Dell OpenManage™ Server Administrator Version 5.1

Compatibility 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.

July 2006

Contents

Tables

1

Introduction

Overview

Dell OpenManage™ Server Administrator provides a powerful, integrated set of systems management applications for keeping the systems on your network healthy. Server Administrator provides fault management information, prefailure information, and asset and inventory information to management applications. You can install the Server Administrator from the *Dell™ PowerEdge™ Installation and Server Management* CD provided with your system. In addition to supporting systems management industry standards, Server Administrator also provides additional systems management information about the components of your specific system. Server Administrator can also configure BIOS and system settings.

NOTE: Starting with Dell OpenManage version 4.3, the *Systems Management* CD has been replaced by the *Dell PowerEdge Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

Server Administrator's integrated security draws on the system's operating system security. Server Administrator uses the secure socket layer (SSL) encryption protocol.

NOTE: For more information on the secure socket layer, see the Dell Support website at **support.dell.com**.

What's New in Dell OpenManage Version 5.1?

The following changes in the Dell OpenManage version 5.1 (Dell OpenManage Server Administrator version 5.1) affect the Compatibility Guide:

- Added support for the following Dell PowerEdge systems: 840, 860 and 1900
- Added support for SUSE® Linux Enterprise Server version 10
- Removed access to OnLine Diagnostics through the Server Administrator.

  NOTE: To run Diagnostics on your system, you can either install Dell PowerEdge diagnostics from your *Dell PowerEdge Service and Diagnostics Utilities* CD or download the Dell PowerEdge diagnostics under Diagnostic Utilities from the Dell Support website at **support.dell.com**. Dell PowerEdge Diagnostics is a stand-alone application that can be run without installing Server Administrator.

Purpose of This Guide

Server Administrator operates on many Dell hardware platforms (hereafter called systems) with operating systems such as Microsoft Windows, SUSE LINUX Enterprise Server, and Red Hat® Enterprise Linux. To use the systems management features of Server Administrator fully, you must understand which features of Server Administrator match your system's hardware configuration and operating system.

Update of Compatibility Guide

The *Server Administrator Compatibility Guide* is updated each business quarter. It summarizes all *Dell PowerEdge Installation and Server Management* CD releases that precede the current release date. Always consult the **readme.txt** file on your *Dell PowerEdge Installation and Server Management* CD for each release for the most current information on compatible systems management elements.

NOTE: You can find systems management software on the *Systems Management* CD for Dell OpenManage versions prior to version 4.3 of the CD. You can find systems management software on the *Applications* CD prior to version 3.0 of the CD. The systems management software was relocated to the *Systems Management* CD beginning with version 3.0. For the purposes of this guide, some references to the *Systems Management* CD may also include the *Applications* CD.

Supported Instrumentation

Each supported *Dell PowerEdge Installation and Server Management* CD contains instrumentation for your Dell PowerEdge system. Three sections of this guide are organized around the primary instrumentation product names and show the relationship among the following variables:

- *Dell PowerEdge Installation and Server Management* CD version number (or the *Systems Management* CD or *Applications* CD)
- Supported operating systems
- Instrumentation service
- Dell PowerEdge system product name (for example, PowerEdge 1600SC)

In Table 1-1, instrumentation product names are associated with a range of the *Applications* CD or *Systems Management* CD version (prior to Dell OpenManage version 4.3) or *Dell PowerEdge Installation and Server Management* CD numbers.

Table 1-1. Systems Management Product Name and Corresponding Version Numbers

Instrumentation Product Names	CD Version	Section in This Guide
Dell OpenManage Server Administrator	4.3 or later (*Installation and Server Management CD*)	Server Administrator Supported Applications and Systems
	3.0 through 4.2 (*Systems Management* CD)	Server Administrator Supported Applications and Systems
Dell OpenManage Server Agent	2.0 through 2.2 (*Applications* CD)	Server Agent Supported Applications and Systems
Dell OpenManage Hardware Instrumentation Package (HIP)	1.2 through 1.7 (*Applications* CD)	Hardware Instrumentation Package Supported Applications and Systems

Supported Operating Systems

Server Administrator supports major operating systems offered by Microsoft, Novell®, and Red Hat. See the tables in "Server Administrator Supported Applications and Systems" to find the operating system that matches the configuration of system and applications that you are installing or upgrading.

NOTE: Each *Dell PowerEdge Installation and Server Management* CD supports specific operating system versions, service packs, support packs, and kernels.

NOTE: For Dell OpenManage information specific to VMware®, see the latest Installation Guide, Release Notes, and the Dell–VMware Compatibility Matrix at **www.dell.com/vmware**, under the **Dell/VMware Resource Center** section.

For precise operating system, application, firmware, and other requirements, see the table that lists the *Dell PowerEdge Installation and Server Management* CD (or *Systems Management* CD) version for the system that you are configuring. The tables in the following sections of this guide are a good place to begin:

- Server Administrator Supported Applications and Systems
- Server Agent Supported Applications and Systems
- Hardware Instrumentation Package Supported Applications and Systems

Operating system version numbers, support packs, service packs, and kernel versions can vary with each *Dell PowerEdge Installation and Server Management* CD (or *Systems Management* CD) version and cannot be accurately generalized. For example, a particular *Dell PowerEdge Installation and Server Management* CD (or *Systems Management* CD) may support only a version of the Red Hat Enterprise Linux operating system with a specific kernel. Some systems management applications are available only on specific operating systems.

NOTE: To address any Simple Network Management Protocol (SNMP) security vulnerabilities associated with an operating system, see the appropriate website for your system's operating system (for example, **www.microsoft.com**, **www.redhat.com**, or **www.novell.com**).

Supported Browsers

Server Administrator supports Microsoft Internet Explorer (IE) version 6.0 SP2 and 7.0, Mozilla Firefox version 1.5, and Mozilla versions 1.7.11 open-source Web browsers.

NOTE: Server Administrator versions 4.3 and later do not support Netscape Navigator.

Supported GUI Languages

Dell OpenManage is localized into French, German, Spanish, Japanese, and Simplified Chinese. Dell OpenManage software is localized according to the matrix in the following table. Dell does not support languages outside of this table.

Table 1-2 plots the language of the Dell OpenManage GUI against the operating system languages.

Table 1-2. Supported Dell OpenManage GUI Languages

Dell OpenManage GUI Languages	English OS	French OS	German OS	Spanish OS	Simplified Chinese OS	Japanese OS
English	X	X	X	X	X	X
French		X				
German			X			
Spanish				X		
Simplified Chinese					X	
Japanese						X

Other Documents You Might Need

In addition to this *Compatibility Guide*, you can find the following guides either on the Dell Support website at **support.dell.com** or on the Documentation CD:

- The *Dell OpenManage Installation and Security User's Guide* provides complete information on installation procedures and step-by-step instructions for installing, upgrading, and uninstalling Server Administrator for each supported operating system.
- The *Dell OpenManage Software Quick Installation Guide* provides an overview of applications that you can install on your management station (console) and on your managed systems and procedures for installing your console and managed system applications on systems running supported operating systems.
- The *Dell OpenManage Server Administrator User's Guide* describes the installation and use of Server Administrator. Server Administrator is a suite of management agents, installed on the managed system, that provide fault management information, prefailure information, and asset inventory information to management console applications such as Server Administrator and IT Assistant. This guide also provides information about configuring your remote access controller (RAC).

- The *Dell OpenManage Server Administrator SNMP Reference Guide* documents the Simple Network Management Protocol (SNMP) management information base (MIB). The SNMP MIB defines variables that extend the standard MIB to cover the capabilities of systems management agents.
- The *Dell OpenManage Server Administrator CIM Reference Guide* documents the Common Information Model (CIM) provider, an extension of the standard management object format (MOF) file. The CIM provider MOF documents supported classes of management objects.
- The *Dell OpenManage Server Administrator Messages Reference Guide* lists the messages that are displayed in your Server Administrator home page Alert log or on your operating system's event viewer. This guide explains the text, severity, and cause of each alert message that Server Administrator issues.
- The *Dell OpenManage Server Administrator Command Line Interface User's Guide* documents the complete command line interface for Server Administrator, including an explanation of CLI commands to view system status, access logs, create reports, configure various component parameters, and set critical thresholds.
- The *Dell Remote Access Controller Installation and Setup Guide* provides complete information about installing and configuring a DRAC III, DRAC III/XT, and an ERA/O controller, configuring an ERA controller, and using a RAC to remotely access an inoperable system.
- The *Dell Remote Access Controller Racadm User's Guide* provides information about using the DRAC III, DRAC III/XT, and ERA/O controller racadm command-line utility.
- The *Dell OpenManage Baseboard Management Controller Utilities User's Guide* provides information about installing and using the BMC.
- The *Dell Remote Access Controller Modular Chassis User's Guide* provides complete information about configuring and using the DRAC/MC to remotely manage and monitor your modular system and its shared resources through a network.
- The *Dell OpenManage Remote Install User's Guide* provides information about unattended, simultaneous provisioning and configuration solutions over the network by leveraging image-based technology.
- The *Dell Update Packages User's Guide* provides information about obtaining and using Dell Update Packages as part of your system update strategy.
- The *Server Update Utility User's Guide* provides information about obtaining and using the Server Update Utility (SUU) to update your Dell PowerEdge server or to view the updates available for any server listed in the Repository.

The *Dell PowerEdge Installation and Server Management* CD contains a readme file for Server Administrator and additional readme files for most applications found on the CD.

2

Server Administrator Services

Overview

Dell OpenManage™ Server Administrator has a modular architecture that allows you to select and install the functions that are most needed in your particular IT environment. The available services vary from one operating system to another. The following sections describe the contribution of each service to your systems management capabilities.

NOTE: Starting with Dell OpenManage version 4.3, the *Systems Management* CD has been replaced by the *Dell™ PowerEdge™ Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

Descriptions of Server Administrator Services

Each service provides a functionally related set of systems management tasks that you can use to manage your system.

Instrumentation Service

The Instrumentation Service provides rapid access to detailed fault and performance information gathered by industry-standard systems management agents. The instrumentation service allows remote administration of monitored systems, including shutdown, start-up, and security.

Remote Access Service

The Remote Access Service provides a complete remote systems management solution for systems equipped with a remote access controller (RAC) solution. The Remote Access Service provides remote access to an inoperable system, allowing the system administrator to get the system up and running as quickly as possible. The Remote Access Service also provides alert notification when a system is down and allows the system administrator to restart a system remotely. Additionally, the Remote Access Service logs the probable cause of system crashes and saves the most recent crash screen.

Storage Management Service

Express Setup installs the Storage Management Service (earlier known as the enhanced Storage Management Service) by default on Microsoft® Windows®. On Red Hat® Enterprise Linux and SUSE® LINUX Enterprise Server systems, you can either install the Storage Management Service through the Red Hat Package Manager (RPM) or use the `srvadmin-install.sh` script—a menu driven script that installs the appropriate RPMs based on the options you choose.

NOTE: The Red Hat Enterprise Linux operating system provides drivers for some of the RAID controllers listed in the "RAID Controller Supported Servers, Operating Systems, Firmware, and Driver Versions" section.

See the *Dell OpenManage Server Administrator User's Guide* for more information on Storage Management Service.

Logs

Server Administrator displays logs of commands issued to or by the system, monitored hardware events, POST events, and system alerts. You can view logs on the home page, print or save them as reports, and send them by e-mail to a designated service contact.

Available Services on Supported Operating Systems

Table 2-1 summarizes the services that are available for each supported operating system.

Table 2-1. Server Administrator Services Available With Supported Operating Systems

Operating System	Services Available
Microsoft Windows Server™ 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1), Microsoft Windows Small Business Server 2003 (SP1), Microsoft Windows Server 2003 R2 — for x86 and x64 editions, and Microsoft Windows Storage Server 2003 R2 (includes Express, Standard, Workgroup, and Enterprise Editions)	• Instrumentation • Storage Management • Remote Access
Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Microsoft Windows Small Business Server 2000)	• Instrumentation • Storage Management • Remote Access
Red Hat Enterprise Linux AS, ES, and WS (version 3 Update 6) for Intel® Extended Memory 64 Technology (Intel EM64T) and Intel x86	• Instrumentation • Remote Access • Storage Management Service (*Dell PowerEdge Installation and Server Management* CD for Dell OpenManage version 4.4 and later, or *Systems Management* CD for Dell OpenManage version 4.1 or later)

Table 2-1. Server Administrator Services Available With Supported Operating Systems *(continued)*

Operating System	Services Available
Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86	• Instrumentation • Remote Access • Storage Management Service (*Dell PowerEdge Installation and Server Management* CD for Dell OpenManage version 4.4 and later, or *Systems Management* CD for Dell OpenManage version 3.0 through 4.2)
SUSE LINUX Enterprise Server (version 9 SP3) for EM64T	• Instrumentation • Remote Access • Storage Management Service (*Dell PowerEdge Installation and Server Management* CD for Dell OpenManage version 5.0 and later)
SUSE LINUX Enterprise Server (version 10) for EM64T	• Instrumentation • Remote Access • Storage Management Service (*Dell PowerEdge Installation and Server Management* CD for Dell OpenManage version 5.0 and later)

NOTE: The Storage Management Service refers to the enhanced Storage Management Service. Server Administrator no longer supports the basic Storage Management Service (also known as Array Manager).

3

Systems Management Standards Availability

Overview

Dell OpenManage™ Server Administrator supports the following major systems management protocols:

- HyperText Transfer Protocol Secure (HTTPS)
- Common Information Model (CIM)
- Simple Network Management Protocol (SNMP)

NOTE: Starting with Dell OpenManage version 4.3, the *Systems Management* CD has been replaced by the *Dell™ PowerEdge™ Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

NOTE: See the Dell OpenManage Server Administrator **readme** file on the *Dell PowerEdge Installation and Server Management* CD (or *Systems Management* CD) for information on SNMP security concerns, as well as the Dell Support website at **support.dell.com**. You must apply updates from your operating system's master SNMP agents to ensure that Dell's SNMP subagents are secure.

NOTE: After you install SNMP, it must be enabled. For more information on enabling SNMP–supported agents, see the *Server Administrator User's Guide*.

If your system supports SNMP, you must install and enable the service on your operating system. If SNMP services are available on your operating system, the Server Administrator installation program installs the supporting agents for SNMP.

HTTPS is supported on all operating systems. Support for CIM and SNMP is operating system-dependent and, in some cases, operating system-version dependent.

Availability on Supported Systems

On supported Microsoft® Windows® operating systems, Server Administrator supports these two systems management standards: CIM/WMI and SNMP.

On supported Red Hat® Enterprise Linux and SUSE® LINUX Enterprise Server operating systems, Server Administrator supports the SNMP systems management standard.

Server Administrator adds considerable security to these systems management standards. All set operations for attributes (for example, changing the value of an asset tag) must be performed with Dell OpenManage IT Assistant while logged in with the required authority. As a result of the added security that IT Assistant offers for systems management, IT Assistant is the only management console that you can use to change attributes.

Availability on Supported Operating Systems

Table 3-1 shows the availability of the systems management standards for each supported operating system.

Table 3-1. Availability of Systems Management Standard by Operating System

Operating System	SNMP	CIM
Windows Server™ 2003 family and Windows 2000 Server family	Available from the operating system installation media	Always installed
Red Hat Enterprise Linux AS and ES (version 3 and version 4)	Available in **net-snmp** package from the operating system installation media	Unavailable
SUSE LINUX Enterprise Server (version 9 and 10)	Available in **net-snmp** package from the operating system installation media	Unavailable

4

Server Administrator Supported Applications and Systems

This section provides information on instrumentation, applications, and systems that are supported by the *Dell OpenManage™ Systems Management* CD versions 3.0 through 4.2, and *Dell™ PowerEdge™ Installation and Server Management* CD version 4.3 onwards.

NOTE: Starting with Dell OpenManage version 4.3, the *Systems Management* CD has been replaced by the *Dell PowerEdge Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

The *Dell PowerEdge Installation and Server Management* CD (or the *Systems Management* CD) supports both, Dell OpenManage Server Administrator and Server Agent. For more information about applications and systems supported by Server Agent, see "Server Agent Supported Applications and Systems." Server Agent is referred to as the Instrumentation Service starting with *Systems Management* CD 3.*x*. The Instrumentation Service is also called Hardware Instrumentation Package (HIP) on older releases.

NOTE: The *Systems Management* CD version 3.0 and later does not fully support the following Dell PowerEdge systems: 1300, 2100, 2200, 2300, 4100, 4200, 4300, 4350, 6100, 6300, and 6350.

NOTE: The *Systems Management* CD version 3.2.1 was not released.

Version Number Information

All software supporting the Dell PowerEdge servers and Dell PowerVault™ NAS systems are delivered in Dell OpenManage *stack releases* that include the complete group of programs and that are fully tested for the supported platforms. An example is the Dell OpenManage 3.4.2 release of the Dell OpenManage software that supports most Dell systems from February 1998 through June 2003. The version of the software is significant. In this example, the first number (3) represents the major version number. You should upgrade your software any time Dell delivers a new major version. The second number (4) is the release number. A new release may have some minor features and fixes associated with it. You do not need to upgrade to the latest release unless that release is enabling your specific hardware or solving an issue you may be experiencing. You may skip releases as needed. The last number (2) is the hardware *platform refresh* number. This indicates that the software has been updated to support a new system. For example, if you have older systems running version 3.4.1, there is no need to upgrade to version 3.4.2 for a platform refresh.

