

Symantec NetBackup™ Appliance and Symantec Storage Shelf Product Description

Release 2.6

NetBackup 5230



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Product overview

This chapter includes the following topics:

- About the appliance
- About storage capacity
- About best practices for rack installation
- About the appliance front panel
- About the appliance rear panel
- About the mainboard RAID controller
- About the NetBackup 5230 rear panel configurations
- About the FC HBA target and initiator ports
- About the 2-port 8 Gb FC HBA
- About the dual-port 10 Gb Ethernet card
- About the Symantec Storage Shelf
- Appliance and storage shelf connections
- NetBackup 5230 documentation

About the appliance

The NetBackup 5230 appliance and the Symantec Storage Shelf provide complete deduplication and backup solutions.

This document describes the NetBackup 5230 appliance and the Symantec Storage Shelf. The NetBackup 5230 appliance supports zero, one, or two storage shelves.

The base appliance that uses 1TB storage disk drives has 4 TB of storage capacity without a storage shelf.

Table 1-1 Appliance features

Feature	Description
Space reduction	The deduplication engine provides up to 100 times reduction in storage. The client side plug-in provides similar levels of bandwidth reduction.
Scalable architecture	Due to fingerprinting and RAID redundancy, the overall storage capabilities are not a simple multiplication of the disk size and the total number of disks. See “About storage capacity” on page 11.
High availability	Supports redundant, hot-swappable disks, power modules, and fan modules.
Easy management	Provides separate out-of-band management network interfaces. You can remotely turn on, turn off, and reset appliances through the network. Supports remotely configuring and managing the appliances through KVM over IP. Supports SNMP traps and automatically reports alarms. Supports reporting the disk information through the out-of-band management channel.
RAID levels	RAID 1 (standard mirroring) and RAID 6 (block level striping with double distributed parity) are used as follows: <ul style="list-style-type: none">■ Appliance system disks: RAID 1■ Appliance storage disks: RAID 6■ Storage shelf data storage disks: RAID 6 Note: The disk drives in the appliance are pre-formatted before the appliance is shipped. These drives should not be moved into different slots or otherwise rearranged.
Fibre Channel support	The NetBackup 5230 appliance can be ordered with two to five FC HBA cards already installed. A 10Gb Ethernet card can also be ordered and preinstalled.

Table 1-1 Appliance features (*continued*)

Feature	Description
Rear panel ports See “About the appliance rear panel ” on page 15.	<p>Two SAS ports that connect to the storage shelf</p> <p>One 1 Gb/s IPMI management network port</p> <p>One VGA port</p> <p>Three USB 2.0 ports</p> <p>Four 1Gb Ethernet network ports, each with link and activity LEDs. Two of the ports are reserved for private networks.</p> <p>Two 10Gb Ethernet network ports, each with link and activity LEDs. These ports support fiber cabling and copper cabling. Two 10GBASE-SR (Short Range) SFP+ transceivers ship with each server. The customer can use these connectors. Alternately, customers can provide 10GBASE-LR (Long Range) transceivers or twin-ax copper cables depending on their network environment. Contact Symantec Technical Support for more information.</p> <p>The appliance can be ordered with several combinations of SAS RAID cards, Fibre Channel cards, and 10Gb Ethernet cards installed.</p> <p>See “About the NetBackup 5230 rear panel configurations” on page 18.</p>

The technical specification section contains dimensions and weights for both types of devices.

See “About storage capacity” on page 11.

About storage capacity

The Symantec Storage Shelf supports up to 36 TB of formatted, available disk space. The disks available for the storage shelf can have either 2-TB or 3-TB capacity.

The NetBackup 5230 appliance ships with zero, one, or two Symantec Storage Shelves. The standard appliance provides 4 TB of storage capacity without any storage shelves. A storage capacity of 76-TB is achieved when two storage shelves with the 3 TB individual disks are used with the appliance.

The following table provides information regarding the different storage capacities.

Table 1-2 NetBackup 5230 storage capacity options

Appliance storage drives	Appliance available storage capacity	Storage shelf drives	Storage shelf available storage capacity	Appliance and one storage shelf available storage capacity	Appliance and two storage shelves available storage capacity
1-TB	4-TB	2-TB	24-TB	28-TB	52-TB
1-TB	4-TB	3-TB	36-TB	40-TB	76-TB

See “About best practices for rack installation” on page 12.

About best practices for rack installation

The heaviest equipment should be installed at the bottom of a rack. Heavy devices that are installed at the top of a rack make the rack “top-heavy”, or unstable. Unstable racks jeopardize staff and equipment safety and are subject to risk.

