SV SNMP AGENT

Installation

and

User Guide

SUN RELEASE

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PREFACE

Document Overview

This document is intended to assist in using the SV SNMP Agent, a software process that interprets SNMP requests, performs the actions required by that request, and produces an SMNP reply. The agent is designed to provide SAN information to MIB browsers that support SNMP v1.

The SNMP Agent normally listens on UDP port 161; if that port is in use, it can use another. You can view SAN and zone information (created in SV SAN Builder and SV Zone Manager) through the MIB browser, and you also can set up traps that will retrieve particular information and send that information back to you.

Note: See the *SV SAN Builder – Installation and User Guide* and *SV Zone Manager – Installation and User Guide* for more information on SAN and zone configuration.

Chapter 1 explains how to install and configure SV SNMP Agent.

Chapter 2 explains the different fields in the Vicom SV MGMT MIB and how the agent is used with the tables, rows, and entries found in a MIB browser.

Chapter 3 lists the agent traps that are used in SV SNMP Agent, their descriptions, and the trap messages.

Chapter 4 lists the tables, entries, fields, and their descriptions, as seen in a typical MIB browser.

Related Publications

SV SAN Builder – Installation and User Guide – Sun Release	prt no. 310-606154
SV Router FC-FC 3 – Installation and User Guide – Sun Release	prt no. 310-606155
SV Zone Manager – Installation and User Guide – Sun Release	prt no. 310-606156
Vicom SVE Service Manual for UNIX – Sun Release	prt no. 310-606187

Revision History

Software Version	Date	Document
1.0	Sep 17 2001	Preliminary Release 1.0.1
1.0	Oct 15 2001	Release 1.0.2

Service and Support

Please fill out and mail or fax the warranty registration card included with the hardware as soon as possible. Each installation must be registered in order to qualify for technical support.

Vicom provides 24x7x365 support. Customers may call: 1-877-868-4266 or 510-743-1427.

At any time, customers may request support via email at support@vicom.com. Responses to requests will be made during the following business day.

CHAPTER 1

SV SNMP AGENT INSTALLATION AND CONFIGURATION

This chapter explains how to install SV SNMP Agent and how to configure it. It includes these sections:

- System Requirements

- Configuring and Running SV SNMP Agent

System Requirements

In order to function, the SV SNMP Agent must be in the same network as the computer running the SLIC Daemon controlling your SAN, and must be able to communicate with that computer.

The SV SNMP Agent requires one of the following operating systems:

- SUN Solaris® 2.6, 2.7 (7), or 8;

SUN Solaris Package Installation

This application must be installed in the server (management server) directly connected to the SV Router via the Ethernet port.

If you want to install the packages in a directory other than the default directory, **-R** option is available. Use the parameter **-R** to define the full path name of a directory to use as the root_path. All files, including package system information files, are relocated to a directory tree starting in the specified root_path.

Solaris Installation

To install SV SNMP Agent on Sun Solaris, follow these steps:

1. Login as root.

2. Insert the Vicom SVE software module v.2.5 in the CD-ROM drive.

3. Mount the CD-ROM.

4. Type **pkgadd -d . SUNWveagt**, and press enter. The default directory is **/svengine**.

5. If the installation was successful, a message is displayed; **Installation of <SUNWveagt> was successful.**

Solaris Uninstall

To uninstall SV SNMP Agent on Sun Solaris, follow these steps:

1. Type **pkgrm SUNWveagt**, and press enter.

2. If the uninstall was successful, a message is displayed; **Removal of <SUNWveagt> was successful.**

SUN Solaris Server Package Information

Use this command to determine if the package is installed or to display package details.

- • Type **pkgparam -l SUNWveser**, and press enter.

If successful, a message similar to the following is displayed.

```
CLASSES='none'
BASEDIR='/'
PKG='SUNWveagt'
NAME='Vicom SVE Software Module -- SNMP Agent'
DESC='Vicom SNMP Agent, SVE module'
PRODNAME='Virtualization Engine'
PRODVERS='2.5'
VERSION='1.0, REV=2001.11.01.113'
ARCH='sparc'
CATEGORY='application'
VENDOR='Sun Microsystems, Inc.'
HOTLINE='Please contact your local service provider'
EMAIL=''
MAXINST='1000'
PSTAMP='sagem01122117'
PKGINST='SUNWveagt'
INSTDATE='Nov 01 2001 18:08'
```

Configuring and Running SV SNMP Agent

After the installation is complete, the default directory will contain:

svmgmtagent	The executable file (Sun Solaris only).
svmgmtagent.exe	The executable file (Windows only).
sanlist.cfg	The SAN configuration file. A text file that lists all the SANs you want to monitor.
trapclientlist.cfg	The Trap Client configuration file. A text file that lists the host(s) you want to send the trap information to.

