



SNMP Configuration Guide for Concerto OS

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Table of Contents

CHAPTER 1. SNMP Configuration Overview	1
About SNMP Configuration in Concerto OS	1
About Violin Memory SNMP MIBs	1
MIB Files for Array Controller Modules (ACMs)	2
MIB Files for Memory Gateways	2
CHAPTER 2. Configuring SNMP on Violin Memory Devices	3
Configuring SNMP on Array Controller Modules	3
Enabling SNMP Functions on the ACM	4
Setting the SNMP Community Name	4
Specifying SNMP Trap Sinks	5
Enabling Traps	5
Setting System Contact Information	6
Specifying the System Location	6
Setting the SNMP Agent Port	7
Specifying a SNMP Listen Interface	7
Configuring SNMP v3 Users	8
Sending a Test SNMP Trap	10
Displaying SNMP Configuration Information	10
Configuring SNMP on Violin Memory Gateways	11
Enabling Heartbeat Traps	12
CHAPTER 3. ACM SNMP Trap Reference	15
CHAPTER 4. IPSTOR-MIB Reference	21
APPENDIX A. MIB Query Examples	51
Spare VIMMs	51
Failed VIMMs	51
PSU States	52
Temperatures: per VIMM and Chassis	52
Performance Statistics	53
Fibre Channel Performance Statistics	54



Preface

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

- [Intended Audience](#) on page v
- [Document Organization](#) on page vi
- [Reference Documents](#) on page vi
- [Document Conventions](#) on page vii
- [Contacting Violin Memory](#) on page viii

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.
- [Chapter 3, ACM SNMP Trap Reference](#)—Provides information about SNMP traps generated by Array Controller Modules (ACMs).
- [Chapter 4, IPSTOR-MIB Reference](#)—Describes the tables and fields in the IPSTOR-MIB file on the Memory Gateway.
- [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.
<i>Violin 7300 Flash Storage Platform Installation Guide</i>	This guide provides instructions for installing the Violin 7300 Series Flash Storage Platform in an equipment rack and completing the system setup and configuration.
<i>Concerto User's Guide for Concerto 7.5 and Aria 7.0</i>	This guide provides instructions for managing, monitoring, and maintaining the Violin 7300 Series Flash Storage Platform using the Violin Web interface and Command Line Interface (CLI).
<i>Concerto 7.5 Command Line Interface Reference</i>	This guide is a reference for the Violin Memory CLI commands used to configure, manage, and monitor Violin Memory Gateways.
<i>Aria 7.0 Command Line Interface Reference</i>	This guide is a reference for the CLI commands used to configure, manage, and monitor the ACMs in the Violin Flash Storage Platform.

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.
<i>Italic</i>	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.

About SNMP Configuration in Concerto OS

You can configure SNMP on Violin Memory devices using either Violin Symphony or the Command Line Interface (CLI). Violin Symphony is a multi-array and cluster management tool that provides enterprise-scale management and monitoring of Violin devices from a single window.

If you do not have Violin Symphony installed at your site, you must configure SNMP using the Violin Memory device's CLI. This manual explains how to configure SNMP using the CLI, describes the SNMP traps that can be generated, and provides examples of retrieving information from a Violin Memory device using the `snmpwalk` utility.

For information about configuring SNMP using Violin Symphony, see the Symphony online help.

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.

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>

MIB Files for Array Controller Modules (ACMs)

The MIB files for the ACMs are listed in the following table:

This file...	Provides this information...
VIOLIN-MEMORY-ROOT-MIB.txt	The root ACM Object Identifiers (OIDs).
VIOLIN-MEMORY-ARRAY-MIB.txt	Individual 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 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 ACM 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 for Array Controller Modules (ACMs)

You can download the ACM MIB files directly from the array using a web browser. Below are example URLs for MIBs on an ACM named `HOSTNAME`:

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

MIB Files for Memory Gateways

The MIB files for a Violin Memory Gateway are located in the `/usr/local/concerto/etc/snmp/mibs` directory on the controller. The `IPSTOR-MIB.TXT` file provides information about the Memory Gateway. See [IPSTOR-MIB Reference](#) on page 21 for descriptions of the fields and tables in the `IPSTOR-MIB.TXT` file.

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). It contains the following sections:

- [Configuring SNMP on Array Controller Modules](#) on page 3
- [Configuring SNMP on Violin Memory Gateways](#) on page 11

Configuring SNMP on Array Controller Modules

Using the Aria CLI on an ACM, you can configure the following SNMP settings:

- [Enabling SNMP Functions on the ACM](#) on page 4
- [Setting the SNMP Community Name](#) on page 4
- [Specifying SNMP Trap Sinks](#) on page 5
- [Enabling Traps](#) on page 5
- [Setting System Contact Information](#) on page 6
- [Specifying the System Location](#) on page 6
- [Setting the SNMP Agent Port](#) on page 7
- [Specifying a SNMP Listen Interface](#) on page 7
- [Configuring SNMP v3 Users](#) on page 8
- [Sending a Test SNMP Trap](#) on page 10
- [Displaying SNMP Configuration Information](#) on page 10

Enabling SNMP Functions on the ACM

To activate SNMP or individual SNMP components on the ACM, 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 ACM entirely, or for a specified option.

For example, the following command enables the SNMP server on the ACM.

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

The following example enables sending of SNMP traps from the ACM.

```
(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 Flash Storage Platform. 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 Flash Storage Platform.

```
(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 ACM, use the following command:

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

where:

<code><ip-address></code>	Is the IP address of a host to be used as an SNMP trap sink.
<code>disable</code>	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.
<code>traps</code>	Enables sending SNMP traps to the specified host.
<code><community></code>	Optionally specifies the community string.
<code>port <number></code>	Overrides the default target port for this trap sink.
<code>version 1 2c</code>	Sets the SNMP version of traps to send to this host.

For example, the following command configures the Violin Flash Storage Platform 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 Flash Storage Platform, use the following command:

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

where:

<code>community</code> <code><community></code>	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.
<code>event <event-name></code>	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.
<code>port <number></code>	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 ACM 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 ACM, 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 Flash Storage Platform. 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 Flash Storage Platform. Use the following command:

```
show snmp user
```

The following example displays information about SNMPv3 users on the Violin Flash Storage Platform.

```
# 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 Flash Storage Platform.

```
# 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 ACM, use the following command:

```
show snmp
```

The following example displays information about the SNMP settings on the Violin Flash Storage Platform.

```
# 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 Flash Storage Platform, 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 Flash Storage Platform, set with the ro option in the snmp-server community command.
Interface listen enabled	Whether the Violin Flash Storage Platform 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 ACM 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 Flash Storage Platform, set with the snmp-server host command.

Configuring SNMP on Violin Memory Gateways

On Violin Memory Gateways, SNMP configuration is done through the `snmpd.conf` file, which is located in the `/usr/local/concerto/etc/snmp` directory on the Memory Gateway.

If your SNMP manager resides on a different network, you must modify the `snmpd.conf` file before you can implement SNMP support through your SNMP manager.

In addition, you can modify this file if you want to limit SNMP communication to a specific subnet or change the community name. The default read-write community is “vmem”. This is the only community you should change.

To re-use your SNMP configuration for multiple Memory Gateways, go to `/usr/local/concerto/etc/snmp` and copy the following files to the same directory on each Memory Gateway.

- `snmpd.conf` - contains trapSinkSettings

-
- IPStorSNMP.conf - contains trapSettings

Note: In order for the configuration to take effect, you must restart the SNMPD module on each Memory Gateway to which you copied these files.

Enabling Heartbeat Traps

Using the CLI on a Violin Memory Gateway, you can configure the controller to send heartbeat traps at specified intervals to a list of trap sinks. To do this, use the following command:

(short form)