When you install more than one device per rack, do the following:

- Find out how much each device weighs.
- Determine device order and cabling limits.
 - A fully-populated storage device is heavier than an appliance. The storage device should always be installed under the appliance.
- Be aware of the depth of the guide rails and the devices. Ensure that the distance between cabinet posts accommodates the rails and devices.
 - The rack rails that are provided for the NetBackup 5230 Appliance are extensible to 30” (752mm). This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 30” (752mm) the rails and the appliance cannot be properly installed. The width of the appliance is 19” (482.6mm).
 - The rack rails that are provided for the Symantec Storage Shelf are extensible to 36” (914mm). This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 36” (914mm) the rails and the appliance cannot be properly installed. The width of the storage shelf is 19” (482.6mm).
 - If your rack dimensions do not conform to these requirements contact Symantec Technical Support.

See “About the appliance front panel ” on page 13.

About the appliance front panel

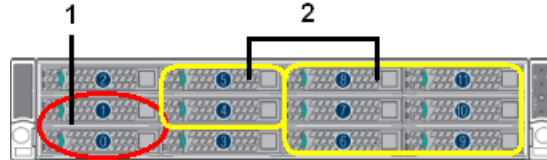
The appliance front panel contains 12 disk slots, as shown. See Figure 1-1 on page 13. The slots are labeled from 0 to 11, starting at the bottom left slot. The NetBackup appliance contains two SAS system hard disk drives (HDDs), which are located in slots 0 and 1. These disks provide the operating system and mirrored RAID1 functions for the appliance. You can hot-swap one of these disks at a time. You cannot operate the appliance if both disks are removed.

In the NetBackup 5230, 8 storage disk drives are installed in the appliance. These 8 drives are installed in slots 4 through 11. These 8 drives are installed in slots 4 through 11.

Blank carriers are installed in the unused slots to maintain proper airflow. The carriers must stay in place.

Warning: The disk drives are pre-formatted before the appliance is shipped. Do not rearrange the disks from their original locations.

Figure 1-1 NetBackup 5230 appliance front panel with system disk drives and storage disk drives



The following table describes the slots and disk drives in the front panel of the NetBackup 5230 appliance.

Table 1-3 Appliance front panel disk drives

Number	Description
1	System disk drives in slot 0 and slot 1, forming a RAID 1 group.
2	Storage disk drives in slots 4 through 11. Slots 2 and 3 contain blank drive carriers. The available storage capacity of the storage disks is 4-TB.

Each disk drive module contains two LEDs on the left-hand side of each module. The LEDs appear as follows:

- The LED on the top is solid green when power is supplied to the disk drive. This LED flashes green when the disk drive is active.

- The LED on the bottom is solid amber when a disk drive fault occurs. This LED is not lit when there are no disk drive faults.

Figure 1-2 Disk drive module LEDs

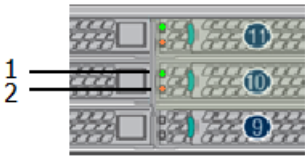


Table 1-4 Disk drive LEDs

Number	Description
1	Power/activity LED
2	Fault LED

Note that the disk drive modules that do not contain disk drives also have LEDs. Although there is no drive activity going on, some colored lights may still be seen through the disk modules.

The front panel includes a small panel that is attached to the right side of the device. System information is shown on this panel.

Figure 1-3 LED panel

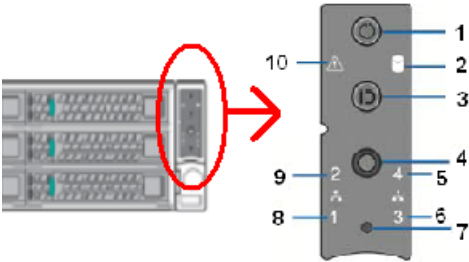


Table 1-5 describes LEDs on the front panel.

Table 1-5 LED panel

Number	Description
1	AC power button with integrated LED (executes a shutdown before turning off power)
2	Hard drive activity LED

Table 1-5 LED panel (*continued*)

Number	Description
3	ID button with integrated LED
4	Cold reset button (turns off power instantly)
5	NIC4/eth3 activity LED (for public network use)
6	NIC3/eth2 activity LED (for public network use)
7	NMI button (This button triggers a nonmaskable interrupt. All server data is lost.)
8	NIC1/eth0 activity LED (for private, NetBackup network use)
9	NIC2/eth1 activity LED (for public network use)
10	Status LED

You can see a black tag on the left side of the front panel. Pull out the tag to display the serial number of the appliance.



See “About the appliance rear panel ” on page 15.

About the appliance rear panel

The rear panel of the appliance has several access ports and other features, which are displayed in the following diagram and table.

