMA. • **Enabled—**The processor uses VT-d Pass-through DMA as required.
Intel VT-d Coherency Support	Whether the processor supports Intel VT-d Coherency. This can be one of the following: • **Disabled—**The processor does not support coherency. • **Enabled—**The processor uses VT-d Coherency as required.
Intel VT-d ATS Support	Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following: • **Disabled—**The processor does not support ATS. • **Enabled—**The processor uses VT-d ATS as required.

Name	Description
CPU Performance	Sets the CPU performance profile for the server. The performance profile consists of the following options: • DCU Streamer Prefetcher • DCU IP Prefetcher • Hardware Prefetcher • Adjacent Cache-Line Prefetch This can be one of the following: • **Enterprise—**All options are enabled. • **High Throughput—**Only the DCU IP Prefetcher is enabled. The rest of the options are disabled. • **HPC—**All options are enabled. This setting is also known as high performance computing. • **Custom—**All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.
Hardware Prefetcher	Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following: • **Disabled—**The hardware prefetcher is not used. • **Enabled—**The processor uses the hardware prefetcher when cache issues are detected.
Adjacent Cache Line Prefetcher	Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following: • **Disabled—**The processor only fetches the required line. • **Enabled—** The processor fetches both the required line and its paired line.

Name	Description
DCU Streamer Prefetch	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines. • **Enabled—**The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.
DCU IP Prefetcher	Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following: • **Disabled—**The processor does not preload any cache data. • **Enabled—**The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.
Direct Cache Access Support	Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following: • **Disabled—**Data from I/O devices is not placed directly into the processor cache. • **Enabled—**Data from I/O devices is placed directly into the processor cache.

Name	Description
Power Technology	Enables you to configure the CPU power management settings for the following options: • Enhanced Intel Speedstep Technology • Intel Turbo Boost Technology • Processor Power State C6 Power Technology can be one of the following: • **Custom—**The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters. • **Disabled—**The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored. • **Energy Efficient—**The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.
Enhanced Intel Speedstep Technology	Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following: • **Disabled—**The processor never dynamically adjusts its voltage or frequency. • **Enabled—**The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power. We recommend that you contact your operating system vendor to make sure the operating system supports this feature. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.

Name	Description
Intel Turbo Boost Technology	Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following: • **Disabled—**The processor does not increase its frequency automatically. • **Enabled—**The processor utilizes Turbo Boost Technology if required. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor C3 Report	Whether the BIOS sends the C3 report to the operating system. When the OS receives the report, it can transition the processor into the lower C3 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following: • **Disabled—**BIOS does not send C3 report. • **Enabled—**BIOS sends the C3 report, allowing the OS to transition the processor to the C3 low power state. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor C6 Report	Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following: • **Disabled—**The BIOS does not send the C6 report. • **Enabled—**The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Processor Power State C1 Enhanced	Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following: • **Disabled—**The CPU continues to run at its maximum frequency in C1 state. • **Enabled—**The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.

Name	Description
P-STATE Coordination	Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification. • **HW_ALL—**The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package). • **SW_ALL—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors. • **SW_ANY—**The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain. **Note** **Power Technology** must be set to **Custom** or the server ignores the setting for this parameter.
Energy Performance Tuning	Allows you to choose BIOS or Operating System for energy performance bias tuning. This can be one of the following: • **OS—** Chooses OS for energy performance tuning. • **BIOS—** Chooses BIOS for energy performance tuning.
Energy Performance	Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following: • **Balanced Energy** • **Balanced Performance** • **Energy Efficient** • **Performance**