Compatible Systems and Applications by Installation and Server Management CD Version

Table 4-1 shows compatible applications and Dell systems for the *Dell PowerEdge Installation and Server Management* CD (versions 5.0 to 5.1)

Table 4-1. Compatible Dell Systems and Applications for Installation and Server Management CD Version 5.0 to 5.1.

Installation and Server Management CD Version	5.0	5.1
PowerEdge systems (* Indicates new systems for the given version of the CD)	600SC 650 700 750 750N 755N 770N 775N 800 830 850 1600SC 1650 1655MC 1750 1800 1850 1855 1950* 1955* 2600 2650 2800 2850 2900* 2950* 4600 6600 6650 6800 6850	600SC 650 700 750 750N 755N 770N 775N 800 830 840* 850 860* 1600SC 1650 1655MC 1750 1800 1850 1855 1900* 1950 1955 2600 2650 2800 2850 2900 2950 4600 6600 6650 6800 6850

Table 4-1. Compatible Dell Systems and Applications for Installation and Server Management CD Version 5.0 to 5.1. *(continued)*

Installation and Server Management CD Version	5.0	5.1
Supported operating systems	• Microsoft® Windows Server™ 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1) • Microsoft Windows® Small Business Server 2003 (SP1) • Microsoft Windows Server 2003 R2 • Microsoft Windows Storage Server 2003 R2 (includes Express, Standard, Workgroup, and Enterprise editions) • Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Microsoft Windows Small Business Server 2000) • Red Hat® Enterprise Linux AS, ES, and WS (version 3 Update 6) for Intel® Extended Memory 64 Technology (Intel EM64T) and Intel x86 • Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86 SUSE® Linux Enterprise Server (version 9 SP3) for EM64T	• Microsoft Windows Server™ 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1) • Microsoft Windows Small Business Server 2003 (SP1) • Microsoft Windows Server 2003 R2 • Microsoft Windows Storage Server 2003 R2 (includes Express, Standard, Workgroup, and Enterprise editions) • Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Microsoft Windows Small Business Server 2000) • Red Hat Enterprise Linux AS, ES, and WS (version 3 Update 6) for Intel® Extended Memory 64 Technology (Intel EM64T) and Intel x86 • Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86 SUSE Linux Enterprise Server (version 9 SP3 and 10) for EM64T **NOTE:** SUSE Linux Enterprise Server verison 10 does not support the DRAC 4 and DRAC 5 client GUI.
Server Administrator	5.0	5.1
Managed Node Framework (MNF)	3.0	3.1
Instrumentation Service: Server Agent	5.6	5.6
Diagnostic Service	3.6	NA
Server Administrator Core	5.0	5.0

Table 4-1. Compatible Dell Systems and Applications for Installation and Server Management CD Version 5.0 to 5.1. ***(continued)***

Installation and Server Management CD Version	5.0	5.1
IT Assistant	7.2	8.0
Storage Management Service	2.0	2.1
RAC Firmware		
DRAC 5	1.0	1.0
DRAC 4	1.3.5	1.4.0
DRAC/MC	1.3	1.3
DRAC III, ERA, ERA/O, ERA/XT	3.3.5	3.3.5
ERA/MC	1.4.4	1.4.4
BMC Firmware Version On		
PowerEdge 800	1.30 or later	1.30 or later
PowerEdge 830	1.41 or later	1.41 or later
PowerEdge 840	1.0 or later	1.0 or later
PowerEdge 850	1.41 or later	1.41 or later
PowerEdge 860	1.0 or later	1.0 or later
PowerEdge 1425SC	1.30 or later	1.30 or later
PowerEdge 1800	1.23 or later	1.23 or later
PowerEdge 1850	1.23 or later	1.23 or later
PowerEdge 1855	1.0 or later	1.0 or later
PowerEdge 1900	NA	1.0 or later
PowerEdge 1950	1.0 or later	1.0 or later
PowerEdge 1955	1.0 or later	1.0 or later
PowerEdge 2800	1.23 or later	1.23 or later
PowerEdge 2850	1.23 or later	1.23 or later
PowerEdge 2900	1.0 or later	1.0 or later
PowerEdge 2950	1.0 or later	1.0 or later
PowerEdge 6800	1.40 or later	1.40 or later
PowerEdge 6850	1.40 or later	1.40 or later

Table 4-2 shows compatible applications and Dell systems for the *Dell PowerEdge Installation and Server Management* CD (versions 4.3 to 4.5.1).

Table 4-2. Compatible Dell Systems and Applications for Installation and Server Management CD Version 4.3 to 4.5.1

Installation and Server Management CD Version	4.3	4.4	4.5	4.5.1[a]
PowerEdge systems (* Indicates new systems for the given version of the CD)	350 500SC 600SC 650 700 750 800 1400 1500SC 1550 1600SC 1650 1655MC 1750 1800 1850 1855 2400 2450 2500 2550 2600 2650 2800 2850 4400 4600 6400 6450 6600 6650 6800* 6850*	350 500SC 600SC 650 700 750 800 1400 1500SC 1550 1600SC 1650 1655MC 1750 1800 1850 1855 2400 2450 2500 2550 2600 2650 2800 2850 4400 4600 6400 6450 6600 6650 6800 6850	350 500SC 600SC 650 700 750 800 830* 850* 1400 1500SC 1550 1600SC 1650 1655MC 1750 1800 1850 1855 2400 2450 2500 2550 2600 2650 2800 2850 4400 4600 6400 6450 6600 6650	1850 2850 6800 6850

Table 4-2. Compatible Dell Systems and Applications for Installation and Server Management CD Version 4.3 to 4.5.1 *(continued)*

Installation and Server Management CD Version	4.3	4.4	4.5	4.5.1[a]
	8450 750N 755N 770N 775N	8450 750N 755N 770N 775N	6800 6850 8450 750N 755N 770N 775N	
Supported operating systems	• Microsoft Windows Server 2003 family (includes Web, Standard, and Enterprise editions) • Microsoft Windows Small Business Server [SBS] 2003	• Microsoft Windows Server 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1) • Microsoft Windows Small Business Server 2003 (SP1)	• Microsoft Windows Server 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1) • Microsoft Windows Small Business Server 2003 (SP1)	• Microsoft Windows Server 2003 family (includes Web, Standard, Enterprise, and x64 Editions) (SP1) • Microsoft Windows Small Business Server 2003 (SP1)
	• Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Windows Small Business Server 2000)	• Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Microsoft Windows Small Business Server 2000)	• Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Microsoft Windows Small Business Server 2000)	• Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server and Microsoft Windows Small Business Server 2000)
	• Novell® NetWare® 5.1 (Support Pack 7 or later, plus hot fixes) • Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	• Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	• Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	• NA

Table 4-2. Compatible Dell Systems and Applications for Installation and Server Management CD Version 4.3 to 4.5.1 *(continued)*

Installation and Server Management CD Version	4.3	4.4	4.5	4.5.1[a]
	• Red Hat Enterprise Linux AS and ES (version 2.1) • Red Hat Enterprise Linux AS, ES, and WS (version 3)	• Red Hat Enterprise Linux AS, ES, and WS (version 3) for Intel Extended Memory 64 Technology (Intel EM64T) and Intel x86 • Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86	• Red Hat Enterprise Linux AS, ES, and WS (version 3) for Intel Extended Memory 64 Technology (Intel EM64T) and Intel x86 • Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86	• Red Hat Enterprise Linux AS, ES, and WS (version 3) for Intel Extended Memory 64 Technology (Intel EM64T) and Intel x86 • Red Hat Enterprise Linux (version 4) for Intel EM64T and Intel x86
Server Administrator	2.0	2.1	2.2	2.3
Managed Node Framework (MNF)	2.0	2.1	2.2	2.3
Instrumentation Service: Server Agent	5.3	5.3	5.3	5.5.1
Diagnostic Service	3.2	3.3	3.4	3.4
Server Administrator Core	2.0	2.1	2.2	2.2
IT Assistant	7.0	7.0	7.1	7.1
Storage Management Service: Array Manager	3.7	3.7	3.7	3.7
enhanced Storage Management Service	1.1	1.2	1.2	1.4
RAC Firmware				
DRAC 4	1.20	1.30	1.30	1.30
DRAC/MC	1.1	1.2	1.2	NA
DRACIII, ERA, ERA/O, and ERA/XT	3.21	3.3	3.3	NA

Table 4-2. Compatible Dell Systems and Applications for Installation and Server Management CD Version 4.3 to 4.5.1 *(continued)*

Installation and Server Management CD Version	4.3	4.4	4.5	4.5.1[a]
RAC firmware: DRAC II	NA **NOTE:** The DRAC II software is no longer included on the *Systems Management Consoles* CD, but can be obtained from earlier releases or support.dell.com.	NA	NA	NA
ERA/MC	1.44	NA	NA	NA
BMC Firmware Version On				
PowerEdge 800	1.30 or later	1.30 or later	1.30 or later	NA
PowerEdge 830	NA	NA	1.41 or later	NA
PowerEdge 850	NA	NA	1.41 or later	NA
PowerEdge 1425SC	1.30 or later	1.30 or later	1.30 or later	NA
PowerEdge 1800	1.23 or later	1.23 or later	1.23 or later	NA
PowerEdge 1850	1.23 or later	1.23 or later	1.23 or later	1.23 or later
PowerEdge 1855	1.0 or later	1.0 or later	1.0 or later	NA
PowerEdge 2800	1.23 or later	1.23 or later	1.23 or later	NA
PowerEdge 2850	1.23 or later	1.23 or later	1.23 or later	1.23 or later
PowerEdge 6800	1.33 or later	1.33 or later	1.33 or later	1.40 or later
PowerEdge 6850	1.33 or later	1.33 or later	1.33 or later	1.40 or later

a. Introduced SAS support for Dell PowerEdge 6800 and 6850.

Table 4-3 shows compatible applications and Dell systems for *Systems Management* CD version 4.1.3 to 4.2.

Table 4-3. Compatible Dell Systems and Applications for Systems Management CD Versions 4.1.3 to 4.2.

Systems Management CD Version	4.1.3	4.1.4	4.2
PowerEdge systems (* Indicates new systems for the given version of the CD)	1855*	1855	350 500SC 600SC 650 700 750 800 1400 1500SC 1550 1600SC 1650 1655MC 1750 1800 1850 1855 2400 2450 2500 2550 2600 2650 2800 2850 4400 4600 6400 6450 6600 6650 8450 750N 755N 770N 775N

Table 4-3. Compatible Dell Systems and Applications for Systems Management CD Versions 4.1.3 to 4.2. *(continued)*

Systems Management CD Version	4.1.3	4.1.4	4.2
Supported operating systems	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003 (supported by PowerEdge 2800 only)	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003 (supported by PowerEdge 2800 only)	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003
	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 SBS)
	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes)	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes)	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes) **NOTE:** Novell NetWare is not supported on the PowerEdge 650 system.
	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes) **NOTE:** Novell NetWare is not supported on the PowerEdge 650 system.
	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)
Server Administrator	1.9.1	1.9.1	1.9.2
Managed Node Framework (MNF)	1.9	1.9	1.9
Instrumentation Service: Server Agent	5.2	5.2	5.2
Diagnostic Service	3.1.1	3.1.1	3.1
Update Service	1.9.2	NA	1.9.1
Server Administrator Core	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.

Table 4-3. Compatible Dell Systems and Applications for Systems Management CD Versions 4.1.3 to 4.2. *(continued)*

Systems Management CD Version	4.1.3	4.1.4	4.2
IT Assistant	6.5.3	6.5.3	6.5.3
Storage Management Service: Array Manager	NA	NA	3.6
enhanced Storage Management Service	1.0	1.0.1	1.0
RAC Firmware			
DRAC 4	1.0	1.1	1.1
DRAC/MC	1.0	NA	NA
DRACIII, ERA, ERA/O, and ERA/XT	NA	NA	3.21
RAC firmware: DRAC II	NA		NA **NOTE:** The DRAC II software is no longer included on the *Systems Management* CD, but can be obtained from earlier releases or **support.dell.com**.
ERA/MC	NA	NA	1.44
BMC Firmware Version	1.0	1.0.1	1.0.1

Table 4-4 shows compatible applications and Dell systems for *Systems Management* CD version 4.0.1 to 4.1.2.

Table 4-4. Compatible Dell Systems and Applications for Systems Management CD Versions 4.0.1 to 4.1.2.

Systems Management CD Version	4.0.1	4.1	4.1.1	4.1.2
PowerEdge systems (* Indicates new systems for the given version of the CD)	1850* 2800* 2850*	350 500SC 600SC 650 700 750 1400 1500SC 1550 1600SC 1650 1655MC 1750 1850 2400 2450 2500 2550 2600 2650 2800 2850 4400 4600 6400 6450 6600 6650 8450 750N 755N 770N 775N	1800*	800*

Table 4-4. Compatible Dell Systems and Applications for Systems Management CD Versions 4.0.1 to 4.1.2. *(continued)*

Systems Management CD Version	4.0.1	4.1	4.1.1	4.1.2
Supported operating systems	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003 (supported by PowerEdge 2800 only)	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003
	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 SBS)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 SBS)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 SBS)
	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes)	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes) **NOTE:** Novell NetWare is not supported on the PowerEdge 650 system.	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes)	Novell NetWare 5.1 (Support Pack 7 or later, plus hot fixes)
	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes) **NOTE:** Novell NetWare is not supported on the PowerEdge 650 system.	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)	Novell NetWare 6.5 (Support Pack 1 or later, plus hot fixes)
	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)	Red Hat Enterprise Linux AS and ES (version 2.1) and AS, ES, and WS (version 3)
Server Administrator	1.8.1	1.9	1.9	1.9

Table 4-4. Compatible Dell Systems and Applications for Systems Management CD Versions 4.0.1 to 4.1.2. *(continued)*

Systems Management CD Version	4.0.1	4.1	4.1.1	4.1.2
Managed Node Framework (MNF)	1.8.1	1.9	1.9	1.9
Instrumentation Service: Server Agent	5.1.1	5.2	5.2	5.2
Remote Access Service SW	4.0.0	3.30 (DRAC III) 4.0.0 (DRAC 4)	NA	NA
BMC Firmware Version	1.0	1.0.1	1.0.1	1.0.1
Diagnostic Service	3.0.1	3.1	3.1	3.1
Update Service	1.9	1.9.1	1.9.1	1.9.1
Server Administrator Core	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.
IT Assistant	6.5.2	6.5.3	6.5.3	6.5.3
Storage Management Service: Array Manager	3.5	3.6	3.6	3.6
enhanced Storage Management Service	NA	1.0	1.0	1.0
RAC Firmware				
DRAC 4	1.0	1.0	NA	NA
RAC firmware: DRAC II	NA	NA **NOTE:** The DRAC II software is no longer included on the *Systems Management* CD, but can be obtained from earlier releases or **support.dell.com**.	NA	NA
RAC firmware: DRAC III	NA	3.12	NA	NA

Table 4-4. Compatible Dell Systems and Applications for Systems Management CD Versions 4.0.1 to 4.1.2. *(continued)*

Systems Management CD Version	4.0.1	4.1	4.1.1	4.1.2
RAC firmware: DRAC III/XT	NA	3.12	NA	NA
RAC firmware: ERA	NA	3.12	NA	NA
RAC firmware: ERA/O	NA	3.12	NA	NA

Table 4-5. Compatible Dell Systems and Applications for Systems Management CD Versions 3.5 Through 3.8

Systems Management CD Version	3.5	3.6	3.7	3.8
PowerEdge systems (* Indicates new systems for the given version of the CD)	350 500SC 600SC 650 1400 1500SC 1550 1600SC 1650 1655MC 1750 2400 2450 2500 2550 2600 2650 4400 4600 6400 6450 6600 6650 8450	350 500SC 600SC 650 1400 1500SC 1550 1600SC 1650 1655MC 1750 2400 2450 2500 2550 2600 2650 4400 4600 6400 6450 6600 6650 8450	350 500SC 600SC 650 1400 1500SC 1550 1600SC 1650 1655MC 1750 2400 2450 2500 2550 2600 2650 4400 4600 6400 6450 6600 6650 8450	350 500SC 600SC 650 700* 750* 1400 1500SC 1550 1600SC 1650 1655MC 1750 2400 2450 2500 2550 2600 2650 4400 4600 6400 6450 6600 6650 8450

Table 4-5. Compatible Dell Systems and Applications for Systems Management CD Versions 3.5 Through 3.8 *(continued)*

Systems Management CD Version	3.5	3.6	3.7	3.8
Supported operating systems	Microsoft Windows Server 2003	Windows Server 2003 family	Windows Server 2003 family	Windows Server 2003 family (includes Web, Standard, and Enterprise editions) and Microsoft Windows Small Business Server [SBS] 2003
	Windows 2000 Server family (SP3 recommended)	Windows 2000 Server family (SP3 recommended)	Windows 2000 Server family (SP3 recommended)	Windows 2000 Server family (includes Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 SBS)
	Novell NetWare 5.1 (SP4 or later)	NetWare 5.1 (SP5 or later)	Novell NetWare 5.1 (Support Pack 6 or later)	Novell NetWare 5.1 (Support Pack 6 or later)
	NetWare 6.0 (SP1 or later)	NetWare 6.5	Novell NetWare 6.5 (Support Pack 1 or later)	Novell NetWare 6.5 (Support Pack 1 or later)
	Red Hat Linux Advanced Server 2.1	Red Hat Enterprise Linux AS (version 2.1)	Red Hat Enterprise Linux AS and ES (version 2.1 and 3), and WS (version 3)	Red Hat Enterprise Linux AS (version 2.1) and AS, ES, and WS (version 3)
	Red Hat Linux 9	Red Hat Linux 9	Red Hat Linux 9	NA
Server Administrator	1.5	1.6	1.7	1.8
Managed Node Framework (MNF)	1.5	1.6	1.7	1.8
Instrumentation Service: Server Agent	4.10.0	4.11	4.12	5.1
Diagnostic Service	2.5	2.6	2.7	3.0
Update Service	1.6	1.7	1.8	1.9

Table 4-5. Compatible Dell Systems and Applications for Systems Management CD Versions 3.5 Through 3.8 *(continued)*

Systems Management CD Version	3.5	3.6	3.7	3.8
Server Administrator Core	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.
IT Assistant	6.4.4	6.5	6.5	6.5
Storage Management Service: Array Manager	3.4	3.5	3.5	3.5
RAC Firmware				
Remote Access Service (RAS)	2.5	3.0	3.10	3.20
RAC firmware: DRAC II	2.5	2.5	2.5	2.5
RAC firmware: DRAC III	2.5	3.0	3.10	3.10
RAC firmware: DRAC III/XT	2.5	3.0	3.10	3.10
RAC firmware: ERA	2.5	3.0	3.10	3.10
RAC firmware: ERA/O	2.5	3.0	3.10	3.10

Table 4-6 shows compatible applications and Dell systems for *Systems Management* CD versions 3.2.3 through 3.4.

