Veritas NetBackup™ 5330 Appliance Product Description

Release 2.7.3

VERITAS™

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Contents

Chapter 1

NetBackup 5330 Appliance overview

This chapter includes the following topics:

About the NetBackup 5330 Appliance

The NetBackup 5330 Appliance is a hardware and software storage system that scales to a total of 456 TB of usable backup capacity. It consists of a 2U NetBackup 5330 Appliance compute node and one externally attached 4U Primary Storage Shelf. You can add up to two optional 4U Expansion Storage Shelfs if you require additional storage.

Fibre channel (FC) cables connect the NetBackup 5330 Appliance compute node to the Primary Storage Shelf. SAS cables connect the Primary Storage Shelf to the Expansion Storage Shelf.

NetBackup 5330 Appliance system features

Table 1-1 NetBackup 5330 Appliance system features

Feature	Description
Performance and capacity	■ Processor - two Intel Xeon 10-core 3.0 GHz E5-2690 v2 CPUs. ■ Supports the high-performance processors with low-power consumption. ■ Provides high-capacity intra-appliance switching bandwidth, along with high I/O throughput. ■ Usable capacity can be any combination of up to 229.2 TB. The usable capacity can be allocated either in part or in whole to a deduplication pool or to an AdvancedDisk pool (non-deduplicated storage).
System memory configuration (DIMMs)	16 GB x 24; total RAM: 384 GB
RAID cache	24 GB
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. The NetBackup 5330 Appliance storage system can be configured with a required Primary Storage Shelf, or a Primary Storage Shelf with one or more optional Expansion Storage Shelfs. A NetBackup 5330 Appliance compute node that is paired with a Primary Storage Shelf provides usable storage capacity of 229 TB. When the compute node is paired with both the Primary Storage Shelf and the optional Expansion Storage Shelfs, usable storage capacity increases to 456 TB.
High availability	Supports redundant hot-swappable diskssh and power modules.

Table 1-1 NetBackup 5330 Appliance system features *(continued)*

Feature	Description
Easy management	Provides separate out-of-band management network interfaces. You can remotely turn on, turn off, and reset appliances through the network. Supports the SNMP traps and automatically reports alarms. Supports reporting the disk information through the out-of-band management channel.
RAID levels	RAID1 (striping and mirroring) and RAID6 (block level striping with double distributed parity) are used as follows: ■ NetBackup 5330 compute node system disks: RAID1 ■ Storage shelf data storage disks: RAID6
Fibre Channel support	The NetBackup 5330 compute node can be ordered with two, three, five, or six Fibre Channel (FC) HBA cards already installed. Each card includes two standard Fibre Channel ports. If less than six FC HBA cards are ordered, a 10 Gb Ethernet card with two standard ports can be ordered. The compute node uses the QLE2562, a QLogic 8 Gb FC PCIe dual port adapter.
Rear panel ports	One 1 Gb/s IPMI remote network port One VGA port Four 1 GbE network ports, with an RJ-45 connector, and link and activity LEDs. Two of the ports are reserved for private networks. Two 10 GbE network ports, with Small Form-factor Pluggable (SFP) modules, and link and activity LEDs.

See "NetBackup 5330 Appliance compute node disk drive configurations" on page 10.

See "NetBackup 5330 Appliance compute node disk drive LED descriptions" on page 11.

See "NetBackup 5330 Appliance compute node control panel information" on page 12.

See "About the NetBackup 5330 Appliance compute node rear panel" on page 13.

See "NetBackup 5330 Appliance compute node PCIe slot I/O configuration options" on page 14.

See "NetBackup 5330 compute node Ethernet port configurations" on page 15.

See “Dual-port 8 Gb Fibre Channel Host Bus Adapter (FC HBA) specifications” on page 17.

NetBackup 5330 Appliance compute node disk drive configurations

The NetBackup 5330 Appliance compute node contains eight 3TB SAS disk drives. Two of the 3 TB disk drives include two operating system disks, one each in slot 0 and slot 1. These two disk drives comprise Volume 0, which is a RAID 1 volume. Volume 0 contains both the operating system and the NetBackup application.

Slot 2 contains a hot spare disk drive. Slot 3 and slot 4 comprise Volume 1, which is a RAID 1 volume that contains the swap file system for the operating system. Slot 5 contains another hot spare disk drive. Both of the hot spares can be used by either volume. Slots 6 and 7 contain disk drives that are reserved for future use. The remaining slots contain blank carriers.

Figure 1-1 NetBackup 5330 Appliance compute node front panel disk slot assignments

NetBackup 5330 Appliance compute node disk slot assignments and RAID disk assignments:

- Slot 0 - Disk0 of RAID1, Volume 0 (set as the Boot volume and contains the operating system)
- Slot 1 - Disk1 of RAID1, Volume 0 (set as the Boot volume and contains the operating system)
- Slot 2 - Hot spare disk
- Slot 3 - Disk0 of RAID1, Volume 1 (contains the swap file for the operating system, along with log files)
- Slot 4 - Disk1 of RAID1, Volume 1 (contains the swap file for the operating system, along with log files)
- Slot 5 - Hot spare disk
- Slot 6 - The disk drive in slot 6 is reserved for future use
- Slot 7 - The disk drive in slot 7 is reserved for future use

Note: Slots 8, 9, 10, and 11 are intentionally empty for compute node cooling purposes.

