Dell Remote Access Controller 5

Firmware Version 1.30 User's Guide

Notes and Notices

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

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

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1

DRAC 5 Overview

The Dell™ Remote Access Controller 5 (DRAC 5) is a systems management hardware and software solution designed to provide remote management capabilities, crashed system recovery, and power control functions for Dell systems.

By communicating with the system's baseboard management controller (BMC), the DRAC 5 (when installed) can be configured to send you e-mail alerts for warnings or errors related to voltages, temperatures, intrusion, and fan speeds. The DRAC 5 also logs event data and the most recent crash screen (for systems running the Microsoft® Windows® operating system only) to help you diagnose the probable cause of a system crash.

The DRAC 5 has its own microprocessor and memory, and is powered by the system in which it is installed. The DRAC 5 may be preinstalled on your system, or available separately in a kit.

To get started with the DRAC 5, see "Installing and Setting Up the DRAC 5" on page 35.

What's New in DRAC 5 in this Release?

For this release, DRAC 5 firmware version 1.30:

- Provides support for Microsoft Windows Server® 2008.

  NOTE: Microsoft Windows Server 2008 is scheduled to be available in the first half of 2008. For the latest information, see http://www.microsoft.com/windowsserver2008/default.mspx.

- Enables Smart Card logon that provides a higher level of security by implementing the two-factor authentication.
- Provides advanced security options for the local DRAC administrator
- Provides advanced security options for the remote DRAC administrator
- Supports a new macro—<RightCtrl>+<ScrlLock><ScrlLock> key code sequence to initiate a crash dump of the Microsoft Windows operating system. For more information, see the Microsoft Knowledge Base article at: **http://support.microsoft.com/kb/256986/**.

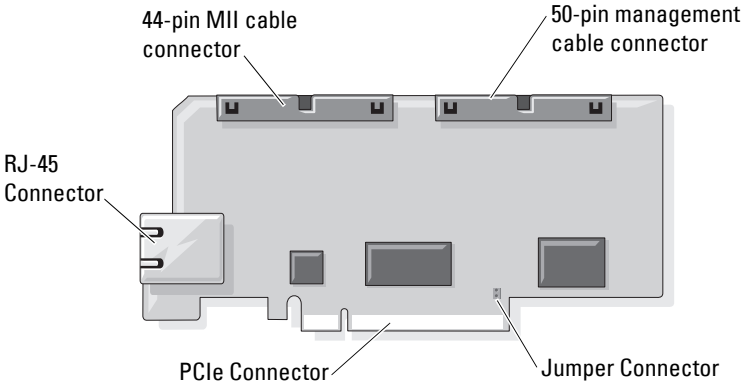
NOTE: You must keep the <RightCtrl> key pressed during the additional keystrokes.

- Supports an option to allow users to specify LDAP or Global Catalog servers to handle user authentication.
- Provides the ability to specify a list of LDAP servers and Global Catalog servers.
- Removed support for SSL version 2.0.

DRAC 5 Hardware Features

Figure 1-1 shows the DRAC 5 hardware.

Figure 1-1. DRAC 5 Hardware Features



Hardware Specifications

Power Specifications

Table 1-1 lists the power requirements for the DRAC 5.

Table 1-1. DRAC 5 Power Specifications

System Power
1.2 A on +3.3 V AUX (maximum)
550 mA on +3.3 V main (maximum)
0 mA on +5V main (maximum)

Connectors

NOTE: The DRAC 5 hardware installation instructions can be found in the *Installing a Remote Access Card* document or the *Installation and Troubleshooting Guide* included with your system.

The DRAC 5 includes one onboard 10/100 Mbps RJ-45 NIC, a 50-pin management cable, and a 44-pin MII cable. See Figure 1-1 for the DRAC 5 cable connectors.

The 50-pin management cable is the main interface to the DRAC that provides connectivity to USB, serial, video, and an inter-integrated circuit (I2C) bus. The 44-pin MII cable connects the DRAC NIC to the system's motherboard. The RJ-45 connector connects the DRAC NIC to an out-of-band connection when the DRAC 5 is configured in **Dedicated NIC** mode.

Using the management and MII cables, you can configure your DRAC in three separate modes, depending on your needs. See "DRAC Modes" on page 225 in "Using the RACADM Command Line Interface" on page 209 for more information.

DRAC 5 Ports

Table 1-2 identifies the ports used by the DRAC 5 that listen for a server connection. Table 1-3 identifies the ports that the DRAC 5 uses as a client. This information is required when opening firewalls for remote access to a DRAC 5.

Table 1-2. DRAC 5 Server Listening Ports

Port Number	Function
22*	Secure Shell (SSH)
23*	Telnet

Table 1-2. DRAC 5 Server Listening Ports *(continued)*

Port Number	Function
80*	HTTP
161	SNMP Agent
443*	HTTPS
623	RMCP/RMCP+
3668*	Virtual Media server
3669*	Virtual Media Secure Service
5900*	Console Redirection keyboard/mouse
5901*	Console Redirection video

* Configurable port

Table 1-3. DRAC 5 Client Ports

Port Number	Function
25	SMTP
53	DNS
68	DHCP-assigned IP address
69	TFTP
162	SNMP trap
636	LDAPS
3269	LDAPS for global catalog (GC)

Supported Remote Access Connections

Table 1-4 lists the connection features.

Table 1-4. Supported Remote Access Connections

Connection	Features
DRAC 5 NIC	• 10/100 Mbps Ethernet • DHCP support • SNMP traps and e-mail event notification • Dedicated network interface for the DRAC 5 Web-based interface • Support for telnet/ssh 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 text-only console redirection to a VT-100 terminal or terminal emulator

DRAC 5 Security Features

The DRAC 5 provides the following security features:

- Two-factor authentication, which is provided by the Smart Card logon. The two-factor authentication is based on what the users have (the Smart Card) and what they know (the PIN).
- Advanced Security options for the DRAC administrator:
  - The Console Redirection disable option allows the *local* system user to disable console redirection using the DRAC 5 Console Redirection feature.
  - The local configuration disable features allows the *remote* DRAC administrator to selectively disable the ability to configure the DRAC 5 from:
    - BIOS POST option-ROM
    - operating system using the local racadm
    - Dell OpenManage™ Server Administrator utilities

- User authentication through Microsoft Active Directory (optional) or hardware-stored user IDs and passwords
- Role-based authority, which enables an administrator to configure specific privileges for each user
- User ID and password configuration through the Web-based interface or RACADM CLI
- RACADM CLI and Web-based interface operation, which supports 128-bit SSL encryption and 40-bit SSL encryption (for countries where 128 bit is not acceptable)

  NOTE: Telnet does not support SSL encryption.
- Session time-out configuration (in seconds) through the Web-based interface or RACADM CLI
- Configurable IP ports (where applicable)
- Secure Shell (SSH), which uses an encrypted transport layer for higher security.
- Login failure limits per IP address, with login blocking from the IP address when the limit is exceeded.
- Limited IP address range for clients connecting to the DRAC 5

Supported Platforms

The DRAC 5 supports the following Dell systems:

- 1900
- 1950
- 2900
- 2950
- 2970
- 6950
- R300
- R600
- T600
- M605

- R805
- R900
- R905
- T300
- PowerVault™ 500
- PowerVault 600

NOTE: The PowerEdge R805 is scheduled to be available in Q4 CY07–Q1 CY08.

See the *Dell Systems Software Support Matrix* located on the Dell Support website at **support.dell.com** for the latest supported platforms.

Supported Operating Systems

Table 1-5 lists the operating systems that support the DRAC 5.

See the *Dell Systems Software Support Matrix* located on the Dell Support website at **support.dell.com** for the latest information.

Table 1-5. Supported Operating Systems

Operating System Family	Operating System
Microsoft Windows	Microsoft Windows Server™ 2008 Web, Standard, Enterprise, and Core Edition (x86)
	Microsoft Windows Server 2008 Standard, Enterprise, DataCenter, and Core Edition (x64)
	Windows 2000 Advanced Server with Service Pack 4 (SP4)
	Windows 2000 Server with SP4
	Windows Server 2003 R2 Standard and Enterprise Editions with SP2 (32-bit)
	Windows Server 2003 Web Edition with SP2 (32-bit)
	Windows Server 2003 R2 Standard and Enterprise Editions with SP2 (x86_64)
	Windows Server 2003 Standard and Enterprise X64 Editions with SP1 and SP2
	Windows Storage Server 2003 R2 Workgroup, Standard, and Enterprise x64 Editions (x86_64)
	Windows Unified Data Storage Server 2003 Gold Standard and Enterprise X64 Editions (x86_64)
	Windows Vista™
	NOTE: When installing Windows Server 2003 with Service Pack 1, be aware of changes to DCOM security settings. For more information, see article 903220 from the Microsoft Support website at **support.microsoft.com/kb/903220**.

Table 1-5. Supported Operating Systems *(continued)*

Operating System Family	Operating System
Red Hat® Linux	Enterprise Linux® WS, ES, and AS (version 3) (x86 and x86_64)
	Enterprise Linux WS, ES, and AS (version 4) (ia32 and x86_64)
	Enterprise Linux WS, ES, and AS (version 4) (x86 and x86_64)
	Enterprise Linux WS, ES, and AS (Version 4.5) (x86)
	Enterprise Linux WS, ES, and AS (Version 4.5) (x86_64)
	Enterprise Linux WS and AS (Version 4.5) (ia64)
	Enterprise Linux 5 (x86 and x86-64)
	NOTE: When using DRAC 5 with Red Hat Enterprise Linux (version 5) systems, support is limited to a managed node and racadm CLI; managed console (web-based interface) is not supported.
SUSE® Linux	Linux Enterprise Server 9 with SP3 (x86_64)
	Linux Enterprise Server 9 with Update 2 and 3 (x86_64)
	Linux Enterprise Server 10 (Gold) (x86_64).

Supported Web Browsers

NOTICE: Console Redirection and Virtual Media only supports 32-bit Web browsers. Using 64-bit Web browsers may generate unexpected results or failure of operations.

Table 1-6 lists the Web browsers that support the DRAC 5.

See the *Dell System Software Support Matrix* located on the Dell Support website at **support.dell.com** for the latest information.

Table 1-6. Supported Web Browsers

Operating System	Supported Web Browser
Windows	Internet Explorer 6.0 (32-bit) with Service Pack 2 (SP2) for Windows XP and Windows 2003 R2 SP2 only. Internet Explorer 7.0 for Windows Vista, Windows XP, and Windows 2003 R2 SP2 only. To view localized versions of the DRAC 5 Web-based interface: **1** Open the Windows **Control Panel**. **2** Double-click the **Regional Options** icon. **3** Select the desired locale from the **Your locale (location)** drop-down menu. **NOTICE:** If you are running the Virtual Media client, you must use Internet Explorer 6.0 with Service Pack 1 or later.
Linux	Mozilla Firefox 1.5 (32-bit) on SUSE Linux (version 10) only. Mozilla Firefox 2.0 (32-bit).

Disabling the Whitelist Feature in Mozilla Firefox

Firefox includes a "whitelist" feature that provides additional security. When the whitelist feature is enabled, the browser requires user permission to install plug-ins for each distinct site that hosts the plug-in. This process requires that you install a plug-in for each distinct RAC IP/DNS name, even though the plug-in versions are identical.

To disable the whitelist feature and avoid repetitive, unnecessary plugin installations, perform the following steps:

1. Open a Firefox Web browser window.
2. In the address field, type the following and press <Enter>:

   ```
   about:config
   ```

3 In the **Preference Name** column, locate and double-click **xpinstall.whitelist.required**.

The values for **Preference Name**, **Status**, **Type**, and **Value** change to bold text. The **Status** value changes to **user set** and the **Value** value changes to **false**.

4 In the **Preferences Name** column, locate **xpinstall.enabled**.

Ensure that **Value** is **true**. If not, double-click **xpinstall.enabled** to set **Value** to **true**.

Features

The DRAC 5 provides the following features:

- Dynamic Domain Name System (DNS) registration
- Remote system management and monitoring using a Web-based interface, serial connection, remote RACADM, or telnet connection.
- Support for Active Directory authentication — Centralizes all DRAC 5 user ID and passwords in Active Directory using Standard Schema and Extended Schema.
- Console Redirection — Provides remote system keyboard, video, and mouse functions.
- Virtual Media — Enables a managed system to access a media drive on the management station.
- Access to system event logs — Provides access to the system event log (SEL), DRAC 5 log, and last crash screen of the crashed or unresponsive system that is independent of the operating system state.
- Dell OpenManage software integration — Enables you to launch the DRAC5 Web-based interface from Dell OpenManage Server Administrator or IT Assistant.
- RAC alert — Alerts you to potential managed node issues through e-mail messages or an SNMP trap using the **Dedicated**, **Shared with Failover**, or **Shared** NIC settings.
- Local and remote configuration — Provides local and remote configuration using the RACADM command-line utility.

- Remote power management — Provides remote power management functions from a management console, such as shutdown and reset.
- IPMI support.
- Secure Sockets Layer (SSL) encryption — Provides secure remote system management through the Web-based interface.
- Password-level security management — Prevents unauthorized access to a remote system.
- Role-based authority — Provides assignable permissions for different systems management tasks.

Other Documents You May Need

In addition to this *User's Guide*, the following documents provide additional information about the setup and operation of the DRAC 5 in your system:

- DRAC 5 online help provides information about using the Web-based interface.
- The *Dell OpenManage™ IT Assistant User's Guide* and the *Dell OpenManage IT Assistant Reference Guide* provide information about IT Assistant.
- The *Dell OpenManage Server Administrator's User's Guide* provides information about installing and using Server Administrator.
- The *Dell OpenManage Server Administrator SNMP Reference Guide* documents the Server Administrator SNMP management information base (MIB). The MIB defines variables that extend the standard MIB to cover the capabilities of systems management agents.
- The *Dell OpenManage Baseboard Management Controller Utilities User's Guide* provides information about configuring the Baseboard Management Controller (BMC), configuring your managed system using the BMC Management Utility, and additional BMC information.
- The *Dell Update Packages User's Guide* provides information about obtaining and using Dell Update Packages as part of your system update strategy.
- The *Dell Systems Software Support Matrix* provides information about the various Dell systems, the operating systems supported by these systems, and the Dell OpenManage components that can be installed on these systems.

The following system documents are also available to provide more information about the system in which your DRAC 5 is installed:

- The *Product Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.
- The *Rack Installation Guide* and *Rack Installation Instructions* included with your rack solution describes how to install your system into a rack.
- The *Getting Started Guide* provides an overview of system features, setting up your system, and technical specifications.
- The *Hardware Owner's Manual* provides information about system features and describes how to troubleshoot the system and install or replace system components.
- Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- Operating system documentation describes how to install (if necessary), configure, and use the operating system software.
- Documentation for any components you purchased separately provides information to configure and install these options.
- Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

  NOTE: Always read the updates first because they often supersede information in other documents.

- Release notes or readme files may be included to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.

2

Installing and Setting Up the DRAC 5

This section provides information about how to install and setup your DRAC 5 hardware and software.

Before You Begin

Gather the following items that were included with your system prior to installing and configuring the DRAC 5 software:

- DRAC 5 hardware (currently installed or in the optional kit)
- DRAC 5 installation procedures (located in this chapter)
- *Dell Systems Console and Agent* CD
- *Dell Systems Documentation* CD
- *Dell Systems Service and Diagnostic Tools* CD

Installing the DRAC 5 Hardware

NOTE: The DRAC 5 connection emulates a USB keyboard connection. As a result, when you restart the system, the system will not notify you if your keyboard is not attached.

The DRAC 5 may be preinstalled on your system, or available separately in a kit. To get started with the DRAC 5 that is installed on your system, see "Software Installation and Configuration Overview" on page 37.

If a DRAC 5 is not installed on your system, see the *Installing a Remote Access Card* document that is included with your DRAC 5 kit, or see your platform *Installation and Troubleshooting Guide* for hardware installation instructions.

NOTE: See the *Installation and Troubleshooting Guide* included with your system for information about removing the DRAC 5. Also, review all Microsoft® Active Directory® RAC properties associated with the removed DRAC 5 to ensure proper security if you are using extended schema.

Configuring Your System to Use a DRAC 5

To configure your system to use a DRAC 5, use the Dell™ Remote Access Configuration Utility (formerly known as the BMC Setup Module).

To run the Dell Remote Access Configuration Utility, perform the following steps:

1. Turn on or restart your system.
2. Press <Ctrl><E> when prompted during POST.

   If your operating system begins to load before you press <Ctrl><E>, allow the system to finish booting, and then restart your system and try again.
3. Configure the NIC.
   a. Using the down-arrow key, highlight **NIC Selection**.
   b. Using the left-arrow and right-arrow keys, select one of the following NIC selections:
      - **Dedicated** — Select this option to enable the remote access device to utilize the dedicated network interface available on the Remote Access Controller (RAC). This interface is not shared with the host operating system and routes the management traffic to a separate physical network, enabling it to be separated from the application traffic. This option is available only if a DRAC card is installed in the system.
      - **Shared** — Select this option to share the network interface with the host operating system. The remote access device network interface is fully functional when the host operating system is configured for NIC teaming. The remote access device receives data through NIC 1 and NIC 2, but transmits data only through NIC 1. If NIC 1 fails, the remote access device will not be accessible.
      - **Failover** — Select this option to share the network interface with the host operating system. The remote access device network interface is fully functional when the host operating system is configured for NIC teaming. The remote access device receives data through NIC 1 and NIC 2, but transmits data only through NIC 1. If NIC 1 fails, the remote access device fails over to NIC 2 for all data transmission. The remote access device continues to use NIC 2 for data transmission. If NIC 2 fails, the remote access device fails over all data transmission back to NIC 1.

4 Configure the network controller LAN parameters to use DHCP or a Static IP address source.
   a Using the down-arrow key, select **LAN Parameters**, and press <Enter>.
   b Using the up-arrow and down-arrow keys, select **IP Address Source**.
   c Using the right-arrow and left-arrow keys, select **DHCP** or **Static**.
   d If you selected **Static**, configure the **Ethernet IP Address**, **Subnet Mask**, and **Default Gateway** settings.
   e Press <Esc>.
5 Press <Esc>.
6 Select **Save Changes and Exit**.

   The system automatically reboots.

NOTE: When viewing the Web user interface on a Dell PowerEdge™ 1900 system that is configured with one NIC, the NIC Configuration page displays two NICs (NIC1 and NIC2). This behavior is normal. The PowerEdge 1900 system (and other Dell systems that are configured with a single LAN On Motherboard) can be configured with NIC teaming. Shared and Teamed modes work independently on these systems.

See the *Dell OpenManage Baseboard Management Controller Utilities User's Guide* for more information about the Dell Remote Access Configuration Utility.

Software Installation and Configuration Overview

This section provides a high-level overview of the DRAC 5 software installation and configuration process. Configure your DRAC 5 using the Web-based interface, RACADM CLI, or Serial/Telnet/SSH console.

For more information about the DRAC 5 software components, see "Installing the Software on the Managed System" on page 38.

Installing Your DRAC 5 Software

To install your DRAC 5 software, perform the following steps in order:

1 Install the software on the managed system. See "Installing the Software on the Managed System" on page 38.
2 Install the software on the management station. See "Installing the Software on the Management Station" on page 40.

Configuring Your DRAC 5

To configure your DRAC 5, perform the following steps in order:

1. Select one of the following configuration tools:
   - Web-based interface
   - RACADM CLI
   - Serial/Telnet/SSH console

NOTICE: Using more than one DRAC 5 configuration tool at the same time may generate unexpected results.

2. Configure the DRAC 5 network settings. See "Configuring the DRAC 5 Network Settings" on page 45.
3. Add and configure DRAC 5 users. See "Adding and Configuring DRAC 5 Users" on page 46.
4. Configure the Web browser to access the Web-based interface. See "Configuring a Supported Web Browser" on page 42.
5. Disable the Windows® Automatic Reboot Option. See "Disabling the Windows Automatic Reboot Option" on page 39.
6. Update the DRAC 5 Firmware. See "Updating the DRAC 5 Firmware" on page 46.
7. Access the DRAC 5 through a network. See "Accessing the DRAC 5 Through a Network" on page 48.

Installing the Software on the Managed System

Installing software on the managed system is optional. Without managed system software, you lose the ability to use the RACADM locally, and for the RAC to capture the last crash screen.

To install the managed system software, install the software on the managed system using the *Dell Systems Console and Agent* CD. For instructions about how to install this software, see your *Quick Installation Guide*.

Managed system software installs your choices from the appropriate version of Server Administrator on the managed system.

NOTE: Do not install the DRAC 5 management station software and the DRAC 5 managed system software on the same system.

If Server Administrator is not installed on the managed system, you cannot view the system's last crash screen or use the **Auto Recovery** feature.

For more information about the last crash screen, see "Viewing the Last System Crash Screen" on page 132.

Configuring the Managed System to Capture the Last Crash Screen

Before the DRAC 5 can capture the last crash screen, you must configure the managed system with the following prerequisites.

1. Install the managed system software. For more information about installing the managed system software, see the *Server Administrator User's Guide*.
2. Run a supported Microsoft® Windows® operating system with the Windows "automatically reboot" feature deselected in the **Windows Startup and Recovery Settings**.
3. Enable the Last Crash Screen (disabled by default).

   To enable using local RACADM, open a command prompt and type the following commands:

   ```
   racadm config -g cfgRacTuning -o
   cfgRacTuneAsrEnable 1
   ```

4. Enable the Auto Recovery timer and set the **Auto Recovery** action to **Reset**, **Power Off**, or **Power Cycle**. To configure the **Auto Recovery** timer, you must use Server Administrator or IT Assistant.

   For information about how to configure the **Auto Recovery** timer, see the *Server Administrator User's Guide*. To ensure that the last crash screen can be captured, the **Auto Recovery** timer must be set to 60 seconds or greater. The default setting is 480 seconds.

   The last crash screen is not available when the **Auto Recovery** action is set to **Shutdown** or **Power Cycle** if the managed system is powered off.

Disabling the Windows Automatic Reboot Option

To ensure that the DRAC 5 Web-based interface last crash screen feature works properly, disable the **Automatic Reboot** option on managed systems running the Microsoft Windows Server 2003 and Windows 2000 Server operating systems.

Disabling the Automatic Reboot Option in Windows Server 2003

1. Open the Windows **Control Panel** and double-click the **System** icon.
2. Click the **Advanced** tab.
3. Under **Startup and Recovery**, click **Settings**.
4. Deselect the **Automatically Reboot** check box.
5. Click **OK** twice.

Disabling the Automatic Reboot Option in Windows 2000 Server

1. Open the Windows **Control Panel** and double-click the **System** icon.
2. Click the **Advanced** tab.
3. Click the **Startup and Recovery...** button.
4. Deselect the **Automatically Reboot** check box.

Installing the Software on the Management Station

Your system includes the Dell OpenManage System Management Software Kit. This kit includes, but is not limited to, the following components:

- *Dell Systems Build and Update Utility* CD — A bootable CD that provides the tools you need to install your operating system, configure and update your system. The CD enables you to streamline Dell system deployment and redeployment.
- *Dell Systems Console and Agent* CD — Contains all the latest Dell systems management software products such as Dell OpenManage Server Administrator and console products including Dell OpenManage IT Assistant.
- *Dell Systems Service and Diagnostics Tools* CD — Provides the tools you need to configure your system and delivers the latest BIOS, firmware, diagnostics, and Dell-optimized drivers for your system.
- *Dell Systems Documentation* CD — Helps you stay current with documentation for systems, systems management software products, peripherals, and RAID controllers.

NOTE: Starting with Dell OpenManage version 5.3, you can also obtain all the above components from the *Dell Systems Management Tools and Documentation* DVD and the *Dell Server Updates* DVD.

For information about installing Server Administrator software, see your *Server Administrator User's Guide*.

Configuring Your Red Hat Enterprise Linux (Version 4) Management Station

The Dell Digital KVM Viewer requires additional configuration to run on a Red Hat Enterprise Linux (version 4) management station. When you install the Red Hat Enterprise Linux (version 4) operating system on your management station, perform the following procedures:

- When prompted to add or remove packages, install the optional **Legacy Software Development** software. This software package includes the necessary software components to run the Dell Digital KVM viewer on your management station.
- To ensure that the Dell Digital KVM Viewer functions properly, open the following ports on your firewall:
  - Keyboard and mouse port (default is port 5900)
  - Video port (default is port 5901)

Installing and Removing RACADM on a Linux Management Station

To use the remote RACADM functions, install RACADM on a management station running Linux.

NOTE: When you run **Setup** on the *Dell Systems Console and Agent* CD, the RACADM utility for all supported operating systems are installed on your management station.

Installing RACADM

1. Log on as root to the system where you want to install the management station components.
2. If necessary, mount the *Dell Systems Console and Agent CD* using the following command or a similar command:

   ```
   mount /media/cdrom
   ```

3. Navigate to the **/linux/rac** directory and execute the following command:

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

For help with the RACADM command, type **racadm help** after issuing the previous commands. For more information about RACADM, see "Using the RACADM Command Line Interface" on page 209.

Uninstalling RACADM

To uninstall RACADM, open a command prompt and type:

```
rpm -e <racadm_package_name>
```

where *<racadm_package_name>* is the rpm package that was used to install the RAC software.

For example, if the rpm package name is **srvadmin-racadm5**, then type:

```
rpm -e srvadmin-racadm5
```

Configuring a Supported Web Browser

The following sections provide instructions for configuring the supported Web browsers. For a list of supported Web browsers, see "Supported Web Browsers" on page 29.

Configuring Your Web Browser to Connect to the Web-Based Interface

If you are connecting to the DRAC 5 Web-based interface from a management station that connects to the Internet through a proxy server, you must configure the Web browser to access the Internet from this server.

To configure your Internet Explorer Web browser to access a proxy server, perform the following steps:

1. Open a Web browser window.
2. Click **Tools**, and click **Internet Options**.
3. From the **Internet Options** window, click the **Connections** tab.
4. Under **Local Area Network (LAN) settings**, click **LAN Settings**.
5. If the **Use a proxy server** box is selected, select the **Bypass proxy server for local addresses** box.
6. Click **OK** twice.

List of Trusted Domains

When you access the DRAC 5 Web-based interface through the Web browser, you are prompted to add the DRAC 5 IP address to the list of trusted domains if the IP address is missing from the list. When completed, click Refresh or relaunch the Web browser to reestablish a connection to the DRAC 5 Web-based interface.

32-bit and 64-bit Web Browsers

The DRAC 5 Web-based interface is not supported on 64-bit Web browsers. If you open a 64-bit Browser, access the Console Redirection page, and attempt to install the plug-in, the installation procedure fails. If this error was not acknowledged and you repeat this procedure, the Console Redirect Page loads even though the plug-in installation fails during your first attempt. This issue occurs because the Web browser stores the plug-in information in the profile directory even though the plug-in installation procedure failed. To fix this issue, install and run a supported 32-bit Web browser and log in to the DRAC 5.

Viewing Localized Versions of the Web-Based Interface

Windows

The DRAC 5 Web-based interface is supported on the following Windows operating system languages:

- English
- French
- German
- Spanish
- Japanese
- Simplified Chinese

To view a localized version of the DRAC 5 Web-based interface in Internet Explorer, perform the following steps:

1. Click the **Tools** menu and select **Internet Options**.
2. In the **Internet Options** window, click **Languages**.
3. In the **Language Preference** window, click **Add**.

4 In the **Add Language** window, select a supported language.

To select more than one language, press <Ctrl>.

5 Select your preferred language and click **Move Up** to move the language to the top of the list.

6 Click **OK**.

7 In the **Language Preference** window, click **OK**.

Linux

If you are running Console Redirection on a Red Hat Enterprise Linux (version 4) client with a Simplified Chinese GUI, the viewer menu and title may appear in random characters. This issue is caused by an incorrect encoding in the Red Hat Enterprise Linux (version 4) Simplified Chinese operating system. To fix this issue, access and modify the current encoding settings by performing the following steps:

1 Open a command terminal.

2 Type "locale" and press <Enter>. The following output appears.

```
LANG=zh_CN.UTF-8
LC_CTYPE="zh_CN.UTF-8"
LC_NUMERIC="zh_CN.UTF-8"
LC_TIME="zh_CN.UTF-8"
LC_COLLATE="zh_CN.UTF-8"
LC_MONETARY="zh_CN.UTF-8"
LC_MESSAGES="zh_CN.UTF-8"
LC_PAPER="zh_CN.UTF-8"
LC_NAME="zh_CN.UTF-8"
LC_ADDRESS="zh_CN.UTF-8"
LC_TELEPHONE="zh_CN.UTF-8"
LC_MEASUREMENT="zh_CN.UTF-8"
LC_IDENTIFICATION="zh_CN.UTF-8"
LC_ALL=
```

3 If the values include "zh_CN.UTF-8", no changes are required. If the values do not include "zh_CN.UTF-8", go to step 4.

4 Navigate to the /etc/sysconfig/i18n file.

5 In the file, apply the following changes:

Current entry:

```
LANG="zh_CN.GB18030"
SUPPORTED="zh_CN.GB18030:zh_CH.GB2312:zh_CN:zh"
```

Updated entry:

```
LANG="zh_CN.UTF-8"
SUPPORTED="zh_CN.UTF-
8:zh_CN.GB18030:zh_CH.GB2312:zh_CN:zh"
```

6 Log out and then login to the operating system.

7 Relaunch the DRAC 5.

When you switch from any other language to the Simplified Chinese language, ensure that this fix is still valid. If not, repeat this procedure.

Configuring DRAC 5 Properties

Configure the DRAC 5 properties (network, users, alerts, etc.) using the Web-based interface or RACADM.

For more information about using the Web-based interface, see "Accessing the Web-Based Interface" on page 91. For more information about using RACADM in a serial or telnet connection, see "Using the RACADM Command Line Interface" on page 209.

Configuring the DRAC 5 Network Settings

NOTICE: Changing your DRAC 5 Network settings may disconnect your current network connection.

Configure the DRAC 5 network settings using one of the following tools:

- Web-based Interface — See "Configuring the DRAC 5 NIC" on page 93
- RACADM CLI — See "cfgLanNetworking" on page 295
- Dell Remote Access Configuration Utility — See "Configuring Your System to Use a DRAC 5" on page 36

NOTE: If you are deploying the DRAC 5 in a Linux environment, see "Installing RACADM" on page 41.

Adding and Configuring DRAC 5 Users

Use one of the following tools to add and configure DRAC 5 users:

- Web-based interface — See "Adding and Configuring DRAC 5 Users" on page 98.
- RACADM CLI — See "cfgUserAdmin" on page 305.

Updating the DRAC 5 Firmware

Use one of the following methods to update your DRAC 5 firmware.

- Web-based Interface — See "Updating the DRAC 5 Firmware Using the Web-Based Interface" on page 47.
- RACADM CLI — See "fwupdate" on page 253.
- Dell Update Packages — See the *Dell Update Packages User's Guide* for information about obtaining and using Dell Update Packages as part of your system update strategy

Before You Begin

Before you update your DRAC 5 firmware using local RACADM or the Dell Update Packages, perform the following procedures. Otherwise, the firmware update operation may encounter a failure.

1. Install and enable the appropriate IPMI and managed node drivers.
2. If your system is running the Windows operating system, enable and start the **Windows Management Instrumentation** (WMI) services.
3. If your system is running SUSE Linux Enterprise Server (Version 10) for Intel EM64T, start the **Raw** service.
4. Ensure that the RAC virtual flash is unmounted or not in use by the operating system or another application or user.
5. Disconnect and unmount Virtual Media.
6. Ensure that USB is enabled.

Downloading the DRAC 5 Firmware

To update your DRAC 5 firmware, download the latest firmware from the Dell Support website located at **support.dell.com** and save the file to your local system.

The following software components are included with your DRAC 5 firmware package:

- Compiled DRAC 5 firmware code and data
- Expansion ROM image
- Web-based interface, JPEG, and other user interface data files
- Default configuration files

Use the **Firmware Update** page to update the DRAC 5 firmware to the latest revision. When you run the firmware update, the update retains the current DRAC 5 settings.

Updating the DRAC 5 Firmware Using the Web-Based Interface

1. Open the Web-based interface and login to the remote system.

   See "Accessing the Web-Based Interface" on page 91.

2. In the **System** tree, click **Remote Access** and click the **Update** tab.
3. In the **Firmware Update** page in the **Firmware Image** field, type the path to the firmware image that you downloaded from **support.dell.com** or click **Browse** to navigate to the image.

   NOTE: If you are running Firefox, the text cursor does not appear in the **Firmware Image** field.

   For example:

   `C:\Updates\V1.0\<image_name>`.

   The default firmware image name is **firmimg.d5**.

4. Click **Update**.

   The update may take several minutes to complete. When completed, a dialog box appears.

5. Click **OK** to close the session and automatically log out.
6. After the DRAC 5 resets, click **Log In** to log in to the DRAC 5.

Clearing the Browser Cache

After the firmware upgrade, clear the Web browser cache.

See your Web browser's online help for more information.

Accessing the DRAC 5 Through a Network

After you configure the DRAC 5, you can remotely access the managed system using one of the following interfaces:

- Web-based interface
- RACADM
- Telnet Console
- SSH
- IPMI

Table 2-1 describes each DRAC 5 interface.

Table 2-1. DRAC 5 Interfaces

Interface	Description
Web-based interface	Provides remote access to the DRAC 5 using a graphical user interface. The Web-based interface is built into the DRAC 5 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 "Supported Web Browsers" on page 29.

Table 2-1. DRAC 5 Interfaces *(continued)*

Interface	Description

RACADM	Provides remote access to the DRAC 5 using a command line interface. RACADM uses the managed system's IP address to execute RACADM commands (racadm remote capability option [-r]).
	NOTE: The racadm remote capability is supported only on management stations. For more information, see "Supported Web Browsers" on page 29.
	NOTE: When using the racadm remote capability, you must have write permission on the folders where you are using the **racadm** subcommands involving file operations, for example:
	`racadm getconfig -f <file name>`
	or:
	`racadm sslcertupload -t 1 -f c:\cert\cert.txt subcommands`

Telnet Console	Provides access through the DRAC 5 to the server RAC port and hardware management interfaces through the DRAC 5 NIC and provides support for serial and RACADM commands including **powerdown**, **powerup**, **powercycle**, and **hardreset** commands. **NOTE:** Telnet is an unsecure protocol that transmits all data—including passwords—in plain text. When transmitting sensitive information, use the SSH interface.
SSH Interface	Provides the same capabilities as the telnet console using an encrypted transport layer for higher security.
IPMI Interface	Provides access through the DRAC 5 to the remote system's basic management features. The interface includes IPMI over LAN, IPMI over Serial, and Serial over LAN. See the *Dell OpenManage Baseboard Management Controller User's Guide* for more information.

NOTE: The DRAC 5 default user name is `root` and the default password is `calvin`.

You can access the DRAC 5 Web-based interface through the DRAC 5 NIC by using a supported Web browser, or through Server Administrator or IT Assistant.

See "Supported Web Browsers" on page 29 for a list of supported Web browsers.

To access the DRAC 5 using a supported Web browser, see "Accessing the Web-Based Interface" on page 91.

To access the DRAC 5 remote access interface using Server Administrator, launch Server Administrator. From the system tree on the left pane of the Server Administrator home page, click **System→Main System Chassis→ Remote Access Controller**. For more information, see your Server Administrator User's Guide.

For information about accessing the DRAC 5 using RACADM, see "Using the RACADM Command Line Interface" on page 209.

Configuring IPMI

This section provides information about configuring and using the DRAC 5 IPMI interface. The interface includes the following:

- IPMI over LAN
- IPMI over Serial
- Serial over LAN

The DRAC5 is fully IPMI 2.0 compliant. You can configure the DRAC IPMI using your browser; using an open source utility, such as *ipmitool*; using the Dell OpenManage IPMI shell, **ipmish**; or using RACADM.

For more information about using the IPMI Shell, ipmish, see the *Dell OpenManage™ BMC User's Guide* located on the Dell Support website at **support.dell.com**.

For more information about using RACADM, see "Using RACADM" on page 210.

Configuring IPMI Using the Web-Based Interface

1. Login to the remote system using a supported Web browser.
   See "Accessing the Web-Based Interface" on page 91.
2. Configure IPMI over LAN.
   a. In the **System** tree, click **Remote Access**.
   b. Click the **Configuration** tab and click **Network**.
   c. In the **Network Configuration** page under **IPMI LAN Settings**, select **Enable IPMI Over LAN** and click **Apply Changes**.
   d. Update the IPMI LAN channel privileges, if required.

   NOTE: This setting determines the IPMI commands that can be executed from the IPMI over LAN interface. For more information, see the IPMI 2.0 specifications.

   Under **IPMI LAN Settings**, click the **Channel Privilege Level Limit** drop-down menu, select **Administrator**, **Operator**, or **User** and click **Apply Changes**.
   e. Set the IPMI LAN channel encryption key, if required.

   NOTE: The DRAC 5 IPMI supports the RMCP+ protocol.

   Under **IPMI LAN Settings** in the **Encryption Key field**, type the encryption key and click **Apply Changes**.

   NOTE: The encryption key must consist of an even number of hexadecimal characters with a maximum of 40 characters.
3. Configure IPMI Serial over LAN (SOL).
   a. In the **System** tree, click **Remote Access**.
   b. In the **Configuration** tab, click **Serial Over LAN**.
   c. In the **Serial Over LAN Configuration** page, select **Enable Serial Over LAN**.
   d. Update the IPMI SOL baud rate.

   NOTE: To redirect the serial console over LAN, ensure that the SOL baud rate is identical to your managed system's baud rate.
   e. Click the **Baud Rate** drop-down menu, select the appropriate baud rate, and click **Apply Changes**.

f Update the **Minimum Required Privilege**. This property defines the minimum user privilege that is required to use the **Serial Over LAN** feature.

Click the **Channel Privilege Level Limit** drop-down menu, select **User**, **Operator**, or **Administrator**.

g Click **Apply Changes**.

4 Configure IPMI Serial.

a In the **Configuration** tab, click **Serial**.

b In the **Serial Configuration** menu, change the IPMI serial connection mode to the appropriate setting.

Under **IPMI Serial**, click the **Connection Mode Setting** drop-down menu, select the appropriate mode.

c Set the IPMI Serial baud rate.

Click the **Baud Rate** drop-down menu, select the appropriate baud rate, and click **Apply Changes**.

d Set the Channel Privilege Level Limit.

Click the **Channel Privilege Level Limit** drop-down menu, select **Administrator**, **Operator**, or **User**.

e Click **Apply Changes**.

f Ensure that the serial MUX is set correctly in the managed system's BIOS Setup program.

- Restart your system.
- During POST, press <F2> to enter the BIOS Setup program.
- Navigate to **Serial Communication**.
- In the **Serial Connection** menu, ensure that **External Serial Connector** is set to **Remote Access Device**.
- Save and exit the BIOS Setup program.
- Restart your system.

If IPMI serial is in terminal mode, you can configure the following additional settings:

- Delete control
- Echo control
- Line edit
- New line sequences
- Input new line sequences

For more information about these properties, see the IPMI 2.0 specification.

Configuring IPMI Using the RACADM CLI

1. Login to the remote system using any of the RACADM interfaces. See "Using RACADM" on page 210.
2. Configure IPMI over LAN.

   Open a command prompt, type the following command, and press <Enter>:

   ```
   racadm config -g cfgIpmiLan -o cfgIpmiLanEnable 1
   ```

   NOTE: This setting determines the IPMI commands that can be executed from the IPMI over LAN interface. For more information, see the IPMI 2.0 specifications.

   a. Update the IPMI channel privileges.

      At the command prompt, type the following command and press <Enter>:

      ```
      racadm config -g cfgIpmiLan -o
      cfgIpmiLanPrivilegeLimit <level>
      ```

      where *<level>* is one of the following:

      - 2 (User)
      - 3 (Operator)
      - 4 (Administrator)

For example, to set the IPMI LAN channel privilege to 2 (User), type the following command:

```
racadm config -g cfgIpmiLan -o
cfgIpmiLanPrivilegeLimit 2
```

b Set the IPMI LAN channel encryption key, if required.

NOTE: The DRAC 5 IPMI supports the RMCP+ protocol. See the IPMI 2.0 specifications for more information.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiLan -o
cfgIpmiEncryptionKey <key>
```

where *<key>* is a 20-character encryption key in a valid hexadecimal format.

3 Configure IPMI Serial over LAN (SOL).

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiSol -o cfgIpmiSolEnable 1
```

a Update the IPMI SOL minimum privilege level.

NOTICE: The IPMI SOL minimum privilege level determines the minimum privilege required to activate IPMI SOL. For more information, see the IPMI 2.0 specification.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiSol -o
cfgIpmiSolMinPrivilege <level>
```

where *<level>* is one of the following:

- 2 (User)
- 3 (Operator)
- 4 (Administrator)

For example, to configure the IPMI privileges to 2 (User), type the following command:

```
racadm config -g cfgIpmiSol -o
cfgIpmiSolMinPrivilege 2
```

b Update the IPMI SOL baud rate.

NOTE: To redirect the serial console over LAN, ensure that the SOL baud rate is identical to your managed system's baud rate.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiSol -o
cfgIpmiSolBaudRate <baud_rate>
```

where *<baud_rate>* is 9600, 19200, 57600, or 115200 bps.

For example:

```
racadm config -g cfgIpmiSol -o
cfgIpmiSolBaudRate 57600
```

c Enable SOL.

NOTE: SOL can be enabled or disabled for each individual user.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgUserAdmin -o
cfgUserAdminSolEnable -i <id> 2
```

where *<id>* is the user's unique ID.

4 Configure IPMI Serial.

a Change the IPMI serial connection mode to the appropriate setting.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgSerial -o
cfgSerialConsoleEnable 0
```

b Set the IPMI Serial baud rate.

