

Exploring the Next-Generation

DRAC 4 Dell Remote Access Controller

Dell™ remote access controllers help provide users with the necessary tools and functionality to monitor, troubleshoot, and repair servers whether they are around the corner or around the world. This article discusses the features and functionality of the new Dell Remote Access Controller 4 (DRAC 4) and explores how administrators can reduce the time required to manage servers, enable faster recovery of remote servers, and lower total cost of ownership.

BY JON MCGARY AND DONNIE BELL

In the world of high technology, it seems at times that the only constant is change. A chief concern for many IT professionals is managing change—particularly when large numbers of remote servers are involved. Dell remote access controllers (RACs) can help empower administrators with significant capabilities to efficiently cope with change, and the latest remote management controller from Dell, the Dell Remote Access Controller 4 (DRAC 4), takes enhancements to a new level.

The baseline Dell remote access architecture in the Dell OpenManage™ 4 suite consists of hardware and software components that enable administrators to do the following:

- Access a server after a server failure, power outage, or loss of network connection by using a network interface card (NIC)
- Remotely view a server's internal event logs for diagnostic purposes
- Manage servers at multiple locations from a central location
- Manage servers by redirecting the console output (graphics and text) to a remote console

- Perform an orderly shutdown of a server for maintenance tasks
- Diagnose a server failure and restart the server
- Alert an administrator using an alphanumeric page, numeric page, e-mail, or Simple Network Management Protocol (SNMP) trap when the server detects an error

Hardware that can enable remote access

The DRAC 4 is an optional hardware controller that can be integrated into a Dell PowerEdge™ server as either a half-length Peripheral Component Interconnect (PCI) or a daughterboard. DRAC 4/P is a PCI card compatible with Dell PowerEdge x850 servers, and DRAC 4/I is a daughterboard that connects to the system motherboard and is compatible with Dell PowerEdge x8x0 servers. Each card provides the same features and functionality.

Both implementations interface with the Embedded Server Management (ESM) chip on the server motherboard. The ESM chip is based on a standard hardware implementation called Intelligent Platform Management Interface (IPMI) 1.5, which helps Dell provide remote management capabilities at a low cost.

The DRAC 4 is built with a flash file system that allows various alert configurations and up to 16 defined local users. As an alternative, administrators may choose to implement Microsoft® Active Directory® directory service as the method for managing security. The DRAC 4 supports an integrated Web server that enables up to four RAC users to be connected at the same time using a supported Web browser; two administrators who have redirection privileges may use the console redirection feature simultaneously.

Methods to access the RAC

Several interfaces can be used to access the RAC. These interfaces include the following:

- **Dell OpenManage Server Administrator:** Server Administrator is an application installed on the managed server that provides a comprehensive Web-based graphical user interface (GUI) to configure components of the managed server such as alerts and sensors.
- **DRAC 4 GUI:** The DRAC 4 provides a dedicated Web-based GUI (see Figure 1) to configure the RAC and monitor the server through the RAC network adapter. While access to this user interface is provided in Dell OpenManage Server Administrator, the DRAC 4 GUI can be accessed using any supported Web browser—Server Administrator does not have to be installed on the managed server or management station.
- **Racadm command-line interface:** The Racadm interface provides a scriptable command-line interface (CLI) that enables administrators to configure the RAC locally or remotely through the RAC network adapter. This CLI requires the installation of a small client-side executable, which interacts directly with the DRAC 4 across the network. No additional software is required on the managed server.
- **Dell OpenManage IT Assistant:** IT Assistant can configure and launch the DRAC 4 GUI and operate much like