See "NetBackup 5330 Appliance compute node disk drive LED descriptions" on page 11.

NetBackup 5330 Appliance compute node disk drive LED descriptions

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 amber when a disk drive fault occurs. This LED is not lit when there are no disk drive faults.
- The LED on the bottom is solid green when power is supplied to the disk drive. This LED flashes green when the disk drive is active.

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.

Figure 1-2 Disk drive module LEDs

Table 1-2 Disk drive module LED descriptions

LED color	Condition	Description/Behavior
Amber	Off	No access and no fault
Amber	Solid On	A hard drive fault has occurred
Amber	Blinking	A RAID rebuild is in progress (1 Hz), Identify (2 Hz)
Green	Power on with no drive activity	LED stays on
Green	Power on with drive activity	LED blinks off when processing a command

Table 1-2 Disk drive module LED descriptions *(continued)*

LED color	Condition	Description/Behavior
Green	Power on and drive spun down	LED stays off
Green	Power on and drive spinning up	LED blinks

NetBackup 5330 Appliance compute node control panel information

The front panel of the NetBackup 5330 Appliance compute node includes a small panel that is attached to the right side of the device. System information is shown on this panel.

Figure 1-3 NetBackup 5330 Appliance compute node control panel

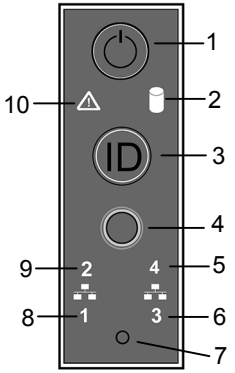


Table 1-3 LED panel descriptions

Label	Description
1	AC power button with integrated LED (executes a shutdown before turning off power)
2	Hard drive activity LED
3	ID button with integrated LED
4	Cold reset button (restarts the appliance instantly)
5	NIC4/eth3 activity LED (for public use)
6	NIC3/eth2 activity LED (for public use)

Table 1-3 LED panel descriptions *(continued)*

Label	Description
7	NMI button (recessed; a tool is required for use)
8	NIC1/eth0 activity LED (for public use)
9	NIC2/eth1 activity LED (for public use)
10	Status LED

About the NetBackup 5330 Appliance compute node rear panel

The rear panel of a NetBackup 5330 Appliance compute node has several access ports and other features, which are displayed in the following diagram and table.

Figure 1-4 NetBackup 5330 Appliance compute node rear panel access ports and features

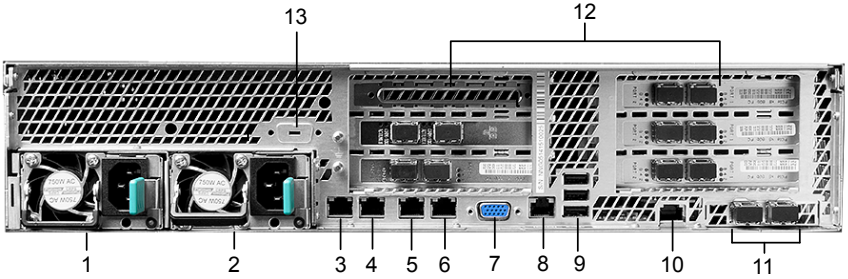


Table 1-4 NetBackup 5330 Appliance compute node port functions

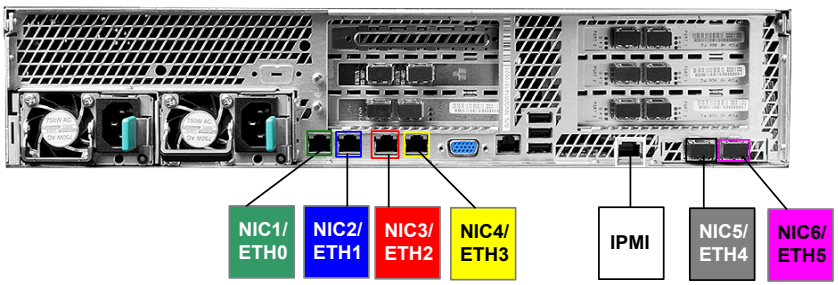
Number	Function
1,2	Power Supply Modules #1, #2 (120/220VAC)
3,4	NIC1/eth0 and NIC2/eth1. NIC1/eth0 is reserved for use during the initial configuration of the appliance. However, after initial configuration is complete, both NIC1/eth0 and NIC2/eth1 can be used for public networks. Both are 1GB connectors
5,6	NIC3/eth2 and NIC4/eth3 - used for public networks. Both are 1GB connectors
7	DB-15 VGA connector

Table 1-4 NetBackup 5330 Appliance compute node port functions *(continued)*

Number	Function
8	RJ45 Serial-A port (reserved)
9	USB connectors
10	A NIC port for IPMI remote management
11	NIC5/eth4 and NIC6/eth5, left to right: 10Gb network connectors that can be used for public networks
12	Add-in PCIe adapter slots (Fibre Channel, 10Gb Ethernet)
13	Serial-B port (reserved)

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

Figure 1-5 NetBackup 5330 Appliance compute node rear port colors

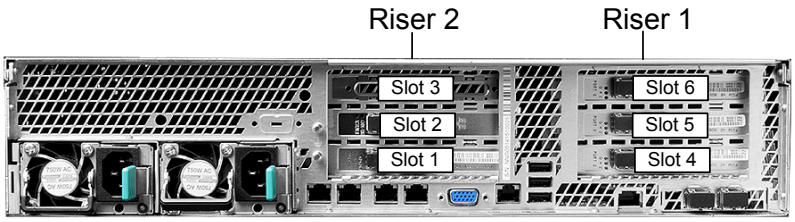


The rear panel also has two sets of low profile, full height, 3.5" form factor PCIe slots.

