

NetApp™ Hardware

S300 Hardware Guide

NetApp, Inc.
495 East Java Drive
Sunnyvale, CA 94089 U.S.A.
Telephone: +1 (408) 822-6000
Fax: +1 (408) 822-4501
Support telephone: +1 (888) 4-NETAPP
Documentation comments: doccomments@netapp.com
Information Web: <http://www.netapp.com>

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Preface

About this guide

This guide describes how to connect, remove, and replace various field-replaceable units and troubleshoot a StoreVault S300 storage system. For more information about installation and network administration, see the *StoreVault Manager 3.2 User's Guide*.

The preface contains the following sections:

- ◆ “Audience” on page v
- ◆ “Formatting conventions” on page v
- ◆ “Keyboard conventions” on page vi
- ◆ “Special messages” on page vi
- ◆ “Other documents” on page vii

Audience

The *StoreVault S300 Hardware Guide* is for system administrators and personnel who are familiar with installing hardware connected to the network. For definitions of terms used in this guide, see the “Glossary” on page 77.

Formatting conventions

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

Formatting convention	Type of information
<i>Italic type</i>	◆ Words or characters that require special attention. ◆ Placeholders for information you must supply. For example, if the guide requires you to enter the <code>fcctest adaptername</code> command, you enter the characters “fcctest” followed by the actual name of the adapter. ◆ Book titles in cross-references.
Monospaced font	◆ Command and daemon names. ◆ Information displayed on the system console or other computer monitors. ◆ The contents of files.

Formatting convention	Type of information
Bold monospaced font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Keyboard conventions

The following table lists different 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.
<i>Enter</i>	Used to refer to the key that generates a carriage return; the key is named Return on some keyboards.
type	Used for information you must type.

Special messages

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 documentation for the StoreVault S300 storage system includes:

- ◆ *StoreVault S300 Quick Start Hardware Guide*
- ◆ *StoreVault Manager 3.2 User's Guide*
- ◆ *StoreVault Manager Quick Start Guide*

Safety Information (Sicherheitshinweise)

Safety rules

All products are Class 1 laser devices, except the NVRAM5 cluster media converter, which is Class 1M. You must follow these safety rules when working with this equipment:

WARNING

Failure to follow these directions could result in bodily harm or death.

- ◆ When using an NVRAM5 cluster media converter, the storage system must be installed in a restricted access location.
- ◆ **Switzerland only—for FAS900, GF900, R200, and C6200 systems:** This equipment relies on fuses/circuit breakers in the building installation for overcurrent protection. Each power supply must receive power from a separately dedicated outlet with a 10A fuse/circuit breaker.
- ◆ When installing disk shelves and a storage system into a movable cabinet or rack, install from the bottom up for best stability.
- ◆ DC-based systems must be installed in a restricted access location and the two input power terminals for the DC power supply must be connected to separate isolated branch circuits.
- ◆ To reduce the risk of personal injury or equipment damage, allow internal components time to cool before touching them and ensure that the equipment is properly supported or braced when installing options.
- ◆ This equipment is designed for connection to a grounded outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.
- ◆ This equipment has one or more replaceable batteries. There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

For units with multiple power cords

If your storage system or disk shelf has multiple power cords and you need to turn the unit off, heed the following warning:

WARNING

This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing.

Sicherheitsvorgaben

Alle Produkte sind Lasergeräte der Klasse 1, mit Ausnahme des NVRAM5 Cluster-Medienkonverters, der in Klasse 1M fällt. Beim Einsatz dieser Geräte sind die Sicherheitsvorschriften zu beachten:

Vorsicht

Nichtbeachtung dieser Vorschriften kann zu Verletzungen oder Tod führen.

- ◆ Bei der Verwendung eines NVRAM5 Cluster-Medienkonverters muss das Speichersystem an einem Standort mit beschränktem Zugriff installiert werden.
- ◆ **Nur für die Schweiz - Systeme FAS900, GF900, R200 und C6200:**
Diese Geräte erfordern den Festeinbau von Sicherungen zum Überstromschutz. Jeder Netzanschluss muss mit Strom aus getrennten, speziell für diesen Zweck vorgesehenen Steckdosen versorgt werden, die jeweils mit einer 10A-Sicherung geschützt sind.
- ◆ Werden die Plattenregale und das Speichersystem in einen beweglichen Schrank oder Turm eingebaut, ist wegen der höheren Stabilität der Einbau von unten nach oben vorzunehmen.
- ◆ Gleichstrom-Systeme müssen an Betriebsstätte mit beschränktem Zutritt installiert sein und die beiden Eingangsstromklemmen für das Gleichstrom-Netzteil müssen an separate und isolierte Abzweigungen angeschlossen sein.
- ◆ Zum Schutz vor Körperverletzung oder Sachschäden am Gerät lassen Sie die inneren Bauteile stets vor dem Berühren abkühlen. Sorgen Sie dafür, dass das Gerät richtig abgestützt ist oder fest aufrecht steht, bevor Sie neues Zubehör einbauen.
- ◆ Dieses Gerät ist für die Einspeisung aus einer geerdeten Netzverbindung ausgelegt. Der Netzstecker mit Erdungsvorrichtung ist ein wichtiger Sicherheitsschutz. Zum Schutz vor elektrischem Schlag oder Sachschäden am Gerät die Erdung nicht abschalten.
- ◆ Das Gerät ist mit einer oder mehreren auswechselbaren Batterien ausgestattet. Bei unsachgemäßem Auswechseln der Batterie besteht Explosionsgefahr. Batterien nur mit dem vom Hersteller empfohlenen Typ oder entsprechenden Typen ersetzen. Gebrauchte Batterien sind gemäß den Anweisungen des Herstellers zu entsorgen.

Für Geräte mit mehrfachen Netzan- schlussleitungen

Wenn Ihr Speichersystem oder Plattenregal über mehrere Stromkabel verfügt und Sie die Einheit ausschalten müssen, folgenden Warnhinweis beachten:

ACHTUNG

**Gerät besitzt zwei Netzan-
schlussleitungen. Vor Wartung alle Anschlüsse
vom Netz trennen.**

About this chapter This chapter gives an overview of the StoreVault S300 storage system.

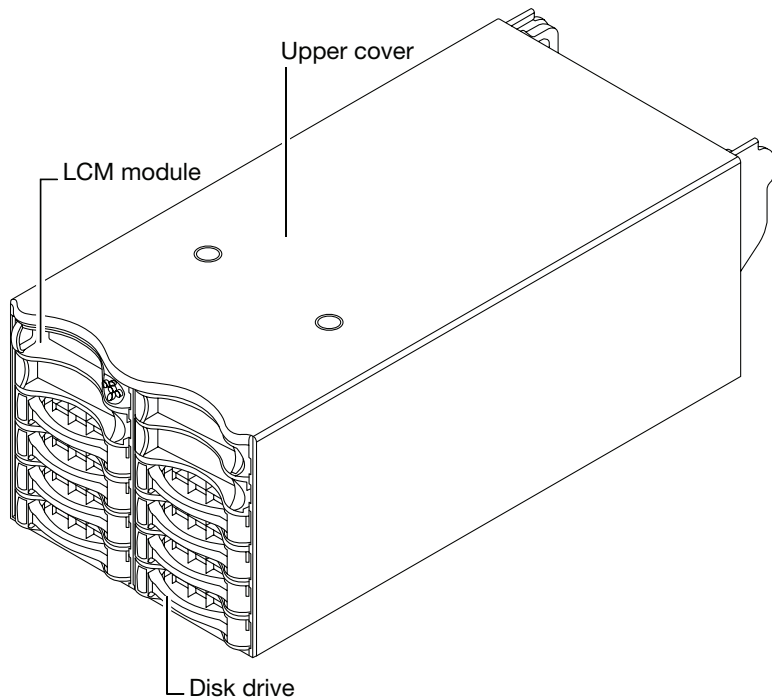
Topics in this chapter This chapter discusses the following topics:

- ◆ “[An overview of the StoreVault S300](#)” on page 2
- ◆ “[Primary storage](#)” on page 6
- ◆ “[StoreVault S300 components](#)” on page 7
- ◆ “[System requirements](#)” on page 8