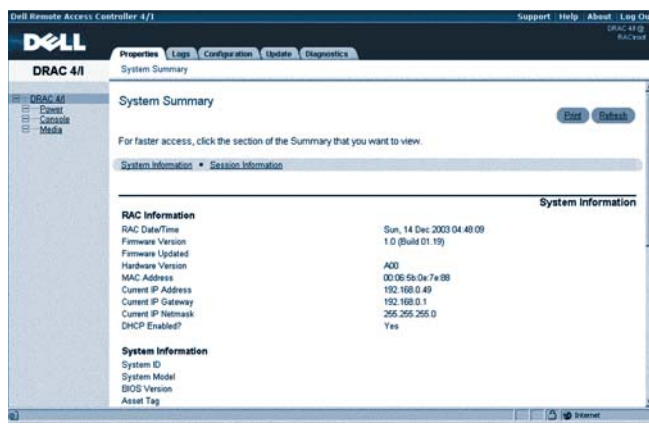


Figure 1. DRAC 4 System Summary screen

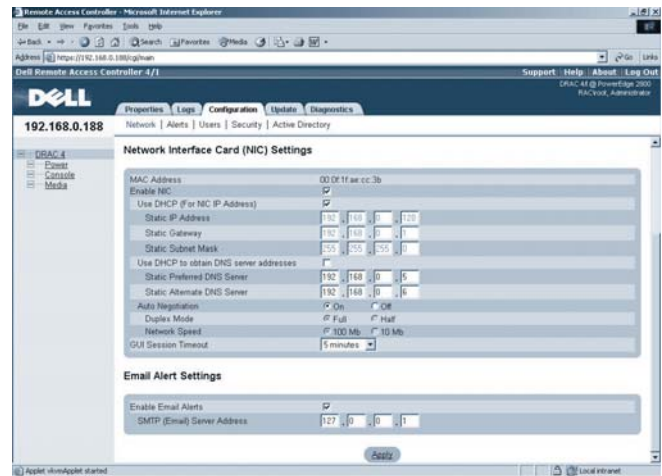


Figure 2. Network Interface Card (NIC) Settings screen

Dell OpenManage Server Administrator, except that Dell OpenManage IT Assistant displays groups of servers installed in the network.

- **Option ROM interface:** A option ROM is available to facilitate pre-operating system (OS) configuration of the DRAC 4 without loading any other management software.

Features new to the DRAC 4

The DRAC 4 adds the following features to the Dell remote management portfolio:

- Sophisticated GUI
- Capability to configure RAC network settings, alerts, and security settings from the RAC GUI
- Capability to assign RAC user groups and permissions
- OS-independent console, keyboard, and mouse redirection functionality
- Virtual floppy and virtual CD media functionality
- Support for Active Directory authentication

DRAC 4 GUI. Dell has modified the DRAC III GUI to provide additional usability features. The interface now offers a combination of tabs and links to logically group common functionality. Each major tab allows administrators to select various submenus that display status information or that provide the capability to perform an assortment of actions.

RAC network settings, alerts, users, and security settings. One powerful feature provided with the DRAC 4 is the capability to configure the network, alerts, users, and security settings directly from the RAC GUI (see Figure 2). By using Secure Sockets Layer (SSL) encryption, an administrator can securely connect to the DRAC via a Web browser and configure the controller as necessary.

RAC user groups and permissions. The DRAC 4 provides network security by enabling administrators to configure RAC user permissions. A permission or privilege is a unique capability assigned to the RAC user such as the capability to log in to the controller, power up or power down the server, or create RAC user accounts. The DRAC 4 defines four user permission groups, each with a different set of permissions, which administrators can assign when adding a RAC user: Administrator, Power User, Guest User, and E-mail Alerts Only. If the defined groups do not match the privileges desired, a fifth group, Custom, can be used to assign individual permissions to a new user.

OS-independent console, keyboard, and mouse redirection functionality. The DRAC 4 provides a hardware-based video and text redirection console that can operate regardless of server state, enabling administrators to monitor and interact with server installation, configuration operations, and recovery operations. When redirection functionality is enabled, a console redirection window opens to provide administrators with complete server console, keyboard, and mouse redirection capabilities of the local managed server to the management station (see Figure 3). A maximum of two console redirection sessions can be opened at one time.