Table 4-6. Compatible Dell Systems and Applications for Systems Management CD Versions 3.2.3 Through 3.4

Systems Management CD Version	3.2.3	3.3	3.3.3	3.4
PowerEdge systems (* Indicates new systems for the given version of the CD)	300 350 500SC 600SC 1300 1400 1500SC 1550 1600SC 1650 1655MC* 2300 2400 2450 2500 2550 2600 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450	300 350 500SC 600SC 1300 1400 1500SC 1550 1600SC 1650 2300 2400 2450 2500 2550 2600 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450	300 350 500SC 600SC 650* 1300 1400 1500SC 1550 1600SC 1650 1655MC 1750* 2300 2400 2450 2500 2550 2600 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450	300 350 500SC 600SC 650 1300 1400 1500SC 1550 1600SC 1650 1655MC 1750 2300 2400 2450 2500 2550 2600 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450

Table 4-6. Compatible Dell Systems and Applications for Systems Management CD Versions 3.2.3 Through 3.4 *(continued)*

Systems Management CD Version	3.2.3	3.3	3.3.3	3.4
Supported operating systems	Microsoft Windows 2000 Server Family (SP3 recommended)	Microsoft Windows NT® 4.0 Server family (SP6a or later)	Windows NT 4.0 Server family (SP6a or later)	Windows Server 2003
	NetWare 5.1 (SP2 or later)	Windows 2000 Server family (SP3 recommended)	Windows 2000 Server family (SP3 recommended)	Windows 2000 Server family (SP3 recommended)
	NetWare 6.0 (SP1 or later)	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)
	Red Hat Enterprise Linux Advanced Server 2.1	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)
	Red Hat Linux 7.3 (with the 2.4.18-4smp kernel)	Linux Advanced Server 2.1	Linux Advanced Server 2.1	Linux Advanced Server 2.1
		Linux 7.3 (with the 2.4.18-4smp kernel)	Linux 7.3 (with the 2.4.18-4smp kernel)	Linux 8.0 and Linux 9
		Linux 8.0 (with the 2.4.18-14smp kernel)	Linux 8.0 (with the 2.4.18-14smp kernel)	
Server Administrator	1.2.3	1.3	1.3.4	1.4
Managed Node Framework (MNF)	1.2.3	1.3	1.3	1.4
Instrumentation Service: Server Agent	4.7.2	4.8	4.8.1	4.9
Remote Access Service (RAS)	1.3.1	2.0	2.1	2.2
RAC firmware: DRAC II	2.5	2.5	2.5	2.5
RAC firmware: DRAC III	1.3	2.0	2.0	2.2
RAC firmware: DRAC III/XT	NA	2.0	2.0	2.2
RAC firmware: ERA	1.2	2.0	2.1	2.2
RAC firmware: ERA/O	1.2	2.0	2.0	2.2
Diagnostic Service	2.2.1	2.3	2.3.1	2.4
Update Service	1.3	1.4	1.4.3	1.5
Server Administrator Core	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.	See "MNF" in this table.

Table 4-6. Compatible Dell Systems and Applications for Systems Management CD Versions 3.2.3 Through 3.4 *(continued)*

Systems Management CD Version	3.2.3	3.3	3.3.3	3.4
IT Assistant	6.4.2	6.4.3	6.4.3	6.4.4
Storage Management Service: Array Manager	3.3	3.3	3.4	3.4

Table 4-7 shows supported elements for *Systems Management* CD versions 3.0 through 3.2.2.

Table 4-7. Compatible Dell Systems and Applications for Systems Management CD Versions 3.0 Through 3.2.2

Systems Management CD Version	3.0	3.0.1	3.0.2	3.1	3.2	3.2.2
PowerEdge systems (* Indicates new systems for the given version of the CD)	300 350 500SC 1300 1400 1500SC 1550 2300 2400 2450 2500 2550 4300 4350 4400 6300 6350 6400 6450 8450	300 350 500SC 1300 1400 1500SC 1550 1650* 2300 2400 2450 2500 2550 4300 4350 4400 4600* 6300 6350 6400 6450 8450	300 350 500SC 1300 1400 1500SC 1550 1650 2300 2400 2450 2500 2550 2650* 4300 4350 4400 4600 6300 6350 6400 6450 6600* 6650* 8450	300 350 500SC 1300 1400 1500SC 1550 1650 2300 2400 2450 2500 2550 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450	300 350 500SC 600SC* 1300 1400 1500SC 1550 1650 2300 2400 2450 2500 2550 2600* 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450	300 350 500SC 600SC 1300 1400 1500SC 1550 1600SC* 1650 2300 2400 2450 2500 2550 2600 2650 4300 4350 4400 4600 6300 6350 6400 6450 6600 6650 8450

Table 4-7. Compatible Dell Systems and Applications for Systems Management CD Versions 3.0 Through 3.2.2 *(continued)*

Systems Management CD Version	3.0	3.0.1	3.0.2	3.1	3.2	3.2.2
Supported operating systems	Windows NT 4.0 with SP4	Windows NT 4.0 Server family (SP6a or later)	Windows NT 4.0 Server family (SP6a or later)	Windows NT 4.0 Server family (SP6a or later)	Windows NT 4.0 Server family (SP6a or later)	Windows NT 4.0 Server family (SP6a or later)
	Windows 2000 Server family	Windows 2000 Server family (hot fixes rec. for SNMP)	Windows 2000 Server family (hot fixes rec. for SNMP)	Windows 2000 Server family (hot fixes rec. for SNMP)	Windows 2000 Server family (SP3 rec.)	Windows 2000 Server family (SP3 rec.)
	Novell NetWare 4.*x*, 5.*x*, or 6.*x*	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)	NetWare 5.1 (SP2 or later)
	Linux 7.1	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)	NetWare 6.0 (SP1 or later)
	Linux Advanced Server 2.1	Linux 7.1 (with latest ucd-snmp package)	Linux 7.1 (with latest ucd-snmp package)	Linux 7.1 (with latest ucd-snmp package)	Linux Advanced Server 2.1	Linux Advanced Server 2.1
				Linux Advanced Server 2.1	Linux 7.3 (with the 2.4.18-4smp kernel)	Linux 7.3 (with the 2.4.18-4smp kernel)
Server Administrator	1.0	1.0.1	1.0.2	1.1	1.2	1.2.2
Managed Node Framework	NA	NA	NA	NA	1.2	1.2.2
Instrumentation Service: Server Agent	4.5.1	4.5.1 4.5.2	4.5.1 4.5.2	4.6	NA	1.2.1
Remote Access Service (RAS)	NA	NA	NA	NA	4.7	4.7.1
RAC firmware: DRAC II	2.4.1	2.4.1	2.5	2.5	NA	1.3
RAC firmware: DRAC III	NA	1.1	1.1	1.2	2.5	2.5

Table 4-7. Compatible Dell Systems and Applications for Systems Management CD Versions 3.0 Through 3.2.2 *(continued)*

Systems Management CD Version	3.0	3.0.1	3.0.2	3.1	3.2	3.2.2
RAC firmware: DRAC III/XT	NA	NA	NA	NA	1.3	1.3
RAC firmware: ERA	NA	NA	1.05	1.05	NA	1.0
RAC firmware: ERA/O	NA	NA	NA	1.1	1.07	1.2
Diagnostic Service	2.0	2.0.1	2.0.2	2.1	1.2	1.2
Update Service	1.1	1.1	1.1	1.2	1.2	1.2.1
Server Administrator Core	NA	NA	NA	1.10	1.3	1.3
IT Assistant	6.2	6.2	6.2	6.3	1.2	See "MNF" in this table.
Storage Management Service: Array Manager	3.1.1	3.1.2	3.1.2	3.1.3	3.2	3.3

Device Drivers and Red Hat Enterprise Linux Kernel Support

NOTE: The "Supported Operating Systems" section of Table 4-6 and Table 4-7 includes Red Hat Enterprise Linux kernel versions. Updated or later versions of Red Hat Enterprise Linux may require the use of dynamic kernel support (see "Installing Server Administrator" in the *Server Administrator User's Guide* for an explanation of this feature).

The Instrumentation Service provides device drivers for the precompiled kernels listed in Table 4-6 and Table 4-7. When the Instrumentation Service detects that none of its prebuilt device drivers supports the running kernel, it attempts to build a device driver for that kernel. This feature of Server Administrator is called dynamic kernel support. Server Administrator's dynamic kernel support builds a device driver when needed during the Instrumentation Service installation or start-up.

5

Server Agent Supported Applications and Systems

This section provides information on instrumentation, applications, and systems that are supported by *Dell OpenManage™ Applications* CD versions 2.0 through 2.2. The Dell OpenManage Server Agent was supported concurrently with the Hardware Instrumentation Package (HIP) by *Applications* CD versions 1.3 through 1.7.

For more information about applications and systems supported by HIP, see "Hardware Instrumentation Package Supported Applications and Systems."

For more information about Server Administrator supported applications and systems, see "Server Administrator Supported Applications and Systems."

NOTE: The *Applications* CD version 2.0.1 and later does not fully support the following Dell™ PowerEdge™ systems: 1300, 2100, 2200, 2300, 4100, 4200, 4300, 4350, 6100, 6300, and 6350.

Table 5-1 shows compatible applications and PowerEdge systems for each *Applications* CD, versions 2.0 through 2.2.

Table 5-1. Server Agent Versions, Applications, and Dell Systems

Applications **CD Version**	**2.0**	**2.0.1**	**2.0.2**	**2.1**	**2.2**
PowerEdge systems (* Indicates new systems for the given version of the CD)	300 350 1300 1400 1550 2300 2400 2450 2500* 2550* 4300 4350 4400 6300 6350 6400 6450 8450	300SC 350 1400SC 1550 2400 2450 2500 2500SC 2550 4400 6400 6450 8450	350 500SC* 1550	300 350 500SC 1300 1400 1550 2300 2400 2450 2500 2550 4300 4350 4400 6300 6350 6400 6450 8450	300 350 500SC 1300 1400 1500SC* 1550 2300 2400 2450 2500 2550 4300 4350 4400 6300 6350 6400 6450 8450
Supported operating systems	Microsoft® Windows NT® 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP 4 or later	Windows NT 4.0 with SP4 or later
	Windows® 2000 Server family	Windows 2000 Server family	Windows 2000 Server family	Windows 2000 Server family	Windows 2000 Server family
	Novell® NetWare® 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*
	Red Hat® Linux 7.0 (kernel version: 2.2.16)	Linux 7.0 (kernel version: 2.2.16)	Linux 7.0 (kernel version: 2.2.16)	Linux 7.0	Linux 7.0
Instrumentation Service: Server Agent	4.3	4.3	4.4	4.4.1	4.5
Remote Access Service: DRAC II	2.3.2	2.3.3	2.3.3	2.4	2.4

Table 5-1. Server Agent Versions, Applications, and Dell Systems *(continued)*

Applications **CD Version**	**2.0**	**2.0.1**	**2.0.2**	**2.1**	**2.2**
Remote Access Service: DRAC III	NA	NA	NA	NA	NA
Online Diagnostics	1.1	1.1	1.1	1.1.1	1.1.2
IT Assistant	6.0	6.0	6.0	6.0	6.0
Storage Management Service: Array Manager	2.7	3.0	3.0	3.0	3.1

6

Hardware Instrumentation Package Supported Applications and Systems

This section provides information about instrumentation, applications, and systems that are supported by the *Dell OpenManage™ Applications* CD versions 1.1 through 1.7. Both Dell OpenManage Hardware Instrumentation Package (HIP) and the Dell OpenManage Server Agent are supported by the *Applications* CD versions 1.3 through 1.7.

For more information about applications and systems supported by Server Agent, see "Server Agent Supported Applications and Systems."

Table 6-1 shows compatible applications and Dell™ PowerEdge™ systems for the *Applications* CD versions 1.1 through 1.7.

Table 6-1. HIP Versions, Applications, and Dell PowerEdge Systems

***Applications* CD Version**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**
PowerEdge systems (* Indicates new systems for the given version of the CD)	1300 2100 2200 2300 2400 2450 4100 4200 4300 4350 4400 6100 6300 6350 6400 6450 8450	1300 2100 2200 2300 2400 2450 4100 4200 4300 4350 4400 6100 6300 6350 6400 6450 8450	1300 2100 2200 2300 2400 2450 4100 4200 4300 4350 4400 6100 6300 6350 6400 6450 8450	1300 2100 2200 2300 2400 2450 4100 4200 4300 4350 4400 6100 6300 6350 6400 6450 8450	1300 1400* 2100 2200 2300 2400 2450 4100 4200 4300 4350 4400 6100 6300 6350 6400 6450 8450	300* 1300 1400 1550* 2300 2400 2450 4300 4350 4400 6300 6350 6400 6450 8450	300 350* 1300 1400 1550 2300 2400 2450 4300 4350 4400 6300 6350 6400 6450 8450

Table 6-1. HIP Versions, Applications, and Dell PowerEdge Systems *(continued)*

***Applications* CD Version**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**
Supported operating systems	Microsoft® Windows NT® 4.0 with SP3 or later	Windows NT 4.0 with SP3 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later	Windows NT 4.0 with SP4 or later
			Windows® 2000 Server family	Windows 2000 Server family	Windows 2000 Server family	Windows 2000 Server family	Windows 2000 Server family
	Novell® NetWare® 4.11 with SP5 or later	Novell NetWare 4.11 with SP5 or later					
	NetWare 5.0	NetWare 5.0	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*	NetWare 4.*x* or 5.*x*
Instrumentation Service: HIP	3.5.2	3.5.2	3.5.2	3.5.2	3.5.2	3.5.2	3.5.2
Instrumentation Service: Server Agent	NA	NA	4.0	4.0	4.0	4.2.1	4.2.2
Remote Access Service: DRAC II	2.2.1	2.2.1	2.3	2.3	2.3	2.3.1	2.3.1
Online Diagnostics	NA	NA	NA	NA	NA	NA	1.0
IT Assistant	5.1	5.1	5.1	5.2	6.0	6.0	6.0
Storage Management Service: Array Manager	1.5	1.5	2.0	2.0	2.5	2.5	2.7

7

BIOS Update Requirements

Overview

NOTE: Starting with Dell OpenManage™ version 4.3, the *Systems Management* CD has been replaced by the *Dell™ PowerEdge™ Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

Prior to Dell OpenManage 4.3, Server Administrator Update Service provided the ability to update system BIOS remotely from within the Server Administrator GUI. The Update Service also provided interfaces for updating many firmware and driver packages. The remote BIOS update capability did not require that you be logged in directly to the system whose BIOS you were updating. If the target system had the minimum required BIOS version installed, you could update the BIOS to the latest version *remotely*. The purpose of this section is to help you to identify the minimum prerequisite BIOS version to update to the latest available BIOS for each supported Dell PowerEdge system. You can use this method of BIOS update only if you are running *Dell OpenManage Systems Management* CD version 4.2 or earlier.