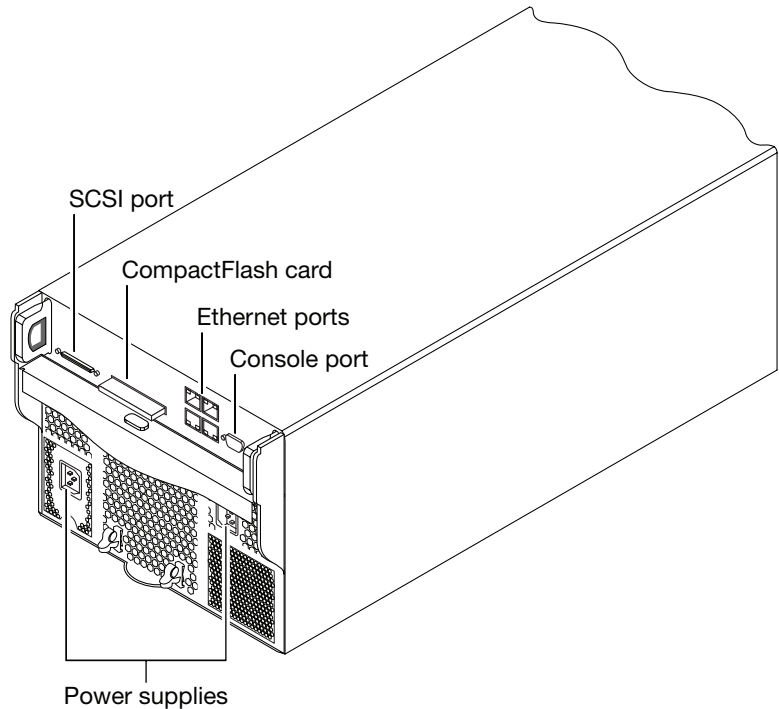
An overview of the StoreVault S300

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 part 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 proven RAID4 and RAID-DP technology for unparalleled data protection. The front LCM screen displays the status of your storage system and information during the boot process. To protect your valuable data disks, the StoreVault S300 storage system comes with a theft prevention mechanism. For more information, see “[StoreVault S300 theft prevention mechanism](#)” on page 4



StoreVault S300 rear view: The rear part of the StoreVault S300 storage system has a control module and dual power supplies. The dual power supplies provide redundant electricity 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, four Gigabit network interface ports: e0a, e0b, e0c, and e0d. These network ports support the network failover mechanism and load balancing, a CompactFlash® card of 512 MB for firmware, and a console port. The console port enables connection to the StoreVault S300 for diagnostics. The StoreVault S300 runs on the Data ONTAP® 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. The disk drive lock can be used to lock disk drives and LCM module. The left side of 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.

Note

Before following any field replacement procedure (FRU), you must unlock the storage system using the key.

StoreVault S300 management application

StoreVault Manager is management software for running your StoreVault S300.

StoreVault Manager is a graphical user interface (GUI) based software for managing StoreVault S300. Using StoreVault Manager, you can perform the following functions:

- ◆ Manage StoreVault S300 as well other StoreVault model storage systems
- ◆ Set up shared directories on the network
- ◆ Add storage capacity
- ◆ Configure storage for specific applications
- ◆ Set quota rules for users and groups
- ◆ Create application-centric logical unit numbers (LUNs)
- ◆ Schedule Snapshots™ copies
- ◆ Back up data onto a tape device
- ◆ Automatically monitor the overall health of the storage system

The StoreVault S300 provides unparalleled data-protection features based on proven enterprise-level technology from NetApp®.

For more information about StoreVault Manager, see the *StoreVault Manager 3.2 User's Guide*.

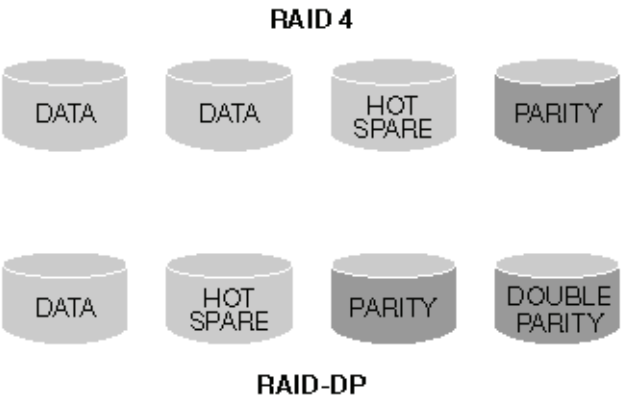
What RAID is

The StoreVault S300 storage system uses a RAID technology.

The following table describes the two levels of RAID that are supported by the StoreVault S300 storage system.

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	Double-parity RAID 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 illustrates RAID4 and RAID-DP.



Primary storage

The StoreVault S300 storage system has a capacity for eight disk drives. Each of the disk drives can be configured as a primary storage or spare disk drive. The following table explains the configuration types.

Drive type	Description
Primary storage drive	A primary storage drive can store data or parity information. This drive is considered as a part of the RAID group of active drives.
Spare drive	A spare drive is a working drive that you can for one of the following tasks: ◆ Adding to the RAID group to increase the overall storage capacity ◆ Replacing a drive that has fails

Note

You should maintain at least one spare drive at all times.

StoreVault S300 components

The following tables give details about StoreVault S300 hardware components.

Description	Function
Disk drives	The StoreVault S300 storage system supports a maximum of eight 250-GB to 500-GB SATA II. For information about removing and installing disk drive, see “Removing a disk drive” on page 25 “Installing a disk drive” on page 28.
LCM module	The LCM module displays the current system status information and booting information. For more information, see “Replacing the Liquid Crystal Monitor Module” on page 29.
SATA Backplane	SATA backplane is connected to the disk drives, power supply and control module. For more information, see “Replacing the SATA Backplane” on page 41.
Control module	Control module holds important components. For more information, see “Removing a control module” on page 34.
Power supply	100-127/200-240V~ 6/3A 50-60 Hz Dual power supplies for redundant power supply to the storage system. For more information, see “Removing a power supply” on page 38. “Replacing the Power Supply” on page 37.
StoreVault S300 chassis	StoreVault S300 half 4U chassis can be mounted on a rack. For more information, see “Chassis replacement” on page 50.
SCSI card	One 68-pin VHDCI for LVD SCSI devices enables in tape backup.
Network interface	4 Gigabit on board 10/100/1000 BT NICs.

Description	Function
Fan assembly	The fan assembly provides cooling for StoreVault S300 components and control module. Fan assembly is the part of power supply.
CompactFlash card	512-MB CompactFlash provides operating system redundancy.
NVMEM card	NVMEM, 1 GB, the NVMEM battery is inside LCM module that provides a 72-hour battery backup for data and file system integrity left in cache from an unexpected power failure.
Console port	Using the console port and console cable, you can connect to the StoreVault S300 for diagnostics.

System requirements

For the StoreVault S300 storage system environmental requirements, see [“Electrical and Environmental Specifications”](#) on page 67.

Software features

The following table provides details about StoreVault Manager software features.

Type	Description
Data ONTAP operating system	StoreVault S300 runs on the Data ONTAP operating system for simplicity and reliability.
Windows-based management application	StoreVault Manager is supported on Windows® 2003 Server, and Windows XP. StoreVault Manager runs on the Windows client to easily configure and manage your data storage needs on the StoreVault S300 storage system.
Data protection	StoreVault Manager Snapshot technology for data protection. Battery-powered NVMEM maintains user data in the event of total power failure and ensures file system integrity. SnapRestore® (StoreVault Edition) provides complete system restore.
Snapshot technology	Snapshot copy on the StoreVault S300 storage system is a virtual image of the set of files and directories as they were at a specific time and allows easy recovery of data. You can schedule Snapshot copies and you can also take them manually as needed.
StoreVault Replication	StoreVault Replication enables scheduled replication of file or block-based data from one StoreVault S300 storage system to another StoreVault storage system for disaster recovery or data distribution. Data is available in read-only form on the destination storage system.
NDMP	Network Data Management Protocol; used for data backup.

AutoSupport Diagnostics E-mails (ASUP)	The StoreVault system automatically sends e-mail messages to the administrator and technical support if the StoreVault system experiences problems.
Cross-protocol	The StoreVault S300 storage system enables a Windows client to access the UNIX® machine data and a UNIX client to access the Windows machine data with cross-protocol support. You can share or export directories existing in default /vol/shares or /vol/exports directory paths. For a Windows client to access a UNIX security style directory, you need to 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 in the directory. For a UNIX client to access a Windows security style directory, you need to 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 in the directory.
Network Time Protocol (NTP) support	The NTP feature synchronizes the date and time of StoreVault S300 with the NTP server. You need to provide the NTP server name or IP address and the synchronization occurs automatically.

