

# Veritas NetBackup™ 5230 Appliance and Storage Shelf Product Description

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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 rear panel](#)
- [About the mainboard RAID controller](#)
- [About the external RAID controller](#)
- [About the NetBackup 5230 rear panel configurations](#)
- [About the FC HBA port configurations](#)
- [About the 2-port 8 Gb FC HBA](#)
- [About the dual-port 10 Gb Ethernet card](#)
- [About the Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf](#)
- [Appliance and storage shelf connections](#)
- [NetBackup 5230 documentation](#)

## About the appliance

The NetBackup 5230 appliance and the Storage Shelf provide complete deduplication and backup solutions. This document describes the major hardware aspects of these devices. This document is available to the general public.

[Table 1-1](#) lists the features of the product.

**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	<p>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.</p> <p>See <a href="#">“About storage capacity”</a> on page 9.</p>
High availability	Supports the redundant hot-swappable disks and power modules.
Easy management	<p>Provides separate out-of-band management network interfaces. You can remotely turn on, turn off, and reset appliances through the network.</p> <p>Supports remotely configuring and managing the appliances through KVM over IP.</p> <p>Supports the SNMP traps and automatically reports alarms.</p> <p>Supports reporting the disk information through the out-of-band management channel.</p>
System memory configuration (DIMMS)	<p>64 GB, up to a maximum of 192 GBs</p> <p><b>Note:</b> You can purchase additional 64-GB memory kits to maximize the amount of memory in the NetBackup 5230 Appliance. You can also use the memory kits to increase the appliance memory when you add an optional storage shelf to the system.</p>
RAID levels	<p>RAID 1 (standard mirroring) and RAID 6 (block level striping with double distributed parity) are used as follows:</p> <ul style="list-style-type: none"><li>■ Appliance system disks: RAID 1</li><li>■ Appliance storage disks: RAID 6</li><li>■ Storage shelf data storage disks: RAID 6</li></ul> <p><b>Note:</b> 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.</p>

**Table 1-1** Appliance features (*continued*)

Feature	Description
Performance and capacity	<ul style="list-style-type: none"> <li>■ Supports the high-performance processors with low-power consumption.</li> <li>■ Provides the high-capacity intra-appliance switching bandwidths and high I/O throughput.</li> <li>■ Usable capacity can be any combination of up to 144 TB deduplication pool or 148 TB AdvancedDisk pool (non-deduplicated storage). Refer to the following section for capacity details. See <a href="#">“About storage capacity”</a> on page 9.</li> <li>■ Processor - two 6-core 2.5GHz E5-2620 CPUs</li> <li>■ An appliance with 4-TBs of internal storage and zero storage shelves contains eight 8Gb DIMMs.</li> <li>■ An appliance with 14-TBs of internal storage and zero storage shelves contains eight 8Gb DIMMs.</li> <li>■ An appliance with 4-TBs of internal storage and one or more storage shelves contains sixteen 8Gb DIMMs.</li> <li>■ An appliance with 14-TBs of internal storage and one or more storage shelves contains sixteen 8Gb DIMMs.</li> </ul>
Fibre Channel support	The NetBackup 5230 appliance can be ordered with up to five FC HBA cards preinstalled. A 10Gb Ethernet card can also be ordered and preinstalled.



**Table 1-1** Appliance features (*continued*)

Feature	Description
Rear panel ports  See <a href="#">“About the appliance rear panel”</a> on page 12.	Two SAS ports that connect to the storage shelf  One 1 Gb/s IPMI remote management network port  One VGA port  Three USB 2.0 ports  Four 1Gb Ethernet network ports, each with link and activity LEDs.  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 Technical Support for more information.  The appliance can be ordered with several combinations of SAS RAID cards, Fibre Channel cards, and 10Gb Ethernet cards installed.  See <a href="#">“About the NetBackup 5230 rear panel configurations”</a> on page 16.

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

See [“About storage capacity”](#) on page 9.

## About storage capacity

The standard NetBackup 5230 Appliance without attached storage shelves provides 4.55 TB of storage capacity. This configuration uses 1-TB storage drives in slots 4 through 11 in the front panel of the appliance. You can also use 3-TB storage drives in these slots to achieve 13.65 TB of formatted storage without any externally attached storage shelves. The option of 3-TB appliance drives is available in NetBackup Appliance release 2.6.0.2 and subsequent releases.

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**Note:** The disk drives in slots 0 and 1 of the appliance are 1-TB drives. These drives provide the operating system for the appliance.

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To expand the NetBackup 5230 Appliance storage capacity, you can connect up to four storage shelves to the appliance.

The storage shelf models include the:

- Veritas 3U16 24TB Storage shelf featuring 24TBs of usable MSDP storage capacity
- Veritas 3U16 36TB Storage shelf featuring 36TBs of usable MSDP storage capacity
- Veritas 2U12 49TB Storage Shelf featuring 49TB of usable MSDP storage capacity

See [“About the optional Veritas 2U12 49TB Storage Shelf”](#) on page 35.

Table 1-2 provides information regarding the different storage capacity configurations that are available with the NetBackup 5230 Appliance.

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**Note:** Storage shelves use disk drives with capacities of 2-TB, 3-TB, or 6-TB, depending on the storage shelf model.

See [“About the Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf”](#) on page 19.

See [“About the optional Veritas 2U12 49TB Storage Shelf”](#) on page 35.

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**Table 1-2** NetBackup 5230 storage capacity options

Appliance storage drives (TB)	Appliance available MSDP storage capacity (TB)	Storage shelf drives (TB)	Storage shelf available MSDP storage capacity (TB)	Appliance and one storage shelf available MSDP storage capacity (TB)	Appliance and two storage shelves available MSDP storage capacity (TB)	Appliance and three storage shelves available MSDP storage capacity (TB)***	Appliance and four storage shelves available MSDP storage capacity (TB)***
1	4.55	2	24	28.55	52.55	*	*
1	4.55	3	36	40.55	76.55	112.55	148.55
1	4.55	6	49**	53.55	102.55	151.55	200.55
3	13.65	2	24	37.65	61.65	*	*
3	13.65	3	36	49.65	85.65	121.65	157.65

**Table 1-2** NetBackup 5230 storage capacity options (*continued*)

Appliance storage drives (TB)	Appliance available MSDP storage capacity (TB)	Storage shelf drives (TB)	Storage shelf available MSDP storage capacity (TB)	Appliance and one storage shelf available MSDP storage capacity (TB)	Appliance and two storage shelves available MSDP storage capacity (TB)	Appliance and three storage shelves available MSDP storage capacity (TB)***	Appliance and four storage shelves available MSDP storage capacity (TB)***
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\* If required, 2-TB storage drives are available.

