Veritas NetBackup™ 5230 Appliance Hardware Installation Guide

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Veritas Services and Operations Readiness Tools (SORT)

Veritas Services and Operations Readiness Tools (SORT) is a website that provides information and tools to automate and simplify certain time-consuming administrative tasks. Depending on the product, SORT helps you prepare for installations and upgrades, identify risks in your datacenters, and improve operational efficiency. To see what services and tools SORT provides for your product, see the data sheet:

https://sort.veritas.com/data/support/SORT_Data_Sheet.pdf

Contents

Chapter 1

Overview

This chapter includes the following topics:

Product overview

Note: The majority of this document explains the installation of a new NetBackup 5230 Appliance and optional storage shelves that ship at the same time. If you have an existing appliance and want to add new storage shelves, refer to the appendices at the end of this guide.

Up to four external storage shelves can be used to increase the storage capacity of the appliance.

The following storage shelves can be used with the NetBackup 5230 Appliance.

- 3U16 24TB storage shelves
- 3U16 36TB storage shelves
- 2U12 49TB storage shelves

Any combination of these shelves can be used, however they must be connected in a specific order. A total of four storage shelves is supported for each NetBackup 5230 Appliance.

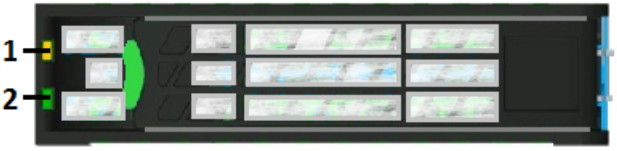
Refer to the *Veritas NetBackup 5230 Appliance Product Description* for information about:

- Storage capacities
- Disk drive functions
- I/O configurations

Appliance front panel

NetBackup 5230 appliances contain 12 disk slots. They are numbered from 0 to 11, starting at the lower left-hand corner.

Each hard disk drive has two LEDs which give the drive status (1) and activity (2).



A small panel is attached to the right side of the appliance. The panel contains system function LEDs and operations buttons.

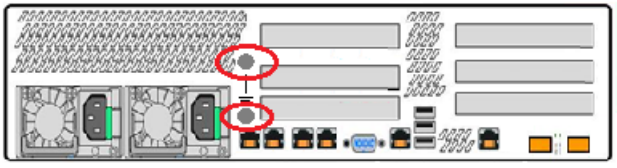
Refer to the following section for details about the disk LEDs and the control panel.

See “Turning on the appliance ” on page 40.

Appliance rear panel

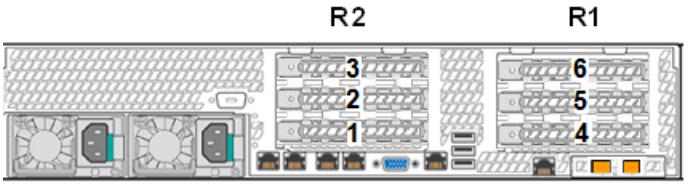
The appliance rear panel provides access to the communication ports, PCIe add-in cards, and the hot-swappable power supplies.

NetBackup 5230 appliances ship with grounding studs that are located on the rear panel of the appliance. You can use standard grounding practices to connect grounding wires to the studs.



PCIe riser assemblies and slots

Each appliance contains two PCIe riser assemblies with three slots. The risers R1 and R2 and slot numbers determine which slot a card can occupy.



3U16 storage shelf

The 3U16 storage shelf front panel contains 16 disk drives.

The 16 disk drives in the 3U16 storage shelf are numbered from 1 to 16 starting at the top left corner.

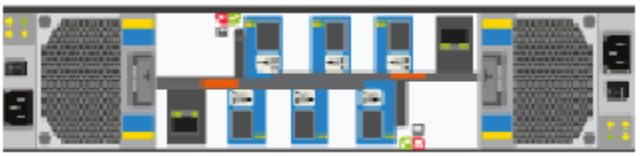
The storage shelf front panel includes two sets of three LEDs embedded in the handle on the right side of the shelf. These LEDs provide information about the overall storage system and about the system components.

The rear panel of the 3U16 storage shelf contains two I/O modules and two power supplies. The I/O modules connect the appliance to a storage shelf.

2U12 storage shelf

The front panel of the 2U12 storage shelf contains 12 disk drives. The disks are numbered from 0 to 11 starting at the top left corner.

The rear panel of the 2U12 storage shelf contains two power cooling modules and two I/O modules. The power modules are on the left and the right sides of the rear panel. The I/O modules are horizontally placed in the center of the rear panel.



Product documentation

The following table describes the hardware and the software documents that are available at the following website.

NetBackup Appliance Documentation

Table 1-1 NetBackup Appliance and Storage Shelf documentation

Document	Description
Product Description	Describes all aspects of the appliance and the attached storage shelf.
Safety and Maintenance Guide	Provides the safety, maintenance, physical monitoring, and compliance information.
Initial Configuration Guide	Provides the information to set up the appliance in your network and to create storage partitions.
Administrator's Guide	Describes the aspects of the NetBackup appliance software, and how to implement a storage pool across your company's network.
Command Reference Guide	Contains the detailed information about the NetBackup appliance shell commands.
Release Notes	Lists the important information for a specific software release.

Chapter 2

Preparing for hardware installation

This chapter includes the following topics:

Tools

The following tools and supplies are required for hardware installation.

- Phillips screwdrivers M3-M6
- Knife (for opening cartons)
- ESD preventive wrist strap or gloves

- Cable labels
- Pen or pencil with which to write on labels
- Cable ties and diagonal cutting pliers (optional)
- Multimeter (optional)

Hardware installation flow

Warning: NetBackup equipment and containers can weigh in excess of 70 lbs (31.75 kg). Improper handling can result in injury or equipment damage. Use appropriate techniques, tools, and materials when handling NetBackup equipment.

The hardware installation flow is as follows:

- Unpack the devices.
- Remove the protective film from the 3U16 storage shelf.
- Install rack rails in the equipment racks for the appliance and 3U16 storage shelf. The appliance height is two rack units (RU) and the 3U16 storage shelf height is 3RU. The storage shelf is heavier than the appliance. Storage shelves should be installed at the bottom of the rack, below the appliance.
- Install the appliance and storage shelf into the rack rails. Screws are provided with the hardware as needed.
- If your appliance rails have built-in pins instead of screws, secure the pins in the rack holes. The blue pin indicates the bottom of the rail.
- Connect the appliance and the 3U16 storage shelf that is closest to the appliance with SAS2 cables.
- Connect additional 3U16 storage shelves to each other with SAS2 cables.
- Plug the two power cables which are provided for each device into appropriate AC power supplies.
- Turn on the storage shelf first, and let it initialize. If you have two or more storage shelves, turn on the storage shelf that is farthest from the appliance. When that storage shelf has initialized turn on the other storage shelves one by one and let them initialize.
- Turn on the appliance.
- Ensure that the devices operate properly.

3U16 storage shelf weights and dimensions

Storage shelf weight and dimensions:

- Weight: 32.5 kg (71.7 lbs)
- Height: 13.1 cm (5.15”)
- Width: 44.7 cm (17.6”)
- Depth: 56.1 cm (22.1”)

Appliance weight and dimensions:

- Weight: 23.58 kg (52 lbs)
- Height: 8.76 cm (3.45")
- Width: 43.8 cm (17.24")
- Depth: 69.59 cm (27.39")

See “Appliance front panel” on page 8.

Rack guidelines

Use the following guidelines to ensure proper rack installation.

- The heaviest devices in any equipment rack should be installed in the bottom of the rack. If heavy devices are installed at the top of the rack, the rack may tip over. Injury to personnel and damage to equipment is very possible. The Storage Shelf is heavier than the appliance. Therefore, you must install the storage shelf in the bottom of the rack. Install the appliance above the storage shelves.
- Ensure that the rack is properly installed and grounded.
- The rack rails that are provided for the appliance are extensible to 31.5” (800mm). The part number of these rails is AXXPRAIL. This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 31.5” (800mm) the rails and the appliance cannot be properly installed. Other rails may have different lengths. The width of the appliance is 19” (482.6mm).
- The rack rails that are provided for the 3U16 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 3U storage shelf is 19” (482.6mm).
- Make sure that the installation location has extra space for the following:

  - Front bezels and rack handles
  - Rear panel power supply latches
  - Rear panel cable connectors
- Ensure that the rack is at least 100 cm (approximately 3 feet) away from the walls.
- Ensure that the clearance between any racks is at least 120 cm (approximately 4 feet) for maintenance, adequate ventilation, and effective heat dissipation. Data centers with two foot spaces in the front and in the back of the appliances are acceptable with proper cooling and ventilation.
- Ensure that other equipment does not prevent air transfer between the cabinet and the room. Adequate distance is necessary for cooling of the devices.

