

# Enhancing Server Management with the Dell OpenManage Server Administrator

*By Donnie Bell*

The Dell® OpenManage™ Server Administrator simplifies management of Dell PowerEdge® servers. The browser-based and command-line interfaces of this software provide administrators with easy-to-use, scalable management tools never before available. These tools can reduce management costs for servers in stand-alone environments and mixed environments that incorporate hardware and system management tools from other manufacturers.

System administrators have usually managed Intel®-based servers from the server itself or from a central console. In a typical scenario, the console detects an event on a server and sends an e-mail or page notification to an administrator. The administrator works at a central console to troubleshoot the problem. If the problem requires diagnostics or system updates, the administrator dispatches a technician to the server itself.

Dell® OpenManage™ Server Administrator is a secure Web tool designed to make day-to-day management of individual servers easier. Using this tool, an administrator with an Internet or intranet connection can manage servers from any location using a standard Web browser. Besides obtaining status information with this tool, administrators can troubleshoot, configure, and update the system—management tasks that have traditionally been possible only from a central console or at the server.

OpenManage Server Administrator runs on each managed server, off-loading all processing (except rendering the user interface) to local systems management agents. This architecture allows an administrator to manage the server without burdening the central console. Even when Server Administrator is launched from the central console, most processing occurs on the managed server, which reduces the amount of required communication between the managed server and the console. Instead of a dialogue, the console simply initiates an operation and the rest of the processing occurs

on the server. In addition, because the management software resides on the managed server, the console may not require an update for each new server platform.

## Capabilities and interfaces of OpenManage Server Administrator

OpenManage Server Administrator is a complete set of integrated software components that form a single application for managing a Dell PowerEdge® server. The application can be accessed at the server or remotely over any network topology that supports TCP/IP and Internet protocols. The Server Administrator application consists of the following features:

- » Web server to host Web pages for the Web-based user interface (Server Administrator Web server does not conflict with other Web server software that may be running on the server)
- » Command-line interface (CLI)
- » Instrumentation for the server and its component hardware, such as RAID (redundant array of independent disks) controller, SCSI/IDE (Integrated Drive Electronics) controller, and network interface card (NIC)
- » Online diagnostics
- » Utilities for updating BIOS and firmware

- ▶▶ Standard set of system information reports
- ▶▶ Security mechanisms

The Web server and CLI components provide two interfaces for Server Administrator. Dell and third-party usability experts developed the Web interface to ensure a visually clean and user-friendly management tool. This HTML interface provides access to a standard set of system information reports (detailed configuration, fault, and performance information) gathered by industry-standard systems management agents installed on the server. In addition to these reporting capabilities, the Web interface allows administrators to access online diagnostics and system update services.

The CLI allows administrators to run commands or automated scripts on a server or group of servers. Administrators can script reports, configuration changes, and updates to the Server Administrator software and the components it manages. CLI scripts can be run on groups of servers using nearly any software distribution medium including Microsoft® Systems Management Server (SMS), Computer Associates™ ShipIT™, or Tivoli® Software Distribution. If these software distribution mediums are not available, a script residing on a group of managed servers can execute a central batch file from a network drive to perform maintenance tasks, such as flashing the BIOS on target servers.

The integrated security features of Server Administrator leverage a server's operating system (OS) security infrastructure. Users are not required to maintain a proprietary security scheme with separate login names and passwords; administrators use their network domain login names and passwords with the associated domain rules (such as password length and change frequency). Server Administrator specifies three levels of access rights ranging from full administrative rights ("Administrator") to the most restricted rights ("User"). Transmissions are encrypted using the

industry-standard Secure Sockets Layer (SSL) protocol to protect data from attack or theft.

### Key features of OpenManage Server Administrator

Administrators can perform several systems management functions from the Web interface or the CLI:

- ▶▶ Run online diagnostics to troubleshoot problems
- ▶▶ Update firmware and BIOS
- ▶▶ Maintain an audit trail of changes made to the server
- ▶▶ Monitor and report the server status
- ▶▶ Provide asset and array information
- ▶▶ Shut down and restart remotely

#### Troubleshoot with online diagnostics

Administrators can run diagnostics on various components of the server, including the RAID and SCSI controllers, CPU, hard drive, memory, NIC, and peripheral component interconnect (PCI) bus using OpenManage Server Administrator.