Open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgIpmiSerial -o
cfgIpmiSerialBaudRate <baud_rate>
```

where *<baud_rate>* is 9600, 19200, 57600, or 115200 bps.

For example:

```
racadm config -g cfgIpmiSerial -o
cfgIpmiSerialBaudRate 57600
```

c Enable the IPMI serial hardware flow control.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiSerial -o
cfgIpmiSerialFlowControl 1
```

d Set the IPMI serial channel minimum privilege level.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiSerial -o
cfgIpmiSerialChanPrivLimit <level>
```

where *<level>* is one of the following:

- 2 (User)
- 3 (Operator)
- 4 (Administrator)

For example, to set the IPMI serial channel privileges to 2 (User), type the following command:

```
racadm config -g cfgIpmiSerial -o
cfgIpmiSerialChanPrivLimit 2
```

e Ensure that the serial MUX is set correctly in the BIOS Setup program.

- Restart your system.
- During POST, press <F2> to enter the BIOS Setup program.
- Navigate to **Serial Communication**.
- In the **Serial Connection** menu, ensure that **External Serial Connector** is set to **Remote Access Device**.
- Save and exit the BIOS Setup program.
- Restart your system.

The IPMI configuration is complete.

If IPMI serial is in terminal mode, you can configure the following additional settings using **racadm config cfgIpmiSerial** commands:

- Delete control
- Echo control
- Line edit
- New line sequences
- Input new line sequences

For more information about these properties, see the IPMI 2.0 specification.

Configuring Platform Events

Platform event configuration provides a mechanism for configuring the remote access device to perform selected actions on certain event messages. These actions include reboot, power cycle, power off, and triggering an alert (Platform Events Trap [PET] and/or e-mail).

The filterable Platform Events include the following:

- Fan Probe Failure
- Battery Probe Warning
- Battery Probe Failure
- Discrete Voltage Probe Failure
- Temperature Probe Warning

- Temperature Probe Failure
- Chassis Intrusion Detected
- Redundancy Degraded
- Redundancy Lost
- Processor Warning
- Processor Failure
- Processor Absent
- PS/VRM/D2D Warning
- PS/VRM/D2D Failure
- Power Supply Absent
- Hardware Log Failure
- Automatic System Recovery

When a platform event occurs (for example, a fan probe failure), a system event is generated and recorded in the System Event Log (SEL). If this event matches a platform event filter (PEF) in the Platform Event Filters list in the Web-based interface and you have configured this filter to generate an alert (PET or e-mail), then a PET or e-mail alert is sent to a set of one or more configured destinations.

If the same platform event filter is also configured to perform an action (such as rebooting the system), the action is performed.

Configuring Platform Event Filters (PEF)

Configure your platform event filters before you configure the platform event traps or e-mail alert settings.

Configuring PEF Using the Web User Interface

1. Login to the remote system using a supported Web browser. See "Accessing the Web-Based Interface" on page 91.
2. Click the **Alert Management** tab and then click **Platform Events**.
3. Enable global alerts.
   a. Click **Alert Management** and select **Platform Events**.
   b. Select the **Enable Platform Event Filter Alert** checkbox.

4 Under **Platform Events Filters Configuration**, select the **Enable Platform Event Filter alerts** check box and then click **Apply Changes**.

5 Under **Platform Event Filters List**, double-click a filter that you wish to configure.

6 In the **Set Platform Events** page, make the appropriate selections and then click **Apply Changes**.

NOTE: Generate Alert must be enabled for an alert to be sent to any valid, configured destination (PET or e-mail).

Configuring PEF Using the RACADM CLI

1 Enable PEF.

Open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgIpmiPef -o cfgIpmiPefEnable -i
1 1
```

where 1 and 1 are the PEF index and the enable/disable selection, respectively.

The PEF index can be a value from 1 through 17. The enable/disable selection can be set to 1 (Enabled) or 0 (Disabled).

For example, to enable PEF with index 5, type the following command:

```
racadm config -g cfgIpmiPef -o cfgIpmiPefEnable -i
5 1
```

2 Configure your PEF actions.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiPef -o cfgIpmiPefAction -i
1 <action>
```

where the <*action*> values bits are as follows:

- <*action*> value bit 0 – 1 = enable alert action, 0 = disable alert
- <*action*> value bit 1 – 1 = power off; 0 = no power off
- <*action*> value bit 2 – 1 = reboot; 0 = no reboot
- <*action*> value bit 3 – 1 = power cycle; 0 = no power cycle

For example, to enable PEF to reboot the system, type the following command:

```
racadm config -g cfgIpmiPef -o cfgIpmiPefAction -i
1 2
```

where 1 is the PEF index and 2 is the PEF action to reboot.

Configuring PET

Configuring PET Using the Web User Interface

1. Login to the remote system using a supported Web browser. See "Accessing the Web-Based Interface" on page 91.
2. Ensure that you followed the procedures in "Configuring PEF Using the Web User Interface" on page 58.
3. Configure your PET policy.
   a. In the **Alert Management** tab, click **Traps Settings**.
   b. Under **Destination Configuration Settings**, configure the **Community String** field with the appropriate information and then click **Apply Changes**.
4. Configure your PET destination IP address
   a. In the **Destination Number** column, click a destination number.
   b. Ensure that the **Enable Destination** checkbox is selected.
   c. In the **Destination IP Address** field, type a valid PET destination IP address.
   d. Click **Apply Changes**.
   e. Click **Send Test Trap** to test the configured alert (if desired).

   NOTE: Your user account must have **Test Alerts** permission to perform this procedure. See Table 4-9.

   f. Repeat step a through step e for any remaining destination numbers.

Configuring PET Using RACADM CLI

1 Enable your global alerts.

Open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgIpmiLan -o
cfgIpmiLanAlertEnable 1
```

2 Enable PET.

At the command prompt, type the following commands and press <Enter> after each command:

```
racadm config -g cfgIpmiPet -o
cfgIpmiPetAlertEnable -i 1 1
```

where `1` and `1` are the PET destination index and the enable/disable selection, respectively.

The PET destination index can be a value from 1 through 4. The enable/disable selection can be set to 1 (Enabled) or 0 (Disabled).

For example, to enable PET with index 4, type the following command:

```
racadm config -g cfgIpmiPet -o
cfgIpmiPetAlertEnable -i 4 0
```

3 Configure your PET policy.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgIpmiPet -o
cfgIpmiPetAlertDestIPAddr -i 1 <IP_address>
```

where `1` is the PET destination index and *<IP_address>* is the destination IP address of the system that receives the platform event alerts.

4 Configure the Community Name string.

At the command prompt, type:

```
racadm config -g cfgIpmiLan -o
cfgIpmiPetCommunityName <Name>
```

Configuring E-Mail Alerts

Configuring E-mail Alerts Using the Web User Interface

1. Login to the remote system using a supported Web browser. See "Accessing the Web-Based Interface" on page 91.
2. Ensure that you followed the procedures in "Configuring PEF Using the Web User Interface" on page 58.
3. Configure your e-mail alert settings.
   a. In the **Alert Management** tab, click **Email Alert Settings**.
   b. Under **SMTP (Email) Server Address settings**, configure the **SMTP (Email) Server IP address** field with the appropriate information and then click **Apply Changes**.
4. Configure your e-mail alert destination.
   a. In the **Email Alert Number** column, click an e-mail alert number.
   b. Ensure that the **Enable Email Alert** checkbox is selected.
   c. In the **Destination Email Address** field, type a valid e-mail address.
   d. In the **Email Description** field, enter a description (if required).
   e. Click **Apply Changes**.
   f. Click **Send Test Email** to test the configured e-mail alert (if desired).

   NOTE: Your user account must have **Test Alerts** permission to perform this procedure. See Table 4-9.

   g. Repeat step a through step e for any remaining e-mail alert settings.
5. Enable global alerts.
   a. Click **Alert Management** and select **Platform Events**.
   b. Select the **Enable Platform Event Filter Alert** checkbox.

Configuring E-Mail Alerts Using RACADM CLI

1 Enable your global alerts.

Open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgIpmiLan -o
cfgIpmiLanAlertEnable 1
```

2 Enable e-mail alerts.

At the command prompt, type the following commands and press <Enter> after each command:

```
racadm config -g cfgEmailAlert -o
cfgEmailAlertEnable -i 1 1
```

where 1 and 1 are the e-mail destination index and the enable/disable selection, respectively.

The e-mail destination index can be a value from 1 through 4. The enable/disable selection can be set to 1 (Enabled) or 0 (Disabled).

For example, to enable e-mail with index 4, type the following command:

```
racadm config -g cfgEmailAlert -o
cfgEmailAlertEnable -i 4 1
```

3 Configure your e-mail settings.

At the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgEmailAlert -o
cfgEmailAlertAddress -i 1 <e-mail_address>
```

where 1 is the e-mail destination index and *<e-mail_address>* is the destination e-mail address that receives the platform event alerts.

To configure a custom message, at the command prompt, type the following command and press <Enter>:

```
racadm config -g cfgEmailAlert -o
cfgEmailAlertCustomMsg -i 1 <custom_message>
```

where 1 is the e-mail destination index and *<custom_message>* is the custom message.

3

Configuring and Using the DRAC 5 Command Line Console

This section provides information about the DRAC 5 command line console (or *serial/telnet/ssh console*) features, and explains how to set up your system so you can perform systems management actions through the console.

Command Line Console Features

The DRAC 5 supports the following serial and telnet console features:

- One serial client connection and up to four, simultaneous telnet client connections
- Up to four simultaneous SSH client connections
- Access to the managed system consoles through the system serial port and through the DRAC 5 NIC
- Console commands that allow you to power-on, power-off, power-cycle, reset, view logs, or configure the DRAC 5
- Supports the **RACADM** command, which is useful for scripting
- Command-line editing and history
- The **connect com2** serial command to connect, view, and interact with the managed system text console that is being output through a serial port (including BIOS and the operating system)

  NOTE: If you are running Linux on the managed system, the **connect com2** serial command provides a true Linux console stream interface.

- Session timeout control on all console interfaces

Enabling and Configuring the Managed System to Use a Serial or Telnet Console

The following subsections provide information about how to enable and configure a serial/telnet/ssh console on the managed system.

Using the connect com2 Serial Command

When using the **connect com2** serial command, the following must be configured properly:

- The **Serial Communication→Serial Port** setting in the **BIOS Setup** program.
- The DRAC configuration settings.

When a telnet session is established to the DRAC 5 and these settings are incorrect, **connect com2** may display a blank screen.

Configuring the BIOS Setup Program for a Serial Connection on the Managed System

Perform the following steps to configure your **BIOS Setup** program to redirect output to a serial port.

NOTE: You must configure the **System Setup** program in conjunction with the **connect com2** command.

1. Turn on or restart your system.
2. Press <F2> immediately after you see the following message:

   ```
   <F2> = System Setup
   ```

3. Scroll down and select **Serial Communication** by pressing <Enter>.
4. Set the **Serial Communication** screen to the following settings:

   External Serial Connector — Remote Access Device

   Redirection After Boot — Disabled

5. Press <Esc> to exit the **System Setup** program to complete the **System Setup** program configuration.

Using the Remote Access Serial Interface

When establishing a serial connection to the RAC device, the following interfaces are available:

- IPMI serial interface
- RAC serial interface

IPMI Serial Interface

In the IPMI serial interface, the following modes are available:

- **IPMI terminal mode** — Supports ASCII commands that are submitted from a serial terminal. The command set is limited to a limited number of commands (including power control) and supports raw IPMI commands that are entered as hexadecimal ASCII characters.
- **IPMI basic mode** — Supports a binary interface for program access, such as the IPMI shell (IPMISH) that is included with the Baseboard Management Utility (BMU).

To configure the IPMI mode using RACADM, perform the following steps:

1. Disable the RAC serial interface.

   At the command prompt, type:

   ```
   racadm config -g cfgSerial -o
   cfgSerialConsoleEnable 0
   ```

2. Enable the appropriate IPMI mode.

   For example, at the command prompt, type:

   ```
   racadm config -g cfgIpmiSerial -o
   cfgIpmiSerialConnectionMode <0 or 1>
   ```

See "DRAC 5 Property Database Group and Object Definitions" on page 293 for more information.

RAC Serial Interface

RAC also supports a serial console interface (or *RAC Serial Console*) that provides a RAC CLI, which is not defined by IPMI. If your system includes a RAC card with **Serial Console** enabled, the RAC card will override the IPMI serial settings and display the RAC CLI serial interface.

To enable the RAC serial terminal interface, set the **cfgSerialConsoleEnable** property to 1 (TRUE).

For example:

```
racadm config -g cfgSerial -o cfgSerialConsoleEnable 1
```

See "cfgSerialConsoleEnable (Read/Write)" on page 314 for more information.

Table 3-1 provides the serial interface settings.

Table 3-1. Serial Interface Settings

IPMI Mode	RAC Serial Console	Interface
Basic	Disabled	Basic Mode
Basic	Enabled	RAC CLI
Terminal	Disabled	IPMI Terminal Mode
Terminal	Enabled	RAC CLI

Configuring Linux for Serial Console Redirection During Boot

The following steps are specific to the Linux GRand Unified Bootloader (GRUB). Similar changes would be 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 x 80 columns to ensure proper text display; otherwise, some text screens may be garbled.

Edit the **/etc/grub.conf** file as follows:

1. Locate the general setting sections in the file and add 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.

Table 3-2 provides a sample **/etc/grub.conf** file that show the changes described in this procedure.

Table 3-2. Sample File: /etc/grub.conf

```
# 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/sda1
#          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 s
   initrd /boot/initrd-2.4.9-e.3.im
```

When you edit the **/etc/grub.conf** file, use the following guidelines:

1. Disable GRUB's graphical interface and use the text-based interface; otherwise, the GRUB screen will not be displayed in RAC console redirection. To disable the graphical interface, comment out the line starting with `splashimage`.
2. To start multiple GRUB options to start console sessions through the RAC serial connection, add the following line to all options:

   ```
   console=ttyS1,57600
   ```

   Table 3-2 shows `console=ttyS1,57600` added to only the first option.

Enabling Login to the Console After Boot

Edit the file **/etc/inittab**, as follows:

Add a new line to configure `agetty` on the COM2 serial port:

```
co:2345:respawn:/sbin/agetty -h -L 57600 ttyS1 ansi
```

Table 3-3 shows a sample file with the new line.

Table 3-3. Sample File: /etc/innitab

```
#
# 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
```

Table 3-3. Sample File: /etc/innitab *(continued)*

```
# 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 file **/etc/securetty**, as follows:

Add a new line, with the name of the serial tty for COM2:

```
ttyS1
```

Table 3-4 shows a sample file with the new line.

Table 3-4. Sample File: /etc/securetty

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

Enabling the DRAC 5 Serial/Telnet/SSH Console

The serial/telnet/ssh console can be enabled locally or remotely.

Enabling the Serial/Telnet/SSH Console Locally

NOTE: You (the current user) must have **Configure DRAC 5** permission in order to perform the steps in this section.

To enable the serial/telnet/ssh console from the managed system, type the following local RACADM commands from a command prompt:

```
racadm config -g cfgSerial -o cfgSerialConsoleEnable 1
racadm config -g cfgSerial -o cfgSerialTelnetEnable 1
racadm config -g cfgSerial -o cfgSerialSshEnable 1
```

For detailed information about how to use **RACADM**, **serial/telnet/ssh**, and **RACADM** commands, see "Using the RACADM Command Line Interface" on page 209.

Enabling the Serial/Telnet/SSH Console Remotely

To enable the serial/telnet/ssh console remotely, type the following remote RACADM commands from a command prompt:

```
racadm -u <username> -p <password> -r <DRAC 5 IP
address> config -g cfgSerial cfgSerialConsoleEnable 1
```

```
racadm -u <username> -p <password> -r <DRAC 5 IP
address> config -g cfgSerial cfgSerialTelnetEnable   1
```

```
racadm -u <username> -p <password> -r <DRAC 5 IP
address> config -g cfgSerial cfgSerialSshEnable   1
```

Using the RACADM Command to Configure the Settings for the Serial and Telnet Console

This subsection provides steps to configure the default configuration settings for serial/telnet/ssh console redirection.

To configure the settings, type the RACADM **config** command with the appropriate group, property, and property value(s) for the setting that you want to configure.

You can type RACADM commands locally or remotely. When using RACADM commands remotely, you must include the user name, password, and managed system DRAC 5 IP address.

For a complete list of available serial/telnet/ssh and RACADM CLI commands, see "Using the RACADM Command Line Interface" on page 209.

Using RACADM Locally

To type RACADM commands locally, type the following command from a command prompt on the managed system:

```
racadm config -g <group> -o <property> <value>
```

To view a list of properties, type the following command from a command prompt on the managed system:

```
radadm getconfig -g <group>
```

Using RACADM Remotely

To use RACADM commands remotely, type the following command from a command prompt on a management station:

```
racadm -u <username> -p <password> -r <DRAC 5 IP
address> config -g <group> -o <property> <value>
```

Ensure that your web server is configured with a DRAC 5 card before you use RACADM remotely. Otherwise, RACADM times out and the following message appears:

```
Unable to connect to RAC at specified IP address.
```

To enable your web server using Secure Shell (SSH), telnet or local RACADM, type the following command from a command prompt on a management station:

```
racadm config -g cfgRacTuning -o
cfgRacTuneWebServerEnable 1
```

Displaying Configuration Settings

Table 3-5 provides the actions and related commands to display your configuration settings. To run the commands, open a command prompt on the managed system, type the command, and press <Enter>.

Table 3-5. Displaying Configuration Settings

Action	Command
List the available groups.	`racadm getconfig -h`

Display the current settings for a particular group.	`racadm getconfig -g <group>`
	For example, to display a list of all **cfgSerial** group settings, type the following command:
	`racadm getconfig -g cfgSerial`

Display the current settings for a particular group remotely.	`racadm -u <user> -p <password> -r <DRAC 5 IP address> getconfig -g cfgSerial`
	For example, to display a list of all of the settings for the **cfgSerial** group remotely, type:
	`racadm -u root -p calvin -r 192.168.0.1 getconfig -g cfgSerial`

Configuring the Telnet Port Number

Type the following command to change the telnet port number on the DRAC 5.

```
racadm config -g cfgRacTuning -o cfgRacTuneTelnetPort
<new port number>
```

Using the Secure Shell (SSH)

It is critical that your system's devices and device management is secure. Embedded connected devices are the core of many business processes. If these devices are compromised, the customer's business may be at risk, which requires new security demands for command line interface (CLI) device management software.

Secure Shell (SSH) is a command line session that includes the same capabilities as a telnet session, but with improved security. The DRAC 5 supports SSH version 2 with password authentication. SSH is enabled on the DRAC 5 when you install or update your DRAC 5 firmware.

You can use either `PuTTY` or `OpenSSH` on the management station to connect to the managed system's DRAC 5. When an error occurs during the login procedure, the secure shell client issues an error message. The message text is dependent on the client and is not controlled by the DRAC 5.

NOTE: `OpenSSH` should be run from a VT100 or ANSI terminal emulator on Windows. Running `OpenSSH` at the Windows command prompt does not result in full functionality (that is, some keys do not respond and no graphics are displayed).

Only four SSH sessions are supported at any given time. The session time-out is controlled by the `cfgSsnMgtSshIdleTimeout` property as described in the "DRAC 5 Property Database Group and Object Definitions" on page 293.

You can enable the SSH on the DRAC 5 with the command:

```
racadm config -g cfgSerial -o cfgSerialSshEnable 1
```

You can change the SSH port with the command:

```
racadm config -g cfgRacTuning -o cfgRacTuneSshPort
<port number>
```

For more information on `cfgSerialSshEnable` and `cfgRacTuneSshPort` properties, see "DRAC 5 Property Database Group and Object Definitions" on page 293.

The DRAC 5 SSH implementation supports multiple cryptography schemes, as shown in Table 3-6.

Table 3-6. 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

NOTE: SSHv1 is not supported.

Enabling Additional DRAC 5 Security Options

To prevent unauthorized access to your remote system, the DRAC 5 provides the following features:

- IP address filtering (IPRange) — Defines a specific range of IP addresses that can access the DRAC 5.
- IP address blocking — Limits the number of failed login attempts from a specific IP address

These features are disabled in the DRAC 5 default configuration. Use the following subcommand or the Web-based interface to enable these features.

```
racadm config -g cfgRacTuning -o <object_name> <value>
```

Additionally, use these features in conjunction with the appropriate session idle time-out values and a defined security plan for your network.

The following subsections provide additional information about these features.

IP Filtering (IpRange)

IP address filtering (or *IP Range Checking*) allows DRAC 5 access only from clients or management workstations whose IP addresses are within a user-specific range. All other logins are denied.

IP filtering compares the IP address of an incoming login to the IP address range that is specified in the following **cfgRacTuning** properties:

- cfgRacTuneIpRangeAddr
- cfgRacTuneIpRangeMask

The **cfgRacTuneIpRangeMask** property is applied to both the incoming IP address and to the **cfgRacTuneIpRangeAddr** properties. If the results of both properties are identical, the incoming login request is allowed to access the DRAC 5. Logins from IP addresses outside this range receive an error.

The login proceeds if the following expression equals zero:

```
cfgRacTuneIpRangeMask & (<incoming_IP_address> ^
cfgRacTuneIpRangeAddr)
```

where & is the bitwise AND of the quantities and ^ is the bitwise exclusive-OR.

See "DRAC 5 Property Database Group and Object Definitions" on page 293 for a complete list of **cfgRacTune** properties.

Table 3-7. IP Address Filtering (IpRange) Properties

Property	Description
cfgRacTuneIpRangeEnable	Enables the IP range checking feature.
cfgRacTuneIpRangeAddr	Determines the acceptable IP address bit pattern, depending on the 1's in the subnet mask. This property is bitwise AND'd with **cfgRacTuneIpRangeMask** to determine the upper portion of the allowed IP address. Any IP address that contains this bit pattern in its upper bits is allowed to establish a DRAC 5 session. Logins from IP addresses that are outside this range will fail. The default values in each property allow an address range from 192.168.1.0 to 192.168.1.255 to establish a DRAC 5 session.
cfgRacTuneIpRangeMask	Defines the significant bit positions in the IP address. The subnet mask should be in the form of a netmask, where the more significant bits are all 1's with a single transition to all zeros in the lower-order bits.

Enabling IP Filtering

Below is an example command for IP filtering setup.

See "Using RACADM" on page 210 for more information about RACADM and RACADM commands.

NOTE: The following RACADM commands block all IP addresses except 192.168.0.57)

To restrict the login to a single IP address (for example, 192.168.0.57), use the full mask, as shown below.

```
racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeEnable 1

racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeAddr 192.168.0.57

racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeMask 255.255.255.255
```

To restrict logins to a small set of four adjacent IP addresses (for example, 192.168.0.212 through 192.168.0.215), select all but the lowest two bits in the mask, as shown below:

```
racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeEnable 1

racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeAddr 192.168.0.212

racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeMask 255.255.255.252
```

IP Filtering Guidelines

Use the following guidelines when enabling IP filtering:

- Ensure that **cfgRacTuneIpRangeMask** is configured in the form of a netmask, where all most significant bits are 1's (which defines the subnet in the mask) with a transition of all 0's in the lower-order bits.
- Use the desired range's base address as the value of **cfgRacTuneIpRangeAddr**. The 32-bit binary value of this address should have zeros in all the low-order bits where there are zeros in the mask.

IP Blocking

IP blocking dynamically determines when excessive login failures occur from a particular IP address and blocks (or prevents) the address from logging into the DRAC 5 for a preselected time span.

The IP blocking parameter uses **cfgRacTuning** group features that include:

- The number of allowable login failures ("cfgRacTuneIpBlkFailcount" on page 323)
- The timeframe in seconds when these failures must occur ("cfgRacTuneIpBlkFailWindow" on page 324)
- The amount of time in seconds when the "guilty" IP address is prevented from establishing a session after the total allowable number of failures is exceeded ("cfgRacTuneIpBlkPenaltyTime" on page 324)

As login failures accumulate from a specific IP address, they are "aged" by an internal counter. When the user logs in successfully, the failure history is cleared and the internal counter is reset.

NOTE: When login attempts are refused from the client IP address, some SSH clients may display the following message: `ssh exchange identification: Connection closed by remote host.`

See "DRAC 5 Property Database Group and Object Definitions" on page 293 for a complete list of **cfgRacTune** properties.

Table 3-8 lists the user-defined parameters.

Table 3-8. Login Retry Restriction Properties

Property	Definition
cfgRacTuneIpBlkEnable	Enables the IP blocking feature. When consecutive failures (**cfgRacTuneIpBlkFailCount**) from a single IP address are encountered within a specific amount of time (**cfgRacTuneIpBlkFailWindow**), all further attempts to establish a session from that address are rejected for a certain timespan (**cfgRacTuneIpBlkPenaltyTime**).
cfgRacTuneIpBlkFailCount	Sets the number of login failures from an IP address before the login attempts are rejected.
cfgRacTuneIpBlkFailWindow	The timeframe in seconds when the failure attempts are counted. When the failures exceed this limit, they are dropped from the counter.
crgRacTuneIpBlkPenaltyTime	Defines the timespan in seconds when all login attempts from an IP address with excessive failures are rejected.

Enabling IP Blocking

The following example prevents a client IP address from establishing a session for five minutes if that client has failed its five login attempts in a one-minute period of time.

```
racadm config -g cfgRacTuning -o
cfgRacTuneIpRangeEnable 1
```

```
racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkFailCount 5

racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkFailWindows 60

racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkPenaltyTime 300
```

The following example prevents more than three failed attempts within one minute, and prevents additional login attempts for an hour.

```
racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkEnable 1

racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkFailCount 3

racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkFailWindows 60

racadm config -g cfgRacTuning -o
cfgRacTuneIpBlkPenaltyTime 3600
```

Disabling Local Configuration of DRAC 5

DRAC 5 version 1.30 includes new security features that provide system administrators with flexible tools to augment the data center security without compromising on the manageability.

Disabling Local Configuration During System Reboot

This feature enables the DRAC administrator to disable the ability of a local user to configure the DRAC 5 from the BIOS power-on self test (POST) option-ROM.

```
racadm config -g cfgRacTune -o
cfgRacTuneCtrlEConfigDisable 1
```

NOTE: This command is available only through the remote `racadm`.

NOTE: This option is supported only on the Remot Access Configuration Utility version 1.13 and later. To upgrade to this version, upgrade your BIOS using the BIOS update package from the *Dell Server Updates* DVD or the Dell Support Website at **support.dell.com**.

Disabling Local Configuration From Local racadm

This feature disables the ability of the managed system's user to configure the DRAC 5 using the local racadm or the Dell OpenManage Server Administrator utilities.

```
racadm config -g cfgRacTune -o
cfgRacTuneLocalConfigDisable 1
```

NOTICE: Use these features discreetly as they severely limit the ability of the local user to configure the DRAC 5 from the local system, including performing a reset to default of the configuration.

NOTE: This command is available only through the remote `racadm`.

NOTE: See the white paper on *Effectively Using the New Security Options in the DRAC 5 Firmware and Software Version 1.30* on the Dell Support site at **support.dell.com** for more information.

Disabling Console Redirection

The disable console redirection option allows the administrator of the local DRAC 5 to disable the console redirection to the management station.The disable console redirection option provides a secure mechanism for the local DRAC 5 administrator to configure BIOS and DRAC settings without the risk of someone else being able to view the administrator's actions over a console redirection session.

To disable console redirection:

```
racadm localConRedirDisable 1
```

NOTE: To enable console redirection, use the argument 0.

NOTE: The disable console redirection option is only available to local racadm users.

Connecting to the Managed System Through the Local Serial Port or Telnet Management Station (Client System)

The managed system provides access between the DRAC 5 and the serial port on your system to enable you to power on, power off, or reset the managed system, and access logs.

The serial console is available on the DRAC 5 through the managed system external serial connector. Only one serial client system (management station) may be active at any given time. The telnet and SSH consoles are available on the DRAC 5 through the DRAC modes (see "DRAC Modes" on page 225). Up to four telnet client systems and four SSH clients may connect at any given time. The management station connection to the managed system serial or telnet console requires management station terminal emulation software. See "Configuring the Management Station Terminal Emulation Software" on page 85 for more information.

The following subsections explain how to connect your management station to the managed system using the following methods:

- A managed system external serial port using terminal software and a null modem cable
- A telnet connection using terminal software through the managed system DRAC 5 NIC or the shared, teamed NIC

Connecting the DB-9 Cable for the Serial Console

To access the managed system using a serial text console, connect a DB-9 null modem cable to the COM port on the managed system. Not all DB-9 cables carry the pinout/signals necessary for this connection. The DB-9 cable for this connection must conform to the specification shown in Table 3-9.

NOTE: The DB-9 cable can also be used for BIOS text console redirection.

Table 3-9. Required Pinout for DB-9 Null Modem Cable

Signal Name	DB-9 Pin (server pin)	DB-9 Pin (workstation pin)
FG (Frame Ground)	–	–
TD (Transmit data)	3	2
RD (Receive Data)	2	3
RTS (Request To Send)	7	8
CTS (Clear To Send)	8	7
SG (Signal Ground)	5	5
DSR (Data Set Ready)	6	4
CD (Carrier Detect)	1	4
DTR (Data Terminal Ready)	4	1 and 6

Configuring the Management Station Terminal Emulation Software

Your DRAC 5 supports a serial or telnet text console from a management station running one of the following types of terminal emulation software:

- Linux Minicom in an Xterm
- Hilgraeve's HyperTerminal Private Edition (version 6.3)
- Linux Telnet in an Xterm
- Microsoft® Telnet

Perform the steps in the following subsections to configure your type of terminal software. If you are using Microsoft Telnet, configuration is not required.

Configuring Linux Minicom for Serial Console Emulation

Minicom is the serial port access utility for Linux. The following steps are valid for configuring Minicom version 2.0. Other Minicom versions may differ slightly but require the same basic settings. Use the information in "Required Minicom Settings for Serial Console Emulation" on page 86 to configure other versions of Minicom.

Configuring Minicom Version 2.0 for Serial Console Emulation

NOTE: To ensure that the text displays properly, Dell recommends that you use an Xterm window to display the telnet console instead of the default console provided by the Linux installation.

1. To start a new Xterm session, type `xterm &` at the command prompt.
2. In the Xterm window, move your mouse arrow to the lower right-hand corner of the window and resize the window to 80 x 25.
3. If you do not have a Minicom configuration file, go to the next step.

   If you have a Minicom configuration file, type `minicom <Minicom config file name>` and skip to step 17.
4. At the Xterm command prompt, type `minicom -s`.
5. Select **Serial Port Setup** and press <Enter>.
6. Press <a> and select the appropriate serial device (for example, **/dev/ttyS0**).

7 Press <e> and set the **Bps/Par/Bits** option to **57600 8N1**.

8 Press <f> and set **Hardware Flow Control** to **Yes** and set **Software Flow Control** to **No**.

9 To exit the **Serial Port Setup** menu, press <Enter>.

10 Select **Modem and Dialing** and press <Enter>.

11 In the **Modem Dialing and Parameter Setup** menu, press <Backspace> to clear the **init**, **reset**, **connect**, and **hangup** settings so that they are blank.

12 Press <Enter> to save each blank value.

13 When all specified fields are clear, press <Enter> to exit the **Modem Dialing and Parameter Setup** menu.

14 Select **Save setup as config_name** and press <Enter>.

15 Select **Exit From Minicom** and press <Enter>.

16 At the command shell prompt, type `minicom <Minicom config file name>`.

17 To expand the Minicom window to 80 x 25, drag the corner of the window.

18 Press <Ctrl+a>, <z>, <x> to exit Minicom.

NOTE: If you are using Minicom for serial text console redirection to configure the managed system BIOS, it is recommended to turn on color in Minicom. To turn on color, type the following command in the command prompt: `minicom -c on`

Ensure that the Minicom window displays a command prompt such as `[DRAC 5\root]#`. When the command prompt appears, your connection is successful and you are ready to connect to the managed system console using the **connect** serial command.

Required Minicom Settings for Serial Console Emulation

Use Table 3-10 to configure any version of Minicom.

Table 3-10. Minicom Settings for Serial Console Emulation

Setting Description	Required Setting
Bps/Par/Bits	57600 8N1
Hardware flow control	Yes
Software flow control	No

Table 3-10. Minicom Settings for Serial Console Emulation *(continued)*

Setting Description	Required Setting
Terminal emulation	ANSI
Modem dialing and parameter settings	Clear the **init**, **reset**, **connect**, and **hangup** settings so that they are blank
Window size	80 x 25 (to resize, drag the corner of the window)

Configuring HyperTerminal for Serial Console Redirection

HyperTerminal is the Microsoft Windows serial port access utility. To set the size of your console screen appropriately, use Hilgraeve's HyperTerminal Private Edition version 6.3.

To configure HyperTerminal for serial console redirection, perform the following steps:

1. Start the HyperTerminal program.
2. Type a name for the new connection and click **OK**.
3. Next to **Connect using:**, select the COM port on the management station (for example, COM2) to which you have connected the DB-9 null modem cable and click **OK**.
4. Configure the COM port settings as shown in Table 3-11.
5. Click **OK**.
6. Click **File** →**Properties**, and then click the **Settings** tab.
7. Set the **Telnet terminal ID:** to **ANSI**.
8. Click **Terminal Setup** and set **Screen Rows** to **26**.
9. Set **Columns** to 80 and click **OK**.

Table 3-11. Management Station COM Port Settings

Setting Description	Required Setting
Bits per second	57600
Data bits	8
Parity	None
Stop bits	1
Flow control	Hardware

The HyperTerminal window displays a command prompt such as `[DRAC 5\root]#`. When the command prompt appears, your connection is successful and you are ready to connect to the managed system console using the **connect com2** serial command.

Configuring Linux XTerm for Telnet Console Redirection

Use the following guidelines when performing the steps in this section:

- When you are using the **connect com2** command through a telnet console to display the System Setup screens, set the terminal type to **ANSI** in System Setup and for the telnet session.
- To ensure that the text is properly displayed, Dell recommends that you use an Xterm window to display the telnet console instead of the default console provided by the Linux installation.

To run telnet with Linux, perform the following steps:

1. Start a new Xterm session.

   At the command prompt, type `xterm &`

2. Using the mouse arrow, click on the lower right-hand corner of the XTerm window and resize the window to 80 x 25.
3. Connect to the DRAC 5 in the managed system.

   At the Xterm prompt, type `telnet <DRAC 5 IP address>`

Enabling Microsoft Telnet for Telnet Console Redirection

NOTE: Some telnet clients on Microsoft operating systems may not display the BIOS setup screen correctly when BIOS console redirection is set for VT100 emulation. If this issue occurs, update the display by changing BIOS console redirection to ANSI mode. To perform this procedure in the BIOS setup menu, select **Console Redirection** →**Remote Terminal Type** →**ANSI**.

1. Enable **Telnet** in **Windows Component Services**.
2. Connect to the DRAC 5 in the management station.

   Open a command prompt, type the following, and press <Enter>:

   `telnet <IP address>:<port number>`

   where *IP address* is the IP address for the DRAC 5 and *port number* is the telnet port number (if you are using a new port).

Configuring the Backspace Key For Your Telnet Session

Depending on the telnet client, using the <Backspace> key may produce unexpected results. For example, the session may echo `^h`. However, most Microsoft and Linux telnet clients can be configured to use the <Backspace> key.

To configure Microsoft telnet clients to use the <Backspace> key, perform the following steps:

1. Open a command prompt window (if required).
2. If you are not running a telnet session, type:

   ```
   telnet
   ```

   If you are running a telnet session, press <Ctrl><]>.
3. At the prompt, type:

   ```
   set bsasdel
   ```

   The following message appears:

   ```
   Backspace will be sent as delete.
   ```

To configure a Linux telnet session to use the <Backspace> key, perform the following steps:

1. Open a command prompt and type:

   ```
   stty erase ^h
   ```
2. At the prompt, type:

   ```
   telnet
   ```

Using a Serial or Telnet Console

Serial and **telnet** commands, and RACADM CLI can be typed in a serial or telnet console and executed on the server locally or remotely. The local RACADM CLI is installed for use by a root user only.

For more information about the **serial/telnet/ssh** commands and RACADM CLI, see "Using the RACADM Command Line Interface" on page 209.

Running Telnet Using Windows XP or Windows 2003

If your management station is running Windows XP or Windows 2003, you may experience an issue with the characters in a DRAC 5 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 the Microsoft Support website at **support.microsoft.com**. See Microsoft Knowledge Base article 824810 for more information.

Running Telnet Using Windows 2000

If your management station is running Windows 2000, you cannot access BIOS setup by pressing the <F2> key. To fix this issue, use the telnet client supplied with the Windows Services for UNIX® 3.5—a recommended free download from Microsoft. Browse to **www.microsoft.com/downloads/** and search for "*Windows Services for UNIX 3.5*."

4

Configuring the DRAC 5 Using the Web User Interface

The DRAC 5 provides a Web-based interface and RACADM (a command-line interface) that enables you to configure the DRAC 5 properties and users, perform remote management tasks, and troubleshoot a remote (managed) system for problems. For everyday systems management, use the DRAC 5 Web-based interface. This chapter provides information about how to perform common systems management tasks with the DRAC 5 Web-based interface and provides links to related information.

All Web-based interface configuration tasks can also be performed with RACADM. For a list of all RACADM and serial/telnet/ssh console commands that can be used to perform the text-based equivalents of each task, see "Using the RACADM Command Line Interface" on page 209.

See your DRAC 5 online help for context sensitive information about each Web-based interface page.

Accessing the Web-Based Interface

To access the DRAC 5 Web-based interface, perform the following steps:

1. Open a supported Web browser window.

   See "Supported Web Browsers" on page 29 for more information.

2. In the **Address** field, type the following and press <Enter>:

   `https://<IP address>`

   If the default HTTPS port number (port 443) has been changed, type:

   `https://<IP address>:<port number>`

   where *IP address* is the IP address for the DRAC 5 and *port number* is the HTTPS port number.

   The DRAC 5 **Log in** window appears.

Logging In

You can log in as either a DRAC 5 user or as a Microsoft® Active Directory® user. The default user name and password are **root** and **calvin**, respectively.

Before you log in to the DRAC 5, verify that you have **Log In to DRAC 5** permission.

To log in, perform the following steps:

1. In the **User Name** field, type one of the following:
   - Your DRAC 5 user name.

     For example, <*username*>

     The DRAC 5 user name for local users is case sensitive
   - Your Active Directory user name.

     For example, <*domain*>\<*username*>, <*domain*>/<*username*>, or <*user*>@<*domain*>.

     Examples of an Active Directory user name are: **dell.com\john_doe** or **john_doe@dell.com**.

     The Active Directory user name is not case sensitive.
2. In the **Password** field, type your DRAC 5 user password or Active Directory user password.

   This field is case sensitive.
3. Click **OK** or press <Enter>.

Logging Out

1. In the upper-right corner of the DRAC 5 Web-based interface window, click **Log Out** to close the session.
2. Close the browser window.

NOTE: The **Log Out** button does not appear until you log in.

NOTE: Closing the browser without gracefully logging out causes the session to remain open until it times out. It is strongly recommended that you click the logout button to end the session; otherwise, the session remains active until the session timeout is reached.

NOTE: Closing the DRAC 5 Web-based interface within Microsoft Internet Explorer using the close button ("x") at the top right corner of the window may generate an application error. To fix this issue, download the latest Cumulative Security Update for Internet Explorer from the Microsoft Support website, located at support.microsoft.com.

Configuring the DRAC 5 NIC

Configuring the Network and IPMI LAN Settings

NOTE: You must have **Configure DRAC 5** permission to perform the following steps.

NOTE: Most DHCP servers require a server to store a client identifier token in its reservations table. The client (DRAC 5, for example) must provide this token during DHCP negotiation. For RACs, the DRAC 5 supplies the client identifier option using a one-byte interface number (0) followed by a six-byte MAC address.

NOTE: If your managed system DRAC is configured in **Shared** or **Shared with Failover** mode and the DRAC is connected to a switch with Spanning Tree Protocol (STP) enabled, network clients will experience a 20-30 second delay in connectivity when the management station's LOM link state changes during the STP convergence.

1. In the **System** tree, click **Remote Access**.
2. Click the **Configuration** tab and then click **Network**.
3. In the **Network Configuration** page, configure the DRAC 5 NIC settings.

   Table 4-1 and Table 4-2 describes the **Network Settings** and **IPMI Settings** on the **Network Configuration** page.
4. When completed, click **Apply Changes**.
5. Click the appropriate **Network Configuration** page button to continue. See Table 4-3.

Table 4-1. Network Settings

Setting	Description
NIC Selection	Displays the selected NIC mode (**Dedicated**, **Shared with Failover**, or **Shared**). The default setting is **Dedicated**.
MAC Address	Displays the DRAC 5 MAC address.
Enable NIC	Enables the DRAC 5 NIC and activates the remaining controls in this group. The default setting is **Enabled**.
Use DHCP (For NIC IP Address)	Enables Dell OpenManage™ Server Administrator to obtain the DRAC 5 NIC IP address from the Dynamic Host Configuration Protocol (DHCP) server. Selecting the check box deactivates the **Static IP Address**, **Static Gateway**, and **Static Subnet Mask** controls. The default setting is **Disabled**.
Static IP Address	Specifies or edits the static IP address for the DRAC 5 NIC. To change this setting, deselect the **Use DHCP (For NIC IP Address)** check box.
Static Gateway	Specifies or edits the static gateway for the DRAC 5 NIC. To change this setting, deselect the **Use DHCP (For NIC IP Address)** check box.
Static Subnet Mask	Specifies or edits the static subnet mask for the DRAC 5 NIC. To change this setting, deselect the **Use DHCP (For NIC IP Address)** check box.
Use DHCP to obtain DNS server addresses	Obtains the primary and secondary DNS server addresses from the DHCP server instead of the static settings. The default setting is **Disabled**.
Static Preferred DNS Server	Uses the primary DNS server IP address only when **Use DHCP to obtain DNS server addresses** is **not selected**.
Static Alternate DNS Server	Uses the secondary DNS server IP address when **Use DHCP to obtain DNS server addresses** is **not selected**. You may enter an IP address of 0.0.0.0 if you do not have an alternate DNS server.
Register DRAC on DNS	Registers the DRAC 5 name on the DNS server. The default setting is **Disabled**.

Table 4-1. Network Settings *(continued)*

Setting	Description
DNS DRAC Name	Displays the DRAC 5 name only when **Register DRAC 5 on DNS** is selected. The default DRAC 5 name is RAC-*service tag*, where *service tag* is the service tag number of the Dell server (for example, RAC-EK00002).
Use DHCP for DNS Domain Name	Uses the default DNS domain name. When the box is not selected and the **Register DRAC 5 on DNS** option is selected, you can modify the DNS domain name in the **DNS Domain Name** field. The default setting is **Disabled**.
DNS Domain Name	The default DNS domain name is **MYDOMAIN**. When the **Use DHCP for DNS Domain Name** check box is selected, this option is grayed out and you cannot modify this field.
Auto Negotiation	Determines whether the DRAC 5 automatically sets the **Duplex Mode** and **Network Speed** by communicating with the nearest router or hub (**On**) or allows you to set the **Duplex Mode** and **Network Speed** manually (**Off**).
Network Speed	Sets the network speed to 100 Mb or 10 Mb to match your network environment. This option is not available if **Auto Negotiation** is set to **On**.
Duplex Mode	Sets the duplex mode to full or half to match your network environment. This option is not available if **Auto Negotiation** is set to **On**.

Table 4-2. IPMI LAN Settings

Setting	Description
Enable IPMI Over LAN	Enables the IPMI LAN channel.
Channel Privilege Level Limit	Configures the user's maximum privilege level that can be accepted on the LAN channel. Select one of the following options: Administrator, Operator, or User.
Encryption Key	Configures the encryption key character format: 0 to 20 hexadecimal characters (no blanks allowed). The default setting is **0000000000000000000**.

Table 4-2. IPMI LAN Settings *(continued)*

Setting	Description
Enable VLAN ID	Enables the VLAN ID. If enabled, only matched VLAN ID traffic is accepted.
VLAN ID	The VLAN ID field of 802.1g fields.
Priority	The Priority field of 802.1g fields.

Table 4-3. Network Configuration Page Buttons

Button	Description
Print	Prints the **Network Configuration** page
Refresh	Reloads the **Network Configuration** page
Advanced Settings	Displays the **Network Security** page.
Apply Changes	Saves the changes made to the network configuration. **NOTE:** Changes to the NIC IP address settings will close all user sessions and require users to reconnect to the DRAC 5 Web-based interface using the updated IP address settings. All other changes will require the NIC to be reset, which may cause a brief loss in connectivity.

