Dell Chassis Management Controller Version 1.2 for PowerEdge FX2/FX2s

User's Guide

Notes, cautions, and warnings

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

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

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

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Overview

The Dell Chassis Management Controller (CMC) for PowerEdge FX2/FX2s is a Systems Management hardware and software solution for managing the **PowerEdge FX2/FX2s** chassis. The CMC has its own microprocessor and memory and is powered by the modular chassis into which it is plugged.

The CMC enables an IT administrator to:

- View inventory.
- Perform configuration and monitoring tasks.
- Remotely turn on and turn off chassis and servers.
- Enable alerts for events on servers and components in the server module.
- View the PCIe mapping information and reassign PCIe slots.
- Provide a one–many management interface to the iDRACs and I/O modules in the chassis.

The CMC provides multiple System Management functions for servers. Power and thermal management are the primary functions of CMC, which are listed as follows:

- Enclosure-level real-time automatic power and thermal management.
  - The CMC reports real-time power consumption, which includes logging high and low points with a time stamp.
  - The CMC supports setting an optional enclosure maximum power limit (System Input Power Cap), which alerts and takes actions such as limiting the power consumption of servers, and/or preventing the turning on of new servers to keep the enclosure under the defined maximum power limit.
  - The CMC monitors and automatically controls the functions of cooling fans based on actual ambient and internal temperature measurements.
  - The CMC provides comprehensive enclosure inventory and status or error reporting.
- The CMC provides a mechanism for centralized configuration of the:
  - Network and security setting of the PowerEdge FX2/FX2s enclosure.
  - Power redundancy and power ceiling settings.
  - I/O switch and iDRAC network settings.
  - First boot device on the server module.
  - I/O fabric consistency checks between the I/O module and servers. CMC also disables components, if necessary, to protect the system hardware.
  - User access security.
  - PCIe slots.

You can configure CMC to send email alerts or SNMP trap alerts for warnings or errors such as temperature, hardware misconfiguration, power outage, and fan speed.

NOTE: The terms “storage sled” and “storage module” are used interchangeably in this document.

Key Features

The CMC features are grouped into management and security features.

What is new in this release

This release of CMC for Dell PowerEdge FX2/FX2s supports:

- PowerEdge FC830 and PowerEdge FC430 compute sleds.
- PowerEdge FD332 and the following features that are supported for storage sleds:
  - Multiple compute-storage sled mappings.
  - Identification of storage sleds along with compute nodes.
  - Module reporting for storage sleds.
  - Move storage sleds to different slots or chassis.
  - PCIe mapping when storage sleds exist.
- RACADM proxy to manage CMC from iDRAC.
- Forwarding CMC or chassis alerts through iDRAC for rack-based mode servers.
- Licensing for one RAID controller and one non-RAID controller or two RAID controllers.

Management features

CMC provides the following management features:

- Dynamic Domain Name System (DDNS) registration for IPv4 and IPv6.
- Login management and configuration for local users, Active Directory, and LDAP.
- Remote system management and monitoring using SNMP, a web interface, integrated KVM, Telnet, or SSH connection.
- Monitoring — Provides access to system information and status of components.
- Access to system event logs — Provides access to the hardware log and chassis log.
- Firmware updates for various chassis components — Enables you to update the firmware for CMC, iDRAC on servers, storage sleds, and chassis infrastructure.
- Firmware update of server components such as BIOS and network controllers across multiple servers in the chassis using Lifecycle Controller.
- Dell OpenManage software integration — Enables you to launch the CMC web interface from Dell OpenManage Server Administrator or OpenManage Essentials (OME) 1.2.
- CMC alert — Alerts you about potential managed node issues through Remote syslog email message or SNMP trap.
- Remote power management — Provides remote power management functions, such as turn off and reset of any chassis component, from a management console.
- Power usage reporting.
- Secure Sockets Layer (SSL) encryption — Provides secure remote system management through the web interface.
- Launch point for the Integrated Dell Remote Access Controller (iDRAC) web interface.
- Support for WS-Management.

- Multi-node Sled adaptation. PowerEdge FM120x4 is a multi-node Sled.
- Chassis Power Limit Monitoring.
- iDRAC IO Identity feature support for enhanced WWN/MAC Address Inventory.
- FlexAddress feature — Replaces the factory-assigned World Wide Name/Media Access Control (WWN/MAC) IDs with chassis-assigned WWN/MAC IDs for a particular slot, an optional upgrade.
- Graphical display of chassis component status and health.
- Support for single and multi-slot servers.
- iDRAC single sign-on.
- Network time protocol (NTP) support.
- Enhanced server summary, power reporting, and power control pages.
- Multi-chassis management, allows up to 19 other chassis to be visible from the lead chassis.

  NOTE: Multi-Chassis Management is not supported on IPv6 networks.
- Local and remote iDRAC RACADM proxy feature to manage storage sleds in the FX2s chassis.

Security features

The CMC provides the following security features:

- Password-level security management — Prevents unauthorized access to a remote system.
- Centralized user authentication through:
  - Active Directory using Standard Schema or an Extended Schema (optional).
  - Hardware-stored user IDs and passwords.
- Role-based authority — Enables an administrator to configure specific privileges for each user.
- User ID and password configuration through the web interface. Web interface supports 128-bit SSL 3.0 encryption and 40-bit SSL 3.0 encryption (for countries where 128-bit is not acceptable).

  NOTE: Telnet does not support SSL encryption.
- Configurable IP ports (if applicable).
- Login failure limits per IP address, with login blocking from the IP address when the limit is exceeded.
- Configurable session auto time out, and more than one simultaneous sessions.
- Limited IP address range for clients connecting to CMC.
- Secure Shell (SSH), which uses an encrypted layer for higher security.
- Single Sign-on, Two-Factor Authentication, and Public Key Authentication.
- CMC Signed Image — Used to protect the firmware image from undetected modification using digital signature.

Chassis overview

A Back Panel view of the chassis is given here with a table that lists the parts and devices available in the CMC.

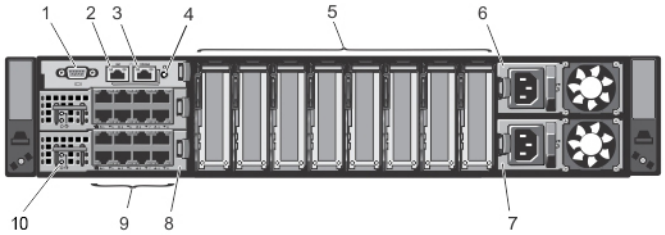


Figure 1.

Item	Indicator, Button, or Connector
1	Serial connector
2	Ethernet connector Gb1
3	Ethernet connector STK/Gb2 (stack)
4	System identification button
5	Low-profile PCIe expansion slots
6	Power supply (PSU1)
7	Power supply (PSU2)
8	I/O module (2)
9	I/O module ports
10	I/O module indicators

A Front Panel view of the chassis is given here with a table that lists the parts and devices available in the CMC.

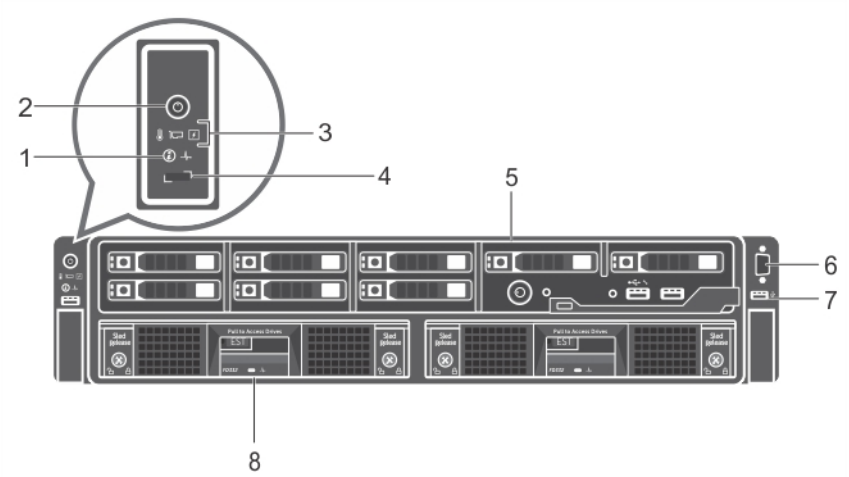


Figure 2.

Item	Indicator, Button, or Connector
1	System identification button
2	Enclosure power-on indicator, power button
3	Diagnostic indicators
4	KVM select button
5	Compute sled
6	Video connector
7	USB connector
8	Storage sled

Supported remote access connections

The following table lists the supported remote access connections.

Table 1. Supported remote access connections

Connection	Features
CMC Network Interface ports	• Gb ports: Dedicated network interface for the CMC web interface. The CMC has two RJ-45 Ethernet ports: – Gb1 (the uplink port) – Gb2 (the stacking or cable consolidation port). The STK/Gb2 port can also be used for CMC NIC failover. NOTE: Ensure that the CMC setting is changed from default **Stacking** to **Redundant** to implement NIC failover.

Connection	Features
	CAUTION: Connecting the STK/Gb2 port to the management network will have unpredictable results if the CMC setting is not changed from default Stacking to Redundant, to implement NIC failover. In the default Stacking mode, cabling the Gb1 and STK/Gb2 ports to the same network (broadcast domain) can cause a broadcast storm. A broadcast storm can also occur if the CMC setting is changed to Redundant mode, but the cabling is daisy chained between chassis in the Stacking mode. Ensure that the cabling model matches the CMC setting for the intended usage. • DHCP support. • SNMP traps and e-mail event notification. • Network interface for the iDRAC and I/O Modules (IOMs). • Support for Telnet/SSH command console and RACADM CLI commands including system boot, reset, power-on, and shutdown commands.
Serial port	• Support for serial console and RACADM CLI commands including system boot, reset, power-on, and shutdown commands. • Support for binary interchange for applications specifically designed to communicate with a binary protocol to a particular type of IOM. • Serial port can be connected internally to the serial console of a server, or I/O module, using the connect (or racadm connect) command.

Supported platforms

The CMC supports the **PowerEdge FX2** and **FX2s** chassis models. The supported platforms are PowerEdge FC630, PowerEdge FM120x4, and PowerEdge FC830. For information about compatibility with CMC, see the documentation for your device.

For the latest supported platforms, see the *Dell Chassis Management Controller (CMC) Version 1.2 for Dell PowerEdge FX2/FX2s Release Notes* available at **dell.com/support/manuals**.

Supported web browsers

For the latest information about supported web browsers, see the *Dell Chassis Management Controller (CMC) Version 1.2 for Dell PowerEdge FX2/FX2s Release Notes* at **dell.com/support/manuals**.

Managing licenses

The CMC features are available based on the license (CMC Express or CMC Enterprise) purchased. Only licensed features are available in the interfaces that allow you to configure or use CMC. For example, CMC web interface, RACADM, WS-MAN, and so on. CMC license management and firmware update functionality is always available through CMC web interface and RACADM.

Storage sled licenses

You can also purchase storage sled licenses to manage RAID controllers in CMC. The storage sled licenses can be installed at the factory or purchased online. Following are the supported storage sled license types:

- One RAID controller and one HBA controller (RAID/HBA)
- Both RAID controllers

Storage sled licenses can be used for one or two RAID controllers. If a license is assigned to RAID on a single controller, the license is applicable only to the first controller. Deleting a storage sled license may result in loss of RAID data.

Storage sled licenses are specific to a storage sled and are associated to the Service Tag of the storage sled. For example, if you move a storage sled from one chassis to another, the license is also moved along with the storage sled. The master copies of storage sled licenses are stored in the persistent store. For more information, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

The log messages for all storage sled license activities are stored in the CMC log file.

NOTE: Storage sled licenses are required to change the FD33xS and FD33xD RAID controllers from HBA mode to RAID mode.

Types of licenses

The types of licenses offered are:

- 30–day evaluation and extension — The license expires after 30 days that can be extended for 30 days. Evaluation licenses are duration-based, and the timer runs when power is applied to the system. These licenses are not applicable to storage sleds.
- Perpetual — The license is bound to the Service Tag and is permanent.

NOTE: Evaluation and site licenses are applicable only to CMC.

Acquiring licenses

Use any of the following methods to acquire the licenses:

- E-mail — License is attached to an e-mail that is sent after requesting it from the technical support center.
- Self-service portal — A link to the Self-Service Portal is available from CMC. Click this link to open the licensing Self-Service Portal on the internet from where you can purchase licenses. For more information, see the online help for the self-service portal page.
- Point-of-sale — License is acquired while placing the order for a system.

License operations

Before you perform the license management tasks, make sure to acquire the licenses. For more information, see the Acquiring Licenses section and *Overview and Feature Guide* available at **dell.com/support**.

NOTE: If you have purchased a system with all the licenses pre-installed, then license management is not required.

You can perform the following licensing operations using CMC, RACADM, and WS-MAN for one-to-one license management, and **Dell License Manager** for one-to-many license management:

- View — View the current license information for CMC and storage sleds.
- Import — After acquiring the license, store the license in a local storage and import it into CMC using one of the supported interfaces. The license is imported if it passes the validation checks.

  NOTE: For a few features, a CMC restart may be required to enable the features.

  You can also import licenses for storage sleds that are installed in a chassis and when the storage sleds are powered off. If a storage sled is already licensed, delete the existing license before importing a new one. The imported license is stored in the CMC license manager and storage sled persistent store. The licensed features are available only if the RAID is reset when the host server is rebooted. You can import storage sled licenses only to the targeted device.
- Export — Export the installed license into an external storage device backup or to reinstall it after a service part is replaced. The file name and format of the exported license is **<EntitlementID>.xml**
- Delete — Delete the license that is assigned to a component or storage sled if the component or storage sled is missing. After the license is deleted, it is not stored in CMC and the base product functions are enabled.

  You can delete storage sled licenses only when the storage sled is powered off. Deleted licenses are removed from the storage sled persistent store and the License Manager.
- Replace — Replace the license to extend an evaluation license, change a license type such as an evaluation license with a purchased license, or extend an expired license.

  For storage sleds, the new license overwrites the existing license in the CMC license manager and the storage sled persistent store. Power off the storage sleds before replacing the license. The licensed features are available only after the RAID controller is reset at the next host reboot.
- An evaluation license may be replaced with an upgraded evaluation license or with a purchased license.
- A purchased license may be replaced with an updated license or with an upgraded license. For more information, see Dell Software License Management Portal available at **WWW.DELL.COM/SUPPORT/LICENSING/US/EN/19**
- Learn More — Learn more about an installed license, or the licenses available for a component installed in the server.

  NOTE: For the Learn More option to display the correct page, make sure that ***.dell.com** is added to the list of Trusted Sites in the Security Settings. For more information, see the Internet Explorer help documentation.

  NOTE: If you try to install the PowerEdge FM120x4 license on PowerEdge FC630, the license installation fails. For more information on licensing refer *Integrated Dell Remote Access Controller (iDRAC) User's Guide* .

Licensable features in CMC

A list of CMC features that are enabled on the basis of your license is given here in the table.

Feature	Express	Enterprise
CMC Network	Yes	Yes

CMC Serial Port	Yes	Yes
RACADM (SSH, Local, and Remote)	Yes	Yes
WS-MAN	Yes	Yes
SNMP	Yes	Yes
Telnet	Yes	Yes
SSH	Yes	Yes
Web-based Interface	Yes	Yes
Email Alerts	Yes	Yes
CMC Settings Backup	No	Yes
CMC Settings Restore	Yes	Yes
Remote Syslog	No	Yes
Directory Services	No	Yes
Single Sign-On Support	No	Yes
Two-Factor Authentication	No	Yes
PK Authentication	No	Yes
Remote File Share	No	Yes
Enclosure level power capping	No	Yes
Multi-chassis management	No	Yes
FlexAddress Enablement	No	Yes
One-to-many Server Firware Update	No	Yes
One-to-many configuration for iDRAC	No	Yes

License component state or condition and available operations

The following table provides the list of license operations available based on the license state or condition.

Table 1. License Operations Based on State and Condition

License/ Component state or condition	Import	Export	Delete	Replace	Learn More
Non-administrator login	No	Yes	No	No	Yes
Active license	Yes	Yes	Yes	Yes	Yes
Expired license	No	Yes	Yes	Yes	Yes
License installed but component missing	No	Yes	Yes	No	Yes

Viewing localized versions of the CMC web interface

To view localized versions of the CMC web interface, read through your web browser's documentations. To view the localized versions, set the browser to the desired language.

Supported management console applications

The CMC supports integration with Dell OpenManage Console. For more information, see the OpenManage Console documentation available at **dell.com/support/manuals**.

How to use this User's Guide

The contents of this User's Guide enable you to perform the tasks by using:

- The Web interface: Only the task-related information is given here. For information about the fields and options, see the *CMC for Dell PowerEdge FX2/FX2s Online Help* that you can open from the Web interface.
- The RACADM commands: The RACADM command or the object that you must use is provided here. For more information about a RACADM command, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at dell.com/support/manuals.

Other documents you may need

To access the documents from the Dell Support site. Along with this Reference Guide, you can access the following guides available at **dell.com/support/manuals**.

- The *CMC FX2/FX2s Online Help* provides information about using the web interface. To access the Online Help, click **Help** on the CMC web interface.
- The *Chassis Management Controller Version 1.2 for Dell PowerEdge FX2/FX2s RACADM Command Line Reference Guide* provides information about using the FX2/FX2s–related RACADM features.
- The *Dell Chassis Management Controller (CMC) for Dell PowerEdge FX2/FX2s Version 1.2 Release Notes* provides last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.
- The *Integrated Dell Remote Access Controller 8 (iDRAC) User's Guide* provides information about installation, configuration, and maintenance of the iDRAC8 on managed systems.

- The *Dell OpenManage Server Administrator's User's Guide* provides information about installing and using Server Administrator.
- The *Dell Update Packages User's Guide* provides information about obtaining and using Dell Update Packages as part of your system update strategy.
- Dell systems management application documentation provides information about installing and using the systems management software.

The following system documents provide more information about the system in which CMC PowerEdege FX2/FX2s is installed:

- The safety instructions that came with your system provide important safety and regulatory information. For additional regulatory information, see the Regulatory Compliance home page at **www.dell.com/regulatory_compliance**. Warranty information may be included within this document or as a separate document.
- The setup placemat shipped with your system provides information about the initial system setup and configuration.
- The server module's *Owner's Manual* provides information about the server module's features and describes how to troubleshoot the server module and install or replace the server module's components. This document is available online at dell.com/poweredgemanuals.
- The rack documentation included with your rack solution describes how to install your system into a rack, if required.
- For the full name of an abbreviation or acronym used in this document, see the Glossary at **dell.com/support/manuals**.
- Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- Documentation for any components you purchased separately provides information to configure and install these options.
- Any media that ships with your system that provides documentation and tools for configuring and managing your system, including those pertaining to the operating system, system management software, system updates, and system components that you purchased with your system. For more information on the system, scan the Quick Resource Locator (QRL) available on your system and the system setup placemat that shipped with your system. Download the QRL application from your mobile platform to enable the application on your mobile device.

Updates are sometimes included with the system to describe changes to the system, software, and/or documentation. Always read the updates first, because they often supersede information in other documents.

Accessing documents from Dell Support Site

You can access the required documents in one of the following ways:

- Using the following links:
  - For all Enterprise Systems Management documents — **dell.com/softwaresecuritymanuals**
  - For Enterprise Systems Management documents — **dell.com/openmanagemanuals**
  - For Remote Enterprise Systems Management documents — **dell.com/esmmanuals**
  - For OpenManage Connections Enterprise Systems Management documents — **dell.com/OMConnectionsEnterpriseSystemsManagement**
  - For Serviceability Tools documents — **dell.com/serviceabilitytools**
  - For Client Systems Management documents — **dell.com/clientsystemsmanagement**
  - For OpenManage Connections Client Systems Management documents — **dell.com/dellclientcommandsuitemanuals**

- From the Dell Support site:
  a. Go to **dell.com/support/home**.
  b. Under **Select a product** section, click **Software & Security**.
  c. In the **Software & Security** group box, click the required link from the following:
     - **Enterprise Systems Management**
     - **Remote Enterprise Systems Management**
     - **Serviceability Tools**
     - **Client Systems Management**
     - **Connections Client Systems Management**
  d. To view a document, click the required product version.
- Using search engines:
  - Type the name and version of the document in the search box.

2

Installing and setting up CMC

This section provides information about how to install your CMC hardware, establish access to CMC, configure your management environment to use CMC, and guides you through the tasks for configuring a CMC:

- Set up initial access to CMC.
- Access CMC through a network.
- Add and configure CMC users.
- Update CMC firmware.

Installing CMC hardware

The CMC is pre-installed on your chassis and hence no installation is required.

Checklist to set up chassis

The following tasks enable you to accurately setup the chassis:

1. The CMC and the management station, where you use your browser, must be on the same network, which is called the management network. Connect an Ethernet network cable from the port labelled **GB1** to the management network.

   Management Network: CMC and the iDRAC (on each server) and the network management ports for the switch I/O module are connected to a common internal network in the PowerEdge FX2/FX2s chassis. This allows the management network to be isolated from the server data network.

   Application Network: Access to the managed servers is accomplished through network connections to the I/O module (IOM). This allows the application network to be isolated from the management network. It is important to separate this traffic for uninterrupted access to chassis management.

   NOTE: It is recommended to isolate chassis management from the data network. Due to the potential of traffic on the data network, the management interfaces on the internal management network can be saturated by traffic intended for servers. This results in CMC and iDRAC communication delays. These delays may cause unpredictable chassis behavior, such as CMC displaying iDRAC as offline even when it is up and running, which in turn causes other unwanted behavior. If physically isolating the management network is impractical, the other option is to separate CMC and iDRAC traffic to a separate VLAN. CMC and individual iDRAC network interfaces can be configured to use a VLAN.
2. The STK/Gb2 port can also be used for CMC NIC failover. Ensure that the CMC setting is changed from default **Stacking** to **Redundant** to implement NIC failover. For more information, see Configuring Management Port 2

CAUTION: Connecting the STK/Gb2 port to the management network will have unpredictable results if the CMC setting is not changed from default Stacking to Redundant, to implement NIC failover. In the default Stacking mode, cabling the Gb1 and STK/Gb2 ports to the same network (broadcast domain) can cause a broadcast storm. A broadcast storm can also occur if the CMC setting is changed to Redundant mode, but the cabling is daisy chained between chassis in the Stacking mode. Ensure that the cabling model matches the CMC setting for the intended usage.

3. Install the I/O module in the chassis and connect the network cable to the I/O module.
4. Insert the servers in the chassis.
5. Connect the chassis to the power source.
6. To power on the chassis, press the power button or use the following interfaces after completing the task 6. Using the Web interface, go to **Chassis Overview → Power → Control → Power Control Options → Power On System**. Click **Apply**.

   You can also power on the chassis using the command line interface, use `racadm chassisaction powerup` command to accomplish it.

   NOTE: Do not turn on the servers.
7. The default CMC network configuration is Static with the CMC IP address 192.168.0.120. If you want to change the network configuration to DHCP, connect a serial cable to serial port on the CMC. For more information on serial connection, refer to Serial interface/protocol setup in Using Remote Access Software From a Management Station section.

   After the serial connection is established, login and use the command `racadm setniccfg –d` to change the network configuration to DHCP. CMC takes 30 to 60 seconds approximately to obtain the IP address from the DHCP server.

   To view the DHCP assigned CMC IP address, use one of the following methods:

   - To view CMC IP address using serial connection with CMC, perform the following steps:
     1. Connect one end of the serial null modem cable to the serial connector on the back of the chassis.
     2. Connect the other end of the cable to the management system serial port.
     3. After the connection is established, login to CMC using default root account credentials.
     4. Run the `racadm getniccfg` command.

        In the output displayed, search for **Current IP Address**.
   - To view CMC IP address by connecting the server using KVM, perform the following steps:
     1. Connect to a server in the chassis using KVM.

        NOTE: For more details on how to connect a server through KVM, see Accessing Server Using KVM.
     2. Turn on the server.
     3. Make sure the server is set to boot in Unified Extensible Firmware Interface (UEFI) mode.
     4. Press F2 to access the System Setup page.
     5. In the **System Setup** page, click **iDRAC Settings → System Summary**.

        The CMC IP address is displayed in the **Chassis Management Controller** section.

        For more information about **iDRAC Settings** page in the iDRAC GUI, see the *Dell Integrated Dell Remote Access Controller (iDRAC) User's Guide* .
8. Connect to the CMC IP address by using a web browser by typing the default root account credential.

9. Configure iDRAC network settings as required. by default, iDRAC LAN is enabled with static IP configured. To determine the default static IP address with an **Enterprise license**, go to **Server Overview → Setup → iDRAC**. You can also determine the static IP address with an **Express license**. Go to **Server Overview → Server-Slot → Setup → iDRAC**.
10. Provide the IO module with an external management IP address(if applicable) in the CMC web interface. You can get the IP address by clicking **I/O Module Overview**, and then clicking **Setup**.
11. Connect to each iDRAC through the web interface using default root account credential to complete any necessary configuration.
12. Turn on the servers and install the operating system.

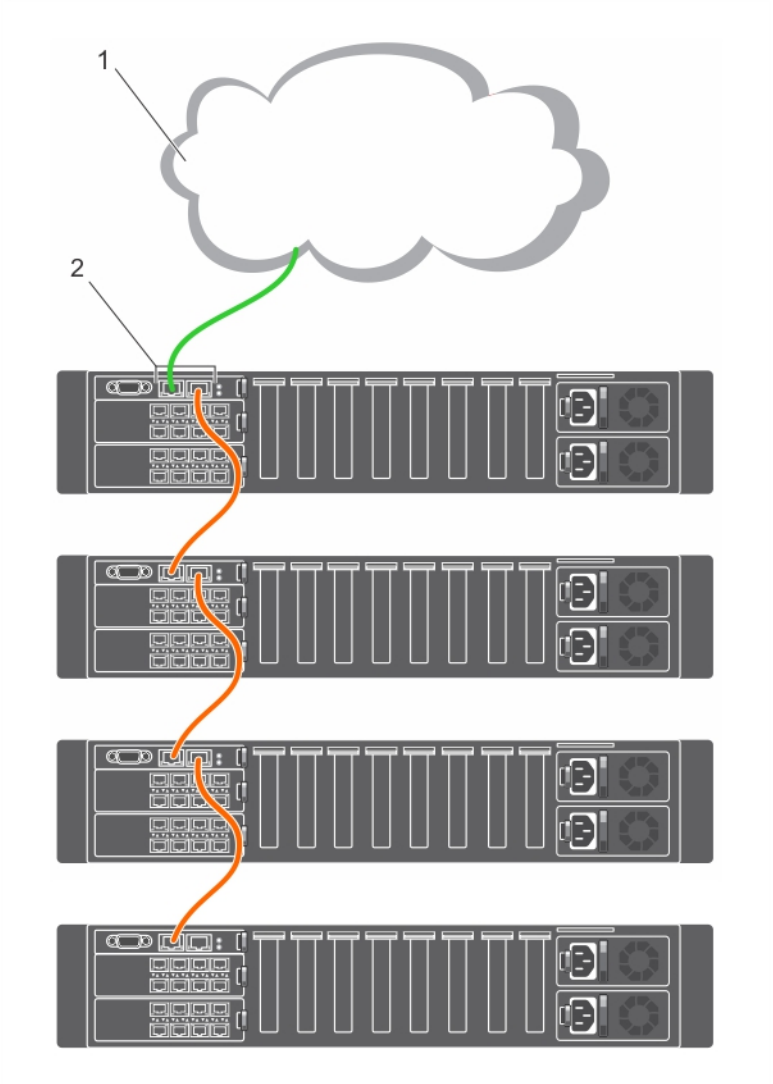
NOTE: The default local account credential is root (user name) and calvin (user password).

Daisy chain FX2 CMC network connection

If you have multiple chassis in a rack, you can reduce the number of connections to the management network by daisy-chaining up to ten chassis together. You can reduce the number of management network uplink connections required from ten to one.

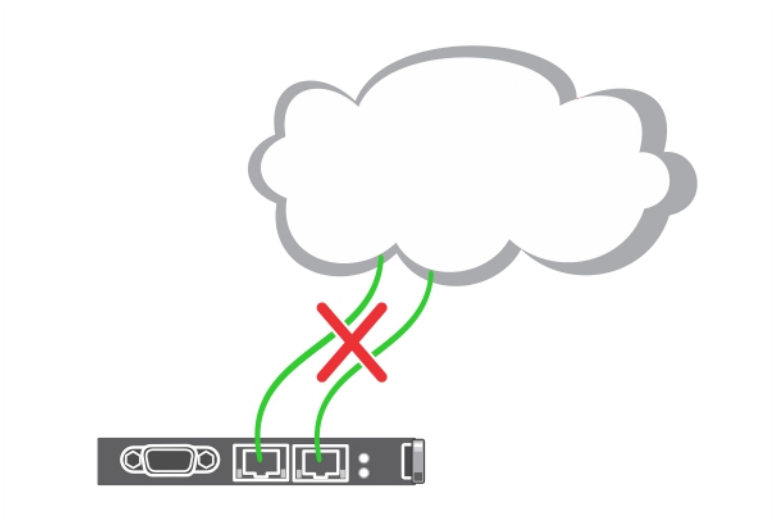
When daisy-chaining chassis together, GB is the uplink port and STK is the stacking (cable consolidation) port. Connect the Gb ports to the management network or to the STK port of CMC in a chassis that is closer to the network. Connect the STK port only to a Gb port further from the chain or network.

The following figure illustrates the arrangement of cables for four daisy-chained chassis, each with active CMCs.



1	Management Network
2	Active CMC

The following figure illustrates an example of incorrect cabling of CMC in stacking mode.



Following are the steps to daisy-chain four FX2 CMC modules:

1. Connect the GB port of the FX2 CMC in the first chassis to the management network.
2. Connect the GB port of the FX2 CMC in the second chassis to the STK port of the FX2 CMC in the first chassis.
3. If you have a third chassis, connect the GB port of its FX2 CMC to the STK port of the FX2 CMC in the second chassis.
4. If you have a fourth chassis, connect the GB port of its FX2 CMC to the STK port of the FX2 CMC in the third chassis.

CAUTION: The STK port on any CMC must never be connected to the management network. It can only be connected to the GB port on another chassis. Connecting a STK port to the management network can disrupt the network and cause loss of data. Cabling GB and STK to the same network (broadcast domain) can cause a broadcast storm.

NOTE: Resetting a CMC whose STK port is chained to another CMC can disrupt the network for CMCs that appear later in the chain. The child CMCs may log messages indicating that the network link is lost.

Using remote access software from a management station

You can access CMC from a management station using various remote access software. Here is a list of remote access softwares by Dell which is available from your Operating System.

Interface/Protocol	Description
Serial	CMC supports a serial text console that can be launched using any terminal emulation software. Following are couple of examples of terminal emulation software that can used to connect to CMC. • Linux Minicom • Hilgraeve's HyperTerminal for Windows Connect one end of the serial null modem cable (present at both ends) to the serial connector on

	the back of the chassis. Connect the other end of the cable to management station serial port. For more information on connecting cables, refer to the back panel of the chassis in Chassis Overview section. Configure your terminal emulation software with the following parameters: • Baud rate: 115200 • Port: COM1 • Data: 8 bit • Parity: None • Stop: 1 bit • Hardware flow control: Yes • Software flow control: No
Remote RACADM CLI	Remote RACADM is a client utility that runs on a management station. It uses the out-of-band network interface to run RACADM commands on the managed system and uses the HTTPs channel. The –r option runs the RACADM command over a network, it requires CMC IP, username and password. To use remote RACADM from your management station, install remote RACADM using the Dell Systems Management Tools and Documentation DVD that is available with your system. For more information on Remote RACADM
Web Interface	Provides remote access to CMC using a graphical user interface. The Web interface is built into the CMC firmware and is accessed through the NIC interface from a supported web browser on the management station. For a list of supported Web browsers, see the **Supported Browsers** section in the Dell System Software Support Matrix at **dell.com/support/manuals**.
Telnet	Provides command line access to CMC through the network. The RACADM command line interface and the connect command, which is used to connect to the serial console of a server or IO module, are available from the CMC command line. NOTE: Telnet is not a secure protocol and is disabled by default. Telnet transmits all data, including passwords in plain text.
SNMP	Simple Network Management Protocol (SNMP) is a set of protocol definitions for managing devices on the networks. The CMC provides access to SNMP, which allows you to use SNMP tools to query the CMC for Systems Management information. The

CMC MIB file can be downloaded from the CMC Web interface, go to **Chassis Overview → Network → Services → SNMP**. See the *Dell OpenManage SNMP Reference Guide* for more information about the CMC MIB.

The following example show how the `net-snmp snmpget` command can be used to get the chassis service tag from the CMC.

```
snmpget -v 1 -c <CMC community name>
<CMC IP address>.
1.3.6.1.4.1.674.10892.2.1.1.6.0
```

WS-MAN

The WSMAN Services is based on the Web Services for Management (WSMAN) protocol to perform one-to-many systems management tasks. You can use WS-MAN client such as WinRM client (Windows) or the OpenWSMAN client (Linux) to use the LC-Remote Services functionality. You can also use Power Shell and Python script the WS-MAN interface.

WSMAN is a Simple Object Access Protocol (SOAP)–based protocol used for systems management. CMC uses WS–Management to convey Distributed Management Task Force (DMTF) Common Information Model (CIM)–based management information. The CIM information defines the semantics and information types that can be modified in a managed system.

The CMC WS-MAN implementation uses SSL on port 443 for transport security, and supports basic authentication. The data available through WS-Management is provided by CMC instrumentation interface mapped to the DMTF profiles and extension profiles.

NOTE: The SSL port used for transport security is the same as the CMC HTTPS port.

For more information, see:

- MOFs and Profiles — **delltechcenter.com/page/DCIM.Library**
- DTMF Web site — **dmtf.org/standards/profiles/**
- WS-MAN Release notes file.
- **www.wbemsolutions.com/ws_management.html**
- DMTF WS-Management Specifications: **www.dmtf.org/standards/wbem/wsman**

For client connection using Microsoft WinRM, the minimum required version is 2.0. For more information, refer to the Microsoft article, <**support.microsoft.com/kb/968929**>.

Launching CMC using other systems management tools

You can also launch CMC from the Dell Server Administrator or Dell OpenManage Essentials.

To access CMC interface using Dell Server Administrator, launch Server Administrator on your management station. In the left pane of the Server Administrator home page, click **System → Main System Chassis → Remote Access Controller**. For more information, see the *Dell Server Administrator User's Guide* at **dell.com/support/manuals**.

Remote RACADM installation

To use remote RACADM from your management station, install remote RACADM using the *Dell Systems Management Tools and Documentation* DVD that is available with your system. This DVD includes the following Dell OpenManage components:

- DVD root — Contains the Dell Systems Build and Update Utility.
- SYSMGMT — Contains the systems management software products including Dell OpenManage Server Administrator.
- Docs — Contains documentation for systems, systems management software products, peripherals, and RAID controllers.
- SERVICE — Contains the tools required to configure your system, and delivers the latest diagnostics and Dell-optimized drivers for your system.

For information about installing Dell OpenManage software components, see the *Dell OpenManage Installation and Security User's Guide* available at **dell.com/support/manuals**. You can also download the latest version of the Dell DRAC Tools from **support.dell.com**.