```
isscli setsnmption -s <server-name>
    [-u <username> -p <password>]
    -tl <trap-level>
    -ht <on|off>
    -hi <heartbeatInterval>
    [-TL <trap-sink-list>]
    [-X <rpc-timeout>]
```

(long form)

```
isscli setsnmption server-name=<server-name>
    [--server-username=<username> --server-password=<password>]
    --trap-level=<trap-level>
    --heartbeat-trap=<on|off>
    --heartbeat-interval=<heartbeat-interval>
    [--trap-sink-list=<trap-sink-list>]
    [--rpc-timeout=<rpc-timeout>]
```

where:

-s (server-name)	Is the hostname or IP address of the Memory Gateway.
-u (--server-username)	Optionally specifies the username and password for the administrative user on the Memory Gateway.
-p (--server-password)	
-tl (--trap-level)	Sets the trap level. This can be one of the following: <ul style="list-style-type: none">• None• Critical• Error• Warning• Informational
-ht (--heartbeat-trap)	Enables or disables heartbeat traps.
-hi (--heartbeat-interval)	Sets the interval in seconds for heartbeat traps.

-
- | | |
|------------------------|--|
| -TL (--trap-sink-list) | Optionally specifies the name of a file containing a list of SNMP servers and communities. The file should contain a list of server and community pairs in the format:
<server IP> <community name>
For example:
192.168.10.1 community1
192.168.10.2 community2 |
| -X (--rpc-timeout) | Is an option to specify the number of seconds (between 1 and 30000) for the RPC timeout. The default RPC timeout is 30 seconds if not specified. |

The following example enables heartbeat traps to be sent at 30-second intervals to the trap sinks listed in the file `/tmp/trapsink_list.txt`:

```
# isscli setsnmption -s array1-mga -u root -p ViolinMEM1 -tl  
Informational -ht on -hi 30 -TL /tmp/trapsink_list.txt
```


CHAPTER 3 ACM SNMP Trap Reference

This chapter provides reference information about SNMP traps generated on Violin Array Controller Modules (ACMs). 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

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.
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
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.
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
array-module-state-change	State Change	State			
array-pcie-link-up*	Event	Triggered	The Violin Array specified in the trap has detected that the PCIe link has gone active.	Nothing.	Low
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
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
chassis-temperature-high*	75	Celsius	Temperature inside a Violin chassis has exceeded normal operating range	Check airflow and operating environment.	High
chassis-temperature-ok*	70	Celsius	Temperature inside a Violin chassis has dropped into normal operating range	Nothing.	Low
lid-ajar*	State Change	Triggered	Violin chassis lid is open.	Close and secure the lid.	High
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
lid-ajar-time-ok*	1	Seconds	A Violin Array chassis lid has been closed for at least this period	Nothing.	Low

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.
liveness-failure*	Event	Triggered	An internal process on a Violin device has been detected as hung.	Please contact Violin customer support	High
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
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
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
snmp-authtrap	Event	Triggered	An SNMP v3 request has failed authentication.		

Trap Event Name	Threshold	Value Unit	Description	Solution	Sev.
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
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
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
user-login	Event	Triggered	A login to a Violin Memory Array 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 Array 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
vimm-temperature-high*	80	Celsius	VIMM temperature has exceeded normal operating range	Check airflow and operating environment.	High
vimm-temperature-ok*	75	Celsius	VIMM temperature has dropped into normal operating range	Nothing.	Low

CHAPTER 4 IPSTOR-MIB Reference

This chapter describes the tables and fields in the IPSTOR-MIB file, which is located in `/usr/local/concerto/etc/snmp/mibs/IPSTOR-MIB.TXT` on the Memory Gateway

IPSTOR MIB Table / Field Descriptions	
Violin Memory Appliance Information	
modelName	Model name of the Violin Memory device
serialNumber	Serial number of the Violin Memory device
Global Deduplication Statistics	
dataWritten	Total amount of data written in bytes across all pools
dataStored	Total amount of data stored after deduplication and compression
ratio	Ratio of bytes input to bytes output
Physical Resources	
serverName	Server hostname
loginMachineName	Server you are logged into
serverVersion	Server version and build number
OSVersion	Server operating system version
kernelVersion	Server kernel version
Processor Table	A table containing the information about processors on the server <ul style="list-style-type: none">• processorEntry: Processor information• processorNo: Sequential number that represents the index key of the processor table• processorInfo: Processor type and power
memory	Amount of memory on the server

IPSTOR MIB Table / Field Descriptions

swap	Amount of server swap space
netInterfaceTable	<p>Table containing information about network interfaces on the server</p> <ul style="list-style-type: none"> • netInterfaceEntry: Network interface information • netInterfaceNo: Sequential number that represents the index key of the network interface table • netInterfaceInfo: Network interface MAC, IP address and MTU
FailoverInformationTable	<p>Table containing server failover information</p> <ul style="list-style-type: none"> • FailoverInformationEntry: Failover mode and state • foIndex: sequential number that represents the index key of the failover table • foName: Failover configuration properties • foValue: Failover configuration setting • foConfType: Failover configuration type • foPartner: Failover partner server • foPrimaryIPResource: IP address of the primary failover server • foSecondaryIPResource: IP address of the secondary failover server • foCheckInterval: Failover self-checking interval • foHearbeatInterval: FailoverHearbeat Interval • foRecoverySetting: Failover recovery setting • foState: Failover state • foPrimaryStorageClusterInterlinkIP: Failover Storage Cluster Interlink IP address • foSecondaryStorageClusterInterlinkIP: Failover Storage Cluster Interlink secondary IP address • foSuspended: Failover suspension status • foPowerControl: Failover power control configuration • foFcWWPN: Fibre Channel WWPN for a failover configuration. • foStretchedClusterOption: Stretched cluster failover configuration
fcInfoTable	<p>Table containing information about Fibre Channel HBAs on the server</p> <ul style="list-style-type: none"> • fcInfoEntry: Fibre Channel HBA specification and access mode • fcIndex: Sequential number that represents the index key of the Fibre Channel HBA table • fcWWPN: Fibre Channel HBA WWPN • fcMode: Fibre Channel HBA mode • fcTargetWWPN: Fibre Channel dual mode target HBA WWPN
MTCPVersion	Replication TCP version

IPSTOR MIB Table / Field Descriptions

PerformanceTable	<p>Table containing information about server performance</p> <ul style="list-style-type: none"> • performanceEntry: Server performance information • performanceMirrorSyncTh: Mirror synchronization throttle • performanceSyncMirrorInterval: Synchronization interval for out-of-sync mirrors • performanceSyncMirrorRetry: Synchronization retry times for out-of-sync mirrors • performanceSyncMirrorUpnum: Synchronization up numbers for out-of-sync mirrors • performanceInitialMirrorSync: Initial synchronization option • performanceIncludeReplicaMirror: Include replica mirror in the automatic synchronization • performanceReplicationMicroScan: Status of ThinRay replication option • performanceMirrorAutoSwapOption: Status of AutoSwap mirror option
serverRole	Server role
smisoption	Status of the SMI-S option
ServerIPAliasTable	<p>Table containing information about IP aliases on the server</p> <p>ServerIPAliasIP: IP alias</p>
iSCSIportal	Default iSCSI portal
DHCPTable	<p>Table containing information about DHCP settings on the server</p> <ul style="list-style-type: none"> • DHCPEntry: DHCP information • DHCPOption: DHCP Option • DHCPNameServer: DHCP server name • DHCPNetmask: DHCP netmask • DHCPGateway: DHCP gateway • DHCPIPRangeBegin: DHCP starting IP range • DHCPIPRangeEnd: DHCP ending IP range
ActivityDBMaintenanceTable	<p>Table containing information about server activity database maintenance</p> <ul style="list-style-type: none"> • ActivityDBMaintenanceEntry: Activity database maintenance information • MAXActDBSize: Maximum activity data file size in MB • NumofDaystoKeep: Number of days of activities to keep
StatisticsLogsTable	<p>Table containing information about the Statistics Logs option</p> <ul style="list-style-type: none"> • StatisticsLogsEntry: Statistics Logs information • StatisticsLogsOption: Status of the statistics logs option • StatisticsLogsLogOption: Log option of the statistics logs • StatisticsLogsStartTime: Start time of the statistics logs • StatisticsLogsInterval: Interval of the statistics logs • StatisticsLogsPurgeTime: Purge time of the statistics logs

IPSTOR MIB Table / Field Descriptions

AutoSaveConfigTable	<p>Table containing information about the auto save configuration on the server</p> <ul style="list-style-type: none"> • AutoSaveConfigEntry: Auto Save Configuration information • AutoSaveConfigOption: Status of the auto save configuration • AutoSaveConfigFtpServerName: FTP server name of the auto save configuration • AutoSaveConfigFtpPort: FTP port of the auto save configuration • AutoSaveConfigTargetDirectory: target directory of the auto save configuration • AutoSaveConfigInterval: Interval of the auto save configuration • AutoSaveConfigCopiesNumber: Number of copies of the auto save configuration
CDPPerformanceTable	<p>Table containing information about CDP performance</p> <ul style="list-style-type: none"> • CDPPerformanceInfoEntry: CDP Performance information • CDPPerformanceAggressiveThreshold: Aggressive threshold for CDP Performance • CDPPerformanceAggressiveDataFlushSpeed: Aggressive data flush speed for CDP performance • CDPPerformanceAggressiveIntactDataFlushSpeed: Aggressive data flush speed during inactivity for CDP Performance • CDPPerformanceModerateThreshold: Moderate threshold for CDP performance • CDPPerformanceModerateDataFlushSpeed: Moderate data flush speed for CDP Performance • CDPPerformanceModerateFlushSpeed: Moderate data flush speed during inactivity for CDP Performance
SNMPMaintenanceTable	<p>Table containing information about the SNMP configuration on the server</p> <ul style="list-style-type: none"> • SNMPMaintenanceEntry: SNMP configuration information • SNMPMaintenanceTrapLevel: SNMP trap level • SNMPMaintenanceServer: SNMP server • SNMPMaintenanceCommunity: SNMP community