NOTE: Starting with Dell OpenManage version 4.3, you can update your system's BIOS, drivers, and firmware from the *Dell PowerEdge Updates* CD or from the Dell Support Website at **support.dell.com**.

Minimum Requirements for BIOS Update Support

This section lists the minimum BIOS requirements for upgrading to the latest BIOS version available for each Dell PowerEdge system supported by Server Administrator. You can download the latest BIOS versions from the Dell Support website at **support.dell.com**.

NOTE: This guide is updated only once per business quarter. To ensure that you have the latest BIOS version available, always download the latest BIOS versions from the Dell Support website at **support.dell.com**.

To locate the BIOS update files that you want, perform the steps in the following subsections.

Downloading the Latest BIOS Packages

1. Go to the Dell Support website at **support.dell.com.**
2. Register to log in if you have not logged in before.
3. Click **log in**.
4. Specify your system either by entering your Service Tag or by selecting the product model. Click **Go**.
5. Under **File Library**, select **Downloads**.

6 Under **Select Your Download Category**, select **Flash BIOS Updates.**

7 Under **Select an Operating System**, select **Not Applicable**.

8 Under **Select an Operating System Language**, select English.

9 Click **Submit**.

The download page for your system's FlashBIOS appears.

10 Under **Select a Device**, select the device you want to update.

11 Continue to select the BIOS device until you reach the page where you select the format for the FlashBIOS file you want to download.

Select a format that fits your intended installation method: floppy disk or operating system format.

12 Select download by **HTTP** or **FTP**.

NOTE: It is strongly recommended that you print out and follow the detailed installation instructions for your BIOS provided on this Web page.

The Export Compliance Disclaimer appears.

13 Click **I agree** to continue.

The **File Download** window appears.

14 Specify where you want to save your FlashBIOS file and click **OK**.

A download complete popup appears.

15 Follow the installation instructions (appropriate for your file format) that appear on the **Download and Install** page.

Minimum Required and Latest Available BIOS for Update by System

Table 7-1 lists the minimum version of the BIOS that must be installed on each system for the latest FlashBIOS package to be applied by remote update. Table 7-1 also lists the latest available BIOS version for each system that Server Administrator supports.

Table 7-1. PowerEdge Systems and Minimum BIOS Versions Required for Remote Flash Update

PowerEdge System	Minimum BIOS Required for Remote Flash Update	Latest Available BIOS Version for System
300	A00	A03
350	BIOS update is not supported for PowerEdge 350 systems.	
500SC	A05	A07
600SC	A00	A09
650	A01	A05
700	A00	A03
750	A00	A03
800	A00	A01
1300	A04	A12
1400/1400SC	A00	A09
1500SC	A04	A06
1550	A01	A09
1600SC	A00	A10
1650	A05	A12
1655MC	A00	A02
1750	A05	A10
1800	A00	A02
1850	A00	A02
1855	A00	A00
2300	A09	A15
2400	A01	A09
2450	A02	A09
2500/2500SC	A00	A07
2550	A06	A09
2600	A01	A13

Table 7-1. PowerEdge Systems and Minimum BIOS Versions Required for Remote Flash Update *(continued)*

PowerEdge System	Minimum BIOS Required for Remote Flash Update	Latest Available BIOS Version for System
2650	A00	A20
4300	A06	A12
4350	A03	A06
4400	A04	A11
4600	A00	A13
6300	A08	A13
6350	A08	A13
6400	A01	A14
6450	A01	A14
6600	A08	A16
6650	A08	A16
8450	A06	A06

8

RAID Controller Supported Servers, Operating Systems, Firmware, and Driver Versions

Overview

Starting with Dell OpenManage™ Server Administrator version 5.0, only enhanced Storage Management Service will be supported. The Storage Management Service allows you to configure and manage your storage devices from within Server Administrator.

NOTE: The Storage Management Service mentioned in this guide refers to the enhanced Storage Management Service. Server Administrator no longer supports the basic Storage Management Service (also known as Array Manager).

NOTE: Starting with Dell OpenManage version 4.3, the *Systems Management* CD has been replaced by the *Dell™ PowerEdge™ Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

Most versions of the *Systems Management* CD support management of RAID controllers in the form of PERC cards, and some systems management releases also support CERC IDE and SATA controllers. System administrators responsible for monitoring the compatibility of their systems' storage devices with their latest installed operating system or *Dell PowerEdge Installation and Server Management* CD (or *Systems Management* CD) need a clear matrix that shows the elements that are compatible with a particular storage controller. Each storage controller version in turn supports a specific array of elements, including:

- Version of the Storage Management Service
- Dell PowerEdge system
- Firmware version number required for a particular controller
- Supported operating systems, where each operating system requires a specific driver

See the *Dell OpenManage Server Administrator User's Guide* and the *Dell OpenManage Storage Management User's Guide* for more information on Storage Management Services.

Five types of controllers are included in this section:

- The RAID controller card group contains the following controllers: PERC 3/DC, PERC 3/SC, PERC 3/QC, PERC 4/SC, PERC 4/DC, PERC 4e/DC, PERC 5/e, PERC 5/i Adapter, PERC 5/i Integrated, SAS 5/iR Adapter, CERC ATA 100/4 Channel, and CERC SATA 1.5/6 Channel.
- The RAID on motherboard (ROMB) group includes the following controllers: PERC 3/Di, PERC 4/Di, PERC 4e/Di, PERC 4e/Si, SAS 5/iR Integrated, and CERC SATA 1.5/2S.
- The internal mirroring group, provided through the system BIOS, includes the PERC 4/IM controller.
- The LSI 1020/1030 embedded SCSI controller.
- The SAS 5/i Integrated SAS controller.

NOTE: The firmware and drivers listed in this section refer to the minimum supported version as of the publication date of this document. Later versions of the firmware and drivers may also be supported or required. For the most recent driver and firmware requirements, refer to **support.dell.com** for the Storage Management Service.

Key to Table Footnotes

Some drivers in the following tables are marked with an asterisk. You can refer to the following paragraph for more information:

Linux Driver Included in RPM*

The 1.1.4 Linux driver is included in RPM 2302 (Red Hat® Package Manager 2302).

PERC 4/DC

The PERC 4/DC supports the following PowerEdge systems: 650, 750, 1650, 1750, 1800, 1850, 2600, 2650, 2800, 2850, 4600, 6600, 6650, 6800, and 6850.

Table 8-1 shows the other elements supported by the PERC 4/DC.

Table 8-1. Storage Management Service Supported Elements: PERC 4/DC

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows® 2000 Driver	Windows Server™ 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE® LINUX Enterprise Server (version 9 and 10)
1.1	4.3	3500	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	351Q	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.7	2.20.4.4	NA

Table 8-1. Storage Management Service Supported Elements: PERC 4/DC *(continued)*

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows® 2000 Driver	Windows Server™ 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE® LINUX Enterprise Server (version 9 and 10)
2.0	5.0	351X (32-bit) 351S (64-bit)	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7
2.1	5.1	351X (32-bit) 351S (64-bit)	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7

PERC 4e/DC

The PERC 4e/DC supports the following PowerEdge systems: 800, 830, 850, 1800, 1850, 1900, 2800, 2850, 6800, and 6850.

Table 8-2 shows the other elements supported by the PERC 4e/DC.

Table 8-2. Storage Management Service Supported Elements: PERC 4/e DC

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	513T	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	521Q	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.7	2.20.4.4	NA
2.0	5.0	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7
2.1	5.1	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7

PERC 3/DC

The PERC 3/DC supports the following PowerEdge systems: 1650, 2600, 2650, 4600, 6600, and 6650. Table 8-3 shows the other elements supported by the PERC 3/DC.

Table 8-3. Storage Management Service Supported Elements: PERC 3/DC

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	1970	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	198Q	5.48	6.46.2.32 (32-bit) 6.41.2.64 (64-bit)	2.10.7	2.20.4.4	NA
2.0	5.0	198X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1	5.1	198X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA

PERC 3/QC

The PERC 3/QC supports the following PowerEdge systems: 2600, 2650, 4600, 6600, and 6650. Table 8-4 shows the other elements supported by the PERC 3/QC.

Table 8-4. Storage Management Service Supported Elements: PERC 3/QC

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	1970	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	198Q	5.48	6.46.2.32 (32-bit) 6.41.2.64 (64-bit)	2.10.7	2.20.4.4	NA
2.0	5.0	198X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1	5.1	198X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA

PERC 4/Di

The PERC 4/Di supports the following PowerEdge systems: 1750 and 2600. Table 8-5 shows the other elements supported by the PERC 4/Di.

Table 8-5. Storage Management Service Supported Elements: PERC 4/Di

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1 on a PowerEdge 1750	4.3	4130	5.46	6.41.2.32	2.10.7	NA	NA
1.1 on a PowerEdge 2600	4.3	2.500	5.46	6.41.2.32	2.10.7	NA	NA

Table 8-5. Storage Management Service Supported Elements: PERC 4/Di *(continued)*

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.2 on a PowerEdge 1750	4.4	421Q	5.48	6.46.2.32 (32-bit) 6.41.2.32 (64-bit)	2.10.7	2.20.4.4	NA
1.2 on a PowerEdge 2600	4.4	251Q	5.48	6.46.2.32 (32-bit) 6.41.2.32 (64-bit)	2.10.7	2.20.4.4	NA
2.0 on a PowerEdge 1750	5.0	421W	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.0 on a PowerEdge 2600	5.0	251X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1 on a PowerEdge 1750	5.1	421W	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1 on a PowerEdge 2600	5.1	251X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA

CERC ATA 100 4/CH

The CERC ATA 100 4/CH supports the following PowerEdge system: 600SC, 650, and 1600SC Table 8-6 shows the other elements supported by the CERC ATA 100 4/CH.

Table 8-6. Storage Management Service Supported Elements: CERC ATA 100 4/CH

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	6.62	5.46	6.41.2.32	Native	NA	NA
1.2	4.4	6.62	5.46	6.41.2.32	2.10.1	2.10.1	NA
2.0	5.0	6.62	5.46	6.41.2.32	2.10.1	2.10.1	NA
2.1	5.1	6.62	5.46	6.41.2.32	2.10.1	2.10.1	NA

PERC 3/Di

The PERC 3/Di supports the following PowerEdge systems: 1650, 2650, and 4600. Table 8-7 show the other elements supported by the PERC 3/Di.

Table 8-7. Storage Management Service Supported Elements: PERC 3/Di

Storage Management Service*	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1 on a PowerEdge 1650	4.3	2.8.0.6092	2.8.0.6085	2.8.0.6085	1.1.4*	NA	NA
1.1 on a PowerEdge 2650	4.3	2.8.0.6092	2.8.0.6085*	2.8.0.6085*	1.1.4*	NA	NA
1.1 on a PowerEdge 4600	4.3	2.8.0.6092	2.8.0.6085*	2.8.0.6085*	1.1.4*	NA	NA
1.2 on a PowerEdge 1650	4.4	2.8.0.6092	2.8.0.6085*	2.8.0.6085	1.1.4*	1.1.5.2372	NA
1.2 on a PowerEdge 2650	4.4	2.8.0.6092	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2372	NA

Table 8-7. Storage Management Service Supported Elements: PERC 3/Di *(continued)*

Storage Management Service*	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.2 on a PowerEdge 4600	4.4	2.8.0.6092	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2372	NA
2.0 on a PowerEdge 1650	5.0	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA
2.0 on a PowerEdge 2650	5.0	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA
2.0 on a PowerEdge 4600	5.0	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA
2.1 on a PowerEdge 1650	5.1	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA
2.1 on a PowerEdge 2650	5.1	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA
2.1 on a PowerEdge 4600	5.1	2.8.0.6098	2.8.0.6085*	2.8.0.6085*	1.1.4*	1.1.5.2392	NA

* The 1.1.4 Linux driver is included in the Red Hat Package Manager (RPM) 2302.

PERC 4/IM

The PERC 4/IM supports the following PowerEdge systems: 1655MC and 1855.

Table 8-8 shows the other elements supported by the PERC 4/IM.

Table 8-8. Storage Management Service Supported Elements: PERC 4/IM

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1 on PowerEdge 1655MC	4.3	1.00.12.00 1.00.0c.00 Hex	1.08.06	1.08.18 (Native)	NA	NA	NA
1.0.1 on PowerEdge 1855	4.1.4	1.03.23.90	1.09.11	1.09.11	Native	NA	NA

Table 8-8. Storage Management Service Supported Elements: PERC 4/IM *(continued)*

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.2 on PowerEdge 1655MC	4.4	1.00.12.00 1.00.0c.00 Hex	1.08.06	1.08.18 (Native)	NA	NA	NA
1.2 on PowerEdge 1855	4.4	1.03.23.90	1.09.11	1.09.11	Native	Native	NA
2.0 on PowerEdge 1655MC	5.0	1.03.23.90	1.08.06	Native	NA	NA	NA
2.0 on PowerEdge 1855	5.0	1.03.23.90	1.09.11	1.09.11	Native	Native	NA
2.1 on PowerEdge 1655MC	5.1	1.03.23.90	1.08.06	Native	NA	NA	NA
2.1 on PowerEdge 1855	5.1	1.03.23.90	1.09.11	1.09.11	Native	Native	NA

PERC 4/SC

The PERC 4/SC supports the following PowerEdge systems: 600SC, 650, 700, 750, 800, 830, 850, 1600SC, 1800, and 1850.

Table 8-9 shows the other elements supported by the PERC 4/SC.

Table 8-9. Storage Management Service Supported Elements: PERC 4/SC

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	3500	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	351Q	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.7	2.20.4.4	NA

Table 8-9. Storage Management Service Supported Elements: PERC 4/SC *(continued)*

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	351X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1	5.1	351X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA

CERC SATA 1.5/6 Channel

The CERC SATA 1.5/6 Channel supports the following PowerEdge systems: 700, 750, 800, 830, 850, and 1800. Table 8-10 shows the other elements supported by the CERC SATA 1.5/6 Channel.

Table 8-10. Storage Management Service Supported Elements: CERC SATA 1.5/6 Channel

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	2.8.0.7403	2.8.0.7010	2.8.0.7010	1.1.4*	NA	NA
1.2	4.4	4.1.0.7406	4.1.0.7010	4.1.0.7010 (32-bit) 4.1.1.7035 (64-bit)	1.1.4*	NA	NA
2.0	5.0	4.1.0.7417	4.1.0.7010	4.1.0.7010 (32-bit) 4.1.1.7038 (64-bit)	1.1.4*	1.1.5-2372	NA
2.1	5.1	4.1.0.7417	4.1.0.7010	4.1.0.7010 (32-bit) 4.1.1.7038 (64-bit)	1.1.4*	1.1.5-2372	NA

* The 1.1.4 Linux driver is included in the Red Hat Package Manager (RPM) 2302.

PERC 4e/Di

The PERC 4e/DI supports the following PowerEdge systems: 2800, 2850, 6800, and 6850.

Table 8-11 shows the other elements supported by the PERC 4e/Di.

Table 8-11. Storage Management Service Supported Elements: PERC 4e/Di

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	5130	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	521Q	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.7	2.20.4.4	NA
2.0	5.0	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7
2.1	5.1	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	2.20.4.7

PERC 4e/Si

The PERC 4e/Si supports the following PowerEdge system: 1850.

Table 8-12 show the other elements supported by the PERC 4e/Si.

Table 8-12. Storage Management Service Supported Elements: PERC 4e/Si

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	5130	5.46	6.41.2.32	2.10.7	NA	NA
1.2	4.4	521Q	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.7	2.20.4.4	NA
2.0	5.0	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA
2.1	5.1	521X	5.48	6.46.2.32 (32-bit) 6.46.3.64 (64-bit)	2.10.10.1	2.20.4.4	NA

PERC 5/E Adapter

The PERC 5/E Adapter supports the following PowerEdge systems: 840, 860, 1850, 1900, 1950, 2850, 2900, 2950, 6800, and 6850

Table 8-13 shows the other elements supported by the PERC 5/E Adapter.

Table 8-13. Storage Management Service Supported Elements: PERC 5/E Adapter

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.4	4.5.1	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.00	00.00.02.00	00.00.02.00
2.0	5.0	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05
2.1	5.1	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05

PERC 5/i Adapter

The PERC 5/i Adapter supports the following PowerEdge system: 840, 860, and 6850

Table 8-14 shows the other elements supported by the PERC 5/i Adapter.

Table 8-14. Storage Management Service Supported Elements: PERC 5/i Adapter

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05
2.1	5.1	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05

PERC 5/i Integrated

The PERC 5/i Integrated supports the following PowerEdge systems: 1900, 1950, 2900, and 2950

Table 8-15 shows the other elements supported by the PERC 5/i Integrated.

