Symantec NetBackup™ Appliance and Symantec Storage Shelf Safety and Maintenance Guide

Release 2.6.0.3

NetBackup 5230

Symantec™

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- Hardware information

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- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
  - Error messages and log files
  - Troubleshooting that was performed before contacting Symantec
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Licensing and registration

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Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

Contents

Technical Support 4

Chapter 1 Product overview 10

Appliance front panel 10
Appliance rear panel 11
FTMS support 11
Appliance dimensions and weight 13
Symantec Storage Shelf description 13
Symantec Storage Shelf dimensions and weight 15
NetBackup 5230 documentation 15

Chapter 2 LED status indicators 16

Appliance disk drive LEDs 16
Appliance front panel LEDs 17
Appliance Ethernet port LEDs 18
8Gb FC HBA LEDs 19
10GE add-in card LEDs 20
Symantec Storage Shelf disk drive module and system LEDs 20
Symantec Storage Shelf I/O module and power module LEDs 22

Chapter 3 Safety guidelines 25

Overview 25
Symbol conventions 26
Identifier conventions 26
General power instructions 28
High-voltage precautions 28
ESD (Electrostatic Discharge) 29
Combustible gas 30
Batteries 30
Lasers 31
Optical fibers 31
Precautions when troubleshooting with the power turned on 32
Lifting heavy objects 33
Binding signal cables 33

Chapter 4 Maintenance guidelines 34

Basic maintenance 34
General rack installation guidelines 34
Maintenance requirements and timeframes 36
Maintenance tools 37
Maintenance log 38

Chapter 5 Detailed safety and maintenance information 42

Product safety information 43
NetBackup appliance and Symantec Storage Shelf 43
NetBackup Appliance 44
Safety warnings and cautions 44
Applications 45
About equipment maintenance 45
Equipment handling practices 46
Rack mount guidelines 46
Power and electrical warnings 47
Power safety 48
Power cord usage 48
Power cord criteria 49
AC power connections 49
Checking the resistance and voltage 51
Electrostatic discharge (ESD) 52
Appliance shutdown and hardware access warnings 53
Front and rear panels 53
Bezel 54
Battery replacement 54
Cooling and airflow 55
Laser peripherals or devices 55

Chapter 6 Troubleshooting 57

Troubleshooting issues with the NetBackup appliance 57
Appliance-induced shut down 57
Temperature issues 58
Chassis issues 59
Power supply module issues 59

Appendix A Technical references 60

750W single power supply input voltages 60
Environmental specifications 61

Appendix B Product regulatory and compliance 62

Overview 62
Product regulatory compliance 63
Product safety compliance 63
Product EMC Compliance - Class A Compliance 64
Product ecology compliance 65
Certifications / Registrations / Declarations 65
Electromagnetic compatibility notices 66
FCC Verification Statement (USA) 66
ICES-003 (Canada) 67
CE Declaration of Conformity (Europe) 67
VCCI (Japan) 67
BSMI (Taiwan) 67

Index 68

Chapter 1

Product overview

This chapter includes the following topics:

- Appliance front panel
- Appliance rear panel
- FTMS support
- Appliance dimensions and weight
- Symantec Storage Shelf description
- Symantec Storage Shelf dimensions and weight
- NetBackup 5230 documentation

Appliance front panel

The following sections describe the physical features of the NetBackup 5230 appliance.

The disks in Slots 0 and 1 provide the operating system for the appliance. The NetBackup 5230 appliance contains eight data storage disks in slots 4 through 11. Disks that have 1-TB formatted storage capacity provide a RAID6 group and 4-TB of storage. You can also use 3-TB disks for 14-TB of storage.

The following image shows the storage disks, circled in yellow. The two operating system disks are circled in red. The hot spare is in slot 11 in the upper right corner of the front panel.

The 5230 appliance can have expanded storage capability with up to four storage shelves.

See " Appliance rear panel" on page 11.

Appliance rear panel

The following image shows the rear panel of the NetBackup appliance.

Table 1-1 lists the appliance rear panel components that are displayed in the image.

Table 1-1 Appliance rear panel components

Number	Description
1	1Gb Ethernet ports (labeled from left to right, eth0/NIC1, eth1/NIC2, eth2/NIC3, eth3/NIC4)
2	Video Graphics Array (VGA) port
3	Serial port (reserved)
4	USB ports (quantity 3)
5	Remote management port
6	10Gb Ethernet ports (labeled from left to right, eth4/NIC5 and eth5/NIC6)

See " Appliance dimensions and weight" on page 13.

FTMS support

The NetBackup 5230 Appliance supports some Fibre Transport media server (FTMS) configurations. Some NetBackup 5230 Appliance configurations do not support FTMS. You need to understand the difference between Initiator and Target FC ports to verify that cable connections are correct.

NetBackup 5230 Appliance configurations D and E are shown. These configurations support FTMS. The yellow port (1) is the Target port. Blue ports are Initiator ports.

In Configuration D the blue ports on the cards in slots 2 and 4 are Initiator ports. In Configuration E the blue ports on the cards in slots 2, 3, and 4 are Initiator ports.

Fibre Channel cards that support FTMS are installed in PCIe slots 5 and 6. The cards in the other slots cannot be used for FTMS.

The following images and tables show the D and the E configurations.

Figure 1-1 NetBackup 5230 Appliance configuration D

Table 1-2 NetBackup 5230 Appliance configuration D components

Number	Component
1	Target ports on FC cards
2	Initiator ports on FC cards
3	SAS RAID ports
4	10 Gb Ethernet ports

Figure 1-2 NetBackup 5230 Appliance configuration E

Table 1-3 NetBackup 5230 Appliance configuration E components

Number	Component
1	Target ports on FC cards
2	Initiator ports on FC cards

Table 1-3 NetBackup 5230 Appliance configuration E components *(continued)*

Number	Component
3	SAS RAID ports

See " Appliance rear panel" on page 11.

Appliance dimensions and weight

The 2U appliance has the following parameters:

- 3.44 inches (87.38 mm) high
- 16.93 inches (430 mm) wide
- 27.75 inches (704.8 mm) deep
- 52 pounds (23.58 kg)

See "Symantec Storage Shelf dimensions and weight" on page 15.

Symantec Storage Shelf description

The NetBackup 52xx appliance can be ordered with 0, 1, 2, 3, or 4 storage shelves. The appliance provides 4 TB of storage capacity without any storage shelves.

The front and the rear panels of the storage shelf are shown in the following images.

The following table describes the components of the front panel.

Table 1-4 Front panel components

Number	Description
1	Disk drive module #1 of 16
2	Disk module release button

Table 1-4 Front panel components *(continued)*

Number	Description
3	Disk status LED
4	Power/activity LED
5	Slot 16 - hot spare

The following image shows the rear panel.

The following table describes the components of the rear panel.

Table 1-5 Rear panel components

Number	Description
1	Serial port (not to be used without Symantec approval)
2	I/O module release latch
3	I/O module #1
4	SAS_IN port
5	SAS_OUT port
6	I/O module #2
7	Power supply and fans #1
8	Power supply and fans #2

See “Symantec Storage Shelf dimensions and weight” on page 15.

Symantec Storage Shelf dimensions and weight

The Symantec Storage Shelf is 3U high and contains 16 drives. The storage shelf has the following parameters:

- 5.25 inches (13.1 cm) high
- 17.6 inches (44.7 cm) wide
- 22.1 inches (56.1 cm) deep
- Weight is 71.65 pounds (32.5 kg)

See " Appliance rear panel" on page 11.

NetBackup 5230 documentation

Table 1-6 lists the documents for the NetBackup 5230 appliance and Symantec Storage Shelf.

