StoreVault® Manager 3.2
User's Guide

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Preface

About this guide

This guide describes the following tasks and topics:

- Installation of StoreVault® Manager software
- Configuration of the StoreVault storage system using StoreVault Manager
- StoreVault storage system administration
- Storage management
- Quota management for users and groups
- Back up and restore of data
- StoreVault replication and recovery for remote data protection
- StoreVault command-line interface (CLI)

This guide does not cover installation and replacement of hardware components. For installation and replacement of hardware components, see the relevant model Hardware Guide. For the StoreVault S550 storage system, see the NetApp Hardware *S550 Hardware Guide*, for the StoreVault S500 storage system, See the NetApp Hardware *S500 Hardware Guide,* and for the StoreVault S300 storage system, see the NetApp Hardware *S300 Hardware Guide*.

The preface contains the following sections:

- "Audience" on page v
- "Typographic conventions" on page vi
- "Notices in this guide" on page vii
- "Other documents" on page vii

Audience

This guide is for system administrators of the StoreVault storage system. The system administrator needs access to the StoreVault storage system and privileges on the network. For definitions of terms used in this guide, see the "Glossary" section.

Typographic conventions

The following table describes the typographic conventions used in this guide.

Convention	Type of information
Italic font	Words or characters that require special attention. Placeholders for information you must supply. For example, if the guide says to enter the **`arp -d hostname`** command, you enter the characters "arp -d" followed by the actual name of the host. Book titles in cross-references.
`Monospaced` font	Command names, option names, keywords, and daemon names. Information displayed on the system console or other computer monitors. The contents of files.
`Bold monospaced` font	Words or characters you type. What you type is always shown in lowercase letters, unless you must type it in uppercase letters.

Keyboard conventions

The following table lists the character formats used in this guide to set off special information.

What is in this guide…	What it means…
hyphen (-)	Used to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key.
Enter	Used to refer to the key that generates a carriage return; the key is named Return on some keyboards.
type	Used to mean pressing one or more keys on the keyboard.
enter	Used to mean pressing one or more keys and then pressing the Enter key.

Notices in this guide

This document might contain the following types of messages to alert you to conditions you need to be aware of. Danger notices and caution notices only appear in hardware documentation, where applicable.

Note

A note contains important information that helps you install or operate the system efficiently.

Attention

An attention notice contains instructions that you must follow to avoid a system crash, loss of data, or damage to the equipment.

Danger

A danger notice warns you of conditions or procedures that can result in death or severe personal injury.

Caution

A caution notice warns you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous.

Other documents

The following are other documents related to StoreVault storage.

- *StoreVault Manager Quick Start Guide*
- *StoreVault Hardware Guides*

Introduction to the StoreVault storage system 1

About this chapter

This chapter provides a brief overview of the StoreVault S500, StoreVault S550, and StoreVault S300 storage systems hardware and their components. This chapter also provides an overview of the StoreVault Manager software.

Topics in this chapter

This chapter discusses the following topics:

- "Overview of StoreVault hardware" on page 2
- "Overview of StoreVault Manager software" on page 10
- "What RAID is" on page 16
- "Configuring disk drives" on page 17

Overview of StoreVault hardware

A StoreVault S500, S550, or S300 storage system is a hardware and software-based data storage and retrieval system. It responds to network requests from clients and fulfills them by writing data to or retrieving data from its disk drives.

About the StoreVault S500

The StoreVault S500 is an all-inclusive storage system that can be deployed as network attached storage (NAS), storage area network (SAN), and direct-attached storage. It supports up to 12 disk drives of 250 GB storage capacity SATA I or 500 GB storage capacity SATA II and scales up from 1 TB to 6 TB. StoreVault uses proven RAID4 and RAID-DP for unparalleled data protection. The StoreVault runs on Data ONTAP® S Family Edition operating system for simplicity and reliability. The dual hot-swap power supplies give redundant power supply to the device. You can set up a high performance Fibre Channel SAN by attaching the QLogic SAN starter kit to StoreVault.

StoreVault S500 components: The following table lists the StoreVault S550 components.

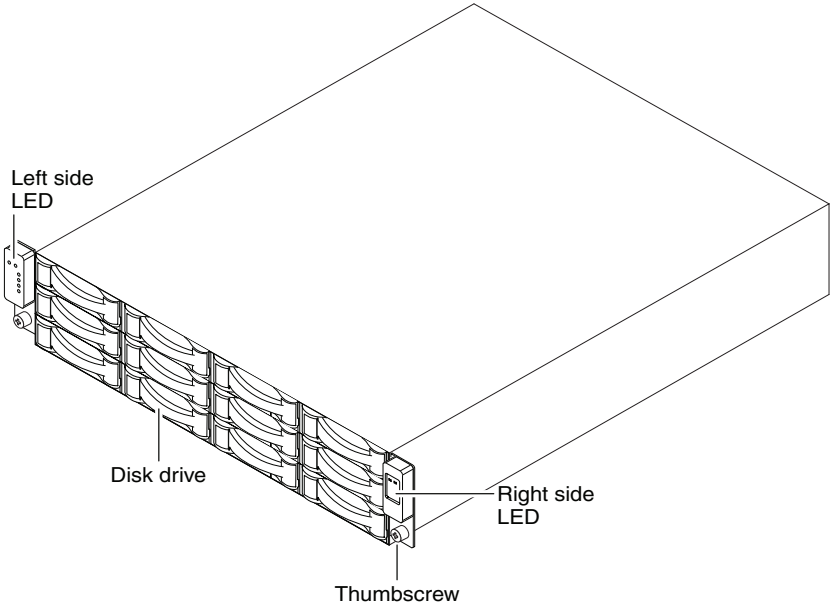
Component	Function
Disk drives	Supports up to 12 250-GB or 500-GB SATA disk drives.
Power supply	Input 100-127V ~9A or 200-240V~4.5A Auto ranging 50/60 Hz Output +3.3V DC / +5V DC / +12V DC / -5VDC / -12VDC Redundant power supplies can be hot-swapped without powering down the unit.
SCSI card	One 68-pin VHDCI for connecting LVD SCSI devices. SCSI card is optional
FCP Card	Fibre Channel SAN Starter Kit uses the Fibre Channel Target Card. FCP card is optional.
CompactFlash card	256-MB CompactFlash card provides cache for the operating system.
NVRAM (nonvolatile RAM) card	256-MB, provides 72-hour battery backup for data not yet written to the disk if a power failure.
Fan assembly	Provides cooling for StoreVault components and CPU.
Network interface	Onboard Dual 10/100/1000 Ethernet Network Interface
StoreVault S550 chassis	2U chassis, compatible with 19” system racks (2 or 4 post)

About the StoreVault S550

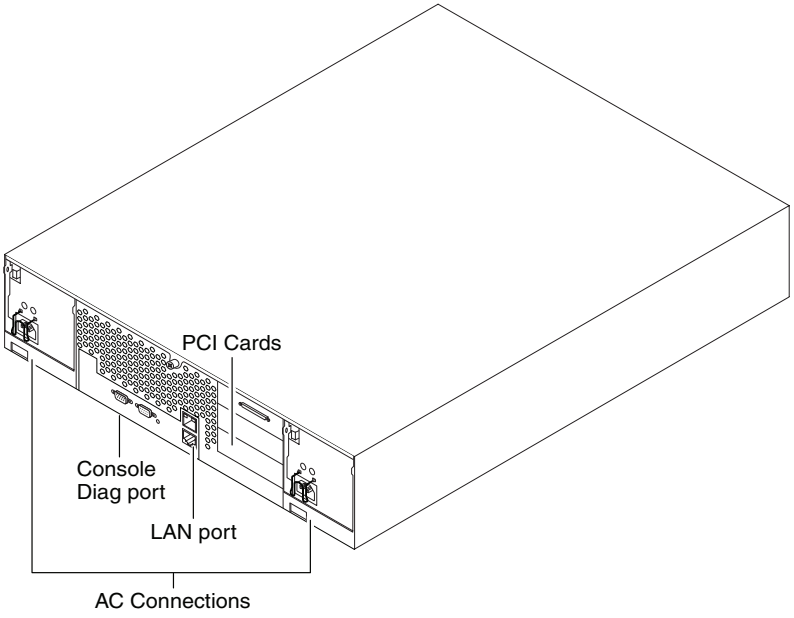
The StoreVault S550 supports up to 12 SATA II (serial advanced technology attachment) disk drives with individual drive capacities of up to 1 TB. Overall capacity scales from 3 TB to 12 TB of storage. StoreVault products provide RAID4 or state-of-the-art RAID-DP™ technology for unparalleled data protection. StoreVault products are powered by Data ONTAP S Family Edition operating system for simplicity and reliability. Dual hot-swappable power supplies in the StoreVault S550 provide resiliency if power supply fails. The optional Fibre Channel SAN target card allows the StoreVault S550 to provide storage on a Fibre Channel SAN.

The StoreVault S550 storage system can contain 4 to 12 hard disks.

StoreVault S550 front view: In the figure, the front of the StoreVault S550 storage system contains bays for disks, Light-emitting diodes (LEDs) on the right and left, and thumbscrews below the LED panels.



StoreVault S550 rear view: The rear of the StoreVault S550 storage system contains connections for AC power, a LAN port, a console diagnostics port, and optional PCI slots for a QLogic Fibre Channel card and a SCSI card.



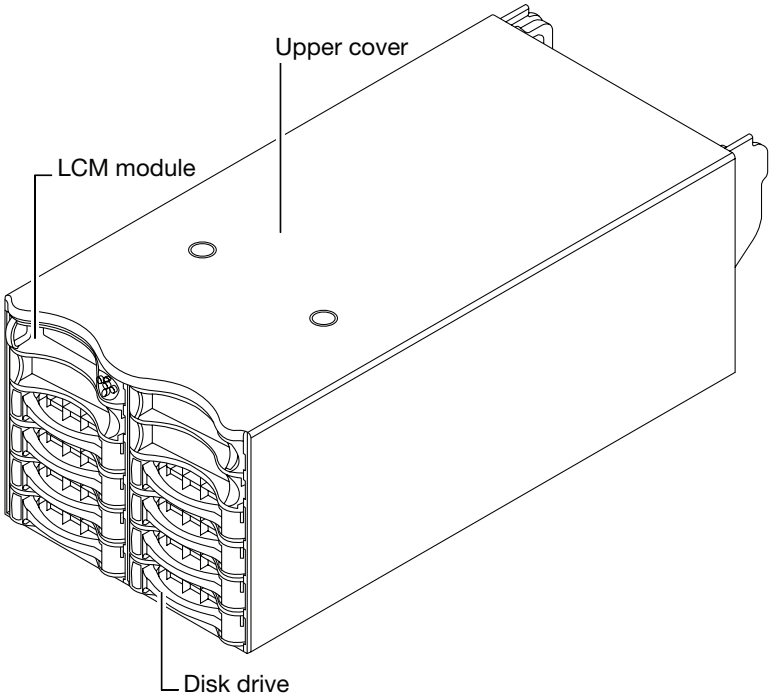
StoreVault S550 components: The following table lists the StoreVault S550 components.

Component	Function
Disk drives	Can have up to 12 500-GB, 750-GB or 1-TB SATA disk drives
Power supply	Input 100-27V ~9A or 200-240V~4.5A Auto ranging 50/60 Hz Output +3.3V DC / +5V DC / +12V DC / -5V DC / -12V DC Redundant power supplies can be hot-swapped without powering down the unit
SCSI card	One 68-pin VHDCI for connecting LVD SCSI devices. This is optional.
CompactFlash card	512-MB Flash card provides operating system redundancy
NVRAM (nonvolatile RAM) card	256-MB NVRAM, provides 72-hour battery backup for data and file system integrity left in cache from an unexpected power failure
RAM	2-GB RAM for better performance
Processor	Intel® Pentium® 4 3.4 GHz
Fan assembly	Provides cooling for StoreVault S550 components and CPU
Network interface	Onboard Dual 10/100/1000 Ethernet Network Interface
StoreVault S550 chassis	2U chassis, compatible with 19” system racks (2- or 4- post)

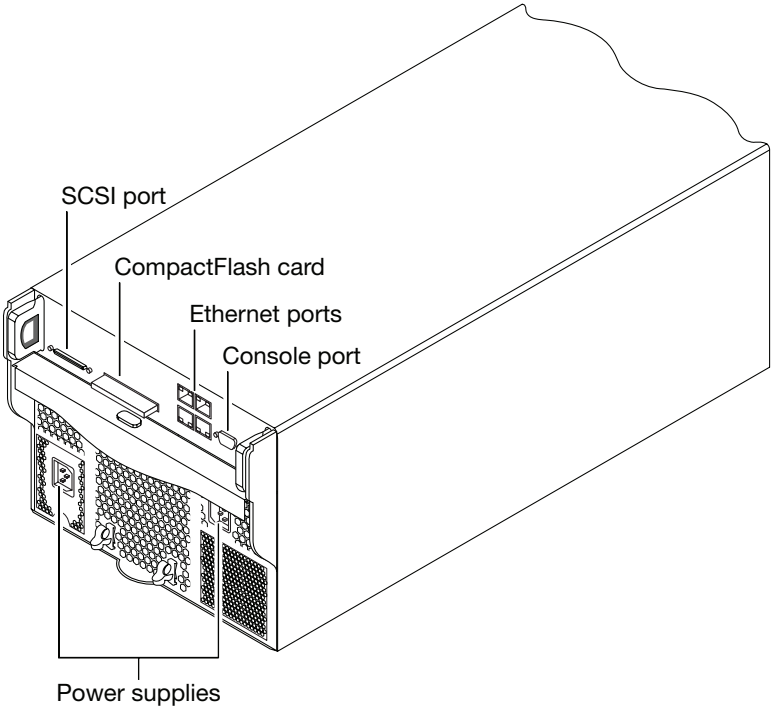
About the StoreVault S300

The StoreVault S300 is an all-inclusive small business storage system that is capable of network-attached storage (NAS), storage area network (SAN), and direct-attached storage. This hardware is an FCC Class A compliant storage system. You can mount the StoreVault S300 on a two-post rack. The storage system chassis is a half 4U type; this size enables you to rack two StoreVault S300 storage systems on a single tray. You can easily remove and replace the field-replaceable units because these components are pressure fitted.

StoreVault S300 front view: The front of the StoreVault S300 has disk drives and a Liquid Crystal Monitor (LCM) module. The StoreVault S300 storage system can hold up to eight hot-swappable 250-GB or 500-GB SATA II disk drives to scale up from 1 TB to 4 TB. The StoreVault S300 storage system uses RAID 4 and RAID-DP technology for unparalleled data protection. The front LCM displays the status of your storage system and information during the boot process.



StoreVault S300 rear view: The rear of the StoreVault S300 storage system has a control module and dual power supplies. The dual power supplies provide redundant power supply to the storage system. The fan assembly is the part of power supply. The control module has a SCSI port for connecting the third-party backup device, 4-Gb network interface ports: e0a, e0b, e0c, and e0d, a CompactFlash card of 512 MB for firmware, and a console port. The network ports support the network failover mechanism and load balancing, and the console port enables connection to the StoreVault S300 for diagnostics. The StoreVault S300 runs on Data ONTAP S Family Edition for simplicity and reliability.



StoreVault S300 theft prevention mechanism: The StoreVault S300 storage system includes a disk drive lock and a facility to lock the complete system for theft prevention. You can use the disk drive lock to lock disk drives and the LCM module. The left side of the StoreVault S300 chassis has a lock; two keys are shipped along with the StoreVault system to lock and unlock the storage system. When you lock the storage system using the key, all components of the storage system are locked, including the upper cover.

StoreVault S300 components: The following table lists the StoreVault S300 hardware components.

Component	Function
Disk drives	Supports up to eight 250-GB or 500-GB SATA disk drives.
LCM module	Displays the StoreVault S300 system status.
Disk lock	Provides security to your disk drives and LCM Module.
Power supply	100-127/200-240V~ 6/3A 50-60 Hz. Dual power supplies for redundant power supply to the storage system.
SCSI card	One 68-pin VHDCI for LVD SCSI devices. This is optional.
CompactFlash card	512-MB CompactFlash card provides a cache for the operating system.
Fan assembly	Fan assembly is part of power supply. It provides cooling for StoreVault components and the CPU.
Network interface cards (NIC)	4-Gb onboard 10/100/1000 BT NICs
NVMEM (nonvolatile memory management) card	1-GB NVMEM provides a 72-hour battery backup for data and file system integrity left in cache from an unexpected power failure. NVMEM is a part of the LCM module.
Console port	Using the console port and console cable, you can connect to the StoreVault S300 for diagnostics purposes.
StoreVault S300 chassis	Half 4U type.

Overview of StoreVault Manager software

The StoreVault Manager management software enables you to manage the StoreVault storage systems. It is a GUI-based software with a familiar Windows look-and-feel. StoreVault Manager helps you to share and manage directories, create and manage LUNs, set quota rules for users and groups, manage disk drives, access cross-platform data, run tape backup, take Snapshot™ copies, replicate data on to another StoreVault storage system or to FAS series storage systems, and perform storage administration tasks.

StoreVault Manager software features

The following table describes the software features of the StoreVault Manager.

Feature	Description
Data ONTAP S Family Edition operating system	StoreVault storage systems run on the Data ONTAP S Family Edition operating system for simplicity and reliability.
Windows-based management software	You can install StoreVault Manager on Windows Server 2003 and Windows XP®. StoreVault Manager runs on the Windows client and helps you to configure and manage the StoreVault storage system based on your data storage requirements. **Note** You cannot use enterprise NetApp management tools such as FilerView® or the Data ONTAP command-line interface (CLI) to manage the StoreVault storage system.

Feature	Description
Data Protection	StoreVault Manager uses NetApp Snapshot™ technology for data protection. In case of total power failure, battery-powered nonvolatile RAM (NVRAM) ensures system integrity by maintaining a backup of the system data. Battery-powered NVRAM maintains system data if total power failure occurs and ensures file system integrity. SnapRestore® StoreVault edition provides for complete system restore. This is an optional license feature.
Snapshot Technology	A Snapshot copy on the StoreVault storage system is a virtual image of the set of files and directories as they were at a specific time, and enables easy recovery of data. Snapshot copies can be scheduled, and they can also be taken manually as needed.
StoreVault Replication	This feature enables you to scheduled replication of file or block-based data from one StoreVault storage system to another for disaster protection or data distribution. Data is available in read-only form on the destination storage system. StoreVault Replication is an optional licensed feature. To use this feature, you must buy the StoreVault Replication licenses for both the source system and destination storage systems along with the StoreVault setup.
CIFS for Windows file sharing	Uses the Common Internet File System (CIFS) protocol to store and update files in a Windows environment (optional license feature).

Feature	Description
Data Protection	StoreVault Manager uses NetApp Snapshot™ technology for data protection. In case of total power failure, battery-powered nonvolatile RAM (NVRAM) ensures system integrity by maintaining a backup of the system data. Battery-powered NVRAM maintains system data if total power failure occurs and ensures file system integrity. SnapRestore® StoreVault edition provides for complete system restore. This is an optional license feature.
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StoreVault Replication	This feature enables you to scheduled replication of file or block-based data from one StoreVault storage system to another for disaster protection or data distribution. Data is available in read-only form on the destination storage system. StoreVault Replication is an optional licensed feature. To use this feature, you must buy the StoreVault Replication licenses for both the source system and destination storage systems along with the StoreVault setup.
CIFS for Windows file sharing	Uses the Common Internet File System (CIFS) protocol to store and update files in a Windows environment (optional license feature).

Feature	Description
NFS	Uses the Network File System (NFS), which enables users to access remote files and directories on a network as if they were local. NFS is compatible with Microsoft® Windows and UNIX-based systems, including Linux® and Mac® OS X (optional license feature). **Note** After licensing either CIFS or NFS from the Software dialog box, users must log out of StoreVault Manager and log in again to use CIFS or NFS, respectively.
iSCSI	Uses the iSCSI standard for transfer of Small Computer System Interface (SCSI) commands over Internet Protocol (IP) networks.
FCP	Uses the Fibre Channel Protocol (FCP) standard for transfer of FCP commands over IP networks.
NDMP	Network Data Management Protocol (NDMP) is used for data backup. For more information about NDMP, see“NDMP” on page 114.
AutoSupport Diagnostics E-mails (ASUP)	The StoreVault storage system automatically sends e-mail messages to the administrator and technical support if the StoreVault storage system experiences problems. **Note** You should keep AutoSupport Diagnostic E-mail enabled to ensure proper service for your StoreVault storage system.
Network Time Protocol support (NTP)	The Network Time Protocol (NTP) feature synchronizes the date and time of StoreVault with the NTP server. Synchronization occurs automatically after you provide the NTP server name or IP address

Feature	Description
LUN reserve auto-tuner	The StoreVault Manager LUN reserve auto-tuner feature reserves a guaranteed amount of space for Snapshot copies. StoreVault Manager automatically enables the LUN reserve auto-tuner while creating a LUN of 50 GB and larger. In this feature, a default amount of space is allocated by the system for Snapshot copies. As the data is written to the LUN and Snapshot copies are taken, the system allocates extra space for the Snapshot copies. The system reclaims the reserved space when the Snapshot copies are deleted, and the reclaimed space is added to the global free space of the system. For more information, see "LUN reserve auto-tuner" on page 229.
Cross-protocol	The StoreVault Manager cross-protocol feature enables a Windows client to access the UNIX® platform data and a UNIX client to access the Windows platform data. You can share or export directories existing in the default /vol/shares or /vol/exports directory paths. **Note** You must have licenses for both NFS and CIFS to use the cross-protocol feature. For a Windows client to access UNIX security style directory, you must add a share to the existing UNIX security style directory. The existing directory can be a part of either the /vol/shares or the /vol/exports default directory and can be at any level with in the directory. For a UNIX client to access Windows security style directory, you must add an export to the existing Windows security style directory. The existing Windows directory can be a part of either the /vol/shares or the /vol/exports default directories and can be at any level within the directory. User mapping enables cross-protocol support.

Feature	Description
User mapping	Mapping a user having a Windows username and a UNIX username is a fundamental aspect of cross-protocol access. Cross-protocol access evaluates the user's rights to perform file and folder operations within the Windows and UNIX environments. For cross-protocol access to work, ensure that the Windows user name and the UNIX user name are same. **Note** A default user mapping exists between the Windows administrator and UNIX root user for same rights in the cross-protocol environment.

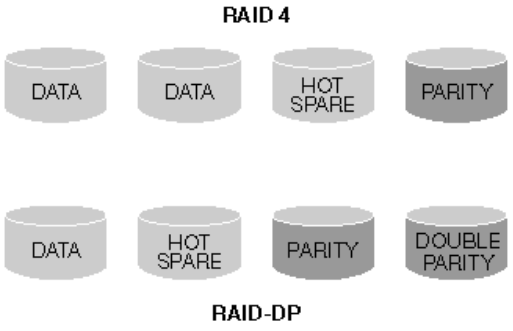
What RAID is

The StoreVault storage system uses redundant array of independent disks (RAID) technology to store your data safely.

The following table describes the two levels of RAID that are supported by the StoreVault storage system. Both types of RAID protect your data.

RAID level	Description
RAID-4 (default)	Single parity RAID uses one dedicated parity disk in addition to the data storage disks to protect your data. It offers protection against a single disk failure. Data is re-created using parity and data information remaining on unaffected disks in the array.
RAID-DP	RAID double-parity uses a second parity disk in addition to the standard parity disk to give a second layer of data protection. With RAID-DP, data can be recovered even if two disks fail at the same time.

The following figure shows the data disks, hot spare disks, parity disks, and double-parity disk in RAID-4 and RAID-DP.



Configuring disk drives

The StoreVault S500 and S550 storage systems have a capacity for 12 disks and the StoreVault S300 has a capacity for 8 disks. You can configure each of these disks as a primary drive or a spare drive. The following table explains the configuration types.

Drive type	Description
Primary	A primary storage drive can store data or parity information. This drive is considered part of the RAID group of active disks.
Spare	A spare drive is a working drive that can be used for one of the following tasks: ◆ increase the overall storage capacity when added to the RAID group ◆ replace a drive that has failed

Note

It is recommended that you maintain at least one spare drive at all times.

The following table shows how StoreVault Manager software indicates the status of the StoreVault disk drives.

Icon	Symbol	Description
	Green up arrow	Normal condition or active disk in the aggregate (either data drive or parity drive)
	Green DP	Double parity drive (RAID-DP)
	Green P	Parity drive (RAID-4)
	Green S	Spare drive
	Yellow up arrow	Drive rebuilding or RAID-DP drive calculating
	Red X	Drive has failed
	Gray E	Empty drive bay
	Orange up arrow	A foreign disk drive installed from another StoreVault system

Note

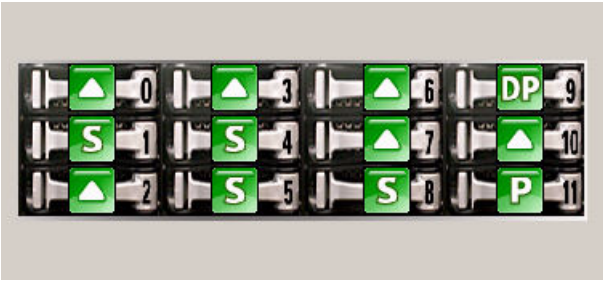
For replication purposes, you need to use a foreign disk drive as a spare disk.

For more information about the process of adding a spare disk to the primary storage pool, see“Disk Management” on page 207.

Storage example for StoreVault

For example, if you have 12 disks in the StoreVault storage system, set eight of them as primary disks and set four as spare disks. Of the eight primary disks, six are used to store data and two are used to store parity information in a RAID-DP configuration.

The StoreVault S550 screen displays the following information in the Drives section.



StoreVault Manager Installation 2

About this chapter

This chapter guides you through the installation, setup, and upgrade procedure of the StoreVault Manager software.

Topics in this chapter

This chapter discusses the following topics:

- "Installation prerequisites" on page 22
- "Installing the StoreVault Manager software" on page 24
- "Configuring the StoreVault system" on page 27
- "Upgrading StoreVault Manager" on page 41

Installation prerequisites

The Windows workstation or server must meet the hardware, software, and license key requirements before you install StoreVault Manager software.

Hardware requirements:

- Intel-based PC with single 2 GHz CPU (Xeon® or Pentium® 4)
- 40 MB of free disk space minimum
- 512 MB of memory minimum

Software requirements: One of the following Windows operating systems and other software mentioned in the list:

- Windows XP Professional
- Windows Server 2003
- JRE1.4

Note

Ensure that the DNS entry for the StoreVault storage system has been created prior to running the StoreVault Manager.

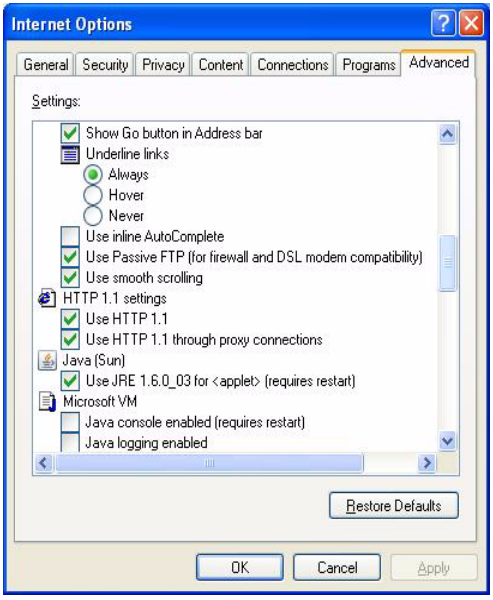
Configuring CIFS in an Active Directory environment:

This is required only when you want to use the CIFS protocol in the Active Directory environment. Before you run setup to register the StoreVault storage system with the domain, complete the following steps:

1. Create a new DNS host (A) record for the storage system with the intended static IP address.
2. Use the intended host name for the StoreVault storage system to create a new computer account in Active Directory for the storage subsystem.

Note

You must install Java and Microsoft Virtual Machine for certain pages in StoreVault Manager to work. To verify if the virtual machine is installed on your system, ensure that the settings as shown in the following screenshot are selected in the Advanced tab of Internet Options.



Installing the StoreVault Manager software

You can install StoreVault Manager software from the following sources:

- StoreVault Manager software CD-ROM
- Latest version of the StoreVault Manager software downloaded from http://now.netapp.com.

Note

The StoreVault storage system requires a static IP address. The static IP address and host name must be updated in the DNS tables.

Note

Before installing StoreVault Manager 3.2, upgrade the S family storage system to Data ONTAP S family Edition 7.2.1S10. You can download the latest software from the http://now.netapp.com Web site.

Things to check before installation

Ensure that the following points are completed:

- The Windows server or workstation meets the requirements described in the "Installation prerequisites" on page 22 section of this chapter.
- You have a login with domain administrator or local administration rights for the Windows management workstation.
- Optionally, a DHCP server is available for the StoreVault storage system before you begin the setup process.
- The StoreVault hardware is set up according to your model of *StoreVault Hardware Guide*.
- The StoreVault storage system is powered on.

Installing the software

To install StoreVault Manager software on the Windows XP Professional or Windows 2003 workstation, complete the following steps.

Step	Action
1	Insert the StoreVault Software CD-ROM into the CD-ROM drive of the management workstation, or use the downloaded StoreVault Manager software for installation. The StoreVault Software Installer screen appears. **Note** It is recommended that an active DHCP server be available to the unit before you begin the StoreVault setup. If there is no DHCP server, the StoreVault storage system defaults to the IP address of 10.10.10.10 at the e0a interface. In this case, you need to reconfigure the Windows workstation to the 10.10.10 subnet to discover the StoreVault storage system. This can be done using the crossover cable directly between the StoreVault storage system and Windows workstation.
2	In the StoreVault Software Installer screen, click **Install StoreVault Manager**. **Result:** The preparing to install screen appears, followed by the InstallShield screen. **Note** For installing SnapDrive for Windows StoreVault Edition software, see "SnapDrive 5.0 for Windows StoreVault Edition" on page 43, and for other software applications installation, see relevant admin guides.
3	In the InstallShield Wizard dialog box, click **Next**. **Result:** The License Agreement screen appears.
4	In the License Agreement screen, read the license agreement, select the **I accept...** option, and then click **Next**. **Result:** The Customer Information dialog box appears.

Step	Action
5	In the Customer Information dialog box, complete the following steps: **a.** Enter the user name and organization. **b.** Select the option to install the application for all users or for an individual user who use this system. **c.** Click **Next**. **Result:** The Destination Folder dialog box appears.
6	In the Destination Folder dialog box, complete either of the following actions. ❖ To change the folder for installing StoreVault Manager, click **Change**, and then follow the instructions in that dialog box. ❖ To install StoreVault Manager in the default folder, click **Next**. **Result:** The Ready to Install the Program dialog box appears.
7	In the Ready to Install the Program screen, click **Install**. **Result:** The InstallShield Wizard Completed dialog box appears.
8	In the InstallShield Wizard Completed screen, Click **Finish**.

Configuring the StoreVault system

To configure your StoreVault storage system, complete the following steps.

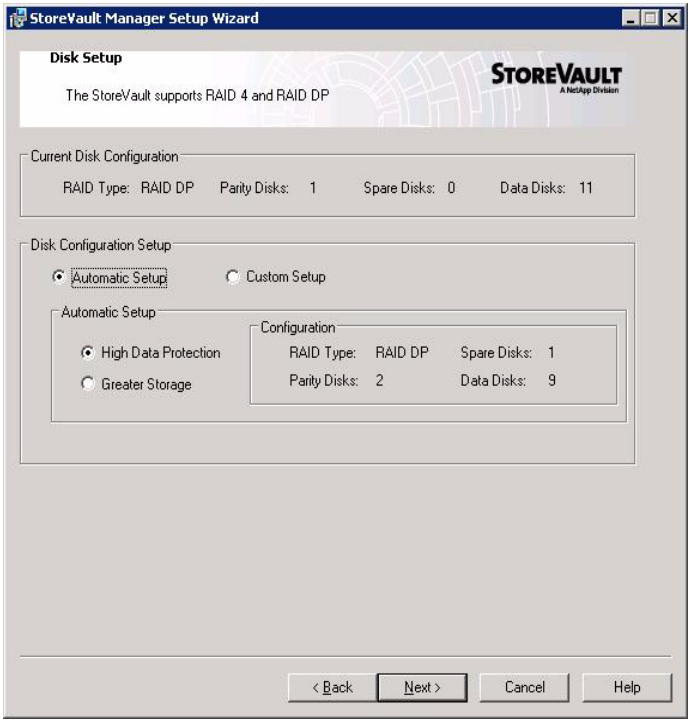
Step	Action
1	Double-click the StoreVault Manager icon on your desktop. OR Select **Start > All Programs > Network Appliance > StoreVault > StoreVault Manager**. **Result:** The StoreVault Manager Sign On dialog box appears.
2	Click **Discover** to discover the StoreVault storage system on the network. **Note** Make sure that the StoreVault static IP address and host name are updated in the DNS tables. **Result:** The StoreVault Discovery dialog box appears.

Step	Action
3	In the StoreVault Discovery dialog box, complete the following steps: **a.** Enter a specific IP address to discover a StoreVault system that is not listed. **b.** Enter the subnet mask depending on the configuration of your network. **c.** Click **Start Discover**y. **d.** After the StoreVault system appears on screen, select it and click **Configure**. **Result:** The StoreVault Software Licenses dialog box appears and displays keys for licenses that you have already purchased. **Note** If you still cannot find the StoreVault system you installed, the system might not have received a DHCP address. In this case, it will have defaulted to 10.10.10.10. You need to change your client address and rediscover the StoreVault storage system on that subnet.
4	In the StoreVault Software Licenses dialog box, complete the following steps: **a.** Type the license key in the text box. **b.** Click **Add**. **Note** To add more license keys repeat preceding step **a** and **b.** **c.** After adding license keys, click **Next**. **Result:** The Administrative Settings dialog box appears.