Edit the sanlist.cfg file. For each line, enter the SAN name, the SLIC Daemon name, the IP address of the host running the SLIC Daemon, and the SLIC Daemon TCP/IP Port. Separate each field with one or more spaces. The # symbol is used for comments only. For example:

```
#SAN_Name        Daemon_Name        Host_IPAddress        Tcp/Ip_Port
#SAN110              c0                10.0.2.110              default
#SAN111              c0                10.0.2.111              default
#SAN112              r0                10.0.2.112              default
```

Note: Use the default port unless you know exactly which port numbers on your system are usable.

Edit the trapclient.cfg file. For each line, enter the IP address of the host to which you wish to send trap messages, the UDP port number on which that host is listening, and a severity level filter for the traps. Separate each field with one or more spaces. The # symbol is used for comments only. For example:

```
#TrapClient_IPAddress TrapClient_Port SeverityFilter_Number
#127.0.0.1              162                 6
10.0.2.161              162                 6
10.0.2.110              162                 4
```

Traps are sent to clients depending on the severity filter number. All messages with a level up to and including the chosen severity filter number will be sent. The greater the number, the more messages you will receive. The severity level numbers are:

Severity Level 1	unknown
Severity Level 2	alert
Severity Level 3	critical
Severity Level 4	error
Severity Level 5	warning
Severity Level 6	info

Starting SV SNMP Agent

After installing the agent, follow these steps to start it:

1. Make sure all daemons listed in the sanlist.cfg are running before starting the agent.

2. Type **svmgmtagent** at the command line prompt to start the agent with the default SNMP port 161.

   If port 161 is unavailable, you will see an **SNMP port init failed** error.

   If that happens, type **svmgmtagent <port number>** to start the agent (**<port number>** can be any available port number).

It should take several minutes for the agent to collect the data from all the SANs.

Stopping SV SNMP Agent

To stop the agent, kill the **svmgmtagent** process. Type **kill <process id>** at the UNIX prompt, or **<control> c** at the windows command line prompt.

Configuring your MIB Browser

Once the SV SNMP Agent is running, you can start your MIB Browser or SNMP Agent Manager, then load the **vicom-sv-mgmt-mib.mib** MIB file.

The **vicom-sv-mgmt-mib.mib** file is located in the **/MIB** directory of the CD-ROM. Depending on the MIB browser you use, this MIB file may have to be compiled, or it simply may be added to the existing MIB files.

Once the MIB file is loaded, you should be able to view the SANs.

If your MIB Browser does not support traps, you will need a separate Trap Watcher program. These programs simply listen to port 162 on your computer for messages, so they do not require any configuration.

CHAPTER 2

SNMP AGENT MIB FIELDS

This chapter explains the different fields in the Vicom SV MGMT MIB and how the agent is used with the tables, rows, and entries found in a MIB browser. It includes this section:

- MIB Tree Structure/Hierarchy

MIB Tree Structure/Hierarchy

SV SMNP Agent provides a read-only view of your SANs, arranged by fields. To find the value of a particular field, the agent searches through each table, row, and specific field until it finds the object. It then reports that value or reports a null or empty value if none is found.

In Figure 1 'Sample section of a MIB Browser' shown below, the fields are represented with an icon different from the tables and the entries (table rows). Each table has one entry, and that entry has a number of fields that belong to it.

Figure 1   Sample section of a MIB Browser

This example shows the connSANTable and its single row, connSANEntry, which contains all of the connSAN fields that are related.

There are two ways to view this information. You can select a field and request that this information be retrieved (this is often called 'Walking'), or you can open the table itself. Opening the table allows you to view the information in all of the fields at once.

Figure 2 'MIB Table' shows the first few fields from connSANEntry with the corresponding data.

Instance	connSANIndex(IDX)	connSANName	connSANDaemon	connSANStatus	connSANSignonDrive	connSANSign
1	1	SAN181r0	r0/10.0.2.181	active(2)	Ethernet Router	IP 10.0.2.34

Figure 2   MIB Table

The tables in the Vicom SV MGMT MIB are grouped together in three main folders.