About this chapter

This chapter describes the following:

- ◆ Components included with the StoreVault S300 storage system shipment
- ◆ Tools and equipment required for installation
- ◆ Physical characteristics, such as height and weight
- ◆ Electrical, environmental, and space requirements

Topics in this chapter

This chapter discusses the following topics:

- ◆ [“Required tools, equipment, and documentation”](#) on page 12
- ◆ [“Dimensions and environmental parameters”](#) on page 14

Required tools, equipment, and documentation

Equipment received with the StoreVault S300

The StoreVault S300 storage system shipment includes the following components:

- ◆ One StoreVault S300 storage system
- ◆ Two power cables
- ◆ Two network cables
- ◆ Rack mount kit for installing two StoreVault S300 storage systems (optional)
- ◆ Console cable for advanced diagnostics
- ◆ StoreVault S300 documentation

Note

Use the console cable only on instructions from the technical support team.

Required tools

To install the StoreVault S300 components, you need the following tools and equipment:

- ◆ Antistatic wrist strap with grounding leash or wireless wrist strap or pair of ESD protective gloves

CAUTION

The StoreVault S300 storage system has electronic components that are sensitive to static electricity. Static discharge from your clothing or other fixtures can damage these components. It is recommended that you wear an antistatic wrist strap and a grounding leash to prevent static discharge.

Required configuration equipment

To configure the storage system, you need the following equipment:

- ◆ Windows workstation connected to the network
- ◆ StoreVault Manager software (included)
- ◆ License keys (included)

Required documentation

The following table lists the documents that you need to manage the StoreVault S300 storage system.

Document name	When to use
<i>StoreVault Manager Quick Start Guide</i>	Use this guide to install the StoreVault Manager software and setup for your StoreVault S300.
<i>StoreVault S300 Hardware Guide</i>	Use this guide to install and connect the StoreVault S300 storage system.
<i>StoreVault Manager 3.2 User's Guide</i>	Use this guide to install the StoreVault Manager software, and administer, manage, and optimize the StoreVault S300.

Dimensions and environmental parameters

Installation considerations

You need to consider the following elements:

- ◆ Physical characteristics, such as height and weight
- ◆ Space requirements
- ◆ Environmental requirements, such as temperature and humidity
- ◆ Electrical requirements

Physical characteristics

The following table lists the physical characteristics of the StoreVault S300.

Characteristic	U.S.	Metric
Height	6.85 in.	17.4 cm
Width	8.81 in.	22.4 cm
Depth	19.44 in.	49.4 cm
Weight (fully loaded)	41.88 lb	19 kg

Space requirements

The following table lists the recommended minimum clearances for the StoreVault S300.

Recommended minimum clearance	U.S.	Metric
Front clearance	10.55 in.	26.8 cm.
Rear clearance	16.3 in.	41.4 cm.

Environmental requirements

The following table lists the environmental ranges for operation and storage for StoreVault S300.

Environmental condition	Operating range	Storage range
Temperature	0° C to 40° C 32° F to 104° F	-10° C to 65° C -40° F to 149° F
Relative humidity, non-condensing	20% to 85%	20% to 95%

Environmental stress specifications

The following table lists the environmental stress specifications for StoreVault S300.

Condition	Requirement
Operating shock	5g 10 ms
Operating vibration	0.21g 5 to 500 Hz random
Altitude	0 to 10,000 ft (3,048m)

Electrical ratings

The following table lists the AC power ratings for StoreVault S300.

Condition	Requirement
AC Power/ Maximum current	100-127/200-240V~ 6/3A 50-60Hz
Frequency	50 to 60 Hz

Power consumption ratings

The following table lists the power consumption rating for the StoreVault S300.

Power	Rating
Heat dissipation BTU/hr	1,706 BTU fully loaded

About this chapter

This chapter describes how to connect the StoreVault S300 storage system to an Ethernet network and AC power source.

Topics in this chapter

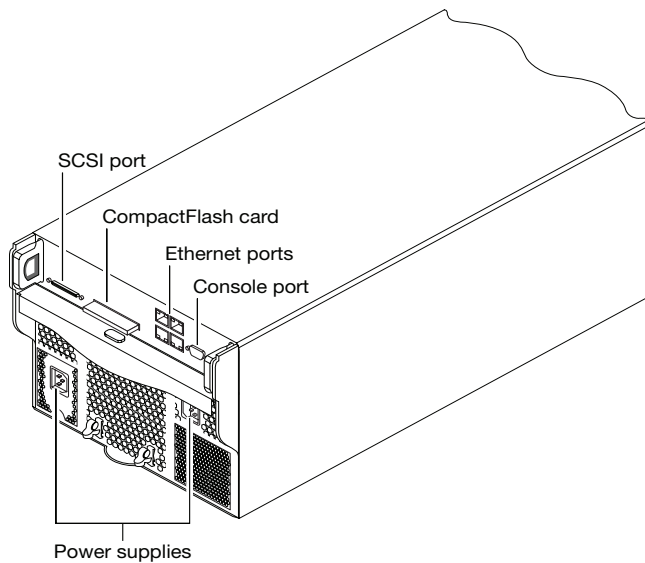
This chapter discusses the following topics:

- ◆ “[Locating the appropriate connections](#)” on page 18
- ◆ “[Connecting to an Ethernet network](#)” on page 19
- ◆ “[Connecting to an Ethernet port using copper cabling](#)” on page 20
- ◆ “[Connecting to an AC power source](#)” on page 21

Locating the appropriate connections

Storage system connection ports

The StoreVault S300 rear part has the network and power connection ports. The rear part has a control module and power supply. The following illustration gives an overview of onboard ports and power connections.



The control module has the following ports:

- ◆ Four NIC ports—for connecting to the network
- ◆ One SCSI port—for connecting third-party backup devices
- ◆ One console port—for connecting the StoreVault S300 for diagnostics

The power supply has two power receptacles, one on either side of the power supply.

Connecting to an Ethernet network

Supported Ethernet NICs The StoreVault S300 storage system control module has four onboard 10/100/1000 TX Ethernet ports: e0a, e0b, e0c, and e0d. You can group the NIC ports virtually using StoreVault Manager for the failover mechanism and load balancing.

Supported Ethernet connections Use the following table to determine the Ethernet connection and cabling requirements of your Ethernet NICs.

Attention —————
Do not exceed the maximum cable length specification.

Ethernet type	Supported ports	Cabling requirements	Maximum distance
10Base-T/ 100Base-TX/1000Base-T Copper	◆ Dual	Category 5 unshielded twisted-pair (UTP) copper cable with RJ-45 connectors	100m
	◆ Quad ◆ Onboard	Category 5e or category 6 UTP copper cable with RJ-45 connectors	100m

Connecting to an Ethernet port using copper cabling

Connecting to a multiport GbE NIC

To connect to the onboard Ethernet ports, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap and grounding leash.
2	Ensure that the storage system is turned off.
3	Push the RJ-45 connector into the Ethernet port until it clicks and locks into place. Repeat this step to connect the other network connectors to the other ports.

Connecting to an AC power source

About the power supplies

The StoreVault S300 power supply unit (PSU) is fitted with dual power supplies and a fan assembly. Each power supply has its own AC power cord.

Note _____
Ensure that you have separate circuit breakers for each power supply for redundancy.

The power-on sequence for a new installation automatically checks all connections to the StoreVault S300 storage system.

Note _____
For more information about connecting the cables to the StoreVault S300 storage system, see the *StoreVault S300 Hardware Quick Start Guide*.

Connecting your storage system power

To connect your StoreVault S300 to an AC power source and power it on, complete the following steps.

Step	Action
1	Plug the first power cord socket end into the left power receptacle of the power supply.
2	Plug the second power cord socket end into the right power receptacle of the power supply.
3	Plug the other end of each power cord into a grounded AC power source. Attention _____ To obtain power supply redundancy, you must connect the second power supply to a separate AC circuit.
4	The StoreVault S300 starts after 10 seconds.

About this chapter

This chapter guides you through the process of removing and replacing disk drives in the StoreVault S300 storage system.

Topics in this chapter

This chapter discusses the following topics:

- ◆ “[About disk drives](#)” on page 24
- ◆ “[Proper drive handling](#)” on page 24
- ◆ “[Removing a disk drive](#)” on page 25
- ◆ “[Installing a disk drive](#)” on page 28

About disk drives

The disk drives are fixed to a disk carrier. The disk carrier has a handle with a clasp so that you can replace the disk drives. Each disk drive contains two light emitting diodes (LED) on the left side of disk carrier. The drive LEDs indicate the drive status. All LEDs light up when the power cord is connected to the power supply after the StoreVault S300 starts booting. The drive status LED indicator shows the disk drive activity. The rear portion of the disk drive is connected to the SATA backplane. The LCM screen on the front side of the storage system displays the disk drive status.