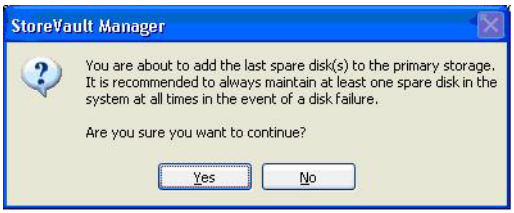
Step	Action
5	In the Administrative Settings dialog box, complete the following steps. **a.** Enter the StoreVault name and password. The StoreVault storage system has a default host name of StoreVault -XXXX, where XXXX is the last four digits of the system serial number. You can change the StoreVault host name. **b.** Enter the SMTP server name or IP address. The SMTP server processes the e-mail alerts sent by the StoreVault storage system. Identifiable by your e-mail server, to deliver administrative alerts to several recipients. **c.** Enter the administrator's e-mail address. The SMTP server name and administrator's e-mail address are used for the StoreVault AutoSupport function. The StoreVault storage system sends an automated e-mail to this address when the system notices a problem. An e-mail is also sent to the technical support team. In addition, a message is sent once a week that the system is working without errors. To deliver administrative alerts to several recipients, you can enter a group distribution list e-mail address, if identifiable by your e-mail server.

Step	Action
6	In the Set Date/Time section, select the **Use NTP server for date and time synchronization** check box. **Note** The time difference between the StoreVault storage system and NTP server can be between 0 to 30 minutes for synchronization. For more information about NTP, see "Network Time Protocol support (NTP)" on page 13. **a.** Enter the NTP server name or IP address in the NTP server field. **Note** StoreVault Manager enables you to provide up to five NTP server names for redundant synchronization. Use a comma to separate multiple server names. **b.** From the drop-down list, select daily, hourly, or multihourly. daily—StoreVault synchronizes date and time on daily basis. hourly—StoreVault synchronizes date and time on hourly basis. multihourly—StoreVault synchronizes date and time after every six hours. However, to specify the date and time manually, clear the Use NTP server for date and time synchronization check box. This disables the NTP server fields. Enter the date and time. **c.** Select the time zone. **d.** Select the language. **e.** Click **Next**. **Result:** The Administrative Alert Settings dialog box appears.

Step	Action
7	In the Administrative Alert settings dialog box, complete the following steps. **a.** In the Alert Groups section, select All Alerts or select individual alerts. **Note** For Aggregate Alerts, you must set Storage Full Threshold Alert (%) **b.** Click **Next**. For more information about Administrative Alert Settings, see "Administrative alerts" on page 81. **Result:** The Disk Setup dialog box appears.

Step	Action
8	The Disk Setup dialog box displays current disk configuration of the StoreVault storage system.  The Disk Setup has two disk configuration options. ◆ Automatic Setup ◆ Custom Setup **Automatic Setup:** The automatic setup gives an option to select High Data Protection or Greater Storage. ◆ The High Data Protection automatically configures RAID-DP with two parity disks, one spare, and the rest as data disks. ◆ The Greater Storage automatically configures RAID4 with one parity, one spare, and the rest as data disks.

Step	Action
	If Custom Setup is selected, the following screen appears.  **Custom Setup:** In Custom Setup you can select the RAID type, and the dialog box displays available spare disks list in the pane. **a.** Select RAID4 or RAID DP. **b.** Select Disks from the available spare disks list.

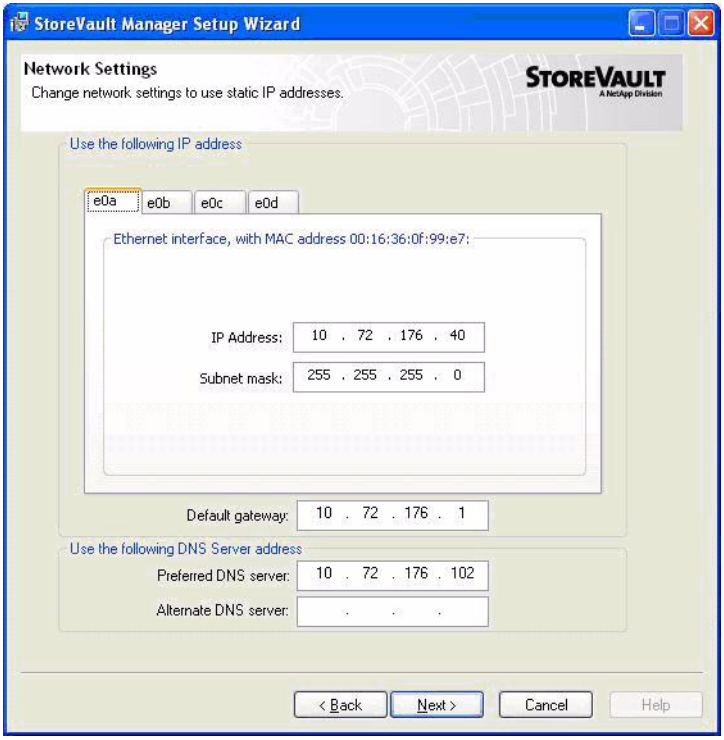
Step	Action
	Note If you are selecting last available spare disk then, the following message appears. Click **Yes** to continue, or click **No** to keep the last drive as a spare drive.  **c.** In the Disk Setup dialog box, click **Next**. The following message appears displaying the new disk configuration.  **d.** Click **Yes** to continue. **Result**: The Network Settings dialog box appears.

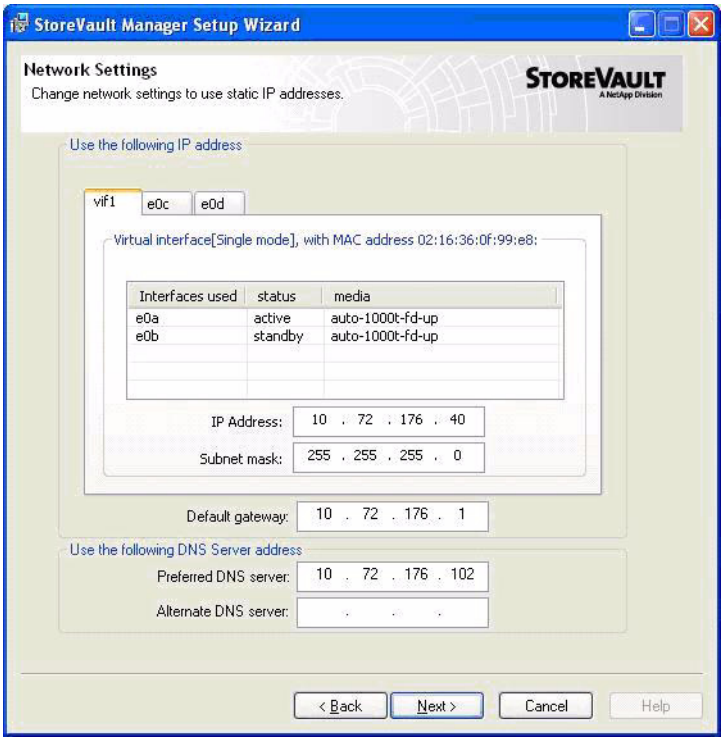
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>9</td><td>In the Network Setting dialog box you can configure the network setting.

Note
The StoreVault S500 and StoreVault S550 storage systems have two NIC ports e0a and e0b, and StoreVault S300 storage system has four NIC ports e0a, e0b, e0c, and e0d. StoreVault Manager Network Setting dialog box represents these NIC ports in the form of tabs respectively.

Note
Ensure that the static IP address and host name are updated in the DNS tables.

<table>
<tr><th>If the network interfaces...</th><th>Then.</th></tr>
<tr><td>Are not grouped</td><td>Go to Step 10.</td></tr>
<tr><td>Were grouped earlier, and you are running setup for the second time.</td><td>Go to Step 11.</td></tr>
</table>
</td></tr>
</table>

Step	Action
10	In the Network Settings dialog box, complete the following steps. **a.** Select the network interface tab. **b.** Enter a static IP address and subnet mask for each of the Ethernet interfaces. **c.** Click **Next**.  **Note** You can group the network interfaces into a virtual interface after completing setup. For more information, see "Virtual network interface" on page 90. **Result:** The Windows Authentication Mode dialog box appears.

Step	Action
11	If your network interfaces were grouped earlier and you are running setup for the second time, complete the following steps: **a.** Change the IP address. **b.** Change the subnet mask of the grouped interface. **c.** Click **Next**.  **Result:** The Windows Authentication Mode dialog box appears.

Step	Action
12	There are three types of Windows authentication modes. ◆ **Active Directory Domain** (Windows Security): The installer must have the domain administrator name (or account with domain administrative rights) and password. **Note** DNS IP configuration is mandatory for ADS integration. The system time at the StoreVault storage system and domain controller should be same. Otherwise, the ADS integration will fail. ◆ **Windows NT Domain:** The NT domain in which the installer must create the StoreVault account on the domain controller before continuing. ◆ **Windows Workgroup**: This option requires local user accounts on the StoreVault storage system. In the Windows Authentication Mode dialog box, complete the following steps. **a.** Enter the StoreVault name for Windows. **b.** Select the Windows authentication mode that is in use in your site. **c.** Click **Next**. **Result:** The UNIX NIS Settings dialog box appears. If you do not have a UNIX or Linux license key, this dialog box is not displayed.

Step	Action
13	In the UNIX NIS Settings dialog box, complete the following steps. **a.** Enter the Network Information System (NIS) domain. **b.** Enter NIS Server IP addresses. **c.** Enter the Name or IP address of the administration host. **d.** Click **Next**. NIS allows many UNIX or Linux machines on a network to share the configuration information, including password data. NIS is valid only in a UNIX or Linux environment. **Result:** The Summary dialog box appears.
14	In the Summary dialog box, complete the following steps. **a.** Verify the configuration information for the StoreVault configuration. **b.** If something needs to be changed, click **Back** to return to the dialog box to edit the information. **c.** If the information is correct, click **Finish**. **Result:** After you confirm the configuration settings on the Summary dialog box, the Setup Status dialog box appears.
15	In the Setup Status dialog box, click **Done**. **Result:** The Registration Information (required) dialog box appears.

Step	Action
16	In the Registration Information (required) dialog box, complete the following steps. **a.** Enter your name and company details. This option is very important for technical support of the StoreVault storage system. This enables the StoreVault system to send status and troubleshooting e-mails to the support team. The e-mail address that you enter is not used for marketing or other purposes. This information is not shared with anybody. **b.** Select the Optional Information check boxes, if applicable **c.** Click **Next**. **Result:** The StoreVault Setup successfully Completed dialog box appears.
17	In the StoreVault Setup successfully completed dialog box, complete the following steps. **a.** To view available special offers, select the '**View Special Offers on Exit**' check box. **b.** To close the window, click **Exit**.

Upgrading StoreVault Manager

This section contains procedure for upgrading StoreVault Manager software on a Windows host system that is running Windows 2003 or Windows XP. See the following topic for more information:

- "Upgrading Procedure" on page 42

Upgrading Procedure

If you already have a previous version of StoreVault Manager on your system, simply run the *.exe* program to upgrade the existing StoreVault Manager software. The StoreVault Manager software automatically upgrades the program on your computer. The StoreVault Manager InstallShield Wizard appears.

Note

Before installing StoreVault Manager 3.2, upgrade the S family storage system to Data ONTAP S family Edition 7.2.1S10. You can download the latest software from the http://now.netapp.com Web site.

Step	Action
1	Insert the StoreVault Manager Software CD-ROM into the CD-ROM drive of the management workstation, or use the downloaded StoreVault Manager software for installation. **Result:** The StoreVault Software Installer screen appears.
2	In the StoreVault Software Installer screen, click **Install StoreVault Manager**. **Result:** A confirmation message box appears.
3	In the confirmation message box, click **Yes to upgrade**. **Result:** The StoreVault Manager InstallShield Wizard appears.
4	In the StoreVault Manager InstallShield Wizard, click **Next**. **Result:** Installing StoreVault Manager window appears.
5	In the Installing StoreVault Manager window, click **Next**. **Result:** The InstallShield Wizard Completed dialog box appears.
6	In the InstallShield Wizard Completed dialog box appears, complete the following steps. **a.** Select the Launch StoreVault Manager check box to launch StoreVault Manager automatically. **b.** Click **Finish**.

SnapDrive 5.0 for Windows StoreVault Edition 3

Overview of SnapDrive for Windows StoreVault Edition

The SnapDrive® for Windows StoreVault Edition software is LUN and Snapshot copy management software for the Microsoft Windows environments. The SnapDrive for Windows StoreVault Edition software is packaged with the StoreVault Manager software. You need to install SnapDrive for Windows StoreVault Edition on a Windows Server 2003. SnapDrive for Windows StoreVault Edition integrates with StoreVault Manager and works in the background while creating server and application-centric LUNs for Windows operating system. The application-centric LUN created using SnapDrive for Windows StoreVault Edition uses the NTFS file system. The LUN Snapshot copies of these LUNs can be mounted as local virtual disk drives.

Prerequisites for installing SnapDrive for Windows StoreVault Edition

Following are the prerequisites for installing SnapDrive for Windows StoreVault Edition.

- Windows Server 2003 or Windows Server 2003 R2
- Windows Server 2003 Hot fixes
- StoreVault Manager R3.0 or later
- Data ONTAP 7.0.3S8 or later version

Limitations

Following are the SnapDrive for Windows StoreVault Edition limitations.

- Does not support clustering and MPIO
- Does not work with Windows XP or Windows Vista

Points to keep in mind

1. Install StoreVault Manager R3.0 or later on Windows Server 2003 with the following licenses:
   a. CIFS
   b. iSCSI
   c. SnapRestore
2. Complete CIFS configuration for the StoreVault storage system.
3. Install Windows Server 2003 Hot fixes.

- 898790
- 902837
- 908249
- 912063
- 913648
- 922772
- 923424
- 923801
- 931300

4. Start the SnapDrive for Windows StoreVault Edition installation procedure.

Note

Before installing the SnapDrive for Windows StoreVault Edition software, you need to uninstall any installed SnapDrive for Windows software from your server.

Installing SnapDrive for Windows StoreVault Edition

To install SnapDrive for windows StoreVault Edition, complete the following steps.

Step	Action
1	In the StoreVault Software Installer screen, click **Install SnapDrive for Windows StoreVault Edition**. **Result:** SnapDrive StoreVault Edition-InstallShield Wizard appears.
2	In the SnapDrive StoreVault Edition-InstallShield Wizard, click **Next**. **Result:** The License Agreement screen appears.
3	In the License Agreement screen, review and accept the license agreement, and then click **Next**. **Result:** The Customer Information screen appears.
4	In the Customer Information screen, complete the User Name and Organization fields, and then click Next. **Result:** The Destination Folder screen appears.
5	In the Destination Folder, click **Next** to install the software to the indicated folder or click **Change** to install the software to a different folder you specify, and then click **Next**. **Result:** The Ready to Install the SnapDrive StoreVault Edition Application screen appears.
6	In the Ready to Install the SnapDrive StoreVault Edition Application screen, click **Install** to launch the installation. **Result:** The Installing SnapDrive StoreVault Edition screen appears. After installation is complete, the SnapDrive StoreVault Edition Service Credentials screen appears.
7	In the SnapDrive StoreVault Edition Service Credentials screen, click **Add**. **Result:** The Select User dialog box appears.

Step	Action
8	In the Select User dialog box, complete the following steps. **a.** Enter the administrator name of the domain in the Enter the object name to select box. **b.** Click **Check Names**. **c.** Click **OK**. **Result:** The SnapDrive StoreVault Edition Service Credentials screen appears again.
9	In the SnapDrive StoreVault Edition Service Credentials screen, complete the following steps. **a.** Enter the domain password **b.** Confirm the password. **c.** Click **Next**. **Result:** The InstallShield Wizard Completed screen appears.
10	In the InstallShield Wizard Completed screen, click **Finish.** **Result:** SnapDrive for Windows StoreVault Edition software is installed and works in the background of the StoreVault Manager and it enables you to create application-centric LUNs. For more information about application-centric LUNs, see "Creating a LUN" on page 145.

Starting StoreVault Manager 4

About this chapter

This chapter discusses how to start StoreVault Manager and explains about the StoreVault Manager GUI.

Topics in this

This chapter discusses the following topics:

- "Logging in to StoreVault Manager" on page 48
- "StoreVault Manager GUI" on page 51

Logging in to StoreVault Manager

This section explains the StoreVault login modes and the procedure for logging in to the StoreVault Manager software.

- "StoreVault Manager login modes" on page 48
- "Remember me on this computer" on page 48
- "Removing cached passwords" on page 49
- "Login procedure" on page 50

StoreVault Manager login modes

The StoreVault Manager's Sign On dialog box provides two types of login modes.

- Normal mode
- Maintenance mode

- **Normal mode**

  For generic activities use this mode, such as managing disks. In this mode, you have all the privileges on the StoreVault storage system.

  Note
  The first time you log in, you can only log in using the Normal mode.

- **Maintenance mode**

  Use this mode for resetting administrator password of the StoreVault system. In this mode, you do not have other privileges.

  Note
  Start StoreVault system in normal mode for first time to activate maintenance mode.

Remember me on this computer

The "Remember me on this computer" feature caches your StoreVault system password on your host computer so that you do not have to reenter your password every time you log in. You enable this feature from the StoreVault Manager sign on dialog box. To use this feature, you must select the StoreVault system name or IP address from the login screen drop down list.

Removing cached passwords

To remove cached passwords, complete the following steps.

Step	Action
1	Right-click the StoreVault icon on the notification area of the Windows taskbar, and then select **Remove Cache data**.
2	In the confirmation message, click **Yes** to remove all cached passwords. **Note** The “Remove Cache Data” menu option removes all StoreVault system cached passwords from your host computer.

Login procedure

To start StoreVault Manager, complete the following steps.

Step	Action
1	Double-Click the **StoreVault Manager** icon on the Desktop. OR You can also open StoreVault by selecting **Start > All Programs > Network Appliance > StoreVault >StoreVault Manager**. **Result:** The StoreVault Manager's Sign on dialog box is displayed.
2	In the StoreVault Manager's Sign On dialog box, complete the following steps. **a.** Select Normal Mode. **b.** Type the password. **c.** Type or select the StoreVault Name or IP address. **d.** Select **Remember me on this computer**. **e.** Click **Sign In**. **Result:** The StoreVault Manager screen appears.

StoreVault Manager GUI

This section explains the different sections of the StoreVault Manager main screen.

- "StoreVault Manager main screen" on page 52
- "StoreVault tasks pane" on page 53
- "Discovery pane" on page 53
- "Drives section" on page 60
- "Disk properties" on page 62
- "System status" on page 63
- "Storage overview" on page 66
- "Primary storage" on page 68
- "Secondary storage" on page 71
- "Backup device" on page 72

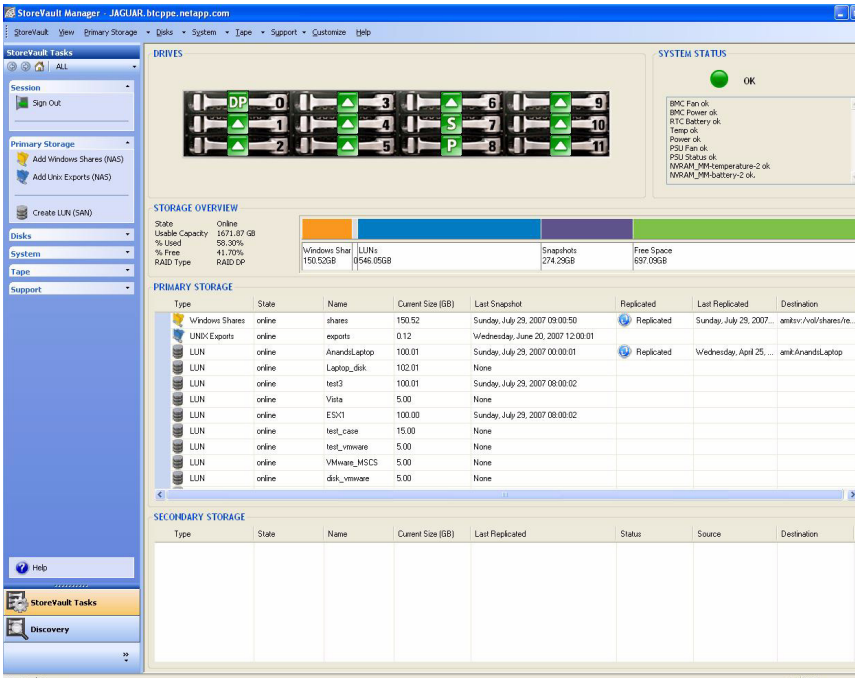
StoreVault Manager main screen

StoreVault Manager is a graphical user interface (GUI) based software that helps you to manage StoreVault systems. Using StoreVault Manager, you can manage disks and tape drives, and perform other storage management tasks.

The StoreVault Manager main screen has three panes.

- The left (tasks) pane displays the menu bar functionality.
- The discovery pane displays the available StoreVault systems in the network.
- The right pane displays a visual representation of the drives, system status, information, storage overview, primary storage, and backup storage.

You can use the StoreVault Tasks and Discover buttons at the left bottom corner of the StoreVault Manager main screen to switch between task pane and discovery pane.



Note

The use of enterprise NetApp management tools, such as FilerView or the Data ONTAP command-line interface (CLI) are not supported for StoreVault storage systems. Use of these tools can result in unpredictable behavior, such as the appearance of ‘unrecognized’ elements in the primary or secondary storage grids. If ‘unrecognized’ appears on the main console, you need to contact support.

StoreVault tasks pane

The StoreVault tasks pane helps you to perform common tasks, such as creating and managing shares and exports, with fewer steps. Instead of drop-down menu options, the tasks pane displays the command options on the left side of the screen.

Note

Add shares and Add Exports options are not functional if CIFS and NFS license are not installed.

Discovery pane

The StoreVault Manager Discovery pane displays the StoreVault storage systems connected in the network in a tree structure. Click the Discovery button in the left bottom corner of the StoreVault Manager main screen to access the discovery pane. The discovery pane displays the StoreVault systems that are available in the network. The available StoreVault storage systems display the model number and IP address after you log in to StoreVault Manager. You can run different discovery options to locate StoreVault storage systems in the network.

Note

From the discovery pane, you can log in to another StoreVault system and you are automatically signed off from the existing StoreVault Manager session.

Discovery pane nodes

The StoreVault Manager discovery pane has three nodes.

- “StoreVault systems node” on page 54
- “Subnet node” on page 57
- “StoreVault system node” on page 58

StoreVault systems node

Right-click the StoreVault system node, a menu appears. Using this menu option you can run a local discovery, new discovery, and refresh the discovery pane.

Running a Local Discovery: A Local Discovery menu option discovers the StoreVault systems in the local subnet where StoreVault Manager is installed and adds newly discovered StoreVault systems to the discovery tree.

To run a local discovery, complete the following steps.

Step	Action
1	In the discovery pane, right-click the StoreVault Systems node.
2	Select **Run Local Discovery**. **Result:** StoreVault Manager searches for the available StoreVault systems in the local subnet and adds the available systems to the discovery pane.

Running a New Discovery: The discovery menu option discovers a specific StoreVault system in the network. You must provide a subnet IP address and a subnet mask. The located StoreVault system is then added to the Discovery pane for that subnet.

To run a new discovery, complete the following steps.

Step	Action
1	In the StoreVault Manager main screen, click the **Discovery** button if the discovery pane is not available. **Result:** The discovery pane appears.
2	In the discovery pane, right-click the StoreVault Systems node and select **New Discovery**. **Result:** The New Discovery dialog box appears.

Step	Action
3	In the New Discovery dialog box, complete the following steps. **a.** Type a specific IP address. **b.** Type a subnet mask for the subnet IP address. **c.** Click **OK**. **Result:** The StoreVault systems that are discovered in the specified subnet or the IP address are added to the discovery pane.

Refreshing the Discovery pane: The Refresh menu option pings the StoreVault systems in the network and removes all the unreachable StoreVault systems from the discovery pane.

To refresh a discovery pane, complete the following steps.

Step	Action
1	In the StoreVault Manager main screen, click the **Discovery** button if the discovery pane is not available. **Result:** The discovery pane appears.
2	In the discovery pane, right-click the StoreVault Systems node and select **Refresh**. **Result:** A message appears **Any StoreVault systems that are not reachable will be removed from the list**.
3	In the message box, click **OK**. **Result:** The StoreVault systems that cannot be contacted do not appear in the Discovery pane tree.

Subnet node

The subnet node is under the StoreVault node in the tree. This node displays the list of StoreVault systems under a particular subnet along with the model number, name, and IP address of the system. You can discover different StoreVault systems under this subnet.

To run discovery at the subnet node level, complete the following steps.

Step	Action
1	In the StoreVault Manager main screen, click the **Discovery** button if the discovery pane is not available. **Result:** The discovery pane appears.
2	In the discovery pane, right-click the subnet node and select **Discover**. **Result:** After discovering StoreVault systems under a particular subnet, the discovery pane list is updated.

StoreVault system node

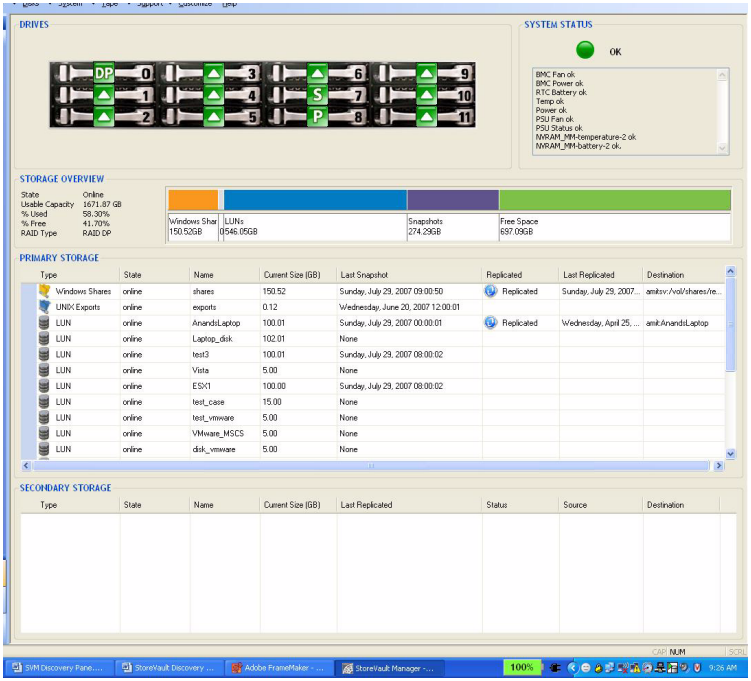
The StoreVault system node of the discovery pane enables you to log in to another StoreVault system available in the network. The system automatically signs off from the current StoreVault manager session.

To log in to another StoreVault storage system from your current StoreVault Manager session, complete the following steps.

Step	Action
1	In the StoreVault Manager main screen, click the **Discovery** button if the discovery pane is not available. **Result:** The discovery pane appears.
2	In the discovery pane, right-click the system node and select **Sign In**. **Result:** The StoreVault Manager Sign on dialog box appears.
3	In the StoreVault Manager Sign On dialog box, type the password.
4	Click **Sign In.** **Result:** You are signed into another StoreVault system**.**

StoreVault system pane

The system pane gives you the ability to manage the system, disks, primary storage, secondary storage, and storage backup devices.



The system pane has six sections:

- **Drives**

  A graphical representation of the drives currently installed in the StoreVault storage system. This area has mouse-over capabilities to view more information about the drives.

- **System Status**

  Status information for the StoreVault hardware devices.

- **Storage Overview**

  The Storage Overview panel of the main screen displays the usable capacity chart as shown in earlier figure (colored bars). The chart displays the space used for Windows Shares, UNIX Exports, LUNs, Snapshot copies, StoreVault replicas, and free capacity available for data.

- **Primary Storage**

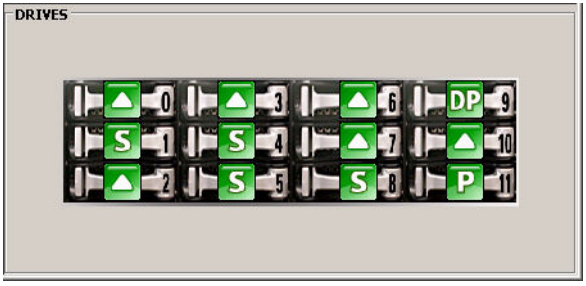
  The primary storage section provides details Type (Windows Shares, UNIX Exports, LUNs), state, name used, current size, last Snapshot copies, last replicated date, and time, and destination to which the data is replicated.
- **Secondary Storage**

  Secondary storage information and status: This includes type, state, name used, current size, last replicated date and time, status, and the source to which the data must be recovered, and the destination.
- **Backup Device**

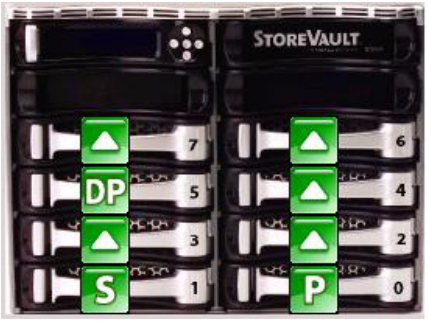
  Tape device information and status.

Drives section

The following figure is the Drives section of the StoreVault S500 and S550 system pane.



The following figure shows the Drives section of the StoreVault S300 system pane.



The following table shows how StoreVault Manager indicates the status of the StoreVault disk drives.

Icon	Symbol	Indication
	Green up arrow	Normal condition or active disk in the aggregate (either data drive or parity drive)
	Green DP	Double parity drive (RAID-DP)
	Green P	Parity drive (RAID4)
	Green S	Spare drive
	Yellow up arrow	Drive rebuilding or RAID-DP drive calculating
	Red X	Failed drive
	Gray E	Empty drive bay
	Orange up arrow	Foreign disk drive installed from another StoreVault system

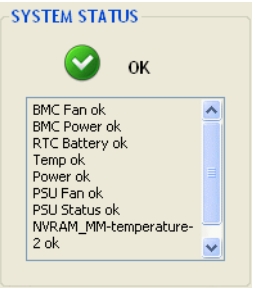
Disk properties

You can view the status of disks, disk type, serial numbers, and usable space by moving the mouseover the disk status indicator. The status information and their descriptions are listed in the following table.

Status Information	Description
Disk	Used to identify the disk type. The possible values are Primary and Spare.
Disk State	Shows the status of the disk. Possible values are Rebuilding, Failure, Online, and Is Zeroed:true (for a spare disk).
Serial Number	Manufacturer serial number, used to identify the disk.
Usable Space	Total writable space available on disk.

System status

The System Status section on the right pane of the StoreVault Manager main screen displays an icon represents the overall status of the hardware components of the StoreVault storage system. The section below the icon lists the StoreVault system components. The components that are not working properly are highlighted in bold font and the icon color changes.



The following table lists the various Icon color/Status and their description.

Icon color/Status	Description
Green/OK	All the hardware components of the StoreVault system are OK.
Yellow/Warning	The hardware components that have a problem are displayed in boldface.
Red/Critical	The hardware components that have a problem are displayed in boldface.

The following table explains the action to be taken if the system status section displays a warning or critical message.

Note

For field-replacement procedures, see the relevant *StoreVault Hardware Guide*.

StoreVault Manager system status components	Warning	Critical
BMC Fan	Contact technical support and follow the instructions provided. You might need to replace the fan. For replacing fan, follow the field-replacement unit procedure.	Contact technical support and follow the instructions provided. You might have to replace the fan. For replacing the fan, follow the field-replacement unit procedure.
BMC Power	Contact technical support and follow the instructions provided.	Contact technical support and follow the instructions provided.
RTC Battery	Contact technical support and follow the instructions provided. You might have to replace the real-time clock (RTC) battery. For replacing the RTC battery, follow the Field replacement unit procedure.	Contact technical support and follow the instructions provided. You might need to replace the RTC battery. For replacing the RTC battery, follow the Field replacement unit procedure.
Temp	Move the StoreVault storage system to a cooler place.	Move the StoreVault storage system to a cooler place.

StoreVault Manager system status components	Warning	Critical
Power	Contact technical support and follow the instructions.	Contact technical support and follow the instructions.
PSU Fan	Not applicable	Contact technical support and follow the instructions.
PSU Status	Not applicable	Contact technical support and follow the instructions.
NVRAM_MM-temperature-2	Move the StoreVault storage system to a cooler place.	Move the StoreVault storage system to a cooler place.
NVRAM_MM-battery-2	Wait for about three hours; if the warning status persists, contact technical support team.	Wait for three hours approximately and if warning status still continues call the technical support team.

Storage overview

The following table describes the information available for primary storage.

Field	Possible values
State	State of a storage unit; online or offline.
Usability Capacity	Total usable capacity of the StoreVault system as it is configured. If you add primary drives, this number increases.
% Used	Percentage of available storage within the StoreVault storage system that is being used. You must monitor this number. It is recommended that this should not go beyond 80%.
% Free	Percentage of available storage within the StoreVault storage system that is available. You must monitor this number.
RAID Type	Type of RAID that is currently active; RAID-DP (Double Parity RAID) or RAID4 (RAID with single parity drive).

The Storage Overview panel displays the storage system state, RAID type, total available storage size available for data, percentage used, and free space.

Note

When you move the cursor over the space utilization bars, the tool tips appear with details about the corresponding bar.

Step	Action
1	In the Storage Overview panel, right-click and select **Show Storage Details**. **Result:** The Storage Details dialog box appears. The dialog box displays a pie chart and a legend for the total capacity in the system that includes Usable Capacity, RAID, Hot Spare, Extra Spares, and Advanced Protection. The Storage Overview panel also displays the available disk space in GB. For details, see the Legend and the information displayed below the pie chart. Advanced Protection refers to the capacity overhead used by Data ONTAP to ensure data integrity.

RAID group upgrading and downgrading

After StoreVault Manager software installation, you can upgrade and downgrade the RAID type. This feature enables you to change the RAID type that you have selected during the StoreVault setup.

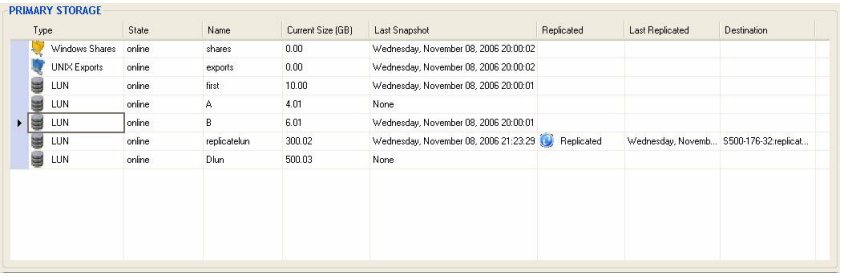
To upgrade or downgrade the RAID group type, complete the following steps.