- vSVSANMgmt holds the information corresponding to the SV SAN Builder program. It contains connSANCount and two subfolders: connSANView and logicalSANView.

  - connSANView contains the following tables: connSANTable, connSLICTable, connPhysicalDevTable, and connOfflineDevTable.

  - logicalSANview contains the following tables: globalMappedDeviceTable, generalSpareDevTable, complexDeviceTable, memberDeviceTable, diskPoolTable, virtualDriveTable, and poolDriveTable.

- vSVZoneMgmt holds the information corresponding to the SV Zone Manager program. It contains the following tables: hostAdapterTable, svDomainTable, zoneTable, zoneViewHostAdapterTable, zoneViewDeviceTable, slicViewDeviceTable, and HostAdapterViewDeviceTable

- trapReg holds the information about the traps and who is authorized to receive them. It contains trapMaxClients, trapClientCount, and the trapRegTable.

CHAPTER 3

SNMP TRAPS

This section lists the agent traps that are used in SV SNMP Agent, their descriptions, and the trap messages. It includes these sections:

- SAN Configuration Changed Trap

- SAN Daemon Status Changed Trap

- SAN Device Deleted Trap

- SAN Device Event Trap

Note: Trap messages are subject to change.

SAN Configuration Changed Trap

Name: *sanConfigurationChanged*

Description: General status of physically connected devices in SAN has changed. Recommended severity level (for filtering): info.

Messages:

- SRN = 7xx3x. SAN global configuration has changed (info).

- SRN = 7xx4x. Zone configuration has changed (info).

- SRN=70020. SAN topology has changed (info).

SAN Daemon Status Changed Trap

Name: *sanDaemonStatusChanged*

Description: General status of logical devices in SAN has changed. Recommended severity level (for filtering): alert.

Messages:

- SRN = 71001. Daemon SLIC communication failure (daemon detected). (alert)

- SRN = 71002. Daemon SLIC communication failure (daemon timeout). (alert)

SAN Device Deleted Trap

Name: *sanDeviceDeleted*

Description: A physical device has been deleted from the SAN. Recommended severity level (for filtering): alert.

Messages:

- SRN = 70021. A physical device is missing (critical).

- SRN = 70022. An SV Router (SLIC) is missing (critical).

SAN Device Event Trap

Name: *sanDeviceEvent*

Description: An event has occurred in the SAN. Recommended severity level (for filtering): info.

Messages:

- SRN = 70023. Device is not responding (critical).

- SRN = 70024. Partner router's IP is reachable (info).

- SRN = 70025. Partner router's IP is not reachable (critical).

- SRN = 70050. MultiPath drive failover (info).

- SRN = 70051. MultiPath drive failback (info).

- SRN = 72000. Primary/secondary SLIC Daemon connection is active (info).

- SRN = 72001. Failed to read SAN drive configuration (alert).

- SRN = 72002. Failed to lock on to SLIC Daemon (alert).

- SRN = 72003. Failed to read SAN SignOn information (alert).

- SRN = 72004. Failed to read zone configuration (alert).

- SRN = 72005. Failed to check for SAN changes (alert).

- SRN = 72006. Failed to read SAN event log (alert).

- SRN = 72007. SLIC Daemon connection is down (alert).

Note: See the *SV SAN Builder – Installation and User Guide* for a complete list of SRNs.

CHAPTER 4

REFERENCE TABLES

This section lists the tables, entries, fields, and their descriptions, as seen in a typical MIB browser. It includes these sections:

- Scalar Variables and Trap Tables

- SV SAN Builder Tables

- SV Zone Manager Tables

Scalar Variables and Trap Tables

There are three scalar variables that are not associated with any of the tables. Table 1 lists the scalar variables and their descriptions.

Table 1   Scalar Variable Field Descriptions

Scalar Variable	Description
connSANcount	Displays the number of connected SANs.
trapMaxClients	Displays the maximum number of clients allowed.
trapClientCount	Displays the current number of users.

TrapRegTable

TrapRegEntry

Table 2 lists the information in the trapclient.cfg file.

Table 2   TrapRegTable Fields and Descriptions

Field	Description
trapRegIpAddress	The IP Address of a client registered to receive traps.
trapRegPort	The UDP port to receive traps for this host (default = 162).
trapRegFilter	This value defines the trap severity filter for this trap host. The Agent will send traps to the client that have a severity level that is less than or equal to this value.

SV SAN Builder Tables

connSANTable

connSANEntry

Table 3 lists information about all the connected SANs.