Table 8-15. Storage Management Service Supported Elements: PERC 5/i Integrated

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05
2.1	5.1	5.0.1	1.18.00.32	1.18.0.32 (32-bit) 1.18.0.64 (64-bit)	00.00.02.03	00.00.02.03	00.00.02.05

SAS 5/iR Adapter

The SAS 5/iR Adapter supports the following PowerEdge system: 840, 860, and 1900

Table 8-16 shows the other elements supported by the SAS 5/iR Adapter.

Table 8-16. Storage Management Service Supported Elements: SAS 5/iR Adapter

Storage Management Service	Dell OpenManage Version	PERC Firm-ware/BIOS Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	00.06.50.00/ 06.06.00.02	1.21.08.00	1.21.08.00	02.06.32	03.02.63	03.02.63
2.1	5.1	00.06.50.00/ 06.06.00.02	1.21.08.00	1.21.08.00	02.06.32	03.02.63	03.02.63

SAS 5/iR Integrated

The SAS 5/iR Integrated supports the following PowerEdge system: 1955

Table 8-17 shows the other elements supported by the SAS 5/iR Integrated.

Table 8-17. Storage Management Service Supported Elements: SAS 5/iR Integrated

Storage Management Service	Dell OpenManage Version	PERC Firm-ware/BIOS Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	00.06.50.00/ 06.06.00.02	1.21.08.00	1.21.08.00	2.06.32	3.02.63	3.02.63
2.1	5.1	00.06.50.00/ 06.06.00.02	1.21.08.00	1.21.08.00	2.06.32	3.02.63	3.02.63

SAS 5/i Integrated

The SAS 5/i Integrated supports the following PowerEdge system: 1950, 2900, and 2950.

Table 8-18 shows the other elements supported by the SAS 5/i Integrated.

Table 8-18. Storage Management Service Supported Elements: SAS 5/i Integrated

Storage Management Service	Dell OpenManage Version	PERC Firm-ware/BIOS Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0	5.0	00.06.40.00/ 06.06.00.01	1.21.08.00	1.21.08.00	02.06.32	03.02.63	03.02.63
2.1	5.1	00.06.40.00/ 06.06.00.01	1.21.08.00	1.21.08.00	02.06.32	03.02.63	03.02.63

CERC SATA 1.5/2S

The CERC SATA 1.5/2s supports the following PowerEdge systems: 800 and 1800.

Table 8-19 show the other elements supported by the CERC SATA 1.5/2S.

Table 8-19. Storage Management Service Supported Elements: CERC SATA 1.5/2S

Storage Management Service*	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1	4.3	NA	6.00.048	6.00.048	NA	NA	NA
1.2	4.4	NA	6.00.050	6.00.050	NA	NA	NA
2.0	5.0	NA	6.00.050	6.00.050	NA	NA	NA
2.1	5.1	NA	6.00.050	6.00.050	NA	NA	NA

* The 1.1.4 Linux driver is included in the Red Hat Package Manager (RPM) 2302.

LSI 1020/1030 Embedded SCSI Controller

This embedded SCSI controller is an onboard chip. It supports the following systems: 1600SC, 1750, 1800, 1850, 2600, 2650, 2800, 2850, 6800, 6850, and 7250.

Table 8-20 and Table 8-21 show the other elements supported by the LSI 1020/1030.

Table 8-20. Storage Management Service Supported Elements: LSI 1020

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1 on a PowerEdge 1600SC	4.3	1.03.04.00	1.08.19	1.08.18 (Native)	NA	NA	NA
1.2 on a PowerEdge 1600SC	4.4	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
2.0 on a PowerEdge 1600SC	5.0	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
2.1 on a PowerEdge 1600SC	5.1	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA

Table 8-21. Storage Management Service Supported Elements: LSI 1030

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
1.1 on PowerEdge 1750	4.3	1.01.61.00	1.08.19	1.08.18 (Native)	NA	NA	NA
1.1 on PowerEdge 2600	4.3	1.01.61.00	1.08.19	1.08.18 (Native)	NA	NA	NA
1.2 on a PowerEdge 1750	4.4	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
1.2 on a PowerEdge 2600	4.4	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
2.0 on a PowerEdge 1750	5.0	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA

Table 8-21. Storage Management Service Supported Elements: LSI 1030 *(continued)*

Storage Management Service	Dell OpenManage Version	PERC Firmware Version	Windows 2000 Driver	Windows Server 2003 Driver	Red Hat Enterprise Linux 3 Driver	Red Hat Enterprise Linux 4 Driver	SUSE LINUX Enterprise Server (version 9 and 10)
2.0 on a PowerEdge 2600	5.0	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
2.1 on a PowerEdge 1750	5.1	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA
2.1 on a PowerEdge 2600	5.1	1.03.23	1.09.11	1.09.11 (Native)	2.05.11.03	Native	NA

9

Network Interface Controllers and Supported Operating Systems

Overview

The drivers that are required for a Network Interface Card (NIC) depend on the operating system that is installed on your system.

Table 9-1 shows the relationship between NICs supported by Server Administrator and the drivers that they require on each supported operating system.

For a list of Server Administrator supported operating systems, see the tables in "Server Administrator Supported Applications and Systems."

NOTE: Starting with Dell OpenManage™ version 4.3, the *Dell OpenManage Systems Management* CD has been replaced by the *Dell™ PowerEdge™ Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

NIC Drivers and Operating Systems

To determine required drivers for NIC systems management, locate your NIC manufacturer in Table 9-1 and the operating system that is installed on your system.

In Table 9-1, "NA" indicates that the driver is supplied by the operating system rather than by the manufacturer of the NIC.

Table 9-1. NIC Manufacturers and Drivers Required for Supported Operating Systems

NIC Product Name	Microsoft® Windows® 2000	Microsoft Windows 2003	Red Hat® Enterprise Linux 3	Red Hat Enterprise Linux 4	SUSE® LINUX Enterprise Server (version 9 and 10)
3COM® 3C98*x* Family of Adapters **NOTE:** Dell no longer supports this NIC.	NA	NA	NA	NA	NA
Alteon ACEnic Copper Gigabit	7.100 (7.7 family of adapters)	7.100 (7.7 family of adapters)	7.4.12 (7.7 family of adapters)	3.10 Broadcom driver **NOTE:** bcm5700 is not supported on Red Hat Enterprise Linux version 4.	NA
Broadcom NetXtreme Family of Adapters	7.100 (7.7 family of adapters)	7.100 (7.7 family of adapters)	7.4.12 (7.7 family of adapters)	3.10 Broadcom driver	3.37 (Broadcom Tigon3 ethernet driver)
Intel® EtherExpress® Family of Adapters	6.0	8.0.17 (Intel PRO/100 Adapters)	NA	NA (Intel PRO/100 Adapters)	3.4.14p1-NAPI (Intel PRO/100 Network Driver)
		8.4.21 (Intel PRO/1000 Adapters)		5.7.6.1(Intel PRO/1000 Adapters)	6.2.15-NAPI (Intel PRO/1000 Network Driver)

10

Remote Access Service Availability

Overview

Although all supported operating systems for Server Administrator support remote access, remote access availability is system-dependent. The Remote Access Service is supported on the following Dell™ PowerEdge™ systems only: 700 SC, 750, 800, 840, 830, 850, 860, 1600SC, 1650, 1655, 1750, 1800, 1850, 1855, 1900, 1950, 1955, 2600, 2650, 2800, 2850, 2900, 2950, 4600, 6600, 6650, 6800, and 6850.

The Server Administrator GUI does not display any services on your system that are not available for that system or for that system configuration.

NOTE: Starting with Dell OpenManage™ version 4.3, the *Systems Management* CD has been replaced by the *Dell PowerEdge Installation and Server Management* CD. References in this guide to the *Systems Management* CD are for Dell OpenManage versions 3.0 through 4.2.

RAC Types

The remote access controller (RAC) cards that are available for specific Dell PowerEdge systems are: DRAC III, DRAC III/XT, ERA, ERA/O, ERA/MC (for Dell PowerEdge 1655MC) DRAC 4/I (for PowerEdge 1850, 2800, and 2850), DRAC 4/P (for PowerEdge 800, 830, 840, 850, 860, 1800, 6800, and 6850), DRAC/MC (for PowerEdge 1855 and 1955), and DRAC 5 (for PowerEdge 1900, 1950, 2900, and 2950).

NOTE: The DRAC III is unique among the 3G RACs. The DRAC III occupies a PCI slot, and has a modem, a battery, and an external AC power connection unlike the other 3G RACs.

Availability of RACs on Specific PowerEdge Systems

Table 10-1 shows the RACs that are available on specific PowerEdge systems.

NOTE: The ERA/MC is supported only on PowerEdge 1655MC systems.

Table 10-1. RACs Availability on Specific PowerEdge Systems

PowerEdge System	DRAC III	ERA	ERA/O	DRAC III/XT	DRAC 4	DRAC/MC	DRAC 5
700				X			
750				X			
800					X		
830					X		
840					X		
850					X		
860					X		
1600SC				X			
1650	X		X				
1750			X				
1800					X		
1850					X		
1855						X	
1900							X
1950							X
1955						X	
2600			X				
2650		X					
2800					X		
2850					X		
2900							X
2950							X
4600	X						
6600	X						
6650	X						
6800					X		
6850					X		

RAC Firmware Versions

Table 10-2 shows the firmware version required for each RAC that is offered on the corresponding *Systems Management* CD.

Table 10-2. RAC Firmware Version by Systems Management CD Version

Systems Management CD Version	Firmware Version				
	DRAC III	ERA	ERA/O	DRAC III/XT	DRAC 4
3.0	1.10	NA	NA	NA	NA
3.0.1	1.10	NA	NA	NA	NA
3.0.2	1.10	1.05	NA	NA	NA
3.1	1.20	1.05	1.10	NA	NA
3.1.1	1.20	1.05	1.20	NA	NA
3.2	1.30	1.07	1.20	NA	NA
3.2.2	1.30	1.07	1.20	1.30	NA
NA	NA	1.21	NA	NA	NA
3.3	2.0	2.0	2.0	2.0	NA
3.4	2.2	2.2	2.2	2.2	NA
3.5	2.5	2.5	2.5	2.5	NA
3.6	3.0	3.0	3.0	3.0	NA
3.7	3.10	3.10	3.10	3.10	NA
3.8	3.12	3.12	3.12	3.12	NA
4.0.1	NA	NA	NA	NA	1.0
4.1	3.14	3.14	3.14	3.14	1.0
4.1.1	NA	NA	NA	NA	1.0
4.1.2	NA	NA	NA	NA	1.0
4.1.3	NA	NA	NA	NA	1.0
4.1.4	NA	NA	NA	NA	NA
4.2	3.20	3.20	3.20	3.20	1.1

Table 10-3 shows the firmware version required for each RAC that is offered on the corresponding Dell *Server Update Utility* application CD.

Table 10-3. RAC Firmware Version by Server Update Utility CD Version

Systems Management Consoles CD Version	Firmware Version						
	DRAC III	ERA	ERA/O	DRAC III/XT	DRAC 4	DRAC/MC	DRAC 5
4.3	3.2.1	3.20	3.20	3.20	1.2	1.1.0	NA
4.4	3.3.0	3.3.0	3.3.0	3.3.0	1.30	1.1.1	NA
4.5	3.3.0	3.3.0	3.3.0	3.3.0	1.30	1.2.0	NA
5.0	3.35	3.35	3.35	3.35	1.35	1.3	1.0
5.1	3.35	3.35	3.35	3.35	1.40	1.3	1.0

11

Historical Release Information for Legacy Systems

Overview

The following sections contain historical information about releases of the Dell OpenManage™ Server Agent running on supported Microsoft® Windows®, Red Hat® Enterprise Linux, and Novell® NetWare® operating systems. The following excerpts from previous **readme.txt** files show a record of features and resolved issues for releases of Server Agent only. For the complete text of **readme.txt** files, see the Dell Support website at **support.dell.com**.

You can find additional information on more recent systems management applications in the Server Administrator **readme.txt** found on the *Systems Management* CDs, version 3.0 or later.

Server Agent 4.5

The following subsections contain requirements, features, and open issues for Server Agent version 4.5.

Release date: October 2001

Requirements

Supported systems: Dell™ PowerEdge™ 1500SC

Operating Systems

- Microsoft Windows NT® Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 5.*x*
- Red Hat Linux 7.1

NOTE: Server Agent is not supported on a PowerEdge 1500SC system running either the Red Hat Linux 7.0 operating system or the Novell NetWare 4.*x* operating system.

New in Server Agent Version 4.5

Support was added for the PowerEdge 1500SC system.

Server Agent 4.4.1

The following subsections contain requirements, features, and open issues for Server Agent version 4.4.1.

Release date: September 2001

Requirements

Supported systems: Dell PowerEdge 300, 350, 500SC, 1300, 1400, 1550, 2300, 2400, 2450, 2500, 2550, 4300, 4350, 4400, 6300, 6350, 6400, 6450, and 8450

Operating Systems

- Microsoft Windows NT Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 4.*x* or 5.*x*
- Red Hat Linux 7.0

NOTE: Server Agent is not supported on a PowerEdge 500SC system running the Red Hat Linux 7.0 operating system.

New in Server Agent Version 4.4.1

This release contains the following new features and changes:

- Support for Red Hat Linux 7.1 SBE (Kernels 2.4.3-6 and 2.4.3-12) with prebuilt device drivers
- Dynamic Kernel Support for Red Hat Linux
- Removal of support for the DMI management protocol
- In the Server Agent MIB file **10892.mib**, replacement of "Dell" by "Server" in the annotation TYPE field for each trap
- In the Server Agent event configuration file **10892evt.cfg**, the changing of the OID_ALIAS value from "Dell_Server3_Baseboard_Agent" to "Server_Agent," and replacement of "Dell" by "Server" in the **Short Descr** field for each event

Server Agent 4.4.0

The following subsections contain requirements, features, and open issues for Server Agent version 4.4.0.

Release date: July 2001

Requirements

Supported systems: Dell PowerEdge 350, 500SC, and 1550

Operating Systems

- Microsoft Windows NT Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 4.*x* or 5.*x*
- Red Hat Linux 7.0; Kernel version: 2.2.16; Red Hat Linux SNMP agent: ucd-snmp version 4.1.2-8smux

New in Server Agent Version 4.4.0

This release adds support for the following Dell systems and features:

- PowerEdge 500SC
- PowerEdge 1550 with the Intel® Pentium® III microprocessor
- PowerEdge 350 watchdog support

Server Agent 4.3.0

Version 4.3.0 is the first release of Server Agent that combines supported operating systems for Microsoft Windows, Novell NetWare, and Red Hat Linux. All of these supported operating systems are documented in this **readme.txt** file.

Release date: March 2001

Requirements

Supported systems: Dell PowerEdge 300, 350, 1300, 1400, 1550, 2300, 2400, 2450, 2500, 2550, 4300, 4350, 4400, 6300, 6350, 6400, 6450, and 8450

Operating Systems

- Microsoft Windows NT Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 4.*x* or 5.*x*
- Red Hat Linux 7.0; Kernel version: 2.2.16; Red Hat Linux SNMP agent: ucd-snmp version 4.1.2-8smux

New in Server Agent Version 4.3.0

This release adds support for the following Dell systems:

- PowerEdge 2500
- PowerEdge 2550

Server Agent 4.3.0 Resolved Issues

- Hung server alerts for PowerEdge 8450 systems

  When you configure the hung server action for a Dell PowerEdge 8450 system, the system either performs a system reset or a recycle system power action.

- PowerEdge 350 issues

  This release addressed the following Dell PowerEdge 350 issues that were originally addressed by Dell OpenManage Server Agent 4.2.0 Update 1:

  – Changes thresholds for the -12 volt (V) voltage probe on the system board. These new thresholds prevent erroneous probe failures and warnings.

  – Corrects erroneous fan failure reports in the event log.

  – Corrects system crashes at start-up caused by incorrect event log record length.

  – Disables the chassis identification feature.

- Dell PowerVault™ 2*xx*S SCSI disk systems and SNMP

  This release addresses the following PowerVault 2*xx*S SCSI disk system issue that was originally addressed by Server Agent 4.2.0 Update 1:

  – Allows Dell PowerEdge systems attached to the PowerVault 2*xx*S SCSI disk system to respond to SNMP requests for information. Under certain rare circumstances, some Dell systems with PowerVault 2*xx*S attached were not responding to SNMP requests.

Server Agent 4.2.2

The following subsections contain requirements, features, and open issues for Server Agent version 4.2.2.

Release date: February 2001

Requirements

Supported systems: Dell PowerEdge 300, 350, 1300, 1400, 1550, 2300, 2400, 2450, 4300, 4350, 4400, 6300, 6350, 6400, 6450, and 8450

Operating Systems

- Microsoft Windows NT Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 4.*x* or 5.*x*

New and Resolved Issues in Server Agent Version 4.2.2

Dell OpenManage Server Agent 4.2.2 now supports the Dell PowerEdge 350 system. In addition, Dell OpenManage Server Agent 4.2.2 resolves the following issues:

- Incorrect current sensor data
  - In rare circumstances Dell OpenManage Server Agent incorrectly reported data for current (amperage) sensors. Incorrect amperage readings may have been reported for the following PowerEdge systems: 4300, 4350, 4400, 6300, 6350, 6400, and 6450.
- SNMP time-outs with PowerVault 2*xx*S SCSI disk systems
  - In rare circumstances the Dell OpenManage Server Agent SNMP interface stops responding when a Dell PowerVault 2*xx*S storage system is attached to a system. The DMI and CIM interfaces may also stop responding.