Power supply overview

The appliance and the 3U16 storage shelf each have two power modules, which connect to the main AC power source. Both modules, on both devices, provide redundant power in case of failure.

Two power cords are provided for each device. Connect each power cord to an independent AC power source.

Caution: If multiple appliances are to be installed on site, check whether the power distribution in your equipment room satisfies the power requirements. You should include the maximum input power and the quantity of devices in your planning.

Table 2-1 Power values

Component	Appliance	Storage Shelf
Maximum power consumption	750 W	580 W
AC voltage range	100 V to 240 V	100 V to 240 V
AC frequency range	47 Hz to 63 Hz	50 Hz to 60 Hz

When selecting the installation site of the appliance and storage shelves, consider the following:

See “Heat dissipation” on page 16.

Electrical safety

Use the following best practices to ensure that your environment has the correct electrical setup.

- Verify proper grounding for the main AC power supply.
- Overcurrent and overload protection must be available for the entire system.
- The circuits and the associated circuit breakers must provide enough power and overload protection.
- Separate the power supply from other large distribution loads or engines to prevent possible damage to the appliance. Examples of systems that have a large power draw include air-conditioners, elevators, or factory machines.

See “Power supply overview” on page 15.

Heat dissipation

This section describes heat dissipation requirements of the appliance and the storage shelf. Before installing the devices, check whether the heat dissipation on site satisfies the conditions for proper running of the device. For optimal maintenance, ventilation, and heat dissipation, pay attention to the following when installing the appliance and the storage shelf into the rack cabinet.

- For proper ventilation, the rack cabinet should be at least 100 cm (4 ft) away from surrounding walls and at least 120 cm (4 ft) away from any other cabinet(s).
- To keep a convective air flow between the cabinet and the equipment room, ensure there are no obstructions on all sides of the cabinet.

The applince takes in air from the front panel and circulates the air through the system. Fans discharge air from the rear of the appliance. Air flows from front to rear. The optional bezel can be installed on the front panel without any reduction in air movement.

Checking the shipping packages

Before unpacking devices, check that the packages are intact and undamaged.

The appliance package should include the following items:

- The appliance
- Mounting rails for the appliance
- Snap-in screw locks for attaching the appliance to the rack

- Two AC-power cords for the appliance
- A envelope containing license information and a USB stick that contains the factory ISO image.

If one or more storage shelves are included with the appliance, each storage shelf package should contain the following:

- A 3U16 storage shelf
- Mounting rails for each shelf
- Screws to attach the rails to the rack
- Snap-in screw locks to secure the screws that attach the rails to the rack
- Two AC-power cords for each shelf
- Two SAS2 cords for each shelf

Removing the protective film from the 3U16 storage shelf

The 3U storage shelf ships with a clear, protective film on the top, bottom, and sides of the chassis. You need to remove the film before you install the storage shelf into the rack. The storage shelf does not install properly if the film is not removed.

The front panel and the rear panel do not include any film.

To remove the protective film

Warning: Make sure that another person is available to help lift the storage shelf.

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1. Peel the protective film from the top of the storage shelf.
2. Lift up one end of the storage shelf and peel the film from the bottom of the chassis.
3. When approximately half of the film is removed, lift the other end of the storage shelf and remove the remaining film.
4. Peel the film from the sides of the storage shelf.
5. Discard all of the film.

See “Installing the 3U16 storage shelf guide rails” on page 21.

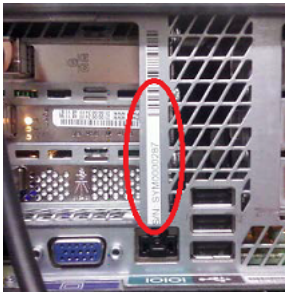
Locating hardware serial numbers

You can locate the serial numbers on the hardware to record the units that you need to install.

Serial number location for the NetBackup 5230 Appliance

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

Figure 2-1 NetBackup 5230 Appliance serial number location



Serial number location for the 3U16 storage shelf

The serial number of the 3U16 storage shelf is located on the rear panel of the storage shelf. On the right side of the shelf pull the white tab from the storage shelf.

Figure 2-2 3U16 Storage Shelf serial number location

Note: Earlier models of the storage shelves may have two numbers. The HOST number applies to an appliance, which you can disregard. In these models the STORAGE number is the serial number for the storage shelf.

Prerequisites for IPMI configuration

Verify the following configuration prerequisites:

- Ensure that you have a dedicated network infrastructure. The remote management port is 1 Gbps for NetBackup 5230 appliances.
- The remote management port can auto-negotiate its link speed of up to 1 Gbps.

  Note: If the IPMI is connected to a managed switch port, it is recommended that you configure the switch port to auto-negotiation.

- If a firewall exists between the appliance and the remote devices that manage an appliance (like a laptop computer), open the following ports:

22	SSH
80	HTTP
162	SNMP
443	HTTPS
623	KVM
5120	RMM ISO/CD
5123	RMM floppy
5124	CD
5127	SSL
5900	KVM CLI
7578	RMM CLI
7582	SSL

  Note: If you have a private internal network, remember to configure the settings accordingly in your network address translation (NAT).

- The remote management port must be configured as a DHCP or static address.

Chapter 3

Installing hardware into racks

This chapter includes the following topics:

Precautions - heavy equipment

Warning: Inappropriate handling of NetBackup components can result in serious injury, equipment damage, or both. Use appropriate practices, techniques, and tools when handling these components.

The heaviest devices in any equipment rack should be installed in the bottom of the rack. If heavy devices are installed at the top of the rack, the rack may tip over. Injury to personnel and damage to equipment is very possible. The storage shelf is heavier than the appliance. Therefore, you must install the storage shelf in the bottom of the rack. Install the appliance higher in the rack than the storage shelves. Refer to the following section for weights and dimensions of the hardware.

See “3U16 storage shelf weights and dimensions” on page 14.

Installing the 3U16 storage shelf guide rails

The 3U16 storage shelf is shipped with left and right mounting rails. These rails install in a standard 19-inch rack. The front plates of the rails are marked left and right. Two-inch lips on the bottoms of the rails provide a shelf on which the storage system sits. Extenders that are built into the rails let you adjust the rails for the depth of the rack.

Caution: Due to the weight of the units, Veritas recommends that storage shelves be installed at or near the bottom of the rack.

Requirements

- 19-inch equipment rack
- Available 3U slot
- Six M5 screws (provided)
- Six cage nuts (provided)
- Number 2 Phillips screwdriver
- Flashlight

To install the 3U16 storage shelf guide rails

1 Determine the installation positions of the guide rails in the rack.

This list describes the components in the diagram.

Number	Description
1	Location of a screw on the rear of the storage shelf handle. Insert the screw here to connect the bottom of the rail to the rack. The shelf sits on the ledge of the rail.
2	Location of a second screw to hold the storage shelf to the rack.

2 Locate the left mounting rail in the box in which the 3U16 storage shelf is shipped. The mounting plate at the front end of the rail is marked Front Left.

3 Install snap-in cage nuts in the rack as follows:

- Locate the M5 snap-in cage nuts in the package in which the storage shelf was sent.
- Identify the bottom third of the 3U section in the front and back of the rack where you want to install the storage shelf.

Note: The mounting rails are 1U high. The holes that are used to secure the rail in the rack are in the middle of that height.

- From the inside of the rack, insert snap-in cage nuts in cutouts in the front and back where you want to install the mounting rail. Make sure that the nuts are installed at the same level.

4 Orient the left mounting rail so that the lip is at the bottom and on the inside of the rack. You can adjust the length of the rail to fit the depth of the rack.

Note: The lip on the rail that supports the 3U16 storage shelf must be on the inside of the rack and at the bottom of the rail.

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5 Align the screw holes in the rail with the snap-in cage nut that you installed in the rack.

6 Insert M5 screws and tighten. Screws are shipped with the unit.

7 Repeat Steps 1 through 6 for the right mounting rail. Be sure that rails are installed at the same height.

Installing the 3U16 Storage Shelf into a rack

Caution: Due to the weight of the units, Veritas recommends that storage shelves be installed at or near the bottom of the rack.

