

SOFTWARE GUIDE

MegaRAID® SNMP Configuration Guide

February 2003

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Chapter 1

Introduction

This chapter describes the MegaRAID Simple Network Management Protocol (SNMP) Extension Agent for MegaRAID controllers and connected storage devices, and includes these topics.

- [Section 1.1, “Overview,” page 1-1](#)
- [Section 1.1.1, “SNMP Installation Overview,” page 1-1](#)

1.1 Overview

An SNMP-based management application (also known as an SNMP manager) can monitor and manage devices through SNMP extension agents. An example of an SNMP management application is Hewlett-Packard's Open View.

MegaRAID SNMP subagent reports the information about the RAID controller, logical drives, physical devices, enclosures, etc. per SNMP request. The SNMP extension agent sends out SNMP traps that depend on the notification from the firmware.

1.1.1 SNMP Installation Overview

The installation of the SNMP subagent is accomplished in several phases:

- Installing and enabling SNMP main agent of the Operating System
- Installing the agent software on the server
- Placing a copy of the Management Information Base (MIB) in a directory which is accessible to the management application
- Compiling the MIB description file with the management application

Chapter 2

SNMP Installation for Windows 2000, 2003

This chapter describes the MegaRAID SNMP installation for Windows 2000, 2003 operating systems, and includes these topics:

- [Section 2.1, "Introduction," page 2-1](#)
- [Section 2.2, "Install the SNMP Extension Agent," page 2-1](#)

2.1 Introduction

The MegaRAID SNMP Extension Agent is available on Windows 2000, 2003. The SNMP extension agent files are:

- Megasnmp.dll
- Megaraid.tdf
- Megaraid.mib

2.2 Install the SNMP Extension Agent

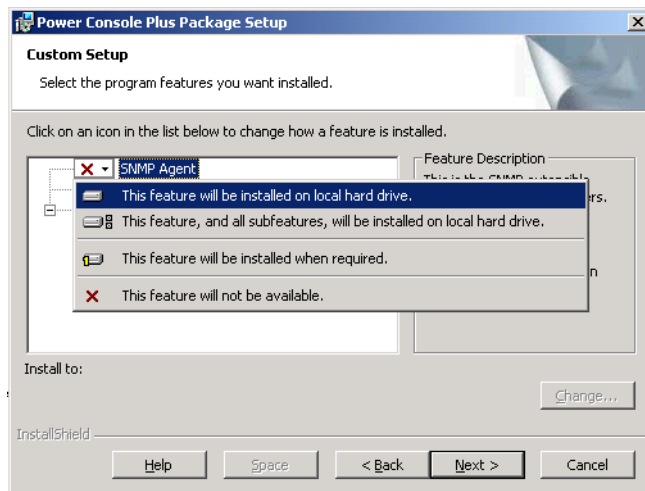
To install the SNMP Extension Agent on Windows 2000 and 2003, follow these steps:

- Step 1. Click **Start-> Settings-> Control Panel->Add/Remove Programs**.
- Step 2. In the left pane, select the **Add/Remove Window Components** icon.
- Step 3. Select the **Management and Monitoring Tools** option.
- Step 4. Click **Next**. Windows will ask you to insert the Windows 2000 or 2003 CD-ROM.
- Step 5. Insert the Windows 2000 or 2003 CD-ROM and click **OK**.

Using Windows 2000 or 2003, you will need to change the permissions to allow the SNMP Agent to read and write. Windows 2000 and 2003 have a default setting to read only.

- Step 6. Go to **Start->Control Panel->Administrative Tools->Services**.
- Step 7. Right-click **SNMP Services** and select **Properties**.
- Step 8. Select the **Security tab** and click **Edit** and change to **READ WRITE**.
- Step 9. Click **OK**.
- Step 10. Locate the MegaRAID Power Console Plus Package folder.
- Step 11. Double-click **setup.exe**.
- Step 12. Click the SNMP Agent icon and select "This feature will be installed on local hard drive."

Figure 2.1 Installing SNMP with Power Console Plus



- Step 13. Click **Next**. The SNMP feature will be automatically added.