Server Agent 4.2.1

The following subsections contain requirements, features, and open issues for Server Agent version 4.2.1.

Release date: December 2000

Requirements

Supported systems: Dell PowerEdge 1300, 1400, 1550, 2300, 2400, 2450, 4300, 4350, 4400, 6300, 6350, 6400, 6450, and 8450

Operating Systems

- Microsoft Windows NT Server 4.*x* with SP 4 or later
- Microsoft Windows 2000 Server family (includes Windows 2000 Server and Windows 2000 Advanced Server)
- Novell NetWare 4.*x* or 5.*x*

New in Server Agent Version 4.2.1

Added support for PowerEdge 1550 system

Resolved Issues for Server Agent Version 4.2.1

Table 11-1. Resolved Issues for Server Agent Version 4.2.1

Problem	Solution
IT Assistant is unable to perform a remote flash BIOS update for the PowerEdge 300 system.	Server Agent 4.2.1 enables IT Assistant to perform a remote flash BIOS update for the PowerEdge 300 system.
Server Agent reports an error message that values are incorrect for CPU voltage threshold values for the PowerEdge 8450 system on systems with a CPU speed of 700 MHz and higher.	Server Agent 4.2.1 reports correct CPU voltage threshold values.
Server Agent 4.0 did not implement the 96 alert parameter correctly in the local response agent.	Server Agent 4.2.1 correctly parses the %ALERT parameter. The %ALERT parameter can now be located anywhere in the command line and can optionally be enclosed in double quotes when the user wants to pass the alert message to the command line as a single string.
Intermittent incorrect fan probe readings of zero RPMs cause faulty alerts to be generated. Invalid fan probe readings also compromise the usability of Server Agent.	Server Agent 4.2.1 prevents false alerts for fan probes based on incorrect readings of fan RPM values. This update also addresses usability issues caused by these incorrect fan RPM values. The incorrect fan RPM readings originate on PowerEdge systems that report systems management information to the management console using Server Agent version 4.0.
Seven-character service tags display incorrectly.	Formerly, certain combinations of characters and numbers in the seven-character service tag either did not display correctly or did not display at all. Server Agent 4.2.1 displays service tags correctly.
False power supply fan readings. Server Agent reports high power supply fan RPM readings. The readings exceed the upper failure threshold and are reported as failures.	Server Agent 4.2.1 corrects the problem of false fan probe alerts.

Server Agent 4.2.0

The following subsections contain requirements, features, and open issues for Server Agent version 4.2.0.

Release date: December 2000

Requirements

Supported systems: Dell PowerEdge 300, 1300, 1400, 1550, 2300, 2400, 2450, 4300, 4350, 4400, 6300, 6350, 6400, 6450, and 8450

Operating Systems

Red Hat Linux 7.0 (Kernel version: 2.2.16), Red Hat Linux SNMP agent: ucd-snmp version 4.1.2-8smux or later

Glossary

The following list defines or identifies technical terms, abbreviations, and acronyms used in your system documents.

A
Abbreviation for ampere(s).

AC
Abbreviation for alternating current.

AC power switch
A switch with two AC power inputs that provides AC power redundancy by failing over to a standby AC input in the event of a failure to the primary AC input.

access
Refers to the actions a user can take on a variable value. Examples include read-only and read-write.

ACL
Abbreviation for access control list. ACL files are text files that contain lists that define who can access resources stored on a Novell® Web server.

adapter card
An expansion card that plugs into an expansion-card connector on the system's system board. An adapter card adds some specialized function to the system by providing an interface between the expansion bus and a peripheral device. Examples of adapter cards include network cards, sound cards, and SCSI adapters.

ADB
Abbreviation for assign database.

AGP
Abbreviation for advanced graphics port.

ASCII
Acronym for American Standard Code for Information Interchange. A text file containing only characters from the ASCII character set (usually created with a text editor, such as Notepad in Microsoft® Windows®), is called an ASCII file.

ASIC
Acronym for application-specific integrated circuit.

ASPI
Acronym for advanced SCSI programming interface.

asset tag code
An individual code assigned to a system, usually by a system administrator, for security or tracking purposes.

attribute
An attribute, or property, contains a specific piece of information about a manageable component. Attributes can be combined to form groups. If an attribute is defined as read-write, it may be defined by a management application.

autoexec.bat file
The **autoexec.bat** file is executed when you boot your system (after executing any commands in the **config.sys** file). This start-up file contains commands that define the characteristics of each device connected to your system, and it finds and executes programs stored in locations other than the active directory.

backup
A copy of a program or data file. As a precaution, you should back up your system's hard drive on a regular basis. Before making a change to the configuration of your system, you should back up important start-up files from your operating system.

baud rate
A measurement of data transmission speed. For example, modems are designed to transmit data at one or more specified baud rate(s) through the COM (serial) port of a system.

beep code
A diagnostic message in the form of a pattern of beeps from your system's speaker. For example, one beep, followed by a second beep, and then a burst of three beeps is beep code 1-1-3.

BGA
Abbreviation for ball grid array, an integrated circuit (IC) package that uses an array of solder balls, instead of pins, to connect to a system board.

binary
A base-2 numbering system that uses 0 and 1 to represent information. The system performs operations based on the ordering and calculation of these numbers.

BIOS
Acronym for basic input/output system. Your system's BIOS contains programs stored on a flash memory chip. The BIOS controls the following:

- Communications between the microprocessor and peripheral devices, such as the keyboard and the video adapter
- Miscellaneous functions, such as system messages

bit
The smallest unit of information interpreted by your system.

BMC
Abbreviation for baseboard management controller, which is a controller that provides the intelligence in the IPMI structure.

boot routine
When you start your system, it clears all memory, initializes devices, and loads the operating system. Unless the operating system fails to respond, you can reboot (also called warm boot) your system by pressing <Ctrl><Alt><Del>; otherwise, you must perform a cold boot by pressing the reset button or by turning the system off and then back on.

bootable diskette
You can start your system from a diskette. To make a bootable diskette, insert a diskette in the diskette drive, type `sys a:` at the command line prompt, and press <Enter>. Use this bootable diskette if your system will not boot from the hard drive.

bpi
Abbreviation for bits per inch.

bps
Abbreviation for bits per second.

BTU
Abbreviation for British thermal unit.

bus
An information pathway between the components of a system. Your system contains an expansion bus that allows the microprocessor to communicate with controllers for all the various peripheral devices connected to the system. Your system also contains an address bus and a data bus for communications between the microprocessor and RAM.

byte
Eight contiguous bits of information, the basic data unit used by your system.

C
Abbreviation for Celsius.

CA
Abbreviation for certification authority.

cache
A fast storage area that keeps a copy of data or instructions for quicker data retrieval. For example, your system's BIOS may cache ROM code in faster RAM. Or, a disk-cache utility may reserve RAM in which to store frequently accessed information from your system's disk drives; when a program makes a request to a disk drive for data that is in the cache, the disk-cache utility can retrieve the data from RAM faster than from the disk drive.

capability
Refers to the actions that an object can perform, or actions that can be taken on a managed object. For example, if a card is hot-pluggable, it is capable of being replaced while the system power is on.

CDRAM
Abbreviation for cached DRAM, which is a high-speed DRAM memory chip developed by Mitsubishi that includes a small SRAM cache.

CD-ROM
Abbreviation for compact disc read-only memory. CD drives use optical technology to read data from CDs. CDs are read-only storage devices; you cannot write new data to a CD with standard CD drives.

CHAP
Acronym for Challenge-Handshake Authentication Protocol, an authentication scheme used by PPP servers to validate the identity of the originator of the connection upon connection or any time later.

chip
A set of microminiaturized, electronic circuits that are designed for use as processors and memory in systems. Small chips can hold from a handful to tens of thousands of transistors. They look like tiny chips of aluminum, no more than 1/16 inch square by 1/30 inch thick, which is where the term "chip" came from. Large chips, which can be more than a half inch square, hold millions of transistors. It is actually only the top one thousandth of an inch of a chip's surface that holds the circuits. The rest of it is just a base.

CIM
Acronym for Common Information Model, which is a model for describing management information from the DMTF. CIM is implementation independent, allowing different management applications to collect the required data from a variety of sources. CIM includes schemas for systems, networks, applications and devices, and new schemas will be added. It provides mapping techniques for interchange of CIM data with MIB data from SNMP agents.

CIMOM
Acronym for common information model object manager.

CI/O
Abbreviation for comprehensive input/output.

CLI
Abbreviation for command line interface.

cm
Abbreviation for centimeter(s).

CMOS
Acronym for complementary metal-oxide semiconductor. In systems, CMOS memory chips are often used for NVRAM storage.

COM*n*
The device names for the first through fourth serial ports on your system are COM1, COM2, COM3, and COM4. The default interrupt for COM1 and COM3 is IRQ4, and the default interrupt for COM2 and COM4 is IRQ3. Therefore, you must be careful when configuring software that runs a serial device so that you don't create an interrupt conflict.

config.sys file
The **config.sys** file is executed when you boot your system (before running any commands in the **autoexec.bat** file). This start-up file contains commands that specify which devices to install and which drivers to use. This file also contains commands that determine how the operating system uses memory and controls files.

ConsoleOne
Novell ConsoleOne is a Java-based foundation for graphical utilities that manage and administer network resources from different locations and platforms. ConsoleOne provides a single point of control for all Novell and external products.

controller
A chip that controls the transfer of data between the microprocessor and memory or between the microprocessor and a peripheral device such as a disk drive or the keyboard.

control panel
The part of the system that contains indicators and controls, such as the power switch, hard drive access indicator, and power indicator.

conventional memory
The first 640 KB of RAM. Conventional memory is found in all systems. Unless they are specially designed, MS-DOS® programs are limited to running in conventional memory.

COO
Abbreviation for cost of ownership.

cooling unit
Sets of fans or other cooling devices in a system chassis.

coprocessor
A chip that relieves the system's microprocessor of specific processing tasks. A math coprocessor, for example, handles numeric processing. A graphics coprocessor handles video rendering. The Intel® Pentium® microprocessor, for example, includes a built-in math coprocessor.

cpi
Abbreviation for characters per inch.

CPU
Abbreviation for central processing unit. See also microprocessor.

CRC
Abbreviation for cyclic redundancy code, which is a number derived from, and stored or transmitted with, a block of data in order to detect corruption. By recalculating the CRC and comparing it to the value originally transmitted, the receiver can detect some types of transmission errors.

CSR
Abbreviation for certificate signing request.

cursor
A marker, such as a block, underscore, or pointer that represents the position at which the next keyboard or mouse action will occur.

DAT
Acronym for digital audio tape.

dB
Abbreviation for decibel(s).

dBA
Abbreviation for adjusted decibel(s).

DBS
Abbreviation for Demand Based Switching. DBS is power management performed by switching to a low power state (frequency and voltage) when the processor utilization is low. It maintains application performance while lowering the average system power.

DC
Abbreviation for direct current.

Also, abbreviation for Dual Channel.

device driver
A program that allows the operating system or some other program to interface correctly with a peripheral device, such as a printer. Some device drivers—such as network drivers—must be loaded from the config.sys file (with a device= statement) or as memory-resident programs (usually, from the autoexec.bat file). Others—such as video drivers—must load when you start the program for which they were designed.

DHCP
Abbreviation for Dynamic Host Configuration Protocol, a protocol that provides a means to dynamically allocate IP addresses to computers on a LAN.

DIMM
Acronym for dual in-line memory module. A small circuit board containing DRAM chips that connects to the system board.

DIN
Acronym for Deutsche Industrie Norm which is the standards-setting organization for Germany. A DIN connector is a connector that conforms to one of the many standards defined by DIN. DIN connectors are used widely in personal computers. For example, the keyboard connector for personal computers is a DIN connector.

DIP
Acronym for dual in-line package. A circuit board, such as a system board or expansion card, may contain DIP switches for configuring the circuit board. DIP switches are always toggle switches, with an on position and an off position.

directory
Directories help keep related files organized on a disk in a hierarchical, "inverted tree" structure. Each disk has a "root" directory; for example, a **C:\>** prompt normally indicates that you are at the root directory of hard drive C. Additional directories that branch off of the root directory are called subdirectories. Subdirectories may contain additional directories branching off of them.

display adapter
See video adapter.

DKS
Abbreviation for dynamic kernel support.

DMA
Abbreviation for direct memory access. A DMA channel allows certain types of data transfer between RAM and a device to bypass the microprocessor.

DMTF
Abbreviation for Distributed Management Task Force, a consortium of companies representing hardware and software providers.

dpi
Abbreviation for dots per inch.

DPMS
Abbreviation for Display Power Management Signaling. A standard developed by the Video Electronics Standards Association (VESA®) that defines the hardware signals sent by a video controller to activate power management states in a monitor. A monitor is said to be DPMS-compliant when it is designed to enter a power management state after receiving the appropriate signal from a system's video controller.

DRAC 4
Acronym for Dell™ Remote Access Card 4.

DRAC II
Acronym for Dell OpenManage™ Remote Assistant Card II.

DRAC III
Acronym for Dell Remote Access Card III.

DRAC III/XT
Acronym for Dell Remote Access Card III/XT.

DRAM
Acronym for dynamic random-access memory. A system's RAM is usually made up entirely of DRAM chips. Because DRAM chips cannot store an electrical charge indefinitely, your system continually refreshes each DRAM chip in the system.

drive-type number
Your system can recognize a number of specific hard drives. Each is assigned a drive-type number that is stored in NVRAM. The hard drive(s) specified in your system's System Setup program must match the actual drive(s) installed in the system. The System Setup program also allows you to specify physical parameters (logical cylinders, logical heads, cylinder number, and logical sectors per pack) for drives not included in the table of drive types stored in NVRAM.

DTE
Abbreviation for data terminal equipment. Any device, such as a computer system, that can send data in digital form by means of a cable or communications line. The DTE is connected to the cable or communications line through a data communications equipment (DCE) device, such as a modem.

ECC
Abbreviation for error checking and correction.

ECP
Abbreviation for Extended Capabilities Port.

EDO
Acronym for extended data output dynamic random access memory which is a type of DRAM that is faster than conventional DRAM. EDO RAM can start fetching the next block of memory at the same time that it sends the previous block to the microprocessor.

EEPROM
Acronym for electrically erasable programmable read-only memory.

EIDE
Abbreviation for enhanced integrated drive electronics. EIDE devices add one or more of the following enhancements to the traditional IDE standard:

- Data transfer rates of up to 16 MB/sec
- Support for drives other than just hard drives, such as CD and tape drives
- Support for hard drives with capacities greater than 528 MB
- Support for up to two controllers, each with up to two devices attached

EISA
Acronym for Extended Industry-Standard Architecture, a 32-bit expansion-bus design. The expansion-card connectors in an EISA system are also compatible with 8- or 16-bit ISA expansion cards.

To avoid a configuration conflict when installing an EISA expansion card, you must use the EISA Configuration Utility. This utility allows you to specify which expansion slot contains the card and obtains information about the card's required system resources from a corresponding EISA configuration file.

EMC
Abbreviation for electromagnetic compatibility.

EMI
Abbreviation for electromagnetic interference.

EMM
Abbreviation for expanded memory manager. A utility that uses extended memory to emulate expanded memory on systems with an Intel386™ or higher microprocessor.

EMS
Abbreviation for Expanded Memory Specification.

EPP
Abbreviation for Enhanced Parallel Port which provides improved bidirectional data transmission. Many devices are designed to take advantage of the EPP standard, especially devices, such as network or SCSI adapters that connect to the parallel port of a portable computer.

EPROM
Acronym for erasable programmable read-only memory.

ERA
Abbreviation for embedded remote access.

ERA/MC
Abbreviation for embedded remote access modular computer. See modular system.

ERA/O
Abbreviation for embedded remote access option.

ESD
Abbreviation for electrostatic discharge.

ESM
Abbreviation for embedded systems management.

expanded memory
A technique for accessing RAM above 1 MB. To enable expanded memory on your system, you must use an EMM. You should configure your system to support expanded memory only if you run application programs that can use (or require) expanded memory.

expansion bus
Your system contains an expansion bus that allows the microprocessor to communicate with controllers for peripheral devices, such as a network card or an internal modem.

expansion-card connector
A connector on the system's system board or riser board for plugging in an expansion card.

extended memory
RAM above 1 MB. Most software that can use it, such as the Windows operating system, requires that extended memory be under the control of an XMM.

external cache memory
A RAM cache using SRAM chips. Because SRAM chips operate at several times the speed of DRAM chips, the microprocessor can retrieve data and instructions faster from external cache memory than from RAM.

F
Abbreviation for Fahrenheit.