See “NetBackup 5330 Appliance compute node PCIe slot I/O configuration options” on page 14.

NetBackup 5330 Appliance compute node PCIe slot I/O configuration options

The rear panel of the NetBackup 5330 Appliance compute node contains six PCIe slots that are numbered 1 to 6. Slots 1, 2, and 3 are located in PCIe Riser Assembly 2. Slots 4, 5, and 6 are located in PCIe Riser Assembly 1.



All PCIe slots are populated with an 8 Gb Fibre Channel (FC) host bus adapter (HBA) card or a 10 Gb Ethernet network interface card (NIC). Slots 1 and 4 are reserved exclusively for attachment to the Primary Storage Shelf.

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

Table 1-5 describes the PCIe slot I/O configuration options for the NetBackup 5330 Appliance.

Table 1-5 PCIe slot I/O configuration options for the NetBackup 5330 Appliance compute node

I/O configuration option	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
A	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	10 GbE NIC	10 GbE NIC
B	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	10 GbE NIC	8 Gb FC HBA
C	8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA
D	8 Gb FC HBA	8 Gb FC HBA	10 GbE NIC	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA
E	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA	8 Gb FC HBA

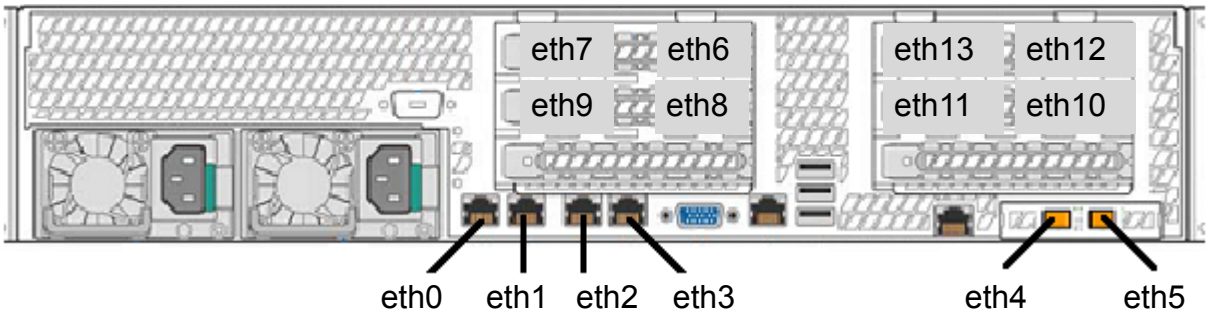
NetBackup 5330 compute node Ethernet port configurations

The rear panel of the NetBackup 5330 compute node contains six PCIe slots, which are populated according to five different supported configurations. The PCIe slot configuration determines the number of Ethernet ports that are available.

All NetBackup 5330 Appliances include the following ports, which are built in along the base of the rear panel:

- 1-GbE ports: eth0, eth1, eth2, and eth3
- 10-GbE ports: eth4 and eth5

The following picture shows the location of all Ethernet ports on the rear panel of the compute node, including the PCIe card-based ports.



The 10-Gb Ethernet network interface cards that are installed in the PCIe slots contain additional ports. The number of ports depends on the PCIe slot configuration of your compute node.

Table 1-6 shows the available Ethernet ports for each PCIe slot configuration.

Table 1-6 NetBackup 5330 compute node PCIe Ethernet port configurations

Option	Slot and Ethernet port numbers
A (four 10-Gb Ethernet cards)	■ Slot 2: eth8 (right), eth9 (left) ■ Slot 3: eth6 (right), eth7 (left) ■ Slot 5: eth10 (right), eth11 (left) ■ Slot 6: eth12 (right), eth13 (left)
B (three 10-Gb Ethernet cards)	■ Slot 2: eth8 (right), eth9 (left) ■ Slot 3: eth6 (right), eth7 (left) ■ Slot 5: eth10 (right), eth11 (left)
C (two 10-Gb Ethernet cards)	■ Slot 2: eth8 (right), eth9 (left) ■ Slot 3: eth6 (right), eth7 (left)
D (one 10-Gb Ethernet card)	■ Slot 3: eth6 (right), eth7 (left)
E (no 10-Gb Ethernet cards)	N/A

Dual-port 8 Gb Fibre Channel Host Bus Adapter (FC HBA) specifications

The Fiber Channel (FC) host bus adapter ports are used to connect the appliance to a Primary Storage Shelf, along with clients and other devices for Fibre Transport data transfer.

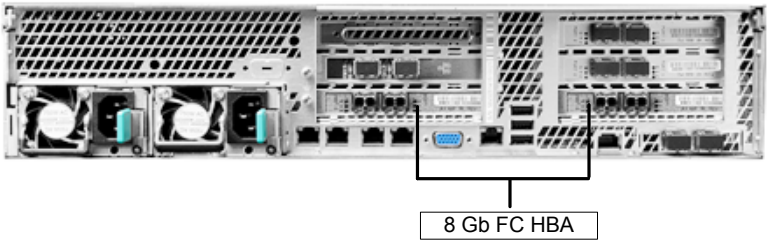


Table 1-7 Dual-port 8 Gb Fibre Channel Host Bus Adapter specifications

Item	Description
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)

Dual-port 10Gb Ethernet card with SFP+ transceiver ports

The 10Gb Ethernet card with SFP+ transceivers is available with the appliance. The card can be installed in the PCI Riser Assembly in addition to Fibre Channel cards.

