

An Introduction to OpenManage[™] for Dell PowerEdge Servers

By Tony Yaptangco

The Dell[™] OpenManage[™] solution enables system administrators to effectively manage network resources for their organizations. This article gives an overview of the Dell OpenManage components that help administrators deploy, manage, and service their Dell PowerEdge[™] servers.

Managing a server network can be a challenging task. System administrators face many demands to keep servers running efficiently and performing optimally while minimizing downtime. They must also sort through a wide range of products offered by hardware and software vendors that are designed to help them manage their networks. Complicating matters, new technology drives new server designs, introducing changes in the way servers are managed.

In its simplest form, systems management is about managing the server life cycle, which includes:

- » **Deploying a server:** Administrators need a simple way to deploy the operating system, management agents, and management applications.
- » **Managing a server:** Administrators need the ability to monitor, manage, and report on the health of the server network.
- » **Repairing a server:** Administrators need an easy way to diagnose a problem and quickly repair it.

This article introduces the Dell[™] OpenManage[™] solution for Dell PowerEdge[™] servers, a comprehensive set of software and hardware designed to assist with the deployment, management, and service of Dell server and storage systems.

The role of enterprise system software

Enterprise system software incorporates capabilities that assure the reliability, availability, serviceability, usability, and installability

(RASUI) characteristics of a server. Software reliability and high availability are typically achieved through features of the operating system and cluster configurations, which are outside the scope of this article. This article focuses on Dell deployment, operations, and service products that provide serviceability, usability, and installability capabilities for Dell servers (Figure 1).

Deployment: Simplifying installation

Deployment products simplify the software installation process and provide scripting capabilities for easily replicating these processes. The process of installing the operating system,

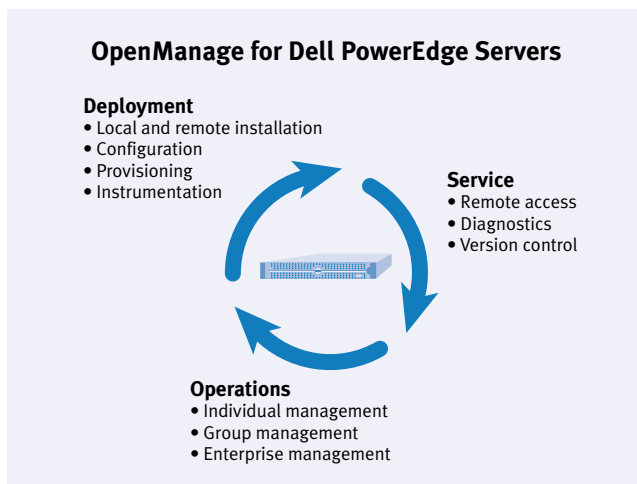


Figure 1. Capabilities provided by Dell OpenManage

appropriate drivers, and the OpenManage applications begins with the server CD kit.

The server CD kit includes all Dell software, utilities, and documentation necessary to set up a Dell server. It consists of three CDs:

- » The Dell OpenManage Server Assistant CD contains the Dell OpenManage Server Assistant application, BIOS, firmware, drivers, diagnostics, and utilities.
- » The Dell OpenManage Systems Management CD contains OpenManage products and peripheral management software, some of which is provided by vendors for managing specific devices such as network interface cards (NICs) or RAID arrays.
- » The Product Documentation CD contains Dell PowerEdge and OpenManage user documentation.

The kit is distributed with each PowerEdge server delivered by Dell. Quarterly updates to the kit are available through the Dell OpenManage Subscription Service.

Setting up and configuring PowerEdge servers

The Server Assistant CD is a bootable, stand-alone CD-ROM that has the drivers and tools required to set up and configure PowerEdge servers and system components. Server Assistant simplifies the operating system installation process and requires minimal technical experience. It provides integrated RAID configuration, smart installation that installs only the necessary components, and unattended installation of Microsoft® Windows NT®, Microsoft Windows® 2000, Red Hat® Linux®, and Novell® NetWare® operating systems.

Upon boot, Server Assistant prompts the user to enter the date and time, configure the RAID array, select the operating system, configure the hard drive, and enter the operating system parameters. It then automatically installs the operating system in as little as 20 minutes, rebooting only once. Server Assistant also provides the ability to integrate the installation of OpenManage agents during the operating system installation process. Administrators have the option of creating default or custom-scripted installs using Server Assistant.

Preparing managed systems and consoles

The Systems Management CD contains an application that enables administrators to install the OpenManage instrumentation and management applications on any operating system supported by Dell. The server setup application offers express setup, a one-button installation process that automatically detects the hardware components on the PowerEdge server and installs only the systems management software required to manage those components.

Custom setup is also available so that administrators can select the specific management components for installation on the server.

The server setup application provides two additional features: unattended installation and uninstall and upgrade. Unattended installation lets administrators create a package for remotely installing agents. The package can be distributed using a management application such as Microsoft Systems Management Server and can perform a clean install or upgrade, depending on what data already exists on the targeted server. The uninstall and upgrade feature automatically detects and removes previous versions of the application, agents, and associated dynamic link libraries (DLLs) prior to installing the latest generation.

Operations: Managing networked servers

System administrators manage a wide variety of environments, ranging from a small group of servers in a centralized location to hundreds of heterogeneous servers located globally. Depending on the complexity of the computer network, administrators require three levels of server management capabilities: individual server management, group management, and enterprise management. Operations products address these needs by providing the means to administrate servers, to monitor servers from a centralized location, and to integrate servers within broader enterprise management frameworks.