Name	Description
Package C State Limit	The amount of power available to the server components when they are idle. This can be one of the following: • **C0 state—**The server provides all server components with full power at all times. This option maintains the highest level of performance and requires the greatest amount of power. • **C1 state—**When the CPU is idle, the system slightly reduces the power consumption. This option requires less power than C0 and allows the server to return quickly to high performance mode. • **C3 state—**When the CPU is idle, the system reduces the power consumption further than with the C1 option. This requires less power than C1 or C0, but it takes the server slightly longer to return to high performance mode. • **C6 state—**When the CPU is idle, the system reduces the power consumption further than with the C3 option. This option saves more power than C0, C1, or C3, but there may be performance issues until the server returns to full power. • **C7 state—**When the CPU is idle, the server makes a minimal amount of power available to the components. This option saves the maximum amount of power but it also requires the longest time for the server to return to high performance mode. • **No Limit—**The server may enter any available C state.
Extended APIC	Allows you to enable or disable extended APIC support. This can be one of the following: • **XAPIC—**Enables APIC support. • **X2APIC—**Enables APIC and also enables Intel VT-d and Interrupt Remapping .
Workload Configuration	Allows you to set a parameter to optimize workload characterization. This can be one of the following: • **Balanced—** Chooses balanced option for optimization. • **I/O Sensitive—** Chooses I/O sensitive option for optimization. **Note** We recommend you to set the workload configuration to **Balanced**.

Memory Configuration Parameters

Name	Description
Select Memory RAS	How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following: • **Maximum Performance—**System performance is optimized. • **Mirroring—**System reliability is optimized by using half the system memory as backup. • **Lockstep—**If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.
NUMA	Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following: • **Disabled—**The BIOS does not support NUMA. • **Enabled—**The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.
Channel Interleaving	Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some channel interleaving is used. • **2 Way** • **3 Way** • **4 Way—**The maximum amount of channel interleaving is used.

Name	Description
Rank Interleaving	Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following: • **Auto—**The CPU determines what interleaving is done. • **1 Way—**Some rank interleaving is used. • **2 Way** • **4 Way** • **8 Way—**The maximum amount of rank interleaving is used.
Patrol Scrub	Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following: • **Disabled—**The system checks for memory ECC errors only when the CPU reads or writes a memory address. • **Enabled—**The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.
Demand Scrub	Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following: • **Disabled—** Single bit memory errors are not corrected. • **Enabled—** Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.

Name	Description
Altitude	The approximate number of meters above sea level at which the physical server is installed. This can be one of the following: • **Auto—**The CPU determines the physical elevation. • **300 M—**The server is approximately 300 meters above sea level. • **900 M—**The server is approximately 900 meters above sea level. • **1500 M—**The server is approximately 1500 meters above sea level. • **3000 M—**The server is approximately 3000 meters above sea level.

QPI Configuration Parameters

Name	Description
QPI Link Frequency Select	The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following: • **Auto—**The CPU determines the QPI link frequency. • **6.4 GT/s** • **7.2 GT/s** • **8.0 GT/s**
QPI Snoop Mode	The Intel QuickPath Interconnect (QPI) snoop mode. This can be one of the following: • **Home Snoop—**The snoop is always spawned by the home agent (centralized ring stop) for the memory controller. This mode has a higher local latency than early snoop, but it provides extra resources for a larger number of outstanding transactions. • **Cluster on Die—**Enables Cluster On Die. When enabled LLC is split into two parts with an independent caching agent for each. This helps increase the performance in some workloads. This mode is available only for processors that have 10 or more cores. It is the best mode for highly NUMA optimized workloads. • **Early Snoop—**The distributed cache ring stops can send a snoop probe or a request to another caching agent directly. This mode has lower latency and it is best for workloads that have shared data sets across threads and can benefit from a cache-to-cache transfer, or for workloads that are not NUMA optimized.

USB Configuration Parameters

Name	Description
Legacy USB Support	Whether the system supports legacy USB devices. This can be one of the following: • **Disabled—**USB devices are only available to EFI applications. • **Enabled—**Legacy USB support is always available. • **Auto—**Disables legacy USB support if no USB devices are connected.
Port 60/64 Emulation	Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following: • **Disabled—**60h/64 emulation is not supported. • **Enabled—**60h/64 emulation is supported. You should select this option if you are using a non-USB aware operating system on the server.
xHCI Mode	Whether the xHCI controller legacy support is enabled or disabled. This can be one of the following: • **Disabled—**Disables the xHCI controller legacy support. • **Enabled—**Enables the xHCI controller legacy support.