Table 1-8 Dual-port 10Gb Ethernet card with SFP+ transceivers specifications

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

Table 1-8 Dual-port 10Gb Ethernet card with SFP+ transceivers specifications *(continued)*

Item	Specification
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)
System Interface Type	PCIe v3.0
Speed and slot width	8.0 GT/s (gigatransfers per second)
Storage over Ethernet	Fibre Channel over Ethernet (FCoE), Network File System (NFS)
Data rate supported per port	Optical: 1GbE/10GbE Direct attach: 10GbE
LED indicators	LINK (solid) and ACTIVITY (blinking) LINK SPEED (green=10Gbps; yellow=1Gbps)
Certifications	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Air Flow (minimum)	50 LFM (linear feet per minute)
Operating temperature	0 to 55 C (32 to 131 F)
Storage temperature	-40 to 70 C (-40 to 158 F)
Storage humidity	90% non-condensing relative at 35 C

About NetBackup 5330 Appliance storage shelves

The NetBackup 5330 Appliance storage system supports two types of externally-connected hard disk drive-based storage shelves.

These include:

- A Primary Storage Shelf (required)
- One or more Expansion Storage Shelfs (optional)

The NetBackup 5330 Appliance compute node does not contain internal storage. Instead, a required Primary Storage Shelf that uses RAID6 technology connects to the compute node as the main storage device. In addition, you can extend the RAID6 capabilities of the Primary Storage Shelf to the optional Expansion Storage Shelfs if you require additional storage.

The NetBackup 5330 Primary Storage Shelf and the NetBackup 5330 Expansion Storage Shelfs each contain 60 SAS hard disk drives. Two of the disks are global hot spares, while four of the disks provide a dedicated RAID1 metadata volume group. The remaining 54 disks are used for data storage purposes. Both the Primary Storage Shelf and Expansion Storage Shelfs contain five drawers, and each drawer contains 12 disk drives. The front panels of both systems are physically and functionally the same.

The NetBackup 5330 Appliance Primary Storage Shelf and the optional NetBackup 5330 Appliance Expansion Storage Shelf each contain 60 SAS hard disk drives. Two of the disks are global hot spares, while four of the disks provide a dedicated RAID1 metadata volume group. The remaining 54 disks are used for data storage purposes. Both the Primary Storage Shelf and Expansion Storage Shelf contain five drawers, and each drawer contains 12 disk drives. The front panels of both systems are physically and functionally the same.

Each storage shelf provides 229 TB of formatted storage capacity, for a total of 458 TB of usable backup capacity when you use both shelves with the appliance.

Available appliance storage options

You can configure the NetBackup 5330 Appliance for use with up to 458 TB of total storage capacity. The capacities of the disks within the Primary Storage Shelf and the Expansion Storage Shelves determine the available storage capacity of the appliance. Both 3TB disks and 6 TB disks are available.

Note: Individual storage shelves contain either the 3 TB disks or the 6 TB disks but not both.

The following sections explain the storage options and storage configurations that are available with the different software versions of the NetBackup 5330 Appliance.

Storage options for a NetBackup 5330 Appliance that runs software version 2.7.3

Storage options for a NetBackup 5330 Appliance that runs software versions 2.7.1 or 2.7.2

Storage options for a NetBackup 5330 Appliance that runs software version 2.6.x

How to increase the storage capacity for a NetBackup 5330 Appliance that runs software version 2.6.x

Storage options for a NetBackup 5330 Appliance that runs software version 2.7.3

Table 1-9 NetBackup 5330 Appliance version 2.7.3 storage options

NetBackup 5330 Appliance (software version 2.7.3)	Primary Storage Shelf	Expansion Storage Shelf	Expansion Storage Shelf	Total storage capacity
Storage option A	114 TB	-	-	114 TB
Storage option B	114 TB	114 TB	-	229 TB
Storage option C	114 TB	114 TB	114 TB	343 TB
Storage option D	114 TB	229 TB	-	343 TB
Storage option E	114 TB	114 TB	229 TB	458 TB
Storage option F	229 TB	-	-	229 TB
Storage option G	229 TB	229 TB	-	458 TB

Storage options for a NetBackup 5330 Appliance that runs software versions 2.7.1 or 2.7.2

The following table shows the available storage options for NetBackup 5330 Appliances that run software versions 2.7.1 or 2.7.2.

Table 1-10 NetBackup 5330 Appliance software versions 2.7.1 / 2.7.2 storage options

NetBackup 5330 Appliance (software version 2.7.1/2.7.2)	Primary Storage Shelf	Expansion Storage Shelf	Expansion Storage Shelf	Total storage capacity
Storage option A	114 TB	-	-	114 TB
Storage option B	114 TB	114 TB	-	229 TB
Storage option C	114 TB	229 TB	-	343 TB
Storage option D	114 TB	114 TB	229 TB	458 TB
Storage option E	229 TB	-	-	229 TB

Table 1-10 NetBackup 5330 Appliance software versions 2.7.1 / 2.7.2 storage options *(continued)*

NetBackup 5330 Appliance (software version 2.7.1/2.7.2)	Primary Storage Shelf	Expansion Storage Shelf	Expansion Storage Shelf	Total storage capacity
Storage option F	229 TB	229 TB	-	458 TB

Storage options for a NetBackup 5330 Appliance that runs software version 2.6.x

The following table shows the available storage options for NetBackup 5330 Appliances that run software version 2.6.x.

