Violin Memory SNMP Configuration Guide

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Preface

This preface outlines the organization of this book, describes document conventions, and provides information about additional resources.

Intended Audience

This guide is intended for experienced systems administrators. Violin Memory assumes that you are experienced in installing and servicing high-performance storage systems.

Contact Violin Memory Customer Support for any assistance with installing and servicing this system. See Contacting Violin Memory on page viii for contact information.

Document Organization

This guide is organized into the following chapters:

- Chapter 1, SNMP Configuration Overview—Provides basic information about configuring SNMP on Violin Memory devices and lists the available MIB files.
- Chapter 2, Configuring SNMP on Violin Memory Devices—Contains procedures for configuring SNMP using the Violin CLI and Web Interface.
- Chapter 3, SNMP Trap Reference—Provides information about SNMP traps generated on Violin Memory devices.
- Appendix A, MIB Query Examples—Shows examples of using the `snmpwalk` utility to retrieve information from a Violin Memory device.

Reference Documents

In addition to this guide, the following Violin Memory documents comprise the documentation suite that will assist you with setting up, using and servicing Violin Memory products. These guides are available for download from the Violin Memory Support site at http://www.violin-memory.com/support/

This document...	Provides this information...
Release Notes	This document describes the new features, resolved issues, known limitations and software upgrade instructions for the current release.
Violin 6000 Series Memory Array Installation Guide	This guide provides instructions for installing the Violin 6000 Series Memory Array in an equipment rack and completing the system setup and configuration.
Violin 6000 Series Memory Array User's Guide	This guide provides instructions for managing, monitoring, and maintaining the Violin 6000 Series Memory Array using the Violin Web interface and Command Line Interface (CLI).

Reference Documents

Document Conventions

Safety Icons

The table below summarizes warning, caution, and note icons used in this document and includes sample text.

Safety Icons

Icon	Sample Text
WARNING!	**WARNING!** Only authorized, qualified, and trained personnel should attempt to work on this equipment.
Caution:	**Caution:** Follow the listed safety precautions when working on the Violin Memory device.
Note:	**Note:** Read through this entire chapter and plan your installation according to your location before installing the equipment. The following procedures and the order in which they appear are general installation guidelines only.

Typographical Conventions

The following typographic conventions are used in this guide:

Format	Meaning
Bold	Command names.
Italic	Provides emphasis and identifies document titles.
`Courier`	Examples and output.
`Courier bold`	Input you must type exactly as shown.
`<Courier>`	Information for which you must supply a value.
`[ ]`	Optional command parameters are enclosed within square brackets.
`|`	Separates a set of command choices from which only one may be chosen.
`{ }`	Required command parameters that must be specified are enclosed within curly brackets.

Typographical Conventions

Security

Violin Memory, Inc., cannot be responsible for unauthorized use of equipment and will not make allowance or credit for unauthorized use or access.

Contacting Violin Memory

To obtain additional information or technical support for Violin Memory products, contact us at:

Phone: 1-855-VIOLIN-5 (1-855-846-5465)

International: +1 650-396-1500 Extension 3

Web site: http://www.violin-memory.com

When contacting Violin Memory Customer Support, please have the following information available:

- Model and serial number of the system for which you are requesting support.
- Software version.
- A brief description of the problem.

CHAPTER 1 SNMP Configuration Overview

Simple Network Management Protocol (SNMP) is an Internet standard protocol for managing and monitoring devices on an IP network. You can use SNMP-enabled management systems, such as HP Network Node Manager and IBM Tivoli, to track the status of Violin Memory devices.

This manual explains how to configure SNMP on Violin Memory devices using the CLI and the Web Interface, describes the SNMP traps that can be generated, and provides examples of retrieving information from a Violin Memory device using the `snmpwalk` utility.

About Violin Memory SNMP MIBs

Violin Memory SNMP Management Information Base (MIB) files are available for use with standard SNMP clients. An enterprise manager should be configurable to track these items and report changes in the enterprise.

Note: You must use the MIB associated with the product version. MIBs are not guaranteed to be backwards/forwards compatible from version to version at this time.

MIB files are available for direct download from the Violin Web Interface. Go to **Administration** > **Information** page to obtain the MIB files, which are described in the following table.

This file...	Provides this information...
VIOLIN-MEMORY-ROOT-MIB.txt	The root Violin Memory Array and Gateway Object Identifiers (OIDs).
VIOLIN-MEMORY-ARRAY-MIB.txt	Individual Memory Array module information, including, model and serial numbers, software version, temperature, VIMM health, format, read and write, link speed, power and other states.
VIOLIN-MEMORY-MEDIA-MIB.txt	Basic Memory Array information, including chassis information, module states, alarms, VIMM life, format percentage and state, IP addresses, LED information, I/O information, read and write operations, and more.
VIOLIN-MEMORY-TRAP-MIB.txt	OIDs for SNMP traps sent from the Violin Memory device to configured destination points to alert when events occur, such as the lid is ajar, state changes to license keys, fans, and more.
TallMaple-MIB.txt	Basic system information about CPU load, process failures, mounted file systems, and more.

