



Preface

This guide is intended for systems administrators, network administrators, and for anyone who wants to write Simple Network Management Protocol (SNMP) management information base (MIB) applications to monitor systems.

This reference guide provides a formatted version of the Server Administrator MIB (filename **10892.mib**) which was released with Dell OpenManage™ Server Administrator 1.0 or later. Chapters in this manual follow MIB groups and provide explanations and definitions for the terms used to define MIB objects.

Content of This Reference Guide

Content and organization of the chapters are as follows:

Chapter	Topics	MIB Group Number
1	Introduction to server administrator and to SNMP	NA
2	MIB Group — defines major and minor version numbers of the MIB	1
3	Systems Management Software Group — defines the supported systems management standards	100
4	System State Group — defines status, state, and redundancy for a system and its components	200
5	Chassis Information Group — defines chassis types, events, and indicators	300
6	Operating System Group — defines variables for name, version, service pack, and other information about a system's operating system	400
7	System Resource Group — defines variables for input/output ports, memory, interrupts, and direct memory access	500
8	Power Group — defines variables for power units, power supplies, and their current and voltage probes	600
9	Thermal Group — defines variables for temperature probes and cooling devices	700
10	User Security Group — defines variables for creating and modifying user accounts	800
11	Remote Flash BIOS Group — defines variables for updating the system's BIOS remotely	900

Chapter	Topics	MIB Group Number
12	Port Group — defines variables for major port types such as keyboard, monitor, small computer system interface (SCSI), Universal Serial Bus (USB), and parallel and serial ports	1000
13	Device Group — defines variables for pointing, keyboard, processor, cache, memory, and personal computer interface devices	1100
14	Slot Group — defines variables for the system's slots	1200
15	Memory Group — defines variables for the system's physical memory	1300
16	Basic Input/Output System (BIOS) Setup Control Group — defines variables for BIOS functions such as boot sequence, speakers, Wake on the local area network (LAN), diskettes, ports, and network interface controllers (NIC)	1400
17	Local Response Agent Group — defines variables for global settings and actions. These variables allow users to predetermine how the system responds to a particular type of event	1500
18	Cost of Ownership Group — defines variables for tracking data on the system's service contract, lease, repair records, trouble tickets, and so on	1600
19	Remote Access Group — provides information about remote access hardware that may be present in your system and defines variables for administrative users, SNMP trap destinations, modem configuration for dial-up networking, dial-in configuration, and dial-out destinations.	1700
20	Traps Group — defines the different sorts of alerts that can be sent to report the status of critical components	5000
Glossary	Defines acronyms, abbreviations, and technical terms used in this reference guide	NA
Appendix A	Defines standard data types used in this reference guide	NA
Appendix B	Provides a sample SNMP output	NA

How This Guide Defines Technical Terms

The following table provides information about where to find definitions for technical terms in this reference guide:

Type of Definition	See
Basic SNMP terms.	Preface and Chapter 1
Server Administrator-specific variable values. Server Administrator-specific MIB variables contain links to the tables that define these values in the last section of the chapter in which these variables are used.	Chapters 3, 5, 7, 8, 9, and 11 through 18.
Systems management terms, acronyms, and commonly managed components referred to in this reference guide.	Glossary
Industry-standard data types that specify variable values in this reference guide.	Appendix A

SNMP Basic Terminology

It is important to have a good understanding of the key technical terms used in this guide. This guide provides definitions for all essential terms used in describing the server administrator MIB. The Glossary contains definitions for all essential terms and acronyms.

Managed Object

A managed object is any item in a computer system that can be singled out for discovery, monitoring, or user intervention and correction.

NOTE: Not all managed objects described in this guide are supported by all systems.



MIB

A MIB acts as a structured roadmap for managed objects. As an Application Programming Interface (API), a MIB allows systems management tools to retrieve data maintained by an agent. The server administrator MIB is divided into several major groups of managed objects.

Variable

A variable is 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 locate specific temperature probes. One index for the probe would be the probe's chassis number. Some systems may have multiple chassis—one chassis for the central processing unit and another chassis for storage. A chassis within a

system can also have more than one temperature probe. Variables for a temperature probe include its capabilities, status, chassis index, and index.