Table 1-11 NetBackup 5330 Appliance software version 2.6.x storage options

NetBackup5330 Appliance (software version 2.6.1.x)	Primary Storage Shelf	Expansion Storage Shelf	Total appliance storage capacity
Storage option A	114 TB	-	114 TB
Storage option B	114 TB	114 TB	229 TB

How to increase the storage capacity for a NetBackup 5330 Appliance that runs software version 2.6.x

You can increase the storage capacity of an existing NetBackup 5330 Appliance that runs software version 2.6.x by adding a 229TB capacity Expansion Storage Shelf. Before you add the 229TB Expansion Storage Shelf however, you must first upgrade the appliance software to version 2.7.1. Total appliance storage capacity then increases up to 458TBs after you complete the software upgrade and then add the higher capacity storage shelf.

Table 1-12 NetBackup 5330 Appliance storage options after upgrading from software version 2.6.x to version 2.7.1

NetBackup 5330 Appliance (software version 2.7.1)	Primary Storage Shelf	Expansion Storage Shelf	Expansion Storage Shelf	Total storage capacity
Storage option C	114 TB	229 TB*	-	343 TB
Storage option D	114 TB	114 TB	229 TB*	458 TB

Table 1-12 NetBackup 5330 Appliance storage options after upgrading from software version 2.6.x to version 2.7.1 *(continued)*

NetBackup 5330 Appliance (software version 2.7.1)	Primary Storage Shelf	Expansion Storage Shelf	Expansion Storage Shelf	Total storage capacity

***** Upgrade the appliance software version from 2.6.x to 2.7.1 before you add the second Expansion Storage Shelf that uses 6 TB disks.

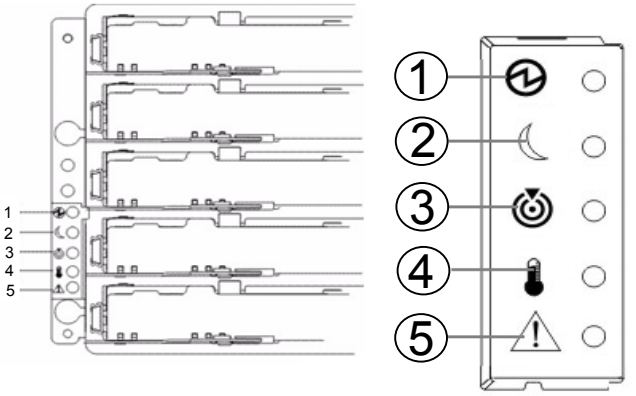
About the NetBackup 5330 Appliance Primary Storage Shelf and Expansion Storage Shelf front panel

The NetBackup 5330 Appliance Primary Storage Shelf and Expansion Storage Shelf each contain 60 SAS hard disk drives. The front panel of the Primary Storage Shelf and Expansion Storage Shelf contain five drawers. The drawers are numbered one through five, beginning with the top drawer. Each storage shelf drawer contains 12 disk drives. The front panels of both systems are physically and functionally the same, as seen in the following diagram.

Figure 1-6 Primary Storage Shelf and Expansion Storage Shelf front panel

The following table shows the front panel LEDs in detail.

Figure 1-7 Disk system front panel LEDs



The following table describes LEDs available on the disk system front panel.

Table 1-13 Primary Storage Shelf and Expansion Storage Shelf front panel LED definitions

Number	Definition	Color
1	Power LED	Green
2	Standby Power LED	Green
3	Locate LED	White
4	Over-temperature LED	Amber
5	Service Action Required LED	Amber

As mentioned, each drawer in a storage shelf contains slots for 12 disks. The slots are numbered as shown in the following diagram.

Figure 1-8 Drawer disk layout

About the NetBackup 5330 Appliance Primary Storage Shelf and Expansion Storage Shelf rear panels

The NetBackup 5330 Appliance Primary Storage Shelf and the Expansion Storage Shelf includes two power cords that should be plugged into the appropriate external power source within a rack. When connecting power cables, wear an ESD-preventive wrist strap to prevent equipment damage.

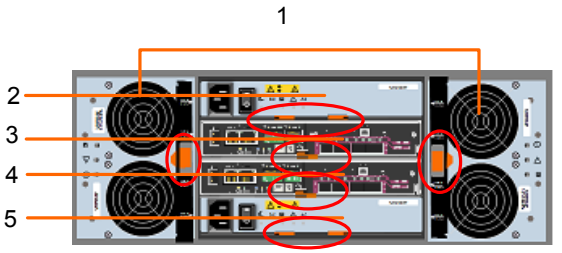
The rear panel of both disk systems contains three types of canisters:

- RAID or Expansion canisters
- AC power canisters (220VAC)
- Fan canisters

The Primary Storage Shelf has two RAID canisters, which are inserted in the central slots of the back panel. The power supplies are inserted at the top and bottom of the back panel, and the fans are on either side. The RAID canisters are attached to the NetBackup Appliance model Appliance with fiber optic cables. The device must have at least one functioning RAID canister, one functioning power supply, and one functioning fan.