Figure 1-4 Rear panel access ports and features

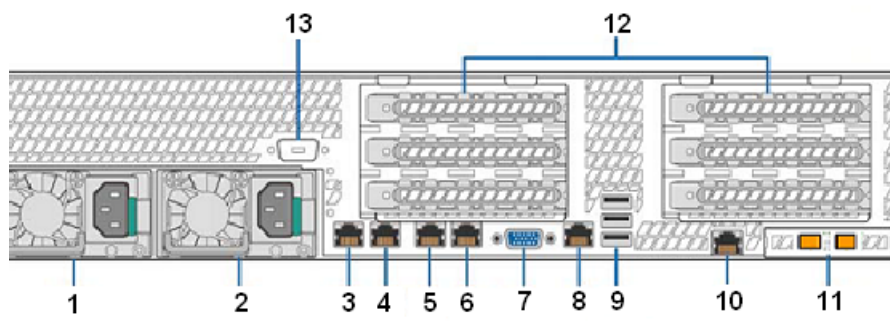
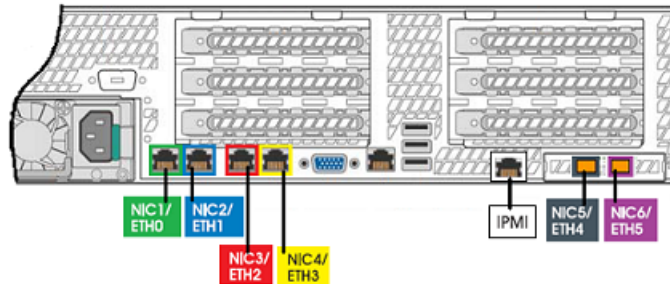


Table 1-6 Rear panel connectors and features

Number	Function
1, 2	Power Supply Modules #1, #2 (120VAC)
3	NIC1/eth0, a 1Gb connector that is reserved for private management usage
4, 5, 6	NIC2/eth1, NIC3/eth2, and NIC4/eth3, reserved for public networks. All three are 1Gb connectors.
7	DB-15 VGA connector
8	RJ45 Serial-A port (reserved)
9	USB connectors
10	IPMI remote management port
11	NIC5/eth4 and NIC6/eth5, left to right: 10Gb network connectors for public networks
12	Add-in PCIe adapter slots (SAS, Fibre Channel, 10Gb Ethernet)
13	Serial-B port (reserved)

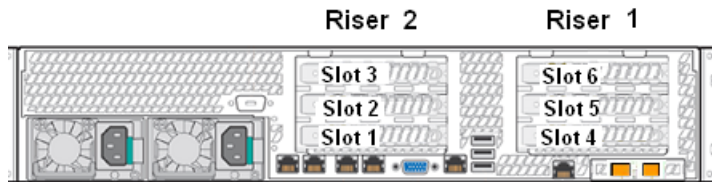
The ports on the rear panel are color-coded for easy identification.

Figure 1-5 Rear panel port colors



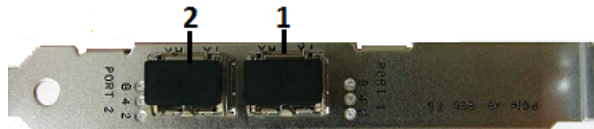
The rear panel has two sets of low profile, full height, 3.5" form factor PCIe slots. The following diagram shows the slot numbers.

Figure 1-6 Rear panel slot numbers



In some configurations the FC HBA cards are installed into some of the PCIe slots. If the cards are installed in slots 5 and 6 the configuration supports Fibre Transport media server (FTMS) mode. Port 1 of each card is configured in Target mode (1) as shown. Port 2 is configured in Initiator mode (2). Only configurations D and E support FTMS.

Figure 1-7 FC HBA ports in slots 5 and 6



See “About the NetBackup 5230 rear panel configurations” on page 18.

About the mainboard RAID controller

The SAS RAID controller in the appliance is an Intel RMS25CB080 card. The controller is preinstalled at the factory, on the mainboard of the appliance. This

RAID controller is not related to the SAS RAID controller which may be installed in the PCIe riser slots.

The mainboard RAID controller includes a maintenance-free backup unit (MFBU) with a super-capacitor and flash memory. The parameters that are associated with the controller are as follows:

- Dimensions - 2.713 in x 6.600 in (6.891 cm x 16.764 cm) (low-profile). The card is full height and low profile.
- Operating voltage - +3.3 V +/-8%, +12 V +/-8%
- PCI power (nominal) - 9W typical, airflow minimum 200 LFM
- Environmental humidity - 0°C to 50°C; 5% to 90% non-condensing, operating
- Environmental humidity - -45°C to 105°C; 5% to 90% non-condensing, storage
- MTBF - more than 3,000,000 hours

See “About the 2-port 8 Gb FC HBA ” on page 21.