PCI Configuration Parameters

Name	Description
Memory Mapped I/O Above 4GB	Whether to enable or disable MMIO above 4GB or not. This can be one of the following: • **Disabled—**The server does not map I/O of 64-bit PCI devices to 4GB or greater address space. • **Enabled—**The server maps I/O of 64-bit PCI devices to 4GB or greater address space. **Note** PCI devices that are 64-bit compliant but use a legacy option ROM may not function correctly with this setting enabled.

Name	Description
Sriov	Whether SR-IOV (Single Root I/O Virtualization) is enabled or disabled on the server. This can be one of the following: • **Disabled—**SR-IOV is disabled. • **Enabled—**SR-IOV is enabled.

Serial Configuration Parameters

Name	Description
Out-of-Band Mgmt Port	Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following: • **Disabled—**Configures the COM port 0 as a general purpose port for use with the Windows Operating System. • **Enabled—**Configures the COM port 0 as a remote management port for Windows Emergency Management services.
Console Redirection	Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following: • **Disabled—**No console redirection occurs during POST. • **COM 0—**Enables console redirection on COM port 0 during POST. • **COM 1—**Enables console redirection on COM port 1 during POST.
Terminal Type	What type of character formatting is used for console redirection. This can be one of the following: • **PC-ANSI—**The PC-ANSI terminal font is used. • **VT100—**A supported vt100 video terminal and its character set are used. • **VT100+—**A supported vt100-plus video terminal and its character set are used. • **VT-UTF8—**A video terminal with the UTF-8 character set is used. **Note** This setting must match the setting on the remote terminal application.

Name	Description
Bits per second	What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following: • **9600—**A 9,600 BAUD rate is used. • **19200—**A 19,200 BAUD rate is used. • **38400—**A 38,400 BAUD rate is used. • **57600—**A 57,600 BAUD rate is used. • **115200—**A 115,200 BAUD rate is used. **Note** This setting must match the setting on the remote terminal application.
Flow Control	Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following: • **None—**No flow control is used. • **Hardware RTS/CTS—**RTS/CTS is used for flow control. **Note** This setting must match the setting on the remote terminal application.
Putty KeyPad	Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following: • **VT100—**The function keys generate ESC OP through ESC O[. • **LINUX—**Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E. • **XTERMR6—**Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate **ESC OP** through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals. • **SCO—**The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{. • **ESCN—**The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~. • **VT400—**The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.

Name	Description
Redirection After BIOS POST	Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following: • **Always Enable—**BIOS Legacy console redirection is active during the OS boot and run time. • **Bootloader—**BIOS Legacy console redirection is disabled before giving control to the OS boot loader.

LOM and PCIe Slots Configuration Parameters

Name	Description
CDN Support for VIC	Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following: • **Disabled—** CDN support for VIC cards is disabled. • **Enabled—** CDN support is enabled for VIC cards. **Note** CDN support for VIC cards work with Windows 2012 or the latest OS only.
PCI ROM CLP	PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled. • **Enabled—** Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately. • **Disabled—**The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.
All PCIe Slots OptionROM	Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following: • **Disabled—**The Option ROM for slot ***n*** is not available. • **Enabled—**The Option ROM for slot ***n*** is available. • **UEFI Only—**The Option ROM for slot ***n*** is available for UEFI only. • **Legacy Only—**The Option ROM for slot ***n*** is available for legacy only.

Name	Description
SBNVMe1 OptionROM	Whether the server can use Option ROM present in SBNVMe1 controller. This can be one of the following: • **Disabled—**The Option ROM for SBNVMe1 controllers is not available. • **Enabled—**The Option ROMs for SBNVMe1 controller is available. • **UEFI Only—**The Option ROMs for slot are available for UEFI only. • **Legacy Only—**The Option ROM for slot are available for legacy only.
SIOC1 OptionROM **set SIOC1OptionROM**	Whether the server can use Option ROM present in System IO Controller 1 (SIOC1). This can be one of the following: • **Disabled—**The Option ROM for System IO Controller 1 (SIOC1) is not available. • **Enabled—**The Option ROMs for System IO Controller 1 (SIOC1) is available. • **UEFI Only—**The Option ROMs for slot are available for UEFI only. • **Legacy Only—**The Option ROM for slot are available for legacy only.
SIOC2 OptionROM set SIOC2OptionROM **set SIOC2OptionROM**	Whether the server can use Option ROM present in System IO Controller 2 (SIOC2). This can be one of the following: • **Disabled—**The Option ROM for System IO Controller 2 (SIOC2) is not available. • **Enabled—**The Option ROMs for System IO Controller 2 (SIOC2) is available. • **UEFI Only—**The Option ROMs for slot are available for UEFI only. • **Legacy Only—**The Option ROM for slot are available for legacy only.