Fields

Managed object variables contain fields. In this reference guide, managed object variables have the following fields defined:

Name is the exact string by which the variable is known in the MIB. MIB variables are named according to the following conventions:

- Variable names start with a lowercase letter.
- Spaces are not allowed between words in the variable name.
- Acronyms are in uppercase letters, except when an acronym is the first word in the variable name.
- With the exception of the first letter of the variable name and acronyms, all other words in the variable name start with capital letters.

The following variable names illustrate these conventions:

```
temperatureProbeLowerCriticalThreshold
```

```
coolingUnitIndex
```

```
pCIDeviceSpeed
```

Object Identifier (OID) is the unique number assigned to an object defined in a MIB. An OID is written as a sequence of subidentifiers in decimal notation. Each OID in this reference guide has a prefix that identifies the managed objects as belonging to Dell: 1.3.6.1.4.1.674. The additional numbers identify the MIB group and subgroup as well as the table entry number of any variables.

For example, the OID for the temperature probe managed object table is 700.20 and the variable for the location of the temperature probe (temperatureProbeLocationName) has an OID of 700.20.1.8. The full OIDs for these items are 1.3.6.1.4.1.674.10892.1.700.20 for the temperatureProbeTable and 1.3.6.1.4.1.674.10892.1.700.20.1.8 for the temperatureProbeLocation. For more information about the structure of OIDs, see “SNMP MIB OIDs” in Chapter 1.

Description is a brief explanation of what a particular managed object does.

Syntax defines the data type in which the values of the variable must be expressed. Most variables in this reference guide use standard data types such as string or boolean. All data types that are unique to server administrator variables are defined at the end of the chapter in which they occur. Standard data types are defined in Appendix A of this reference guide.

Access specifies whether persons with administrative privileges can read but not modify the value of a variable (read only) or can both read and modify the value of a variable (read-write).

Frequently Used Terms in Variable Names

The following terms are frequently used in the name of a MIB variable:

Capability refers to the actions an object can perform, or to actions that can be taken by the object. Hot-pluggable is an example of a capability. If a card is hot-pluggable, it can be replaced while a system is running. Capability settings refer to the capabilities of the object that the user can select from and activate if desired. Capability settings allow users of the server administrator to predetermine how an object will behave under specific conditions.

Settings are the conditions of a manageable object that 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 causes an alert to be sent to the management console. Some settings, when reached, can trigger a system shutdown or other response to prevent damage to the system.

State refers to the condition of an object that has more than one condition. For example, an object may be in a "not ready" or in an "enabled" state.

Status refers to the health of an object or how the object is functioning. For example, the status of a temperature probe that is measuring acceptable temperatures would be reported as normal. When the probe begins reading temperatures that exceed limits set by the user, it reports a critical status.

Tables

This reference guide contains two types of tables: tables that are used to organize and define variable values and tables that define MIB objects. Readers must understand the differences between these two types of tables.

SNMP Tables

Most of the MIB objects defined in this reference guide are organized into SNMP tables. SNMP tables organize data into two-dimensional structural arrays. In SNMP, objects that have a relationship to other objects are called columnar objects. Columnar objects are the type of object used to form lists and tables. When a MIB group is divided into one or more discrete tables, the word "table" has a technical meaning. For example, the section of this reference guide entitled Universal Unique Identifier (UUID). The UUID object has a type and a value that uniquely identify an object such as a chassis. The table defines all of the variables that comprise the managed object UUID.

The following table is an example of an SNMP table. The table contains variables that must occur in a definite sequence. In the example table the defined variables are UUID Chassis Index, UUID Index, UUID Type, and UUID Value.

Example SNMP Table

These objects comprise the server administrator definitions for the Universal Unique Identifier (UUID).