SNMP MIB Files

You can also download MIB files from the Violin Memory device using a web browser. Below are example URLs for MIBs on a Violin Memory device named HOSTNAME:

```
http://HOSTNAME/doc/VIOLIN-MEMORY-MIB.txt
http://HOSTNAME/doc/TallMaple-MIB.txt
http://HOSTNAME/doc/VIOLIN-MEMORY-TRAP-MIB.txt
```

You can obtain a free MIB Browser from iReasoning (Linux, Mac, Windows) that allows a load of up to 10 MIBs. A MIB Browser is a tool for managing SNMP enabled network devices and applications. It allows you to load MIBs, issue SNMP requests to retrieve agent's data, or make changes to the agent. A built-in trap receiver can receive SNMP traps and handle trap storms.

To download a free iReasoning MIB Browser, go to the company Web site at http://ireasoning.com

CHAPTER 2 Configuring SNMP on Violin Memory Devices

This chapter describes how to configure SNMP on Violin Memory devices using the Command Line Interface (CLI) and the Violin Web Interface. It contains the following sections:

Configuring SNMP Using the CLI

Using the CLI on the Violin Memory device, you can configure the following SNMP settings:

Enabling SNMP Functions on the Violin Memory Device

To activate SNMP or individual SNMP components on the Violin Memory device, use the following command:

```
snmp-server enable [communities | mult-communities | traps]
```

Entering the **snmp-server enable** command without options enables the SNMP server, including serving of SNMP variables sending of SNMP traps. The **communities** option enables community-based authentication on this system. The **mult-communities** option allows multiple communities to be configured. The **traps** option enables sending of SNMP traps from this system.

The **no** form of the command disables SNMP on the Violin Memory device entirely, or for a specified option.

For example, the following command enables the SNMP server on the Violin Memory device.

```
(config) # snmp-server enable
```

The following example enables sending of SNMP traps from the Violin Memory device.

```
(config) # snmp-server enable traps
```

Traps may only be enabled if the SNMP server overall is enabled. The following traps are sent by the SNMP agent by default:

- Cold boot (may include SNMP configuration having been changed)
- Link up/down
- CPU load too high
- CPU load no longer too high
- Paging activity too high

Note that traps are only sent if there are trap sinks configured with the **snmp-server host** command, and if these trap sinks are themselves enabled.

Setting the SNMP Community Name

An SNMP community name is required to be supplied with SNMP requests to the system. To set the system's SNMP community name, use the following command:

```
snmp-server community <community> [ro]
```

where `<community>` is the SNMP community. The **ro** option adds the community as a read-only community, so that management stations can retrieve, but not modify MIB objects on the Violin Memory device. The **no** form of the command removes all SNMP communities and resets to the default community, or if a `<community>` is specified, removes the community name from the configuration.

For example, the following command configures the SNMP community name `mgmtaccess` on the Violin Memory device.

```
(config) # snmp-server community mgmtaccess
```

Specifying SNMP Trap Sinks

An SNMP trap sink defines a host and a community string pair. When a trap event occurs, the SNMP agent sends out a trap to the hosts specified as SNMP trap sinks, using the community string.

To specify the hosts that will receive SNMP traps from the Violin Memory device, use the following command:

```
snmp-server host <ip-address> traps [<community>] [port <number>]
[version 1 | 2c]
snmp-server host <ip-address> disable
```

where:

`<ip-address>`	Is the IP address of a host to be used as an SNMP trap sink.
`disable`	Disables sending traps to the SNMP trap sink, but does not remove it from the configuration. Use the **no** form of the command to re-enable sending traps to the host.
`traps`	Enables sending SNMP traps to the specified host.
`<community>`	Optionally specifies the community string.
`port <number>`	Overrides the default target port for this trap sink.
`version 1	2c`	Sets the SNMP version of traps to send to this host.

For example, the following command configures the Violin Memory device to send SNMP traps to the host at 10.10.10.10.

```
(config) # snmp-server host 10.10.10.10 traps
```

Enabling Traps

By default the entire list of notifiable events are sent as SNMP traps to any configured trap sinks.

To specify settings for sending SNMP traps to hosts configured to receive them from the Violin Memory device, use the following command:

```
snmp-server traps {community <community> | event <event-name> | port
<number>}
```

where:

`community` `<community>`	Set the default community string for SNMP traps. This setting applies to SNMP traps sent to hosts that do not have a custom community string set.
`event <event-name>`	Specifies the events that are sent as SNMP traps. Use the **no** form of the command to disable individual events for conversion to SNMP traps.
`port <number>`	Sets the default port to which SNMP traps are sent. The **no** form of the command resets the port used for sending traps to the default of UDP port 162.

The following example configures the default community string for SNMP traps.

```
(config) # snmp-server traps community mgmtaccess
```

The following example disables sending SNMP traps for the event `user-logout`.

```
(config) # no snmp-server traps event user-logout
```

Setting System Contact Information

You can specify contact information for the Violin Memory device administrator. To do this, use the following command:

```
snmp-server contact <contact name>
```

The **snmp-server contact** command sets the syscontact variable served from the System MIB in MIB-II The **no** form of the command clears the contents of the syscontact variable.

For example, the following command sets the syscontact variable to vmem_admin.

```
(config) # snmp-server contact vmem_admin
```

Specifying the System Location

You can optionally specify the physical location of the Violin Memory device, which can be useful if you need to determine the location of the device in a large network. To do this, use the following command:

```
snmp-server location <system location>
```

The **snmp-server location** command sets the syslocation variable served from the System MIB in MIB-II. The **no** form of the command clears the contents of the syslocation variable.