Table 3   connSANTable Field Descriptions

Field	Description
connSANIndex	SAN index.
connSANName	SAN name.
connSANDaemon	SLIC Daemon name and the host on which it is running.
connSANStatus	SAN status (active or inactive).
connSANSignonDrive	SAN SignOn drive.
connSANSignonMapping	SignOn drive LUN ID Mapping of this SAN.
connSANSignonPartition	SignOn drive partition.
connSANSignonAltPartition	Alternate SignOn partition.
connSANSLICCount	Total initiator SLICs of this SAN.
connSANPhysicalDevCount	Total physical devices of this SAN.
connSANMirrorDevCount	Total number of mirror devices in this SAN.
connSANCompositeDevCount	Total composite devices in this SAN.
connSANInstcpyDevCount	Total number of Instant Copy drives in this SAN.
connSANGenSpareCount	Total general spare drives in this SAN.
connSANOfflineDevCount	Total number of offline devices in this SAN.

connSLICTable

connSLICEntry

Table 4 lists information about the SV Router and how it is connected.

Table 4   connSLICTable Field Descriptions

Field	Description
connSLICIndex	SLIC index.
connSLICSANName	SAN name.
connSLICNum	SLIC (SV Router) initiator number.
connSLICName	SLIC (SV Router) name.
connSLICType	SLIC (SV Router) type.
connSLICUID	SLIC (SV Router) ID.
connSLICStatus	SLIC (SV Router) status.
connSLICMaster	Master SV Router.
connSLICFCID	SLIC (SV Router) FC ID setting.
connSLICRevision	SLIC (SV Router) revision.
connSLICVPDDescription	SLIC Vital Product Data description.
connSLICSerialNum	SLIC (SV Router) serial number.

connPhysicalDevTable

connPhysicalDevEntry

Table 5 lists information about the physical devices in the SAN.

Table 5   connPhysicalDevTable Field Descriptions

Field	Description
connPDevIndex	Physical device index.
connPDevSANName	SAN name.
connPDevTargetID	Physical device target number.
connPDevType	Physical device type.
connPDevGlobalMapping	Physical device global LUN ID Mapping.

Table 5   connPhysicalDevTable Field Descriptions

Field	Description
connPDevUID	Physical device UID.
connPDevCapacity	Physical device disk space.
connPDevStatus	Physical device status.
connPDevAttribute	Physical device attribute.
connPDevRevision	Physical device revision description.
connPDevVPDDescription	Vital Product Data description of this physical device.
connPDevSerialNum	Serial number of this physical device.

connOfflineDevTable

connofflineDevEntry

Table 6 lists information about the offline devices in the SAN.

Table 6   connOfflineDevTable Fields and Descriptions

Field	Description
connOffDevIndex	Offline device index.
connOffDevSANName	SAN name.
connOffDevTargetID	Offline device target number.
connOffDevType	Offline device type.
connOffDevUID	Offline Device UID.

globalMappedDeviceTable

globalMappedDeviceEntry

Table 7 lists information about the mapped devices in the SAN.

Table 7   globalMappedDeviceTable Fields and Descriptions

Field	Description
mappedDevIndex	Mapped device index.

Table 7   globalMappedDeviceTable Fields and Descriptions

Field	Description
mappedDevSANName	SAN name.
mappedDevTargetID	Target ID description of mapped devices.
mappedDevName	Device name description.
mappedDevType	Mapped device type.
mappedDevMapping	Device LUN Mapping.
mappedDevCapacity	Device capacity.
mappedDevStatus	Mapped device status.

generalSpareDevTable

generalSpareDevEntry

Table 8 lists the general spare drives in the SAN. General spare drives can take the place of a mirror member drive that fails.

Table 8   generalSpareDevTable Fields and Descriptions

Field	Description
gspareIndex	General spare drive index.
gspareSANName	SAN name.
gspareTargetID	General spare drive target number.
gspareStatus	General spare drive status.
gspareUIDName	General spare UID or name.
gspareCapacity	General spare drive disk space.
gspareAttribute	General spare drive attribute.

complexDeviceTable

complexDeviceEntry

Table 9 lists the complex devices in the SAN. These are all the logical drives that have been created in SV SAN Builder.