TimeMarkMaintenanceTable	<p>Table containing information about MemSnap maintenance on the server</p> <ul style="list-style-type: none"> • TimeMarkMaintenanceEntry: MemSnap maintenance information • TimeMarkMaintenanceSchedule: MemSnap maintenance start time • TimeMarkMaintenanceReclamThreshold: MemSnap maintenance reclamation threshold (minimum amount of space that can be reclaimed per TimeMark) • TimeMarkMaintenanceReclamStartTime: MemSnap maintenance reclamation start time • TimeMarkMaintenanceReclamRepeatTime: MemSnap maintenance reclamation repeat schedule interval • TimeMarkMaintenanceReclamMaxProcessingTime: MemSnap maintenance reclamation maximum processing time

IPSTOR MIB Table / Field Descriptions

LocationTable	<p>Table containing information about the location setting on the server</p> <ul style="list-style-type: none"> • LocationEntry: Location information • LCLocation: Location • LCRoom: Room • LCFloor: Floor • LCBuilding: Building • LCAddress: Address • LCCity: City • LCState: State • LCZipCode: Zip code • LCCountry: Country • LCOwner: Owner • LCOwnersPhone: Owner's phone number • LCOwnersEmail: Owner's email address • LCOwnersIM: Owner's IM • LCDescription: Description • LCImagePath: Image path
SNMPHeartBeatTable	<p>Table containing information about the SCMP heartbeat of the server</p> <ul style="list-style-type: none"> • SNMPHeartbeatEntry: SNMP heartbeat information • SNMPHeartbeatOption: SNMP heartbeat option • SNMPHeartbeatInterval: SNMP heartbeat interval
serverOption	<ul style="list-style-type: none"> • fibreChannelOption: Indicates if the Fibre Channel option is enabled or disabled on the Memory Gateway. • replicationOption: Indicates if the Replication option is enabled or disabled on the Memory Gateway. • syncMirroringOption: Indicates if the synchronized Mirroring option is enabled or disabled on the Memory Gateway. • TimeMarkOption: Indicates if the MemSnap option is enabled or disabled on the Memory Gateway.
MTCPVersion	The MTCP Version which the Memory Gateway uses.

IPSTOR MIB Table / Field Descriptions

performanceTable	<p>A table containing the information of the performance in the host which the Memory Gateway is running.</p> <ul style="list-style-type: none"> • performanceMirrorSyncTh: Mirror synchronization throttle • performanceSyncMirrorInterval: Synchronization interval for out-of-sync mirrors • performanceSyncMirrorRetry: Synchronization retry times for out-of-sync mirrors • performanceSyncMirrorUpnum: Synchronization up numbers for out-of-sync mirrors • performanceInitialMirrorSync: Initial synchronization option • performanceIncludeReplicaMirror: Include replica mirror in the automatic synchronization • performanceReplicationMicroScan: Status of ThinRay replication option • performanceMirrorAutoSwapOption: Status of AutoSwap mirror option
serverRole	The Memory Gateway role.
smioption	The Memory Gateway SMI-S option
ServerIPAliasTable	<p>A table containing information about the IP alias in the host on which the Memory Gateway is running</p> <ul style="list-style-type: none"> • ServerIPAliasEntry: IP alias information • ServerIPAliasIP: The Memory Gateway IP Alias
Physical Resources	
numOfAdapters	Number of configured physical adapters
numOfDevices	Number of configured physical devices
scsiAdapterTable	<p>A table containing the information of all the installed SCSI adapters of the Memory Gateway</p> <ul style="list-style-type: none"> • scsiAdapterEntry: SCSI adapter hardware and vendor information • adapterIndex: Sequential number that represents the index key of the adapter table • adapterNumber: The SCSI adapter number • adapterInfo: The model name of the SCSI adapter

IPSTOR MIB Table / Field Descriptions

scsiDeviceTable	<p>A table containing all the SCSI devices of the Memory Gateway</p> <ul style="list-style-type: none">• scsiDeviceEntry: SCSI device hardware and vendor information• deviceNo: Sequential number that represents the index key of the device table• deviceType: SCSI device access type• vendorID: SCSI device vendor ID• productID: SCSI device model name• firmwareRev: SCSI device firmware version• adapterNo: SCSI adapter number• channelNo: SCSI device channel number• scsiID: SCSI device ID• lun: SCSI device LUN• totalSectors: Sectors or block size• sectorSize: The size of bytes for each sector or block.• totalSize: Device size in MB• configStatus: : Attachment status of the SCSI device.• totalSizeQuantity: Device size• totalSizeUnit: Total size of the device. 0=KB. 1=MB. 2=GB. 3=TB• totalSectors64: Number of sectors or blocks• totalSize64: Device size in megabytes
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IPSTOR MIB Table / Field Descriptions

StoragePoolTable	<p>A table containing information about storage pools on the server</p> <ul style="list-style-type: none"> • StoragePoolEntry: Storage pool information • PoolName: The name of the storage pool • PoolID: The storage pool ID • PoolType: The storage pool Type • DeviceCount: The storage pool device count • PoolCount: The storage pool count • PoolTotalSize: The storage pool size in MB (for 32-bit values) • PoolUsedSize: The storage pool used size in MB (for 32-bit values) • PoolAvailableSize: The storage pool available size in MB (for 32-bit values) • PoolTotalSizeQuantity: The storage pool size • PoolTotalSizeUnit: The storage pool size quantity unit. 0=KB, 1=MB, 2=GB, 3=TB • PoolUsedSizeQuantity: The storage pool used size • PoolUsedSizeUnit: The storage pool used size quantity unit. 0=KB, 1=MB, 2=GB, 3=TB • PoolAvailableSizeQuantity: The storage pool available size • PoolAvailableSizeUnit: The storage pool available size unit. 0=KB, 1=MB, 2=GB, 3=TB • PoolTotalSize64: The storage pool total size • PoolUsedSize64: The storage pool used size • PoolAvailableSize64: The storage pool available size • PoolStorageAttribute: The storage pool attribute
LogicalResources	
numOfLogicalResources	The number of logical resources available in the Memory Gateway.

IPSTOR MIB Table / Field Descriptions

SnapshotReservedArea	<ul style="list-style-type: none">• snapShotReservedEntry: Snapshot reserved area information• numOfSnapshotReserved: Quantity of shareable snapshot reserved areas• snapshotReservedTable: Table listing snapshot reserved areas information• ssrName: The name of the snapshot reserved area• ssrDeviceName: The physical device name of the snapshot reserved area• ssrSCSIAddress: The SCSI address of the physical device which the snapshot reserved area created• ssrFirstSector: The first sector of the snapshot reserved area• ssrLastSector: The last sector of the snapshot reserved area• ssrTotalSectors: Quantity of sectors created by the snapshot reserved area• ssrSize: The resource size (in megabytes) of the snapshot reserved area• ssrSizeQuantity: The resource size of the snapshot reserved area• ssrSizeUnit: The resource size (units) of the snapshot reserved area. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB.• ssrFirstSector64: The first sector of the snapshot reserved area• ssrLastSector64: The last sector of the snapshot reserved area• ssrTotalSectors64: Number of snapshot reserved area sectors• ssrSize64: The resource size (in megabytes) of the snapshot reserved area
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IPSTOR MIB Table / Field Descriptions

srThinProvisionTable	<p>Table containing the Thin provisioned resource usage information</p> <ul style="list-style-type: none"> • srThinProvisionEntry: Thin provisioned resource usage information • srThinProvisionOption : Indicates if the Thin Provisioning option is enabled or disabled on the resource • srThinProvisionCurrAllocSize : Current allocated size (for 32-bit values) • srThinProvisionUsageSize : Current usage (for 32-bit values) • srThinProvisionUsagePercentage : Current usage percentage of the Thin Provision resource • srThinProvisionCurrAllocSizeQuantity : Current Allocated Size quantity of the Thin Provision resource on the Memory Gateway • srThinProvisionCurrAllocSizeUnit : Current Allocated Size unit of the Thin Provision resource on the Memory Gateway.0=KB. 1=MB. 2=GB. 3=TB. • srThinProvisionUsageSizeQuantity : Current usage size quantity of the Thin Provision resource • srThinProvisionUsageSizeUnit : Current usage size unit of the Thin Provision resource. 0=KB. 1=MB. 2=GB. 3=TB • srThinProvisionCurrAllocSize64 : Current Allocated Size of the Thin Provision resource on the Memory Gateway • srThinProvisionUsageSize64 : Current usage size of the Thin Provision resource • srThinProvisionSANResourceID: SAN resource ID • srThinProvisionSANResourceName: SAN resource name
srISCSIClientInfoTable	<p>Table containing the iSCSI clients information</p> <ul style="list-style-type: none"> • srISCSIClientNo: The iSCSI client ID assigned by the Memory Gateway • srISCSIClientName: The iSCSI client name assigned by the Memory Gateway • srISCSISANResourceID: SAN resource ID assigned by the Memory Gateway • srISCSISANResourceName: The SAN resource name created by the user • srISCSIAccessType: The resource access type of the iSCSI client • srISCSICoconnectAccess: Identifies the connection and access status with a resource of the iSCSI client

IPSTOR MIB Table / Field Descriptions