Step	Action
1	In the Storage Overview section, right-click, and select **Upgrade RAID type/Downgrade RAID type**. **Note** If the existing RAID type is RAID4, then the right-click menu option enables you to upgrade the RAID type. If the existing RAID type is RAID-DP, then the menu option enables you to downgrade. **Result:** A confirmation message box appears.
2	In the confirmation message box, click **Yes**. Result: The available spare disk starts rebuilding and constructs a parity or dual-parity disk.

Note
If you configure RAID4 without a spare hard disk, you cannot convert to RAID-DP with a spare hard disk. In such a case, contact technical support.

Primary storage

The following figure shows the Primary Storage section of the system pane.



The following table describes the information available for the different primary storage types.

Field	Possible values
Type	Type of storage: ◆ Windows shares ◆ UNIX exports ◆ LUN (iSCSI or Fibre Channel block storage) ◆ XenStorage
State	State of the storage area; online or offline.
Name	*Shares* for Windows data. *Exports* for UNIX or Linux data, or the LUN name.
Current Size (GB)	Current size of the storage element.
Last Snapshot copy	Day, date, and time of the most recent Snapshot copy.
Replicated	Replicated icon (if replication is turned on).
Last Replicated	Day, date, and time of the most recent replica.
Destination	Name of the *target* StoreVault system to where the Shares, Exports, or LUN is replicated.

Note

When selecting a LUN, the right-click option for replication is not displayed unless you enable Snapshot copies for that LUN.

XenCenter-created volumes

StoreVault Manager recognizes volumes created using XenCenter software on the StoreVault storage system. The Primary storage section displays Xen volume under the Type field as XenStorage. However, you cannot use StoreVault Manager to manage the Xen volumes; you need to use the XenCenter software. The StoreVault Manager Storage overview section displays storage that is allocated to a Xen volume in the LUN section of the space chart.

Storage type status

Windows Shares, UNIX Exports, XenStorage, and LUNs are displayed in the Primary Storage table in any one of the following states:

- **Online**: When an item is online, read, or write access is allowed to the user.
- **Offline**: When an item is offline, read or write access is not allowed to the user.

Note

You do not use these options in a normal operation. However, if a storage element goes offline for some reason, you can bring it back online by clicking Online on the context menu.

To change the mount state of a storage element, right-click the element and click any of these options on the context menu. For example, if a Windows Share is online, you can make it offline, as well as reverse. The Primary Storage area refreshes and the new mount state is displayed under the State column of the Primary Storage table.

Field chooser: The Field chooser feature helps you to shift and change the display of the fields on the **Primary Storage** section.

Note

This feature is also available for managing the display on the Secondary Storage table.

Step	Action
1	In the Primary Storage section, right-click on any field, and select **Field Chooser** in the context menu. **Result:** The Field Chooser box appears

Step	Action
2	Select the column title that you want to shift, and drag that title into the Field Chooser box. For example, here the *Replicated* column header was selected and dragged into the Field Chooser box. **Result:** The column disappears from the Primary Storage section.
3	To display the column again, select and drag the column title in the Primary Storage section.

Secondary storage

The following figure shows the Secondary Storage area of the system pane. This table shows all the destination data that has been replicated from other StoreVault storage systems to this StoreVault storage system. You can access Shares and Exports destination data as read-only for data distribution or tape backup purposes.



The Secondary Storage table describes the destination data on this StoreVault storage system.

Field	Possible values
Type	Shares, Exports, or LUN
State	Replicated or Not
Name	Name of the destination element (in the case of LUNs, the LUN name)
Current Size (GB)	Size of the replicated element
Last Replicated	Day, date, and time of the most recent replication update
Status	Updating or Idle
Source	Name of the source storage element (including the StoreVault system and element name) where the original copy of the storage element is located.
Destination	Name of the destination storage element.

Backup device

The following figure shows the Backup Device area of the system pane.



The following table describes the information available for backup tape drives.

Field	Possible values
Device Type	Type of device
Description	Description of the backup device, which might include the manufacturer name
Name	Name of the unit
Serial No.	Serial number of the unit
Status	Available or Not Available message
Backup/Restore Status	Messages that indicate the status of the backup or restore process

StoreVault Administration 5

About this chapter

This chapter discusses administration of the StoreVault storage system with the StoreVault Manager software.

Topics in this chapter

This chapter discusses the following topics:

- "StoreVault Manager frequently used tasks" on page 74
- "Resetting administrator password" on page 75
- "Managing StoreVault system settings" on page 77

StoreVault Manager frequently used tasks

The following list describes the frequently used tasks.

Task	Use
Add CIFS Shares	To add Shares so that users can store their data on the StoreVault storage system.
Monitor Storage Utilization	To check the disk usage
Monitoring Snapshot copies Utilization	To determine whether the Snapshot copies are scheduled correctly
Data Backup	To back up data to another device
NFS Exports	To add Exports so that users can store their data on the StoreVault storage system.
Replication	To replicate data from one StoreVault storage system to another, which is at a remote site for disaster recovery purpose.
Quotas	To limit the disk space, number of files, or both that a user or group can use.
Tape back up	To archive data to a tape drive.

Resetting administrator password

You can reset the administrator password by logging in to maintenance mode. Use the StoreVault system serial number as password for logging in to Maintenance Mode.

Note
To use maintenance mode, you must log in to StoreVault Manager using normal mode at least once.

To reset the password, complete the following steps.

Step	Action
1	Double-Click the **StoreVault Manager** icon on the Desktop. OR Select **Start** > **Programs** > **Network Appliance** > **StoreVault** > **StoreVault Manager**. **Result:** The StoreVault Manager Sign On dialog box appears.
2	In the StoreVault Manager Sign On dialog box, complete the following steps. **a.** Select Maintenance Mode. **b.** Type the password. **Note** Use your system serial number as password for logging in maintenance mode. You can find this serial number on the back pane of the storage system or in the StoreVault Manager screen, select **Help > About StoreVault**. **c.** Select the StoreVault system name or type its IP address. **d.** Click **Sign In**. **Result:** A confirmation message box appears.

Step	Action
3	In the confirmation message box, click **Yes** to reset the password. **Result:** The Modify User Password dialog box appears.
4	In the Modify User Password dialog box, complete the following steps. **a.** Type a new password. **b.** Confirm the password. **c.** Click **Apply**. **Result:** The password successfully changed message box appears.
5	In the successfully changed message box, click **OK**. **Note** You can also reset the password from the StoreVault Administrative setting dialog box.

Signing out

To sign out from StoreVault Manager, complete the following step.

Step	Action
1	In tasks pane, click **Sign Out**.

Managing StoreVault system settings

This section discusses managing of administrative settings, network settings, security settings, and explains about upgrading the Data ONTAP operating system. This section also discusses about uploading tape configuration files, enabling and disabling services, and adding software licenses. You can perform all the system setting activities using system menu option.

- "Administrative settings" on page 78
- "Administrative alerts" on page 81
- "Network settings" on page 85
- "Setting security" on page 97
- "Managing Software Licenses" on page 100
- "Managing users" on page 106
- "StoreVault advance settings" on page 110

Ways to access system menu options

You can access system menu using either of the following methods.

- Using the Task pane
- From the System main menu

Administrative settings

To access the StoreVault Administrative Setting dialog box, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Administrative**. **OR** Click the system menu, and then select **Administrative**. **Result:** The StoreVault Administrative Setting dialog box appears.
2	The StoreVault Administrative Setting dialog has two tabs. ◆ StoreVault Administrative settings ◆ StoreVault Administrative alerts In the StoreVault Administrative Setting dialog you can perform the following functions. ◆ ”StoreVault Identification” ◆ ”Set Administrator Password:” ◆ ”Administrative E-mail Alerts” ◆ ”Set Date/Time”
3	**StoreVault Identification:** You can name the StoreVault storage system for identification.

Step	Action
4	**Set Administrator Password:** To change the administrator password, complete the following steps: **a.** In the Set Administrator Password section, type a new password. **b.** Confirm the new password. **c.** Click **OK**. **Result:** The system commits the new configuration and prompts you to log in using the new password.
5	**Administrative E-mail Alerts:** To change the Administrative E-mail Alerts particulars, complete the following steps. **a.** In the Administrative e-mail Alerts section, type an SMTP server name or IP address for sending administrative alerts and AutoSupport diagnostic e-mails. **b.** Type an e-mail address to receive administrative alerts. **c.** Click **OK**.

Step	Action
6	**Set Date/Time:** To set the date and time from the administrative setting dialog box, complete the following steps. In the Set Date/Time section, select the Use **NTP server for date and time synchronization** check box. **Note** The time difference between the StoreVault storage system and NTP server can be between zero to 30 minutes for synchronization. For more information about NTP, see "Network Time Protocol support (NTP)" on page 13. **a.** Type the NTP server name or IP address in the NTP server field. **Note** The StoreVault Manager enables you to provide up to five NTP server names for redundant synchronization. Use a comma to separate multiple server names. daily—StoreVault synchronizes date and time on daily basis. hourly—StoreVault synchronizes date and time on hourly basis. multihourly—StoreVault synchronizes date and time after every six hour. However, to specify the date and time manually, clear the 'Use NTP server for date and time synchronization' check box. This disables the NTP server fields. Type the date and time. **b.** Select the time zone. **c.** Select the language. **d.** Click **OK**.

Administrative alerts

An Administrative Alert is an e-mail generated by the StoreVault Manager when an event occurs on your storage system. StoreVault Manager sends alert messages to the e-mail ID you provide in the administrative settings. This feature helps you to take necessary action basing on the e-mail alert received.

You use the StoreVault Administrative Alerts feature to enable or disable the administrative settings for your StoreVault system.

The Administrative Alerts dialog box has the following sections:

- Alert Group
- Configuration & Description

Related administrative alerts together form an alert group. The Alert Group section displays all alert groups in a tree form. Double-click the “All Alerts” to expand or collapse the groups.

The following are the administrative alert groups:

- Aggregate Alerts
- Disk and RAID Alerts
- HW(hardware) Environment Alerts
- Tape Alerts

You can enable all alerts or any specific alert group. When an event occurs StoreVault Manager generates e-mail alerts for the alert groups that you enabled. When you click any alert group in the alert group section you can see the description of that particular group.

Aggregate alerts

Aggregate alerts provide information about the storage utilization on your storage system. You can set the storage full threshold for your storage system. After setting the threshold you will receive the alert when threshold is reached. StoreVault Manager also sends an alert when the storage threshold reaches 95% of the total storage and when the storage is full.

Disk and RAID alerts

StoreVault Manager generates alerts for disk and RAID when the reconstruction is started and reconstruction is completed.

Hardware Environment alerts

StoreVault Manager generates alerts when chassis power is degraded and RTC battery is dangerously low.

Tape alerts

The StoreVault Manager generates alerts when tape restoration success and tape restoration fails.

You can perform the following functions from the StoreVault Administrative Settings dialog box:

- "Enabling alert groups" on page 83
- "Disabling alert groups" on page 84

Enabling alert groups

To enable the alert groups, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Administrative**. **OR** Click the system menu, select **Administrative**.
2	In the StoreVault Administrative Setting dialog box, click the StoreVault Administrative Alerts tab.
3	In the Administrative Alert settings tab, complete the following substeps: **a.** In the Alert Groups section, select All Alerts or select individual alerts. **b.** Click **OK**. **Note** For Aggregate Alerts, in the Configuration & Description section you need to set Storage Full Threshold Alert (%).

Disabling alert groups

To disable alert groups, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Administrative**. **OR** Click the system menu, select **Administrative**.
2	In the StoreVault Administrative Setting dialog box, click StoreVault **Administrative Alerts tab**.
3	In the Administrative Alert settings tab, complete the following substeps: **a.** In the Alert Groups section, clear All Alerts or clear the desired individual alert. **b.** Click **OK**.

Network settings

The Network Settings dialog box enables you to set the network configuration, including default gateway, grouping, and ungrouping the network interfaces. It also allows you to enable or disable the Ethernet interfaces.

Ways to access the StoreVault Network Setting dialog box

You can access the Network Setting dialog box using either of the following methods.

Task pane: In the task pane click System drop-down list box and select **Network**

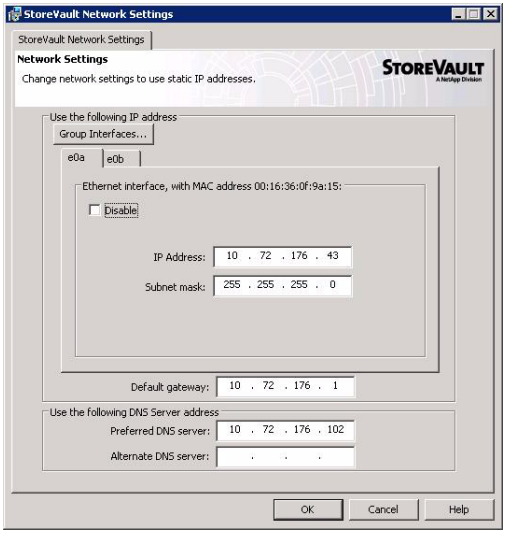
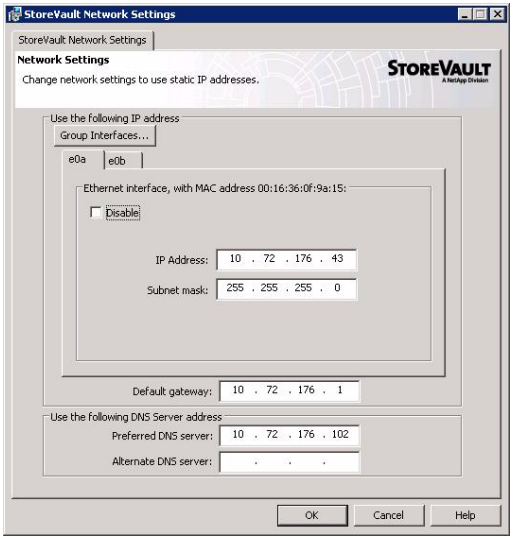
System main menu: Click **System > Network**

The StoreVault Network Setting dialog box has the following sections.

- "Ethernet interfaces" on page 86
- "Default gateway" on page 87
- "DNS server address" on page 87

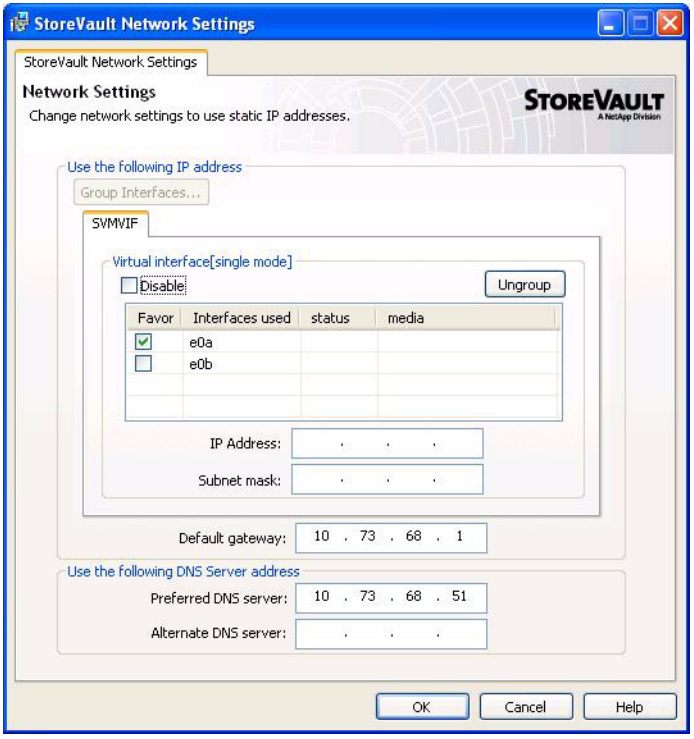
Ethernet interfaces

The StoreVault S500 and S550 storage system has two NICs, e0a and e0b, and the StoreVault S300 storage system has four NICs e0a, e0b, e0c, and e0. The StoreVault Manager Network Setting dialog box represents these NICs in the form of separate tabs, as shown in the following screenshots. The following screenshots are of StoreVault S550 and StoreVault S300.

StoreVault S550	StoreVault S300
	

The individual network interfaces can be grouped for supporting failover and load balancing. Only StoreVault S300 supports load balancing. After grouping, the individual interfaces tabs are replaced with the virtual interfaces tab in the network setting dialog box and a virtual interface section appears. The virtual interface section has a table with the following details.

- Favor
- Interfaces used
- Status - Active, Broken, and standby
- Media



Note

The Favor column appears only for single-mode virtual interface. You must select a favored interface in single-mode interface.

Default gateway Specifies the default gateway IP address to be used for the storage system.

DNS server address From the DNS Server Address section, you can specify the preferred DNS server address and alternative DNS server address.

Tasks you can perform from the network setting dialog box.

From the StoreVault Network Setting dialog box, you can perform the following tasks:

- "Setting up the network" on page 88
- "Grouping network interfaces" on page 90
- "Disabling the network interface group" on page 94
- "Enabling network interface group" on page 95
- "Disabling/enabling the network interface" on page 95
- "Ungrouping the network interface" on page 96

Setting up the network

To set up the network, complete the following steps for your StoreVault storage system.

Note

Ensure that you configure the StoreVault storage system with static IP addresses or set your DHCP server to issue an IP address with an infinite lease.

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td rowspan="4">1</td><td colspan="2">In the task pane, click System drop-down list box and select Network.

OR

Click the system menu, select Network.

Result: The Network Setting dialog box appears.</td></tr>
<tr><td>If your storage system is..</td><td>Then..</td></tr>
<tr><td>StoreVault S500/S550</td><td>Go to Step 2.</td></tr>
<tr><td>StoreVault S300</td><td>Go to Step 3.</td></tr>
<tr><td>2</td><td colspan="2">In the Network Settings dialog box of the StoreVault S550, complete the following steps:

a. Click the e0a network interface.

b. Type the IP address.

c. Type the Subnet mask.

Repeat Step a to Step c to configure the e0b interface.</td></tr>
</table>

Step	Action
3	In the Network Setting dialog box of the StoreVault S300, complete the following steps. **Note** The StoreVault S300 has four network interfaces e0a, e0b,e0c, and e0d. **a.** Click the e0a network interface. **b.** Type IP address. **c.** Type Subnet mask. Repeat Step a to Step c to configure the e0b, e0c, and e0d interfaces.
4	If necessary, in the DNS Server section, type the IP addresses for DNS Server.
5	Click **OK**.

Grouping network interfaces

This section provides information about virtual network interface, failover mechanism, load-balancing, and types of virtual network interfaces, and explains the process of grouping network interfaces.

Virtual network interface

StoreVault Manager enables you to group the network interfaces of the StoreVault storage system and create a logical interface. This logical interface is called as a virtual interface. You can create one or more virtual interface depending upon the availability of network interfaces. You can configure a virtual interface either in single-mode or multimode. The grouping of interfaces supports network failover mechanism and load-balancing. The network failover mechanism provides uninterrupted network connectivity to the storage system. The load balancing provides faster and uninterrupted network connectivity to StoreVault storage system.

What network failover mechanism does

Network failover mechanism automatically switches to an available standby network interface if the primary network interface fails due to some technical problems.

What load-balancing does

Load-balancing distributes the network traffic load equally among the available network interfaces on the storage system. This helps in providing faster service to clients. The load-balancing feature is active only with the multi-mode virtual interface.

Types of virtual network interfaces

StoreVault storage systems support single-mode virtual interface and multimode virtual interface.

Single-mode virtual interface: In a single-mode virtual interface, only one of the interfaces is active. The other interfaces are on standby, ready to take over if the active interface fails. The active interface fails when the link status is down, which signals that the interface has lost connection with the storage system. In a single-mode virtual interfaces failover is controlled by the storage system. This

mode of virtual interface network does not require any switch configuration or a switch that supports link aggregation. A common Media Access Control (MAC) address is shared by all the network interfaces of a single-mode virtual interface.

Multimode virtual interface: In a multimode virtual network interface, all interfaces are active. This logical aggregation of interfaces provides higher throughput than a single-mode virtual network interface. Multimode virtual interfaces can recover from a failure of up to (*n*-1) interfaces, where *n* is the total number of interfaces that form the virtual interface. A multimode virtual interface requires a switch that supports link aggregation over multiple switch ports. Data ONTAP is responsible for distributing outbound traffic. Data ONTAP does not have control over how inbound packets arrive because each end of an aggregate is responsible for controlling the distribution of its outbound traffic. A common Media Access Control (MAC) address is shared by all the network interfaces of a multimode virtual interface.

Link Aggregation Control Protocol (LACP), Port Aggregation Protocol (PAgP), and Cisco System's proprietary link aggregation protocol are not supported for the multimode virtual network interface. You can use any switch that supports aggregates, but does not have to control packet exchange for configuring an aggregate, for the multimode virtual network interfaces. For information about configuring the switch, see your switch vendor's documentation.

Advantages of virtual interfaces

Following are the advantages of using virtual interfaces:

- Fault tolerance. If one interface in a virtual interface group goes down, your storage system can stay connected to the network using the other interfaces.
- Higher throughput with multimode virtual interface. Multiple interfaces work as one interface.
- No single point of failure. If the physical interfaces in a virtual interface are connected to different switches and a switch goes down, your storage system stays connected to the network through the other switch.

Note

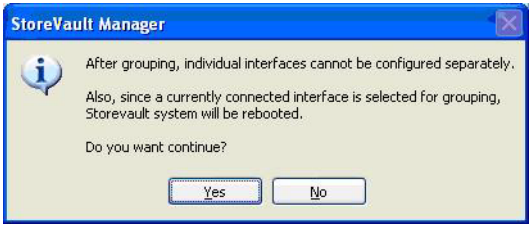
Data ONTAP 7.0.3S8 or later supports grouping of network interfaces. If you have a Data ONTAP earlier than 7.0.3S8, upgrade using the StoreVault system software upgrade feature.

Procedure to group network interfaces

To group network interfaces, complete the following steps.

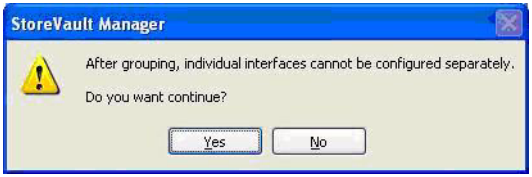
Step	Action
1	In the task pane, click the System drop-down list box and select **Network**. **OR** Click the System menu, and then select **Network**. **Result:** The StoreVault Network Setting dialog box appears.
2	In the Network Setting dialog box, click the **Group Interfaces** button. **Result:** The Group Interfaces dialog box appears.
3	In the Group Interfaces dialog box, complete the following steps. **a.** Type a name for virtual interface. **Note** The virtual interface name must begin with a letter, and cannot have more than 15 characters. There should be no space between the characters. **b.** In the Type of grouping section, select Single-mode or Multimode. **c.** In the Available interfaces pane, select the interfaces to group. **d.** Click the right arrow to move the required interfaces to the Selected interfaces list. **e.** Click **OK**. **Attention** The StoreVault storage system reboots each time after grouping the presently connected network interfaces.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>
f. If connected network interfaces are grouped, then the following message appears.



Or

g. If interfaces that are not presently connected to the network are grouped, then the following message appears.



h. Click Yes to continue.

Result: The Network Settings dialog box appears.
</td></tr>
<tr><td></td><td>
In the network setting dialog box you can create single or multi-mode VIF
<table>
<tr><th>If you have...</th><th>Then...</th></tr>
<tr><td>Selected Single mode</td><td>Follow Step 4</td></tr>
<tr><td>Selected Multi Mode</td><td>Follow Step 5</td></tr>
</table>
</td></tr>
</table>

Step	Action
4	For a single-mode network interface grouping you need to select a favored network interface by selecting the check box under the favor in the Virtual Interface section. **a.** Select a favored interface. **a.** Type an IP address for the grouped network interfaces. **b.** Type a subnet mask for the grouped network interfaces. **c.** Click **OK**.
5	In a Multimode network interface grouping all the grouped network interfaces are active. **a.** Type an IP address for the grouped network interfaces. **b.** Type a subnet mask for the grouped network interfaces. **c.** Click **OK**. **Result:** The StoreVault reboot message appears.
6	In the message box, click **OK**. **Result:** StoreVault Manager logs off and the StoreVault storage system reboots. After rebooting, you can see the grouping changes in the Network Settings dialog box of StoreVault Manager. **Note** Grouping or ungrouping of network interfaces is not allowed during StoreVault Manager setup. You can only change the IP address and subnet mask number of the grouped network interface.

Disabling the network interface group

To disable the grouped interfaces, select the **Disable** check box in the Virtual interface section.

After the grouped interfaces are ungrouped, the network interfaces work as a normal interface.

Enabling network interface group

To enable the grouped interfaces, clear the **Disable** check box in the Virtual interface section.

Disabling/enabling the network interface

To disable the network interface, select the **Disable** check box. To enable, clear the **Disable** check box.

Ungrouping the network interface

To ungroup the network interface, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Network**. **OR** Click the System menu, and then select **Network**. **Result:** The StoreVault Network Setting dialog box appears.
2	In the Network Setting dialog box, click the interface tab to ungroup.
3	Click **Ungroup**. **Attention** The StoreVault storage system reboots each time after ungrouping the currently connected network interfaces. **Result:** A confirmation message appears.
4	Click **Yes**. **Result:** The virtual interface tab is replaced with individual network interfaces.

Setting security

From the security settings dialog box, you set Windows Authentication mode and UNIX NIS settings for your StoreVault storage system.

Windows Authentication mode

To access the StoreVault Security Setting dialog box, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Security**. **OR** Click the system menu, and then select **Security**. **Result:** The StoreVault Security Setting dialog box appears with the Windows Authentication Mode tab selected.
2	**Windows Authentication Mode:** The Windows Authentication mode tab enables you to set the security models for the CIFS protocol. You can perform the following tasks from this window. ◆ "StoreVault Name for Windows" ◆ "Choose a Windows authentication mode for the StoreVault storage system" ◆ "Enter WINS Servers" ◆ "Enter name and password of a Windows administrator" ◆ "Windows file sharing administrator"
	StoreVault Name for Windows: Type a name of the StoreVault storage system for Windows.

Step	Action
	Choose a Windows authentication mode for the StoreVault storage system: The following Windows authentication modes are available: ◆ Active Directory Domain ◆ Windows NT Domain ◆ Windows Workgroup You can select any one of the authentication modes and type Name of the Windows Domain
	Enter WINS Servers: You can type four WINS servers names. Use a comma to separate WINS server names.
	Enter name and password of a Windows administrator: Type the Windows administrator name and password.
	Windows file sharing administrator: Type the Domain User or Group name
3	Click **OK** to update the security settings.

UNIX NIS settings

To access the UNIX Settings tab of the StoreVault Security Setting dialog box, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Security**. **OR** Click the system menu, select **Security**. **Result:** The StoreVault Security Setting dialog box appears.
2	In the StoreVault Security Setting dialog box, click Windows UNIX NIS Settings tab. **Result:** The UNIX NIS setting dialog box appears.
3	You can type the UNIX NIS settings if your site is using Network Information Service. If your site is not using NIS, or if you want NIS to broadcast to find a server, then enter "*" in the NIS Servers field. NIS allows many UNIX or Linux® machines on a network to share the configuration information, including password data. NIS is valid only in a UNIX or Linux environment. In the UNIX NIS setting dialog box, complete the following steps. **a.** Type the NIS Domain name. **b.** Type the NIS Servers IP address. **c.** Type the Name or IP address of the administration host. **d.** Click **OK** to update the UNIX NIS settings.

Managing Software Licenses

StoreVault Manager supports several software licenses. You need to install the software licenses by using the StoreVault Manager interface. The StoreVault Software Licenses dialog box enables you to add, modify, and remove a license key. The StoreVault Software Licenses dialog box displays licenses installed on your StoreVault system, type of license (permanent or evaluation), expiration date for the evaluation license, and the license key. If you are using a demonstration license, then you can upgrade to a permanent license. For more information about the license key, select the license key in the StoreVault Software Licenses dialog box, and then click **Details**.

You can install the following licenses:

- CIFS
- NFS
- iSCSI
- FCP
- HTTP
- FTP
- SnapManager for SQL Server
- SnapManager for Exchange Server
- SnapMirror
- SnapRestore

You can perform the following functions from the StoreVault Software License dialog box:

- "Adding a license key" on page 101
- "Modifying a license key" on page 101
- "Removing a license key" on page 102

Adding a license key

To add a new license key, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Software**. **OR** Click the system menu, and then select **Software**.
2	In the StoreVault Software Licenses dialog box, type the new license key in the text box.
3	Click **Add**. **Result:** The newly added license appears in the Installed Licenses list.
4	Click **OK**.

Modifying a license key

You can modify the software license to upgrade it to the latest license or install a permanent license.

To modify a license, complete the following steps.

Step	Action
1	In the task pane, click the System drop-down list box and select **Software**. **OR** Click the system menu, and then select **Software**.
2	From the list of software licenses, select the license key to modify.
3	In the StoreVault Software Licenses dialog, type the latest or permanent license key in the text box.
4	Click **Modify**.
5	Click **OK**.

Removing a license key

To remove a license key, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Software**. **OR** Click the system menu, select **Software**.
2	From list of software licenses, select the license key to remove.
3	Click **Remove**. **Result:** A confirmation message appears.
4	In the confirmation message box, click **OK**.
5	Click **OK** to close the dialog box.

Upgrading Data ONTAP

Procedure

The StoreVault storage system runs on Data ONTAP S Family Edition operating system for simplicity and reliability.

Note

You can download latest Data ONTAP version from http://now.netapp.com for your model of storage system.

To upgrade Data ONTAP version, complete the following steps.

Step	Action
1	Log in to StoreVault Manager.
2	Click System menu and select Software.
3	In the StoreVault Software Licenses dialog box, select *StoreVault System Upgrade* tab.
4	Click Browse and go to the location where you downloaded Data ONTAP.
5	Click **OK**.
6	The system reboot message appears, read the message, and click **Yes** to upgrade.

Uploading a tape configuration file

You can upload a tape configuration file in the StoreVault storage system for a newly qualified tape drive. A tape configuration file has a .tcf file name extension and the file name contains the vendor ID and product ID. Use only the tape configuration files that are supported by NetApp.

You can download a tape configuration file for a newly qualified tape drive from http://now.netapp.com.

You can also request a tape configuration file for the newly qualified tape drive from the technical support team.

Note

You can only upload one .tcf file at a time.

To upload a tape configuration file, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Software**. **OR** Click the system menu, select **Software**. **Result:** The StoreVault Software dialog box appears.
2	In the StoreVault Software dialog box, click **Upload Tape Config File** tab. **Result:** The Upload Tape Config File dialog box appears.
3	Click **Browse**. **Result:** The file Open dialog box appears.
4	In the file Open dialog box, select the new .tcf file and click **Open**. **Result:** An Upload button appears in the Upload Tape Config file dialog box.
5	In the StoreVault Software dialog box, click **Upload**. **Result:** After successful uploading, a message box appears.

Step	Action
6	In the message box, click **OK**. **Result:** The Upload Tape configuration File dialog box appears again. The status section dialog box now displays the successfully uploaded message.
7	Click **OK** to close the StoreVault Software Licenses dialog box.

Managing users

This selection lets you add administrative users to the system, remove users, and change their password.

You can perform the following functions in the Users dialog box.

- "Adding a user" on page 106
- "Removing a user" on page 108
- "Modifying a password" on page 108

Adding a user

To add a user, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Users**. **OR** Click the system menu, and then select **Users**. **Result:** The Users dialog box appears.
2	In the Users dialog box, right-click and select **Add User**. **Result:** The Add User dialog box appears.
3	In the Add User dialog box, complete the following substeps. **a.** Type the user name. **b.** Select the group from the list. **c.** Type full name. **d.** Type description. **e.** Type a new password. **f.** Confirm the password. **g.** Click **Add**. **Result:** The user name appears in the Users dialog box.

Step	Action
4	Click **OK** to close the Users dialog box.

Removing a user

To remove a user, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Users**. **OR** Click the system menu, and then select **Users**. **Result:** The Users dialog box appears.
2	In the Users dialog box, right-click the user name and select **Remove User**. **Result:** A confirmation message appears.
3	In the confirmation message box, click **Yes**. **Result:** Selected User is removed.
4	Click **OK** to close the Users dialog box.

Modifying a password

To modify the password, complete the following steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Users**. **OR** Click the system menu, and then select **Users**. **Result:** The Users dialog box appears.
2	In the Users dialog box, right-click the user name and select **Modify Password**. **Result:** The Modify Password screen appears.

Step	Action
3	In the Modify Password screen, complete the following substeps. **a.** Type a new password. **b.** Confirm the new password. **c.** Click **Apply**.
4	Click **OK** to close the Users dialog box.

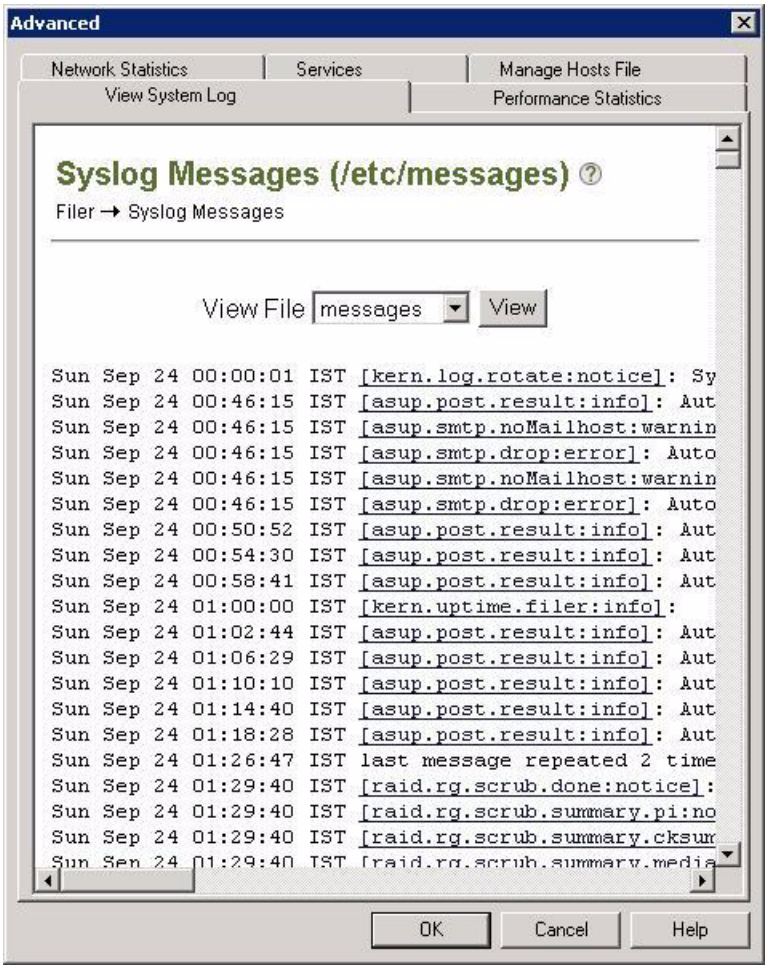
StoreVault advance settings

Click Advanced on the System menu or the tasks pane.