Table 1-6 NetBackup 5230 hardware documentation

Document	Description
Symantec NetBackup 5230 Product Description Guide	Describes all aspects of the NetBackup 5230 and the attached storage shelf. Provides the compliance and environmental information.
Symantec NetBackup 52xx Hardware Installation and Initial Configuration Guide	Describes the hardware installation and startup procedures for the appliance and the storage shelf. The document includes hardware validation and initial configuration instruction.

You can also look at the following documents:

- *Symantec NetBackup Appliance Administrator Guide*
- *Symantec NetBackup Appliance Command Reference Guide*
- *Symantec NetBackup Appliance Release Notes*

You can find hardware and software documentation for the NetBackup 5230 appliance at the following URL.

http://www.symantec.com/docs/DOC2792

Chapter 2

LED status indicators

This chapter includes the following topics:

- Appliance disk drive LEDs
- Appliance front panel LEDs
- Appliance Ethernet port LEDs
- 8Gb FC HBA LEDs
- 10GE add-in card LEDs
- Symantec Storage Shelf disk drive module and system LEDs
- Symantec Storage Shelf I/O module and power module LEDs

Appliance disk drive LEDs

Drive bay slots are labeled 0-11 starting from the lower, left corner. Each drive has two LEDs which appear as follows:

Figure 2-1 Appliance disk drive LEDs

Table 2-1 Disk drive module LEDs

Number	Description	Color	Indication
1	Status LED	Not lit Solid amber Blinking amber	No faults Disk fault RAID rebuild is in progress
2	Activity LED	Not lit Solid green Blinking green Blinking green occasionally	The disk has spun down. No disk activity. The disk spins up. Commands are processed.

See "Appliance front panel LEDs" on page 17.

Appliance front panel LEDs

Figure 2-2 Front panel LEDs

Table 2-2 LED functions and indicators

Number	Description
1	System ID button with integrated LED.
2	Hard drive activity LED
3	ID button with integrated LED

Table 2-2 LED functions and indicators *(continued)*

Number	Description
4	Cold reset button
5	NIC4 activity LED
6	NIC3 activity LED
7	NMI button (This button triggers a nonmaskable interrupt. All server data is lost.)
8	NIC1 activity LED
9	NIC2 activity LED
10	Appliance status LED

See "Appliance Ethernet port LEDs" on page 18.

Appliance Ethernet port LEDs

Each Ethernet port on the rear panel of the appliance has two LEDs. These LEDs indicate the status and the transmission rate of the network connection. The following image shows the 1Gb Ethernet port LEDs.

Figure 2-3 1 Gb port LEDs

The following table lists the 1 Gb Ethernet port LED indications.

Table 2-3 1Gb port LED indications

LED location	State	Description
1	Off	No LAN connection
	Solid Green	Connected to LAN
	Flashes Green	Transmit/receive activity occurs
2	Off	10-Mbps connection
	Solid Amber	100-Mbps connection
	Solid Green	1000-Mbps connection

8Gb FC HBA LEDs

An 8Gb FC HBA card connects the appliance to other network and storage devices. The card provides two FC ports for tape transport. By using the Fibre Channel tape out card, data can be exported from the appliance to a tape library for offline storage.

Each port contains a Receive (RX) LED (1) and a Transmit (TX) LED (2). These LEDs show the type of input or output through each port.

Figure 2-4 8Gb FC HBA ports

Each port on the 8Gb FC HBA card has three data transfer rate LEDs. The LEDs are labeled “8”, “4”, and “2” to correspond to the rate of data transfer (8Gbit/s, 4Gbit/s, or 2Gbit/s).

Table 2-4 8Gb FC HBA data transfer rate LED descriptions

8 - Yellow	4 - Green	2 - Amber	Description
Off	Off	Off	Turn off.
Off	Off	On, Flashes	Data transfers at a rate of 2 Gbit/s.
Off	On, Flashes	Off	Data transfers at a rate of 4 Gbit/s.
On, Flashes	Off	Off	Data transfers at a rate of 8 Gbit/s.

Table 2-4 8Gb FC HBA data transfer rate LED descriptions *(continued)*

8 - Yellow	4 - Green	2 - Amber	Description
On	On	On	Turn on (before firmware initialization).
Flashes	Flashes	Flashes	Turn on (after firmware initialization).
Flashes alternately			Firmware error.

10GE add-in card LEDs

This section provides the physical view, features, and technical specifications for the 10GE (10 Gigabit Ethernet) card. This card provides two 10GE network ports for backup.

Figure 2-5 10GE ports

Table 2-5 10GE LED indicators

Type	Color	Status	Description
ACT/LINK	Green	Flashes	The link is normal and data transfers.
	Green	On	The link is normal.
	n/a	Off	No link.
GRN=10G	n/a	Off	No link.
	Green	On	Data transfers at a rate of 10 Gbit/s.
	Yellow	On	Data transfers at a rate of 1 Gbit/s.

See "Symantec Storage Shelf disk drive module and system LEDs" on page 20.

Symantec Storage Shelf disk drive module and system LEDs

The front panel shows two different sets of LEDs:

- Two LEDs each per disk drive module, for a total of 32 LEDs

- Six system LEDs show the status of the entire storage shelf

Figure 2-6 Symantec Storage Shelf front panel LEDs

Table 2-6 Disk drive module LEDs

Number	LED name	State	Description
1	Power	Not lit Solid green	Off On
2	Global Enclosure Status	Not lit Solid green Amber Red	Off On One power supply offline Both power supplies offline
3	Reserved	N/A	N/A
4	Disk status	Solid green Amber or red	Disk drive operation normal Disk drive fault
5	Disk Power/activity	Solid blue Flashing blue	Disk drive operation normal, after appliance is turned on Disk activity is in progress.
6	I/O module 1 activity	Not lit Flashes green	No activity Activity
7	I/O module 2 activity	Not lit Flashes green	No activity Activity

Table 2-6 Disk drive module LEDs *(continued)*

Number	LED name	State	Description
8	Heartbeat	Not lit	System off
		Flashes green	Normal operation

Release 2.6.0.3 enables support of up to four storage shelves for each appliance. The number designations of storage shelves is the same. Shelf #3 is connected to Shelf #2 and to Shelf #4 if a fourth shelf is used. Shelf #4 is only connected to Shelf #3.

A storage shelf has two I/O modules which contain the SAS_IN and SAS_OUT ports. In the rear panel of a storage shelf, the I/O module on the left is I/O Module 1. The I/O module to the right of I/O Module 1 is known as I/O Module 2.

Table 2-7 Storage shelf system LEDs

LED name	State	Description
Power	Solid green	The storage shelf functions normally.
Global Enclosure Status	Solid green	The storage shelf functions normally.
Reserved	Off (no light)	This LED is not in use at this time.
Heartbeat	Flashes green once every 4 seconds.	If one I/O module in one storage shelf is properly connected to an external SAS port.
Heartbeat	Flashes green once every 2 seconds.	If two I/O modules in one storage shelf are properly connected to external SAS ports.

See "Symantec Storage Shelf disk drive module and system LEDs" on page 20.

Symantec Storage Shelf I/O module and power module LEDs

The right side of the rear panel of the Symantec Storage Shelf contains two power modules. Each module includes two fans, a connector to a main AC power supply, an on/off switch, and a status indicator LED.

The Symantec Storage Shelf contains two I/O modules, that are accessed from the rear panel. You can connect two storage shelves with their total of four I/O modules to an appliance. The SAS_IN port on the storage shelf is used to attach to a SAS

port on the rear panel of the appliance. The SAS ports are in slot #1 of the PCI riser assembly #2 in the rear of the appliance.