Table 9   complexDeviceTable Fields and Description

Field	Description
cmplxDevIndex	Logical device index.
cmplxDevSANName	SAN name.
cmplxDevTargetID	Logical device target number.
cmplxDevName	Logical device name.
cmplxDevType	Logical device type.
cmplxDevGlobalMapping	Logical device LUN Mapping.
cmplxDevCapacity	Logical device total disk capacity.
cmplxDevStatus	Logical device status.
cmplxDevMemberCount	Total number of member drives of this logical drive.

memberDeviceTable

memberDeviceEntry

Table 10 lists the member drives (drives that belong to complex drives) in the SAN.

Table 10   memberDeviceTable Fields and Descriptions

Field	Description
memberDevSANName	SAN name.
memberDevLogicalDev	Logical/complex drive of this member drive.
memberDevTargetID	Member drive target number.
memberDevType	Member drive type.
memberDevUIDName	Member drive UID/name.
memberDevCapacity	Member drive capacity (disk space).

diskPoolTable

diskPoolEntry

Table 11 lists all disk pools in the SAN. Drives that are part of a disk pool can be carved up into virtual drives.

Table 11   diskPoolTable Fields and Descriptions

Field	Description
dpoolIndex	Disk pool index.
dpoolSANName	Disk pool SAN name.
dpoolName	Disk pool name.
dpoolPoolDrvCount	Total number of physical drives counted in this disk pool.
dpoolVirtualDriveCount	Total number of virtual drives counted in this disk pool.
dpoolCapacity	Disk pool total disk space.

virtualDriveTable

VirtualDriveEntry

Table 12 lists all the virtual drives in the SAN. Virtual drives are carved out of drives in the disk pool.

Table 12   virtualDriveTable Fields and Descriptions

Field	Description
virtualDrvIndex	Virtual drive index.
virtualDrvSANName	Virtual drive SAN name.
virtualDriveTargetID	Virtual drive target number.
virtualDriveNameID	Virtual drive name description.
virtualDriveGlobalMapping	Virtual drive global LUN Mapping.
virtualDriveCapacity	Virtual drive total disk space.
virtualDriveSourceLBA	Location in source drive of this virtual drive.

poolDriveTable

poolDriveEntry

Table 13 lists all the pool drives in the SAN. Pool drives are drives that have been placed into a disk pool.

Table 13　　poolDriveTable Fields and Descriptions

Field	Description
poolDrvIndex	Pool drive (physical drive) index.
poolDrvSANName	Pool drive SAN name.
poolDriveTargetID	Pool drive (physical drive) target ID.
poolDriveNameID	Pool drive name description.
poolDriveCapacity	Pool drive (physical drive) total disk space.
poolDriveStatus	Pool drive current status.
poolDriveFreeDiskSpace	Total amount of free disk space for this pool drive.

SV Zone Manager Tables

hostAdapterTable

hostAdapterEntry

Table 14 lists all host bus adapters that can be viewed from a particular SAN.

Table 14   hostAdapterTable Fields and Descriptions

Field	Description
hostAdapterIndex	Host bus adapter index.
hostAdapterSANName	SAN name.
hostAdapterSLICNum	SLIC initiator number.
hostAdapterStatus	Host bus adapter status.
hostAdapterName	Host bus adapter name.
hostAdapterUID	Host bus adapter UID.

svDomainTable

svDomainEntry

Table 15 describes the SV Domains that have been created.

Table 15   svDomainTable Fields and Descriptions

Field	Description
svDomainIndex	Domain index.
svDomainSANName	SAN name.
svDomainSLICNum	Initiator Number of the SV Router to which the SV Domain belongs.
svDomainName	Domain name.
svDomainID	Domain ID description.
svDomainStatus	Domain status.
svDomainZoneCount	Total number of zones in the domain.

zoneTable

zoneTableEntry

Table 16 lists information about all of the zones that have been defined.

Table 16   zoneTable Fields and Descriptions

Field	Description
zoneIndex	Zone index.
zoneSANName	SAN name.
zoneSLICNum	SLIC initiator number.
zoneSVDomainName	Domain name of this zone.
zoneName	Zone name description.
zoneID	Zone ID description.
zonePublic	Public zone.
zoneHostAdapterCount	Total number of host bus adapters in this zone.
zoneDeviceCount	Total number of devices in this zone.

zoneViewHostAdapterTable

zoneviewHostAdapterEntry

Table 17 lists information about the host bus adapters in each zone.

Table 17   zoneViewHostAdapterTable Fields and Descriptions

Field	Description
zoneViewHASANName	SAN name.
zoneViewHAZoneID	Zone ID description.
zoneViewHAName	Host bus adapter name.
zoneViewHAUID	Host bus adapter UID (worldwide name).
zoneViewHAStatus	Host bus adapter status.

zoneViewDeviceTable

zoneViewDeviceEntry

Table 18 lists all of the devices that can be seen in each zone.