Configuring the Network Security Settings

NOTE: You must have **Configure DRAC 5** permission to perform the following steps.

1. In the **System** tree, click **Remote Access**.
2. Click the **Configuration** tab and then click **Network**.
3. In the **Network Configuration** page, click **Advanced Settings**.
4. In the **Network Security** page, configure the attribute values and then click **Apply Changes**.

   Table 4-4 describes the **Network Security** page settings.
5. Click the appropriate **Network Security** page button to continue. See Table 4-5.

Table 4-4. Network Security Page Settings

Settings	Description
IP Range Enabled	Enables the IP Range checking feature, which defines a specific range of IP addresses that can access the DRAC 5.
IP Range Address	Determines the acceptable IP subnet address.
IP Range Subnet Mask	Defines the significant bit positions in the IP address. The subnet mask should be in the form of a netmask, where the more significant bits are all 1's with a single transition to all zeros in the lower-order bits. For example: **255.255.255.0**
IP Blocking Enabled	Enables the IP address blocking feature, which limits the number of failed login attempts from a specific IP address for a preselected time span.
IP Blocking Fail Count	Sets the number of login failures attempted from an IP address before the login attempts are rejected from that address.
IP Blocking Fail Window	Determines the time span in seconds within which IP Block Fail Count failures must occur to trigger the IP Block Penalty Time.
IP Blocking Penalty Time	The time span in seconds within which login attempts from an IP address with excessive failures are rejected.

Table 4-5. Network Security Page Buttons

Button	Description
Print	Prints the **Network Security** page
Refresh	Reloads the **Network Security** page
Apply Changes	Saves the changes made to the **Network Security** page.
Go Back to Network Configuration Page	Returns to the **Network Configuration** page.

Adding and Configuring DRAC 5 Users

To manage your system with the DRAC 5 and maintain system security, create unique users with specific administrative permissions (or *role-based authority*). For additional security, you can also configure alerts that are e-mailed to specific users when a specific system event occurs.

To add and configure DRAC 5 users, perform the following steps:

NOTE: You must have Configure DRAC 5 permission to perform the following steps.

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Users**.

   The **Users** page appears, which includes each user's **State**, **User Name, RAC Privilege**, **IPMI LAN Privilege**, **IPMI Serial Privilege** and **Serial Over LAN**.
3. In the **User ID** column, click a user ID number.
4. On the **User Main Menu** page, you can configure users, upload a user certificate, view an existing user certificate, upload a trusted certification authority (CA) certificate, or view a trusted CA certificate.

   If you select **Configure User** and click **Next**, the User Configuration page is displayed. See step 5 for more information.

   See Table 4-6 if you select the options under the **Smart Card Configuration** section.
5. In the **User Configuration** page, configure the user's properties and privileges.

   Table 4-7 describes the **General** settings for configuring a new or existing DRAC username and password.

   Table 4-8 describes the **IPMI User Privileges** for configuring the user's LAN privileges.

   Table 4-9 describes the **User Group Permissions** for the **IPMI User Privileges** and the **DRAC User Privileges** settings.

   Table 4-10 describes the **DRAC Group** permissions. If you add a DRAC User Privilege to the Administrator, Power User, or Guest User, the **DRAC Group** will change to the **Custom** group.
6. When completed, click **Apply Changes**.
7. Click the appropriate **User Configuration** page button to continue. See Table 4-11.

Table 4-6. Options in the Smart Card Configuration section

Option	Description
Upload User Certificate	Enables you to upload the user certificate to DRAC and import it to the user profile.
View User Certificate	Displays the user certificate page that has been uploaded to the DRAC.
Upload Trusted CA Certificate	Enables you to upload the trusted CA certificate to DRAC and import it to the user profile.
View Trusted CA Certificate	Displays the trusted CA certificate that has been uploaded to the DRAC. The trusted CA certificate is issued by the CA who is authorized to issue certificates to users.

Table 4-7. General Properties

Property	Description
User ID	Specifies one of 16 preset User ID numbers. If you are editing information for user root, this field is static. You cannot edit the username for root.
Enable User	Enables the user to access the DRAC 5. When unchecked, the User Name cannot be changed.
User Name	Specifies a DRAC 5 user name with up to 16 characters. Each user must have a unique user name. **NOTE:** User names on the local DRAC 5 cannot include the **/** (forward slash) or **.** (period) characters. **NOTE:** If the user name is changed, the new name will not appear in the user interface until the next user login.
Change Password	Enables the **New Password** and **Confirm New Password** fields. When unchecked, the user's **Password** cannot be changed.
New Password	Specifies or edits the DRAC 5 user's password.
Confirm New Password	Requires you to retype the DRAC 5 user's password to confirm.

Table 4-8. IPMI User Privileges

Property	Description
Maximum LAN User Privilege Granted	Specifies the user's maximum privilege on the IPMI LAN channel to one of the following user groups: **Administrator**, **Operator**, **User**, or **None**.
Maximum Serial Port User Privilege Granted	Specifies the user's maximum privilege on the IPMI Serial channel to one of the following: **Administrator**, **Operator**, **User**, or **None**.
Enable Serial Over LAN	Allows user to use IPMI Serial Over LAN. When checked, this privilege is enabled.

Table 4-9. DRAC User Privileges

Property	Description
DRAC Group	Specifies the user's maximum DRAC user privilege to one of the following: **Administrator**, **Power User**, **Guest User**, **None**, or **Custom**. See Table 4-10 for **DRAC Group** permissions.
Login to DRAC	Enables the user to log in to the DRAC.
Configure DRAC	Enables the user to configure the DRAC.
Configure Users	Enables the user to allow specific users to access the system.
Clear Logs	Enables the user to clear the DRAC logs.
Execute Server Control Commands	Enables the user to execute racadm commands.
Access Console Redirection	Enables the user to run Console Redirection.
Access Virtual Media	Enables the user to run and use Virtual Media.
Test Alerts	Enables the user to send test alerts (e-mail and PET) to a specific user.
Execute Diagnostic Commands	Enables the user to run diagnostic commands.

Table 4-10. DRAC Group Permissions

User Group	Permissions Granted
Administrator	Login to DRAC, Configure DRAC, Configure Users, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts, Execute Diagnostic Commands
Power User	Login to DRAC, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts
Guest User	Login to DRAC
Custom	Selects any combination of the following permissions: **Login to DRAC**, **Configure DRAC**, **Configure Users**, **Clear Logs**, **Execute Server Action Commands**, **Access Console Redirection**, **Access Virtual Media**, **Test Alerts**, **Execute Diagnostic Commands**
None	No assigned permissions

Table 4-11. User Configuration Page Buttons

Button	Action
Print	Prints the **User Configuration** page
Refresh	Reloads the **User Configuration** page
Go Back To Users Page	Returns to the **Users Page**.
Apply Changes	Saves the changes made to the network configuration.

Configuring and Managing Active Directory Certificates (Standard Schema and Extended Schema)

NOTE: You must have **Configure DRAC 5** permission to configure Active Directory and upload, download, and view an Active Directory certificate.

NOTE: For more information about Active Directory configuration and how to configure Active Directory with Standard Schema or Extended Schema, see "Using the DRAC 5 With Microsoft Active Directory" on page 137.

Use the Microsoft® Active Directory® service to configure your software to provide access to the DRAC 5. The service allows you to add and control the DRAC5 user privileges of your existing users.

See "Using the DRAC 5 With Microsoft Active Directory" on page 137 for more information.

To access the Active Directory Main Menu:

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and click **Active Directory**.

Table 4-12 lists the **Active Directory Main Menu** page options. The buttons in Table 4-13 are available on the **Active Directory Main Menu** page.

Table 4-12. Active Directory Main Menu Page Options

Field	Description
Configure Active Directory	Configures the Active Directory's DRAC Name, ROOT Domain Name, DRAC Domain Name, Active Directory Authentication Timeout, Active Directory Schema Selection, and Role Group settings.
Upload Active Directory CA Certificate	Uploads an Active Directory certificate to the DRAC.
Download DRAC Server Certificate	The Windows Download Manager enables you to download a DRAC server certificate to your system.
View Active Directory CA Certificate	Displays the Active Directory Certificate that has been uploaded to the DRAC.

Table 4-13. Active Directory Main Menu Page Buttons

Button	Definition
Print	Prints the contents of the open window to your default printer
Next	Go to the next selected **Option** page.

Configuring Active Directory (Standard Schema and Extended Schema)

1. In the **Active Directory Main Menu** page, select **Configure Active Directory** and click **Next**.
2. In the **Active Directory Configuration and Management** page, enter the Active Directory settings.

   Table 4-14 describes the **Active Directory Configuration and Management** page settings.
3. Click **Apply** to save the settings.
4. Click the appropriate **Active Directory Configuration** page button to continue. See Table 4-15.
5. To configure the Role Groups for Active Directory Standard Schema, click on the individual Role Group (1-5). See Table 4-16 and Table 4-17.

NOTE: To save the settings on the **Active Directory Configuration and Management** page, you have to click **Apply** before proceeding to the **Custom Role Group** page.

Table 4-14. Active Directory Configuration and Management Page Settings

Setting	Description
Enable Active Directory	Enables Active Directory. Checked=Enabled; Unchecked=Disabled.
ROOT Domain Name	The Active Directory ROOT domain name. This value is **NULL** by default. The name must be a valid domain name consisting of *x.y*, where *x* is a 1-254 character ASCII string with no blank spaces between characters, and *y* is a valid domain type such as com, edu, gov, int, mil, net, org.

Table 4-14. Active Directory Configuration and Management Page Settings *(continued)*

Setting	Description
Timeout	The time in seconds to wait for Active Directory queries to complete. Minimum value is equal to or greater than 15 seconds. The default value is 120 seconds.
Use Standard Schema	Uses Standard Schema with Active Directory
Use Extended Schema	Uses Extended Schema with Active Directory
DRAC Name	The name that uniquely identifies the DRAC 5 card in Active Directory. This value is **NULL** by default. The name must be a 1-254 character ASCII string with no blank spaces between characters.
DRAC Domain Name	The DNS name (string) of the domain, where the Active Directory DRAC 5 object resides. This value is **NULL** by default. The name must be a valid domain name consisting of *x.y*, where *x* is a 1-254 character ASCII string with no blank spaces between characters, and *y* is a valid domain type such as com, edu, gov, int, mil, net, org.
Role Groups	The list of role groups associated with the DRAC 5 card. To change the settings for a role group, click their role group number, in the role groups list. The **Configure Role Group** window displays. **NOTE:** If you click on the role group link prior to applying the settings for the **Active Directory Configuration and Management** page, you will lose these settings.
Group Name	The name that identifies the role group in the Active Directory associated with the DRAC 5 card.
Group Domain	The domain that the group is in.
Group Privilege	The privilege level for the group.

Table 4-15. Active Directory Configuration and Management Page Buttons

Button	Description
Print	Prints the **Active Directory Configuration and Management** page.
Apply	Saves the changes made to the **Active Directory Configuration and Management** page.
Go Back to Active Directory Main Menu	Returns to the **Active Directory Main Menu** page.

Table 4-16. Role Group Privileges

Setting	Description
Role Group Privilege Level	Specifies the user's maximum DRAC user privilege to one of the following: Administrator, Power User, Guest user, None, or Custom. See Table 4-17 for **Role Group** permissions
Login to DRAC	Enables the user to log in to the DRAC.
Configure DRAC	Enables the user to configure the DRAC.
Configure Users	Enables the user to allow specific users to access the system.
Clear Logs	Enables the user to clear the DRAC logs.
Execute Server Control Commands	Enables the user to execute racadm commands.
Access Console Redirection	Enables the user to run Console Redirection.
Access Virtual Media	Enables the user to run and use Virtual Media.
Test Alerts	Enables the user to send test alerts (e-mail and PET) to a specific user.
Execute Diagnostic Commands	Enables the user to run diagnostic commands.

Table 4-17. Role Group Permissions

Property	Description
Administrator	Login to DRAC, Configure DRAC, Configure Users, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts, Execute Diagnostic Commands
Power User	Login to DRAC, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts
Guest User	Login to DRAC
Custom	Selects any combination of the following permissions: Login to DRAC, Configure DRAC, Configure Users, Clear Logs, Execute Server Action Commands, Access Console Redirection, Access Virtual Media, Test Alerts, Execute Diagnostic Commands
None	No assigned permissions

Uploading an Active Directory CA Certificate

1. In the **Active Directory Main Menu** page, select **Upload Active Directory CA Certificate** and click **Next**.
2. In the **Certificate Upload page,** in the **File Path** field, type the file path of the certificate or click **Browse** to navigate to the certificate file.

NOTE: The **File Path** value displays the relative file path of the certificate you are uploading. You must type the absolute file path, which includes the full path and the complete file name and file extension.

3. Click **Apply**.
4. Click the appropriate **Certificate Upload** page button to continue. See Table 4-18.

Table 4-18. Certificate Upload Page Buttons

Button	Description
Print	Print the **Certificate Upload** page.
Go Back to Active Directory Main Menu	Return to the **Active Directory Main Menu** page.
Apply	Apply the certificate to the DRAC 5 firmware.

Downloading a DRAC Server Certificate

1. In the **Active Directory Main Menu** page, select **Download DRAC Server Certificate** and click **Next**.
2. In the **File Download** window, click **Save** and save the file to a directory on your system.
3. In the **Download Complete** window, click **Close**.

Viewing an Active Directory CA Certificate

Use the **Active Directory Main Menu** page to view a CA server certificate for your DRAC 5.

1. In the **Active Directory Main Menu** page, select **View Active Directory CA Certificate** and click **Next**.

   Table 4-19 describes the fields and associated descriptions listed in the **Certificate** window.

   Table 4-20 describes the available page buttons on the **View Active Directory CA Certificate** page.
2. Click the appropriate **View Active Directory CA Certificate** page button to continue. See Table 4-20.

Table 4-19. Active Directory CA Certificate Information

Field	Description
Serial Number	Certificate serial number.
Subject Information	Certificate attributes entered by the subject.
Issuer Information	Certificate attributes returned by the issuer.
Valid From	Certificate issue date.
Valid To	Certificate expiration date.

Table 4-20. View Active Directory CA Certificate Page Buttons

Button	Description
Print	Prints the **Active Directory CA Certificate**.
Go Back to Active Directory Main Menu	Returns to the **Active Directory Main Menu** page.

Securing DRAC 5 Communications Using SSL and Digital Certificates

This subsection provides information about the following data security features that are incorporated in your DRAC 5:

- Secure Sockets Layer (SSL)
- Certificate Signing Request (CSR)
- Accessing the SSL main menu
- Generating a new CSR
- Uploading a server certificate
- Viewing a server certificate

Secure Sockets Layer (SSL)

The DRAC includes a Web server that is configured to use the industry-standard SSL security protocol to transfer encrypted data over the Internet. Built upon public-key and private-key encryption technology, SSL is a widely accepted technique for providing authenticated and encrypted communication between clients and servers to prevent eavesdropping across a network.

SSL allows an SSL-enabled system to perform the following tasks:

- Authenticate itself to an SSL-enabled client
- Allow the client to authenticate itself to the server
- Allow both systems to establish an encrypted connection

This encryption process provides a high level of data protection. The DRAC employs the 128-bit SSL encryption standard, the most secure form of encryption generally available for Internet browsers in North America.

The DRAC Web server includes a Dell self-signed SSL digital certificate (Server ID). To ensure high security over the Internet, replace the Web server SSL certificate by submitting a request to the DRAC to generate a new Certificate Signing Request (CSR).

Certificate Signing Request (CSR)

A CSR is a digital request to a Certificate Authority (CA) for a secure server certificate. Secure server certificates ensure the identity of a remote system and ensure that information exchanged with the remote system cannot be viewed or changed by others. To ensure the security for your DRAC, it is strongly recommended that you generate a CSR, submit the CSR to a CA, and upload the certificate returned from the CA.

A Certificate Authority is a business entity that is recognized in the IT industry for meeting high standards of reliable screening, identification, and other important security criteria. Examples of CAs include Thawte and VeriSign. After the CA receives your CSR, they review and verify the information the CSR contains. If the applicant meets the CA's security standards, the CA issues a certificate to the applicant that uniquely identifies that applicant for transactions over networks and on the Internet.

After the CA approves the CSR and sends you a certificate, you must upload the certificate to the DRAC firmware. The CSR information stored on the DRAC firmware must match the information contained in the certificate.

Accessing the SSL Main Menu

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **SSL**.

Use the **SSL Main Menu** page options (see Table 4-21) to generate a CSR to send to a CA. The CSR information is stored on the DRAC 5 firmware. The buttons in Table 4-22 are available on the **SSL Main Menu** page.

Table 4-21. SSL Main Menu Options

Field	Description
Generate a New Certificate Signing Request (CSR)	Click **Next** to open the **Certificate Signing Request Generation** page that enables you to generate a CSR to send to a CA to request a secure Web certificate. **NOTICE:** Each new CSR overwrites any pervious CSR on the firmware. For a CA to accept your CSR, the CSR in the firmware must match the certificate returned from the CA.
Upload Server Certificate	Click **Next** to upload an existing certificate that your company has title to, and uses to control access to the DRAC 5. **NOTICE:** Only X509, Base 64 encoded certificates are accepted by the DRAC 5. DER encoded certificates are not accepted. Upload a new certificate to replace the default certificate you received with your DRAC 5.
View Server Certificate	Click **Next** to view an existing server certificate.

Table 4-22. SSL Main Menu Buttons

Button	Description
Print	Prints the **SSL Main Menu** page.
Next	Navigates to the next page.

Generating a New Certificate Signing Request

NOTE: Each new CSR overwrites any previous CSR on the firmware. Before a certificate authority (CA) can accept your CSR, the CSR in the firmware must match the certificate returned from the CA. Otherwise, the DRAC 5 will not upload the certificate.

1. In the **SSL Main Menu** page, select **Generate a New Certificate Signing Request (CSR)** and click **Next**.
2. In the **Generate Certificate Signing Request (CSR)** page, type a value for each CSR attribute value.

   Table 4-23 describes the **Generate Certificate Signing Request (CSR)** page options.

3 Click **Generate** to save or view the CSR.

4 Click the appropriate **Generate Certificate Signing Request (CSR)** page button to continue. See Table 4-24.

Table 4-23. Generate Certificate Signing Request (CSR) Page Options

Field	Description
Common Name	The exact name being certified (usually the Web server's domain name, for example, **www.xyzcompany.com**). Only alphanumeric characters, hyphens, underscores, and periods are valid. Spaces are not valid.
Organization Name	The name associated with this organization (for example, XYZ Corporation). Only alphanumeric characters, hyphens, underscores, periods and spaces are valid.
Organization Unit	The name associated with an organizational unit, such as a department (for example, Enterprise Group). Only alphanumeric characters, hyphens, underscores, periods, and spaces are valid.
Locality	The city or other location of the entity being certified (for example, Round Rock). Only alphanumeric characters and spaces are valid. Do not separate words using an underscore or some other character.
State Name	The state or province where the entity who is applying for a certification is located (for example, Texas). Only alphanumeric characters and spaces are valid. Do not use abbreviations.
Country Code	The name of the country where the entity applying for certification is located. Use the drop-down menu to select the country.
Email	The e-mail address associated with the CSR. You can type your company's e-mail address, or any e-mail address you desire to have associated with the CSR. This field is optional.

Table 4-24. Generate Certificate Signing Request (CSR) Page Buttons

Button	Description
Print	Print the **Generate Certificate Signing Request (CSR)** page.
Go Back to Security Main Menu	Return to the **SSL Main Menu** page.
Generate	Generate a CSR.

Uploading a Server Certificate

1. In the **SSL Main Menu** page, select **Upload Server Certificate** and click **Next**.

   The **Certificate Upload** page appears.

2. In the **File Path** field, type the path of the certificate in the **Value** field or click **Browse** to navigate to the certificate file.

NOTE: The **File Path** value displays the relative file path of the certificate you are uploading. You must type the absolute file path, which includes the full path and the complete file name and file extension

3. Click **Apply**.
4. Click the appropriate page button to continue. See Table 4-25.

Table 4-25. Certificate Upload Page Buttons

Button	Description
Print	Print the **Certificate Upload** page.
Go Back to SSL Main Menu	Return to the **SSL Main Menu** page.
Apply	Apply the certificate to the DRAC 5 firmware.

Viewing a Server Certificate

1. In the **SSL Main Menu** page, select **View Server Certificate** and click **Next**.

   Table 4-26 describes the fields and associated descriptions listed in the **Certificate** window.

2. Click the appropriate **View Server Certificate** page button to continue. See Table 4-27.

Table 4-26. Certificate Information

Field	Description
Serial Number	Certificate serial number
Subject Information	Certificate attributes entered by the subject
Issuer Information	Certificate attributes returned by the issuer
Valid From	Issue date of the certificate
Valid To	Expiration date of the certificate

Table 4-27. View Server Certificate Page Buttons

Button	Description
Print	Print the **View Server Certificate** page.
Go Back to SSL Main Menu	Return to the **SSL Main Menu** page.

Configuring Serial and Terminal Modes

Configuring IPMI and RAC Serial

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Serial**.
3. Configure the IPMI serial settings.

   Table 4-28 provides information about the IPMI serial settings.
4. Configure the RAC serial settings.

   Table 4-29 provides information about the RAC serial settings.
5. Click **Apply Changes**.
6. Click the appropriate **Serial Configuration** page button to continue. See Table 4-30.

Table 4-28. IPMI Serial Settings

Setting	Description
Connection Mode Setting	• Direct Connect Basic Mode - IPMI Serial Basic Mode • Direct Connect Terminal Mode - IPMI Serial Terminal Mode
Baud Rate	Sets the data speed rate. Select 9600 bps, 19.2 kbps, 57.6 kbps, or 115.2 kbps.
Flow Control	• None — Hardware Flow Control Off • RTS/CTS — Hardware Flow Control On
Channel Privilege Level Limit	• Administrator • Operator • User

Table 4-29. RAC Serial Settings

Setting	Description
Enabled	Enables or disables the RAC serial console. Checked=Enabled; Unchecked=Disabled
Maximum Sessions	The maximum number of simultaneous sessions allowed for this system.
Timeout	The maximum number of seconds of line idle time before the line is disconnected. The range is 60 to 1920 seconds. Default is 300 seconds. Use 0 seconds to disable the Timeout feature.
Redirect Enabled	Enables or disables Console Redirection. Checked=Enabled; Unchecked=Disabled
Baud Rate	The data speed on the external serial port. Values are 9600 bps, 28.8 kbps, 57.6 kbps, and 115.2 kbps. Default is 57.6 kbps.
Escape Key	Specifies the <Esc> key. The default are the ^\ characters.

Table 4-29. RAC Serial Settings *(continued)*

Setting	Description
History Buffer Size	The size of the serial history buffer, which holds the last characters written to the console. The maximum and default = 8192 characters.
Login Command	The DRAC command line to be executed upon valid login.

Table 4-30. Serial Configuration Page Settings

Button	Description
Print	Print the **Serial Configuration** page.
Refresh	Refresh the **Serial Configuration** page.
Apply Changes	Apply the IPMI and RAC serial changes.
Terminal Mode Settings	Opens the **Terminal Mode Settings** page.

Configuring Terminal Mode

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Serial**.
3. In the **Serial Configuration** page, click **Terminal Mode Settings**.
4. Configure the terminal mode settings.

   Table 4-31 provides information about the terminal mode settings.
5. Click **Apply Changes**.
6. Click the appropriate **Terminal Mode Settings** page button to continue. See Table 4-32.

Table 4-31. Terminal Mode Settings

Setting	Description
Line Editing	Enables or disables line editing.
Delete Control	Select one of the following: • BMC outputs a <bksp><sp><bksp> character when <bksp> or <del> is received — • BMC outputs a <del> character when <bksp> or <del> is received —
Echo Control	Enables or disables echo.
Handshaking Control	Enables or disables handshaking.
New Line Sequence	Select None, <CR-LF>, <NULL>, <CR>, <LF-CR>, or <LF>.
Input New Line Sequence	Select <CR> or <NULL>.

Table 4-32. Terminal Mode Settings Page Buttons

Button	Description
Print	Print the Terminal Mode Settings page.
Refresh	Refresh the Terminal Mode Settings page.
Go Back to Serial Port Configuration	Return to the Serial Port Configuration page.
Apply Changes	Apply the terminal mode settings changes.

Configuring Serial Over LAN

NOTE: For complete Serial Over LAN information, see the *Dell OpenManage Baseboard Management Controller User's Guide*.

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Serial Over LAN**.
3. Configure the Serial Over LAN settings.

   Table 4-33 provides information about the **Serial Over LAN Configuration** page settings.

4 Click **Apply Changes**.

5 Configure the advanced settings, if required. Otherwise, click the appropriate **Serial Over LAN Configuration** page button to continue (see Table 4-34).

To configure the advanced settings, perform the following steps:

a Click **Advanced Settings**.

b In the **Serial Over LAN Configuration Advanced Settings** page, configure the advanced settings as required. See Table 4-35.

c Click **Apply Changes**.

d Click the appropriate **Serial Over LAN Configuration Advanced Settings** page button to continue. See Table 4-36.

Table 4-33. Serial Over LAN Configuration Page Settings

Setting	Description
Enable Serial Over LAN	Enables Serial Over LAN. Checked=Enabled; Unchecked=Disabled.
Baud Rate	The IPMI data speed. Select **9600 bps**, **19.2 kbps**, **57.6 kbps**, or **115.2 kbps**.
Channel Privilege Level Limit	Sets the IPMI Serial Over LAN minimum user privilege: **Administrator**, **Operator**, or **User**.

Table 4-34. Serial Over LAN Configuration Page Buttons

Button	Description
Print	Prints the **Serial Over LAN Configuration** page.
Refresh	Refreshes the **Serial Over LAN Configuration** page.
Advanced Settings	Opens the **Serial Over LAN Configuration Advanced Settings** page.
Apply Changes	Applies the **Serial Over LAN Configuration** page settings.

Table 4-35. Serial Over LAN Configuration Advanced Settings Page Settings

Setting	Description
Character Accumulate Interval	The amount of time that the BMC will wait before transmitting a partial SOL character data package. 1-based 5ms increments.
Character Send Threshold	The BMC will send an SOL character data package containing the characters as soon as this number of characters (or greater) has been accepted. 1-based units.

Table 4-36. Serial Over LAN Configuration Advanced Settings Page Buttons

Button	Description
Print	Prints the **Serial Over LAN Configuration Advanced Settings** page.
Refresh	Refreshes the **Serial Over LAN Configuration Advanced Settings** page.
Go Back To Serial Over LAN Configuration Page	Returns to the **Serial Over LAN Configuration** page.
Apply Changes	Applies the **Serial Over LAN Configuration Advanced Settings** page settings.

Configuring Services

NOTE: To modify these settings, you must have **Configure DRAC 5** permission. Additionally, the remote RACADM command-line utility can only be enabled if the user is logged in as **root**.

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Services**.
3. Configure the following services as required:
   - Local Configuration (Table 4-37)
   - Web server (Table 4-38)
   - SSH (Table 4-39)
   - Telnet (Table 4-40)

- Remote RACADM (Table 4-41)
- SNMP agent (Table 4-42)
- Automated System Recovery Agent (Table 4-43)

Use the **Automated Systems Recovery Agent** to enable the **Last Crash Screen** functionality of the DRAC 5.

NOTE: Server Administrator must be installed with its **Auto Recovery** feature activated by setting the **Action** to either: **Reboot System**, **Power Off System**, or **Power Cycle System**, for the **Last Crash Screen** to function in the DRAC 5.

4 Click **Apply Changes**.

5 Click the appropriate **Services** page button to continue. See Table 4-44.

Table 4-37. Local Configuration Settings

Setting	Description
Disable the DRAC local configuration using option ROM	Disables local configuration of the DRAC 5 using option ROM. The option ROM prompts you to enter the setup module by pressing <Ctrl+E> during system reboot.
Disable the DRAC local configuration using RACADM	Disables local configuration of the DRAC 5 using local RACADM.

Table 4-38. Web Server Settings

Setting	Description
Enabled	Enables or disables the Web server. Checked=Enabled; Unchecked=Disabled.
Max Sessions	The maximum number of simultaneous sessions allowed for this system.
Active Sessions	The number of current sessions on the system, less than or equal to the **Max Sessions**.
Timeout	The time in seconds that a connection is allowed to remain idle. The session is cancelled when the timeout is reached. Changes to the timeout setting do not affect the current session. When you change the timeout setting, you must log out and log in again to make the new setting effective. Timeout range is 60 to 1920 seconds.

Table 4-38. Web Server Settings *(continued)*

Setting	Description
HTTP Port Number	The port used by the DRAC that listens for a server connection. The default setting is **80**.
HTTPS Port Number	The port used by the DRAC that listens for a server connection. The default setting is **443**.

Table 4-39. SSH Settings

Setting	Description
Enabled	Enables or disables SSH. Checked=Enabled; Unchecked=Disabled.
Max Sessions	The maximum number of simultaneous sessions allowed for this system. Up to four sessions are supported.
Active Sessions	The number of current sessions on the system, less than or equal to the **Max Sessions**.
Timeout	The Secure Shell idle timeout, in seconds. Range = 60 to 1920 seconds. Enter 0 seconds to disable the Timeout feature. The default setting is 300.
Port Number	The port used by the DRAC that listens for a server connection. The default setting is 22.

Table 4-40. Telnet Settings

Setting	Description
Enabled	Enables or disables Telnet. Checked=Enabled; Unchecked=Disabled.
Max Sessions	The maximum number of simultaneous sessions allowed for this system. Up to four sessions are supported.
Active Sessions	The number of current sessions on the system, less than or equal to the **Max Sessions**.
Timeout	The Secure Shell idle timeout, in seconds. Range = 60 to 1920 seconds. Enter 0 seconds to disable the Timeout feature. The default setting is 0.
Port Number	The port used by the DRAC that listens for a server connection. The default setting is 23.

Table 4-41. Remote RACADM Settings

Setting	Description
Enabled	Enables or disables remote RACADM. Checked=Enabled; Unchecked=Disabled.
Max Sessions	The maximum number of simultaneous sessions allowed for this system. Up to four sessions are supported.
Active Sessions	The number of current sessions on the system, less than or equal to the **Max Sessions**.

Table 4-42. SNMP Agent Settings

Setting	Description
Enabled	Enables or disables the SNMP agent. Checked=Enabled; Unchecked=Disabled.
Community Name	The name of the community that contains the IP address for the SNMP Alert destination. The Community Name can be up to 31 non-blank characters in length. The default setting is **public**.

Table 4-43. Automated System Recovery Agent Setting

Setting	Description
Enabled	Enables the Automated System Recovery Agent.

Table 4-44. Services Page Buttons

Button	Description
Print	Prints the **Services** page.
Refresh	Refreshes the **Services** page.
Apply Changes	Applies the **Services** page settings.

Configuring Smart Card

NOTE: To modify these settings, you must have **Configure DRAC 5** permission.

NOTE: For more information about the Smart Card, see the white paper on the Dell website at **www.dell.com/openmanage**.

1. Expand the **System** tree and click **Remote Access**.
2. Click the **Configuration** tab and then click **Smart Card**.
3. Configure the Smart Card logon settings.

   Table 4-45 provides information about the **Smart Card** page settings.
4. Click **Apply Changes**.

Table 4-45. Smart Card Settings

Setting	Description
Configure Smart Card Logon	• Disabled — Disables Smart Card logon. Subsequent logins from the graphical user interface (GUI) display the regular login page. All command line out-of-band interfaces including secure shell (SSH), Telnet, Serial, and remote RACADM are set to their default state. • Enabled — Enables Smart Card logon. After applying the changes, logout, insert your Smart Card and then click **Login** to enter your Smart Card PIN. Enabling Smart Card logon disables all CLI out-of-band interfaces including SSH, Telnet, Serial, remote RACADM, and IPMI over LAN. • Enabled with Remote Racadm — Enables Smart Card logon along with remote RACADM. All other CLI out-of-band interfaces are disabled. **NOTE:** The Smart Card logon requires you to configure the local DRAC 5 users with the appropriate certificates. If the Smart Card logon is used to log in a Microsoft Active Directory user, then you must ensure that you configure the Active Directory user certificate for that user. You can configure the user certificate in the **Users→ User Main Menu** page.

Table 4-45. Smart Card Settings *(continued)*

Setting	Description
Enable CRL check for Smart Card Logon	This check is available only for Active Directory login users. Select this option if you want the DRAC 5 to check the Certificate Revocation List (CRL) for revocation of the user's Smart Card certificate. The user will not be able to login if: • The user certificate is listed as revoked in the CRL file. • DRAC is not able to communicate with the CRL distribution server. • DRAC is not able to download the CRL. **NOTE:** You must correctly configure the IP address of the DNS server in the **Configuration→Network** page for this check to succeed.

Frequently Asked Questions

Table 4-46 lists frequently asked questions and answers.

Table 4-46. Managing and Recovering a Remote System: Frequently Asked Questions

Question	Answer
When accessing the DRAC 5 Web-based interface, I get a security warning stating the hostname of the SSL certificate does not match the hostname of the DRAC 5.	The DRAC 5 includes a default DRAC 5 server certificate to ensure network security for the Web-based interface and remote racadm features. When this certificate is used, the Web browser displays a security warning because the default certificate is issued to **DRAC5 default certificate** which does not match the host name of the DRAC 5 (for example, the IP address). To address this security concern, upload a DRAC 5 server certificate issued to the IP address of the DRAC 5. 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 the DRAC 5 (for example, 192.168.0.120) or the registered DNS DRAC name. To ensure that the CSR matches the registered DNS DRAC name, perform the following steps: **1** In the **System** tree, click **Remote Access**. **2** Click the **Configuration** tab and then click **Network**. **3** In the **Network Settings** page, perform the following steps: **a** Select the **Register DRAC on DNS** checkbox. **b** In the **DNS DRAC Name** field, enter the DRAC name. **4** Click **Apply Changes**. See "Securing DRAC 5 Communications Using SSL and Digital Certificates" on page 108 for more information about generating CSRs and issuing certificates.

Table 4-46. Managing and Recovering a Remote System: Frequently Asked Questions *(continued)*

Question	Answer
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-based interface to become available after the DRAC 5 Web server resets. The DRAC 5 Web server is reset after the following occurrences: • When changing the network configuration or network security properties using the DRAC 5 web user interface • When the **cfgRacTuneHttpsPort** property is changed (including when a config -f <*config file*> changes it) • When **racresetcfg** is used • When the DRAC 5 is reset • When a new SSL server certificate is uploaded
Why doesn't my DNS server register my DRAC 5?	Some DNS servers only register names of 31 characters or fewer.
When accessing the DRAC 5 Web-based interface, I get a security warning stating the SSL certificate was issued by a certificate authority (CA) that is not trusted.	DRAC 5 includes a default DRAC 5 server certificate to ensure network security for the Web-based interface and remote racadm features. This certificate was not issued by a trusted CA. To address this security concern, upload a DRAC 5 server certificate issued by a trusted CA (for example, Thawte or Verisign). See "Securing DRAC 5 Communications Using SSL and Digital Certificates" on page 108 for more information about issuing certificates.

Table 4-46. Managing and Recovering a Remote System: Frequently Asked Questions *(continued)*

Question	Answer

The following message is displayed for unknown reasons:
`Remote Access: SNMP Authentication Failure`
Why does this happen?
	As part of discovery, IT Assistant attempts to verify the device's get and set community names. In IT Assistant, you have the get **community name = public** and the set **community name = private.** By default, the community name for the DRAC 5 agent is public. When IT Assistant sends out a set request, the DRAC 5 agent generates the SNMP authentication error because it will only accept requests from **community = public**.
	You can change the DRAC 5 community name using RACADM.
	To see the DRAC 5 community name, use the following command:
	`racadm getconfig -g cfgOobSnmp`
	To set the DRAC 5 community name, use the following command:
	`racadm config -g cfgOobSnmp -o cfgOobSnmpAgentCommunity <community name>`
	To prevent SNMP authentication traps from being generated, you must input community names that will be accepted by the agent. Since the DRAC 5 only allows one community name, you must input the same **get** and **set** community name for IT Assistant discovery setup.

5

Recovering and Troubleshooting the Managed System

This section explains how to perform tasks related to recovering and troubleshooting a crashed remote system using the DRAC 5 Web-based interface. For information about troubleshooting your DRAC 5, see "Deploying Your Operating System Using VM-CLI" on page 227.

- Troubleshooting a remote system
- Managing power on a remote system
- Using the System Event Log (SEL)
- Viewing the Last System Crash screen
- Using the RAC Log
- Using the Diagnostic Console

First Steps to Troubleshoot a Remote System

The following questions are commonly used to troubleshoot high-level problems in the managed system:

1. Is the system powered on or off?
2. If powered on, is the operating system functioning, crashed, or just frozen?
3. If powered off, did the power turn off unexpectedly?

For crashed systems, check the last crash screen (see "Viewing the Last System Crash Screen" on page 132), and use console redirection (see "Supported Screen Resolutions Refresh Rates on the Managed System" on page 170) and remote power management (see "Managing Power on a Remote System" on page 128) to restart the system and watch the reboot process.

Managing Power on a Remote System

The DRAC 5 enables you to remotely perform several power management actions on the managed system so you can recover after a system crash or other system event.

Use the **Power Management** page to do the following:

- Perform an orderly shutdown through the operating system when rebooting, and power the system on or off.
- View the system's current **Power Status**—either **ON** or **OFF**.

To access the **Power Management** page from the **System** tree, click **System** and then click the **Power Management** tab.

NOTE: You must have **Execute Server Action Commands** permission to perform power management actions.

Selecting Power Control Actions

1. Select one of the following **Power Control Actions**.
   - **Power On System**— Turns on the system power (equivalent to pressing the power button when the system power is off).
   - **Power Off System**— Turns off the system power (equivalent to pressing the power button when the system power is on).
   - **Reset System**— Resets the system (equivalent to pressing the reset button); the power is not turned off by using this function.
   - **Power Cycle System**— Power off, then reboot (cold boot) the system.
2. Click **Apply** to perform the power management action (for example, cause the system to power cycle).
3. Click the appropriate **Power Management** page button to continue (see Table 5-1).

Table 5-1. Power Management Page Buttons (Top Right)

Button	Action
Print	Prints the **Power Management** page
Refresh	Reloads the **Power Management** page

Viewing System Information

The **System Summary** page displays information about the following system components:

- Main System Chassis
- Remote Access Controller
- Baseboard Management Controller

To access the system information, expand the **System** tree and click **Properties**.

Main System Chassis

Table 5-2 and Table 5-3 describes the main system chassis properties.

NOTE: To receive **Host Name** and **OS Name** information, you must have DRAC 5 services installed on the managed system.

Table 5-2. System Information Fields

Field	Description
Description	System description.
BIOS Version	System BIOS version.
Service Tag	System Service Tag number.
Host Name	Host system's name.
OS Name	Operating system running on the system.

Table 5-3. Auto Recovery Fields

Field	Description
Recovery Action	When a "system hang" is detected, the DRAC can be configured to do one of the following actions: No Action, Hard Reset, Power Down, or Power Cycle.
Initial Countdown	The number of seconds after a "system hang" is detected at which the DRAC will perform a Recovery Action.
Present Countdown	The current value, in seconds, of the countdown timer.

Remote Access Controller

Table 5-4 describes the Remote Access Controller properties.

Table 5-4. RAC Information Fields

Field	Description
Name	Short name.
Product Information	Verbose Name.
Hardware Version	Remote Access Controller card version, or "unknown".
Firmware Version	DRAC 5 current firmware version level.
Firmware Updated	Date and time that the firmware was last updated.
RAC Time	System clock setting.

Baseboard Management Controller

Table 5-5 describes the Baseboard Management Controller properties.

Table 5-5. BMC Information Fields

Field	Description
Name	"Baseboard Management Controller".
IPMI Version	Intelligent Platform Management Interface (IPMI) version.
Number of Possible Active Sessions	Maximum number of session that can be active at the same time.
Number of Current Active Sessions	Total number of current active sessions.
Firmware Version	Version of the BMC firmware.
LAN Enabled	LAN Enabled or LAN Disabled.

Using the System Event Log (SEL)

The **SEL Log** page displays system-critical events that occur on the managed system.

To view the System Event Log, perform the following steps:

1. In the **System** tree, click **System**.
2. Click the **Logs** tab and then click **System Event Log**.

   The **System Event Log** page displays the event severity and provides other information as shown in Table 5-6.
3. Click the appropriate **System Event Log** page button to continue (see Table 5-7).

Table 5-6. Status Indicator Icons

Icon/Category	Description
	A green check mark indicates a healthy (normal) status condition.
	A yellow triangle containing an exclamation point indicates a warning (noncritical) status condition.
	A red X indicates a critical (failure) status condition.
	A question mark icon indicates that the status is unknown.
Date/Time	The date and time that the event occurred. If the date is blank, then the event occurred at System Boot. The format is mm/dd/yyyy hh:mm:ss, based on a 24-hour clock.
Description	A brief description of the event

Table 5-7. SEL Page Buttons

Button	Action
Print	Prints the SEL in the sort order that it appears in the window.
Clear Log	Clears the SEL. **NOTE:** The **Clear Log** button appears only if you have **Clear Logs** permission.
Save As	Opens a pop-up window that enables you to save the SEL to a directory of your choice. **NOTE:** If you are using Internet Explorer and encounter a problem when saving, be sure to download the Cumulative Security Update for Internet Explorer, located on the Microsoft Support website at support.microsoft.com.
Refresh	Reloads the SEL page.

Viewing the Last System Crash Screen

NOTICE: The last crash screen feature requires the managed system with the **Auto Recovery** feature configured in Server Administrator. In addition, ensure that the **Automated System Recovery** feature is enabled using the DRAC. Navigate to the **Services** page under the **Configuration** tab in the **Remote Access** section to enable this feature.

The **Last Crash Screen** page displays the most recent crash screen, which includes information about the events that occurred before the system crash. The last system crash information is saved in DRAC 5 memory and is remotely accessible.

To view the **Last Crash Screen** page, perform the following steps:

1. In the **System** tree, click **System**.
2. Click the **Logs** tab and then click **Last Crash**.

The **Last Crash Screen** page provides the following buttons (see Table 5-8) in the top-right corner of the screen:

Table 5-8. Last Crash Screen Page Buttons

Button	Action
Print	Prints the **Last Crash Screen** page.
Save	Opens a pop-up window that enables you to save the Last Crash Screen to a directory of your choice.
Delete	Deletes the **Last Crash Screen** page.
Refresh	Reloads the **Last Crash Screen** page.

NOTE: Due to fluctuations in the Auto Recovery timer, the **Last Crash Screen** may not be captured when the System Reset Timer is set to a value less than 30 seconds. Use Server Administrator or IT Assistant to set the System Reset Timer to at least 30 seconds and ensure that the **Last Crash Screen** functions properly. See "Configuring the Managed System to Capture the Last Crash Screen" on page 39 for additional information.