Name	Description
SBMezz1 OptionROM	Whether the server can use Option ROM present in SBMezz1 controller. This can be one of the following: • **Disabled—**The Option ROM for SBMezz1 controllers is not available. • **Enabled—**The Option ROMs for SBMezz1 controller is available. • **UEFI Only—**The Option ROMs for slot are available for UEFI only. • **Legacy Only—**The Option ROM for slot are available for legacy only.
IOESlot1 OptionROM	Whether option ROM is enabled on the IOE slot 1. This can be one of the following: • **Disabled—** Option ROM is disabled. • **Enabled—** Default value. Option ROM is enabled. • **UEFI Only—** slot 1 option ROM is available for UEFI only. • **Legacy Only—** slot 1 option ROM is available for legacy only.
IOEMezz1 OptionROM	Whether option ROM is enabled on the IOE Mezz1. This can be one of the following: • **Disabled—** Option ROM is disabled. • **Enabled—** Default value. Option ROM is enabled. • **UEFI Only—** Mezz1 option ROM is available for UEFI only. • **Legacy Only—** Mezz1 option ROM is available for legacy only.
IOESlot2 OptionROM	Whether option ROM is enabled on the IOE slot 2. This can be one of the following: • **Disabled—** Option ROM is disabled. • **Enabled—** Default value. Option ROM is enabled. • **UEFI Only—** slot 2 option ROM is available for UEFI only. • **Legacy Only—** slot 2 option ROM is available for legacy only.

Name	Description
IOENVMe1 OptionROM	Whether option ROM is enabled on the IOE NVMe1. This can be one of the following: • **Disabled—** Option ROM is disabled. • **Enabled—** Default value. Option ROM is enabled. • **UEFI Only—** Mezz1 option ROM is available for UEFI only. • **Legacy Only—** Mezz1 option ROM is available for legacy only.
IOENVMe2 OptionROM	Whether option ROM is enabled on the IOE NVMe2. This can be one of the following: • **Disabled—** Option ROM is disabled. • **Enabled—** Default value. Option ROM is enabled. • **UEFI Only—** Mezz1 option ROM is available for UEFI only. • **Legacy Only—** Mezz1 option ROM is available for legacy only.
SBNVMe1 Link Speed	SBNVMe1 add-on slot 1 link speed. • **Auto—**Link speed is automatically assigned. • **GEN1—** Link speed can reach up to first generation. • **GEN2—**The default link speed. Link speed can reach up to second generation. • **GEN3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.
SIOC1 Link Speed	System IO Controller 1 (SIOC1) add-on slot 1 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.

Name	Description
SIOC2 Link Speed	System IO Controller 2 (SIOC2) add-on slot 2 link speed. • **GEN1 —** Link speed can reach up to first generation. • **GEN2 —** Link speed can reach up to second generation. • **GEN3—** The default link speed. Link speed can reach up to third generation. • **Disabled —** Slot is disabled, and the card is not enumerated.
SBMezz1 Link Speed	SBMezz1 add-on slot 1 link speed. • **Auto—**Link speed is automatically assigned. • **GEN1—** Link speed can reach up to first generation. • **GEN2—**The default link speed. Link speed can reach up to second generation. • **GEN3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.
IOESlot1 Link Speed	Slot 1 link speed. This can be one of the following: • **Auto—** Default value. Slot is enabled. • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.
IOEMezz1 Link Speed **set IOEMezz1LinkSpeed**	Mezz1 link speed. This can be one of the following: • **Auto—** Default value. Slot is enabled. • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.