Table 18   zoneViewDeviceTable Fields and Descriptions

Field	Description
zoneViewDevSANName	SAN name.
zoneViewDevZoneID	Zone ID.
zoneViewDevTargetID	Logical drive target number.
zoneViewDevUIDName	Drive UID name.
zoneViewDevCapacity	Disk space of the drive in this zone.
zoneViewDevMapping	Drive mapping in this zone.

slicViewDeviceTable

slicViewDeviceEntry

Table 19 is the SLIC (SV Router) View of all devices in the zone.

Table 19   slicViewDeviceTable Fields and Descriptions

Field	Description
slicViewDevSANName	SAN name.
slicViewDevSLICNum	SLIC initiator number.
slicViewDevTargetID	SLIC View of the device unit configuration type.
slicViewDevType	SLIC View of a device unit target number, name, or ID description.
slicViewDevName	Name description of the device in this SLIC View.
slicViewDevCapacit	Device disk space.
slicViewDevStatus	Device status.

hostAdapterViewDeviceTable

hostAdapterViewDeviceEntry

Table 20 displays the host bus adapter view of all the devices in the zone.

Table 20   hostAdapterViewDeviceTable Fields and Descriptions

Field	Description
haViewDevSANName	SAN name.
haViewDevSLICNum	SLIC (SV Router) number description.
haViewDevHostAdapterID	Host bus adapter name description.
haViewDevTargetNameID	Device target ID description.
haViewDevType	Configured device type.
haViewDevMapping	Device LUN Mapping.
haViewDevCapacity	Device disk space.
haViewDevStatus	Device status.

GLOSSARY

async alert	A signal sent by a drive or a storage area router to inform the user that an error has occurred with the originator of the signal.
auto rebuild	The storage router automatically replaces the failed drive with the spare drive. Router then copies the data from the primary drive to the spare drive, which is now a member of the mirror drive.
available drive pool	A list of usable, functional drives. This includes composite, simple, and general spare drives.
command line interface	A program that accepts commands as typed-in phrases for both UNIX and NT operating systems.
complex drive	A group of storage drives that contains a single ID and LUN. Complex drives can be mirror, composite, mirror composite or multipath.
composite drive	A combination of multiple drives that are seen by the host computer as one. The host sees one drive with the capacity of all the drives combined. Maximum number of drives that a user may combine is eight. When writing to this drive, the information is written in a sequential manner.
concatenation	See composite drive.
configuration file (config file)	The configuration (config) file defines the function of the SLIC daemon.
daemon	See SLIC daemon.
daemon server	The server used to run the SLIC daemon.

dedicated spare

A drive assigned to replace any failed drive within a designated mirror set.

delete Instant Copy

Removes Instant Copy member from a mirror drive.

device router

The router connected to the storage loop.

disk partition

A designated section of memory created on a disk drive.

disk pool

The disk pool is a group of drives from which virtual drives are created. The group of drives that make up the disk pool are called pool drives. Pool drives are created from mapped drive(s), unmapped drive(s), spare drive(s), or multipath drive(s).

DMP

An acronym for dynamic multi-pathing. A software based process that provides and manages multiple data paths. It provides load balancing across multiple I/O channels and if a path fails, it redirects the data through an alternate route.

encapsulation technique

Creating a partition on a drive for use by the storage router.

Ethernet communication

Also called out-of-band communication. SAN connection where control-related signals are transmitted through TCP, rather than in-band with the data.

failover

Automatic and seamless possession of a device's operations when it fails.

FC-AL

An acronym for Fibre Channel – Arbitrated loop. A form of Fibre Channel network in which up to 127 nodes are connected in an arbitrated loop topology. All devices share the same bandwidth and only two devices can communicate with each other at the same time.

FC Node

Fibre Channel Architecture. Any device on the FC-AL loop.