Warning: A Storage Shelf weighs about 71.7 lbs (32.5 kg). Use appropriate practices, techniques, and tools when handling these components.

To install the Storage Shelf into a rack

1 Verify that the guide rails are properly installed and securely fastened in the rack.

2 Insert snap-in cage nuts in cutouts on both sides of the front of the rack to secure the storage shelf. The snap-in cage nuts must align with through-holes in top third of each storage shelf when the storage shelf is installed.

3 Slide the storage shelf along the mounting rails into the rack cabinet.

4 Insert M5 screws in the through-holes in the ears of the front panel and tighten. The through-holes must align with the snap-in cage nuts installed earlier.

See “Installing the appliance guide rails” on page 23.

Installing the appliance guide rails

Before you install the devices in a rack:

- Determine the installation positions of the guide rails in the rack.

This list describes the components of the drawing.

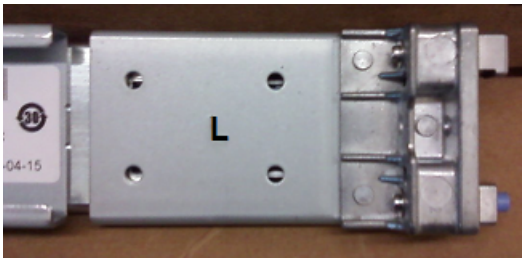
Number	Description
1	Captive screw that connects the appliance to the rack.
2	Blue peg that connects the rail bottom to the rack.
3	Empty (no screws or pegs).
4	Silver peg that connects the rail top to the rack.

The silver peg is on the top of each rail. The blue peg is on the bottom of each rail. The blue peg and the square silver peg snap into the rack without screws or cage nuts.

To install the rack rails

1. Identify the one RU on each side of the rack where you plan to install the rails.
2. Verify that there is one complete RU available under the RU used for rail installation.

3 Locate the left rail, with the **L** at the front end. The **L** faces the left side wall of the rack, not the center of the rack.

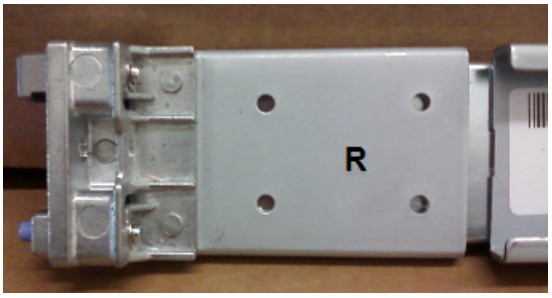


4 Guide the rail into the two holes in the one RU that you selected.

5 Hook the silver peg on the front of the rail into the top hole in the RU.

6 Snap the blue peg on the front of the rail into the bottom hole in the RU.

7 Repeat steps 3 to 6 for the rail on the right side of the rack.



8 Verify that both rails are parallel and fastened securely.

See “Installing the appliance into a rack” on page 25.

Installing the appliance into a rack

The appliance should be installed above any storage shelves. This configuration allows proper weighting of the rack.

To install the NetBackup appliance into a rack

1. Verify that the guide rails are properly installed and securely fastened.
2. Insert two snap-in screw locks into the rack immediately underneath the guide rails.

   These locks secure the appliance when it is fully installed into the rack.
3. Pull out both the rail extenders as far as they can easily and safely extend. The release button should click when the rails have been fully extended.

   Warning: The appliance weighs at least 52 lbs (23.58 kg). Use at least two people to lift or move the appliance.
4. Lift the appliance with the rear panel facing towards the rear of the rack.
5. Tilt the device down towards the back of the rack.
6. Insert the two rear "standoff" pegs extending from the side of the device into the rail slots at the back of the rail extenders.
7. Slowly drop the front of the device into the rail slots at the front of the rail extenders. A peg in the middle and a peg at the front of the device fit into the rail slots.
8. Lift up on the guide rail release buttons and push the device into the rack.
9. Fasten the appliance to the rack with the two screws that are attached to the device. Screw them into the snap-in cage nuts previously attached to the rack in the correct position.

See “About the cables” on page 27.

Chapter 4

Cables

This chapter includes the following topics:

About the cables

The NetBackup appliances and storage devices use the following cables.

Cables shipped with the product:

- Power Distribution Unit (PDU) cords for connecting the devices to main AC power source.
  Most NetBackup appliances and storage shelves ship with two PDU compatible cords (C13-C14). Other power cables ship to limited, specified, countries.
- SAS2 cables to connect the appliance to a 3U16 storage shelf and to connect 3U16 storage shelves to each other.
- SAS2-to-SAS3 cables to connect the appliance to a 2U12 storage shelf.
- SAS3 cables to connect 2U12 storage shelfs to each other.

Cables which the customer must provide:

- 1 Gb/s network cables
- 10 Gb/s network cables

- Fibre Channel cables for client and device connections
- PS/2 to USB adapter cable
- KVM cable

Connecting the VGA cable

When the appliance is initialized, a monitor can be connected to the Video Graphics Array (VGA). You can attach a keyboard to the USB port. Alternatively, you can connect the VGA to a Keyboard Video Mouse (KVM) adapter or switch.

To connect the VGA Cable

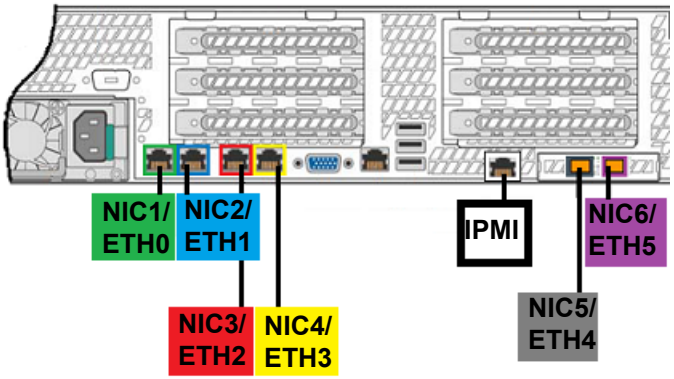
1. Insert the connector of a VGA (DB15) cable into the video port on the rear panel of the NetBackup appliance.

   See “Appliance rear panel” on page 9.

2. Connect the other end of the cable directly to a monitor, or to a KVM adapter, or KVM switch.

Connecting the network cables

The networking ports are accessed on the rear panel of the appliance. The following picture shows the layout of the network ports. It includes the four 1 Gb Ethernet ports on the left and the two 10 Gb Ethernet ports on the right. The remote management (IPMI) port is located to the left of the 10 Gb Ethernet ports.



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. Once the initial configuration has been completed you can connect NIC1 (eth0) to an administrative network.

Ethernet ports NIC2/eth1, NIC3/eth2, NIC4/eth3, NIC5/eth4, and NIC6/eth5 can be connected to public networks.

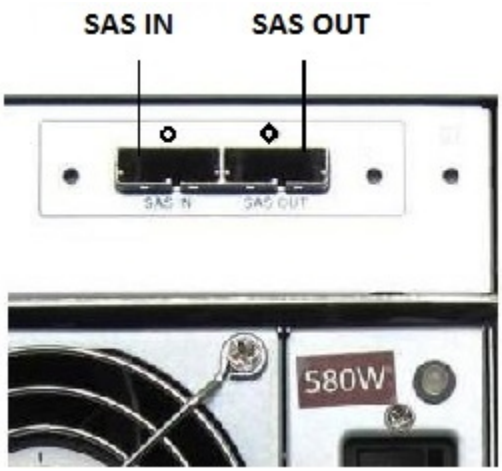
See “Connecting the small form-factor pluggable (SFP+) transceivers” on page 33.

Connecting the appliance to one or more 3U16 storage shelves

SAS2 cables must be used to connect the appliance with one or more 3U16 storage shelves.

The first 3U16 storage shelf is connected to the SAS RAID ports in the appliance PCIe RAID card. The SAS_IN ports on the 3U16 storage shelf must connect to the SAS RAID ports in the appliance.

Each 3U16 storage shelf has two sets of SAS-2 ports with one set in each I/O module. Each set of ports has one SAS_IN port and one SAS_OUT port.



To connect the SAS2 cables

1. Connect a SAS2 cable to each of the two ports marked "SAS_IN" on the 3U16 storage shelf.
2. Connect the other end of each SAS2 cable to a SAS port on the PCIe RAID card in the appliance.