srCDPJournalTable	<p>Table containing the CDP Journal resources created by the SAN resource</p> <ul style="list-style-type: none"> • srCDPJournalResourceID : The CDP Journal ID assigned by the Memory Gateway • srCDPJournalSANResourceID : The CDP Journal SAN resource ID assigned by the Memory Gateway • srCDPJournalOption : Indicates if the CDP Journal option is enabled or disabled on the SAN resource • srCDPJournalTotalSize : The CDP Journal Total size of the SAN resource. • srCDPJournalStatus : The status represents current CDP Journal of the SAN resource • srCDPJournalPerformanceLevel : The setting Performance level for the CDP Journal of the SAN resource • srCDPJournalPolicy: CDP journal storage policy • srCDPJournalCoveragePeriod: CDP journal minimum continuous coverage period • srCDPJournalExpansionTH: CDP journal expansion threshold • srCDPJournalExpansionAllocate: CDP Journal expansion amount • srCDPJournalExpansionAllocMB: CDP Journal expansion amount in MB (for 32-bit values) • srCDPJournalMaxSize: Maximum CDP journal size (for 32-bit values) • srCDPJournalTotalSizeQuantity : CDP Journal Total size • srCDPJournalTotalSizeUnit: The CDP Journal Total size unit of the SAN resource. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • srCDPJournalMaxSizeQuantity: CDP journal maximum storage size • srCDPJournalMaxSizeUnit: CDP journal maximum storage size quantity unit. 0=KB. 1=MB. 2=GB. 3=TB • srCDPJournalExpansionAllocMBQuantity: CDP Journal expansion allocation amount • srCDPJournalExpansionAllocMBUnit: CDP Journal expansion allocation amount.0=KB. 1=MB. 2=GB. 3=TB
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IPSTOR MIB Table / Field Descriptions

srCDPJournalTable	<ul style="list-style-type: none"> • srCDPJournalTotalSize64: The CDP Journal total size of the SAN resource. • srCDPJournalAvalibleTimerange: The CDP Journal Avaible time range of the SAN resource • srCDPJournalUsageSize: CDP Journal usage size(MB) of the SAN resource • srCDPJournalUsagePercentage: CDP Journal usage percentage of the SAN resource • srCDPJournalUsageQuantity: CDP Journal Usage size quantity of the SAN resource • srCDPJournalUsageUnit: CDP Journal Usage size unit of the SAN resource. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • srCDPJournalUsageSize64: CDP Journal Usage size of the SAN resource. • srCDPJournalSANResourceName: CDP journal SAN Resource name
Logical Resources --> SANResources	
numOfSANResources	The number of SAN resources available on the Memory Gateway
SANResourceTable	<p>A table containing the SAN resources information</p> <ul style="list-style-type: none"> • sanResourceID: The SAN resource ID assigned by the Memory Gateway • sanResourceName: The SAN resource name created by the user • srAllocationType: Represents the resource type when user is allocating the SAN device • srTotalSectors: The quantity of sectors allocated by the SAN resource • srTotalSize: The device size (in megabytes) of the SAN resource • srConfigStatus: Represents the attached status of the SAN resource • srMirrorSyncStatus: Represents the mirror synchronization status of the SAN resource • srReplicaDevice: Represents the target replica server and device in the format <hostname of target>:<virtual device id>, if the replication option is enabled of the SAN resource • srReplicatingSchedule: Represents the current status of the replicating schedule(On-schedule, Suspended, or N/A) set for the SAN resource • srSnapshotCopyStatus: The snapshot copy status of the SAN resource • srTotalSizeQuantity: The device size of the SAN resource • srTotalSizeUnit: The device size of the SAN resource • srTotalSectors64: The amount of sectors allocated by the SAN resource • srTotalSize64: The device size (in megabytes) of the SAN resource

IPSTOR MIB Table / Field Descriptions

srPhysicalAllocLayoutTable	<p>Table containing the physical layout information for the SAN resources</p> <ul style="list-style-type: none"> • srpaSanResourceName: The SAN resource name created by the user • srpaSanResourceID: The SAN resource ID assigned by the Memory Gateway • srpaName: The physical device name • srpaType: Represents the type(Primary, or Mirror) of the physical layout • srpaAdapterNo: The SCSI adapter number of the physical device • srpaChannelNo: The SCSI channel number of the physical device • srpaScsiID: The SCSI ID of the physical device • srpaLun: The SCSI LUN number of the physical device • srpaFirstSector: The first sector of the physical device which is allocated by the SAN resource • srpaLastSector: The last sector of the physical device which is allocated by the SAN resource • srpaSize: The allocated size (in megabytes) within a physical device • srpaSizeQuantity: The allocated size within a physical device • srpaSizeUnit: The allocated space within a physical device. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • srpaFirstSector64: The first sector of the physical device allocated by the SAN resource • srpaLastSector64: Last sector of the physical device allocated by the SAN resource • srpaSize64: The allocated size (in megabytes) of the physical device
srClientInfoTable	<p>Table containing SAN client information</p> <ul style="list-style-type: none"> • srClientNo: SAN client ID assigned by the Memory Gateway • srcName: SAN client name assigned by the Memory Gateway • srcSANResourceID: SAN resource ID assigned by the Memory Gateway • srcSANResourceName: SAN resource name created by the user • srcAdapterNo: Adapter number of the SAN client • srcChannelNo: Channel number of the SAN client • srcScsiID : The SCSI ID of the SAN client • srcLun : The SCSI LUN number of the SAN client • srcAccess : SAN client access mode • srcConnAccess: Identifies the connection and access status with a resource of the SAN client

IPSTOR MIB Table / Field Descriptions

srFCClientInfoTable	<p>Table containing the Fibre Channel clients information</p> <ul style="list-style-type: none">• srFCClientNo: Fibre Channel client ID assigned by the Memory Gateway• srFCName : Fibre Channel client name assigned by the Memory Gateway• srFCSANResourceID:SAN resource ID assigned by the Memory Gateway• srFCSANResourceName : The SAN resource name• srFCInitatorWWPN: Initiator HBA world wide port name(WWPN)• srFCTargetWWPN: Target HBA world wide port name(WWPN)• srFCLun : Fibre Channel client SCSI LUN• srFCAccess : Fibre Channel client resource access mode• srFCConnAccess : Fibre Channel client resource connection and access status
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IPSTOR MIB Table / Field Descriptions

srSnapshotTable	<p>Table containing the snapshot resources created by the SAN resource</p> <ul style="list-style-type: none"> • srSnapshotResourceID : SAN resource ID assigned by Memory Gateway • srSnapshotResourceName : SAN resource name created by the user • srSnapshotOption : Indicates if the snapshot option is enabled or disabled on the SAN resource • srSnapshotSize : The allocated size when the SAN resource is created for the first time • srSnapshotThreshold : The value indicates the threshold setting (in %) of the SAN resource • srSnapshotReachTh : The policy is setting for expanding resource automatically or manually while reaching the threshold • srSnapshotIncSize : The incremental size for each time when is running out the resource. This is meaningful when expanding resource is automatically • srSnapshotMaxSize : The maximum resource size (in megabytes) allowed for allocation • srSnapshotUsedSize64: The resource size (in kilobytes) used • srSnapshotFreeSize64: The free resource size (in megabytes) before reaching the threshold • srSnapshotReclaimPolicy: Indicates if the snapshot Reclaim option is enabled or disabled for the SAN resource • srSnapshotReclaimTime: The initial time when the snapshot Reclaim option is enabled of the SAN resource • srSnapshotReclaimInterval: The schedule interval to start the snapshot Reclaim of the SAN resource • srSnpaShotReclaimWaterMark: The threshold for the minimum amount of space that can be reclaimed per MemSnap of the SAN resource • srSnapshotReclaimMaxTime: The maximum time for the reclaim process of the SAN resource • srSnapshotShrinkPolicy: Indicates if the snapshot Shrink option is enabled or disabled on the SAN resource • srSnapshotShrinkThresHold: The minimum disk space to shrink the snapshot resource of the SAN resource • srSnapshotShrinkMinSize: The minimum size for the snapshot resource to shrink • srSnapshotShrinkMinSizeQuantity: The minimum size quantity for the snapshot resource to shrink • srSnapshotShrinkMinSizeUnit: The minimum size for the snapshot resource to shrink. 0 = KB. 1 = MB. 2 = GB. 3 = TB • srSnapshotShrinkMinSize64: The minimum size for the snapshot resource to shrink • srSnapshotResourceStatus: The snapshot resource status of the SAN resouce
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IPSTOR MIB Table / Field Descriptions

srTimeMarkTable	<p>Table containing the MemSnap resources created by the SAN resource</p> <ul style="list-style-type: none"> • srTimeMarkResourceID: The SAN resource ID assigned by the Memory Gateway • srTimeMarkResourceName: The SAN resource name created by the user • srTimeMarkOption: Indicates if the MemSnap option is enabled or disabled on the SAN resource • srTimeMarkCounts: Maximum allowed MemSnaps • srTimeMarkSchedule: The MemSnap creation interval • srTimeMarkLastTimeStamp: The last MemSnap timestamp • srTimeMarkSnapshotImage: Automatic MemSnap creation time • srTimeMarkSnapshotNotificationOption: Status of snapshot notification • srTimeMarkReplicationOption: Status of MemSnap replication