Name	uUIDTable
Object ID	1.3.6.1.4.1.674.10892.1.300.20
Description	Defines the UUID table.
Syntax	SEQUENCE OF UUIDTableEntry
Access	Not accessible

UUID Table Entry

Name	uUIDTableEntry
Object ID	1.3.6.1.4.1.674.10892.1.300.20.1
Description	Defines the UUID Table entry.
Syntax	UUIDTableEntry
Access	Not accessible
Index	uUIDchassisIndex, uUIDIndex

UUID Chassis Index

Name	uUIDchassisIndex
Object ID	1.3.6.1.4.1.674.10892.1.300.20.1.1
Description	Defines the index (ones-based) of this chassis.
Syntax	DellObjectRange
Access	Read-only

UUID Index

Name	uUIDIndex
Object ID	1.3.6.1.4.1.674.10892.1.300.20.1.2
Description	Defines the index of the UUID in a specified chassis.
Syntax	DellObjectRange
Access	Read-only

UUID Type

Name	uUUIDType
Object ID	1.3.6.1.4.1.674.10892.1.300.20.1.3
Description	Defines the type of the UUID for this chassis.
Syntax	DellUUIDType
Access	Read-only

UUID Value

Name	uUUIDValue
Object ID	1.3.6.1.4.1.674.10892.1.300.20.1.4
Description	Defines the value of the UUID for this chassis.
Syntax	OCTET STRING (SIZE(16))
Access	Read-only



Reference Guide Content Tables

NOTE: Variable values are defined for any variable that is server administrator-specific. Industry standard variable definitions are documented in Appendix A of this guide.

Some of the tables in this guide have no technical significance in SNMP. These tables are designed to show information in a readable form. The following table, for example, defines the server administrator specific variable, DellFanControlCapabilities. The table provides the name of the variable, its data type, the values that are valid for the variable, and what each value means.

Variable Name: DellFanControlCapabilities

Data Type: Integer

Possible Data Values

Meaning of Data Value

unknown (1)	The fan's capabilities are unknown.
lowSpeedCapable (2)	The fan can be set to low speed.
highSpeedCapable (4)	The fan can be set to high speed.
lowOrHighSpeedCapable (6)	The fan can be set to low or high speed.

This type of table is used throughout the reference guide to list and define variable values. Tables that explain server administrator-specific variable values are located in the final section of chapters where server administrator-specific variables are defined. In the preceding example, the variable name is DellFanControlCapabilities. This

variable must be expressed as an integer and has four possible values: unknown, lowSpeedCapable, highSpeedCapable, and lowOrHighSpeed Capable.

Chapter Organization

Chapters in this reference guide are based on the server administrator MIB, so the complexity of each chapter depends on the complexity of each MIB group. The first section provides a high level introduction to the MIB group. If the group is defined by one or more tables, the second section of the chapter lists these tables. The third section of the chapter documents the variables that comprise the group, and if applicable, the variables that comprise the tables. The fourth section of the chapter contains definitions for any server administrator-specific variables that are used in the chapter. The following example shows the typical content of these four sections:

1. BIOS Setup Control Group

This section explains the purpose of the MIB group and summarizes the major features of the component groups.

2. BIOS Group Tables

If there is more than one SNMP table for a group, this section lists all of the tables. For this BIOS group example, there are eight tables listed. Double-clicking any table on the list takes you to that table.

- BIOS Setup Control Table
- SCSI Control Table
- Parallel Port Control Table
- Serial Port Control Table
- USB Control Table
- IDE Control Table
- Diskette Control Table
- Network Interface Control Table

3. Variables that make up each table in the group

This section documents the variables for the eight tables that comprise the BIOS group.

4. BIOS Variable Values

This section explains any server administrator-specific variables and data types that are used in this chapter. In the BIOS group example, there are 17 unique, server administrator-specific variable meanings. Information on each server administrator-specific variable is presented in a formatted table.

Other Documents You May Need

In addition to this *Dell OpenManage Server Administrator SNMP Reference Guide*, you can find the following guides on your online documentation CD:

- The *Dell OpenManage Server Administrator Messages Reference Guide* lists the messages that you can receive on your systems management console or on your operating system's event viewer. This guide explains the text, severity, and cause of each message that the server administrator issues.
- 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 server administrator provider MOF documents supported classes of management objects.