Administrators can schedule diagnostics that do not require administrator interaction for a later time and can arrange to e-mail the results to specific accounts. For example, the results could be e-mailed to the Dell Support organization, which could then use the information to provide better support.

Figure 1 shows the online diagnostics screen in the Server Administrator Web interface.

#### Regularly update firmware and BIOS

OpenManage Server Administrator enables system administrators to update the BIOS and firmware, including the Embedded Server Management 2 (ESM2) firmware. Administrators can perform updates on a single system from the Server Administrator Web interface or on multiple systems through the CLI. Administrators also can perform the following BIOS and firmware functions:

- ▶▶ View a version report that includes current versions for BIOS, firmware, and OS
- ▶▶ Select a BIOS or firmware update package
- ▶▶ Validate the selected update package
- ▶▶ Apply the update to the BIOS or firmware
- ▶▶ Print BIOS and firmware information displayed on the home page
- ▶▶ Send e-mail containing a report of the update to specified e-mail addresses

#### Keep track of server history with an audit trail

The OpenManage Server Administrator maintains a log of all hardware events, alerts, and commands that have occurred on the server. Figure 2 shows this log in the Web interface. Administrators can specify

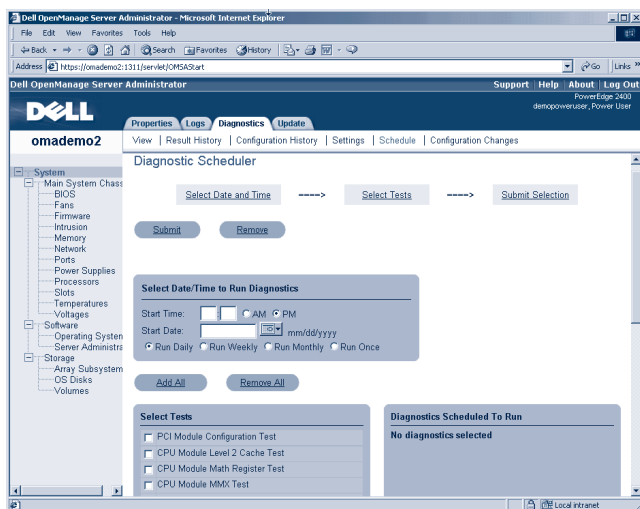


Figure 1. Online diagnostics screen of Server Administrator Web interface

the location and size of the log file. The file is circular; when it reaches a specified size, new information overwrites the oldest information.

The audit trail helps administrators troubleshoot a problem by providing a reference log to the Server Administrator commands executed when the problem developed. This log can be exported as an ASCII file, which automated scripts can gather for archiving or analysis.

### Monitor server status and system health

OpenManage Server Administrator also monitors system health and provides rapid access to the detailed fault and performance information gathered by system instrumentation agents. These reporting and viewing features allow retrieval of overall health status for each chassis that composes the system. At the subsystem level, the Server Administrator provides information about the system voltages, temperatures, current, fan rpm, and memory functioning. The reporting views may also display cost-of-ownership information.

Administrators can configure Server Administrator to generate alerts when specific conditions exist, such as a temperature or voltage level that falls outside a normal range. Based on the type of alert, Server Administrator can respond in various ways, such as sending a Simple Network Management Protocol (SNMP) trap to a central console, broadcasting a message to any user logged onto the server, or launching an application.

### Report asset and array information

Figure 3 shows the OpenManage Server Administrator system summary screen, which provides basic system information such as the location of the server, service tag, asset tag, processor information, available slots inventory, and hard-disk capacity. Administrators can export these reports for use in other software packages such as Microsoft Excel for financial or inventory reporting systems.

Disk array information is also available as shown in Figure 4.