Installing remote RACADM on a Windows management station

If you are using the DVD, run **<*path*>\SYSMGMT\ManagementStation\windows\DRAC\<*.msi file name*>**

If you have downloaded the software from **support.dell.com**:

1. Extract the downloaded file and execute the **.msi** file provided.

   Depending on the version downloaded, the file will be named DRAC.msi, RACTools.msi, or RACTools64Bit.msi.
2. Accept the license agreement. Click **Next**.
3. Select the location where it is to be installed. **Click Next**.
4. Click **Install**.

   The installing window appears.
5. Click **Finish**.

Open an administrative command prompt, type `racadm` and press **Enter**. If you get the RACADM help instructions, it implies that the software is installed correctly.

Installing remote RACADM on a Linux management station

1. Log in as root to the system running a supported Red Hat Enterprise Linux or SUSE Linux Enterprise Server operating system where you want to install the managed system components.
2. Insert the *Dell Systems Management Tools and Documentation DVD* into the DVD drive.
3. To mount the DVD to a required location, use the mount command or a similar command.

NOTE: On the Red Hat Enterprise Linux 5 operating system, DVDs are auto-mounted with the –noexec mount option. This option does not allow you to run any executable from the DVD. You need to mount the DVD-ROM manually, and then run the commands.

4. Navigate to the **SYSMGMT/ManagementStation/linux/rac** directory. To install the RAC software, type the following command:

   ```
   rpm -ivh *.rpm
   ```

5. For help about the RACADM command, type `racadm help` after you run the previous commands. For more information about RACADM, see the *Chassis Management Controller for Dell PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

   NOTE: When using the RACADM remote capability, you must have the 'write' permission on the folders where you are using the RACADM subcommands, involving the file operations. For example, `racadm getconfig -f <file name>`.

Uninstalling remote RACADM from a Linux management station

1. Log in as `root` to the system where you want to uninstall the management station features.
2. Run the following rpm query command to determine which version of the DRAC tools is installed:

   ```
   rpm -qa | grep mgmtst-racadm
   ```

3. Verify the package version to be uninstalled and uninstall the feature by using the rpm `-e rpm -qa | grep mgmtst-racadm` command.

Configuring a web browser

You can configure and manage CMC, servers, and modules installed in the chassis through a web browser. See the "Supported Browsers" section in the *Dell Systems Software Support Matrix* at **dell.com/support/manuals**.

The CMC and the management station where you use your browser must be on the same network, which is called the *management network*. On the basis of your security requirements, the management network can be an isolated and highly secure network.

NOTE: Make sure that the security measures on the management network such as firewalls and proxy servers, do not prevent your web browser from accessing the CMC.

Some browser features can interfere with connectivity or performance, especially if the management network does not have a route to the Internet. If your management station is running on a Windows operating system, some Internet Explorer settings can interfere with connectivity, even though you use a command line interface to access the management network.

NOTE: To address security issues, Microsoft Internet Explorer strictly monitors the time on its cookie management. To support this, the time on your computer that runs Internet Explorer must be synchronized with the time on the CMC.

Proxy server

To browse through a proxy server that does not have access to the management network, you can add the management network addresses to the exception list of the browser. This instructs the browser to bypass the proxy server while accessing the management network.

Microsoft phishing filter

If the Microsoft Phishing Filter is enabled in Internet Explorer on your management system, and your CMC does not have Internet access, accessing CMC may be delayed by a few seconds. This delay can

happen if you are using the browser or another interface such as remote RACADM. To disable the phishing filter:

1. Start Internet Explorer.
2. Click **Tools** → **Phishing Filter**, and then click **Phishing Filter** Settings.
3. Select the **Disable Phishing Filter** option and click **OK**.

Downloading files from CMC with Internet Explorer

When you use Internet Explorer to download files from the CMC, you may experience problems when the **Do not save encrypted pages to disk** option is not enabled.

To enable the **Do not save encrypted pages to disk** option:

1. Start Internet Explorer.
2. Click **Tools** → **Internet Options** → **Advanced**.
3. In the **Security** section, select the **Do not save encrypted pages to disk** option.

Enabling animations in Internet Explorer

When transferring files to and from the web interface, a file transfer icon spins to show transfer activity. While using Internet explorer, you have to configure the browser to play animations.

To configure Internet Explorer to play animations:

1. Start Internet Explorer.
2. Click **Tools** → **Internet Options** → **Advanced**.
3. Go to the **Multimedia** section, and then select the **Play animations in web pages** option.

Downloading and updating CMC firmware

To download the CMC firmware, see Downloading CMC Firmware.

To update the CMC firmware, see Updating CMC Firmware.

Setting chassis physical location and chassis name

You can set the chassis location in a data center and the chassis name to identify the chassis on the network (default name is **cmc-"Service Tag"**). For example, an SNMP query on the chassis name returns the name you configure.

Setting chassis physical location and chassis name using web interface

To set the chassis location and chassis name using the CMC web interface:

1. In the left pane, go to **Chassis Overview**, and then click **Setup**.
2. On the **General Chassis Settings** page, type the location properties and the chassis name. For more information about setting chassis properties, see the *CMC Online Help*.

   NOTE: The **Chassis Location** field is optional. It is recommended to use the **Data Center**, **Aisle**, **Rack**, and **Rack Slot** fields to indicate the physical location of the chassis.
3. Click **Apply**. The settings are saved.

Setting chassis physical location and chassis name using RACADM

To set the chassis name, location, date, and time by using the command line interface, see the **setsysinfo** and **setchassisname** commands.

For example `racadm setsysinfo –c chassisname` or `racadm setsysinfo –c chassislocation`

For more information, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Setting date and time on CMC

You can manually set the date and time, or you can synchronize the date and time with a Network Time Protocol (NTP) server.

Setting date and time on CMC using CMC web interface

To set the date and time on CMC:

1. In the left pane, click **Chassis Overview → Setup → Date/Time**.
2. To synchronize the date and time with a Network Time Protocol (NTP) server, on the **Date/Time** page, select **Enable NTP** and specify up to three NTP servers. To manually set the date and time, clear the **Enable NTP** option, and then edit the **Date** and **Time** fields.
3. Select the **Time Zone** from the drop-down menu, and then click **Apply**.

Setting date and time on CMC using RACADM

To set the date and time using the command line interface, see the **config** command and `cfgRemoteHosts` database property group sections in the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

For example `racadm setractime -l 20140207111030`.

To read the date and time use `racadm getractime` command.

Configuring LEDs to identify components on the chassis

You can enable the LEDs of components (chassis, servers, storage sleds, and I/O Modules) to blink so that you can identify the component on the chassis.

NOTE: To modify these settings, you must have the **Debug Administrator** privilege on a CMC.

When a compute sled is performing an identify action, the front LED of the connected storage sled also flashes the identify pattern. If a storage sled is in split-single mode and is connected to two compute nodes, it shall flash the identify pattern if either of the two compute nodes is performing an identify action.

If you start an identify action using OMSS or iDRAC for a compute sled, drive or enclosure, the storage sled associated with them also performs the identify action.

NOTE: You cannot select only storage sleds for an identify action.

Configuring LED blinking using CMC web interface

To enable blinking for one, multiple, or all component LEDs:

- In the left pane, go to any of the following pages:
  - **Chassis Overview → Troubleshooting**.
  - **Chassis Overview → Chassis Controller → Troubleshooting**.
  - **Chassis Overview → Server Overview → Troubleshooting**.

    NOTE: Only servers can be selected on this page.

To enable blinking of a component LED, select the respective component , and then click **Blink**. To disable blinking of a component LED, deselect the server, and then click **Unblink**.

Configuring LED blinking using RACADM

Open a serial/Telnet/SSH text console to CMC, log in, and type:

`racadm setled -m <module> [-l <ledState>]`, where `<module>` specifies the module whose LED you want to configure. Configuration options:

- `server-n` where *n* = 1-4 (PowerEdge FM120x4), and `server-nx` where *n* = 1–4 and *x* = a to b (PowerEdge FC630).
- `switch-1`
- `cmc-active`

and `<ledState>` specifies whether or not the LED should blink. Configuration options:

- 0 — not blinking (default)
- 1 — blinking

Configuring CMC properties

You can configure CMC properties such as power budgeting, network settings, users, and SNMP and email alerts using the web interface or RACADM commands.

Configuring front panel

You can use the front panel page to configure:

- Power button
- KVM

Configuring power button

To configure the chassis power button:

1. In the left pane, click **Chassis Overview → Front Panel → Setup**.
2. On the **Front Panel Configuration** page, under the **Power Button Configuration** section, select the **Disable Chassis Power Button** option, and then click **Apply**.

   The chassis power button is disabled.

Accessing a server using KVM

To map a Server to KVM from web interface:

1. Connect a monitor to the video connector and a keyboard to USB connector located on the front of the chassis.
2. In the left pane, click **Chassis Overview → Front Panel → Setup**.
3. On the **Front Panel Configuration** page, under the **KVM Configuration** section, select **Enable KVM Mapping** option.
4. On the **Front Panel Configuration** page, under the **KVM Configuration** section, for **KVM Mapped** option, select the desired server from the drop down list.
5. Click **Apply**.

To map a Server to KVM using racadm, use`racadm config -g cfgKVMInfo -o cfgKvmMapping [server slot #]` command.

To view the current KVM mapping using racadm, use `racadm getconfig -g cfgKVMInfo`.

Configuring chassis management at server mode

This feature allows you to manage and monitor the chassis shared components and chassis nodes as rack servers. When this feature is enabled, you can use the iDRAC RACADM proxy, blade server operating systems and Lifecycle Controller to do the following:

- Monitor and manage chassis fans, power supplies, temperature sensors
- Update and configure the CMC firmware

Configuring chassis management at server using CMC web interface

To enable chassis management at server mode:

1. In the left pane, click **Chassis Overview → Setup → General**.
2. In the **General Chassis Settings** page, from the **Chassis Management at Server Mode** drop-down, select one of the following modes:
   - **None** — This mode does not enable you to monitor or manage the chassis component through iDRAC, OS, or Lifecycle Controller.
   - **Monitor** — This mode enables you to monitor the chassis components but you cannot perform any firmware update through iDRAC, OS, iDRAC RACADM proxy, or Lifecycle Controller.
   - **Manage and Monitor** — This mode enables you to monitor the chassis components and update the CMC firmware using DUP through iDRAC, OS, iDRAC RACADM, or Lifecycle Controller.

Configuring chassis management at server mode using RACADM

To enable the Chassis Management at server using RACADM, use the following commands:

- To disable Chassis Management at Server mode, use:
  `racadm config –g cfgRacTuning – cfgRacTuneChassisMgmtAtServer 0`
- To change Chassis Management at Server mode to monitor, use:
  `racadm config –g cfgRacTuning – cfgRacTuneChassisMgmtAtServer 1`
- To change Chassis Management at server mode to manage and monitor, use:
  `racadm config –g cfgRacTuning – cfgRacTuneChassisMgmtAtServer 2`

3

Logging into CMC

You can log in to CMC as a CMC local user, as a Microsoft Active Directory user, or as an LDAP user. You can also log in using Single Sign-On or a Smart Card.

Configure public key authentication over SSH

You can configure up to six public keys that can be used with the service username over an SSH interface. Before adding or deleting public keys, make sure to use the `view` command to see what keys are already set up, so that a key is not accidentally overwritten or deleted. The service username is a special user account that can be used when accessing the CMC through SSH. When the PKA over SSH is set up and used correctly, you need not enter username or passwords to log in to the CMC. This can be very useful to set up automated scripts to perform various functions.

NOTE: There is no GUI support for managing this feature, you can use only the RACADM.

When adding new public keys, make sure that the existing keys are not already at the index, where the new key is added. CMC does not perform checks to ensure previous keys are deleted before a new one is added. As soon as a new key is added, it is automatically in effect as long as the SSH interface is enabled.

When using the public key comment section of the public key, remember that only the first 16 characters are utilized by the CMC. The public key comment is used by the CMC to distinguish SSH users when using the RACADM `getssninfo` command, because all the PKA users use the service username to log in.

For example, if two public keys are set up one with comment PC1 and one with comment PC2:

```
racadm getssninfo
Type       User  IP Address  Login
Date/Time
SSH        PC1   x.x.x.x     06/16/2009
09:00:00
SSH        PC2   x.x.x.x     06/16/2009
09:00:00
```

For more information about the `sshpkauth`, see the *Chassis Management Controller for PowerEdge FX2/FX2s Command Line Reference Guide*.

Generating public keys for systems running Windows

Before adding an account, a public key is required from the system that accesses the CMC over SSH. There are two ways to generate the public/private key pair: using PuTTY Key Generator application for clients running Windows or ssh-keygen CLI for clients running Linux.

This section describes simple instructions to generate a public/private key pair for both applications. For additional or advanced usage of these tools, see the application Help.

To use the PuTTY Key Generator to create a basic key for clients running Windows:

1. Start the application and select SSH-2 RSA or SSH-2 DSA for the type of key to generate (SSH-1 is not supported).
2. Enter the number of bits for the key. RSA key size should be between 768 and 4096 and the recommended DSA key size is 1024.

   NOTE:
   - CMC may not display a message if you add keys less than 768 or greater than 4096, but when you try to log in with these keys, it fails.
   - For DSA keys greater than 2048, use the following racadm command. CMC accepts RSA keys up to key strength 4096, but the recommended key strength is 1024.

     ```
     racadm -r 192.168.8.14 -u <default root account username>  -p
     <default root account password> sshpkauth -i svcacct -k 1 -p 0xfff -f
     dsa_2048.pub
     ```
3. Click **Generate** and move the mouse in the window as directed.

   After the key is created, you can modify the key comment field.

   You can also enter a passphrase to make the key secure. Ensure that you save the private key.
4. You have two options for using the public key:
   - Save the public key to a file to upload later.
   - Copy and paste the text from the **Public key for pasting** window when adding the account using the text option.

Generating public keys for systems running Linux

The ssh-keygen application for Linux clients is a command line tool with no graphical user interface. Open a terminal window and at the shell prompt type:

```
ssh-keygen –t rsa –b 1024 –C testing
```

where,

`–t` must be dsa or rsa.

`–b` specifies the bit encryption size between 768 and 4096.

`–c` allows modifying the public key comment and is optional.

The < *passphrase* > is optional. After the command completes, use the public file to pass to the RACADM for uploading the file.

Accessing CMC web interface

Before you log in to CMC using the web interface, make sure that you have configured a Supported Web Browser and the user account is created with the required privileges.

NOTE: If you are using Microsoft Internet Explorer, connect using a proxy, and if you see the error `The XML page cannot be displayed`, you must disable the proxy to continue.

To access the CMC web interface:

1. Open a web browser supported on your system.

For the latest information on supported web browsers, see the *Dell Systems Software Support Matrix* located at **dell.com/support/manuals**.

2. In the **Address** field, type the following URL, and then press <Enter>:
   - To access CMC using IPv4 address: `https://<CMC IP address>`
     If the default HTTPS port number (port 443) was changed, type: `https://<CMC IP address>:<port number>`
   - To access CMC using IPv6 address: `https://[<CMC IP address>]`
     If the default HTTPS port number (port 443) was changed, type: `https://[<CMC IP address>]:<port number>`, where <*CMC IP address*> is the IP address for CMC and <*port number*> is the HTTPS port number.

     The **CMC Login** page appears.

   NOTE: While using IPv6, you must enclose the CMC IP address in parenthesis ([ ]).

Logging into CMC as a local user, active directory user, or LDAP user

To log in to CMC, you must have a CMC account with the **Log In to CMC** privilege. The default root account is the default administrative account that ships with CMC.

NOTE: For added security, it is strongly recommended that you change the default password of the root account during initial setup.

NOTE: When Certificate Validation is enabled, FQDN of the system should be provided. If certificate validation is enabled and IP address is provided for the Domain Controller, then the login will fail.

CMC does not support extended ASCII characters, such as ß, å, é, ü, or other characters used primarily in non-English languages.

To log in as a local user, Active Directory user, or LDAP user.

1. In the **Username** field, type your user name:
   - CMC user name: <user name>

     NOTE: The CMC user name can contain only alphanumeric characters and certain special characters. The at (@) symbol and following special characters are not supported:
     - Forward slash (/)
     - Backward slash (/)
     - Semicolon (;)
     - Backward Quote (`)
     - Quotations (")
   - Active Directory user name: <domain>\<user name>, <domain>/<user name> or <user>@<domain>.
   - LDAP user name: <user name>

   NOTE: This field is case-sensitive.
2. In the **Password** field, type the user password.

   NOTE: For Active Directory user, the **Username** field is case-sensitive.
3. In the **Domain** field, from the drop-down menu, select the required domain.

4. Optionally, select a session timeout. This is the duration for which you can stay logged in with no activity before you are automatically logged out. The default value is the **Web Service Idle Timeout.**
5. Click **OK**.

   You are logged into CMC with the required user privileges.

   You cannot log in to the Web interface with different user names in multiple browser windows on a single workstation.

Logging into CMC using a smart card

To use this feature, you must have an Enterprise License. You can log in to CMC using a smart card. Smart cards provide Two Factor Authentication (TFA) that provide two-layers of security:

- Physical smart card device.
- Secret code such as a password or PIN.

Users must verify their credentials using the smart card and the PIN.

NOTE: You cannot use the IP address to log in to CMC using the Smart Card login. Kerberos validates your credentials based on the Fully Qualified Domain Name (FQDN).

Before you log in as an Active Directory user using a Smart Card, make sure to:

- Upload a Trusted Certificate Authority (CA) certificate (CA-signed Active Directory certificate) to CMC
- Configure the DNS server.
- Enable Active Directory login.
- Enable Smart Card login.

To log in to CMC as an Active Directory user using a smart card:

1. Log in to CMC using the link `https://<cmcname.domain-name>`.

   The **CMC Login** page is displayed asking you to insert a smart card.

   NOTE: If you changed the default HTTPS port number (port 80), access the CMC web page using `<cmcname.domain-name>:<port number>`, where cmcname is the CMC host name for CMC, *domain-name* is the domain name, and *port number* is the HTTPS port number.
2. Insert the smart card and click **Login**.

   The PIN dialog box is displayed.
3. Type the PIN and click **Submit**.

   NOTE: If the smart card user is present in Active Directory, an Active Directory password is not required. Else, you have to log in by using an appropriate username and password.

   You are logged in to CMC with your Active Directory credentials.

Logging into CMC using Single Sign-On

When Single Sign-On (SSO) is enabled, you can log in to CMC without providing your domain user authentication credentials, such as user name and password. To use this feature, you must have an Enterprise License.

NOTE: You cannot use the IP address to log in to the SSO. Kerberos validates your credentials against the Fully Qualified Domain Name (FQDN).

Before logging in to CMC using SSO, make sure that:

- You have logged in to your system using a valid Active Directory user account.
- Single Sign-On option is enabled during the Active Directory configuration.

To log in to CMC using SSO:

1. Log in to the client system using your network account.
2. Access the CMC web interface by using: `https://<cmcname.domain-name>`

   For example, **cmc-6G2WXF1.cmcad.lab,**, where **cmc-6G2WXF1** is the cmc-name and **cmcad.lab** is the domain name.

   NOTE: If you have changed the default HTTPS port number (port 80), access the CMC web interface using `<cmcname.domain-name>:<port number>`, where the *cmcname* is the CMC host name for CMC, **domain-name** is the domain name, and **port number** is the HTTPS port number.

   CMC logs you in, using the Kerberos credentials that were cached by your browser when you logged in using your valid Active Directory account. If the login is unsuccessful, the browser is redirected to the normal CMC login page.

   NOTE: If you are not logged in to the Active Directory domain and are using a browser other than Internet Explorer, the login is unsuccessful and the browser displays a only blank page.

Logging into CMC using serial, Telnet, or SSH console

You can log into CMC through a serial, Telnet, or SSH connection.

After you configure your management station terminal emulator software, perform the following tasks to log in to CMC:

1. Connect to CMC using your management station terminal emulation software.
2. Type your CMC user name and password, and then press <Enter>.

   You are logged in to CMC.

Logging into CMC using public key authentication

You can log in to the CMC over SSH without typing a password. You can also send a single RACADM command as a command line argument to the SSH application. The command line options behave similar to the remote RACADM, because the session ends after the command is completed.

Before logging in to CMC over SSH, make sure that the public keys are uploaded. To use this feature, you must have an Enterprise License.

For example:

- **Logging in**: `ssh service@<domain>` or `ssh service@<IP_address>`, where IP_address is the CMC IP address.
- **Sending RACADM commands**: `ssh service@<domain> racadm getversion` and `ssh service@<domain> racadm getsel`

When you log in using the service account, if a passphrase was set up when creating the public or private key pair, you may be prompted to enter that passphrase again. If the passphrase is used with the keys,

client systems running Windows and Linux provide methods to automate the method. On client systems running Windows, you can use the Pageant application. It runs in the background and makes entering the passphrase transparent. For client systems running Linux, you can use the ssh agent. For setting up and using either of these applications, see their product documentation.

Multiple CMC sessions

A list of multiple CMC sessions that are possible by using the various interfaces is given here.

Table 2. Multiple CMC sessions

Interface	Number of Sessions
CMC web interface	4
RACADM	4
Telnet	4
SSH	4

4

Updating firmware

You can update firmware for:

- The CMC
- Chassis infrastructure
- I/O Module
- PERC
- Expander and HDD

You can update firmware for the following server components:

- BIOS
- iDRAC7 on FM120x4 (12th generation of servers)
- iDRAC8 on FC630 (13th generation of servers)
- Lifecycle Controller
- 32–bit diagnostics
- Operating System Drivers Pack
- Network Interface Controllers
- RAID controllers

Signed CMC firmware image

The CMC firmware includes a signature. The CMC firmware performs a signature verification step to ensure the authenticity of the uploaded firmware. The firmware update process is successful only if the firmware image is authenticated by CMC to be a valid image from the service provider and has not been altered. The firmware update process is stopped if CMC cannot verify the signature of the uploaded firmware image. A warning event is then logged and an appropriate error message is displayed.

When you try to upgrade CMC firmware version, CMC Firmware Update Process verifies the firmware image in the selected version for the signature from the service provider. The firmware update is stopped, if the signature is not found or if the verification of the image is not successful. A warning event is logged and an appropriate error message is displayed.

When a firmware downgrade to a earlier version is attempted, CMC Firmware Update Process verifies the firmware image in the earlier versions for the signature from the service provider. The firmware downgrade is stopped, if the computed signature of the earlier version is not recognized by the current CMC firmware. CMC firmware logs a warning event and an appropriate error message is displayed.

Downloading CMC firmware

Before beginning the firmware update, download the latest firmware version from **support.dell.com**, and save it to your local system.

It is recommended to follow the following update order while updating firmware for the chassis:

- Blade components firmware
- CMC firmware
- Chassis infrastructure firmware

Viewing currently installed firmware versions

You can view the currently installed firmware versions using the CMC web interface or RACADM.

Viewing currently installed firmware versions using CMC web interface

In the CMC web interface, go to any of the following pages to view the current firmware versions:

- **Chassis Overview → Update**
- **Chassis Overview → Chassis Controller → Update**
- **Chassis Overview → Server Overview → Server Component Update**

The **Firmware Update** page displays the current version of the firmware for each listed component and allows you to update the firmware to the latest version.

If the chassis contains an earlier generation server, whose iDRAC is in recovery mode or if CMC detects that iDRAC has corrupted firmware, then the earlier generation iDRAC is also listed on the **Firmware Update** page.

Viewing currently installed firmware versions using RACADM

You can view the currently installed firmware versions using `racadm getversion` command. For more information about other RACADM commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Updating the CMC firmware

You can update the CMC firmware using web interface or RACADM. The firmware update, by default, retains the current CMC settings.

NOTE: To update firmware on CMC, you must have the Chassis Configuration Administrator privilege.

NOTE: You cannot update the CMC firmware if the firmware image file does not contain a verification signature or it contains a verification signature, which is not valid or corrupted.

NOTE: You cannot downgrade the CMC firmware to an earlier version if the computed signature of that earlier version is not recognized by the current CMC firmware.

If a Web user interface session is used to update system component firmware, the Idle Timeout (**0, 60–10800**) setting must be set to a higher value to accommodate the file transfer time. In some cases, the

firmware file transfer time may be as high as 30 minutes. To set the idle timeout value, see Configuring Services.

During CMC firmware updates, it is normal for some or all of the fan units in the chassis to rotate at 100% speed.

To avoid disconnecting other users during a reset, notify authorized users who may log in to CMC and check for active sessions on the **Sessions** page. To open the **Sessions** page, click **Chassis Overview** in the left pane, click **Network**, and then click the **Sessions**.

When transferring files to and from CMC, the file transfer icon spins during the transfer. If your icon is not animated, make sure that your browser is configured to allow animations. For more information about allowing animations in the browser, see Allow Animations in Internet Explorer.

Updating CMC firmware using web interface

To update the CMC firmware using the CMC web interface:

1. In the left pane, go to any of the following pages:
   - **Chassis Overview → Update**
   - **Chassis Overview → Chassis Controller → Update**
2. On the **Firmware Update** page, in the **CMC Firmware** section, select the required components under the **Update Targets** column for the CMC you want to update, and then click **Apply CMC Update**.
3. In the **Firmware Image** field, enter the path to the firmware image file on the management station or shared network, or click **Browse** to browse through to the file location. The default name of the CMC firmware image file is `fx2_cmc.bin`.
4. Click **Begin Firmware Update**, and then click **Yes**. The **Firmware Update Progress** section provides firmware update status information. A status indicator displays on the page while the image file is uploaded. File transfer time varies based on the connection speed. When the internal update process begins, the page automatically refreshes and the Firmware update timer is displayed. For more information about the various firmware status, see Online Help.
5. For the CMC, during the final phases of the firmware update process, the browser session and connection with CMC is lost temporarily because the CMC is not connected to the network. You must log in after a few minutes, when the CMC has restarted. After CMC resets, the new firmware version is displayed on the **Firmware Update** page.

   NOTE: After the firmware update, delete the files from the web browser cache. For instructions about clearing the browser cache, see the web browser's online help.

Additional instructions:

- During a file transfer, do not click the **Refresh** icon or navigate to another page.
- To cancel the process, select the **Cancel File Transfer and Update** option. This option is available only during file transfer.
- The **Update State** field displays the firmware update status.

  NOTE: The update process may take several minutes.

Updating CMC firmware using RACADM

To update CMC firmware using RACADM, use the `fwupdate` subcommand.

For example, `racadm fwupdate <options> <firmware image>`.

For more information about RACADM commands, see *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Updating the CMC using DUP

You can update the firmware of the CMC using Dell Update Package (DUP) through the following components:

- iDRAC RACADM proxy
- Blade Server Operating System
- Lifecycle Controller

For more information about updating CMC through iDRAC, see *Integrated Dell Remote Access Controller User's Guide*.

Before you update the CMC using DUP, make sure:

- The CMC firmware package is available as DUP on a Local system or network share.
- **Chassis Management at Server Mode** is set to **Manage and Monitor**.

  For more information, see Configuring Chassis Management at Server Mode
- For updates through OS or Lifecycle Controller, the iDRAC option **Enable Shared Components Update through OS/USC** must be enabled. For more information on how to enable is this option, see *Integrated Dell Remote Access Controller User's Guide*.

NOTE: When you update the CMC using DUP, the updates to the IOM Coprocessor available in the CMC image are applied on the next chassis power-up cycle.

Updating chassis infrastructure firmware

The chassis infrastructure update operation updates the Main Board component.

NOTE: Before you update the Chassis Infrastructure firmware, turn off all the servers in the chassis if required.

Updating chassis infrastructure firmware using CMC web interface

1. Go to any of the following pages:
   - **Chassis Overview → Update**.
   - **Chassis Overview → Chassis Controller → Update**.
2. On the **Firmware Update** page, in the **Chassis Infrastructure Firmware** section, in the **Update Targets** column, select the option, and then click **Apply Chassis Infrastructure Firmware**.
3. On the **Firmware Update** page, click **Browse**, and then select the appropriate chassis infrastructure firmware.
4. Click **Begin Firmware Update**, and then click **Yes**.

   The **Firmware Update Progress** section provides firmware update status information. While the image file uploads, a status indicator displays on the page. File transfer time varies on the basis of connection speed. When the internal update process begins, the page automatically refreshes and the firmware update timer is displayed.

Additional instructions to follow:

- Do not click the **Refresh** icon, or navigate to another page during the file transfer.
- The **Update State** field displays the firmware update status.

When the update is complete, connection to the CMC is lost as the entire Chassis is reset. Refresh the web interface to login again. Go to **Chassis Overview → Chassis Controller**.

After the update is complete the updated Mainboard firmware version is displayed.

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Updating chassis infrastructure firmware using RACADM

To update chassis infrastructure firmware using RACADM, use the `fwupdate` sub-command.

For example, `racadm fwupdate <options> <firmware image>`.

For more information about using the RACADM commands, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

NOTE: To update the chassis infrastructure firmware, make sure the servers are turned off.

Updating server iDRAC firmware

You can update firmware for iDRAC7 or iDRAC8. To use this feature:

- You must have an Enterprise License.
- The iDRAC7 firmware version must be 1.57.57 or later.
- The iDRAC8 firmware version must be 2.05.05 or later.

The iDRAC (on a server) resets and is temporarily unavailable after a firmware update.

Updating server iDRAC firmware using web interface

To update the iDRAC firmware in the server:

1. Go to any of the following pages:
   - **Chassis Overview → Update**.
   - **Chassis Overview → Chassis Controller → Update**.

   The **Firmware Update** page is displayed.

   NOTE:
   You can also update server iDRAC firmware using **Chassis Overview → Server Overview → Update**. For more information, see Upgrading Server Component Firmware
2. To update the iDRAC7 or iDRAC8 firmware, in the **iDRAC<revision number> Enterprise Firmware** section, click the **Update** link of the server for which you want to update the firmware.

   The **Server Component Update** page is displayed. To continue, see Updating Server Component Firmware.

Updating server component firmware

The one-to-many update feature in CMC enables you to update server component firmware across multiple servers. You can update the server components using the Dell Update Packages available on the

local system or on a network share. This operation is enabled by leveraging the Lifecycle Controller functionality on the server.

The Lifecycle Controller service is available on each server and is facilitated by iDRAC. You can manage the firmware of the components and devices on the servers using the Lifecycle Controller service. The Lifecycle Controller uses an optimization algorithm to update the firmware that efficiently reduces the number of restarts.

The Lifecycle Controller provides module update support for iDRAC7 and later servers. The iDRAC firmware must be at version 2.3 or later to update firmware using Lifecycle Controller.

Dell Update Packages (DUPs) are used to perform the firmware updates using Lifecycle Controller. The Operating System Driver Pack component DUP exceeds this limit and must be updated separately using the Extended Storage feature.

NOTE: Before using the Lifecycle Controller–based update feature, server firmware versions must be updated. You must also update the CMC firmware before updating the server component firmware modules.

NOTE: To update component firmware, the CSIOR option must be enabled for servers. To enable CSIOR on:

- 12th generation servers and later— After restarting the server, from the F2 setup, select **iDRAC Settings → Lifecycle Controller**, enable **CSIOR** and save the changes.
- 13th generation servers —After rebooting the server, when prompted, press F10 to access Lifecycle Controller. Go to the **Hardware Inventory** page by selecting **Hardware Configuration → Hardware Inventory**. On the **Hardware Inventory** page, click **Collect System Inventory on Restart**.

The **Update from File** method enables you to update the server component firmware using DUP files stored on a local system. You can select the individual server components to update the firmware using the required DUP files. You can update large number of components at a time by using an SD Card to store DUP file of more than 48 MB memory size.

NOTE: Note the following:

- While selecting the individual server components for update, make sure that there are no dependencies between the selected components. Else, selecting some components that have dependencies on other components for update may cause the server to stop functioning abruptly.
- Make sure to update the server components in the recommended order. Else, the process of component firmware update may become unsuccessful.

  Always update the server component firmware modules in the following order:

  – iDRAC
  – Lifecycle Controller
  – BIOS

The Single Click all blade update or the **Update from Network Share** method enables you to update the server component firmware using DUP files stored on a network share. You can use the Dell Repository Manager (DRM) based update feature to access the DUP files stored on a network share and update the

server components in a single operation. You can setup a custom remote repository of firmware DUPs and binary images using the Dell Repository Manager and share it on the Network Share. Alternatively, use the Dell Repository Manager (DRM) to check for the latest available firmware updates. The Dell Repository Manager (DRM) ensures that the Dell systems are up-to-date with the latest BIOS, driver, firmware, and software. You can search for the latest updates available from the Support site (**support.dell.com**) for supported platforms based on Brand and Model or a Service Tag. You can download the updates or build a repository from the search results. For more information on using the DRM to search for latest firmware updates, refer to http://en.community.dell.com/TECHCENTER/EXTRAS/M/WHITE_PAPERS/20438118/DOWNLOAD on the Dell Tech Center. For information on saving the inventory file that DRM uses as input to create the repositories, see Saving Chassis Inventory Report Using CMC Web Interface

NOTE: The Single Click all blade update method has the following benefits:

- Enables you to update all the components on all the blade servers with minimal clicks.
- All the updates are packaged in a directory. This avoids individual upload of each component's firmware.
- Faster and consistent method of updating the server components.
- Enables you to maintain a standard image with the required updates versions of the server components that can be used to update multiple servers in a single operation.
- You can copy the directories of updates from the Dell Server Update Utility (SUU) download DVD or create and customize the required update versions in the Dell Repository Manager (DRM). You do not need the latest version of the Dell Repository Manager to create this directory. However, Dell Repository Manager version 1.8 provides an option to create a repository (directory of updates) based on the inventory that was exported from the servers in the chassis. For information on creating a repository using the Dell Repository Manger see the *Dell Repository Manager Data Center Version 1.8 User's Guide* and the *Dell Repository Manager Business Client Version 1.8 User's Guide* available at **dell.com/support/manuals**.

It is recommended to update the CMC firmware before updating the server component firmware modules. After updating the CMC firmware, in the CMC Web interface, you can update the server component firmware on the **Chassis Overview → Server Overview → Update → Server Component Update** page. It is also recommended to select all the component modules of a server to be updated together. This enables Lifecycle Controller to use its optimized algorithms to update the firmware, reducing the number of reboots.

To update the server component firmware, using the CMC Web interface, click **Chassis Overview → Server Overview → Update → Server Component Update**.

If the server does not support the Lifecycle Controller service, the **Component/Device Firmware Inventory** section displays **Not Supported**. For the latest generation servers, install the Lifecycle Controller firmware and update the iDRAC firmware to enable the Lifecycle Controller service on the server. For earlier generation servers, this upgrade is not possible.

Normally, the Lifecycle Controller firmware is installed using an appropriate installation package that is executed on the server operating system. For supported servers, a special repair or installation package with an **.usc** file extension is available. This file enables you to install the Lifecycle Controller firmware through the firmware update facility available on the native iDRAC Web browser interface.

You can also install Lifecycle Controller firmware through an appropriate installation package executed on the server OS. For more information, see the *Dell Lifecycle Controller User's Guide*.

If Lifecycle Controller service is disabled on the server, the **Component/Device Firmware Inventory** section displays:

`Lifecycle Controller may not be enabled.`

Server component update sequence

In case of individual component updates, you must update the firmware versions for the server components in the following sequence:

- iDRAC
- Lifecycle Controller
- BIOS
- Diagnostics (optional)
- OS Driver Pack (optional)
- RAID
- NIC
- CPLD
- Other Components

NOTE: When you update the firmware versions for all the server components at one time, the update sequence is handled by Lifecycle Controller.