For example, the following command sets the syslocation variable to datacenter_1.

```
(config) # snmp-server location datacenter_1
```

Setting the SNMP Agent Port

You can optionally change the port used by the SNMP agent from its default value of UDP port 161. to do this, use the following command:

```
snmp-server port <number>
```

The **no** form of the command resets the port used for the SNMP agent to the default of UDP port 161.

For example, the following command sets the port for the SNMP agent to UDP port 4310.

```
(config) # snmp-server port 4310
```

Specifying a SNMP Listen Interface

You can optionally configure an interface listen list for SNMP connections. If this feature is enabled, and at least one non-DHCP interface is specified in the listen list, SNMP connections are only accepted on interfaces in the list. By default the feature is disabled, and SNMP connections are accepted on any interface.

To enable the SNMP listen list feature, use the following command:

```
snmp-server listen enable
```

The **no** form of the command allows SNMP connections to be accepted on any interface.

The following command enables the interface listen list for SNMP connections.

```
(config) # snmp-server listen enable
```

To specify the interfaces in the listen list, use the following command:

```
snmp-server listen interface <ifname>
```

Where `<ifname>` is an interface to add to the SNMP listen list. The interface should be statically configured; that is DHCP and zeroconf should be disabled.

If the interface is also running as a DHCP client, it will be as if the interface was not added to the listen list. If DHCP is later disabled on the interface, it will be as if the interface was then added to the listen list.

For example, the following command adds interface `eth0` to the listen list for SNMP connections.

```
(config) # snmp-server listen enable
(config) # snmp-server listen interface eth0
```

Configuring SNMP v3 Users

You can enable or disable SNMPv3 access for specified users on the Violin Memory device. To do this, use the following command:

```
snmp-server user <username> v3 enable
```

The **no** form of the **snmp-server user v3 enable** disables SNMPv3 access for the specified `<username>`.

The following example enables SNMPv3 access for a user named "oboe".

```
(config) # snmp-server user oboe v3 enable
```

The following example disables SNMPv3 access for the user "oboe".

```
(config) # no snmp-server user oboe v3 enable
```

For users with SNMP v3 access enabled, you can specify identity and security parameters. Use the following command:

```
snmp-server user <username> v3 [encrypted | prompt] auth <hash-type>
<password> [priv <encryption-type> [<password>]]
```

where:

`<username>`	Specifies the name of the SNMPv3 user to be configured.
`encrypted`	Allows you to specify the passwords for the command in encrypted format.
`prompt`	Causes the CLI to prompt you for the passwords. Use this as an alternative to entering the passwords on the command line.
`auth <hash-type> <password>`	Specifies the hash algorithm and hashed password to be used for authentication of the SNMPv3 user.
`priv <encryption-type> [<password>]`	Optionally configures the SNMPv3 privacy settings for this user. You can specify the encryption type and optionally specify a password. If you do not specify a password here, the password specified with the **auth** parameter is used.

The **no** form of the **snmp-server user v3** command deletes the SNMPv3 user from the configuration.

The following example creates an SNMPv3 user named "oboe" with password "violin". The MD5 hash algorithm is used for authentication.

```
(config) # snmp-server user oboe v3 auth md5 violin
```

Displaying SNMP v3 User Information

You can display the identity and security parameters for SNMPv3 users configured on the Violin Memory device. Use the following command:

```
show snmp user
```

The following example displays information about SNMPv3 users on the Violin Memory device.

```
# show snmp user
User name: admin
   Enabled overall:        no
   Authentication type:    sha
   Privacy type:           aes-128
   Authentication password: (NOT SET; user disabled)
   Privacy password:       (NOT SET; user disabled)
```

For each SNMPv3 user, the following fields are displayed by the command. These settings are configured with the **snmp-server user v3** command.

User name	The name of the SNMPv3 user.
Enabled overall	Whether SNMPv3 access is enabled for the user.
Authentication type	The hash algorithm to be used for authentication of the SNMPv3 user.
Privacy type	The privacy encryption type.
Authentication password	Encrypted version of the SNMPv3 user's password, if configured.
Privacy password	Encrypted version of the SNMPv3 user's privacy password, if configured. If not set, then the authentication password is used as the privacy password.

Displaying the Local SNMPv3 Engine ID

The local SNMPv3 engine ID is used in conjunction with SNMPv3 user passwords to generate authentication and encryption keys for SNMPv3 users. To display the value of the local SNMPv3 engine ID, use the following command:

```
show snmp engineID
```

The following example displays the local SNMPv3 engine ID on the Violin Memory device.

```
# show snmp engineID
Local SNMP engineID: 0x80008c3123456789306533396464626464
```

Sending a Test SNMP Trap

You can send a test SNMP trap to all configured trap sinks. The trap that is sent is the testTrap notification from the TMS-MIB. This trap is only ever sent on request from the user; it is never triggered automatically. The testTrap notification cannot be enabled or disabled with the **snmp-server traps events** command; it is always enabled, meaning it will always be sent when requested by the user.