Virtual floppy and virtual CD media functionality. This feature provides the capability to map a virtual floppy or virtual CD drive from a client machine to the managed server.¹ When mapped, the managed server has access to the floppy or CD drive on the management station. When the console redirection and virtual media features are used together, they provide the capability to remotely install an OS or copy files to a target server. A limit of one active virtual media session is supported at a time.

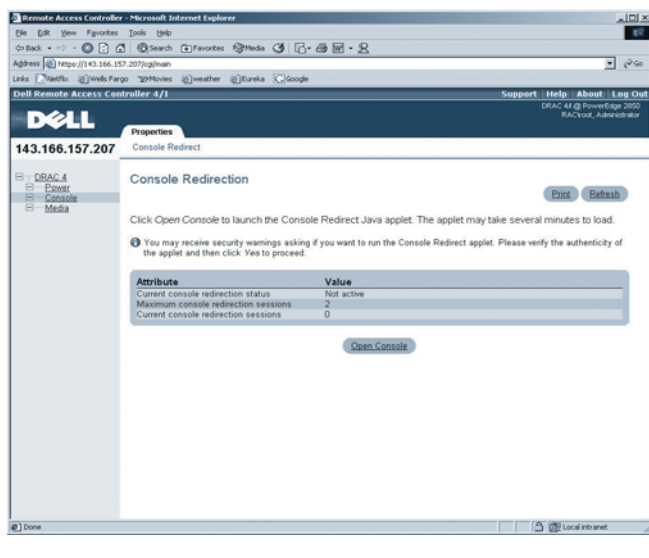


Figure 3. Console Redirection screen

Dell RACs can help empower administrators with significant capabilities to efficiently cope with change.

When the RAC browser is launched for the first time and the virtual media page is accessed, the virtual media plug-in is downloaded from the DRAC 4 Web server and automatically installed on the management station. When the virtual media is connected, all virtual floppy and virtual CD drive access requests from the managed server are directed to the management station across the network. The virtual devices on the managed system are visible to the managed system's OS and BIOS at all times, whether the DRAC 4 virtual media feature is connected or not.

Support for Active Directory authentication. The DRAC 4 provides local user authorization but also supports authentication in an Active Directory directory service network. Dell has developed an optional snap-in schema to extend an organization's directory service to include DRAC 4 controllers, RAC users, and RAC permissions. Existing Active Directory users have the choice of logging in to the DRAC 4 by using their Active Directory authentication account name or by using their local RAC account. Active Directory functionality provides administrators with the capability to centralize all user ID and password management into their existing corporate infrastructure. Administrators may even choose to disable all local RAC passwords to facilitate a central management process.

Centralized, remote access for managing global networks

In today's world of distributed computing, the capability to manage a large number of servers remotely is not simply a helpful option—it is a fundamental requirement. With administrators managing larger networks of servers globally through centralized support centers, the need for advanced remote management capabilities plays a critical role in the success of an IT organization. Therefore, the capability of the DRAC 4 to help remotely manage, upgrade, troubleshoot, and repair systems can be increasingly important to businesses whose goals include reducing time spent on maintenance activities.

Jon McGary is a senior software developer in the Dell OpenManage Remote Management Group. Prior to joining Dell, Jon was employed by Tandem Computers and specialized in remote management of fault-tolerant computers. He has a B.S. from Texas A&M University.

Donnie Bell has been a senior marketing consultant in the Dell OpenManage Strategy Group since 1997. Prior to joining Dell, Donnie was employed by IBM for 16 years in technical marketing support and technical education. His areas of expertise are distributed systems management, network communications, UNIX® administration, electronic commerce, and software channel relationships. He has a B.B.A. from Texas A&M University.

¹For more information about virtual media in the DRAC 4, see "Remote Management with Virtual Media in the DRAC 4" by Weimin Pan and Gang Liu in *Dell Power Solutions*, October 2004.