Proper drive handling

While handling a new or replacement disk drive, observe the following precautions to help ensure that your disk drive is not accidentally damaged:

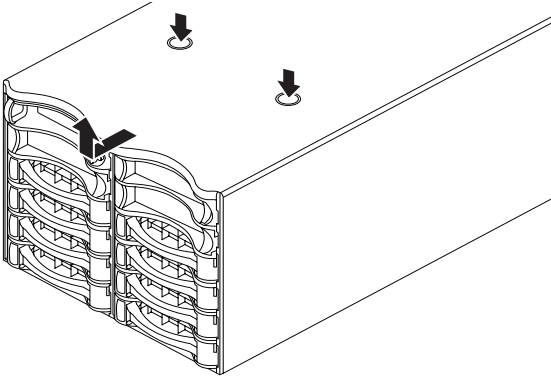
- ◆ Do not drop or jar the disk drive.
- ◆ Keep the disk drive in the protective antistatic and packing container until ready to install.
- ◆ Protect the disk drive from static charge by wearing a grounded wrist strap.
- ◆ Handle the disk drive by the edges of the frame.
- ◆ Do not apply pressure or attach labels to the circuit board or the top cover of the disk drive.

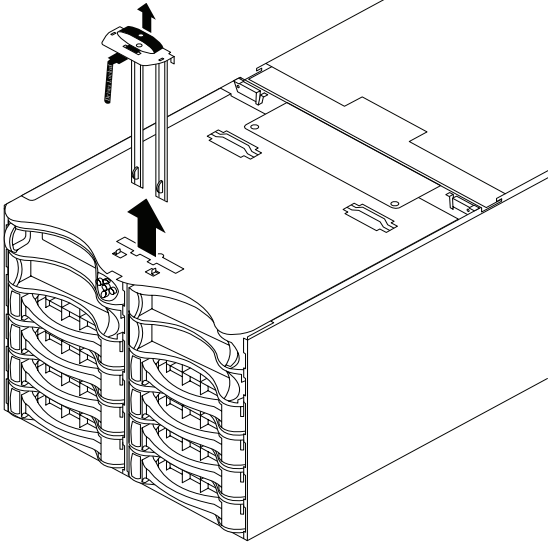
Removing a disk drive

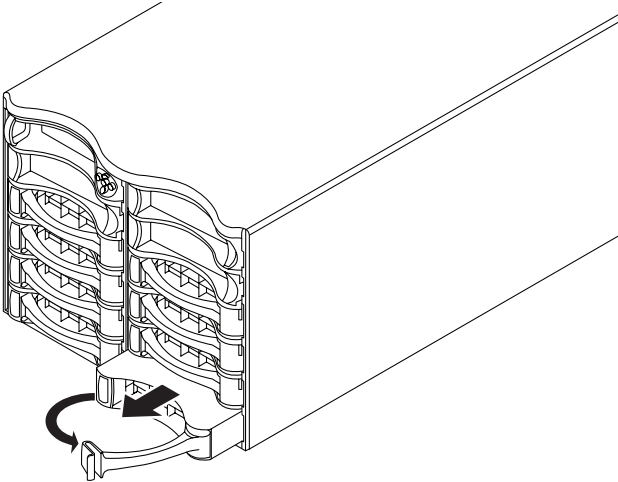
Procedure To remove a disk drive, complete the following steps. The time required to install a disk drive is approximately five minutes.

Attention When removing a disk, use two hands to support its weight.

Note Because the disk drives are hot-swappable you do not need to power down the StoreVault S300 storage system while you complete this procedure.

Step	Action
1	Put on the antistatic wrist strap.
2	If you are removing a failed disk, locate the failed disk from the StoreVault Manager main screen drives section represented red 'X' icon. 
3	Press the two buttons on the top cover of the StoreVault S300 system with your thumb. Slightly slide the cover forward and lift it up to remove. 

Step	Action
4	Pull up the disk drive lock.  The diagram shows a perspective view of a server chassis with multiple drive bays. A vertical lock mechanism is shown in the process of being pulled up. A black arrow points upwards from the base of the lock, and another black arrow points upwards from the top handle of the lock. The lock is currently in a partially extended position.
5	Press the disk carrier clasp and pull the handle of the disk carrier.

Step	Action
6	Pull the disk drive toward you until the disk is free from the bay.  Attention If you have any empty disk drive bays, make sure to install the drive bay cover over the empty slot to ensure proper cooling.

Installing a disk drive

Procedure

To install a disk drive, complete the following steps. The time required is approximately five minutes.

Step	Action
1	Remove the new disk drive from the antistatic bag.
2	Align the disk drive properly in the drive bay and gently push it in until it stops. Ensure that the disk drive connects with the backplane.
3	Push the drive carrier handle until the clasp fits properly. Attention _____ Do not slam the drive carrier into place. _____
4	Replace the disk drive lock.
5	Align the upper cover on the chassis groove and push the cover backward.
6	Ensure normal disk operation by checking the disk LEDs.

About this chapter

Replacing the liquid crystal monitor (LCM) in the StoreVault S300 storage system consists of removing the old LCM module and installing the replacement LCM module.

CAUTION

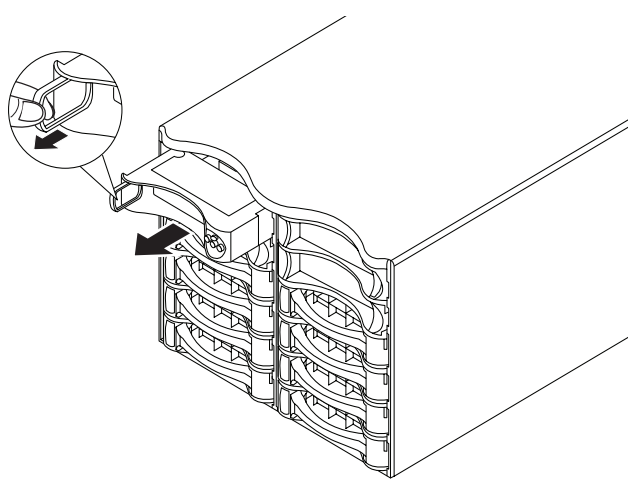
It is a disruptive operation to replace a component that is not redundant and not hot-swappable. Never attempt a disruptive operation with the StoreVault S300 storage system powered on.

Attention

NVMEM battery is inside LCM module that provides a 72-hour battery backup for data from an unexpected power failure. Removing LCM module disconnect the NVMEM battery and lead to loss of cached data, thus should not be removed in case the battery back-up is required.

Procedure

To replace an LCM module, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap.
2	Shut down the StoreVault S300 storage system using StoreVault Manager.
3	Power off the StoreVault S300 storage system by simultaneously pressing the LCM left and right buttons and then pressing the LCM middle button.
4	Press the two buttons on the top cover of the StoreVault system with your thumb. Slightly slide the cover forward and lift it up to remove.
5	Pull up the disk drive lock.
6	Pull out the LCM clasp, hold the LCM module with both hands, and gently pull out the module from the chassis. 
7	Carefully unpack the new LCM module from the antistatic bag.
8	Properly align the new LCM module into the bay and push the LCM module until it stops. Ensure that the LCM module connects to the backplane.
9	Push the clasp inside until it clicks.

Step	Action
10	Replace the disk drive lock.
11	Align the upper cover on the chassis groove and push the cover backwards.
12	Ensure that the power cord is connected to the StoreVault S300 power supplies, then power on the StoreVault S300 storage system. To power on, press the middle button of the LCM module.

About this chapter

Replacing a control module in the StoreVault S300 storage system consists of the following procedures:

- ❖ [“Removing a control module”](#) on page 34
- ❖ [“Installing a control module”](#) on page 36

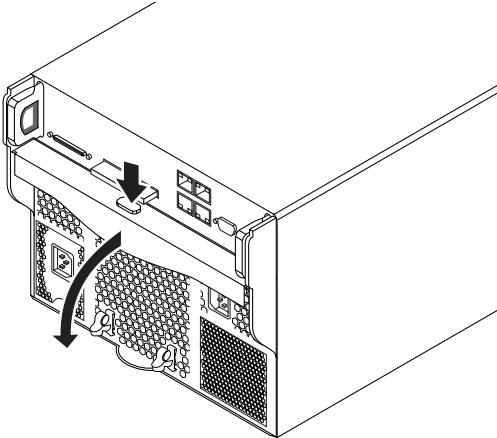
CAUTION

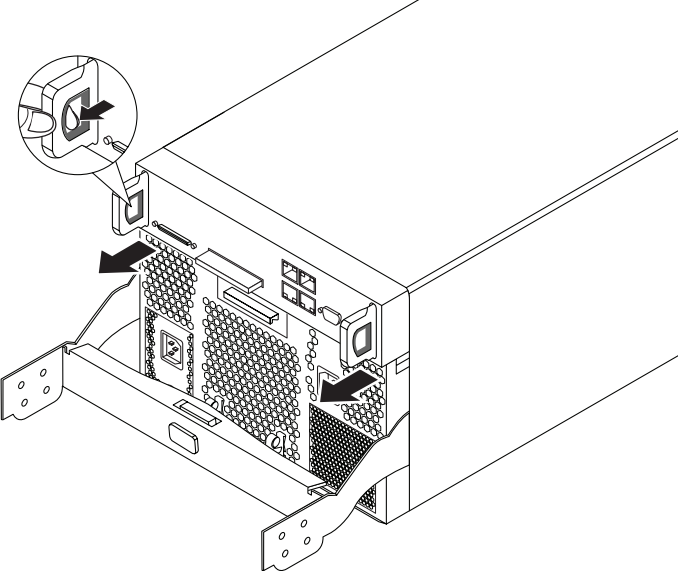
It is a disruptive operation to replace a component that is not redundant and not hot-swappable. Never attempt a disruptive operation with the StoreVault S300 storage system powered on.