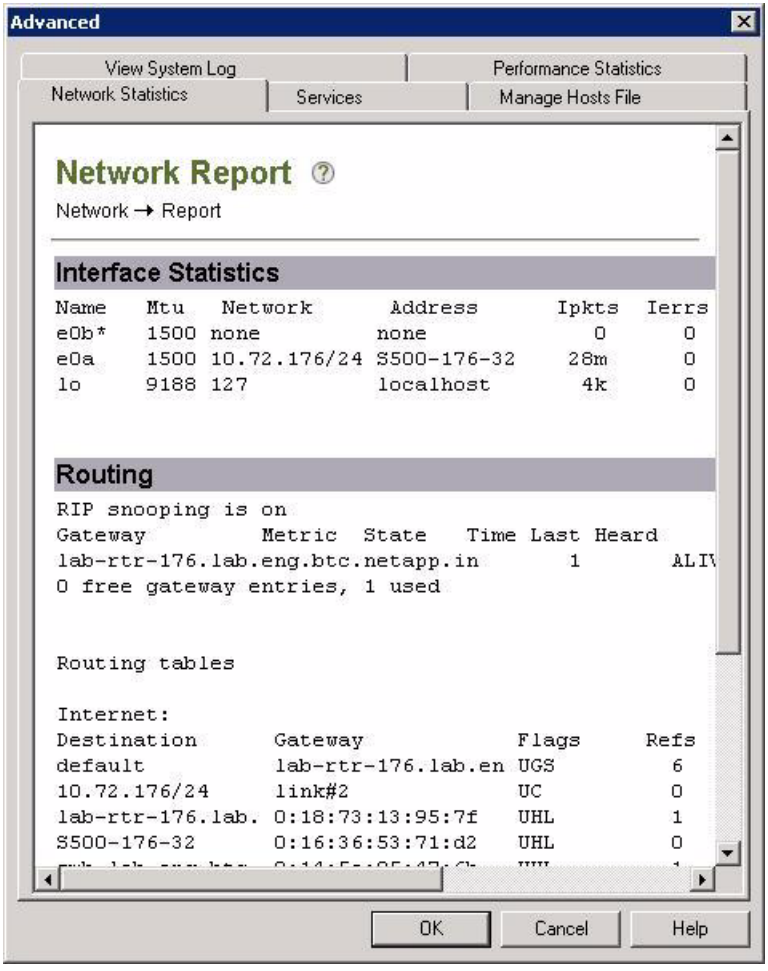
The Advanced dialog box with the following five tabs appears:

- "View System Log" on page 111
- "Network Statistics" on page 112
- "Performance Statistics" on page 113
- "Services" on page 114
- "Manage Hosts File" on page 116

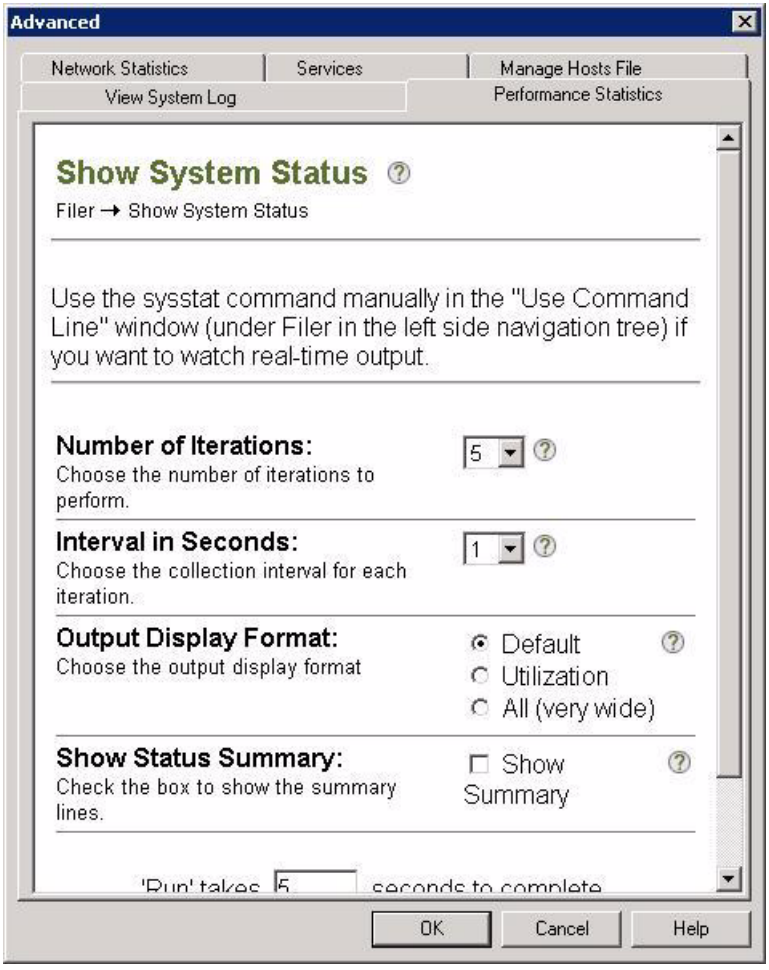
View System Log: The View System Log tab is used to view log messages.



Network Statistics: The Network Statistics tab is used to view advanced network information.



Performance Statistics: The Performance Statistics tab is used to view advanced system statistics.



Services: The Services tab on the Advanced dialog box is used to enable and disable FTP, DNS, NetBIOS Over TCP/IP, Replication log, NDMP, and AutoSupport diagnostic e-mails (ASUP), and to make the Snapshot copies directory visible or invisible.

- FTP

  FTP is used only to upgrade the version of Data ONTAP on the StoreVault storage system. In addition, in Active Directory based environments, FTP can also be used as a service. Administrators have to create a directory for every domain user under shares\ftp\. The name of the directory has to match the domain user ID. After this is done, when the corresponding domain user logs in, the FTP service authenticates the user just like a domain user. After the user has successfully logged in, the FTP user is automatically included in the shares\ftp\<user ID> directory.

- **DNS**

  Enables the location of computers and services by user-friendly names, and it also enables the discovery of other information stored in the database.

- **NetBIOS over TCP/IP (NetBT)**

  Specifies whether the network connection is obtained the setting from a Dynamic Host Configuration Protocol (DHCP) server. If you are manually configuring an IP address, select this option to enable NetBT. This option is not available for dial-up connections.

- **Replication log**

  Displays logs related to the replication process.

- ~Snapshot directory—Enables or disables the display of Snapshot copy folders to end users from the Windows Internet Explorer browser.

- **NDMP**

  The Network Data Management Protocol (NDMP) is a standardized protocol for controlling backup, recovery, and other transfers of data between primary and secondary storage.

  - By enabling NDMP protocol support on StoreVault, you enable the StoreVault to carry out communications with NDMP-enabled data protection applications, tape devices or servers that are participating in backup or recovery operations.

Note

After you disable the NDMP service, the StoreVault storage system continues processing all requests of already established sessions, but rejects new sessions. To start a new session, you need to enable the NDMP service.

- **AutoSupport Diagnostics Emails (ASUP)**

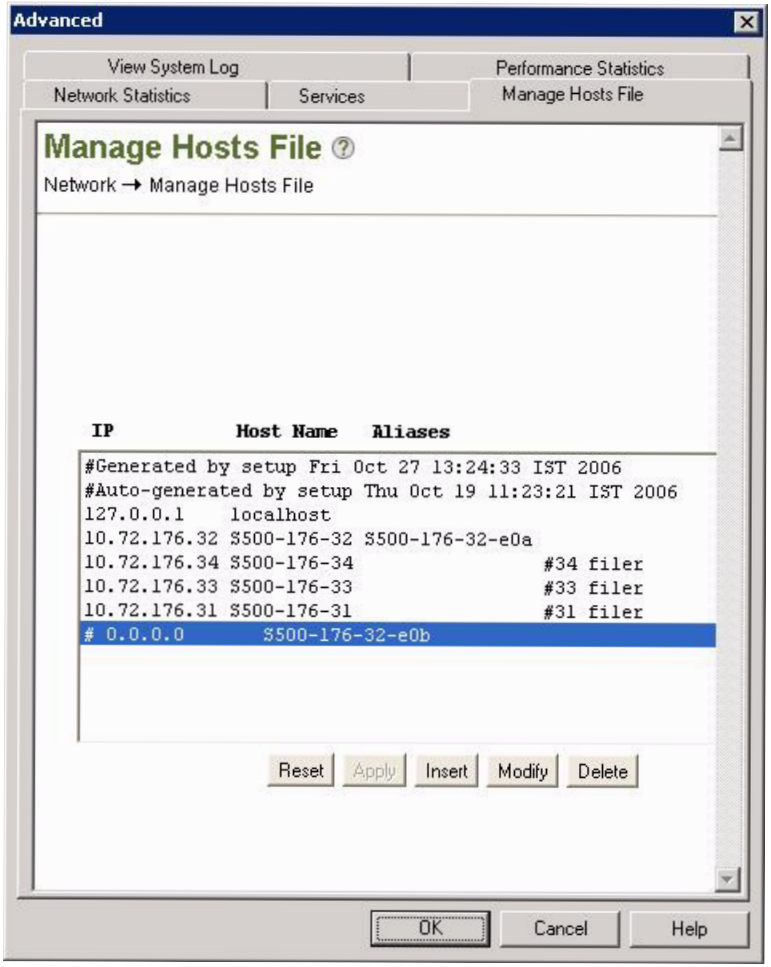
  By enabling the 'AutoSupport Diagnostic Email' check box your StoreVault system automatically sends e-mail messages to the administrator and technical support team if the StoreVault system experiences problems.

  Note

  You should keep 'AutoSupport Diagnostic Emails' enabled to ensure proper service for your StoreVault. For more information, click 'What are ASUPs?' in the services dialog box.

Manage Hosts File: This tab allows you to type the IP address and host name information about each storage system. This information is required for replication to work properly.

It is not mandatory to update Manage Hosts File. It is used only in environments where the StoreVault storage systems that are involved in replication cannot resolve each other's names. This occurs when the user's DNS is not configured to include both the storage systems. You should update the DNS, if possible. In the case when this cannot be done, the administrator needs to resort to managing the hosts file.



Click these buttons to perform the following functions:

- **Reset** — to reset the information
- **Apply** —to accept the changes
- **Insert** —to add a new IP address and host name information
- **Modify** —to modify existing information
- **Delete** —to delete information

Click **OK**.

Registration

This option is important for technical support of the StoreVault. This enables the StoreVault unit to send status and troubleshooting e-mails to the support team. The e-mail address that you enter will not be used for marketing or other purposes.

To update the registration details, complete the following steps.

Step	Action
1	From the task pane's primary storage section, click **System > Registration**. **OR** Click the system menu, select **Registration**. **Result:** The StoreVault Registration dialog box appears.
2	In the StoreVault Registration dialog box, complete the following step. Fill all the registration details in the End User Information section.
3	Select the Optional Information check boxes.
4	Click **OK**.

Shutdown

To shut down the system, complete the following the steps.

Step	Action
1	In the task pane, click System drop-down list box and select **Shutdown**. **OR** Click the system menu, select **Shutdown**. **Result:** The Shut Down StoreVault dialog box appears.
2	From the Shut Down StoreVault dialog box, you can perform the following tasks. ◆ ”Shutdown” ◆ ”Reboot:” ◆ ”Enable DHCP and Shutdown”
	Shutdown: This option ends your session and shutdown the StoreVault storage system. After shutting down you can safely turn off power. **Reboot:** This option will reboot your StoreVault storage system. **Enable DHCP and Shutdown:** Use this option of shutting down to move the StoreVault system to a new location. This option keeps DHCP enabled while it is shutting down and make sure the DHCP is available after reconnecting and turn on the power.
3	As per the requirement, select any of the option and click **OK**.

Windows Shares Management 6

About this chapter

This chapter guides you about creating Windows shares, removing Windows shares, and overall Windows shares management using StoreVault Manager.

Topics in this chapter

This chapter discusses the following topics:

- "Adding Windows shares" on page 122
- "Adding an Export entry" on page 127
- "Renaming Windows shares" on page 129
- "Removing Windows shares" on page 130

Adding Windows shares

As an administrator, you can create directories on the storage system. These directories do not automatically become accessible to users. You must create shares that correspond to these directories so that users can share them.

A Windows share is location on a computer network, which allows multiple users on the same network to have a centralized space to store files.

The following steps describe how to create an area for users to store their data on the StoreVault storage system. The Common Internet File System (CIFS) protocol is used for sharing these files and folders over the network. All security for access is handled through Windows.

1. You must have Windows authorization to access the default share named *Shares*.

   Computer Manager manages Share permissions.

2. Create a new directory in the default */vol/shares* directory. Right-click on the Windows shares element in the Primary Storage area and select **Add Shares** to launch a Windows Explorer window.

3. Share the directory using the shares snap-in directly from Explorer.

   This step creates a *share* through which the end users can access Windows files over the network. You will need to reenter the administrator login and password for the StoreVault storage system.

Note

You can share or export folders existing in */vol/shares* or */vol/exports*.

Ways to create Windows shares

You can access Windows shares using any of the following ways.

- Using Task pane
- Right-click menu option
- Primary Storage main menu option

From Task pane: In the task pane's primary storage section, click **Add Windows Shares (NAS)**

Right-click menu option: In the primary storage section of the StoreVault main screen right-click the UNIX Exports icon, and select **Add Shares**.

From Primary Storage main menu: Click **Primary Storage > Add Windows Shares (NAS)**

Note

In the following explanation of the tasks right-click menu option is used.

Mapping the default share

To access the default share of the StoreVault storage system, complete the following steps.

Step	Action
1	In your Windows administrative system, click **Start > My Computer**. From this window, click **Tools** menu > **Map Network Drive.**
2	In the My Computer Windows, click **Tools > Map Network Drive**. **Result:** The Map Network Drive dialog box appears.
3	In the Map Network Drive dialog box, select drive letter and browse for a folder. Use the StoreVault storage system name or IP address followed by *shares.* **Note** If required, click connect using a different user name, The user name needs to have Windows authorization to access the default share on the StoreVault storage system. For example, *Admin@domainname.com* Here the domain name is the domain where the StoreVault storage system resides.
4	Click **Finish**. **Result:** The default share is mapped as a network drive.
5	In the mapped shares directory, right-click and select **New > Folder**. Name the folder.
6	Right-click the new folder and select **StoreVault > Share** Now, the folder is shared and can be accessed by Windows clients.

Adding a Windows Share from StoreVault Manager

You can also add a Windows Share from the StoreVault Manager.

To add a Windows Share from StoreVault Manager, complete the following steps.

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td rowspan="4">1</td><td colspan="2">In the Primary Storage area of the StoreVault Manager main screen, right-click Windows Shares and select Manage Shares or select Add Shares.

Result: If Manage Shares is selected, the StoreVault Shares Properties dialog box appears. If add shares is selected, the default Shares directory appears.</td></tr>
<tr><td>If..</td><td>Then..</td></tr>
<tr><td>If Manage Shares is selected</td><td>Follow Step 2.</td></tr>
<tr><td>If Add Shares is selected</td><td>Follow Step 3.</td></tr>
<tr><td>2</td><td colspan="2">In the StoreVault Shares Properties dialog box, right-click and select Add Shares.

Result: The default Shares directory appears in the Windows Explorer screen.</td></tr>
<tr><td>3</td><td colspan="2">In the default shares directory, right-click the folder to share and select StoreVault > Share.

You can also create a new folder and share it.

Result: The folder Properties dialog box appears, with the StoreVault Sharing tab selected.</td></tr>
</table>

Step	Action
4	In the folder Properties dialog box, complete the following steps. **a.** Click **Share this folder**. **b.** Type a Share Name. **c.** Type Comment (optional). **d.** Click **OK**. **Note** You do not need to type the user name and password. The cached user name and password are used. **Result:** An information dialog box appears indicating that the share was created successfully.
5	In the information dialog box, click **OK**. **Result:** The Windows Shares dialog box appears with new share created.

Adding an Export entry

By adding an export entry you are giving access to a share for UNIX clients in the network.

To add an Export entry to the Windows Shares directory path from the StoreVault Manager, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *Windows Shares* and select **Manage Shares**. **Result:** The StoreVault Shares Properties dialog box appears.
2	In the StoreVault Shares Properties dialog box, right-click the required Share name and select **Add Export Entry**. **Result:** The Add Unix Export Wizard appears.
3	In the Add Unix Export wizard screen, click **Next**. **Result:** The Export Directory Path or Alias Name and Alias Path screen appears.
4	In the Export Directory Path, the /vol/shares/ path along with the directory name are displayed in the Export Directory path or Alias Name field. Click **Next**. **Result:** The Unix Exports Access dialog box appears.
5	In the Unix Exports Access dialog box, complete the following steps. **a.** Specify read-only, read-write, or root access for a specific host or for all hosts. **b.** Type specific hosts by using any one of the following items: host name, host IP address, netgroup, subnet, or DNS domain name. **c.** Click **Next**. **Result:** The Unix Exports Security dialog box appears.

Step	Action
6	In the Unix Exports Security dialog box, complete the following steps. The Anonymous User ID (UID) sets user ID will be given to an unknown user trying to access a particular Export. The default value is 65534. **Note** Change this value only if you have an extensive knowledge of the UNIX file system security. **a.** Enter the user ID for the anonymous user on the client. **b.** Select a check box for the security protocol to be used. **c.** Click **Next**. **Result:** The Add Unix Exports Summary dialog box appears.
7	In the Add Unix Exports Summary dialog box, verify the information and click **Apply**. **Result:** The Add Export Wizard has Finished dialog box appears.
8	In the Add Export Wizard Finished dialog box, click **Finish**. **Result:** The Export Properties dialog box now displays the newly created UNIX Export Entry.

Renaming Windows shares

You can rename an existing Windows shares using StoreVault Manager.

To rename a Windows share, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *Windows Shares* and select **Add Shares**. **Result:** The default Shares directory appears in Windows Explorer.
2	In the Windows Explorer screen, click **Up** icon to access the Shares.
3	Right-click a share and select **StoreVault > Share**. **Result:** The folder Properties dialog box appears, with the StoreVault Sharing tab selected.
4	In the folder Properties dialog box, click **Rename**. **Result:** The Rename Share dialog box appears.
5	In the Rename Share dialog box, complete the following. **a.** Enter a new name for the share. **b.** Enter description for the share (optional). **c.** Click **OK**. **Result:** Share renamed message appears and you are back to the Explorer folder Properties dialog box.
6	In the folder Properties dialog box, click **OK**. **Result:** Now, after refreshing the Windows Explorer, you can see the renamed share.

Removing Windows shares

To stop sharing for any particular share you need to remove it. The following steps explains the removing share using StoreVault Manager.

Note

Removing shares does not delete the data stored on the StoreVault system; it removes the connection to the data.

To remove a Share, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *Windows Shares* and select **Manage Shares**. **Result:** The StoreVault Shares Properties dialog box appears.
2	In the StoreVault Shares Properties dialog box, right-click the required Share name and select **Remove Share**. **Result:** A confirmation message appears.
3	In the confirmation message box, click **Yes**. **Result:** The selected share entry disappears from the shares Properties dialog box.

Managing UNIX Exports 7

About this chapter

This chapter guides you on creating and removing UNIX Exports, and discusses overall UNIX Exports management using StoreVault Manager.

Topics in this chapter

This chapter discusses the following topics:

- "Adding UNIX exports" on page 132
- "Adding a share entry" on page 137
- "Modifying UNIX exports" on page 138
- "Removing UNIX exports" on page 139

Adding UNIX exports

This part of StoreVault Manager enables you to prepare your StoreVault storage system for sharing storage resources (files, directories, and containers) with Network File System (NFS). NFS is the file system for UNIX clients.

Note

For those familiar with the UNIX or Linux command line, it is recommended that you use the StoreVault command-line interface (CLI) to create Exports directly from the command line on a UNIX or Linux host system. For more information, see "StoreVault Command-Line Interface" on page 277.

Note

You can share or export directories existing in /vol/shares or /vol/exports with the cross protocol support. For more information, see "Cross-protocol" on page 14

Ways to access the UNIX exports wizard

You can access the UNIX exports wizard using any of the following ways:

- From the Task pane
- Through Right-click option
- From the Primary Storage main menu

From the Task pane: In the Task pane's primary storage section, you click **Add UNIX Exports (NAS)**.

Right-click menu option: In the primary storage section of the StoreVault main screen, you right-click the UNIX Exports icon, and select **Add Exports**.

From the Primary Storage main menu: You click **Primary Storage > Add UNIX Exports (NAS)**

Note

The tasks that follow use the right-click menu option.

You can add an export using browse or wizard option from UNIX Exports Properties dialog box.

For more information on browse option, see “Adding UNIX export using browse option” on page 136.

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td rowspan="4">1</td><td colspan="2">In the Primary Storage area of the StoreVault Manager main screen, right-click UNIX Exports and select Manage Exports or select Add Exports.

Result: If Manage Exports is selected, the StoreVault Export Properties dialog box appears. If Add Export is selected, Add Unix Exports Wizard appears.</td></tr>
<tr><td>If..</td><td>Then..</td></tr>
<tr><td>If Manage Exports is selected</td><td>Follow Step 2</td></tr>
<tr><td>If Add Exports is selected</td><td>Follow Step 3</td></tr>
<tr><td>2</td><td colspan="2">In the StoreVault Exports Properties dialog box, right-click and select Add Exports >Wizard.

Result: The Add Unix Exports Wizard appears.</td></tr>
<tr><td>3</td><td colspan="2">In the Add Unix Exports Wizard, click Next.

Result: The Export Directory Path dialog box appears.</td></tr>
</table>

Step	Action
4	In the Export Directory Path dialog box, complete the following steps. **a.** Enter the export directory path or the alias name and alias path. **b.** Mount *exports* on the host UNIX or Linux system. **c.** Create a new directory under the *exports* mountpoint. **d.** Create a new export with StoreVault Manager. **e.** Click **Next**. **Note** You can give alias name to the export directory path, if the path name is long. If you enter an optional alias path, it must be different from the export path. All export paths must start with */vol/exports/*. **Result:** The Unix Exports Access dialog box appears.
5	In the Unix Exports Access dialog box, complete the following steps. **a.** Specify read-only, read-write, or root access for specific hosts or for all hosts. **b.** Enter specific hosts by using any one of the following items: host name, host IP address, netgroup, subnet, or DNS domain name. **c.** Click **Next**. **Result:** The Unix Exports Security dialog box appears.

Step	Action
6	In the Unix Exports Security dialog box, complete the following steps. The Anonymous User ID (UID) sets what UID will be given to an unknown user trying to access a particular export. The default value is 65534. **Note** Change this value only if you have an extensive knowledge of the UNIX file system security. **a.** Enter the user ID for the anonymous user on the client. **b.** Select a check box for the security protocol to be used. **c.** Click **Next**. **Result:** The Add Unix Exports Summary dialog box appears.
7	In the Add Unix Exports Summary dialog box, verify the information and click **Apply**. **Result:** The Add Export Wizard Finished dialog box appears.
8	Click **Finish**. **Result:** The Exports Properties dialog box appears displaying the newly created UNIX export.

Adding UNIX export using browse option

You can add an export using browse menu option from the UNIX Export Properties dialog box.

To create an export, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *UNIX Exports* and select **Manage Exports**. **Result:** The StoreVault Export Properties dialog box appears.
2	In the StoreVault Exports Properties dialog box, right-click and select **Add Exports >Browse**. **Result:** The explorer window appears.
3	In the explorer window browse the directory, and right-click the desired folder, select **StoreVault > Export**. **Result:** The folder Properties dialog box appears.
4	In the folder Properties dialog box, complete the following steps. **a.** Specify read-only, read-write, or root access for specific hosts or for all hosts. **b.** The Anonymous User ID (UID) sets what UID will be given to an unknown user trying to access a particular export. The default value is 65534. **c.** Select a check box for the security protocol to be used. **d.** Give user name and password. **e.** Click **OK**. **Result:** The export created successfully message appears.
5	In the Export created successfully message box, click **OK**. **Result:** The exported path appears in the StoreVault UNIX Export Properties dialog box.

Adding a share entry

To give access of UNIX style data for a Windows client you need to add a share entry for an Export.

To add a share entry for a UNIX-exported directory path from the StoreVault Manager, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *UNIX Exports* and select **Manage Exports**. **Result:** The StoreVault Export Properties dialog box appears.
2	In the StoreVault Export Properties dialog box, right-click the required Export directory path and select **Add Share Entry**. **Result:** The Add Share dialog box appears.
3	In Add Share dialog box, complete the following steps. **a.** Enter a Share Name. **b.** Enter Comments (optional). **c.** Click **Add**. **Note** You cannot have a duplicate share name. **Result:** The share created successfully message appears.
4	In the Share created successfully message box, click **OK**.

Modifying UNIX exports

To modify the UNIX exports using StoreVault Manager, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *UNIX Exports* and select **Manage Exports**. **Result:** The StoreVault Export Properties dialog box appears.
2	In the StoreVault Exports Properties dialog box, right-click and select **Modify Exports**. **Result:** The Modify Unix Exports Wizard appears.
3	In the Modify Unix Exports Wizard, click **Next**. **Result:** The Modify Exports screen appears.
4	In the Modify Exports screen, verify that the export displayed is the one to modify, and then click **Next**. **Result:** The Modify Exports Host Access dialog box appears.
5	In the Modify Exports Host Access dialog box, complete the following steps. **a.** Click **Add** and enter the new information. **b.** Verify the information and click **Next**. **Result:** The Modify Exports Security dialog box appears.
6	Click **Next**. **Result:** The Modify Unix Exports Summary dialog box appears.
7	In the Modify Unix Exports Summary dialog box, verify the information and click **Apply**. **Result:** The Modify Export Wizard Finished dialog box appears.
8	In the Modify Export Wizard Finished dialog box, click **Finish**. **Result:** The StoreVault Exports Properties dialog box appears displaying the changes.

Removing UNIX exports

To remove a UNIX exports using StoreVault Manager, complete the following steps.

Note

Removing a UNIX export does not delete any data on the StoreVault storage system. It simply removes the UNIX NFS path to the data.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click *UNIX Exports* and select **Manage Exports**. **Note** You can also double-click **UNIX Exports** in the **Primary Storage** area to access the Exports Properties dialog box. **Result:** The StoreVault Export Properties dialog box appears.
2	In the StoreVault Exports Properties dialog box, right-click the export to remove and select **Remove Exports**. **Result:** The StoreVault Remove Export confirmation message appears.
3	In the message box, click **Yes** to remove the export **Result:** The export that was selected and deleted is no longer displayed in the list of storage areas.

Managing LUNs 8

About this chapter

This chapter discusses LUNs and their properties, and discusses how to create, resize, and delete LUNs using StoreVault Manager.

Topics in this chapter

This chapter discusses the following topics:

- "About LUNs" on page 142
- "Creating a LUN" on page 145
- "LUN properties" on page 167
- "Resizing a LUN" on page 171
- "Initiator groups" on page 185
- "Deleting a LUN" on page 174

About LUNs

This section provides information about types of LUNs, information about iSCSI and FCP protocols.

- "What a LUN is" on page 142
- "About iSCSI" on page 143
- "About FCP" on page 143
- "Differences between iSCSI and FCP" on page 143
- "About VDS LUNs" on page 143
- "About GPT partition LUNs" on page 144
- "LUN reserve auto-tuner" on page 144

What a LUN is

The logical unit number (LUN) represents a logical unit of storage on a storage system that is accessed by clients.

LUN management involves the following activities:

- LUN and initiator group setup using the LUN wizard
- Enabling and disabling FCP and iSCSI services
- Initiator group management
- FCP management

For proper LUN connections, complete the following steps.

Step	Action
1	Use the host server application to configure the host server (Windows or UNIX host) to connect to the StoreVault storage system using iSCSI or FCP.
2	Create the LUN (iSCSI or FCP) on the StoreVault storage system using StoreVault Manager software.

About iSCSI

Internet SCSI (iSCSI) is a transport protocol that encapsulates SCSI block-level storage commands into standard Ethernet packets for transport over IP networks. When using iSCSI with a file server such as StoreVault, storage devices or LUNs appear as local disks to the host that connects to the file server using the iSCSI protocol.

About FCP

Fibre Channel Protocol (FCP) is a transport protocol that encapsulates SCSI block-level storage commands into fibre channel for transport over SAN networks.

FCP enables Fibre Channel connections for high-performance SANs.

Differences between iSCSI and FCP

The following table lists the differences between FCP and iSCSI.

	FCP	**iSCSI**
Wire speed	2 Gbit/sec	1 Gbit/sec
Single wire throughput limit	200 MB/sec	100 MB/Sec
Single HBA/NIC IOP limit	~ 22k	~18k

Note

Using StoreVault Manager, you can create both iSCSI and FCP LUNs. The steps to create a LUN are same for both the types of protocols.

Attention

If both iSCSI and FCP network cards are active at the same time on the StoreVault storage system, then the iSCSI LUN appears twice on the server.

About VDS LUNs

A Virtual Disk Service (VDS) LUN is created on StoreVault by using Microsoft Storage Manager for SANs with a VDS provider. You can enable Snapshot copies for a VDS LUN using StoreVault Manager.

After you enable Snapshotting on a VDS LUN using the StoreVault Manager, then the VDS-created LUN changes to StoreVault Manager LUN. You can reserve space for Snapshot copies, and also replicate and resize a VDS LUN using StoreVault Manager as you do for a StoreVault Manager LUN. However, you cannot use Microsoft Storage Manager SANs to resize and replicate LUNs, and create Snapshot copies.

The VDS LUN icon appearance is different from StoreVault Manager LUN icon.



Note

After creating a VDS LUN you can enable Snapshottting using StoreVault Manager.

About GPT partition LUNs

StoreVault Manager supports the GUID partition table (GPT) partitioning style on new Generic LUN types created by StoreVault Manager. For creating GPT partitioning style LUNs, you need Data ONTAP S family Edition 7.2.1S10 installed on your storage system. GPT based LUNs are supported with Windows Server 2003 SP1 or later Windows version.

You can create a LUN with a maximum size of 12 TB.

Note

To create a generic LUN of size greater than 2 TB, you must select the OS Type as Windows GPT.

LUN reserve auto-tuner

For information on LUN reserve auto-tuner, see “LUN reserve auto-tuner” on page 229

Creating a LUN

This section contains information about application-centric LUN wizard, explains how SnapDrive works with the StoreVault Manager, and about different application centric LUNs.

- "Overview of Application-centric LUN wizard" on page 145
- "Ways to access the Create LUN wizard" on page 145
- "SnapDrive for Windows StoreVault Edition integration with StoreVault Manager" on page 146
- "SnapDrive for Windows Limitations" on page 146
- "Points to remember for using SnapDrive for Windows StoreVault Edition" on page 147
- "LUN naming guidelines" on page 147
- "Creating application-centric LUNs" on page 150
- "LUN properties" on page 167
- "Resizing a LUN" on page 171
- "Guidelines for using CHAP authentication" on page 178
- "Initiator groups" on page 185

Overview of Application-centric LUN wizard

The StoreVault Manager LUN wizard is an application-centric LUN wizard. The Create LUN Wizard enables you to create application-centric LUNs. These LUNs can then be used to store data for that application. This simplifies the management of LUNs using the StoreVault Manager. The wizard enables you to create LUNs for the following applications.

- VMware®
- Oracle Database Server
- Microsoft SQL Server™
- Microsoft® Exchange Server

Ways to access the Create LUN wizard

You can access the Create LUN wizard any of the following ways.

- From the Task pane
- Right-click menu option
- From the Primary Storage main menu

From Task pane: In the task pane's primary storage section, click **Create LUN (SAN)**

Right-click menu option: In the primary storage section of the StoreVault main screen, right-click the existing LUN, and select **Create LUN**.

From Primary Storage main menu: Click **Primary Storage > Create LUN (SAN)**

SnapDrive for Windows StoreVault Edition integration with StoreVault Manager

The SnapDrive for Windows StoreVault Edition software is provided with the StoreVault Manager software. You need to install SnapDrive for Windows StoreVault Edition on a Windows Server 2003 computer. SnapDrive for Windows StoreVault Edition integrates with StoreVault Manager, and works in the background while creating some application-centric LUNs for the Windows operating system. This LUN uses the NTFS file system and the LUN Snapshot copies can be mounted as virtual disk drives.

For more information about SnapDrive for Windows StoreVault Edition, see "SnapDrive 5.0 for Windows StoreVault Edition" on page 43.