The following figure shows the Primary Storage Shelf rear panel.

Figure 1-9 Primary Storage Shelf rear panel



Note: Latches that let you remove the canisters are circled in red.

Table 1-14 Primary Storage Shelf rear panel components

Number	Description
1	Fan canisters
2 and 5	Power canisters
3 and 4	RAID controller canisters

Each RAID canister has a set of LEDs which are defined in the following figure. The table describes the LEDs functions and colors. The LEDs labeled '1' track the data rate of the link. If both are off, the link is inactive, and if both are on, the data rate is 8 Gb per second. If only one LED is on, the LED on the left indicates a 2 Gb/s data rate, and the one on the right indicates a 4 Gb/s data rate. The canister also displays the ID of the Primary Storage Shelf, which is set to '99'.

Figure 1-10 RAID canister LEDs

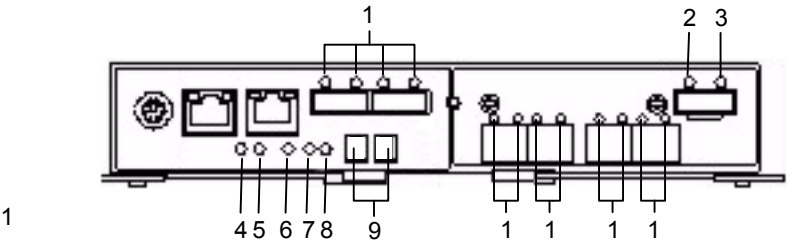


Table 1-15 RAID canister LEDs

Number	Description	Color
1	Data link activity	Green
2	SAS expansion fault	Amber
3	SAS expansion active	Green
4	Battery service action required	Amber
5	Battery charging	Green
6	RAID service system action allowed	Blue
7	RAID service system action required	Amber
8	Cache active	Green
9	Seven-segment display LEDs for system ID	Displays '99'

The Expansion Storage Shelf also contains two fans, on either side, and two power supplies, in the top and the bottom slots. The power supplies should be connected to the Power Distribution Units (PDU), which must be connected to an external 240V power supply. The two center slots contain expansion canisters, one of which must always function. The Expansion Storage Shelf must be attached to a Primary Storage Shelf by SAS cables, plugged into the expansion canisters.

Figure 1-11 Expansion Storage Shelf rear panel

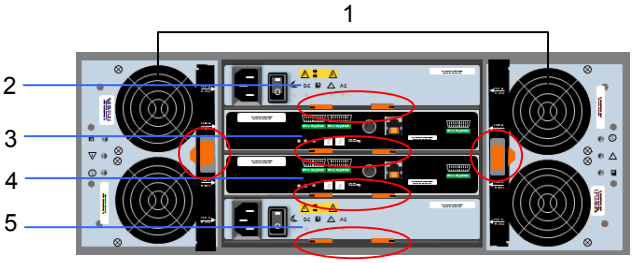


Table 1-16 Expansion Storage Shelf rear panel components

Number	Description
1	Fan canisters
2 and 5	Power canisters
3 and 4	Expansion canisters

The following diagram shows the LEDs in the Expansion Storage Shelf canister, along with the SAS ports. It also gives the location of the tray ID that is displayed when the system is initialized. The Primary Storage Shelf recognizes the Expansion Storage Shelf where the ID is set to 00.

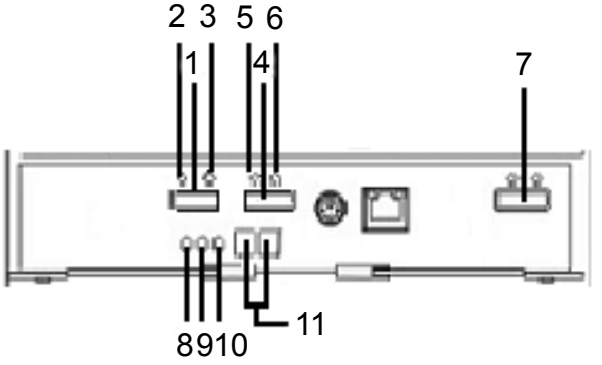


Table 1-17 Expansion Storage Shelf rear panel features

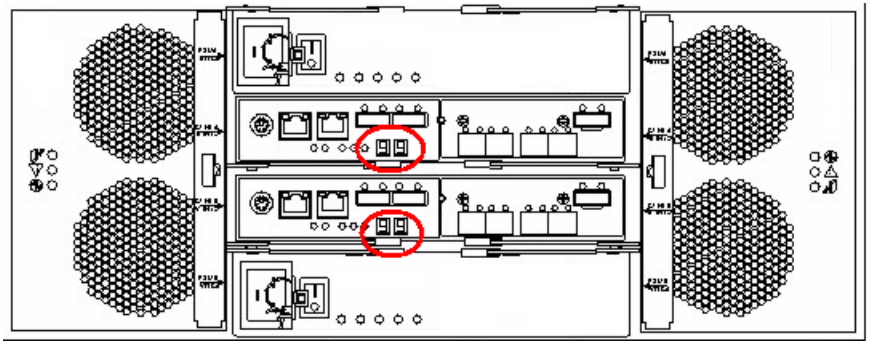
Number	Description	LED Display
1	SAS port	n/a
2	Link fault LED	Amber
3	Data Link LED	Green
4	SAS port	n/a
5	Link fault LED	Amber
6	Data Link LED	Green
7	SAS port	n/a
8	Service action allowed LED	Blue
9	Service action required LED	Amber

Table 1-17 Expansion Storage Shelf rear panel features *(continued)*

Number	Description	LED Display
10	Power LED	Green
11	Seven-segment display LEDs for system ID	00

As seen in both diagrams, the seven-segment display LEDs shows the storage system ID, once the devices have been turned on and are recognized. The following diagram shows the location of these displays, as seen on the rear panel of the Primary Storage Shelf, which are circled in red.