Using the RAC Log

The **RAC Log** is a persistent log maintained in the DRAC 5 firmware. The log contains a list of user actions (such as log in, log out, and security policy changes) and alerts issued by the DRAC 5. The oldest entries are overwritten when the log becomes full.

To access the RAC Log, perform the following steps:

1. In the **System** tree, click **Remote Access**.
2. Click the **Logs** tab and then click **RAC Log**.

The **RAC Log** provides the information in Table 5-9.

Table 5-9. RAC Log Page Information

Field	Description
Date/ Time	The date and time (for example, `Dec 19 16:55:47`). When the DRAC 5 initially starts and is unable to communicate with the managed system, the time will be displayed as `System Boot`.
Source	The interface that caused the event.
Description	A brief description of the event and the user name that logged into the DRAC 5.

Using the RAC Log Page Buttons

The **RAC Log** page provides the following buttons (see Table 5-10).

Table 5-10. RAC Log Buttons

Button	Action
Print	Prints the **RAC Log** page.
Clear Log	Clears the **RAC Log** entries. **NOTE:** The **Clear Log** button only appears if you have **Clear Logs** permission.

Table 5-10. RAC Log Buttons *(continued)*

Button	Action
Save As	Opens a pop-up window that enables you to save the **RAC Log** to a directory of your choice. **NOTE:** If you are using Internet Explorer and encounter a problem when saving, be sure to download the Cumulative Security Update for Internet Explorer, located on the Microsoft Support website at support.microsoft.com.
Refresh	Reloads the **RAC Log** page.

Using the Diagnostic Console

The DRAC 5 provides a standard set of network diagnostic tools (see Table 5-11) that are similar to the tools included with Microsoft® Windows® or Linux-based systems. Using the DRAC 5 Web-based interface, you can access the network debugging tools.

To access the **Diagnostic Console** page, perform the following steps:

1. In the **System** tree, click **Remote Access**.
2. Click the **Diagnostics** tab.

Table 5-11 describes the options that are available on the **Diagnostic Console** page. Type a command and click **Submit**. The debugging results appear in the **Diagnostic Console** page.

To refresh the **Diagnostic Console** page, click **Refresh**. To execute another command, click **Go Back to Diagnostics Page**.

Table 5-11. Diagnostic Commands

Command	Description
arp	Displays the contents of the Address Resolution Protocol (ARP) table. ARP entries may not be added or deleted.
ifconfig	Displays the contents of the network interface table.

Table 5-11. Diagnostic Commands *(continued)*

Command	Description
netstat	Prints the content of the routing table. If the optional interface number is provided in the text field to the right of the **netstat** option, then netstat prints additional information regarding the traffic across the interface, buffer usage, and other network interface information.
ping <*IP Address*>	Verifies that the destination IP address is reachable from the DRAC 5 with the current routing-table contents. A destination IP address must be entered in the field to the right of this option. An Internet control message protocol (ICMP) echo packet is sent to the destination IP address based on the current routing-table contents.
gettracelog	Displays the DRAC 5 trace log. See "gettracelog" on page 275 for more information.

Troubleshooting Network Problems

The internal DRAC 5 Trace Log is used by administrators to debug DRAC 5 alerting and networking. You can access the Trace Log from the DRAC 5 Web-based interface by clicking the **Diagnostics** tab, typing the **gettracelog** command, or typing the **racadm gettracelog** command. See "gettracelog" on page 275 for more information.

The Trace Log tracks the following information:

- DHCP — Traces packets sent to and received from a DHCP server.
- IP — Traces IP packets sent and received.

The trace log may also contain DRAC 5 firmware-specific error codes that are related to the internal DRAC 5 firmware, not the managed system's operating system.

NOTE: The DRAC 5 will not echo an ICMP (ping) with a packet size larger than 1500 bytes.

Troubleshooting Alerting Problems

Use logged SNMP trap information to troubleshoot a particular type of DRAC 5 alert. SNMP trap deliveries are logged in the Trace Log by default. 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.

6

Using the DRAC 5 With Microsoft Active Directory

A directory service maintains a common database of all information needed for controlling users, computers, printers, etc. on a network. If your company uses the Microsoft® Active Directory® service software, you can configure the software to provide access to the DRAC 5, allowing you to add and control DRAC 5 user privileges to your existing users in your Active Directory software.

NOTE: Using Active Directory to recognize DRAC 5 users is supported on the Microsoft Windows® 2000 and Windows Server® 2003 operating systems.

You can use Active Directory to define user access on DRAC 5 through two methods: you can use the extended schema solution which uses Dell-defined Active Directory objects or a standard schema solution which uses Active Directory group objects only.

Advantages and Disadvantages of Extended Schema and Standard Schema

When using Active Directory to configure access to the DRAC 5, you must choose either the extended schema or the standard schema solution.

The advantages of using the extended schema solution are:

- All of the access control objects are maintained in Active Directory.
- Maximum flexibility in configuring user access on different DRAC 5 cards with different privilege levels.

The advantages of using the standard schema solution are:

- No schema extension is required because standard schema uses Active Directory objects only.
- Configuration on Active Directory side is simple.

Extended Schema Active Directory Overview

There are two ways to enable Extended Schema Active Directory:

- With the DRAC 5 web-based user interface. See "Configuring the DRAC 5 With Extended Schema Active Directory and Web-Based Interface" on page 152.
- With the RACADM CLI tool. See "Configuring the DRAC 5 With Extended Schema Active Directory and RACADM" on page 154.

Active Directory Schema Extensions

The Active Directory data is a distributed database of Attributes and Classes. The Active Directory schema includes the rules that determine the type of data that can be added or included in the database. The user class is one example of a Class that is stored in the database. Some example user class attributes can include the user's first name, last name, phone number, and so on. Companies can extend the Active Directory database by adding their own unique Attributes and Classes to solve environment-specific needs. Dell has extended the schema to include the necessary changes to support remote management Authentication and Authorization.

Each Attribute or Class that is added to an existing Active Directory Schema must be defined with a unique ID. To maintain unique IDs across the industry, Microsoft maintains a database of Active Directory Object Identifiers (OIDs) so that when companies add extensions to the schema, they can be guaranteed to be unique and not to conflict with each other. To extend the schema in Microsoft's Active Directory, Dell received unique OIDs, unique name extensions, and uniquely linked attribute IDs for our attributes and classes that are added into the directory service.

Dell extension is: dell

Dell base OID is: 1.2.840.113556.1.8000.1280

RAC LinkID range is:12070 to 12079

The Active Directory OID database maintained by Microsoft can be viewed at **http://msdn.microsoft.com/certification/ADAcctInfo.asp** by entering our extension Dell.

Overview of the RAC Schema Extensions

To provide the greatest flexibility in the multitude of customer environments, Dell provides a group of properties that can be configured by the user depending on the desired results. Dell has extended the schema to include an Association, Device, and Privilege property. The Association property is used to link together the users or groups with a specific set of privileges to one or more RAC devices. This model provides an Administrator maximum flexibility over the different combinations of users, RAC privileges, and RAC devices on the network without adding too much complexity.

Active Directory Object Overview

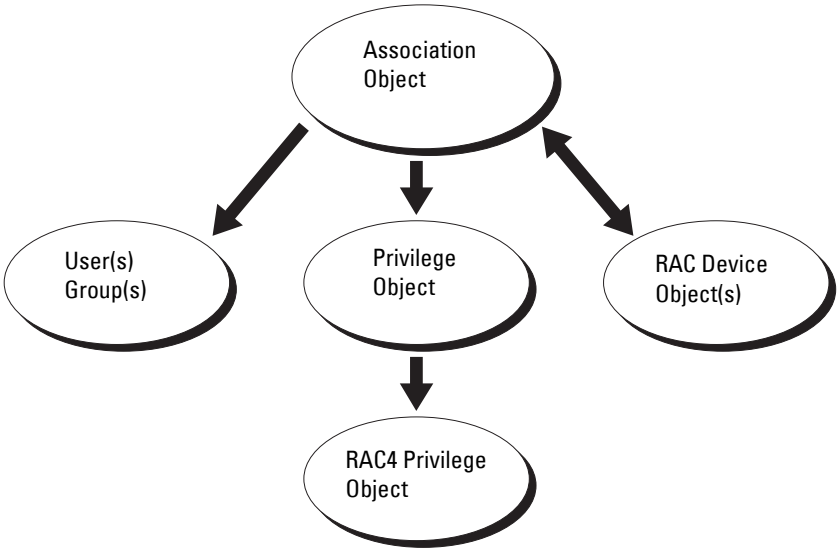
For each of the physical RACs on the network that you want to integrate with Active Directory for Authentication and Authorization, create at least one Association Object and one RAC Device Object. You can create multiple Association Objects, and each Association Object can be linked to as many users, groups of users, or RAC Device Objects as required. The users and RAC Device Objects can be members of any domain in the enterprise.

However, each Association Object can be linked (or, may link users, groups of users, or RAC Device Objects) to only one Privilege Object. This example allows an Administrator to control each user's privileges on specific RACs.

The RAC Device object is the link to the RAC firmware for querying Active Directory for authentication and authorization. When a RAC is added to the network, the Administrator must configure the RAC and its device object with its Active Directory name so users can perform authentication and authorization with Active Directory. Additionally, the Administrator must add the RAC to at least one Association Object in order for users to authenticate.

Figure 6-1 illustrates that the Association Object provides the connection that is needed for all of the Authentication and Authorization.

Figure 6-1. Typical Setup for Active Directory Objects



NOTE: The RAC privilege object applies to both DRAC 4 and DRAC 5.

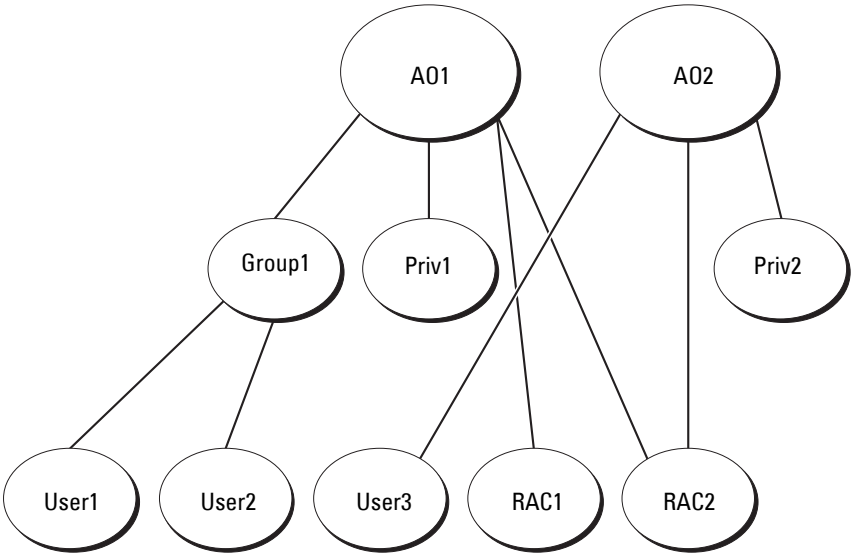
You can create as many or as few association objects as required. However, you must create at least one Association Object, and you must have one RAC Device Object for each RAC (DRAC 5) on the network that you want to integrate with Active Directory for Authentication and Authorization with the RAC (DRAC 5).

The Association Object allows for as many or as few users and/or groups as well as RAC Device Objects. However, the Association Object only includes one Privilege Object per Association Object. The Association Object connects the "Users" who have "Privileges" on the RACs (DRAC 5s).

Additionally, you can configure Active Directory objects in a single domain or in multiple domains. For example, you have two DRAC 5 cards (RAC1 and RAC2) and three existing Active Directory users (user1, user2, and user3). You want to give user1 and user2 an administrator privilege to both DRAC 5 cards and give user3 a login privilege to the RAC2 card. Figure 6-2 shows how you set up the Active Directory objects in this scenario.

When adding Universal Groups from separate domains, create an Association Object with Universal Scope. The Default Association objects created by the Dell Schema Extender Utility are Domain Local Groups and will not work with Universal Groups from other domains.

Figure 6-2. Setting Up Active Directory Objects in a Single Domain



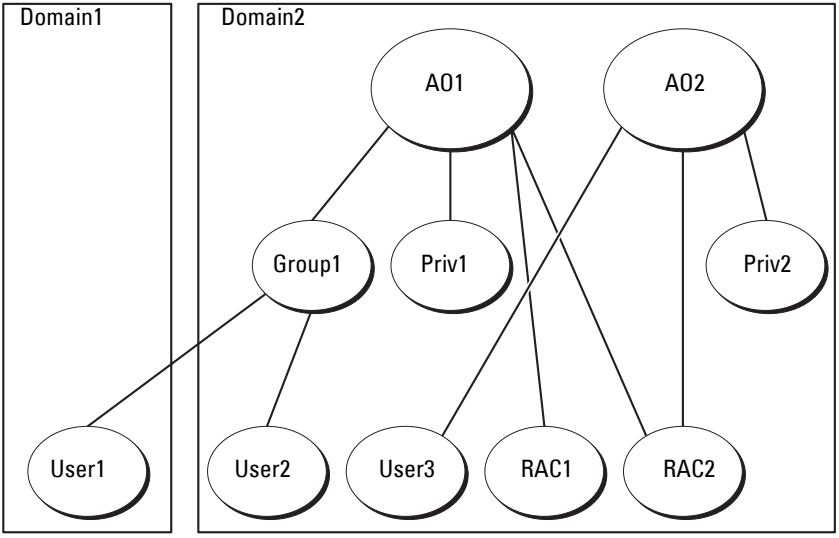
To configure the objects for the single domain scenario, perform the following tasks:

1. Create two Association Objects.
2. Create two RAC Device Objects, RAC1 and RAC2, to represent the two DRAC 5 cards.
3. Create two Privilege Objects, Priv1 and Priv2, in which Priv1 has all privileges (administrator) and Priv2 has login privileges.
4. Group user1 and user2 into Group1.
5. Add Group1 as Members in Association Object 1 (AO1), Priv1 as Privilege Objects in AO1, and RAC1, RAC2 as RAC Devices in AO1.
6. Add User3 as Members in Association Object 2 (AO2), Priv2 as Privilege Objects in AO2, and RAC2 as RAC Devices in AO2.

See "Adding DRAC 5 Users and Privileges to Active Directory" on page 150 for detailed instructions.

Figure 6-3 provides an example of Active Directory objects in multiple domains. In this scenario, you have two DRAC 5 cards (RAC1 and RAC2) and three existing Active Directory users (user1, user2, and user3). User1 is in Domain1, and user2 and user 3 are in Domain2. In this scenario, configure user1 and user 2 with administrator privileges to both DRAC 5 cards and configure user3 with login privileges to the RAC2 card.

Figure 6-3. Setting Up Active Directory Objects in Multiple Domains



To configure the objects for the multiple domain scenario, perform the following tasks:

1. Ensure that the domain forest function is in Native or Windows 2003 mode.
2. Create two Association Objects, AO1 (of Universal scope) and AO2, in any domain.

   Figure 6-3 shows the objects in Domain2.
3. Create two RAC Device Objects, RAC1 and RAC2, to represent the two DRAC 5 cards.

4. Create two Privilege Objects, Priv1 and Priv2, in which Priv1 has all privileges (administrator) and Priv2 has login privileges.
5. Group user1 and user2 into Group1. The group scope of Group1 must be Universal.
6. Add Group1 as Members in Association Object 1 (AO1), Priv1 as Privilege Objects in AO1, and RAC1, RAC2 as RAC Devices in AO1.
7. Add User3 as Members in Association Object 2 (AO2), Priv2 as Privilege Objects in AO2, and RAC2 as RAC Devices in AO2.

Configuring Extended Schema Active Directory to Access Your DRAC 5

Before using Active Directory to access your DRAC 5, configure the Active Directory software and the DRAC 5 by performing the following steps in order:

1. Extend the Active Directory schema (see "Extending the Active Directory Schema" on page 143).
2. Extend the Active Directory Users and Computers Snap-in (see "Installing the Dell Extension to the Active Directory Users and Computers Snap-In" on page 149).
3. Add DRAC 5 users and their privileges to Active Directory (see "Adding DRAC 5 Users and Privileges to Active Directory" on page 150).
4. Enable SSL on each of your domain controllers (see "Enabling SSL on a Domain Controller" on page 162).
5. Configure the DRAC 5 Active Directory properties using either the DRAC 5 Web-based interface or the RACADM (see "Configuring the DRAC 5 With Extended Schema Active Directory and Web-Based Interface" on page 152 or "Configuring the DRAC 5 With Extended Schema Active Directory and RACADM" on page 154").

Extending the Active Directory Schema

Extending your Active Directory schema adds a Dell organizational unit, schema classes and attributes, and example privileges and association objects to the Active Directory schema. Before you extend the schema, ensure that you have Schema Admin privileges on the Schema Master Flexible Single Master Operation (FSMO) Role Owner of the domain forest.

You can extend your schema using one of the following methods:

- Dell Schema Extender utility
- LDIF script file

If you use the LDIF script file, the Dell organizational unit will not be added to the schema.

The LDIF files and Dell Schema Extender are located on your *Dell Systems Console and Agent* CD in the following respective directories:

- *CD drive*:**\support\OMActiveDirectory Tools\RAC4-5\LDIF_Files**
- *CD drive*:**\support\OMActiveDirectory Tools\RAC4-5\Schema_Extender**

To use the LDIF files, see the instructions in the readme included in the **LDIF_Files** directory. To use the Dell Schema Extender to extend the Active Directory Schema, see "Using the Dell Schema Extender" on page 144.

You can copy and run the Schema Extender or LDIF files from any location.

Using the Dell Schema Extender

NOTICE: The Dell Schema Extender uses the **SchemaExtenderOem.ini** file. To ensure that the Dell Schema Extender utility functions properly, do not modify the name of this file.

1. In the **Welcome** screen, click **Next.**
2. Read and understand the warning and click **Next**.
3. Select **Use Current Log In Credentials** or enter a user name and password with schema administrator rights.
4. Click **Next** to run the Dell Schema Extender.
5. Click **Finish**.

   The schema is extended. To verify the schema extension, use the Microsoft Management Console (MMC) and the Active Directory Schema snap-in to verify that the following exist:

   - Classes (see Table 6-1 through Table 6-6)
   - Attributes (Table 6-7)

   See your Microsoft documentation for more information on how to enable and use the Active Directory Schema snap-in the MMC.

Table 6-1. Class Definitions for Classes Added to the Active Directory Schema

Class Name	Assigned Object Identification Number (OID)
dellRacDevice	1.2.840.113556.1.8000.1280.1.1.1.1
dellAssociationObject	1.2.840.113556.1.8000.1280.1.1.1.2
dellRACPrivileges	1.2.840.113556.1.8000.1280.1.1.1.3
dellPrivileges	1.2.840.113556.1.8000.1280.1.1.1.4
dellProduct	1.2.840.113556.1.8000.1280.1.1.1.5

Table 6-2. dellRacDevice Class

OID	1.2.840.113556.1.8000.1280.1.1.1.1
Description	Represents the Dell RAC device. The RAC device must be configured as dellRacDevice in Active Directory. This configuration enables the DRAC 5 to send Lightweight Directory Access Protocol (LDAP) queries to Active Directory.
Class Type	Structural Class
SuperClasses	dellProduct
Attributes	dellSchemaVersion
	dellRacType

Table 6-3. dellAssociationObject Class

OID	1.2.840.113556.1.8000.1280.1.1.1.2
Description	Represents the Dell Association Object. The Association Object provides the connection between the users and the devices.
Class Type	Structural Class
SuperClasses	Group
Attributes	dellProductMembers
	dellPrivilegeMember

Table 6-4. dellRAC4Privileges Class

OID	1.2.840.113556.1.8000.1280.1.1.1.3
Description	Used to define the privileges (Authorization Rights) for the DRAC 5 device.
Class Type	Auxiliary Class
SuperClasses	None
Attributes	**dellIsLoginUser** **dellIsCardConfigAdmin** **dellIsUserConfigAdmin** **dellIsLogClearAdmin** **dellIsServerResetUser** **dellIsConsoleRedirectUser** **dellIsVirtualMediaUser** **dellIsTestAlertUser** **dellIsDebugCommandAdmin**

Table 6-5. dellPrivileges Class

OID	1.2.840.113556.1.8000.1280.1.1.1.4
Description	Used as a container Class for the Dell Privileges (Authorization Rights).
Class Type	Structural Class
SuperClasses	User
Attributes	**dellRAC4Privileges**

Table 6-6. dellProduct Class

OID	1.2.840.113556.1.8000.1280.1.1.1.5
Description	The main class from which all Dell products are derived.
Class Type	Structural Class
SuperClasses	Computer
Attributes	**dellAssociationMembers**

Table 6-7. List of Attributes Added to the Active Directory Schema

Attribute Name/Description	Assigned OID/Syntax Object Identifier	Single Valued
dellPrivilegeMember List of dellPrivilege Objects that belong to this Attribute.	1.2.840.113556.1.8000.1280.1.1.2.1 Distinguished Name (LDAPTYPE_DN 1.3.6.1.4.1.1466.115.121.1.12)	FALSE
dellProductMembers List of dellRacDevices Objects that belong to this role. This attribute is the forward link to the dellAssociationMembers backward link. Link ID: 12070	1.2.840.113556.1.8000.1280.1.1.2.2 Distinguished Name (LDAPTYPE_DN 1.3.6.1.4.1.1466.115.121.1.12)	FALSE
dellIsLoginUser TRUE if the user has Login rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.3 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsCardConfigAdmin TRUE if the user has Card Configuration rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.4 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsUserConfigAdmin TRUE if the user has User Configuration rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.5 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
delIsLogClearAdmin TRUE if the user has Log Clearing rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.6 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsServerResetUser TRUE if the user has Server Reset rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.7 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsConsoleRedirectUser TRUE if the user has Console Redirection rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.8 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE

Table 6-7. List of Attributes Added to the Active Directory Schema *(continued)*

Attribute Name/Description	Assigned OID/Syntax Object Identifier	Single Valued
dellIsVirtualMediaUser TRUE if the user has Virtual Media rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.9 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsTestAlertUser TRUE if the user has Test Alert User rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.10 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellIsDebugCommandAdmin TRUE if the user has Debug Command Admin rights on the device.	1.2.840.113556.1.8000.1280.1.1.2.11 Boolean (LDAPTYPE_BOOLEAN 1.3.6.1.4.1.1466.115.121.1.7)	TRUE
dellSchemaVersion The Current Schema Version is used to update the schema.	1.2.840.113556.1.8000.1280.1.1.2.12 Case Ignore String (LDAPTYPE_CASEIGNORESTRING 1.2.840.113556.1.4.905)	TRUE
dellRacType This attribute is the Current Rac Type for the dellRacDevice object and the backward link to the dellAssociationObjectMembers forward link.	1.2.840.113556.1.8000.1280.1.1.2.13 Case Ignore String (LDAPTYPE_CASEIGNORESTRING 1.2.840.113556.1.4.905)	TRUE
dellAssociationMembers List of dellAssociationObjectMembers that belong to this Product. This attribute is the backward link to the dellProductMembers Linked attribute. Link ID: 12071	1.2.840.113556.1.8000.1280.1.1.2.14 Distinguished Name (LDAPTYPE_DN 1.3.6.1.4.1.1466.115.121.1.12)	FALSE

Installing the Dell Extension to the Active Directory Users and Computers Snap-In

When you extend the schema in Active Directory, you must also extend the Active Directory Users and Computers snap-in so the administrator can manage RAC (DRAC 5) devices, Users and User Groups, RAC Associations, and RAC Privileges.

When you install your systems management software using the *Dell Systems Console and Agent* CD, you can extend the snap-in by selecting the **Dell Extension to the Active Directory User's and Computers Snap-In** option during the installation procedure. See the *Dell OpenManage Software Quick Installation Guide* for additional instructions about installing systems management software.

For more information about the Active Directory User's and Computers snap-in, see your Microsoft documentation.

Installing the Administrator Pack

You must install the Administrator Pack on each system that is managing the Active Directory DRAC 5 Objects. If you do not install the Administrator Pack, you cannot view the Dell RAC Object in the container.

See "Opening the Active Directory Users and Computers Snap-In" on page 149 for more information.

Opening the Active Directory Users and Computers Snap-In

To open the Active Directory Users and Computers snap-in, perform the following steps:

1. If you are logged into the domain controller, click **Start Admin Tools→ Active Directory Users and Computers**.

   If you are not logged into the domain controller, you must have the appropriate Microsoft Administrator Pack installed on your local system. To install this Administrator Pack, click **Start→Run**, type `MMC`, and press **Enter**.

   The Microsoft Management Console (MMC) appears.

2. In the **Console 1** window, click **File** (or **Console** on systems running Windows 2000).
3. Click **Add/Remove Snap-in**.

4 Select the **Active Directory Users and Computers** snap-in and click **Add**.

5 Click **Close** and click **OK**.

Adding DRAC 5 Users and Privileges to Active Directory

Using the Dell-extended Active Directory Users and Computers snap-in, you can add DRAC 5 users and privileges by creating RAC, Association, and Privilege objects. To add each object type, perform the following procedures:

- Create a RAC device Object
- Create a Privilege Object
- Create an Association Object
- Add objects to an Association Object

Creating a RAC Device Object

1 In the MMC **Console Root** window, right-click a container.

2 Select **New→Dell RAC Object**.

The **New Object** window appears.

3 Type a name for the new object. The name must be identical to the DRAC 5 Name that you will type in step a of "Configuring the DRAC 5 With Extended Schema Active Directory and Web-Based Interface" on page 152.

4 Select **RAC Device Object**.

5 Click **OK**.

Creating a Privilege Object

NOTE: A Privilege Object must be created in the same domain as the related Association Object.

1 In the **Console Root** (MMC) window, right-click a container.

2 Select **New→Dell RAC Object**.

The **New Object** window appears.

3 Type a name for the new object.

4 Select **Privilege Object**.

5 Click **OK**.

6 Right-click the privilege object that you created, and select **Properties**.

7 Click the **RAC Privileges** tab and select the privileges that you want the user to have (for more information, see Table 4-9).

Creating an Association Object

The Association Object is derived from a Group and must contain a Group Type. The Association Scope specifies the Security Group Type for the Association Object. When you create an Association Object, choose the Association Scope that applies to the type of objects you intend to add.

For example, if you select **Universal**, the association objects are only available when the Active Directory Domain is functioning in Native Mode or above.

1 In the **Console Root** (MMC) window, right-click a container.

2 Select **New→Dell RAC Object**.

This opens the **New Object** window.

3 Type a name for the new object.

4 Select **Association Object**.

5 Select the scope for the **Association Object**.

6 Click **OK**.

Adding Objects to an Association Object

Using the **Association Object Properties** window, you can associate users or user groups, privilege objects, and RAC devices or RAC device groups. If your system is running Windows 2000 mode or higher, use Universal Groups to span domains with your user or RAC objects.

You can add groups of Users and RAC devices. The procedure for creating Dell-related groups and non-Dell-related groups is identical.

Adding Users or User Groups

1 Right-click the **Association Object** and select **Properties**.

2 Select the **Users** tab and click **Add**.

3 Type the user or User Group name and click **OK**.

Click the **Privilege Object** tab to add the privilege object to the association that defines the user's or user group's privileges when authenticating to a RAC device. Only one privilege object can be added to an Association Object.

Adding Privileges

1. Select the **Privileges Object** tab and click **Add**.
2. Type the Privilege Object name and click **OK**.

Click the **Products** tab to add one or more RAC devices to the association. The associated devices specify the RAC devices connected to the network that are available for the defined users or user groups. Multiple RAC devices can be added to an Association Object.

Adding RAC Devices or RAC Device Groups

To add RAC devices or RAC device groups:

1. Select the **Products** tab and click **Add.**
2. Type the RAC device or RAC device group name and click **OK**.
3. In the **Properties** window, click **Apply** and click **OK**.

Configuring the DRAC 5 With Extended Schema Active Directory and Web-Based Interface

1. Open a supported Web browser window.
2. Log in to the DRAC 5 Web-based interface.
3. Expand the **System** tree and click **Remote Access**.
4. Click the **Configuration** tab and select **Active Directory**.
5. On the **Active Directory Main Menu** page, select **Configure Active Directory** and click **Next**.
6. In the Common Settings section:
   a. Select the **Enable Active Directory** check box.
   b. Type the **Root Domain Name**. The **Root Domain Name** is the fully qualified root domain name for the forest.
   c. Type the **Timeout** time in seconds.
7. Click **Use Extended Schema** in the Active Directory Schema Selection section.

8 In the Extended Schema Settings section:

a Type the **DRAC Name**. This name must be the same as the common name of the new RAC object you created in your Domain Controller (see step 3 of "Creating a RAC Device Object" on page 150).

b Type the **DRAC Domain Name** (for example, `drac5.com`). Do not use the NetBIOS name. The **DRAC Domain Name** is the fully qualified domain name of the sub-domain where the RAC Device Object is located.

9 Click **Apply** to save the Active Directory settings.

10 Click **Go Back To Active Directory Main Menu**.

11 Upload your domain forest Root CA certificate into the DRAC 5.

a Select the **Upload Active Directory CA Certificate** check-box and then click **Next**.

b In the **Certificate Upload** page, type the file path of the certificate or browse to the certificate file.

NOTE: The **File Path** value displays the relative file path of the certificate you are uploading. You must type the absolute file path, which includes the full path and the complete file name and file extension.

The domain controllers' SSL certificates should have been signed by the root CA. Have the root CA certificate available on your management station accessing the DRAC 5 (see "Exporting the Domain Controller Root CA Certificate" on page 162).

c Click **Apply**.

The DRAC 5 Web server automatically restarts after you click **Apply**.

12 Log out and then log in to the DRAC 5 to complete the DRAC 5 Active Directory feature configuration.

13 In the **System** tree, click **Remote Access**.

14 Click the **Configuration** tab and then click **Network**.

The **Network Configuration** page appears.

15 If **Use DHCP (for NIC IP Address)** is selected under **Network Settings**, then select **Use DHCP to obtain DNS server address**.

To manually input a DNS server IP address, deselect **Use DHCP to obtain DNS server addresses** and type your primary and alternate DNS server IP addresses.

16 Click **Apply Changes**.

The DRAC 5 Extended Schema Active Directory feature configuration is complete.

Configuring the DRAC 5 With Extended Schema Active Directory and RACADM

Using the following commands to configure the DRAC 5 Active Directory Feature with Extended Schema using the RACADM CLI tool instead of the Web-based interface.

1 Open a command prompt and type the following racadm commands:

```
racadm config -g cfgActiveDirectory -o cfgADEnable 1

racadm config -g cfgActiveDirectory -o cfgADType 1

racadm config -g cfgActiveDirectory -o
cfgADRacDomain <fully qualified rac domain name>

racadm config -g cfgActiveDirectory -o
cfgADRootDomain <fully qualified root domain name>

racadm config -g cfgActiveDirectory -o
cfgADRacName <RAC common name>

racadm sslcertupload -t 0x2 -f <ADS root CA
certificate>

racadm sslcertdownload -t 0x1 -f <RAC SSL
certificate>
```

2 If you want to specify an LDAP or Global Catalog server instead of using the servers returned by the DNS server to search for a user name, type the following command to enable the **Specify Server** option:

```
racadm config -g cfgActive Directory -o
cfgADSpecifyServer Enable 1
```

NOTE: If you use this option, the hostname in the CA certificate is not matched against the name of the specified server. This is particularly useful if you are a DRAC administrator because it enables you to enter a hostname as well as an IP address.

After the **Specify Server** option is enabled, you can specify an LDAP server with an IP address or a fully qualified domain name of the server (FQDN). The FQDN consists of the hostname and the domain name of the server.

To specify an LDAP server, type:

```
racadm config -g cfgActive Directory -o
cfgADDomainController <fully qualified domain name
or IP address>
```

To specify a Global Catalog server, type:

```
racadm config -g cfgActive Directory -o
cfgGlobalCatalog <fully qualified domain name or
IP address>
```

NOTE: If you specify the IP address as 0.0.0.0, DRAC 5 will not search for any server.

NOTE: You can specify a list of LDAP or Global Catalog servers separated by commas. DRAC 5 allows you to specify up to three IP addresses or hostnames.

NOTE: If LDAPS is not correctly configured for all domains and applications, enabling it may produce unexpected results during the functioning of the existing applications/domains.

3 If DHCP is enabled on the DRAC 5 and you want to use the DNS provided by the DHCP server, type the following racadm command:

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

4 If DHCP is disabled on the DRAC 5 or you want manually to input your DNS IP address, type following racadm commands:

```
racadm config -g cfgLanNetworking -o
cfgDNSServersFromDHCP 0

racadm config -g cfgLanNetworking -o cfgDNSServer1
<primary DNS IP address>

racadm config -g cfgLanNetworking -o cfgDNSServer2
<secondary DNS IP address>
```

5 Press **Enter** to complete the DRAC 5 Active Directory feature configuration.

Standard Schema Active Directory Overview

As shown in Figure 6-4, using standard schema for Active Directory integration requires configuration on both Active Directory and the DRAC 5. On the Active Directory side, a standard group object is used as a role group. A user who has DRAC 5 access will be a member of the role group. In order to give this user access to a specific DRAC 5 card, the role group name and its domain name need to be configured on the specific DRAC 5 card. Unlike the extended schema solution, the role and the privilege level is defined on each DRAC 5 card, not in the Active Directory. Up to five role groups can be configured and defined in each DRAC 5. Table 4-16 shows the privileges level of the role groups and Table 6-8 shows the default role group settings.

Figure 6-4. Configuration of DRAC 5 with Microsoft Active Directory and Standard Schema

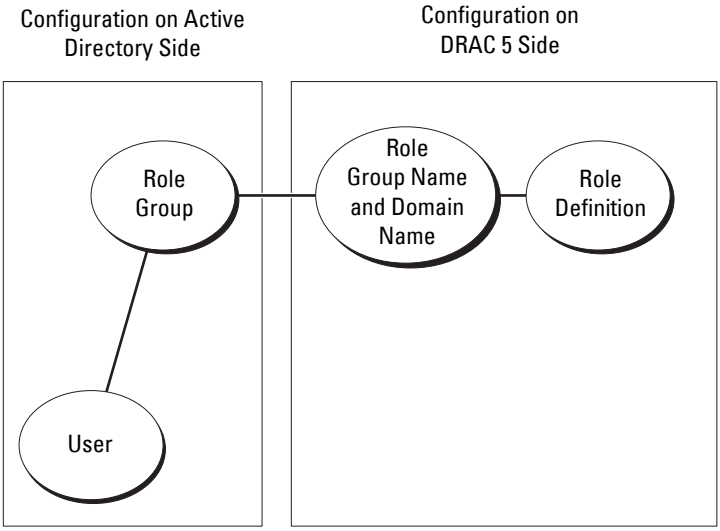


Table 6-8. Default Role Group Privileges

Role Groups	Default Privilege Level	Permissions Granted	Bit Mask
Role Group 1	Administrator	Login to DRAC, Configure DRAC, Configure Users, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts, Execute Diagnostic Commands	0x000001ff
Role Group 2	Power User	Login to DRAC, Clear Logs, Execute Server Control Commands, Access Console Redirection, Access Virtual Media, Test Alerts	0x000000f9

Table 6-8. Default Role Group Privileges *(continued)*

Role Groups	Default Privilege Level	Permissions Granted	Bit Mask
Role Group 3	**Guest User**	**Login to DRAC**	0x00000001
Role Group 4	**None**	No assigned permissions	0x00000000
Role Group 5	**None**	No assigned permissions	0x00000000

NOTE: The Bit Mask values are used only when setting Standard Schema with the RACADM.

There are two ways to enable Standard Schema Active Directory:

- With the DRAC 5 web-based user interface. See "Configuring the DRAC 5 With Standard Schema Active Directory and Web-Based Interface" on page 159.
- With the RACADM CLI tool. See "Configuring the DRAC 5 With Standard Schema Active Directory and RACADM" on page 161.

Configuring Standard Schema Active Directory to Access Your DRAC 5

You need to perform the following steps to configure the Active Directory before an Active Directory user can access the DRAC 5:

1. On an Active Directory server (domain controller), open the Active Directory Users and Computers Snap-in.
2. Create a group or select an existing group. The name of the group and the name of this domain will need to be configured on the DRAC 5 either with the web-based interface or RACADM (see "Configuring the DRAC 5 With Standard Schema Active Directory and Web-Based Interface" on page 159 or "Configuring the DRAC 5 With Standard Schema Active Directory and RACADM" on page 161).
3. Add the Active Directory user as a member of the Active Directory group to access the DRAC 5.

Configuring the DRAC 5 With Standard Schema Active Directory and Web-Based Interface

1. Open a supported Web browser window.
2. Log in to the DRAC 5 Web-based interface.
3. Expand the **System** tree and click **Remote Access**.
4. Click the **Configuration** tab and select **Active Directory**.
5. On the **Active Directory Main Menu** page, select **Configure Active Directory** and click **Next**.
6. In the Common Settings section:
   a. Select the **Enable Active Directory** check box.
   b. Type the **Root Domain Name**. The **Root Domain Name** is the fully qualified root domain name for the forest.
   c. Type the **Timeout** time in seconds.
7. Click **Use Standard Schema** in the Active Directory Schema Selection section.
8. Click **Apply** to save the Active Directory settings.
9. In the **Role Groups** column of the Standard Schema settings section, click a **Role Group**.

   The **Configure Role Group** page appears, which includes a role group's **Group Name**, **Group Domain**, and **Role Group Privileges**.
10. Type the **Group Name**. The group name identifies the role group in the Active Directory associated with the DRAC 5 card.
11. Type the **Group Domain**. The **Group Domain** is the fully qualified root domain name for the forest.
12. In the **Role Group Privileges** page, set the group privileges.

    Table 4-16 describes the **Role Group Privileges**.

    Table 4-17 describes the **Role Group Permissions**. If you modify any of the permissions, the existing **Role Group Privilege** (Administrator, Power User, or Guest User) will change to either the Custom group or the appropriate Role Group Privilege based on the permissions modified.
13. Click **Apply** to save the Role Group settings.

14 Click **Go Back To Active Directory Configuration and Management**.

15 Click **Go Back To Active Directory Main Menu**.

16 Upload your domain forest Root CA certificate into the DRAC 5.

a Select the **Upload Active Directory CA Certificate** check-box and then click **Next**.

b In the **Certificate Upload** page, type the file path of the certificate or browse to the certificate file.

NOTE: The **File Path** value displays the relative file path of the certificate you are uploading. You must type the absolute file path, which includes the full path and the complete file name and file extension.

The domain controllers' SSL certificates should have been signed by the root CA. Have the root CA certificate available on your management station accessing the DRAC 5 (see "Exporting the Domain Controller Root CA Certificate" on page 162).

c Click **Apply**.

The DRAC 5 Web server automatically restarts after you click **Apply**.

17 Log out and then log in to the DRAC 5 to complete the DRAC 5 Active Directory feature configuration.

18 In the **System** tree, click **Remote Access**.

19 Click the **Configuration** tab and then click **Network**.

The **Network Configuration** page appears.

20 If **Use DHCP (for NIC IP Address)** is selected under **Network Settings**, select **Use DHCP to obtain DNS server address**.

To manually input a DNS server IP address, deselect **Use DHCP to obtain DNS server addresses** and type your primary and alternate DNS server IP addresses.

21 Click **Apply Changes**.

The DRAC 5 Standard Schema Active Directory feature configuration is complete.

Configuring the DRAC 5 With Standard Schema Active Directory and RACADM

Using the following commands to configure the DRAC 5 Active Directory Feature with Standard Schema using the RACADM CLI instead of the Web-based interface.

1. Open a command prompt and type the following racadm commands:

   ```
   racadm config -g cfgActiveDirectory -o cfgADEnable 1
   racadm config -g cfgActiveDirectory -o cfgADType 2
   racadm config -g cfgActiveDirectory -o
   cfgADRootDomain <fully qualified root domain name>
   racadm config -g cfgStandardSchema -i <index> -o
   cfgSSADRoleGroupName <common name of the role group>
   racadm config -g cfgStandardSchema -i <index> -o
   cfgSSADRoleGroupDomain <fully qualified domain name>
   racadm config -g cfgStandardSchema -i <index> -o
   cfgSSADRoleGroupPrivilege <Bit Mask Number for
   specific user permissions>
   racadm sslcertupload -t 0x2 -f <ADS root CA
   certificate>
   racadm sslcertdownload -t 0x1 -f <RAC SSL
   certificate>
   ```

   NOTE: For Bit Mask number values, see Table B-4.

2. If DHCP is enabled on the DRAC 5 and you want to use the DNS provided by the DHCP server, type the following racadm commands:

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

3. If DHCP is disabled on the DRAC 5 or you want manually to input your DNS IP address, type the following racadm commands:

   ```
   racadm config -g cfgLanNetworking -o
   cfgDNSServersFromDHCP 0
   racadm config -g cfgLanNetworking -o cfgDNSServer1
   <primary DNS IP address>
   racadm config -g cfgLanNetworking -o cfgDNSServer2
   <secondary DNS IP address>
   ```

Enabling SSL on a Domain Controller

If you are using Microsoft Enterprise Root CA to automatically assign all your domain controllers to an SSL certificate, perform the following steps to enable SSL on each domain controller.

1. Install a Microsoft Enterprise Root CA on a Domain Controller.
   a. Select **Start**→**Control Panel**→**Add or Remove Programs**.
   b. Select **Add/Remove Windows Components**.
   c. In the **Windows Components Wizard**, select the **Certificate Services** check box.
   d. Select **Enterprise root CA** as **CA Type** and click **Next**.
   e. Enter **Common name for this CA**, click **Next**, and click **Finish**.
2. Enable SSL on each of your domain controllers by installing the SSL certificate for each controller.
   a. Click **Start**→**Administrative Tools**→**Domain Security Policy**.
   b. Expand the **Public Key Policies** folder, right-click **Automatic Certificate Request Settings** and click **Automatic Certificate Request**.
   c. In the **Automatic Certificate Request Setup Wizard**, click **Next** and select **Domain Controller**.
   d. Click **Next** and click **Finish**.

Exporting the Domain Controller Root CA Certificate

NOTE: If your system is running Windows 2000, the following steps may vary.

1. Locate the domain controller that is running the Microsoft Enterprise CA service.
2. Click **Start**→**Run**.
3. In the **Run** field, type `mmc` and click **OK**.
4. In the **Console 1** (MMC) window, click **File** (or **Console** on Windows 2000 machines) and select **Add/Remove Snap-in**.
5. In the **Add/Remove Snap-In** window, click **Add**.
6. In the **Standalone Snap-In** window, select **Certificates** and click **Add**.

7 Select **Computer** account and click **Next**.

8 Select **Local Computer** and click **Finish**.

9 Click **OK**.

10 In the **Console 1** window, expand the **Certificates** folder, expand the **Personal** folder, and click the **Certificates** folder.

11 Locate and right-click the root CA certificate, select **All Tasks**, and click **Export...** .

12 In the **Certificate Export Wizard**, click **Next**, and select **No do not export the private key**.

13 Click **Next** and select **Base-64 encoded X.509 (.cer)** as the format.

14 Click **Next** and save the certificate to a directory on your system.

15 Upload the certificate you saved in step 14 to the DRAC 5.

To upload the certificate using RACADM, see "Configuring the DRAC 5 With Extended Schema Active Directory and Web-Based Interface" on page 152.