Enabling Lifecycle Controller

You can enable the Lifecycle Controller service when turning on a server:

- For iDRAC servers, on the boot console, to access **System Setup**, press the <F2> key.
- On the **System Setup Main Menu** page, go to **iDRAC Settings** → **Lifecycle Controller**, click **Enabled**. Go to the **System Setup Main Menu** page and click **Finish** to save the settings.
- Cancelling System Services enables you to cancel all scheduled jobs that are pending and remove them from the queue. For more information about the Lifecycle Controller and supported server components, and device firmware management, see *Lifecycle Controller-Remote Services Quick Start Guide* or **delltechcenter.com/page/Lifecycle+Controller**.
- The **Server Component Update** page enables you to update various firmware components on the server. To use the features and functions on this page, you must have:
  - For CMC: The Server Administrator privilege.
  - For iDRAC: The configure iDRAC privilege and log in to iDRAC privilege.

In case of insufficient privileges, you can only view the firmware inventory of components and devices on the server. You cannot select any components or devices for any type of Lifecycle Controller operation on the server.

Choosing server component firmware update type using CMC web interface

To select the type of server component update type:

1. In the system tree, go to **Server Overview**, and then click **Update** → **Server Component Update**. The **Server Component Update** page is displayed.
2. In the **Choose Update Type** section, select the required update method:

- **Update from File**
- **Update from Network Share**

Filtering components for firmware updates

Information about all the components and devices across all servers is retrieved at one time. To manage this large amount of information, Lifecycle Controller provides various filtering mechanisms.

NOTE: To use this feature, you must have an Enterprise License.

The **Component/Device Update Filter** section in the **Server Component Update** page that allows you to filter the information based on the component, is available only for the **Update by File** mode.

These filters enable you to:

- Select one or more categories of components or devices for easy viewing.
- Compare firmware versions of components and devices across the server.
- To narrow the category of a particular component or device based on types or models, automatically filter the selected components and devices.

  NOTE: Automatic filtering feature is important while using the Dell Update Package (DUP). The update programming of a DUP can be based on the type or model of a component or device. The automatic filtering behavior is designed to minimize the subsequent selection decisions after an initial selection is made.

Following are some examples where the filtering mechanisms are applied:

- If the BIOS filter is selected, only the BIOS inventory of all the servers is displayed. If the set of servers consists of a number of server models, and a server is selected for BIOS update, the automatic filtering logic automatically removes all the other servers that do not match with the model of the selected server. This makes sure that the selection of the BIOS firmware update image (DUP) is compatible with the correct model of the server.

  Sometimes, a BIOS firmware update image may be compatible across a number of server models. Such optimizations are ignored in case this compatibility is no longer true in the future.
- Automatic filtering is important for firmware updates of Network Interface Controllers (NIC) and RAID Controllers. These device categories have different types and models. Similarly, the firmware update images (DUP) may be available in optimized forms, where a single DUP may be programmed to update multiple types or models of devices of a given category.

Viewing firmware inventory

You can view the summary of the firmware versions for all components and devices for all servers currently present in the chassis along with their status.

NOTE: To use this feature, you must have an Enterprise License.

Viewing firmware inventory using CMC web interface

To view the firmware inventory:

1. In the left pane, click **Server Overview**, and then click **Update**.
2. On the **Server Component Update** page, view the firmware inventory details in the **Component/ Device Firmware Inventory** section. On this page, you can view the following information:
   - If the server is listed as **Not Ready**, it indicates that when the firmware inventory was retrieved, the iDRAC on the server was still initializing. Wait for the iDRAC to be fully operational, and then refresh the page for the firmware inventory to be retrieved again.

- A hyperlink is provided to an alternative page, where you can directly update only the iDRAC firmware. This page supports only iDRAC firmware update and not any other component and device on the server. iDRAC firmware update is not dependent on the Lifecycle Controller service.
- If the inventory of components and devices do not reflect what is physically installed on the server, you must invoke the Lifecycle Controller when the server is in the boot process. This helps to refresh the internal components and devices information and allows you to verify the currently-installed components and devices. This occurs when:
  - The server iDRAC firmware is updated to newly introduce the Lifecycle Controller functionality to the server management.
  - The new devices are inserted into the server.

  To automate this action for the iDRAC Settings Utility you have an option that can be accessed through the boot console:

  1. On the boot console, to access **System Setup**, press <F2>.
  2. On the **System Setup Main Menu** page, click **iDRAC Settings → Collect System Inventory on Restart**, select **Enabled**, go back to the **System Setup Main Menu** page, and then click **Finish** to save the settings.
- Options to perform the various Lifecycle Controller operations such as Update, Rollback, Reinstall, and Job Deletion are available. Only one type of operation can be performed at a time. Components and devices that are not supported may be listed as part of the inventory, but do not permit Lifecycle Controller operations.

The following table displays the component and devices information on the server:

Table 3. Component and Devices Information

Field	Description
Slot	Displays the slot occupied by the server in the chassis. Slot numbers are sequential IDs for the four available slots in the chassis: • 1, 1a, 1b, 1c, 1d • 2, 2a, 2b, 2c, 2d • 3, 3a, 3b, 3c, 3d • 4, 4a, 4b, 4c, 4d This numbering scheme helps you to identify the location of the server in the chassis. When there are less than four servers occupying slots, only those slots populated by servers are displayed.
Name	Displays the name of the server in each slot.
Model	Displays the model of the server.
Component/ Device	Displays a description of the component or device on the server. If the column width is too narrow, the mouse-over tool provides a view of the description.
Current Version	Displays the current version of component or device on the server.
Rollback Version	Displays the rollback version of component or device on the server.

Field	Description
Job Status	Displays the job status of any operations that are scheduled on the server. The job status is continuously updated dynamically. If a job completion with state completed is detected, then the firmware versions for the components and devices on that server are automatically refreshed in case there has been a change of firmware version on any of the components or devices. An information icon is also presented adjacent to the current state, which provides additional information about the current job status. This information can be viewed by clicking or pausing the mouse over the icon.
Update	Click to select the component or device for firmware update on the server.

Viewing firmware inventory using RACADM

To view firmware inventory using RACADM, use the `getversion` command:

```
racadm getversion -l [-m <module>] [-f <filter>]
```

For more information, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

Saving chassis inventory report using CMC web interface

To save the chassis inventory report:

1. In the system tree, go to **Server Overview**, and then click **Update → Server Component Update**.
   The **Server Component Update** page is displayed.
2. Click **Save Inventory Report**.
   The *Inventory.xml* file is saved on an external system.

   NOTE: The Dell Repository Manager Application uses the *Inventory.xml* file as an input to create a repository of updates for all the blades available in the chassis. This repository can be later exported to a network share. **Update from Network Share** mode of firmware update uses this network share to update the components of all the servers. You must have CSIOR enabled on the individual servers and save the chassis inventory report every time there is a change to the chassis hardware and software configuration.

Configuring network share using CMC web interface

To configure or edit the Network Share location or credentials:

1. In the CMC Web interface, in the system tree, go to **Server Overview** and then click **Network Share**.
   The **Edit Network Share** page is displayed.
2. In the **Network Share Settings** section, configure the following settings as required:
   - Protocol
   - IP Address or Host Name
   - Share Name
   - Update folder
   - File Name (optional)

     NOTE: **File Name** is optional only when the default catalog file name is *catalog.xml*. If the catalog file name is changed then the new name must be entered in this field.

- Profile Folder
- Domain Name
- User Name
- Password

For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

3. Click **Test Directory** to verify whether the directories are readable and writeable.
4. Click **Test Network Connection** to verify if the network share location is accessible.
5. Click **Apply** to apply the changes to the network share properties.

NOTE:

Click **Back** to return to the **Server Component Update** page.

Lifecycle Controller job operations

NOTE: To use this feature, you must have an Enterprise License.

You can perform Lifecycle Controller operations such as:

- Re-install
- Rollback
- Update
- Delete Jobs

Only one type of operation can be performed at a time. Components and devices that are not supported may be listed as part of the inventory, but do not permit Lifecycle Controller operations.

To perform the Lifecycle Controller operations, you must have:

- For CMC: Server Administrator privilege.
- For iDRAC: Configure iDRAC privilege and Log in to iDRAC.

A Lifecycle Controller operation scheduled on a server may take 10 to 15 minutes to complete. The process involves several server reboots during which the firmware installation is performed, which also includes a firmware verification stage. You can view the progress of this process using the server console. If there are several components or devices that need to be updated on a server, you can consolidate all the updates into one scheduled operation thus minimizing the number of reboots required.

Sometimes, when an operation is in the process of being submitted for scheduling through another session or context, another operation is attempted. In this case, a confirmation message is displayed indicating the situation and the operation must not be submitted. Wait for the operation in process to complete and then submit the operation again.

Do not navigate away from the page after an operation is submitted for scheduling. If an attempt is made, a confirmation message is displayed allowing the intended navigation to be cancelled. Otherwise, the operation is interrupted. An interruption, especially during an update operation may cause the firmware image file upload to be terminated before proper completion. After an operation has been submitted for scheduling, ensure that the confirmation message indicating that the operation has been successfully scheduled is acknowledged.

Reinstalling server component firmware

You can reinstall the firmware image of the currently installed firmware for selected components or devices across one or more servers. The firmware image is available within the Lifecycle Controller.

Re-installing server component firmware using web interface

To reinstall a server component firmware:

1. In the left pane, click **Server Overview** → **Update**.
2. On the **Server Component Update** page, click the appropriate type in the **Choose Update Type** section.
3. In the **Current Version** column, select the option for the component or device for which you want to reinstall the firmware.
4. Select one of the following options:
   - **Reboot Now** — Restart the server immediately.
   - **On Next Reboot** — Manually restart the server at a later time.
5. Click **Reinstall**. The firmware version is reinstalled for the selected component or device.

Rolling back server component firmware

You can install the firmware image of the previously installed firmware for selected components or devices across one or more servers. The firmware image is available within the Lifecycle Controller for a rollback operation. The availability is subject to the version compatibility logic of the Lifecycle Controller. It also assumes the previous update was facilitated by the Lifecycle Controller.

NOTE: To use this feature, you must have an Enterprise License.

Rolling back server component firmware using the CMC web interface

To roll back the server component firmware version to an earlier version:

1. In the left pane, click **Server Overview** → **Update**.
2. On the **Server Component Update** page, click the appropriate type in the **Choose Update Type** section.
3. In the **Rollback Version** column, select the option for the component or device for which you want to roll back the firmware.
4. Select one of the following options:
   - **Reboot Now** — Restart the server immediately.
   - **On Next Reboot** - Manually restart the server at a later time.
5. Click **Rollback**. The previously installed firmware version is reinstalled for the selected component or device.

Upgrading server component firmware

You can install the next version of the firmware image for selected components or devices across one or more servers. The firmware image is available within the Lifecycle Controller for a rollback operation. To use this feature, you must have an Enterprise License.

NOTE: For iDRAC and Operating System Driver packs firmware update, make sure the **Extended Storage** feature is enabled.

It is recommended to clear the job queue before initializing a server component firmware update. A list of all jobs on the servers is available on the **Lifecycle Controller Jobs** page. This page enables deletion of single or multiple jobs or purging of all jobs on the server.

BIOS updates are specific to the model of the server. Sometimes, even though a single Network Interface Controller (NIC) device is selected for firmware update on a server, the update may get applied to all the NIC devices on the server. This behavior is inherent in the Lifecycle Controller functionality and particularly the programming contained with the Dell Update Package (DUP). Currently, Dell Update Packages (DUP) that are less than 85 MB in size are supported.

If the update file image size is greater, the job status indicates that the download has failed. If multiple server component updates are attempted on a server, the combined size of all the firmware update files may also exceed 85 MB. In such a case, one of the component updates fails as its update file is truncated. To update multiple components on a server, it is recommended to update the Lifecycle Controller and 32-Bit Diagnostics components together first. These do not require a server reboot and are relatively quick to complete. The other components can then be updated together.

All Lifecycle Controller updates are scheduled for immediate execution. However, the system services can delay this execution sometimes. In such situations, the update fails as a result of the remote share that is hosted by the CMC being no longer available.

Upgrading server component firmware from file using CMC web interface

To upgrade the server components firmware version to the next version using the Update from File method:

1. In the CMC Web interface, in the system tree, go to **Server Overview** and then click **Update → Server Component Update**.

   The **Server Component Update** page is displayed.
2. In the **Choose Update Type** section, select **Update from File**. For more information, see Choosing Server Component Firmware Update Type
3. In the **Component/Device Update Filter** section, filter the component or device (optional). For more information see CMC_Stmp_Filtering Components for Firmware Updates
4. In the **Update** column, select the checkbox(es) for the component or device for which you want to update the firmware to the next version. Use the CRTL key shortcut to select a type of component or device for update across all the applicable servers. Pressing and holding the CRTL key highlights all the components in yellow. While the CRTL key is pressed down, select the required component or device by enabling the associated check box in the **Update** column.

   A second table is displayed that lists the selected type of component or device and a selector for the firmware image file. For each type of component, one selector for the firmware image file is displayed.

   Few devices such as Network Interface Controllers (NICs) and RAID Controllers contain many types and models. The update selection logic automatically filters the relevant device type or model based on the initially selected devices. The primary reason for this automatic filtering behavior is that only one firmware image file for the category can be specified.

   NOTE: The update size limitation of either a single DUP or combined DUPs can be ignored if the Extended Storage feature is installed and enabled. For information on enabling extended storage, see Configuring CMC Extended Storage Card
5. Specify the firmware image file for the selected component(s) or devic(es). This is a Microsoft Windows Dell Update Package (DUP) file.

6. Select one of the following options:
   - **Reboot Now** — Reboot immediately. The firmware update is applied immediately
   - **On Next Reboot** — Manually reboot the server at a later time. The firmware update is applied after the next reboot.

   NOTE: This step is not valid for Lifecycle Controller and 32-bit Diagnostics firmware update. A server reboot is not required for these devices.
7. Click **Update**. The firmware version is updated for the selected component or device.

Server component single click update using network share

The Servers or server component update from a network share using Dell Repository Manager and Dell PowerEdge FX2/FX2s modular chassis integration simplifies the update by using customized bundle firmware, so that you can deploy faster and more easily. Update from a network share provides flexibility to update all the 12G server components at the same time with a single catalog either from a CIFS or from a NFS.

This method provides a quick and easy way to build a custom repository for connected systems that you own using the Dell Repository Manager and the chassis inventory file exported using the CMC Web interface. DRM enables you to create a fully customized repository that only includes the update packages for the specific system configuration. You can also build repositories that contain updates for only out-of-date devices, or a baseline repository that contains updates for all the devices. You can also create update bundles for Linux or Windows based on the update mode required. DRM enables you to save the repository to a CIFS or NFS share. The CMC Web interface enables you to configure the credentials and location details for the share. Using the CMC Web interface, you can then perform the server components update for a single server or multiple servers.

Pre-requisites for using network share update mode

The following pre-requisites are required to update server component firmware using Network Share mode:

- The servers must have iDRAC Enterprise license
- Lifecycle controller must be enabled on servers..
- Dell Repository Manager 1.8 or later must be installed on the system.
- You must have CMC Administrator privileges.

Upgrading server component firmware from network share using CMC web interface

To upgrade the server components firmware version to the next version using the **Update from Network Share** mode:

1. In the CMC Web interface, in the system tree, go to **Server Overview** and then click **Update → Server Component Update**.

   The **Server Component Update** page is displayed.
2. In the **Choose Update Type** section, select **Update from Network Share**. For more information, see Choosing Server Component Firmware Update Type.
3. If the Network Share is not connected, configure the Network Share for the chassis. To configure or edit the network share details, in the Network Share Properties table click **Edit**. For more information see Configuring Network Share Using CMC Web Interface.
4. Click **Save Inventory Report** to export the chassis inventory file that contains the components and firmware details.

The *Inventory.xml* file is saved on an external system. The Dell Repository Manager uses the *inventory.xml* file to create customized bundles of updates. This Repositry is stored in the CIFS or NFS Share configured by CMC. For information on creating a repository using the Dell Repository Manger see the *Dell Repository Manager Data Center Version 1.8 User's Guide* and the *Dell Repository Manager Business Client Version 1.8 User's Guide* available at **dell.com/support/manuals**.

5. Click **Check for Updates** to view the firmware updates available in the network share.

   The **Component/Device Firmware Inventory** section displays the current firmware versions of the components and devices across all the servers present in the chassis and firmware versions of the DUPs available in the Network Share.

   NOTE: Click **Collapse** against a slot to collapse the component and device firmware details for the specific slot. Alternatively, to view all the details again, click **Expand**.

6. In the **Component/Device Firmware Inventory** section, select the check box against **Select/ Deselect All** to select all the supported servers. Alternatively, select the check box against the server for which you want to update the server component firmware. You cannot select individual components for the server.
7. Select one of the following options to specify if a system reboot is required after the updates are scheduled:
   - Reboot Now — Updates are scheduled and the server is rebooted, immediately applying the updates to the server components.
   - On Next Reboot — Updates are scheduled but are applied only after the next server reboot.
8. Click **Update** to schedule firmware updates for the available components of the selected servers.

   A message is displayed based on the type of updates contained and asking you to confirm if you want to continue.
9. Click **OK** to continue and complete scheduling the firmware update for the selected servers.

   NOTE: The Job Status column displays the job status of the operations scheduled on the server. The job status is dynamically updated.

Deleting Scheduled Server Component Firmware Jobs

NOTE: To use this feature, you must have an Enterprise License.

You can delete jobs scheduled for the selected components and/or devices across one or more servers.

Deleting scheduled server component firmware jobs using the web interface

To delete scheduled server component firmware jobs:

1. In the left pane, click **Server Overview**, and then click **Update**.
2. On the **Server Component Update** page, filter the component or device (optional).
3. In the **Job Status** column, if a check box is displayed next to the job status, it implies that a Lifecycle Controller job is in progress and currently in the indicated state. It can be selected for a job-deletion operation.
4. Click **Delete Job**. The jobs are deleted for the selected components or devices.

Recovering iDRAC firmware using CMC

iDRAC firmware is typically updated using iDRAC interfaces such as the iDRAC web interface, the SM-CLP command line interface, or operating system specific update packages downloaded from **support.dell.com**. For more information, see the *Dell Integrated Dell Remote Access Controller (iDRAC) User's Guide* .

5

Viewing chassis information and monitoring chassis and component health

You can view information and monitor the health of the following:

- CMC
- All severs and individual servers
- IO Modules
- Fans
- Power Supply Units (PSUs)
- Temperature sensors
- PCIe devices
- Storage sleds

Viewing chassis and component summaries

When you log in to the CMC web interface, the **Chassis Health** page displays the health of the chassis and its components. It displays a graphical view of the chassis and its components. It is dynamically updated, and the component subgraphic overlays and text hints are automatically changed to reflect the current state.

To view the chassis health, click **Chassis Overview**. The system displays the overall health status of the chassis, CMC, server modules, IO Modules (IOM), fans, power supply units (PSUs), storage sleds, and PCIe devices. Detailed information about each component is displayed when you click that component. In addition, the latest events in the CMC Hardware Log are also displayed. For more information, see the *Dell Integrated Dell Remote Access Controller (iDRAC) User's Guide*.

If your chassis is configured as a Group Lead, the **Group Health** page is displayed after login. It displays the chassis level information and alerts. All active, critical, and non-critical alerts are displayed.

Chassis graphics

The chassis is represented by the front, back, and the top views (the upper and lower images respectively). Servers, and KVMs are shown in the front view and the remaining components are shown in the back view. Component selection is indicated by a blue cast and is controlled by clicking the image of the required component. When a component is present in the chassis, an icon of the component type is displayed in the graphics in the position (slot), where the component has been installed. Empty positions are shown with a charcoal gray background. The component icon visually indicates the state of the

component. Other components display icons that visually represent the physical component. Pausing the cursor over a component displays a tool tip with additional information about that component.

Selected component information

Information for the selected component is displayed in three independent sections:

- Health and Performance, and Properties — Displays the active, critical, and non-critical events as displayed by the hardware logs and the performance data that vary with time.
- Properties — Displays the component properties that do not vary with time, or that change only infrequently.
- Quick Links — Provides links to navigate to the most frequently accessed pages, and also the most frequently performed actions. Only links applicable to the selected component are displayed in this section.

The following table lists the component properties and information displayed on the **Chassis Health** page in Web interface.

Component	Heath and Performance Properties	Properties	Quick Links
CMC	• MAC Address • IPv4 • IPv6	• Firmware • Standby Firmware • Last Update • Hardware	• CMC Status • Networking • Firmware Update
All Servers and Individual Servers	• Power State • Power Consumption • Health • Power Allocated • Temperature	• Name • Model • Service Tag • Host Name • iDRAC • CPLD • BIOS • OS • CPU Information • Total System Memory	• Server Status • Launch Remote Console • Launch iDRAC GUI • Power Off Server • Graceful Shutdown • Remote File Share • Deploy iDRAC Network • Server Component Update **NOTE:** Quick links for Power Off Server and Graceful Shutdown are displayed only if the Server Power state is On. If the Server Power State is Off, then the quick link for Power On Server is displayed instead.
All Storage and	Health	• Name • Model	• Storage Array Status • Storage Array Setup

Component	Heath and Performance Properties	Properties	Quick Links
Individual Storage Sleds		• Service Tag • Asset Tag • Number of Controllers – Physical Disk Slots – Connected to Server – Controller Mode Capability • Intrusion State	
Power Supply Units	Power Status	Capacity	• Power Supply Status • Power Consumption • System Budget
PCIe Devices	• Installed • Assigned	• Model • Mapping • Vendor ID • Device ID • Slot Type • Module Type • Fabric • Power Status	• PCIe Status • PCIe Setup
Fans	• Speed • PWM (% of Max) • Fan Offset	• Warning Threshold • Critical Threshold	• Fans Status • Fan Configuration
IOM Slot	• Power State • Role	• Model • Service Tag	IOM Status

Viewing server model name and Service Tag

You can view the model name and Service Tag of each server instantly using the following steps:

1. In the left pane, under **Server Overview** tree node, all the servers (SLOT-01 to SLOT-04) appear in the servers list. If a server is not present in a slot, the corresponding image in the graphic is grayed out.
2. Point the cursor to the slot name or slot number of a server. A tool tip is displayed with the server's model name and Service Tag, if available.

Viewing storage model name and Service Tag

You can view the model name and Service Tag of each storage sled using the following steps:

1. In the left pane, under the **Server Overview** tree node, all the storage sleds appear in the list. If a storage sled is not present in a slot, the corresponding image in the graphic is grayed out.

2. Point the cursor to the storage sled slot number.

A tool tip, if available, is displayed with the model name and Service Tag of the storage sled.

Viewing chassis summary

To view the chassis summary information, in the left pane, click **Chassis Overview → Properties → Summary**.

The **Chassis Summary** page is displayed. For more information about this page, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing chassis controller information and status

To view the chassis controller information and status, in the CMC Web interface, click **Chassis Overview → Chassis Controller**.

The **Chassis Controller Status** page is displayed. For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing information and health status of all servers

To view the health status of all the servers, do one of the following:

- Click **Chassis Overview**. The **Chassis Health** page displays a graphical overview of all the servers installed in the chassis. Server health status is indicated by the overlay of the server subgraphic. For more information about the chassis health, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.
- Click **Chassis Overview → Server Overview**. The **Servers Status** page provides an overview of the servers in the chassis. For more information, see the *Online Help*.

Viewing information and health status of storage sleds

To view the health status of storage sleds:

In the left pane, click **Chassis Overview → Server Overview**, and select the storage sled.

The **Storage Array Status** page displays the storage sled properties and the list of storage nodes connected to the compute sled. For more information, see *Online Help*.

Viewing information and health status of the IOMs

To view health status of the IOMs, in the CMC Web interface, do any of the following:

1. Click **Chassis Overview** .

   The **Chassis Health** page is displayed. The graphics in the left pane displays the rear, front, and top view of the chassis and contains the health status for the IOM. IOM health status is indicated by the overlay of the IOM sub-graphic. Move the cursor over the individual IOM sub-graphic. The text hint provides additional information about that IOM. Click the IOM sub-graphic to view the IOM information in the right pane.
2. Go to **Chassis Overview → I/O Module Overview** .

   The **I/O Module Status** page provides an overview of IOM associated with the chassis. For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing information and health status of fans

CMC controls the speed of the chassis fan by increasing or decreasing the fan speed on the basis of system events. You can run the fan in three modes such as Low, Medium, and High (fan offset). For more information about configuring a fan, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

To set up the properties of fans by using RACADM commands, type the following command at the CLI interface.

```
racadm fanoffset [-s <off|low|medium|high>]
```

NOTE: The CMC monitors the temperature sensors in the chassis and automatically adjust the fan speed as needed. When overridden using this command, the CMC will always run the fan to the selected speed even though the chassis does not require the fans to run at that speed. However, you can override to maintain a minimum fan speed by the racadm `fanoffset` command.

For more information about the RACADM commands, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at dell.com/support/manuals.

CMC generates an alert and increases the fan speeds when the following events occur:

- CMC ambient temperature threshold is exceeded.
- A fan stops functioning.
- A fan is removed from the chassis.

NOTE: During updates of CMC or iDRAC firmware on a server, some or all of the fan units in the chassis rotates at 100%. This is normal.

To view the health status of fans, in the CMC Web interface, do any of the following:

1. Go to **Chassis Overview**.

   The **Chassis Health** page is displayed. The upper right section of chassis graphics provides the top left view of the chassis and contains the health status of the fans. Fan health status is indicated by the overlay of the fan sub-graphic. Move the cursor over the fan sub-graphic. The text hint provides additional information about a fan. Click the fan sub-graphic to view the fan information in the right pane.
2. Go to **Chassis Overview → Fans**.

   The **Fans Status** page provides the status, speed measurements in revolutions per minute (RPMs), and threshold values of the fans in the chassis. There can be one or more fans.

   NOTE: In the event of a communication failure between CMC and the fan unit, CMC cannot obtain or display the health status for the fan unit.

   NOTE: The following message is displayed when both the fans are not present in the slots or if a fan is rotating at a low speed:

   ```
   Fan <number> is less than the lower critical threshold.
   ```

   For more information, see the *Online Help*.

Configuring fans

Fan Offset — This feature allows you to increase the airflow delivery to the PCIe card slots. An example usage of the Fan Offset is when you use high-power or custom PCIe cards that require more cooling than normal. The Fan Offset feature has options of Off, Low, Medium, and High. These settings

correspond to a fan speed offset (increase) of 20%, 50%, and 100% of the maximum speed respectively. There are also minimum speeds setup for each option, which are 35% for Low, 65% for Medium, and 100% for High.

Using the Medium Fan Offset setting for example, increases the speed of fans by 50% of its maximum speed. The increase is above the speed already set by the system for cooling on the basis of installed hardware configuration.

With any of the Fan Offset options enabled, the power consumption will be increased. The system will be louder with the Low offset, noticeably louder with the Medium offset, and significantly louder with the High offset. When the Fan Offset option is not enabled, the fan speeds will be reduced to the default speeds required for system cooling for the installed hardware configuration.

To set the offset feature, go to **Chassis Overview → Fans → Setup**. On the **Advanced Fan Configuration** page, from the **Value** drop-down menu corresponding to **Fan Offset**, select appropriately.

For more information about the Fan Offset feature, see the *Online Help*.

For setting up these features by using RACADM commands, user the following command:

```
racadm fanoffset [-s <off|low|medium|high>]
```

Viewing front panel properties

To view the front panel properties:

1. In the left pane, click **Chassis Overview → Front Panel**.
2. On the **Properties** page, you can view the following:
   - **Power Button Properties**
   - **KVM Properties**
   - **Front Panel Indicators**

Viewing KVM information and health status

To view the health status of the KVMs associated with the chassis, do any of the following:

Click **Chassis Overview → Front Panel**.

On the **Status** page, under the **KVM Properties** section, you can view the status and properties of a KVM associated with the chassis. For more information, see the *Online Help*.

Viewing information and health status of temperature sensors

To view the health status of the temperature sensors:

In the left pane, click **Chassis Overview → Temperature Sensors**.

The **Temperature Sensors Status** page displays the status and readings of the temperature probes on the entire chassis (chassis and servers). For more information, see *Online Help*.

NOTE: The temperature probes value cannot be edited. Any change beyond the threshold generates an alert that causes the fan speed to vary. For example, if the CMC ambient temperature probe exceeds the threshold, the speed of the fans on the chassis increases.

6

Configuring CMC

Chassis Management Controller enables you to configure properties, set up users, and alerts to perform remote management tasks.

Before you begin configuring the CMC, you must first configure the CMC network settings to allow CMC to be managed remotely. This initial configuration assigns the TCP/IP networking parameters that enable access to the CMC.

You can configure CMC using Web interface or Setting up Initial Access to CMC RACADM.

NOTE: When you configure CMC for the first time, you must be logged in as root user to execute RACADM commands on a remote system. Another user can be created with privileges to configure CMC.

After setting up the CMC and performing the basic configurations, you can do the following:

- Modify the network settings, if required.
- Configure interfaces to access CMC.
- Setup chassis groups, if required.
- Configure servers, I/O module, or front panel.
- Configure VLAN settings.
- Obtain the required certificates.
- Add and configure CMC users with privileges.
- Configure and enable e-mail alerts and SNMP traps.
- Set the power cap policy, if required.
- Add and configure storage sleds.

NOTE: The following characters cannot be used in the property strings of both the CMC interfaces (GUI and CLI):

- &#
- < and > together
- ; (semicolon)

Enabling or disabling DHCP for the CMC Network Interface Address

When enabled, the CMC's DHCP for NIC address feature requests and obtains an IP address from the Dynamic Host Configuration Protocol (DHCP) server automatically. This feature is disabled by default.

You can enable the DHCP to obtain an IP address from the DHCP server automatically.

Enabling the CMC network interface

To enable or disable the CMC network interface for both IPv4 and IPv6, type:

```
racadm config -g cfgLanNetworking -o cfgNicEnable 1
racadm config -g cfgLanNetworking -o cfgNicEnable 0
```

NOTE:
If you disable CMC network interface, the disable operation performs the following actions:

- Disables the network interface access to out-of-band chassis management, including iDRAC and IOM management.
- Prevents the down link status detection.

To disable only CMC network access, disable both CMC IPv4 and CMC IPv6.

NOTE: The CMC NIC is enabled by default.

To enable or disable the CMC IPv4 addressing, type:

```
racadm config -g cfgLanNetworking -o cfgNicIPv4Enable 1
racadm config -g cfgLanNetworking -o cfgNicIPv4Enable 0
```

NOTE: The CMC IPv4 addressing is enabled by default.

To enable or disable the CMC IPv6 addressing, type:

```
racadm config -g cfgIpv6LanNetworking -o cfgIPv6Enable 1
racadm config -g cfgIpv6LanNetworking -o cfgIPv6Enable 0
```

NOTE: The CMC IPv6 addressing is disabled by default.

For an IPv4 network, to disable DHCP and specify static CMC IP address, gateway, and subnet mask, type:

```
racadm config -g cfgLanNetworking -o cfgNicUseDHCP 0
racadm config -g cfgLanNetworking -o cfgNicIpAddress <static IP address>
racadm config -g cfgLanNetworking -o cfgNicGateway <static gateway>
racadm config -g cfgLanNetworking -o cfgNicNetmask <static subnet mask>
```

By default, the DHCP is disabled. To enable DHCP and use the DHCP server on the network to assign iDRAC or CMC IPv4 address, subnet mask, and gateway, type:

```
racadm config -g cfgLanNetworking -o cfgNicUseDHCP 1
```

By default, for IPv6, the CMC requests and automatically obtains a CMC IP address from the IPv6 autoconfiguration mechanism.

For an IPv6 network, to disable the Autoconfiguration feature and specify a static CMC IPv6 address, gateway, and prefix length, type:

```
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6AutoConfig 0
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6Address <IPv6 address>
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6PrefixLength 64
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6Gateway <IPv6 address>
```

Enabling or disabling DHCP for DNS IP addresses

By default, the CMC's DHCP for DNS address feature is disabled. When enabled, this feature obtains the primary and secondary DNS server addresses from the DHCP server. While using this feature, you do not have to configure static DNS server IP addresses.

To enable the DHCP for DNS address feature and specify the static preferred and alternate DNS server addresses, type:

```
racadm config -g cfgLanNetworking -o
cfgDNSServersFromDHCP 1
```

To enable the DHCP for DNS address feature for IPv6 and specify the static preferred and alternate DNS server addresses, type:

```
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6DNSServersFromDHCP6 1
```

Setting static DNS IP addresses

NOTE: The static DNS IP addresses settings are not valid unless the DCHP for DNS address feature is disabled.

For IPv4, to set the preferred primary and secondary DNS IP server addresses, type:

```
racadm config -g cfgLanNetworking -o cfgDNSServer1 <IP-address>
racadm config -g cfgLanNetworking -o cfgDNSServer2 <IPv4-address>
```

For IPv6, to set the preferred and secondary DNS IP Server addresses, type:

```
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6DNSServer1 <IPv6-address>
racadm config -g cfgIPv6LanNetworking -o
cfgIPv6DNSServer2 <IPv6-address>
```

Viewing and modifying CMC network LAN settings

The LAN settings, such as community string and SMTP server IP address, affect both the CMC and the external settings of the chassis.

When IPv6 is enabled at boot time, three router solicitations are sent after every four seconds. If external network switches are running the Spanning Tree Protocol (STP), the external switch ports may be blocked for more than 12 seconds in which the IPv6 router solicitations are sent. In such cases, there may be a period when IPv6 connectivity is limited, until router advertisements are gratuitously sent by the IPv6 routers.

NOTE: Changing the CMC network settings may disconnect your current network connection.

NOTE: You must have **Chassis Configuration Administrator** privilege to set up CMC network settings.

Viewing and modifying CMC network LAN settings using CMC web interface

To view and modify the CMC LAN network settings using CMC Web interface:

1. In the left pane, click **Chassis Overview**, and then click **Network**. The **Network Configuration** page displays the current network settings.
2. Modify the general, IPv4, or IPv6 settings as required. For more information, see the *Online Help*.
3. Click **Apply Changes** for each section to apply the settings.

Viewing and modifying CMC network LAN settings using RACADM

To view IPv4 settings, use the object `cfgCurrentLanNetworking` with the following subcommands:

- `getniccfg`
- `getconfig`

To view IPv6 settings, use the `cfgIpv6LanNetworking` with the `getconfig` subcommand.

To view IPv4 and IPv6 addressing information for the chassis, use the `getsysinfo` subcommand.

For more information about the subcommands and objects, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Configuring DNS settings (IPv4 and IPv6)

- **CMC Registration** — To register the CMC on the DNS server, type:

  ```
  racadm config -g cfgLanNetworking -o
  cfgDNSRegisterRac 1
  ```

  NOTE: Some DNS servers only register names of 31 characters or fewer. Make sure the designated name is within the DNS required limit.

  NOTE: The following settings are valid only if you have registered the CMC on the DNS server by setting **cfgDNSRegisterRac** to 1.

- **CMC Name** — By default, the CMC name on the DNS server is cmc-<*service tag*>. To change the CMC name on the DNS server, type:

  ```
  racadm config -g cfgLanNetworking -o cfgDNSRacName <name>
  ```

  where < *name* > is a string of up to 63 alphanumeric characters and hyphens. For example: cmc-1, d-345.

  NOTE: If a DNS Domain name is not specified then the maximum number of characters is 63. If a domain name is specified then the number of characters in CMC name plus the number of characters in the DNS Domain Name must be less than or equal to 63 characters.