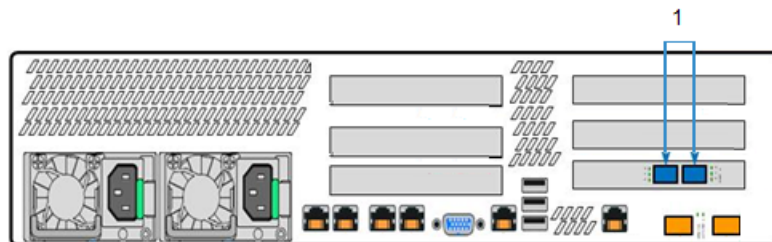
About the NetBackup 5230 rear panel configurations

The NetBackup 5230 appliance ships in five configurations. The Symantec Storage Shelves can be ordered as separate devices.

Configuration A

In Configuration A, one FC HBA card (1) is installed. You can use the FC ports for VMware, Optimized Deduplication over FC, or tape library connectivity. This configuration is not used with a storage shelf.

Figure 1-8 NetBackup 5230 configuration A



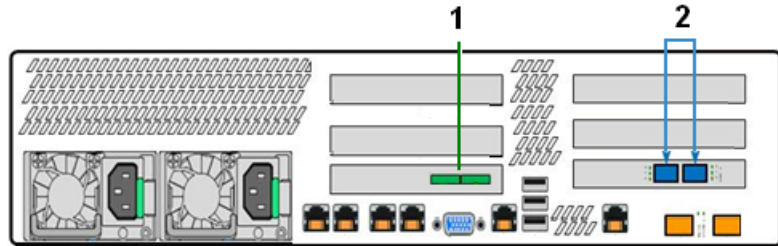
Configuration B

In Configuration B, one SAS RAID controller card (1) is installed into Slot 1. The SAS ports on the RAID controller connect to the SAS_IN ports on one storage

shelf. The SAS_OUT ports on the first storage shelf are attached to the SAS_IN ports on the second storage shelf, if two shelves are used.

One FC HBA card (2) is installed. You can use the FC ports for VMware, Optimized Deduplication over FC, or tape library connectivity.

Figure 1-9 NetBackup 5230 configuration B



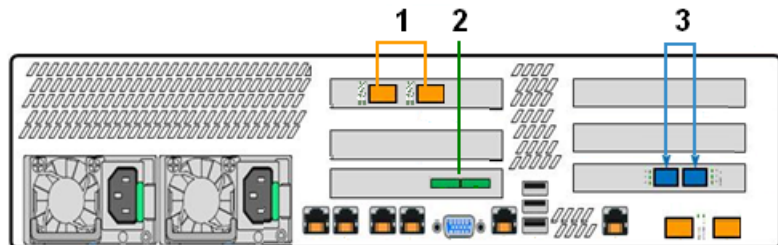
Configuration C

In Configuration C, one 10 Gb Ethernet card (1) is installed. You can connect the Ethernet ports to other devices that are connected to your network.

One SAS RAID controller card (2) is installed into Slot 1. The SAS ports on the RAID controller connect to the SAS_IN ports on one storage shelf. The SAS_OUT ports on the first storage shelf are attached to the SAS_IN ports on the second storage shelf, if two shelves are used.

One FC HBA card (3) is installed. You can use the FC ports for VMware, Optimized Deduplication over FC, or tape library connectivity.

Figure 1-10 NetBackup 5230 configuration C



Configuration D

In Configuration D, one 10 Gb Ethernet card is installed. You can connect the Ethernet ports to other devices that are connected to your network.

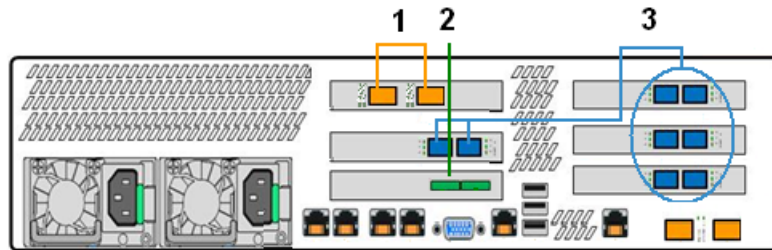
One SAS RAID controller card is installed into Slot 1. The SAS ports on the RAID controller connect to the SAS_IN ports on one storage shelf. The SAS_OUT ports

on the first storage shelf are attached to the SAS_IN ports on the second storage shelf, if two shelves are used.

Four FC HBA cards are installed.