### Shut down and restart from remote locations

When a server is operational, administrators can shut it down and restart it from OpenManage Server Administrator without a remote access card. Administrators will need a remote access card, however, to restart or diagnose problems on a server that has been powered down.

### CLI of OpenManage Server Administrator

The OpenManage Server Administrator CLI is best suited for environments in which system administrators perform most tasks by running scripts on multiple servers. Using the Server Administrator CLI, an administrator could write a configuration script that specifies warning thresholds for each major system component and what actions to take when thresholds are exceeded.

For critical components, the script can specify that the system be powered down to prevent damage. Administrators can

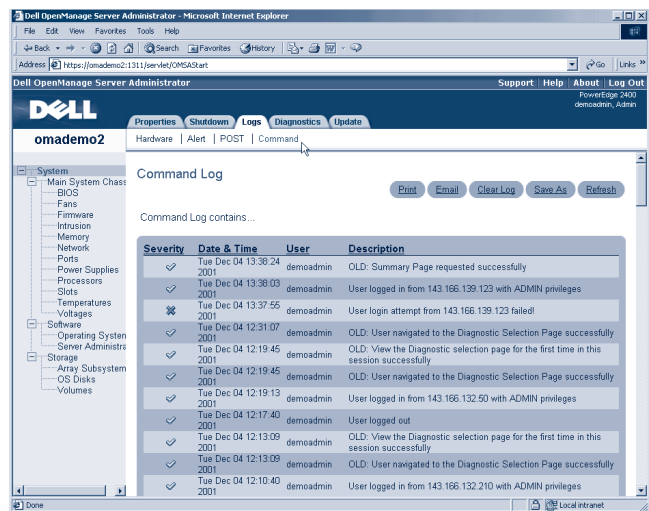


Figure 2. Command log of Server Administrator Web interface

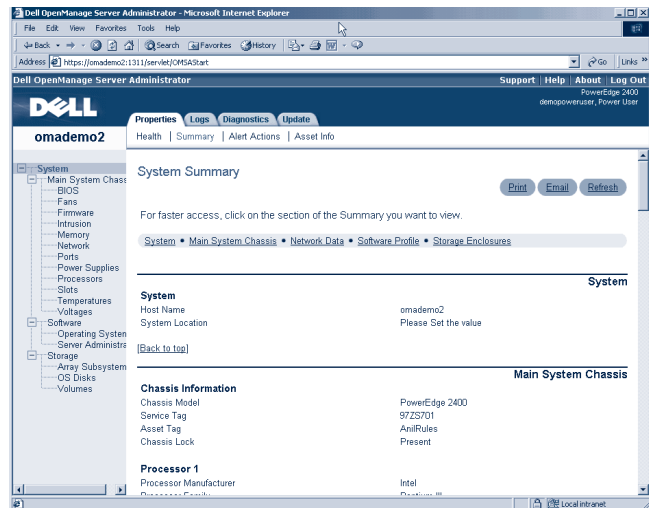


Figure 3. System summary screen of Server Administrator Web interface

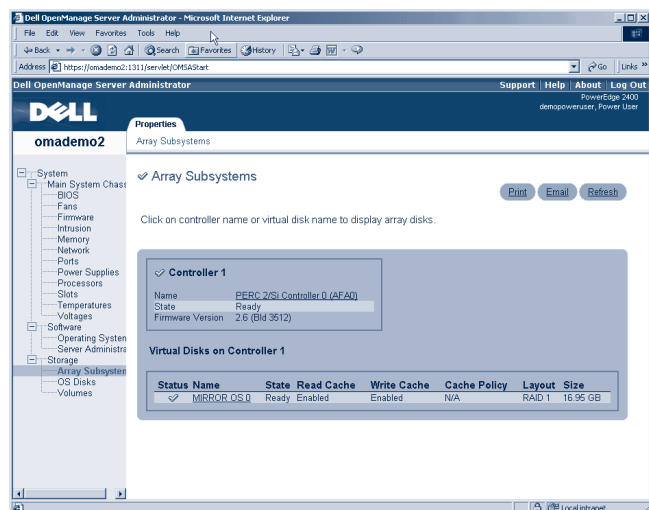


Figure 4. Disk array information screen of Server Administrator Web interface

then distribute the script and execute it on a group of systems. This scripting capability allows administrators to easily configure new systems or implement new system administration policies on existing systems.