\*\* You can also add a 2U12 49TB Storage Shelf to an existing 4.55TB appliance with attached 3U16 24TB or 3U16 36TB Storage Shelves. However, you must connect the 2U12 49TB Storage Shelf to the last 3U16 24TB or 36TB Storage Shelf that is connected to the appliance.

For example, NetBackup 5230 Appliance + 3U16 24TB Storage Shelf + 3U16 24TB Storage Shelf + 3U16 36TB Storage Shelf + **2U12 49TB Storage Shelf**.

In addition, attaching a 2U12 49TB Storage Shelf to a 3U16 24TB or 36TB Storage Shelf requires a SAS3-to-SAS2 cable to connect the shelves. Finally, the SAS3 data transfer rate of the 2U12 49TB Storage Shelf drops to match the SAS2 data transfer rate of the 3U16 24TB or 36TB Storage Shelf.

See "[About the optional Veritas 2U12 49TB Storage Shelf](#)" on page 35.

\*\*\* For all 3- and 4-storage shelf configurations, Veritas strongly recommends that you upgrade the memory capacity from 128GB to 192GB when using NetBackup Appliance software versions 3.1 or later, due to the increased resource requirements from updated MSDP encryption standards.

**Note:** Connecting up to four Veritas 3U16 24TB or 36TB Storage Shelves requires the NetBackup 5230 Appliance to be running appliance software version **2.6.0.2 or later**.

To connect a Veritas 2U12 49TB Storage Shelf requires the NetBackup 5230 Appliance to be running appliance software version **3.0 or higher**. A patch is available for appliance software version 2.7.3, which you can download using the following link:

[https://www.veritas.com/support/en\\_US/article.000116670](https://www.veritas.com/support/en_US/article.000116670)

See "[About best practices for rack installation](#)" on page 11.

## About best practices for rack installation

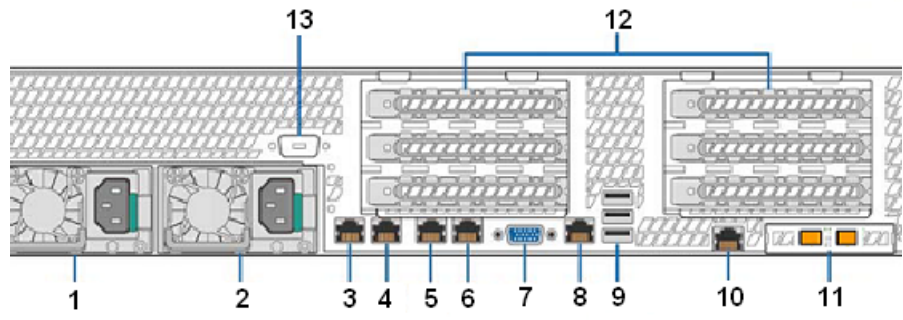
The heaviest equipment should be installed at the bottom of a rack. The heavy devices that are installed at the top of a rack make the rack "top-heavy", or unstable. Unstable racks jeopardize staff and equipment safety and are subject to risk.

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 storage device is heavier than an appliance and must 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 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 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 Veritas Technical Support.
- Populate the bottom of the rack with heavier devices, such as the storage devices.  
 A fully-populated storage device is heavier than an appliance. The storage devices should always be installed under the appliance.

## About the appliance rear panel

The rear panel of the appliance has several access ports and other features, which are displayed in [Figure 1-1](#).

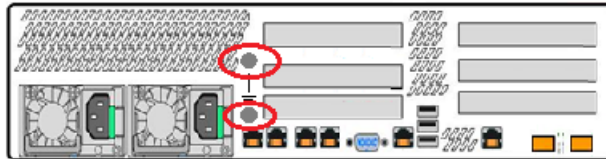
**Figure 1-1** Rear panel access ports and features

**Table 1-3** 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 By default, NIC1 (eth0) is factory set to IP address 192.168.229.233. This private network address is reserved to provide a direct connection from a laptop to perform the initial configuration of the appliance. NIC1 (eth0) is typically not connected to your network environment. After you complete the initial configuration, you can connect NIC1 (eth0) to an administrative network that does not provide any backup data transfer.
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)

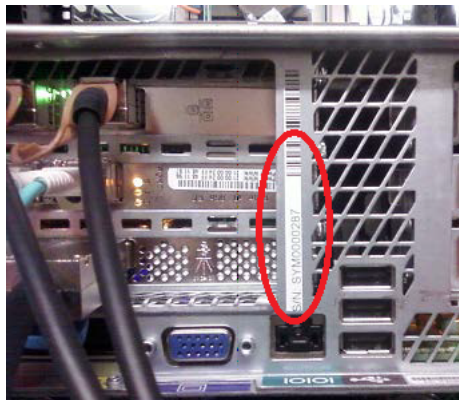
Starting in January 2014 NetBackup appliances may include grounding studs in case your lab environment has such a requirement. The studs are located on the

rear panel of the appliance. You can use standard grounding practices to connect grounding wires to the studs.

**Figure 1-2** Appliance grounding studs

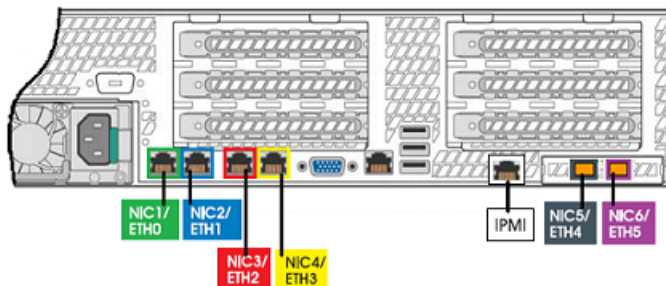


The serial number is located on a vertical bar in the rear panel of the appliance.



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

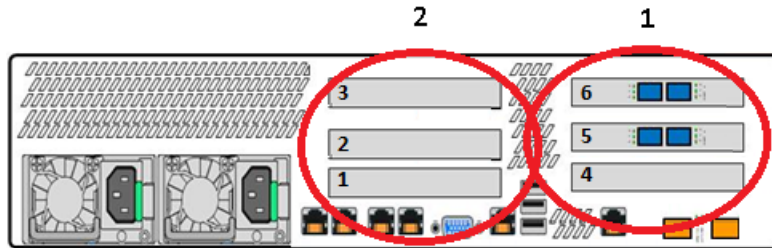
**Figure 1-3** Rear panel port colors



The rear panel has two sets of low profile, full height, 3.5" form factor PCIe slots. The following diagram shows the slot numbers 1 through 6. Riser assembly 2

includes slots 1, 2, and 3. Riser assembly 1 includes slots 4, 5, and 6. Fibre channel cards are shown in slots 5 and 6. This configuration is one of several options.