- You can use the FC ports in slots 2 and 4 for VMware, Optimized Deduplication over FC, or tape library connectivity. Both ports on each card are configured in Initiator mode.
- You can use the FC ports in slots 5 and 6 for Fibre Transport media server (FTMS) support.
- Port 1 on the FC HBA cards in slots 5 and 6 is configured in Target mode. The other port on these cards is configured in Initiator mode.

Figure 1-11 NetBackup 5230 configuration D



Configuration E

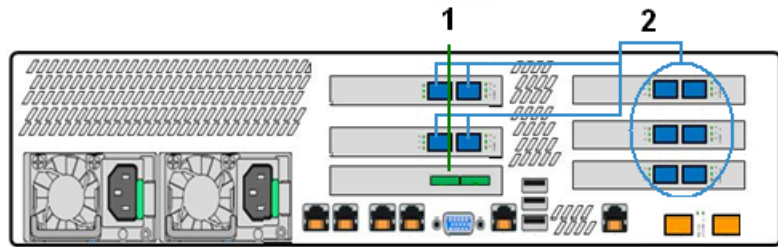
In Configuration E, one SAS RAID controller card is installed into Slot 1 (1). The SAS ports on the RAID controller connect to the SAS_IN ports on one storage shelf. The SAS_OUT ports on the first storage shelf are attached to the SAS_IN ports on the second storage shelf, if two shelves are used.

Five FC HBA cards (2) are installed. You can connect the FC ports to Fibre Transport data transfer clients or other devices. This configuration provides the maximum number of FC ports in a NetBackup 5230 appliance.

- You can use the FC ports in slots 2, 3, and 4 for VMware, Optimized Deduplication over FC, or tape library connectivity. Both ports on each card are configured in Initiator mode.
- You can use the FC ports in slots 5 and 6 for Fibre Transport media server (FTMS) support.
- Port 1 on the FC HBA cards in slots 5 and 6 is configured in Target mode. The other port on these cards is configured in Initiator mode.

Zero Ethernet cards are included in this configuration.

Figure 1-12 NetBackup 5230 configuration E



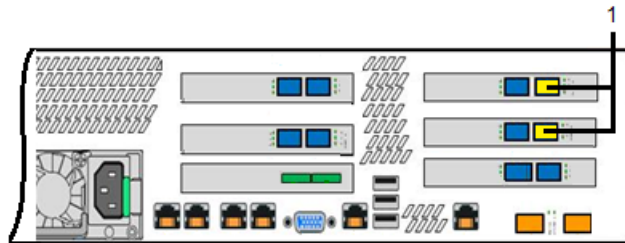
Other configurations or other cards in the PCIe slots of the NetBackup 5230 appliance are not supported.

See “About the FC HBA target and initiator ports” on page 21.

About the FC HBA target and initiator ports

Configurations D and E support FTMS. In these configurations Port 1 on each FC HBA card (1) in slots 5 and 6 are configured in Target mode. Port 2 in slots 5 and 6 and all of the other FC ports are configured in Initiator mode.

Figure 1-13 FC HBA card target and initiator ports



See “About the NetBackup 5230 rear panel configurations” on page 18.

About the 2-port 8 Gb FC HBA

The Fiber Channel (FC) ports connect the appliance to clients or other devices for Fibre Transport data transfer.

Dimensions - 2.54 in x 6.6 in (6.4516 cm to 16.764 cm) (low-profile)

Power consumption - Typical: 6.2 watts at 0°C to 55°C (32°F to 131°F)

Operating temperature - 0°C to 55°C

Storage temperature - -40°C to +70°C (-40°F to +158°F)

Storage humidity - 10% RH to 90% RH (operating, non-condensing) and 5% RH to 93% RH (non-operating, non-condensing)

See “About the dual-port 10 Gb Ethernet card” on page 22.

About the dual-port 10 Gb Ethernet card

A 10Gb Ethernet card is available with the NetBackup 5230 appliance.

Dimensions - 2.54 in x 6.6 in (6.4516 cm to 16.764 cm) (low-profile)

Power consumption - Typical: 6.2 watts at 0°C to 55°C (32°F to 131°F)

Operating temperature - 0°C to 55°C

Storage temperature - -40°C to +70°C (-40°F to +158°F)

Storage humidity - 10% RH to 90% RH (operating, non-condensing) and 5% RH to 93% RH (non-operating, non-condensing)

See “About the Symantec Storage Shelf ” on page 22.

About the Symantec Storage Shelf

The Symantec Storage Shelf features are listed in the following table.