SnapDrive for Windows Limitations

The limitations of the SnapDrive for Windows StoreVault Edition are as follows:

- Does not support clustering and MPIO
- Does not work with Windows XP or Windows Vista
- Does not support other NetApp storage systems

Points to remember for using SnapDrive for Windows StoreVault Edition

Remember the following points when creating LUNs using SnapDrive for Windows StoreVault Edition:

- Install StoreVault Manager on the same Windows Server 2003 as SnapDrive for Windows StoreVault Edition.
- If you are using SnapManager for Exchange Server StoreVault Edition for managing your Exchange Server database, then you need to install SnapManager for Exchange Server on the same Windows Server 2003.
- You can manage the LUNs only on the Windows Server 2003 on which they are created. You cannot manage the LUNs from any other server.
- The LUNs created on Windows Server 2003 can be mapped to that computer initiator only (host).
- If you want to use the LUN on a different server, you need to un-map the LUN from the existing local machine initiator. Log on to the other Windows Server 2003 from which you want to manage the LUN. Then, map the LUN to that local machine initiator.
- LUNs created using SnapDrive at the background use the NTFS file system.
- SnapDrive works in the background for the following LUN types.
  - Oracle LUN type with Windows as operating system
  - Exchange Server
  - SQL Server
  - Server LUN

LUN naming guidelines

Remember the following guidelines when naming a LUN:

A LUN name cannot:

- Start with a number
- Have space between characters
- Have special characters

Generic LUN

A Generic LUN is a standard LUN for storing any kind of data. You can create a generic LUN for Windows, Linux, Solaris®, Windows GPT, and NetWare operating system. A Generic LUN does not have any file system. You cannot mount the Snapshot copies of these LUNs.

VMware LUN

VMware LUN type is for storing VMware application data. The operating system for a VMware LUN type is VMware. You can create, delete, and restore the Snapshot copies for this LUN type. The LUN wizard displays only VMware hosts for mapping while LUN creation. The Snapshot copies created using SnapDrive for Windows StoreVault Edition can be mounted as virtual disk drives, and unmount the Snapshot copy. The procedure for creating and resizing a VMware LUN are same as the Generic LUN.

Microsoft SQL database LUN

Microsoft SQL Database LUN type is for storing SQL database application data. The operating system type for the SQL LUN type is Windows. If SnapDrive for Windows StoreVault Edition is installed on your system, then the wizard uses the Snapdrive for creating SQL database LUN. You can create, delete, and restore the Snapshot copies. You can also mount the Snapshot copy as a virtual disk drive and unmount the Snapshot copies of the SQL LUN. The steps for creating an SQL Database LUN are same as the Server LUN.

Oracle database LUN

An Oracle Database LUN type is for storing Oracle application data. The OS type for this LUN can be Windows, Linux, Solaris or NetWare. For Oracle database LUN if you select Windows as operating system, then the LUN is created using SnapDrive for Windows in the back-end. You can create, delete, restore, mount and unmount the Snapshot copies for an Oracle Database LUN. The steps for creating an Oracle Database LUN are same as the Server LUN.

Microsoft Exchange Server LUN

The Microsoft Exchange Server LUN type is use to store the Microsoft Exchange server database application data. For more information on this, see“Creating a Microsoft Exchange Server LUN” on page 160.

LUN for server software application

A server LUN is normal LUN for storing any kind of data. You can create a server LUN on a system having SnapDrive for Windows StoreVault Edition and Windows 2003 Sever is installed. The OS type for the Server LUN is Windows. You can create, delete, restore, mount, and unmount the Snapshot copies for the Server LUN. The Server LUNs can be mounted only on the local server on which StoreVault Manager and SnapDrive for Windows are installed. It cannot be mapped and mounted on other systems.

Note

If StoreVault Manager is installed on a Windows XP system or Windows Server 2003 without SnapDrive for Windows StoreVault Edition, then the *Application Type* list of the Create LUN Wizard will not have Microsoft SQL Database, Microsoft Exchange, or Server.

Creating application-centric LUNs

This section explains steps for creating Generic LUN, Server LUN, and Microsoft Exchange Server LUN.

- "Creating a generic LUN" on page 151
- "Creating a server LUN" on page 155
- "Creating a Microsoft Exchange Server LUN" on page 160

Note

The steps for creating VMware LUN are same as Generic LUN and the steps for Oracle LUN with Windows as operating system and SQL server LUN are same as Server LUN.

Creating a generic LUN

You can create a LUN for generic application using the LUN wizard for different operating systems. For this LUN you can enable Snapshot copies and LUN reserve auto-tuner

For creating a LUN for generic application type, complete the following steps.

Step	Action
1	In the task pane, click Primary Storage drop-down list box and select **Create LUN (SAN)**. OR In the Primary Storage section of the StoreVault Manager main screen, right-click an existing LUN, and select **Create LUN**. **Result:** The Create LUN Wizard appears.
2	In the Create LUN Wizard, click **Next**. **Result:** The LUN Parameters dialog box appears.
3	In the LUN Parameters dialog box, complete the following. **a.** In LUN Application Type list, select Generic. **b.** Type the name of the LUN. **Note** Ensure that there are no blank spaces in the LUN name. For example, type name as *LUN1* instead of *LUN 1*. *shares* and *exports* are reserved names and cannot be used as LUN names. Special characters are not allowed while naming LUNs. **c.** Type the size of the LUN. **Note** The minimum size for a LUN is 5 GB and the maximum is 2047 GB. By selecting Windows GPT OS type you can create a LUN size of maximum of 12 TB. **d.** Select the operating system for the LUN from the list (Windows, Linux, Solaris, NetWare, or Windows GPT). **e.** Type a description (optional).

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td></td><td colspan="2">
f. To capture Snapshot copies, select ‘Turn on snapshotting’.

Note
Select the ‘Turn on snapshotting’ check box to set up replication for a LUN. When selecting a LUN, the right-click option for replication will not be visible unless Snapshotting is enabled for that LUN.

For more information on Snapshot technology, see “Snapshot Management” on page 225.

g. Select Enable LUN Reserve AutoTuner.

Note
You can enable LUN reserve auto-tuner for a LUN size of 50 GB or greater and you need to enable snapshotting before enabling LUN reserve auto-tuner, see “LUN reserve auto-tuner” on page 144

Attention
You cannot enable LUN reserve auto-tuner after creating a LUN.

h. Click Next.

Result: The Map Servers to the LUN dialog box appears.
</td></tr>
<tr><td></td><td>If..</td><td>Then..</td></tr>
<tr><td></td><td>You want add an existing host to the list</td><td>Follow Step 4</td></tr>
<tr><td></td><td>You want to change the host name</td><td>Follow Step 5</td></tr>
<tr><td></td><td>You want to manually add host</td><td>Follow Step 6</td></tr>
</table>

Step	Action
4	The list on the left displays all existing hosts that are connected to the StoreVault storage system using iSCSI or FCP. The list on the right displays the host that the LUN will be mapped to after the wizard has created it. To add an existing host to the list, select a host from the list on the left pane, and click the right arrow to move it to the mapped hosts in the list on the right pane. Similarly, to remove a mapped group, select the group to remove, and click the **left** arrow. **Note** For a GPT-based LUN of size greater than 2 TB, you must map this LUN to a Windows 2003 SP1 (or later version) initiator. If you map the LUN to an initiator of another Windows operating system, then the LUN does not display in the Disk Management window. Click **Next**. **Result:** The Confirm LUN Settings dialog box appears.
5	**Changing host names:** To change the host name, complete the following steps. **a.** Select the host initiator whose name you would like to change. To change the host name, click **Change host name**. The Change Host Name dialog box appears. **b.** Enter the new name and click **OK**. You will be taken to the Map Servers to the LUN dialog box and the new name appears on the list on the left side. **c.** In the Map Servers to the LUN dialog box, follow Step 4

Step	Action
6	**Manually adding hosts:** **a.** Click **Manually add host** on the Map Servers to the LUN dialog box. The Add Initiator Group dialog box appears. **b.** Enter the initiator group name, protocol type (iSCSI or FCP), operating system (Windows, Linux, Solaris, NetWare, and VMware), and enter the list of initiator names. For an FCP initiator group, enter worldwide port names (WWPNs). For an iSCSI initiator group, enter iSCSI initiator node names. **c.** Click **OK**. You are returned to the Map Servers to the LUN dialog box. **d.** In the Map Servers to the LUN dialog box, follow Step 4 **Note** To get the iSCSI initiator node name, go to **Start > Programs > Microsoft iSCSI Initiator > Microsoft iSCSI Initiator**. The iSCSI Initiator Properties dialog opens. You will find the initiator node name on the General tab.
7	In the Confirm LUN Settings dialog box verify the information and click **Commit**. **Result:** The Create LUN Success dialog box appears.
8	In the Create LUN Success dialog box, click **Finish**. The Storage Overview and Primary Storage section gets refreshed. For example, the iSCSI LUN named *Sales* now appears in the Primary Storage list. Now, the host server is ready to initialize, partition, and format this new LUN.

Creating a server LUN

A server LUN for server software application type. You can store any kind of data in this LUN. You can create a LUN on a system having SnapDrive for Windows StoreVault Edition and Windows Server 2003 is installed.

You can create a Server LUN using the LUN wizard. While creating a Server LUN you need to select Windows as operating system. The Snapshooting is by default enabled for this kind of LUNs. You can also enable LUN reserve auto-tuner while creating this kind of LUNs.

For creating a Server LUN, complete the following steps.

Step	Action
1	In the task pane, click Primary Storage drop-down list box and select **Create LUN (SAN)**. **OR** In the Primary Storage section of the StoreVault Manager main screen, right-click an existing LUN, and select **Create LUN**. **Result:** The Create LUN Wizard appears.
2	In the Create LUN Wizard, click **Next**. **Result:** The LUN Parameters dialog box appears.
3	In the LUN Parameters dialog box, complete the following. **a.** In LUN Application Type list, select Server. **b.** Type a name for the LUN. **Note** Ensure that there are no blank spaces in the LUN name. For example, type name as *LUN1* instead of *LUN 1*. *shares* and *exports* are reserved names and cannot be used as LUN names. Special characters are not allowed while naming LUNs. **c.** Enter the size of the LUN. **Note** The minimum size for a LUN is 5 GB and the maximum is 2047 GB.

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td></td><td colspan="2">
Note
By default, Turn on snapshotting is enabled for a Server, Microsoft Exchange Server, Microsoft SQL Database LUNs, and Oracle LUNs if SnapDrive is installed and the OS type is Windows.

d. Select Enable LUN Reserve AutoTuner.

Attention
You cannot enable LUN reserve auto-tuner after creating a LUN.

Note
You can enable LUN reserve auto-tuner for a LUN size of 50 GB or greater and you need to enable snapshotting before enabling LUN reserve auto-tuner. For more information on LUN reserve auto-tuner, see “LUN reserve auto-tuner” on page 14

e. Click Next.

The Map Servers to the LUN dialog box appears.

The list on the left displays all existing hosts that are connected to the StoreVault storage system using iSCSI or FCP.

The list on the right displays the host that the LUN will be mapped to after the wizard has created it.

Result: The Map Servers to the LUN dialog box appears.
</td></tr>
<tr><td></td><td>If..</td><td>Then..</td></tr>
<tr><td></td><td>You want to add an existing host to the list</td><td>Follow Step 4</td></tr>
<tr><td></td><td>You want to change the host name</td><td>Follow Step 5</td></tr>
</table>

Step	Action	
	You want to manually add host	Follow Step 6
4	The list on the left displays all existing hosts that are connected to the StoreVault storage system using iSCSI or FCP. The list on the right displays the host that the LUN will be mapped to after the wizard has created it. To add an existing host to the list, select a host from the list on the left pane, and click the right arrow to move it to the mapped hosts in the list on the right pane. **Note** Similarly, to remove a mapped group, select the group to remove and click the **left** arrow. Click **Next**. **Result:** The Server LUN Parameters dialog box appears.	
5	**Changing host name:** To change the host name, complete the following steps. **a.** Select the host initiator whose name you would like to change. To change the host name, click **Change host name**. The Change Host Name dialog box appears. **b.** Enter the new name and click **OK**. You will be taken to the Map Servers to the LUN dialog box and the new name appears on the list on the left side. **c.** In the Map Servers to the LUN dialog box, follow Step 4	

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6</td><td>Manually adding hosts:

a. Click Manually add host on the Map Servers to the LUN dialog box.

The Add Initiator Group dialog box appears.

b. Enter the initiator group name, protocol type (iSCSI or FCP), operating system (Windows, Linux, Solaris, NetWare, and VMware), and enter the list of initiator names. For an FCP initiator group, enter worldwide port names (WWPNs). For an iSCSI initiator group, enter iSCSI initiator node names.

c. Click OK.

You are returned to the Map Servers to the LUN dialog box.

d. In the Map Servers to the LUN dialog box, follow Step 4

Note
To get the iSCSI initiator node name, go to Start > Programs > Microsoft iSCSI Initiator > Microsoft iSCSI Initiator. The iSCSI Initiator Properties dialog opens. You will find the initiator node name on the General tab.</td></tr>
<tr><td>7</td><td>In the Server LUN Parameters dialog box you can assign a drive letter to the LUN, or mount the LUN to an empty NTFS folder.

<table><tr><th>If..</th><th>Then..</th></tr><tr><td>You want to assign a drive letter</td><td>Follow Step 8</td></tr><tr><td>You want mount on to an empty NTFS folder</td><td>Follow Step 9</td></tr></table></td></tr>
</table>

Step	Action
8	To assign a drive letter to a LUN, complete the following steps. **a.** Select *Assign the following drive letter.* **b.** Select the drive letter from the corresponding list. **c.** In the virtual Disk Type section, select **Dedicated**. **d.** Click **Next**. **Result:** The Confirm LUN Settings dialog box appears.
9	To mount the LUN to an empty NTFS folder, complete the following steps. **a.** Select *Mount in the following empty NTFS folder,* and click Browse. The Browse For Folder dialog box appears. **b.** Click **Make New Folder** and name the folder. **c.** Click **OK**. The path appears in the Microsoft Exchange LUN Parameters dialog box. **d.** In the virtual Disk Type section, select **Dedicated**. **e.** Click **Next**. **Result:** The Confirm LUN Settings dialog box appears.
10	In the Confirm LUN Settings dialog box verify the information and click **Commit**. **Result:** The Create LUN Success dialog box appears.
11	In the Create LUN Success dialog box, click **Finish**. The Storage Overview and Primary Storage sections gets refreshed. For example, the iSCSI LUN named *Sales* now appears in the Primary Storage list. Now, the host server is now ready to initialize, partition, and format this new LUN.

Creating a Microsoft Exchange Server LUN

The LUN wizard of the StoreVault Manager enables you to create a LUN for storing the Microsoft Exchange Server database. You can create a Microsoft Exchange Server LUN on a system with Microsoft Exchange Server 2003 and SnapDrive for Windows StoreVault Edition. These LUNs can be managed using either SnapManager for Exchange StoreVault Edition or StoreVault Manager. If SnapManager for Exchange StoreVault Edition is installed on the server, you cannot use StoreVault Manager for managing the Microsoft Exchange Server LUNs. When you create a Microsoft Exchange Server LUN, two different LUNs are created; a database LUN for storing the Exchange database, and a log LUN for storing transactional log files. The combined size of the two LUNs is restricted by the total available storage. For a LUN size of 50 GB or greater, the snapshotting and LUN reserve auto-tuner are enabled. For more information on LUN reserve auto-tuner, see "LUN reserve auto-tuner" on page 229.

Note

After creating Microsoft Exchange Server LUNs by using StoreVault Manager, you can manage the LUNs by using either SnapManager for Exchange StoreVault Edition 4.0 or StoreVault Manager.

To create a Microsoft Exchange Server LUN, complete the following steps.

Step	Action
1	In the task pane, click Primary Storage drop-down list box and select **Create LUN (SAN)**. **OR** In the Primary Storage section of the StoreVault Manager main screen, right-click an existing LUN, and select **Create LUN**. **Result:** The Create LUN Wizard appears.
2	In the Create LUN Wizard, click **Next**. **Result:** The LUN Parameters dialog box appears.

Step	Action
3	In the LUN Parameters dialog box, complete the following. **a.** From the LUN Application Type list, select Microsoft Exchange. The LUN Parameters dialog box displays the available free space in the storage system. **b.** In the LUN Properties (Database LUN) section, type the name of the LUN. **Note** Microsoft Exchange LUN name must be all lowercase. Ensure that there are no blank spaces in the LUN name. *shares* and *exports* are reserved names and cannot be used as LUN names. The following list of characters are not allowed while naming a LUN: - + % * & ( ) $ @ # ! < >/ \ | ; , [ ] { } = . : ^ ~ ‘? The OS type displays Windows as the default operating system. **c.** In the LUN Properties (Log LUN) section, type the log LUN name.

Step	Action
	Note If you do not specify a name for the log LUN, the system uses the database LUN name as log LUN name with the suffix *log*. For example: If the database LUN name is *exchange,* and you do not specify a name for the log LUN, then the log name will be *exchange_log*. **d.** Click **Configure**. The Microsoft Exchange LUN Sizing dialog box appears. **e.** In the Microsoft Exchange LUN Sizing dialog box, specify the number of mailboxes and the mailbox size, or specify the LUN size. **Note** The default number of mailboxes is 128. The default mailbox size is 512 MB. **Note** For a LUN size of 50 GB or greater, the snapshotting and LUN reserve autotuner are enabled for a Microsoft Exchange LUN.

<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td></td><td colspan="2">You can change the number of mailboxes, the mailbox size, the database LUN size, or the Log LUN size.
❖ If you change the number of mailboxes or the mailbox size, the database LUN and Log LUN size is automatically recalculated by the system.
❖ If you change the database LUN size or the Log LUN size, the number of mailboxes and the mailbox size is automatically recalculated by the system.
f. Click OK.
Now, you will return to the LUN parameters dialog box.
The LUN parameters dialog box displays the Database LUN and Log LUN size in GB.
g. Enter the LUN description (optional).
h. Click Next.
Result: The Map Servers to the LUN dialog box appears.</td></tr>
<tr><td></td><td>If...</td><td>Then..</td></tr>
<tr><td></td><td>You want to change the host name</td><td>See, “Changing host names:” on page 153</td></tr>
<tr><td></td><td>You want to manually add host</td><td>See,“Manually adding hosts” on page 154</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>The list on the left displays all existing hosts that are connected to the StoreVault storage system using iSCSI or FCP.

The list on the right displays the host that the LUN will be mapped to after the wizard has created it.

To add an existing host to the list, select a host from the list on the left pane, and click the right arrow to move it to the mapped hosts in the list on the right pane.

Note
Similarly, to remove a mapped group, select the group to remove and click the left arrow.

Click Next.

Result: The Microsoft Exchange LUN Parameters dialog box appears.</td></tr>
<tr><td>5</td><td>The Microsoft Exchange LUN Parameters dialog box has three sections: Mount Point (Database LUN), Mount Point (Long LUN), and Virtual Disk Type. In Microsoft Exchange LUN Parameters dialog box, complete the following steps.

<table><tr><th>If..</th><th>Then..</th></tr><tr><td>You want assign a drive letter</td><td>Follow Step 6</td></tr><tr><td>You want mount on to an empty NTFS folder</td><td>Follow Step 7</td></tr></table></td></tr>
</table>

Step	Action
6	In the Mount Point (Database LUN) section: **a.** Select *Assign the following drive letter.* **b.** Select the drive letter from the corresponding list. In the Mount Point(Log LUN) section: **c.** Select *Assign the following drive letter.* **d.** Select the drive letter from the corresponding list. **e.** In the virtual Disk Type section, select **Dedicated**. **f.** Click **Next**. **Note** You can also mount the LUN onto an empty NTFS folder if drive letters are exhausted. To mount the LUN to an empty NTFS folder, complete the following steps. **Result:** The Confirm LUN Settings dialog box appears.
7	To mount the LUN an empty NTFS folder, complete the following steps. **a.** Select *Mount in the following empty NTFS folder,* and click Browse. The Browse For Folder dialog box appears. **b.** Click **Make New Folder** and name the folder. **c.** Click **OK**. The path appears in the Microsoft Exchange LUN Parameters dialog box. **d.** In the virtual Disk Type section, select **Dedicated**. **e.** Click **Next**. **Note** Repeat step a to step e for mounting Log LUN also. **Result:** The Confirm LUN Settings dialog box appears.

Step	Action
8	In the Confirm LUN Settings dialog box verify the information and click **Commit**. **Result:** The Create LUN Success dialog box appears.
9	In the Create LUN Success dialog box, click **Finish**. The Storage Overview and Primary Storage section gets refreshed. For example, the iSCSI LUN named *Sales* now appears in the Primary Storage list. Now, the host server is now ready to initialize, partition, and format this new LUN.

LUN properties

To manage LUNs that have been created on the StoreVault storage system, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click a LUN and select **Manage LUN**. **Result:** The LUN Properties dialog box appears.
2	There are six tabs in the LUN Properties dialog box.

The following table describes the different tabs in the LUN Properties dialog box.

Tab	Description
"LUN information"	All LUNs are listed, along with state, size, maps, operating system on which the LUNs are running, and description. Adjust the column width of any column to display additional information. Right-click one of the LUNs to access the following options: ◆ Map LUN ◆ Unmap LUN ◆ Resize LUN ◆ Manage Disk
"General tab"	Provides information about the specific LUN selected.
"Snapshot copies"	Provides information about the Snapshot copies schedule, number of Snapshot copies to maintain, and facility to create and restore Snapshot copies manually.
"Initiators"	Provides information about the adapter, initiator names, Information Services ID (ISID), and Portal Group ID
"Initiator groups"	Provides information about the initiator group linked to the LUN selected Right-click any initiator group listed to access the Rename, Add, Delete, or Edit Group.
"Adapters"	Provides information about the interface, status, and any type of the adapters in use.

LUN information

The following table explains the columns of LUN Information tab in the LUN Properties dialog box.

Column Heading	Description
LUN	Displays LUN name
Status	Displays LUN status online/offline
Size	Displays the size of the LUN
Maps	Displays host name to which it is mapped
OS Type	Displays operating system of the LUN
LAT	Displays whether the LUN reserve auto-tuner is enabled or not. Yes/no
Description	Displays extra information about the LUN

You can perform the following functions in the LUN Information tab of the LUN Properties dialog box.

- "Mapping a LUN" on page 169
- "Unmapping a LUN" on page 170
- "Resizing a LUN" on page 171
- "Resizing an Exchange Server LUN" on page 172
- "Managing disks" on page 173

Mapping a LUN

To map a LUN to a host, complete the following steps.

Step	Action
1	In the StoreVault iSCSI/LUN properties dialog box right-click a LUN, and select **Map LUN** on the context menu. **Result:** The Manage LUN Server Map dialog box for that LUN appears.

Step	Action
2	In the Manage LUN Server Map dialog box, select the initiator (that is, host) in the left pane that you want to connect to this LUN and click the right arrow. **Result:** The initiator appears on the right side.
3	Click **OK**. You are taken back to the StoreVault iSCSI/FCP LUN Properties dialog box. The new mapping appears in the LUN Information tab.

Unmapping a LUN

To unmap a LUN, complete the following steps.

Step	Action
1	In the StoreVault iSCSI/LUN properties dialog box, right-click a LUN and select **Unmap LUN** on the context menu. **Result:** The Manage LUN Server Map dialog box for that LUN appears.
2	In the Manage LUN Server Map dialog box, select the initiator (that is, host) in the right pane that you want to disconnect to this LUN and click the left arrow.
3	Click **OK**. You are taken back to the StoreVault iSCSI/FCP LUN Properties dialog box. The LUN is disconnected from the host.

Resizing a LUN

You can resize the LUN based on your requirement.

Note

The LUN created using SnapDrive for Windows can be resized only from the same system on which it was created.

To resize the LUN, complete the following steps.

Step	Action
1	In the StoreVault Manager Primary storage section, right-click on a LUN and select **Resize LUN** on the context menu. **Note** You can also access the Resize LUN dialog box from the LUN Properties dialog box. **Result:** The Resize LUN dialog box appears. It displays total free space of the storage system, the LUN name, existing LUN size, and the maximum LUN size. You cannot change these values.
2	In the Resize LUN dialog box, enter the new LUN size. **Note** The New LUN Size (GB) field displays the existing LUN size as the default value. You can either enter a value in the text field or use the scroll bar to change the value. You can only increase the size of an existing LUN, you cannot reduce the size.
3	Click **OK**. **Result:** You are back to the StoreVault iSCSI/FCP LUN Properties dialog box. The updated LUN size is now displayed in the LUN Information tab. The Primary Storage area also reflects the new value.

Resizing an Exchange Server LUN

To resize an Exchange Server LUN, complete the following steps.

Step	Action
1	In the StoreVault Manager Primary storage section, right-click on any Exchange database or Log LUN and select Resize LUN on the menu. **Note** To change the mailbox size, select an Exchange database LUN while re-sizing. You cannot change the mailbox size while re-sizing an Exchange log LUN. **Note** You can also access the Resize LUN dialog box from the LUN Properties dialog box. **Result:** The Microsoft Exchange LUN Re-sizing dialog box for that LUN appears. In the Resizing dialog box, total free space of the storage system, existing DB LUN size, existing Log LUN size, and the mailbox size are displayed. You cannot change the mailbox size for an Exchange log LUN, you can only change mailbox size from an Exchange database LUN.
2	In the Microsoft Exchange LUN Re-sizing dialog box, enter the new LUN size or change the number of mailboxes.
3	Click **OK**. **Result:** You are back to the StoreVault iSCSI/FCP LUN Properties dialog box. The updated LUN size is now displayed in the LUN Information tab. The Primary Storage area also reflects the new value.

Managing disks

The manage disk feature enables you to initialize the LUN.

To manage disks, complete the following steps.

Step	Action
1	In the StoreVault iSCSI/LUN Properties dialog box, right-click a LUN and select Manage Disk. **Result:** The LUN Properties dialog box for that LUN appears. The amount of allocated and unallocated disk space on the primary storage system appears. You can perform a number of disk management functions. **Note** You can select a local host-mapped LUN and execute the Manage Disk pop-up menu command to open Microsoft's Disk Manager to initialize the LUN.

Deleting a LUN

If a LUN is no longer needed, it can be deleted. When the LUN is removed, all data within the LUN is deleted, and the space reserved for that LUN is released and ready to use.

Attention

Removing a LUN deletes all data in the LUN. Always back up or copy the data before deleting the LUN.

Note

Ensure that the LUN is disconnected from the host server. Use the host server (iSCSI or FCP) application to disconnect from the LUN (iSCSI or FCP) before you delete the LUN from the StoreVault storage system.

Note

The LUN created using SnapDrive for Windows in background can be deleted only from the same system on which it was created.

Step	Action
1	In the StoreVault Manager Primary storage section, right-click on a LUN and select **Delete LUN**. **Result:** The Confirm LUN Deletion confirmation message box appears.
2	In the Confirm LUN Deletion confirmation message box, click **Yes** to delete. The LUN that was selected and deleted is no longer displayed in the list of storage areas.

General tab

This tab provides the following information about the StoreVault primary storage system.

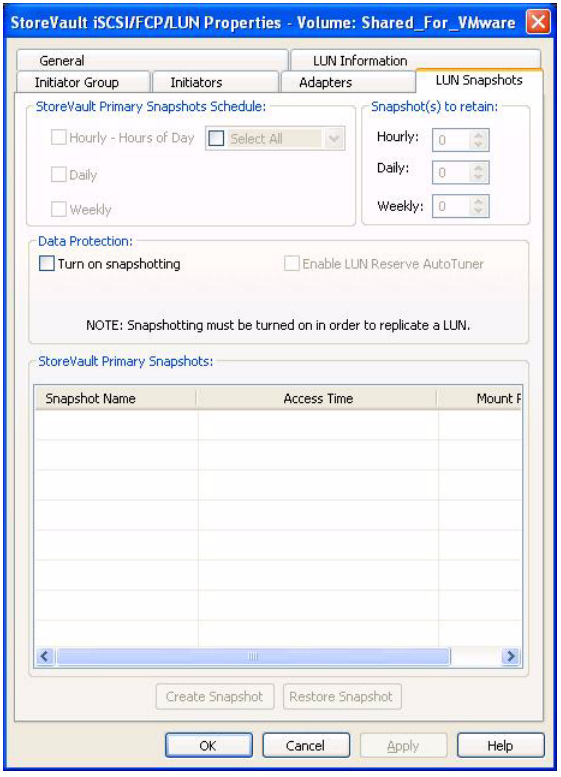
- **Name**—indicates the name of the LUN
- **Type**—indicates whether it is a Windows share, UNIX export, or LUN
- **State**—online (available to a user) or offline (not available to a user).
- **Current Size (GB)**—indicates the total size of the LUN.
- **LUN Size (GB)**—indicates the size of the LUN
- **Snapshot Reserve (GB)**—indicates Snapshot reserve space for the LUN
- **Snapshotting Enabled**—indicates Yes or No
- **Reserve AutoTuner Enabled**—indicates Yes or No
- **LUN Application Type**— indicates the application type of the LUN
- **SDW SVE Created**—indicates whether LUN is created using SnapDrive for Windows StoreVault Edition or not
- **Mount Point**—indicates the drive letter onto which the LUN is mounted

Snapshot copies

The LUN Snapshots tab contains the following settings:

- StoreVault Primary Snapshots Schedule—you can schedule Snapshot copies on an hourly, weekly, and daily basis
- Snapshots to retain—this sets the maximum number of hourly, daily, and weekly Snapshot copies to retain
- Turn on snapshotting
- Enable LUN Reserve Auto Tuner

For more information on Snapshot copies, see“Snapshot Management” on page 225.



Initiators

This displays the initiator name of the clients with the initiator actively connected to the StoreVault storage system. In the case of FCP clients, it displays the WWPN. In the case of iSCSI clients, you must specify the iSCSI node name.

The Initiators tab only displays initiators that are actively connected and provides the following details.

- **Adapter**—name of the adapter
- **Type**—type of protocol (ISCSI or FCP)
- **Initiator Name (iSCSI)/ Node Name (FCP)**—name of the initiator or node
- **ISID (ISCSI)/ Port Name**— Initiator Session ID
- **Portal Group ID (iSCSI)/Port Address (FCP)**—name of the target portal group

Managing security for iSCSI initiators

How iSCSI authentication works

During the initial stage of an iSCSI session, the initiator sends a login request to the storage system to begin an iSCSI session. The storage system permits or denies the login request according to one of the following authentication methods:

- none—The storage system does not require authentication for the initiator.
- deny—The initiator is denied access to the storage system.
- Challenge Handshake Authentication Protocol (CHAP)—The initiator logs in using a CHAP user name and password. You can specify a CHAP password or generate a random password.

There are two types of CHAP user names and passwords:

- Inbound—The storage system authenticates the initiator. Inbound settings are required if you are using CHAP authentication.
- Outbound—This is an optional setting to enable the initiator to authenticate the storage system. You can use outbound settings only if you defined an inbound user name and password on the storage system.

You can define a list of initiators and their authentication methods. If you do not specify a list of initiators and authentication methods, the default method is none - any initiator can access the storage system without authentication.

Guidelines for using CHAP authentication

The following guidelines apply to CHAP authentication:

- If you define an inbound user name and password on the storage system, you must use the same user name and password for outbound CHAP settings on the initiator.
- If you also define an outbound user name and password on the storage system to enable bidirectional authentication, you must use the same user name and password for inbound CHAP settings on the initiator.
- You cannot use the same user name and password for inbound and outbound settings on the storage system.

Ways to manage initiator security with authentication methods

You can manage the security for iSCSI initiators by performing the following tasks:

On StoreVault Manager, complete the following steps.

Step	Action
1	Right-click a LUN on the Primary Storage area and select Manage LUN on the context menu.
2	Select the Initiators tab on the StoreVault iSCSI/FCP/LUN Properties sheet.
3	Right-click any cells inside the initiator list and select Change Security on the context menu.
4	If your initiator is on the iSCSI Initiator Security list, select it. If not, enter the name of your iSCSI initiator in the edit field under the Security for iSCSI Initiator title.
5	Right-click any empty cells inside the initiator list and select Modify on the context menu for an existing initiator, or click Add on the context menu for a new initiator. The iSCSI Initiator Security Wizard appears.
6	Follow the iSCSI Initiator Security Wizard and complete the iSCSI initiator security configuration. **a.** Click **Next** on the Welcome page. **b.** On the iSCSI Initiator Security Settings dialog box, choose one of the following in the Security list: none, deny, or CHAP.

Step	Action
7	When CHAP is selected, the following section appears in this dialog box for you to enter CHAP inbound security parameters. 

Step	Action
8	In the iSCSI Initiator CHAP Outbound security settings, complete the following steps.



a. Enter User name.

b. Enter Password.

c. Retype Password.

d. Click **Next**.

Note

If the "Configure outbound security parameters" dialog box is selected, the Outbound Security Parameters wizard appears. Otherwise, this dialog box is skipped. The iSCSI Initiator CHAP Outbound Security Settings dialog box appears. Enter the user name (once) and password (twice).

Step	Action
9	If everything is OK, commit the iSCSI initiator security settings, click **Commit**. The Modified Initiator Security Successfully dialog box appears with a message that indicates whether the process is successful or not.
10	Click **Finish**.
11	The Security Type column on the iSCSI initiator list gets updated. For example, the security type for initiator iqn.1991-05.com.microsoft:rsu-lxp.hq.netapp.com is changed from "none" to "CHAP" after this successful configuration process.
12	Click **OK**.

On the Microsoft Windows PC host, complete the following steps.

Step	Action
1	Install and set up the iSCSI initiator using Microsoft iSCSI Software Initiator Version 2.02 downloadable from http://www.microsoft.com/downloads/details.aspx?FamilyID=12cb3c1a-15d6-4585-b385-befd1319f825&DisplayLang=en
2	Start the Microsoft iSCSI Software Initiator from the Windows startup menu: **Start > All Programs > Microsoft iSCSI Initiator > Microsoft iSCSI Initiator**.
3	In the Discovery tab, click **Add** for the Target Portals list.
4	The Add Target Portal dialog box appears. Enter the IP or DNS name of the StoreVault storage system, and click **Advanced**.

Step	Action
5	On the Advanced Settings dialog box, complete the following steps. **a.** Select the "CHAP logon information" check box to enable CHAP. **b.** Type the inbound user name and target secret for the target storage system, that is, your StoreVault storage system. **c.** If you want the initiator to validate the outbound user name and password from your StoreVault storage system, select the "Perform mutual authentication" check box. Click **OK** to close this dialog.
6	To add your StoreVault storage system to the Target Portals list, click **OK** on the Add Target Portal dialog box.
7	In the General tab, click **Secret** if you select the "Perform mutual authentication" check box.
8	In CHAP Secret Setup screen, complete the following substeps. **a.** Enter the outbound password from your StoreVault storage system as the inbound secret of the initiator. **b.** Click **OK** to close the CHAP Secret Setup dialog.
9	You are taken to the iSCSI Initiator Properties dialog box. In the Targets tab, your StoreVault storage system appears in the Targets list.
10	The Log On to Target dialog box appears. In the Log On to Target dialog box, click **Advanced**. The Advanced Settings dialog box appears. In the advanced settings dialog box, complete the following substeps. **a.** Enter the same information as in Step 5. **b.** If you want this target to be persistent, select 'Automatically restore this connection when the system boots.' Click **OK** to connect the initiator to your StoreVault storage system.