GBIC

An acronym for Gigabit Interface Converter. An interface that converts serial optical signals to serial electrical signals and vice versa. The GBIC is designed to transmit signals via Fibre Channel and Ethernet protocol. It can be designed for use with an optical or copper path. The GBIC is also hot-swappable.

general spare

A spare drive prepared to replace any failed mirror drive.

heartbeat	A signal used to identify and ensure that paired failover devices in the network are functioning. Once the partner no longer detects the heartbeat signal then the device will perform failover.
heterogeneous	Dissimilar. In storage it usually refers to servers or storage that have differing protocol (SCSI, FC, SSA etc.) and exist within the same network.
host	The computer that is coordinating the functions of the (local) SV Router in use.
host bus adapter	A device that connects one or more peripheral units to a computer.
host router	The router connected to the host computer.
host server	The computer that is coordinating the functions of the target router in use.
hot plugging (hot swapping)	The connection and disconnection of peripherals or other components without interrupting system operation.
in-band communication	SAN connection where both control-related signals and data are transmitted through the same path.
initiator	A device that originates a signal or a command.
Instant Copy	An Instant Copy drive will duplicate the data on any mirror drive (two-way or three-way) without interrupting normal operating functions.
IOCB	I/O Control Block. It restricts the number of I/O commands sent from the Host Buffer. When the IOCB count is reached, it will issue a "Queue Full" message to the corresponding HBA. Limiting the Queue Depth keeps the host bus adapters from issuing too many commands, which can slow down system performance.
IOPS	Input/Output Per Second. It is the number of inputs and outputs or read/writes per second.
Ixxxxx	The initiator's identification number.
local SLIC	The SV Router that is attached to the host computer running the daemon.

logical drive	A group of drives that contain a single ID and LUN. Logical drives can be mirror, composite, mirror composite, Instant Copy or multipath.
logical volume	A designated section of memory created on a disk drive.
logical unit number (LUN)	The SCSI identifier of a logical unit within a target. Each SCSI ID can be divided into eight (0-7) logical units. These logical units can represent whole disks. This identifying number determines the device's priority.
LUN mapping	The ability to change the virtual LUN number as presented to the server from the storage. This allows such benefits as the ability for a server to boot from the SAN without the requirement of a local disk drive. Each server requires LUN 0 to boot.
LUN masking	Enables an administrator to dynamically map an HBA to a specified LUN. This allows an individual server or multiple servers access to an individual drive or to multiple drives, and prohibits unwanted server access to the same drive(s).
management information base	See MIB.
mapped drive	A drive that is assigned an ID and/or LUN for addressing purposes.
mapping table	See SAN database.
master SLIC (master router)	This is the SV Router that controls the storage loop including the drive configuration. All changes to drives must come through this master.
member drive	A drive within a complex drive. Within a Mirror drive, a member can be a simple or a composite drive.
media	The permanent storage area of a drive.
MIB	Acronym for Management Information Base. A database that describes the objects of the a device monitored by SNMP agent.
microcode	An instructional program to enable the proper operations between electrical functions of the computer and its corresponding device(s).
mirror composite drive	A combined group of drives seen as one drive by the host and mirrored or copied by another drive or combined group of drives.

mirror drive	A group of two or three members that contain the same information. A member of a mirror drive can be a simple or a composite drive.
mirroring	Writing identical information to separate drives simultaneously. Also known as RAID Level 1.
multipath drive	A logical LUN or drive created to hide, from the data server, the active and passive paths to a disk array that does not support multi-initiator attach.
node	Any device on the storage loop.
node mapping table	See SAN database.
node table	See SAN database.
offline	Describes a device that is not connected to or not installed in the storage subsystem. A drive could be connected physically to the SAN, but if it is not turned on or not in ready mode, it is considered offline.
owner	The SV Router or SV Routers that have access to the corresponding drive.
one-way mirror	A drive that contains only one mirror member. A one-way Mirror Drive is designed specifically to transmit data from a physical or a composite drive to an Instant Copy drive. This feature is only useful with the Instant Copy command.
out-of-band communication	SAN connection where both control-related signals and data are transmitted through separate paths.
physical drive	A drive that exist in the storage subsystem. They can be mapped or unmapped drives.
primary member	The drive that is copied via mirroring by other drives.
pool drives	The name for drives in the disk pool.
private drive	A simple drive or a complex drive that can be accessed only by an authorized storage router.
public drive	A drive (simple or complex) that can be accessed by any router on the storage loop.

quick initialize

Prompts SV SAN Builder to write zeros to the first block of the disk. After this process is complete, the drive appears new to the host. The host then will review the drive's configuration again. It is not a full initialization.

RAID Level 5

Data is striped across three or more drives for performance, and parity bits are used for fault tolerance. The parity bits from two drives are stored on a third drive.

RMBPS

An acronym for Read MegaBytes Per Second. Displays the rate at which data is read from a specific drive within the storage loop.