FAT
Acronym for file allocation table. FAT and FAT32 are file systems that are defined as follows:

- **FAT** — A file system used by MS-DOS, Windows 3.*x*, Windows 95, and Windows 98. Windows NT® and Windows 2000 also can use the FAT file system. The operating system maintains a table to keep track of the status of various segments of disk space used for file storage.
- **FAT32** — A derivative of the FAT file system. FAT32 supports smaller cluster sizes than FAT, thus providing more efficient space allocation on FAT32 drives.

FCC
Abbreviation for Federal Communications Commission.

FEPROM
Acronym for flash erasable programmable read-only memory. Flash memory is a kind of nonvolatile storage device similar to EEPROM, but the erasing is done only in blocks or the entire chip.

Fibre Channel
A data transfer interface technology that allows for high-speed I/O and networking functionality in a single connectivity technology. The Fibre Channel Standard supports several topologies, including Fibre Channel Point-to-Point, Fibre Channel Fabric (generic switching topology), and Fibre Channel Arbitrated Loop (FC_AL).

firmware
Software (programs or data) that has been written onto read-only memory (ROM). Firmware can boot and operate a device. Each controller contains firmware which helps provide the controller's functionality.

flash bios
A BIOS that is stored in flash memory rather than in ROM. A flash BIOS chip can be updated in place, whereas a ROM BIOS must be replaced with a newer chip.

flash memory
A type of EEPROM chip that can be reprogrammed from a utility on diskette while still installed in a system; most EEPROM chips can only be rewritten with special programming equipment.

format
To prepare a hard drive or diskette for storing files. An unconditional format deletes all data stored on the disk.

FPBGA
Abbreviation for field programmable gate array, a programmable logic chip (PLD) with a high density of gates.

FRU
Abbreviation for field replaceable unit.

ft
Abbreviation for feet.

FTP
Abbreviation for file transfer protocol.

g
Abbreviation for gram(s).

G
Abbreviation for gravities.

GB
Abbreviation for gigabyte(s). A gigabyte equals 1024 megabytes or 1,073,741,824 bytes.

gcc
Abbreviation for gnu C compiler.

graphics coprocessor
See coprocessor.

graphics mode
A video mode that can be defined as x horizontal by y vertical pixels by z colors.

GUI
Acronym for graphical user interface.

h
Abbreviation for hexadecimal. A base-16 numbering system, often used in programming to identify addresses in the system's RAM and I/O memory addresses for devices. The sequence of decimal numbers from 0 through 16, for example, is expressed in hexadecimal notation as: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 10. In text, hexadecimal numbers are often followed by h.

HBA
Abbreviation for host bus adapter. A PCI adapter card that resides in the system whose only function is to convert data commands from PCI-bus format to storage interconnect format (examples: SCSI, Fibre Channel) and communicate directly with hard drives, tape drives, CD drives, or other storage devices.

heat sink
A metal plate with metal pegs or ribs that help dissipate heat. Most microprocessors include a heat sink.

HMA
Abbreviation for high memory area. The first 64 KB of extended memory above 1 MB. A memory manager that conforms to the XMS can make the HMA a direct extension of conventional memory. Also see XMM.

host adapter
A host adapter implements communication between the system's bus and the controller for a peripheral device. (hard drive controller subsystems include integrated host adapter circuitry.) To add a SCSI expansion bus to your system, you must install or connect the appropriate host adapter.

hot plug
The ability to remove and replace a redundant part while the system is still running. Also called a "hot spare."

HPFS
Abbreviation for the High Performance File System option in the Windows NT operating systems.

HTTP
Abbreviation for Hypertext Transfer Protocol. HTTP is the client-server TCP/IP protocol used on the World Wide Web for the exchange of HTML documents.

HTTPS
Abbreviation for HyperText Transmission Protocol, Secure. HTTPS is a variant of HTTP used by Web browsers for handling secure transactions. HTTPS is a unique protocol that is simply SSL underneath HTTP. You need to use "https://" for HTTP URLs with SSL, whereas you continue to use "http://" for HTTP URLs without SSL.

Hz
Abbreviation for hertz.

ICES
Abbreviation for Interface-Causing Equipment Standard (in Canada).

ICMP
Abbreviation for Internet Control Message Protocol. ICMP is a TCP/IP protocol used to send error and control messages.

ICU
Abbreviation for ISA Configuration Utility.

ID
Abbreviation for identification.

IDE
Abbreviation for Integrated Drive Electronics. IDE is a computer system interface, used primarily for hard drives and CDs.

I/O
Abbreviation for input/output. The keyboard is an input device, and a printer is an output device. In general, I/O activity can be differentiated from computational activity. For example, when a program sends a document to the printer, it is engaging in output activity; when the program sorts a list of terms, it is engaging in computational activity.

IHV
Abbreviation for independent hardware vendor. IHVs often develop their own MIBs for components that they manufacture.

interlacing
A technique for increasing video resolution by only updating alternate horizontal lines on the screen. Because interlacing can result in noticeable screen flicker, most users prefer noninterlaced video adapter resolutions.

internal microprocessor cache
An instruction and data cache built in to the microprocessor. The Intel Pentium microprocessor includes a 16-KB internal cache, which is set up as an 8-KB read-only instruction cache and an 8-KB read/write data cache.

IP address
Abbreviation for Internet Protocol address. See TCP/IP.

IPMI
Abbreviation for Intelligent Platform Management Interface, which is an industry standard for management of peripherals used in enterprise computers based on Intel architecture. The key characteristic of IPMI is that inventory, monitoring, logging, and recovery control functions are available independent of the main processors, BIOS, and operating system.

IPX
Abbreviation for internetwork packet exchange.

IRQ
Abbreviation for interrupt request. A signal that data is about to be sent to or received by a peripheral device travels by an IRQ line to the microprocessor. Each peripheral connection must be assigned an IRQ number. For example, the first serial port in your system (COM1) is assigned to IRQ4 by default. Two devices can share the same IRQ assignment, but you cannot operate both devices simultaneously.

ISA
Acronym for Industry-Standard Architecture. A 16-bit expansion bus design. The expansion-card connectors in an ISA system are also compatible with 8-bit ISA expansion cards.

ISV
Abbreviation for independent software vendor.

ITE
Abbreviation for information technology equipment.

Java
A cross-platform programming language developed by Sun Microsystems.

JSSE
Abbreviation for Java Secure Socket Extension.

jumper
Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. Jumpers provide a simple and reversible method of changing the circuitry in a printed circuit board.

K
Abbreviation for kilo-, indicating 1000.

KB
Abbreviation for kilobyte(s), 1024 bytes.

KB/sec
Abbreviation for kilobyte(s) per second.

Kbit(s)
Abbreviation for kilobit(s), 1024 bits.

Kbit(s)/sec
Abbreviation for kilobit(s) per second.

key combination
A command requiring you to press multiple keys at the same time. For example, you can reboot your system by pressing the <Ctrl><Alt><Del> key combination.

kg
Abbreviation for kilogram(s), 1000 grams.

kHz
Abbreviation for kilohertz, 1000 hertz.

LAN
Acronym for local area network. A LAN system is usually confined to the same building or a few nearby buildings, with all equipment linked by wiring dedicated specifically to the LAN.

lb
Abbreviation for pound(s).

LCC
Abbreviation for leaded or leadless chip carrier.

LIF
Acronym for low insertion force. Some systems use LIF sockets and connectors to allow devices, such as the microprocessor chip, to be installed or removed with minimal stress to the device.

LED
Abbreviation for light-emitting diode. An electronic device that lights up when a current is passed through it.

local bus
On a system with local-bus expansion capability, certain peripheral devices (such as the video adapter circuitry) can be designed to run much faster than they would with a traditional expansion bus. Some local-bus designs allow peripherals to run at the same speed and with the same width data path as the system's microprocessor.

LPT*n*
The device names for the first through third parallel printer ports on your system are LPT1, LPT2, and LPT3.

LRA
Abbreviation for local response agent.

m
Abbreviation for meter(s).

mA
Abbreviation for milliampere(s).

mAh
Abbreviation for milliampere-hour(s).

managed system
A managed system is any system that is monitored and managed using Server Administrator. Systems running Server Administrator can be managed locally or remotely through a supported Web browser. See remote management system.

math coprocessor
See coprocessor.

Mb
Abbreviation for megabit.

MB
Abbreviation for megabyte(s). The term megabyte means 1,048,576 bytes; however, when referring to hard drive storage, the term is often rounded to mean 1,000,000 bytes.

MB/sec
Abbreviation for megabytes per second.

Mbps
Abbreviation for megabits per second.

MBR
Abbreviation for master boot record.

MCA
Abbreviation for Micro Channel Architecture, which is designed for multiprocessing. MCA eliminates potential conflicts that arise when installing new peripheral devices. MCA is not compatible with either EISA or XT bus architecture, so older cards cannot be used with it.

memory
A system can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM; for example, an unqualified statement such as "a system with 16 MB of memory" refers to a system with 16 MB of RAM.

memory address
A specific location, usually expressed as a hexadecimal number, in the system's RAM.

memory manager
A utility that controls the implementation of memory in addition to conventional memory, such as extended or expanded memory.

memory module
A small circuit board containing DRAM chips that connects to the system board.

MHz
Abbreviation for megahertz.

MIB
Acronym for management information base. The MIB is used to send detailed status/commands from or to an SNMP managed device.

microprocessor
The primary computational chip inside the system that controls the interpretation and execution of arithmetic and logic functions. Software written for one microprocessor must usually be revised to run on another microprocessor. CPU is a synonym for microprocessor.

MIDI
Acronym for musical instrument digital interface.

mm
Abbreviation for millimeter(s).

modem
A device that allows your system to communicate with other systems over telephone lines.

modular system
A system that can include multiple server modules. Each server module functions as an individual system. To function as a system, a server module is inserted into a chassis which includes power supplies, fans, a system management module, and at least one network switch module. The power supplies, fans, system management module, and network switch module are shared resources of the server modules in the chassis. See server module.

MOF
Acronym for managed object format, which is an ASCII file that contains the formal definition of a CIM schema.

mouse
A pointing device that controls the movement of the cursor on a screen. Mouse-aware software allows you to activate commands by clicking a mouse button while pointing at objects displayed on the screen.

MPEG
Acronym for Motion Picture Experts Group. MPEG is a digital video file format.

ms
Abbreviation for millisecond(s).

MS-DOS
Acronym for Microsoft Disk Operating System.

MTBF
Abbreviation for mean time between failures.

multifrequency monitor
A monitor that supports several video standards. A multifrequency monitor can adjust to the frequency range of the signal from a variety of video adapters.

mV
Abbreviation for millivolt(s).

name
The name of an object or variable is the exact string that identifies it in an SNMP Management Information Base (MIB) file or in a CIM Management Object File (MOF).

NDIS
Abbreviation for Network Driver Interface Specification.

NIC
Acronym for network interface controller.

NIF
Acronym for network interface function. This term is equivalent to NIC.

NMI
Abbreviation for nonmaskable interrupt. A device sends an NMI to signal the microprocessor about hardware errors, such as a parity error.

noninterlaced
A technique for decreasing screen flicker by sequentially refreshing each horizontal line on the screen.

ns
Abbreviation for nanosecond(s), one billionth of a second.

NTFS
Abbreviation for the Windows NT File System option in the Windows NT operating system. NTFS is an advanced file system designed for use specifically within the Windows NT operating system. It supports file system recovery, extremely large storage media, and long file names. It also supports object-oriented applications by treating all files as objects with user-defined and system-defined attributes. See also FAT and FAT32.

NTLM
Abbreviation for Windows NT LAN Manager. NTLM is the security protocol for the Windows NT operating system.

NuBus
Proprietary expansion bus used on Apple Macintosh personal computers.

NVRAM
Acronym for nonvolatile random-access memory. Memory that does not lose its contents when you turn off your system. NVRAM is used for maintaining the date, time, and system configuration information.

OID
Abbreviation for object identifier. An implementation-specific integer or pointer that uniquely identifies an object.

online access service
A service that typically provides access to the Internet, e-mail, bulletin boards, chat rooms, and file libraries.

OTP
Abbreviation for one-time programmable.

PAM
Acronym for Pluggable Authentication Modules. PAM allows system administrators to set an authentication policy without having to recompile authentication programs.

parallel port
An I/O port used most often to connect a parallel printer to your system. You can usually identify a parallel port on your system by its 25-hole connector.

parameter
A value or option that you specify to a program. A parameter is sometimes called a switch or an argument.

partition
You can divide a hard drive into multiple physical sections called partitions with the fdisk command. Each partition can contain multiple logical drives. After partitioning the hard drive, you must format each logical drive with the format command.

PC card
A credit-card sized, removable module for portable computers standardized by PCMCIA. PC Cards are also known as "PCMCIA cards." PC Cards are 16-bit devices that are used to attach modems, network adapters, sound cards, radio transceivers, solid state disks and hard disks to a portable computer. The PC Card is a "plug and play" device, which is configured automatically by the Card Services software.

PCI
Abbreviation for Peripheral Component Interconnect. The predominant 32-bit or 64-bit local-bus standard developed by Intel Corporation.

PCMCIA
Personal Computer Memory Card International Association. An international trade association that has developed standards for devices, such as modems and external hard drives, that can be plugged into portable computers.

PERC
Acronym for PowerEdge Expandable RAID controller.

peripheral device
An internal or external device—such as a printer, a disk drive, or a keyboard—connected to a system.

PGA
Abbreviation for pin grid array, a type of microprocessor socket that allows you to remove the microprocessor chip.

physical memory array
The physical memory array is the entire physical memory of a system. Variables for physical memory array include maximum size, total number of memory slots on the motherboard, and total number of slots in use.

physical memory array mapped
The physical memory array mapped refers to the way physical memory is divided.

For example, one mapped area may have 640 KB and the other mapped area may have between 1 MB and 127 MB.

PIC
Acronym for programmable interrupt controller.

PIP
Acronym for peripheral interchange program.

pixel
A single point on a video display. Pixels are arranged in rows and columns to create an image. A video resolution, such as 640 x 480, is expressed as the number of pixels across by the number of pixels up and down.

PKCS #7
Abbreviation for Public Key Cryptography Standard #7. PKCS #7 is an RSA Data Security, Inc., standard for encapsulating signed data such as a certificate chain.

PKIS
Abbreviation for Novell Public Key Infrastructure Services.

PLCC
Abbreviation for plastic leaded chip carrier.

Plug and Play
An industry-standard specification that makes it easier to add hardware devices to personal computers. Plug and Play provides automatic installation and configuration, compatibility with existing hardware, and dynamic support of mobile computing environments.

PME
Abbreviation for Power Management Event. A PME is a pin on a peripheral component interconnect that allows a PCI device to assert a wake event.

POST
Acronym for power-on self-test. Before the operating system loads when you turn on your system, the POST tests various system components such as RAM, the disk drives, and the keyboard.

power supply
An electrical system that converts AC current from the wall outlet into the DC currents required by the system circuitry. The power supply in a personal computer typically generates multiple voltages.

power unit
A set of power supplies in a system chassis.

ppm
Abbreviation for pages per minute.

PPP
Abbreviation for Point-to-Point Protocol.

PQFP
Abbreviation for plastic quad flat pack, a type of microprocessor socket in which the microprocessor chip is permanently mounted.

program diskette set
The set of diskettes from which you can perform a complete installation of an operating system or application program. When you reconfigure a program, you often need its program diskette set.

protected mode
An operating mode supported by 80286 or higher microprocessors, protected mode allows operating systems to implement:

- A memory address space of 16 MB (80286 microprocessor) to 4 GB (Intel386 or higher microprocessor)
- Multitasking
- Virtual memory, a method for increasing addressable memory by using the hard drive

The Windows NT, OS/2®, and UNIX® 32-bit operating systems run in protected mode. MS-DOS cannot run in protected mode; however, some programs that you can start from MS-DOS, such as the Windows operating system, are able to put the system into protected mode.

provider
A provider is an extension of a CIM schema that communicates with managed objects and accesses data and event notifications from a variety of sources. Providers forward this information to the CIM Object Manager for integration and interpretation.

PS
Abbreviation for power supply.

PS/2
Abbreviation for Personal System/2.

PXE
Abbreviation for Pre-boot eXecution Environment.

QFP
Abbreviation for quad flat pack.

RAC
Acronym for remote access controller.

RAID
Acronym for redundant array of independent drives.

RAM
Acronym for random-access memory. A system's primary temporary storage area for program instructions and data. Each location in RAM is identified by a number called a memory address. Any information stored in RAM is lost when you turn off your system.

RAMDAC
Acronym for random-access memory digital-to-analog converter.

RAW
Unprocessed. The term refers to data that is passed along to an I/O device without being interpreted. In contrast, cooked refers to data that is processed before being passed to the I/O device. It often refers to uncompressed text that is not stored in any proprietary format. The term comes from UNIX, which supports cooked and raw modes for data output to a terminal.

RBAC
Abbreviation for role-based access control.