To upload the certificate using the Web-based interface, perform the following procedure:

a Open a supported Web browser window.

b Log in to the DRAC 5 Web-based interface.

c Expand the **System** tree and click **Remote Access**.

d Click the **Configuration** tab, and then click **Security**.

e In the **Security Certificate Main Menu** page, select **Upload Server Certificate** and click **Apply**.

f In the **Certificate Upload** screen, perform one of the following procedures:

- Click **Browse** and select the certificate
- In the **Value** field, type the path to the certificate.

g Click **Apply**.

Importing the DRAC 5 Firmware SSL Certificate

Use the following procedure to import the DRAC 5 firmware SSL certificate to all domain controller trusted certificate lists.

NOTE: If your system is running Windows 2000, the following steps may vary.

NOTE: If the DRAC 5 firmware SSL certificate is signed by a well-known CA, you are not required to perform the steps in this section.

The DRAC 5 SSL certificate is the identical certificate used for the DRAC 5 Web server. All DRAC 5 controllers are shipped with a default self-signed certificate.

To access the certificate using the DRAC 5 Web-based interface, select **Configuration→Active Directory→Download DRAC 5 Server Certificate**.

1. On the domain controller, open an **MMC Console** window and select **Certificates→Trusted Root Certification Authorities**.
2. Right-click **Certificates**, select **All Tasks** and click **Import**.
3. Click **Next** and browse to the SSL certificate file.
4. Install the RAC SSL Certificate in each domain controller's **Trusted Root Certification Authority**.

   If you have installed your own certificate, ensure that the CA signing your certificate is in the **Trusted Root Certification Authority** list. If the Authority is not in the list, you must install it on all your Domain Controllers.
5. Click **Next** and select whether you would like Windows to automatically select the certificate store based on the type of certificate, or browse to a store of your choice.
6. Click **Finish** and click **OK**.

Using Active Directory to Log In To the DRAC 5

You can use Active Directory to log in to the DRAC 5 using one of the following methods:

- Web-based interface
- Remote RACADM
- Serial or telnet console.

The login syntax is consistent for all three methods:

<username@domain>

or

*<domain>**<username>* or *<domain>*/*<username>*

where *username* is an ASCII string of 1–256 bytes.

White space and special characters (such as \, /, or @) cannot be used in the user name or the domain name.

NOTE: You cannot specify NetBIOS domain names, such as Americas, as these names cannot be resolved.

Frequently Asked Questions

Table 6-9 lists frequently asked questions and answers.

Table 6-9. Using DRAC 5 With Active Directory: Frequently Asked Questions

Question	Answer
Can I log into the DRAC 5 using Active Directory across multiple trees?	Yes. The DRAC 5's Active Directory querying algorithm supports multiple trees in a single forest.
Does the log in to the DRAC 5 using Active Directory work in mixed mode (that is, the domain controllers in the forest run different operating systems, such as Microsoft Windows NT® 4.0, Windows 2000, or Windows Server 2003)?	Yes. In mixed mode, all objects used by the DRAC 5 querying process (among user, RAC Device Object, and Association Object) have to 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 mixed mode.
Does using the DRAC 5 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.

Table 6-9. Using DRAC 5 With Active Directory: Frequently Asked Questions *(continued)*

Question	Answer
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 forces you to create these two objects in the same domain. Other objects can be in different domains.
Are there any restrictions on Domain Controller SSL configuration?	Yes. All Active Directory servers' SSL certificates in the forest must be signed by the same root CA since DRAC 5 only allows uploading one trusted CA SSL certificate.

I created and uploaded a new RAC certificate and now the Web-based interface does not launch.	If you use Microsoft Certificate Services to generate the RAC certificate, one possible cause of this is you inadvertently chose **User Certificate** instead of **Web Certificate** when creating the certificate.
	
	To recover, generate a CSR and then create a new web certificate from Microsoft Certificate Services and load it using the RACADM CLI from the managed system by using the following racadm commands:
	
	`racadm sslcsrgen [-g] [-u] [-f {filename}]`
	
	`racadm sslcertupload -t 1 -f {web_sslcert}`

Table 6-9. Using DRAC 5 With Active Directory: Frequently Asked Questions *(continued)*

Question	Answer
What can I do if I cannot log into the DRAC 5 using Active Directory authentication? How do I troubleshoot the issue?	**1** Ensure that you use the correct user domain name during a login and not the NetBIOS name. **2** If you have a local DRAC user account, log into the DRAC 5 using your local credentials. After you are logged in, perform the following steps: **a** Ensure that you have checked the **Enable Active Directory** box on the DRAC 5 Active Directory configuration page. **b** Ensure that the DNS setting is correct on the DRAC 5 Networking configuration page. **c** Ensure that you have uploaded the Active Directory certificate from your Active Directory root CA to the DRAC 5. **d** Check the Domain Controller SSL certificates to ensure that they have not expired. **e** Ensure that your **DRAC Name**, **Root Domain Name**, and **DRAC Domain Name** match your Active Directory environment configuration. **f** Ensure that the DRAC 5 password has a maximum of 127 characters. While the DRAC 5 can support passwords of up to 256 characters, Active Directory only supports passwords that have a maximum length of 127 characters.

7

Using GUI Console Redirection

This section provides information about using the DRAC 5 console redirection feature.

Overview

The DRAC 5 console redirection feature enables you to access the local console remotely in either graphic or text mode. Using console redirection, you can control one or more DRAC 5-enabled systems from one location.

Today with the power of networking and the Internet, you do not have to sit in front of each server to perform all the routine maintenance. You can manage the servers from another city or even from the other side of the world from your desktop or laptop computer. You can also share the information with others— remotely and instantly.

Using Console Redirection

NOTE: When you open a console redirection session, the managed system does not indicate that the console has been redirected.

The **Console Redirection** page enables you to manage the remote system by using the keyboard, video, and mouse on your local management station to control the corresponding devices on a remote managed system. This feature can be used in conjunction with the Virtual Media feature to perform remote software installations.

The following rules apply to a console redirection session:

- Only two simultaneous console redirection sessions are supported.
- Console redirection sessions can only be connected to one remote target system.
- You cannot configure a console redirection session on the local system.
- A minimum available network bandwidth of 1 MB/sec is required.

Supported Screen Resolutions Refresh Rates on the Managed System

Table 7-1 lists the supported screen resolutions and corresponding refresh rates for a console redirection session that is running on the managed system.

Table 7-1. Supported Screen Resolutions and Refresh Rates

Screen Resolution	Refresh Rate (Hz)
720x400	70
640x480	60, 72, 75, 85
800x600	60, 70, 72, 75, 85
1024x768	60, 70, 72, 75, 85
1280x1024	60

Configuring Your Management Station

To use Console Redirection on your management station, perform the following procedures:

1. Install and configure a supported Web browser. See the following sections for more information:
   - "Supported Web Browsers" on page 29

     NOTICE: Console Redirection and Virtual Media only support 32-bit Web browsers. Using 64-bit Web browsers may generate unexpected results or failure of operations.
   - "Configuring a Supported Web Browser" on page 42
2. Configure your monitor display resolution to at least 1280 x 1024 pixels at 60 Hz with 128 colors. Otherwise, you may not view the console in **Full Screen Mode**.

Configuring Console Redirection

1. On your management station, open a supported Web browser and log into the DRAC 5. See "Accessing the Web-Based Interface" on page 91 for more information.
2. In the **System** tree, click **System**.

3 Click the **Console** tab and then click **Configuration**.

4 In the **Console Redirect Configuration** page, use the information in Table 7-2 to configure your console redirection session and then click **Apply Changes**.

Table 7-2. Console Redirection Configuration Page Information

Information	Description
Enabled	Checked = Enabled; Unchecked=Disabled
Max Sessions	Displays the number of console redirection sessions that are available.
Active Sessions	Displays the number of active console redirection sessions.
Keyboard and Mouse Port Number	Default = 5900
Video Port Number	Default = 5901
Video Encryption Enabled	Checked = Enabled; Unchecked=Disabled
Local Server Video Enabled	Checked = Enabled; Unchecked=Disabled

The buttons in Table 7-3 are available on the **Console Redirection Configuration** page.

Table 7-3. Console Redirection Configuration Page Buttons

Property	Description
Print	Prints the **Console Redirection Configuration** page
Refresh	Reloads the **Console Redirection Configuration** page
Apply Changes	Saves your configuration settings.

NOTE: With DRAC 5 version 1.30 and later, you can disable console redirection for a remote user. For more information, see "Disabling Console Redirection" on page 83.

Opening a Console Redirection Session

When you open a console redirection session, the Dell Virtual KVM Viewer Application starts and the remote system's desktop appears in the viewer. Using the Virtual KVM Viewer Application, you can control the system's mouse and keyboard functions from a local or remote management station.

To open a console redirection session, perform the following steps:

1. On your management station, open a supported Web browser and log into the DRAC 5. See "Accessing the Web-Based Interface" on page 91 for more information.
2. In the **System** tree, click **System** and then in the **Console** tab, click **Console Redirect**.

NOTE: If you receive a security warning prompting you to install and run the Console Redirection plug-in, verify the plug-in's authenticity and then click **Yes** to install and run the plug-in. If you are running Firefox, restart the browser and then go to step 1.

3. In the **Console Redirection** page, use the information in Figure 7-4 to ensure that a console redirection session is available.

Table 7-4. Console Redirection Page Information

Property	Description
Console Redirection Enabled	Yes/No
Video Encryption Enabled	Yes/No
Local Server Video Enabled	Yes/No
Status	Connected or Disconnected
Max Sessions	The maximum number of supported console redirection sessions
Active Sessions	The current number of active console redirection sessions

The buttons in Table 7-5 are available on the **Console Redirection** page.

Table 7-5. Console Redirection Page Buttons

Button	Definition
Refresh	Reloads the **Console Redirection Configuration** page
Connect	Opens a console redirection session on the targeted remote system.
Print	Prints the **Console Redirection Configuration** page.

4 If a console redirection session is available, click **Connect**.

NOTE: Multiple message boxes may appear after you launch the application. To prevent unauthorized access to the application, you must navigate through these message boxes within three minutes. Otherwise, you will be prompted to relaunch the application.

NOTE: If one or more **Security Alert** windows appear in the following steps, read the information in the window and click **Yes** to continue.

The management station connects to the DRAC 5 and the remote system's desktop appears in the Dell Digital KVM Viewer Application.

5 If two mouse pointers appear on the remote system's desktop, synchronize the mouse pointers on the management station and the remote system. See "Synchronizing the Mouse Pointers" on page 178.

Disabling or Enabling Local Video

To disable or enable local video, perform the following procedure:

1 On your management station, open a supported Web browser and log into the DRAC 5. See "Accessing the Web-Based Interface" on page 91 for more information.

2 In the **System** tree, click **System**.

3 Click the **Console** tab and then click **Configuration**.

4 If you want to enable (turn ON) local video on the server, in the **Console Redirect Configuration** page, select the **Local Server Video Enabled** check-box and then click **Apply Changes**. The default value is ON.

5 If you want to disable (turn OFF) local video on the server, in the **Console Redirect Configuration** page, deselect the **Local Server Video Enabled** checkbox and then click **Apply Changes**.

The **Console Redirection** page displays the status of the Local Server Video.

NOTE: The local server video enabled feature is supported on all x9xx PowerEdge systems except PowerEdge SC1435 and 6950.

NOTE: By disabling (turning OFF) the local video on the server, only the monitor connected to the local server will be disabled.

NOTE: With DRAC 5 version 1.30 and later, you can disable console redirection for a remote user. For more information, see "Disabling Console Redirection" on page 83.

Using the Video Viewer

The Video Viewer provides a user interface between the management station and the remote system, allowing you to see the remote system's desktop and control its mouse and keyboard functions from your management station. When you connect to the remote system, the Video Viewer starts in a separate window.

The Video Viewer provides various control adjustments such as video calibration, mouse acceleration, and snapshots. Click **Help** for more information on these functions.

When you start a console redirection session and the Video Viewer appears, you may be required to adjust the following controls in order to view and control the remote system properly. These adjustments include:

- Accessing the Viewer Menu Bar
- Adjusting the video quality
- Synchronizing the mouse pointers

Accessing the Viewer Menu Bar

The viewer menu bar is a hidden menu bar. To access the menu bar, move your cursor near the top-center edge of the Viewer's desktop window.

Also, the menu bar can be activated by pressing the default function key <F9>. To reassign this function key to a new function, perform the following steps:

1. Press <F9> or move your mouse cursor to the top of the Video Viewer.
2. Press the "push pin" to lock the viewer menu bar.
3. In the viewer menu bar, click **Tools** and select **Session Options.**
4. In the **Session Options** window, click the **General** tab.
5. In the **General** tab window in the **Menu Activation Keystroke** box, click the drop-down menu and select another function key.
6. Click **Apply**, and then click **OK**.

Table 7-6 provides the main features that are available for use in the viewer menu bar.

Table 7-6. Viewer Menu Bar Selections

Menu Item	Item	Description
File	Capture to File	Captures the current remote system screen to a **.bmp** (Windows) or **.png** (Linux) file on the local system. A dialog box is displayed that allows you to save the file to a specified location.
	Exit	Exits the **Console Redirection** page.
View	Refresh	Updates the entire remote system-screen viewport.
	Full Screen	Expands the session screen from a window to full screen.

Table 7-6. Viewer Menu Bar Selections *(continued)*

Menu Item	Item	Description
Macros	Various keyboard shortcuts	Executes a keystroke combination on the remote system. To connect your management station's keyboard to the remote system and run a macro, perform the following steps: **1** Click **Tools**. **2** In the **Session Options** window, click the **General** tab. **3** Select **Pass all keystrokes to target**. **4** Click **OK**. **5** Click **Macros**. **6** In the **Macros** menu, click a keystroke combination to execute on the target system.

Table 7-6. Viewer Menu Bar Selections *(continued)*

Menu Item	Item	Description
Tools	Automatic Video Adjust	Recalibrates the session viewer video output.
	Manual Video Adjust	Provides individual controls to manually adjust the session viewer video output. **NOTE:** Adjusting the horizontal position off-center desynchronizes the mouse pointers.
	Session Options	Provides additional session viewer control adjustments. The **Mouse** tab enables you to select the operating system you are using to optimize console redirection mouse performance. Select **Windows**, **Linux**, or **None**. The **General** tab provides the following options: • **Keyboard pass through mode —** Select **Pass all keystrokes to target** to pass your management station's keystrokes to the remote system. • **Menu Activation Keystroke** — Selects the function key that activates the viewer menu bar. The **Toolbar** tab enables you to adjust the **Toolbar Hide Delay** time between 1 and 10 seconds.
Help	N/A	Activates the **Help** menu.

Adjusting the Video Quality

The Video Viewer provides video adjustments that allow you to optimize the video for the best possible view. Click **Help** for more information.

To automatically adjust the video quality, perform the following steps:

1. Access the Viewer Menu Bar. See "Accessing the Viewer Menu Bar" on page 175.
2. Click **Tools** and select **Automatic Video Adjust**.

   The video quality is recalibrated, and the session viewer reappears.

To manually adjust the video quality, perform the following steps:

1. Access the Viewer Menu Bar. See "Accessing the Viewer Menu Bar" on page 175.
2. Click **Tools** and select **Manual Video Adjust**.
3. In the **Video Adjustment** window, click each video adjustment button and adjust the controls as needed.

When you manually adjust the video quality, observe the following guidelines:

- To prevent the mouse pointers from desyncronizing, adjust the horizontal setting so the remote system's desktop is centered in the session window.
- Reducing the Pixel Noise Ratio setting to zero causes multiple video refresh commands that generates excessive network traffic and flickering video in the Video Viewer window. Dell recommends that you adjust the Pixel Noise Ratio setting at a level that provides optimal system performance and pixel enhancement while minimizing network traffic.

Synchronizing the Mouse Pointers

When you connect to a remote Dell system using Console Redirection, the mouse acceleration speed on the remote system may not synchronize with the mouse pointer on your management station, causing two mouse pointers to appear in the Video Viewer window.

To synchronize the mouse pointers, perform the following steps:

1. Access the Viewer Menu Bar. See "Accessing the Viewer Menu Bar" on page 175.
2. Click **Tools** and select **Session Options**.

3 Click the **Mouse** tab, select your management station's operating system, and click **OK**.

4 Click **Tools** and select **Manual Video Adjust**.

5 Adjust the horizontal controls so the remote system's desktop appears in the center of the session window.

6 Click **OK**.

When using Linux (Red Hat® or Novell®), the operating system's default mouse settings are used to control the mouse arrow in the DRAC 5 Console Redirection screen.

NOTE: On Linux (Red Hat or Novell) systems, there are known mouse arrow synchronization issues. To minimize mouse synchronization problems, ensure that all users use the default mouse settings.

Frequently Asked Questions

Table 7-7 lists frequently asked questions and answers.

Table 7-7. Using Console Redirection: Frequently Asked Questions

Question	Answer
Can a new remote console video session be started when the local video on the server is turned OFF?	Yes.
Why does it take 15 seconds to turn OFF the local video on the server after requesting to turn OFF the local video?	It gives a local user an opportunity to take any action before the video is switched OFF.
Is there a time delay when turning ON the local video?	No, once a local video turn ON request is received by DRAC 5 the video is turned ON instantly.
Can the local user also turn OFF the video?	Yes, a local user can use racadm CLI (local) to turn OFF the video.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
Can the local user also turn ON the video?	Yes, the user should have racadm CLI installed on the server and only if the user is able to get to the server over an RDP connection, like terminal services, telnet, or SSH. The user can then log on to the server and can run racadm (local) to turn ON the video.
My local video is turned OFF and for some reason my DRAC 5 is not accessible remotely and the server is not accessible with RDP, telnet, or SSH. How do I recover the local video?	The only way to recover the local video in this case is by removing the AC power cord from the server, draining the server flee power and reconnecting the AC power cord; this will bring back the local video on the server monitor. Also, the DRAC 5 configuration is changed to local video ON (default). The DRAC 5 needs to be reconfigured if the local video needs to be turned OFF again.
Does switching OFF the local video also switch OFF the local keyboard and mouse?	No, switching OFF the local video only switches OFF the video going from the server's monitor output connector; it will *not* switch off the keyboard and mouse connected locally to the server.
Does turning off the local server video turn off the video on the remote vKVM session?	No, turning the local video ON or OFF is independent of the remote console session.
What privileges are needed for a DRAC 5 user to turn ON or OFF the local server video?	Any user with DRAC 5 configuration privileges can turn the local server video ON or OFF.
How can I get the current status of the local server video?	The status is displayed on the **Console Redirection Configuration** page of the DRAC 5 web-based interface. The racadm CLI command racadm getconfig –g cfgRacTuning displays the status in the object cfgRacTuneLocalServerVideo. The status is also seen by the local user on the server LCD screen as "Video OFF" or as "Video OFF in 15".

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
Why is it that sometimes I do not see the "Video OFF" or "Video OFF in 15" status on the server LCD screen?	The local video status is a low-priority message and will get masked if a high priority server event has occurred. The LCD messages are based on priority; you must resolve any high-priority LCD messages and once that event is cleared or resolved, the next low priority message is displayed. The server video message on the LCD screen is informational in nature.
Where can I get more information on the Local Server Video feature?	There will be a white paper discussing this feature on the Dell Support website located at **support.dell.com**.
I see video corruption on my screen. How do I fix this issue?	In the **Console Redirection** window, click **Refresh** to refresh the screen. **NOTE:** Clicking **Refresh** several times may be required to correct the video corruption.
During Console Redirection, the keyboard and mouse became locked after coming back from hibernation on a Windows 2000 system. What caused this to happen?	To resolve this issue, you must reset the DRAC 5 by running the **racadm racreset** command.
I cannot see the bottom of the system screen from the Console Redirection window.	Ensure that the management station's monitor resolution is set to 1280x1024.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
During Console Redirection, the mouse became locked after coming back from hibernation on a Windows Server 2003 system. Why did this happen?	To resolve this issue, select a different operating system than Windows for mouse acceleration from the virtual KVM (vKVM) window pull-down menu, wait 5 to 10 seconds, and then select Windows again. If the problem is not resolved, you must reset the DRAC 5 by running the **racadm racreset** command. If the problem is still not resolved, you must reset the DRAC 5 by running the **racadm racreset hard** command.
Why aren't the vKVM keyboard and mouse working?	You must set the USB controller to **On with BIOS support** in the BIOS settings of the managed system. Restart the managed system and press <F2> to enter setup. Select **Integrated Devices**, and then select **USB Controller**. Save your changes and restart the system.
Why does the managed system console screen go blank when Windows has a blue screen?	The managed system does not have the correct ATI video driver. You must update the video driver by using the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD.
Why do I get a blank screen on the remote console after completing a Windows 2000 installation?	The managed system does not have the correct ATI video driver. The DRAC 5 Console Redirection will not run correctly on the SVGA video driver on the Windows 2000 distribution CD. You must install Windows 2000 by using the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD to ensure that you have the latest, supported drivers for the managed system.
Why do I get a blank screen on the managed system when loading the Windows 2000 operating system?	The managed system does not have the correct ATI video driver. You must update the video driver by using the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
Why do I get a blank screen on the managed system in the Windows full screen DOS window?	The managed system does not have the correct ATI video driver. You must update the video driver by using the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD.
Why can't I enter BIOS setup by pressing the <F2> key?	This behavior is typical in a Windows environment. Use your mouse to click on an area of the Console Redirection window to adjust the focus. To move the focus to the bottom menu bar of Console Redirection window, use the mouse and click one of the objects on the bottom menu bar.
Why doesn't the vKVM mouse sync when I use the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD to remotely install the operating system?	Configure Console Redirection for the operating system that is running on the target system. **1** In the vKVM toolbar menu, click **Tools** and select **Session Options**. **2** In the **Session Options** window, click the **Mouse** tab. **3** In the **Mouse Acceleration** box, select the operating system that is running on the target system and click **OK**.
Why doesn't the vKVM mouse sync after coming back from hibernation on a Windows system?	Select a different operating system for mouse acceleration on the vKVM window pull-down menu. Next, return to the original operating system to initialize the USB mouse device. **1** In the vKVM toolbar, click **Tools** and select **Session Options**. **2** In the **Session Options** window, click the **Mouse** tab. **3** In the **Mouse Acceleration** box, select another operating system and click **OK**. **4** Initialize the USB mouse device.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
Why doesn't the mouse sync in DOS when performing Console Redirection?	The Dell BIOS is emulating the mouse driver as a PS/2 mouse. By design, the PS/2 mouse uses relative position for the mouse pointer, which causes the lag in syncing. DRAC 5 has a USB mouse driver, which allows absolute position and closer tracking of the mouse pointer. Even if DRAC 5 passes the USB absolute mouse position to the Dell BIOS, the BIOS emulation would convert it back to relative position and the behavior would remain.
Why doesn't the mouse sync under the Linux text console?	Virtual KVM requires the USB mouse driver, but the USB mouse driver is available only under the X-Window operating system.
I am still having issues with mouse synchronization.	Ensure that the target system's desktop is centered in the console redirection window. **1** In the vKVM toolbar, click **Tools** and select **Manual Video Adjustment**. **2** Adjust the horizontal and vertical controls as needed to align the desktop in the console redirection window. **3** Click **Close**. **4** Move the target system's mouse cursor to the top left corner of the console redirection window, and then move the cursor back to the center of the window. **5** Repeat step 2 through step 4 until both cursors are synchronized.
Why doesn't the vKVM mouse and keyboard work when changing mouse acceleration for different operating systems?	The USB vKVM keyboard and mouse are inactive from 5 to 10 seconds after changing the mouse acceleration. The network load can sometimes cause this operation to take longer than normal (more than 10 seconds).
Why can't I see the bottom of the server screen from the vKVM window?	Ensure that the server screen resolution is 1280 x 1024 pixels at 60 Hz with 128 colors.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
Why can't I use a keyboard or mouse while installing a Microsoft® operating system remotely by using DRAC5 Console Redirection?	When you remotely install a supported Microsoft operating system on a system with Console Redirection enabled in the BIOS, you receive an EMS Connection Message that requires that you select **OK** before you can continue. You cannot use the mouse to select **OK** remotely. You must either select **OK** on the local system or restart the remotely managed system, reinstall, and then turn Console Redirection Off in the BIOS. This message is generated by Microsoft to alert the user that Console Redirection is enabled. To ensure that this message does not appear, always turn off Console Redirection in the BIOS before installing an operating system remotely.
Why does console redirection fail to show the operating system boot menu in the Chinese, Japanese, and Korean versions of Microsoft Windows 2000?	On systems running Windows 2000 that can boot to multiple operating systems, change the default boot operating system by performing the following steps: **1** Right-click the **My Computer** icon and select **Properties**. **2** Click the **Advanced** tab. **3** Click **Startup and Recovery**. **4** Select the new default operating system from the **Startup** list. **5** In the **Show** list for box, type the number of seconds that the list of choices should be displayed before the default operating system automatically boots.
Why doesn't the Num Lock indicator on my management station reflect the status of the Num Lock on the remote server?	When accessed through the DRAC 5, the Num Lock indicator on the management station does not necessarily coincide with the state of the Num Lock on the remote server. The state of the Num Lock is dependent on the setting on the remote server when the remote session is connected, regardless of the state of the Num Lock on the management station.
Why do multiple Session Viewer windows appear when I establish a console redirection session?	You are configuring a console redirection session to the local system. Reconfigure the session to a remote system.

Table 7-7. Using Console Redirection: Frequently Asked Questions *(continued)*

Question	Answer
If I am running a console redirection session and a local user accesses the remote system, do I receive a warning message?	No. If a local user accesses the system, he/she can override your actions with no warning.
How much bandwidth do I need to run a console redirection session?	Dell recommends a 5 MB/sec connection for good performance. A 1 MB/sec connection is required for minimal performance.
What are the minimum system requirements for my management station to run console redirection?	The management station requires an Intel Pentium III 500 MHz processor with at least 256 MB of RAM.
What are the maximum number of console redirection sessions that I can run on a remote system?	The DRAC 5 supports up to two simultaneous console redirection sessions.
Why do I have mouse synchronization problems?	On Linux (Red Hat or Novell) systems, there are known mouse arrow synchronization issues. To minimize mouse synchronization problems, ensure that all users use the default mouse settings.

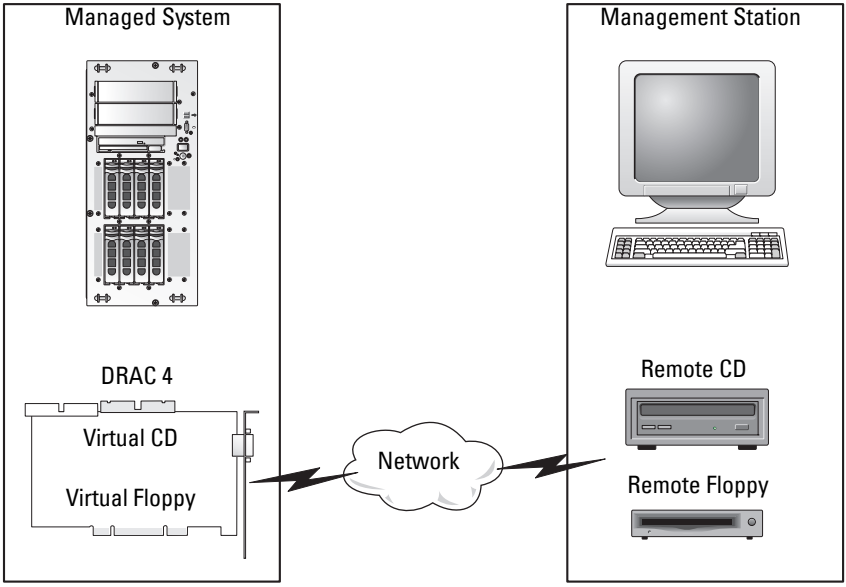
8

Using and Configuring Virtual Media

Overview

The Virtual Media feature provides the managed system with a virtual CD drive, which can use standard media from anywhere on the network. Figure 8-1 shows the overall architecture of virtual media.

Figure 8-1. Overall Architecture of Virtual Media



Using Virtual Media, administrators can remotely boot their managed systems, install applications, update drivers, or even install new operating systems remotely from the virtual CD/DVD and diskette drives.

NOTE: Virtual media requires a minimum available network bandwidth of 128 Kbps.

The managed system is configured with a DRAC 5 card. The virtual CD and floppy drives are two electronic devices embedded in the DRAC 5 that are controlled by the DRAC 5 firmware. These two devices are present on the managed system's operating system and BIOS at all times, whether virtual media is connected or disconnected.

The management station provides the physical media or image file across the network. When you launch the RAC browser for the first time and you access the virtual media page, the virtual media plug-in is downloaded from the DRAC 5 Web server and is automatically installed on the management station. The virtual media plug-in must be installed on the management station for the virtual media feature to function properly.

When virtual media is connected, all virtual CD/floppy drive access requests from the managed system are directed to the management station across the network. Connecting virtual media is identical to inserting media into virtual devices. When virtual media is not connected, virtual devices on the managed system appear as two drives without media installed in the drives.

Table 8-1 lists the supported drive connections for virtual floppy and virtual optical drives.

NOTE: Changing virtual media while connected could stop the system boot sequence.

Table 8-1. Supported Drive Connections

Supported Virtual Floppy Drive Connections	Supported Virtual Optical Drive Connections
Legacy 1.44 floppy drive with a 1.44 floppy diskette	CD-ROM, DVD, CDRW, combination drive with CD-ROM media
USB floppy drive with a 1.44 floppy diskette	CD-ROM image file in the ISO9660 format
1.44 floppy image	USB CD-ROM drive with CD-ROM media.

Installing the Virtual Media Plug-In

The virtual media browser plug-in must be installed on your management station to use the virtual media feature. After you open the DRAC 5 user interface and launch the Virtual Media page, the browser automatically downloads the plug-in, if required. If the plug-in is successfully installed, the Virtual Media page displays a list of floppy diskettes and optical disks that connect to the virtual drive.

Windows-Based Management Station

To run the virtual media feature on a management station running the Microsoft Windows operating system, install a supported version of Internet Explorer with the ActiveX Control plug-in. Set the browser security to **Medium** or a lower setting to enable Internet Explorer to download and install signed ActiveX controls.

See "Supported Web Browsers" on page 29 for more information.

Additionally, you must have administrator rights to install and use the virtual media feature. Before installing the ActiveX control, Internet Explorer may display a security warning. To complete the ActiveX control installation procedure, accept the ActiveX control when Internet Explorer prompts you with a security warning.

Linux-Based Management Station

To run the virtual media feature on a management station running the Linux operating system, install a supported version of Mozilla or Firefox. If the virtual media plug-in is not installed or if a newer version is available, a dialog box appears during the installation procedure to confirm the plug-in installation on the management station. Ensure that the user ID running the browser has write permissions in the browser's directory tree. If the user ID does not have write permissions, you cannot install the virtual media plug-in.

See the *Dell Systems Software Support Matrix* on the Dell Support website at **support.dell.com** for more information.

Running Virtual Media

NOTICE: Do not issue a **racreset** command when running a Virtual Media session. Otherwise, undesired results may occur, including loss of data.

Using Virtual Media, you can "virtualize" a diskette image or drive, enabling a floppy image, floppy drive, or optical drive on your management console to become an available drive on the remote system.

Supported Virtual Media Configurations

You can enable Virtual Media for one floppy drive and one optical drive. Only one drive for each media type can be virtualized at a time.

Supported floppy drives include a floppy image or one available floppy drive. Supported optical drives include a maximum of one available optical drive or one ISO image file.

Running Virtual Media Using the Web User Interface

Connecting Virtual Media

1. Open a supported Web browser on your management station. See the *Dell Systems Software Support Matrix* on the Dell Support website at **support.dell.com** for more information

   NOTICE: Console Redirection and Virtual Media only supports 32-bit Web browsers. Using 64-bit Web browsers may generate unexpected results or failure of operations.

2. Connect and log into the DRAC 5. See "Accessing the Web-Based Interface" on page 91 for more information.

3. Click the **Media** tab and then click **Virtual Media**.

   The **Virtual Media** page appears with the client drives that can be virtualized.

   NOTE: The **Floppy Image File** under **Floppy Drive** (if applicable) may appear, as this device can be virtualized as a virtual floppy. You can select one optical drive and one floppy at the same time, or a single drive.

   NOTE: The virtual device drive letters on the managed system do not coincide with the physical drive letters on the management station.

4 If prompted, follow the on-screen instructions to install the virtual media plug-in.

5 In the **Attribute** box, perform the following steps:

a In the **Value** column, ensure that the **Attach/Detach** status value is **Attached**.

If the value is **Detached**, perform the following steps:

- In the **Media** tab, click **Configuration**.
- In the **Value** column, ensure that the **Attach Virtual Media** checkbox is selected.
- Click **Apply Changes**.
- In the **Virtual Media** tab, click **Virtual Media**.
- In the **Value** column, ensure that the **Attach/Detach** status value is **Attached**.

b Ensure that the **Current Status** value is **Not connected**. If the **Value** field displays connected, you must disconnect from the image or drive before reconnecting. This status denotes the current status of the Virtual Media connection on the current Web-based interface only.

c Ensure that the **Active Session** value is **Available**. If the **Value** field display **In Use**, you must wait for the existing Virtual Media session to be released or terminate it by going to the Session Management tab under Remote Access and terminating the active Virtual Media session. Only one active Virtual Media session is allowed at one time. This session could have been created by any Web-based interface or VM-CLI utility.

d Select the **Encryption Enabled** checkbox to establish an encrypted connection between the remote system and your management station (if desired).

6 If you are virtualizing a floppy image or ISO image, select **Floppy Image File** or **ISO Image File** and enter or browse to the image file you want to virtualize.

If you are virtualizing a floppy drive or an optical drive, select the button next to the drives that you want to virtualize.

7 Click **Connect**.

If the connection is authenticated, the connection status becomes **Connected** and a list of all connected drives is displayed. All available diskette images and drives you selected become available on the managed system's console as though they are real drives.

NOTE: The assigned virtual drive letter (for Microsoft® Windows® systems) or device special file (for Linux systems) may not be identical to the drive letter on your management console.

NOTE: Virtual Media may not function properly on Windows operating system clients that are configured with Internet Explorer Enhanced Security. To resolve this issue, see your Microsoft operating system documentation or contact your administrator.

Disconnecting Virtual Media

Click **Disconnect** to disconnect all virtualized images and drives from the management station. **All** virtualized images or drives disconnect and are no longer available on the managed system.

Attaching and Detaching the Virtual Media Feature

The DRAC 5 Virtual Media feature is based on USB technology and can take advantage of the USB plug and play features. DRAC 5 adds the option to attach and detach the virtual devices from the USB bus. When the devices are detached, the operating system or BIOS cannot see any attached drives. When the virtual devices are attached, the drives are visible. Unlike DRAC 4, where the drives could only be enabled or disabled at the next system boot, DRAC 5 virtual devices can be attached or detached at any time.

The virtual devices can be attached or detached using a Web browser, local racadm, remote racadm, telnet, and serial port. To configure virtual media using a Web browser, you can navigate to the **Media** page and then to the **Configuration** page where you can change settings and apply them.You may

also specify the **Virtual Media Port Number** and the **Virtual Media SSL Port Number.** In addition, you can enable or disable the **Virtual Flash** and the **Boot Once** feature.

Attaching and Detaching Virtual Media using the Web browser

To Attach the virtual media feature, do the following:

1. Click **System-> Media-> Configuration**
2. Select the **Value** checkbox for **Attach Virtual Media**
3. Click **Apply Changes**

To Detach the virtual media feature, do the following:

1. Click **System-> Media-> Configuration**
2. De-select the **Value** checkbox for **Attach Virtual Media**
3. Click **Apply Changes**

Attaching and Detaching Virtual Media using RACADM

To Attach the virtual media feature, open a command prompt, type the following command, and press <Enter>.:

```
racadm config -g cfgRacVirtual -o cfgVirMediaAttached 1
```

To Detach the virtual media feature, open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgRacVirtual -o cfgVirMediaAttached 0
```

Booting From Virtual Media

On supported systems, the system BIOS enables you to boot from virtual optical drives or virtual floppy drives. During POST, enter the BIOS setup window and verify that the virtual drives are enabled and listed in the correct order.

To change the BIOS setting, perform the following steps:

1. Boot the managed system.
2. Press <F2> to enter the BIOS setup window.
3. Scroll to the boot sequence and press <Enter>.

   In the pop-up window, the virtual optical drives and virtual floppy drives are listed with the standard boot devices.

4 Ensure that the virtual drive is enabled and listed as the first device with bootable media. If required, follow the on-screen instructions to modify the boot order.

5 Save the changes and exit.

The managed system reboots.

The managed system attempts to boot from a bootable device based on the boot order. If virtual device is connected and a bootable media is present, the system boots to the virtual device. Otherwise, the system overlooks the device—similar to a physical device without bootable media.

Installing Operating Systems Using Virtual Media

This section describes a manual, interactive method to install the operating system on your management station that may take several hours to complete. A scripted operating system installation procedure using Virtual Media may take less than 15 minutes to complete. See "Deploying Your Operating System Using VM-CLI" on page 227 for more information.

1 Verify the following:

- The operating system installation CD is inserted in the management station's CD drive.
- The local CD drive is selected.
- You are connected to the virtual drives.

2 Follow the steps for booting from the virtual media in the "Booting From Virtual Media" on page 193 section to ensure that the BIOS is set to boot from the CD drive that you are installing from.

3 Follow the on-screen instructions to complete the installation.

Using Virtual Media When the Server's Operating System Is Running

Windows-Based Systems

On Windows systems, the virtual media drives are automounted and configured with a drive letter.

Using the virtual drives from within Windows is similar to using your physical drives. When you connect to the media at a management station, the media is available at the system by clicking the drive and browsing its content.

Linux-Based Systems

On Linux systems, the virtual media drives are not configured with a drive letter. Depending on the software installed on your system, the virtual media drives may not be automounted. If your drives are not automounted, manually mount the drives.

Using Virtual Flash

The DRAC 5 provides persistent Virtual Flash—16 MB of flash memory that resides in the DRAC 5 file system that can be used for persistent storage and accessed by the system. When enabled, Virtual Flash is configured as a third virtual drive and appears in the BIOS boot order, allowing a user to boot from the Virtual Flash.

NOTE: To boot from the Virtual Flash, the Virtual Flash image must be a bootable image.

Unlike a CD or floppy drive that requires an external client connection or functional device in the host system, implementing Virtual Flash only requires the DRAC 5 persistent Virtual Flash feature. The 16 MB of flash memory appears as an unformatted, removable USB drive in the host environment.

Use the following guidelines when implementing Virtual Flash:

- Attaching or detaching the Virtual Flash performs a USB renumeration, which attaches and detaches all Virtual Media devices, respectively (for example, CD drive and floppy drive).
- When you enable or disable Virtual Flash, the Virtual Media CD/floppy drive connection status does not change.

NOTICE: The Detach and Attach procedures disrupt active Virtual Media read and write operations.

Enabling Virtual Flash

To enable Virtual Flash, open a command prompt, type the following command, and press <Enter>:

```
racadm config -g cfgRacVirtual -o
cfgVirMediaKeyEnable 1
```

Disabling Virtual Flash

To disable Virtual Flash, open a command prompt, type the following command, and press <Enter>:

```
racadm config -gcfgRacVirtual -o cfgVirMediaKeyEnable 0
```

Storing Images in a Virtual Flash

The Virtual Flash can be formatted from the managed host. If you are running the Windows operating system, right-click the drive icon and select **Format**. If you are running Linux, system tools such as **format** and **fdisk** allow you to partition and format the USB.

Before you upload an image from the RAC Web browser to the Virtual Flash, ensure that the image file is between 1.44 MB and 16 MB in size (inclusive) and Virtual Flash is disabled. After you download the image and re-enable the Virtual Flash drive, the system and BIOS recognize the Virtual Flash.

Configuring a Bootable Virtual Flash

1. Insert a bootable diskette into the diskette drive or insert a bootable CD into the optical drive.
2. Restart your system and boot to the selected media drive.
3. Add a partition to Virtual Flash and enable the partition.

   Use **fdisk** if Virtual Flash is emulating the hard drive. If Virtual Flash is configured as Drive B:, the Virtual Flash is floppy emulated and does not require a partition to configure Virtual Flash as a bootable drive.
4. Using the **format** command, format the drive with the /s switch to transfer the system files to the Virtual Flash.

   For example:

   ```
   format /s x
   ```

   where *x* is the drive letter assigned to Virtual Flash.
5. Shut down the system and remove the bootable floppy or CD from the appropriate drive.
6. Turn on the system and verify that the system boots from Virtual Flash to the `C:\` or `A:\` prompt.

Using the Virtual Media Command Line Interface Utility

The Virtual Media Command Line Interface (VM-CLI) utility is a scriptable command-line interface that provides virtual media features from the management station to the DRAC 5 in the remote system.

The VM-CLI utility provides the following features:

- Supports multiple, simultaneously-active sessions.

  NOTE: When virtualizing read-only image files, multiple sessions may share the same image media. When virtualizing physical drives, only one session can access a given physical drive at a time.

- Removable media devices or image files that are consistent with the Virtual Media plug-ins
- Automatic termination when the DRAC firmware boot once option is enabled.
- Secure communications to the DRAC 5 using Secure Sockets Layer (SSL)

Before you run the utility, ensure that you have Virtual Media user privilege to the DRAC 5 in the remote system.

If your operating system supports administrator privileges or an operating system-specific privilege or group membership, administrator privileges are also required to run the VM-CLI command.

The client system's administrator controls user groups and privileges, thereby controlling the users who can run the utility.

For Windows systems, you must have Power User privileges to run the VM-CLI utility.

For Linux systems, you can access the VM-CLI utility without administrator privileges by using the **sudo** command. This command provides a centralized means of providing non-administrator access and logs all user commands. To add or edit users in the VM-CLI group, the administrator uses the **visudo** command. Users without administrator privileges can add the **sudo** command as a prefix to the VM-CLI command line (or to the VM-CLI script) to obtain access to the DRAC 5 in the remote system and run the utility.

Utility Installation

The VM-CLI utility is located on the *Dell Systems Console and Agent CD*, which is included with your Dell OpenManage System Management Software Kit. To install the utility, insert the *Systems Console and Agent* CD into your system's CD drive and follow the on-screen instructions.

The *Systems Console and Agent* CD contains the latest systems management software products, including diagnostics, storage management, remote access service, and the RACADM utility. This CD also contains readme files, which provide the latest systems management software product information.

Additionally, the *Systems Console and Agent* CD includes **vmdeploy**—a sample script that illustrates how to use the VM-CLI and RACADM utilities to deploy software to multiple remote systems. For more information, see "Deploying Your Operating System Using VM-CLI" on page 227.

Command Line Options

The VM-CLI interface is identical on both Windows and Linux systems. The utility uses options that are consistent with the RACADM utility options. For example, an option to specify the DRAC 5 IP address requires the same syntax for both RACADM and VM-CLI utilities.

The VM-CLI command format is as follows:

```
racvmcli [parameter] [operating_system_shell_options]
```

NOTE: You need **Administrator** privileges to run the `racvmcli` command.

All command-line syntax are case sensitive. See "VM-CLI Parameters" on page 199 for more information.

If the remote system accepts the commands and the DRAC 5 authorizes the connection, the command continues to run until either of the following occurs:

- The VM-CLI connection terminates for any reason.
- The process is manually terminated using an operating system control. For example, in Windows, you can use the Task Manager to terminate the process.

VM-CLI Parameters

DRAC 5 IP Address

`-r <RAC-IP-address>[:<RAC-SSL-port>]`

where *<RAC-IP-address>* is a valid, unique IP address or the DRAC 5 Dynamic Domain Naming System (DDNS) name (if supported).

This parameter provides the DRAC 5 IP address and SSL port. The VM-CLI utility needs this information to establish a Virtual Media connection with the target DRAC 5. If you enter an invalid IP address or DDNS name, an error message appears and the command is terminated.

If *<RAC-SSL-port>* is omitted, port 443 (the default port) is used. The optional SSL port is not required unless you change the DRAC 5 default SSL port.

DRAC 5 User Name

`-u <DRAC-user-name>`

This parameter provides the DRAC 5 user name that will run Virtual Media.

The *<DRAC-user-name>* must have the following attributes:

- Valid user name
- DRAC Virtual Media User permission

If DRAC 5 authentication fails, an error message appears and the command is terminated.

DRAC User Password

`-p <DRAC-user-password>`

This parameter provides the password for the specified DRAC 5 user.

If DRAC 5 authentication fails, an error message displays and the command terminates.

Floppy/Disk Device or Image File

`-f {<device-name> | <image-file>}`

where *<device-name>* is a valid drive letter (for Windows systems) or a valid device file name, including the mountable file system partition number, if applicable (for Linux systems); and *<image-file>* is the filename and path of a valid image file.

This parameter specifies the device or file to supply the virtual floppy/disk media.

For example, an image file is specified as:

`-f c:\temp\myfloppy.img` (Windows system)

`-f /tmp/myfloppy.img` (Linux system)

If the file is not write-protected, Virtual Media may write to the image file. Configure the operating system to write-protect a floppy image file that should not be overwritten.

For example, a device is specified as:

`-f a:\` (Windows system)

`-f /dev/sdb4 # 4th partition on device /dev/sdb` (Linux system)

If the device provides a write-protection capability, use this capability to ensure that Virtual Media will not write to the media.

Additionally, omit this parameter from the command line if you are not virtualizing floppy media. If an invalid value is detected, an error message displays and the command terminates.

CD/DVD Device or Image File

`-c {`*<device-name>* `|` *<image-file>*`}`

where *<device-name>* is a valid CD/DVD drive letter (Windows systems) or a valid CD/DVD device file name (Linux systems) and *<image-file>* is the file name and path of a valid ISO-9660 image file.

This parameter specifies the device or file that will supply the virtual CD/DVD-ROM media:

For example, an image file is specified as:

`-c c:\temp\mydvd.img` (Windows systems)

`-c /tmp/mydvd.img` (Linux systems)

For example, a device is specified as:

`-c d:\` (Windows systems)

`-c /dev/cdrom` (Linux systems)

Additionally, omit this parameter from the command line if you are not virtualizing CD/DVD media. If an invalid value is detected, an error message is listed and the command terminates.

Specify at least one media type (floppy or CD/DVD drive) with the command, unless only switch options are provided. Otherwise, an error message displays and the command terminates and generates an error.

Version Display

`-v`

This parameter is used to display the VM-CLI utility version. If no other non-switch options are provided, the command terminates without an error message.

Help Display

`-h`

This parameter displays a summary of the VM-CLI utility parameters. If no other non-switch options are provided, the command terminates without error.

Encrypted Data

`-e`

When this parameter is included in the command line, the VM-CLI utility will use an SSL-encrypted channel to transfer data between the management station and the DRAC 5 in the remote system. If this parameter is not included in the command line, the data transfer is not encrypted.

VM-CLI Operating System Shell Options

The following operating system features can be used in the VM-CLI command line:

- stderr/stdout redirection — Redirects any printed utility output to a file.

  For example, using the greater-than character (>) followed by a filename overwrites the specified file with the printed output of the VM-CLI utility.

  NOTE: The VM-CLI utility does not read from standard input (**stdin**). As a result, **stdin** redirection is not required.

- Background execution — By default, the VM-CLI utility runs in the foreground. Use the operating system's command shell features to cause the utility to run in the background. For example, under a Linux operating system, the ampersand character (&) following the command causes the program to be spawned as a new background process.

The latter technique is useful in script programs, as it allows the script to proceed after a new process is started for the VM-CLI command (otherwise, the script would block until the VM-CLI program is terminated). When multiple VM-CLI instances are started in this way, and one or more of the command instances must be manually terminated, use the operating system-specific facilities for listing and terminating processes.

VM-CLI Return Codes

0 = No error

1 = Unable to connect

2 = VM-CLI command line error

3 = RAC firmware connection dropped

English-only text messages are also issued to standard error output whenever errors are encountered.

Frequently Asked Questions

Table 8-2 lists frequently asked questions and answers.

Table 8-2. Using Virtual Media: Frequently Asked Questions

Question	Answer
Sometimes, I notice my Virtual Media client connection drop. Why?	When a network time-out occurs, the DRAC 5 firmware drops the connection, disconnecting the link between the server and the Virtual Drive. To reconnect to the Virtual Drive, use the Virtual Media feature.
Which operating systems support the DRAC 5?	See the *Dell Systems Software Support Matrix* on the Dell Support website at **support.dell.com** for a list of supported operating systems.
Which Web browsers support the DRAC 5?	See the *Dell Systems Software Support Matrix* on the Dell Support website at **support.dell.com** for more information for a list of supported Web browsers.
Why do I sometimes lose my client connection?	• You can sometimes lose your client connection if the network is slow or if you change the CD in the client system CD drive. For example, if you change the CD in the client system's CD drive, the new CD might have an autostart feature. If this is the case, the firmware can time out and the connection can be lost if the client system takes too long before it is ready to read the CD. If a connection is lost, reconnect from the GUI and continue the previous operation. • When a network time-out occurs, the DRAC 5 firmware drops the connection, disconnecting the link between the server and the Virtual Drive. To reconnect to the Virtual Drive, use the Virtual Media feature.

Table 8-2. Using Virtual Media: Frequently Asked Questions *(continued)*

Question	Answer
What do I do if Windows 2000 with Service Pack 4 fails to install properly?	If you use Virtual Media and the Windows 2000 operating system CD to install Windows 2000 with Service Pack 4, your system may momentarily lose its connection to the CD drive during the installation procedure, and the operating system may fail to install properly. To fix this issue, download the file **usbstor.sys** from the Microsoft Support website at support.microsoft.com and run the program only on your systems that experience this issue. For more information, see Microsoft Knowledge Base article 823086.
Why can't I install Windows 2000 locally or remotely?	If Virtual Flash is enabled and does not contain a valid image; for example, the virtual flash contains a corrupted or random image, you may not be able to install Windows 2000 locally or remotely. To fix this issue, install a valid image on Virtual Flash or disable Virtual Flash if it will not be used during the installation procedure.
Why does the Virtual Media connection drop when configured in the Shared-NIC mode?	Installing network and chipset drivers on the server causes the Virtual Media connection to drop when configured in the Shared-NIC mode. Installing the network or chipset drivers causes the LOM to reset, which in turn causes network packets to timeout and the Virtual Media connection to timeout and drop. To work around this issue, copy the drivers from your virtual drive to the server's local hard drive. To prevent a dropped Virtual Media connection from interfering with your driver installation procedure, start the driver installation directly from the server.

Table 8-2. Using Virtual Media: Frequently Asked Questions *(continued)*

Question	Answer
An installation of the Windows operating system seems to take too long. Why?	If you are installing the Windows operating system using the *Dell Systems Build and Update Utility* CD or the *Dell Systems Management Tools and Documentation* DVD and have a slow network connection, the installation procedure may require an extended amount of time to access the DRAC 5 Web-based interface due to network latency. While the installation window does not indicate the installation progress, the installation procedure is in progress.
I am viewing the contents of a floppy drive or USB memory key. If I try to establish a Virtual Media connection using the same drive, I receive a connection failure message and am asked to retry. Why?	Simultaneous access to Virtual Floppy drives is not allowed. Close the application used to view the drive contents before you attempt to virtualize the drive.
How do I configure my virtual device as a bootable device?	On the managed system, access the BIOS Setup and navigate to the boot menu. Locate the virtual CD, Virtual Floppy, or Virtual Flash and change the device boot order as needed. For example, to boot from a CD drive, configure the CD drive as the first drive in the boot order.
What types of media can I boot from?	The DRAC 5 allows you to boot from the following bootable media: • CDROM/DVD Data media • ISO 9660 image • 1.44 Floppy disk or floppy image • DRAC 5 embedded virtual flash • A USB key that is recognized by the operating system as a removable disk • A USB key image

Table 8-2. Using Virtual Media: Frequently Asked Questions *(continued)*

Question	Answer
How can I make my USB key bootable?	Only USB keys with Windows 98 DOS can boot from the Virtual Floppy. To configure your own bootable USB key, boot to a Windows 98 startup disk and copy system files from the startup disk to your USB key. For example, from the DOS prompt, type the following command: `sys a: x: /s` where "x:" is the USB key you want to make bootable. You can also use the Dell boot utility to create a bootable USB key. This utility is only compatible with Dell-branded USB keys. To download the utility, open a supported Web browser, navigate to the Dell Support website located at **support.dell.com**, and search for "R122672.exe."
Do I need Administrator privileges to install the ActiveX plug-in?	You must have Administrator or Power User privileges on Windows systems to install the Virtual Media plug-in.
What privileges do I need to install and use the Virtual Media plug-in on a Red Hat Linux Management station?	You must have `Write` privileges on the browsers directory tree to successfully install the Virtual Media plug-in.

Table 8-2. Using Virtual Media: Frequently Asked Questions *(continued)*

Question	Answer

I cannot locate my Virtual Floppy device on a system running Red Hat Enterprise Linux or the SUSE Linux operating System. My Virtual Media is attached and I am connected to my remote floppy. What should I do?	Some Linux versions do not automount the Virtual Floppy Drive and the Virtual CD drive in a similar manner. In order to mount the Virtual Floppy Drive, locate the device node that Linux assigns to the Virtual Floppy Drive. Perform the following steps to correctly find and mount the Virtual Floppy Drive:
	1 Open a Linux command prompt and run the following command:
	`grep "Virtual Floppy" /var/log/messages`
	2 Locate the last entry to that message and note the time.
	3 At the Linux prompt, run the following command:
	`grep "hh:mm:ss" /var/log/messages`
	where:
	`hh:mm:ss` is the time stamp of the message returned by grep in step 1.
	4 In step 3, read the result of the grep command and locate the device name that is given to the "Dell Virtual Floppy"
	5 Ensure that you are attached and connected to the Virtual Floppy Drive.
	6 At the Linux prompt, run the following command:
	`mount /dev/sdx /mnt/floppy`
	where:
	`/dev/sdx` is the device name found in step 4
	`/mnt/floppy` is the mount point.

Table 8-2. Using Virtual Media: Frequently Asked Questions *(continued)*

Question	Answer
What file system types are supported on my Virtual Floppy Drive or Virtual Flash?	Your Virtual Floppy Drive or Virtual Flash supports FAT16 or FAT32 file systems.
When I performed a firmware update remotely using the DRAC 5 Web-based interface, my virtual drives at the server were removed. Why?	Firmware updates cause the DRAC 5 to reset, drop the remote connection, and unmount the virtual drives. The drives will reappear when the DRAC reset is complete.
When enabling or disabling the Virtual Flash, I noticed that all my virtual drives disappeared and then reappeared. Why?	Disabling or enabling the Virtual Flash causes a USB reset and causes all virtual drives to detach from and then reattach to the USB bus.

9

Using the RACADM Command Line Interface

The serial/telnet/ssh console provides a set of racadm commands. The racadm commands provide access to the text-based features supported by the DRAC 5 Web-based interface.

RACADM enables you to locally or remotely configure and manage your DRAC 5. RACADM runs on the management station and the managed system. RACADM is included on the *Dell Systems Console and Agent* CD.

You can use RACADM to write scripts to automatically configure multiple DRAC 5s. For more information about configuring multiple DRAC 5s, see "Configuring Multiple DRAC 5 Cards" on page 215.

This section provides the following information:

- Using the **serial** and **racadm** commands. See "Using a Serial or Telnet Console" on page 209 or "Using RACADM" on page 210
- Configuring your DRAC5 using the **racadm** command
- Using the racadm configuration file to configure multiple DRAC 5 cards

Using a Serial or Telnet Console

You can run the serial commands in Table 9-1 remotely using RACADM or from the serial/telnet/ssh console command prompt.

Logging in to the DRAC 5

After you have configured your management station terminal emulator software and managed node BIOS, perform the following steps to log into the DRAC 5:

1. Connect to the DRAC 5 using your management station terminal emulation software.
2. Type your DRAC 5 user name and press <Enter>.

   You are logged into the DRAC 5.

Starting a Text Console

After you have logged into the DRAC 5 through your management station terminal software with telnet or SSH, you can redirect the managed system text console by using **connect com2**, which is a telnet/SSH command. Only one **connect com2** client is supported at a time.

To connect to the managed system text console, open a DRAC 5 command prompt (displayed through a telnet or SSH session) and type:

```
connect com2
```

From a serial session, you can connect to the managed system's serial console by pressing <Esc><Shift><Q>, which connects the managed system's serial port directly to the servers' COM2 port and bypasses the DRAC 5. To reconnect the DRAC 5 to the serial port, press <Esc><Shift><9>. The managed node COM2 port and the DRAC 5 serial port baud rates must be identical.

The `connect -h com2` command displays the contents of the serial history buffer before waiting for input from the keyboard or new characters from the serial port.

NOTE: When using the **-h** option, the client and server terminal emulation type (ANSI or VT100) must be identical; otherwise, the output may be garbled. Additionally, set the client terminal row to **25**.

The default (and maximum) size of the history buffer is 8192 characters. You can set this number to a smaller value using the command:

```
racadm config -g cfgSerial -o cfgSerialHistorySize
<number>
```

Using RACADM

You can run the RACADM commands locally or remotely from the serial or telnet console command prompt or through a normal command prompt.

Use the **racadm** command to configure DRAC 5 properties, perform remote management tasks, or recover a crashed system.

To display the racadm subcommand list using RACADM, type:

```
racadm help
```

The subcommand list includes all commands that are supported by the DRAC 5.

Without options, the **racadm** command displays general use information. Type `racadm help` to display a list of all available subcommands. Type `racadm help <subcommand>` to list any syntax and command-line options for the subcommand.

The following sections provide information about how to use the **racadm** commands.

Using RACADM Remotely

NOTE: Configure the IP address on your DRAC 5 before using the racadm remote capability. For more information about setting up your DRAC 5 and a list of related documents, see "Installing and Setting Up the DRAC 5" on page 35.

RACADM provides a remote capability option (**-r**) that allows you to connect to the managed system and execute **racadm** subcommands from a remote console or management station. To use the remote capability, you need a valid user name (**-u** option) and password (**-p** option), and the DRAC 5 IP address.

NOTE: If the system from where you are accessing the remote system does not have a DRAC certificate in its default certificate store, a message is displayed when you type a racadm command.

```
Security Alert: Certificate is invalid - Name on
Certificate is invalid or does not match site name

Enter "Y" to continue, or any other key to quit
```

NOTE: The racadm remote capability is supported only on management stations. For more information, see the Dell Systems Software Support Matrix on the Dell Support website at support.dell.com for more information.

NOTE: When using the racadm remote capability, you must have write permissions on the folders where you are using the racadm subcommands involving file operations, for example:

```
racadm getconfig -f <file name>
```

or

```
racadm sslcertupload -t 1 -f c:\cert\cert.txt
subcommands
```

RACADM Synopsis

```
racadm -r <RAC IP Address> -u <username> -p <password>
<subcommand> <subcommand options>
```

```
racadm -i -r <RAC IP Address> <subcommand> <subcommand
options>
```

For example:

```
racadm -r 192.168.0.120 -u root -p calvin getsysinfo
```

```
racadm -i -r 192.168.0.120 getsysinfo
```

If the HTTPS port number of the RAC has been changed to a custom port other than the default port (443), the following syntax must be used:

```
racadm -r <RAC IP Address>:<port> -u <username> -p
<password> <subcommand> <subcommand options>
```

```
racadm -i -r <RAC IP Address>:<port> <subcommand>
<subcommand options>
```

RACADM Options

Table 9-1 lists the options for the **racadm** command.

Table 9-1. racadm Command Options

Option	Description
-**r** <*racIpAddr*>	Specifies the controller's remote IP address.
-**r** <*racIpAddr*>:<*port number*>	Use :<*port number*> if the DRAC 5 port number is not the default port (443)
-**i**	Instructs **racadm** to interactively query the user for user name and password.
-**u** <*usrName*>	Specifies the user name that is used to authenticate the command transaction. If the -**u** option is used, the -**p** option must be used, and the -**i** option (interactive) is not allowed.
-**p** <*password*>	Specifies the password used to authenticate the command transaction. If the -**p** option is used, the -**i** option is not allowed.

Enabling and Disabling the racadm Remote Capability

NOTE: It is recommended that you run these commands on your local system.

The racadm remote capability is enabled by default. If disabled, type the following racadm command to enable:

```
racadm config -g cfgRacTuning -o
cfgRacTuneRemoteRacadmEnable 1
```

To disable the remote capability, type:

```
racadm config -g cfgRacTuning -o
cfgRacTuneRemoteRacadmEnable 0
```

RACADM Subcommands

Table 9-2 provides a description of each **racadm** subcommand that you can run in RACADM. For a detailed listing of **racadm** subcommands including syntax and valid entries, see "RACADM Subcommand Overview" on page 245.

When entering a RACADM subcommand, prefix the command with `racadm`. For example:

```
racadm help
```

Table 9-2. RACADM Subcommands

Command	Description
help	Lists DRAC 5 subcommands.
help *<subcommand>*	Lists usage statement for the specified subcommand.
arp	Displays the contents of the ARP table. ARP table entries may not be added or deleted.
clearasrscreen	Clears the last ASR (crash) screen (last blue screen).
clrraclog	Clears the DRAC 5 log. A single entry is made to indicate the user and time that the log was cleared.
config	Configures the RAC.
getconfig	Displays the current RAC configuration properties.
coredump	Displays the last DRAC 5 coredump.
coredumpdelete	Deletes the coredump stored in the DRAC 5.

Table 9-2. RACADM Subcommands *(continued)*

Command	Description
fwupdate	Executes or displays status on DRAC 5 firmware updates.
getssninfo	Displays information about active sessions.
getsysinfo	Displays general DRAC 5 and system information.
getractime	Displays the DRAC 5 time.
ifconfig	Displays the current RAC IP configuration.
netstat	Displays the routing table and the current connections.
ping	Verifies that the destination IP address is reachable from the DRAC 5 with the current routing-table contents.
setniccfg	Sets the IP configuration for the controller.
getniccfg	Displays the current IP configuration for the controller.
getsvctag	Displays service tags.
racdump	Dumps DRAC 5 status and state information for debug.
racreset	Resets the DRAC 5.
racresetcfg	Resets the DRAC 5 to the default configuration.
serveraction	Performs power management operations on the managed system.
getraclog	Displays the RAC log.
clrsel	Clears the System Event Log entries.
gettracelog	Displays the DRAC 5 trace log. If used with `-i`, the command displays the number of entries in the DRAC 5 trace log.
sslcsrgen	Generates and downloads the SSL CSR.
sslcertupload	Uploads a CA certificate or server certificate to the DRAC 5.
sslcertdownload	Downloads a CA certificate.
sslcertview	Views a CA certificate or server certificate in the DRAC 5.
testemail	Forces the DRAC 5 to send an e-mail over the DRAC 5 NIC.
testtrap	Forces the DRAC 5 to send an SNMP over the DRAC 5 NIC.
vmdisconnect	Forces a virtual media connection to close.
vmkey	Resets the virtual flash size to its default size (16 MB).

RACADM Error Messages

For information about racadm CLI error messages, see "Frequently Asked Questions" on page 226.

Configuring Multiple DRAC 5 Cards

Using RACADM, you can configure one or more DRAC 5 cards with identical properties. When you query a specific DRAC 5 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 DRAC 5 cards, you can configure your controllers with identical properties in a minimal amount of time.

NOTE: Some configuration files contain unique DRAC 5 information (such as the static IP address) that must be modified before you export the file to other DRAC 5 cards.

To configure multiple DRAC 5 cards, perform the following procedures:

1. Use RACADM to query the target DRAC 5 that contains the appropriate configuration.

   NOTE: The generated **.cfg** file does not contain user passwords.

   Open a command prompt and type:

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

   NOTE: Redirecting the RAC configuration to a file using **getconfig -f** is only supported with the local and remote RACADM interfaces.

2. Modify the configuration file using a simple text editor (optional).
3. Use the new configuration file to modify a target RAC.

   In the command prompt, type:

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

4. Reset the target RAC that was configured.

   In the command prompt, type:

   ```
   racadm reset
   ```

The **getconfig -f racadm.cfg** subcommand requests the DRAC 5 configuration and generates the **racadm.cfg** file. If required, you can configure the file with another name.

You can use the **getconfig** command to enable you 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 DRAC 5s. Use **config** to synchronize the user and password database with Server Administrator

The initial configuration file, **racadm.cfg**, is named by the user. In the following example, the configuration file is named **myfile.cfg**. To create this file, type the following at the command prompt:

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

NOTICE: It is recommended that you edit this file with a simple text editor. The racadm utility uses an ASCII text parser. Any formatting confuses the parser, which may corrupt the racadm database.

Creating a DRAC 5 Configuration File

The DRAC 5 configuration file **<***filename***>.cfg** is used with the `racadm config -f <filename>.cfg` command. The configuration file is a simple text file that allows the user to build a configuration file (similar to an **.ini** file) and configure the DRAC 5 from this file. You may use any file name, and the file does not require a **.cfg** extension (although it is referred to by that designation in this subsection).

The **.cfg** file can be:

- Created
- Obtained from a `racadm getconfig -f <filename>.cfg` command
- Obtained from a `racadm getconfig -f <filename>.cfg` command, and then edited

NOTE: See "getconfig" on page 249 for information about the **getconfig** command.

The **.cfg** file is first parsed to verify that valid group and object names are present and that some simple syntax rules are being followed. Errors are flagged with the line number that detected the error, and a simple message explains the problem. The entire file is parsed for correctness, and all errors are displayed. Write commands are not transmitted to the DRAC 5 if an error is found in the **.cfg** file. The user must correct *all* errors before any configuration can take place. The **-c** option may be used in the **config** subcommand, which verifies syntax only and does *not* perform writes to the DRAC 5.

Use the following guidelines when you create a **.cfg** file:

- If the parser encounters an indexed group, it is the value of the anchored object that differentiates the various indexes.

  The parser reads in all of the indexes from the DRAC 5 for that group. Any objects within that group are simple modifications when the DRAC 5 is configured. If a modified object represents a new index, the index is created on the DRAC 5 during configuration.

- The user cannot specify a desired index in a **.cfg** file.

  Indexes may be created and deleted, so over time the group may become fragmented with used and unused indexes. If an index is present, it is modified. If an index is not present, the first available index is used. This method allows flexibility when adding indexed entries where the user does not need to make exact index matches between all the RACs being managed. New users are added to the first available index. A **.cfg** file that parses and runs correctly on one DRAC 5 may not run correctly on another if all indexes are full and you must add a new user.

- Use the **racresetcfg** subcommand to configure all DRAC 5 cards with identical properties.

  Use the **racresetcfg** subcommand to reset the DRAC 5 to original defaults, and then run the `racadm config -f <filename>.cfg` command. Ensure that the **.cfg** file includes all desired objects, users, indexes, and other parameters.

NOTICE: Use the **racresetcfg** subcommand to reset the database and the DRAC 5 NIC settings to the original default settings and remove all users and user configurations. While the root user is available, other users' settings are also reset to the default settings.

Parsing Rules

- All lines that start with '#' 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 its string. 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 DRAC 5, without adding escape characters.

  Example:

  ```
  #

  # This is a comment

  [cfgUserAdmin]

  cfgUserAdminPageModemInitString=<Modem init # not
  a comment>
  ```

- All group entries must be surrounded by "[" and "]" characters.

  The starting "[" character denoting a group name *must* start 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 "DRAC 5 Property Database Group and Object Definitions" on page 293.

  The following example displays a group name, object, and the object's property value.

  Example:

  ```
  [cfgLanNetworking] -{group name}

  cfgNicIpAddress=143.154.133.121 {object name}
  ```

- 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

'=' is taken as is (for example, a second '=', or a '#', '[', ']', and so forth). These characters are valid modem chat script characters.

See the example in the previous bullet.

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

  The user *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 the user to see the included comments.

NOTE: The user 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.

  The user 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 DRAC 5 to delete the index for the specified group.

To view the contents of an indexed group, use 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>
  ```

  If you type `racadm getconfig -f <myexample>.cfg`, the command builds a **.cfg** file for the current DRAC 5 configuration. This configuration file can be used as an example and as a starting point for your unique **.cfg** file.

Modifying the DRAC 5 IP Address

When you modify the DRAC 5 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.

For example:

```
#
#   Object Group "cfgLanNetworking"
#
[cfgLanNetworking]
cfgNicIpAddress=10.35.10.110
cfgNicGateway=10.35.10.1
```

This file will be 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 will update 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.

NOTE: "Anchor" is an internal term and should not be used in the file.

Using the RACADM Utility to Configure the DRAC 5

NOTE: You must be logged in as user **root** to execute RACADM commands on a remote Linux system.

The DRAC 5 Web-based interface is the quickest way to configure a DRAC 5. If you prefer command-line or script configuration or need to configure multiple DRAC 5s, use RACADM, which is installed with the DRAC 5 agents on the managed system.

To configure multiple DRAC 5s with identical configuration settings, perform one of the following procedures:

- Use the RACADM examples in this section as a guide to create a batch file of **racadm** commands and then execute the batch file on each managed system.
- Create the DRAC 5 configuration file as described in "RACADM Subcommand Overview" on page 245 and execute the **racadm config** subcommand on each managed system using the same configuration file.

Before You Begin

You can configure up to 16 users in the DRAC 5 property database. Before you manually enable a DRAC 5 user, verify if any current users exist. If you are configuring a new DRAC 5 or you ran the **racadm racresetcfg** command, the only current user is `root` with the password `calvin`. The **racresetcfg** subcommand resets the DRAC 5 back to the original defaults.

NOTICE: Use caution when using the **racresetcfg** command, as *all* configuration parameters are reset to the original defaults. Any previous changes are lost.

NOTE: Users can be enabled and disabled over time. As a result, a user may have a different index number on each DRAC 5.

To verify if a user exists, type the following command at the command prompt:

```
racadm getconfig -u <username>
```

OR

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 DRAC 5 configuration parameters.

Several parameters and object IDs are displayed with their current values. Two objects of interest 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 appears after the "=", that index is taken by that user name.

NOTE: When you manually enable or disable a user with the **racadm config** subcommand, you *must* specify the index with the **-i** option. Observe that the **cfgUserAdminIndex** object displayed in the previous example contains a '#' character. 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 multiple DRAC 5s with the same settings.

Adding a DRAC 5 User

To add a new user to the RAC configuration, a few basic commands can be used. In general, perform the following procedures:

1. Set the user name.
2. Set the password.
3. Set the user privileges.
4. Enable the user.

Example

The following example describes how to add a new user named "John" with a "123456" password and LOGIN privileges to the RAC.

```
racadm config -g cfgUserAdmin -o cfgUserAdminUserName
-i 2 john

racadm config -g cfgUserAdmin -o cfgUserAdminPassword
-i 2 123456

racadm config -g cfgUserAdmin -i 2 -o cfgUserPrivilege
0x00000001
```

```
racadm config -g cfgUserAdmin -i 2 -o
cfgUserAdminEnable 1
```

To verify, use one of the following commands:

```
racadm getconfig -u john
```

```
racadm getconfig –g cfgUserAdmin –i 2
```

Removing a DRAC 5 User

When using RACADM, users must be disabled manually and on an individual basis. Users cannot be deleted by using a configuration file.

The following example illustrates the command syntax that can be used to delete a RAC user:

```
racadm config -g cfgUserAdmin -o cfgUserAdminUserName
-i <index> ""
```

A null string of double quote characters ("") instructs the DRAC 5 to remove the user configuration at the specified index and reset the user configuration to the original factory defaults.

Testing e-mail Alerting

The RAC e-mail alerting feature allows users to receive e-mail alerts when a critical event occurs on the managed system. The following example shows how to test the e-mail alerting feature to ensure that the RAC can properly send out e-mail alerts across the network.

```
racadm testemail -i 2
```

NOTE: Ensure that the **SMTP** and **Email Alert** settings are configured before testing the e-mail alerting feature. See "Configuring E-Mail Alerts" on page 62 for more information.

Testing the RAC SNMP Trap Alert Feature

The RAC SNMP trap alerting feature allows SNMP trap listener configurations to receive traps for system events that occur on the managed system.

The following example shows how a user can test the SNMP trap alert feature of the RAC.

```
racadm testtrap -i 2
```

Before you test the RAC SNMP trap alerting feature, ensure that the SNMP and trap settings are configured correctly. See "**testtrap**" on page 285 and "**testemail**" on page 284 subcommand descriptions to configure these settings.

Enabling a DRAC 5 User With Permissions

To enable a user with specific administrative permissions (role-based authority), first locate an available user index by performing the steps in "Before You Begin" on page 221. Next, type the following command lines with the new user name and password.

NOTE: See Table B-2 for a list of valid bit mask values for specific user privileges. The default privilege value is 0, which indicates the user has no privileges enabled.

```
racadm config -g cfgUserAdmin -o
cfgUserAdminPrivilege -i <index> <user privilege
bitmask value>
```

Configuring DRAC 5 Network Properties

To generate a list of available network properties, type the following:

```
racadm getconfig -g cfgLanNetworking
```

To use DHCP to obtain an IP address, use the following command to write the object **cfgNicUseDhcp** and enable this feature:

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

The commands provide the same configuration functionality as the option ROM at boot-up when you are prompted to type <Ctrl><e>. For more information about configuring network properties with the option ROM, see "Configuring DRAC 5 Network Properties" on page 224.

The following is an example of how the command may be used to configure desired LAN network properties.

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

racadm config -g cfgLanNetworking -o cfgNicIpAddress
192.168.0.120

racadm config -g cfgLanNetworking -o cfgNicNetmask
255.255.255.0
```

```
racadm config -g cfgLanNetworking -o cfgNicGateway
192.168.0.120

racadm config -g cfgLanNetworking -o cfgNicUseDHCP 0

racadm config -g cfgLanNetworking -o
cfgDNSServersFromDHCP 0

racadm config -g cfgLanNetworking -o cfgDNSServer1
192.168.0.5

racadm config -g cfgLanNetworking -o cfgDNSServer2
192.168.0.6

racadm config -g cfgLanNetworking -o
cfgDNSRegisterRac 1

racadm config -g cfgLanNetworking -o cfgDNSRacName
RAC-EK00002

racadm config -g cfgLanNetworking -o
cfgDNSDomainNameFromDHCP 0

racadm config -g cfgLanNetworking -o cfgDNSDomainName
MYDOMAIN
```

NOTE: If **cfgNicEnable** is set to **0**, the DRAC 5 LAN is disabled even if DHCP is enabled.

DRAC Modes

The DRAC 5 can be configured in one of three modes:

- Dedicated
- Shared
- Shared with failover

Table 9-3 provides a description of each mode.

Table 9-3. DRAC 5 NIC Configurations

Mode	Description
Dedicated	The DRAC uses its own NIC (RJ-45 connector) and the BMC MAC address for network traffic.
Shared	The DRAC uses Broadcom LOM1 on the planar.
Shared with failover	The DRAC uses Broadcom LOM1 and LOM2 as a team for failover. The team uses the BMC MAC address.

Frequently Asked Questions

Table 9-4 lists the frequently asked questions and answers.

Table 9-4. Using the serial and racadm Commands: Frequently Asked Questions

Question	Answer

After performing a DRAC 5 reset (using the **racadm racreset** command), I issue a command and the following message is displayed:
`racadm <command name>`
`Transport: ERROR: (RC=-1)`
What does this message mean?
	You must wait until the DRAC 5 completes the reset before issuing another command.

When I use the **racadm** commands and subcommands, I get errors that I don't understand.	You may encounter one or more of the following errors when using the **racadm** commands and subcommands: • Local error messages — Problems such as syntax, typographical errors, and incorrect names. Example: `ERROR: <message>`
When I ping the DRAC IP address from my system and then switch my DRAC 5 card between **Dedicated** and **Shared** modes during the ping response, I do not receive a response.	Clear the ARP table on your system.

10

Deploying Your Operating System Using VM-CLI

The Virtual Media Command Line Interface (VM-CLI) utility is a command-line interface that provides Virtual Media features from the management station to the DRAC 5 in the remote system. Using VM-CLI and scripted methods, you can deploy your operating system on multiple remote systems in your network.

This section provides information on integrating the VM-CLI utility into your corporate network.

Before You Begin

Before using the VM-CLI utility, ensure that your targeted remote systems and corporate network meet the requirements listed in the following sections.

Remote System Requirements

- DRAC 5 card is installed in each remote system
- The virtual device in each remote system is the first device in the BIOS boot order.

Dell Custom Factory Integration

When you order your Dell™ system using the Dell Custom Factory Integration (CFI) options, Dell can preconfigure your system with a DRAC 5 card that includes a DDNS name and a preconfigured system BIOS that is enabled for Virtual Media. Using this configuration, your system is ready to boot from its Virtual Media devices when installed into your corporate network.

For more information, see the Dell website at **www.dell.com**.

Network Requirements

A network share must contain the following components:

- Operating system files
- Required drivers
- Operating system boot image file(s)

  The image file must be a floppy image or CD/DVD ISO image with an industry-standard, bootable format.

Creating a Bootable Image File

Before you deploy your image file to the remote systems, ensure that a supported system can boot from the file. To test the image file, transfer the image file to a test system using the DRAC 5 Web user interface and then reboot the system.

The following sections provide specific information for creating image files for Linux and Windows systems.

Creating an Image File for Linux Systems

Use the Data Duplicator utility to create a bootable image file for your Linux system.

To run the utility, open a command prompt and type the following:

```
dd if=<input-device> of=<output-file>
```

For example:

```
dd if=/dev/fd0 of=myfloppy.img
```

Creating an Image File for Windows Systems

When choosing a data replicator utility for Windows image files, select a utility that copies the image file and the CD/DVD boot sectors.

Preparing for Deployment

Configuring the Remote Systems

1. Create a network share that can be accessed by the management station.
2. Copy the operating system files to the network share.
3. If you have a bootable, preconfigured deployment image file to deploy the operating system to the remote systems, skip this step.

   If you do not have a bootable, preconfigured deployment image file, create the file. Include any programs and/or scripts used for the operating system deployment procedures

   For example, to deploy Microsoft® Windows® operating system, the image file may include programs that are similar to deployment methods used by Microsoft Systems Management Server (SMS).

   When you create the image file, do the following:

   - Follow standard network-based installation procedures
   - Mark the deployment image as "read only" to ensure that each target system boots and executes the same deployment procedure
4. Perform one of the following procedures:
   - Integrate RACADM and the Virtual Media command line interface (VM-CLI) into your existing operating system deployment application. Use the sample deployment script as a guide when integrating the DRAC 5 utilities into your existing operating system deployment application.
   - Use the existing **vmdeploy** script to deploy your operating system.

Deploying the Operating System

Use the VM-CLI utility and the **vmdeploy** script included with the utility to deploy the operating system to your remote systems.

Before you begin, review the sample **vmdeploy** script included with the VM-CLI utility. The script offers detailed requirements to deploy the operating system to remote systems in your network.

The following procedure provides a high-level overview for deploying the operating system on targeted remote systems.

1. Identify the remote systems that will be deployed.
2. Record the DRAC 5 names and IP addresses of the targeted remote systems.
3. Perform the following procedure for each targeted remote system:
   a. Configure a VM-CLI process that includes the following parameters for the targeted system:
      - DRAC 5 IP address or DDNS name
      - Bootable deployment image file name
      - DRAC 5 user name
      - DRAC 5 user password
   b. Using RACADM, set the target DRAC 5 **boot once** option.
   c. Using RACADM, reboot the DRAC 5 system.

11

Using the DRAC 5 SM-CLP Command Line Interface

This section provides information about the Server Management Workgroup (SMWG) Server Management-Command Line Protocol (SM-CLP) that is incorporated in the DRAC 5.

NOTE: This section assumes that you are familiar with the Systems Management Architecture for Server Hardware (SMASH) Initiative and the SMWG SM-CLP specifications. For more information on these specifications, see the Distributed Management Task Force (DMTF) website at **www.dmtf.org**.

The DRAC 5 SM-CLP is a protocol driven by the DMTF and SMWG to provide standards for systems management CLI implementations. Many efforts are driven by a defined SMASH architecture that is targeted as a foundation for more standardized systems management set of components. The SMWG SM-CLP is a subcomponent of the overall SMASH efforts driven by DMTF.

DRAC 5 SM-CLP Support

DRAC 5 is the first RAC product that provides support for the SM-CLP standard-based command line protocol. The SM-CLP is hosted from the DRAC 5 controller firmware and supports telnet, SSH, and serial-based interfaces. The DRAC 5 SM-CLP interface is based on the SM-CLP Specification Version 1.0 provided by the DMTF organization.

The following sections provide an overview of the SM-CLP feature that is hosted from the DRAC 5.

SM-CLP Features

The SM-CLP specification provides a common set of standard SM-CLP verbs that can be used for simple systems management through the CLI.

Table 11-1 provides a list of supported CLI verbs.

Table 11-1. Supported CLI Verbs

Verb	Definition
cd	Navigates through the MAP using the shell.
delete	Deletes an object instance.
help	Displays help for a specific target.
reset	Resets the target.
show	Displays the target properties, verbs, and subtargets.
start	Turns on a target.
stop	Shuts down a target.
exit	Exits from the SM-CLP shell session.
version	Displays the version attributes of a target.

SM-CLP Management Operations and Targets

The SM-CLP promotes the concept of verbs and targets to provide system management capabilities through the CLI. The verb indicates the operation to perform, and the target determines the entity (or object) that runs the operation.

Below is an example of the SM-CLP command line syntax.

```
<verb> [<options>] [<target>] [<properties>]
```

During a typical SM-CLP session, the user can perform operations using the verbs listed in Table 11-1.

Management Operations

The DRAC 5 SM-CLP enables users to manage the following:

- Server Power Management — Turn on, shutdown, or reboot the system
- System Event Log (SEL) Management — Display or clear the SEL records

Targets

Table 11-2 provides a list of targets provided through the SM-CLP to support these operations.

Table 11-2. SM-CLP Targets

Target	Definition
/system1	The managed system target.
/system1/logs1	The log collections target
/system1/logs1/log1	The System Event Log (SEL) target on the managed system.
/system1/logs1/log1/record1	An individual SEL record instance on the managed system.

Options

Table 11-3 lists the supported SM-CLP options.

Table 11-3. Supported SM-CLP Options

SM-CLP Option	Description
-all	Instructs the verb to perform all possible functions.
-display	Displays the user-defined data.
-examine	Instructs the command processor to validate the command syntax without executing the command.
-help	Displays command verb help.
-version	Displays the command verb version.

SM-CLP Output Format

The DRAC 5 currently supports text-based output as described in the SM-CLP specifications.

DRAC 5 SM-CLP Examples

The following subsections provide sample scenarios for using the SM-CLP to perform the following operations:

- Server power management
- SEL management
- MAP target navigation
- Display system properties

Server Power Management

Table 11-4 provides examples of using SM-CLP to perform power management operations on a managed system.

Table 11-4. Server Power Management Operations

Operation	Syntax

Logging into the RAC using the telnet/SSH interface	`>ssh 192.168.0.120`
	`>login: root`
	`>password:`

Starting the SM-CLP management shell	`-`
	`>smclp`
	`DRAC5 SM-CLP System Management Shell, version 1.0`
	`Copyright (c) 2004-2006 Dell, Inc.`
	`All Rights Reserved`
	`->`

Power down the server	`-`
	`->stop /system1`
	`system1 has been stopped successfully`

Power up the server from a powered-off state	`-`
	`->start /system1`
	`system1 has been started successfully`

Reboot the server	`->reset /system1` `system1 has been reset successfully`

SEL Management

Table 11-5 provides examples of using the SM-CLP to perform SEL-related operations on the managed system.

Table 11-5. SEL Management Operations

Operation	Syntax
Viewing the SEL	->show /system1/logs1/log1 /system1/logs1/log1 Targets: Record1 Record2 Record3 Record4 Record5 Properties: InstanceID = IPMI:BMC1 SEL Log MaxNumberOfRecords = 512 CurrentNumberOfRecords = 5 Name = IPMI SEL EnabledState = 2 OperationalState = 2 HealthState = 2 Caption = IPMI SEL Description = IPMI SEL ElementName = IPMI SEL Commands: cd show help exit version

Table 11-5. SEL Management Operations *(continued)*

Operation	Syntax
Viewing the SEL record	->show /system1/logs1/log1/record4 /system1/logs1/log1/record4 Properties: LogCreationClassName = CIM_RecordLog CreationClassName = CIM_LogRecord LogName = IPMI SEL RecordID = 1 MessageTimeStamp = 20050620100512.000000-000 Description = FAN 7 RPM: fan sensor, detected a failure ElementName = IPMI SEL Record Commands: cd show help exit version
Clearing the SEL	->delete /system1/logs1/log1/record* All records deleted successfully

MAP Target Navigation

Table 11-6 provides examples of using the **cd** verb to navigate the MAP. In all examples, the initial default target is assumed to be /.

Table 11-6. Map Target Navigation Operations

Operation	Syntax
Navigate to the system target and reboot	->cd system1 ->reset **NOTE:** The current default target is /.

Table 11-6. Map Target Navigation Operations *(continued)*

Operation	Syntax

Navigate to the SEL target and display the log records	`->cd system1`
	`->cd logs1/log1`
	`->show`

	`->cd system1/logs1/log1` `->show`
Display current target	`->cd .`
Move up one level	`->cd ..`
Exiting the shell	`->exit`

System Properties

The Table 11-7 lists the system properties that are displayed when the user types the following:

`show /system1`

These properties are derived from the Base System Profile that is provided by the standards body and is based on the **CIM_ComputerSystem** class as defined by the CIM schema.

For additional information, see the DMTF CIM schema definitions.

Table 11-7. System Properties

Object	Property	Description
CIM_ComputerSystem	`Name`	Unique identifier of a System instance that exists in the enterprise environment. MaxLen = 256
	`ElementName`	User-friendly name for the system. MaxLen = 64

Table 11-7. System Properties *(continued)*

Object	Property	Description
	NameFormat	Identifies the method by which the Name is generated. Values: Other, IP, Dial, HID, NWA, HWA, X25, ISDN, IPX, DCC, ICD, E.164, SNA, OID/OSI, WWN, NAA
	Dedicated	Enumeration indicating whether the system is a special-purpose system or general-purpose system. Values: 0=Not Dedicated 1=Unknown 2=Other 3=Storage 4=Router 5=Switch 6=Layer 3 Switch 7=CentralOffice Switch 8=Hub 9=Access Server 10=Firewall 11=Print 12=I/O 13=Web Caching 14=Management 15=Block Server

Table 11-7. System Properties *(continued)*

Object	Property	Description
		16=File Server 17=Mobile User Device, 18=Repeater 19=Bridge/Extender 20=Gateway 21=Storage Virtualizer 22=Media Library 23=Extender Node 24=NAS Head 25=Self-Contained NAS 26=UPS 27=IP Phone 28=Management Controller 29=Chassis Manager
	`ResetCapability`	Defines the reset methods available on the system Values: 1=Other 2=Unknown 3=Disabled 4=Enabled 5=Not Implemented
	`CreationClassName`	The superclass from which this instance is derived.

Table 11-7. System Properties *(continued)*

Object	Property	Description
	EnabledState	Indicates the enabled/disabled states of the system. Values: 0=Unknown 1=Other 2=Enabled 3=Disabled 4=Shutting Down 5=Not Applicable 6=Enabled but Offline 7=In Test 8=Deferred 9=Quiesce 10=Starting
	EnabledDefault	Indicates the default startup configuration for the enabled state of the system. By default, the system is "Enabled" (value=2). Values: 2=Enabled 3=Disabled 4=Not Applicable 5=Enabled but Offline 6=No Default

Table 11-7. System Properties *(continued)*

Object	Property	Description
	RequestedState	Indicates the last requested or desired state for the system. Values: 2=Enabled 3=Disabled 4=Shut Down 5=No Change 6=Offline 7=Test 8=Deferred 9=Quiesce 10=Reboot 11=Reset 12=Not Applicable
	HealthState	Indicates the current health of the system. Values: 0=Unknown 5=OK 10=Degraded/Warning 15=Minor Failure 20=Major Failure 30=Critical Failure 35=Non-recoverable Error

Table 11-7. System Properties *(continued)*

Object	Property	Description
	OperationalStatus	Indicates the current status of the system. Values: 0=Unknown 1=Other 2=OK 3=Degraded 4=Stressed 5=Predictive Failure 6=Error 7=Non-Recoverable Error 8=Starting 9=Stopping 10=Stopped 11=In Service 12=No Contact 13=Lost Communication 14=Aborted 15=Dormant 16=Supporting Entity in Error 17=Completed 18=Power Mode
	Description	A text-based description of the system.

12

Troubleshooting

Troubleshooting the DRAC 5

See the following tables for help with troubleshooting the DRAC 5 and the RACADM:

Table 6-9, "Using DRAC 5 With Active Directory: Frequently Asked Questions" on page 165

Table 7-7, "Using Console Redirection: Frequently Asked Questions" on page 179

Table 8-2, "Using Virtual Media: Frequently Asked Questions" on page 203

Table 9-4, "Using the serial and racadm Commands: Frequently Asked Questions" on page 226

A

RACADM Subcommand Overview

This section provides descriptions of the subcommands that are available in the RACADM command line interface.

help

NOTE: To use this command, you must have **Log In DRAC 5** permission.

Table A-1 describes the **help** command.

Table A-1. Help Command

Command	Definition
help	Lists all of the subcommands available to use with **racadm** and provides a short description for each.

Synopsis

```
racadm help
racadm help <subcommand>
```

Description

The **help** subcommand lists all of the subcommands that are available when using the **racadm** command along with a one-line description. You may also type a subcommand after **help** to get the syntax for a specific subcommand.

Output

The **racadm help** command displays a complete list of subcommands.

The **racadm help** <*subcommand*> command displays information for the specified subcommand only.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

arp

NOTE: To use this command, you must have **Execute Diagnostic Commands** permission.

Table A-2 describes the **arp** command.

Table A-2. arp Command

Command	Definition
arp	Displays the contents of the ARP table. ARP table entries may not be added or deleted.

Synopsis

```
racadm arp
```

Supported Interfaces

- Remote RACADM
- telnet/ssh/serial RACADM

clearasrscreen

NOTE: To use this command, you must have **Clear Logs** permission.

Table A-3 describes the **clearasrscreen** subcommand.

Table A-3. clearasrscreen

Subcommand	Definition
clearasrscreen	Clears the last crash screen that is in memory.

Synopsis

```
racadm clearasrscreen
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

config

NOTE: To use the **getconfig** command, you must have **Log In DRAC 5** permission.