The storage shelf that is connected directly to the appliance is known as Storage Shelf #1. The storage shelf that connects to Storage Shelf #1 is known as Storage Shelf #2.

A storage shelf connected to Storage Shelf #2 is known as Storage Shelf #3. A storage shelf connected to Storage Shelf #3 is known as Storage Shelf #4. Storage shelves #2, #3, and #4 are not directly connected to the appliance.

One I/O module is shown, however each storage shelf includes two such modules.

Figure 2-7 I/O module and power module components

Table 2-8 I/O module and power module descriptions

Number	Component	LED states	Description
1	SAS_IN port LED	▪ Solid green ▪ Flashes green ▪ Red ▪ Not lit	▪ Link available ▪ Activity ▪ N/A ▪ No link available
2	SAS_IN port	N/A	N/A
3	SAS_OUT port	N/A	N/A
4	SAS_OUT port LED	▪ Solid green ▪ Flashes green ▪ Red ▪ Not lit	▪ Link available ▪ Activity ▪ N/A ▪ No link available

Table 2-8 I/O module and power module descriptions *(continued)*

Number	Component	LED states	Description
5	I/O module LED	■ Solid green ■ Flashes green ■ Red ■ Not lit	■ Ready ■ n/a ■ Starting up ■ Off
6	Power module LED	Solid green Flashes green Red Not lit	Power ok Power ok, but turned off Turning on the power failed Power not detected

Note: When you start the Symantec Storage Shelf, the primary I/O module (on the left side of the rear panel) starts up first. The LED turns green a few seconds after the main startup. The LED of the secondary I/O module (on the right of the rear panel) starts after the primary module is operational.

Chapter 3

Safety guidelines

This chapter includes the following topics:

- Overview
- Symbol conventions
- Identifier conventions
- General power instructions
- High-voltage precautions
- ESD (Electrostatic Discharge)
- Combustible gas
- Batteries
- Lasers
- Optical fibers
- Precautions when troubleshooting with the power turned on
- Lifting heavy objects
- Binding signal cables

Overview

Before you perform installation or maintenance operations, learn the safety regulations of the site. Read the safety precautions in this document for correct operating methods to ensure safety of persons and devices.

To prevent the risk of accidents, carefully read all operation instructions and precautions in this manual before performing any operation(s). The Caution, Warning, and Danger statements in this document do not cover all possible safety precautions that must be followed. Only specific supplements to standard safety precautions are provided. Personnel responsible for installing and maintaining Symantec products are required to understand the basics of standard electronic device safety practices. Training and qualification are required to learn the proper operating methods.

See "Overview" on page 25.

Symbol conventions

Warning symbols remind you of safety precautions to be followed during installation and maintenance operations.

Table 3-1 Warning symbols

Symbol	Description
	Indicates a hazard with a high level of risk that may result in death or serious injury.
	Indicates a hazard with a medium or a low level of risk, that can result in minor or moderate injury.
	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.

See "Identifier conventions" on page 26.

Identifier conventions

The following table describes warning and safety identifiers.

Table 3-2 Warning and safety identifiers

Identifier	Descriptions
	Electrostatic discharge (ESD) prevention identifier. To avoid electrostatic injuries or damage you must take strict ESD-preventive measures such as wearing ESD-preventive gloves or an ESD preventive wrist strap.
	Weight warning identifier. You must pay attention to the weight of the media server before moving it.
	Warning identifier against inserting and removing system disks. You should not insert or remove system disks without following proper procedures.
	Power warning identifier. You must shut off all power sources when turning off a media server.
	Identifier for reading the manual. You must read the manual before operating the media server.
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Drive identifier. Indicates the ID number of the slot where a disk drive resides.

See “High-voltage precautions” on page 28.

General power instructions

The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing to qualified personnel only.

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply always comes with a separate AC power cord for each supply.

The power button, DOES NOT completely turn off the AC power. Standby power is still active whenever the system is plugged in. To remove AC power from the appliance, you must unplug each AC power cord from the outlet or the power source.

The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the device plugs into should be installed near the equipment and should be easily accessible.

See “Checking the resistance and voltage” on page 51.

High-voltage precautions

A high-voltage power supply provides power for the device. Direct or indirect contact (through damp objects) with a high-voltage power supply (including the main power in a building) can result in fatal danger.

- When installing the AC power supply, follow standard safety regulations. Personnel who install the AC power supply must be qualified to perform high voltage and AC operations.
- Do not wear conductive objects such as a watch, chain, bracelet, or ring during the operation.
- Switch off the power supply immediately if you find water in the cabinet or if the rack is damp.
- Make sure that the device is kept away from water when being operated in a damp environment.

Improper operation on a high-voltage power supply may result in fire and electric shock. To connect and route the AC cables through a certain area, you must follow standard rules and regulations. Personnel must have an up-to-date certificate for operating high voltage and AC power devices.

You must use insulated tools when operating on high voltage and AC power.

Do not install or remove a power cord or PDU cord when the power is turned on. Minimal contact between the core of the cord and a conductor can generate an electric arc or spark, to cause a fire or injury.

- Wrap bare wires of the power cable with insulated tape before connecting the cable to the power distribution cabinet.
- Before installing or removing the power cord or PDU cord, turn off the power.
- Before connecting the power cord or PDU cord, make sure that the cord and label conform to the requirements for the installation.

Do not perform operations on high voltage, power supplies and connections, or other conductive materials during the storms which may produce lightening.

Be sure that all devices are properly grounded to prevent damage or injury during storms.

See “ESD (Electrostatic Discharge)” on page 29.

ESD (Electrostatic Discharge)

The static discharged by human bodies can damage static-sensitive components on the boards.

When you install and maintain equipment, observe appropriate static safety precautions to prevent personnel injuries or device damage.

Wear ESD-preventive gloves, an ESD-preventive wrist strap, or ESD-preventive clothes to avoid personnel injury or damage to a device. When a warning indicates an electrostatic sensitive area, when operating a device you must take ESD-preventive measures. To prevent the devices from damage, pay attention to the following during operations:

- Do not touch devices with bare hands because the ESD from the human body may damage the electrostatically sensitive elements on a board.
- Electronic circuits are prone to damage caused by ESD. When dealing with a disk, especially a raw disk, wear an ESD-preventive wrist strap, ESD-preventive gloves, and ESD-preventive suit. Touch only the edge of the disk.
- Use appropriate ESD-preventive bags when picking up, putting down, and transporting equipment or parts.

To prevent short-circuits, do not leave or drop screws or other metallic parts in the chassis.

When you install or maintain a device, follow regulations about the use and placement of tools. You can avoid short-circuits of the devices that are caused by metallic tools.

See "Combustible gas" on page 30.

Combustible gas

Never place or operate a device in an environment with combustible or explosive gases, or smoke.

Operations to any electronic devices in the presence of combustible gases cause an extreme danger.

See "Batteries" on page 30.

Batteries

Follow the safety precautions for operating lithium (Li-ion) batteries against personnel and device damage during installation and maintenance of Symantec products.

Be sure that you use correct replacement batteries. Otherwise, an explosion may occur.

- Only use batteries of the same or a similar model as recommended by the vendor.
- Deal with the waste batteries according to standard instructions.
- Do not put a lithium battery into a fire.

See "Lasers" on page 31.

Lasers

When you install and maintain equipment, observe standard laser safety precautions to prevent personnel injury or device damage.

The laser that is emitted by the optical interface board is an invisible infrared ray. This laser can cause permanent damage to eyes.