- **DNS Domain Name** — The default DNS domain name is a single blank character. To set a DNS domain name, type:

  ```
  racadm config -g cfgLanNetworking -o
  cfgDNSDomainName <name>
  ```

  where < *name* > is a string of up to 254 alphanumeric characters and hyphens. For example: p45, a-tz-1, r-id-001.

Configuring auto negotiation, duplex mode, and network speed (IPv4 and IPv6)

When enabled, the auto negotiation feature determines whether the CMC automatically sets the duplex mode and network speed by communicating with the nearest router or switch. By default, auto negotiation feature is enabled.

You can disable auto negotiation and specify the duplex mode and network speed by typing:

```
racadm config -g cfgNetTuning -o cfgNetTuningNicAutoneg 0
racadm config -g cfgNetTuning -o cfgNetTuningNicFullDuplex <duplex mode>
```

where:

< *duplex mode* > is 0 (half duplex) or 1 (full duplex, default)

```
racadm config -g cfgNetTuning -o cfgNetTuningNicSpeed <speed>
```

where:

< *speed* > is 10 or 100 (default).

Configuring Management Port 2

The second network port on the CMC can be used for daisy-chaining CMCs together for cable reduction, or as a redundant port for failover networking operation. **Management Port 2** may be connected to the top-of-rack (TOR) switch or to another switch. There is no requirement that the two CMC NIC ports be connected to the same subnet.

The CMC cannot be cabled for Management Network Port redundancy prior to actually configuring it for this operation. The CMC must use the standard single network connection for deployment, after which the second redundant connection may be made.

NOTE: When Management Port 2 is set for Redundant but is cabled for Stacking, the downstream CMCs (further from the TOR switch) will not have a network link.

NOTE: When Management Port 2 is set for Stacking but is cabled for Redundant (two connections to the TOR switch), routing loops could cause a network storm.

To specify Redundant operation, use `racadm config -g cfgNetTuning -o cfgNetTuningNicRedundant 1` command.

To specify Stacking operation, use `racadm config -g cfgNetTuning -o cfgNetTuningNicRedundant 0` command.

By default, the Management Port 2 is set for Stacking.

Configuring Management Port 2 using CMC web interface

To configure Management Port using CMC Web Interface:

1. In the left pane, click **Chassis Overview** → **Network**, and then click the **Network** tab.
2. On the **Network Configuration** page, in the **General Settings** section, next to **Management Port 2**, select either **Redundant** or **Stacking**.

3. Click **Apply Changes**.

- When Management Port 2 is set for Redundant but is cabled for Stacking, the downstream CMCs (further from the top-of-rack switch) does not have a network link.
- When Management Port 2 is set for Stacking but is cabled for Redundant (two connections to the TOR switch), routing loops could cause a network storm.

Configuring Management Port 2 using RACADM

To specify Redundant operation, use `racadm config –g cfgNetTuning –o cfgNetTuningNicRedundant 1` command.

To specify Stacking operation, use `racadm config –g cfgNetTuning –o cfgNetTuningNicRedundant 0` command.

By default, the Management Port 2 is set for Stacking.

Configuring services

You can configure and enable the following services on CMC:

- CMC serial console — Enable access to CMC using the serial console.
- Web Server — Enable access to CMC web interface. Disabling the web server also disables Remote RACADM.
- SSH — Enable access to CMC through firmware RACADM.
- Telnet — Enable access to CMC through firmware RACADM
- Remote RACADM — Enable access to CMC using RACADM.
- SNMP — Enable CMC to send SNMP traps for events.
- Remote Syslog — Enable CMC to log events to a remote server. To use this feature, you must have an Enterprise license.

NOTE: When modifying CMC service port numbers for SSH, Telnet, HTTP, or HTTPS, avoid using commonly used ports by OS services such as port 111. See Internet Assigned Numbers Authority (IANA) reserved ports at http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xhtml.

CMC includes a web server that is configured to use the industry-standard SSL security protocol to accept and transfer encrypted data from and to clients over the Internet. The web server includes a Dell self-signed SSL Digital Certificate (Server ID), and is responsible for accepting and responding to secure HTTP requests from clients. This service is required by the web interface and remote RACADM CLI tool for communicating with CMC.

If the web server resets, wait at least one minute for the services to become available again. A web server reset usually happens as a result of any of the following events:

- Network configuration or network security properties are changed through the CMC web user interface or RACADM.
- Web server port configuration is changed through the web user interface or RACADM.
- CMC is reset.
- A new SSL server certificate is uploaded.

NOTE: To modify service settings, you must have the Chassis Configuration Administrator privilege.

Remote syslog is an additional log target for CMC. After you configure the remote syslog, each new log entry generated by CMC is forwarded to the respective destinations.

NOTE: Because the network transport for the forwarded log entries is UDP, there is no guaranteed delivery of log entries, nor is there any feedback to CMC about whether the log entries were received successfully.

The reserved network ports for CMC and iDRAC communication are 21, 68, 69, 123, 161, 546, 801, 4003, 4096, 5985 to 5990, 6900, and 60106.

Configuring services using RACADM

To enable and configure the various services, use the following RACADM objects:

- `cfgRacTuning`
- `cfgRacTuneRemoteRacadmEnable`

For more information about these objects, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at dell.com/support/manuals.

If the firmware on the server does not support a feature, configuring a property related to that feature displays an error. For example, using RACADM to enable remote syslog on an unsupported iDRAC displays an error message.

Similarly, when displaying the iDRAC properties using the RACADM `getconfig` command, the property values are displayed as N/A for an unsupported feature on the server.

For example:

```
$ racadm getconfig -g cfgSessionManagement -m server-1
# cfgSsnMgtWebServerMaxSessions=N/A
# cfgSsnMgtWebServerActiveSessions=N/A
# cfgSsnMgtWebServerTimeout=N/A
# cfgSsnMgtSSHMaxSessions=N/A
# cfgSsnMgtSSHActiveSessions=N/A
# cfgSsnMgtSSHTimeout=N/A
# cfgSsnMgtTelnetMaxSessions=N/A
# cfgSsnMgtTelnetActiveSessions=N/A
# cfgSsnMgtTelnetTimeout=N/A
```

Configuring CMC extended storage card

You can enable or repair the optional Removable Flash Media for use as an extended non-volatile storage. Some CMC features depend on extended nonvolatile storage for their operation.

To enable or repair the Removable Flash Media using the CMC web interface:

1. In the left pane, go to **Chassis Overview**, and then click **Chassis Controller → Flash Media**.
2. On the **Removable Flash Media** page, from the drop-down menu, select one of the following as appropriate:
   - **Repair active controller media**
   - **Stop using flash media for storing chassis data**

For more information about these options, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

3. Click **Apply** to apply the selected option.

Setting up Chassis Group

CMC enables you to monitor multiple chassis from a single lead chassis. When a chassis group is enabled, CMC in the lead chassis generates a graphical display of the status of the lead chassis and all member chassis within the chassis group. To use this feature, you must have an Enterprise License.

The Chassis group features are:

- Displays images portraying the front and back of each chassis, a set for the leader and a set for each member.
- Health concerns for the leader and members of a group are recognized by red or yellow overlays and an X or an ! on the component with the symptoms. Details are visible below the chassis image when you click the chassis image or **Details**.
- Quick launch links are available to open web pages for member chassis or servers.
- A server and Input/Output inventory is available for a group.
- A selectable option is available to synchronize a new member's properties to the leader's properties when the new member is added to the group.

A chassis group may contain a maximum of 19 members. Also, a leader or member can only participate in one group. You cannot join a chassis, either as a leader or member, that is part of a group to another group. You can delete the chassis from a group and add it later to a different group.

To set up the Chassis Group using the CMC web interface:

1. Log in with chassis administrator privileges to the leader chassis.
2. Click **Setup** → **Group Administration**.
3. On the **Chassis Group** page, under **Role**, select **Leader**. A field to add the group name is displayed.
4. Type the group name in the **Group Name** field, and then click **Apply**.

   NOTE: The same rules that apply for a domain name apply to the group name.

   When the chassis group is created, the GUI automatically switches to the **Chassis Group** page. The left pane indicates the group by the group name and the lead chassis, and the unpopulated member chassis appear in the left pane.

   NOTE: When the chassis group is created, the **Chassis Overview** item in the tree structure is replaced with the name of the lead chassis.

Adding members to Chassis Group

After the Chassis Group is setup, add members to the group by doing the following:

1. Log in with chassis administrator privileges to the leader chassis.
2. Select the lead chassis in the tree.
3. Click **Setup** → **Group Administration**.
4. Under **Group Management**, enter the member's IP address or DNS name in the **Hostname/IP Address** field.

   NOTE: For MCM to function properly, you must use the default HTTPS port (443) on all group members and the leader chassis.

5. In the **User Name** field, enter a user name with chassis administrator privileges for the member chassis.
6. Type the corresponding password in the **Password** field.
7. Optionally, select **Sync New Member with Leader Properties** to push leader properties to the member. For more information about adding members to chassis group, see Synchronizing a New Member With Leader Chassis Propertie.
8. Click **Apply**.
9. To add a maximum of eight members, complete the tasks in step 4 through step 8. The chassis names of the new members appear in the **Members** dialog box.

NOTE: The credentials entered for a member are passed securely to the member chassis to establish a trust relationship between the member and lead chassis. The credentials are not persisted on either chassis, and are never exchanged again after the initial trust relationship is established.

Removing a member from the leader

You can remove a member from the group from the lead chassis. To remove a member:

1. Log in with chassis administrator privileges to the leader chassis.
2. In the left pane, select the lead chassis.
3. Click **Setup → Group Administration**.
4. From the **Remove Members** list, select the member's name to be deleted, and then click **Apply**.

   The lead chassis then communicates to the member or members, if more than one is selected, that it has been removed from the group. The member name is removed. The member chassis may not receive the message, if a network issue prevents contact between the leader and the member. In this case, disable the member from the member chassis to complete the removal.

Disbanding a Chassis Group

To disband a chassis group from the lead chassis:

1. Log in with administrator privileges to the leader chassis.
2. Select the lead chassis in the left pane.
3. Click **Setup → Group Administration**.
4. In the **Chassis Group** page, under **Role**, select **None**, and then click **Apply**.

   The lead chassis then communicates to all the members that they have been removed from the group. The lead chassis can be assigned as a leader or member of a new group.

   If a network issue prevents contact between the leader and the member, the member chassis may not receive the message. In this case, disable the member from the member chassis to complete the removal process.

Disabling an individual Member at the Member chassis

Sometimes a member cannot be removed from a group by the lead chassis. This can happen if network connectivity to the member is lost. To remove a member from a group at the member chassis:

1. Log in with chassis administrator privileges to the member chassis.
2. In the left pane, click **Chassis Overview → Setup → Group Administration**.
3. Select **None**, and then click **Apply**.

Launching the web page of a Member chassis or server

You can access the web page of the member chassis, remote console of the server, or the web page of the iDRAC server from the lead chassis group page. If the member device has the same login credentials as the lead chassis, you can use the same credentials to access the member device.

NOTE: Single Sign On and Smart Card Login are not supported in Multiple Chassis Management. Launching members by Single Sign On from Lead chassis requires a common username/password between Lead and members. Use of common username/password works only with Active Directory, local, and LDAP users.

To navigate to member devices:

1. Log in to the lead chassis.
2. Select **Group: name** in the tree.
3. If a member CMC is the required destination, select **Launch CMC** for the required chassis.

   If a server in a chassis is the required destination:

   a. Select the image of the destination chassis.
   b. In the chassis image that appears in the **Health** section, select the server.
   c. In the box labeled **Quick Links**, select the destination device. A new window is displayed with the destination page or login screen.

Propagating Leader chassis properties to Member chassis

You can apply the properties from the leader to the member chassis of a group. To synchronize a member with the leader properties:

1. Login with administrator privileges to the leader chassis.
2. Select the Lead chassis in the tree.
3. Click **Setup** → **Group Administration**.
4. In the **Chassis Properties Propagation** section, select one of the propagation types:
   - On-Change Propagation — Select this option for automatic propagation of the selected chassis property settings. The property changes are propagated to all current group members, whenever lead properties are changed.
   - Manual Propagation — Select this option for manual propagation of the chassis group leader properties with its members. The lead chassis property settings are propagated to group members only when a lead chassis administrator clicks **Propagate**.
5. In the **Propagation Properties** section, select the categories of lead configuration properties to be propagated to member chassis.

   Select only those setting categories that you want identically configured, across all members of the chassis group. For example, select **Logging and Alerting Properties** category, to enable all chassis in the group to share the logging and alerting configuration settings of the lead chassis.
6. Click **Save**.

   If **On-Change Propagation** is selected, the member chassis take on the properties of the leader. If **Manual Propagation** is selected, click **Propagate** whenever you want to propagate the chosen settings to member chassis. For more information on propagation of leader chassis properties to member chassis, see the *Online Help*.

Synchronizing a new Member with Leader chassis properties

You can apply the properties from the leader to a newly added member chassis of a group. To synchronize a new member with the leader properties:

1. Log in with administrator privileges to the leader chassis.
2. Select the lead chassis in the tree structure.
3. Click **Setup → Group Administration**.
4. While adding a new member to the group, in the **Chassis Group** page, select **Sync New Member with Leader Properties**.
5. Click **Apply**. The member takes on the properties of the leader.

The following configuration service properties of several systems within the chassis are affected after synchronization:

Table 4. Configuration Service Properties

Property	Navigation
SNMP configuration	In the left pane, click **Chassis Overview → Network → Services → SNMP**.
Chassis remote logging	In the left pane, click **Chassis Overview → Network → Services → Remote Syslog**.
User authentication using LDAP and Active Directory services	In the left pane, click **Chassis Overview → User Authentication → Directory Services**.
Chassis alerts	In the left pane, click **Chassis Overview**, and then click **Alerts**.

Server inventory for MCM group

A group is a lead chassis that has 0 to 19 chassis group members. The **Chassis Group Health** page displays all the member chassis and allows you to save the server inventory report to a file, using standard browser download capability. The report contains data for:

- All servers currently in all the group chassis (including the leader).
- Empty slots and extension slots.

Saving server inventory report

To save the server inventory report using the CMC web interface:

1. In the left pane, select the **Group**.
2. On the **Chassis Group Health** page, click **Save Inventory Report**. The **File Download** dialog box is displayed asking you to open or save the file.
3. Click **Save** and specify the path and file name for the server module inventory report.

NOTE: The chassis group leader and chassis group member chassis, and the server module in the associated chassis, must be turned on to get the most accurate server module inventory report.

Configuring multiple CMCs using RACADM

Using RACADM, you can configure one or more CMCs with identical properties.

When you query a specific CMC card using its group ID and object ID, RACADM creates the `racadm.cfg` configuration file from the retrieved information. By exporting the file to one or more CMCs, you can configure your controllers with identical properties in a minimal amount of time.

NOTE: Some configuration files contain unique CMC information (such as the static IP address) that must be modified before you export the file to other CMCs.

1. Use RACADM to query the target CMC that contains the desired configuration.

   NOTE: The generated configuration file is **myfile.cfg**. You can rename the file. The **.cfg** file does not contain user passwords. When the **.cfg** file is uploaded to the new CMC, you must re-add all passwords.

2. Open a Telnet/SSH text console to the CMC, log in, and type:

   ```
   racadm getconfig -f myfile.cfg
   ```

   NOTE: Redirecting the CMC configuration to a file using `getconfig -f` is only supported with the remote RACADM interface.

3. Modify the configuration file using a plain-text editor (optional). Any special formatting characters in the configuration file may corrupt the RACADM database.
4. Use the newly created configuration file to modify a target CMC. At the command prompt, type:

   ```
   racadm config -f myfile.cfg
   ```

5. Reset the target CMC that was configured. At the command prompt, type:

   ```
   racadm reset
   ```

   The `getconfig -f myfile.cfg` subcommand requests the CMC configuration for the CMC and generates the **myfile.cfg** file. If required, you can rename the file or save it to a different location.

   You can run the `getconfig` command to perform the following actions:

   - Display all configuration properties in a group (specified by group name and index).
   - Display all configuration properties for a user by user name.

   The `config` subcommand loads the information into other CMCs. The Server Administrator uses the `config` command to synchronize the user and password database.

Parsing rules

- Lines that start with a hash character (#) are treated as comments.
  A comment line must start in column one. A "#" character in any other column is treated as a # character.

  Some modem parameters may include # characters in their strings. An escape character is not required. You may want to generate a **.cfg** from a `racadm getconfig -f <filename> .cfg` command, and then perform a `racadm config -f <filename> .cfg` command to a different CMC, without adding escape characters.

For example:

```
#
# This is a comment
[cfgUserAdmin]
cfgUserAdminPageModemInitString= <Modem init # not
a comment>
```

- All group entries must be surrounded by open- and close-brackets ([and]).

  The starting [character that denotes a group name must be in column one. This group name must be specified before any of the objects in that group. Objects that do not include an associated group name generate an error. The configuration data is organized into groups as defined in the database property chapter of the *RACADM Command Line Reference Guide for iDRAC and CMC*. The following example displays a group name, object, and the object's property value:

  ```
  [cfgLanNetworking] -{group name}
  cfgNicIpAddress=143.154.133.121 {object name}
  {object value}
  ```

- All parameters are specified as "object=value" pairs with no white space between the object, =, or value. White spaces that are included after the value are ignored. A white space inside a value string remains unmodified. Any character to the right of the = (for example, a second =, a #, [,], and so on) is taken as-is. These characters are valid modem chat script characters.

  ```
  [cfgLanNetworking] -{group name}
  cfgNicIpAddress=143.154.133.121 {object value}
  ```

- The **.cfg** parser ignores an index object entry.

  You cannot specify which index is used. If the index already exists, it is either used or the new entry is created in the first available index for that group.

  The `racadm getconfig -f <filename>.cfg` command places a comment in front of index objects, allowing you to see the included comments.

  NOTE: You may create an indexed group manually using the following command:

  ```
  racadm config -g <groupname>  -o <anchored object> -i <index 1-16>
  <unique anchor name>
  ```

- The line for an indexed group cannot be deleted from a **.cfg** file. If you do delete the line with a text editor, RACADM stops when it parses the configuration file and alert you of the error.

  You must remove an indexed object manually using the following command:

  ```
  racadm config -g <groupname>  -o <objectname> -i <index 1-16> ""
  ```

  NOTE: A NULL string (identified by two " characters) directs the CMC to delete the index for the specified group.

  To view the contents of an indexed group, run the following command:

  ```
  racadm getconfig -g <groupname> -i <index 1-16>
  ```

- For indexed groups the object anchor must be the first object after the [ ] pair. The following are examples of the current indexed groups:

  ```
  [cfgUserAdmin]
  cfgUserAdminUserName= <USER_NAME>
  ```

- When using remote RACADM to capture the configuration groups into a file, if a key property within a group is not set, the configuration group is not saved as part of the configuration file. If these configuration groups are needed to be cloned onto other CMCs, the key property must be set before executing the `getconfig -f` command. Alternatively, you can manually enter the missing properties into the configuration file after running the `getconfig -f` command. This is true for all the RACADM–indexed groups.

This is the list of the indexed groups that exhibit this behavior and their corresponding key properties:

- cfgUserAdmin — cfgUserAdminUserName
- cfgEmailAlert — cfgEmailAlertAddress
- cfgTraps — cfgTrapsAlertDestIPAddr
- cfgStandardSchema — cfgSSADRoleGroupName
- cfgServerInfo — cfgServerBmcMacAddress

Modifying the CMC IP address

When you modify the CMC IP address in the configuration file, remove all unnecessary `<variable> = <value>` entries. Only the actual variable group's label with [and] remains, including the two `<variable> = <value>` entries pertaining to the IP address change.

Example:

```
#
# Object Group "cfgLanNetworking"
#
[cfgLanNetworking]
cfgNicIpAddress=192.x.x.x
cfgNicGateway=10.35.10.1
```

This file is updated as follows:

```
#
# Object Group "cfgLanNetworking"
#
[cfgLanNetworking]
cfgNicIpAddress=10.35.9.143
# comment, the rest of this line is ignored
cfgNicGateway=10.35.9.1
```

The command `racadm config -f <myfile>.cfg` parses the file and identifies any errors by line number. A correct file updates the proper entries. Additionally, you can use the same `getconfig` command from the previous example to confirm the update.

Use this file to download company-wide changes or to configure new systems over the network with the command, `racadm getconfig -f <myfile>.cfg`.

NOTE: *Anchor* is a reserved word and should not be used in the **.cfg** file.

7

Configuring servers

You can configure the following settings of a server:

- Slot Names
- iDRAC Network Settings
- DRAC VLAN Tag Settings
- First Boot Device
- Server FlexAddress
- Remote File Share
- BIOS Settings Using Server Clone

Configuring slot names

Slot names are used to identify individual servers. When choosing slot names, the following rules apply:

- Names may contain a maximum of 15 non-extended ASCII characters (ASCII codes 32 through 126). Also standard, and special characters are allowed in the names.
- Slot names must be unique within the chassis. Slots should not have the same name.
- Strings are not case-sensitive. `Server-1, server-1, and SERVER-1` are equivalent names.
- Slot names must not begin with the following strings:
  - Switch-
  - Fan-
  - PS-
  - DRAC-
  - MC-
  - Chassis
  - Housing-Left
  - Housing-Right
  - Housing-Center
- The strings `Server-1` through `Server-4` may be used, but only for the corresponding slot. For example, `Server-3` is a valid name for slot 3, but not for slot 4. However, `Server-03` is a valid name for any slot.

  NOTE: To change a slot name, you must have the **Chassis Configuration Administrator** privilege.

The slot name setting in the web interface resides on CMC only. If a server is removed from the chassis, the slot name setting does not remain with the server.

The slot name setting in the CMC web interface always overrides any change you make to the display name in the iDRAC interface.

To edit a slot name using the CMC Web interface:

1. In the left pane, go to **Chassis Overview → Server Overview → Setup → Slot Names**.
2. On the **Slot Names** page, edit the slot name, in the **Slot Name** field.
3. To use a server's host name as slot name, select the **Use Host Name for the Slot name** option. This overrides the static slot names with the server's Host Name (or system name), if available. This requires the OMSA agent to be installed on the server. For more information about the OMSA agent, see the *Dell OpenManage Server Administrator User's Guide* available at dell.com/support/manuals.
4. To save the settings, click **Apply**.

To restore the default slot name (SLOT-01 through SLOT-4) on the basis of a server's slot position) to a server, click **Restore Default Value**.

Configuring iDRAC network settings

To use this feature, you must have an Enterprise License. You can configure the iDRAC network configuration setting of a server. You can use the QuickDeploy settings to configure the default iDRAC network configuration settings and root password for severs that are installed later. These default settings are the iDRAC QuickDeploy settings.

For more information about iDRAC, see the *iDRAC User's Guide* at dell.com/support/manuals.

Configuring iDRAC QuickDeploy network settings

Use the QuickDeploy Settings to configure the network settings for newly inserted servers.

To enable and set the iDRAC QuickDeploy settings:

1. In the left pane, click **Server Overview → Setup → iDRAC**.
2. On the **Deploy iDRAC** page, in the **QuickDeploy Settings** section, specify the settings mentioned in the following table. For more information about the fields, see the *Online Help*.

Table 5. QuickDeploy settings

Setting	Description
Action When Server is Inserted	Select one of the following options from the list: • **No Action** — No action is performed when the server is inserted. • **QuickDeploy Only** — Select this option to apply iDRAC network settings when a new server is inserted in the chassis. The specified auto-deployment settings are used to configure the new iDRAC, which includes the root user password **if Change Root Password** is selected. • **Server Profile Only** — Select this option to apply server profile assigned when a new server is inserted in the chassis. • **Quick Deploy and Server Profile** — Select this option to first apply the iDRAC network

Setting	Description
	settings, and then to apply the server profile assigned when a new server is inserted in the chassis.
Set iDRAC Root Password on Server Insertion	Select the option to change iDRAC root password to match the value provided in the **iDRAC Root Password** field, when a server is inserted.
iDRAC Root Password	When the **Set iDRAC Root Password on Server Insertion** and **QuickDeploy Enabled** options are selected, this password value is assigned to a server's iDRAC root user password when the server is inserted into a chassis. The password can have 1 to 20 printable (including white spaces) characters.
Confirm iDRAC Root Password	Allows you to retype the password provided in the **Password** field.
Enable iDRAC LAN	Enables or disables the iDRAC LAN channel. By default, this option is cleared.
Enable iDRAC IPv4	Enables or disables IPv4 on iDRAC. By default, this option is selected.
Enable iDRAC IPMI over LAN	Enables or disables the IPMI over LAN channel for each iDRAC present in the chassis. By default, this option is selected.
Enable iDRAC IPv4 DHCP	Enables or disables DHCP for each iDRAC present in the chassis. If this option is enabled, the fields **QuickDeploy IP**, **QuickDeploy Subnet Mask**, and **QuickDeploy Gateway** are disabled, and cannot be modified since DHCP is used to automatically assign these settings for each iDRAC. To select this option, you must select the **Enable iDRAC IPv4** option. Quick Deploy IP address option is provided with two values 4 and 2.
Reserved QuickDeploy IP Address	Select the number of static IPv4 addresses reserved for iDRACs in the chassis. The IPv4 addresses starting from **Starting iDRAC IPv4 Address (Slot 1)** are considered as reserved and assumed to be unused elsewhere in the same network. Quick Deploy feature does not work for servers that are inserted into slots for which there is no reserved static IPv4 address.
Starting iDRAC IPv4 Address (Slot 1)	Specifies the static IP address of iDRAC in the server, in slot 1 of the enclosure. The IP address

Setting	Description
	of each subsequent iDRAC is incremented by 1 for each slot from slot 1's static IP address. In the case where the IP address plus the slot number is greater than the subnet mask, an error message is displayed. NOTE: The subnet mask and the gateway are not incremented such as the IP address. For example, if the starting IP address is `192.168.0.250` and the subnet mask is `255.255.0.0` then the QuickDeploy IP address for slot 4c is `192.168.0.265`. If the subnet mask is `255.255.255.0`, the `QuickDeploy IP address range is not fully within QuickDeploy Subnet` error message is displayed when you click **Save QuickDeploy Settings** or **Auto-Populate Using QuickDeploy Settings**.
iDRAC IPv4 Netmask	Specifies the QuickDeploy subnet mask that is assigned to all newly inserted servers.
iDRAC IPv4 Gateway	Specifies the QuickDeploy default gateway that is assigned to all the DRAC present in the chassis.
Enable iDRAC IPv6	Enables IPv6 addressing for each iDRAC present in the chassis that is IPv6 capable.
Enable iDRAC IPv6 Autoconfiguration	Enables the iDRAC to obtain IPv6 settings (address and prefix length) from a DHCPv6 server and also enables stateless address auto configuration. By default, this option is enabled.
iDRAC IPv6 Gateway	Specifies the default IPv6 gateway to be assigned to the iDRACs. The default value is "::".
iDRAC IPv6 Prefix Length	Specifies the prefix length to be assigned for the IPv6 addresses on the iDRAC. The default value is 64.

3. Click **Save QuickDeploy Settings** to save the settings. If you have made changes to the iDRAC network setting, click **Apply iDRAC Network Settings** to deploy the settings to the iDRAC.
   The QuickDeploy feature only executes when it is enabled, and a server is inserted in the chassis.

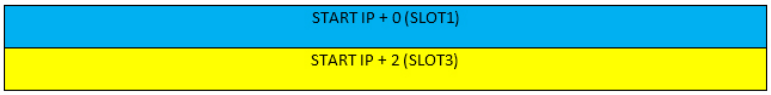
   To copy the QuickDeploy settings into the **iDRAC Network Settings** section, click **Auto-Populate Using QuickDeploy Settings**. The QuickDeploy network configurations settings are copied into the corresponding fields in the **iDRAC Network Configuration Settings** table.

   NOTE: Changes made to QuickDeploy fields are immediate, but changes made to one or more iDRAC server network configuration settings may require a couple of minutes to propagate from CMC to iDRAC. Clicking **Refresh** early may display only partially correct data for one or more iDRAC servers.

QuickDeploy IP address assignments for servers

The following tables show the way that the QuickDeploy IP addresses assigned to the servers based on the sleds present in the FX2/FX2s Chassis:

- Two full-width sleds in the chassis:



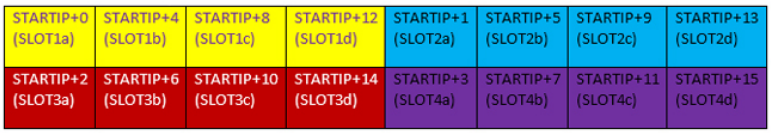
- Four half-width sleds in the chassis:

- Eight quarter-width sleds in the chassis:

  NOTE: The **Reserved QuickDeploy IPAddresses** must be set to a minimum of 8.

- Four FM120x4 sleds in the chassis:

  NOTE: The **Reserved QuickDeploy IPAddresses** must be set to 16.



- Top row contains only quarter-width sleds and bottom row contains only half-width sleds:

  NOTE: The **Reserved QuickDeploy IPAddresses** must be set to a minimum of 8.

- Top row contains only full-width sleds and bottom row contains only half-width sleds:

- Top row contains full-width sleds and bottom row contains only quarter-width sleds:

  NOTE: The **Reserved QuickDeploy IPAddresses** must be set to a minimum of 8.

Modifying iDRAC Network Settings for individual server iDRAC

Using this feature, you can configure the iDRAC network configurations settings for each installed server. The initial values displayed for each of the fields are the current values read from the iDRAC. To use this feature, you must have an Enterprise License.

To modify the iDRAC Network Settings:

1. In the left pane, click **Server Overview**, and then click **Setup**. On the **Deploy iDRAC** page the **iDRAC Network Settings** section lists the iDRAC IPv4 and IPv6 network configuration settings of all the installed servers.
2. Modify the iDRAC network settings as required for the servers.

   NOTE: You must select the **Enable LAN** option to specify the IPv4 or IPv6 settings. For information about the fields, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.
3. To deploy the setting to iDRAC, click **Apply iDRAC Network Settings**. Any changes made to the **QuickDeploy Settings** are also saved.

   The **iDRAC Network Settings** table reflects future network configuration settings; the values shown for installed servers may or may not be the same as the currently installed iDRAC network configuration settings. Click **Refresh** to update the **iDRAC Deploy** page with each installed iDRAC network configuration settings after changes are made.

   NOTE: Changes made to QuickDeploy fields are immediate, but changes made to one or more iDRAC server network configuration settings may require a couple of minutes to propagate from CMC to iDRAC. Clicking **Refresh** too soon may display only partially correct data for a one or more iDRAC servers.

Modifying iDRAC network settings using RACADM

RACADM `config` or `getconfig` commands support the `-m <module>` option for the following configuration groups:

- `cfgLanNetworking`
- `cfgIPv6LanNetworking`
- `cfgRacTuning`
- `cfgRemoteHosts`
- `cfgSerial`
- `cfgSessionManagement`

For more information about the property default values and ranges, see the *Dell Integrated Dell Remote Access Controller (iDRAC) RACADM Command Line Reference Guide* and *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

Configuring iDRAC VLAN tag settings

VLANs are used to allow multiple virtual LANs to co-exist on the same physical network cable and to segregate the network traffic for security or load management purposes. When you enable the VLAN functionality, each network packet is assigned a VLAN tag. VLAN tags are chassis properties. They remain with the chassis even when a component is removed.

NOTE: The iDRAC VLAN settings from CMC are effective only when iDRAC NIC selection is set on the iDRAC for Chassis (dedicated) LOM mode.

Configuring iDRAC VLAN tag settings using web interface

To configure VLAN for server:

1. Go to any of the following pages:
   - In the left pane, click **Chassis Overview → Network → VLAN**.
   - In the left pane, click **Chassis Overview → Server Overview** and click **Setup → VLAN**.
2. On the **VLAN Tag Settings** page, in the **iDRAC** section, enable VLAN for the servers, set the priority and enter the ID. For more information about the fields, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.
3. Click **Apply** to save the settings.

Configuring iDRAC VLAN tag settings using RACADM

- Specify the VLAN ID and priority of a particular server with the following command:
  `racadm setniccfg -m server-<n> -v <VLAN id> <VLAN priority>`

  The valid values for <*n*> are 1–4.

  The valid values for <*VLAN*> are 1–4000 and 4021–4094. Default is 1.

  The valid values for <*VLAN priority*> are 0–7. Default is 0.

  For example:
  `racadm setniccfg -m server-1 -v 1 7`

  For example:

- To remove a server VLAN, disable the VLAN capabilities of the specified server's network:
  `racadm setniccfg -m server-<n> -v`

  The valid values for <*n*> are 1–16.

  For example:
  `racadm setniccfg -m server-1 -v`

Setting first boot device

You can specify the CMC first boot device for each server. This may not be the actual first boot device for the server, or may not even represent a device present in that server. It represents a device sent by CMC to the server and used as its first boot device of that server. This device can be set as the default first-boot device or an one-time device so that you can boot an image to perform tasks such as running diagnostics or reinstalling an operating system.

You can set the first boot device for the next boot only or for all subsequent reboots. You can also set the first boot device for the server. The system boots from the selected device on the next and subsequent reboots and remains as the first boot device in the BIOS boot order, until it is changed again either from the CMC web interface or from the BIOS boot sequence.

NOTE: The first boot device setting in CMC web Interface overrides the system BIOS boot settings.

The boot device that you specify must exist and contain a bootable media.

You can set the following devices for first boot. However, to set a device as a default first-boot device, select **Default**.

To not to override the server firmware version if the firmware version running on the server is same as the version available in the first boot device, select **None**.

You can set the following devices for first boot.

Table 6. Boot Devices

Boot Device	Description
PXE	Boot from a Preboot Execution Environment (PXE) protocol on the Network Interface Card.
Hard Drive	Boot using a Hard disk drive.
Local CD/DVD	Boot from a CD or DVD drive on the server.
BIOS Setup	Boot during the BIOS setup.
Virtual Floppy	Boot from a virtual floppy disk.
Virtual CD/DVD	Boot from a Virtual CD or DVD drive.
Local SD Card	Boot from the local SD (Secure Digital) card.
Remote File Share	Boot from remote file share.
BIOS Boot Manager	Boot using the BIOS boot manager.
Lifecycle Controller	Boot using the Lifecycle controller.
Local Floppy	Boot from a floppy disk in the local floppy disk drive.

Setting first boot device for multiple servers using CMC web interface

NOTE: To set the first boot device for servers, you must have the **Server Administrator** privileges or **Chassis Configuration Administrator** privileges, and the **iDRAC login** privileges.

To set the first boot device for multiple servers:

1. In the left pane, click **Server Overview** → **Setup** → **First Boot Device**. A list of servers is displayed.
2. In the **First Boot Device** column, from the drop-down menu corresponding to a server, select the boot device you want to use for a server.
3. If you want the server to boot from the selected device every time it boots, clear the **Boot Once** option for the server. If you want the server to boot from the selected device only on the next boot cycle, select the **Boot Once** option for the server.
4. Click **Apply** to save the settings.

Setting first boot device for individual server using CMC web interface

NOTE: To set the first boot device for servers, you must have **Server Administrator** privileges or **Chassis Configuration Administrator** privileges and **iDRAC login** privileges.