Name	Description
IOESlot2 Link Speed	Slot 2 link speed. This can be one of the following: • **Auto—** Default value. Slot is enabled. • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.
IOENVMe1 Link Speed	NVMe1 link speed. This can be one of the following: • **Auto—** Default value. Slot is enabled. • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.
IOENVMe2 Link Speed	NVMe2 link speed. This can be one of the following: • **Auto—** Default value. Slot is enabled. • **GEN 1—** Link speed can reach up to first generation. • **GEN 2—** Link speed can reach up to second generation. • **GEN 3—** Link speed can reach up to third generation. • **Disabled—**Slot is disabled, and the card is not enumerated.

Server Management BIOS Parameters for C3X60 M4 Servers

Server Management BIOS Parameters

Name	Description
FRB-2 Timer	Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following: • **Disabled—**The FRB2 timer is not used. • **Enabled—**The FRB2 timer is started during POST and used to recover the system if necessary.

Name	Description
OS Watchdog Timer	Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following: • **Disabled—**The watchdog timer is not used to track how long the server takes to boot. • **Enabled—**The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the **OS Boot Watchdog Timer Timeout** field, the Cisco IMC logs an error and takes the action specified in the **OS Boot Watchdog Policy** field.
OS Watchdog Timer Timeout	If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following: • **5 Minutes—**The OS watchdog timer expires 5 minutes after it begins to boot. • **10 Minutes—**The OS watchdog timer expires 10 minutes after it begins to boot. • **15 Minutes—**The OS watchdog timer expires 15 minutes after it begins to boot. • **20 Minutes—**The OS watchdog timer expires 20 minutes after it begins to boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.
OS Watchdog Timer Policy	What action the system takes if the watchdog timer expires. This can be one of the following: • **Do Nothing—**The server takes no action if the watchdog timer expires during OS boot. • **Power Down—**The server is powered off if the watchdog timer expires during OS boot. • **Reset—**The server is reset if the watchdog timer expires during OS boot. **Note** This option is only applicable if you enable the OS Boot Watchdog Timer.

APPENDIX B

BIOS Token Name Comparison for Multiple Interfaces

This appendix contains the following section:

BIOS Token Name Comparison for Multiple Interfaces

The following table lists the BIOS token names used in the XML, CLI and Web GUI interfaces. You can use this list to map the names across these interfaces.

Note The parameters that are available depend on the type of Cisco UCS server you are using.

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
Main	TPM Support	biosVfTPMSupport/ vpTPMSupport	TPMAdminCtrl
Process Configuration	Intel(R) Hyper-Threading Technology	biosVfIntelHyperThreadingTech/ vpIntelHyperThreadingTech	IntelHyperThread
	Number of Enable Cores	biosVfCoreMultiProcessing/ vpCoreMultiProcessing	CoreMultiProcessing
	Execute Disable	biosVfExecuteDisableBit/ vpExecuteDisableBit	ExecuteDisable
	Intel(R) VT	biosVfIntelVirtualizationTechnology/ vpIntelVirtualizationTechnology	IntelVT

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
	Intel(R) VT-d	biosVfIntelVTForDirectedIO/ vpIntelVTForDirectedIO	IntelVTD
	Intel(R) VT-d Coherency Support	biosVfIntelVTForDirectedIO/ vpIntelVTDCoherencySupport	CoherencySupport
	Intel(R) VT-d ATS Support	biosVfIntelVTForDirectedIO/ vpIntelVTDATSSupport	ATS
	CPU Performance	biosVfCPUPerformance/ vpCPUPerformance	CpuPerformanceProfile
	Hardware Prefetcher	biosVfHardwarePrefetch/ vpHardwarePrefetch	HardwarePrefetch
	Adjacent Cache Line Prefetcher	biosVfAdjacentCacheLinePrefetch/ vpAdjacentCacheLinePrefetch	AdjacentCacheLinePrefetch
	DCU Streamer Prefetch	biosVfDCUPrefetch/ vvpStreamerPrefetch	DcuStreamerPrefetch
	DCU IP Prefetcher	biosVfDCUPrefetch/ vpIPPrefetch	DcuIpPrefetch
	Direct Cache Access Support	biosVfDirectCacheAccess/ vpDirectCacheAccess	DirectCacheAccess
	Power Technology	biosVfCPUPowerManagement/ vpCPUPowerManagement	CPUPowerManagement
	Enhanced Intel Speedstep(R) Technology	biosVfEnhancedIntelSpeedStepTech/ vpEnhancedIntelSpeedStepTech	EnhancedIntelSpeedStep
	Intel(R) Turbo Boost Technology	biosVfIntelTurboBoostTech/ vpIntelTurboBoostTech	IntelTurboBoostTech
	Processor Power state C6	biosVfProcessorCState/ vpProcessorCState	ProcessorC6Report