srBackupTable	<p>List of backup resources created by the SAN resource</p> <ul style="list-style-type: none"> • srBackupResourceID: The SAN resource ID assigned by the Memory Gateway • srBackupResourceName: The SAN resource name created by the user • srBackupOption: Indicates if the backup option is enabled or disabled on the SAN resource • srBackupWindow: The daytime allows for opening one backup session • srBackupSessionLen: The time interval allowed for each backup session • srBackupRelativeTime: The time interval waits before closing the backup session which is in inactivity status • srBackupWaitTime: The time interval (in minutes) waited before closing the backup session after completion • srBackupSelectCriteria: The snapshot image selection criteria (New or Latest) for the backup session. New = always creates a new snapshot image for backup. Latest = always uses the last snapshot image for backup • srBackupRawDeviceName: The SAN Backup Resource Raw Device Name created by the user

IPSTOR MIB Table / Field Descriptions

srReplicationTable	<p>Table containing the replication resources created by the SAN resource</p> <ul style="list-style-type: none"> • srReplicationResourceID: SAN resource ID assigned by the Memory Gateway • srReplicationResourceName: The SAN resource name created by the user • srReplicationOption: Indicates if the replication option is enabled or disabled on the SAN resource • srReplicaServer: The target replia server name • srReplicaDeviceId: The target replica device ID • srReplicaSchedule: Represents Current status of the replicating schedule(On-schedule, Suspended, or N/A) set for the SAN resource. • srReplicaWatermark: The watermark sets to generate one new replication automatically • srReplicaWatermarkRetry: The retry interval (in minutes) if replication fails • srReplicaTime: The daytime of each day creates one new replication • srReplicaInterval: The time interval creates one new replication • srReplicationContinuousMode: Indicates if Continuous Mode for Replication is enabled or disabled • srReplicationCreatePrimaryTimeMark: Allows you to create the primary MemSnap when a replica MemSnap is created • srReplicaSyncTimeMark: Allows you to synchronize the replica MemSnap when a primary MemSnap is created • srReplicationProtocol: Allows you to synchronize the replica MemSnap when a primary MemSnap is created • srReplicationCompression: Indicates if the Compression option is enabled or disabled on Replication • srReplicationEncryption: Indicates if the Encryption option is enabled or disabled for Replication • srReplicationMicroScan : Indicates if the ThinRay option is enabled or disabled on Replication • srReplicationSyncPriority : The Priority setting when Replication Synchronize of the SAN resource • srReplicationStatus: The Replication status of the SAN resource • srReplicationMode : The Replication mode of the SAN resource • srReplicationContinuousResourceID: The Continuous Replication Resource ID of the SAN resource
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IPSTOR MIB Table / Field Descriptions

- | | |
|--|--|
| | <ul style="list-style-type: none">• srReplicationContinuousResourceUsage: The Continuous Replication Resource Usage of the SAN resource• srReplicationDeltaData: The Accumulated Delta Data of replication of the SAN resource• srReplicationUseExistTM: When Continuous Mode is disabled, the option about using existing TimeMark of the replication• srReplicationPreserveTM: When Continuous Mode is disabled, the option about perserving TimeMark of the replication• srReplicaLastSuccessfulSyncTime: The last successful replication synchronization time• srReplicaAverageThroughput: The average throughput (MB/s)• srReplicaAverageThroughputQuantity: The average throughput quantity <p>srReplicaAverageThroughputUnit : The average throughput unit of the replication. 0=KB. 1=MB. 2=GB. 3=TB</p> |
|--|--|

IPSTOR MIB Table / Field Descriptions

srCacheTable	<p>Table listing the cache resources created by the SAN device</p> <ul style="list-style-type: none"> • srCacheResourceID: The SAN resource ID assigned by the Memory Gateway • srCacheResourceName: The SAN resource name created by the user • srCacheOption : Indicates if the cache option is enabled or disabled on the SAN resource • srCacheSuspend: The cache resource is currently suspended or not • srCacheTotalSize: The allocated size when creating the cache resource • srCacheFreeSize: The free resource size (in megabytes) before reaching the maximum resource size • srCacheUsage: The percentage of the used resource size • srCacheThresHold: The data needs to be in the cache before beginning flushing the cache • srCacheFlushTime: The number of milliseconds before cache begins to flush when below the data threshold level • srCacheFlushCommand: The outstanding commands will be sent at one time during the flush process • srCacheSkipWriteCommand: This option allows the system to skip multiple pending write commands targeted for the same block • srCacheFlushSpeed : The flush speed is sent once during the flush process • srCacheTotalSizeQuantity : The allocated size when creating the cache resource • srCacheTotalSizeUnit: The allocated size when creating the cache resource. 0=KB. 1=MB. 2=GB. 3=TB • srCacheFreeSizeQuantity : The amount of free space before reaching the maximum resource size • srCacheFreeSizeUnit: The amount of free space before reaching the maximum resource size. 0=KB. 1=MB. 2=GB. 3=TB • srCacheOwnResourceID : Cache resource ID assigned by the Memory Gateway • srCacheTotalSize64 : The allocated size when creating the cache resource • srCacheFreeSize64 : The free resource size (megabytes) before reaching the maximum resource size
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IPSTOR MIB Table / Field Descriptions

srMirrorTable	<p>Table containing the mirror property created by the SAN device</p> <ul style="list-style-type: none"> • srMirrorResourceID : The SAN resource ID that enables the mirror property • srMirrorType : The mirror type when a SAN resource enable the mirror property • srMirrorSyncPriority : The mirror synchronization priority when a SAN resource enable the mirror property • srMirrorSuspended Whether the mirror is suspended • srMirrorThrottle : The mirror throttle value for SAN resource • srMirrorHealthMonitoringOption : Indicates if the mirror health monitoring option is enabled or disabled • srMirrorHealthCheckInterval : The Interval to Check and report mirror health status • srMirrorMaxLagTime : The Maximum acceptable lag time for mirror I/O • srMirrorSuspendThPercent: Suspends mirroring when the threshold of failure reaches the percentage of the failure conditions • srMirrorSuspendThIOnum: Suspends mirroring when the outstanding IOs is greater than or equal to the threshold • srMirrorRetryPolicy: Indicates if the mirror synchronization retry policy is enabled or disabled • srMirrorRetryInterval: The mirror synchronization retry at specified interval • srMirrorRetryActivity: The mirror synchronization retry when I/O activity is below or at threshold • srMirrorRetryTimes: The maximum number of mirror synchronization retries • srMirrorSynchronizationStatus : Represents the mirror synchronization status of the SAN resource • srMirrorAlterReadMirror : Represents the alternative read mirror option of the SAN resource • srMirrorAverageThroughput : The average throughput (MB/s) of the mirror synchronization operation • srMirrorAverageThroughputQuantity : The average throughput quantity of the mirror synchronization operation • srMirrorAverageThroughputUnit : The average throughput unit of the mirror synchronization operation. 0=KB. 1=MB. 2=GB. 3=TB
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IPSTOR MIB Table / Field Descriptions

<p>srPhysicalTotalAllocLayout Table</p>	<p>Table listing the total physical layout information for the SAN resources</p> <ul style="list-style-type: none"> • srpaAllocSANResourceName : SAN resource name created by the user • srpaAllocName : The physical device name • srpaAllocType : The type(Primary, or Mirror) of the physical layout • srpaAllocAdapterNo: The SCSI adapter number of the physical device • srpaAllocChannelNo: The SCSI channel number of the physical device • srpaAllocScsiID : The SCSI ID of the physical device • srpaAllocLun : The SCSI LUN number of the physical device • srpaAllocFirstSector : The first sector of the physical device which is allocated by the SAN resource • srpaAllocLastSector : The last sector of the physical device which is allocated by the SAN resource • srpaAllocFirstSector64 : The first sector of the physical device which is allocated by the SAN resource • srpaAllocLastSector64 : The last sector of the physical device which is allocated by the SAN resource • srpaAllocSize : The allocated size (in megabytes) within a physical device • srpaAllocSizeQuantity : The allocated size quantity within a physical device • srpaAllocSizeUnit : The amount of the allocated size unit within a physical device. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • srpaAllocSize64 : The allocated size (in megabytes) within a physical device
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IPSTOR MIB Table / Field Descriptions