Chapter 3

SNMP Installation for Windows NT 4x

This chapter describes the MegaRAID SNMP installation for Windows NT 4x operating system, and includes these topics:

- [Section 3.1, "Introduction," page 3-1](#)
- [Section 3.2, "Install the SNMP Extension Agent," page 3-1](#)

3.1 Introduction

The MegaRAID SNMP Extension Agent is available on Windows NT 4x. The SNMP extension agent files are:

- Megasnmp.dll
- Megaraid.tdf
- Megaraid.mib

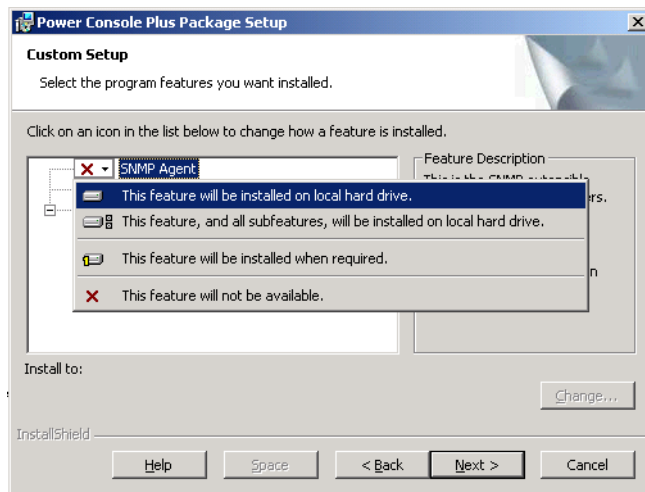
3.2 Install the SNMP Extension Agent

To install the SNMP Extension Agent on Windows NT4.x, follow these steps:

- Step 1. Click **Start-> Settings-> Control Panel->Services**.
- Step 2. Scroll and locate **SNMP Trap Services**. If the SNMP Trap Services is set to Started Automatic go to [step 7](#). If not, go to [step 3](#).
- Step 3. Click **Start->Settings->Control Panel->Network**.
- Step 4. Select **SNMP Services**.
- Step 5. Click **OK**. A message window will open asking you for the NT CD-ROM. Insert the CD-ROM and click **OK**.

- Step 6. The SNMP Properties window opens.
- Step 7. Select the **Agent** Tab and type the appropriate information into the following fields:
- Contact Name: <type computer user name>
 - Location: <type IP address of your server>
- Step 8. Select the **Traps** Tab and type the appropriate information into the following fields:
- Community Name: <type Public>
 - Trap Destination: <type IP address of the trap system>
- Step 9. Select the **Security** Tab and leave the default settings.
- Step 10. Click **OK**.
- Step 11. Click **Close**.
- Step 12. Reboot your system in order for the new settings to take effect.
- Step 13. Locate the MegaRAID Power Console Plus Package folder.
- Step 14. Double-click **setup.exe**.
- Step 15. Click the SNMP Agent icon and select "This feature will be installed on local hard drive."

Figure 3.1 Installing SNMP with Power Console Plus



- Step 16. Click **Next**. The SNMP feature will be automatically added.

Chapter 4

SNMP Installation for Novell NetWare 4x, 5x, and 6x

This chapter describes the MegaRAID SNMP installation for Novell NetWare 4x and 5x operating system, and includes these topics:

- [Section 4.1, "Introduction," page 4-1](#)
 - [Section 4.2, "Install the SNMP Extension Agent," page 4-1](#)
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4.1 Introduction

The MegaRAID SNMP Extension Agent is available on Novell NetWare 4x, 5x, and 6x. The SNMP extension agent files are:

- megasnp.nlm
 - megammio.nlm
-

4.2 Install the SNMP Extension Agent

To install the SNMP Extension Agent on Novell NetWare, follow these steps:

Step 1. Using the Netware server console, copy the following files from the distribution CD-ROM to the Netware system volume:

- megasnp.nlm
- megammio.nlm (this file will load automatically with the megasnp.nlm file)

Step 2. Load the INETCFG from the Netware server console, type:

LOAD INETCFG

Step 3. Go to Manage Configuration->Configure SNMP parameter.

Step 4. Type the appropriate information in the following fields:

- monitor state
- control state
- trap state

Step 5. Go to Manage Configuration->Configure SNMP info.

Step 6. Type the appropriate information in the following fields:

- Node name for SNMP
- Hardware Description
- Physical Location
- Human Contact

Step 7. From the Netware prompt, type **LOAD EDIT** and press **Enter**.

Step 8. Press the **Insert** key and select **SYS->ETC->traptarg.cfg**.