3 For more than one 3U16 storage shelf, connect the SAS_OUT ports in the first 3U16 shelf to the SAS_IN ports in the second 3U16 shelf.

4 Connect the SAS_OUT ports on the second 3U16 storage shelf to the SAS_IN ports on the next storage shelf.

5 Connect the SAS_OUT ports of each 3U16 storage shelf to the SAS_IN ports on the next 3U16 storage shelf.

6 Do not connect the SAS_OUT ports of the last 3U16 storage shelf to any device.

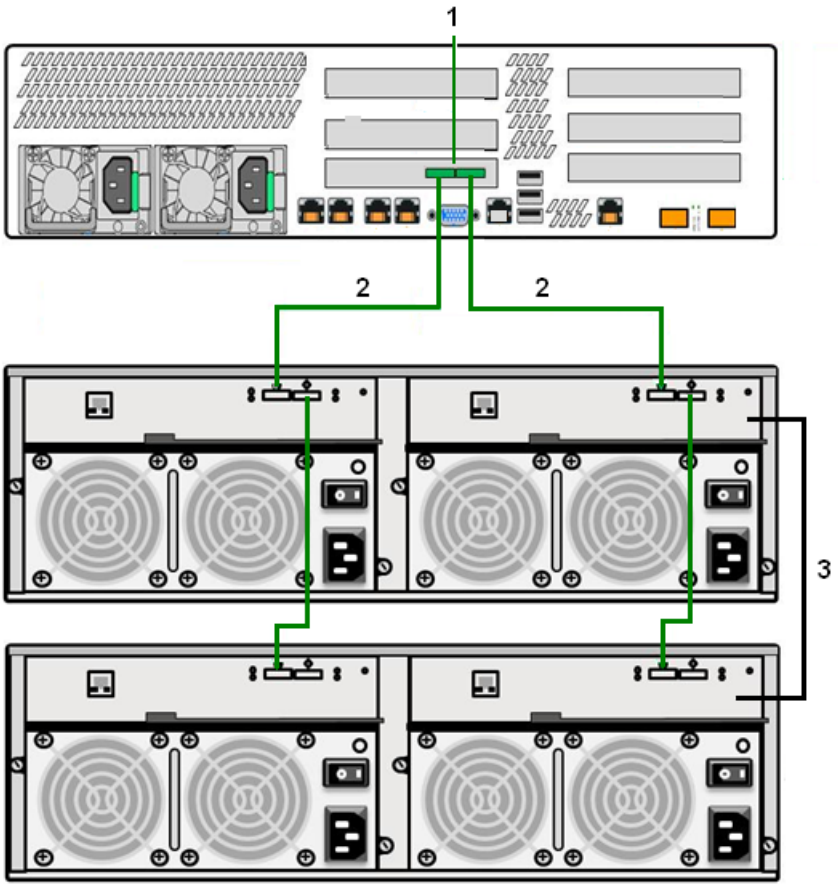


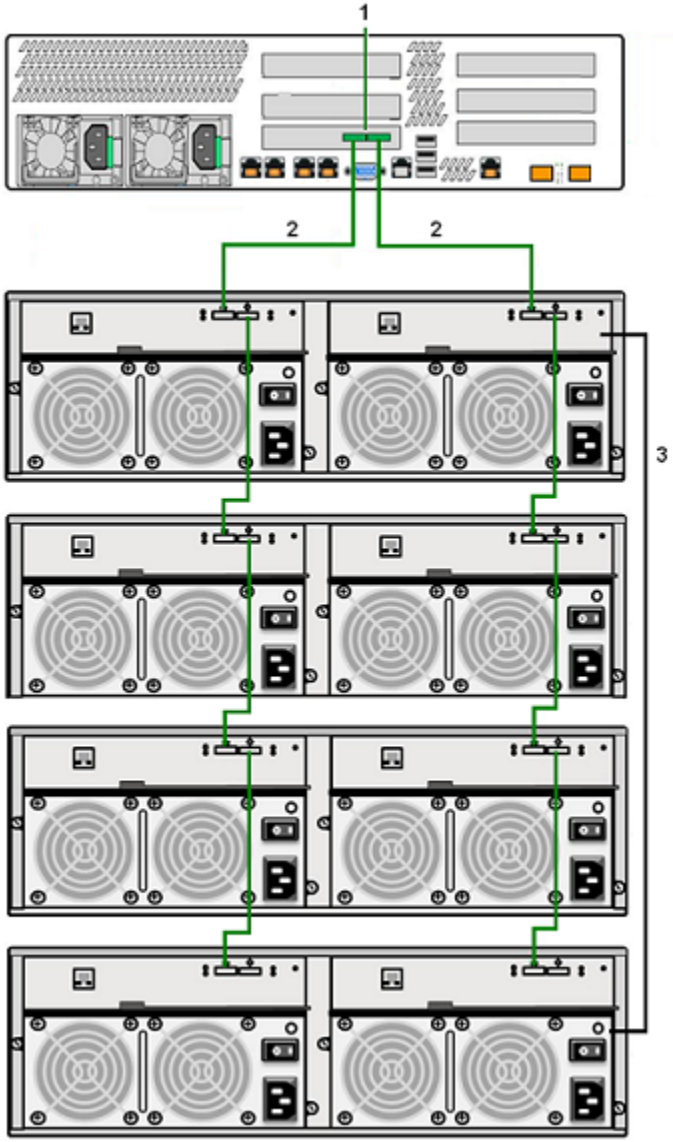
Table 4-1 Appliance and 3U16 storage shelf components

Numbers	Feature
1	SAS RAID PCIe card

Table 4-1 Appliance and 3U16 storage shelf components *(continued)*

Numbers	Feature
2	SAS2 cables
3	3U16 storage shelves

The following diagram shows a NetBackup 5230 appliance that is attached to the maximum number of four 3U16 storage shelves.



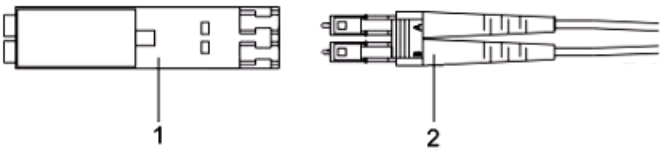
See “Connecting the power cables” on page 34.

Connecting the small form-factor pluggable (SFP+) transceivers

The NetBackup appliance requires an SFP Fibre Channel adapter to be plugged into the Fibre Channel ports if the appliance uses a Fibre Channel plug-in. The adapter allows usage of optical and copper Fibre Channel cables.

The NetBackup appliance supports Fibre Channel (FC) tape out PCIe add-in cards. The cards connect to other devices through fiber optic cables.

The fiber optic cables require Small Form-factor Pluggable (SFP+) transceivers. The diagram shows the SFP (1) and the fiber optic cable which is attached to it (2).



Warning: The laser beams of an optical interface board or inside an optical fibre can cause eye damage. Do not look directly into the transceiver or point the transceiver at another person's eyes.

When connecting optical fibers, note the following:

- An optical transceiver is electrostatically sensitive and it should be placed in an ESD-preventive and dust-proof environment for transportation, storage, and use.
- Optical fibers and optical transceivers not in use must be protected with dust caps seated properly on the connectors. If the optical transceiver is contaminated, carefully clean the optical interface.
- Keep the surface of all optical connectors clean and free from scratches.
- Do not squeeze, distort, fold, or repair an optical fiber.
- Do not bend the optical fiber into a circle with a radius less than 5 cm. Otherwise, the optical fiber may be damaged, which reduces the system performance or causes data loss.

To connect optical fibers

1. Put on proper ESD-preventive gloves or wrist straps.
2. Take the cap of the optical transceiver out of the interface of the tape out card (two-port 8 Gb FC HBA).

3 Remove an optical fiber from its packaging.

4 Remove the caps of the optical connectors.

5 Plug an optical connector into the interface of the card.

6 Ensure that the optical connector is securely inserted into the optical transceiver.

7 Connect the other optical connector of the optical fiber to a Fibre Channel switch.

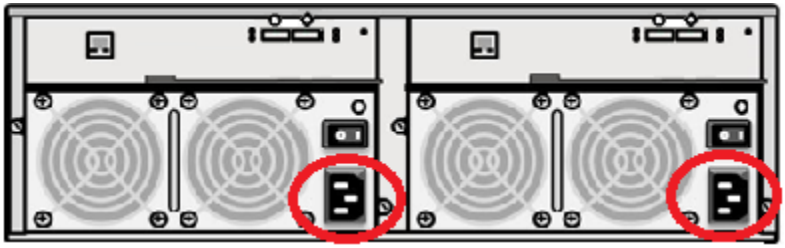
See “About the cables” on page 27.