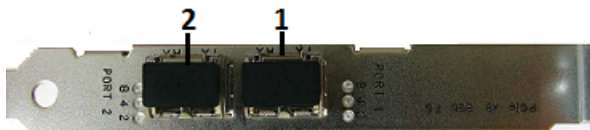
**Figure 1-4** Rear panel slot numbers



The NetBackup 5230 appliance add-in cards are available in five configurations. Several configurations include at least one FC HBA card for VMware, Optimized Deduplication over FC, or tape library connectivity.

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 1-5** FC HBA ports in slots 5 and 6



See [“About the NetBackup 5230 rear panel configurations”](#) on page 16.

## 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 controller is also known as the *internal* controller. The SAS RAID controller that is installed in the PCIe riser slot is known as the *external* controller.

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
- See [“About the 2-port 8 Gb FC HBA ”](#) on page 19.

## About the external RAID controller

When at least one storage shelf is purchased with an appliance, a factory-installed PCIe RAID card is installed in the following slots:

- Slot 5 - NetBackup 5220 Appliance
- Slot 1 - NetBackup 5230/5240 Appliances

The RAID card contains two SAS ports which connect to the storage shelf with SAS cables. If the optional external storage shelves are not included in the order at the time of the appliance purchase, the PCIe RAID card is not included.

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**Note:** The NetBackup 5330 Appliance compute node does not contain an external RAID controller. NetBackup 5330 Appliance storage shelf RAID functions are controlled by the NetBackup 5330 Appliance's attached Primary Storage Shelf.

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## About the NetBackup 5230 rear panel configurations

The NetBackup 5230 appliance ships in the following configurations. The external storage shelves can be ordered as separate devices.

**Table 1-4** NetBackup 5230 rear panel configurations

Configuration	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
A	Not populated	Not populated	Not populated	Not populated	Not populated	Not populated
B	Not populated	Not populated	Not populated	Dual 8 Gb Fibre Channel	Not populated	Not populated



**Table 1-4** NetBackup 5230 rear panel configurations (*continued*)

Configuration	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
C	Not populated	Not populated	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Not populated	Not populated
D	Not populated	Dual 8 Gb Fibre Channel	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
E	Not populated	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
A (with an external storage shelf)	SAS RAID controller	Not populated	Not populated	Not populated	Not populated	Not populated
B (with an external storage shelf)	SAS RAID controller	Not populated	Not populated	Dual 8 Gb Fibre Channel	Not populated	Not populated
C (with an external storage shelf)	SAS RAID controller	Not populated	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Not populated	Not populated
D (with an external storage shelf)	SAS RAID controller	Dual 8 Gb Fibre Channel	Dual 10 GbE Ethernet	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel
E (with an external storage shelf)	SAS RAID controller	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel	Dual 8 Gb Fibre Channel

Configuration D notes:

- 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.
- Understand that 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.

Configuration E notes:

- 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.
- Understand that 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.

For complete information about FC HBA card usage, see the *NetBackup Appliance Fibre Channel Guide*.

See [“About the FC HBA port configurations”](#) on page 18.

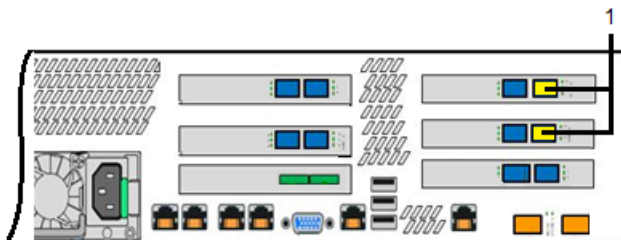
## About the FC HBA port configurations

The NetBackup 5230 appliance add-in cards are available in five configurations. Several configurations include one FC HBA card for VMware, Optimized Deduplication over FC, or tape library connectivity.

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 by default when SAN Client Fibre Transport is enabled. Port 2 in slots 5 and 6 and all of the other FC ports are configured in Initiator mode.

All configurations support the appliance to work as a replication target for Optimized Duplication and Auto Image Replication. For more information about available HBA cards for target port use, refer to the *NetBackup Appliance Fibre Channel Guide*.

**Figure 1-6** FC HBA card target and initiator ports



See [“About the NetBackup 5230 rear panel configurations”](#) on page 16.

## 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 19.

## About the dual-port 10 Gb Ethernet card

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

See the *NetBackup™ Appliance and Storage Shelf Product Description*, the *Veritas NetBackup™ 5240 Appliance and NetBackup 5240 Storage Shelf Product Description* or the *Veritas NetBackup™ 5330 Appliance Product Description* for more information.

See [“About the Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf”](#) on page 19.

## About the Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf

[Table 1-5](#) lists the Veritas 3U16 storage shelf features.

**Table 1-5** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf features

Feature	Description
Capacity	Holds 16 3.5-inch 2-TB or 3-TB 7,200 rpm SAS disk drives.  <b>Note:</b> The disk capacities that are used in the 3U16 storage shelves depends on the 3U16 storage shelf model that you purchase.  For example, the Veritas 3U16 24TB Storage Shelf uses 2-TB disks and offers 24 terabytes of usable storage capacity. The Veritas 3U16 36TB Storage Shelf uses 3-TB disks and offers 36 terabytes of usable storage capacity.
RAID level	RAID 6
I/O ports	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 3U16 storage shelf has two I/O modules. Therefore, a 3U16 storage shelf has two SAS_IN ports and two SAS_OUT ports.  Two serial RJ-11 ports (1 per I/O module) - for Technical Support use only.

Figure 1-7 shows the front and the rear panels of the 3U16 Storage Shelf.

**Figure 1-7** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf front panel

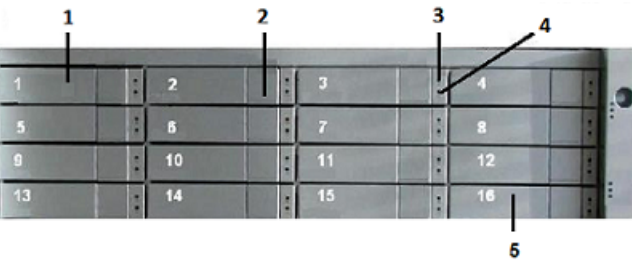


Table 1-6 lists the 3U16 storage shelf front panel components that are shown in Figure 1-7.