Step 9. Scroll to the bottom of the traptarg file and type the IP or IPX address(es) of the machines that you want to send traps to.

Step 10. Save the changes to the traptarg file, and close the file.

Chapter 5

SNMP Installation for Linux

This chapter describes the MegaRAID SNMP installation for Linux operating system, and includes these topics:

- [Section 5.1, “Introduction,” page 5-1](#)
- [Section 5.2, “Install the SNMP Extension Agent,” page 5-1](#)

5.1 Introduction

The MegaRAID SNMP Extension Agent is available on Linux. The SNMP extension agent files are:

- Mrd.mib

5.2 Install the SNMP Extension Agent

The SNMP Extension Agent on Linux, has been released in two formats:

- megasnm.rpm
- megasnm.tar

use one of the following installation procedures.

5.2.1 Installing the SNMP Extension Agent Using .RPM

Step 1. To install the MegaRAID SNMP Extension Agent, go to the directory (or media) that contains the megasnm.rpm file and type the following command.

```
rpm -i megasnm.rpm
```

The megasnm agent will install the following files:

- Directory

`/etc/mrdsnmp`

`mrdsnmp.conf` -- Trap configuration file

`mrd.mib`-- LSI Generic MIB file

`percsnmpd.conf`-- Sample SNMP configuration file.

`readme.txt` -- Readme file

`install`-- This script is used to install the RPM

`uninstall`-- This script is used to uninstall the RPM

`mrdsnmpd` -- Link to `/etc/rc.d/init.d/mrdsnmpd`

- Links created:

`/etc/rc.d/rc0.d/K45mrdsnmpd`

`/etc/rc.d/rc1.d/K45mrdsnmpd`

`/etc/rc.d/rc2.d/S55mrdsnmpd`

`/etc/rc.d/rc3.d/S55mrdsnmpd`

`/etc/rc.d/rc4.d/S55mrdsnmpd`

`/etc/rc.d/rc5.d/S55mrdsnmpd`

`/etc/rc.d/rc6.d/K45mrdsnmpd`

All the above links point to `/etc/rc.d/init.d/mrdsnmpd`

These links are used to start/stop the agent when run level changes.

For details about SNMP security options with Linux, go to the following web site:

<http://net-snmp.sourceforge.net>

5.2.2 Installing the SNMP Extension Agent Using .TAR

1. To install the MegaRAID SNMP Extension Agent, go to the directory (or media) that contains the `megasnmp.rpm` file and type the following command.

```
tar -zxvf megasnmp.tgz
```

2. Go to the following directory:

```
cd megasnmp
```

3. Type the following to install the `megasnmp` agent.

```
./install
```

4. See the ReadMe text for more information.

Appendix A

Setting up and Testing the SNMP Extension Agent Using HP OpenView

This appendix describes setting up the MegaRAID SNMP Extension Agent using HP OpenView, and includes these topics:

- [Section A.1, “Setting Up HP OpenView with Megasnmp,” page A-1](#)
 - [Section A.2, “Testing the Extension Agent with HP OpenView,” page A-2](#)
-

A.1 Setting Up HP OpenView with Megasnmp

- Step 1. Insert the HP OpenView CD into your CD-ROM drive.
- Step 2. Start HP OpenView from the CD.
- Step 3. Select **Options->Customize Traps**.
- Step 4. Insert the diskette that contains the file megaraid.tdf into your floppy disk drive. The megaraid.tdf file is the Trap information file for MegaRAID controllers.
- Step 5. Select **Load** and add megaraid.tdf.
- Step 6. Remove the diskette from your floppy disk drive.
- Step 7. Click **Control->SNMP Manager->Manage Database**.
- Step 8. Insert the diskette that contains the file megaraid.mib into your floppy disk drive.
- Step 9. Select **Import** and select the **megaraid.mib** file.
- Step 10. Click **OK**.
- Step 11. From the Available column, highlight the megaraid.mib file and add it to the Database column. Do not remove the RFC1213.mib file.

A.2 Testing the Extension Agent with HP OpenView

- Step 1. Start HP OpenView.
- Step 2. Select **Controller->SNMP Manager->Define Query**.
- Step 3. Type the IP address of the server you want to get information from.
- Step 4. Select **Variables->Available** and locate MegaRAID.
- Step 5. Depending on the version of HP OpenView, you might find the file in the following path:

Iso/org/dod/internet/private/enterprise/megaRAID/MegaRAID/MegaRAID.mib

- Step 6. Select the information you wish to get and select **PERFORM**.
- Step 7. Query all the variables:

- Adapter table
- Logical Table
- Physical Table
- Channel Table

Verify that the information displayed is correct.