SAN

Acronym for Storage Area Network. A high-speed network that connects storage devices. The SV Routers are the foundation of the Vicom SAN. They share a common backbone and enable communication between storage device such as; data servers, switches, and disk arrays. In certain cases, the combination of all these devices may also be referred to as a SAN.

SAN database

A data reference source for the configuration of the SAN. The database is shared among all the SV Routers in the SAN, and each SV Router retains a copy of the database. Each time a change occurs in the SAN, all SV Routers are updated.

SLIC

An acronym for Serial Loop IntraConnect. Often used to represent SV Router.

SCSI-FC Extender

Extends SCSI connectivity to 500 meters, overcoming the SCSI distance constraint.

SCSI ID

An acronym for Small Computer Serial Interface Identification. A unique number, given to each device on the SCSI bus. This identifying number determines the device's priority. The numbers range from 0-15, with 7 reserved for the host.

SCSI topology

A map or view of all the complex drives on the storage loop.

service and diagnostic codes

A code composed of numbers referring to problems and events within the storage subsystem. Presented through an LED readout on the SV Router.

service request number

See SRN.

serial loop

A loop of devices connected via fibre channel or SSA protocol.

SignOn drive   The logical or physical drive containing all the configuration data that is located on the storage or serial loop. The host communicates with the SAN through this drive.

SignOn path   The path that points to the location of the SLIC Partition on the sign-on drive.

SignOn router   The router attached to the host computer running the SLIC daemon, through which communication to the SAN is established.

simple drive   One storage drive that contains an ID and LUN. It is not a complex drive.

SLIC daemon   A software agent running on the host (either a local or remote server) that permits communication between the client and the subsystem (SV Routers and Drives).

SNMP   An acronym for Simple Network Management Protocol. A network protocol. Used with software (SNMP agent and manager) that monitors the network and transmit the information to the network administrator.

spare drive   See general spare.

SRN   An acronym for Service Request Number. A number used to notify the user of changes or problems that occur within the storage system

SSA   An acronym for Serial Storage Architecture. A storage loop from IBM with speeds that can reach 160 Mbps. The loop's design provides added security. If one drive fails, access to the storage loop is maintained.

SSA node   Any device on the SSA (Serial Storage Architecture) loop.

SSA topology   A map of the nodes on the SSA loop.

standby drive   An unmapped drive that is a member of a disk pool.

storage subsystem   A combination of disk drives and controllers.

storage capacity   The amount of data that can be stored on each drive or complex drive.

storage virtualization   The secure and dynamic pooling of diverse storage equipment across heterogeneous servers and clients.

SV Router   A Vicom developed hardware module in SVE, which serves as the fundamental building block in a SAN. It provides storage management functions that enable a Fibre Channel host to interface with and control all storage-related elements in a SAN.

SV SAN Builder   A Vicom developed software module in SVE, which creates virtual drives and logical drives on the SAN. Logical drives can be composite drive(s), mirror drive(s), general spare drives, and Instant Copy drives.

SV SNMP Agent   A Vicom developed software module in SVE, which stores and retrieves data from the SAN, and signals the SNMP manager when an event occurs.

SV Zone Manager   A Vicom developed software module in SVE, which enables the system administrator to map logical or physical storage to an HBA. This ability allows the administrator to allocate storage on demand.

target   The recipient of a command or a signal sent by the initiator.

target number   A number assigned to each drive on the loop, except unmapped drives.

target router   The router attached to the host computer.

three-way mirror   Triplicate drives that are created either by data simultaneously written to three separate drives or by data copied from one drive to another drive. Either method ensures that they become duplicates.

two-way Mirror   Duplicate drives that are created either by data simultaneously written to two separate drives or by data copied from one drive to another drive. Either method ensures that they become duplicates.

Txxxxx   The Target's identification number.

unmapped drive   A drive that has not been assigned an ID and/or LUN for addressing purposes.

virtual drive   A logical drive created from the free space of a disk pool.

VPD   An acronym for Vital Product Data. Information about a device that is stored on the device itself. It allows the device to be administered at a system or network level. Typical VPD information includes a product model number, a unique serial number, product release level, maintenance level, and other information specific to the device type.

web walk   The process of a device scanning the storage subsystem.

WMBPS   Acronym for Write MegaBytes Per Second. Displays the rate at
                                      which data is written to a specific drive within the storage loop.

zone   A dedicated path between a LUN and the HBA to which it is mapped.

zoning   The act of mapping a LUN(s) to an HBA(s).

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