srHotZonePrefetchInfoTable	<p>Table containing the HotCache Prefetch information</p> <ul style="list-style-type: none"> • srHotZonePrefetchSANResourceID : The SAN resource ID that assigned by Memory Gateway • srHotZonePrefetchMaximumChains : The maximum number of sequential read chains to detect • srHotZonePrefetchMaximumReadAhead : The maximum size to read ahead representing with KB • srHotZonePrefetchReadAhead : The size of read the read command issued when reading ahead representing with KB • srHotZonePrefetchChainTimeout : The amount of time before the chain is removed and the read-ahead buffers are freed • srHotZoneReadCacheInfoTable : Table listing HotCache Read Cache information • srHotZoneCacheResourceID : Resource ID that assigned by Memory Gateway • srHotZoneCacheSANResourceID : The SANResource ID that assigned by Memory Gateway • srHotZoneCacheTotalSize : The device size (in megabytes) of the HotCache read cache resource • srHotZoneCacheStatus : The status represents current HotCache Read Cache of the SAN resource • srHotZoneCacheSuspended : The Suspended status represents current HotCache Read Cache of the SAN resource • srHotZoneCacheAccesType : The zone's access type policy of the SAN resource • srHotZoneCacheAccessIntensity : The access intensity to determine how the zone is accessed • srHotZoneCacheMinimumStayTime : The minimum time that how long a zone can stay at least in the HotCache before it is swapped out • srHotZoneCacheEachZoneSize : The size of each zone setting • srHotZoneCacheTotalZones : The total zones of the SAN resource allocated • srHotZoneCacheUsedZones : Current used zones of the SAN resource • srHotZoneCacheHitRatio : The hit ratio represents current HotCache read cache of the SAN resource • srHotZoneCacheTotalSizeQuantity : The device size (in megabytes) of the HotCache resource • srHotZoneCacheTotalSizeUnit : The device size unit of the Read Cache resource. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • srHotZoneCacheTotalSize64 : The device size (in megabytes) of the Read Cache resource
Logical Resources --> replicaResources	
numOfReplica	The amount of replica resources created by the Memory Gateway

IPSTOR MIB Table / Field Descriptions

ReplicaResourceTable	<p>A table containing the replica resources</p> <ul style="list-style-type: none"> • rrVirtualID : The resource ID assigned by the Memory Gateway • rrVirtualName : The resource name created by the user • rrAllocationType : Represents the resource type when user allocation of the resource • rrSectors : The amount of sectors allocated by the resource • rrTotalSize : The device size (in megabytes) of the resource • rrConfigurationStatus : Represents the attached status of the resource • rrGUID : The GUID string of the replica resource • rrPrimaryVirtualID : Primary replication server and device in the format <hostname of source>:<virtual device id>, if the replication option is enabled • rrReplicationStatus : Replication schedule status (Replication failed, New, Idle, or Merging) • rrLastStartTime : The latest timestamp of the replication • rrMirrorSyncStatus : Mirror synchronization status of the resource • rrThinProvisionOption : Status of the Thin Provisioning option • rrThinProvisionCurrAllocSize : Current Allocated Size (for 32-bit values) • rrThinProvisionUsageSize : Current usage (for 32-bit values) • rrThinProvisionUsagePercentage : Current usage percentage • rrTotalSizeQuantity : The device size of the resource • rrTotalSizeUnit : The device size of the resource. 0=KB. 1=MB. 2=GB. 3=TB • rrThinProvisionCurrAllocSizeQuantity : Current Allocated Size • rrThinProvisionCurrAllocSizeUnit : Current Allocated Size unit of the resource which enables Thin Provisioning. 0=KB. 1=MB. 2=GB. 3=TB • rrThinProvisionUsageSizeQuantity : Current usage size • rrThinProvisionUsageSizeUnit : Current usage size unit of the resource which enables Thin Provisioning. 0=KB. 1=MB. 2=GB. 3=TB. • rrSectors64 : Number of sectors allocated by the resource • rrTotalSize64 : The device size (in megabytes) of the resource • rrThinProvisionCurrAllocSize64 : Current Allocated Size • rrThinProvisionUsageSize64 : Current usage size of the resource which enables Thin Provisioning • rrLastSuccessSyncTime : The last successful synchronize timestamp of the replication • rrAverageThroughput : The average throughput (MB/s) of the replication. • rrAverageThroughputQuantity : The average throughput quantity of the replication • rrAverageThroughputUnit : The average throughput unit of the replication. 0=KB. 1=MB. 2=GB. 3=TB
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IPSTOR MIB Table / Field Descriptions

ReplicaPhyAllocLayoutTable	<p>A table containing the physical layout information for the replica resources</p> <ul style="list-style-type: none"> • rrpavirtualID : The replica resource ID assigned by the Memory Gateway • rrpavirtualName : The replica resource name created by the user • rrpaname : The physical device name • rrpatype : Represents the type(Primary, or Mirror) of the physical layout • rrpascsiaddress : The SCSI address with <Adapter:Channel:SCSI:LUN> format of the replica resource • rrpafirstsector : The first sector of the physical device which is allocated by the replica resource • rrpalastsector : The last sector of the physical device which is allocated by the replica resource • rrpasize : The allocated size (in megabytes) within a physical device • rrpasizequantity : The allocated size quantity within a physical device • rrpasizeunit : The allocated size unit within a physical device. The size unit of the device. 0=KB. 1=MB. 2=GB. 3=TB • rrpafirstsector64 : The first sector of the physical device which is allocated by the replica resource • rrpalastsector64 : The last sector of the physical device which is allocated by the replica resource • rrpasize64 : The allocated size (in megabytes) within a physical device
Logical Resources --> Snapshot Group Resources	
numOfGroup	The quantity of snapshot groups created by the Memory Gateway.
snapshotgroupInfoTable	<ul style="list-style-type: none"> • snapshotgroupName : The user-created snapshot group resource name • snapshotgroupType : The property of the snapshot group, which it can be one of the following types. MemSnap, backup, replication, MemSnap + backup, MemSnap + replication, backup + replication, and MemSnap + backup + replication
snapshotgroupBackupInfoTable	<p>Table containing the backup properties of snapshot groups</p> <ul style="list-style-type: none"> • snapshotgroupBackupGroupID : The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupBackupOption : Indicates if the backup option is enabled or disabled on the snapshot group resource • snapshotgroupBackupWindow : The amount of time allowed for opening one backup session • snapshotgroupBackupSessionLen : The time interval allowed for one backup session in each time • snapshotgroupBackupRelativeTime : The time interval waited before closing the backup session which is in inactivity status • snapshotgroupBackupWaitTime : The wait time (in minutes) before closing the backup session after completion • snapshotgroupBackupSelectCriteria : The snapshot image selection criteria (new or latest) for the backup session. New = always create new snapshot image for backup. Latest = Use the last created snapshot image for backup

IPSTOR MIB Table / Field Descriptions

<p>snapshotgroupReplicationInfoTable</p>	<p>Table containing the replication properties of snapshot</p> <ul style="list-style-type: none"> • snapshotgroupReplicationGroupID: The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupReplicationOption : Indicates if the replication option is enabled or disabled on the snapshot group resource • snapshotgroupReplicaServer: The target replia server name • snapshotgroupReplicaGroupID: The target replica group ID • snapshotgroupReplicaWatermark: The watermark sets to generate one new replication automatically • snapshotgroupReplicaTime: The daytime of each day creates one new replication • snapshotgroupReplicaInterval: The time interval creates one new replication • snapshotgroupReplicawatermarkRetry: The retry interval (in minutes) if the replication failed • snapshotgroupReplicaContinuousMode: Indicates that Continuous Mode Replication is enabled or disabled • snapshotgroupReplicaCreatePrimaryTimeMark: Allows you to create the primary MemSnap when a replica MemSnap is created • snapshotgroupReplicaSyncTimeMark: Allows you to synchronize the replica MemSnap when a primary MemSnap is created • snapshotgroupReplicaProtocol: Shows which Protocol Replication uses. • snapshotgroupReplicaCompression: Indicates if the Compression option is enabled or disabled for Replication • snapshotgroupReplicaEncryption: Indicates if the Encryption option is enabled or disabled for Replication • snapshotgroupReplicaMicroScan: Indicates if the ThinRay option is enabled or disabled for Replication • snapshotgroupReplicaSyncPriority: The Priority setting when Replication Synchronizes the SAN resource • snapshotgroupReplicaMode: The Replication mode of the SAN resource • snapshotgroupReplicaUseExistTM: When Continuous Mode is disabled, the option about using existing MemSnap of the replication • snapshotgroupReplicaPreserveTM: When Continuous Mode is disabled, the option about perserving MemSnap of the replication
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IPSTOR MIB Table / Field Descriptions

<p>snapshotgroupTimeMarkInfo Table</p>	<p>Table containing the TimeMark properties of snapshot groups</p> <ul style="list-style-type: none"> • snapshotgroupTimeMarkGroupID : The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupTimeMarkOption: Indicates if the TimeMark option is enabled or disabled on the snapshot group resource • snapshotgroupTimeMarkCounts: The maximum MemSnaps that is allowed to create of the snapshot group resource • snapshotgroupTimeMarkSchedule: MemSnap schedule time interval • snapshotgroupTimeMarkSnapshotImage: Time day the snapshot is taken • snapshotgroupTimeMarkNotificationOption: Status of snapshot notification option • snapshotgroupTimeMarkReplicationOption: Status of the replication option after the MemSnap is taken