To set the first boot device for individual servers:

1. In the left pane, click **Server Overview**, and then click the server for which you want to set the first boot device.
2. Go to **Setup** → **First Boot Device**. The **First Boot Device** page is displayed.
3. From the **First Boot Device** drop-down menu, select the boot device you want to use for each server.
4. If you want the server to boot from the selected device every time it boots, clear the **Boot Once** option for the server. If you want the server to boot from the selected device only on the next boot cycle, select the **Boot Once** option for the server
5. Click **Apply** to save the settings.

Setting first boot device using RACADM

To set the first boot device, use the `cfgServerFirstBootDevice` object.

To enable boot once for a device, use the `cfgServerBootOnce` object.

For more information about these objects, see the *Chassis Management Controller for PowerEdge FX2s RACADM Command Line Reference Guide* available at dell.com/support/manuals.

Configuring sled network uplink

You can configure the Sled Network Uplink only on the PowerEdge FM120x4 sleds that contain an internal network switch.

To configure the Sled Network Uplink, go to **Chassis Overview** → **Server Overview** → **Setup** → **Sled Network Uplink**

Select one of the following values for Sled network uplink configuration Property:

- Standard (aggregated): Uplink configuration where all four IOM uplink ports are configured in a single trunk group and all LOMs are mapped to that group. This is selected by default.
- Network adapter isolation (enhanced security): Uplink configuration similar to standard, but routing between local nodes is not allowed.
- Isolated networks: Uplink configuration where each node's LOM1 is mapped to IOM A1 and LOM2 is mapped to IOM A2.

Deploying remote file share

The Remote Virtual Media File Share feature maps a file from a share drive on the network to one or more servers through CMC to deploy or update an operating system. When connected, the remote file is accessible similar to a file that you can access on a local server. Two types of media are supported: floppy drives and CD/DVD drives.

To perform a remote file share operation (connect, disconnect, or deploy), you must have the **Chassis Configuration Administrator** or **Server Administrator** privileges. To use this feature, you must have an Enterprise license.

To configure the remote file share:

1. In the left pane, click **Server Overview → Setup → Remote File Share**.
2. On the **Deploy Remote File Share** page, type appropriate data in the fields. For more information about the field descriptions, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.
3. To connect to a remote file share, click **Connect**. To connect a remote file share, you must provide the path, user name, and password. A successful operation allows access to the media.

   Click **Disconnect** to disconnect a previously-connected remote file share.

   Click **Deploy** to deploy the media device.

   NOTE: Before you click the Deploy button, make sure that you save all the working files, because this action restarts the server.

   When you click **Deploy**, the following tasks are executed:
   - The remote file share is connected.
   - The file is selected as the first boot device for the servers.
   - The server is restarted.
   - Power is supplied to the server if the server is turned off.

Configuring server FlexAddress

For information about configuring FlexAddress for servers, see Configuring FlexAddress for Chassis-Level Fabric and Slots Using CMC Web Interface. To use this feature, you must have an Enterprise License.

Configuring profile settings using server configuration replication

The server configurations replicating feature allows you to apply all profile settings from a specified server to one or more servers. Profile settings that can be replicated are those profile settings which can be modified and are intended to be replicated across servers. The following three profile groups for servers are displayed and can be replicated:

- BIOS — This group includes only the BIOS settings of a server.
- BIOS and Boot — This group includes the BIOS and the Boot settings of a server.
- All Settings — This version includes all the settings of the server and components on that server. These profiles are generated from:
  - 12th generation servers with iDRAC7 1.57.57 or later and Lifecycle Controller 2 version 1.1 or later
  - 13th generation servers with iDRAC8 2.05.05 with Lifecycle Controller 2.00.00.00 or later.

The server cloning feature supports iDRAC7 and iDRAC8 Servers. Earlier generation RAC servers are listed, but are greyed out on the main page, and are not enabled to use this feature.

To use the server configurations replication feature:

- iDRAC must have the minimum version that is required. iDRAC7 servers require version 1.57.57. iDRAC8 servers require version 2.05.05.
- Server must be turned on.

You can:

- View profile settings on a server or from a saved profile.
- Save a profile from a server.
- Apply a profile to other servers.
- Import stored profiles from a management station or remote file share.
- Edit the profile name and description.
- Export stored profiles to a management station or remote file share.
- Delete stored profiles.
- Deploy selected profiles to the target devices using **Quick Deploy** option.
- Display the log activity for recent server profile tasks.

Accessing Profile page

You can add, manage, and apply profiles to one or more servers using the **Profile** page.

To access the **Profile** page using the CMC Web interface, in the left pane, click **Chassis Overview** → **Server Overview** → **Setup** → **Profiles**. The **Profiles** page is displayed.

Managing stored profiles

You can edit, view, or delete BIOS profiles. To manage the stored profiles of a CMC:

1. In the left pane, click **Chassis Overview** → **Server Overview** → **Setup** → **Profiles**.
2. On the **Profiles** page, in the **Apply Profile** section, click **Manage Profiles**. The **Manage BIOS Profiles** page is displayed.

- To edit a profile, click **Edit**.
- To view BIOS settings, click **View**.
- To delete a profile, click **Delete**. For more information about the field descriptions, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Adding or saving profile

Before copying the properties of a server, first capture the properties to a stored profile. Create a stored profile and provide a name and optional description for each profile. You can save a maximum of 16 stored profiles on the CMC nonvolatile extended storage media.

NOTE: If a remote share is available, you can store a maximum of 100 profiles using the CMC extended storage and remote share. For more information, see Configuring Network Share Using CMC web Interface

Removing or disabling the non-volatile extended storage media prevents access to Stored Profiles, and disables the Server Cloning feature.

To add a profile:

1. Go to the **Server Profiles** page. In the **Server Profiles** section, click **Apply and Save Profiles**.
2. Select the server from whose settings you want to generate the profile, and then click **Save Profile**. The **Save Profile** section is displayed.

3. Select **Extended Storage** or **Network Share** as the location to save the profile.

   NOTE: The Network Share option is enabled and the details are displayed in the Stored Profiles section only if the network share is mounted and is accessible. If the Network Share is not connected, configure the Network Share for the chassis. To configure the Network Share, click Edit in the Stored Profiles section. For more information, see Configuring Network Share Using CMC web Interface

4. In the **Profile Name** and **Description** fields, enter the profile name and description (optional), and click **Save Profile**.

   NOTE:

   When saving a Server Profile the list of characters that are not supported for the Profile Name include the character hash (#), comma (,) and question mark (?).

   The standard ASCII extended character set is supported. The following special characters are not supported:

   ), “, ., *, >, <, \, /, :, and |

   CMC communicates with the LC to get the available server profile settings and store them as a named profile.

   A progress indicator indicates that the Save operation is in progress. After the action is complete, a message, "Operation Successful" is displayed.

   NOTE: The process to gather the settings runs in the background. Hence, it may take some time before the new profile is displayed. If the new profile is not displayed, check the profile log for errors.

Applying profile

Server cloning is possible only when server profiles are available as stored profiles in the nonvolatile media on the CMC or stored on the remote share. To initiate a server cloning operation, you can apply a stored profile to one or more servers.

The operation status, slot number, slot name, and model name is displayed for each server in the **Apply Profile** table.

NOTE: If a server does not support Lifecycle Controller or the chassis is turned off, you cannot apply a profile to the server.

To apply a profile to one or more servers:

1. Go to the **Server Profiles** page. In the **Save and Apply Profiles** section, select the server or servers for which you want to apply the selected profile.

   The **Select Profile** drop-down menu gets enabled.

   NOTE: The **Select Profile** drop-down menu displays all available profiles and sorted by type, including those that are on the repository and SD card.

2. From the **Select Profile** drop-down menu, select the profile that you want to apply.

   The **Apply Profile** option gets enabled.

3. Click **Apply Profile**.

A warning message is displayed that applying a new server profile overwrites the current settings and also reboots the selected servers. You are prompted to confirm if you want to continue the operation.

NOTE: To perform server cloning operations on servers, the CSIOR option must be enabled for the servers. If CSIOR option is disabled, a warning message is displayed that CSIOR is not enabled for the servers. To complete the blade cloning operation, make sure to enable CSIOR option on the servers.

4. Click **OK** to apply the profile to the selected server.

   The selected profile is applied to the servers and the servers may be rebooted immediately, if necessary. For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Importing profile

You can import a server profile that is stored on a management station to CMC.

To import a stored profile from CMC:

1. In the **Server Profiles** page, in the **Stored Profiles** section, click **Import Profile**.

   The **Import Server Profile** section is displayed.
2. Click **Browse** to access the profile from the required location and then click **Import Profile**.

   For more information, see the *Online Help*.

Exporting profile

You can export a stored server profile to a specified path on a management station.

To export a stored profile:

1. Go to the **Server Profiles** page. In the **Stored Profiles** section, select the required profile, and then click **Export Copy of Profile**.

   A **File Download** message is displayed prompting you to open or save the file.
2. Click **Save** or **Open** to export the profile to the required location.

   NOTE: If the source profile is on the SD card, then a warning message is displayed that if the profile is exported, then the description is lost. Press **OK** to continue exporting the profile.

   A message is displayed prompting you to select the destination of the file:

   - Local or Network Share if the source file is on a SD card.

     NOTE: The **Network Share** option is enabled and the details are displayed in the **Stored Profiles** section only if the network share is mounted and is accessible. If the Network Share is not connected, configure the Network Share for the chassis. To configure the Network Share, click **Edit** in the **Stored Profiles** section. For more information see Configuring Network Share Using CMC web Interface
   - Local or SD Card if the source file is on the Network Share.

   For more information, see the *Online Help*.
3. Select **Local**, **Extended Storage**, or **Network Share** as the destination location based on the options displayed.
   - If you select **Local**, a dialog box appears allowing you to save the profile to a local directory.
   - If you select **Extended Storage** or **Network Share**, a **Save Profile** dialog box is displayed.
4. Click **Save Profile** to save the profile to the selected location.

Editing profile

You can edit the name and description of a server profile that is stored on the CMC nonvolatile media (SD Card).

To edit a stored profile:

1. Go to the **Server Profiles** page. In the **Stored Profiles** section, select the required profile and then click **Edit Profile**.

   The **Edit BIOS Profile — <Profile Name>** section is displayed.
2. Edit the profile name and description of the server profile as required and then click **Edit Profile**.

   NOTE: You can edit the profile description only for profiles stored on SD cards.

   For more information, see the *Online Help*.

Viewing profile settings

To view Profile settings for a selected server, go to the **Server Profiles** page. In the **Server Profiles** section, click **View** in the **Server Profile** column for the required server. The **View Settings** page is displayed.

For more information on the displayed settings, see the *Online Help*.

NOTE: The CMC Server Configuration Replication feature retrieves and displays the settings for a specific server, only if the **Collect System Inventory on Restart (CSIOR)** option is enabled.

To enable CSIOR, after rebooting the server, from the **F2** setup, select **iDRAC Settings → Lifecycle Controller**, enable **CSIOR** and save the changes.

To enable CSIOR on:

1. 12th generation servers — After rebooting the server, from the F2 setup, select **iDRAC Settings → Lifecycle Controller**, enable **CSIOR** and save the changes.
2. 13th generation servers —After rebooting the server, when prompted, press F10 to access Lifecycle Controller. Go to the **Hardware Inventory** page by selecting **Hardware Configuration → Hardware Inventory**. On the **Hardware Inventory** page, click **Collect System Inventory on Restart**.

Viewing stored profile settings

To view profile settings of the stored server profiles, go to the **Server Profiles** page. In the **Server Profiles** section, click **View** in the **View Profile** column for the required server. The **View Settings** page is displayed. For more information on the displayed settings, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing profile log

To view the profile log, in the **Server Profiles** page, see the **Recent Profile Log** section. This section lists the 10 latest profile log entries directly from server cloning operations. Each log entry displays the severity, the time and date of submission of the server configuration replication operation, and the replication log message description. The log entries are also available in the RAC log. To view the other available entries, click **Go to Profile Log**. The **Profile Log** page is displayed. For more information, see the *Online Help*.

Completion status and troubleshooting

To check the completion status of an applied BIOS profile:

1. In the left pane, click **Chassis Overview → Server Overview → Setup → Profiles**.
2. On the **Server Profiles** page, note down the Job ID (JID) of the submitted job from the **Recent Profile Log** section.
3. In the left pane, click **Server Overview → Troubleshooting → Lifecycle Controller Jobs**. Search for the same JID in the **Jobs** table. For more information about performing Lifecycle Controller jobs using CMC, see Lifecycle Controller Job Operations.

Quick Deploy of profiles

The Quick Deploy feature enables you to assign a stored profile to a server slot. Any server supporting server configuration replication that is inserted into a slot is configured using the profile assigned to that slot. You can perform the Quick Deploy action only if the **Action When Server is Inserted** option in the Deploy iDRAC page is set to **Server Profile** or **Quick Deploy and Server Profile**. Selecting this option allows to apply the server profile assigned when a new server is inserted in the chassis. To go to the **Deploy iDRAC** page, select **Server Overview → Setup → iDRAC** . Profiles that can be deployed are contained in the SD card.

NOTE: To set up the profiles for quick deploy, you must have **Chassis Administrator** privileges.

Assigning server profiles to slots

The **Server Profiles** page enables you to assign server profiles to slots. To assign a profile to the chassis slots:

1. In the **Server Profiles** page, click **Profiles for QuickDeploy** section.

   The current profile assignments are displayed for the slots in the select boxes contained in the **Assign Profile** column.

   NOTE: You can perform the Quick Deploy action only if the **Action When Server is Inserted** option in the **Deploy iDRAC** page is set to **Server Profile** or **Quick Deploy then Server Profile**. Selecting this option allows to apply the server profile assigned when a new server is inserted in the chassis.
2. From the drop-down menu, select the profile to assign to the required slot. You can select profiles to apply to multiple slots.
3. Click **Assign Profile**.

   The profiles gets applied to the selected slots.

NOTE: When the FM120x4 sled is inserted, the stored profile assigned to the server slot is applied to all the four servers.

NOTE:

- A slot that does not have any profile assigned to it is indicated by the term "No Profile Selected" that appears in the select box.
- To remove a profile assignment from one or more slots, select the slots and click **Remove Assignment**. A message is displayed warning you that removing a profile from the slot or slots removes the XML configuration settings in the profile from any servers inserted in the slots when **Quick Deploy Profiles** feature is enabled. Click **OK** to remove the profile assignments.
- To remove all profile assignments from a slot, in the drop-down menu, select **No Profile Selected**.

NOTE: When a profile is deployed to a server using the **Quick Deploy Profile** feature, the progress and results of the application are retained in the Profile Log.

NOTE:

The **Network Share** option is enabled and the details are displayed in the **Stored Profiles** section only if the network share is mounted and is accessible. If the Network Share is not connected, configure the Network Share for the chassis. To configure the Network Share, click **Edit** in the Stored Profiles section. For more information see Configuring Network Share Using CMC Web Interface

Launching iDRAC using Single Sign-On

CMC provides limited management of individual chassis components, such as servers. For complete management of these individual components, CMC provides a launch point for the server's management controller (iDRAC) web-based interface.

A user may be able to launch iDRAC web interface without having to login a second time, as this feature utilizes single sign-on. Single sign-on policies are:

- A CMC user who has server administrative privilege, is automatically logged into iDRAC using single sign-on. Once on the iDRAC site, this user is automatically granted Administrator privileges. This is true even if the same user does not have an account on iDRAC, or if the account does not have the Administrator's privileges.
- A CMC user who does **NOT** have the server administrative privilege, but has the same account on iDRAC is automatically logged into iDRAC using single sign-on. Once on the iDRAC site, this user is granted the privileges that were created for the iDRAC account.
- A CMC user who does not have the server administrative privilege, or the same account on the iDRAC, does **NOT** automatically logged into iDRAC using single sign-on. This user is directed to the iDRAC login page when the **Launch iDRAC GUI** is clicked.

  NOTE: The term "the same account" in this context means that the user has the same login name with a matching password for CMC and for iDRAC. The user who has the same login name without a matching password, is considered to have the same account.

  NOTE: Users may be prompted to log in to iDRAC (see the third Single Sign-on policy bullet above).

  NOTE: If the iDRAC network LAN is disabled (LAN Enabled = No), single sign-on is not available.

If the server is removed from the chassis, the iDRAC IP address is changed, or the iDRAC network connection experiences a problem, then clicking Launch iDRAC GUI may display an error page.

Launching iDRAC from Server Status page

To launch the iDRAC management console for an individual server:

1. In the left pane, expand **Server Overview**. All four servers appear in the expanded **Servers Overview** list.
2. Click the server for which you want to launch the iDRAC Web interface.
3. On the **Servers Status** page, click **Launch iDRAC GUI**.

   The iDRAC Web interface is displayed. For information about the field descriptions, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Launching iDRAC from Servers Status page

To launch the iDRAC management console from the **Servers Status** page:

1. In the left pane, click **Server Overview**.
2. On the **Servers Status** page, click **Launch iDRAC** for the server you want to launch the iDRAC Web interface.

Launching remote console from server status page

To launch a remote console for an individual server:

1. In the left pane, expand **Server Overview**. All the four servers appear in the expanded servers' list.
2. Click the server for which you want to launch the remote console.
3. On the **Server Status** page, click **Launch Remote Console**.

NOTE: The **Launch Remote Console** button or link is enabled only if the server has Enterprise license installed.

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Configuring storage sleds

Half-width storage sleds that are used in the FX2s chassis contain the following:

- One or two RAID controllers
- Maximum of 16 disk drives

You can configure individual storage sleds containing two RAID controllers to operate in the following modes:

- Split-single
- Split-dual
- Joined

NOTE: Do not insert a storage sled in slot 1 of the chassis as it is not a valid location for storage sleds.

NOTE: This section is applicable only to dual-controller storage modules.

NOTE: You can also configure and monitor storage sleds using the iDRAC Comprehensive Embedded Management (CEM). For more information, see the *Integrated Dell Remote Access Controller (iDRAC) User's Guide*.

Configuring storage sleds in split-single mode

In split-single mode, the two RAID controllers are mapped to a single compute sled. Both the controllers are enabled and each controller is connected to eight disk drives.

Configuring storage sleds in split-dual mode

In split-dual mode, both RAID controllers in a storage sled are connected to two compute sleds.

If a storage sled is located below a full-width PowerEdge FC830 sled, it can be configured in the split-dual mode. But the controllers are connected to a single compute sled and only that compute sled is reported.

If a storage sled is configured in the split dual mode and is in a location where it cannot be connected to two compute sleds, then the second controller is not connected to any compute sled.

You must have the **Chassis Configuration Administrator** privilege and power off the compute sled before changing the setting.

Configuring storage sleds in joined mode

In joined mode, the RAID controllers are mapped to a single compute sled. However, only one controller is enabled and all the disk drives are connected to it.

Configuring storage sleds using CMC web interface

1. In the left pane, click **Chassis Overview → Server Overview** and click a storage sled.
   The details of the storage sled are displayed.
2. In the menu on the right side, click **Setup**.
   The **Storage Configuration** page is displayed.
   You can also access the **Storage Configuration** page by selecting a storage sled on the **Chassis Health** page. Under **Quick Links**, click **Storage Array Setup**.
3. Under **Components**, select one of the following options:
   - **Split Dual Host**
   - **Split Single Host**
   - **Joined**

   NOTE: Power off the compute sled before configuring the storage sled. Click **Server Power Control** at the top of the page to power off the compute sled. For more information, see the Online Help.
4. Click **Apply**.

Configuring storage sleds using RACADM

You can connect storage sleds with compute sleds using the `config` or `getconfig` RACADM command with the `cfgStorageModule` option. For more information, see the **getstoragemoduleinfo** section in the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

Managing storage sleds using iDRAC RACADM proxy

The iDRAC RACADM proxy feature enables you to manage storage sleds in the FX2s chassis through iDRAC RACADM, when CMC is not in the network.

To access iDRAC locally, use the following command:

```
racadm <command> --proxy
```

Example: `racadm getractime --proxy`

You can also access the iDRAC RACADM remotely. For more information, see the section, "*RACADM Proxy*", in the *Integrated Dell Remote Access Controller 8 (iDRAC8) Version 2.10.10.10 RACADM Command Line Interface Reference Guide*.

NOTE: Only local and remote RACADM proxies are supported in this release.

Viewing storage array status

In the left pane, click **Chassis Overview** → **Server Overview** → **<storage sled>**. The **Storage Array Status** page is displayed in the right pane. You can also access the **Storage Array Status** page from the **Chassis Health** page.

1. On the **Chassis Health** page, click a storage sled on the front panel image.
   The details of the storage sled are displayed at the bottom of the right pane.
2. Under **Quick Links**, click **Storage Array Status**.

For more information, see the Online Help.

9

Configuring CMC to send alerts

You can set alerts and actions for certain events that occur on the chassis. An event occurs when the status of a system component is greater than the pre-defined condition. If an event matches an event filter and you have configured this filter to generate an alert message (email alert or SNMP trap), then an alert is sent to one or more configured destinations such as email address, IP address, or an external server.

To configure CMC to send alerts:

1. Enable the **Chassis Event Alerts** option.
2. Optionally, filter the alerts based on category or severity.
3. Configure the email alert or SNMP trap settings.
4. Enable chassis event alerts to send an e-mail alert, or SNMP traps to configured destinations.

Enabling or disabling alerts

To send alerts to configured destinations, you must enable the global alerting option. This property overrides the individual alert setting.

Make sure that the SNMP or email alert destinations are configured to receive the alerts.

Enabling or disabling alerts using CMC web interface

To enable or disable generating alerts:

1. In the left pane, click **Chassis Overview → Alerts**.
2. On the **Chassis Events** page, under the **Chassis Alert Enablement** section, select the **Enable Chassis Event Alerts** option to enable, or clear the option to disable the alert.
3. To save the settings, click **Apply**.

Enabling or disabling alerts using RACADM

To enable or disable generating alerts, use the **cfgIpmiLanAlertEnable** RACADM object. For more information, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Filtering alerts

You can filter alerts on the basis of category and severity.

Configuring alert destinations

The management station uses Simple Network Management Protocol (SNMP) to receive data from CMC.

You can configure the IPv4 and IPv6 alert destinations, email settings, and SMTP server settings, and test these settings.

Before configuring the email alert or SNMP trap settings, make sure that you have the Chassis Configuration Administrator privilege.

Configuring SNMP trap alert destinations

You can configure the IPv6 or IPv4 addresses to receive the SNMP traps.

Configuring SNMP Trap Alert Destinations Using CMC Web Interface

To configure IPv4 or IPv6 alert destination settings using CMC Web interface:

1. In the system tree, go to **Chassis Overview**, and then click **Alerts** → **Trap Settings**.
   The **Chassis Event Alert Destinations** page is displayed.
2. Enter the following:
   - In the **Destination** field, enter a valid IP address. Use the quad-dot IPv4 format, standard IPv6 address notation, or FQDN. For example: 123.123.123.123 or 2001:db8:85a3::8a2e:370:7334 or dell.com.
     Choose a format that is consistent with the networking technology or infrastructure. The Test Trap functionality cannot detect incorrect choices based on the current network configuration (example, use of an IPv6 destination in an IPv4-only environment).
   - In the **Community String** field, enter a valid community string to which the destination management station belongs.
     This community string differs from the community string on the **Chassis** → **Network** → **Services** page. The SNMP traps community string is the community that CMC uses for outbound traps destined to management stations. The community string on the **Chassis** → **Network** → **Services** page is the community string that management stations use to query the SNMP daemon on CMC.

     NOTE: CMC uses a default SNMP community string as public. To ensure higher security, it is recommended to change the default community string and set a value which is not blank.
   - Under **Enabled** , select the check box corresponding to the destination IP to enable the IP address to receive the traps. You can specify up to four IP addresses.
3. Click **Apply** to save the settings.
4. To test whether the IP address is receiving the SNMP traps, click **Send** in the **Test SNMP Trap** column.
   The IP alert destinations are configured.

Configuring SNMP Trap Alert Destinations Using RACADM

To configure IP alert destination using RACADM:

1. Open a serial/Telnet/SSH text console to CMC and log in.

NOTE: Only one filter mask may be set for both SNMP and email alerting. You can skip step 2 if you have already selected the filter mask.

2. Enable alert generation:

   ```
   racadm config -g cfgAlerting -o cfgAlertingEnable 1
   ```

3. Enable traps alerts:

   ```
   racadm config -g cfgTraps -o cfgTrapsEnable 1 -i <index>
   ```

   where <index> is a value between 1–4. CMC uses the index number to distinguish up to four configurable destinations for traps alerts. Destinations may be specified as appropriately formatted numeric addresses (IPv6 or IPv4), or Fully-Qualified Domain Names (FQDNs).

4. Specify a destination IP address to receive the traps alert:

   ```
   racadm config -g cfgTraps -o cfgTrapsAlertDestIPAddr <IP address> -i <index>
   ```

   where <IP address> is a valid destination, and <index> is the index value specified in step 3.

5. Specify the community name:

   ```
   racadm config -g cfgTraps -o cfgTrapsCommunityName <community name> -i
   <index>
   ```

   where <community name> is the SNMP community to which the chassis belongs, and <index> is the index value specified in steps 4 and 5.

   NOTE: CMC uses a default SNMP community string as public. To ensure higher security, it is recommended to change the default community string and set a value which is not blank.

   You can configure up to four destinations to receive traps alerts. To add more destinations, repeat steps 2–5.

   NOTE: The commands in steps 2–5 overwrites any existing settings configured for the index specified (1–4). To determine whether an index has previously configured values, type: `racadm getconfig -g cfgTraps -i <index>`. If the index is configured, values appear for the **cfgTrapsAlertDestIPAddr** and **cfgTrapsCommunityName** objects.

6. To test an event trap for an alert destination, type:

   ```
   racadm testtrap -i <index>
   ```

   where <index> is a value 1–4 representing the alert destination you want to test.

   If you are not sure of the index number, use:

   ```
   racadm getconfig -g cfgTraps -i <index>
   ```

Configuring e-mail alert settings

When CMC detects a chassis event, such as an environmental warning or a component failure, it can be configured to send an e-mail alert to one or more e-mail addresses.

You must configure the SMTP email server to accept relayed emails from the CMC IP address, a feature which is normally turned off in most mail servers due to security concerns. For instructions to do this in a secure manner, see the documentation that was provided with the SMTP server.

NOTE: If your mail server is Microsoft Exchange Server 2007, make sure that CMC domain name is configured for the mail server to receive the email alerts from CMC.

NOTE: Email alerts support both IPv4 and IPv6 addresses. The DRAC DNS Domain Name must be specified when using IPv6.

If your network has an SMTP server that releases and renews IP address leases periodically, and the addresses are different, then there is a duration when this property setting does not work due to change in the specified SMTP server IP address. In such cases, use the DNS name.

Configuring e-mail alert settings using CMC web interface

To configure the e-mail alert settings using web interface:

1. In the system tree, go to **Chassis Overview**, and then click **Alerts → E-mail Alert Settings**.
2. Specify the SMTP email server settings and the email address(es) to receive the alerts. For information about the fields, see the *CMC Online Help*.
3. Click **Apply** to save the settings.
4. Click **Send** under **Test E-mail** to send a test email to the specified email alert destination.

Configuring e-mail alert settings using RACADM

To send a test e-mail to an e-mail alert destination using RACADM:

1. Open a serial/Telnet/SSH text console to CMC and log in.
2. Enable alert generation:
   ```
   racadm config -g cfgAlerting -o cfgAlertingEnable 1
   ```
3. Enable email alert generation:
   ```
   racadm config -g cfgEmailAlert -o cfgEmailAlertEnable 1 -i <index>
   ```
   where `<index>` is a value between 1–4. CMC uses the index number to distinguish up to four configurable destination email addresses.
4. Specify a destination email address to receive the email alerts:
   ```
   racadm config -g cfgEmailAlert -o cfgEmailAlertAddress <email address> -i
   <index>
   ```
   where `<email address>` is a valid email address, and `<index>` is the index value you specified in step 4.
5. Specify the name of the person receiving the email alert:
   ```
   racadm config -g cfgEmailAlert -o cfgEmailAlertEmailName <email name> -i
   <index>
   ```
   where `<email name>` is the name of the person or group receiving the email alert, and `<index>` is the index value specified in step 4 and step 5. The email name can contain up to 32 alphanumeric characters, dashes, underscores, and periods. Spaces are not valid.
6. Setup the SMTP host:
   ```
   racadm config -g cfgRemoteHosts -o cfgRhostsSmtpServerIpAddr host.domain
   ```
   where `host.domain` is the FQDN.

   You can configure up to four destination email addresses to receive email alerts. To add more email addresses, repeat step 2 – step 5.

   NOTE: The commands in steps 2–5 overwrite any existing settings configured for the index you specify (1–4). To determine whether an index has previously configured values, type:x`racadm getconfig -g cfgEmailAlert — I <index>`. If the index is configured, values appear for the **cfgEmailAlertAddress** and **cfgEmailAlertEmailName** objects.

For more information, see the *RACADM Command Line Reference Guide for iDRAC and CMC* available at **dell.com/support/manuals**.

10
Configuring user accounts and privileges

You can setup user accounts with specific privileges (role-based authority) to manage your system with CMC and maintain system security. By default, CMC is configured with a default root account. As an administrator, you can set up user accounts to allow other users to access the CMC.

You can set up a maximum of 16 local users, or use directory services such as Microsoft Active Directory or LDAP to setup additional user accounts. Using a directory service provides a central location for managing authorized user accounts.

CMC supports role-based access to users with a set of associated privileges. The roles are administrator, operator, read-only, or none. The role defines the maximum privileges available.

Types of users

There are two types of users:

- CMC users or chassis users
- iDRAC users or server users (since the iDRAC resides on a server)

CMC and iDRAC users can be local or directory service users.

Except where a CMC user has **Server Administrator** privilege, privileges granted to a CMC user are not automatically transferred to the same user on a server, because server users are created independently from CMC users. In other words, CMC Active Directory users and iDRAC Active Directory users reside on two different branches in the Active Directory tree. To create a local server user, the Configure Users must log in to the server directly. The Configure Users cannot create a server user from CMC or vice versa. This rule protects the security and integrity of the servers.

Table 7. User Types

Privilege	Description
CMC Login User	User can log in to CMC and view all the CMC data, but cannot add or modify data or execute commands. It is possible for a user to have other privileges without the CMC Login User privilege. This feature is useful when a user is temporarily not allowed to login. When that user's CMC Login User privilege is restored, the user retains all the other privileges previously granted.
Chassis Configuration Administrator	User can add or change data that: • Identifies the chassis, such as chassis name and chassis location.

Privilege	Description
	• Is assigned specifically to the chassis, such as IP mode (static or DHCP), static IP address, static gateway, and static subnet mask. • Provides services to the chassis, such as date and time, firmware update, and CMC reset. • Is associated with the chassis, such as slot name and slot priority. Although these properties apply to the servers, they are strictly chassis properties relating to the slots rather than the servers themselves. For this reason, slot names and slot priorities can be added or changed whether or not servers are present in the slots. When a server is moved to a different chassis, it inherits the slot name and priority assigned to the slot it occupies in the new chassis. The previous slot name and priority remain with the previous chassis. NOTE: CMC users with the **Chassis Configuration Administrator** privilege can configure power settings. However, the **Chassis Control Administrator** privilege is required to perform chassis power operations, including power on, power off, and power cycle.
User Configuration Administrator	User can: • Add a new user. • Change the password of a user. • Change the privileges of a user. • Enable or disable the login privilege of a user but retain the name and other privileges of the user in the database.
Clear Logs Administrator	User can clear the hardware log and CMC log.
Chassis Control Administrator (Power Commands)	CMC users with the **Chassis Power Administrator** privilege can perform all power-related operations. They can control chassis power operations, including power on, power off, and power cycle. NOTE: To configure power settings, the **Chassis Configuration Administrator** privilege is needed.
Server Administrator	This is a blanket privilege, granting a CMC user all rights to perform any operation on any servers present in the chassis. When a user with **Server Administrator** privilege issues an action to be performed on a server, the CMC firmware sends the command to the targeted server without checking the privileges of a user on the server. In other words, the **Server Administrator** privilege overrides any lack of administrator privileges on the server. Without the **Server Administrator** privilege, a user created on the chassis can only execute a command on a server when all of the following conditions are true: • The same user name exists on the server. • The same user name must have the same password on the server. • The user must have the privilege to execute the command.

Privilege	Description
	When a CMC user who does not have **Server Administrator** privilege issues an action to be performed on a server, CMC sends a command to the targeted server with the user's login name and password. If the user does not exist on the server, or if the password does not match, the user is denied the ability to perform the action. If the user exists on the target server and the password matches, the server responds with the privileges of which the user was granted on the server. Based on the privileges responding from the server, CMC firmware decides if the user has the right to perform the action. Listed below are the privileges and the actions on the server to which the Server Administrator is entitled. These rights are applied only when the chassis user does not have the Server Administrative privilege on the chassis. Server Configuration Administrator: • Set IP address • Set gateway • Set subnet mask • Set first boot device Configure Users: • Set iDRAC root password • iDRAC reset Server Control Administrator: • Power on • Power off • Power cycle • Graceful shutdown • Server Reboot
Test Alert User	User can send test alert messages.
Debug Command Administrator	User can execute system diagnostic commands.
Fabric A Administrator	User can set and configure the Fabric A IOM.

The CMC user groups provide a series of user groups that have pre-assigned user privileges.

NOTE: If you select Administrator, Power User, or Guest User, and then add or remove a privilege from the pre-defined set, the CMC Group automatically changes to Custom.

Table 8. CMC Group Privileges

User Group	Privileges Granted
Administrator	• CMC Login User • Chassis Configuration Administrator • User Configuration Administrator • Clear Logs Administrator

User Group	Privileges Granted
	• Server Administrator • Test Alert User • Debug Command Administrator • Fabric A Administrator
Power User	• Login • Clear Logs Administrator • Chassis Control Administrator (Power commands) • Server Administrator • Test Alert User • Fabric A Administrator
Guest User	Login
Custom	Select any combination of the following permissions: • CMC Login User • Chassis Configuration Administrator • User Configuration Administrator • Clear Logs Administrator • Chassis Control Administrator (Power commands) • Server Administrator • Test Alert User • Debug Command Administrator • Fabric A Administrator
None	No assigned permissions

Table 9. Comparison of Privileges Between CMC Administrators, Power Users, and Guest Users

Privilege Set	Administrator Permissions	Power User Permissions	Guest User Permissions
CMC Login User	Yes	Yes	Yes
Chassis Configuration Administrator	Yes	No	No
User Configuration Administrator	Yes	No	No
Clear Logs Administrator	Yes	Yes	No
Chassis Control Administrator (Power commands)	Yes	Yes	No
Server Administrator	Yes	Yes	No
Test Alert User	Yes	Yes	No
Debug Command Administrator	Yes	No	No

Privilege Set	Administrator Permissions	Power User Permissions	Guest User Permissions
Fabric A Administrator	Yes	Yes	No

Modifying root user administrator account settings

For added security, it is strongly recommended that you change the default password of the root (User 1) account. The root account is the default administrative account that is shipped with CMC.

To change the default password for the root account:

1. In the left pane, click **Chassis Overview**, and then click **User Authentication**.
2. On the **Users** page, in the **User ID** column, click **1**.

   NOTE: The user ID **1** is the root user account that is shipped by default with CMC. This cannot be changed.
3. On the **User Configuration** page, select the **Change Password** option.
4. Type the new password in the **Password** field, and then type the same password in **Confirm Password**.
5. Click **Apply**. The password is changed for the **1** user ID.