Step	Action
11	See the Target tab on the iSCSI Initiator Properties dialog box. The status adjacent to your StoreVault is displayed as “Connected”. **Note** The Microsoft iSCSI software initiator does not accept the secret/password in the "0x..." format. The Microsoft iSCSI software initiator requires the secret/password to be at least 12 characters in length.
12	Click **OK** to exit the iSCSI Initiator Properties dialog box.

Initiator groups

About initiator groups

An initiator group (igroup) is a collection of initiators. An igroup is a list of initiators that can provide access to one or more LUNs. When you map a LUN to an igroup, you are granting access to that LUN to all the initiators within that igroup. If an initiator is not a member of an igroup that is mapped to a LUN, that initiator does not have access to the LUN. You can map a LUN to an initiator which is already a member of an igroup.

In the case of iSCSI clients, initiators are identified in an igroup by their node names. In the case of FCP clients, initiators are identified in an igroup by their worldwide port names (WWPNs).

The Initiator Group tab provides the following details.

- **Group**—name of the initiator group. Right-click on the group name to rename, add a group, delete a group or edit a group.
- **Type**—type of protocol (iSCSI or FCP).
- **OS**— UNIX, Linux, Solaris, NetWare, and VMware
- **Initiators**—indicates the name of the initiators.

You can perform the following tasks from the initiator dialog box:

- "Renaming an igroup" on page 186
- "Adding an igroup" on page 187
- "Editing an igroup" on page 188
- "Deleting an igroup" on page 190

Renaming an igroup

To rename an igroup, complete the following steps.

Step	Action
1	In the primary storage area, right-click a LUN in the primary storage section, and select Manage LUN. **Result:** The StoreVault iSCSI/FCP/LUN Properties dialog box appears.
2	In the StoreVault iSCSI/FCP/LUN Properties dialog box, click the **Initiator Group** tab.
3	Under the Initiator Group tab, right-click the igroup to rename, and then select **Rename Group**. **Result:** The Change Host Name dialog box appears.
4	In the Change Host Name, enter a new name and click **OK**. **Result:** You can see the changed name under the Group column of the **StoreVault iSCSI/FCP/LUN Properties** dialog box.
5	In the **StoreVault iSCSI/FCP/LUN Properties** dialog box, click **OK** to close the dialog box.

Adding an igroup

To add an igroup, complete the following steps.

Step	Action
1	In the primary storage area, right-click a LUN in the primary storage section, and select Manage LUN. **Result:** The StoreVault iSCSI/FCP/LUN Properties dialog box appears.
2	In the StoreVault iSCSI/FCP/LUN Properties dialog box, click the **Initiator Group** tab.
3	Under the Initiator Group tab, right-click the igroup to rename and select **Add Group**. **Result:** The Add Initiator Group dialog box appears.
4	In the Add Initiator Group dialog box, complete the following steps. **a.** Enter the name for the initiator group. **b.** Select the type of initiator from the list (that is, iSCSI or FCP.) **c.** Select the operating system of the initiators Windows, Linux, Solaris, or Netware®. **d.** Enter list of initiators names. You can enter multiple initiators separated by a comma, space, or new line in the initiators field of the Add Initiator Group dialog box. **e.** Click **OK**. You can now see the new igroup in the StoreVault iSCSI/FCP/LUN Properties dialog box.
5	In the StoreVault iSCSI/FCP/LUN Properties dialog box, click **OK** to close the dialog box.

Editing an igroup

You can edit an igroup and add or remove a particular initiator from an igroup. You can add only those initiators which are connected to the StoreVault storage system. This enables you to give access privileges to a LUN for a particular igroup.

Note

You can only add iSCSI initiators to an iSCSI igroup and FCP initiators to an FCP igroup, and can add an initiator to an igroup of the same OS type.

Reference ID: An igroup or an initiator is allotted with a reference ID when a LUN is mapped onto it. The reference ID helps you to identify which LUN is mapped with which initiator or igroup. The allocated reference ID of the igroup is applicable to all the initiators of that igroup. You cannot add an initiator to an igroup if the initiator reference ID and the igroup reference ID are the same.

To see the reference ID of an initiator or igroup, open the StoreVault iSCSI/FCP /LUN Properties dialog box, select the LUN information tab, and check under Maps column.

Example: You have two LUNs (LUN-A and LUN-B) and initiators (I1, I2, and I3). Form an igroup IGR with initiators I1 and I2. The following table displays the mapping status.

LUN name	Mapped with igroup/initiator	Reference ID
LUN-A	IGR (I1 and I2)	0
LUN-B	I3	0

However, you cannot add I3 to IGR because both have the same reference ID 0 (zero).

To edit an igroup, complete the following steps.

Step	Action
1	In the primary storage area, right-click a LUN in the primary storage section, and select **Manage LUN**. **Result:** The StoreVault iSCSI/FCP/LUN Properties dialog box appears.
2	In the StoreVault iSCSI/FCP/LUN Properties dialog box, click the **Initiator Group** tab.
3	Under the Initiator Group tab, right-click the igroup to rename and Select **Edit Group**. **Result:** The Edit igroup dialog box appears.
4	In the Edit Initiator Group dialog box, complete the following steps. **a.** To add an initiator, select the initiators from the left pane of the Edit igroup dialog box. **b.** Click **Add**. **c.** Repeat Step a and Step b to add multiple initiators to an igroup. **d.** To remove an initiator, select the initiators from the right pane of the Edit igroup dialog box. **e.** Click **Remove**. Repeat Step d and Step e to remove multiple initiators from an igroup. **f.** Click **Save** after adding or removing the initiators from an igroup. An added, removed successfully and failed to add massage box appears.
5	In the **StoreVault iSCSI/FCP/LUN Properties** dialog box, click **OK** to close the dialog box.

Deleting an igroup

You cannot delete an igroup which is mapped to a LUN. To delete an igroup, you need to un-map the LUN and then delete.

To delete an igroup, complete the following steps.

Step	Action
1	In the primary storage area, right-click a LUN in the primary storage section, and select Manage LUN. **Result:** The StoreVault iSCSI/FCP/LUN Properties dialog box appears.
2	In the StoreVault iSCSI/FCP/LUN Properties dialog box, click the **Initiator Group** tab.
3	Under the Initiator Group tab, right-click the igroup to rename and Select **Delete Group**. **Result:** The selected igroup get deleted.
4	In the **StoreVault iSCSI/FCP/LUN Properties** dialog box, click **OK** to close the dialog box.

Adapters

The Adapters tab provides the following information.

- **Interface**—name of the interface
- **Status**—whether online or link not connected
- **Type**—refers to the type of protocol (that is, iSCSI or FCP)

Quota Management 9

About this chapter

This chapter provides an overview on quotas, discuss about adding quota rule for users and groups, modifying, deleting, and about quota reports.

Topics in this chapter

This chapter discusses the following topics:

- "About quotas" on page 194
- "Creating quota rules" on page 196
- "Adding a quota" on page 198
- "Modifying a quota" on page 200
- "Deleting a quota" on page 201
- "Quota report" on page 202
- "Enabling or disabling a quota" on page 204
- "Quota notification" on page 206

About quotas

What a quota is

A quota is a set of rules. A quota limits the disk space or number of files, or both that can be used by a user or group. The StoreVault Manager enables you to set and manage quota for a user in Windows and UNIX environments. In UNIX environments, you can set quotas only for groups.

Note

If a user name is the same for Windows and UNIX environments, you can set a single quota for that user.

Use quota for the following:

- To limit the amount of disk space or the number of files that can be used by a user or group
- To track the amount of disk space or the number of files that can be used by a quota target, without imposing a limit
- To notify users when disk space or file usage file usage is high

Quota target

A quota target can be any one of the following:

- A user, as represented by a UNIX ID or a Windows ID.
- A group, as represented by a UNIX group name or group ID (GID).

The quota target determines the quota type, as shown in the following table.

Quota target	Quota type
User	user quota
Group	group quota

Quota limits

Hard limit: A hard limit is a quota limit that cannot be exceeded.

Soft limit: A soft limit is a quota limit that can be exceeded. For example, the registered e-mail ID receives an alert if the user or group exceeds their soft quota limit.

Note

You can specify hard and soft limits for users and groups on disk space and number files.

Quota types

Explicit quota: If the quota specification references the name or ID of the quota target, the quota is an explicit quota.

Default quota: You can restrict or rack the disk space usage by a quota target even without specifying explicit quota.

Derived quota: If a quota is applied to a target that does not have an explicit quota, it is called a derived quota.

Tracking quota: A tracking quota tracks the resources that are used by a particular user or group, but does not limit the disk space or number of files. You can use a quota report to view the resources that are used by a user or group. For more information, see "Quota report" on page 202.

Quota for mapped users

The cross-protocol feature enables a Windows user to access UNIX data and a UNIX user to access Windows data. A default mapping exists if both the Windows user name and UNIX user name are same. When a quota rule is set for a UNIX user and the user is mapped with the same user name in the Windows environment, then this quota rule is also applied to the Windows user when trying to access the UNIX data. Similarly, if a quota rule is set for a Windows user and the user is mapped with the same user name in the UNIX environment, then this quota rule is also applied to the UNIX user when trying to access the Windows data.

For Example: A UNIX user (User1) is mapped with a Windows user (domain\User1) and a quota rule is set for User1 with a quota limit of 10 files. User1 writes five files. Now, domain\User1 accessing the UNIX Exports, can create 5 files only, as this quota rule for User 1is also applies to the Windows SMB\User1.

Creating quota rules

You can access the quotas dialog box either from StoreVault Windows Shares Properties window or StoreVault Export Properties window. From quotas dialog box you can manage quotas for users and groups. You can add, modify, delete a quota, and view a quota report from quotas dialog box.

StoreVault Manager enables you to set quotas for users and groups. You can create a quota rule for a single user based on the user name or user ID. Similarly, you can create and apply a quota rule for group based on group name or group ID. The quota rule that is created first is applied and appears in the quota report even though a second rule is created later. However, if you want to apply the second quota rule, delete the first quota rule.

Note

You cannot set a quota for a LUN.

You can perform the following functions from the quotas dialog box.

- "Adding a quota" on page 198
- "Modifying a quota" on page 200
- "Deleting a quota" on page 201
- "Quota report" on page 202

The following table provides description of the fields in the quotas dialog box.

Field	Description
Target	Displays the target quota name. A ‘‘*’’ is displayed for a default quota.
Type	Displays whether the target type is a user or group.
Area	Displays whether the area type is a Windows Share or UNIX Export.
Disk	Displays the disk space limit of a user or group.
Files	Displays the files limit of a user or group.
Soft Disk	Displays the soft disk limit of a user or group.
Soft Files	Displays the soft files limit of a user or group.
Status	Displays the quota status as ON or OFF.

Adding a quota

To add a quota, complete the following steps.

Step	Action
1	In the StoreVault Manager screen, right-click the Windows Shares or UNIX Exports of the primary storage area and select **Manage Quotas**. **Result:** As per the selection made, the Quotas dialog box appears in the Windows Shares Properties or UNIX Exports Properties window.
2	In the quotas dialog box, right-click and select Add on the context menu of the Manage Quotas dialog box. **Result:** The Add Quota Rule dialog box appears.
3	In the Add Quota Rule dialog, complete the following steps. **a.** Click **User** or **Group** in the Select Quota Target section. **Note** To set *Default Quota*, select the default quota check box. If you select the Default Quota check box, the User or Group text box is disabled. For more information, see "Default quota" on page 195 **Note** While adding a quota rule, if you explicitly select a UNIX area for a Windows user or a Windows area for a UNIX user in the Add Quota Rule dialog box, then the quota rule is not applied. However, the quota report displays the files used as zero for that user. **b.** Type the user name or group name in the User or Group name text field.

Step	Action
	Note You can apply a common quota rule for multiple users. To apply a common quota rule, separate multiple user names with a comma in the text field. Specify a domain name for Windows users. You cannot specify multiple groups. **c.** Select a quota area from the list. A quota area can be a Windows Shares or UNIX Exports. **Note** You need to select a quota area as Windows Shares for Windows user and UNIX Exports for a UNIX user. **d.** Enter soft and hard disk space limit. **e.** Type soft and hard files limit. **Note** The file limit cannot be more than three GB for both soft and hard limits. The disk space limit cannot be more than 4095 GB for both soft and hard limits.
4	Click **OK** to apply quota. **Result:** The Manage Quotas dialog box displays the new quota rule. **Note** You can create a tracking quota if the limit fields in the Add Quota dialog box are not specified. For information, see “Tracking quota” on page 195

Modifying a quota

You can modify quota limit fields in the Modify Quota dialog box.

To modify a quota, complete the following steps.

Step	Action
1	In the StoreVault Manager screen, right-click the Windows Shares or UNIX Exports of the primary storage area and select **Manage Quotas**. **Result:** As per the selection made, the Quotas dialog box appears in the Windows Shares Properties or UNIX Exports Properties window.
2	In the quotas dialog box, right-click and select **Modify** on the context menu of the Manage Quotas dialog box. **Result:** The Modify Quota Rule dialog box appears.
3	In the Modify Quota Rule dialog, complete the following steps. **a.** Modify soft and hard disk space limit. **b.** Modify soft and hard files limit.
4	Click **OK** to apply the quota. **Result:** The Manage Quotas dialog box displays the new quota rule.

Deleting a quota

You can delete a quota rule if it is not required.

To delete a quota, complete the following steps.

Step	Action
1	In the StoreVault Manager screen, right-click the Windows Shares or UNIX Exports of the primary storage area and select **Manage Quotas**. **Result:** As per the selection made, the Quotas dialog box appears in the Windows Shares Properties or UNIX Exports Properties window.
2	In the quotas dialog box, right-click and select **Delete** on the context menu of the Manage Quotas dialog box. **Result:** The Confirm Deletion message box appears.
3	In the message box, click **Yes** to confirm deletion.

Quota report

A quota report helps you to monitor the quota utilization by users and groups.

To view a quota report, complete the following steps.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>In the StoreVault Manager screen, right-click the Windows Shares or UNIX Exports of the primary storage area and select Manage Quotas.

Result: As per the selection made, the Quotas dialog box appears in the Windows Shares Properties or UNIX Exports Properties window.</td></tr>
<tr><td>2</td><td>In the quotas dialog box, right-click and select Quota Report on the context menu of the Manage Quotas dialog box.

Result:The Quota Report dialog box appears.

The Quota Report dialog box displays an icon beside a user or group. The icon color changes according to the user or group status:
<table>
<tr><th>Icon color</th><th>Status</th></tr>
<tr><td>Green</td><td>OK</td></tr>
<tr><td>Red</td><td>Hard limit is reached.</td></tr>
<tr><td>Yellow</td><td>Soft limit is exceeded.</td></tr>
</table></td></tr>
<tr><td></td><td>Note
Quota report dialog box displays status of the quota on the left bottom corner. To see the description, select the quota type of the Quota Report dialog box.</td></tr>
</table>

The following table provides description of the fields in the Quota Report dialog box.

Field	Description
Type	Displays the quota target, which is, a user, or group
Name	Displays the user or the group name
Area	Displays whether it is a Windows Shares or UNIX Exports
Space Used	Displays the amount of disk space that is used by a user or group
Space Soft	Displays the set limit of disk space for the user or group
Space Hard	Displays the set limit of disk space for the user or group
Files Used	Displays the amount of disk space that is used by the user or group
Files Soft	Displays the set limit of disk space for the user or group
Files Hard	Displays the set limit of disk space for the user or group
Status	Displays the quota status as OK, Reached, or Exceeded

Enabling or disabling a quota

You can enable or disable a quota for Windows Shares and UNIX Exports.

- To enable the quota, set the quota status **ON**.
- If a quota status is **OFF,** then the quota is disabled for that particular area.

To change the quota status of the Windows Shares, complete the following steps.

Step	Action
1	In the Primary storage area, right-click the Windows Shares and select **Shares Quota ON/OFF**. **Result:** A confirmation message box appears displaying the status.
	If the present status of the Shares Area is ON and you want to change it to OFF, then the following confirmation dialog box appears. 
	If the present status of the Shares Area is OFF and you want to change it to ON, then the following confirmation dialog box appears. 
2	In the message box, click **Yes**.

To change a quota status of the UNIX Exports, complete the following steps.

Step	Action
1	In the Primary storage area, right-click the UNIX Exports and select **Exports Quota ON/OFF**. Result: A confirmation message box appears displaying the status.
	If the present status of the Exports Area is ON and you want to change it to OFF, then the following confirmation dialog box appears. 
	If the present status of Exports Area is OFF and you want to change it to ON, then the following confirmation dialog box appears. 
2	In the message box, click **Yes**.

Quota notification

The registered e-mail ID receives alerts when a user exceeds the quota limit and a warning message is logged on the storage system. The quota type is marked with an appropriate color in the quota report.

To use this feature, complete the following steps.

Step	Action
1	Click the System menu and select Administrative. **Result:** The StoreVault Administrative Settings dialog box appears.
2	In the Administrative Settings dialog box, complete the following steps. **a.** Type the SMTP server name or IP address. **b.** Type an e-mail address in the administrative E-mail alerts section.
3	Click **OK**. **Note** You can disable the e-mail alert support by selecting the Disable Alerts check box.

Disk Management 10

About this chapter

This chapter guides you on adding and removing the disk drives from the StoreVault storage system using StoreVault Manager.

Topics in this chapter

This chapter discusses the following topics:

- "Managing disk drives" on page 208
- "Adding a disk" on page 209
- "Removing a disk" on page 211

Managing disk drives

Disk management procedures include the following:

- Calculating the capacity of overall system
- Monitoring the available space on the system
- Checking the storage status
- Checking for new Shares and Exports that need to be created
- Verifying that the last backup was successful
- Checking the schedule for the next backup

A graphical presentation of the StoreVault shows each disk, its status and its name. When you place the cursor over a disk, the status information appears.

Status information	Description
Disk	Used to identify the disk type. Possible values are Primary and Spare.
Disk State	Shows the status of the disk. Possible values are Rebuilding, Failure, Online, and Is Zeroed.
Serial Number	Manufacturer serial number, used to identify the disk.
Usable Space	Total writable space available on disk.

Ways to access the Add/Remove Disk wizard

You can access the Add Disk wizard using any of the following ways.

- Using Task pane
- Main menu

Adding a disk

This wizard enables you to add a disk from the set of spares to the primary storage disks and increase the storage capacity.

Any spares to be added through this wizard must first be physically inserted into the StoreVault device before running this wizard. For the procedure for installing a new disk, see the *StoreVault Hardware Guide*.

To add a spare disk drive, complete the following steps.

Step	Action
1	From task pane's primary storage section, click **Add Disk**. **OR** From the Disk menu, select **Add Disk**. **Result:** The Add Disk Wizard appears.
2	In the Add Disk Wizard, click **Next**. **Note** You should always maintain at least one spare drive on the StoreVault storage system at all times. **Result:** Select Disk(s) to Add dialog box appears.
3	In the Select Disk(s) to Add dialog box, click the drop-down and select **Add disk to primary storage and increase primary capacity** from the list.
4	Click **Next**. **Result:** The Confirm Disks to be Added dialog box appears.
5	In the Confirm Disks to be Added, Verify the summary of disks and click **Apply**. **Result:** The Confirmation dialog box appears.

Step	Action
6	In the Confirmation dialog box, check the results and click **Finish**. **Result:** The total available space increases in the StoreVault system. **Note** Verify that the available space for storage has increased.

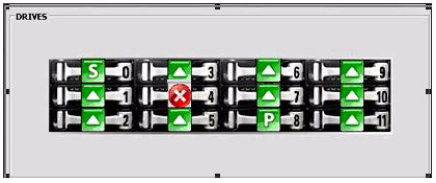
Removing a disk

This wizard removes disks from the pool of spare disks.

Note

This wizard should be run prior to physically removing any spare disks from the StoreVault storage system.

Step	Action
1	From task pane's primary storage section, click **Remove Disk**. **OR** From the Disk menu, select **Remove Disk**. **Result:** The Remove Disk Wizard appears.
2	In the Remove Disk Wizard, click **Next**. **Result:** The Select Disks to Remove dialog box appears.
3	In the Select Disks to Remove dialog box, select the disk to remove and click **Next**. **Result:** The Confirm Disks to be Removed dialog box appears.
4	In the Confirmation dialog box, check the results and click **Apply**. **Result:** The Confirmation dialog box appears.
5	In the confirmation dialog box, click **Finish**.



Note

Note that disk 4 has a red X symbol and is now ready to be removed.

Tape Drive Management 11

About this chapter

This chapter guides you on usage of tape drive with StoreVault storage system and discuss about tape back up and recovery process using StoreVault Manager.

Topics in this chapter

This chapter discusses the following topics:

- "Backing up to tape" on page 214
- "Restoring from tape" on page 219
- "Managing SCSI adapters" on page 221
- "Rewinding tape" on page 223
- "Erasing tape" on page 224

Backing up to tape

StoreVault supports a locally attached tape drive on the optional 68-pin LVD SCSI port. StoreVault Manager includes some basic backup and restore commands that allow rudimentary backup and restore activities. More sophisticated backup software can control a tape device attached to the StoreVault unit using the Network Data Management Protocol (NDMP). Contact your reseller for more information.

The Dump to Tape option lets you back up data from any of the drives to the tape backup system.

Note
You need to enable NDMP service for NDMP enabled tape backup devices.

To enable or disable NDMP service, complete the following steps:

From the System menu, select **Advanced > services and select NDMP** check box in the services dialog box.

For information on NDMP, see "NDMP" on page 114

For information on tape configuration file see, "Uploading a tape configuration file" on page 104

Note
For a current list of qualified tape backup systems, visit http://now.netapp.com/.

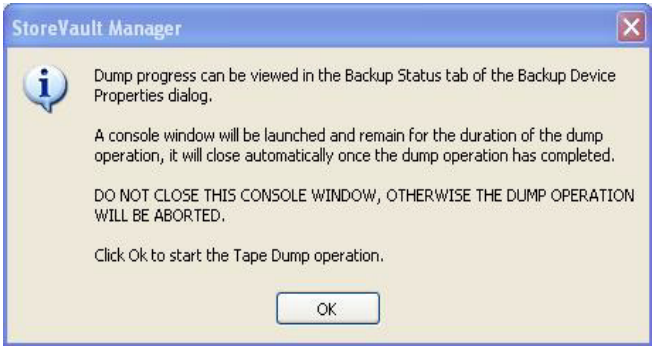
Ways to access Tape menu options

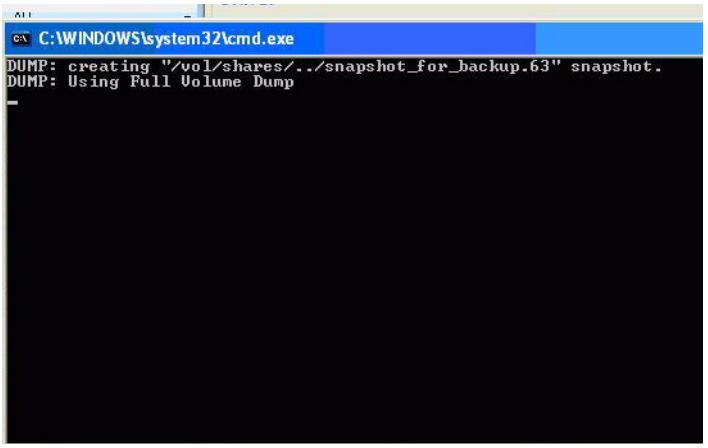
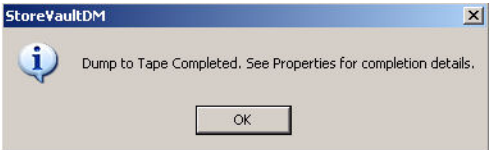
You can access Tape menu using any of the following ways.

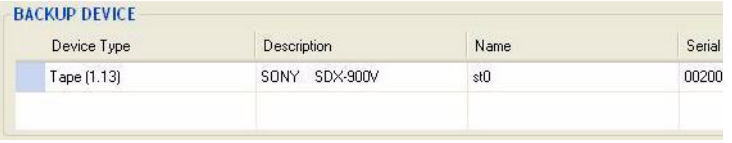
- Using Task pane
- Menu option

To start the back up process onto the tape drive, complete the following steps.

Step	Action
1	In the task pane, click Tape drop down list box and select **Backup to Tape**. **OR** Click the Tape menu, select **Backup to Tape**. **Result:** The Tape Dump wizard appears.
2	In the Tape Dump Wizard, click **Next**. **Result:** The Select Primary Storage to Dump screen appears.
3	In the Select Primary Storage to Dump screen, select the primary storage area to be saved to tape from the drop-down list. ❖ To dump the full Shares or Exports, click **Next**. The Confirm Primary Storage for Dump to Tape appears. ❖ To dump a specific share or export, click **Add** and enter the share name (depending on whether Shares or Exports is selected in the list, the add dialog's edit box will be prefixed with either "shares/" or "exports/"). ❖ For LUNs, select the LUN from the list. The complete LUN will be dumped because you cannot choose to dump specific directories on the LUN. ❖ To start back up process from the existing position of the tape clear the **Position Tape at End of Data before Dump** check box. ❖ To rewind after completing dump process select **Rewind Tape after Dump**. **Note** Snapshotting must be turned on for the LUN to be dumped, otherwise the dump will fail.
4	Click **Next**. **Result:** The Confirming Primary Storage for Dump to Tape dialog box appears.

Step	Action
5	In the Confirming Primary Storage for Dump to Tape dialog box appears, click **Finish**.
6	The following message appears.  Click **OK**.

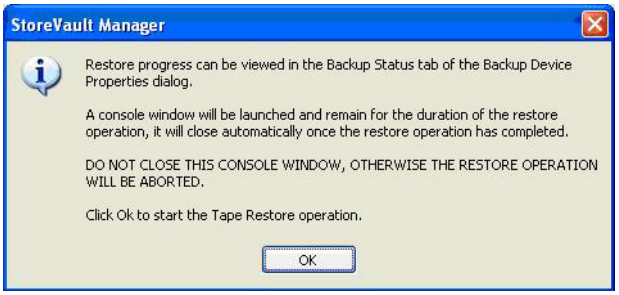
Step	Action
7	The Back up/Restore status column of the Backup Device table displays "Back up in progress". **Attention** A console window appears - do not close this window else the backup will be aborted.  **Note** Before actually performing a backup, StoreVault Manager automatically positions the tape at the end of data, so that no existing data on the tape is overwritten.
8	The backup progress is displayed on the Backup/Restore status tab of the StoreVault Tape Properties dialog box. Click **OK**.
9	The **Backup/Restore Status** in the Backup Device area displays the following message. 

Step	Action
10	After completing, an information box indicates that the tape backup was successful. Click **OK**. The **Back up/Restore Status** indicates **Dump Completed**. 

Restoring from tape

To restore data from a tape drive, complete the following steps.

Step	Action
1	In the task pane, click Tape drop down list box and select **Restore from Tape**. OR Click the Tape menu, select **Restore from Tape**. **Result:** The Tape Restore wizard appears.
2	In the Tape Restore Wizard, click **Next**. **Result:** The Tape Restore Catalog dialog box appears.
3	In the Tape Restore Catalog dialog box, select the primary storage area to be restored.
4	Click **Next**. **Result:** The Select Tape Restore Destination dialog box appears.
5	In the Select Tape Restore Destination, complete the following steps. Select any one of the options: ❖ Restore to the original path ❖ Restore to a new location **Note** The restored LUN only maps to an igroup if the user selects an igroup to map to from the list box. **Attention** Restoring to the original path overwrites any data currently existing in the original location.
6	Click **Next**. **Result:** The Confirm Storage to Restore from Tape dialog box appears.

Step	Action
7	In the Confirm Storage to Restore from Tape dialog box, verify the information and click **Finish**. **Result:** The following message is displayed. 
8	In the message box, click **OK**. **Note** You can also view the restore progress from the Backup/Restore status tab of the Tape Properties dialog box. The **Back up/Restore Status** in the Backup Device area indicates **Restore in Progress**. When completed, an information box indicates that the tape restore was successful.
9	In the message box, click **OK**.

Managing SCSI adapters

Qualified SCSI tape drives are not plug and play for StoreVault. Only Fibre Channel drives are. To connect or disconnect a tape drive, use the following menu options:

- "Disabling SCSI adapters"
- "Enabling SCSI adapters"

1. Disable the SCSI Adapter to plug or unplug the tape drive unit.
2. Enable the SCSI Adapter when the task is completed.

Disabling SCSI adapters

Use the Enable and Disable SCSI Adapter options to physically attach a SCSI tape drive to or remove it from the StoreVault storage system.

To disable the SCSI adapter, complete the following steps.

Step	Action
1	In the task pane, click Tape drop down list box and select **Disable SCSI Adapter**. OR Click the Tape menu, select **Disable SCSI Adapter**. **Result:** A confirmation message box appears.
2	In the confirmation message box, click **Yes**. **Result:** An information dialog box appears, indicating that the SCSI adapter was successfully disabled.
3	Click **OK**.

Enabling SCSI adapters

To enable the SCSI adapter, complete the following steps.

Step	Action
1	In the task pane, click Tape drop down list box and select **Enable SCSI Adapter.** or Click the tape menu, select **Enable SCSI Adapter**. **Result:** A confirmation message box appears.
2	In the confirmation message box, click **Yes**. **Result:** An information dialog box appears, indicating that the SCSI adapter was successfully enabled.
3	Click **OK**.

Rewinding tape

If you selected the **Rewind Tape after Backup** check box when you requested a backup to tape, the tape rewinds automatically when the backup to tape is completed.

To rewind the tape manually, complete the following steps.

Step	Action
1	In the task pane, click Tape drop down list box and select **Rewind Tape**. OR Click the Tape menu, select **Rewind Tape**. **Result:** A confirmation message box appears.
2	In the confirmation message box, click **Yes**. **Result:** After the tape is rewound, a confirmation dialog box appears.
3	Click **OK**.

Erasing tape

To erase the tape, complete the following steps.

Attention
This erases all data on the tape. This action cannot be undone.

Step	Action
1	In the task pane, click Tape drop down list box and select **Erase Tape**. OR Click the Tape menu, select **Erase Tape**. **Attention** This erases all data on the tape. This action cannot be undone. **Result:** A confirmation message box appears.
2	In the message box, click **Yes** to erase tape. **Result:** A completion message box appears.
3	In the message box, click **OK**.

Snapshot Management 12

About this chapter

This chapter discusses about StoreVault Snapshot technology.

Topics in this chapter

This chapter discusses the following topics:

- "What a Snapshot copy is" on page 226
- "Windows shares and UNIX Exports Snapshot" on page 228
- "LUN Snapshot copy" on page 229
- "Administering Snapshot copies for Shares/Exports and LUNs" on page 231

What a Snapshot copy is

About Snapshot copies

A Snapshot copy is a locally retained point-in-time image of the data, which is taken instantly with no impact on system performance and with very little impact on storage capacity. A Snapshot copy is a read-only image of the file system frozen in time, which cannot be changed or deleted. Snapshot copies can be browsed in a directory structure that looks just like the original. In fact, the only difference is that the a Snapshot copy can be recovered instantaneously to revert to that point in time for an individual file, a folder, a directory, or even for the entire file system. A Snapshot copy on the StoreVault storage system is a point-in-time image of the set of files and directories in the Windows Shares, UNIX Exports, and LUNs as they were at a specific time. After a Snapshot copy is taken, changes to the data are made to the original files and the Snapshot copies remain unchanged.

The creation of Snapshot copies can be set up on an hourly, daily, or weekly schedule. The administrator can determine how many of the Snapshot copies are taken, how many are retained, and the period of time these images are retained.

Note

A Snapshot copy takes up very little space and can be taken at any time. The Snapshot consists of a set of additional pointers to the data. A total of 255 Snapshot copies can be taken for the Windows Shares and UNIX Exports.

When Snapshot copies are created

The StoreVault Manager automatically takes Snapshot copies as per the schedule. Snapshot copies can also be created and deleted manually using StoreVault Manager.

Advantages of Snapshot copies

Snapshot copies enable system administrators to perform the following tasks:

- Create instantaneous backups for the Windows Shares, UNIX Exports, and LUNs
- Recover older versions or sets of files that were accidentally changed or deleted
- Restore their own files without needing a system administrator to restore files from tape

Accessing the Snapshot dialog box

To access the Snapshot dialog box:

- For Shares, right-click Windows Shares in the Primary Storage area.
- For Exports, right-click UNIX Exports in the Primary Storage area.
- For LUNs, right-click the specific LUN in the Primary Storage area.

Windows shares and UNIX Exports Snapshot

The StoreVault Manager enables you to schedule automatic Snapshot copies and also allows to taking manual Snapshot copies. The Snapshot copies taken for Windows Shares reside within the *Snapshot* folder of the default Shares folder, and the Snapshot copies taken for UNIX Exports reside within the *Snapshot* folder of the default Export directory.

Windows Shares and UNIX Exports Snapshot dialog box

The Windows Shares and UNIX Exports Snapshots dialog box has the following sections.

- StoreVault Primary Snapshots Schedule
- Snapshots to retain
- Snapshot Space reservation
- StoreVault Primary Snapshot copies

StoreVault Primary Snapshots Schedule: From the StoreVault Primary Snapshots Schedule section you can schedule hourly, daily, and/or weekly automatic Snapshot copies.

Snapshots to retain: From the Snapshots to retain section you can retain Snapshot copies as per your requirement.

Snapshot space reservation: The Snapshots tab for Shares and Exports includes a slider control to adjust the space reserved for Snapshot copies.

You can move the slider to increase or decrease reserve space for Snapshot copies.

You can increase the Snapshot space reservation if you need to retain more number of Snapshot copies.

StoreVault Primary Snapshots: The StoreVault Primary Snapshots section displays the name, access time, and mounts point of a Snapshot copy. From this section you can create, restore, or delete a Snapshot copy.