**Table 1-6** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf front panel components

Number	Component
1	Disk module #1 of 16.
2	Disk module release button.

**Table 1-6** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf front panel components *(continued)*

Number	Component
3	Disk status LED
4	Disk power and activity LED
5	Slot #16 - hot spare

**Figure 1-8** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf rear panel

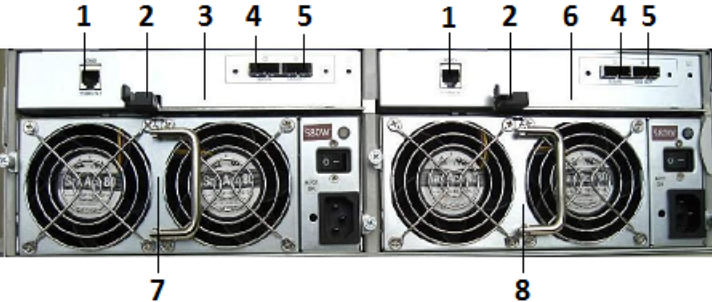


Table 1-7 lists the 3U16 storage shelf rear panel components that are shown in the illustration.

**Table 1-7** Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB 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

3U16 storage shelf serial numbers are located on a white plastic panel that pulls out from the right, rear panel of the storage shelf.

**Figure 1-9** Serial number tab



## Appliance and storage shelf connections

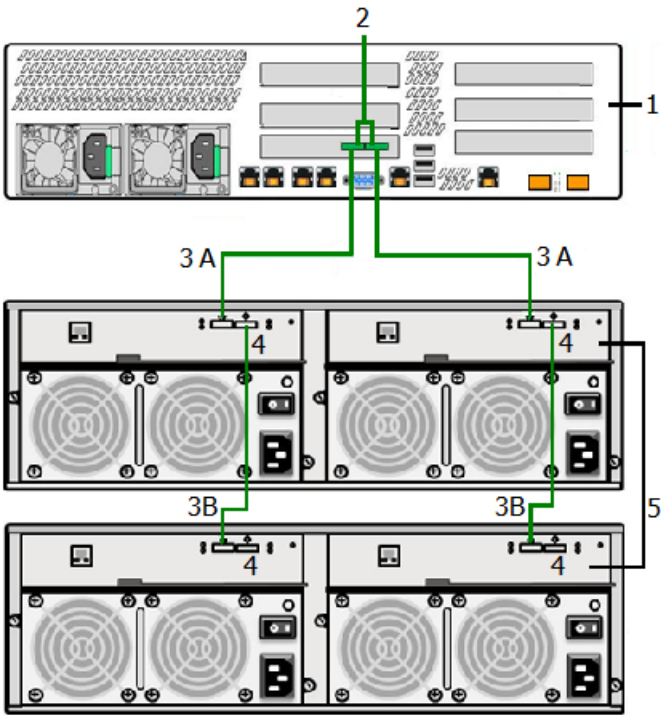
When more than one storage shelf is used, SAS cables connect the second shelf to the first shelf. The second shelf is not physically connected to the appliance.

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

The following figure shows the cable connections between the appliance and the storage shelves.

[Table 1-8](#) defines the numbers that are used in the drawings.

**Figure 1-10** Connecting the NetBackup 5230 appliance and two storage shelves



[Table 1-8](#) describes the configuration of an appliance and two storage shelves.

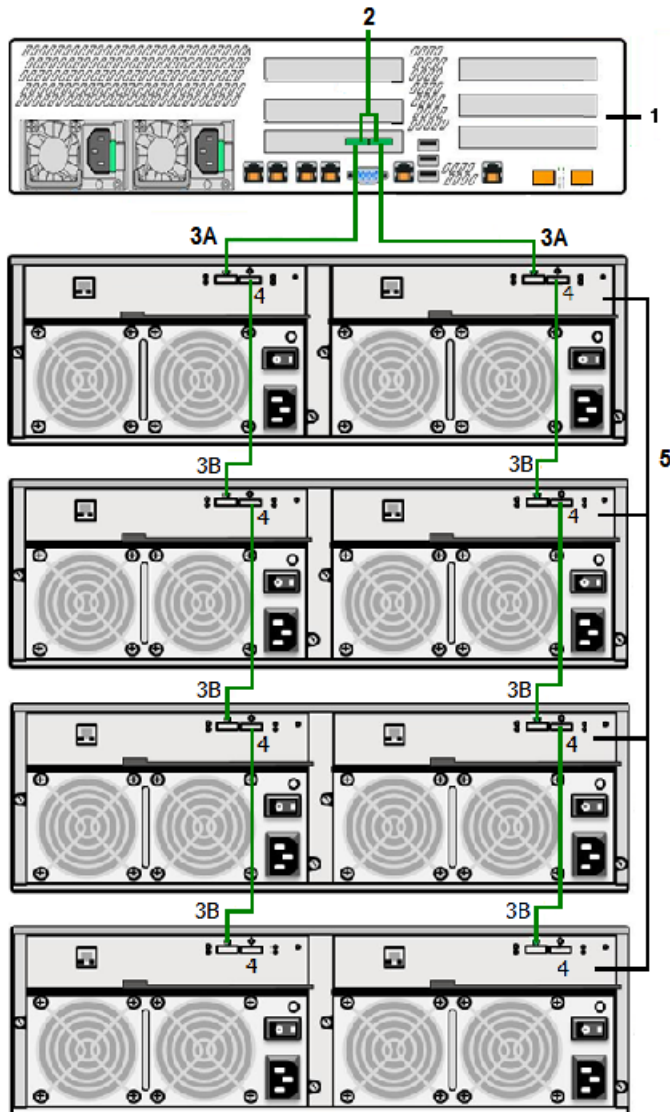
**Table 1-8** Appliance connection to two storage shelves

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

Starting with the NetBackup Appliance release 2.6.0.3, the use of up to four storage shelves with one appliance is supported.

Table 1-8 also lists the components in the four-shelf configuration.

**Figure 1-11** Four storage shelves and one appliance





See [“About the Veritas 3U16 24TB Storage Shelf / Veritas 3U16 36TB Storage Shelf”](#) on page 19.

## 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 link.

[NetBackup Appliance Documentation](#)

See [“About the appliance”](#) on page 6.