<p>snapshotgroupCDPInfoTable</p>	<p>A table containing the CDP properties of snapshot groups</p> <ul style="list-style-type: none"> • snapshotgroupCDPInfoGroupID: The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupCDPInfoOption: Indicates if the snapshot group CDP Journal option is enabled or disabled on the Memory Gateway • snapshotgroupCDPInfoTotalSize: The total size of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoStatus: The status of the snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoPerformanceLevel: The performance level setting of the snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoAvailableTimerange: The available time range of the snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoUsageSize: The usage size(MB) of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoUsagePercent: The usage percentage of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoTotalSizeQuantity : The total size quantity of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoTotalSizeUnit : The total size unit of snapshot group CDP Journal of the Memory Gateway. 0=KB. 1=MB. 2=GB. 3=TB • snapshotgroupCDPInfoTotalSize64 : The total size 64 bit long of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoUsageSizeQuantity : The usage size quantity of snapshot group CDP Journal of the Memory Gateway • snapshotgroupCDPInfoUsageSizeUnit : The usage size unit of snapshot group CDP Journal of the Memory Gateway. 0=KB. 1=MB. 2=GB. 3=TB. • snapshotgroupCDPInfoUsageSize64 : Usage size

IPSTOR MIB Table / Field Descriptions

<p>snapshotgroupSafeCacheInfoTable</p>	<p>Table containing the properties of snapshot groups</p> <ul style="list-style-type: none"> • snapshotgroupSafeCacheInfoGroupID : The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupSafeCacheInfoTotalSize : The allocated size when creating the cache resource • snapshotgroupSafeCacheInfoFreeSize : The free resource size which is representing in megabyte unit before reaching the maximum resource size • snapshotgroupSafeCacheInfoUsage : Percentage of the used resource size • snapshotgroupSafeCacheInfoThreshold : The data needs to be in the cache before beginning flushing the cache • snapshotgroupSafeCacheInfoFlushTime : The number of milliseconds before cache begins to flush when below the data threshold level • snapshotgroupSafeCacheInfoSkeipWriteCommands Allows the system to skip multiple pending write commands targeted for the same block • snapshotgroupSafeCacheInfoFlushSpeed : The flush speed will be sent at one time during the flush process • snapshotgroupSafeCacheInfoTotalSizeQuantity : The allocated size quantity when creating the cache resource • snapshotgroupSafeCacheInfoTotalSizeUnit : The allocated size unit when creating the cache resource. 0=KB. 1=MB. 2=GB. 3=TB • snapshotgroupSafeCacheInfoFreeSizeQuantity : The free resource size quantity before reaching the maximum resource size • snapshotgroupSafeCacheInfoFreeSizeUnit : The free resource size unit before reaching the maximum resource size. 0=KB. 1=MB. 2=GB. 3=TB. • snapshotgroupSafeCacheInfoResourceID : The Cache resource ID assigned by the Memory Gateway • snapshotgroupSafeCacheInfoTotalSize64 : The allocated size when creating the cache resource • snapshotgroupSafeCacheInfoFreeSize64 : The free resource size which is representing in megabyte unit before reaching the maximum resource size
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IPSTOR MIB Table / Field Descriptions

<p>snapshotgroupResources Info</p>	<ul style="list-style-type: none"> • snapshotgroupMembers: Number of snapshot group members • snapshotgroupAssignClients : The snapshot group assign client counts of the Memory Gateway • snapshotgroupCacheOption : Indicates if the snapshot group cache option is enabled or disabled on the Memory Gateway • snapshotgroupReplicationOption : Indicates if the snapshot group replication option is enabled or disabled on the Memory Gateway • snapshotgroupTimeMarkOption : Indicates if the snapshot group MemSnap option is enabled or disabled on the Memory Gateway • snapshotgroupCDPOption : Indicates if the snapshot group CDP option is enabled or disabled on the Memory Gateway • snapshotgroupBackupOption : Indicates if the snapshot group backup option is enabled or disabled on the Memory Gateway • snapshotgroupSnapShotOption : Indicates if the snapshot group snapshot notification option is enabled or disabled on the Memory Gateway
<p>snapshotgroupMemberTable</p>	<ul style="list-style-type: none"> • snapshotgroupMemberTableGroupID: The snapshot group resource ID assigned by the Memory Gateway • snapshotgroupMemberTableName : Virtual resource name created by the user

IPSTOR MIB Table / Field Descriptions

sanServerTable	<p>Table containing the servers to which the client is connected</p> <ul style="list-style-type: none"> • clsName: Server hostname • clsIPAddress: Server IP address • clsType: Server type • clsOS: Server operating system version • clsTypeOfCPU: Server CPU model • clsNumOfCPU: Number of server CPUs • clsSpeedOfCPU: Server CPU speed • clsFlags: Server special properties (UTF-8 encoding, IPv6/IPv4) • clsDataPort: UDP port used to send/receive data between server and client • clsManagePort: UDP port used to send/receive managed data between server and client • clsNumOfAdapters: Number of SCSI adapters • clsNumOfDevices: Number of logical devices • clsVersion: Server version • clsBuild: Server build number • clsReleaseDate: Release date of server version • clsConnErrors: Number of connection errors between server and client • clsConn: Server connection status (including Attached, Connected, Mounted, Registered, Skipped, Disabled) • clsActivity: Server activity (including read, Write, misc, Error, or Reconnect) • clsSCSIReadCmds: Number of SCSI read commands sent to the server • clsSCSIWriteCmds: Number of SCSI write commands sent to the device • clsOtherSCSICmds: Number of other (not read or write) SCSI commands sent to the device: Number of read/wite error SCSI commands sent to the device • clsDataRead: Number of bytes read from the device • clsDataWritten: Number of bytes written to the device
clsAdapterTable	<p>Table containing the adapters configured on the server</p> <ul style="list-style-type: none"> • clsaName: Server hostname • clsaAdapterNum: SCSI adapter number • clsaChannels: SCSI channel number • clsaSCSIAddress: SCSI address assigned by the server in <Adapter:Channel:SCSI:LUN> format

IPSTOR MIB Table / Field Descriptions

clsadDeviceTable	<p>Table containing devices attached to the adapter</p> <ul style="list-style-type: none"> • clsadDeviceEntry: Information about the hardware configuration and device read/write statistics • clsadName: Server hostname • clsadAdapterNum: SCSI adapter number • clsadDeviceName: Resource name • clsadType: Resource type • clsadAttachMode: Resource access mode • clsadSCSIAddress: SCSI address assigned by the server in <Adapter:Channel:SCSI:LUN> format • clsadLocalSCSIAddress: SCSI address assigned by the local client in <Adapter:Channel:SCSI:LUN> format • clsadLogicalDevice: Resource name • clsadConnection: connection status (including Attached, Connected, Mounted, Registered, Skipped, or Disable) • clsadActivity: Current activity (including Read, Write, Misc, Error, Reconnect or None) • clsadSCSIReadCmds: Number of SCSI read commands sent • clsadSCSIWriteCmds: Number of SCSI write commands sent to the device • clsadOtherSCSICmds: Number of other (not read or write) SCSI commands sent to the device • clsadErrors: Number of read/write error SCSI commands sent to the device • clsadDataRead: Number of bytes read from the device • clsadDataWritten: Number of bytes written to the device
clsavolumeTable	<p>Table containing volumes created on the device</p> <ul style="list-style-type: none"> • clsadvVolumeEntry: Information about the hardware properties and file systems of a volume • clsadvName: Server hostname • clsadvAdapterNum: SCSI adapter number • clsadvDeviceName: Resource name • clsadvLogicalVolumeName: Volume name • clsadvFS: Type of file system on the volume • clsadvLogical: Drive letter, if available • clsadvTotalSize: Total allocated size in bytes • clsadvAvailSize: Available size in bytes

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.chassisSystemArrayEntry.chassisSystemPowerPSUA."lab-fender-098" = STRING: "ON"
enterprises.violin-memory.products.memoryGateway.appliance.media.chassisSystemArrayTable.chassisSystemArrayEntry.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.temp."lab-system-098"."vimm00" = INTEGER: 39
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm01" = INTEGER: 43
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm02" = INTEGER: 43
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm03" = INTEGER: 45
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm04" = INTEGER: 42
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm05" = INTEGER: 41
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm06" = INTEGER: 39
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm07" = INTEGER: 38
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."lab-system-098"."vimm08" = INTEGER: 37
enterprises.violin-memory.products.memoryGateway.appliance.media.arrayVimmTable.arrayVimmEntry.temp."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

The following is an example of querying Fibre Channel performance statistics.

```
$ 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
```