Figure 1-12 Primary Storage Shelf LED location



IMPORTANT: Notice that both systems have identical power supply canisters and fan canisters. However, the Primary Storage Shelf contains RAID controller canisters. The Extension Storage Shelf contains expansion canisters instead of RAID canisters. The following figure provides a comparison of the two canister types.

Figure 1-13 Comparison of the Primary Storage Shelf and Extension Storage Shelf - rear view

Primary Storage Shelf

Expansion Storage Shelf

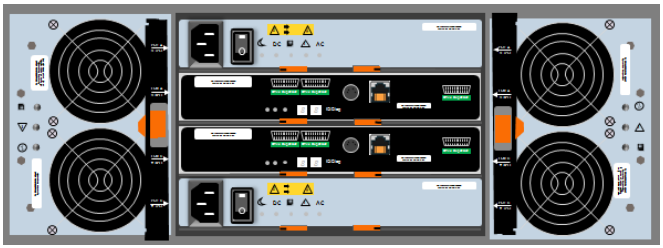
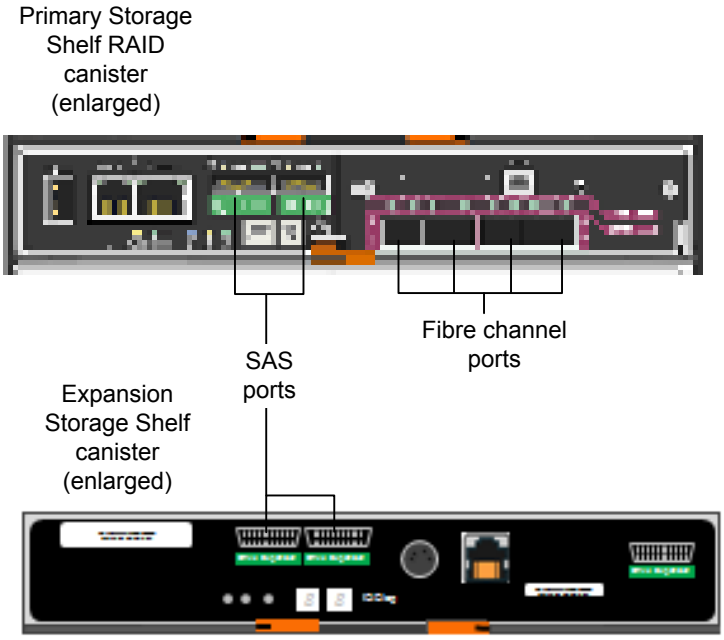


Figure 1-14 Comparison of the Primary Storage Shelf and Extension Storage Shelf canisters



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.

  Note: A storage device is heavier than an appliance and must always be installed under the appliance.

- Determine device order and cabling limits.
- 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 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 technical support.

Chapter 2

NetBackup 5330 Appliance cables

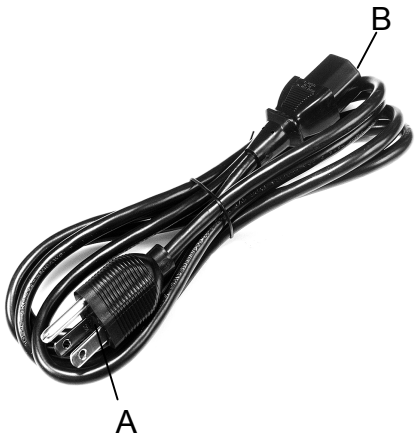
This chapter includes the following topics:

Power cables

Each AC power module of the appliance and of the storage device is configured with one 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 AC power connector to wall outlet.

B AC power connector to an appliance or a storage device.

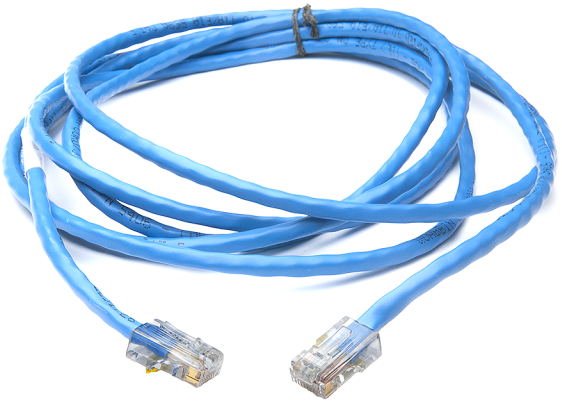
Note: This figure shows an example of possible connectors. Actual connectors vary per country.

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

Network cable

The NetBackup Appliance communicates with the outside 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 are RJ-45 connectors.