Individual server management

By using Dell OpenManage Server Administrator, administrators can manage individual servers from virtually anywhere at any time. Server Administrator lets administrators monitor system status, report on asset and array information, view an audit trail of changes by analyzing system logs, provide version control for firmware and BIOS, and execute online diagnostics for preventive maintenance or troubleshooting.

Administrators can access Server Administrator through an industry-standard Web browser that does not require special software, so they can manage a server locally or remotely from another location. The main page of the HTML-based graphical user interface enumerates a server's assets in a manner resembling Microsoft Windows Explorer, and it also provides a task selection menu listing the services accessible through Server Administrator. Menu options include:

- » **Properties:** Provides information about a selected item
- » **Shutdown:** Lets administrators remotely shut down the server
- » **Logs:** Provides access to the embedded hardware log, the alert log, the power-on self test (POST) log, and the command log

The Diagnostics and Update Services menu options will be discussed in the “Service” section of this article.

Server Administrator also offers a command-line interface through which administrators can script reports, configuration changes, and updates to Server Administrator and the server components being managed. Administrators can use scripts and network shares to automate server management. In addition, they can leverage third-party solutions from companies such as BMC, Computer Associates, Hewlett-Packard, NetIQ, and Tivoli to more effectively manage networked servers.

Group server management

Whereas Server Administrator provides management capabilities for individual networked servers, Dell OpenManage IT Assistant provides console capabilities for managing groups of networked servers. IT Assistant is a Windows-based central management console that presents a complete view of Dell servers in the network. The application automatically discovers all Dell servers (or a configurable subset) and supplies a simple status of each server’s health. It can also provide asset information on desktops, notebooks, and workstations in the network.

IT Assistant incorporates an event management system that can send alphanumeric pages or e-mail if the system reports a fault. It also has group functions that apply actions, such as start-up, shut-down, or flash BIOS, to a group of servers. The application uses standard protocols including Simple Network Management Protocol (SNMP), Desktop Management Interface (DMI), Common Information Model (CIM), and HTTP to support servers running Windows NT, Windows 2000, Linux, and NetWare operating systems.

In addition to server monitoring and management, IT Assistant includes integrated storage management, providing automatic detection of storage components, event capture and logging of storage components, and propagation of storage status to the server status icons.

Using the array management functions, administrators can manage local and remote storage devices attached to a server, configure virtual disks, manage RAID and non-RAID devices, create partitions and volumes, format disks and create file systems, and assign drive letters. These functions are available even if IT Assistant is not used as the management application.

Integration with enterprise suites

Enterprise customers that have large, geographically dispersed data centers containing hundreds of heterogeneous servers often require advanced management capabilities. Common enterprise management tools include Computer Associates™ Unicenter TNG®, Tivoli Enterprise Console®, and HP™ OpenView® Network Node Manager.

These tools generically identify networked servers (for example, as a Windows 2000 server instead of a Dell PowerEdge server), but provide the capability for server management providers to integrate into the tools’ frameworks. The Dell OpenManage Connections provide integration with these tools, allowing administrators to manage and monitor Dell systems from different enterprise management suites. The Connections have three key functions:

- » Icon representation and status propagation of Dell servers to the enterprise management console, providing a single view of Dell server health
- » Formatting traps and forwarding those traps to the enterprise management console
- » Ability to launch the IT Assistant console for specific management functions related to Dell servers

Service: Accessing, diagnosing, and updating servers

Using optional Dell hardware and OpenManage, system administrators can remotely access their networked servers for control, troubleshooting, and maintenance.

Remote server access and control

Remote access capabilities are required when a server is geographically remote, when the servers being managed are situated in a local but secure site, or when the servers being managed are headless (no keyboard or monitor attached). Dell provides remote access for PowerEdge servers either through an optional peripheral component interconnect (PCI) card—the Dell Remote Access Card (DRAC)—or through embedded capabilities—Embedded Remote Access (ERA). Two versions of DRAC are available: DRAC II for existing and legacy systems, and DRAC III for the PowerEdge 1650, PowerEdge 4600, PowerEdge 7150, and new PowerEdge servers.

During normal operation, console redirection through DRAC or ERA enables administrators to take control of the server equipped with remote access. Administrators can use these remote access solutions as a diagnostic tool by accessing a hung system, viewing POST logs to see where the server hung, and initiating a hardware-level reboot. They can also initiate functions such as power up and power down and run remote diagnostics.

Online diagnostics

Remote diagnostics run online (while the server is still operational) to assist administrators in identifying server problems. Accessible from the task selection menu of Server Administrator, the Diagnostics option provides status reports about the PCI

bus, CPUs, memory, COM ports, printer port, NICs, CMOS (complementary metal oxide semiconductor), and floppy disk drive. Administrators can interactively run one or more diagnostics and immediately receive results. They can also schedule diagnostics for later execution because these diagnostics affect system resources, degrading the performance of applications running at the same time.


Update services

A key part of the server life cycle, version management is often required to assure server reliability and performance. Dell version management software provides the ability to update BIOS, firmware, and drivers.

Administrators must first download the latest versions from <http://support.dell.com> or from a subscription services CD, and unzip the update package on the local machine. They can then run Update Services from the Server Administrator task selection menu, which will validate the package version and operation. The new firmware and BIOS are then applied during the next reboot of the system.

Server Administrator will be enhanced to provide update capabilities for drivers, notably Dell PowerEdge Expandable RAID Controller (PERC) and DRAC, and other firmware associated with the server.

A comprehensive management solution

Dell OpenManage provides tools that help administrators manage networked systems throughout the server life cycle, including installation, monitoring, administration, reporting, and troubleshooting. This article provided a brief introduction to OpenManage. For details and updates on OpenManage functionality, check the OpenManage Web site at <http://www.dell.com/openmanage>. 

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