# Cables

This chapter includes the following topics:

- [Power cables](#)
- [Network cable](#)
- [Multi-Mode fiber optic cable](#)
- [SAS cable](#)

## Power cables

The AC power modules of the appliance and the storage shelves accept one AC power cable. One end of the AC power cable is connected to the power supply on the appliance or the storage device. The other end of the cable is connected to an external Power Distribution Unit (PDU) on the rack.

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

**Figure 2-1** AC power cable



- A AC power connector (IEC-60320-C14) to an external Power Supply Distribution Unit (PDU) on a rack.
- B AC power connector (IEC-60320-C13) to an appliance or a storage device.

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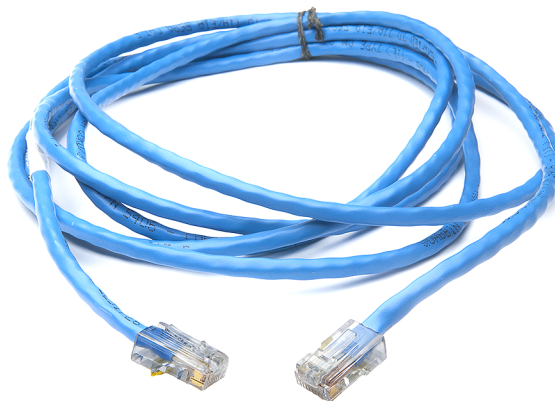
**Note:** If your power distribution unit is not compatible with the IEC-60320-C13 plug, then Veritas recommends that you purchase your power cable locally. Make sure the power cable meets or exceeds the indicated power rating.

---

## Network cable

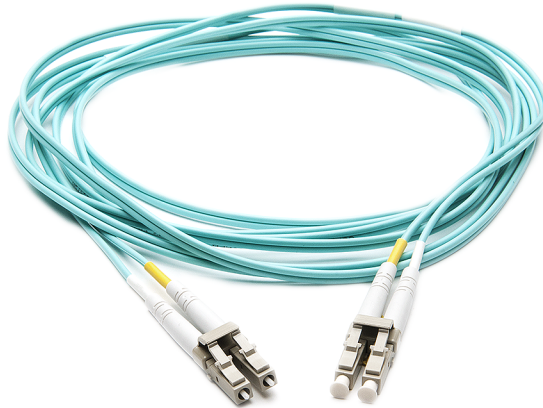
The NetBackup Appliance communicates with data networks through an Ethernet network cable. One end of the network cable connects to the management network port or service network port of the appliance. The other end of the cable connects to the network switch or an external gateway. Both ends of the cable use RJ45 connectors.

**Figure 2-2** Network cable

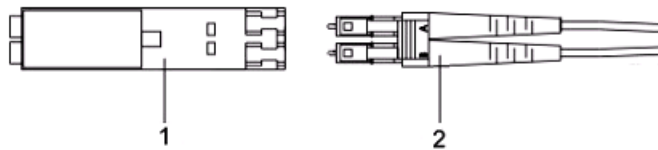


## Multi-Mode fiber optic cable

The NetBackup Appliance communicates with the Fibre Channel switch through a multi-mode fiber optic cable. One end of the multi-mode fiber optic cable connects to the 10GE service network port or the Fibre Channel port. The other end of the cable connects to the Fibre Channel switch or other devices. The two ends of the multi-mode fiber optic cable are LC connectors.

**Figure 2-3** Multi-Mode fiber optic cable

Fiber optic cables require Small Form-factor Pluggable (SFP+) transceivers, which are provided with each device having Fibre Channel ports. The diagram shows the SFP, labeled 1, and the fiber optic cable which is attached to it, labeled 2.



Supported SFPs are listed:

- Finisar
- JDSU

## SAS cable

A SAS cable has a SAS connector on both ends. Two SAS cables ship with each Expansion Storage Shelf.

**Figure 2-4** SAS cable



Refer to the NetBackup Appliance and storage shelf connection sections as needed for details.

# Technical specifications, standards, and compliance information

This chapter includes the following topics:

- [Technical specifications](#)
- [Environmental specifications](#)
- [Protocol standards](#)

## Technical specifications

### Appliance technical specifications

[Table 3-1](#) provides technical specifications for the 5230 Appliance.

[Table 3-2](#) provides technical specifications for the 5230 Appliance storage shelf.

**Table 3-1** Appliance technical specifications

Parameter	Description
Rack information	19" EIA standard

**Table 3-1** Appliance technical specifications (*continued*)

Parameter	Description
System memory configuration (DIMMS)	<p>64 GB, up to a maximum of 192 GB</p> <p><b>Note:</b> You can purchase additional 64-GB memory kits to maximize the amount of memory in the NetBackup 5230 Appliance. You can also use the memory kits to increase the appliance memory when you add an optional storage shelf to the system.</p>
Weight	23.58 kg (52 lbs)
Dimensions	<p>Height: 8.76 cm (3.45") (approximately 2U)</p> <p>Width: 43.80 cm (17.24")</p> <p>Depth: 69.59 cm (27.39")</p>
Power consumption	750 watts 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>
AC power cable	<p>Specification: IEC-60320-C14 to IEC-60320-C13, 10A/250V, Black, 4 ft</p> <p>The IEC-60320-C14 plugs into a Power Distribution Unit. The IEC-60320-C13 plugs into an appliance or storage shelf power supply.</p> <p><b>Note:</b> If your power distribution unit is not compatible with the IEC-60320-C14 plug, then Veritas recommends that you purchase your power cable locally. Make sure the power cable meets or exceed the indicated power rating.</p> <p>See <a href="#">"Power cables"</a> on page 26.</p>
Inherent availability of the system	≥ 99.95%
Mean Time to Repair (MTTR)	1 hour
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

**Table 3-1** Appliance technical specifications (*continued*)

Parameter	Description
Acoustic noise	Sound power: 7.0 dB in operating condition at typical office ambient temperature.  (23°C +/- 2)
System Cooling Requirement	460W typical – 1570 BTU/hour  750W maximum – 2560 BTU/hour

## Storage shelf technical specifications

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 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><b>Note:</b> The maximum weight of a storage shelf includes the 16 disk drive modules and two power modules.</p> <p>Transportation weight: Approx. 50 kg (110.23 lb)</p> <p><b>Note:</b> The transportation weight is the sum of the maximum weight of a device and the maximum weight of the transportation materials.</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>



**Table 3-2** Storage shelf technical specifications (*continued*)

Parameter	Description
Power supplies	Dual 580W, 100 - 240 VAC auto ranging, 50-60 Hz, hot swappable power supplies
Power consumption	326 W at 110 V 372 W at 220 V
Power parameters	AC voltage range: <ul style="list-style-type: none"> <li>■ 110 V at 2.972 A</li> <li>■ 220 V at 1.756 A</li> </ul> AC frequency range: 50 Hz to 60 Hz
Inherent availability of the system	≥ 99.95%
Mean Time to Repair (MTTR)	< 1 hour

See [“Environmental specifications”](#) on page 33.