Connecting the power cables

Caution: The equipment should be completely installed and all network cables should be connected before any devices are connected to power sources.

The rear panel of the appliance has two power modules. Each module requires a separate AC power cable or PDU cord. Connect one end of the cable or cord to a power module. Then, plug the other end into a 110 VAC or a 220 VAC socket.

The rear panel of the 3U16 storage shelf also has two power modules. Each module requires a separate AC power cable or PDU cord. Connect each module to a 110 VAC or a 220 VAC socket.



Chapter 5

Verifying hardware operation and configuring IPMI

This chapter includes the following topics:

Hardware verification

Check the information in Table 5-1 after the hardware installation and cable connections are complete, but before the devices are turned on.

Note: Do not attach external devices, such as tape drives or SAN clients, to the appliance until this process has been completed.

Warning: Confirm that all power to the devices is turned off to prevent personnel injuries and to prevent damage to the devices.

Verify that the devices and cables are installed correctly. The following table provides instructions for checking the device installation.

Table 5-1 Installation confirmation

Component	Correct installation	Incorrect installation
storage shelves	The storage shelves are installed securely in the lowest portion of the rack cabinet.	The storage shelves are insecurely mounted or mounted too high within the rack cabinet.
appliance	The appliance is installed securely in the rack cabinet, above any storage shelves.	The appliance is insecurely mounted or mounted too high within the rack cabinet.
AC power cables	The AC power cables of the appliance and all storage shelves are connected to the power modules and the AC power supply.	Only one power cable is connected to the device.

Turning on the storage shelves

These steps should be followed in the given order when turning on the devices for the first time.

Caution: You must turn on each storage shelf **before** you turn on the appliance. When the storage shelves have initialized, proceed to turn on the appliance.

Note: In this release, when you turn on a new storage shelf, a “foreign configuration” AutoSupport alert with UMI code V-475-100-1004 is generated for each storage disk in the shelf. You can safely ignore these alerts.

If you connect the storage shelf during initial configuration, the alerts are cleared when initial configuration is complete.

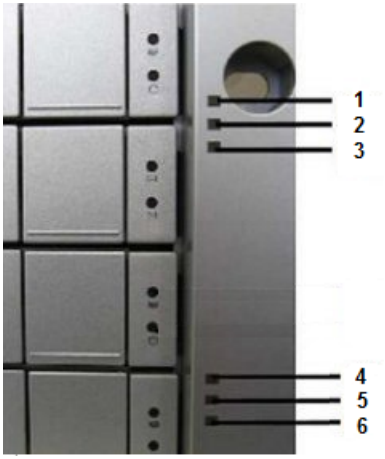
If you connect the storage shelf after initial configuration, the alerts are cleared when you run the storage scan as part of installation. In this case, the NetBackup Appliance Web Console and the NetBackup Appliance Shell Menu may show incorrect data for the storage shelf for approximately five minutes after installation is complete.

To turn on the 3U16 storage shelves

1. Connect both AC power connectors of each storage shelf to two main AC power supply outlets or PDU connections.
2. Identify the storage shelf that is farthest from the appliance.

3 Turn on both power switches.

4 On the front panel of the storage shelf check the system LEDs.



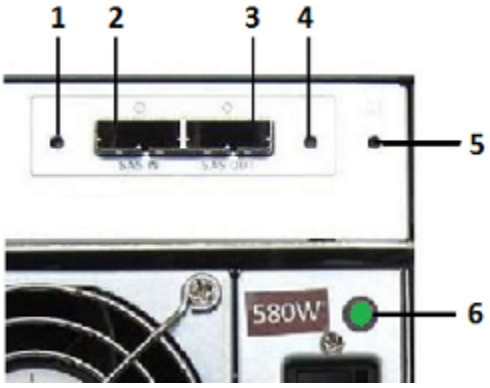
System LEDs	State	Description
Power (1)	Not lit	Off
	Solid green	On
Global enclosure status (2)	Not lit	Off
	Solid green	On
	Amber	One power supply offline
	Red	Both power supplies offline
Reserved (3)	N/A	N/A
I/O Module 1 activity (4)	Not lit	No activity
	Flashes green	Activity
I/O Module 2 activity (5)	Not lit	No activity
	Flashes green	Activity
Heartbeat (6)	Not lit	System off
	Flashes green	Normal operation

5 Check the disk drive LEDs.

Disk drive LEDs	State	Description
Disk status (1)	Green	Normal operation
	Amber	Abnormal or no operation
Power/activity (2)	Green	Normal operation
	Amber	Abnormal or no operation

6 Make sure that the disk status and activity LEDs on each disk drive are green. If they are not green, contact Veritas Technical Support.

7 Verify that the LEDs on the rear panel of the storage shelf show correct operation.



Number	Element	Details
1	SAS_IN port LED	Not lit - no link available Solid green - link available Flashes green - activity Red - power supply failure
2	SAS_IN port	Connected to the appliance
3	SAS_OUT port	Connected to a second storage shelf, if used
4	SAS_OUT port LED	Not lit - no link available Solid green - link available Flashes green - activity Red - power supply failure
5	I/O module LED	Not lit - off Solid green - ready (optimal) Flashes green - N/A Red - starting up
6	Power supply LED	Not lit - power is not detected Solid green - power is ok Flashes green - power supply is not turned on Red - power cannot be turned on

Note: When the 3U16 storage shelf starts, the primary I/O module (on the left side of the rear panel) starts first. Its LED turns green a few seconds after the start. The LED of the secondary I/O module (on the right of the rear panel) starts after the primary module is operational.

8 Repeat this procedure for all storage shelves.

See “Turning on the appliance ” on page 40.

Turning on the appliance

All devices must be correctly installed and all cables must be connected properly.

When turning on the hardware, do not remove or handle any disks, optical fibers, or network cables. Otherwise, data may be lost and equipment may be damaged.

To turn on the appliance

1 Connect both AC power connectors on the rear panel of the appliance to two main AC power supply outlets.

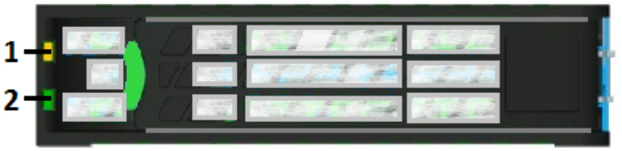
2 Attach a monitor to the VGA plug, and a keyboard to one of the USB ports. If a KVM switch is available, attach both the monitor and keyboard to the switch, and plug the switch into the VGA.

3 Verify that each storage shelf has been turned on and is running properly.

4 Turn on the appliance, using the power button which is located on the right side of the front panel.

5 Determine if the appliance is running properly.

- Check the Status LED (1), and Activity (2) LED on the installed disk drives on the front panel.



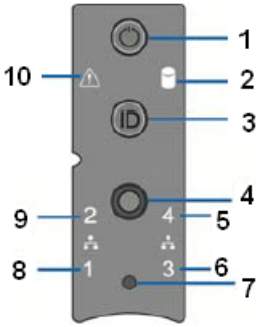
The Status LED (1) should not be lit. The following indications are possible:

- A solid, amber, LED indicates a disk fault.
- A blinking, amber, LED indicates that a RAID rebuild is in progress.

The Activity LED (2) indicates the following:

- The LED is not lit when the disk has spun down, although power is on.
- The LED is solid green when there is no disk activity, although power is on.
- The LED blinks green when the disk spins up.
- The LED blinks green occasionally when commands are processed.

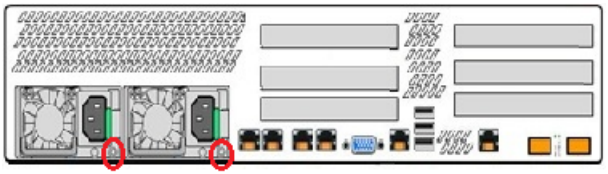
- Review all LEDs on the front control panel.



Number	LED description
1	AC power button with integrated LED
2	Hard drive activity
3	ID button with integrated LED

Number	LED description
4	Cold reset button (instantly restarts the appliance)
5	NIC4/eth3 activity
6	NIC3/eth2 activity
7	NMI button (This button triggers a non-maskable interrupt. All server data is lost.)
8	NIC1/eth0 activity
9	NIC2/eth1 activity
10	Status

- Check the power supply module LEDs on the rear panel. Each module has one LED.