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
	Processor Power state C1 Enhanced	biosVfProcessorC1E/ vpProcessorC1E	ProcessorC1E
	Frequency Floor Override	biosVfCPUFrequencyFloor/ vpCPUFrequencyFloor	CpuFreqFloor
	P-STATE Coordination	biosVfPStateCoordType/ vpPStateCoordType	PsdCoordType
	Energy Performance	biosVfCPUEnergyPerformance/ vpCPUEnergyPerformance	CpuEngPerfBias
Memory Configuration	Select Memory RAS	biosVfSelectMemoryRASConfiguration/ vpSelectMemoryRASConfiguration	SelectMemoryRAS
	DRAM Clock Throttling	biosVfDRAMClockThrottling/ vpDRAMClockThrottling	DRAMClockThrottling
	NUMA	biosVfNUMAOptimized/ vpNUMAOptimized	NUMAOptimize
	Low Voltage DDR Mode	biosVfLvDIMMSupport/ vpNUMAOptimized	LvDDRMode
	DRAM Refresh rate	biosVfDramRefreshRate/ vpDramRefreshRate	DramRefreshRate
	Channel Interleaving	biosVfMemoryInterleave/ vpChannelInterLeave	ChannelInterLeave
	Rank Interleaving	biosVfMemoryInterleave/ vpRankInterLeave	RankInterLeave
	Patrol Scrub	biosVfPatrolScrub/ vpPatrolScrub	PatrolScrub
	Demand Scrub	biosVfDemandScrub/ vpDemandScrub	DemandScrub
	Altitude	biosVfAltitude/ vpAltitude	Altitude

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
QPI Configuration	QPI Link Frequency Select	biosVfQPIConfig/ vpQPILinkFrequency	QPILinkFrequency
	Cluster on Die	biosVfCODEnable/ vpCODEnable	CODEnable
	Snoop Mode	biosVfEarlySnoop/ vpEarlySnoop	EarlySnoop
SATA Configuration	SATA Mode	Not supported	SATAMode
Onboard Storage	Onboard SCU Storage Support	biosVfOnboardStorage/ vpOnboardSCUStorageSupport	DisableSCU
	Onboard SCU Storage SW Stack	biosVfOnboardStorageSWStack vpOnboardSCUStorageSWStack	PchScuOromSelect
USB Configuration	Legacy USB Support	biosVfLegacyUSBSupport/ vpLegacyUSBSupport	LegacyUSBSupport
	Port 60/64 Emulation	biosVfUSBEmulation/ vpUSBEmul6064	UsbEmul6064
	All USB Devices	biosVfUSBPortsConfig/ vpAllUsbDevices	AllUsbDevices
	USB Port:Rear	biosVfUSBPortsConfig/ vpUsbPortRear	UsbPortRear
	USB Port:Front	biosVfUSBPortsConfig/ vpUsbPortFront	UsbPortFront
	USB Port:Internal	biosVfUSBPortsConfig/ vpUsbPortInternal	UsbPortInt
	USB Port:KVM	biosVfUSBPortsConfig/ vpUsbPortKVM	UsbPortKVM
	USB Port:Vmedia	biosVfUSBPortsConfig/ vpUsbPortVMedia	UsbPortVMedia