Table A-4 describes the **config** and **getconfig** subcommands.

Table A-4. config/getconfig

Subcommand	Definition
config	Configures the DRAC 5.
getconfig	Gets the DRAC 5 configuration data.

Synopsis

```
racadm config [-c|-p] -f <filename>
```

```
racadm config -g <groupName> -o <objectName> [-i
<index>] <Value>
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

Description

The **config** subcommand allows the user to set DRAC 5 configuration parameters individually or to batch them as part of a configuration file. If the data is different, that DRAC 5 object is written with the new value.

Input

Table A-5 describes the **config** subcommand options.

NOTE: The **-f** and **-p** options are not supported for the serial/telnet/ssh console.

Table A-5. config Subcommand Options and Descriptions

Option	Description
-f	The **-f** ***<filename>*** option causes **config** to read the contents of the file specified by <*filename*> and configure the DRAC 5. The file must contain data in the format specified in "Parsing Rules" on page 218.
-p	The **-p**, or password option, directs **config** to delete the password entries contained in the config file **-f** ***<filename>*** after the configuration is complete.
-g	The **-g** ***<groupName>***, or group option, must be used with the **-o** option. The <*groupName*> specifies the group containing the object that is to be set.
-o	The **-o** ***<objectName> <Value>***, or object option, must be used with the **-g** option. This option specifies the object name that is written with the string <*value*>.
-i	The **-i** ***<index>,*** or index option, is only valid for indexed groups and can be used to specify a unique group. The <*index*> is a decimal integer from 1 through 16. The index is specified here by the index value, not a "named" value.
-c	The **-c**, or check option, is used with the **config** subcommand and allows the user to parse the **.cfg** file to find syntax errors. If errors are found, the line number and a short description of what is incorrect are displayed. Writes do not occur to the DRAC 5. This option is a check only.

Output

This subcommand generates error output upon encountering either of the following:

- Invalid syntax, group name, object name, index, or other invalid database members
- racadm CLI failures

This subcommand returns an indication of how many configuration objects that were written out of how many total objects were in the **.cfg** file.

Examples

- `racadm config -g cfgLanNetworking -o cfgNicIpAddress 10.35.10.100`

  Sets the **cfgNicIpAddress** configuration parameter (object) to the value 10.35.10.110. This IP address object is contained in the group **cfgLanNetworking**.

- `racadm config -f myrac.cfg`

  Configures or reconfigures the DRAC 5. The **myrac.cfg** file may be created from the **getconfig** command. The **myrac.cfg** file may also be edited manually as long as the parsing rules are followed.

  NOTE: The **myrac.cfg** file does not contain password information. To include this information in the file, it must be input manually. If you want to remove password information from the **myrac.cfg** file during configuration, use the **-p** option.

getconfig

getconfig Subcommand Description

The **getconfig** subcommand allows the user to retrieve DRAC 5 configuration parameters on an individual basis, or all the RAC configuration groups may be retrieved and saved into a file.

Input

Table A-6 describes the **getconfig** subcommand options.

NOTE: The **-f** option without a file specification will output the contents of the file to the terminal screen.

Table A-6. getconfig Subcommand Options

Option	Description
-f	The **-f** ***<filename>*** option directs getconfig to write the entire RAC configuration to a configuration file. This file can be used for batch configuration operations using the **config** subcommand. **NOTE:** The **-f** option does not create entries for the **cfgIpmiPet** and **cfgIpmiPef** groups. You must set at least one trap destination to capture the **cfgIpmiPet** group to the file.
-g	The **-g** ***<groupName>***, or **group** option, can be used to display the configuration for a single group. The **groupName** is the name for the group used in the **racadm.cfg** files. If the group is an indexed group, use the **-i** option.
-h	The **-h**, or **help** option, displays a list of all available configuration groups that you can use. This option is useful when you do not remember exact group names.
-i	The **-i** ***<index>***, or **index** option, is valid only for indexed groups and can be used to specify a unique group. The <*index*> is a decimal integer from 1 through 16. If **-i** <*index*> is not specified, a value of 1 is assumed for groups, which are tables that have multiple entries. The index is specified by the index value, not a "named" value.
-o	The -o ***<objectname>*** or object option specifies the object name that is used in the query. This option is optional and can be used with the -g option.
-u	The **-u** ***<username>***, or **user name** option, can be used to display the configuration for the specified user. The <*username*> option is the login name for the user.
-v	The **-v** option displays additional details with the display of the properties and is used with the **-g** option.

Output

This subcommand generates error output upon encountering either of the following:

- Invalid syntax, group name, object name, index, or other invalid database members
- racadm CLI transport failures

If errors are not encountered, this subcommand displays the contents of the specified configuration.

Examples

- `racadm getconfig -g cfgLanNetworking`

  Displays all of the configuration properties (objects) that are contained in the group **cfgLanNetworking**.

- `racadm getconfig -f myrac.cfg`

  Saves all group configuration objects from the RAC to **myrac.cfg**.

- `racadm getconfig -h`

  Displays a list of the available configuration groups on the DRAC 5.

- `racadm getconfig -u root`

  Displays the configuration properties for the user named root.

- `racadm getconfig -g cfgUserAdmin -i 2 -v`

  Displays the user group instance at index 2 with verbose information for the property values.

Synopsis

```
racadm getconfig -f <filename>

racadm getconfig -g <groupName> [-i <index>]

racadm getconfig -u <username>

racadm getconfig -h
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

coredump

NOTE: To use this command, you must have **Execute Debug Commands** permission.

Table A-7 describes the **coredump** subcommand.

Table A-7. coredump

Subcommand	Definition
coredump	Displays the last DRAC 5 core dump.

Synopsis

```
racadm coredump
```

Description

The **coredump** subcommand displays detailed information related to any recent critical issues that have occurred with the RAC. The coredump information can be used to diagnose these critical issues.

If available, the coredump information is persistent across RAC power cycles and will remain available until either of the following conditions occur:

- The coredump information is cleared with the **coredumpdelete** subcommand.
- Another critical condition occurs on the RAC. In this case, the coredump information will be relative to the last critical error that occurred.

See the **coredumpdelete** subcommand for more information about clearing the **coredump**.

Supported Interfaces

- Remote RACADM
- telnet/ssh/serial RACADM

coredumpdelete

NOTE: To use this command, you must have **Clear Logs** or **Execute Debug Commands** permission.

Table A-8 describes the **coredumpdelete** subcommand.

Table A-8. coredumpdelete

Subcommand	Definition
coredumpdelete	Deletes the core dump stored in the DRAC 5.

Synopsis

```
racadm coredumpdelete
```

Description

The **coredumpdelete** subcommand can be used to clear any currently resident **coredump** data stored in the RAC.

NOTE: If a **coredumpdelete** command is issued and a coredump is not currently stored in the RAC, the command will display a success message. This behavior is expected.

See the **coredump** subcommand for more information on viewing a coredump.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

fwupdate

NOTE: To use this command, you must have **Configure DRAC 5** permission.

NOTE: Before you begin your firmware update, see "Updating the DRAC 5 Firmware" on page 46 for additional instructions.

Table A-9 describes the **fwupdate** subcommand.

Table A-9. fwupdate

Subcommand	Definition
fwupdate	Updates the firmware on the DRAC 5.

Synopsis

```
racadm fwupdate -s

racadm fwupdate -g -u -a <TFTP_Server_IP_Address> -d
<path>

racadm fwupdate -p -u -d <path>
```

Description

The **fwupdate** subcommand allows users to update the firmware on the DRAC 5. The user can:

- Check the firmware update process status
- Update the DRAC 5 firmware from a TFTP server by providing an IP address and optional path
- Update the DRAC 5 firmware from the local file system using local RACADM

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

Input

Table A-10 describes the **fwupdate** subcommand options.

NOTE: The **-p** option is only supported in local RACADM and is not supported with the serial/telnet/ssh console.

Table A-10. fwupdate Subcommand Options

Option	Description
-u	The **update** option performs a checksum of the firmware update file and starts the actual update process. This option may be used along with the **-g** or **-p** options. At the end of the update, the DRAC 5 performs a soft reset.
-s	The **status** option returns the current status of where you are in the update process. This option is always used by itself.

Table A-10. fwupdate Subcommand Options *(continued)*

Option	Description
-g	The **get** option instructs the firmware to get the firmware update file from the TFTP server. The user must also specify the **-a** and **-d** options. In the absence of the **-a** option, the defaults are read from properties contained in the group **cfgRemoteHosts**, using properties **cfgRhostsFwUpdateIpAddr** and **cfgRhostsFwUpdatePath**.
-a	The **IP Address** option specifies the IP address of the TFTP server.
-d	The **-d,** or **directory**, option specifies the directory on the TFTP server or on the DRAC 5's host server where the firmware update file resides.
-p	The **-p**, or **put**, option is used to update the firmware file from the managed system to the DRAC 5. The **-u** option must be used with the **-p** option.

Output

Displays a message indicating which operation is being performed.

Examples

- `racadm fwupdate -g -u - a 143.166.154.143 -d <path>`

  In this example, the **-g** option tells the firmware to download the firmware update file from a location (specified by the **-d** option) on the TFTP server at a specific IP address (specified by the **-a** option). After the image file is downloaded from the TFTP server, the update process begins. When completed, the DRAC 5 is reset.

  If the download exceeds 15 minutes and times out, transfer the firmware flash image to a local drive on the server. Then, using Console Redirection, connect to the remote system and install the firmware locally using local racadm.

- `racadm fwupdate -s`

  This option reads the current status of the firmware update.

- `racadm fwupdate -p -u -d c:\ <images>`

  In this example, the firmware image for the update is provided by the host's file system.

- `racadm -r 192.168.0.120 -u root -p racpassword fwupdate -g -u -a 192.168.0.120 -d <images>`

  In this example, RACADM is used to remotely update the firmware of a specified DRAC using the provided DRAC username and password. The image is retrieved from a TFTP server.

NOTE: The **-p** option is not supported in the Remote RACADM interface for the fwupdate subcommand.

getssninfo

NOTE: To use this command, you must have **Log In To DRAC 5** permission.

Table A-11 describes the **getssninfo** subcommand.

Table A-11. getssninfo Subcommand

Subcommand	Definition
getssninfo	Retrieves session information for one or more currently active or pending sessions from the Session Manager's session table.

Synopsis

```
racadm getssninfo [-A] [-u <username> | *]
```

Description

The **getssninfo** command returns a list of users that are connected to the DRAC. The summary information provides the following information:

- Username
- IP address (if applicable)
- Session type (for example, serial or telnet)
- Consoles in use (for example, Virtual Media or Virtual KVM)

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

Input

Table A-12 describes the **getssninfo** subcommand options.

Table A-12. getssninfo Subcommand Options

Option	Description
-A	The **-A** option eliminates the printing of data headers.
-u	The **-u <username>** user name option limits the printed output to only the detail session records for the given user name. If an "*" symbol is given as the user name, all users are listed. Summary information is not printed when this option is specified.

Examples

- `racadm getssninfo`

Table A-13 provides an example of output from the **racadm getssninfo** command.

Table A-13. getssninfo Subcommand Output Example

User	IP Address	Type	Consoles
root	192.168.0.10	Telnet	Virtual KVM

- `racadm getssninfo -A`

  `"root" 143.166.174.19 "Telnet" "NONE"`
- `racadm getssninfo -A -u *`

  `"root" "143.166.174.19" "Telnet" "NONE"`

  `"bob" "143.166.174.19" "GUI" "NONE"`

getsysinfo

NOTE: To use this command, you must have **Log In To DRAC 5** permission.

Table A-14 describes the **racadm getsysinfo** subcommand.

Table A-14. getsysinfo

Command	Definition
getsysinfo	Displays DRAC 5 information, system information, and watchdog status information.

Synopsis

```
racadm getsysinfo [-d] [-s] [-w] [-A]
```

Description

The **getsysinfo** subcommand displays information related to the RAC, managed system, and watchdog configuration.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

Input

Table A-15 describes the **getsysinfo** subcommand options.

Table A-15. getsysinfo Subcommand Options

Option	Description
-d	Displays DRAC 5 information.
-s	Displays system information
-w	Displays watchdog information
-A	Eliminates the printing of headers/labels.

If the **-w** option is not specified, then the other options are used as defaults.

Output

The **getsysinfo** subcommand displays information related to the RAC, managed system, and watchdog configuration.

Sample Output

```
RAC Information:
RAC Date/Time             = Thu Dec  8 20:01:33 2005
Firmware Version          = 1.0
Firmware Build            = 05.12.08
Last Firmware Update      = Thu Dec  8 08:09:36 2005

Hardware Version          = A00
Current IP Address        = 192.168.0.120
Current IP Gateway        = 192.168.0.1
Current IP Netmask        = 255.255.255.0
DHCP Enabled              = 0
MAC Address               = 00:14:22:18:cd:f9
Current DNS Server 1      = 0.0.0.0
Current DNS Server 2      = 0.0.0.0
DNS Servers from DHCP     = 0
Register DNS RAC Name     = 0
DNS RAC Name              = rac-48192
Current DNS Domain        =

System Information:
System Model              = PowerEdge 2900
System BIOS Version       = 0.2.3
BMC Firmware Version      = 0.17
Service Tag               = 48192
Host Name                 = racdev103
OS Name                   = Microsoft Windows Server
2003
Power Status              = OFF
```

```
Watchdog Information:
Recovery Action          = None
Present countdown value  = 0 seconds
Initial countdown value  = 0 seconds
```

Examples

- `racadm getsysinfo -A -s`

  `"System Information:" "PowerEdge 2900" "A08" "1.0" "EF23VQ-0023" "Hostname"`

  `"Microsoft Windows 2000 version 5.0, Build Number 2195, Service Pack 2" "ON"`

- `racadm getsysinfo -w -s`

```
System Information:
System Model             = PowerEdge 2900
System BIOS Version      = 0.2.3
BMC Firmware Version     = 0.17
Service Tag              = 48192
Host Name                = racdev103
OS Name                  = Microsoft Windows Server
2003
Power Status            = OFF

Watchdog Information:
Recovery Action          = None
Present countdown value  = 0 seconds
Initial countdown value = 0 seconds
```

Restrictions

The Hostname and OS Name fields in the **getsysinfo** output display accurate information only if Dell OpenManage is installed on the managed system. If OpenManage is not installed on the managed system, these fields may be blank or inaccurate.

getractime

NOTE: To use this command, you must have **Log In DRAC 5** permission.

Table A-16 describes the **getractime** subcommand.

Table A-16. getractime

Subcommand	Definition
getractime	Displays the current time from the remote access controller.

Synopsis

```
racadm getractime [-d]
```

Description

With no options, the **getractime** subcommand displays the time in a common readable format.

With the **-d** option, **getractime** displays the time in the format, *yyyymmddhhmmss.mmmmmms*, which is the same format returned by the UNIX **date** command.

Output

The **getractime** subcommand displays the output on one line.

Sample Output

```
racadm getractime
Thu Dec  8 20:15:26 2005


racadm getractime -d
20051208201542.000000
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

ifconfig

NOTE: To use this command, you must have **Execute Diagnostic Commands** or **Configure DRAC 5** permission.

Table A-17 describes the **ifconfig** subcommand.

Table A-17. ifconfig

Subcommand	Definition
ifconfig	Displays the contents of the network interface table.

Synopsis

```
racadm ifconfig
```

netstat

NOTE: To use this command, you must have **Execute Diagnostic Commands** permission.

Table A-18 describes the **netstat** subcommand.

Table A-18. netstat

Subcommand	Definition
netstat	Displays the routing table and the current connections.

Synopsis

```
racadm netstat
```

Supported Interfaces

- Remote RACADM
- telnet/ssh/serial RACADM

ping

NOTE: To use this command, you must have **Execute Diagnostic Commands** or **Configure DRAC 5** permission.

Table A-19 describes the **ping** subcommand.

Table A-19. ping

Subcommand	Definition
ping	Verifies that the destination IP address is reachable from the DRAC 5 with the current routing-table contents. A destination IP address is required. An ICMP echo packet is sent to the destination IP address based on the current routing-table contents.

Synopsis

```
racadm ping <ipaddress>
```

Supported Interfaces

- Remote RACADM
- telnet/ssh/serial RACADM

setniccfg

NOTE: To use the **setniccfg** command, you must have **Configure DRAC 5** permission.

Table A-20 describes the **setniccfg** subcommand.

Table A-20. setniccfg

Subcommand	Definition
setniccfg	Sets the IP configuration for the controller.

NOTE: The terms NIC and Ethernet management port may be used interchangeably.

Synopsis

```
racadm setniccfg -d
racadm setniccfg -s [<ipAddress> <netmask> <gateway>]
racadm setniccfg -o [<ipAddress> <netmask> <gateway>]
```

Description

The **setniccfg** subcommand sets the controller IP address.

- The **-d** option enables DHCP for the Ethernet management port (default is DHCP enabled).
- The **-s** option enables static IP settings. The IP address, netmask, and gateway can be specified. Otherwise, the existing static settings are used. <*ipAddress*>, <*netmask*>, and <*gateway*> must be typed as dot-separated strings.

  ```
  racadm setniccfg -s 192.168.0.120 255.255.255.0
  192.168.0.1
  ```

- The **-o** option disables the Ethernet management port completely. <*ipAddress*>, <*netmask*>, and <*gateway*> must be typed as dot-separated strings.

  ```
  racadm setniccfg -o 192.168.0.120 255.255.255.0
  192.168.0.1
  ```

Output

The **setniccfg** subcommand displays an appropriate error message if the operation is not successful. If successful, a message is displayed.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

getniccfg

NOTE: To use the **getniccfg** command, you must have **Log In To DRAC 5** permission.

Table A-21 describes the **setniccfg** and **getniccfg** subcommands.

Table A-21. setniccfg/getniccfg

Subcommand	Definition
getniccfg	Displays the current IP configuration for the controller.

Synopsis

```
racadm getniccfg
```

Description

The **getniccfg** subcommand displays the current Ethernet management port settings.

Sample Output

The **getniccfg** subcommand will display an appropriate error message if the operation is not successful. Otherwise, on success, the output displayed in the following format:

```
NIC Enabled      = 1
DHCP Enabled     = 1
IP Address       = 192.168.0.1
Subnet Mask      = 255.255.255.0
Gateway          = 192.168.0.1
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

getsvctag

NOTE: To use this command, you must have **Log In To DRAC 5** permission.

Table A-22 describes the **getsvctag** subcommand.

Table A-22. getsvctag

Subcommand	Definition
getsvctag	Displays a service tag.

Synopsis

```
racadm getsvctag
```

Description

The **getsvctag** subcommand displays the service tag of the host system.

Example

Type `getsvctag` at the command prompt. The output is displayed as follows:

```
Y76TP0G
```

The command returns `0` on success and nonzero on errors.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

racdump

NOTE: To use this command, you must have **Debug** permission.

Table A-23 describes the **racdump** subcommand.

Table A-23. racdump

Subcommand	Definition
racdump	Displays status and general DRAC 5 information.

Synopsis

```
racadm racdump
```

Description

The **racdump** subcommand provides a single command to get dump, status, and general DRAC 5 board information.

The following information is displayed when the **racdump** subcommand is processed:

- General system/RAC information
- Coredump
- Session information
- Process information
- Firmware build information

Supported Interfaces

- Remote RACADM
- telnet/ssh/serial RACADM

racreset

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-24 describes the **racreset** subcommand.

Table A-24. racreset

Subcommand	Definition
racreset	Resets the DRAC 5.

NOTICE: When you issue a racreset subcommand, the DRAC may require up to one minute to return to a usable state.

Synopsis

```
racadm racreset [hard | soft]
```

Description

The **racreset** subcommand issues a reset to the DRAC 5. The reset event is written into the DRAC 5 log.

A hard reset performs a deep reset operation on the RAC. A hard reset should only be performed as a last-case resort to recover the RAC.

NOTICE: You must reboot your system after performing a hard reset of the DRAC 5 as described in Table A-25.

Table A-25 describes the **racreset** subcommand options.

Table A-25. racreset Subcommand Options

Option	Description
hard	A *hard* reset performs a deep reset operation on the remote access controller. A hard reset should only be used as a last case resort of resetting the RAC controller for recovery purposes.
soft	A *soft* reset performs a graceful reboot operation on the RAC.

Examples

- `racadm racreset`

  Start the DRAC 5 soft reset sequence.

- `racadm racreset hard`

  Start the DRAC 5 hard reset sequence.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

racresetcfg

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-26 describes the **racresetcfg** subcommand.

Table A-26. racresetcfg

Subcommand	Definition
racresetcfg	Resets the entire RAC configuration to factory default values.

Synopsis

```
racadm racresetcfg
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

Description

The **racresetcfg** command removes all database property entries that have been configured by the user. The database has default properties for all entries that are used to restore the card back to its original default settings. After resetting the database properties, the DRAC 5 resets automatically.

NOTICE: This command deletes your current RAC configuration and resets the RAC and serial configuration to the original default settings. After reset, the default name and password is **root** and **calvin**, respectively, and the IP address is 192.168.0.120. If you issue **racresetcfg** from a network client (for example, a supported Web browser, telnet/ssh, or remote RACADM), you must use the default IP address.

NOTE: This subcommand will also reset the serial interface to its default baud rate (57600) and COM port. The serial settings may need to be reconfigured through the BIOS setup screen for the server in order to access the RAC through the serial port.

serveraction

NOTE: To use this command, you must have **Execute Server Control Commands** permission.

Table A-27 describes the **serveraction** subcommand.

Table A-27. serveraction

Subcommand	Definition
serveraction	Executes a managed system reset or power-on/off/cycle.

Synopsis

```
racadm serveraction <action>
```

Description

The serveraction subcommand enables users to perform power management operations on the host system. Table A-28 describes the **serveraction** power control options.

Table A-28. serveraction Subcommand Options

String	Definition
<*action*>	Specifies the action. The options for the <*action*> string are: • **powerdown** — Powers down the managed system. • **powerup** — Powers up the managed system. • **powercycle** — Issues a power-cycle operation on the managed system. This action is similar to pressing the power button on the system's front panel to power down and then power up the system. • **powerstatus** — Displays the current power status of the server ("ON", or "OFF") • **hardreset** — Performs a reset (reboot) operation on the managed system.

Output

The **serveraction** subcommand displays an error message if the requested operation could not be performed, or a success message if the operation completed successfully.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

getraclog

NOTE: To use this command, you must have **Log In DRAC 5** permission.

Table A-29 describes the **racadm getraclog** command.

Table A-29. getraclog

Command	Definition
getraclog -i	Displays the number of entries in the DRAC 5 log.
getraclog	Displays the DRAC 5 log entries.

Synopsis

```
racadm getraclog -i
racadm getraclog [-A] [-o] [-c count] [-s start-
record] [-m]
```

Description

The **getraclog -i** command displays the number of entries in the DRAC 5 log.

The following options allow the **getraclog** command to read entries:

- **-A** — Displays the output with no headers or labels.
- **-c** — Provides the maximum count of entries to be returned.
- **-m** — Displays one screen of information at a time and prompts the user to continue (similar to the UNIX **more** command).
- **-o** — Displays the output in a single line.
- **-s** — Specifies the starting record used for the display

NOTE: If no options are provided, the entire log is displayed.

Output

The default output display shows the record number, time stamp, source, and description. The timestamp begins at midnight, January 1 and increases until the system boots. After the system boots, the system's timestamp is used.

Sample Output

```
Record:       1
Date/Time:    Dec  8 08:10:11
Source:       login[433]
Description:  root login from 143.166.157.103
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

clrraclog

NOTE: To use this command, you must have **Clear Logs** permission.

Synopsis

```
racadm clrraclog
```

Description

The **clrraclog** subcommand removes all existing records from the RAC log. A new single record is created to record the date and time when the log was cleared.

getsel

NOTE: To use this command, you must have **Log In To DRAC 5** permission.

Table A-30 describes the **getsel** command.

Table A-30. getsel

Command	Definition
getsel -i	Displays the number of entries in the System Event Log.
getsel	Displays SEL entries.

Synopsis

```
racadm getsel -i
```

```
racadm getsel [-E] [-R] [-A] [-o] [-c count] [-s count] [-m]
```

Description

The **getsel -i** command displays the number of entries in the SEL.

The following **getsel** options (without the **-i** option) are used to read entries.

-A — Specifies output with no display headers or labels.

-c — Provides the maximum count of entries to be returned.

-o — Displays the output in a single line.

-s — Specifies the starting record used for the display

-E — Places the 16 bytes of raw SEL at the end of each line of output as a sequence of hex values.

-R — Only the raw data is printed.

-m — Displays one screen at a time and prompts the user to continue (similar to the UNIX **more** command).

NOTE: If no arguments are specified, the entire log is displayed.

Output

The default output display shows the record number, timestamp, severity, and description.

For example:

```
Record:      1
Date/Time:   11/16/2005 22:40:43
Severity:    Ok
Description: System Board SEL: event log sensor for
System Board, log cleared was asserted
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

clrsel

NOTE: To use this command, you must have **Clear Logs** permission.

Synopsis

```
racadm clrsel
```

Description

The **clrsel** command removes all existing records from the system event log (SEL).

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

gettracelog

NOTE: To use this command, you must have **Log In To DRAC 5** permission.

Table A-31 describes the **gettracelog** subcommand.

Table A-31. gettracelog

Command	Definition
gettracelog -i	Displays the number of entries in the DRAC 5 trace log.
gettracelog	Displays the DRAC 5 trace log.

Synopsis

```
racadm gettracelog -i
```

```
racadm gettracelog [-A] [-o] [-c count] [-s
startrecord] [-m]
```

Description

The **gettracelog** (without the **-i** option) command reads entries.
The following **gettracelog** entries are used to read entries:

-i — Displays the number of entries in the DRAC 5 trace log

-m — Displays one screen at a time and prompts the user to continue (similar to the UNIX **more** command).

-o — Displays the output in a single line.

-c — specifies the number of records to display

-s — specifies the starting record to display

-A — do not display headers or labels

Output

The default output display shows the record number, timestamp, source, and description. The timestamp begins at midnight, January 1 and increases until the system boots. After the system boots, the system's timestamp is used.

For example:

```
Record:      1
Date/Time:   Dec  8 08:21:30
Source:      ssnmgrd[175]
Description: root from 143.166.157.103: session
timeout sid 0be0aef4
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

sslcsrgen

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-32 describes the **sslcsrgen** subcommand.

Table A-32. sslcsrgen

Subcommand	Description
sslcsrgen	Generates and downloads an SSL certificate signing request (CSR) from the RAC.

Synopsis

```
racadm sslcsrgen [-g] [-f <filename>]

racadm sslcsrgen -s
```

Description

The **sslcsrgen** subcommand can be used to generate a CSR and download the file to the client's local file system. The CSR can be used for creating a custom SSL certificate that can be used for SSL transactions on the RAC.

Options

NOTE: The **-f** option is not supported for the serial/telnet/ssh console.

Table A-33 describes the **sslcsrgen** subcommand options.

Table A-33. sslcsrgen Subcommand Options

Option	Description
-g	Generates a new CSR.
-s	Returns the status of a CSR generation process (generation in progress, active, or none).
-f	Specifies the filename of the location, <*filename*>, where the CSR will be downloaded.

NOTE: If the **-f** option is not specified, the filename defaults to **sslcsr** in your current directory.

If no options are specified, a CSR is generated and downloaded to the local file system as **sslcsr** by default. The **-g** option cannot be used with the **-s** option, and the **-f** option can only be used with the **-g** option.

The **sslcsrgen -s** subcommand returns one of the following status codes:

- CSR was generated successfully.
- CSR does not exist.
- CSR generation in progress.

Restrictions

The **sslcsrgen** subcommand can only be executed from a local or remote RACADM client and cannot be used in the serial, telnet, or SSH interface.

NOTE: Before a CSR can be generated, the CSR fields must be configured in the RACADM **cfgRacSecurity** group. For example: `racadm config -g cfgRacSecurity -o cfgRacSecCsrCommonName MyCompany`

Examples

```
racadm sslcsrgen -s
```

or

```
racadm sslcsrgen -g -f c:\csr\csrtest.txt
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

sslcertupload

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-34 describes the **sslcertupload** subcommand.

Table A-34. sslcertupload

Subcommand	Description
sslcertupload	Uploads a custom SSL server or CA certificate from the client to the RAC.

Synopsis

```
racadm sslcertupload -t <type> [-f <filename>]
```

Options

Table A-35 describes the **sslcertupload** subcommand options.

Table A-35. sslcertupload Subcommand Options

Option	Description
-t	Specifies the type of certificate to upload, either the CA certificate or server certificate. 1 = server certificate 2 = CA certificate
-f	Specifies the file name of the certificate to be uploaded. If the file is not specified, the **sslcert** file in the current directory is selected.

The **sslcertupload** command returns `0` when successful and returns a nonzero number when unsuccessful.

Restrictions

The **sslcertupload** subcommand can only be executed from a local or remote RACADM client. The **sslcsrgen** subcommand cannot be used in the serial, telnet, or SSH interface.

Example

```
racadm sslcertupload -t 1 -f c:\cert\cert.txt
```

Supported Interfaces

- Local RACADM
- Remote RACADM

sslcertdownload

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-36 describes the **sslcertdownload** subcommand.

Table A-36. sslcertdownload

Subcommand	Description
sslcertupload	Downloads an SSL certificate from the RAC to the client's file system.

Synopsis

```
racadm sslcertdownload -t <type> [-f <filename>]
```

Options

Table A-37 describes the **sslcertdownload** subcommand options.

Table A-37. sslcertdownload Subcommand Options

Option	Description
-t	Specifies the type of certificate to download, either the Microsoft® Active Directory® certificate or server certificate. 1 = server certificate 2 = Microsoft Active Directory certificate
-f	Specifies the file name of the certificate to be uploaded. If the **-f** option or the filename is not specified, the **sslcert** file in the current directory is selected.

The **sslcertdownload** command returns `0` when successful and returns a nonzero number when unsuccessful.

Restrictions

The **sslcertdownload** subcommand can only be executed from a local or remote RACADM client. The **sslcsrgen** subcommand cannot be used in the serial, telnet, or SSH interface.

Example

```
racadm sslcertdownload -t 1 -f c:\cert\cert.txt
```

Supported Interfaces

- Local RACADM
- Remote RACADM

sslcertview

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-38 describes the **sslcertview** subcommand.

Table A-38. sslcertview

Subcommand	Description
sslcertview	Displays the SSL server or CA certificate that exists on the RAC.

Synopsis

```
racadm sslcertview -t <type> [-A]
```

Options

Table A-39 describes the **sslcertview** subcommand options.

Table A-39. sslcertview Subcommand Options

Option	Description
-t	Specifies the type of certificate to view, either the Microsoft Active Directory certificate or server certificate. 1 = server certificate 2 = Microsoft Active Directory certificate
-A	Prevents printing headers/labels.

Output Example

```
racadm sslcertview -t 1

Serial Number             : 00

Subject Information:
Country Code (CC)         : US
State (S)                 : Texas
Locality (L)              : Round Rock
Organization (O)          : Dell Inc.
```

```
Organizational Unit (OU)  : Remote Access Group
Common Name (CN)          : DRAC5 default certificate

Issuer Information:
Country Code (CC)         : US
State (S)                 : Texas
Locality (L)              : Round Rock
Organization (O)          : Dell Inc.
Organizational Unit (OU)  : Remote Access Group
Common Name (CN)          : DRAC5 default certificate

Valid From                : Jul  8 16:21:56 2005 GMT
Valid To                  : Jul  7 16:21:56 2010 GMT
```

```
racadm sslcertview -t 1 -A
```

```
00
US
Texas
Round Rock
Dell Inc.
Remote Access Group
DRAC5 default certificate
US
Texas
Round Rock
Dell Inc.
Remote Access Group
DRAC5 default certificate
Jul 8 16:21:56 2005 GMT
Jul 7 16:21:56 2010 GMT
```

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

sslkeyupload

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-40 describes the **sslkeyupload** subcommand.

Table A-40. sslkeyupload

Subcommand	Description
sslkeyupload	Uploads SSL key from the client to the DRAC 5.

Synopsis

```
racadm sslkeyupload -t <type> [-f <filename>]
```

Options

Table A-41 describes the **sslkeyupload** subcommand options.

Table A-41. sslkeyupload Subcommand Options

Option	Description
-t	Specifies the key to upload. 1 = server certificate
-f	Specifies the file name of the certificate to be uploaded. If the file is not specified, the **sslcert** file in the current directory is selected.

The **sslkeyupload** command returns 0 when successful and returns a nonzero number when unsuccessful.

Restrictions

The **sslkeyupload** subcommand can only be executed from a local or remote RACADM client. The **sslcsrgen** subcommand cannot be used in the serial, telnet, or SSH interface.

Example

```
racadm sslcertupload -t 1 -f c:\cert\cert.txt
```

Supported Interfaces

- Local RACADM
- Remote RACADM

testemail

Table A-42 describes the **testemail** subcommand.

Table A-42. testemail configuration

Subcommand	Description
testemail	Tests the RAC's e-mail alerting feature.

Synopsis

```
racadm testemail -i <index>
```

Description

Sends a test e-mail from the RAC to a specified destination.

Prior to executing the test e-mail command, ensure that the specified index in the RACADM **cfgEmailAlert** group is enabled and configured properly. Table Table A-43 provides a list and associated commands for the **cfgEmailAlert** group.

Table A-43. testemail Configuration

Action	Command
Enable the alert	`racadm config -g cfgEmailAlert -o cfgEmailAlertEnable -i 1 1`
Set the destination e-mail address	`racadm config -g cfgEmailAlert -o cfgEmailAlertAddress -i 1 user1@mycompany.com`
Set the custom message that is sent to the destination e-mail address	`racadm config -g cfgEmailAlert -o cfgEmailAlertCustomMsg -i 1 "This is a test!"`

Table A-43. testemail Configuration

Action	Command
Ensure the SNMP IP address is configured properly	`racadm config -g cfgRemoteHosts -o cfgRhostsSmptServerIpAddr -i 192.168.0.152`
View the current e-mail alert settings	`racadm getconfig -g cfgEmailAlert -i <index>` where *<index>* is a number from 1 to 4

Options

Table A-44 describes the **testemail** subcommand options.

Table A-44. testemail Subcommands

Option	Description
-i	Specifies the index of the e-mail alert to test.

Output

None.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

testtrap

NOTE: To use this command, you must have **Test Alerts** permission.

Table A-45 describes the **testtrap** subcommand.

Table A-45. testtrap

Subcommand	Description
testtrap	Tests the RAC's SNMP trap alerting feature.

Synopsis

```
racadm testtrap -i <index>
```

Description

The **testtrap** subcommand tests the RAC's SNMP trap alerting feature by sending a test trap from the RAC to a specified destination trap listener on the network.

Before you execute the **testtrap** subcommand, ensure that the specified index in the RACADM **cfgIpmiPet** group is configured properly.

Table Table A-43 provides a list and associated commands for the **cfgIpmiPet** group.

Table A-46. cfgEmailAlert Commands

Action	Command
Enable the alert	`racadm config -g cfgIpmiPet -o cfgIpmiPetAlertEnable -i 1 1`
Set the destination e-mail IP address	`racadm config -g cfgIpmiPet -o cfgIpmiPetAlertDestIpAddr -i 1 192.168.0.110`
View the current test trap settings	`racadm getconfig -g cfgIpmiPet -i <index>` where *<index>* is a number from 1 to 4

Input

Table A-47 describes the **testtrap** subcommand options.

Table A-47. testtrap Subcommand Options

Option	Description
-i	Specifies the index of the trap configuration to use for the test Valid values are from 1 to 4.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

vmdisconnect

NOTE: To use this command, you must have **Access Virtual Media** permission.

Table A-48 describes the **vmdisconnect** subcommand.

Table A-48. vmdisconnect

Subcommand	Description
vmdisconnect	Closes all open RAC virtual media connections from remote clients.

Synopsis

```
racadm vmdisconnect
```

Description

The **vmdisconnect** subcommand allows a user to disconnect another user's virtual media session. Once disconnected, the web-based interface will reflect the correct connection status. This is available only through the use of local or remote racadm.

The **vmdisconnect** subcommand enables a RAC user to disconnect all active virtual media sessions. The active virtual media sessions can be displayed in the RAC web-based interface or by using the racadm **getsysinfo** subcommand.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

vmkey

NOTE: To use this command, you must have **Access Virtual Media** permission.

Table A-49 describes the **vmkey** subcommand.

Table A-49. vmkey

Subcommand	Description
vmkey	Performs virtual media key-related operations.

Synopsis

```
racadm vmkey <action>
```

If *<action>* is configured as `reset`, the virtual flash memory is reset to the default size of 16 MB.

Description

When a custom virtual media key image is uploaded to the RAC, the key size becomes the image size. The vmkey subcommand can be used to reset the key back to its original default size, which is 16 MB on the DRAC 5.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

usercertupload

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-50 describes the **sslcertupload** subcommand.

Table A-50. usercertupload

Subcommand	Description
usercertupload	Uploads a user certificate or a user CA certificate from the client to the DRAC.

Synopsis

```
racadm usercertupload -t <type> [-f <filename>] -i
<index>
```

Options

Table A-51 describes the **usercertupload** subcommand options.

Table A-51. usercertupload Subcommand Options

Option	Description
-t	Specifies the type of certificate to upload, either the CA certificate or server certificate. 1 = user certificate 2 = user CA certificate
-f	Specifies the file name of the certificate to be uploaded. If the file is not specified, the **sslcert** file in the current directory is selected.
-i	Index number of the user. Valid values 1-16.

The **usercertupload** command returns `0` when successful and returns a nonzero number when unsuccessful.

Restrictions

The **usercertupload** subcommand can only be executed from a local or a remote RACADM client.

Example

```
racadm usercertupload -t 1 -f c:\cert\cert.txt -i 6
```

Supported Interfaces

- Local RACADM
- Remote RACADM

usercertview

NOTE: To use this command, you must have **Configure DRAC 5** permission.

Table A-52 describes the **usercertview** subcommand.

Table A-52. usercertview

Subcommand	Description
usercertview	Displays the user certificate or user CA certificate that exists on the DRAC.

Synopsis

```
racadm sslcertview -t <type> [-A] -i <index>
```

Options

Table A-53 describes the **sslcertview** subcommand options.

Table A-53. sslcertview Subcommand Options

Option	Description
-t	Specifies the type of certificate to view, either the user certificate or the user CA certificate. 1 = user certificate 2 = user CA certificate
-A	Prevents printing headers/labels.
-i	Index number of the user. Valid values are 1-16.

Supported Interfaces

- Local RACADM
- Remote RACADM
- telnet/ssh/serial RACADM

localConRedirDisable

NOTE: Only a local racadm user can execute this command.

Table A-54 describes the **localConRedirDisable** subcommand.

Table A-54. localConRedirDisable

Subcommand	Description
localConRedirDisable	Disables console redirection to the management station.

Synopsis