Removing a control module

Procedure

To a remove a control module, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap.
2	Shut down the StoreVault S300 storage system from StoreVault Manager.
3	Power off the StoreVault S300 storage system by simultaneously pressing the LCM left and right buttons and then pressing the LCM middle button.
4	Disconnect the power cord from the AC source.
5	Disconnect the two power cords from the power supply.
6	Remove all the network cables from the NIC ports.
7	Disconnect any third-party tape device connected to the control module.
8	Press the button on the power supply handle to pull down the handle. 

Step	Action
9	Hold the right and left clasps of the control module, as shown in the following illustration. Press the clasp buttons with your index finger to pull out the control module. 

Installing a control module

Procedure

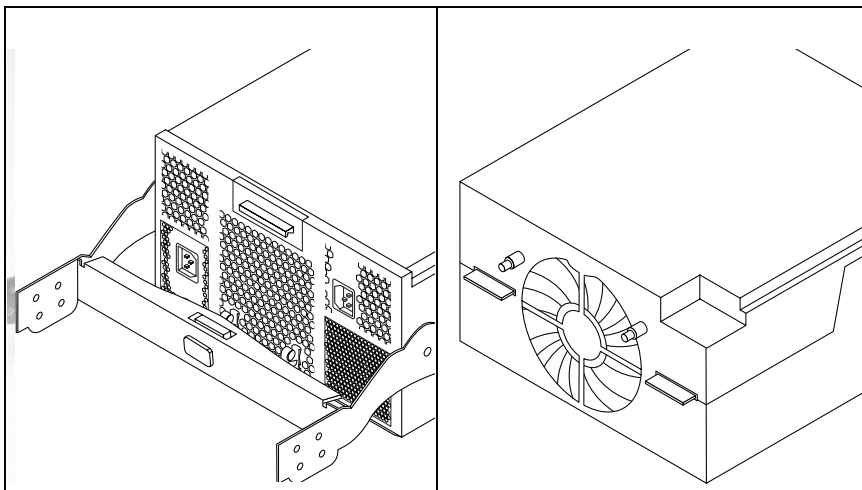
To install a control module, complete the following steps.

Step	Action
1	Unpack the new control module from the antistatic bag.
2	Properly align the control module into the chassis.
3	Gently push the control module into the chassis by holding the two clasps.
4	Pull the power supply handle up.
5	Connect the network cables.
6	Plug the power cord into the two power supplies on the rear part of StoreVault S300.
7	Power on the StoreVault system by pressing the middle button on the LCM module.
8	Ensure normal operation of the StoreVault S300 by logging into the StoreVault Manager.

About this chapter

Replacing the power supply in the StoreVault S300 storage system consists of the following procedures:

- ❖ “[Removing a power supply](#)” on page 38
- ❖ “[Installing a power supply](#)” on page 40



Removing a power supply

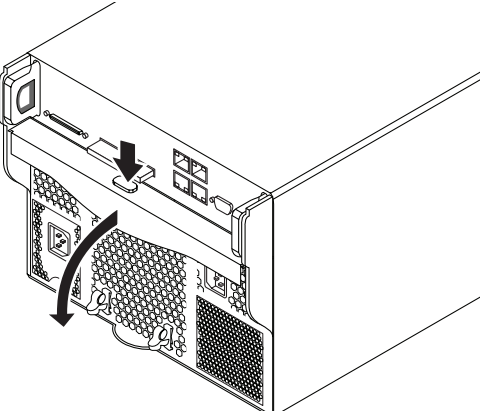
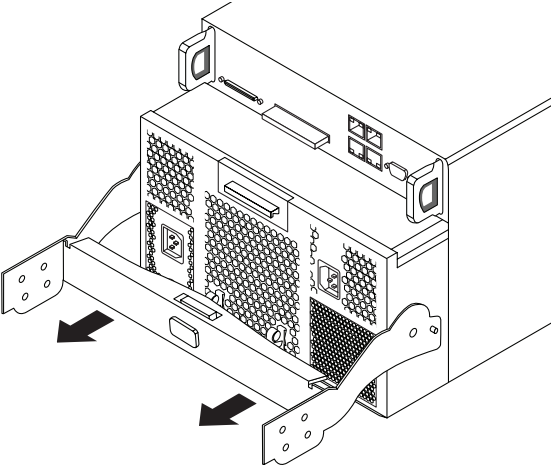
Procedure

To remove the power supply, complete the following steps.

CAUTION _____
The power supply is heavy. Use both hands when removing it from the chassis to avoid injury.

Note _____
The power supply module includes the fan assembly also. Failure of fan assembly requires replacing the power supply module.

Step	Action
1	Put on the antistatic wrist strap.
2	Shut down the StoreVault S300 storage system from the StoreVault Manager.
3	Power off the StoreVault S300 storage system by simultaneously pressing the LCM left and right buttons and then pressing the LCM middle button.
4	Disconnect the two power cords from the grounded AC source.
5	Pull out the two power cords from the power supplies.

Step	Action
6	Press the button on the power supply handle to pull down the handle. 
7	Holding the handle, pull the power supply toward you using both hands. 

Installing a power supply

Procedure

Complete the following steps to install a power supply.

Step	Action
1	Put on the antistatic wrist strap and grounding leash.
2	Properly align the power supply into the StoreVault S300 storage system chassis. Support the bottom of the power supply with your other hand.
3	Gently push the power supplies inside the chassis using both hands.
4	Push the power supply handle up and ensure that the button on the handle fits properly.
5	Plug in the two power cord to the power supplies.
6	Connect the power cords to the grounded AC power source.
7	Power on the StoreVault S300 and ensure normal system operation.

About this chapter

Replacing the SATA backplane in the StoreVault S300 storage system consists of the following procedures:

- ❖ [“Removing a SATA backplane”](#) on page 42
- ❖ [“Installing a SATA backplane”](#) on page 46

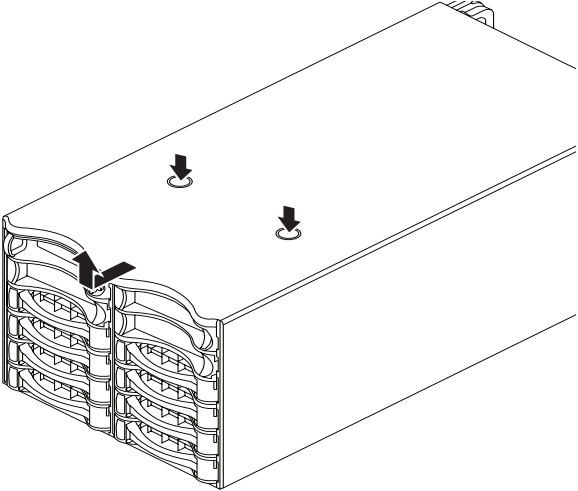
CAUTION

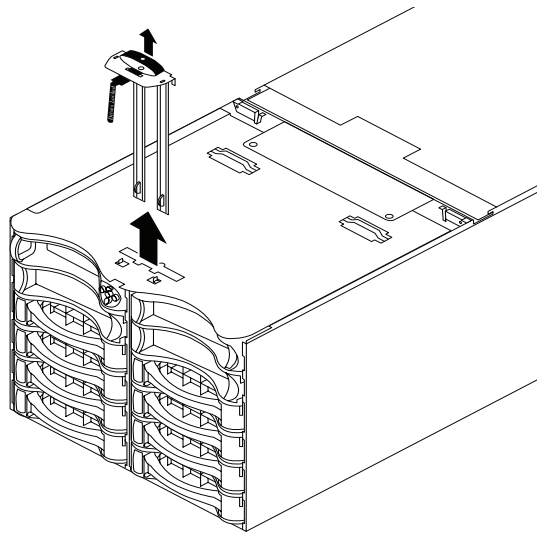
It is a disruptive operation to replace a component that is not redundant and not hot-swappable. Never attempt a disruptive operation with the StoreVault S300 storage system powered on.