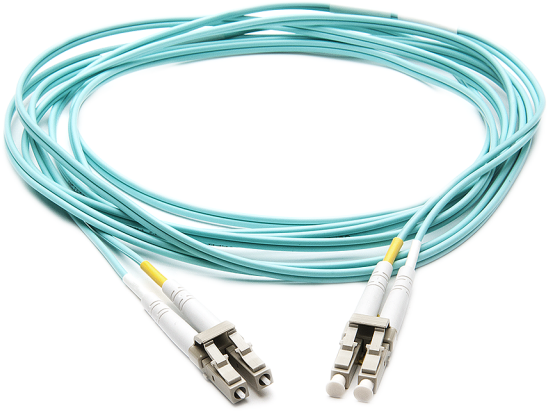
Figure 2-2 Network cable



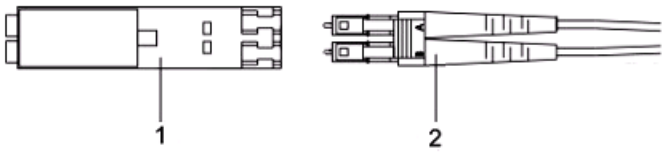
Multi-Mode fibre cable

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

Figure 2-3 Multi-Mode fibre 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

Appendix A

Technical specifications, standards, and compliance information

This appendix includes the following topics:

NetBackup 5330 Appliance system technical specifications

Note: The maximum weight of the NetBackup 5330 Appliance includes the eight disk drive modules, eight disk drive carriers, and two power modules.

Note: The maximum weight of the storage shelves includes 60 disk drive slots, two power canisters, and two fan canisters.

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

Table A-1 NetBackup 5330 Appliance specifications

Parameter	Description
Rack information	The rack installation height is the space occupied by an appliance in a rack cabinet. The rack height for the appliance is 2U (1U = 44.5 cm). Install the appliance in a rack cabinet that is 19 inches (1 inch = 2.54 cm) wide and 39.37 inches (100 cm) deep, or deeper.
Weight	Weight: approximately 30 kg (66 lbs)
Dimensions	Height: 8.76 cm (3.45”) (approximately 2U) Width: 43.8 cm (17.24”) Depth: 69.59 cm (27.39”)
Power consumption	750 watts maximum
AC power requirements	110 VAC or 220 VAC 100 - 110 VAC at 50/60 Hz 8.2 A 200 - 220 VAC at 50/60 Hz 4.4 A
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
Acoustic noise	Sound power: 7.0 dB in operating condition at typical office ambient temperature. (23°C +/- 2)
System Cooling Requirement	460 watts maximum – 1570 BTU/hour 750 watts maximum – 2559 BTU/hour

The technical specifications for the NetBackup 5330 Appliance Primary Storage Shelf and for the NetBackup 5330 Appliance Expansion Storage Shelf are as follows.

Table A-2 Primary Storage Shelf and Expansion Storage Shelf technical specifications

Parameter	Description
Rack information	4U
Weight	Approximately 105.2 kg (232 lb) with the 60 disk drives installed Approximately 80 kg (176 lb) without the disk drives
Dimensions	Height: 82.55 cm (32.50”) (approximately 4U) Width: 48.28 cm (19.00”) Depth: 17.78 cm (7.00”)
Overall maximum AC currents (agency ratings)	7.56 A at 200 VAC 6.3 A at 240 VAC
AC power requirements	Input voltage: 200 - 240 VAC Frequency: Range 50 Hz to 60 Hz Typical operating current: Range 4.9 A to 5.75 A Nameplate rating: Range 6.3 A to 7.56 A
Primary Storage Shelf Power ratings and heat dissipation including two fan canisters, two power canisters, 60 disk drives, and two RAID canisters.	Watts: 1135 AC (typical) Watts: 1222 AC (maximum) Cooling BTU/hr: 3873 (typical) Cooling BTU/hr: 4180 (maximum)
Expansion Storage Shelf Power ratings and heat dissipation including two fan canisters, two power canisters, 60 disk drives, and two expansion canisters.	Watts: 847 AC (typical) Watts: 1222 AC (maximum) Cooling BTU/hr: 2890 (typical) Cooling BTU/hr: 4180 (maximum)
NetBackup 5330 Appliance compute node with a Primary Storage Shelf connected	Watts: 1595 watts (typical) Watts: 1972 watts (maximum) Cooling BTU/hr: 5442 (typical) Cooling BTU/hr: 6739 (maximum)

Table A-2 Primary Storage Shelf and Expansion Storage Shelf technical specifications *(continued)*

Parameter	Description
NetBackup 5330 Appliance compute node with both a Primary Storage Shelf and an Expansion Storage Shelf connected	Watts: 2442 (typical) Watts: 3194 (maximum) Cooling BTU/hr: 8332 (typical) Cooling BTU/hr: 10919 (maximum)
Sound levels	Sound power (standby operation): 6.5 bels Sound power (normal operation): 6.8 bels Sound pressure: 68 dB

Environmental specifications

The following table lists the requirements for the NetBackup 5330 Appliance and the storage shelves.

Table A-3 Environmental specifications

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)
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

Table A-3 Environmental specifications *(continued)*

Component	Requirement
Noise	< 72 A-weighted decibel This value reflects the maximum noise of the appliance when the ambient temperature is 25°C.

Protocol standards

The following table provides standards with which the NetBackup 5330 Appliance and storage shelves comply.

Table A-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

Regulatory, compliance, and certification information

Refer to the *NetBackup Appliance Safety and Maintenance Guide*, which you can find on the NetBackup Appliance Documentation page.

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