```
racadm localConRedirDisable <option>
```

If *<option>* is set to 1, console redirection is disabled.

Supported Interfaces

- Local RACADM

B

DRAC 5 Property Database Group and Object Definitions

The DRAC 5 property database contains the configuration information for the DRAC 5. Data is organized by associated object, and objects are organized by object group. The IDs for the groups and objects that the property database supports are listed in this section.

Use the group and object IDs with the racadm utility to configure the DRAC 5. The following sections describe each object and indicate whether the object is readable, writable, or both.

All string values are limited to displayable ASCII characters, except where otherwise noted.

Displayable Characters

Displayable characters include the following set:

```
abcdefghijklmnopqrstuvwxwz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

0123456789~`!@#$%^&*()_+-={}[]|\:";'<>,.?/
```

idRacInfo

This group contains display parameters to provide information about the specifics of the DRAC 5 being queried.

One instance of the group is allowed. The following subsections describe the objects in this group.

idRacProductInfo (Read Only)

Legal Values

String of up to 63 ASCII characters.

Default

"Dell Remote Access Controller 5"

Description

Uses a text string to identify the product.

idRacDescriptionInfo (Read Only)

Legal Values

String of up to 255 ASCII characters.

Default

"This system component provides a complete set of remote management functions for Dell PowerEdge servers."

Description

A text description of the RAC type.

idRacVersionInfo (Read Only)

Legal Values

String of up to 63 ASCII characters.

Default

"1.0"

Description

A string containing the current product firmware version.

idRacBuildInfo (Read Only)

Legal Values

String of up to 16 ASCII characters.

Default

The current RAC firmware build version. For example, "05.12.06".

Description

A string containing the current product build version.

idRacName (Read Only)

Legal Values

String of up to 15 ASCII characters.

Default

DRAC 5

Description

A user assigned name to identify this controller.

idRacType (Read Only)

Default

6

Description

Identifies the remote access controller type as the DRAC 5.

cfgLanNetworking

This group contains parameters to configure the DRAC 5 NIC.

One instance of the group is allowed. All objects in this group will require the DRAC 5 NIC to be reset, which may cause a brief loss in connectivity. Objects that change the DRAC 5 NIC IP address settings will close all active user sessions and require users to reconnect using the updated IP address settings.

cfgDNSDomainNameFromDHCP (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

1

Description

Specifies that the RAC DNS Domain Name should be assigned from the network DHCP server.

cfgDNSDomainName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String of up to 254 ASCII characters. At least one of the characters must be alphabetic. Characters are restricted to alphanumeric, '-' and '.'

NOTE: Microsoft® Active Directory® only supports Fully Qualified Domain Names (FQDN) of 64 bytes or fewer.

Default

""

Description

The DNS domain name. This parameter is only valid if **cfgDNSDomainNameFromDHCP** is set to 0 (FALSE).

cfgDNSRacName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String of up to 63 ASCII characters. At least one character must be alphabetic.

NOTE: Some DNS servers only register names of 31 characters or fewer.

Default

rac-*service tag*

Description

Displays the RAC name, which is rac-*service tag* (by default). This parameter is only valid if **cfgDNSRegisterRac** is set to 1 (TRUE).

cfgDNSRegisterRac (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Registers the DRAC 5 name on the DNS server.

cfgDNSServersFromDHCP (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Specifies that the DNS server IP addresses should be assigned from the DHCP server on the network.

cfgDNSServer1 (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

A string representing a valid IP address. For example: "192.168.0.20".

Description

Specifies the IP address for DNS server 1. This property is only valid if **cfgDNSServersFromDHCP** is set to **0** (FALSE).

NOTE: cfgDNSServer1 and **cfgDNSServer2** may be set to identical values while swapping addresses.

cfgDNSServer2 (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

A string representing a valid IP address. For example: "192.168.0.20".

Default

0.0.0.0

Description

Retrieves the IP address for DNS server 2. This parameter is only valid if **cfgDNSServersFromDHCP** is set to 0 (FALSE).

NOTE: cfgDNSServer1 and **cfgDNSServer2** may be set to identical values while swapping addresses.

cfgNicEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the RAC network interface controller. If the NIC is disabled, the remote network interfaces to the RAC will no longer be accessible, and the RAC will only be available through the serial or local RACADM interfaces.

cfgNicIpAddress (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission. This parameter is only configurable if the **cfgNicUseDhcp** parameter is set to 0 (FALSE).

Legal Values

A string representing a valid IP address. For example: "192.168.0.20".

Default

192.168.0.120

Description

Specifies the static IP address to assign to the RAC. This property is only valid if **cfgNicUseDhcp** is set to **0** (FALSE).

cfgNicNetmask (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission. This parameter is only configurable if the **cfgNicUseDhcp** parameter is set to 0 (FALSE).

Legal Values

A string representing a valid subnet mask. For example: "255.255.255.0".

Default

255.255.255.0

Description

The subnet mask used for static assignment of the RAC IP address. This property is only valid if **cfgNicUseDhcp** is set to **0** (FALSE).

cfgNicGateway (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission. This parameter is only configurable if the **cfgNicUseDhcp** parameter is set to 0 (FALSE).

Legal Values

A string representing a valid gateway IP address. For example: "192.168.0.1".

Default

192.168.0.1

Description

The gateway IP address used for static assignment of the RAC IP address. This property is only valid if **cfgNicUseDhcp** is set to **0** (FALSE).

cfgNicUseDhcp (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Specifies whether DHCP is used to assign the RAC IP address. If this property is set to 1 (TRUE), then the RAC IP address, subnet mask, and gateway are assigned from the DHCP server on the network. If this property is set to 0 (FALSE), the static IP address, subnet mask, and gateway is assigned from the **cfgNicIpAddress**, **cfgNicNetmask**, and **cfgNicGateway** properties.

NOTE: If you are updating your system remotely, use the **setniccfg** command.

cfgNicSelection (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (shared)

1 (shared with failover)

2 (dedicated)

Default

2

Description

Specifies the current mode of operation for the RAC network interface controller (NIC). Table B-1 describes the supported modes.

Table B-1. cfgNicSelection Supported Modes

Mode	Description
Shared	Used if the host server integrated NIC is shared with the RAC on the host server. This mode enables configurations to use the same IP address on the host server and the RAC for common accessibility on the network.
Shared with Failover	Enables teaming capabilities between host server integrated network interface controllers.
Dedicated	Specifies that the RAC NIC is used as the dedicated NIC for remote accessibility.

cfgNicMacAddress (Read Only)

Legal Values

A string representing the RAC NIC MAC address.

Default

The current MAC address of the RAC NIC. For example, "00:12:67:52:51:A3".

Description

The RAC NIC MAC address.

cfgNicVLanEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the VLAN capabilities of the RAC/BMC.

cfgNicVLanId (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 – 4094

Default

0

Description

Specifies the VLAN ID for the network VLAN configuration. This property is only valid if **cfgNicVLanEnable** is set to 1 (enabled).

cfgNicVLanPriority (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 – 7

Default

0

Description

Specifies the VLAN Priority for the network VLAN configuration. This property is only valid if cfgNicVLanEnable is set to 1 (enabled).

cfgRemoteHosts

This group provides properties that allow configuration of various remote components, which include the SMTP server for e-mail alerts and TFTP server IP addresses for firmware updates.

cfgRhostsSmtpServerIpAddr (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

A string representing a valid SMTP server IP address. For example, `192.168.0.55`.

Default

0.0.0.0

Description

The IP address of the network SMTP server. The SMTP server transmits e-mail alerts from the RAC if the alerts are configured and enabled.

cfgRhostsFwUpdateTftpEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

1

Description

Enables or disables the RAC firmware update from a network TFTP server.

cfgRhostsFwUpdateIpAddr (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

A string representing a valid TFTP server IP address. For example, `192.168.0.61`.

Default

0.0.0.0

Description

Specifies the network TFTP server IP address that is used for TFTP RAC firmware update operations.

cfgRhostsFwUpdatePath (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum length = 255.

Default

""

Description

Specifies TFTP path where the RAC firmware image file exists on the TFTP server. The TFTP path is relative to the TFTP root path on the TFTP server.

NOTE: The server may still require you to specify the drive (for example, **C**).

cfgUserAdmin

This group provides configuration information about the users who are allowed to access the RAC through the available remote interfaces.

Up to 16 instances of the user group are allowed. Each instance represents the configuration for an individual user.

cfgUserAdminIpmiLanPrivilege (Read/Write)

NOTE: To modify this property, you must have **Configure Users** permission.

Legal Values

2 (User)

3 (Operator)

4 (Administrator)

15 (No access)

Default

4 (User 2)

15 (All others)

Description

The maximum privilege on the IPMI LAN channel.

cfgUserAdminIpmiSerialPrivilege (Read/Write)

NOTE: To modify this property, you must have **Configure Users** permission.

Legal Values

2 (User)

3 (Operator)

4 (Administrator)

15 (No access)

Default

4 (User 2)

15 (All others)

Description

The maximum privilege on the IPMI serial channel.

cfgUserAdminPrivilege (Read/Write)

NOTE: To modify this property, you must have **Configure Users** permission.

Legal Values

0x0000000 to 0x00001ff, and 0x0

Default

0x0000000

Description

This property specifies the allowed role-based authority privileges allowed for the user. The value is represented as a bitmask that allows for any combination of privilege values. Table B-2 describes the allowed user privileges' bit masks.

Table B-2. Bit Masks for User Privileges

User Privilege	Privilege Bit Mask
Log In To DRAC 5	0x0000001
Configure DRAC 5	0x0000002
Configure Users	0x0000004

Table B-2. Bit Masks for User Privileges *(continued)*

User Privilege	Privilege Bit Mask
Clear Logs	0x0000008
Execute Server Control Commands	0x0000010
Access Console Redirection	0x0000020
Access Virtual Media	0x0000040
Test Alerts	0x0000080
Execute Debug Commands	0x0000100

Examples

Table B-3 provides sample privilege bit masks for users with one or more privileges.

Table B-3. Sample Bit Masks for User Privileges

User Privilege(s)	Privilege Bit Mask
The user is not allowed to access the RAC.	0x00000000
The user may only login to RAC and view RAC and server configuration information.	0x00000001
The user may login to RAC and change configuration.	0x00000001 + 0x00000002 = 0x00000003
The user may login to RAC, access virtual media, and access console redirection.	0x00000001 + 0x00000040 + 0x00000080 = 0x000000C1

cfgUserAdminUserName (Read/Write)

NOTE: To modify this property, you must have **Configure Users** permission.

Legal Values

String. Maximum length = 16.

Default

""

Description

The name of the user for this index. The user index is created by writing a string into this name field if the index is empty. Writing a string of double quotes ("") deletes the user at that index. You cannot change the name. You must delete and then recreate the name. The string must not contain "/" (forward slash, "\" (backslash), "." (period), "@" ("at" symbol) or quotations marks.

NOTE: This property value MUST be unique from other user instances.

cfgUserAdminPassword (Write Only)

NOTE: To modify this property, you must have **Configure Users** permission.

Legal Values

A string of up to 20 ASCII characters.

Default

""

Description

The password for this user. The user passwords are encrypted and cannot be seen or displayed after this property is written.

cfgUserAdminEnable

NOTE: To modify this property, you must have **Config Users** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables an individual user.

cfgUserAdminSolEnable

NOTE: To modify this property, you must have **Config Users** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables Serial Over LAN (SOL) user access.

cfgEmailAlert

This group contains parameters to configure the RAC e-mail alerting capabilities.

The following subsections describe the objects in this group. Up to four instances of this group are allowed.

cfgEmailAlertIndex (Read Only)

Legal Values

1–4

Default

This parameter is populated based on the existing instances.

Description

The unique index of an alert instance.

cfgEmailAlertEnable (Read/Write)

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Specifies the destination e-mail address for e-mail alerts. For example, `user1@company.com`.

cfgEmailAlertAddress (Read Only)

Legal Values

E-mail address format, with a maximum length of 64 ASCII characters.

Default

""

Description

The e-mail address of the alert source.

cfgEmailAlertCustomMsg (Read Only)

Legal Values

String. Maximum Length = 32.

Default

""

Description

Specifies a custom message that is sent with the alert.

cfgSessionManagement

This group contains parameters to configure the number of sessions that can connect to the DRAC 5.

One instance of the group is allowed. The following subsections describe the objects in this group.

cfgSsnMgtConsRedirMaxSessions (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 2

Default

2

Description

Specifies the maximum number of console redirection sessions allowed on the RAC.

cfgSsnMgtRacadmTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

10 –1920

Default

30

Description

Defines the idle time-out in seconds for the Remote RACADM interface. If a remote RACADM session remains inactive for more than the specified sessions, the session will be closed.

cfgSsnMgtWebserverTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

60 – 1920

Default

300

Description

Defines the Web server time-out. This property sets the amount of time in seconds that a connection is allowed to remain idle (there is no user input). The session is cancelled if the time limit set by this property is reached. Changes to this setting do not affect the current session (you must log out and log in again to make the new settings effective).

An expired Web server session logs out the current session.

cfgSsnMgtSshIdleTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (No time-out)

60 – 1920

Default

300

Description

Defines the Secure Shell idle time-out. This property sets the amount of time in seconds that a connection is allowed to remain idle (there is no user input). The session is cancelled if the time limit set by this property is reached. Changes to this setting do not affect the current session (you must log out and log in again to make the new settings effective).

An expired Secure Shell session displays the following error message only after you press <Enter>:

```
Warning: Session no longer valid, may have timed out
```

After the message appears, the system returns you to the shell that generated the Secure Shell session.

cfgSsnMgtTelnetTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (No timeout)

60 – 1920

Default

0

Description

Defines the Telnet idle time-out. This property sets the amount of time in seconds that a connection is allowed to remain idle (there is no user input). The session is cancelled if the time limit set by this property is reached. Changes to this setting do not affect the current session (you must log out and log in again to make the new settings effective).

An expired Telnet session displays the following error message only after you press <Enter>:

```
Warning: Session no longer valid, may have timed out
```

After the message appears, the system returns you to the shell that generated the Telnet session.

cfgSerial

This group contains configuration parameters for the DRAC 5 serial port.

One instance of the group is allowed. The following subsections describe the objects in this group.

cfgSerialBaudRate (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

9600, 28800, 57600, 115200

Default

57600

Description

Sets the baud rate on the DRAC 5 serial port.

cfgSerialConsoleEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the RAC serial console interface.

cfgSerialConsoleQuitKey (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

STRING

MaxLen = 4

Default

^\ (<Ctrl><\>)

NOTE: The "^" is the <Ctrl> key.

Description

This key or key combination terminates text console redirection when using the **connect com2** command. The **cfgSerialConsoleQuitKey** value can be represented by one of the following:

- Decimal value — For example: "95"
- Hexidecimal value — For example: "0x12"
- Octal value — For example: "007"
- ASCII value — For example: "^a"

  ASCII values may be represented using the following Escape Key codes:

  (a) ^ followed by any alphabetic (a-z, A-Z)

  (b) ^ followed by the listed special characters: [ ] \ ^ _

cfgSerialConsoleIdleTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 = No time-out

60 – 1920

Default

300

Description

The maximum number of seconds to wait before an idle serial session is disconnected.

cfgSerialConsoleNoAuth (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (enables serial login authentication)

1 (disables serial login authentication)

Default

0

Description

Enables or disables the RAC serial console login authentication.

cfgSerialConsoleCommand (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Description

Specifies a serial command that is executed after a user logs into the serial console interface.

Default

""

Example

"connect com2"

cfgSerialHistorySize (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 – 8192

Default

8192

Description

Specifies the maximum size of the serial history buffer.

cfgSerialSshEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

1

Description

Enables or disables the secure shell (SSH) interface on the DRAC 5.

cfgSerialTelnetEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the telnet console interface on the RAC.

cfgSerialCom2RedirEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Default

1

Legal Values

1 (TRUE)

0 (FALSE)

Description

Enables or disables the console for COM 2 port redirection.

cfgNetTuning

This group enables users to configure the advanced network interface parameters for the RAC NIC. When configured, the updated settings may take up to a minute to become active.

NOTICE: Use extra precaution when modifying properties in this group. Inappropriate modification of the properties in this group can result in your RAC NIC become inoperable.

cfgNetTuningNicAutoneg (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (Enabled)

0 (Disabled)

Default

1

Description

Enables autonegotiation of physical link speed and duplex. If enabled, autonegotiation takes priority over values set in the **cfgNetTuningNic100MB** and **cfgNetTuningNicFullDuplex** objects.

cfgNetTuningNic100MB (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (10 MBit)

1 (100 MBit)

Default

1

Description

Specifies the speed to use for the RAC NIC. This property is not used if the **cfgNetTuningNicAutoNeg** is set to 1 (enabled).

cfgNetTuningNicFullDuplex (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (Half Duplex)

1 (Full Duplex)

Default

1

Description

Specifies the duplex setting for the RAC NIC. This property is not used if the **cfgNetTuningNicAutoNeg** is set to 1 (enabled).

cfgNetTuningNicMtu (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

576 – 1500

Default

1500

Description

The size in bytes of the maximum transmission unit used by the DRAC 5 NIC.

cfgNetTuningTcpSrttDflt (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

6 – 384

Default

6

Description

The smoothed round trip time-out base default value for TCP retransmission round trip time in ½ second units. (Type hexadecimal values.)

cfgOobSnmp

The group contains parameters to configure the SNMP agent and trap capabilities of the DRAC 5.

One instance of the group is allowed. The following subsections describe the objects in this group.

cfgOobSnmpAgentCommunity (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 31.

Default

public

Description

Specifies the SNMP Community Name used for SNMP Traps.

cfgOobSnmpAgentEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the SNMP agent in the RAC.

cfgRacTuning

This group is used to configure various RAC configuration properties, such as valid ports and security port restrictions.

cfgRacTuneHttpPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

10 – 65535

Default

80

Description

Specifies the port number to use for HTTP network communication with the RAC.

cfgRacTuneHttpsPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

10 – 65535

Default

443

Description

Specifies the port number to use for HTTPS network communication with the RAC.

cfgRacTuneIpRangeEnable

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the IP Address Range validation feature of the RAC.

cfgRacTuneIpRangeAddr

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String, IP address formatted. For example, `192.168.0.44`.

Default

192.168.1.1

Description

Specifies the acceptable IP address bit pattern in positions determined by the 1's in the range mask property (**cfgRacTuneIpRangeMask**).

cfgRacTuneIpRangeMask

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Standard IP mask values with left-justified bits

Default

255.255.255.0

Description

String, IP-address formatted. For example, `255.255.255.0`.

cfgRacTuneIpBlkEnable

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the IP address blocking feature of the RAC.

cfgRacTuneIpBlkFailcount

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 – 16

Default

5

Description

The maximum number of login failure to occur within the window before the login attempts from the IP address are rejected.

cfgRacTuneIpBlkFailWindow

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 – 65535

Default

60

Description

Defines the timespan in seconds that the failed attempts are counted. When the failure attempts age to this limit, the failures are dropped from the count.

cfgRacTuneIpBlkPenaltyTime

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 – 65535

Default

300

Description

Defines the timespan in seconds that session requests from an IP address with excessive failures are rejected.

cfgRacTuneSshPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 65535

Default

22

Description

Specifies the port number used for the RAC SSH interface.

cfgRacTuneTelnetPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 65535

Default

23

Description

Specifies the port number used for the RAC telnet interface.

cfgRacTuneRemoteRacadmEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

1

Description

Enables or disables the Remote RACADM interface in the RAC.

cfgRacTuneConRedirEncryptEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Encrypts the video in a console redirection session.

cfgRacTuneConRedirPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 65535

Default

5901

Description

Specifies the port to be used for keyboard and mouse traffic during Console Redirection activity with the RAC.

NOTE: This object requires a DRAC 5 reset before it becomes active.

cfgRacTuneConRedirVideoPort (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 65535

Default

5901

Description

Specifies the port to be used for video traffic during Console Redirection activity with the RAC.

NOTE: This object requires a DRAC 5 reset before it becomes active.

cfgRacTuneAsrEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables the crash screen capture feature of the RAC.

NOTE: This object requires a DRAC 5 reset before it becomes active.

cfgRacTuneDaylightOffset (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 – 60

Default

0

Description

Specifies the daylight savings offset (in minutes) to use for the RAC Time.

cfgRacTuneTimezoneOffset (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

-720 – 780

Default

0

Description

Specifies the timezone offset (in minutes) from GMT/UTC to use for the RAC Time. Some common timezone offsets for timezones in the United States are shown below:

-480 (PST — Pacific Standard Time)

-420 (MST — Mountain Standard Time)

-360 (CST — Central Standard Time)

-300 (EST — Eastern Standard Time)

cfgRacTuneWebserverEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables and disables the RAC webserver. If this property is disabled, the RAC will not be accessible using client web browsers or remote RACADM. This property has no effect on the telnet/ssh/serial or local RACADM interfaces.

cfgRacTuneLocalServerVideo (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (Enables)

0 (Disables)

Default

1

Description

Enables (switches ON) or disables (switches OFF) the local server video.

cfgRacTuneLocalConfigDisable

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the ability of a local user to configure the DRAC 5 using local racadm or the Dell OpenManage Server Administrator Utilities.

cfgRacTuneCtrlEConfigDisable

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the ability to disable the ability of the local user to configure the DRAC 5 from the BIOS POST option-ROM.

ifcRacManagedNodeOs

This group contains properties that describe the Managed Server operating system.

One instance of the group is allowed. The following subsections describe the objects in this group.

ifcRacMnOsHostname (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 255.

Default

""

Description

The host name of the managed system.

ifcRacMnOsOsName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 255.

Default

""

Description

The operating system name of the managed system.

cfgRacSecurity

This group is used to configure settings related to the RAC SSL certificate signing request (CSR) feature. The properties in this group MUST be configured prior to generating a CSR from the RAC.

See the RACADM **sslcsrgen** subcommand details for more information on generating certificate signing requests.

cfgRacSecCsrCommonName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR Common Name (CN).

cfgRacSecCsrOrganizationName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR Organization Name (O).

cfgRacSecCsrOrganizationUnit (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR Organization Unit (OU).

cfgRacSecCsrLocalityName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR Locality (L).

cfgRacSecCsrStateName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR State Name (S).

cfgRacSecCsrCountryCode (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 2.

Default

""

Description

Specifies the CSR Country Code (CC)

cfgRacSecCsrEmailAddr (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String. Maximum Length = 254.

Default

""

Description

Specifies the CSR e-mail Address.

cfgRacSecCsrKeySize (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1024

2048

4096

Default

1024

Description

Specifies the SSL asymmetric key size for the CSR.

cfgRacVirtual

This group contains parameters to configure the DRAC 5 Virtual Media feature. One instance of the group is allowed. The following subsections describe the objects in this group.

cfgVirMediaAttached (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

This object is used to attach your virtual devices to the system via the USB bus. When the devices are attached the server will recognize valid USB Mass Storage devices attached to the system. This is equivalent to attaching a local USB CDROM/Floppy drive to a USB port on the system. When the devices are attached you then can connect to the virtual devices remotely using DRAC5 web-based interface or the CLI. Setting this object to 0 will cause the devices to detach from the USB bus.

NOTE: You must restart your system to enable all changes.

cfgVirAtapiSrvPort (Read/Write)

NOTE: To modify this property, you must have **Access Virtual Media** permission.

Legal Values

1 – 65535

Default

3669

Description

Specifies the port number used for encrypted virtual media connections to the RAC.

cfgVirAtapiSrvPortSsl (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any unused port number between 0 and 65535 decimal.

Default

3669

Description

Sets the port used for SSL Virtual Media connections.

cfgVirMediaKeyEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the virtual media key feature of the RAC.

cfgVirMediaBootOnce (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (Enabled)

0 (Disabled)

Default

0

Description

Enables or disables the virtual media boot-once feature of the RAC. If this property is enabled when the host server is rebooted, this feature will attempt to boot from the virtual media devices—if the appropriate media is installed in the device.

cfgFloppyEmulation (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (True)

0 (False)

Default

1

Description

When set to 0, the Virtual Floppy drive is recognized as a removable disk by Windows operating systems. Windows operating systems will assign a drive letter that is C: or higher during enumeration. When set to 1, the Virtual Floppy drive will be seen as a floppy drive by Windows operating systems. Windows operating systems will assign a drive letter of A: or B:.

cfgActiveDirectory

This group contains parameters to configure the DRAC 5 Active Directory feature.

cfgADRacDomain (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any printable text string with no white space. Length is limited to 254 characters.

Default

""

Description

Active Directory Domain in which the DRAC resides.

cfgADRacName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any printable text string with no white space. Length is limited to 254 characters.

Default

""

Description

Name of DRAC as recorded in the Active Directory forest.

cfgADEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables Active Directory user authentication on the RAC. If this property is disabled, local RAC authentication is used for user logins instead.

cfgADSpecifyServerEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 or 0 (True or False)

Default

0

Description

1 (True) enables you to specify an LDAP or a Global Catalog server. 0 (False) disables this option.

cfgADDomainController (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Valid IP address or fully qualified domain name (FQDN)

Default

No default values

Description

DRAC 5 uses the value you specify, to search the LDAP server for user names.

cfgADGlobalCatalog (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Valid IP address or FQDN

Default

No default values

Description

DRAC 5 uses the value you specify, to search the Global Catalog server for user names.

cfgADSmartCardLogonEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the Smart Card logon on DRAC 5.

cfgADCRLEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 (TRUE)

0 (FALSE)

Default

0

Description

Enables or disables the Certificate Revocation List (CRL) check for Active Directory-based Smart Card users.

cfgADAuthTimeout (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

15 – 300

Default

120

Description

Specifies the number of seconds to wait for Active Directory authentication requests to complete before timing out.

cfgADRootDomain (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any printable text string with no white space. Length is limited to 254 characters.

Default

""

Description

Root domain of the Domain Forest.

cfgADType (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 = Enables Extended Schema with Active Directory.

2 = Enables Standard Schema with Active Directory.

Default

1 = Extended Schema

Description

Determines the schema type to use with Active Directory.

cfgStandardSchema

This group contains parameters to configure the Standard Schema settings.

cfgSSADRoleGroupIndex (Read Only)

Legal Values

Integer from 1 to 5.

Description

Index of the Role Group as recorded in the Active Directory.

cfgSSADRoleGroupName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any printable text string with no white space. Length is limited to 254 characters.

Default

(blank)

Description

Name of the Role Group as recorded in the Active Directory forest.

cfgSSADRoleGroupDomain (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

Any printable text string with no white space. Length is limited to 254 characters.

Default

(blank)

Description

Active Directory Domain in which the Role Group resides.

cfgSSADRoleGroupPrivilege (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0x00000000 to 0x000001ff

Default

(blank)

Description

Use the bit mask numbers in Table B-4 to set role-based authority privileges for a Role Group.

Table B-4. Bit Masks for Role Group Privileges

Role Group Privilege	Bit Mask
Log In To DRAC 5	0x00000001
Configure DRAC 5	0x00000002
Configure Users	0x00000004

Table B-4. Bit Masks for Role Group Privileges *(continued)*

Role Group Privilege	Bit Mask
Clear Logs	0x00000008
Execute Server Control Commands	0x00000010
Access Console Redirection	0x00000020
Access Virtual Media	0x00000040
Test Alerts	0x00000080
Execute Debug Commands	0x00000100

cfgIpmiSerial

This group specifies properties used to configure the IPMI serial interface of the BMC.

cfgIpmiSerialConnectionMode (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (Terminal)

1 (Basic)

Default

1

Description

When the DRAC 5 **cfgSerialConsoleEnable** property is set to 0 (disabled), the DRAC 5 serial port becomes the IPMI serial port. This property determines the IPMI defined mode of the serial port.

In Basic mode, the port uses binary data with the intent of communicating with an application program on the serial client. In Terminal mode, the port assumes that a dumb ASCII terminal is connected and allows very simple commands to be entered.

cfgIpmiSerialBaudRate (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

9600, 19200, 57600, 115200

Default

57600

Description

Specifies the baud rate for a serial connection over IPMI.

cfgIpmiSerialChanPrivLimit (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 (User)

3 (Operator)

4 (Administrator)

Default

4

Description

Specifies the maximum privilege level allowed on the IPMI serial channel.

cfgIpmiSerialFlowControl (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (None)

1 (CTS/RTS)

2 (XON/XOFF)

Default

1

Description

Specifies the flow control setting for the IPMI serial port.

cfgIpmiSerialHandshakeControl (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables he IPMI terminal mode handshake control.

cfgIpmiSerialLineEdit (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables line editing on the IPMI serial interface.

cfgIpmiSerialEchoControl (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables echo control on the IPMI serial interface.

cfgIpmiSerialDeleteControl (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

0

Description

Enables or disables delete control on the IPMI serial interface.

cfgIpmiSerialNewLineSequence (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (None)

1 (CR-LF)

2 (NULL)

3 (<CR>)

4 (<LF-CR>)

5 (<LF>)

Default

1

Description

Specifies the newline sequence specification for the IPMI serial interface.

cfgIpmiSerialInputNewLineSequence (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (<ENTER>)

1 (NULL)

Default

1

Description

Specifies the input newline sequence specification for the IPMI serial interface.

cfgIpmiSol

This group is used to configure the Serial-Over-LAN capabilities of the system.

cfgIpmiSolEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables Serial Over LAN (SOL).

cfgIpmiSolBaudRate (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

9600, 19200, 57600, 115200

Default

57600

Description

The baud rate for serial communication over LAN.

cfgIpmiSolMinPrivilege (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 (User)

3 (Operator)

4 (Administrator)

Default

4

Description

Specifies the minimum privilege level required for serial over LAN access.

cfgIpmiSolAccumulateInterval (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 255.

Default

10

Description

Specifies the typical amount of time that the BMC waits before transmitting a partial SOL character data packet. This value is 1-based 5ms increments.

cfgIpmiSolSendThreshold (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 255

Default

255

Description

The SOL threshold limit value.

cfgIpmiLan

This group is used to configure the IPMI-Over-LAN capabilities of the system.

cfgIpmiLanEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables the IPMI-Over-LAN interface.

cfgIpmiLanPrivLimit (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

2 (User)

3 (Operator)

4 (Administrator)

Default

0

Description

Specifies the maximum privilege level allowed for IPMI over LAN access.

cfgIpmiLanAlertEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables global e-mail alerting. This property overrides all individual e-mail alerting enable/disable properties.

cfgIpmiEncryptionKey (Read/Write)

NOTE: To view or modify this property, you must have **Configure DRAC 5** permission and administrator privileges.

Legal Values

A string of hexadecimal digits from 0 to 20 characters with no spaces.

Default

"00000000000000000000"

Description

The IPMI encryption key.

cfgIpmiPetCommunityName (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

A string up to 18 characters.

Default

"public"

Description

The SNMP community name for traps.

cfgIpmiPef

This group is used to configure the platform event filters available on the managed server.

The event filters can be used to control policy related to actions that are triggered when critical events occur on the managed system.

cfgIpmiPefName (Read Only)

Legal Values

String. Maximum Length = 255.

Default

The name of the index filter.

Description

Specifies the name of the platform event filter.

cfgIpmiPefIndex (Read Only)

Legal Values

1 – 17

Default

The index value of a platform event filter object.

Description

Specifies the index of a specific platform event filter.

cfgIpmiPefAction (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (None)

1 (Power Down)

2 (Reset)

3 (Power Cycle)

Default

0

Description

Specifies the action that is performed on the managed system when the alert is triggered.

cfgIpmiPefEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables a specific platform event filter.

cfgIpmiPet

This group is used to configure platform event traps on the managed system.

cfgIpmiPetIndex (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

1 – 4

Default

The appropriate index value.

Description

Unique identifier for the index corresponding to the trap.

cfgIpmiPetAlertDestIpAddr (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

String representing a valid IP address. For example, `192.168.0.67`.

Default

0.0.0.0

Description

Specifies the destination IP address for the trap receiver on the network. The trap receiver receives an SNMP trap when an event is triggered on the managed system.

cfgIpmiPetAlertEnable (Read/Write)

NOTE: To modify this property, you must have **Configure DRAC 5** permission.

Legal Values

0 (FALSE)

1 (TRUE)

Default

1

Description

Enables or disables a specific trap.

C

Supported RACADM Interfaces

The following table provides an overview of RACADM subcommands and their corresponding interface support.

Table C-1. RACADM Subcommand Interface Support

Subcommand	Telnet/SSH/Serial	Local RACADM	Remote RACADM
arp	✓	✗	✓
clearascreen	✓	✓	✓
clrraclog	✓	✓	✓
clrsel	✓	✓	✓
coredump	✓	✗	✓
coredumpdelete	✓	✓	✓
fwupdate	✓	✓	✓
getconfig	✓	✓	✓
getniccfg	✓	✓	✓
getraclog	✓	✓	✓
getractime	✓	✓	✓
getsel	✓	✓	✓
getssninfo	✓	✓	✓
getsvctag	✓	✓	✓
getsysinfo	✓	✓	✓
gettracelog	✓	✓	✓
help	✓	✓	✓
ifconfig	✓	✗	✓
netstat	✓	✗	✓
ping	✓	✗	✓
racdump	✓	✗	✓

Table C-1. RACADM Subcommand Interface Support *(continued)*

Subcommand	Telnet/SSH/Serial	Local RACADM	Remote RACADM
racreset	✓	✓	✓
racresetcfg	✓	✓	✓
serveraction	✓	✓	✓
setniccfg	✓	✓	✓
sslcertdownload	✗	✓	✓
sslcertupload	✗	✓	✓
sslcertview	✓	✓	✓
sslcsrgen	✗	✓	✓
sslkeyupload	✗	✓	✓
testemail	✓	✓	✓
testtrap	✓	✓	✓
vmdisconnect	✓	✓	✓
vmkey	✓	✓	✓
usercertupload	✗	✓	✓
usercertview	✓	✓	✓
localConRedirDisable	✗	✓	✗

✓ = Supported; ✗ =Not supported

D

Browser Pre-installation

If you are running Linux and your management station has a read-only file system, a browser can be installed on a client system without requiring a connection to a DRAC 5. By using the native plug-in installation package, the browser can be manually installed during the client setup phase.

NOTICE: In a read-only client environment, if the DRAC 5 firmware is updated to a newer version of the plug-in, then the installed VM plug-in will become inoperative. This is because earlier plug-in features are disabled when the firmware contains a newer plug-in version. In this case, the client will be prompted for plug-in installation. Since the file system is read-only, the installation will fail and the plug-in features will not be available.

Obtain Plug-in Installation Package

To obtain the plug-in installation package:

1. Login to an existing DRAC5
2. Change the URL in the browser's address bar, from:

   `https://<RAC_IP>/cgi-bin/webcgi/main`

   to:

   `https://<RAC_IP>/plugins/ # Be sure to include the trailing slash.`
3. Notice the two subdirectories `vm` and `vkvm`. Navigate to the appropriate subdirectory, right click the `rac5XXX.xpi` file, and select **Save Link Target As...**.
4. Choose a location to save the plug-in installation package file.

Plug-in Installation

To install the plug-in installation package:

1. Copy the installation package to the client's native file system share that is accessible by the client.
2. Open an instance of the browser on the client system.
3. Enter the file-path to the plug-in installation package in the browser's address bar. For example:

   ```
   file:///tmp/rac5vm.xpi
   ```

4. The browser guides the user through plug-in installation.

Once installed, the browser will not prompt for that plug-in installation again, as long as the target DRAC 5 firmware does not contain a newer version of the plug-in.

Glossary

Active Directory
Active Directory is a centralized and standardized system that automates network management of user data, security, and distributed resources, and enables interoperation with other directories. Active Directory is designed especially for distributed networking environments.

AGP
Abbreviation for accelerated graphics port, which is a bus specification that allows graphics cards faster access to main system memory.

ARP
Acronym for Address Resolution Protocol, which is a method for finding a host's Ethernet address from its Internet address.

ASCII
Acronym for American Standard Code for Information Interchange, which is a code representation used for displaying or printing letters, numbers, and other characters.

BIOS
Acronym for basic input/output system, which is the part of system software that provides the lowest-level interface to peripheral devices and which controls the first stage of the system boot process, including installation of the operating system into memory.

BMC
Abbreviation for baseboard management controller, which is the controller interface between the DRAC 5 and the managed system's BMC.

bus
A set of conductors connecting the various functional units in a computer. Busses are named by the type of data they carry, such as data bus, address bus, or PCI bus.

CA
A certificate authority is a business entity that is recognized in the IT industry for meeting high standards of reliable screening, identification, and other important security criteria. Examples of CAs include Thawte and VeriSign. After the CA receives your CSR, they review and verify the information the CSR contains. If the applicant meets the CA's security standards, the CA issues a certificate to the applicant that uniquely identifies that applicant for transactions over networks and on the Internet.

CD
Abbreviation for compact disc.

CHAP
Acronym for Challenge-Handshake Authentication Protocol, which is an authentication method used by PPP servers to validate the identity of the originator of the connection.

CIM
Acronym for Common Information Model, which is a protocol designed for managing systems on a network.

CLI
Abbreviation for command-line interface.

CLP
Abbreviation for command-line protocol.

console redirection
Console redirection is a function that directs a managed system's display screen, mouse functions, and keyboard functions to the corresponding devices on a management station. You may then use the management station's system console to control the managed system.

CSR
Abbreviation for Certificate Signing Request.

DHCP
Abbreviation for Dynamic Host Configuration Protocol, which is a protocol that provides a means to dynamically allocate IP addresses to computers on a local area network.

DLL
Abbreviation for Dynamic Link Library, which is a library of small programs, any of which can be called when needed by a larger program that is running in the system. The small program that lets the larger program communicate with a specific device such as a printer or scanner is often packaged as a DLL program (or file).

DDNS
Abbreviation for Dynamic Domain Name System.

DMTF
Abbreviation for Distributed Management Task Force.

DNS
Abbreviation for Domain Name System.

DRAC 5
Abbreviation for Dell Remote Access Controller 5.

DSU
Abbreviation for disk storage unit.

extended schema
A solution used with Active Directory to determine user access to DRAC 5; uses Dell-defined Active Directory objects.

FQDN
Acronym for Fully Qualified Domain Names. Microsoft® Active Directory® only supports FQDN of 64 bytes or fewer.

FSMO
Flexible Single Master Operation. It is Microsoft's way of guaranteeing atomicity of the extension operation.

GMT
Abbreviation for Greenwich Mean Time, which is the standard time common to every place in the world. GMT nominally reflects the mean solar time along the prime meridian (0 longitude) that runs through the Greenwich Observatory outside of London, UK.

GPIO
Abbreviation for general purpose input/output.

GRUB
Acronym for GRand Unified Bootloader, a new and commonly-used Linux loader.

GUI
Abbreviation for graphical user interface, which refers to a computer display interface that uses elements such as windows, dialog boxes, and buttons as opposed to a command prompt interface, in which all user interaction is displayed and typed in text.

hardware log
Records events generated by the DRAC 5 and the BMC.

ICMB
Abbreviation for Intelligent Chassis Management Bus.

ICMP
Abbreviation for Internet control message protocol.

ID
Abbreviation for identifier, commonly used when referring to a user identifier (user ID) or object identifier (object ID).

IP
Abbreviation for Internet Protocol, which is the network layer for TCP/IP. IP provides packet routing, fragmentation, and reassembly.

IPMB
Abbreviation for intelligent platform management bus, which is a bus used in systems management technology.

IPMI
Abbreviation for Intelligent Platform Management Interface, which is a part of systems management technology.

Kbps
Abbreviation for kilobits per second, which is a data transfer rate.

LAN
Abbreviation for local area network.

LDAP
Abbreviation for Lightweight Directory Access Protocol.

LED
Abbreviation for light-emitting diode.

LOM
Abbreviation for Local area network On Motherboard.

MAC
Acronym for media access control, which is a network sublayer between a network node and the network physical layer.

MAC address
Acronym for media access control address, which is a unique address embedded in the physical components of a NIC.

managed system
The managed system is the system in which the DRAC 5 is installed or embedded.

management station
The management station is a system that remotely accesses the DRAC 5.

MAP
Abbreviation for Manageability Access Point.

Mbps
Abbreviation for megabits per second, which is a data transfer rate.

MIB
Abbreviation for management information base.

MII
Abbreviation for Media Independent Interface.

NAS
Abbreviation for network attached storage.

NIC
Abbreviation for network interface card. An adapter circuit board installed in a computer to provide a physical connection to a network.

OID
Abbreviation for Object Identifiers.

PCI
Abbreviation for Peripheral Component Interconnect, which is a standard interface and bus technology for connecting peripherals to a system and for communicating with those peripherals.

POST
Acronym for power-on self-test, which is a sequence of diagnostic tests that are run automatically by a system when it is powered on.

PPP
Abbreviation for Point-to-Point Protocol, which is the Internet standard protocol for transmitting network layer datagrams (such as IP packets) over serial point-to-point links.

RAM
Acronym for random-access memory. RAM is general-purpose readable and writable memory on systems and the DRAC 5.

RAM disk
A memory-resident program which emulates a hard drive. The DRAC 5 maintains a RAM disk in its memory.

RAC
Abbreviation for remote access controller.

ROM
Acronym for read-only memory, which is memory from which data may be read, but to which data cannot be written.

RPM
Abbreviation for Red Hat Package Manager, which is a package-management system for the Red Hat Enterprise Linux operating system that helps installation of software packages. It is similar to an installation program.

SAC
Acronym for Microsoft's Special Administration Console.

SAP
Abbreviation for Service Access Point.

SEL
Acronym for system event log.

SMI
Abbreviation for systems management interrupt.

SMTP
Abbreviation for Simple Mail Transfer Protocol, which is a protocol used to transfer electronic mail between systems, usually over an Ethernet.

SMWG
Abbreviation for Systems Management Working Group.

SNMP
Abbreviation for Simple Network Management Protocol, which is a protocol designed to manage nodes on an IP network. DRAC 5s are SNMP-managed devices (nodes).

SNMP trap
A notification (event) generated by the DRAC 5 or the BMC that contains information about state changes on the managed system or about potential hardware problems.

SSH
Abbreviation for Secure Shell.

SSL
Abbreviation for secure sockets layer.

standard schema
A solution used with Active Directory to determine user access to DRAC 5; uses Active Directory group objects only.

TAP
Abbreviation for Telelocator Alphanumeric Protocol, which is a protocol used for submitting requests to a pager service.

TCP/IP
Abbreviation for Transmission Control Protocol/Internet Protocol, which represents the set of standard Ethernet protocols that includes the network layer and transport layer protocols.

TFTP
Abbreviation for Trivial File Transfer Protocol, which is a simple file transfer protocol used for downloading boot code to diskless devices or systems.

UPS
Abbreviation for uninterruptible power supply.

USB
Abbreviation for Universal Serial Bus.

UTC
Abbreviation for Universal Coordinated Time. *See* GMT.

VLAN
Abbreviation for Virtual Local Area Network.

VNC
Abbreviation for virtual network computing.

VT-100
Abbreviation for Video Terminal 100, which is used by the most common terminal emulation programs.

WAN
Abbreviation for wide area network.

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