To send a test trap, use the following command:

```
snmp-server traps send-test
```

The following example sends a test trap to all configured trap sinks.

```
(config) # snmp-server traps send-test
```

Displaying SNMP Configuration Information

To display information about the SNMP configuration on the Violin Memory device, use the following command:

```
show snmp
```

The following example displays information about the SNMP settings on the Violin Memory device.

```
# show snmp
SNMP enabled:           yes
SNMP port:              161
System contact:
System location:        MVII

Read-only communities:
   public

Interface listen enabled: yes
No Listen Interfaces.

Traps enabled:          yes
Default trap community:    public
Default trap port:      162

Trap sinks:
   10.1.4.135
      Enabled: yes
      Type: traps version 2c
      Port: 162 (default)
      Community: public (default)
```

The following fields are displayed by the command:

`SNMP enabled`	Whether SNMP is enabled on the Violin Memory device, set with the **snmp-server enable** command.
`SNMP port`	The UDP port for the SNMP agent, set with the **snmp-server port** command (default 161).
`System contact`	The contents of the syscontact variable served from the System MIB in MIB-II, set with the **snmp-server contact** command.
`System location`	The contents of the syslocation variable served from the System MIB in MIB-II, set with the **snmp-server location** command.
`Read-only communities`	Communities specified as read-only, allowing management stations to retrieve, but not modify, MIB objects on the Violin Memory device, set with the **ro** option in the **snmp-server community** command.
`Interface listen enabled`	Whether the Violin Memory device is configured to accept SNMP connections only on specific interfaces, set with the **snmp-server listen enable** and **snmp-server listen interface** commands. If there are non-DHCP interfaces in the listen list, SNMP connections are only accepted on interfaces in the list. Otherwise, SNMP connections are accepted on any interface.
`Traps enabled`	Whether the Violin Memory device is configured to send SNMP traps to hosts (trap sinks) specified to receive them, set with the **snmp-server traps** command.
`Default trap community`	The default community string for SNMP traps, set with the **snmp-server traps community** command. This setting applies to SNMP traps sent to hosts that do not have a custom community string set.
`Default trap port`	The default UDP port to which SNMP traps are sent, set with the **snmp-server traps port** command (default 162).
`Trap sinks`	Settings for the hosts that will receive SNMP traps from the Violin Memory device, set with the **snmp-server host** command.

Managing SNMP Settings Using the Web Interface

You can individually configure several types of SNMP settings through the Web Interface. This section covers the following:

- Enabling SNMP Management on page 12
- Configuring SNMP Settings on page 12
- Setting SNMP Trap Sinks on page 13

Enabling SNMP Management

You can interactively enable and disable SNMP Management from the SNMP Settings page.

1. In the Violin Web Interface, select **Administration** > **Notification** > **SNMP Settings**.

2. Under **Network Settings: SNMP**, select the Enable SNMP Management box to enable SNMP, or deselect the box to disable SNMP management.

3. Click **Apply** to activate your selection, or click **Cancel** to return to the previous state.

Configuring SNMP Settings

To configure SNMP settings, do the following:

1. In the Violin Web Interface, select **Administration** > **Notification** > **SNMP Settings**.

2. Under SNMP Configuration, enter the following information the appropriate text fields:

- SNMP Port: The port number assigned for SNMP traffic.
- System Location: Physical location of the monitored device; for example "Server room, Rack 1".
- System Contact: Contact information for the device administrator.

3. Enable or disable the following options by selecting the check box next to the option, then from the drop-down list choose between Public, or Private:

- Read-Only Community
- SNMP Traps Community

4. Click **Apply** to activate your selection, or click **Cancel** to return to the previous state.

Setting SNMP Trap Sinks

A trap sink defines a host and a community string pair. When a trap event occurs, the SNMP agent sends out a trap to each host in the trap sink list using the community string. Using the Violin Web Interface, you can configure a trap sink list by adding, enabling, disabling, and removing SNMP servers (hosts) in the list.

The SNMP Trap Sinks panel lists configured SNMP servers, their Type-Version (type of security implemented as related to the version of SNMP), if SNMP management is enabled or not, and the community configuration.

To configure a SNMP trap sink list, do the following:

1. In the Violin Web Interface, select **Administration** > **Notification** > **SNMP Settings**.
2. Under SNMP Trap Sinks, enter the IP address of an SNMP server to be used as a trap sink in the SNMP Server IP field.
3. From the Type-Version drop-down list, choose one of the following:
   - Trap-v1: Implements community-based security
   - Trap-v2: Implements party-based security
4. From the Enable Server drop-down list, choose Yes or No.
5. From the Community drop-down list, choose Public or Private.
6. Click **Add SNMP Server** to add the server to the SNMP trap sink list.
7. To remove an SNMP server from the trap sink list, select the server in the table, and click **Remove Selected Server**.
8. To enable or disable an SNMP server in the list to receive traps, select the server in the table, and click **Enable Server** or **Disable Server**.

Selecting SNMP Trap Events

The SNMP Traps Events page allows you to interactively select SNMP trap events for which notifications are sent. For information on the available SNMP traps, see SNMP Trap Reference on page 15.