## 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 (50°F to 95°F)
Storage temperature	-40°C to 70°C (-40°F to 158°F)
Transportation temperature	-40°C to 70°C (-40°F to 158°F)
Temperature gradient	10°C/hour
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.

**Table 3-3** Environmental requirements (*continued*)

Component	Requirement
Storage altitude	-30 meters to 3,000 meters
Noise	<p>&lt; 72 A-weighted decibel</p> <p>This value reflects the maximum noise of the appliance when the ambient temperature is 25°C.</p>

See [“Protocol standards”](#) on page 34.

## Protocol standards

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

**Table 3-4** Standards compliance

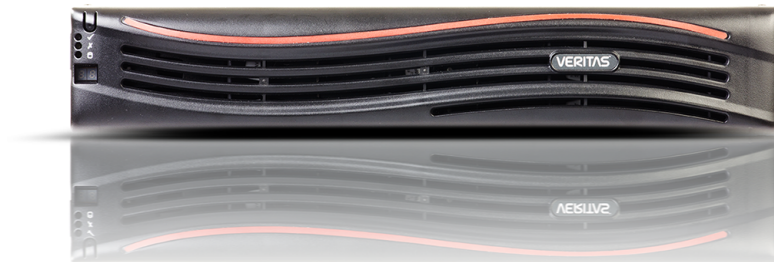
Standard	Version
IPMI 2.0	Intelligent Platform Management Interface Specification Second Generation v2.0, Document Revision 1.0
SMBIOS	System Management BIOS (SMBIOS) Reference Specification, Version 2.5
SAS	SAS- 2.1
ACPI	Advanced Configuration and Power Interface Specification, Revision 3.0, September 2
IP	RFC0791: Internet Protocol
FC	INCITS T11 (X3T9.3)
PCI Express	PCIe 3.0

# About the optional Veritas 2U12 49TB Storage Shelf

This appendix includes the following topics:

- [Veritas 2U12 49TB Storage Shelf overview](#)
- [Components of the Veritas 2U12 49TB Storage Shelf](#)

## Veritas 2U12 49TB Storage Shelf overview



The optional Veritas 2U12 49TB Storage Shelf is a 2U12 drive enclosure that contains twelve 6TB 7200 rpm SAS hard disk drives. Available storage capacity of the storage shelf is 49TBs. Each disk drive can be accessed from the storage shelf's front panel. An embedded RAID controller is used to configure the disk drives into a RAID 6 configuration. One of the disk drives is reserved as a hot spare.

The Veritas 2U12 49TB Storage Shelf also contains two Storage Bay Bridge 2.1 compliant (SBB) Input/Output (I/O) modules. Each I/O module has three SAS-3 ports, which are labeled A, B, and C. As such, each storage shelf contains a total

of six SAS-3 I/O ports. However, only ports A and B of each I/O module are used to connect the storage shelf to the appliance or other storage shelves.

Each I/O module also includes one Ethernet port and a 3.5mm RS232 Interface-to-Enclosure Services Processor jack. The Ethernet port and the RS232 jack are only used during on-site debugging operations. They are not used during normal appliance operations.

Along with the I/O modules and the disk drives, the Veritas 2U12 49TB Storage Shelf also includes a front control panel. The control panel provides LED indications of the health of the storage shelf. It uses a dual seven segment display for enclosure identification and a switch that is used for storage shelf configuration purposes.

The Veritas 2U12 49TB Storage Shelf serial number appears on a plastic panel on the left side of Power Cooling Module 0 (PCM 0). The storage shelf serial number begins with the letters SH.

See [“Veritas 2U12 49TB Storage Shelf front panel components”](#) on page 36.

See [“Veritas 2U12 49TB Storage Shelf rear components”](#) on page 40.

See [“Veritas 2U12 49TB Storage Shelf control panel”](#) on page 38.

## Components of the Veritas 2U12 49TB Storage Shelf

The following sections describe the components of the Veritas 2U12 49TB Storage Shelf.

### Veritas 2U12 49TB Storage Shelf front panel components

#### **Hard disk drive capacities and drive bay slot assignments**

The Veritas 2U12 49TB Storage Shelf contains 12 disk drive storage bays that are populated with 6TB 7200 rpm SAS hard disk drives. The available backup storage capacity of the storage shelf equals 49TBs. One of the disk drives is reserved as a hot spare. All disk drives are accessible from the front panel of the storage shelf after you remove the storage shelf bezel.

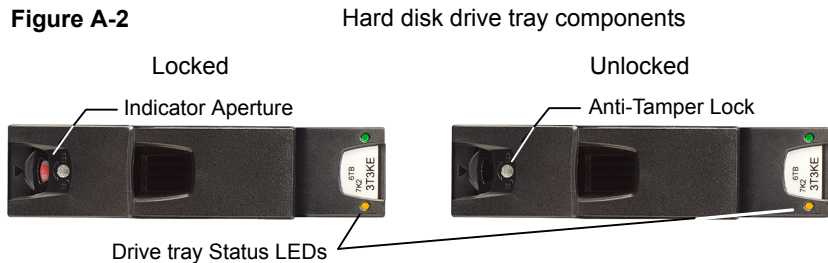
The following figure shows the front panel disk drive slot assignments within the Veritas 2U12 49TB Storage Shelf.

**Figure A-1** Veritas 2U12 49TB Storage Shelf disk drive slot layout



## Hard disk drive carrier characteristics

Each storage shelf hard drive is housed in a disk drive carrier. Each disk drive carrier uses a locking mechanism that secures the disk drive within the storage shelf.



The following table describes the disk drive carrier LEDs. Note that the combination of both LEDs provides the status.

**Table A-1** Veritas 2U12 49TB Storage Shelf disk drive carrier LED status

Status	Activity (green) LED	Fault (amber) LED
No disk drive installed.	OFF	OFF
Drives are installed, turned on, and operational.	Blinks during I/O activity and during startup.	OFF
SCSI Enclosure Services (SES) Device identity set.	ON	Blinks at a rate of 1 second ON and 1 second OFF.
Drive slot fault.	OFF	ON
Drive fault. Power control circuit fault.	ON	ON
Logical fault. Possible drive failed.	ON	Blinks at a rate of 3 seconds ON and one 1 second OFF.