Configuring local users

You can configure up to 16 local users in CMC with specific access privileges. Before you create a CMC local user, verify if any current users exist. You can set user names, passwords, and roles with the privileges for these users. The user names and passwords can be changed using any of the CMC–secured interfaces such as, web interface, RACADM, and WS-MAN.

Configuring local users using CMC web interface

NOTE: You must have **Configure Users** permission to create a CMC user.

To add and configure local CMC users:

1. In the left pane, click **Chassis Overview**, and then click **User Authentication**.
2. On the **Local Users** page, in the **User ID** column, click a user ID number. The **User Configuration** page is displayed.

   NOTE: User ID 1 is the root user account that is shipped by default with a CMC. This cannot be changed.
3. Enable the user ID and specify the user name, password, and access privileges for the user. For more information about the options, see the *Online Help*.
4. Click **Apply**. The user is created with appropriate privileges.

Configure local users using RACADM

NOTE: You must be logged in as a `root` user to execute RACADM commands on a remote Linux system.

You can configure up to 16 users in the CMC property database. Before you manually enable a CMC user, verify if any current users exist.

If you are configuring a new CMC or if you have used the racadm `racresetcfg` command, the only current user account is default root account. The `racresetcfg` subcommand resets all configuration parameters to the default values. Any earlier changes are lost.

NOTE: Users can be enabled and disabled over time, and disabling a user does not delete the user from the database.

To verify if a user exists, open a Telnet/SSH text console to the CMC, log in, and then type the following command once for each index of 1–16:

```
racadm getconfig -g cfgUserAdmin -i <index>
```

NOTE: You can also type `racadm getconfig -f <myfile.cfg>` and view or edit the **myfile.cfg** file, which includes all the CMC configuration parameters.

Several parameters and object IDs are displayed with their current values. Two objects of importance are:

```
# cfgUserAdminIndex=XX
cfgUserAdminUserName=
```

If the `cfgUserAdminUserName` object has no value, that index number, which is indicated by the `cfgUserAdminIndex` object, is available for use. If a name is displayed after the "=", that index is taken by that user name.

When you manually enable or disable a user with the racadm `config` subcommand, you must specify the index with the `-i` option.

The "#" character in the command objects indicates that it is a read-only object. Also, if you use the `racadm config -f racadm.cfg` command to specify any number of groups/objects to write, the index cannot be specified. A new user is added to the first available index. This behavior allows more flexibility in configuring a second CMC with the same settings as the main CMC.

Configuring Active Directory users

If your company uses the Microsoft Active Directory software, you can configure the software to provide access to CMC, allowing you to add and control CMC user privileges to your existing users in your directory service. This is a licensed feature.

NOTE: On the following Operating Systems, you can recognize the users of CMC users by using Active Directory.

- Microsoft Windows 2000
- Microsoft Windows Server 2003
- Microsoft Windows Server 2008

You can configure user authentication through Active Directory to log in to the CMC. You can also provide role-based authority, which enables an administrator to configure specific privileges for each user.

Supported Active Directory authentication mechanisms

You can use Active Directory to define CMC user access using two methods:

- *Standard schema* solution that uses Microsoft's default Active Directory group objects only.

- *Extended schema* solution that has customized Active Directory objects provided by Dell. All the access control objects are maintained in Active Directory. It provides maximum flexibility to configure user access on different CMCs with varying privilege levels.

Standard schema Active Directory overview

As shown in the following figure, using standard schema for Active Directory integration requires configuration on both Active Directory and CMC.

In Active Directory, a standard group object is used as a role group. A user who has CMC access is a member of the role group. To give this user access to a specific CMC card, the role group name and its domain name need to be configured on the specific CMC card. The role and the privilege level is defined on each CMC card and not in the Active Directory. You can configure up to five role groups in each CMC. The following table shows the default role group privileges.

Table 10. : Default Role Group Privileges

Role Group	Default Privilege Level	Permissions Granted	Bit Mask
1	None	• CMC Login User • Chassis Configuration Administrator • User Configuration Administrator • Clear Logs Administrator • Chassis Control Administrator (Power Commands) • Server Administrator • Test Alert User • Debug Command Administrator • Fabric A Administrator	0x00000fff
2	None	• CMC Login User • Clear Logs Administrator • Chassis Control Administrator (Power Commands) • Server Administrator • Test Alert User • Fabric A Administrator	0x00000ed9
3	None	CMC Login User	0x00000001
4	None	No assigned permissions	0x00000000
5	None	No assigned permissions	0x00000000

NOTE: The Bit Mask values are used only when setting Standard Schema with the RACADM.

NOTE: For more information about user privileges, see Types of Users.

Configuring standard schema Active Directory

To configure CMC for an Active Directory login access:

1. On an Active Directory server (domain controller), open **Active Directory Users and Computers Snap-in**.
2. Using the CMC Web interface or RACADM:
   a. Create a group or select an existing group.
   b. Configure the role privileges.
3. Add the Active Directory user as a member of the Active Directory group to access CMC.

Extended schema Active Directory overview

Using the extended schema solution requires the Active Directory schema extension.

Configuring extended schema Active Directory

To configure Active Directory to access CMC:

1. Extend the Active Directory schema.
2. Extend the Active Directory Users and Computers Snap-in.
3. Add CMC users and their privileges to Active Directory.
4. Enable SSL on each of your domain controllers.
5. Configure CMC Active Directory properties using CMC web interface or RACADM.

Configuring generic LDAP users

CMC provides a generic solution to support Lightweight Directory Access Protocol (LDAP)-based authentication. This feature does not require any schema extension on your directory services.

A CMC administrator can now integrate the LDAP server user logins with CMC. This integration requires configuration on both LDAP server and CMC. On the LDAP server, a standard group object is used as a role group. A user who has CMC access becomes a member of the role group. Privileges are still stored on CMC for authorization similar to the working of the Standard Schema setup with Active Directory support.

To enable the LDAP user to access a specific CMC card, the role group name and its domain name must be configured on the specific CMC card. You can configure a maximum of five role groups in each CMC. A user has the option to be added to multiple groups within the directory service. If a user is a member of multiple groups, then the user obtains the privileges of all their groups.

Configuring the generic LDAP directory to access CMC

The CMC's Generic LDAP implementation uses two phases in granting access to a user—user authentication, and then the user authorization.

Configuring generic LDAP directory service using CMC web interface

To configure the generic LDAP directory service:

NOTE: You must have the **Chassis Configuration Administrator** privilege.

1. In the left pane, click **Chassis Overview → User Authentication → Directory Services**.
2. Select **Generic LDAP**.
   The settings to be configured for standard schema is displayed on the same page.
3. Specify the following:

   NOTE: For information about the various fields, see the *Online Help*.

   - Common Settings
   - Server to use with LDAP:
     - Static server — Specify the FQDN or IP address and the LDAP port number.
     - DNS server — Specify the DNS server to retrieve a list of LDAP servers by searching for their SRV record within the DNS.
       The following DNS query is performed for SRV records:
       `_[Service Name]._tcp.[Search Domain]`
       where < *Search Domain* > is the root level domain to use within the query and < *Service Name* > is the service name to use within the query.
       For example:
       `_ldap._tcp.dell.com`
       where `ldap` is the service name and `dell.com` is the search domain.
4. Click **Apply** to save the settings.

   NOTE: You must apply the settings before continuing. If you do not apply the settings, the settings are lost when you navigate to the next page.
5. In the **Group Settings** section, click a **Role Group**.
6. On the **Configure LDAP Role Group** page, specify the group domain name and privileges for the role group.
7. Click **Apply** to save the role group settings, click **Go Back To Configuration page**, and then select **Generic LDAP**.
8. If you have selected **Certificate Validation Enabled** option, then in the **Manage Certificates** section, specify the CA certificate to validate the LDAP server certificate during SSL handshake and click **Upload**. The certificate is uploaded to CMC and the details are displayed.
9. Click **Apply**.
   The generic LDAP directory service is configured.

Configuring generic LDAP directory service using RACADM

To configure the LDAP directory service, use the objects in `cfgLdap` and `cfgLdapRoleGroup` RACADM groups.

There are many options to configure LDAP logins. In most of the cases, some options can be used with their default settings.

NOTE: It is highly recommended to use the racadm `testfeature -f LDAP` command to test the LDAP settings for first time setups. This feature supports both IPv4 and IPv6.

The required property changes include enabling LDAP logins, setting the server FQDN or IP, and configuring the base DN of the LDAP server.

- `$ racadm config -g cfgLDAP -o cfgLDAPEnable 1`
- `$ racadm config -g cfgLDAP -o cfgLDAPServer 192.168.0.1`
- `$ racadm config -g cfgLDAP -o cfgLDAPBaseDN dc=company,dc=com`

CMC can be configured to optionally query a DNS server for SRV records. If the `cfgLDAPSRVLookupEnable` property is enabled, the `cfgLDAPServer` property is ignored. The following query is used to search the DNS for SRV records:

`_ldap._tcp.domainname.com`

`ldap` in the above query is the `cfgLDAPSRVLookupServiceName` property.

`cfgLDAPSRVLookupDomainName` is configured to be **domainname.com**.

For more information about the RACADM commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

11

Configuring CMC for Single Sign-On or Smart Card login

This section provides information to configure CMC for Smart Card login and Single Sign-On (SSO) login for Active Directory users.

SSO uses Kerberos as an authentication method allowing users, who have signed in as an automatic- or single sign-on to subsequent applications such as Exchange. For single sign-on login, CMC uses the client system's credentials, which are cached by the operating system after you log in using a valid Active Directory account.

Two-factor-authentication, provides a higher-level of security by requiring users to have a password or PIN, and a physical card containing a private key or digital certificate. Kerberos uses this two-factor authentication mechanism allowing systems to prove their authenticity.

NOTE: Selecting a login method does not set policy attributes with respect to other login interfaces, for example, SSH. You must set other policy attributes for other login interfaces also. If you want to disable all other login interfaces, navigate to the **Services** page and disable all (or some) the login interfaces.

Microsoft Windows 2000, Windows XP, Windows Server 2003, Windows Vista, Windows 7, and Windows Server 2008 can use Kerberos as the authentication mechanism for SSO and smart card login.

For information about Kerberos, see the Microsoft Website.

System requirements

To use the Kerberos authentication, the network must include:

- DNS server
- Microsoft Active Directory Server

  NOTE: If you are using Active Directory on Microsoft Windows 2003, make sure that you have the latest service packs and patched installed on the client system. If you are using Active Directory on Microsoft Windows 2008, make sure that you have installed SP1 along with the following hot fixes:

  Windows6.0-KB951191-x86.msu for the KTPASS utility. Without this patch the utility generates bad keytab files.

  Windows6.0-KB957072-x86.msu for using GSS_API and SSL transactions during an LDAP bind.
- Kerberos Key Distribution Center (packaged with the Active Directory Server software).
- DHCP server (recommended).
- The DNS server reverse zone must have an entry for the Active Directory server and CMC.

Client Systems

- For only Smart Card login, the client system must have the Microsoft Visual C++ 2005 redistributable. For more information see **www.microsoft.com/downloads/details.aspx?FamilyID=32BC1BEEA3F9-4C13-9C99-220B62A191EE&displaylang=en**
- For Single Sign-On or smart card login, the client system must be a part of the Active Directory domain and Kerberos Realm.

CMC

- Each CMC must have an Active Directory account.
- CMC must be a part of the Active Directory domain and Kerberos Realm.

Prerequisites for Single Sign-On or Smart Card login

The pre-requisites to configure SSO or Smart Card logins are:

- Setup the Kerberos realm and Key Distribution Center (KDC) for Active Directory (ksetup).
- A robust NTP and DNS infrastructure to avoid issues with clock drift and reverse lookup.
- Configure CMC with Active Directory standard schema role group with authorized members.
- For smart card, create Active Directory users for each CMC, configured to use Kerberos DES encryption but not pre-authentication.
- Configure the browser for SSO or smart card login.
- Register the CMC users to the Key Distribution Center with Ktpass (this also outputs a key to upload to CMC).

Generating Kerberos keytab file

To support the SSO and smart card login authentication, CMC supports Windows Kerberos network. The ktpass tool is used to create the Service Principal Name (SPN) bindings to a user account and export the trust information into a MIT-style Kerberos keytab file. For more information about the ktpass utility, see the Microsoft Website.

Before generating a keytab file, you must create an Active Directory user account for use with the **-mapuser** option of the ktpass command. You must use the same name as the CMC DNS name to which you upload the generated keytab file.

To generate a keytab file using the ktpass tool:

1. Run the *ktpass* utility on the domain controller (Active Directory server), where you want to map CMC to a user account in Active Directory.
2. Use the following `ktpass` command to create the Kerberos keytab file:

   ```
   C:\>ktpass -princ HTTP/cmcname.domain_name.com@REALM_NAME.COM - mapuser
   dracname -crypto DES-CBC-MD5 -ptype KRB5_NT_PRINCIPAL -pass * -out c:
   \krbkeytab
   ```

   NOTE: The `cmcname.domainname.com` must be in lower case as required by RFC and the `@REALM_NAME` must be in uppercase. In addition, CMC supports the DES-CBC-MD5 type of cryptography for Kerberos authentication.

   A keytab file is generated that must be uploaded to CMC.

NOTE: The keytab contains an encryption key and must be kept secure. For more information about the *ktpass* utility, see the **Microsoft** Website.

Configuring CMC for Active Directory schema

For information about configuring CMC for Active Directory standard schema, see Configuring Standard Schema Active Directory.

For information about configuring CMC for Extended Schema Active Directory, see Extended Schema Active Directory Overview.

Configuring browser for SSO login

Single Sign-On (SSO) is supported on Internet Explorer versions 6.0 and later, and Firefox versions 3.0 and later.

NOTE: The following instructions are applicable only if CMC uses Single Sign-On with Kerberos authentication.

Internet Explorer

To edit the exception list in Internet Explorer:

1. Start Internet Explorer.
2. Click **Tools** → **Internet Options** → **Connections**.
3. In the **Local Area Network (LAN) settings** section, click **LAN Settings**.
4. In the **Proxy server** section, select the **Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections)** option, and then click **Advanced**.
5. In the **Exceptions** section, add the addresses for CMCs and iDRACs on the management network to the semicolon-separated list. You can use DNS names and wildcards in your entries.

Mozilla Firefox

To edit the exception list in Mozilla Firefox version 19.0:

1. Start Mozilla Firefox.
2. Click **Tools** → **Options** (for systems running on Windows), or click **Edit** → **Preferences** (for systems running on Linux).
3. Click **Advanced**, and then click the **Network** tab.
4. Click **Settings**.
5. Select **Manual Proxy Configuration**.
6. In the **No Proxy for** field, type the addresses for CMCs and iDRACs on the management network to the comma-separated list. You can use DNS names and wildcards in your entries.

Configuring browser for Smart Card login

Internet Explorer — Make sure that the Internet browser is configured to download Active-X plug-ins.

Configuring CMC SSO login or Smart Card login for Active Directory users using RACADM

In addition to the steps performed while configuring Active Directory, run the following command to enable SSO:

```
racadm -g cfgActiveDirectory -o cfgADSSOEnable 1
```

In addition to the steps performed while configuring Active Directory, use the following objects to enable smart card login:

- `cfgSmartCardLogonEnable`
- `cfgSmartCardCRLEnable`

Configuring CMC SSO Or Smart Card Login For Active Directory Users Using Web Interface

To configure Active Directory SSO or smart card login for CMC:

NOTE: For information about the options, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

1. While configuring Active Directory to setup a user account, perform the following additional steps:
   - Upload the keytab file.
   - To enable SSO, select the **Enable Single Sign-On** option.
   - To enable smart card login, select the **Enable Smart-Card Login** option.

     NOTE: If these two options are selected, all command line out-of-band interfaces, including secure shell (SSH), Telnet, Serial, and remote RACADM remain unchanged .
2. Click **Apply**.

   The settings are saved.

   You can test the Active Directory using Kerberos authentication using the RACADM command:

   ```
   testfeature -f adkrb -u <user>@<domain>
   ```

   where <*user*> is a valid Active Directory user account.

   A command success indicates that CMC is able to acquire Kerberos credentials and access the user's Active Directory account. If the command is not successful, resolve the error and run the command again. For more information, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* on dell.com/support/manuals.

Uploading Keytab file

The Kerberos keytab file serves as the CMC's user name and password credentials to the Kerberos Data Center (KDC), which in turns allows access to the Active Directory. Each CMC in the Kerberos realm must be registered with the Active Directory and must have a unique keytab file.

You can upload a Kerberos Keytab generated on the associated Active Directory Server. You can generate the Kerberos Keytab from the Active Directory Server by executing the **ktpass.exe** utility. This keytab establishes a trust relationship between the Active Directory Server and CMC.

To upload the keytab file:

1. In the left pane, click **Chassis Overview → User Authentication → Directory Services**.
2. Select **Microsoft Active Directory (Standard Schema)**.
3. In the **Kerberos Keytab** section, click **Browse**, select a keytab file, and click **Upload**.

   When the upload is complete, a message is displayed indicating whether the keytab file is successfully uploaded or not.

Configuring CMC SSO login or Smart Card login for Active Directory users using RACADM

In addition to the steps performed while configuring Active Directory, run the following command to enable SSO:

```
racadm -g cfgActiveDirectory -o cfgADSSOEnable 1
```

In addition to the steps performed while configuring Active Directory, use the following objects to enable smart card login:

- `cfgSmartCardLogonEnable`
- `cfgSmartCardCRLEnable`

12

Configuring CMC to use Command Line consoles

This section provides information about the CMC command line console (or serial/Telnet/Secure Shell console) features, and explains how to set up the system so that you can perform systems management actions through the console. For information about using the RACADM commands in CMC through the command line console, see *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

CMC Command Line console features

The CMC supports the following serial, Telnet, and SSH console features:

- One serial client connection and up to four simultaneous Telnet client connections.
- Up to four simultaneous Secure Shell (SSH) client connections.
- RACADM command support.
- Built-in connect command connecting to the serial console of servers and I/O module; also available as `racadm connect`.
- Command line editing and history.
- Session timeout control on all console interfaces.

CMC Command Line interface commands

When you connect to the CMC command line, you can enter these commands:

Table 11. CMC Command Line commands

Command	Description
`racadm`	RACADM commands begin with the keyword `racadm`, and then followed by a subcommand. For more information, see *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.
`connect`	Connects to the serial console of a server or I/O module. For more information, see Connecting to Servers or IO Module Using Connect Command. **NOTE:** You can also use the `connect` RACADM command.

Command	Description
`exit`, `logout`, and `quit`	All the commands perform the same action. They end the current session and return to a login commond line interface.

Using Telnet console with CMC

You can have up to four Telnet sessions with CMC at a time.

If your management station is running Microsoft Windows XP or Microsoft Windows Server 2003, you may experience an issue with the characters in a CMC Telnet session. This issue may occur as a frozen login where the return key does not respond and the password prompt does not appear.

To fix this issue, download hotfix 824810 from **support.microsoft.com**. For more information, you can also see Microsoft Knowledge Base article 824810.

Using SSH with CMC

SSH is a command line session that includes the same capabilities as a Telnet session, but with session negotiation and encryption to improve security. CMC supports SSH version 2 with password authentication. SSH is enabled on the CMC by default.

NOTE: CMC does not support SSH version 1.

When an error occurs during the CMC login, the SSH client issues an error message. The message text is dependent on the client and is not controlled by CMC. Review the RACLog messages to determine the cause of the failure.

NOTE: `OpenSSH` must be run from a VT100 or ANSI terminal emulator on Windows. You can also run `OpenSSH` using **Putty.exe**. Running `OpenSSH` at the Windows command prompt does not provide full functionality (that is, some keys do not respond and no graphics are displayed). On servers that run Linux, run SSH client services to connect to CMC with any shell.

Four simultaneous SSH sessions are supported at a time. The session timeout is controlled by the `cfgSsnMgtSshIdleTimeout` property. For more information about the RACADM commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at dell.com/support/Manuals.

CMC also supports Public Key Authentication (PKA) over SSH. This authentication method improves SSH scripting automation by removing the need to embed or prompt for user ID/password.

SSH is enabled by default. If SSH is disabled, then you can enable it using any other supported interface.

Supported SSH cryptography schemes

To communicate with CMC using SSH protocol, it supports multiple cryptography schemes listed in the following table.

Table 12. Cryptography Schemes

Scheme Type	Scheme
Asymmetric Cryptography	Diffie-Hellman DSA/DSS 512–1024 (random) bits per NIST specification
Symmetric Cryptography	• AES256-CBC • RIJNDAEL256-CBC • AES192-CBC • RIJNDAEL192-CBC • AES128-CBC • RIJNDAEL128-CBC • BLOWFISH-128-CBC • 3DES-192-CBC • ARCFOUR-128
Message Integrity	• HMAC-SHA1-160 • HMAC-SHA1-96 • HMAC-MD5-128 • HMAC-MD5-96
Authentication	Password

Configure public key authentication over SSH

You can configure up to six public keys that can be used with the service username over an SSH interface. Before adding or deleting public keys, make sure to use the `view` command to see what keys are already set up, so that a key is not accidentally overwritten or deleted. The service username is a special user account that can be used when accessing the CMC through SSH. When the PKA over SSH is set up and used correctly, you need not enter username or passwords to log in to the CMC. This can be very useful to set up automated scripts to perform various functions.

NOTE: There is no GUI support for managing this feature, you can use only the RACADM.

When adding new public keys, make sure that the existing keys are not already at the index, where the new key is added. CMC does not perform checks to ensure previous keys are deleted before a new one is added. As soon as a new key is added, it is automatically in effect as long as the SSH interface is enabled.

When using the public key comment section of the public key, remember that only the first 16 characters are utilized by the CMC. The public key comment is used by the CMC to distinguish SSH users when using the RACADM `getssninfo` command, because all the PKA users use the service username to log in.

For example, if two public keys are set up one with comment PC1 and one with comment PC2:

```
racadm getssninfo
Type       User   IP Address   Login
Date/Time
SSH        PC1    x.x.x.x      06/16/2009
09:00:00
SSH        PC2    x.x.x.x      06/16/2009
09:00:00
```

For more information about the `sshpkauth`, see the *Chassis Management Controller for PowerEdge FX2/FX2s Command Line Reference Guide*.

Configuring terminal emulation software

CMC supports a serial text console that can be launched using any terminal emulation software. Following are the examples of terminal emulation software that can used to connect to CMC.

1. Linux Minicom
2. Hilgraveve's HyperTerminal for Windows

Connect one end of the serial null modem cable (present at both ends) to the serial connector on the back of the chassis. Connect the other end of the cable to management station serial port. For more information on connecting cables, refer to the back panel of the chassis in Chassis Overview section.

Configure your terminal emulation software with the following parameters:

- **Baud rate**: 115200
- **Port**: COM1
- **Data**: 8 bit
- **Parity**: None
- **Stop**: 1 bit
- **Hardware flow control**: Yes
- **Software flow contro**l: No

Connecting to servers or I/O module using Connect command

CMC can establish a connection to redirect the serial console of a server or I/O module.

For servers, serial console redirection can be accomplished using:

- CMC command line interface (CLI) or the RACADM `connect` command. For more information about running the RACADM commands, see the *Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.
- iDRAC Web interface serial console redirection feature.
- iDRAC Serial Over LAN (SOL) functionality.

In a serial, Telnet, SSH console, CMC supports the `connect` command to establish a serial connection to a server or I/O module. The server serial console contains both the BIOS boot and setup screens, and the operating system serial console. For the I/O module, the switch serial console is available. There is a single IOM on the chassis.

CAUTION: When run from the CMC serial console, the `connect -b` option stays connected until the CMC resets. This connection is a potential security risk.

NOTE: The `connect` command provides the `-b` (binary) option. The `-b` option passes raw binary data, and `cfgSerialConsoleQuitKey` is not used. Additionally, when connecting to a server using the CMC serial console, transitions in the DTR signal (for example, if the serial cable is removed to connect a debugger) will not result in you exiting the application.

NOTE: If the IOM does not support console redirection, the `connect` command displays an empty console. In that case, to return to the CMC console, type the Escape sequence. The default console escape sequence is <Ctrl><\>.

To connect to an IOM:

`connect switch-n`

where `n` is an IOM label A1.

When you reference the IOM in the connect command, the IOM is mapped to switch as shown in the following table.

Table 13. Mapping IO Module to Switches

IO Module Label	Switch
A1	switch-a1 or switch- 1
A2	switch-a2 or switch- 2

NOTE: At a time, there can be only one IOM connection per chassis.

NOTE: You cannot connect to pass-throughs from the serial console.

To connect to a managed-server serial console, run the command `connect server-n` , where *n* = 1-4 (PowerEdge FM120x4), and *n* = 1–8 (PowerEdge FC630). You can also use the `racadm connect server-n` command. When you connect to a server using the `-b` option, binary communication is assumed and the escape character is disabled. If the iDRAC is not available, the `No route to host` error message is displayed.

The `connect server-n` command enables the user to access the server's serial port. After this connection is established, the user can view the server's console redirection through CMC's serial port that includes both the BIOS serial console and the operating system serial console.

NOTE: To view the BIOS boot screens, serial redirection has to be enabled in the servers' BIOS setup. Also, you must set the terminal emulator window to 80×25. Otherwise, the characters on the page are not properly displayed.

NOTE: All keys do not work on the BIOS setup pages. Therefore, provide appropriate keyboard shortcuts for <Ctrl> <Alt> <Delete> and others. The initial redirection screen displays the necessary keyboard shortcuts.

Configuring the managed server BIOS for serial console redirection

You can use a Remote Console session to connect to the managed system using the iDRAC7 web interface (see the *Dell Integrated Dell Remote Access Controller (iDRAC) User's Guide* on **dell.com/support/manuals**).

By default, the Serial communication in the BIOS is turned off. To redirect host text console data to Serial over LAN, you must enable console redirection through COM1. To change the BIOS setting:

1. Turn on the managed server.
2. Press the <F2> key to enter the BIOS setup utility during POST.
3. Go to **Serial Communication**, and then press <Enter> . In the dialog box, the serial communication list displays the following options:

- **off**
- **on without console redirection**
- **on with console redirection via COM1**

To navigate between these options, press the appropriate arrow keys.

NOTE: Make sure that the **On with console redirection via COM1** option is selected.

4. Enable **Redirection After Boot** (default value is **disabled**). This option enables BIOS console redirection across subsequent reboots.
5. Save the changes and exit.

   The managed system restarts.

Configuring Windows for serial console redirection

There is no configuration necessary for servers running the Microsoft Windows Server versions, starting with Windows Server 2003. Windows receives information from the BIOS, and enable the Special Administration Console (SAC) console one COM1.

Configuring Linux for server serial console redirection during boot

The following steps are specific to the Linux GRand Unified Bootloader (GRUB). Similar changes are necessary for using a different boot loader.

NOTE: When you configure the client VT100 emulation window, set the window or application that is displaying the redirected console to 25 rows×80 columns to make sure proper text is displayed. Else, some text screens will appear distorted.

Edit the **/etc/grub.conf** file as follows:

1. Locate the general setting sections in the file and type the following two new lines:

   ```
   serial --unit=1 --speed=57600
   terminal --timeout=10 serial
   ```

2. Append two options to the kernel line:

   ```
   kernel console=ttyS1,57600
   ```

3. If the **/etc/grub.conf** contains a `splashimage` directive, comment it out.

   The following example shows the changes described in this procedure.

   ```
   # grub.conf generated by anaconda
   #
   # Note that you do not have to rerun grub after making
   changes
   # to this file
   # NOTICE: You do not have a /boot partition. This
   means that
   # all kernel and initrd paths are relative to
   /, e.g.
   # root (hd0,0)
   # kernel /boot/vmlinuz-version ro root=
   /dev/sdal
   # initrd /boot/initrd-version.img
   #
   #boot=/dev/sda
   default=0
   timeout=10
   #splashimage=(hd0,2)/grub/splash.xpm.gz
   serial --unit=1 --speed=57600
   ```

```
terminal --timeout=10 serial
title Red Hat Linux Advanced Server (2.4.9-e.3smp)
root (hd0,0)
kernel /boot/vmlinuz-2.4.9-e.3smp ro root=
/dev/sda1 hda=ide-scsi console=ttyS0 console=
ttyS1,57600
initrd /boot/initrd-2.4.9-e.3smp.img
title Red Hat Linux Advanced Server-up (2.4.9-e.3)
root (hd0,00)
kernel /boot/vmlinuz-2.4.9-e.3 ro root=/dev/sda1
initrd /boot/initrd-2.4.9-e.3.img
```

When you edit the **/etc/grub.conf** file, follow these guidelines:

- Disable GRUB's graphical interface and use the text-based interface. Else, the GRUB screen is not displayed in console redirection. To disable the graphical interface, comment out the line starting with `splashimage`.
- To start multiple GRUB options to start console sessions through the serial connection, add the following line to all options:

  `console=ttyS1,57600`

  The example shows `console=ttyS1,57600` added to only the first option.

Configuring Linux for server serial console redirection after boot

Edit the **/etc/inittab** file as follows:

Add a new line to configure `agetty` on the COM2 serial port:

```
co:2345:respawn:/sbin/agetty -h -L 57600 ttyS1
ansi
```

The following example shows the file with the new line.

```
#
# inittab This file describes how the INIT process
# should set up the system in a certain
# run-level.
#
# Author: Miquel van Smoorenburg
# Modified for RHS Linux by Marc Ewing and
# Donnie Barnes
#
# Default runlevel. The runlevels used by RHS are:
# 0 - halt (Do NOT set initdefault to this)
# 1 - Single user mode
# 2 - Multiuser, without NFS (The same as 3, if you
# do not have networking)
# 3 - Full multiuser mode
# 4 - unused
# 5 - X11
# 6 - reboot (Do NOT set initdefault to this)
#
id:3:initdefault:
# System initialization.
si::sysinit:/etc/rc.d/rc.sysinit
l0:0:wait:/etc/rc.d/rc 0
l1:1:wait:/etc/rc.d/rc 1
l2:2:wait:/etc/rc.d/rc 2
l3:3:wait:/etc/rc.d/rc 3
l4:4:wait:/etc/rc.d/rc 4
l5:5:wait:/etc/rc.d/rc 5
```

```
l6:6:wait:/etc/rc.d/rc 6
# Things to run in every runlevel.
ud::once:/sbin/update
# Trap CTRL-ALT-DELETE
ca::ctrlaltdel:/sbin/shutdown -t3 -r now
# When our UPS tells us power has failed, assume we
have a few
# minutes of power left. Schedule a shutdown for 2
minutes from now.
# This does, of course, assume you have power
installed and your
# UPS is connected and working correctly.
pf::powerfail:/sbin/shutdown -f -h +2 "Power Failure;
System Shutting Down"
# If power was restored before the shutdown kicked in,
cancel it.
pr:12345:powerokwait:/sbin/shutdown -c "Power
Restored; Shutdown Cancelled"
# Run gettys in standard runlevels
co:2345:respawn:/sbin/agetty -h -L 57600 ttyS1 ansi
1:2345:respawn:/sbin/mingetty tty1
2:2345:respawn:/sbin/mingetty tty2
3:2345:respawn:/sbin/mingetty tty3
4:2345:respawn:/sbin/mingetty tty4
5:2345:respawn:/sbin/mingetty tty5
6:2345:respawn:/sbin/mingetty tty6

# Run xdm in runlevel 5
# xdm is now a separate service
x:5:respawn:/etc/X11/prefdm -nodaemon
```

Edit the **/etc/securetty**file as follows:

Add a new line, with the name of the serial tty for COM2:

```
ttyS1
```

The following example shows a sample file with the new line.

```
vc/1
vc/2
vc/3
vc/4
vc/5
vc/6
vc/7
vc/8
vc/9
vc/10
vc/11
tty1
tty2
tty3
tty4
tty5
tty6
tty7
tty8
tty9
tty10
tty11
ttyS1
```

Managing CMC using iDRAC RACADM proxy

CMC can be managed using iDRAC RACADM proxy when CMC is not on the network. The following table lists the mapping of CMC privileges with iDRAC privileges for the proxy operation.

CMC Privilege	iDRAC privilege required for proxy operation
CMC Login User	iDRAC Login
Chassis Configuration Administrator	Configure iDRAC
User Configuration Administrator	Configure Users in iDRAC
Clear Logs Administrator	Logs
Chassis Control Administrator	System Control
Server Administrator	System Control
Test Alert User	System Operations
Debug Command Administrator	Debug
Fabric x Administrator (where x is A, B, or C)	System Control

For more information, see the *Dell Chassis Management Controller Version 1.2 for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

13

Using FlexAddress and FlexAddress Plus cards

This section provides information about FlexAddress and how to use FlexAddress Plus card to configure FlexAddress.

NOTE: The FlexAddress feature is licensed. This feature license is included in the Enterprise License.

About FlexAddress

FlexAddress allows CMC to assign WWN/MAC IDs to a particular slot and override the factory IDs. Hence, if the server module is replaced, the slot based WWN/MAC IDs remain the same. This feature eliminates the need to reconfigure Ethernet network management tools, SAN resources, DHCP servers, and routers for various fabrics for a new server module.

Every server module is assigned unique WWN and/or MAC IDs as part of the manufacturing process. Without FlexAddress, if a server had to be replaced with another server module, the WWN/MAC IDs changes and Ethernet network management tools and SAN resources had to be reconfigured to identify the new server module.

If the server is inserted in a new slot or chassis, the server-assigned WWN/MAC is used unless that chassis has the FlexAddress feature enabled for the new slot. If you remove the server, it will revert to the server-assigned address.

Additionally, the *override* action only occurs when a server module is inserted in a FlexAddress enabled chassis; no permanent changes are made to the server module. If a server module is moved to a chassis that does not support FlexAddress, the factory-assigned WWN/MAC IDs is used.

CMC FX2/FX2S chassis is shipped with the FlexAddress Plus SD card, which supports FlexAddress, FlexAddress Plus, and Extended Storage features.

NOTE: Data contained on the FlexAddress Plus SD card is encrypted and may not be duplicated or altered in any manner, because it may inhibit system function and cause the system to not function properly.

NOTE: The use of a FlexAddress Plus SD card is limited to one chassis only. You cannot use the same FlexAddress Plus SD card on another chassis.

About FlexAddress Plus

Each FlexAddress Plus feature card contains unique pool of MAC/WWNs that allow the chassis to assign World Wide Name/Media Access Control (WWN/MAC) addresses to Fibre Channel and Ethernet devices. Chassis assigned WWN/MAC addresses are globally unique and specific to a server slot.

Before installing FlexAddress, you can determine the range of MAC addresses contained on a FlexAddress feature card by inserting the SD card into an USB Memory Card Reader and viewing the **pwwn_mac.xml** file. This clear text XML file on the SD card contains an XML tag `mac_start` that is the first starting hex MAC address that is used for this unique MAC address range. The `mac_count` tag is the total number of MAC addresses that the SD card allocates. To determine the total MAC range allocated, use the following formula:

<mac_start> + <mac_count> - 1 = <mac_end>

For example:

```
(starting_mac)00:18:8B:FF:DC:FA + (mac_count)0xCF – 1 =
(ending_mac)00:18:8B:FF:DD:C8
```

NOTE: Lock the SD card prior to inserting in the USB Memory Card Reader to prevent accidently modifying any of the contents. You *must unlock* the SD card before inserting into CMC.