To select Trap events for notification, do the following:

1. In the Violin Web Interface, select **Administration** > **Notification** > **SNMP Events**.
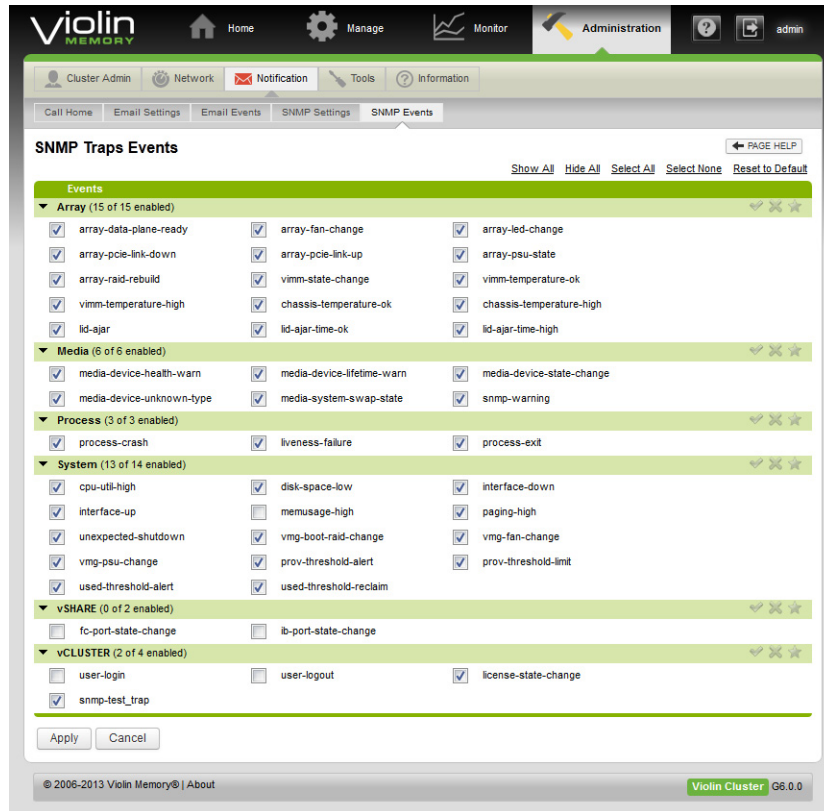
2. Select the desired SNMP trap events using the following actions:

- Expand and collapse a category by clicking the arrow next to its name, or click **Show All** to view all events or **Hide All** to collapse all categories.

- Choose from the following global event actions:
  Select All: Selects all events
  Select None: Deselects all events
  Reset Defaults: Returns to system default selections

- Select individual events in a category by clicking the check box next to the event name.

- Select all the events in a category by clicking the check mark icon on the right side of the header.

- Deselect all selected events in a category by clicking the X icon on the right side of the header.

- Reset the selections for a category to the default selections by clicking the star icon on the right side of the header.

3. Click **Apply** to accept your selections, or **Cancel** to return to the previous settings.

CHAPTER 3 SNMP Trap Reference

This chapter provides reference information about SNMP traps generated on Violin Memory devices. For each trap, the table lists the following:

- Name of the event that generates the trap
- Threshold value that causes the trap to be generated
- Description of the trap event
- User action or solution to the problem indicated by the trap, if applicable
- Severity level of the trap
- Violin Memory software release in which the trap was introduced

An asterisk next to the trap event name indicates that the trap is enabled by default.

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
array-data-plane-ready*	State Change	0 or 1	A Violin Array data plane available state change has occurred. The old value and new values are supplied. A value of 0 = not ready, 1 = ready.	If the new value is 0, then check the Violin Array alarms for more information.	High / Low	5.1.x
array-fan-change	State Change	State	One or more fans have changed state on a Violin Array. The old and new values are provided using the following states: OFF, Absent, Low, Medium, or High.	Check Violin Array for alarms as well as airflow and operating environment.	Medium	

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
array-led-change*	State Change	State	One or more of the LEDs on a Violin Array has changed state. The following LEDs are tracked for state change: Alarm, PowerA, PowerB, and Status. The LED values are: OFF, SLOW_BLINK, FAST_BLINK, or ON.	If the new value is OFF for either Power LED, then check power cables. If Status LED is anything but ON, or Alarm LED is anything but OFF, then check the Violin Array for alarms.	High / Low	5.1.x
array-module-state-change	State Change	State				
array-pcie-link-down*	Event	Triggered	The Violin Array specified in the trap has detected a PCIe link loss.	Check the PCIe cable between the Violin Array and the Violin Memory Gateway.	High	5.1.x
array-pcie-link-up*	Event	Triggered	The Violin Array specified in the trap has detected that the PCie link has gone active.	Nothing.	Low	5.1.x
array-psu-state*	State Change	State	A Violin Array has changed state regarding one or both of the Power Supply Units. A true or false value for psuA and psuB specifies whether the old / new values are different. The PSU state can be: Absent, ON, or OFF.	Check the power source to the Violin Array power supplies.	High / Low	5.1.x
array-raid-rebuild*	State Change	0 or 1	A Violin Array has changed state regarding VIMM RAID group rebuild. A new value of 1 specifies that a RAID rebuild is in progress and that performance will be affected. A new value of 0 specifies that the RAID rebuild has completed.	If the new value is 1, check the Violin Array alarms for a failed VIMM and contact Violin support for a possible replacement.	Medium	5.1.x