Table 1-7 Storage shelf features

Feature	Description
Capacity	Holds 16 3.5-inch, 3 TB, 7,200 rpm SAS disk drives. 2-TB disks are also available for the NetBackup 5230.
Management	Serial port with CLI for troubleshooting. Only Symantec Technical Support or a Symantec approved service provider should use this port.
RAID level	RAID 6

Table 1-7 Storage shelf features (continued)

Feature	Description
I/O ports	<p>Four SAS 6.0-Gbps ports (two per each independent I/O module). Each I/O module contains one SAS_IN port and one SAS_OUT port. Each storage shelf has two I/O modules. Therefore, a storage shelf has two SAS_IN ports and two SAS_OUT ports.</p> <p>The SAS_IN ports on one storage shelf connect to the appliance. The appliance does not physically connect to more than one storage shelf, although the appliance monitoring software can detect all storage shelves in the system..</p> <p>The SAS_OUT ports on one storage shelf connect to the SAS_IN ports on the second storage shelf, if two shelves are used.</p> <p>Two serial RJ-11 ports (1 per I/O module) - for Symantec Technical Support use only.</p>

The front and the rear panels of the Symantec Storage Shelf are shown.

Figure 1-14 Storage shelf front panel

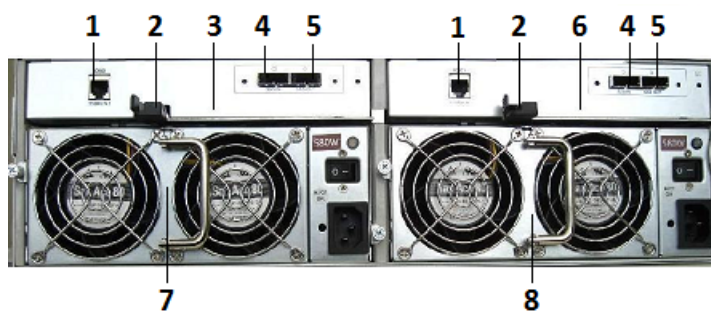


The following table lists the storage shelf front panel components that are shown in the illustration.

Table 1-8 Storage shelf front panel components

Number	Component
1	Disk module #1 of 16. Disk #16 is the hot spare.
2	Disk module release button.
3	Disk status LED
4	Disk power and activity LED

Figure 1-15 Storage shelf rear panel



The following table lists the storage shelf rear panel components that are shown in the illustration.

Table 1-9 Storage shelf rear panel components

Number	Component
1	Serial port
2	Release latch
3	I/O module #1
4	SAS_IN port
5	SAS_OUT port
6	I/O module #2
7	Power supply #1 and fans
8	Power supply #2 and fans

Storage shelf serial numbers are located on a white plastic panel that pulls out from the right, rear panel of the storage shelf.

Figure 1-16 Serial number tab



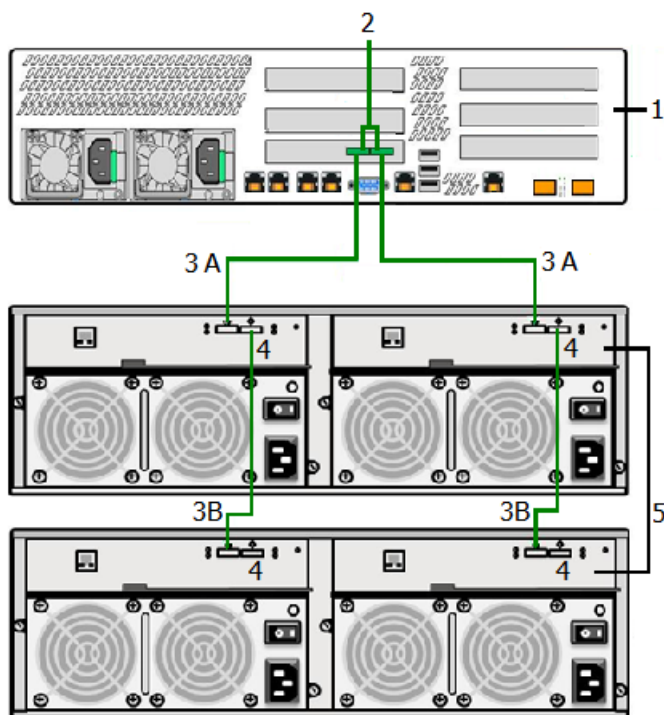
See “Appliance and storage shelf connections” on page 25.

Appliance and storage shelf connections

The appliance is connected to a storage shelf with two SAS cables, as shown in the following diagram.

When more than one storage shelf is used, SAS cables connect the second shelf to the first shelf. The second shelf is not physically connected to the appliance.

Figure 1-17 Connecting the NetBackup 5230 appliance and two storage shelves



The following table describes the configuration of an appliance and two storage shelves.