Removing a SATA backplane

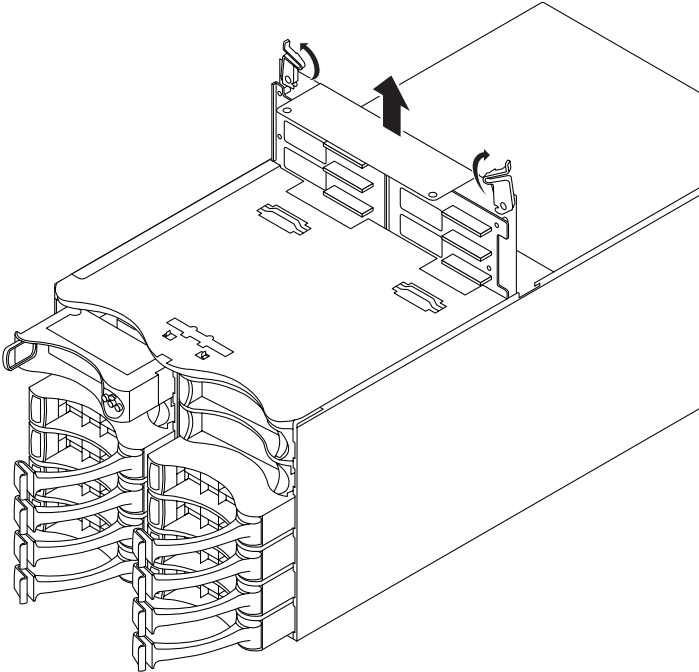
Procedure

To remove the SATA backplane, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap.
2	Shut down the StoreVault S300 storage system from StoreVault Manager.
3	Power off the StoreVault S300 storage system by simultaneously pressing the LCM left and right buttons and then pressing the LCM middle button.
4	Press the two buttons on the top cover of the StoreVault system with your thumb. Slightly slide the cover forward and lift it up to remove. 

Step	Action
5	Pull up the disk drive lock.  The diagram illustrates a server chassis with multiple drive bays. A vertical lock mechanism is shown being pulled upwards from the front of the chassis. Two black arrows indicate the upward direction of movement: one arrow points upwards from the base of the lock, and another arrow points upwards from the top of the lock's handle. The lock is currently in a partially extended position, and the arrows indicate it should be pulled further up to the top of its travel.

Step	Action
6	Remove the following components before removing the SATA backplane. a. Remove all disk drives. To remove disk drives, see “Removing a disk drive” on page 25. b. Remove LCM module. To remove LCM module, see “Replacing the Liquid Crystal Monitor Module” on page 29. c. Remove the power supply. To remove power supply, see “Removing a power supply” on page 38. d. Remove the control module To remove control module, see “Removing a control module” on page 34. Note _____ You must remove all the disk drives. _____

Step	Action
7	Press the two clips of the SATA backplane and gently pull them outward. 
8	Gently lift the SATA backplane up and out.

Installing a SATA backplane

Procedure

To install the SATA backplane, complete the following steps.

Step	Action
1	Unpack the new SATA backplane from the antistatic bag.
2	Position the new SATA backplane into the chassis vertically with the two clips facing up.
3	Gently push the SATA backplane into the chassis.
4	Press the two clips inside and ensure that the clips are locked properly.
5	Install all the components you removed in Step 5 of removing a SATA backplane. Replace the following components after replacing the SATA backplane. a. Install disk drives To install disk drives, see “Installing a disk drive” on page 28. b. Install LCM module To install LCM module, see “Replacing the Liquid Crystal Monitor Module” on page 29. c. Install control module To install Control module, see “Removing a control module” on page 34. d. Install Power supply To install Power supply, see “Installing a power supply” on page 40.
6	Replace the disk drive lock.
7	Place the upper cover on the chassis and slide it backward.

Step	Action
8	Plug the power cord to the two power supplies on the rear part of StoreVault S300.
9	Connect the network cables.
10	Power on the StoreVault system by pressing the enter button (middle button) on the LCM module.

About this chapter

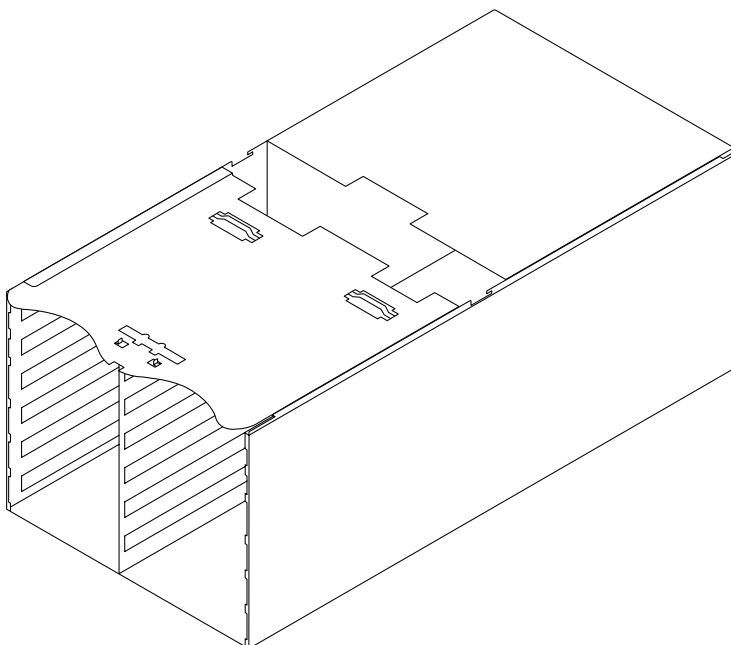
This chapter guides you through the process of replacing the StoreVault S300 storage system chassis. This is primarily a hardware component exchange. This procedure preserves all your data, system, and network settings. The chassis has software license keys that are associated with the system chassis serial number.

CAUTION

It is a disruptive operation to replace a component that is not redundant and not hot-swappable. Never attempt a disruptive operation with the StoreVault S300 storage system powered on.

Chassis replacement

The following figure shows the StoreVault S300 storage system chassis.



Note

The StoreVault S300 storage system software is dependent on the serial number of the chassis unit. This dependency requires additional steps to update the serial number in the StoreVault S300 software.

Prerequisites

- ◆ Plan a sufficient downtime.
- ◆ Back up all the important data from the StoreVault S300 storage system.
- ◆ Note the StoreVault S300 IP address from the StoreVault Manager or from DNS/DHCP records.
- ◆ New license key.

Note

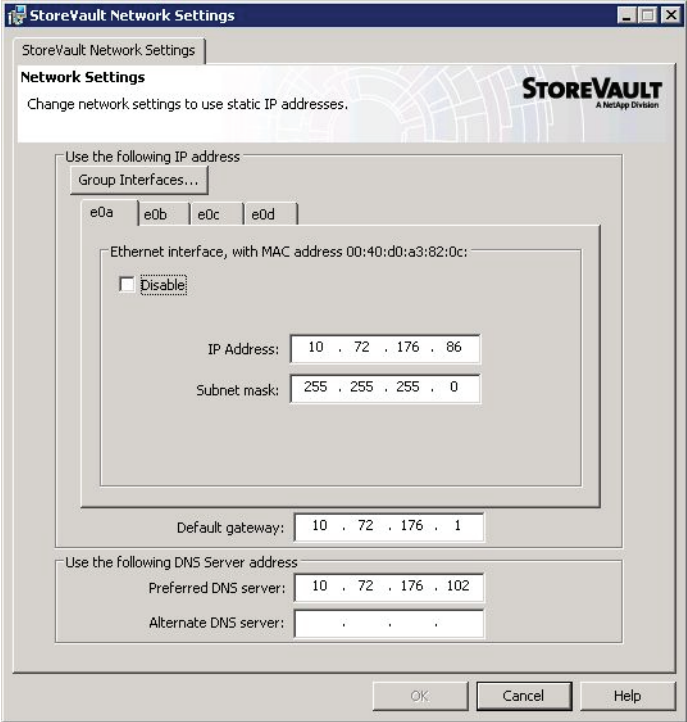
The technical support team sends a new license key through an e-mail for the new chassis. Contact the technical support if you have not received the new license key. For more information, see “[Technical support](#)” on page 57.