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
chassis-temperature-high*	75	Celsius	Temperature inside a Violin chassis has exceeded normal operating range	Check airflow and operating environment.	High	5.1.x
chassis-temperature-ok*	70	Celsius	Temperature inside a Violin chassis has dropped into normal operating range	Nothing.	Low	5.1.x
cpu-util-high*	98	Percent	A Violin Memory Gateway has detected that a CPU has exceeded utilization above the threshold level	Please contact Violin customer support if the system is not under full data traffic load.	Low	pre-5.1.x
disk-io-high	5120	KBytes / sec	The internal disk on a Violin Memory Gateway has crossed a threshold for performing too many I/Os per second.	If the system is not under data traffic load, please contact Violin customer support.	Low	
disk-space-low*	0	Percent Free	A Violin Memory Gateway disk space has crossed the threshold of percent of bytes free.	Please contact Violin customer support.	Medium	pre-5.1.x
fc-port-state-change	State Change	State	One or more Fibre Channel ports have changed state on a Violin Memory Gateway. The old and new values for state are provided from one of: Unknown, Failover Failed, Failover, Not Supported, Online, Lost, Dead, Unconfigured. The FC port speed is included in the data but not used to generate the state change. The following speed values are used: 1 Gbit, 2 Gbit, 4 Gbit, and 8 Gbit.	Verify that OM-3 rate Fibres are used in your config for 8 Gb. Check that the Fibres and SFP ports were properly cleaned and that the cables and SFP's are fully inserted. Verify that the Fibre does not exceed bend radius specifications.	Medium	

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
free-space-low	User configurable	Percent Free	Available free space on the array fell below the threshold.	Adjust the free space threshold to activate space reclamation, and/or delete unused snapshots.	Medium	
ib-port-state-change*	State Change	Active, Down, Initialize, Armed	vSHARE InfiniBand (IB) port state changed.	One or more of the IB ports have changed state on a Violin Memory Gateway. The old and new state values are provided, as well as the IB port speed. If a port is down, contact Violin Memory Customer Support.	Medium to High	5.2.x
interface-down*	Event	Triggered	A network interface on a Violin Memory Gateway has lost link.	Check the network cables to the Violin Memory Gateway.	High	pre-5.1.x
interface-up*	Event	Triggered	A network interface on a Violin Memory Gateway has detected link up.	Nothing.	Low	pre-5.1.x
ipmid-coretemp						
kernel-crash	Event	Triggered	The Violin Memory Gateway kernel crashed.			
license-state-change	State Change	State	A Violin Memory Gateway feature license state has changed. The old and new active state is passed as well as the specific feature license. The active state is a "true" or "false" value. When true, the feature license is active.	If a license has changed to active = false, please contact Violin customer support to see if your license has expired.	Medium	
lid-ajar*	State Change	Triggered	Violin chassis lid is open.	Close and secure the lid.	High	5.2.x
lid-ajar-time-high*	60	Seconds	A Violin chassis lid has been open for at least this period	Verify Violin chassis lid is closed	High	5.1.x

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
lid-ajar-time-ok*	1	Seconds	A Violin Array chassis lid has been closed for at least this period	Nothing.	Low	5.1.x
liveness-failure*	Event	Triggered	An internal process on a Violin Memory Gateway has been detected as hung.	Please contact Violin customer support	High	pre-5.1.x
media-device-health-warn	10	Percent	A Violin Array has one or more health attributes in a warning or critical state. Normalized S.M.A.R.T attributes are used. The key attributes for Violin Arrays are Avail Reserved Space and Media Wearout Indicator. S.M.A.R.T attr 232: Avail Reserved Space is the percentage of reserved blocks available (unused). This threshold is 10%. S.M.A.R.T attr 233: Media Wearout Indicator tracks the number of erase cycles for flash as a percentage of life remaining.	Check the Violin Array for any alarms.	High	
media-device-lifetime-warn	5	Percent	A Violin Array has crossed the threshold for S.M.A.R.T attr 233: Media Wearout Indicator. This tracks the number of erase cycles for flash as a percentage of life remaining.	Contact Violin customer support to determine if any VIMMs should be replaced.	High	
media-device-state-change	State Change	State	A Violin Array has changed state. The possible states are: unknown, online, offline, error, removed, disabled, or onlining.	Verify that the connected Violin Array is in the proper online state.	High / Low	

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
media-device-unknown-type	Event	Triggered	A Violin Memory Gateway has detected a media device connected of an unknown type. The Model, Serial #, and size are provided.	The most common occurrence is a freshly formatted Violin Array has been connected to a Violin Memory Gateway. The CLI "media init ..." command is used to initialize the device.	Low	
media-system-swap-state	State Change	State	An internal Memory Gateway disk has changed state for having an active swap partition. The active state is true when a swap partition has been activated or false for deactivation.	Please contact Violin customer support.	Low	
memusage-high	90	Percent	A Violin Memory Gateway has detected that system RAM has exceeded a percentage in use threshold.	Please contact Violin customer support.	Medium	
netusage-high	10485760	Bytes / sec	A Violin Memory Gateway has detected that a network interface has exceeded a bytes per second threshold.	Please verify your network configuration. For 10 GbE iSCSI, the threshold should be adjusted much higher.	Low	
paging-high*	2000	Duration / sec	Memory paging on a Violin Memory Gateway has exceeded a threshold.	Please contact Violin customer support if the system is not under full data traffic load.	Medium	pre-5.1.x
process-crash*	Event	Triggered	An internal process on a Violin Memory Gateway has crashed. A callhome event is generated with the details of the event.	Please contact Violin customer support.	High	pre-5.1.x