Configuring the IPMI from the NetBackup Appliance Shell Menu

This section explains how to configure IPMI from the NetBackup Appliance Shell Menu.

Before starting the IPMI configuration, obtain the following information for the appliance for which you want to configure the IPMI:

IP address	IP address for the remote management port so that the default static IP address of the remote management port can be changed.
Subnet mask	Enable connectivity between your network computer and the remote management port.
Gateway IP address	Enable connectivity between your network computer and the remote management port.

The defaults for the remote management port are:

- IP Address: 192.168.0.10
- Subnet Mask: 255.255.255.0

Also review the following section on the IPMI prerequisites.

See "Prerequisites for IPMI configuration" on page 19.

To configure the IPMI port by using a keyboard and monitor

1. Connect the following components to the appropriate ports on the rear panel of the appliance:
   - A standard video cable between the VGA (Video Graphics Array) port and a computer monitor.
   - A USB keyboard to a USB port on the appliance.
2. Verify that the appliance is turned on.

   Once the startup process is complete, a login prompt appears.
3. Enter the username and password for the appliance. By default, the user name is `admin` and the password is `P@ssw0rd` where 0 is the number zero.
4. At the **Main_Menu** prompt, type **Support** to navigate to the **Support** menu.
5. From the **Main_Menu > Support** view, enter the following command to configure the remote management port:

   `IPMI Network Configure <IPAddress> <Netmask> <GatewayIPAddress>`

   where *IP address* is the new IP address of the remote management port. The Subnet mask and Gateway enable connectivity between your network computer and the remote management port.

   The remote management port must be configured as a DHCP or static address.

   At any point in time, you can run the following command to see the IPMI network details:

   `IPMI Network Show`

6 Enter the following command if you want to add a new user to access the IPMI sub-system. Note that this is an optional step.

```
IPMI User Add <User_Name>
```

At the **New Password** prompt, enter a password for the user.

The default user name is **sysadmin**. The default password is **P@ssw0rd**, where **0** is the number zero.

At any point in time, you can run the following command to view the users who can access the IPMI:

```
IPMI User List
```

7 Type **Return** to return to the **Main_Menu** prompt.

8 Use a Cat5 or a Cat6 cable to connect the remote management port to the network.

9 Make sure you can reach the Veritas Remote Management Console over the network by using the new address in a web browser.

10 The appliance is ready for initial configuration. See the *NetBackup Appliance Initial Configuration Guide* for the appropriate platform for information about initial configuration requirements and procedures.

Note: Once the initial configuration has been completed, you can connect NIC1 (eth0) to an administrative network that does not provide any backup data transfer.

Accessing and using the Veritas Remote Management interface

The IPMI web interface is known as Veritas Remote Management interface. You can use Veritas Remote Management interface to log on to the NetBackup Appliance Shell Menu.

Note: Alert configuration is not supported using the Veritas Remote Management interface. Alert configuration is supported from either the **Settings > Notification > Alert Configuration** menu in the NetBackup Appliance Web Console or the **Settings > Alerts** command view in the NetBackup Appliance Shell Menu. For details, see the Settings > Notifications > Alert Configuration section in the *NetBackup Appliance Administrator's Guide* or the Main > Settings > Alerts view commands section in the *NetBackup Appliance Commands Reference Guide*.

Before you use the Remote Management interface, the following prerequisites must be met:

- The Remote Management interface must first be configured using the NetBackup Appliance Shell Menu.
- At least one power cable must be connected to a functioning power source.
- At least one user must be enabled to use the LAN channel(s).

To access and use the IPMI web interface from a remote computer

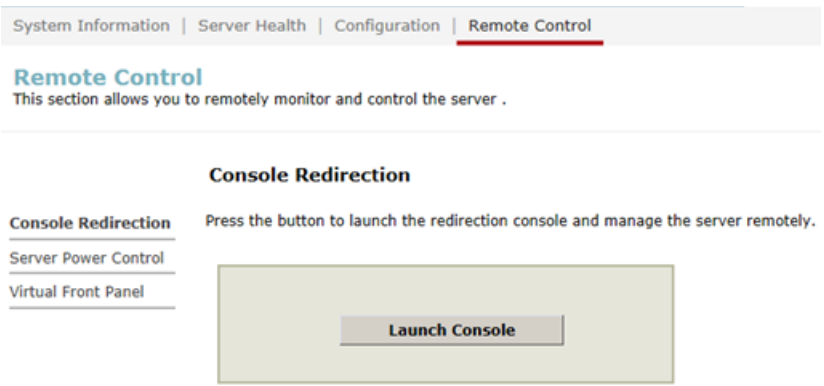
1. Log on to a remote computer in the network and open a supported Windows browser.
2. Enter the remote management port IP address that is assigned to the remote management port. The following page appears:

3. Enter your login information. The default user name is **sysadmin**. The default password is **P@ssw0rd**, where **0** is the number zero.

   Click **Login**.

4 The **Remote Control** section lets you remotely monitor and control the server. Click **Launch Console** under the **Console Redirection** tab to launch the appliance NetBackup Appliance Shell Menu.

The following figure shows the interface for a 5220, 5230, or a 5330 appliance.



5 A JViewer application opens that enables you to remotely monitor and control the appliance. This application requires Java Runtime Environment (JRE) version 6.0 or later. Install Java (as needed).

Caution: Starting with Java 7 update 45, you may receive a security warning when you launch the KVM remote console from the appliance IPMI port. The warning states that you do not have proper permissions and prevents appliance access from the IPMI port. For information about how to resolve this issue, refer to the following document:

http://www.veritas.com/support/TECH212531

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6 You can now access and log on to the NetBackup Appliance Shell Menu. Enter the user name and password for the appliance.

By default, the user name `admin` has the password, `P@ssw0rd` where 0 is the number zero.

Appendix A

Adding 3U16 storage shelves to an operational NetBackup 5230 Appliance

This appendix includes the following topics:

About adding 3U16 storage shelves to an operational appliance

Configurations

The NetBackup 5230 Appliance supports up to four storage shelves.

The following scenarios define the supported and unsupported configurations.

- You can add up to four 3U16 shelves to a standalone NetBackup 5230 Appliance that has no storage shelves attached.
- You can add 2U12 storage shelves to an NetBackup 5230 Appliance that already has at least one 3U16 shelf for a total of four shelves. In doing so, you must connect the 2U12 storage shelf to the last daisy-chained 3U16 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 storage shelf to a 3U16 storage shelf requires a SAS3-to-SAS2 cable to connect the shelves. Finally, the SAS3 data transfer rate of the 2U12 storage shelf drops to match the SAS2 data transfer rate of the 3U16 storage shelf.
- You cannot add additional storage shelves to an NetBackup 5230 Appliance that already has four connected shelves.

Note: Veritas does not support adding additional storage shelves to an existing system without first shutting down the NetBackup 5230 Appliance and all attached storage shelves.

See “Shutting down the appliance” on page 50.

Hardware requirements

A NetBackup 5230 Appliance that does not have storage shelves needs additional components to support the new storage shelves. The components in the NetBackup Expansion Storage Kit must be installed into the appliance. The appliance must be turned off during the installation.

Caution: Veritas service technicians must perform all tasks that involve the inside of the appliance chassis.

Note: When you add an additional storage shelf to an operational appliance, Veritas recommends that you schedule this task during low system activity.

The Expansion Storage Kit contains the following components.

- One external RAID controller PCIe card
- Eight, 8Gb, Dual in-line memory modules (DIMMs)
- One Maintenance Free super-cap Backup Module (MFBU) Kit

The procedures in this appendix explain the following tasks.

- Turning off the appliance and removing it from the rack
- Installing the Expansion Storage Kit components into the appliance
- Installing one or more storage shelves into a rack
- Connecting the appliance to the storage shelves
- Connecting the storage shelf power cords
- Turning on the storage shelves and verifying operation
- Turning on the appliance and verifying operation

These tasks must be performed in the order that is provided in this appendix.

Shutting down the appliance

This section describes how to perform a shutdown of the NetBackup 5230 Appliance. The process is designed to ensure an orderly system shutdown so that data is neither lost nor corrupted. Perform this procedure before you turn off the power switches on the unit.