LUN Snapshot copy

A LUN Snapshot copy is a point-in-time image of a particular LUN. You can schedule automatic Snapshot copies or you can take a manual Snapshot copy of any LUN in the StoreVault storage system. You can enable Snapshotting while creating a LUN and schedule automatic Snapshot copies from the LUN Snapshot dialog box. The LUN Snapshot dialog box also enables to take manual Snapshot copies.

You can perform the following functions from the Snapshot dialog box.

- Set up automatic Snapshot schedule
- Enable/disable snapshotting
- Mount/unmount LUN Snapshots for the LUNs created using SnapDrive for Windows StoreVault Edition
- Restore Snapshot copies
- Delete Snapshot copies
- Enable/disable LUN reserve auto-tuner

The LUN Snapshot dialog box as data protection section to enable/ disable Snapshotting and LUN reserve auto-tuner, all other sections are same as of the Shares and Exports.

Data Protection section

In the Data Protection section of the LUN Snapshot dialog box, you can enable/disable the Snapshots and LUN Reserve auto-tuner.

- You cannot enable LUN reserve auto-tuner from the LUN Snapshots dialog box, if Snapshotting is enabled while creating a LUN.
- You can enable Snapshotting and LUN reserve auto-tuner form LUN Snapshots dialog box, if the Snapshotting and LUN reserve auto-tuner is not enabled while creating a LUN.

LUN reserve auto-tuner

The StoreVault Manager LUN reserve auto-tuner feature reserves a guaranteed amount of space for Snapshot copies. You need to enable the LUN reserve auto-tuner while creating a LUN. In this feature, a default amount of space is allocated by the system for Snapshot copies. As the data is written onto the LUN and Snapshot copies are taken the system allocates extra space for Snapshot copies as

per the requirement. The system reclaims the reserved space when the Snapshot copies are deleted, and the reclaimed space is added to global free space of the system.

How the LUN reserve auto-tuner works: When you create a LUN with Snapshotting on, and enable LUN reserve auto-tuner, the system allocates 20% of the LUN size as Snapshot reserve. This space is free before Snapshot copies are taken. When the data is written on the LUN and Snapshotting is scheduled for the LUN, and then the reserved space is used. The system observes the space utilization by the Snapshot copies, and starts allocating extra space automatically. When the reserve space reaches 130% of the LUN size, then the system starts deleting the oldest Snapshot copy. The reserve space for Snapshot copies can expand up to 140% of the LUN size. Once the Snapshot reserve reaches 140% of the LUN size, the scheduled Snapshotting will be disabled and an alert is sent to the administrator.

Note

You can enable LUN reserve auto-tuner for a LUN size of 50 GB or greater and you need to enable Snapshotting before enabling LUN reserve auto-tuner. If LUN reserve auto-tuner is not enabled while creating the LUN, an additional static Snapshot copy penalty of 100% is added to the 50% Snapshot reserve.

Reclaiming Snapshot copies reserve space: When the LUN Snapshot copies are deleted manually, or deleted by the system faster than it was used, then the system starts reclaiming the freed space. The process of reclaiming free space is performed every hour. This process stops once the Snapshot reserve space reaches the minimum limit of 20% of the LUN size. See “Automatic space tuner for a replicated LUN” on page 246 for a replicated LUNs.

Administering Snapshot copies for Shares/Exports and LUNs

This section gives information on the following functions.

- "Scheduling automated Snapshot" on page 232
- "Creating a manual Snapshot copy" on page 235
- "Restoring a Snapshot copy" on page 236
- "Deleting a Snapshot copy" on page 237
- "Unmounting a LUN Snapshot copy" on page 239

Note

The above mentioned procedures are same for Windows Shares, UNIX Exports, and LUNs.

Complete the following step to access the Snapshot dialog box and perform different functions.

In the Primary Storage area of the StoreVault Manager main screen, right-click Windows Shares or UNIX Exports, or LUN and select **Manage Snapshots**.

Result: The Snapshots dialog box appears.

Note

The Snapshot dialog box with six tabs is displayed only in case of LUNs. For Windows Shares and UNIX Exports, only four tabs are displayed (that is, General, Shares or Exports, Quotas, and Snapshots).

In the Snapshot dialog box you can perform the following functions.

- "Scheduling automated Snapshot"
- "Retaining Snapshot copies"

Note

The above mentioned procedures are same for Windows Shares, UNIX Exports, and LUNs.

Scheduling automated Snapshot

In this area of the Snapshot dialog box, you set the schedule for Snapshot copies.



You can specify the time for taking Snapshot copies or you can select 'Select All' check box for taking hourly Snapshot copies. As per the earlier screenshot, a Snapshot copy will be taken starting at 12:00 a.m. and at 2:00 a.m.

Note

For the Snapshot copy scheduled at 12:00 p.m., this Snapshot copy is actually taken at 12:01 a.m. the following day.

Note

You cannot schedule automated Snapshot copies for the LUNs created using SnapDrive for Windows StoreVault Edition in the background. You can only take manual Snapshot copies.

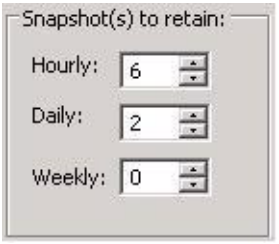
The names of the Snapshot copies will be hourly.0, hourly.1, hourly.2, and so forth, with the most recent Snapshot copy named hourly.0.

These names will appear in the StoreVault Primary Snapshot list.

Retaining Snapshot copies

In this area of the Snapshot dialog box, set the number of Snapshot copies to be retained by the StoreVault storage system.

If you do not want weekly Snapshot copies to be taken, enter 0 (zero) in the Snapshot (s) to retain section.



Hourly

This field indicates how many hourly Snapshot copies are retained on a first in - first out (FIFO) basis. Hourly Snapshot copies are taken based on the time setting on the Primary Snapshot schedule clock.

For example, a number 6 here means that six hourly Snapshot copies are retained. When the seventh hourly Snapshot copy is taken, the oldest hourly Snapshot copies are automatically deleted.

The following table lists the Snapshot copies that will be taken, when they will be taken, and what they will be named.

Daily

This field indicates how many daily Snapshot copies are retained on a FIFO basis. Snapshot copies are taken at 12:01 a.m. daily except on the day a weekly Snapshot is taken.

For example, a number 2 here means that two daily Snapshot copies are retained. When the third daily Snapshot copy is taken, the oldest daily Snapshot expires and is automatically deleted.

Weekly

This field indicates how many total weekly Snapshot copies are retained on a FIFO basis. Weekly Snapshot copies are taken on Monday at 12:01 a.m.

For example, a number 3 here means that three weekly Snapshot copies are retained. When the fourth weekly Snapshot copy is taken, the oldest weekly Snapshot expires and is automatically deleted.

Type of Snapshot	When taken	Name of Snapshot
Weekly	Monday, 00:00:01	weekly.0
Daily	Sunday, 00:00:01	nightly.0
	Saturday, 00:00:01	nightly.1
Hourly	Monday, 12:00:01	hourly.0
	Monday, 08:00:01	hourly.1
	Sunday, 20:00:01	hourly.2
	Sunday, 16:00:01	hourly.3

Type of Snapshot	When taken	Name of Snapshot
	Sunday, 12:00:01	hourly.4
	Sunday, 08:00:01	hourly.5

The StoreVault internal clock uses a 24-hour clock (military time). Therefore, a Snapshot with a time of 16:00 means that this Snapshot was taken at 4:00 p.m.

Naming Snapshot copies

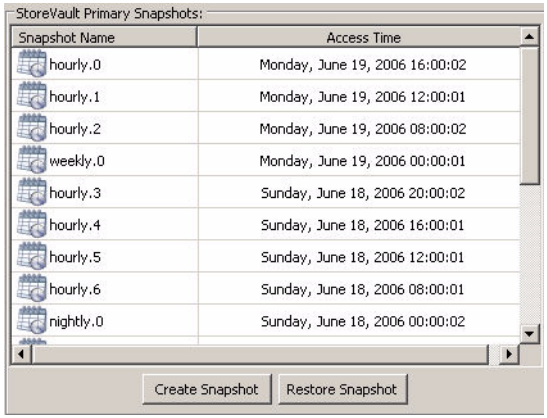
The most recent Snapshot copy has the file extension 0 and the next most recent has the file extension 1, as shown in the following screenshot.

The screenshot shows an example of the nightly Snapshot copies. In the daily Snapshot, the Friday night/Saturday Snapshot copy was taken on May 6 at 00:00:01 (named nightly.1), and the Snapshot taken on Saturday night/Sunday at 00:00:01 (named nightly.0) is the most recent nightly Snapshot copy in the list.

When the next daily scheduled Snapshot copy is taken it is named nightly.0 and the Snapshot copy previously named nightly.0 is renamed nightly.1.

Therefore, the most recent nightly Snapshot copy will always be named nightly.0.

The following dialog box shows the Snapshot copy names and the times that they were taken.



The weekly, daily, and hourly Snapshot copies are taken based on the numbers that you enter for each type of Snapshot copy. StoreVault takes the Snapshot copies automatically based on the schedule that has been assigned.

Creating a manual Snapshot copy

You can also create a manual or unscheduled Snapshot copy, for example, when starting or finishing a big project or prior to cleaning up data files. The manually created Snapshot copy is an addition to the scheduled Snapshot copy.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click Windows Shares or UNIX Exports or LUN and select **Manage Snapshots**. **Result:** Relevant Snapshot dialog box appears.
2	In the *StoreVault Primary Snapshots* section of the Snapshot dialog box, right-click and select **Create Snapshot**. **Result:** The StoreVault Create Snapshot box appears.
3	In the StoreVault Create Snapshot box, enter a name for the Snapshot and click **OK**. **Result:** A confirmation message appears.
4	In the confirmation message screen, click **OK**. **Note** A manually created Snapshot stays on the StoreVault storage system until it is manually deleted by you.

Restoring a Snapshot copy

If your data is corrupted or deleted accidentally, you can restore the data by restoring the Snapshot copies.

Attention

Any changes made after the Snapshot copy was taken will be lost.

Note

Do not restore data to vol0 when using a third-party backup application. vol0 is used for system administration only and not accessible to users.

To restore a Snapshot copy, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click Windows Shares or UNIX Exports or LUN and select **Manage Snapshots**. **Result:** Relevant Snapshot dialog box appears.
2	In the *StoreVault Primary Snapshots* section of the Snapshot dialog box, right-click and select **Restore Snapshot**. **Result:** A warning message appears.
3	In the warning message box, click **Yes** to restore. **Result:** A successfully restored message appears.
4	In the message screen, click **OK**.

Note

The **Restore Snapshot** button appears disabled when multiple Snapshot copies are selected or when there are no Snapshot copies in the list.

Deleting a Snapshot copy

When you manually create a Snapshot copy, it stays in the StoreVault storage system until it is manually deleted.

To view the list of Snapshot copies, right-click the Windows Shares row of the Primary Storage area and click Manage Snapshot.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click Windows Shares or UNIX Exports or LUN and select **Manage Snapshots**. **Result:** Relevant Snapshot dialog box appears.
2	In the *StoreVault Primary Snapshots* section of the Snapshot dialog box, right-click the Snapshot to delete and select **Delete Snapshot**. **Result:** A warning message appears.
3	In the warning message box, click **Yes** to delete. **Result:** The Snapshot gets deleted.

Mounting LUN Snapshot copies

Points to keep in mind on LUN Snapshot copies created using SnapDrive for Windows StoreVault Edition

- You can mount or unmount the Snapshot copies created using SnapDrive for Windows StoreVault Edition.
- If SnapManager for Microsoft Exchange Server StoreVault Edition is installed on the host, you can only restore the Exchange Server LUN Snapshot copies, you cannot create, mount, or unmount.
- If you are using StoreVault Manager for managing Exchange Server LUNs, then you can able to create, delete, restore, mount, and unmount the Snapshot copies.
- You can mount or unmount a Snapshot copy from LUN Snapshots dialog box.

To mount a LUN Snapshot copy, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click a LUN and select **Manage Snapshots**. **Result:** The LUN Snapshot dialog box appears.
2	In the *StoreVault Primary Snapshots* section of the Snapshot dialog box, right-click the Snapshot and select **Mount**. **Result:** The Mount Point for SnapShot dialog box appears.
3	In the Mount Point for Snapshot dialog box select an available drive or browse NTFS folder and click **OK**. **Result:** The mount point appears in the StoreVault Primary Snapshots section.

Unmounting a LUN Snapshot copy

To unmount a LUN Snapshot copy, complete the following steps.

Step	Action
1	In the Primary Storage area of the StoreVault Manager main screen, right-click a LUN and select **Manage Snapshots**. **Result:** The LUN Snapshot dialog box appears.
2	In the *StoreVault Primary Snapshots* section of the Snapshot dialog box, right-click the Snapshot and select **Unmount**. **Result:** Successfully unmounted message appears.
3	In the message box, click **OK**. **Result:** The mount point is deleted from the LUN Snapshot dialog box.

StoreVault Replication 13

About this chapter

This chapter discusses how to replicate data, manage the replicated data, and recover data on the StoreVault storage systems.

Topics in this chapter

This chapter discusses the following topics:

- "Introduction to replication" on page 242
- "Replication process" on page 247
- "Replicating from StoreVault to FAS systems" on page 268

Introduction to replication

This section provides a brief introduction to StoreVault replication, its advantages, and the procedure for setting up replication on StoreVault storage systems. This section has the following topics.

- "About StoreVault replication" on page 242
- "Replication advantages" on page 243
- "The components of replication" on page 244
- "File-based replication (Windows shares and UNIX exports)" on page 244
- "Block based (LUN) replication" on page 245
- "How StoreVault replication works" on page 245
- "Automatic space tuner for a replicated LUN" on page 246
- "Bandwidth throttling" on page 246
- "Concurrent replication" on page 246
- "Replication process" on page 247
- "Replication prerequisites" on page 248

About StoreVault replication

The StoreVault Manager replicates data from one StoreVault storage system (the source) to another StoreVault storage system or fabric-attached storage (FAS) (the destination), and periodically updates the destination to reflect incremental changes of the source. This results in an online, read-only copy at the destination that contains the same data as the source at the time of the most recent update. This feature supports asynchronous replication. The feature enables to replicate Windows Shares, UNIX Exports, and LUNs to the destination storage system.

During replication, a Snapshot copy image replicates from the source storage system to a destination storage system at regular intervals based on the selected schedule.

Note

For replicating between two StoreVault storage systems, the destination storage system must be using the same or later version of Data ONTAP as the source storage system. You can also replicate data from any model of the StoreVault storage system to FAS storage system.

Replication advantages

Replicating data provides the following advantages:

- Provide users quick access to replicated data in the event of a disaster that makes the source Windows Shares or UNIX Exports or LUNs unavailable.
- Update the source to recover from disaster, data corruption (Windows Shares and UNIX Exports).
- Archive the data to tape.
- Back up or distribute the data to remote sites.

The components of replication

The basic deployment for replication consists of the following:

- *replica* directory in Window Shares and UNIX Exports
- LUNs

File-based replication (Windows shares and UNIX exports)

The replication of Windows shares or UNIX exports involves replication of file-based data. The Windows shares and UNIX exports default directories has a special directory called *replica*.

***replica* directory:** After installing replication license a replica directory is created. To replicate data of the Window shares or UNIX exports from the source to the destination, you need to create files and folders inside respective replica directory. To replicate files and folders out side the replica folder, you need to move them into the respective replica directory.

Windows Shares and UNIX Exports replication has the following characteristics:

- Replication is asynchronous.
- Copies only the contents of the replica directory to a destination.
- The destination replica directory is read-only.
- Replication can set up for a maximum of 255 replicas.

Note

Only contents of the **replica** directory are replicated during Windows Shares or UNIX Exports replication process. Therefore, you need to move all the required files and folders which are outside the **replica** directory into the **replica** directory before starting the replication process.

Block based (LUN) replication

In LUN replication, block-based data is replicated. When you replicate a LUN, a read-only copy of the LUN is created on the destination storage system.

LUN replication has the following characteristics:

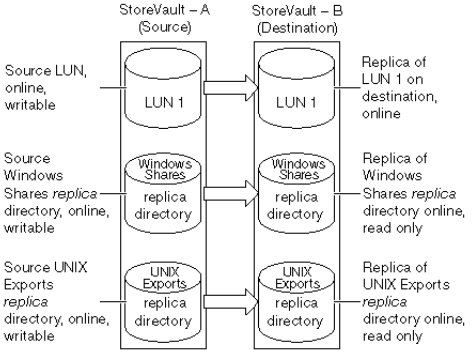
- Replication is asynchronous.
- Snapshotting must be enabled.
- Copies a Snapshot copy of a source LUN and all its folders and files to a destination.
- Destination LUN is read-only and data is not visible until you recover and map to a host.

How StoreVault replication works

StoreVault replication uses Data ONTAP's replication feature to establish a relationship between a specified source *replica* directory or LUN that you want to back up, and the destination *replica* directory or LUN where the backup is kept.

The replication feature does the following:

1. Copies *replica* directory of Windows Shares or UNIX Exports and Snapshotting enabled LUNs to the destination and a read-only source copies are created.
2. Updates the destination to reflect incremental changes on the source, using the schedule you specify.
3. The result of this process is an online, read-only Windows Shares or UNIX Exports or LUNs replica that contains the same data as the source at the time of the most recent update.



Automatic space tuner for a replicated LUN

The StoreVault Manager LUN reserve auto-tuner feature has the capability to automatically resize the replicas of an auto-tuned LUN on the destination StoreVault system when the corresponding source is resized. Here, when a LUN is replicated onto to a destination StoreVault, the system allocates 10% more than the source LUN as replication reserve.

For Example: If the source LUN is 100 GB with Snapshot copies reserve of 20 GB, then the initial replication reserve for the replica to grow is 10% of LUN size+Snapshot copies reserve (100 GB + 20 GB = 120 GB, 10% of 120 GB is 12 GB). So, the replication reserve for the replica to grow in this example is 12 GB. For more information, see "LUN reserve auto-tuner" on page 14.

As the source starts expanding, the replica size on destination automatically adjusts during the replication process. The system provides maximum of 25% of the source as replication reserve.

When the source size decreases, the replica size also decreases. The replication reserve never decreases below 10% of the source.

Note

If LUN reserve auto-tuner is not enabled during LUN creation, an additional static Snapshot penalty of 100% is added to the 50% Snapshot reserve.

Bandwidth throttling

The StoreVault Manager Bandwidth throttling feature ensures that a bandwidth intensive device, such as a server, that limits the quantity of data it transmits within a specific period of time. Bandwidth throttling helps in providing quality of service by limiting network congestion and server crashes. Select the bandwidth to use through the StoreVault Manager replication wizard. You can select maximum bandwidth or you can limit bandwidth. By default, maximum bandwidth is selected.

Concurrent replication

The number of maximum concurrent replication for the StoreVault S550 storage system is 4 sessions and for the StoreVault S300 is 2 sessions.

Replication process

You can perform the following functions from the source storage system:

- "License requirements" on page 248
- "Replication prerequisites" on page 248
- "Creating a replica for Windows shares or UNIX exports" on page 249
- "Creating a replica for a LUN" on page 253
- "Quiescing a replica" on page 256
- "Resuming a replica" on page 258
- "Updating a replica" on page 259
- "Modifying the replication schedule" on page 260
- "Removing a schedule" on page 262
- "Recovering a replica" on page 265
- "Replicating from StoreVault to FAS systems" on page 268

You can perform the following function from the destination storage system:

- "Recovering a replica"

Attention

You should not to change the name of the source and the destination storage system during the replication process. However, if you want to change the name of the source and the destination storage systems, recover the replica on the destination storage system. This will terminate the replication process. After renaming, you need to set up new replication relationship.

License requirements

You need to buy the StoreVault Replication license for both the source and destination storage systems along with the StoreVault setup.

Replication prerequisites

For replication, ensure the following:

- Both the source and the destination storage systems must have StoreVault Manager 3.0 or later and Data ONTAP® 7.2.1Sx or later versions installed.
- Install the Replication license on both source and destination StoreVault storage systems during setup, or install from the StoreVault Software Licenses dialog box.
- Enable Snapshotting on the source LUN to set up replication for that LUN.
- Both the source and destination StoreVault storage systems must be online.
- If there is a firewall between two systems, open the port 10566 on the firewall, for both the systems to listen each other.
- Go to **System > Advanced**.

  The Advanced dialog box appears.

  On the Manage Hosts File tab, you need to type the IP address and host name information of the storage systems that will be part of the replication process. Click Insert to add the above information.

  This procedure must be performed on both the source and destination StoreVault storage system. The source StoreVault should have the destination IP address and host name, and the destination StoreVault should have the source IP address and host name.

  For more details, see “Manage Hosts File” on page 116.
- From the StoreVault Manager Discovery pane, discover the destination storage system.

Creating a replica for Windows shares or UNIX exports

For replicating Windows Shares or UNIX Exports, complete the following steps.

Note

Only contents of the *replica* directory are replicated during Windows Shares or UNIX Exports replication process, so you need to copy all the required files and folders which are outside the replica directory into the replica directory before starting the replication process.

Attention

Do not rename or delete source replica folder in the Windows Shares and UNIX Exports default directory. Replication fails if you delete or rename the replica folder.

Step	Action
1	Move the required files and folders into the replica directory of the Windows Shares or UNIX Exports, if the required files are not present in the replica directory.
2	On the Primary Storage area of the source storage system, right-click on the Windows Shares or UNIX Exports, and then select **Manage Replicas > Create Replica**. **Result:** The Create Replica Wizard appears.
3	In the Create Replica Wizard, click **Next**. **Result:** The Destination StoreVault dialog box appears.
4	In the Destination StoreVault dialog box, complete the following steps: **a.** Type or select the name or IP address of the destination storage system (that you want to replicate to). **b.** Type the destination storage system password to access. **c.** Click **Next**. **Result:** The Set Replica Throttle dialog box appears.

Step	Action
5	In the Set Replica Throttle dialog box. **a.** Select Maximum Bandwidth. **b.** Select Limit Bandwidth (Enter KB per second) and bandwidth you want to set in KB/s. **c.** Click **Next**. **Result:** The Set Replica Schedule dialog box appears.

Step	Action
6	In the Set Replica Schedule dialog box, complete the following steps. **a.** Select date on the calendar. **Note** The time and date displayed in gray color are read-only and cannot be edited. Using this information, you can find the optimal available time to set up a new schedule for an active replica. **b.** To add a schedule, right-click and select **Add replication schedule**. **Result:** The Add or Modify Schedule dialog box appears. **c.** In the Add or Modify Schedule, select Start time for the Hourly schedule for each day. You can select Once a day or specify the number of hours. **d.** Select period for recurrence. **e.** Click **Apply**. You are back to Set Schedule dialog box. **Result:** The new schedule appears as **Active Schedule** on the calendar. **f.** Click **Next**. **Note** Even if you do not select any schedule, and click **Next**, one-time replication is supported. **Result:** The Confirm Replica Settings dialog box appears.
7	In the Confirm Replica Settings dialog box, verify the details click **Apply**. **Result:** The Create Replica Status Wizard dialog box appears.

Step	Action
8	In the Create Replica Status box, click **Finish**. **Note** The created replica is named in the following format, *replica_of__StoreVault name_mm-dd-yyyy_hr-min-sec*. The Primary Storage area of the StoreVault Manager main screen on the source system is refreshed and the replication details are displayed. You can also see the replication details on the Secondary Storage area of the destination storage system.

Creating a replica for a LUN

Using StoreVault Manager you can set up a replication relationship between a source and destination. The replication wizard enables you to schedule the replication or you can also replicate without a schedule.

For replicating a LUN from the source storage system, complete the following steps.

Step	Action
1	In the Primary Storage area of the source storage system, right-click the LUN to replicate and select **Manage Replicas > Create Replica**. **Result:** The Create Replica Wizard appears.
2	In the Create Replica Wizard, click **Next**. **Result:** The Enter Destination StoreVault Appliance dialog box appears.
3	In the Enter Destination StoreVault Appliance dialog box, complete the following steps: **a.** Type or select the name or IP address of the destination storage system (that you want to replicate to). **b.** Type the password to access that destination storage system. **c.** Type the name of the destination LUN. **Note** For all StoreVault systems with replication relationships between each other, all primary LUN names need to be unique. For example, if you have a primary LUN named *LUN123* on a source StoreVault storage system, then you *cannot* have a LUN named *LUN123* on a StoreVault storage system that is being used as a replication target. **d.** Click **Next**. The Set Replica Throttle dialog box appears.

Step	Action
4	In the Set Replica Throttle dialog box, complete the following substeps: **a.** Select Maximum Bandwidth. **b.** To limit bandwidth, select Limit Bandwidth(Enter KB per second) and enter bandwidth you want to set in KB/s. **c.** Click **Next**. **Result:** The Set Replica Schedule dialog box appears.
5	In the Set Replica Schedule dialog box, complete the following steps. **a.** Select date on the calendar. **Note** The time and date displayed in gray color are read-only and cannot be edited. Using this information, you can find the optimal available time to set up a new schedule for an active replica. **b.** To add a schedule, right-click and select **Add replication schedule**. **Result:** The Add or Modify Schedule dialog box appears. **c.** In the Add or Modify Schedule, select Start time for the Hourly schedule for each day. You can select Once a day or specify the number of hours.

Step	Action
	d. Select period for recurrence. **e.** Click **Apply**. You are back to Set Schedule dialog box. **Result:** The new schedule appears as **Active Schedule** on the calendar. **f.** Click **Next**. **Note** Even if you do not select any schedule, and click **Next**, one-time replication is supported. **Result:** The Confirm Replica Settings dialog box appears.
6	In the Confirm Replica Settings dialog, click **Apply**. **Result:** The Replica Status Wizard dialog box appears.
7	Click **Finish**. **Note** If a replica is successfully created on the destination storage system, it displays the message “Create Replica Succeeded.” on the dialog box. The Primary Storage area of the StoreVault Manager main screen on the source system gets refreshed and the replication details are displayed. You are taken to the StoreVault Manager main screen. You can also see the replication details on the Secondary Storage area of the destination storage system.

Quiescing a replica

To create a Snapshot copy of a destination that contains a database, you might need to ensure that its contents are stable during the Snapshot copy is taken. You can use the quiescing feature to temporarily block transfers to the destination storage system so that the destination storage system replica reaches a stable state.

To quiesce a replica on the destination storage system, complete the following steps.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN/Windows Shares / UNIX Exports and select **Manage Replicas > Quiesce** **Result:** The Quiesce Replica Wizard appears.
2	Click **Next**. **Result:** The Destination StoreVault Appliance Replicas dialog box appears.
3	In the Destination StoreVault Appliance Replicas dialog box, complete the following steps. **a.** Enter or select the destination replicas. **b.** Type the destination password. **c.** Click **Next**. **Result:** The Confirm Destination Quiesce Settings dialog box appears.
4	In the Confirm Destination Quiesce Settings dialog box, click **Apply** to confirm the settings. **Result:** The Destination Replica Quiesce Status dialog box appears. If quiescing is successful, the “Replica Quiesce Succeeded.” message is displayed on the dialog box.

Step	Action
5	Click **Finish**. You are back to the StoreVault Manager main screen. The status of the replica changes to *quiesced* in the secondary storage area of the destination storage system.

Resuming a replica

To restore the data transfer to a destination replica that you have quiesced, complete the following steps.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN/Windows Shares/UNIX Exports and select **Manage Replicas > Resume**. **Result:** The Resume Replica Wizard appears.
2	In the Resume Replica Wizard, click **Next**. **Result:** The Destination Replica dialog box appears.
3	In the Destination Replica dialog box, complete the following. **a.** Enter or select the destination replicas system. **b.** Type the destination password. **c.** Click **Next**. **Result:** The Confirm Destination Resume Settings dialog box appears.
4	In the Confirm Destination Resume Settings dialog box, click **Apply** to confirm the settings. **Result:** The Resume Replica Status dialog box appears. When the process is successful, the “Replica Resume Succeeded” message is displayed on the dialog box.
5	In the Resume Replica Status dialog box, click **Finish**. You are back to the StoreVault Manager main screen.

Updating a replica

To update a replica, complete the following steps.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN/Windows Shares / UNIX Exports and select **Manage Replicas > Update**. **Result:** The Update Replica Wizard dialog box appears.
2	In the Update Replica Wizard dialog box, click **Next**. **Result:** The Destination Replica dialog box appears.
3	In the Destination Replica dialog box, complete the following. **a.** Type or select the destination replicas system. **b.** Type the destination password. **c.** Click **Next**. **Result:** The Confirm Destination Update Settings dialog box appears.
4	In the Confirm Destination Update Settings dialog box, click **Apply** to confirm the settings. **Result:** The Destination Replica Update Status dialog box appears. When the update is successful, the "Replica Update Succeeded." message is displayed on the dialog box or displays an error message.
5	In the Destination Replica Update Status dialog box, click **Finish**. You are back to the StoreVault Manager main screen. You can see the replication state as *replicated* on the Primary Storage area of the source storage system and the Secondary Storage area of the destination storage system.

Modifying the replication schedule

To modify replication schedule, complete the following steps.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN and select **Manage Replicas > Modify Schedule**. **Result:** The Modify Replica Schedule Wizard appears.
2	Click **Next**. **Result:** The Destination Replica dialog box appears.
3	In the Destination Replica dialog box, complete the following. **a.** Type or select the destination replicas system. **b.** Type the destination password. **c.** Click **Next**. **Result:** The Modify Replica Throttle dialog box dialog box appears
4	In the Modify Replica Throttle dialog box. **a.** Select Maximum Bandwidth. **b.** To limit bandwidth, select Limit Bandwidth(Enter KB per second) and enter bandwidth you want to set in KB/s. **c.** Click **Next**. **Result:** Modify Replica Schedule for dialog box appears.

Step	Action
5	In the Modify Replica Schedule for dialog box, complete the following steps. **a.** Right-click the active schedule and select Modify replication schedule. **b.** To Modify a schedule, right-click and select **Modify replication schedule**. **Result:** The Add or Modify Schedule dialog box appears. **c.** In the Add or Modify Schedule, select Start time for Hourly schedule for each day. You can select Once a day or specify the number of hours. **d.** Click **Apply**. You are back to Set Schedule dialog box. **Result:** The new schedule appears as **Active Schedule** on the calendar. **e.** Click **Next**. **Result:** The Confirm Replica Settings dialog box appears.
6	Click **Apply** to accept the changes. **Result:** The Modify Replica Schedule Status wizard dialog box appears.
7	Click **Finish**. The results status displays “Replica Modify schedule Succeeded”. If any error occurs, the error message is displayed on the dialog box. You are back to the StoreVault Manager main screen.

Removing a schedule

To remove a replication schedule, complete the following steps:

Note

The remove schedule option only stops the replication schedule. The replication relationship between source and destination StoreVault system still exists. After removing schedule you can still manually update the replica. You can remove the schedule as per the need and reschedule it afterwards using Modify Schedule wizard.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN and select **Manage Replicas > Modify Schedule**. **Result:** The Modify Replica Schedule Wizard appears.
2	In the Modify Replica Schedule wizard, click **Next**. **Result:** The Destination Replica dialog box appears.
3	In the Destination Replica dialog box, complete the following. **a.** Type or select the destination replicas system. **b.** Type the destination password. **c.** Click **Next**. **Result:** The Modify Replica Throttle dialog box appears.
4	In the Modify Replica Throttle dialog box, click **Next**. **Result:** Modify Replica Schedule for dialog box appears.
5	In the Modify Replica Schedule dialog box, complete the following steps. **a.** Right-click the active schedule and select **Remove Schedule**. **b.** Click **Next**. **Result:** The Confirm Replica Settings dialog box appears.

Step	Action
6	In the Confirm Replica Settings dialog box, click **Apply** to accept the changes. **Result:** The Modify Replica Schedule Status dialog box appears.
7	In the Modify Replica Schedule Status, click **Finish**. When the modification is success, the dialog box displays “Replica Modify schedule Succeeded”. If any error occurs, the error message is displayed in the dialog box. You are back to the StoreVault Manager main screen.

Viewing a log report

To view a log report of the previous replicas, complete the following steps.

Step	Action
1	In the Primary Storage area of the source system, right-click a LUN/Windows Shares / UNIX Exports and select **Manage Replicas > View Replica Log**. **Result:** The Administration dialog box appears.
2	In the administration dialog box, complete the following steps. **a.** Type the user name. **b.** Type the password. **c.** Click **OK**. **Result:** The StoreVault Replicas Log dialog box appears. You can view the contents of the replication log file.
3	To close the dialog box, click **OK**.

Recovering a replica

You can recover the replica on the destination storage system. Recovering the replica breaks the replication relationship between source and destination. Recovered LUN or Windows Shares or UNIX Exports becomes part of the primary storage are writable. LUNs can be seen in the primary storage area. The Windows Shares and UNIX Exports writable replicas can be browsed by windows explorer after recover.

To recover the replicated component on the destination storage system, complete the following steps.

Step	Action
1	In the secondary storage area of the destination storage system, right-click LUN or Windows Share or UNIX Exports and select **Restore**. **Result:** The Recover Replication Wizard appears.
2	Click **Next**. **Result:** The Destination Replica dialog box appears.
3	In the Destination Replica dialog box, complete the following. **a.** Type or select the destination replicas system. **b.** Type the source password. **c.** Click **Next**. **Result:** The Confirm Replica Recover dialog box appears.

Step	Action
4	Click **Apply**. The Replica Recover Status dialog box appears. The message “Recover Replica Succeeded” it means that the data was recovered properly to the destination storage system. **Note** After recovering replicas for Windows Shares or UNIX Exports, the broken-off replicas (Shares or Exports) are filtered out and are not displayed under secondary storage. Therefore, you need to use the native Windows browser in case of Shares or the mounts for Exports to manage your recovered replicas.

Resizing or deleting a replicated LUN

To resize or delete the replicated LUN, complete the following steps:

Step	Action
1	In the secondary storage area of the *destination storage system*, right-click the required LUN, and select **Recover** on the context menu.
2	Follow the procedure documented under “Recovering a replica” on page 265
3	In the primary storage area of the *source storage system*, right-click the LUN and select **Delete LUN** or **Resize LUN** on the context menu.

Replicating from StoreVault to FAS systems

This section provides information about replication from StoreVault storage system to FAS storage systems.