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
process-exit*	Event	Triggered	An internal process on a Violin Memory Gateway has unexpectedly exited. A callhome event is generated with the details of the event.	Please contact Violin customer support.	High	pre-5.1.x
prov-threshold-alert	Range: 0-999 Default: 0 (disabled)	Percent	The threshold percentage of provisioned space in a Violin Memory Array has been exceeded; LUN creation succeeds, but an alert is issued.	Check the amount of provisioned space on the Violin Memory Array; delete LUNs if necessary.	Medium	6.0.x
prov-threshold-limit	Range: 0-999 Default: 100	Percent	The threshold percentage of provisioned space in a Violin Memory Array has been exceeded; LUN creation fails and an error is issued.	Delete LUNs or increase the provisioning space threshold.	High	6.0.x
snmp-authtrap	Event	Triggered	An SNMP v3 request has failed authentication.			
unexpected-cluster-join	Event	Triggered	A Violin Memory Gateway has unexpectedly joined a vCLUSTER after the 180 seconds cluster startup time has elapsed.	Check the Violin Memory Gateway log for any errors. Please contact Violin customer support if the join event is unexplained.	Low	
unexpected-cluster-leave	Event	Triggered	A Violin Memory Gateway has unexpectedly left a vCLUSTER after already being a member.	Check power and network connectivity to the missing VMG. Please contact Violin customer support if the leave event is unexplained.	High	

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
unexpected-cluster-size	Expected Nodes	Node count	After a vCLUSTER startup time of 180 seconds has elapsed, the number of detected nodes should match cluster expected-nodes configured. This trap is sent when the number of nodes has changed and is not the expected value.	Use the CLI to configure "cluster expected-nodes" to set the appropriate value.	Low	
unexpected-shutdown*	Event	Triggered	A Violin Memory Gateway has unexpectedly shut down. This may happen during a software upgrade when the upgrade did not cleanly apply and the system reverted back to the previous version prior to upgrade. A callhome event is generated.	Please contact Violin customer support.	High	pre-5.1.x
used-threshold-alert	Range: 0-100 Default: 0 (disabled)	Percent	The threshold percentage of used space in a Violin Memory Array has been exceeded; an alert is issued.	Check the amount of space used on the Violin Memory Array. Adjust the maximum number of snapshots or snap groups to keep.	Medium	6.0.x
used-threshold-limit	Range: 0-100 Default: 0 (disabled)	Percent	The threshold percentage of used space in a Violin Memory Array has been exceeded; snapshot space reclamation begins.	Snapshots and snap groups are automatically deleted from oldest to newest until the amount of used space drops below the threshold value.	High	6.0.x
used-threshold-reclaim	Range: 0-100 Default: 0 (disabled)	Percent	The threshold percentage of used space in a Violin Memory Array has been exceeded; snapshot space reclamation begins.	Snapshots and snap groups are automatically deleted from oldest to newest until the amount of used space drops below the threshold value.	High	6.0.x

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
user-login	Event	Triggered	A login to a Violin Memory Gateway via either the CLI or Web UI has occurred.	Verify the user id has not been compromised.	Low	
user-logout	Event	Triggered	A logout from a Violin Memory Gateway via either the CLI or Web UI has occurred.	Check that the appropriate settings for auto-logout are configured for the user. There are separate settings for the CLI vs. Web UI.	Low	
vimm-state-change*	State Change	State	One or more VIMMs have changed state on a Violin Array. A comma separated list of VIMMs are provided for each state: admin_down, booting, active, spare, failed, present, or alarmed. The set value for each VIMM list / state change is "true" for set or "false" for clear.	Check the Violin Array for alarms to determine severity of state change.	High / Low	5.1.x
vimm-temperature-high*	80	Celsius	VIMM temperature has exceeded normal operating range	Check airflow and operating environment.	High	5.1.x
vimm-temperature-ok*	75	Celsius	VIMM temperature has dropped into normal operating range	Nothing.	Low	5.1.x
vmem-user-login	Event	Triggered	A login to a Violin Memory Gateway via either the CLI or Web UI has occurred.	Verify the user id has not been compromised.	Low	
vmem-user-logout	Event	Triggered	A logout from a Violin Memory Gateway via either the CLI or Web UI has occurred.	Check that the appropriate settings for auto-logout are configured for the user. There are separate settings for the CLI vs. Web UI.	Low	

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.	Rel.
vmg-boot-raid-change*	NA	Active, Degraded, Resyncing Unknown	There was a state change in the book disk. The states are as follows: • Active is a normal state. • Resyncing means the RAID group is rebuilding, which is also normal. • Degraded means the RAID disk is down. • Unknown means the RAID disk is unavailable and could be down.	Degraded and Unknown status mean that the RAID disk is likely down and needs to be replaced.	High	5.2.x
vmg-fan-change*	NA	Off, Absent, Low, Medium, High,	One or more fans have changed state on a Violin Memory Gateway.	An absent status could mean a failed fan. Replace the fan as soon as possible.	High	5.2.x
vmg-ha-split-brain						
vmg-psu-change*	NA	On, Off, Absent	Power supply status changed. There are two power supply units and both should be on.	If the status changes to off or absent, investigate the issue immediately.	High	5.2.x

APPENDIX A MIB Query Examples

This appendix shows some examples of using the snmpwalk utility to retrieve information from a target Violin Memory device.