During device maintenance, direct eye exposure to the laser light must be avoided.

To prevent device damage when you operate the device, take the following precautions:

- Cap any unused optical interfaces and the optical connectors of unused tail fibers.
- Use caps when you remove the optical tail fibre that connects to an optical port that is in use. Cover the optical port on the device and the optical connector of the tail fibre with dust-proof caps.
- Use an attenuator when you perform a hardware loopback test on the optical connector with the tail optical fibre. The attenuator protects the optical transceiver from the received optical power.
- Disconnect the optical tail fibre between the peer device and the local device when you use the Optical Time Domain Effect Reflectometer (OTDR). Disconnecting the fibre protects the optical transceiver from the optical power source.
- Do not remove or insert the optical transceiver that connects to the optical fibre without proper safety procedures.

See “Optical fibers” on page 31.

Optical fibers

The laser beams of the optical interface board or inside the optical fibre may cause damage to the eyes. Do not expose your eyes to the laser beams.

The safe use of optical fibers ensures proper running of the device and avoids personnel injuries and device damage.

The fibre connectors and optical fibre interfaces of a laser must be cleaned with the special tools and the materials that are listed:

- The special cleaning solvent, isoamylol ,is preferred. Propyl alcohol is the next best solvent. Other alcohols and formalin are forbidden.
- Non-woven lens tissue

- Special compressed gas
- Cotton stick (medical cotton or long fibre cotton)
- Special magnifier for optical connectors

When replacing a fibre, cap the connector of a fibre that is not used. Avoid bending or wrapping fibers around narrow or sharp objects.

See “Precautions when troubleshooting with the power turned on ” on page 32.

Precautions when troubleshooting with the power turned on

This section describes the safety precautions you need to follow in case you need to troubleshoot the device when the power is on. Follow these safety precautions to avoid personnel injury and device damage.

- Before checking the device installation and cable connections, confirm that all power supplies to the device are off. Incorrect cable connections or loosened cables can cause personnel injury or damage to the device.
- Do not touch the connectors of power cords, PDU cords, or communication cables. Otherwise, you might receive an electrical shock.
- Do not touch the device with bare hands in an electrostatic sensitive area. To avoid personnel injuries or damage to the devices, take ESD-preventive measures.

If you touch power or PDU cords to perform operations when the power is on, you must remove the ESD-preventive wrist strap to prevent electrocution. To avoid data loss when the power is on:

- Do not unplug cords.
- Turn off all the disk drive activity before turning off the power to the device.
- Wait for a minute before reconnecting the power supply.

During troubleshooting, confirm that:

- The troubleshooting area is clean and dry.
- The cords are intact and effective grounding measures are taken.
  Never carry out troubleshooting in stormy weather when lightening is a possibility.

See “Precautions when troubleshooting with the power turned on ” on page 32.

Lifting heavy objects

Only trained and qualified personnel are allowed to lift heavy objects. The following precautions need to be taken when you lift heavy objects:

- Do not stand or come in the way or walk under when heavy objects are lifted.
- Check whether the required tools are complete and intact.
- Ensure that the lifting tools are firmly fixed on a wall or fixtures with enough load-bearing capacity.
- If a rope is used, ensure that the angle between two sides of the rope is no larger than 90°.
- Use simple and clear commands while speaking to personnel. This approach helps to avoid any confusion that can cause accidents and damage to personnel or materials.

Binding signal cables

Signal cables must be separately bundled from the strong-current cables and high-voltage cables at a spacing of at least 30 mm.

See “Overview” on page 25.

Chapter 4

Maintenance guidelines

This chapter includes the following topics:

- Basic maintenance
- General rack installation guidelines
- Maintenance requirements and timeframes
- Maintenance tools
- Maintenance log

Basic maintenance

The following sections give information about the general maintenance of the NetBackup appliance and the Symantec Storage Shelf.

Reasons for maintaining the NetBackup appliance and the storage shelf include the following:

- Stay aware of general equipment status and current network activity.
- Increase technical expertise with equipment and software to better address the issues that may arise or prevent possible issues.
- Quickly and accurately identify and resolve alarms and problems.

See “Maintenance requirements and timeframes” on page 36.

General rack installation guidelines

Make sure that you go through the following rack installation guidelines:

- **Anchor the equipment rack**: The equipment rack must be anchored to an unmovable support to prevent it from falling over. The rack can fall when one

or more units are extended in front of the rack on the slides. You must also consider the weight of any other device that is installed in the rack. A crush hazard exists and can cause serious injury should the rack tilt forward.

- **Check temperature**: When the media server is installed in an equipment rack, the temperature must be in the range of 5C (41F)- 40C (104F).Extreme fluctuations in temperature can cause a variety of problems for the media server.
- **Check ventilation**: The equipment rack must provide sufficient airflow to the front of the media server to maintain proper cooling. The rack must also include ventilation sufficient to exhaust a maximum of 2550 BTUs (British Thermal Units) per hour for the NetBackup media server.

  The rack that is selected and the ventilation that is provided must be suitable to the environment in which the equipment is used.
- **Main AC power must be accessible**: The AC power cord(s) is considered the main disconnect for the device and must be readily accessible when installed. If the individual power cord(s) are not readily accessible for disconnection, you must install an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack unit.
- **Grounding the rack installation**: To avoid the potential for an electrical shock hazard, you must include a third wire safety ground conductor with the rack installation. The rack itself must have a proper grounding if the media server power cord is plugged into the AC outlet of the rack. The media server must be plugged into a properly grounded AC outlet. You must provide additional, proper grounding for the rack and other devices that are installed in the rack.
- **Overcurrent protection**: The power supplies contain internal overcurrent protection. If power draw increases, the power supplies shut down. Hardware monitoring utilities such as the web UI show alerts that indicate problems in the power supply.

  The following values are based on power supply ratings in the various devices.

  Appliance, depending on power source input current:

  - 100VAC to 127VAC @ 9.2A
  - 200VAC to 240VAC @ 4.4A

  Symantec Storage System:

  - 100VAC to 127 VAC @ 2.972A
  - 200VAC to 240VAC @ 1.756A

See “General power instructions” on page 28.

Maintenance requirements and timeframes

The following table describes requirements and timeframes for hardware and software components.

Table 4-1 Routine requirements and timeframes

Owner	Site	Maintenance requirement	Recommended timeframe
Maintenance engineers	Device site	Check equipment room and device surroundings	Daily
		Check rack cabinet	Monthly
		Check all indicator LEDs on the front panel of the device	Daily for the first week of operation. Then you can check weekly.
		Check all indicator LEDs on the rear panel of the device	Daily for the first week of operation. Then you can check weekly.

Table 4-1 Routine requirements and timeframes *(continued)*

Owner	Site	Maintenance requirement	Recommended timeframe
Network engineers	Management software site	Check the CPU status	Daily for the first week of operation. Then you can check weekly.
		Check the disk status	Daily for the first week of operation. Then you can check weekly.
		Check the RAID status	Daily for the first week of operation. Then you can check weekly.
		Check the fan status	Daily for the first week of operation. Then you can check weekly.
		Check the power supply status	Daily for the first week of operation. Then you can check weekly.
		Check the FC HBA status	Daily for the first week of operation. Then you can check weekly.
		Check the 10GE NIC status	Daily for the first week of operation. Then you can check weekly.
		Check the RAID card status	Daily for the first week of operation. Then you can check weekly.

See “Maintenance tools” on page 37.

Maintenance tools

The following table lists the maintenance tools and their functions.