Table 1-10 Appliance connection to two storage shelves

Number	Component
1	Appliance
2	Appliance SAS_IN and SAS_OUT ports
3A	Symantec Storage Shelf SAS_IN ports connecting to the appliance
3B	Symantec Storage Shelf SAS_IN ports connecting to another storage shelf
4	Symantec Storage Shelf SAS_OUT ports, only used to connect to SAS_IN ports on other storage shelves
5	Storage shelves

Network cables for use with Fibre Channel ports or Ethernet ports are not provided. Customers must supply any Fibre Channel or Ethernet cables.

See “About the Symantec Storage Shelf ” on page 22.

NetBackup 5230 documentation

The NetBackup 5230 appliance runs NetBackup appliance software to provide deduplication and advanced storage backup capabilities. Documentation for the appliance and for the NetBackup software is available at the following URL.

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

See “About the appliance” on page 9.

Cables

This chapter includes the following topics:

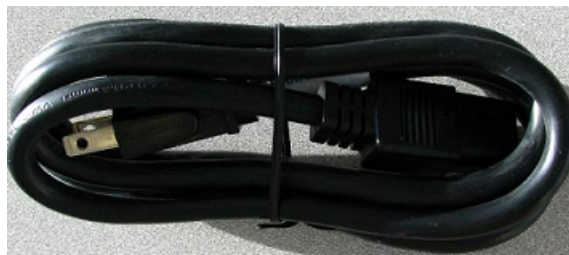
- Power cables
- Network cable
- Multi-Mode fibre cable
- SAS cable

Power cables

Each AC power module of the appliance and of the storage device requires a single AC power cable. One end of the AC power cable is connected to the power socket on the appliance or the storage device. The other end of the cable is connected to the external power supply.

Note: Power cables vary in different regions. Standard international cables are used as an example in this document.

Figure 2-1 AC power cable



A power cable includes live line, neutral line, and grounding lines.

See “Network cable” on page 30.

Network cable

The appliance communicates with the outside through an Ethernet network cable. One end of the network cable connects to the management network port or customer network port of the appliance. The other end of the cable connects to the network switch or an external gateway. Both ends of the cable are RJ-45 connectors.

Figure 2-2 Network cable



See “Multi-Mode fibre cable” on page 30.

Multi-Mode fibre cable

The appliance communicates with the FC switch through a multi-mode fibre. One end of the multi-mode fibre connects to the 10GE customer network port or FC port. The other end of the cable connects to the FC switch or other devices. The two ends of the multi-mode fibre are LC connectors.

Note: Fibre cables are not delivered with the product. Customers must provide these cables.

Figure 2-3 Multi-Mode fibre cable



See “SAS cable” on page 31.

SAS cable

A SAS cable has a SAS connector on both ends. Two SAS cables ship with each storage device.

Refer to the appliance and the storage system connection sections as needed for details.

Figure 2-4 SAS cable



See “Power cables” on page 29.

Technical specifications, standards, and compliance information

This chapter includes the following topics:

- Technical specifications
- Environmental specifications
- Protocol standards
- Regulatory, compliance, and certification information

Technical specifications

Table 3-1 and Table 3-2 provide device specifications.

Note: The weight of the appliance includes 10 disk drive modules, 2 disk drive carriers, and 2 power modules.

Note: The maximum weight of a storage shelf includes the 16 disk drive modules and 2 power modules.

Note: The transportation weight is the sum of the maximum weight of a device and the maximum weight of the transportation materials.

Table 3-1 Appliance specifications

Parameter	Description
Rack information	<p>The rack installation height is the space occupied by an appliance in a rack cabinet. The rack height for the appliance is 2U (3.5 inches, 8.9 cm). Install the appliance in a rack cabinet that is 19 inches (48.26 cm) wide.</p> <p>The rack rails that are provided for the NetBackup 5230 Appliance are extensible to 30" (752mm). This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 30" (752mm) the rails and the appliance cannot be properly installed.</p>
Weight	Weight: 23.58 kg (52 lbs)
Dimensions	<p>Height: 8.76 cm (3.45") (approximately 2U)</p> <p>Width: 43.8 cm (17.24")</p> <p>Depth: 69.59 cm (27.39")</p>
Power consumption	750W maximum
Power parameters	<p>100 - 127 V at 50/60 Hz 8.2 A</p> <p>200 - 240 V at 50/60 Hz 4.4 A</p>
Inherent availability of the system	≥ 99.95%
Mean Time to Repair (MTTR)	1hr
Operating temperature	+10°C to +35°C with the maximum rate of change not to exceed 10°C per hour
Non-operating temperature	-40°C to +70°C
Non-operating humidity	90%, non-condensing at 35°C
Acoustic noise	<p>Sound power: 7.0 dB in operating condition at typical office ambient temperature.</p> <p>(23°C +/- 2)</p>
System Cooling Requirement	<p>460 W maximum – 1570 BTU/hour</p> <p>750 W maximum – 2560 BTU/hour</p>

The following table provides details about the storage shelf.