Verifying FlexAddress activation

To view the FlexAddress feature activation status, run the following RACADM command:

```
racadm featurecard -s

       Feature Name = FlexAddress
       Date/time Activated = 05 Oct 2013 - 11:50:49
       Feature installed from SD-card serial number = CN0H871T1374036T00MXA00

       Feature Name = FlexAddressPlus
       Date/time Activated = 05 Oct 2013 - 11:50:49
       Feature installed from SD-card serial number = CN0H871T1374036T00MXA00

       Feature Name = ExtendedStorage
       Current Status = redundant, active
       Date/time Activated = 05 Oct 2013 - 11:50:58
       Feature installed from SD-card serial number = CN0H871T1374036T00MXA00
```

If there are no active features on the chassis, the command returns a message: racadm feature -s No features active on the chassis

```
racadm feature -s
No features active on the chassis
```

To view the SD card information:

```
$ racadm featurecard -s
Active CMC:
The feature card inserted is valid, serial number CN0H871T1374036T00MXA00
The feature card contains the following feature(s)
       FlexAddress: bound
          FlexAddressPlus: bound
       ExtendedStorage: bound
```

Table 14. Status Messages Returned by the featurecard -s Command

Status Message	Actions
`No feature card inserted.`	Check CMC to verify that the SD card was properly inserted.
`The feature card inserted is valid and contains the following feature(s) FlexAddress: bound.`	No action required.

Status Message	Actions
`The feature card inserted is valid and contains the following feature(s) FlexAddress: bound to another chassis, svctag=ABC1234, SD card SN = 1122334455.`	Remove the SD card; locate and install the SD card for the current chassis.
`The feature card inserted is valid and contains the following feature(s) FlexAddress: not bound.`	The feature card can be moved to another chassis or can be reactivated on the current chassis. To reactivate on the current chassis, enter `racadm racreset` until the CMC module with the feature card installed becomes active.

Dell Feature Cards may contain more than one feature. Once any feature included on a Dell Feature Card has been activated on a chassis, any other features that may be included on that Dell Feature Card cannot be activated on a different chassis. In this case, the racadm feature -s command displays the following message for the affected features:

```
ERROR: One or more features on the SD card are active on another chassis
```

For more information on the `feature` and `featurecard` commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Deactivating FlexAddress

The FlexAddress feature can be deactivated and the SD card returned to a pre-installation state by using a RACADM command. There is no deactivation function within the Web interface. Deactivation returns the SD card to its original state where it can be installed and activated in another chassis. The term FlexAddress, in this context, implies both FlexAddress and FlexAddressPlus.

NOTE: The SD card must be physically installed in CMC, and the chassis must be turned off before running the deactivation command.

If you run the deactivation command without installing an SD card, or with a card from a different chassis installed, the feature is deactivated and change is not made to the card.

To deactivate the FlexAddress feature and restore the SD card:

```
racadm feature -d -c flexaddress
```

The command returns the following status message if it is successfully deactivated:

```
feature FlexAddress is deactivated on the chassis successfully.
```

If the chassis is not turned off before running the command, the command throws the following error:

```
ERROR: Unable to deactivate the feature because the chassis is powered ON
```

NOTE: To activate the FlexAddress feature again, re-boot the CMC.

For further information about the command, see the **feature** command section of the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide.*

Configuring FlexAddress

FlexAddress is an optional upgrade that allows server modules to replace the factory-assigned WWN/MAC ID with a WWN/MAC ID provided by the chassis.

NOTE: By using the `racresetcfg` subcommand, you can reset the Flex Address of a CMC to its factory-default setting, which is "disabled". The RACADM syntax is:

```
racadm racresetcfg -c flex
```

For more information about the FlexAddress-related RACADM commands and data about the other factory-default properties, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

The server must be turned off before you begin configuration. You can enable or disable FlexAddress on a per-fabric–basis. Additionally, you can enable or disable the feature on a per-slot–basis. After you enable the feature on a per-fabric–basis, you can select slots to be enabled. For example, if Fabric-A is enabled, any slots that are enabled have FlexAddress enabled only on Fabric-A. All other fabrics use the factory-assigned WWN/MAC on the server.

NOTE: When the FlexAddress feature is deployed for the first time on a given server module, it requires a power- down and power-up sequence for FlexAddress to take effect. FlexAddress on Ethernet devices is programmed by the server module BIOS. For the server module BIOS to program the address, it needs to be operational which requires the server module to be powered up. When the power-down and power- up sequences complete, the chassis-assigned MAC IDs are available for Wake-On-LAN (WOL) function.

Configuring FlexAddress for chassis-level fabric and slots

At the chassis level, you can enable or disable the FlexAddress feature for fabrics and slots. FlexAddress is enabled on a per-fabric–basis and then slots are selected for participation in the feature. Both fabrics and slots must be enabled to successfully configure FlexAddress.

Viewing World Wide Name/Media Access Control (WWN/MAC) IDs

The **WWN/MAC Summary** page allows you to view the WWN configuration and MAC address of a slot in the chassis.

Command messages

The following table lists the RACADM commands and output for common FlexAddress situations.

Table 15. FlexAddress commands and output

Situation	Command	Output

SD card in the CMC module is bound to another service tag.	`$racadm featurecard -s`	`The feature card inserted is valid and contains the following feature(s)`
		
		`FlexAddress: bound to another chassis, svctag = <Service tag Number> SD`

Situation	Command	Output
		card SN = <Valid flex address serial number>
SD card in the CMC module that is bound to the same service tag.	$racadm featurecard -s	The feature card inserted is valid and contains the following feature(s) FlexAddress: bound
SD card in the CMC module that is not bound to any service tag.	$racadm featurecard -s	The feature card inserted is valid and contains the following feature(s) FlexAddress:not bound
FlexAddress feature not on the chassis for any reason (No SD card inserted/ corrupt SD card/ after feature deactivated /SD card bound to a different chassis).	$racadm setflexaddr [-f *<fabricName> <slotState>*] $racadm setflexaddr [-i *<slot#> <slotstate>*]	ERROR: Flexaddress feature is not active on the chassis
Guest user attempts to set FlexAddress on slots/fabrics.	$racadm setflexaddr [-f *<fabricName> <slotState>*] $racadm setflexaddr [-i *<slot#> <slotstate>*]	ERROR: Insufficient user privileges to perform operation
Deactivating FlexAddress feature with chassis powered ON.	$racadm feature -d -c flexaddress	ERROR: Unable to deactivate the feature because the chassis is powered ON
Guest user tries to deactivate the feature on the chassis.	$racadm feature -d -c flexaddress	ERROR: Insufficient user privileges to perform operation
Changing the slot/fabric FlexAddress settings while the server modules are powered ON.	$racadm setflexaddr -i 1 1	ERROR: Unable to perform the set operation because it affects a powered ON server
Changing the Flexaddress settings of slot or fabric, when the CMC Enterprise License is not installed.	$racadm setflexaddr -i<slotnum> <status> $racadm setflexaddr -f<FabricName> <status>	ERROR: SWC0242 : A required license is missing or expired. Obtain an appropriate license and try again, or contact your service provider for additional details. NOTE: To resolve this issue, you must have a **FlexAddress Enablement** license.

FlexAddress DELL SOFTWARE LICENSE AGREEMENT

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Viewing WWN/MAC address information

You can view the WWW/MAC address inventory of Network Adapters for each server slot or all servers in a chassis. The inventory includes the following:

- Fabric Configuration

  NOTE:

  - Fabric A displays the type of the Input/Output fabric installed. If Fabric A is enabled, unpopulated slots display chassis-assigned MAC addresses for Fabric A.
  - iDRAC management controller is considered as part of Management Fabric and is shown along with rest of Fabrics.
  - A check mark against the component indicates that the fabric is enabled for FlexAddress or FlexAddressPlus.
- Protocol that is being used on the NIC Adapter port. For example, LAN, iSCSI, FCoE, and so on.
- Fibre Channel World Wide Name (WWN) configuration and Media Access Control (MAC) addresses of a slot in the chassis.
- MAC address assignment type and the current active address type — Server assigned, FlexAddress, or I/O Identity MAC. A green check mark indicates the active address type, either server-assigned, chassis-assigned, or remote assigned.
- Status of the NIC partitions for devices supporting partitioning.

You can view the WWN/MAC Address inventory using the Web interface or the RACADM CLI. Based on the interface, you can filter the MAC address and know which WWN/MAC address is in use for that function or partition. If the adapter has NPAR enabled, you can view which partitions are enabled or disabled.

Using the Web interface, you can view the WWN/MAC Addresses information for specific slots using the **FlexAddress** page (Click **Server Overview → Slot <x> → Setup → FlexAddress**). You can view the WWN/MAC Addresses information for all the slots and server using the **WWN/MAC Summary** page (Click **Server Overview → Properties → WWN/MAC**). From both the pages you can view the WWN/MAC Addresses information in the basic mode or the advanced mode:

- **Basic Mode** — In this mode you can view Server Slot, Fabric, Protocol, WWN/MAC addresses, and Partition Status. Only Active MAC addresses are displayed in WWN/MAC address field. You can filter using any or all of the fields displayed.

- **Advanced Mode** — In this mode you can view all the fields displayed in the basic mode and all the MAC types (Server Assigned, Flex Address, and IO Identity). You can filter using any or all of the fields displayed.

In both the Basic mode and the Advanced mode, the WWN/MAC Addresses information is displayed in a collapsed form. Click the + against a slot or click **Expand/Collapse All** to view the information for a specific slot or all the slots.

You can also export the WWN/MAC Addresses information for all the servers in the chassis to a local folder.

For information about the fields, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing basic WWN/MAC address information using web interface

To view WWN/MAC Address information for each server slot or all servers in a chassis, in the basic mode:

1. Click **Server Overview → Properties → WWN/MAC**

   The **WWN/MAC Summary** page displays the WWN/MAC Address Information.

   Alternatively, click **Server Overview → Slot <x> → Setup → FlexAddress** to view the WWN/MAC Address information for a specific server slot. The **FlexAddress** page is displayed.
2. In the **WWN/MAC Addresses** table, click **Export** to save the WWN/MAC addresses locally.
3. Click the + against a slot or click **Expand/Collapse All** to expand or collapse the attributes listed for a specific slot or all the slots in the WWN/MAC Addresses table.
4. From the **View** drop-down menu, select **Basic**, to view the WWN/MAC Addresses attributes in tree view.
5. From the **Server Slot** drop-down menu, select **All Servers** or a specific Slot to view the WWN/MAC Addresses attributes for all servers or servers in specific slots only respectively.
6. From the **Fabric** drop-down menu, select one of the fabric types to view details for all or specific type of management or I/O fabric associated with the servers.
7. From the **Protocol** drop-down menu, select **All Protocols** or one of the listed network protocols to view all the MACSsor the MACs associated with the selected protocol.
8. In the **WWN/MAC Addresses** field, to filter a slot associated with the specific MAC address, enter the exact MAC address. Alternately, partially enter the MAC address entries to view the associated slots. For example, enter `4A` to view the slots with MAC addresses that contain `4A`.
9. From the **Partition Status** drop-down menu, select the status of the partitions to display servers with the selected partition status.

   If a particular partition is disabled, the row displaying the partition is greyed out.

For information about the fields, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing advanced WWN/MAC address information using web interface

To view WWN/MAC Address Information for each server slot or all servers in a chassis, in the advanced mode:

1. Click **Server Overview → Properties → WWN/MAC**

The **WWN/MAC Summary** page displays the WWN/MAC Address Information.

2. From the **View** drop-down menu, select **Advanced**, to view the WWN/MAC Addresses attributes in detailed view.

   In the **WWN/MAC Addresses** table displays Server Slot, Fabric, Protocol, WWN/MAC addresses, MAC address assignment type — Server assigned, FlexAddress, or I/O Identity MAC, and Partition Status. A green check mark indicates the active address type, either server-assigned, chassis-assigned, or remote assigned. MAC. If a server does not have the FlexAddress or I/O Identity enabled, then the status for **FlexAddress (Chassis-Assigned)** or **I/O Identity (Remote-Assigned)** is displayed as **Not Enabled**.
3. In the **WWN/MAC Addresses** table, click **Export** to save the WWN/MAC addresses locally.
4. Click the + against a slot or click **Expand/Collapse All** to expand or collapse the attributes listed for a specific slot or all the slots in the WWN/MAC Addresses table.
5. From the **Server Slot** drop-down menu, select **All Servers** or a specific Slot to view the WWN/MAC Addresses attributes for all servers or servers in specific slots only respectively.
6. From the **Fabric** drop-down menu, select one of the fabric types to view details for all or specific type of management or I/O fabric associated with the servers.
7. From the **Protocol** drop-down menu, select **All Protocols** or one of the listed network protocols to view all the MACS or the MACs associated with the selected protocol.
8. In the **WWN/MAC Addresses** field, enter the MAC address to view only the slots associated with the specific MAC address. Alternately, partially enter the MAC address entries to view the associated slots. For example, enter `4A` to view the slots with MAC addresses that contain `4A`.
9. From the **Partition Status** drop-down menu, select the status of the partitions to display servers with the selected partition status.

   If a particular partition is disabled, the status is displayed as **Disabled** and the row displaying the partition is greyed out.

For information about the fields, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing WWN/MAC address information using RACADM

To view WWNn/MAC address information for all servers or specific servers using RACADM, use the **getflexaddr** and **getmacaddress** subcommands.

To display Flexaddress for the entire chassis, use the following RACADM command:

```
racadm getflexaddr
```

To display Flexaddress status for a particular slot, use the following RACADM command:

```
racadm getflexaddr [-i <slot#>]
```

where <*slot #*> is a value from 1 to 4.

To display the NDC or LOM MAC address, use the following RACADM command:

```
racadm getmacaddress
```

To display the MAC address for chassis, use the following RACADM command:

```
racadm getmacaddress -m chassis
```

To display the iSCSI MAC addresses for all servers, use the following RACADM command:

```
racadm getmacaddress -t iscsi
```

To display the iSCSI MAC for a specific server, use the following RACADM command:

```
racadm getmacaddress [-m <module> [-x]] [-t iscsi]
```

To display the user-defined MAC and WWN address, use the following RACADM command:

```
racadm getmacaddress -c io-identity
```

```
racadm getmacaddress -c io-identity -m server -2
```

To display Ethernet and iSCSI MACS addresses of all LOMs or mezzanine cards, use the following RACADM command:

```
racadm getmacaddress -a
```

To display the console assigned MAC/WWN of all LOMs or mezzanine cards, use the following RACADM command:

```
racadm getmacaddress -c all
```

To display the chassis assigned WWN/MAC address, use the following RACADM command:

```
racadm getmacaddress -c flexaddress
```

To display the MAC/WWN addresses for all LOMs or mezzanine cards, use the following RACADM command:

```
racadm getmacaddress -c factory
```

For more information on the **getflexaddr** and **getmacaddress** subcommand, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

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Managing Fabrics

The chassis supports two fabric types: Fabric A1 and Fabric A2, which are used by the two I/O Modules, and are always connected to the on-board Ethernet adapters of the servers.

NOTE: In the PowerEdge FX2s chassis, fabrics B and C are the PCIe connection to the PCIe Extension cards.

Following IO Modules are supported:

- 1GbE pass-through
- 10GbE pass-through
- I/O Aggregator (available in PowerEdge FX2/FX2s)

Both the Fabrics support only Ethernet. Each server IO adapter (LOM) can have either two or four ports depending on the capability. The mezzanine card slots are occupied by PCIe extension cards that are connected to PCIe cards (and not to IO modules).

NOTE: In the CMC CLI, the IOM is referred to by the convention, switch.

Monitoring IOM health

For information about monitoring IOM health, see Viewing Information and Health Status of the IOM.

Configuring network settings for IOM

You can specify the network settings for the interface used to manage the IOM. For Ethernet switches, the out-of-band management port (IP address) is configured. The in-band management port (that is, VLAN1) is not configured using this interface.

Before configuring the network settings for the IOM, make sure the IOM is turned on.

To configure the network setting of IOM in Group A, you must have the Fabric A Administrator privileges.

NOTE: For Ethernet switches, the in-band (VLAN1) and out-of-band management IP addresses cannot be the same, or cannot be on the same network. This results in the out-of-band IP address in being not set. See the IOM documentation for the default in-band management IP address.

NOTE: Do not configure I/O module network settings for Ethernet pass-through and Infiniband switches.

Configuring network settings for IOM using CMC web interface

To configure the network settings for I/O Module:

1. In the left pane, click **Chassis Overview**, click **I/O Module Overview**, and then click **Setup**. Alternatively, to configure the network settings of the available I/O modules that is **A1** and **A2**, click **A1 Gigabit Ethernet** or **A2 Gigabit Ethernet**, and then click **Setup**.

   On the **Configure I/O Module Network Settings** page, type appropriate data, and then click Apply.
2. If allowed, type the root password, SNMP RO Community string, and Syslog Server IP Address for the IOM. For more information about the field descriptions, see the *Online Help*.

   NOTE: The IP address set on the IOM from CMC is not saved to the permanent startup configuration of the switch. To permanently save the IP address configuration, you must run the `connect switch` command, or `racadm connect switch` RACADM command, or use a direct interface to the IOM GUI to save this address to the startup configuration file.
3. Click **Apply**.

   The network settings are configured for the IOM.

   NOTE: If allowed, you can reset the VLANs, network properties, and IO ports to its default configuration values.

Configuring network settings for IOM using RACADM

To configure the network settings for an IOM by using RACADM, set the date and time. See the deploy command section in the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

You can set the user name, password, and SNMP string for the IOM using the RACADM deploy command:

```
racadm deploy –m switch –u <username> –p <password>

racadm deploy -m switch -u -p <password> -v SNMPv2 <snmpCommunityString> ro

racadm deploy -a [server|switch] -u <username> -p <password>
```

Viewing I/O module uplink and downlink status using web interface

NOTE: This feature is available only in PowerEdge FX2/FX2s.

You can view the uplink and downlink status information for Dell PowerEdge M I/O Aggregator using the CMC Web interface. To do this:

1. Go to **Chassis Overview → I/O Module Overview**.

   All the IOMs (1–2) appear in the expanded list.
2. Click the IOM (slot) you want to view.

   The I/O Module Status page specific to the IOM slot is displayed. The I/O Module Uplink Status and I/O Module Downlink Status tables are displayed. These tables display information about the downlink ports (1-8) and uplink ports (9-12). For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing I/O module FCoE session information using web interface

You can view the FCoE session information for Dell PowerEdge M I/O Aggregator using the CMC web interface. To do this:

1. Go to **Chassis Overview → I/O Module Overview**.

   All the IOMs (1–6) appear in the expanded list.
2. Click the IOM (slot) you want to view. Click **Properties → FCoE**.

   The **FCoE I/O Module** page specific to the IOM slot is displayed.
3. In the **Select Port** drop-down, select the required port number for the selected IOM and click Show Sessions. The selected option retrieves the FCoE session information for the switch, and present it to the user as a table.

   The **FCoE Session Information** section displays the FCoE session information for the switch.

   NOTE: The I/O Aggregator also displays the active FCoE sessions when the switch is using the protocol.

Resetting IOM to factory default settings

You can reset IOM to the factory default settings using the **Deploy I/O Modules** page.

NOTE: This feature is supported on PowerEdge M I/O Aggregator IOM only. Other IOMs including MXL 10/40GbE are not supported.

To reset the selected IOMs to factory default settings using the CMC Web interface:

1. In the system tree, go to **I/O Module Overview** and click **Setup** or expand **I/O Module Overview** in the system tree, select the IOM, and click **Setup**.

   The **Deploy I/O Modules** page displays the IOM(s) that are powered on.
2. For the required IOM(s), click **Reset**.

   A warning message is displayed.
3. Click **OK** to continue.

Updating IOM software using CMC web interface

You can update the IOM software by selecting the required software image from a specified location. You can also rollback to an earlier software version.

NOTE: This feature is supported only on **Dell PowerEdge I/O Aggregator**.

To update the IOM Infrastructure device software, in the CMC Web interface:

1. Go to **Chassis Overview → I/O Module Overview → Update**.

   The IOM Firmware Update page is displayed. Alternatively, go to any of the following
   - **Chassis Overview → Update**.
   - **Chassis Overview → Chassis Controller → Update**.

The Firmware Update page is displayed, which provides a link to access the IOM Firmware and Software page.

2. In the IOM Firmware Update page, in the Firmware section, select the check box in the Update column for the IOM you want to update the software and click **Apply Firmware Update**. Alternatively, to rollback to the earlier versions of the software, select the check box in the Rollback column.
3. Select the software image for the software update, using the Browse option. The name of Software image gets displayed in the IOM Software Location field.

   The Update Status section provides software update or rollback status information. A status indicator displays on the page while the image file uploads. File transfer time varies based on connection speed. When the internal update process begins, the page automatically refreshes and the Firmware update timer is displayed.

   NOTE: Do not click the Refresh icon or navigate to another page during the file transfer.

   NOTE: The file transfer timer is not displayed when updating IOMINF firmware.

   NOTE: The FTOS or IOM software version is displayed in the format X-Y(A-B). For example, 8-3(1-4). If the Rollback Version of the FTOS image is an old image which uses the old version string format 8-3-1-4, then the Current Version is displayed as 8-3(1-4).

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Using VLAN Manager

You can assign or view the VLAN settings on the IOMs by using the **VLAN Manager** option.

NOTE: This feature is supported only on Dell PowerEdge I/O Aggregator.

Assigning VLAN to IOM

Virtual LAN (VLAN) for IOMs allows you to separate users into individual network segments for security and other reasons. By using VLANs you can isolate the networks for individual users on a 32 port switch. You can associate selected ports on a switch with selected VLAN and treat these ports as a separate switch.

CMC Web Interface allows you to configure the in-band management ports (VLAN) on the IOMs.

To assign a VLAN to an IOM, go to **Chassis Overview → I/O Module Overview → Setup → VLAN Manager**.

In the **VLAN Assignment** section, select the I/O Module and choose the type of configuration. Also specify the port range and the slot.

Change or edit the VLANs by selecting from the list in the drop-down menu.

Configuring VLAN settings on IOMs using CMC web interface

To configure the VLAN settings on IOM(s) using the CMC Web interface:

1. Go to **I/O Module Overview** and click **Setup VLAN Manager**.
   The VLAN Manager page displays the IOM(s) that are turned on and the available ports.
2. In the **Select I/O Module** section, select the configuration type from the drop down list, and then select the required IOM(s).
3. In the **Specify Port Range** section, select the range of fabric ports to be assigned to the selected IOM(s).
4. Select the **Select or Deselect All** option to apply the changes to all or no IOMs.
   or

   Select the check box for the specific slots to select the required IOMs.
5. In the **Edit VLANs** section, enter the VLAN IDs for the IOMs. Enter VLAN IDs in the range 1-4094. VLAN IDs can be entered as a range or separated by a comma.
6. Select one of the following options from the drop-down menu as required:

- Add Tagged VLANs
- Remove VLANs
- Update untagged VLANs
- Reset to all VLANs
- Show VLANs

7. Click **Save** to save the new settings made to the **VLAN Manager** page.

   NOTE: The Summary VLANs of All Ports section displays information about the IOMs present in the Chassis and the assigned VLANs. Click **Save** to save a csv file of the summary of the current VLAN settings.

   NOTE: The CMC Managed VLANs section displays the summary of all VLANs assigned to the IOMs.

8. Click **Apply**.
   The network settings are configured for the IOM(s).

Viewing the VLAN settings on IOMs using CMC web interface

To view the VLAN settings on IOM(s) using the CMC Web interface:

1. Go to **I/O Module Overview**, and click **Setup → VLAN Manager**.
   The **VLAN Manager** page is displayed. The Summary VLANs of All Ports section displays information about the current VLAN settings for the IOMs.
2. Click **Save** to save the VLAN settings to a file.

Viewing the current VLAN settings on IOMs using CMC web interface

To view the current VLAN settings on IOMs using the CMC Web Interface:

1. Go to **I/O Module Overview**, and click **Setup → VLAN Manager**.
   The **VLAN Manager** page is displayed.
2. In the **Edit VLANs** section, select **Show VLANs** in the drop down list and click **Apply**.
   An Operation Successful message is displayed. The current VLAN settings that are assigned to the IOMs are displayed in the **VLAN Assignment Summary** field.

Removing VLANs for IOMs using CMC web interface

To remove VLANs from IOM(s) using the CMC Web interface:

1. Go to **I/O Module Overview**, and click **Setup → VLAN Manager.**
   The VLAN Manager page is displayed.
2. In the **Select I/O Module** section, select the required IOMs.
3. In the **Edit VLANs** section, select **Remove VLANs** in the drop down list and click **Apply**.
   The VLANs assigned to the selected IOMs are removed.

An Operation Successful message is displayed. The current VLAN settings that are assigned to the IOMs are displayed in the **VLAN Assignment Summary** field.

Updating untagged VLANs for IOMs using CMC web interface

To update untagged VLANs for IOM(s) using the CMC web interface:

NOTE: The untagged VLANs cannot be set to a VLAN ID that is already tagged.

1. Go to, **I/O Module Overview** , and click **Setup → VLAN Manager**.
   The VLAN Manager page is displayed.
2. In the **Select I/O Module** section, select the required IOMs.
3. In the **Specify Port Range** section, select the range of fabric ports to be assigned to the selected IOM(s).
4. Select the **Select or Deselect All** option to apply the changes to all or no IOMs.
   or
   Select the check box against the specific slots to select the required IOMs.
5. In the **Edit VLANs** section, select **Update the Untagged VLANs** in the drop down list and click **Apply**.
   A warning message is displayed that the configurations of the existing untagged VLAN will be overwritten with the configurations of the newly assigned untagged VLAN.
6. Click **OK** to confirm.
   The untagged VLANs are updated with the configurations of the newly assigned untagged VLAN.
   An Operation Successful message is displayed. The current VLAN settings that are assigned to the IOMs are displayed in the VLAN Assignment Summary field.

Resetting VLANs for IOMs using CMC web interface

To reset VLANs for IOM(s) to default configurations using the CMC Web interface:

1. Go to **I/O Module Overview**, and click **Setup → VLAN Manager**.
   The VLAN Manager page is displayed.
2. In the **Select I/O Module** section, select the required IOMs.
3. In the **Edit VLANs** section, select **Reset VLANs** in the drop down list and click **Apply**.
   A warning message is displayed indicating that the configurations of the existing VLANs will be overwritten with the default configurations.
4. Click **OK** to confirm.
   The VLANs are assigned to the selected IOMs according to the default configurations.
   An Operation Successful message is displayed. The current VLAN settings that are assigned to the IOMs are displayed in the VLAN Assignment Summary field.

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Managing and monitoring power

The PowerEdge FX2/FX2s chassis is the most power-efficient server enclosure. It is designed to include highly efficient power supplies and fans, has an optimized layout for the air to flow more easily through the system, and contains power-optimized components throughout the enclosure. The optimized hardware design is coupled with sophisticated power management capabilities that are built into the Chassis Management Controller (CMC), power supplies, and iDRAC to allow you to further enhance power-efficient server environment.

Power management in PowerEdge FX2/FX2s is relatively different from PowerEdge VRTX. One major change in the power management technique is the use of a Closed Loop System Throttle (CLST) to maintain the desired chassis power cap. The purpose of using this technique is that, it has a better control, also allows the chassis to make full use of the available PSU.

The Power Management features of PowerEdge FX2/FX2s help administrators configure the enclosure to reduce power consumption and to adjust the power as required specific to the environment.

The PowerEdge FX2/FX2s enclosure consumes AC power and distributes the load across the active power supply unit (PSU). The system can deliver up to 3371 Watts of AC power that is allocated to server modules and the associated enclosure infrastructure. However, this capacity varies based on the power redundancy policy that you select.

The PowerEdge FX2/FX2s enclosure can be configured for any of the three redundancy policies that affect PSU behavior and determine how chassis Redundancy state is reported to administrators.

You can also control Power management through **OpenManage Power Center (OMPC)**. When OMPC controls power externally, CMC continues to maintain:

- Redundancy policy
- Remote power logging

OMPC then manages:

- Server power
- System Input Power Capacity

NOTE: Actual power delivery is based on the configuration and workload.

You can use the CMC web interface or RACADM to manage and configure power controls on CMC:

- View the status for the chassis, servers, and PSUs.
- Configure power budget and redundancy policy for the chassis.
- Execute power control operations (turn on, turn off, system reset, power-cycle) for the chassis.

Redundancy policies

Redundancy policy is a configurable set of properties that determine how CMC manages power to the chassis. The following redundancy policies are configurable:

- Grid Redundancy
- No Redundancy
- Redundancy Alerting Only

Grid Redundancy policy

The Grid Redundancy policy is also knows as 1+1 policy, for one active and one spare PSU.

The purpose of the Grid Redundancy policy is to enable an enclosure system to operate in a mode in which the enclosure can tolerate AC power failures. These failures may originate in the AC power grid, the cabling and delivery, or a Power Supply Unit (PSU) itself. When you configure a system for Grid Redundancy, connect PSUs 1 and 2 to separate power grids.

In this mode, the CMC ensures that power usage is maintained such that the system continues to operate with no degradation if there is a failure of either the grid or a single PSU. Server power-on is limited to the available power of a single PSU. If at any time redundancy cannot be maintained (such as if a PSU is removed or fails) alerts are triggered, the chassis health becomes **Critical**.

No Redundancy policy

The No Redundancy policy is also known as 2+0 policy.

In this mode, all the power of both PSUs is available and used, but there is no assurance that a PSU or grid failure does not affect system operation.

Redundancy Alerting Only policy (Default setting)

The Redundancy Alerting Only policy permits server power-on to use the capacity of both PSUs, while alerting on actual conditions such as removal or failure of a PSU, or actual power consumption exceeding the capabilities of a single PSU. This is the default policy.

PSU failures

PSU failures of any type are always alerted, regardless of the selected redundancy policy.

Default Redundancy configuration

Redundancy Alerting Only is the default redundancy configuration for a chassis and two PSUs.

Multi-node sled adaptation

The PowerEdge FM120x4 is a multi-node, half-width sled that can accommodate four servers with the associated iDRAC with independent processors. It is designed for optimal power efficiency and the processors cannot be removed. The processors in PowerEdge FM120 share a common power infrastructure, for example, a single power and temperature sensors for the entire sled.

Chassis power limit monitoring

Open Manage Power Center (OMPC) can be used to monitor and control power consumption of the machines in a data center. PowerEdge FX2/FX2s enables OMPC by providing a provision to set the power cap for the chassis, and bounds to guide the setting of the power cap. The lower and upper bounds for the power cap is set by the CMC and cannot be configured.

NOTE: The lower bound is the minimum power needed to operate the chassis given the current configuration. The upper bound reflects the maximum power available in the current redundancy policy.

Viewing power consumption status

CMC provides the actual input power consumption for the entire system.

Viewing power consumption status using CMC web interface

In the left pane, click **Chassis Overview** → **Power** → **Power Monitoring**. The Power Monitoring page displays the power health, system power status, real-time power statistics, and real-time energy statistics. For more information, see the *Online Help*.

NOTE: You can also view the power redundancy status under Power Supplies.

Viewing power consumption status using RACADM

To view power consumption status using RACADM:

Open a serial/Telnet/SSH text console to CMC, log in, and type:

```
racadm getpminfo
```

Viewing power budget status using CMC web interface

To view power budget status using CMC web interface, in the left pane go to **Chassis Overview** and click **Power** → **Budget Status**. The **Power Budget Status** page displays the system power policy configuration with the attributes **System Input Power cap**, **Redundancy Policy**, power budget details with the attributes **System Input Max Power Capacity**, **Input Redundancy Reserve**, **Power Available for Server Power-on**, and chassis power supply with the power supply unit details. For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

Viewing power budget status using RACADM

Open a serial/Telnet/SSH text console to CMC, log in, and type:

```
racadm getpbinfo
```

For more information about **getpbinfo**, including output details, see the **getpbinfo** command section in the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Redundancy status and overall power health

The redundancy status is a factor in determining the overall power health. When the power redundancy policy is set, for example, to grid redundancy and the redundancy status indicates that the system is operating with redundancy, the overall power health is typically **OK**. However, if the conditions for operating with grid redundancy cannot be met, the redundancy status is **No**, and the overall power health is **Critical**. This is because the system is not able to operate in accordance with the configured redundancy policy.

NOTE: CMC does not perform a pre-check of these conditions when you change the redundancy policy to or from grid redundancy. So, configuring the redundancy policy may immediately result in redundancy lost or a regained condition.

Power management after PSU failure

In the event of a PSU failure or removal, the power supplied to servers may be reduced. In extreme cases servers could be powered off in an attempt to sustain operation. Configuring and maintaining Grid Redundancy avoids any impact to servers for a single PSU failure.

Power supply and Redundancy policy changes in system event log

Changes in the power supply state and power redundancy policy are recorded as events. Events related to the power supply that record entries in the system event log (SEL) are power supply insertion and removal, power supply input insertion and removal, and power supply output assertion and de-assertion.

The following table lists the SEL entries that are related to power supply changes:

Table 16. SEL events for power supply changes

Power Supply Event	System Event Log (SEL) Entry
Insertion	Power supply is present.
Removal	Power supply is absent.
AC input received	The power input for power supply has been restored.
AC input lost	The power input for power supply is lost.
DC output produced	Power supply is operating normally.
DC output lost	Power supply failed.

Events related to changes in the power redundancy status that record entries in the SEL are redundancy loss and redundancy regain for the enclosure that is configured for the **Grid Redundancy** power policy or **Redundancy Alerting Only** power policy. The following table lists the SEL entries that are related to power redundancy policy changes.

Power Policy Event	System Event Log (SEL) Entry
Redundancy lost	Power supply redundancy is lost.
Redundancy regained	The power supplies are redundant.

Configuring power budget and Redundancy

You can configure the power budget, redundancy, and dynamic power of the entire chassis (chassis, servers, I/O module, CMC, PCIe, and chassis infrastructure). The power management service optimizes power consumption and reallocates power to different modules on the basis of requirement.

You can configure the following:

- System Input Power Cap
- Redundancy Policy
- Disable Chassis Power Button
- Max Power Conservation Mode
- Remote Power Logging
- Remote Power Logging Interval

Power conservation and power budget

If the power usage exceeds the System Input Power Cap, the power supplied to the servers by the PSU is reduced to maintain the nominal level.

Configuring power budget and Redundancy using CMC web interface

NOTE: To perform power management actions, you must have the **Chassis Configuration Administrator** privilege.

To configure power budget:

1. In the left pane, click **Chassis Overview → Power → Configuration**.
2. On the **Budget/Redundancy Configuration** page, select any or all of the following properties as appropriate. For information about the field descriptions, see the *Online Help*.
   - **Redundancy Policy**
   - **Disable Chassis Power Button**
   - **Max Power Conservation Mode**
3. Click **Apply** to save the changes.

Configuring power budget and Redundancy using RACADM

NOTE: To perform power management actions, you must have the **Chassis Configuration Administrator** privilege.

To enable and set the redundancy policy:

1. Open a serial/Telnet/SSH text console to CMC and log in.
2. Set properties as needed:
   - To select a redundancy policy, type:

     ```
     racadm config -g cfgChassisPower -o
     cfgChassisRedundancyPolicy <value>
     ```

     where <*value*> is 0 (No Redundancy), 1 (Grid Redundancy), and 3 (Redundancy Alerting Only). The default value is 3.

For example, the following command sets the redundancy policy to :

```
racadm config -g cfgChassisPower -o
cfgChassisRedundancyPolicy 1
```

- To set the power budget value, type:

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisPowerCap <value>
  ```

  where <*value*> is a number between the Current runtime Chassis Burden and 3371, representing the maximum power limit in Watt. The default is 3371.

  For example, the following command sets the maximum power budget to 3371 Watt:

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisPowerCap 3371
  ```

- To view the upper bound and the lower bound, type:

  ```
  racadm getconfig -g cfgchassispower -o cfgchassispowercap <lower,upper>
  bound
  ```

  where <*lower, upper*> is the lower bound and the upper bound limit.