Table 4-2 Maintenance diagnostic tools

Tool	Function
NetBackup Appliance Web Console	Shows the real-time operation of systems and components.
NetBackup Appliance Shell Menu	Checks the running status of the device.
Thermometer	Measures the temperature of the equipment room.
Hygrometer	Measures the humidity of the equipment room.

See "Basic maintenance" on page 34.

Maintenance log

Make copies of this table to keep a log of maintenance activities. Consistent log keeping may help you identify trends or patterns to better maintain your equipment. Electronic copies are recommended. You can create a sortable spreadsheet to track issues.

See "Maintenance requirements and timeframes" on page 36.

Table 4-3 Maintenance log

Requirement/parameter		Status	Comments	Maintenance Owner
Check the equipment running in the environment	Operating temperature	□Normal □Abnormal		
	Operating humidity	□Normal □Abnormal		
	Fire safety	□Normal □Abnormal		
	Dust	□Normal □Abnormal		
	Enclosure power supply	□Normal □Abnormal		

Table 4-3 Maintenance log *(continued)*

Requirement/parameter		Status	Comments	Maintenance Owner
Check the environment inside the cabinet	Power system	□Normal □Abnormal		
	Cable system	□Normal □Abnormal		
	Grounding system	□Normal □Abnormal		
	Protective system	□Normal □Abnormal		
	Dust-proof system	□Normal □Abnormal		
	Cable labeling	□Normal □Abnormal		

Table 4-3 Maintenance log *(continued)*

Requirement/parameter		Status	Comments	Maintenance Owner
Check the indicator status	System power indicator status	□Normal □Abnormal		
	System alarm indicator	□Normal □Abnormal		
	Disk online status indicator	□Normal □Abnormal		
	Disk read and write status indicator	□Normal □Abnormal		
	Power running and alarm indicator	□Normal □Abnormal		
	Fan running and alarm indicator	□Normal □Abnormal		
	NetBackup appliance status	□Normal □Abnormal		
	Link indicator of the management network port	□Normal □Abnormal		
	Active indicator of the management network port	□Normal □Abnormal		
	Link indicator of the service network port	□Normal □Abnormal		
	Active indicator of the service network port	□Normal □Abnormal		
	ACT/LNK indicator of the 10GE NIC port	□Normal □Abnormal		
	GRN=10GE indicator of the 10GE NIC port	□Normal □Abnormal		
	The 2/Amber indicator of the Tape out card (Fiber Channel) port	□Normal □Abnormal		
		□Normal □Abnormal		

Table 4-3 Maintenance log *(continued)*

Requirement/parameter		Status	Comments	Maintenance Owner
	The 4/Green indicator of the Tape out card (Fiber Channel) port			
	The 8/Yellow indicator of the Tape out card (Fiber Channel) port	□Normal □Abnormal		
Checking on the system monitor interface (CLI)	CPU status	□Normal □Abnormal		
	Disk status	□Normal □Abnormal		
	RAID status	□Normal □Abnormal		
	Fan status	□Normal □Abnormal		
	Power Supply status	□Normal □Abnormal		
	Temperature	□Normal □Abnormal		
	FC HBA status	□Normal □Abnormal		
Problems and troubleshooting				
Remaining problems				
Verification				
Date				

See “Maintenance requirements and timeframes” on page 36.

Chapter 5

Detailed safety and maintenance information

This chapter includes the following topics:

- Product safety information
- NetBackup appliance and Symantec Storage Shelf
- NetBackup Appliance
- Safety warnings and cautions
- Applications
- About equipment maintenance
- Equipment handling practices
- Rack mount guidelines
- Power and electrical warnings
- Power safety
- Power cord usage
- Power cord criteria
- AC power connections
- Checking the resistance and voltage
- Electrostatic discharge (ESD)
- Appliance shutdown and hardware access warnings

- Front and rear panels
- Bezel
- Battery replacement
- Cooling and airflow
- Laser peripherals or devices

Product safety information

This document applies to boards, the chassis, and installed peripherals. To prevent bodily injury, electrical shock, fire, and equipment damage, read this document carefully. Observe all warnings and precautions before installing or maintaining the devices.

The device should be installed and serviced only by technically qualified persons.

Please adhere to the guidelines and the assembly instructions in this guide and in the appliance and the storage shelf manuals. The guidelines and instructions ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components that are specified in this guide.

Use of other products or components:

- Voids the UL Listing
- Voids the regulatory approvals
- May result in noncompliance with product regulations in the region(s) where the product is sold or used
- May void the product warranty

See "Safety warnings and cautions" on page 44.

NetBackup appliance and Symantec Storage Shelf

This section provides safety details regarding the removal, installation and replacement of the NetBackup appliance device, chassis, and components. The section also provides safety information for the Symantec Storage Shelf device, components, and peripherals.

You may need the following tools and supplies to work on the appliance and the storage shelf.

- Phillips (cross head) screwdrivers (#1 bit and #2 bit)

- Needle nosed pliers
- Anti-static wrist strap and gloves and conductive foam pad (recommended)

NetBackup Appliance

Read the following points carefully before you start work on the appliance.

- Before installing the devices in the rack cabinet, determine the installation positions of the guide rails according to the installation planning of the devices. The storage shelf should go on the bottom of the rack and then the appliance.
- The NetBackup appliance should be mounted into a rack with the toolless guide rails provided with the device. These rails are installed into a standard (19 inches by up to 30 inches deep) EIA-310D compatible rack cabinet.
- When you install the devices into a rack, it is recommended that you install the devices from the bottom of the rack first. Then install subsequent devices towards the top.
- Locate the three screws projecting from the left and the right sides of the NetBackup appliance. These three screws fit into the three slots in the rail extenders.

CAUTION

- One fully-loaded device weighs up to 33 kg.(73 lbs). More than two persons are required to move and install the device.
- Wear an ESD-preventive wrist strap and ESD-preventive gloves.

Safety warnings and cautions

To avoid personal injury or property damage, it is advisable to read, observe, and adhere to the safety instructions and information in the following sections. Go through these sections before you begin installing the product.

The following safety symbols are used in the document and may be marked on the product and /or the product packaging.

CAUTION

Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.

WARNING

Indicates the presence of a hazard that may result in serious personnel injury if the **warning** is ignored.

Indicates a potential hazard if indicated information is ignored.

Indicates the shock hazards that result in serious injury or death if safety instructions are not followed.

Indicates the hot components or surfaces.

See "Equipment handling practices" on page 46.

Applications

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments other than an ITE application, may require further evaluation. Other product categories and environments include medical, industrial, residential, alarm systems, and test equipment.

See "Product safety information" on page 43.

About equipment maintenance

Environmental conditions surrounding the NetBackup appliance and Symantec Storage Shelf are very important to the devices operating normally and efficiently. Check the equipment room and rack cabinet conditions to help prevent equipment problems or failures.

Requirements for routine maintenance of the NetBackup appliance and the Symantec Storage Shelf include the following:

- Checking equipment room conditions to prevent device problems due to environmental conditions.
- Checking the rack cabinet, ensuring a proper environment to prevent device problems.
- Checking status LED indicators and supplying troubleshooting procedures. See "Basic maintenance" on page 34.

Equipment handling practices

To reduce the risk of personal injury or equipment damage:

- Conform to the local occupational health and safety requirements when moving or lifting the equipment.
- Use mechanical assistance or other suitable assistance when moving or lifting the equipment.
- To reduce the weight for easier handling, remove any easily detachable components.
- Do not touch fan blades, to prevent injury.
- Unplug all AC power cord(s) to disconnect AC power.
- Please recycle all batteries.

See "Power and electrical warnings" on page 47.