Note

The amount of time required to perform this procedure varies depending on the complexity of the network, server, and application environment.

Procedure

To replace the StoreVault S300 chassis, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap and grounding leash.
2	Log in to StoreVault Manager software.
3	Click Network on the System menu. StoreVault Network Settings dialog box appears.
4	In the Network Settings dialog box note the StoreVault S300 IP address or DNS/DHCP records.  Note Ensure that none of the users and servers are connected to the StoreVault S300 storage system.

Step	Action
5	Shut down the StoreVault S300 storage system from StoreVault Manager.
6	Power off the StoreVault S300 storage system by simultaneously pressing the LCM left and right buttons and then pressing the LCM middle button.
7	Unpack the new StoreVault S300 chassis from the carton.
8	In the order specified, remove the following components from the existing defective StoreVault S300 storage system and place them in the new chassis. a. Remove all disk drives. To remove disk drives, see “Removing a disk drive” on page 25. b. Remove LCM module. To remove LCM module, see “Replacing the Liquid Crystal Monitor Module” on page 29. c. Remove the power supply. To remove power supply, see “Removing a power supply” on page 38. d. Remove the control module To remove control module, see “Removing a control module” on page 34. Attention— Remove the CompactFlash card from the new chassis, if installed, and insert the existing CompactFlash card that you removed from the old StoreVault S300 storage system.
9	Install the SATA backplane. For replacing procedure, see “ Installing a SATA backplane ” on page 46.

Step	Action
10	Install the control module. For the installation procedure, see “Installing a control module” on page 36.
11	Install the power supplies. For the installation procedure, see “Installing a power supply” on page 40.
12	Install all the disk drives removed from the defective StoreVault S300 into new chassis one-by-one. For the installation procedure, see “Installing a disk drive” on page 28.
13	Replace the LCM module into the new chassis. For replacing procedure, see “Replacing the Liquid Crystal Monitor Module” on page 29.
14	Place the upper cover on the chassis and slide it backward.
15	Plug the power cable into the power socket and power on the StoreVault S300 storage system. For more information, see “Connecting to an AC power source” on page 21.
16	Connect all network cables to the Ethernet ports on the control module.
17	Log in to StoreVault Manager and confirm that the software licenses are correct.
18	Confirm that no errors are shown in the System Status pane of the StoreVault Manager main screen. Contact technical support team for assistance if the system shows errors after booting. For Support information see, “How to get help” on page 56.
19	Reconnect all the clients and servers to your StoreVault S300 storage system.

About this chapter

This chapter provides a reference to the error messages that you might encounter while installing, configuring, and using a StoreVault S300 storage system.

Topics in this chapter

This chapter discusses the following topics:

- ◆ [“How to get help”](#) on page 56
- ◆ [“Where to go next”](#) on page 58

How to get help

StoreVault Manager Status Indications

The StoreVault Manager software indicates the status of the StoreVault S300 storage system disk drives with the following indications:

Icon	Symbol	Indication
	Green up arrow	Normal condition of an active data disk
	Green S	Spare drive
	Green P	Parity drive
	Green DP	Double parity drive
	Yellow up arrow	Drive rebuilding or RAID DP drive calculating—Warning status
	Red cross	Component failed
	Gray E	Missing or uninstalled component
	Orange up arrow	Foreign disk drive installed from another StoreVault S300

Moving the mouse over the icon will give you more information on that specific component. For more information, see the *StoreVault Manager 3.2 User's Guide*

Technical support

Support for StoreVault S300 is available through the following resources:

- ◆ Web site: <http://now.netapp.com>
- ◆ Support telephone: +1 (888) 4-NETAPP

Where to go next

Next tasks

After installing and powering on the StoreVault S300 storage system, you need to install:

- ◆ The StoreVault Manager software and configure your StoreVault S300.

For information about installation and setup, see the *StoreVault Manager 3.2 User's Guide* or *StoreVault Manager Quick Start Guide*.

About this appendix This appendix discusses how to determine the power line lengths running from the StoreVault S300 storage system to the power source.

Recommended AC power line sizes

About AC power feeds

Longer AC power feeds need to be properly designed to preserve voltage levels to the equipment. The wiring from the breaker panel to the power strip, which supplies power to the StoreVault S300 storage system, can often exceed 50 feet.

Note _____
Total AC wire length = breaker to wall or ceiling outlet + extension cable or ceiling drop.

Recommended conductor size

The following table lists the recommended conductor size for a 2% voltage drop for a particular distance in feet (taken from the Radio Engineer’s Handbook).

110V, single-phase	20A circuit	30A circuit	40A circuit	50A circuit
25 ft	12 AWG	10 AWG	8 AWG	8 AWG
50 ft	8 AWG	6 AWG	6 AWG	4 AWG
75 ft	6 AWG	4 AWG	4 AWG	2 AWG

220V, single-phase	20A circuit	30A circuit	40A circuit	50A circuit
25 ft	14 AWG	12 AWG	12 AWG	10 AWG
50 ft	12 AWG	10 AWG	8 AWG	8 AWG
75 ft	10 AWG	8 AWG	6 AWG	6 AWG

**Wire gauge
approximates**

The following table lists the approximate equivalent of American Wire Gauge (AWG) to Harmonized Cordage.

AWG	8	10	12
Harmonized, mm-mm	4.0	2.5	1.5

About this appendix This appendix contains the regulatory notices you need to be aware of when installing and operating your StoreVault S300.

Regulatory notices

FCC notices

NetApp devices are designed for a CFR 47 (Code Federal Regulations) Part 15 Class A environment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Compliance with ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A conforme à la norme NMB-003 du Canada.

Compliance with EN regulations

Marking by the symbol CE indicates compliance of this NetApp device to the EMC directives and the Low Voltage Directives of the European Union.

This is a class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate remedial measures.

**Voluntary Control
Council for
Interference by
Information
Technology
Equipment (VCCI,
Japan)**

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation of the VCCI notice:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

**Japan JEITA
statement**

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Translation of the JEITA statement:

Please use the attached power cord. The attached power cord is not allowed to use with other product.

Standard Clause	Clause Title	Marking and instruction Details
1.7.1	Power rating - Model	NAS-0701
	Power rating - Company identification	NetApp, Inc.
	Power rating - Ratings	Ratings (voltage, frequency/dc, current) 100 -127V ~ 6A 50-60 Hz 200 - 240V ~ 3A 50-60 Hz
1.7.8.3	Symbols - On/Off switch	All other controls to be marked with symbol for "ON" (60417-2-IEC-5007) and symbol for "OFF" (60417-2-IEC-5008)

Standard Clause	Clause Title	Marking and instruction Details
1.7.9	Multiple power sources	"Disconnect two power supply cords before servicing"
1.7.15	Replaceable batteries	Caution _____ Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions. _____

About this appendix This appendix discusses Electrical and Environmental Specifications of the StoreVault S300 storage system.

Important: Any modifications to the unit, unless expressly approved by Network system, could void the user's authority to operate the equipment.

Dimensions (L x W x H)	494 mm x 224 mm x 174 mm
Weight	19 Kg maximum 41.88 lbs maximum
Power Input, AC	100-127/200-240V~ 6/3A 50-60Hz
Safety	100 to 127 VAC, 6A, 200 to 240 VAC, 3A; 50 to 60 Hz
Processor	Broadcom MIPS
Memory	SDRAM PC133 ECC Up to 4GB
Hard Drives	SATA II 250 GB to 500 GB
Network	4 onboard 10/100/1000BT NICs
MTBF	100,000 Hours

Environmental

	Operating	Non-operating
Temperature	0° C to 40° C 32° F to 104° F	-40° C to 70°C (-40° F to 158° F)
Relative Humidity (non-condensing)	15% to 95% at 35 C (104 F)	15% to 90% at 65 C (149 F)
Maximum altitude	up to 3048m (10,000 ft)	4.6 Km (15,000 ft)

About this chapter This chapter identifies the preparation requirements and instructions for first-time installation of StoreVault S300.