- Step 1. Query individual columns separately such as Firmware version, BIOS version etc...
- Step 2. Change the Adapter property in HP OpenView and compare it with Power Console's Adapter property and vice-versa. Repeat this step for logical and physical drives.
- Step 3. Test the following commands:
 - abort initialization
 - check consistency
 - rebuild
- Step 4. Open the HP OpenView Alarm log and verify that the Trap messages were reported to the log. Verify that the correct information was reported such as Physical ID number, Logical number, etc...

Step 5. Run the Microsoft SNMP Utility (SNMPUTIL.exe from the NT Resource Kit CD or download it from the Microsoft web site.) from an MS-DOS command prompt.

Step 6. Query all of the available variables.

- **Walk the MIB Subtree**

- Verify walking the entire MIB subtree supported by the agent without errors.
- For each table object defined in the MIB, verify whether all the entries within the table returned with correct value.

- **Operation with Other Agents**

- Issue GetNext with OIDs that fall lexicographically before the OIDs supported by this agent and check if it returns the correct variable.
Issue GetNext on the last variable in this agent's subtree correctly and check if it returns the next variable.
- Issue GetNext with multiple OIDs and check if it returns correct variables.

- **Settable Variables**

- Verify that any READ-WRITE variables can be set properly and the values are stored persistently.

- **Octet String Variables**

- Verify octet string variables do not contain NULL terminator character.
- Verify octet string variables are returned with no garbage string inserted.

A.2.0.1 Using the SNMP Utility

- To use the snmputil.exe utility, refer to the corresponding MIB file (Megaraid.mib) for the correct OIDs.
- To WALK an entire table, e.g., logical drive table which is table number 2, use the following command line.

```
snmputil walk host_ip_address public .1.3.6.1.4.1.3582.1.1.2
```

Here, **3582** is the enterprises id of the MegaRAID controller family. This will print the entire Logical drive table and its values.

- To see a particular attribute, use the **GET** function. In this example, let us get the “inquiry string” which is attribute # 8 in the physical drive table, for a device in adapter 1, channel 1, target 6, LUN 0. Use the following command line:

snmputil get host_ip_address public .1.3.6.1.4.1.3582.1.1.3.1.8.1.1.6.0

Here, the last four values are the keys to the device, namely adapter, channel, physical id and the Lun.

- In the same way, we can SET an attribute to an entity.

Always refer the MIB file to get the correct keys and the index of the attributes. It also specifies each object type, whether integer or octet string and the description of the attributes. It also tells if an attribute is a READ-ONLY or a READ-WRITE object. An attribute can be SET to allowable values if it is a READ-WRITE object.

Appendix B

SNMP Extension Agent

Trap Definitions

This appendix describes setting up the MegaRAID SNMP Extension Agent using HP OpenView, and includes these topics:

- [Section B.1, “MegaRAID SNMP Extension Trap Definitions,” page B-1](#)

B.1 MegaRAID SNMP Extension Trap Definitions

The megaraid snmp agent supports a set of traps for any state change in the controller and its attached devices. The traps depend on the notification from the firmware. Following is a list of the traps supported.

There are no traps specific to LUNs as the megaRAID firmware does not allow online removal or addition of luns and hence no notification from the firmware.

Table B.1 MegaRAID Trap Definitions

Trap Number	Trap Definition
9001	Configuration Updated
9002	Physical Drive State Changed
9003	Logical Drive State Changed
9004	Initialization Started
9005	Initialization Successful
9006	Initialization Aborted
9007	Initialization Failed

Table B.1 MegaRAID Trap Definitions

Trap Number	Trap Definition
9008	Check Consistency Started
9009	Check Consistency Completed
9010	Check Consistency Aborted
9011	Consistency Corrected
9012	Check Consistency Failed
9013	Reconstruction Started
9014	Reconstruction Completed
9015	Reconstruction Failed
9016	Predictive Failure Exceeded
9017	Predictive Failure [FALSE]
9018	Physical Drive Sense Data
9019	New Drive Inserted
9020	Battery Module Missing
9021	Battery Voltage Low
9022	Battery Temperature Exceeded