Rack mount guidelines

The following are rack mount guidelines:

- The equipment rack must be anchored to an unmovable support to prevent it from tipping when equipment is extended from it.
- You must consider the weight of any other device that is installed in the rack. A crush hazard (serious injury) exists if the rack tilts forward.
- The equipment rack must be installed according to the rack manufacturer's instructions.
- Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.
- Extend only one piece of equipment from the rack at a time.

- You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit.
- A proper safety ground must be implemented for the rack and each piece of equipment that is installed in it. You thus avoid the risk of a potential electric shock.
- The temperature in the room where the devices operate must not be less than 5 °C (41 °F) or more than 40 °C (104 °F). Extreme fluctuations in temperature can cause problems in the equipment.
- The equipment rack must provide sufficient airflow to the front of the appliance to maintain proper cooling. The rack must include ventilation sufficient to exhaust a maximum of 2550 BTUs per hour for the appliance. BTU is British Thermal Units.

  The rack should include ventilation sufficient enough to exhaust a maximum of 1270 BTUs per hour for the storage shelf.

See "Electrostatic discharge (ESD)" on page 52.

Power and electrical warnings

Refer to the following list of warnings to avoid power and electrical hazards:

- The power button, DOES NOT completely turn off the AC power. A 5V standby power is active whenever the appliance is plugged in.
- To remove power from the appliance, you must completely unplug all the AC power cords from the wall outlets.
- The appliance uses two AC power cords. Make sure all AC power cords are unplugged. Make sure the AC power cords are unplugged before you open the chassis, or add or remove any non-hot-swappable components.
- Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each of the two appliance power supplies.
- The power supply in this product contains no serviceable parts. Do not open the power supply. Hazardous voltage, current, and energy levels are present inside the power supply. Return to manufacturer for servicing.
- When replacing a hot-swappable power supply, unplug the power cord to the power supply being replaced before removing it from the device.
- Before you open the appliance, take precautions to avoid risk of electric shock. Turn off the appliance and disconnect the power cords, any telecommunications systems, networks, and modems that are attached to the appliance.

See “Power cord usage” on page 48.

Power safety

The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing to qualified personnel only.

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply always comes with a separate AC power cord for each supply.

The power button, DOES NOT completely turn off the AC power. A 5V standby power is still active whenever the system is plugged in. To remove AC power from the appliance, you must unplug each AC power cord from the outlet or the power supply.

The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the appliance plugs into, should be installed near the equipment and should be easily accessible.

Power cord usage

If an AC power cord was not provided with the product, purchase two that are approved for use in your country.

To avoid electrical shock or fire, check the power cords to be used with the product and read the following information:

- Never attempt to modify or use the AC power cord(s) if they are not the exact type that is required for your location.
- The power cord must have an electrical rating that is greater than the electrical current rating marked on the product.
- The power cord must have a safety ground pin or contact that is suitable for the electrical outlet.
- The power supply cord(s) is/are the main disconnect device to AC power. The sockets or outlets must be near the equipment and readily accessible for disconnection.
- The power supply cords must be plugged into the sockets or the outlets that are provided with a suitable earth ground.

See “Power cord criteria” on page 49.

Power cord criteria

You must use a power cord set that meets the following criteria:

- Rating: In the U.S. and Canada, cords must be UL (Underwriters Laboratories, Inc.) Listed/CSA (Canadian Standards Organization) Certified type SJT, 18-3 AWG (American Wire Gauge). Outside of the U.S. and Canada, cords must be flexible harmonized (<HAR>) or VDE (Verband Deutscher Electrotechniker, German Institute of Electrical Engineers) certified cord with 3 x 0.75-mm conductors rated 250 VAC (Volts Alternating Current
- Connector, wall outlet end: Cords must be terminated in a grounding-type male plug that is designed for use in your region. The connector must have the certification marks that show a certification by an agency that is acceptable in your region. For U.S. the connector must be listed and rated 125% of the overall current rating of the appliance.
- Connector, appliance end: The connectors that plug into the AC receptacle on the appliance must be an approved IEC (International Electrotechnical Commission) 320, sheet C13, type female connector.
- Cord length and flexibility: Cords must be less than 4.5 meters (14.76 feet) long.

See "Appliance shutdown and hardware access warnings " on page 53.

AC power connections

NetBackup appliances and storage shelves currently ship with two AC power cords. To improve the power distribution within a rack environment, Symantec will ship two Power Distribution Unit (PDU) compatible cords (C13-C14) instead of the AC power cords with these devices. The transition to the new cords will be gradual.

These cords connect the appliance and the storage shelf to AC power outlets on the PDU in the equipment rack. Each cord includes a standard IEC-60320-C14 plug and an IEC-60320-C13 connector.

Figure 5-1 and Table 5-1 show the C13 connector.

Figure 5-1 C13 connector to the appliance or to the storage shelf

Table 5-1 C13 connector details

Number	Component color
1	Green and yellow
2	Blue
3	Brown

Figure 5-2 and Table 5-2 show the C14 plug that connects to the rack PDU.

Figure 5-2 C14 plug to the PDU

Table 5-2 C14 plug details

Number	Component color
1	Green and yellow
2	Brown
3	Blue

Figure 5-3 Appliance AC power connections (rear panel)

Note: The highlighted area indicates the sockets to connect the PDU cords.

Verify that all power cords are connected properly.

Verify that the physical exterior of the device is intact, clean, and in proper condition. Refer to the following sections for maintenance instructions and information.

Locate the power buttons (1) on each power module.

Verify that both PDU cords are connected properly to separate outlets on the PDU (2).

Figure 5-4 Symantec Storage Shelf AC power cable connections (rear panel)

See "Front and rear panels" on page 53.

Checking the resistance and voltage

You can use a multimeter to check the grounding of each rack cabinet component (optional).

To check the resistance using the multimeter

1. Set the multimeter to the resistance position.
2. Connect one lead to a fixed place in the equipment room. You may need to extend the lead cable. Use the other lead to measure each grounding point inside the cabinet.
3. Given the measuring accuracy, the measured resistance of each grounding point should be approximately 1 ohm or less.

   If the resistance that is measured at a grounding point exceeds 1 ohm, check the grounding cable, the connecting terminal, and the fastening screw. Make sure that all interfaces are secure.

To check the voltage using the multimeter

1. Set the multimeter to the voltage position.
2. Connect one lead to a fixed place in the equipment room. You may need to extend the lead cable. Use the other lead to measure each grounding point inside the cabinet.
3. Given the measuring accuracy, the voltage that is measured at each grounding point should range between 0 V and 5 V.

   If the voltage measured at a grounding point is 0 V, the point is not grounded.

   If the value larger than 5 V, check the grounding cable, the connecting terminal, and the fastening screw at the grounding point. Make sure that all interfaces are secure.

See “About equipment maintenance” on page 45.

Electrostatic discharge (ESD)

CAUTION

ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures at an ESD workstation. If an ESD workstation is not available, provide some ESD protection by wearing an antistatic wrist wrap. The wrist wrap must be attached to chassis ground – any unpainted metal surface -- on the appliance.

Always handle boards carefully. They can be sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the appliance, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

See “Battery replacement” on page 54.

Appliance shutdown and hardware access warnings

CAUTION

To avoid personal injury or property damage, the following safety instructions apply whenever accessing the inside of the product. Do a graceful shutdown through the UI or shell menu. Then:

- Turn off all peripheral devices that are connected to this product.
- Turn off the appliance by pressing the power button.
- Disconnect the AC power by unplugging all AC power cords from the appliance or the wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the appliance.
- Do not access the inside of the power supply, there are no serviceable parts in the power supply.
- When replacing a hot-swappable power supply, unplug the power cord to the power supply being replaced before removing the power supply from the appliance.