Topics in this chapter This chapter discusses the following topics:

- ◆ “[Before you begin](#)” on page 70
- ◆ “[Installing the StoreVault S300 in a two-post rack](#)” on page 71

Before you begin

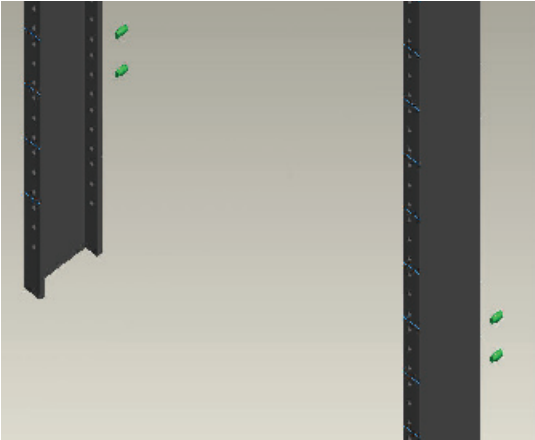
Prerequisites

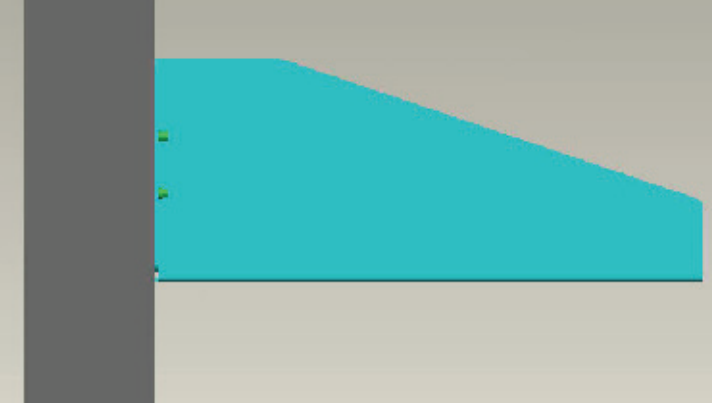
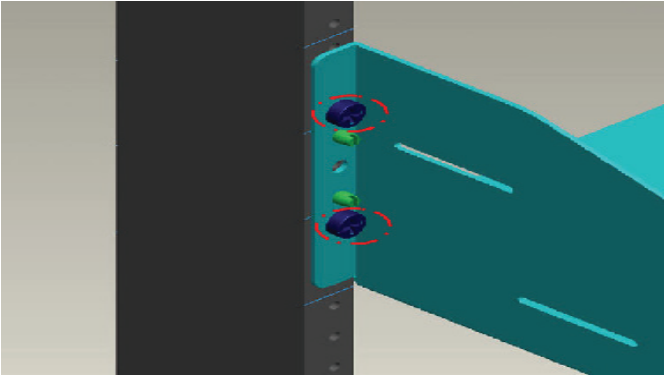
Before beginning the installation of StoreVault S300, have the following items available:

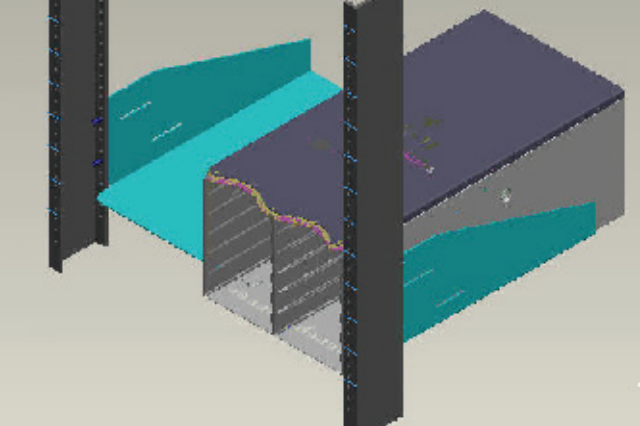
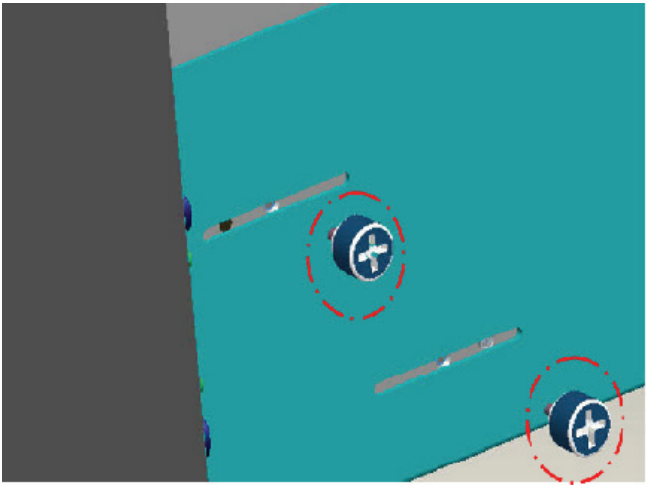
- ◆ StoreVault S300 system
- ◆ Rack installation kit
- ◆ Screwdriver
- ◆ Antistatic wrist strap with grounding leash
- ◆ StoreVault S300 documentation
- ◆ Appropriate screws for mounting

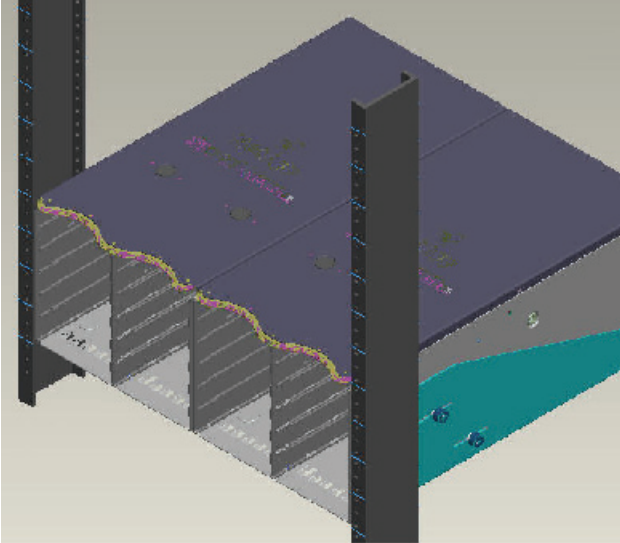
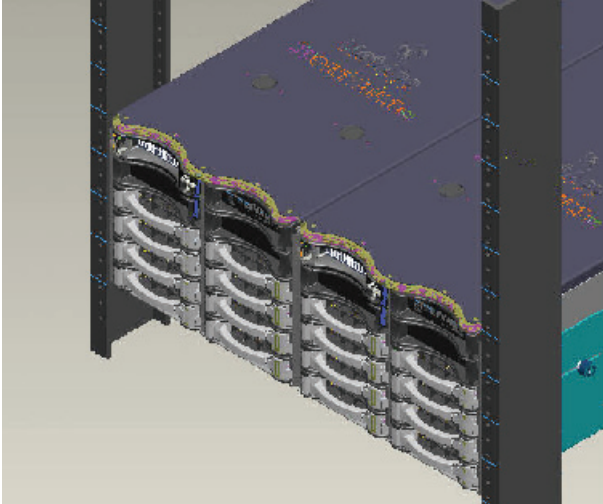
Installing the StoreVault S300 in a two-post rack

Installing with a tray You can mount two StoreVault S300 storage systems on a 19" rack with a tray. To install StoreVault S300 storage systems in a two-post equipment rack using the tray, complete the following steps.

Step	Action
1	Locate where you want install the tray on the two-post rack.
2	Use the rack alignment tool to make sure that you install the tray in the same holes on both rail of the rack.
3	Fit the guide pins into the holes of the left and right rails of the rack. 

Step	Action
4	Secure the tray into the four guide pins fitted to the two rails of the rack. 
5	Insert screws in the rack mounting holes on the left and right rails of the rack. Using screw driver tighten all the screws. 
6	Remove screws of first system on the left side wall and for second system right side wall of the system chassis.

Step	Action
7	Slide the StoreVault S300 chassis onto the tray. Note Remove disk carrier, LCM module, power supply, and control module before sliding the StoreVault S300 onto the tray. 
8	Insert the two cap-screws into the chassis holes one after another through tray slits. Using screw driver tighten two cap-screws. 

Step	Action
9	To install second StoreVault S300 chassis, repeat Step 7 and Step 8. 
10	Install disk drives, LCM Module, Power Supply and Control Module into the chassis. 

Step	Action
11	For instructions about connecting the StoreVault S300 storage system to the network, See “ Connecting the StoreVault S300 to a Network ” on page 17

Glossary

**antistatic grounding
leash**

A wrist strap safety device used to channel static electricity to a proper ground when you are handling sensitive computer equipment.

**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-swappable drive

A disk drive that can replace a defective unit in a system. You can perform the swap while the system is performing its normal function.

LAN

Local Area Network. A communications infrastructure designed to connect a large number of intercommunicating nodes.

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. A methodology that utilizes two or more hard disks to ensure that data is stored safely. The StoreVault S300 uses RAID technology to store your data safely.

RAID-DP™

RAID-DP, or Double Parity RAID, 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 if more than one disks fails at the same time.

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

Small Computer System Interface.

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