Spare VIMMs

To query the spare VIMMs in the system:

```
$ snmpwalk -Ou -M +. -m +./VIOLIN-MEMORY-MIB.txt -v 2c -c public <target> violin-
memory | grep spare | grep "Gauge32: 1"

enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.spa
re."lab-system-098"."vimm30" = Gauge32: 1
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.spa
re."lab-system-098"."vimm31" = Gauge32: 1
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.spa
re."lab-system-098"."vimm32" = Gauge32: 1
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.spa
re."lab-system-098"."vimm52" = Gauge32: 1
```

Failed VIMMs

To query the failed VIMMs in the system:

```
$ snmpwalk -Ou -M +. -m +./VIOLIN-MEMORY-MIB.txt -v 2c -c public <target> violin-
memory | grep fail | grep "Gauge32: 1"

(none)
```

PSU States

To query the state of the power supplies in the system:

```
$ snmpwalk -Ou -M +. -m +./VIOLIN-MEMORY-MIB.txt -v 2c -c public <target> violin-
memory | grep -i psu

enterprises.violin-
memory.products.memoryGateway.appliance.media.chassisSystemArrayTable.chassisSy
stemArrayEntry.chassisSystemPowerPSUA."lab-fender-098" = STRING: "ON"
enterprises.violin-
memory.products.memoryGateway.appliance.media.chassisSystemArrayTable.chassisSy
stemArrayEntry.chassisSystemPowerPSUB."lab-fender-098" = STRING: "ON"
```

Temperatures: per VIMM and Chassis

To query the temperatures (reported in degrees celsius) of the chassis and the VIMMs:

```
$ snmpwalk -Ou -M +. -m +./VIOLIN-MEMORY-MIB.txt -v 2c -c public <target> violin-
memory | grep -i temp

enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm00" = INTEGER: 39
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm01" = INTEGER: 43
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm02" = INTEGER: 43
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm03" = INTEGER: 45
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm04" = INTEGER: 42
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm05" = INTEGER: 41
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm06" = INTEGER: 39
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm07" = INTEGER: 38
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm08" = INTEGER: 37
enterprises.violin-
memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.tem
p."lab-system-098"."vimm09" = INTEGER: 38
```

Performance Statistics

To query performance statistics for the system:

```
$ snmpwalk -Ou -M +. -m +./VIOLIN-MEMORY-MIB.txt -v 2c -c public <target> violin-memory | grep ata-VIOLIN

enterprises.violin-memory.products.memoryGateway.appliance.media.mediaDevTable.mediaDevEntry.mediaDevIdx."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: ata-VIOLIN_MEMORY_ARRAY_2110CR00000304
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaDevTable.mediaDevEntry.devId."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: ata-VIOLIN_MEMORY_ARRAY_2110CR00000304
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaDevTable.mediaDevEntry.fwVersion."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 3.7.2
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaDevTable.mediaDevEntry.g6Model."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: Violin Memory Array
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaBlockTable.mediaBlockEntry.devId."2110CR00000304" = STRING: ata-VIOLIN_MEMORY_ARRAY_2110CR00000304
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaBlockTable.mediaBlockEntry.devPath."2110CR00000304" = STRING: /dev/disk/by-id/ata-VIOLIN_MEMORY_ARRAY_2110CR00000304-part4
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.mediaStatsDevIdx."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: ata-VIOLIN_MEMORY_ARRAY_2110CR00000304
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.kernelOpsInProgress."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 0
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.kernelOpsTime."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 47374
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.kernelOpsTimeWeighted."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 79475
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.kernelReadCompleted."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 1157474
enterprises.violin-memory.products.memoryGateway.appliance.media.mediaStatsDevTable.mediaStatsDevEntry.kernelReadKbytes."ata-VIOLIN_MEMORY_ARRAY_2110CR00000304" = STRING: 11750483
```

Fibre Channel Performance Statistics (vSHARE)

The following is an example of querying Fibre Channel performance statistics for a vSHARE configuration.

```
$ snmpwalk -c public -v 2c <target> VIOLIN-MEMORY-
MIB::statsTargetFcTable.statsTargetFcEntry -m VIOLIN-MEMORY-MIB.txt

VIOLIN-MEMORY-MIB::statsTargetFcIdx."hba-a1" = STRING: hba-a1
VIOLIN-MEMORY-MIB::statsTargetFcIdx."hba-a2" = STRING: hba-a2
VIOLIN-MEMORY-MIB::txFrames."hba-a1" = STRING: 1222433
VIOLIN-MEMORY-MIB::txFrames."hba-a2" = STRING: 1222436
VIOLIN-MEMORY-MIB::rxFrames."hba-a1" = STRING: 611257
VIOLIN-MEMORY-MIB::rxFrames."hba-a2" = STRING: 611260
VIOLIN-MEMORY-MIB::dumpedFrames."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::dumpedFrames."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::nosCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::nosCount."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::linkFailureCount."hba-a1" = STRING: 116
VIOLIN-MEMORY-MIB::linkFailureCount."hba-a2" = STRING: 61
VIOLIN-MEMORY-MIB::lossOfSyncCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::lossOfSyncCount."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::lossOfSignalCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::lossOfSignalCount."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::invalidTxWordCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::invalidTxWordCount."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::invalidCrcCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::invalidCrcCount."hba-a2" = STRING: 0
VIOLIN-MEMORY-MIB::primSeqProtocolErrCount."hba-a1" = STRING: 0
VIOLIN-MEMORY-MIB::primSeqProtocolErrCount."hba-a2" = STRING: 0
```