CAUTION

To avoid the possibility of coming into contact with hot component(s) during a hot-swappable installation, be careful when removing or installing the component(s).

Contact Symantec Technical Support if it is necessary to open the chassis of the appliance or of the storage shelf.

See “Rack mount guidelines” on page 46.

Front and rear panels

Check the front and the rear panels of the appliance and of the storage shelf to verify the following.

- All components are securely attached.
- All components are undamaged.
- No blockages obstruct air vents.
- Inspect the cables that are connected to the ports on the rear panel.
- Verify that the cables are properly connected.
- Verify that the correct cables are used.

See "AC power connections" on page 49.

Bezel

Check the bezel that is attached to the front panel. The black molded-plastic bezel protects the front panel from damage or accidental contact. Proper air flow through the chassis may be impeded if there are problems with the bezel.

Verify that the bezel is:

- Securely attached to the front panel
- Not damaged
- Not obstructed or blocked

See "Front and rear panels" on page 53.

Battery replacement

Only Symantec Technical Support personnel or approved service providers may open the chassis and remove a battery.

If the battery is incorrectly replaced, there is a danger of explosion. When replacing the battery, use only the battery that the equipment manufacturer recommends.

Some precautions that you should follow:

- Dispose of batteries according to local ordinances and regulations.
- Do not attempt to recharge a battery.
- Do not attempt to disassemble, puncture, or otherwise damage a battery.

Cooling and airflow

CAUTION

Carefully route cables as directed to minimize airflow blockage and cooling problems.

For proper cooling and airflow, operate the appliance only with the chassis cover installed.

Operating the appliance without the chassis cover in place leads to a component damage caused due to unacceptable heat build-up.

To install the cover:

- Verify that you have not left tools or loose parts inside the appliance.
- Check that cables, add-in boards, and other components are properly installed.
- Attach the cover to the chassis according to the product instructions.

See “Laser peripherals or devices” on page 55.

Laser peripherals or devices

CAUTION

Lasers may expose you to radiation.

To avoid risk of radiation exposure and avoid personal injury:

- Do not open the enclosure of any laser peripheral or device
- Laser peripherals or devices are not user serviceable
- Return to manufacturer for servicing

See “Product safety information” on page 43.

Chapter 6

Troubleshooting

This chapter includes the following topics:

- Troubleshooting issues with the NetBackup appliance
- Appliance-induced shut down
- Temperature issues
- Chassis issues
- Power supply module issues

Troubleshooting issues with the NetBackup appliance

The following sections give information and guidelines to troubleshoot any problems with the appliance and the storage shelf.

For detailed information, refer to the *NetBackup Appliance Software Administrator Guide*.

See “Appliance-induced shut down” on page 57.

Appliance-induced shut down

The terms "protection" or "protected" refer to a power supply that has shut down or locked up. The appliance may turn off to protect itself and other components that are connected to the appliance. A short-circuit, voltage overload, or power surge can cause self-protection.

If both power supplies are faulty, do not attempt to turn on the appliance. If the power supplies stop working, the fans in the power supplies do not operate to cool the appliance. Physical damage to the appliance and a potential loss of data can occur due to increased temperatures.

Refer to the *NetBackup 52xx Appliance Troubleshooting Guide* for more information, at the following URL.

http://www.symantec.com/docs/DOC2792

Temperature issues

Several problems may affect the devices if ambient temperature is higher than 35C. Refer to the Environmental Specifications section for details regarding acceptable temperature ranges. Thoroughly check all aspects of the rack environment, such as:

See "Environmental specifications" on page 61.

- Make sure that nearby equipment is not overly warm.
- Make sure that room temperature is within specifications.
- Make sure that the AC power that is supplied to the devices is proper.
- Make sure that the front and back of the NetBackup Appliance are clear of any obstructions. Air must flow easily and continually from the front of the appliance to the back of the appliance.

When the system alarm and location indicator on the appliance control panel is red, the alarm information is displayed in the NetBackup Appliance Web Console. The following types of information are shown.

Table 6-1 Temperature alarm information

Alarm indication	Issue	Affected component	Description
Overtemperature of the CPU core	Temperature	CPU	Temperature is not critical yet, but approaches the upper limit of the range.
Overtemperature of the chassis air intake	Temperature	Chassis air intake	Temperature is not critical yet, but approaches the upper limit of the range.
Fan module absence	Cooling device	Fan	Device absent

See "Chassis issues" on page 59.

Chassis issues

Problems may occur because the chassis cover is damaged or improperly installed. Intake and output vents in the front and rear of the chassis may be blocked or damaged. A visual inspection of all external parts of the chassis is required.

If the chassis is damaged, contact Symantec Technical Support for assistance. Photograph the damage for the support engineer.

If there is a significant damage that cannot be repaired, it may be necessary to turn off the appliance. Shut down all programs and jobs that are running. Press the power button on the front of the appliance to turn it off. Unplug the AC power cords from the main AC power sources. Shut down and disconnect any peripherals such as laptops, storage devices, or other servers.

See “Temperature issues” on page 58.

Power supply module issues

The two power supply modules are hot-swappable. However, there must be one functioning power supply in the appliance at all times. If a power supply is faulty, order a new power supply quickly. If there is only one functioning power supply, the appliance is at risk if that power supply also fails. If there are no functioning power supplies in the appliance, internal temperature increases and damages the components inside the chassis.

The fans in the power supply module are not removable. They remain inside the module as a complete unit. If there are problems with the fans, the entire power supply module must be removed and replaced.

See “Chassis issues” on page 59.

Appendix A

Technical references

This appendix includes the following topics:

- 750W single power supply input voltages
- Environmental specifications

750W single power supply input voltages

The power supply must operate within all specified limits over the input voltage range. The following table lists the appliance power supply input voltages.

Table A-1 Power supply input voltages

Parameter	Min.	Rated	Max.	Startup VAC	Power off VAC	Max input AC current	Max rated input AC current
Voltage (110)	90 Vrms	100-127 Vrms	140 Vrms	85 VAC +/- 5 VAC	75 VAC +/- 5VAC	12 Arms	11.0 Arms
Voltage (220)	180 Vrms	200-240 Vrms	264 Vrms	-	-	6.0 Arms	5.5 Arms
Frequency	47 Hz	50/60 Hz	63 Hz	-	-	-	-

Important information about input current:

- Maximum input AC current at low input voltage range is measured at 90 VAC, at maximum load.
- Maximum input AC current at high input voltage range is measured at 180 VAC, at maximum load.
- Maximum rated input current is measured at 100 VAC and 200 VAC.

See "Environmental specifications" on page 61.

Environmental specifications

The following table defines the system level operating and non-operating environmental limits for the NetBackup appliance and the Symantec Storage Shelf.

Table A-2 System Environmental Specifications

Parameter	State	Details
Temperature	Non-operating Operating	-40°F to 70°F The maximum rate of change is 10°C to 35°C and should not to exceed 10°C per hour.
Humidity	Non-operating	90% relative humidity (non-condensing) at 28°C.
Shock	Operating Packaged Unpackaged	2.0-g peak , 11 msec, half sine Non-palletized free fall in height 24" (> 40 lbs to < 80 lbs) Operational after an 18" free fall. Trapezoidal, 25 g, velocity change 136 inches per sec.
Vibration	Unpackaged	5 Hz to 500 Hz, 2.20 g RMS random
Acoustic noise		Sound Power: 7.0 DBA in an idle state at typical office ambient temperature (23 +/- 2°C)
Electrostatic discharge (ESD)		+/-12 KV except I/O port +/- 8 KV
System Cooling Requirement		NetBackup appliance: 2550 BTU/Hr Storage Shelf: 1270 BTU/Hr

See "750W single power supply input voltages" on page 60.