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisPowerCap 3000
  ```

- To enable the maximum power consumption mode, type:

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisMaxPowerConservationMode 1
  ```

- To restore normal operation, type:

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisMaxPowerConservationMode 0
  ```

- To enable the power remote logging feature, enter the following command:

  ```
  racadm config -g cfgRemoteHosts -o
  cfgRhostsSyslogPowerLoggingEnabled 1
  ```

- To specify the desired logging interval, enter the following command:

  ```
  racadm config -g cfgRemoteHosts -o
  cfgRhostsSyslogPowerLoggingInterval n
  ```

  where *n* is 1-1440 minutes.

- To determine if the power remote logging feature is enabled, enter the following command:

  ```
  racadm getconfig -g cfgRemoteHosts -o
  cfgRhostsSyslogPowerLoggingEnabled
  ```

- To determine the power remote logging interval, enter the following command:

  ```
  racadm getconfig -g cfgRemoteHosts -o
  cfgRhostsSyslogPowerLoggingInterval
  ```

  The power remote logging feature is dependent on previously configured remote syslog hosts having been . Logging to one or more remote syslog hosts must be enabled, otherwise power consumption is logged. This can be done either through the web GUI or the RACADM CLI. For more information, see the remote syslog configuration instructions.

- To restore CMC power management, type:

  ```
  racadm config -g cfgChassisPower -o
  cfgChassisServerBasedPowerMgmtMode 0
  ```

For information about RACADM commands for chassis power, see the **config**, **getconfig**, **getpbinfo**, and **cfgChassisPower** sections in the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Executing Power Control Operations

You can execute the following power control operation for the chassis, servers, and IOM.

NOTE: Power control operations affect the entire chassis.

Executing Power Control Operations on the Chassis

CMC enables you to remotely perform several power management actions, such as an orderly shutdown on the entire chassis (chassis, servers, IOM, and PSUs).

Executing Power Control Operations on the Chassis Using Web Interface

To execute power control operations on the chassis using the CMC web interface:

1. In the left pane, click **Chassis Overview** → **Power** → **Control**.
   The **Chassis Power Control** page is displayed.
2. Select one of the following power control operations.
   For information about each option, see the *Online Help*.
   - **Power On System**
   - **Power Off System**
   - **Power Cycle System (cold boot)**
   - **Reset CMC (warm boot)**
   - **Non-Graceful Shutdown**
3. Click **Apply**.
   A dialog box appears asking you for a confirmation.
4. Click **OK** to perform the power management action (for example, cause the system to reset).

Executing Power Control Operations on the Chassis Using RACADM

Open a serial/Telnet/SSH text console to CMC, log in, and type:

```
racadm chassisaction -m chassis <action>
```

where <*action*> is powerup, powerdown, powercycle, nongraceshutdown, or reset.

Executing Power Control Operations for Multiple Servers Using CMC Web Interface

To execute power control operation for multiple servers using the Web interface:

1. In the left pane, click **Server Overview** → **Power**.
   The **Power Control** page is displayed.
2. In the **Operations** column, from the drop-down menu, select one of the following power control operations for the required servers:
   - **No Operation**
   - **Graceful Shutdown**
   - **Power On Server**
   - **Power Off Server**
   - **Reset Server (warm boot)**

- **Power Cycle Server (cold boot)**

For information about the options, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

3. Click **Apply**.
   A dialog box appears requesting for confirmation.
4. Click **OK** to perform the power management action (for example, reset the server).

Executing Power Control Operations on the IOM

You can remotely reset or turn on an IOM.

NOTE: To perform power management actions, you must have the **Chassis Control Administrator** privilege.

Executing Power Control Operations on IOM Using CMC Web Interface

To execute power control operations on the I/O Module:

1. In the left pane, click **Chassis Overview → I/O Module Overview → Power**.
2. On the **Power Control** page, for the IOM, from the drop-down menu, select the operation you want to execute (power cycle).
3. Click **Apply**.

Executing Power Control Operations on the IOM Using RACADM

To execute power control operations on the IOM using RACADM, open a serial/Telnet/SSH text console to CMC, log in, and type:

```
racadm chassisaction -m switch <action>
```

where <*action*> indicates the operation you want to execute: power cycle.

For information about RACADM commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide.* available at dell.com/support/manuals.

Configuring Sled Power Button

You can configure the Sled Power Button to disable, so that when you press the Sled power button, it has no effect. To configure the Sled Power Button, go to **Chassis Overview → Server Overview → Power → Control**.

Under the **Property** section, select the check box to disable or clear the check box to enable.

NOTE: This setting is applicable only to multi-node Sleds present in the chassis. Other Sleds are not affected.

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Configuring PCIe slots

The PowerEdge FX2/FX2s chassis optionally contain eight PCIe slots where each PCIe slot is assigned to a specific sled. By default, all PCIe slots are mapped. You can enable or disable the assignment of PCIe slots to the servers using the CMC web interface or RACADM commands.

The following tables list the PCIe mapping for full-width, half-width, and quarter-width compute sleds.

Table 17. PCIe mapping for full-width compute sleds

PCIe Slot	Mapping for full-width sleds (PowerEdge FC830)
PCIe slot-1	3
PCIe slot-2	3
PCIe slot-3	1
PCIe slot-4	1
PCIe slot-5	3
PCIe slot-6	3
PCIe slot-7	1
PCIe slot-8	1

Table 18. PCIe mapping for half-width compute sleds

PCIe Slot	Mapping for half-width sleds (PowerEdge FC630)
PCIe slot-1	4
PCIe slot-2	4
PCIe slot-3	2
PCIe slot-4	2
PCIe slot-5	3
PCIe slot-6	3
PCIe slot-7	1
PCIe slot-8	1

Table 19. PCIe mapping for quarter-width compute sleds

PCIe Slot	Mapping for quarter-width sleds (PowerEdge FC430)
PCIe slot-1	3d
PCIe slot-2	3c

PCIe Slot	Mapping for quarter-width sleds (PowerEdge FC430)
PCIe slot-3	1d
PCIe slot-4	1c
PCIe slot-5	3b
PCIe slot-6	3a
PCIe slot-7	1b
PCIe slot-8	1a

NOTE: PCIe management is supported only for PowerEdge FX2s and not PowerEdge FX2.

For more information about mapping PCIe slots, see the *Dell PowerEdge FD332 Owner's Manual*.

For more information about managing PCIe slots, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*.

NOTE: The Agent-free monitoring feature is not available for the PCIe PERC and Network cards in the Chassis PCIe slots. Agent-free monitoring is the systems management solution for Dell's 12th generation of PowerEdge servers. It is out-of-band with no dependence on any operating system agents. Using Agent-free monitoring you can monitor the storage attached to the server (PERCs, hard disks, enclosures and so on) network devices using iDRAC without installing any agent on the managed system or management station. For more information on Agent-free monitoring see, *Agent-free inventory and monitoring for storage and network devices in Dell PowerEdge 12G Servers* whitepaper in **Dell TechCenter**.

Viewing PCIe slot properties using CMC web interface

- To view the information about all the eight PCIe slots, in the left pane, click **Chassis Overview → PCIe Overview**. Click the + to view all the properties for the required slot.
- To view the information about one PCIe slot, click **Chassis Overview → PCIe Slot <number> → Properties → Status**.

Viewing PCIe slot properties using RACADM

You can view a PCIe slot assignment to a server by using the RACADM commands. Some of the commands are given here. For more information about the RACADM commands, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/manuals**.

NOTE: The PCIe card name will be displayed only after the BIOS completes `POST` in the associated Sled. Until then, the device name is displayed as **Unknown**.

- To view the current assignment of PCIe devices to servers, run the following command:
  ```
  racadm getpciecfg -a
  ```
- To view the properties of PCIe devices by using FQDD, run the following command:
  ```
  racadm getpciecfg [-c <FQDD>]
  ```

For example, to view the properties of PCIe device 1, run the following command.

```
racadm getpciecfg -c pcie.chassisslot.1
```

- To view the existing PCIe configuration settings, run the following command:

```
racadm getconfig -g cfgPCIe
```

NOTE: The PCIe card is not powered on if the Mezzanine card is not present in the associated Sled.

PCIe reassignment

The PCIe reassignment feature enables you to map PCIe slots assigned to compute sleds in the lower bays to compute sleds in the upper bays.

You can enable or disable the PCIe reassignment option using CMC web interface, CMC WSMAN, or RACADM. You must have the chassis configuration privilege to configure or modify the reassignment settings. Power off all compute sleds in the chassis before modifying the reassignment settings. When the compute sleds are powered on after the reassignment changes, the slots assigned to the compute sleds in the lower bay earlier, are mapped to corresponding compute sleds in the upper bay. Following are some examples for PCIe reassignment:

- **PCIe reassignment in full-width (FW) FC830:**
  - PCIe slots mapped to FW sled-3 (PCIe slots 1 through 4) are reassigned to sled–1. Sled-1 now maps to PCIe slots 1 though 8.
- **PCIe reassignment in half-width (HW) FC630:**
  - PCIe slots mapped to HW sled-3 (PCIe slots 5 and 6) are reassigned to sled-1. Sled-1 now maps to PCIe slots 5 through 8.
  - PCIe slots mapped to HW sled-4 (PCIe slots 1 and 2) are reassigned to sled-2. Sled-2 now maps to PCIe slots 1 through 4.
- **PCIe reassignment in quarter-width (QW) FC430:**
  - PCIe slot mapped to QW sled-3a (PCIe slot 6) is reassigned to sled-1a. Sled-1a now maps to PCIe slots 6 and 8.
  - PCIe slot mapped to QW sled-3b (PCIe slot 5) is reassigned to sled-1b. Sled-1b now maps to PCIe slots 5 and 7.
  - PCIe slot mapped to QW sled-3c (PCIe slot 2) is reassigned to sled-1c. Sled-1c now maps to PCIe slots 2 and 4.
  - PCIe slot mapped to QW sled-3d (PCIe slot 1) is reassigned to sled-1d. Sled-1d now maps to PCIe slots 1 and 3.

For more information, see the *Dell PowerEdge FX2 and FX2s Enclosure Owner's Manual*.

Enabling or disabling the PCIe reassignments using CMC web interface

1. In the left pane, click **PCIe Overview**.
   The **PCIe Status** page is displayed.
2. Click **Setup**.
   The **Mapping: PCIe Slot Reassignment** page is displayed.
3. Select or clear the **Enable PCIe Slot Reassignment** check box and click **Apply**.

Enabling or disabling PCIe reassignments using RACADM

The input values for enabling or disabling the PCIe reassignment to a slot are:

- 1 — Enable
- 0 — Disable

To enable a PCIe reassignment, run the following command:

```
racadm config –g cfgPCIe –o cfgPCIeReassignmentEnable 1
```

To disable a PCIe reassignment, run the following command:

```
racadm config –g cfgPCIe –o cfgPCIeReassignmentEnable 0
```

For more information, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide* available at **dell.com/support/Manuals**.

18

Troubleshooting and recovery

This section explains how to perform tasks related to recovering and troubleshooting problems on the remote system using the CMC web interface.

- Viewing chassis information.
- Viewing the event logs.
- Gathering configuration information, error status, and error logs.
- Using the diagnostic console.
- Managing power on a remote system.
- Managing Lifecycle Controller jobs on a remote system.
- Reset components.
- Troubleshooting Network Time Protocol (NTP) problems.
- Troubleshooting network problems.
- Troubleshooting alerting problems.
- Resetting forgotten administrator password.
- Saving and restoring Chassis configuration settings and certificates.
- Viewing error codes and logs.

Gathering configuration information, chassis status, and logs using RACDUMP

The `racdump` subcommand provides a single command to get comprehensive chassis status, configuration state information, and the historic event logs.

The `racdump` subcommand displays the following information:

- General system/RAC information
- CMC information
- Chassis information
- Session information
- Sensor information
- Firmware build information

Supported interfaces

- CLI RACADM
- Remote RACADM
- Telnet RACADM

`racdump` includes the following subsystems and aggregates the following RACADM commands. For more information about `racdump`, see the *Dell Chassis Management Controller for PowerEdge FX2/FX2s RACADM Command Line Reference Guide*.

Subsystem	RACADM Command
General System/RAC information	`getsysinfo`
Session information	`getssninfo`
Sensor information	`getsensorinfo`
Switches information (IO Module)	`getioinfo`
Mezzanine card information (Daughter card)	`getdcinfo`
All modules information	`getmodinfo`
Power budget information	`getpbinfo`
NIC information (CMC module)	`getniccfg`
Trace log information	`gettracelog`
RAC event log	`getraclog`
System event log	`getsel`

Downloading SNMP Management Information Base (MIB) file

The CMC SNMP MIB file defines the chassis types, events, and indicators. CMC enables you to download the MIB file using the web interface.

To download the CMC's SNMP Management Information Base (MIB) file using the CMC web interface:

1. In the left pane, click **Chassis Overview → Network → Services → SNMP**.
2. In the **SNMP Configuration** section, click **Save** to download the CMC **MIB** file to your local system.
   For more information about the SNMP **MIB** file, see the *Dell OpenManage Server Administrator SNMP Reference Guide* at **dell.com/support/manuals.**

First steps to troubleshoot a remote system

The following questions are commonly used to troubleshoot high-level issues in the managed system:

- Is the system turned on or turned off?
- If turned on, is the operating system functioning, not responding, or stopped functioning?
- If turned off, did the power turn off unexpectedly?

Power Troubleshooting

The following information helps you to troubleshoot power supply and power-related issues:

- **Problem:** Configured the **Power Redundancy Policy** to **Grid Redundancy**, and a Power Supply Redundancy Lost event was raised.
  - **Resolution A:** This configuration requires the power supply in side 1 (the left slot) and the power supply in side 2 (the right slot) to be present and functional in the enclosure. Additionally the capacity of each supply must be enough to support the total power allocations for the chassis to maintain **Grid redundancy**.

  - **Resolution B:** Check if all power supplies are properly connected to the two AC grids: the power supply in side 1 must be connected to one AC grid, the one in side 2 must be connected to the other AC grid, and both AC grids must be working. **Grid Redundancy** is lost when one of the AC grids is not functioning.
- **Problem:** The PSU state is displayed as **Failed (No AC)**, even when an AC cord is connected and the power distribution unit is producing good AC output.
  - **Resolution A:** Check and replace the AC cord. Check and confirm that the power distribution unit providing power to the power supply is operating as expected. If the failure still persists, call Dell customer service for replacement of the power supply.
  - **Resolution B:** Check that the PSU is connected to the same voltage as the other PSUs. If CMC detects a PSU operating at a different voltage, the PSU is turned off and marked Failed.
- **Problem:** Inserted a new server into the enclosure with sufficient power supplies, but the server does not power on.
  - **Resolution A:** Check for the system input power cap setting—it might be configured too low to allow any additional servers to be powered up.
- **Problem:** Available power keeps changing, even when the enclosure configuration has not changed.
  - **Resolution:** CMC has dynamic fan power management that reduces server allocations briefly if the enclosure is operating near the peak user configured power cap; it causes the fans to be allocated power by reducing server performance to keep the input power draw below **System Input Power Cap**. This is normal behavior.
- **Problem:** Overall server performance decreases when the ambient temperature increases in the data center.
  - **Resolution:** This can occur if the **System Input Power Cap** has been configured to a value that results in an increased power need by fans having to be made up by reduction in the power allocation to the servers. User can increase the **System Input Power Cap** to a higher value that allow for additional power allocation to the fans without an impact on server performance.

Troubleshooting Alerts

Use the CMC log and the trace log to troubleshoot CMC alerts. The success or failure of each email and/or SNMP trap delivery attempt is logged into the CMC log. Additional information describing the particular error is logged in the trace log. However, since SNMP does not confirm delivery of traps, use a network analyzer or a tool such as Microsoft's snmputil to trace the packets on the managed system.

Viewing Event Logs

You can view hardware- and chassis logs for information on system-critical events that occur on the managed system.

Viewing Hardware Log

CMC generates a hardware log of events that occur on the chassis. You can view the hardware log using the web interface and remote RACADM.

NOTE: To clear the hardware log, you must have **Clear Logs Administrator** privilege.

NOTE: You can configure CMC to send email or SNMP traps when specific events occur.

Examples of hardware log entries

```
critical System Software event: redundancy lost
Wed May 09 15:26:28 2007 normal System Software
event: log cleared was asserted
```

```
Wed May 09 16:06:00 2007 warning System Software
event: predictive failure was asserted
Wed May 09 15:26:31 2007 critical System Software
event: log full was asserted
Wed May 09 15:47:23 2007 unknown System Software
event: unknown event
```

Viewing Chassis Log

CMC generates a log of the chassis-related events.

NOTE: To clear the chassis log, you must have the **Clear Logs Administrator** privilege.

Using Diagnostic Console

You can diagnose issues related to the chassis hardware using CLI commands if you are an advanced user or a user under the direction of technical support.

NOTE: To modify these settings, you must have the **Debug Command Administrator** privilege.

To access the Diagnostic Console:

1. In the left pane, click **Chassis Overview** → **Troubleshooting** → **Diagnostics**.
   The **Diagnostic Console** page displays.
2. In the **Command** text box, type a command and click **Submit**.
   For information about the commands, see the *Online Help.*

   The diagnostic results page appears.

Resetting Components

You can reset the CMC, or to virtually reset servers making them to behave as if they were removed and reinserted.

NOTE: To reset components, you must have **Debug Command Administrator** privilege.

NOTE: Virtual reseat is not available for the individual nodes of the PowerEdge FM120x4.

To reset the components using the CMC Web interface,

1. In the left pane, click **Chassis Overview** → **Troubleshooting** → **Reset Components**.
   The **Reset Components** page is displayed.
2. To reset the CMC, in the **CMC Status** section, click **Reset CMC**. The CMC that is available is rebooted.

For more information, see the *CMC for Dell PowerEdge FX2/FX2s Online Help*

Saving or Restoring Chassis Configuration

This is a licensed feature. To save or restore a backup of the Chassis configuration using the CMC Web interface:

NOTE: Flexaddress information, server profiles, and extended storage are not saved or restored with the Chassis Configuration. It is recommended to save the Server Profiles that are important separately from the chassis using either a remote file share or a copy saved to a local workstation. For more details on performing these operation, see Adding or Saving Profile

1. In the left pane, click **Chassis Overview → Setup → Chassis Backup**. The **Chassis Backup** page is displayed. To save the chassis configuration, click **Save**. Override the default file path (optional) and click **OK** to save the file. The default backup file name contains the service tag of the chassis. This backup file can be used later to restore the settings and certificates for this chassis only.
2. To restore the chassis configuration, in the "Restore" section, click **Browse**, specify the backup file, and then click **Restore**.

   NOTE: CMC does not reset upon restoring configuration, however CMC services may take some time to effectively impose any changed or new configuration. After successful completion, all current sessions are closed.

Troubleshooting Network Time Protocol (NTP) Errors

After configuring CMC to synchronize the clock with a remote time server over the network, it may take 2-3 minutes before a change in the date and time occurs. If after this time there is still no change, it may be necessary to troubleshoot a problem. CMC may not be able to synchronize the clock for the following reasons:

- Problem with the NTP Server 1, NTP Server 2, and NTP Server 3 settings.
- Invalid host name or IP address may have been accidentally entered.
- Network connectivity problem that prevents CMC from communicating with any of the configured NTP servers.
- DNS problem, preventing any of the NTP server host names from being resolved.

To troubleshoot the NTP–related problems, check the information in the CMC trace log. This log contains an error message for NTP related failures. If CMC is not able to synchronize with any of the configured remote NTP servers, then CMC time is synchronized to the local system clock and the trace log contains an entry similar to the following:

```
Jan 8 20:02:40 cmc ntpd[1423]: synchronized to LOCAL(0), stratum 10
```

You can also check the ntpd status by typing the following racadm command:

```
racadm getractime –n
```

If the '*' is not displayed for one of the configured servers, the settings may not be configured correctly. The output of this command contains detailed NTP statistics that may be useful in debugging the problem.

If you attempt to configure a Windows-based NTP server, it may help to increase the `MaxDist` parameter for `ntpd`. Before changing this parameter, understand all the implications, since the default setting must be large enough to work with most NTP servers.

To modify the parameter, type the following command:

```
racadm config –g cfgRemoteHosts –o cfgRhostsNtpMaxDist 32
```

After making the change, disable NTP, wait for 5-10 seconds, then enable NTP again:

NOTE: NTP may take an additional three minutes to synchronize again.

To disable NTP, type:

```
racadm config –g cfgRemoteHosts –o cfgRhostsNtpEnable 0
```

To enable NTP, type:

```
racadm config –g cfgRemoteHosts –o cfgRhostsNtpEnable 1
```

If the NTP servers are configured correctly and this entry is present in the trace log, then this confirms that CMC is not able to synchronize with any of the configured NTP servers.

If the NTP server IP address is not configured, you may see a trace log entry similar to the following:

```
Jan 8 19:59:24 cmc ntpd[1423]: Cannot find existing interface for address
1.2.3.4 Jan 8 19:59:24 cmc ntpd[1423]: configuration of 1.2.3.4 failed
```

If an NTP server setting was configured with an invalid host name, you may see a trace log entry as follows:

```
Aug 21 14:34:27 cmc ntpd_initres[1298]: host name not found: blabla Aug 21
14:34:27 cmc ntpd_initres[1298]: couldn't resolve `blabla', giving up on it
```

For information on how to enter the `gettracelog` command to review the trace log using the CMC Web interface, see Using Diagnostic Console.

Interpreting LED colors and blinking patterns

The LEDs on the chassis provide the following status of a component:

- A blinking amber LED on a module indicates a fault on that module.
- Blue, blinking LEDs are configurable by the user and used for identification. For more information about configuration, see CMC_Stmp_Configuring LEDs to Identify Components on the Chassis.

Table 20. LED Color and Blinking Patterns

Component	LED Color, Blinking Pattern	Status
CMC		Turned on
		Firmware is being uploaded
		Turned off
	Blue, glowing steadily	Active
	Blue, blinking	User-enabled module identifier
	Amber, glowing steadily	Not used
	Amber, blinking	Fault
Server		Turned on
		Firmware is being uploaded
		Turned off
	Blue, glowing steadily	Server is selected on the KVM
	Blue, blinking	User-enabled module identifier
	Amber, glowing steadily	Not used

Component	LED Color, Blinking Pattern	Status
	Amber, blinking	Fault
	Blue, dark	No fault
IOM (Common)	Green, glowing steadily	Turned on
	Green, blinking	Firmware is being uploaded
	Green, dark	Turned off
	Blue, glowing steadily	Normal/stack master
	Blue, blinking	User-enabled module identifier
	Amber, glowing steadily	Not used
	Amber, blinking	Fault
	Blue, dark	No fault/stack slave
IOM (Pass through)	Green, glowing steadily	Turned on
	Green, blinking	Not used
	Green, dark	Powered off
	Blue, glowing steadily	Normal
	Blue, blinking	User-enabled module identifier
	Amber, glowing steadily	Not used
	Amber, blinking	Fault
	Blue, dark	No fault
Fan	Green, glowing steadily	Fan working
	Green, blinking	Not used
	Green, dark	Turned off
	Amber, glowing steadily	Fan type not recognized, update the CMC firmware
	Amber, blinking	Fan fault; tachometer out of range
	Amber, dark	Not used
PSU	(Oval) Green, glowing steadily	AC OK
	(Oval) Green, blinking	Not used
	(Oval) Green, dark	AC Not OK
	Amber, glowing steadily	Not used
	Amber, blinking	Fault
	Amber, dark	No fault
	(Circle) Green, glowing steadily	DC OK
	(Circle) Green, dark	DC Not OK

Component	LED Color, Blinking Pattern	Status
PCI	Blue, dark	Turned On
	Blue, blinking	PCI identification is in progress.
	Amber, blinking	Fault
Storage sled	Amber, blinking	Fault
	Solid Blue	No fault

Troubleshooting Non-responsive CMC

If you cannot log in to CMC using any of the interfaces (the web interface, Telnet, SSH, remote RACADM, or serial), you can verify the CMC functionality observing the LEDs on CMC, obtaining recovery information using the DB-9 serial port, or recovering the CMC firmware image.

Observing LEDs to Isolate the Problem

The CMC has an LED which changes color to indicate:

Color	Description
Blue	Normal operation
Blue, blinking	ID (0.5 second on, 0.5 second off)
Amber	Chassis fault summary
Amber, blinking	Chassis fault with concurrent ID

Obtain Recovery Information from DB-9 Serial Port

If the CMC LED is amber, recovery information is available from the DB-9 serial port located on the front of CMC.

To obtain recovery information:

1. Install a NULL modem cable between a CMC system and a client system.
2. Open a terminal emulator of your choice (such as HyperTerminal or Minicom). Enter the following specification when prompted: 8 bits, no parity, no flow control, baud rate 115200.

   A core memory failure displays an error message every 5 seconds.
3. Press the <Enter> key.

   If a recovery prompt appears, additional information is available. The prompt indicates the CMC slot number and failure type.

   To display failure reason and syntax for a few commands, type `recover`, and then press <Enter>.

   Sample prompts:

   ```
   recover1[self test] CMC self test failure
   ```

   ```
   recover1[Bad FW images] CMC has corrupted images
   ```

   - If the prompt indicates a self test failure, there are no serviceable components on CMC. CMC is bad and must be returned to Dell.
   - If the prompt indicates **Bad FW Images**, complete tasks in Recovering Firmware Image1.

Recovering Firmware Image

CMC enters recover mode when a normal CMC operating boot is not possible. In recover mode, a small subset of commands are available that allow you to reprogram the flash devices by uploading the firmware update file, **fx2_cmc.bin**. This is the same firmware image file used for normal firmware updates. The recovery process displays its current activity and boots to the CMC OS upon completion.

When you type recover and then press <Enter> at the recovery prompt, the recover reason and available sub-commands display. An example recover sequence may be:

```
recover getniccfg
recover setniccfg 192.168.0.120 255.255.255.0
192.168.0.1
recover ping 192.168.0.100
recover fwupdate -g -a 192.168.0.100
```

NOTE: Connect the network cable to the left most RJ45.

NOTE: In recover mode, you cannot ping CMC normally because there is no active network stack. The `recover ping <TFTP server IP>` command allows you to ping to the TFTP server to verify the LAN connection. You may need to use the `recover reset` command after `setniccfg` on some systems.

Troubleshooting Network Problems

The internal CMC trace log allows you to debug CMC alerts and networking. You can access the trace log using the CMC Web interface or RACADM. See the `gettracelog` command section in the *RACADM Command Line Reference Guide for iDRAC and CMC*.

The trace log tracks the following information:

- DHCP — Traces packets sent to and received from a DHCP server.
- DDNS — Traces dynamic DNS update requests and responses.
- Configuration changes to the network interfaces.

The trace log may also contain CMC firmware-specific error codes that are related to the internal CMC firmware, not the managed system's operating system.

General troubleshooting

When a success message is displayed after an operation completion, such as saving a Server Profile, sometimes the action may not take effect.

To resolve this issue, check if any of the CMC service ports for SSH, Telnet, HTTP, or HTTPS uses ports commonly used by OS services such as 111. If it is used by CMC service ports, change the settings to a non-reserved port. For more information on reserved ports, see http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xhtml

Troubleshooting storage module in FX2 chassis

The following information helps you to troubleshoot issues related to storage sleds in the FX2 chassis.

- **Problem:** Storage module is not detected on insertion. Storage module inserted and the associated server powered on, is not detected

  Resolution: . Ensure that the associated server is power cycled after the storage module is inserted.
- **Problem:** Storage module is inserted and the associated server is power cycled, but the storage module is not detected.

  Resolution: Check the chassis log for more details about the failure. Verify if there is any hardware failure such as no detection of cable spool or RAID.
- **Problem:** Storage Amber LED blinks.

  Resolution: Ensure that the storage module is inserted properly and check the chassis log for warning messages. This error can be cleared only if the underlying fault is addressed and the associated host is power cycled with the sled removed or through a sled virtual reseat.

  Problem: Storage module RAID firmware update is not effective.

  Resolution: When in split-dual host mode, each host that is connected to the storage sled RAID must be power cycled for the RAID firmware change to be effective.
- **Problem:** PCIe slot reassignment option is disabled in the GUI.

  Resolution: Ensure that all hosts in the chassis are powered on. If you attempt changing this setting from RACADM while a host is powered on, an error message is displayed. The chassis configuration administrator privilege is required to change this setting.
- **Problem:** PCIe slot reassignment enabled and host is powered on, but the PCIe slots are not powered on.

  Resolution: Check the Chassis Log for warning messages associated with outdated BIOS, iDRAC, or unsupported host.
- **Problem:** Not able to import, export, or delete storage module licenses.

  Resolution: Chassis configuration privilege is required to import, export, and delete storage module licenses.

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Frequently asked questions

This section lists the frequently asked questions about the following:

- RACADM
- Managing and Recovering a Remote System
- Active Directory
- IOM

RACADM

After performing a CMC reset (using the RACADM racreset subcommand), when a command is entered, the following message is displayed:

```
racadm <subcommand> Transport: ERROR: (RC=-1)
```

What does this message mean?

Another command must be issued only after CMC completes the reset.

Using the RACADM subcommands sometimes displays one or more of the following errors:

- Local error messages — Problems such as syntax, typographical errors, and incorrect names. For example, `ERROR: <message>`

Use the RACADM `help` subcommand to display correct syntax and usage information. For example, if you have an error in clearing a chassis log, run the following sub-command.

```
racadm chassislog help clear
```

CMC–related error messages — Problems where the CMC is unable to perform an action. The following error message is displayed

```
racadm command failed.
```

To view information about a chassis, type the following command.

```
racadm gettracelog
```

While using firmware RACADM, the prompt changes to a ">" and the "$" prompt is not displayed again.

If a non-matched double quotation mark (") or a non-matched single quotation (') is used in the command, the CLI changes to the ">" prompt and queues all commands.

To return to the $ prompt, type <Ctrl>–d.

An error message `Not Found` is displayed while using the `$ logout` and `$ quit` commands.

Managing and recovering a remote system

When accessing the CMC Web interface, a security warning stating that the host name of the SSL certificate does not match the host name of CMC is displayed.

CMC includes a default CMC server certificate to ensure network security for the web interface and remote RACADM features. When this certificate is used, the web browser displays a security warning because the default certificate is issued to CMC default certificate which does not match the host name of CMC (for example, the IP address).

To address this security concern, upload a CMC server certificate issued to the IP address of CMC. When generating the certificate signing request (CSR) to be used for issuing the certificate, ensure that the common name (CN) of the CSR matches the IP address of CMC (for example, 192.168.0.120) or the registered DNS CMC name.

To ensure that the CSR matches the registered DNS CMC name:

1. In the left pane, click **Chassis Overview**.
2. Click **Network.**
   The **Network Configuration** page appears.
3. Select the **Register CMC on DNS** option.
4. Type a CMC name in the **DNS CMC Name** field.
5. Click **Apply Changes**.

Why are the remote RACADM and Web-based services unavailable after a property change?

It may take a minute for the remote RACADM services and the web interface to become available after the CMC Web server resets.

The CMC web server is reset after the following occurrences:

- Changing the network configuration or network security properties using the CMC web user interface.
- The cfgRacTuneHttpsPort property is changed (including when a config -f <config file> changes it).
- `racresetcfg` is used or a chassis configuration backup is restored.
- CMC is reset.
- A new SSL server certificate is uploaded.

My DNS server doesn't register my CMC?

Some DNS servers only register names with a maximum of 31 characters.

When accessing the CMC Web interface, a security warning stating that the SSL certificate was issued by a certificate authority that is not trusted is displayed.

CMC includes a default CMC server certificate to ensure network security for the web interface and remote RACADM features. This certificate is not issued by a trusted certificate authority. To address this security concern, upload a CMC server certificate issued by a trusted certificate authority (such as Thawte or Verisign).

Why is the following message displayed for unknown reasons?

Remote Access: SNMP Authentication Failure

As part of discovery, IT Assistant attempts to verify the device's **get** and **set** community names. In IT Assistant, the **get community name = public** and the **set community name = private.** By default, the community name for the CMC agent is public. When IT Assistant sends out a set request, the CMC agent generates the SNMP authentication error because it only accepts requests from **community = public.**

Change the CMC community name using RACADM. To see the CMC community name, use the following command:

```
racadm getconfig -g cfgOobSnmp
```

To set the CMC community name, use the following command:

```
racadm config -g cfgOobSnmp -o cfgOobSnmpAgentCommunity <community name>
```

To prevent SNMP authentication traps from being generated, enter input community names that are accepted by the agent. Since CMC only allows one community name, enter the same get and set community name for IT Assistant discovery setup.

Active Directory

Does Active Directory support CMC login across multiple trees?

Yes. The CMC's Active Directory querying algorithm supports multiple trees in a single forest.

Does the login to CMC using Active Directory work in mixed mode (that is, the domain controllers in the forest run different operating systems, such as Microsoft Windows 2000 or Windows Server 2003)?

Yes. In mixed mode, all objects used by the CMC querying process (among user, RAC Device Object, and Association Object) must be in the same domain.

The Dell-extended Active Directory Users and Computers Snap-In checks the mode and limits users in order to create objects across domains, if in a mixed mode.

Does using CMC with Active Directory support multiple domain environments?

Yes. The domain forest function level must be in Native mode or Windows 2003 mode. In addition, the groups among Association Object, RAC user objects, and RAC Device Objects (including Association Object) must be universal groups.

Can these Dell-extended objects (Dell Association Object, Dell RAC Device, and Dell Privilege Object) be in different domains?

The Association Object and the Privilege Object must be in the same domain. The Dell-extended Active Directory Users and Computers Snap-In allows to create these two objects in the same domain only. Other objects can be in different domains.

Are there any restrictions on Domain Controller SSL configuration?

Yes. All SSL certificates for Active Directory servers in the forest must be signed by the same root certificate authority-signed certificate, because CMC only allows upload of one trusted certificate authority-signed SSL certificate.

The Web interface does not launch after a new RAC certificate is created and uploaded.

If Microsoft Certificate Services is used to generate the RAC certificate, the User Certificate option may have been used instead of Web Certificate, when creating the certificate.

To recover, generate a CSR, create a new Web certificate from Microsoft Certificate Services, and then upload it by running the following RACADM commands:

```
racadm sslcsrgen [-g] [-f {filename}]

racadm sslcertupload -t 1 -f {web_sslcert}
```

IOM

After a configuration change, sometimes CMC displays the IP address as 0.0.0.0.

Click the **Refresh** icon to see if the IP address is set correctly on the switch. If an error is made in setting the IP/mask/gateway, the switch does not set the IP address and returns a 0.0.0.0 in all fields.

Common errors are:

- Setting the out-of-band IP address to be the same as, or on the same network as, the in-band management IP address.
- Entering an invalid subnet mask.
- Setting the default gateway to an address that is not on a network, which is directly connected to the switch.

Event and error messages

After you downgrade the CMC firmware from the latest CMC version to earlier versions, why does the Chassis Log displays the following message for some of the logs?

```
USR8513 - MessageID missing from message registry.
```

What you see is a new message introduced in the current firmware that older firmware cannot interpret. For more information about the message ID, see the *Event and Error Messages Reference Guide* under OpenManage Software at **www.dell.com/openmanagemanuals**.