- "About StoreVault to FAS replication" on page 268
- "License requirements" on page 268
- "Prerequisites" on page 268
- "Installation steps" on page 269
- "Replication process" on page 270
- "Recovering the replica from a FAS system" on page 271

About StoreVault to FAS replication

The StoreVault Manager replication feature allows you to replicate data from the StoreVault storage systems to fabric-attached storage (FAS) system. You can replicate data to any FAS-series storage system. Here, the StoreVault storage system is the source and the FAS system is the destination.

License requirements

You need to install SnapMirror license on both the source and the destination storage systems.

Prerequisites

- The StoreVault S550 storage system must be running on Data ONTAP 7.2.1Sx and the destination FAS must be running Data ONTAP 7.2.1 or later version.
- The StoreVault S300 must be running on Data ONTAP 7.2.1S1 and the destination FAS must be running Data ONTAP 7.2.1 or later version.
- The client must be running on StoreVault Manager 3.0 or later version.
- The FAS system must have CIFS and NFS licenses installed for Windows Shares and UNIX Exports replication, respectively.
- Discover the destination StoreVault storage system from the StoreVault Manager discovery pane.
- Enable Snapshotting on the source LUN to set up replication for that LUN.
- Both the source and the destination storage systems must be online.
- If there is a firewall that connects two systems, open the port 10566 on the firewall, for both the systems to listen to each other.
- In the StoreVault Manager select **System** > **Advanced**.

The Advanced dialog box appears.

On the Manage Hosts File tab, type the IP address and host name information of the storage systems that is part of the replication process. Click Insert to add the above information.

This must be done on both the source and destination storage system. The source StoreVault must have the destination IP address and host name, and the destination FAS storage system must have the source IP address and host name.

Installation steps

To replicate data from StoreVault to FAS system, complete the following steps.

Step	Action
1	Install the StoreVault Manager 3.0 or later software on the Windows host system. For information about installing StoreVault Manager, see “Installing the StoreVault Manager software” on page 24.
2	Install the StoreVault to FAS replication license on the StoreVault storage system from the StoreVault Manager Software license dialog box.
3	Install the SnapMirror license on the destination FAS system, if the license is not already installed. For information about installing a license, see the relevant FAS documentation.

Replication process

To replicate data from StoreVault to FAS system, complete the following steps.

Step	Action
1	In the StoreVault Manager Discovery pane, right-click the subnet node and select **Discover**. This displays the StoreVault and FAS systems in that subnet along with the IP addresses.
2	Note the FAS system IP address.
3	On the source StoreVault, follow the replication prerequisites.
4	On the destination FAS storage system, provide the source StoreVault system's IP address and host name using FilerView or CLI.
5	From the source StoreVault, set up replication using StoreVault Manager Replication wizard. For information on about replication, see "Creating a replica for a LUN" on page 253 and for Windows Shares or UNIX Exports, see "Creating a replica for Windows shares or UNIX exports" on page 249 **Note** During StoreVault to FAS replication, *The Set Replica Throttle* screen appears with an option to select Aggregate.

Recovering the replica from a FAS system

To recover the Replica from the destination FAS system, use FilerView or Data ONTAP CLI.

To recover the replicated data, complete the following steps.

Step	Action
1	You can recover the replica on the FAS target using the command-line interface or FilerView, and break the replication relationship. You can then use the replica as the primary data from the FAS target system.
2	You must manually release StoreVault source storage system after the replication relationship is broken on the target FAS system. Use the `snapmirror release` command to stop replication schedules for Windows Shares, UNIX Exports, and LUNs. On the FAS system, you can also delete entries from /etc/snapmirror.conf for Windows Shares, UNIX Exports, and LUNs.

If You Have Problems 14

About this chapter

This chapter provides a reference to support in installing, configuring, and using the StoreVault storage system.

Topics in this chapter

This chapter discusses the following topics:

- "How to get help" on page 274
- "Where to go next" on page 276

How to get help

Troubleshooting

The information in this section helps you in solving problems that you might encounter while installing or replacing hardware on the StoreVault storage system.

For additional information regarding the power supplies, disk replacements, and hardware configuration, see the *StoreVault Hardware Guide*.

Drive status indications

The StoreVault Manager indicates the status of the drives installed in the StoreVault with the following symbols:

Icon	Symbol	Indication
	Green Up Arrow	Normal condition or active disk in the aggregate (either data drive or parity drive)
	Green DP	Double parity drive (RAID-DP)
	Green P	Parity drive (RAID-4)
	Green S	Spare Drive
	Yellow Up Arrow	Drive rebuilding or RAID-DP drive calculating

Icon	Symbol	Indication
	Red X	Component has failed
	Gray E	Missing or uninstalled component

System status indications

This system status area displays status information of various hardware components of the StoreVault storage system such as the power supply units, system fans, NVRAM battery, power, and temperature. The symbols in the following table display status of each component.

Icon	Symbol	Indication
	Green Up Arrow	Component is fully operational.
	Red Down Arrow	There is a problem with the component.
	Orange up arrow	A foreign disk drive installed from another StoreVault

Where to go next

Next task

After installing and configuring the StoreVault storage system use StoreVault Manager for administrative tasks.

For additional information on the StoreVault storage system, see the NetApp Web site: http://now.netapp.com

StoreVault Command-Line Interface A

About the StoreVault CLI

The StoreVault command-line interface (CLI) can be used to create exports of UNIX directories directly from the command line on a UNIX or Linux host system. Create a new share in the storage system for CIFS access through a Windows system. To do mapping between root and administrator. This means that you do not need to use StoreVault Manager to create exports or shares.

About this chapter

This chapter describes how to install and use the StoreVault CLI on a UNIX-based system. This chapter corresponds to StoreVault CLI Release 2.1.0.

Topics in this chapter

This chapter discusses the following topics:

- "Overview of StoreVault CLI features for creating UNIX exports" on page 278
- "Installation" on page 279
- "Using the StoreVault CLI" on page 281
- "List of supported commands" on page 283
- "Command objects used" on page 284
- "Commands and syntax" on page 286
- "Error messages" on page 296

Overview of StoreVault CLI features for creating UNIX exports

Overview

The StoreVault CLI is a single-point management interface to access the StoreVault storage system. You can use the StoreVault CLI to create export rules, delete export rules, list the exported directories and export rules from the StoreVault (or equivalent) boxes from where the directories are mounted on UNIX-based systems. You can also create shares, delete shares, and list shares.

With StoreVault CLI, you can manage the following tasks:

- Create a new rule to export a directory from the storage system
- Modify the old rule in the export list and load the new rule
- Delete the rule that exports the particular directory
- List all the exported directories from the storage system
- Get the actual storage path of a particular path on the storage system
- Create a new share
- List the share on the Storage system
- Delete shares

Prerequisites

The Linux workstation or server must meet the following requirements before you install StoreVault CLI.

Hardware requirements	Software requirements
◆ x86_64 bit	◆ Red Hat Linux 9.0 ◆ The following libraries in the UNIX-based system are required: ◆ libnsl.so.1 ◆ libdl.so.2 (GLIBC_2.0/2.1/2.0) ◆ libc.so.6 (GLIBC_2.0/GLIBC_2.1/2.1.2/2.1.3/2.2/ GLIBC_2.3) ◆ libpthread.so.0 (GLIBC_2.0/ 2.1/ 2.3.2) ◆ librt.so.1 ◆ libz.so.1 ◆ libncurses.so.5

Note

You need to enable NFS and CIFS license to use CLI.

Installation steps

To install the StoreVault Manager CLI on the Linux workstation, complete the following steps.

Step	Action
1	Make sure that ◆ Your management workstation meets the requirements described in the "Prerequisites" section. ◆ You have a login with local administration rights for the Linux workstation. ◆ The StoreVault hardware is set up according to the *StoreVault Hardware Guide*. ◆ The StoreVault unit is powered on.
2	Insert the CD into the CD-ROM drive of your management workstation. Locate the StoreVaultCLI-2.1.0-1.x86_32.rpm(2.1.0 represents the version of the StoreVault CLI executable) package in the Unix_Utilities\Linux\StoreVault_CLI
3	Run StoreVaultCLI-2.1.0-1.*.rpm. For example, **`bash$ rpm -Uvh StoreVaultCLI-2.0.0-1.x86_32.rpm`** or Double-click the StoreVaultCLI-2.1.0-1.x86_32.rpm from the Linux File Manager. The StoreVault CLI is installed.
* - indicates the supported hardware that is used.	

Note

In case of any errors during installation, see the "Error messages" section.

Using the StoreVault CLI

Running the StoreVault CLI

The command utility is named svmcli in the Linux system. This utility works in the following modes:

- It executes the command specified on the command line while running the command.
- If no options are specified, it opens a CLI-based interpreter to accept chain of commands for which the StoreVault CLI displays the output.
- It runs commands from a file that can be given as input from the command line.

The utility first gets the details about the login name and the password before executing any command. In all these cases, the utility starts a connection with the server with the login name and the password that has been supplied.

Initial logging in

The StoreVault CLI can be run in three modes:

- CLI mode - Prompts the user for inputs and displays the result to the user continuously.
- Command Mode - Takes one command from the user on the shell command line, executes the same, and displays the result to the user.
- File Input mode - Executes commands in the file given as input and displays the results to the user.

When the StoreVault CLI utility is run, it can be given the following arguments:

- `-h` *`hostname`*: Host name of the storage system that the user wants to work on.
- `-u` *`username`*: User name with which the StoreVault CLI utility connects to the source storage system.
- `-f` *`filename`*: Execute in the File Input mode
- `-e` *`command`* arguments: Execute in the command mode.

  Execute the command that follows the `-e` option.

Examples:

```
bash$ svmcli -h 10.72.162.202 -u root
```

```
bash$ svmcli -h 10.72.162.202 -u root -f
/home/nile/execute.txt
```

```
bash$ svmcli -h 10.72.162.202 -u root -e export list
bash$ svmcli -h 10.72.162.202 -e export list
bash$ svmcli -h 10.72.162.202 -f
/home/nile/execute.txt
bash$ svmcli -f /home/nile/execute.txt
```

If you do not give some of the details, such as host name and user name, the StoreVault CLI prompts for them. You need to enter the details one by one.

Note

The `-e` option should always be the last option. Enter the other options before this option. The `-e` and `-f` options cannot be given as an input at the same time.

List of supported commands

Supported commands

The following commands are supported:

export: Include commands related to exporting a directory from the storage system.

- `create` - Create a new rule to export a directory from the storage system.
- `modify` - Modify the old rule in the export list and load the new rule.
- `delete` - Delete the rule that exports the particular directory.
- `list` - The StoreVault CLI lists all the exported directories from the storage system.

`share` - Shares related commands: Commands that are aligned towards the CIFS shares features.

- `create` - Create a new share in the storage system for CIFS access through a Windows system.
- `delete` - Delete an existing share. This will make the directory un reachable from any Windows system.
- `list` - list the details about the share.

`version`: Displays the version of the StoreVault CLI that is used.

`cmds`: Gets the list of commands that can be run on the StoreVault CLI utility.

`help`: Displays the top level help of a command-specific help

`exit`: Exits the StoreVault CLI application.

Common Command options: Some of the commands offer some common options that can be sent while sending the command.

- `-p` - Persistent option. Use this option for commands that need to retain the same behavior after reboot also.
- `-v` - Verbose output. Run this option to get a verbose output for the command to be executed. This makes the StoreVault CLI print more output about the execution results of the command.

Note

Type these options before the actual command arguments.

Command objects used

The following objects are used in this document. These objects are either abstract or formed using other objects.

- pathname—A string that consists of ASCII characters representing the path in the storage system (that is, /vol/vol1/home) or on a UNIX-based machine.
- sharename— A string of ASCII characters representing the name with which the storage system will display to the CIFS user.
- hostname—A string that represents the host name of a machine on a network.
- subnet—A subnet is represented by the <IP address>/xx where xx is the number of leading 1's in the subnet mask.
- netgroup—A domain name given to a group of hosts that are present in the same subnet.
- filename—The name of the file along with its path in a UNIX-based file system. This can be a standard path or can be a relative path (relative to the current working directory).
- command—The predefined strings that help you to complete a particular operation on the storage system. This can be followed by arguments.
- host—Host is an object that can be any one of the following:
  - *hostname* of a machine
  - *IP address* of a machine
  - *subnet*
  - *netgroup*
- flavor—The flavor field is an object that can contain any of the following strings.
  - none
  - sys
  - Krb5
  - Krb5i
  - Krb5p
- rule—A rule consists of one compulsory path name and several options for the path.

  rule => path=*pathname options*

  Options can include:
  - read write hosts—Hosts that can be given read write permissions in the exported folder
  - rw=[host1[,host2][,host3][..]]

- read only hosts—Hosts that can be given read-only permissions in the exported folder.
- ro= [host1[,host2][,host3][..]]
- root hosts—Hosts that have roots with 'read-write' or 'read-only' privileges.
- root= [host1[,host2][,host3][..]]
- actual pathname—The actual path name in the storage system that has to be exported. By default, the actual pathname is same as pathname.
- act=<pathname>
- anon—User IDs that can be given root permission on the exported folder.
- anon=userid
- nosuid—If true, this option causes the server file system to silently ignore any attempt to enable the setuid or setgid mode bits. The default value is false.
- nosuid=[true|false]
- sec-flavor—List of possible security flavors.
- sec=[flavor1[,flavor2][…]]

Commands and syntax

The following sections describe the export commands and the syntax used. These commands control three directories that are exported and the rules that control the NFS functionality.

Create an export command

This command is used to create a new exported directory from the storage system. This command creates a new rule and exports the directory to the outside environment.

Syntax:

`export create [-p -v] rule rule1 rule rule2`

Command options:

`-p`—Persistent option—If true, modifies the etc/exports file to append the rule for a permanent change. The new rule still takes effect immediately. The default value is false.

`-v`—verbose option—If true, returns a list of directories that were appended. The errors during the append are shown in the result and 'loaded-path names' contain the path names that were successfully appended. The default value is false.

Note

Instead of the host name, the IP address of the host can also be given. Further, subnet masks can also be specified. All hosts can be specified using the `all-hosts` option. If none of the options are given, then the read-write permission is given to all-hosts and security flavor is set to 'sys'.

Example:

```
export create -p -v rule path=/vol/exports/test rw=nile,ganges
root=10.172.62.202 nousid=true anon=101 sec=sys
```

```
export create -p rule path=/vol/vol0/home ro=nile rw=thames
nosuid=false
```

These can be given in any order of preference. You can also provide many rules in a single command. Supersede each command by the `rule` keyword.

Note

To export a directory with embedded spaces, give the path name within " " with the keyword "`path=`" inside it.

Example:

```
export create -p -v rule "path=/vol/exports/test kk"
```

Note

You can create rules from StoreVault CLI only if the path begins with /vol/exports and /vol/shares.

Modify an export command

Run this command to change an already loaded export rule.

Syntax:

`export modify rule` ***`rule1`***

Only one rule can be modified at a time.

Command options:

`-p`—Persistent option—If true, modify the etc/exports file to modify the rule permanently. The default value is false.

Note

Instead of the host name, the IP address of the host can also be given. Further, subnet masks can also be specified. All hosts can be specified using the `all-hosts` option.

Example:

```
export modify -p rule path=/vol/exports/test rw=nile,ganges
root=10.172.62.202 nousid=true anon=101 sec=sys
```

Note

To modify a directory with embedded spaces, give the path name within " " with the keyword "`path=`" inside it.

Example:

```
export modify -p rule "path=/vol/exports/test kk"
```

Note

You can modify a rule from StoreVault CLI only if the path begins with “/vol/exports” or “/vol/shares”

Delete an export

This command can be used to delete an export that is already created. This command gets the path that has to be deleted and then deletes the rule.

Syntax:

export delete [-p] [pathname1[pathname2][pathname3][..]]>/allpaths

Command options:

-p—Persistent option—Modify the etc/exports file to delete the rules permanently. The default value is false.

Example:

```
StoreVault CLI> export delete /vol/exports/test
Paths Deletion: Successful
StoreVault CLI>
```

Run the following command for exporting the \vol\exports directory:

export create -p rule path=/vol/exports/ root=host

-v—verbose option—If true, return a verbose output of what occurred. If there is an error after deleting only a few rules, 'deleted-path names' returns the rules that were deleted. The default value is false.

Note

In case a directory with embedded spaces has to be deleted, then give the path name within " ". You can delete all paths by providing the option allpaths.

Example:

```
export delete -p "/vol/exports/test kk"
export delete -p allpaths
```

Note

You can delete a rule from StoreVault CLI only if the path begins with “/vol/exports/” or “/vol/shares”. You cannot delete the default exported path “/vol/exports/” or “/vol/shares” using the export delete command.

Exported directories command

This command is used to list all the directories that are exported by the storage system. If the -p option is given, then the exported directories from the /etc/exports file is shown.

Syntax:

export list [-p]

Command options:

-p - Persistent option. If true, only the path names that exist in the etc/exports file are displayed. The default value is false.

Example:

```
StoreVault CLI > export list
Executing the NFS Export list Command!!
Exported Directories
  Normal Exports
    path name: /vol/exports/
      Read-Write hosts: All Hosts
      Security flavors: sys
  Cross Protocol Exports
    path name: /vol/shares
      Read-Write hosts: All Hosts
      Root hosts: 10.72.176.106
      Security flavors: sys
  Others
path name: /vol/vol0
      Read-Write hosts: All Hosts
      Root hosts: 10.72.176.107
      Security flavors: sys
StoreVault CLI >
```

Get the actual storage path command

This command gets the actual storage path in the storage system of an exported directory. This exported directory can be a softlink in the storage system or also can be an alias for the actual path name.

Syntax:

`export stpath` *`pathname`*

Example:

```
StoreVault CLI> export stpath /vol/exports/test
Get Storage Path Name: Successful
Path: /vol/exports/tmp/test
StoreVault CLI>
```

Create a share command

This command creates a new share for the Windows user to map using CIFS.

Syntax:

shares create name=*sharename* path=*pathname*

This command will create a new share according to the path name and the sharename designated.

Note

You can create rules from StoreVault CLI only if the path begins with /vol/exports and /vol/shares.

Example:

```
StoreVault CLI > shares list
  Normal Shares
    Share Name: shares. Path: /vol/shares
  Cross Protocol Shares
    Share Name: exports. Path: /vol/exports
  Others
    Share Name: c. Path: /vol/vol0
    Share Name: c$. Path: /vol/vol0

StoreVault CLI > shares create name=krishna_share
path=/vol/shares/krishna
share create: Successful

StoreVault CLI > shares list
Normal Shares
    Share Name: shares. Path: /vol/shares
    Share Name: krishna_share. Path: /vol/shares/krishna
  Cross Protocol Shares
    Share Name: exports. Path: /vol/exports
  Others
    Share Name: c. Path: /vol/vol0
    Share Name: c$. Path: /vol/vol0
StoreVault CLI >
```

Delete a share command

This command is used to delete a share access on the storage system. This means that the storage system will not let anyone map and access the share from any Windows session.

Syntax:

shares delete *sharename*

shares delete name=*sharename*

```
StoreVault CLI > shares list
```

```
Normal Shares
Share Name: shares. Path: /vol/shares
Share Name: krishna_share. Path: /vol/shares/krishna
Cross Protocol Shares
Share Name: exports. Path: /vol/exports
Others
Share Name: c. Path: /vol/vol0
Share Name: c$. Path: /vol/vol0
StoreVault CLI > shares delete krishna_share
shares delete: Successful
StoreVault CLI > shares list
Normal Shares
Share Name: shares. Path: /vol/shares
Cross Protocol Shares
Share Name: exports. Path: /vol/exports
Others
Share Name: c. Path: /vol/vol0
Share Name: c$. Path: /vol/vol0
StoreVault CLI >
```

Note

You can delete only one share with a single command. If you name a share as *help*, then use command shares delete =help to delete the share.

List shares command

This command lists the attributes of the share that is given. In case, the user does not specify any share name, then the utility gets the details about all the shares.

Syntax:

Shares list name = sharename
Shares list [sharename]

This command will list the details about the sharename given in the command. If the sharename is not given the utility lists details about all the shares on the storage system.

Example:

```
StoreVault CLI > shares list
  Normal Shares
    Share Name: shares. Path: /vol/shares
  Cross Protocol Shares
    Share Name: exports. Path: /vol/exports
  Others
    Share Name: c. Path: /vol/vol0
    Share Name: c$. Path: /vol/vol0
```

```
StoreVault CLI > shares list shares
  Normal Share
    Share Name: shares. Path: /vol/shares
StoreVault CLI >

StoreVault CLI > shares list name=shares
  Normal Share
    Share Name: shares. Path: /vol/shares
StoreVault CLI >
```

Note

Any export rule that is created for the directories in the /vol/exports directory will be default UNIX permissions. Any export rule that is created for a directory in /vol/shares directory would be default Windows permissions. Any rule that is created for directories other than the above will be considered as other permissions which comprises any of the above permissions or the mixed mode. If you name a share as *help*, then use command shares list name=help to list the details of the share.

Version command

This command give the version of the StoreVault CLI running in the system.

Syntax:

version

Example:

```
StoreVault CLI > version
StoreVault CLI utility Version: 2.1.0
StoreVault CLI >
```

Get the list of commands

This command displays the list of commands that can be executed by the StoreVault CLI. This has been provided basically to print the whole usage help for the utility.

Syntax:

cmds

Example:

```
StoreVault CLI > cmds
```

Help:

```
-h hostname : Host name of the storage system that the user wants to
work on
```

```
-u username : User name input with which the utility has to connect
to the storage system

-e cmd .. : Execute in the command mode. Execute the following
command

-f filename : Execute in the File Input mode

-version : Get the version number

-help : Get this output
```

Command help:

export - NFS exports-related commands

create - Create rules to export a path by NFS server

modify - Modify a rule that already exports a path

delete - Delete rules that exports a path by NFS server

list - List all paths exported by the storage system

stpath - Get the actual storage path of the directory in the storage system

shares - Shares Related Commands

list - List the shared directories from the storage system

create - Create a rule to share a directory from storage system

delete - Delete a rule to share a directory from storage system

version - Displays the version of the executable

cmds - Displays the list of commands

help - Displays help for the command

exit - Exits the application

Command Level Options

-p -> The persistent option is set to true

-v -> The verbose option is set to true

StoreVault CLI >

Help command

- The help command can be put at the start of any command syntax to get the help of a command.

- The command can also be put at the end to get the help for a particular set of commands.

The keywords that have to be given to get the help are `help` and `?`.

Some valid examples of executing the help command are as follows:

Syntax:

***command* help**

help *command*

? *command*

***command* ?**

Examples:

```
StoreVault CLI > help
help
export: - Commands dealing with Exporting directories in a storage
system
shares: - Commands dealing with sharing directories in a storage
system
exit: - leave the program
version: - Display the version
cmds: - Display the whole list of commands
StoreVault CLI >
```

The basic command help is displayed in case the help is needed for a parent command.

- For the full help, type the help for the child command.

  For example, **`help export`** gives the child command details. It will not display the various options present in the `export create` command.
- For full options, type `help export create` or a similar syntax.

  To display the help for the utility, execute the help command from the command line.

Example:

```
bash$ svmcli -help
bash$ svmcli -help
bash$ svmcli -h
bash$ svmcli -?
```

These commands are currently supported on the StoreVault CLI for UNIX.

Exit command

This command exits the utility from the StoreVault CLI shell and places you back to the original shell from where you started the program.

Syntax:

```
exit
```

Error messages

List of error messages

The following table lists the frequently encountered StoreVault CLI installation errors and execution error messages, their causes, and actions you can take to remedy these errors.

Error number	Error message	Cause	Action to take
13002	Authorization failed. Server failed to initialize successfully! Please check the host.	Incorrect password	Enter the correct password and connect.
113	Can't connect to host (err=113). Server failed to initialize successfully! Please check the host.	The storage system is not able to accept connection.	Check the storage system and reconnect.
	Cannot get exclusive lock on /var/lib/rpm/Packages	You do not have the installation permissions.	Become the super user and reissue the command.
	Cannot open Packages index using db3 - Operation not permitted (1)	You do not have the installation permissions.	Become the super user and reissue the command.
	Cannot open Packages database in /var/lib/rpm	You do not have the installation permissions.	Become the super user and reissue the command.

StoreVault Alert Messages

B

The following table lists the alert messages that StoreVault will be sending to the registered e-mail ID whenever it discovers problem with the storage system. The first column denotes the general category of alerts followed by the EMS message it corresponds to, the severity of the alert, the description, and the corresponding AutoSupport messages, if any.

Alert category	EMS messages	Severity I - Info E - Error	Description	AutoSupport messages
RAID and disk related	raid.disk. offline	E	Marking offline	DISK_FAILED
	raid.label.io. readError	E	Label read on failed with storage error. The system will stop using the disk for I/O operations.	DISK_BADLABEL
	raid.label.io. writeError	E	Label write on failed with storage error. The system will stop using the disk for I/O operations.	DISK_BADLABEL
	raid.rg.recons.aborted	E	Reconstruction aborted at disk block after	DISK_RECONSTRUCTION_FAILED
	raid.rg.recons.bad.cksum	E	Checksum mismatch on, block during reconstruction; assuming data is correct and fixing checksum.	DISK_RECONSTRUCTION_FAILED
	raid.rg.recons.block.fail	E	Block cannot be properly reconstructed on - the block will be zeroed.	DISK_RECONSTRUCTION_FAILED
	raid.rg.recons.cantStart	E	The reconstruction cannot start in RAID group.	DISK_RECONSTRUCTION_FAILED
	raid.rg.recons.cksum.err	E	Checksum error on block during reconstruction	DISK_RECONSTRUCTION_FAILED
	raid.rg.recons.missing	E	RAID group is missing disk(s).	FILESYSTEM_DISK_MISSING
	raid.rg.recons.start	I	starting reconstruction, using disk	FILESYSTEM_DISK_MISSING
	raid.rg.recons.done	I		FILESYSTEM_DISK_MISSING

Alert category	EMS messages	Severity I - Info E - Error	Description	AutoSupport messages
RAID and disk related	raid.rg.recons.media.err	E	Read error on block during reconstruction	DISK_RECONSTRUCTION_FAILED
	monitor.raid.brokenDisk	E	In RAID group broken.\n	DISK_FAILED
	monitor.raidDiskDead	E	disk : Forced failure of disk has failed.	DISK_FAILED
	monitor.raidDiskFail	E	Periodic check of raid disk has failed.\n	DISK_FAILED
	monitor.spareDiskDead	E	disk : Forced failure of spare disk has failed.	SPARE_DISK_FAILED
	monitor.spareDiskFail	E	Periodic check of hot spare disk has failed.\n\tPlease check spare disk \n	SPARE_DISK_FAILED
	monitor.raiddp.vol.singleDegraded	E	In RAID group is broken.	FILESYSTEM_DISK_FAILED
	raid.rg.diskcopy.start	I	starting disk copy from to	DISK_MISSING
	raid.rg.diskcopy.done	I	disk copy from to completed in	DISK_MISSING
	snapmirror.err.SnapCreateFailed	E	StoreVault Replication transfer from to.	N/A
	snapmirror.dst.waflErr	E	StoreVault Replication destination transfer from to	N/A
	snapmirror.dst.err	E	StoreVault Replication destination transfer from to	N/A
	snapmirror.src.err	E	StoreVault Replication source transfer from to	N/A

Alert category	EMS messages	Severity I - Info E - Error	Description	AutoSupport messages
RAID and disk related	snapmirror.dst.no Snapshot copy	E	StoreVault Replication found no Snapshot s in destination %s %s, aborting transfer	N/A
	snapmirror.src.of fline	E	Source %s %s requested offline	CLI_DOIT
	snapmirror.src.no tLicenced	E	Command request while StoreVault Replication not licensed on this filer	N/A
Hardware related failures	monitor.chassisP owerSupply.faile d	E	Chassis power supply failed	CHASSIS_POWER_ SUPPLY_FAIL
	monitor.cpuFan.f ailed	E	CPU Fan %d is stopped	CHASSIS_FAN_FAI LED
	monitor.fan.faile d	E		CHASSIS_FAN_FAI LED
	nvram_mm.bat.er ror	E	The NVRAM battery in the chassis is	N/A
	nvram_mm. bat.missing	E	The NVRAM battery in the chassis is *missing ordead*. . Ensure battery is present and connected to the NVRAM card	N/A
	nvram_mm. bat.missing.error	E	The NVRAM battery in the chassis is *missing ordead*. . Ensure battery is present and connected to the NVRAM card.	N/A
	nvram_mm.ecc.e rrors. dropped	E	There has been excessive ecc errors. Atleast decc errors might have gone unreported	N/A
	nvram_mm.exces sive.sbit. ecc.errs	E	Excessive singlebit ECC errors in the NVRAMcard	N/A

Alert category	EMS messages	Severity I - Info E - Error	Description	AutoSupport messages
Hardware related failures	nvram_mm.multi bit.ecc. error	E	Uncorrectable Multi Bit ECC errors on DIMM 1	N/A
	monitor.shutdow n.chassisOverTe mp	E	Chassis temperature is too hot:	CHASSIS_OVER_T EMPERATURE_SH UTDOWN
	monitor.shutdow n.chassisUnderTe mp	E	Chassis temperature is too cold:	CHASSIS_UNDER_ TEMPERATURE_S HUTDOWN
	monitor.shutdow n.temp	E		N/A
	monitor. rtcLowPower	E	RTC battery is dangerously low. Replace it nexttime you take the system down.	RTC_BATTERY_LO W
	monitor.chassisP ower. degraded	E	Chassis power is degraded:	CHASSIS_POWER_ DEGRADED
	monitor.power.cr itical	E		CHASSIS_POWER_ DEGRADED
On-demand software alerts	alert.tape. dumpSuccess	I		N/A
	alert.tape. dumpFailure	E		N/A
	alert.tape. restoreSuccess	I		N/A
	alert.tape. restoreFailure	E		N/A
	alert.setup. welcome	I	Puma System Setup successful \n	N/A
	alert.aggr. almostFull	I	Storage Pool has become 95 full \n	N/A

Alert category	EMS messages	Severity I - Info E - Error	Description	AutoSupport messages
On-demand software alerts	alert.aggr. almost.Full	I	Storage Pool is full.\n	N/A
WAFL alerts	wafl.vvol. offline	I	Volume is offline	WAFL_VOL_OFFLINE
	wafl.vol.full	I	file system on is full	N/A
	monitor. volume.nearlyFull	I	Storage Pools has become 95 full \n	N/A
Quota alerts	quota. exceeded	I	for on volume	QUOTA_EXCEEDED
	quota.normal	I	for on volume	QUOTA_NORMAL
	quota.softlimit.exceeded	I	for on volume	QUOTA_SOFTLIMIT_EXCEEDED
	quota.softlimit.nomal	I	for on volume	QUOTA_SOFTLIMIT_NORMAL

Glossary

antistatic grounding leash

This wrist strap is a safety device used to channel static electricity to a proper ground when you are handling sensitive computer equipment.

ATA

Advanced Technology Attachment is one of most common storage interfaces used in computers and storage devices. (Also see “Serial ATA” on page 305.)

Fibre Channel

Fibre Channel is a gigabit-speed network technology primarily used for storage networking. It is the standard connection type for storage area networks in enterprise storage. Despite its name, Fibre Channel signaling can run on both twisted-pair copper wire and fiber optic cables.

Fibre Channel Protocol (FCP)

Fibre Channel Protocol (FCP) is the interface protocol of SCSI on the Fibre Channel.

field-replaceable unit (FRU)

A unit or component of a system that is designed to be replaced in the field; that is, without returning the system to the factory or repair location.

Hot spare

A hot spare is a spare drive that is in the StoreVault product, and ready to be used, but not currently used for data. Data ONTAP detects the presence of a drive that has failed or is showing signs of imminent failure. The hot spare is immediately brought online and built in the background to replace the failed drive. The administrator is notified of the event and can physically replace the failed drive at a convenient time.

hot-swappable drive

A disk drive that can replace a defective unit in a system while the system is performing its normal function and without powering down the system.

LAN

Local area network. A communications infrastructure designed to connect a large number of intercommunicating nodes.

LUN Logical unit number. A logical unit of storage on a storage system that is accessed by client systems.

multidrive Having multiple concurrent disk drives working simultaneously.

NAS Network-attached storage. Refers to storage elements that connect to a network and provide file access services to computer systems. A NAS storage element consists of an engine, which implements the file services, and one or more devices on which data is stored.

RAID Redundant array of independent disks. Most RAID techniques work by adding the number of bits in data blocks across multiple disks, the total of which is kept on a separate disk. If one disk fails, the data can be recovered by simply subtracting the sum of the remaining bits from the total stored on the parity disk.

RAID-4 Single parity RAID offers protection against a single disk failure. Data is recreated using parity and data information remains on the unaffected disks in the array.

RAID-DP RAID double-parity uses a second parity disk in addition to the standard parity disk to give a second layer of data protection. With RAID-DP, data can be recovered even if more than one disk fails at the same time. This technology is unique to Network Appliance.

SAN Storage area network. A network whose primary purpose is the transfer of data between computer systems and storage elements. A SAN consists of a communication infrastructure, which provides physical connections, and a management layer, which organizes the connections, storage elements, and computer systems.

SCSI Acronym for Small Computer System Interface.

Serial ATA

Serial Advanced Technology Attachment (ATA) is one of most common storage interfaces used in computers and storage devices.

Shares

A resource such as data or a printer device made available for use by users on other computer systems.

Snapshot copy

An online, read-only copy of an entire file system that protects against accidental deletions or modifications of files without duplicating file contents. Snapshot copies enable users to restore files and to back up the storage system to tape while the storage system is in use.

virtual disk

A set of disk blocks presented to an operating environment as a range of consecutively numbered logical blocks.

Quota

A quota is a set of rules. A quota limits the disk space or number of files, or both that can be used by a user or group.

Explicit quota

If the quota specification references the name or ID of the quota target, the quota is an explicit quota.

Default quota

The disk space used by a quota target can be restricted or tracked even if you do not specify an explicit quota.

Derived quota

If a quota is applied to a target that does not have an explicit quota is called a derived quota.

Tracking quota

A tracking quota tracks the resources that are used by a particular user or group, but does not limit the disk space or number of files.

Initiator group

An initiator group (igroup) is a collection of initiators. An igroup is a list of initiators that can provide access to a one or more LUNs.

MAC address

The Media Access Control (MAC) addresses used to identify a network interface of a LAN are typically based on the manufacturer's serial numbers.

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