RDRAM
Acronym for Rambus DRAM. A dynamic RAM chip technology from Rambus, Inc. Direct RDRAMs are used in systems. Direct RDRAM chips are housed in RIMM modules, which are similar to DIMMs but have different pin settings. The chips can be built with dual channels, doubling the transfer rate to 3.2 GB/sec.

read-only file
A read-only file is one that you are prohibited from editing or deleting. A file can have read-only status if:

- Its read-only attribute is enabled.
- It resides on a physically write-protected diskette or on a diskette in a write-protected drive.
- It is located on a network in a directory to which the system administrator has assigned read-only rights to you.

readme file
A text file included with a software package or hardware product that contains information supplementing or updating the documentation for the software or hardware. Typically, readme files provide installation information, describe new product enhancements or corrections that have not yet been documented, and list known problems or other things you need to be aware of as you use the software or hardware.

real mode
An operating mode supported by 80286 or higher microprocessors, real mode imitates the architecture of an 8086 microprocessor.

refresh rate
The rate at which the monitor redraws the video image on the monitor screen. More precisely, the refresh rate is the frequency, measured in Hz, at which the screen's horizontal lines are recharged (sometimes also referred to as its vertical frequency). The higher the refresh rate, the less video flicker can be seen by the human eye. The higher refresh rates are also noninterlaced.

remote management system
A remote management system is any system that accesses the Server Administrator home page on a managed system from a remote location using a supported Web browser. See managed system.

RFI
Abbreviation for radio frequency interference.

RGB
Abbreviation for red/green/blue.

RIMM
Acronym for Rambus In-line Memory Module, which is the Rambus equivalent of a DIMM module.

RMI
Acronym for Remote Method Invocation. RMI is a part of the Java programming language library that enables a Java program running on one system to access the objects and methods of another Java program running on a different system.

ROM
Acronym for read-only memory. Your system contains some programs essential to its operation in ROM code. Unlike RAM, a ROM chip retains its contents even after you turn off your system. Examples of code in ROM include the program that initiates your system's boot routine and the POST.

rpm
Abbreviation for revolutions per minute.

RPM
Abbreviation for Red Hat® Package Manager.

RTC
Abbreviation for real-time clock. Battery-powered clock circuitry inside the system that keeps the date and time after you turn off the system.

SAN
Acronym for storage area network.

SAS
Acronym for Secure Authentication Services or Serial-attached SCSI. When referring to security protocols or authentication, SAS is Secure Authentication Services. When referring to computer peripheral devices that employ a serial (one bit at a time) means of digital data transfer over thin cables, SAS is Serial-attached SCSI.

SCA
Abbreviation for single connector attachment.

schema
A collection of class definitions that describes managed objects in a particular environment. A CIM schema is a collection of class definitions used to represent managed objects that are common to every management environment, which is why CIM is called the Common Information Model.

SCSI
Acronym for small computer system interface. An I/O bus interface with faster data transmission rates than standard ports. You can connect up to seven devices (15 for some newer SCSI types) to one SCSI interface.

SEL
Acronym for system event log.

SDMS
Abbreviation for SCSI device management system.

sec
Abbreviation for second(s).

SEC
Abbreviation for single-edge contact.

secure port server
An application that makes Web pages available for viewing by Web browsers using the HTTPS protocol. See Web server.

serial port
An I/O port used most often to connect a modem to your system. You can usually identify a serial port on your system by its 9-pin connector.

settings
Settings are conditions of a manageable object help to determine what happens when a certain value is detected in a component. For example, a user can set the upper critical threshold of a temperature probe to 75 degrees Celsius. If the probe reaches that temperature, the setting results in an alert being sent to the management system so that user intervention can be taken. Some settings, when reached, can trigger a system shutdown or other response that can prevent damage to the system.

server module
A modular system component that functions as an individual system. To function as a system, a server module is inserted into a chassis which includes power supplies, fans, a system management module, and at least one network switch module. The power supplies, fans, system management module, and network switch module are shared resources of the server modules in the chassis. See modular system.

service tag number
A bar code label that identifies each system in the event that you need to call for customer or technical support.

SGRAM
Acronym for synchronous graphics RAM.

shadowing
A computer's system and video BIOS code is usually stored on ROM chips. Shadowing refers to the performance-enhancement technique that copies BIOS code to faster RAM chips in the upper memory area (above 640 KB) during the boot routine.

SIMD
Abbreviation for Single Instruction Multiple Data.

SIMM
Acronym for single in-line memory module. A small circuit board containing DRAM chips that connects to the system board.

SIP
Acronym for single in-line package, which is a type of housing for electronic components in which the connecting pins protrude from one side. A SIP is also called a Single In-line Pin Package (SIPP).

SKU
Acronym for stock keeping unit.

SMART
Acronym for Self-Monitoring Analysis and Reporting Technology. A technology that allows hard drives to report errors and failures to the system BIOS, which then displays an error message on the screen. To take advantage of this technology, you must have a SMART-compliant hard drive and the proper support in the system BIOS.

SMBIOS
Acronym for system management BIOS.

SMD
Abbreviation for surface mount device.

SMTP
Abbreviation for Simple Mail Transfer Protocol.

SNMP
Abbreviation for Simple Network Management Protocol. SNMP, a popular network control and monitoring protocol, is part of the original TCP/IP protocol suite. SNMP provides the format in which vital information about different network devices, such as network servers or routers, can be sent to a management application.

SODIMM
Acronym for small outline-DIMM. A DIMM module with a thinner profile due to the use of TSOP chip packages. SODIMMs are commonly used in portable computers.

SOIC
Abbreviation for Small Outline IC, a small-dimension, plastic, rectangular, surface mount chip package that uses gull-wing pins extending outward.

SOJ
Abbreviation for small outline package J-lead, a small-dimension, plastic, rectangular surface mount chip package with j-shaped pins on its two long sides.

SRAM
Abbreviation for static random-access memory. Because SRAM chips do not require continual refreshing, they are substantially faster than DRAM chips.

SSL
Abbreviation for secure socket layer.

state
Refers to the condition of an object that can have more than one condition. For example, an object may be in the "not ready" state.

status
Refers to the health or functioning of an object. For example, a temperature probe can have the status normal if the probe is measuring acceptable temperatures. When the probe begins reading temperatures that exceed limits set by the user, it reports a critical status.

SVGA
Abbreviation for super video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards.

To display a program at a specific resolution, you must install the appropriate video drivers and your monitor must support the resolution. Similarly, the number of colors that a program can display depends on the capabilities of the monitor, the video driver, and the amount of video memory installed in the system.

switch
On a system board, switches control various circuits or functions in your computer system. These switches are known as DIP switches; they are normally packaged in groups of two or more switches in a plastic case. Two common DIP switches are used on system boards: slide switches and rocker switches. The names of the switches are based on how the settings (on and off) of the switches are changed.

syntax
The rules that dictate how you must type a command or instruction so that the system understands it. A variable's syntax indicates its data type.

system board
As the main circuit board, the system board usually contains most of your system's integral components, such as the following:

- Microprocessor
- RAM
- Controllers for standard peripheral devices, such as the keyboard
- Various ROM chips

Frequently used synonyms for system board are motherboard and logic board.

system configuration information
Data stored in memory that tells a system what hardware is installed and how the system should be configured for operation.

system diskette
System diskette is a synonym for bootable diskette.

system memory
System memory is a synonym for RAM.

System Setup program
A BIOS-based program that allows you to configure your system's hardware and customize the system's operation by setting such features as password protection and energy management. Some options in the System Setup program require that you reboot the system (or the system may reboot automatically) in order to make a hardware configuration change. Because the System Setup program is stored in NVRAM, any settings remain in effect until you change them again.

system.ini file
A start-up file for the Windows operating system. When you start Windows, it consults the **system.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **system.ini** file records which video, mouse, and keyboard drivers are installed for Windows.

Running the Control Panel or Windows Setup program may change options in the **system.ini** file. On other occasions, you may need to change or add options to the **system.ini** file manually with a text editor, such as Notepad.

table
In SNMP MIBs, a table is a two dimensional array that describes the variables that make up a managed object.

TCP/IP
Abbreviation for Transmission Control Protocol/Internet Protocol. A system for transferring information over a computer network containing dissimilar systems, such as systems running Windows and UNIX.

termination
Some devices (such as the last device at each end of a SCSI cable) must be terminated to prevent reflections and spurious signals in the cable. When such devices are connected in a series, you may need to enable or disable the termination on these devices by changing jumper or switch settings on the devices or by changing settings in the configuration software for the devices.

text editor
An application program for editing text files consisting exclusively of ASCII characters. Windows Notepad is a text editor, for example. Most word processors use proprietary file formats containing binary characters, although some can read and write text files.

TFTP
Abbreviation for Trivial File Transfer Protocol. TFTP is a version of the TCP/IP FTP protocol that has no directory or password capability.

text mode
A video mode that can be defined as x columns by y rows of characters.

threshold values
Systems are normally equipped with various sensors that monitor temperature, voltage, current, and fan speed. The sensor's threshold values specify the ranges (min and max values) for determining whether the sensor is operating under normal, noncritical, critical or fatal conditions. Server Administrator-supported threshold values are

- UpperThresholdFatal
- UpperThresholdCritical
- UpperThresholdNon-critical
- Normal
- LowerThresholdNon-critical
- LowerThresholdCritical
- LowerThresholdFatal

time-out
A specified period of system inactivity that must occur before an energy conservation feature is activated.

tpi
Abbreviation for tracks per inch.

TQFP
Abbreviation for thin quad flat pack.

TSR
Abbreviation for terminate-and-stay-resident. A TSR program runs "in the background." Most TSR programs implement a predefined key combination (sometimes referred to as a hot key) that allows you to activate the TSR program's interface while running another program. When you finish using the TSR program, you can return to the other application program and leave the TSR program resident in memory for later use. TSR programs can sometimes cause memory conflicts. When troubleshooting, rule out the possibility of such a conflict by rebooting your system without starting any TSR programs.

TSOP
Abbreviation for thin small outline package. A very thin, plastic, rectangular surface mount chip package with gull-wing pins on its two short sides.

UART
Acronym for universal asynchronous receiver transmitter, the electronic circuit that makes up the serial port.

UDP
Abbreviation for user datagram protocol.

UL
Abbreviation for Underwriters Laboratories.

UMB
Abbreviation for upper memory blocks.

unicode
A fixed width, 16-bit world wide character encoding, developed and maintained by the Unicode Consortium.

upper memory area
The 384 KB of RAM located between 640 KB and 1 MB. If the system has an Intel386 or higher microprocessor, a utility called a memory manager can create UMBs in the upper memory area, in which you can load device drivers and memory-resident programs.

UPS
Abbreviation for uninterruptible power supply. A battery-powered unit that automatically supplies power to your system in the event of an electrical failure.

URL
Abbreviation for Uniform Resource Locator (formerly Universal Resource Locator).

USB
Abbreviation for Universal Serial Bus. A USB connector provides a single connection point for multiple USB-compliant devices, such as mice, keyboards, printers, and computer speakers. USB devices can also be connected and disconnected while the system is running.

utility
A program used to manage system resources—memory, disk drives, or printers, for example.

utility partition
A bootable partition on the hard drive that provides utilities and diagnostics for your hardware and software. When activated, the partition boots and provides an executable environment for the partition's utilities.

UTP
Abbreviation for unshielded twisted pair.

UUID
Abbreviation for Universal Unique Identification.

V
Abbreviation for volt(s).

VAC
Abbreviation for volt(s) alternating current.

varbind
An algorithm used to assign an object identifier (OID). The varbind gives rules for arriving at the decimal prefix that uniquely identifies an enterprise, as well as the formula for specifying a unique identifier for the objects defined in that enterprise's MIB.

variable
A component of a managed object. A temperature probe, for example, has a variable to describe its capabilities, its health or status, and certain indexes that you can use to help you in locating the right temperature probe.

VCCI
Abbreviation for Voluntary Control Council for Interference.

VDC
Abbreviation for volt(s) direct current.

VESA
Acronym for Video Electronics Standards Association.

VGA
Abbreviation for video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards. To display a program at a specific resolution, you must install the appropriate video drivers and your monitor must support the resolution. Similarly, the number of colors that a program can display depends on the capabilities of the monitor, the video driver, and the amount of video memory installed for the video adapter.

VGA feature connector
On some systems with a built-in VGA video adapter, a VGA feature connector allows you to add an enhancement adapter, such as a video accelerator, to your system. A VGA feature connector can also be called a VGA pass-through connector.

video adapter
The logical circuitry that provides—in combination with the monitor—your system's video capabilities. A video adapter may support more or fewer features than a specific monitor offers. Typically, a video adapter comes with video drivers for displaying popular application programs and operating systems in a variety of video modes.

On some systems, a video adapter is integrated into the system board. Also available are many video adapter cards that plug into an expansion-card connector.

Video adapters often include memory separate from RAM on the system board. The amount of video memory, along with the adapter's video drivers, may affect the number of colors that can be simultaneously displayed. Video adapters can also include their own coprocessor for faster graphics rendering.

video driver
A program that allows graphics-mode application programs and operating systems to display at a chosen resolution with the desired number of colors. A software package may include some "generic" video drivers. Any additional video drivers may need to match the video adapter installed in the system.

video memory
Most VGA and SVGA video adapters include memory chips in addition to your system's RAM. The amount of video memory installed primarily influences the number of colors that a program can display (with the appropriate video drivers and monitor capabilities).

video mode
Video adapters normally support multiple text and graphics display modes. Character-based software displays in text modes that can be defined as *x* columns by *y* rows of characters. Graphics-based software displays in graphics modes that can be defined as *x* horizontal by *y* vertical pixels by *z* colors.

video resolution
Video resolution—800 x 600, for example—is expressed as the number of pixels across by the number of pixels up and down. To display a program at a specific graphics resolution, you must install the appropriate video drivers and your monitor must support the resolution.

virtual memory
A method for increasing addressable RAM by using the hard drive. For example, in a system with 16 MB of RAM and 16 MB of virtual memory set up on the hard drive, the operating system would manage the system as though it had 32 MB of physical RAM.

virus
A self-starting program designed to inconvenience you. Virus programs have been known to corrupt the files stored on a hard drive or to replicate themselves until a computer system or network runs out of memory. The most common way that virus programs move from one system to another is via "infected" diskettes, from which they copy themselves to the hard drive. To guard against virus programs, you should do the following:

- Periodically run a virus-checking utility on your system's hard drive
- Always run a virus-checking utility on any diskettes (including commercially sold software) before using them

VLSI
Abbreviation for very-large-scale integration.

VLVESA
Acronym for very low voltage enterprise system architecture.

vpp
Abbreviation for peak-point voltage.

VRAM
Acronym for video random-access memory. Some video adapters use VRAM chips (or a combination of VRAM and DRAM) to improve video performance. VRAM is dual-ported, allowing the video adapter to update the screen and receive new image data at the same time.

VRM
Abbreviation fro voltage regulator module.

W
Abbreviation for watt(s).

Wakeup on LAN
The ability for the power in a client station to be turned on by the network. Remote wake-up enables software upgrading and other management tasks to be performed on users' machines after the work day is over. It also enables remote users to gain access to machines that have been turned off. Intel calls remote wake-up "Wake-on-LAN."

Web server
An application that makes Web pages available for viewing by Web browsers using the HTTP protocol.

WH
Abbreviation for watt-hour(s).

win.ini file
A start-up file for the Windows operating system. When you start Windows, it consults the **win.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **win.ini** file records what printer(s) and fonts are installed for Windows. The **win.ini** file also usually includes sections that contain optional settings for Windows application programs that are installed on the hard drive. Running the Control Panel or Windows Setup program may change options in the **win.ini** file. On other occasions, you may need to change or add options to the **win.ini** file manually with a text editor such as Notepad.

Windows 95
An integrated and complete Microsoft Windows operating system that does not require MS-DOS and that provides advanced operating system performance, improved ease of use, enhanced workgroup functionality, and simplified file management and browsing.

Windows NT
High-performance server and workstation operating system software developed by Microsoft that is intended for technical, engineering, and financial applications.

write-protected
Read-only files are said to be write-protected. You can write-protect a 3.5-inch diskette by sliding its write-protect tab to the open position or by setting the write-protect feature in the System Setup program.

WMI
Acronym for Windows Management Instrumentation. WMI provides CIM Object Manager services.

X.509 Certificate
An X.509 certificate binds a public encryption key to the identity or other attribute of its principal. Principals can be people, application code (such as a signed applet) or any other uniquely identified entity (such as a secure port server or Web server).

XMM
Abbreviation for extended memory manager, a utility that allows application programs and operating systems to use extended memory in accordance with the XMS.

XMS
Abbreviation for eXtended Memory Specification.

X Window System
The graphical user interface used in the Red Hat Enterprise Linux environment.

ZIF
Acronym for zero insertion force. Some systems use ZIF sockets and connectors to allow devices such as the microprocessor chip to be installed or removed with no stress applied to the device.

ZIP
A 3.5-inch removable disk drive from Iomega. Originally, it provided 100-MB removable cartridges. The drive is bundled with software that can catalog the disks and lock the files for security. A 250-MB version of the Zip drive also reads and writes the 100-MB Zip cartridges.