---

**Note:** For security purposes, each drive tray is locked by default when the storage shelf is shipped from the factory. To access a hard disk drive, each storage bay must be unlocked using a T10 screw driver.



---

## Veritas 2U12 49TB Storage Shelf control panel

The Veritas 2U12 49TB Storage Shelf control panel is installed on the front left side of the storage shelf.

**Figure A-3**

Veritas 2U12 49TB Storage Shelf control panel



**Table A-2** Veritas 2U12 49TB Storage Shelf control panel functions

Number	Item	Description
1	Input switch	The Input switch enables you to set the Unit Identification display.
2	Power On / Standby LED (Green or Amber)	The Power On/Standby LED shows Amber when only standby power is available. Otherwise, the LED shows Green when system power is available.
3	Module Fault LED (Power Cooling Module, Cooling, I/O module status) (Amber)	The Module Fault LED illuminates when there is a system hardware fault. The system hardware fault may be associated with a fault LED on a Power Cooling Module (PCM) or on an I/O module.
4	Logical status LED (amber)	The Logical Status LED shows a change of status or a fault. Typically these changes of status or faults are associated with the shelf's disk drives. However, the Logical Status LED can also indicate an issue with an internal RAID controller or external RAID controller, or with a host bus adapter.
5	Unit Identification Display	The Unit Identification Display is a dual digit display that provides information about the storage shelf. Its primary function is to assist in the configuration of multiple storage shelves.

**Table A-3** Control panel LED conditions and statuses

System Power (Green or Amber)	Module Fault (Amber)	Logical Fault (Amber)	Associated LEDs/Alarms	Status
On (Amber)	Off	Off	None	Standby power present, Overall Power failed or switched off
On (Green)	On (Amber)	N/A	Single beep, then double beep	Control Panel Power on - test state (Test state = 5 seconds)
On (Green)	Off	Off	None	Power On - All functions good

**Table A-3** Control panel LED conditions and statuses *(continued)*

System Power (Green or Amber)	Module Fault (Amber)	Logical Fault (Amber)	Associated LEDs/Alarms	Status
On (Green)	On (Amber)	N/A	Power Cooling Module Fault LEDs Fan Fault LEDs	Any Power Cooling Module Fault, Fan Fault, or an over or under temperature issue
On (Green)	On (Amber)	N/A	I/O module LEDs	Any I/O module fault
On (Green)	On (Amber)	N/A	None	Enclosure Logical Fault
On (Green)	Flashing	N/A	Module Fault LED on an I/O module	Unknown I/O module type installed (Invalid or Mixed)
On (Green)	Flashing	N/A	Power Cooling Module Fault LEDs Fan Fault LEDs	Unknown Power Cooling Module installed. (Invalid or Mixed)
On (Green)	N/A	On	Array in a failed or degraded state	Drive failure has occurred causing loss of availability or redundancy
On (Green)	N/A	Flashing	Arrays in an impacted state	Array operating background function
On	Flashing	N/A	SES state S1	Enclosure ID setting different from "start of day" setting

N/A - Not Applicable

For more information, see the *NetBackup Appliance Hardware Installation Guide - Release 3.0 - NetBackup 5240*.

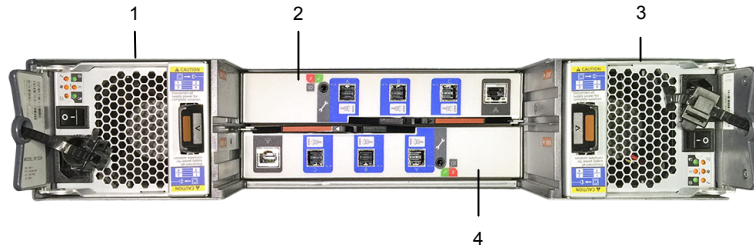
## Veritas 2U12 49TB Storage Shelf rear components

This section describes the rear panel features of the Veritas 2U12 49TB Storage Shelf.



The following figure provides an overview of the components that comprise the Veritas 2U12 49TB Storage Shelf rear panel.

**Figure A-4** Veritas 2U12 49TB Storage Shelf rear components



**Table A-4** Veritas 2U12 49TB Storage Shelf rear components

Number	Component
1	Power Cooling Module 0 (PCM0)
2	I/O module 0
3	Power Cooling Module 1 (PCM1)
4	I/O module 1

See [“Veritas 2U12 49TB Storage Shelf I/O modules”](#) on page 41.

See [“Veritas 2U12 49TB Storage Shelf Power Cooling Modules”](#) on page 45.

See [“Power Cooling Module LEDs”](#) on page 46.

## Veritas 2U12 49TB Storage Shelf I/O modules

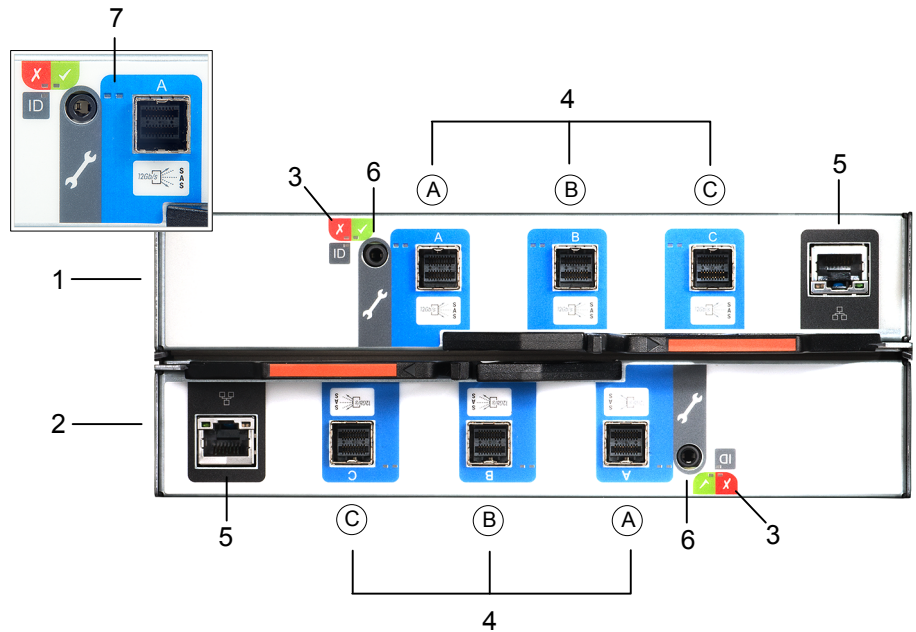
This section discusses the Veritas 2U12 49TB Storage Shelf I/O modules.