Caution: Never turn off the appliance by using the power button on the control panel. Using the power button to turn off the appliance can cause data loss or corruption.

To shut down the NetBackup 5230 appliance

1. Use PuTTY to start an SSH session to access the NetBackup Appliance Shell Menu on the appliance.

   Note: You can also access the NetBackup Appliance Shell Menu using a KVM or laptop with a remote terminal emulator.

   ---

2. At the appropriate prompt, enter the host name or IP address of the appliance. The command-line interface, NetBackup Appliance Shell Menu, is launched.

3 At the login prompt, type `admin` and press `Enter`.

4 At the Password prompt, type the password that is assigned to the administrator for this application. The default password is P@ssw0rd. The Main_Menu prompt appears.

5 At the Main_Menu prompt, type `support` and press `Enter`. The Support prompt appears.

6 At the Support prompt, type `shutdown` and press `Enter`.

7 Wait for the appliance to shut down gracefully. (About five minutes.)

8 Turn off the switches on the power supplies.

Preparing the appliance to install the additional hardware

Best practices recommend removing the appliance from the rack to access the inside of the chassis. Alternatively you can pull out the appliance on its rails. Be sure that the appliance and rack are stable.

To prepare the NetBackup 5230 appliance for the installation of the hardware

1 Verify that the appliance is turned off. Refer to this section as needed.

See "Shutting down the appliance" on page 50.

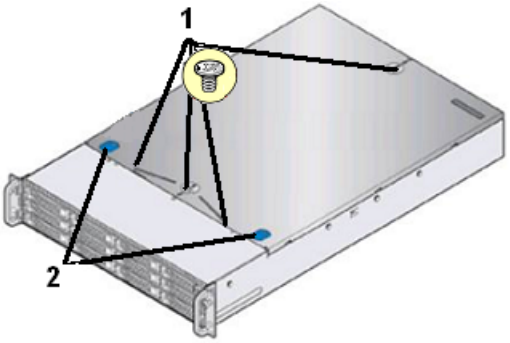
2 Disconnect the AC power cords and peripheral cables as applicable.

3 Slide the NetBackup 5230 appliance forward on the rails to the full extension.

Caution: The unit weighs up to 65 lbs (29.5 kg). Make sure that sliding it forward does not destabilize the rack.

Note: If it is necessary to remove the unit from the rack, place the unit on a grounded, ESD protective surface.

4 Do the following to remove the chassis cover:



- Put on a grounded ESD wrist strap or take other precautions against ESD damage.
- Remove the four screws (1) from the top of the chassis cover as shown in the figure above.
- Press the blue thumb grips (2) to release the locks and slide the cover back 0.5 inches (1.27 cm).
- Lift the cover off the chassis and set it aside where it cannot be damaged.

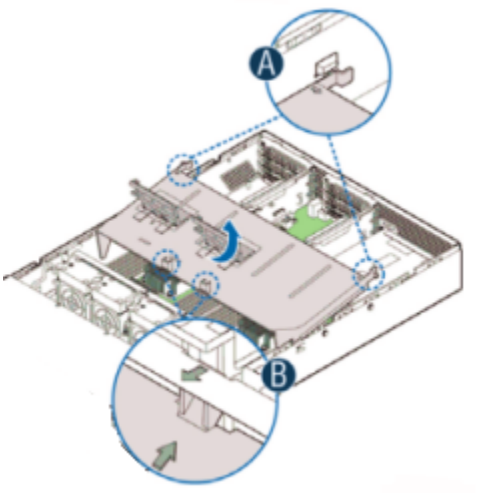
Installing the additional memory

Base NetBackup 5230 appliances are equipped with 64GB of memory in the form of Dual In-line Memory Modules (DIMMs). When a base unit is upgraded to use storage shelves, 64GB of additional memory must be installed.

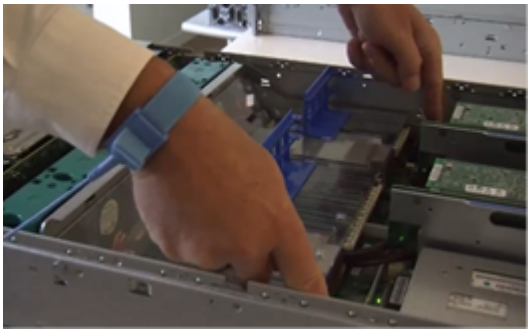
To install the memory

1 Remove the air duct as follows:

Note: The air duct is the plexiglass cover behind the fan bulkhead as shown in the following figure. The air duct has two blue latches attached.



- Locate the two, blue latches (A) that secure the back end of the air duct to the chassis. Push the latches in to release the air duct.

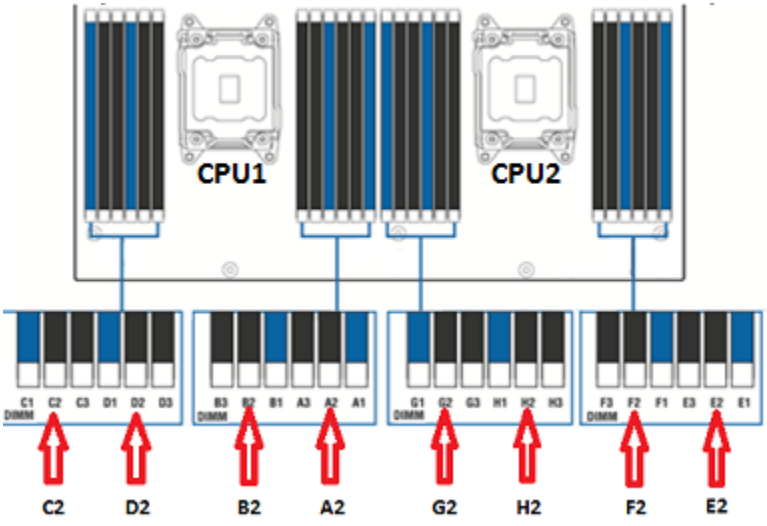


- Lift the back edge of the air duct to disengage the two tabs from the fan bulkhead (B).

- Set the air duct aside in a safe location.

2 Obtain the DIMMs from the Expansion Storage Kit.

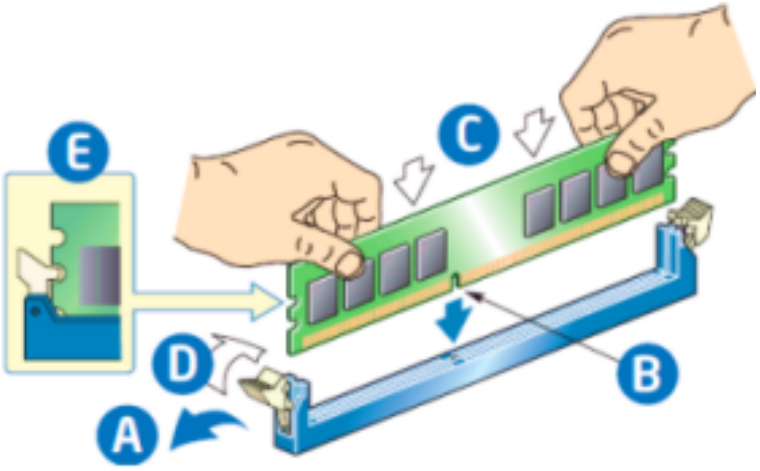
3 Locate the DIMM sockets next to the CPUs on the mainboard.



A blank card is installed in each memory socket that is not used.

4 Install the new DIMM cards in slots A2, B2, C2, D2, E2, F2, G2, and H2 as follows:

- In each slot that requires new memory, remove the blank DIMM card. Open the retaining clips (A) at each end of the socket and remove the blank card.



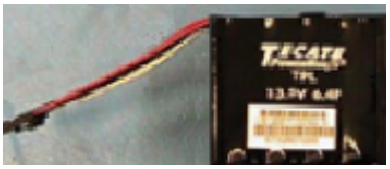
- Grasp a DIMM card by the edges and remove it from the anti-static package. Do not touch the components or gold fingers on the card.
- Position the DIMM card over a socket. Align the notch on the bottom edge of the DIMM card with the key in the DIMM socket. (B)
- Push the card straight down (C).
- Slide the side retaining clips towards the card (D).
- Verify that the retaining clips are inserted properly (E).

Installing the additional Maintenance-Free Backup Unit (MFBU)

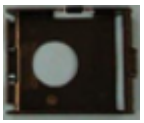
The external controller card that supports the 3U16 storage shelves has a maintenance-free backup unit installed. To ensure that data is retained should the appliance lose power, an MFBU is shipped with the external controller.