Table 3-2 Storage shelf technical specifications

Parameter	Description
Rack information	<p>The rack installation height is the space occupied by a storage shelf in a rack cabinet. The rack height for the storage shelf is 3U (5.25 inches, 13.35 cm). Install the storage shelf in a rack cabinet that is 19 inches (48.26 cm) wide.</p> <p>The rack rails that are provided for the Symantec Storage Shelf are extensible to 36" (914mm). This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 36" (914mm) the rails and the appliance cannot be properly installed.</p>
Weight	<p>Maximum weight: 32.5 kg (71.65 lb)</p> <p>Transportation weight: Approx. 50 kg (110.23 lb)</p>
Dimensions	<p>Height: 13.1 cm (5.25") (approximately 3U)</p> <p>Width: 44.7 cm (17.6")</p> <p>Depth: 56.1 cm (22.1")</p>
Power consumption	580W maximum
Power parameters	<p>AC voltage range: 100 V to 127 V, 200 V to 240 V</p> <p>AC frequency range: 47 Hz to 63 Hz</p>
Inherent availability of the system	≥ 99.95%
Mean Time to Repair (MTTR)	< 1 hour

See "Environmental specifications" on page 35.

Environmental specifications

The following table lists the requirements for the NetBackup appliance and the storage devices.

Table 3-3 Environmental requirements

Component	Requirement
Operating temperature	10°C to 35°C (41°F to 95°F)
Storage temperature	-40°C to 70°C (-40°F to 158°F)

Table 3-3 Environmental requirements *(continued)*

Component	Requirement
Transportation temperature	-40°C to 70°C (-40°F to 158°F)
Temperature gradient	10°C/h
Operating humidity	10%RH to 85%RH
Operating altitude	-30 meters to 3,000 meters In altitudes from -60 meters to +1,800 meters, the ambient temperature ranges from 5°C to 35°C. When the altitude ranges from 1,800 meters to 3,000 meters, the environment temperature decreases by 0.6°C when the altitude increases by 100 meters.
Storage altitude	-30 meters to 3,000 meters
Noise	< 72 A-weighted decibel This value reflects the maximum noise of the appliance when the ambient temperature is 25°C.

See “Protocol standards” on page 36.

Protocol standards

The following table provides standards with which the NetBackup appliance and storage devices comply.

Table 3-4 Standards compliance

Standard	Version
IPMI2.0	Intelligent Platform Management Interface Specification Second Generation v2.0, Document Revision 1.0
SMBIOS	System Management BIOS (SMBIOS) Reference Specification, Version 2.5
SAS	SAS- 2.1
ACPI	Advanced Configuration and Power Interface Specification, Revision 3.0, September 2
IP	RFC0791: Internet Protocol
FC	INCITS T11 (X3T9.3)

Table 3-4 Standards compliance (*continued*)

Standard	Version
PCI Express	PCIe 3.0

See “Regulatory, compliance, and certification information” on page 37.

Regulatory, compliance, and certification information

Refer to the *NetBackup 5230 Appliance and Symantec Storage Shelf Safety and Maintenance Guide* for detailed information.

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

See “Technical specifications” on page 33.

Appendix

This appendix includes the following topics:

- Abbreviations and Acronyms

Abbreviations and Acronyms

The following is a list of acronyms and abbreviations that are used in this document.

AC	Alternating Current
BIOS	Basic Input/Output System
BMC	Baseboard Management Controller
CCC	China Compulsory Certification
CE	Conformite Europeenne
CPU	Central processing unit
CRU	Customer Replaceable Unit
DC	Direct Current
DDR3	3rd Generation Double data rate SDRAM
DHCP	Dynamic Host Configuration Protocol
DIMM	Dual Inline Memory Module

ECC	Error Checking and Correction
FC	Fibre Channel
FCC	Federal Communications Commission
FRU	Field Replaceable Unit
GE	Gigabit Ethernet
HBA	Host bus adapter
IIC	Inter-Integrated Circuit
IOAT	Input/Output Acceleration Technology
IPMI	Intelligent Platform Management Interface for remote management
KVM	Keyboard Video Mouse
LC	Lucent Connector
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
NIC	Network interface card
PCIe	Peripheral Component Interconnect Express
RAID	Redundant Array of Independent Disks

REACH	Registration, Evaluation, Authorization, and Restriction of Chemicals
RoHS	Restriction of the Use of Certain Hazardous Substances
SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SNMP	Simple Network Management Protocol
TOC	Total cost of ownership
UL	Underwriters Laboratories
USB	Universal Serial Bus
VGA	Video Graphics Array

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