**Figure A-5** Veritas 2U12 49TB Storage Shelf I/O module



The following figure and table provides details of the two Veritas 2U12 49TB Storage Shelf I/O module canisters.

**Figure A-6** Veritas 2U12 49TB Storage Shelf I/O modules



**Table A-5** Veritas 2U12 49TB Storage Shelf I/O module components

Number	Description
1	I/O module 0
2	I/O module 1
3	I/O module Status LEDs See <a href="#">“I/O module Status LED location and conditions”</a> on page 43.
4	SAS-3 ports - A, B, and C
5	Ethernet port (debugging purposes only)
6	RS232 jack (debugging purposes only)
7	SAS Activity LEDs See <a href="#">“I/O module SAS Activity LED location and conditions”</a> on page 44.

### I/O module Status LED location and conditions

This section discusses the location of the Status LEDs on the I/O module and the Status LED conditions.

**Figure A-7** I/O module Status indicator LED location

I/O module Status LED location



**Table A-6** I/O module Status LED conditions

Condition	Activity LED (green)	Fault LED (amber)
Module Fault (amber)	On	The I/O module has encountered a fault condition.
	Off	The I/O module is operating normally.
Power (green)	On	The I/O module is on.

**Table A-6** I/O module Status LED conditions (*continued*)

Condition	Activity LED (green)	Fault LED (amber)
	Off	The I/O module is off.
ID (blue)	On	The I/O module controller is being identified.

See [“I/O module SAS Activity LED location and conditions”](#) on page 44.

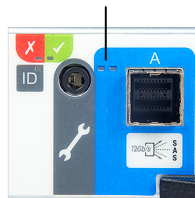
See [“Veritas 2U12 49TB Storage Shelf I/O modules”](#) on page 41.

### I/O module SAS Activity LED location and conditions

This section discusses the location of the SAS Activity LEDs on the I/O module and the SAS Activity LED conditions.

**Figure A-8** I/O module SAS Activity LED location

SAS Activity LED location



**Table A-7** I/O module SAS Activity LED conditions

Condition	Activity LED (green)	Fault LED (amber)
No Cable Present	Off	Off
Cable Present All links up, no activity.	On	Off
Cable Present All links up.	Flash with aggregate port activity	Off
Critical Fault Any fault which causes operation of the cable to cease or fail to start. For example, an OVERCURRENT trip.	Off	On

**Table A-7** I/O module SAS Activity LED conditions (*continued*)

Condition	Activity LED (green)	Fault LED (amber)
Non-Critical Fault  Any fault which does not cause the connection to cease operation.  For example, not all links established; OVERTEMPERATURE condition detected.	Flash with aggregate port activity	Flashing - One second on; one second off

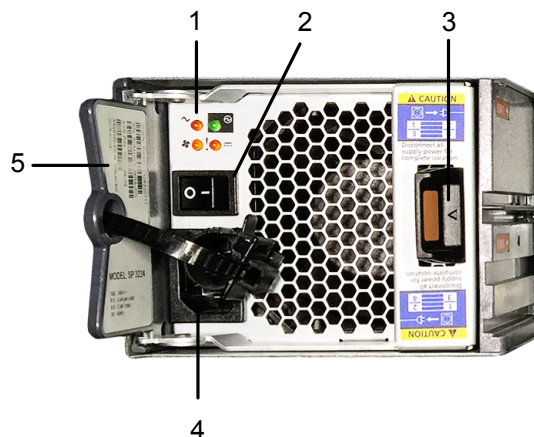
See [“Veritas 2U12 49TB Storage Shelf I/O modules”](#) on page 41.

See [“I/O module Status LED location and conditions”](#) on page 43.

## Veritas 2U12 49TB Storage Shelf Power Cooling Modules

The Veritas 2U12 49TB Storage Shelf includes two Power Cooling Modules (PCM). The dual PCMs provide redundant power to the storage shelf. If one PCM fails, the storage shelf continues to operate as the second PCM continues to supply the storage shelf with power.

**Figure A-9** Power Cooling Module



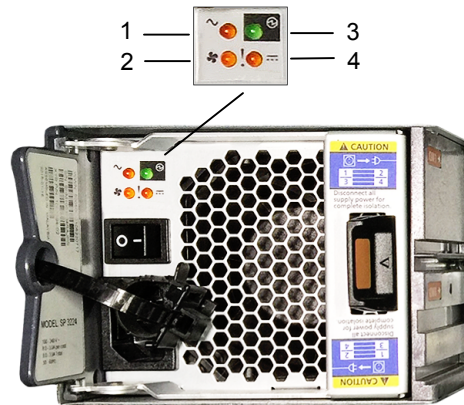
**Table A-8** Power Cooling Module components

Number	Component
1	Power Cooling Module LEDs See “ <a href="#">Power Cooling Module LEDs</a> ” on page 46.
2	On/Off switch
3	Release tab
4	AC power socket
5	Serial number - located on the Power Cooling Module 0 tab <b>Note:</b> The storage shelf serial number begins with the letters <b>SH</b> .

## Power Cooling Module LEDs

Power Cooling Modules (PCM) use four LEDs to indicate the status of the PCM.

**Figure A-10** Power Cooling Module LEDs



**Table A-9** Power Cooling Module LED legend

Number	LED condition
1	AC fail
2	Fan fail
3	Power Cooling Module OK
4	DC fail

**Table A-10** Power Cooling Module LED conditions

Status	Power Cooling Module OK (Green)	Fan Fail (Amber)	AC Fail (Amber)	DC Fail (Amber)
No AC Power (any Power Cooling Module)	Off	Off	Off	Off
No AC Power (this Power Cooling Module only)	Off	Off	On	On
AC Present (Power Cooling Module On OK)	On	Off	Off	Off
Power Cooling Module fan out of tolerance	On	Off	Off	On

**Table A-10** Power Cooling Module LED conditions (*continued*)

Status	Power Cooling Module OK (Green)	Fan Fail (Amber)	AC Fail (Amber)	DC Fail (Amber)
Power Cooling Module fan fail	Off	On	Off	Off
Power Cooling Module Fault (Over temp, over volts, over current)	Off	On	On	On
Standby Mode	Flashing	Off	Off	Off
Power Cooling Module firmware download	Off	Flashing	Flashing	Flashing

See [“Veritas 2U12 49TB Storage Shelf Power Cooling Modules”](#) on page 45.



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