In many cases, the CLI allows a user with a well-defined task to retrieve system information rapidly. Administrators can use CLI to review a comprehensive summary of all system components and then save that summary information to a file for comparison with later system states. Administrators also can write batch programs or scripts to capture reports on specific components at specific times (for example, reporting on fan rpm during periods of high and low system usage). They can then route the results—in text, table, semicolon-delimited variables, or Extensible Markup Language (XML) format—to a file for later analysis.

The primary OpenManage Server Administrator CLI commands include:

- ▶▶ `omdiag`—Runs diagnostic tests on system hardware and software to isolate problems
- ▶▶ `omupdate`—Updates BIOS and firmware versions
- ▶▶ `omreport`—Displays summary information about components that pertain to the entire system
- ▶▶ `omconfig`—Sets governing values for configurable system components, such as threshold values, asset information, and actions required when threshold values are exceeded

## Integration into enterprise environments

OpenManage Server Administrator uses standard technologies for reporting on the server, including SNMP and the Common Information Model (CIM). The former is defined by the Internet Engineering Task Force (IETF) and the latter is defined by the Distributed Management Task Force (DMTF) as part of the Web-Based Enterprise Management (WBEM) initiative. Server Administrator also uses XML to access and display content.

These technologies allow Server Administrator to deliver its content easily to the browser or to integrate with other management applications. Server Administrator primarily uses SNMP to report status changes to central consoles like Dell OpenManage IT Assistant, HP™ OpenView®, Tivoli Enterprise Console®, and Computer Associates Unicenter®.

Administrators also can launch Server Administrator from a central console using a simple command:  
`https://<insert hostname>:1311`

## Supported environments

Administrators can install, upgrade, or uninstall OpenManage Server Administrator by using the OpenManage systems management software CD included with Dell PowerEdge servers. They also can download Server Administrator from the Dell Web site at <http://support.dell.com>. During the installation process, administrators can upgrade existing PowerEdge servers with Hardware Instrumentation Package (HIP) 3.5 or later and Server Agent 4.0 or later.

All Server Administrator features are available when running the following Microsoft OS:


- ▶▶ Microsoft Windows NT® Server 4 (Service Pack 5 or higher)
- ▶▶ Microsoft Windows® 2000 Server family, which includes Windows 2000 Server, Windows 2000 Advanced Server, Windows 2000 Terminal Services, and Windows Small Business Server (SBS) 2000

Server Administrator also runs on Red Hat® Linux®, version 7.1 or later.<sup>1</sup> Under Linux, support for disk array information reporting and for firmware and BIOS updates is not yet available.

Server Administrator runs with a limited feature set on Novell® NetWare® versions 5.1 (Service Pack 3), 6.0, or later. Under NetWare, the online diagnostics and update features for firmware and BIOS are not available.

Server Administrator can be run from Netscape® Navigator® (6.01 or later) and Microsoft Internet Explorer (version 5.5 or later).

## Efficient, simplified server management

OpenManage Server Administrator allows administrators to easily manage individual servers from virtually any location—whether at the server itself or remotely from a Web-enabled device such as a laptop computer or a co-worker's PC. This tool offers standard functions for remotely managing individual servers, and extends these functions with additional features such as diagnostic capability, integrated security, and a user-friendly Web interface. 

*Donnie Bell (donnie\_bell@dell.com) is a senior marketing consultant in Dell OpenManage Strategy at Dell. 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, UNIX to Windows NT interoperability, electronic commerce, and software channel relationships. He has a B.B.A. from West Texas State University.*

<sup>1</sup> Support for some updated kernels and for later versions of Red Hat Linux may require the use of Dynamic Kernel Support.