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
	USB Port:SD Card	biosVfUSBPortsConfig/ vpUsbPortSDCard	UsbPortSdCard
	xHCI Mode	biosVfPchUsb30Mode/ vpPchUsb30Mode	PchUsb30Mode
PCI Configuration	PCI ROM CLP	Not Supported	PciRomClp
	MMIO above 4GB	biosVfMemoryMappedIOAbove4GB/ vpMemoryMappedIOAbove4GB	MemoryMappedIOAbove4GB
	ASPM Support	biosVfASPMSupport/ vpASPMSupport	ASPMSupport
	VGA Priority	biosVfVgaPriority/ vpVgaPriority	VgaPriority
Serial Configuration	Console Redirection	biosVfConsoleRedirection/ vpConsoleRedirection	ConsoleRedir
	Terminal Type	biosVfConsoleRedirection/ vpTerminalType	TerminalType
	Bits per second	biosVfConsoleRedirection/ vpBaudRate	BaudRate
	Flow Control	biosVfConsoleRedirection/ vpFlowControl	FlowCtrl
	Putty KeyPad	biosVfConsoleRedirection/ vpPuttyKeyPad	PuttyFunctionKeyPad
	Redirection After BIOS POST	biosVfConsoleRedirection/ vpLegacyOSRedirection	RedirectionAfterPOST
LOM and PCIe Slots Configuration	PCH SATA Mode	biosVfSataModeSelect/ vpSataModeSelect	SataModeSelect
	All Onboard LOM Ports	biosVfSataModeSelect/ vpSataModeSelect	AllLomPortControl

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
	LOM Port 0 OptionROM	biosVfLOMPortOptionROM/ vpLOMPort0State	LomOpromControlPort0
	LOM Port 1 OptionROM	biosVfLOMPortOptionROM/ vpLOMPort1State	LomOpromControlPort1
	All PCIe Slots OptionROM	biosVfPCIOptionROMs/ vpPCIOptionROMs	PcieOptionROMs
	PCIe Slot:*n* OptionROM	biosVfPCISlotOptionROMEnable/ vpSlot*n*State	PcieSlot*n*OptionROM
	PCIe Mezzanine OptionROM	biosVfPCISlotOptionROMEnable/ vpSlotMezzState	PcieMezzOptionROM
	PCIe Slot:1 Link Speed or SIOC1 Link Speed	biosVfPCISlotOptionROMEnable/ vpSlot1LinkSpeed	PcieSlot1LinkSpeed
	PCIe Slot:2 Link Speed or SIOC2 Link Speed	biosVfPCISlotOptionROMEnable/ vpSlot2LinkSpeed	PcieSlot2LinkSpeed
	PCIe Slot:MLOM OptionROM	biosVfPCISlotOptionROMEnable/ vpSlotMLOMState	PcieSlotMLOMOptionROM
	PCIe Slot:HBA OptionROM	biosVfPCISlotOptionROMEnable/ vpSlotHBAState	PcieSlotHBAOptionROM
	PCIe Slot:N1 OptionROM	biosVfPCISlotOptionROMEnable/ vpSlotN1State	PcieSlotN1OptionROM
	PCIe Slot:N2 OptionROM	biosVfPCISlotOptionROMEnable/ vpSlotN2State	PcieSlotN2OptionROM
Server Management	FRB-2 Timer	biosVfFRB2Enable/ vpFRB2Enable	FRB-2

BIOS Token Group	BIOS Token Name	XML Object	CLI and Web GUI Object
	OS Watchdog Timer	biosVfOSBootWatchdogTimer/ vpOSBootWatchdogTimer	OSBootWatchdogTimer
	OS Watchdog Timer Timeout	biosVfOSBootWatchdogTimerPolicy/ vpOSBootWatchdogTimerPolicy	OSBootWatchdogTimerTimeout
	OS Watchdog Timer Policy	biosVfOSBootWatchdogTimerTimeOut/ vpOSBootWatchdogTimerPolicy	OSBootWatchdogTimerPolicy
	Boot Order Rules	biosVfUCSMBootOrderRuleControl/ vpUCSMBootOrderRule	UCSMBootOrderRule

BIOS Token Name Comparison for Multiple Interfaces

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