Appendix B

Product regulatory and compliance

This appendix includes the following topics:

- Overview
- Product regulatory compliance
- Product safety compliance
- Product EMC Compliance - Class A Compliance
- Product ecology compliance
- Certifications / Registrations / Declarations
- Electromagnetic compatibility notices
- FCC Verification Statement (USA)
- ICES-003 (Canada)
- CE Declaration of Conformity (Europe)
- VCCI (Japan)
- BSMI (Taiwan)

Overview

The following sections give information about the product regulations and compliance.

WARNING

To ensure regulatory compliance, you must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components that are specified in this guide. Use of other products or components voids the UL listing and other regulatory approvals of the product. The result is noncompliance with product regulations in the region(s) in which the product is sold.

Before computer integration make sure that the appliance, power supply, and other modules have passed EMC testing. This process helps to ensure EMC compliance with your local regional rules and regulations. The testing is done using a server board with a microprocessor from the same family (or higher) and operating at the same (or higher) speed as the microprocessor that is used on this server board. The final configuration of your appliance product may require additional EMC compliance testing.

This product is an FCC Class A device. Integration of it into a Class B system does not result in a Class B device.

See "Product regulatory compliance" on page 63.

Product regulatory compliance

The NetBackup appliance, when correctly integrated per this guide, complies with the following safety and electromagnetic compatibility (EMC) regulations.

Intended Application - This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments, other than an ITE application, may require further evaluation. Other product categories and environments may include medical, industrial, telecommunications, NEBS, residential, alarm systems, and test equipment.

See "Product safety compliance" on page 63.

Product safety compliance

The following is a list of product safety compliance norms for different countries:

- UL60950 - CSA 60950 (USA / Canada)
- EN60950 (Europe)

- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- GS Certification (Germany)
- GOST R 50377-92 - Certification (Russia)
- Belarus Certification (Belarus)
- Ukraine Certification (Ukraine)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)
- GB4943- CNCA Certification (China)

See "Product EMC Compliance - Class A Compliance" on page 64.

Product EMC Compliance - Class A Compliance

The following is a list of EMC compliance norms for different countries:

- FCC /ICES-003 - Emissions (USA/Canada) Verification
- CISPR 22 - Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- EN61000-3-2 - Harmonics (Europe)
- EN61000-3-3 - Voltage Flicker (Europe)
- CE - EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)
- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R 29216-91 Emissions (Russia)
- GOST R 50628-95 Immunity (Russia)
- Belarus Certification (Belarus)
- Ukraine Certification (Ukraine)
- GB 9254 - CNCA Certification (China)
- GB 17625 - (Harmonics) CNCA Certification (China)

See "Product ecology compliance" on page 65.

Product ecology compliance

Use of banned substances are restricted in accordance with world-wide regulatory requirements. A Material Declaration Data Sheet is available.

- Use of banned substances are restricted in accordance with world-wide regulatory requirements. A Material Declaration Data Sheet is available.
  - Quantity limit of 0.1% by mass (1000 PPM) for: Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls Diphenyl-Ethers (PBB/PBDE)
  - Quantity limit of 0.01% by mass (100 PPM) for: Cadmium
- California Code of Regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials
- China - Restriction of Hazardous Substances (China RoHS)
- WEEE Directive (Europe)
- Packaging Directive (Europe)

See "Certifications / Registrations / Declarations" on page 65.

Certifications / Registrations / Declarations

The following is a list of the required certifications, registrations, and declarations:

- NRTL Certification (US/Canada)
- CE Declaration of Conformity (CENELEC Europe)
- FCC/ICES-003 Class A Attestation (USA/Canada)
- VCCI Certification (Japan)
- C-Tick Declaration of Conformity (Australia)
- MED Declaration of Conformity (New Zealand)
- BSMI Certification (Taiwan)
- GOST R Certification / Certification (Russia)
- Belarus Certification / Certification (Belarus)
- IRAM Certification (Argentina)
- CNCA CCC Certification (China)
- Ecology Declaration (International)

- China RoHS Environmental Friendly Use Period
- Packaging & Product Recycling Marks

See "Electromagnetic compatibility notices" on page 66.

Electromagnetic compatibility notices

The following sections list the compatibility notices for USA, Canada, Europe, Japan, and Taiwan.

See "FCC Verification Statement (USA)" on page 66.

FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If the equipment is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to a radio or a television reception (can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. Any changes or modifications not expressly approved by the grantee of this device can void the user's authority to operate the equipment. The customer is responsible to ensure the compliance of the modified product. Only peripherals (computer input or output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception. All cables that are used to connect to peripherals must be shielded and grounded. Operation with

the cables that are connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

See “ICES-003 (Canada)” on page 67.

ICES-003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Apparelis Numériques", NMB-003 édictee par le Ministre Canadian des Communications.

English translation of the notice above:

This digital apparatus does not exceed the Class A limits for radio noise emissions from the digital apparatus that is set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

See “CE Declaration of Conformity (Europe)” on page 67.

CE Declaration of Conformity (Europe)

This product has been tested in accordance to, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

See “VCCI (Japan)” on page 67.

VCCI (Japan)

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If the product is used near a radio or a television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

See “BSMI (Taiwan)” on page 67.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning label is located on the outside rear area of the product.

See “Certifications / Registrations / Declarations” on page 65.

Index

A

appliance
- 10GE card LEDs 20
- 8Gb FC HBA card LEDs 19
- data storage disks 10
- dimensions 13
- disk drive LEDs 16
- front panel LEDs 17
- operating system disks 10
- rear panel 11
- shutdown 53
- system ID 17
- weight 13

C

certifications 65
chassis issues 59
compliance
- ecological 65
- EMC Class A 64
- guidelines 62
- regulatory 63
- safety 63

conventions
- safety
  - identifiers 26
  - symbols 26

D

dimensions
- appliance 13
- storage shelf 15

documentation 15

E

electromagnetic compatibility
- BSMI (Taiwan) 67
- CE declaration of conformity (Europe) 67
- FCC (USA) 66
- ICES-003 (Canada) 67

electromagnetic compatibility *(continued)*
- VCCI (Japan) 67

environmental specifications 61

F

FTMS 11

L

LEDs
- appliance
  - 10GE card 20
  - 8Gb FC HBA card 19
  - disk drives 16
  - Ethernet ports 18
  - system 17
- storage shelf
  - disk drive 20
  - I/O modules 22
  - power module 22
  - system 20

M

maintenance
- bezel 54
- checks 45
- front panels 53
- log 38
- rear panels 53
- reasons 34
- task owners 36
- tools 37

multimeter 51

O

overcurrent protection 35

P

power
- cords 48

power *(continued)*
overview 28
safety 48
power cords
appliance 49
storage shelf 51
power supply
hot swapping 59
input voltage 60
protection mode 57
product safety compliance 63

R

rack installation 34
rack mount guidelines 46

S

safety concerns
batteries 30
combustible gas 30
electrostatic discharge (ESD) 29
heavy objects 33
high voltage 28
identifier conventions 26
lasers 31
optical fibers 31
power-on work 32
signal cables 33
symbol conventions 26
storage shelf
dimensions 15
disk drive LEDs 20
fans 14
front panel 13
I/O module 14
I/O module LEDs 22
power module LED 22
power supplies 14
rear panel 13
system LEDs 20
weight 15

T

temperature issues 58

W

weight
appliance 13
weight *(continued)*
storage shelf 15