To install the MFBU

1. Put on an ESD wrist strap or take other ESD precautions.
2. Remove the following components from the Expansion Storage Kit.
   - MFBU (battery)

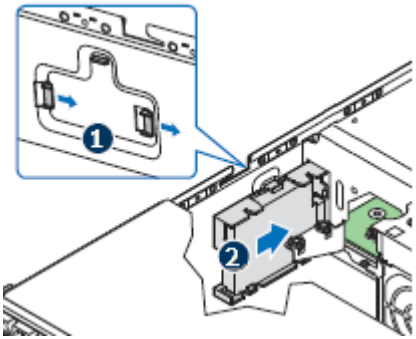


- MFBU case



- MFBU cable

3 Insert the MFBU into the case. Do not damage or twist the wires that are attached to the MFBU.



4 View the appliance from the front left side.

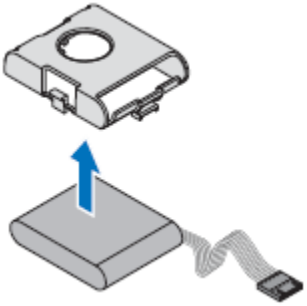
5 Locate the fan on the left side of the chassis.

6 Remove the air baffle that is located near the fans as needed.

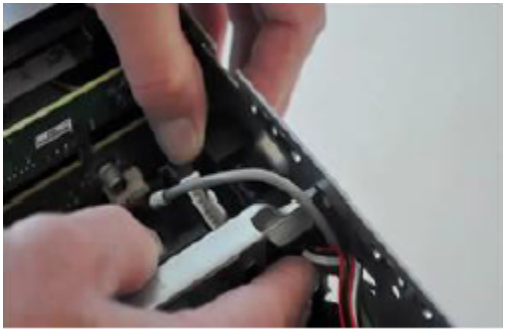
7 Remove the fan on the far left.

8 Attach the separate MFBU cable to the connector on the MFBU. The other end of the cable attaches to the external RAID card when it is installed.

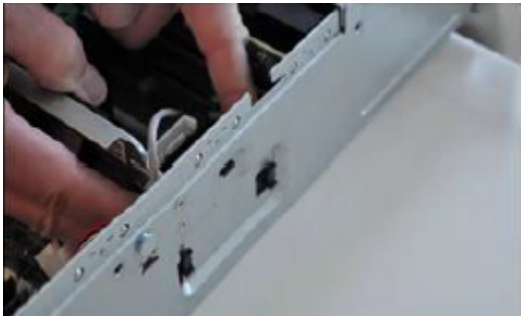
9 Position the MFBU against the chassis side wall (1) and through the opening in the fan bulk-head (2).



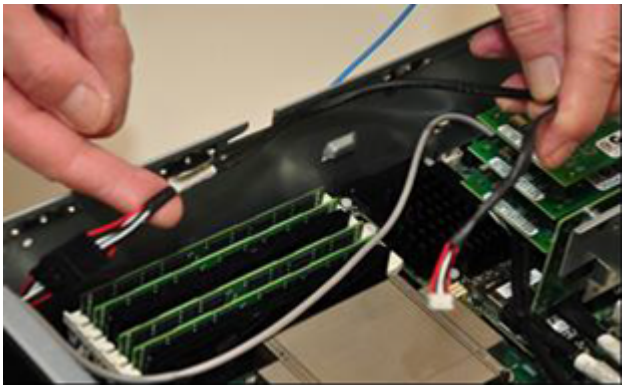
10 Align the tabs on the MFBU case with the mounting holes in the chassis.



11 Slide the MFBU case towards the front of the appliance until the tabs engage with the mounting holes.



12 Route the MFBU cable along the side of the chassis towards the rear of the appliance.



13 Proceed to the next section to install the external RAID PCIe card and to connect it to the MFBU cable.

See "Installing the external RAID controller card" on page 58.

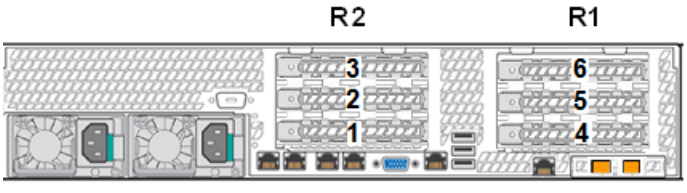
Installing the external RAID controller card

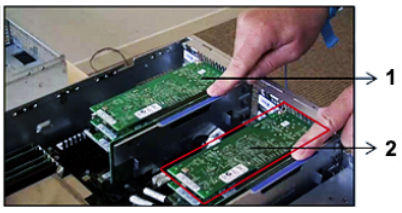
This section describes how to install the external controller card.

To install the RAID controller card

1 Put on an ESD wrist strap or take other ESD precautions.

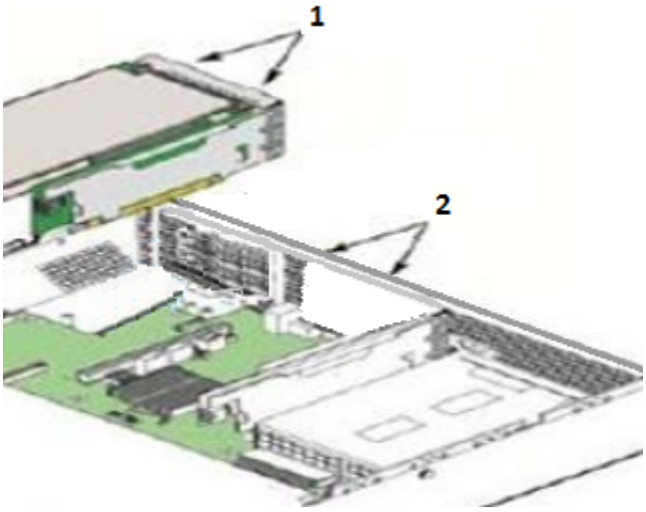
2 Locate PCIe riser assembly 2 slot 1. Riser 2 is located next to the power supply.



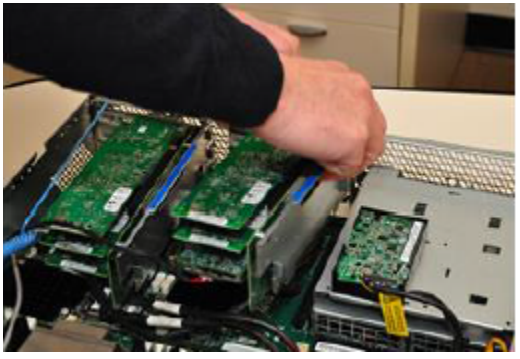


3 Remove the PCIe riser assembly as follows.

- Disengage the two hooks (1) from the chassis slots (2) that secure the riser 2 assembly to the chassis.



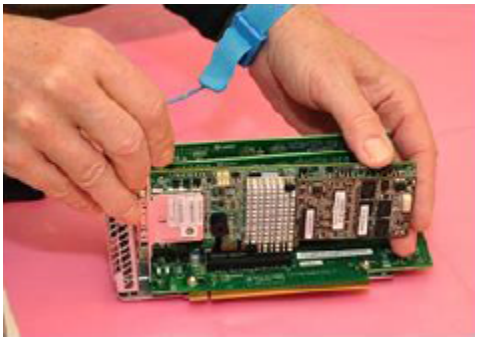
- Grasp the riser assembly with both hands. With firm even pressure lift it out of the connector on the mainboard.



- Slot 1 is on the bottom of the riser. Remove the screw that secures slot 1 to the riser assembly.
- Remove the metal cover plate from slot 1.

4 Remove the RAID controller card from the Expansion Storage Kit.

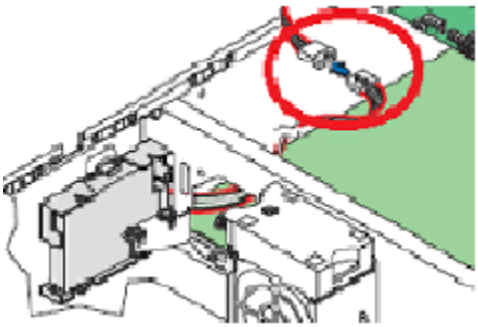
5 Align the edge connector on the card with the bottom PCIe-card socket (or slot 1). The edge connector is keyed to install one way only.



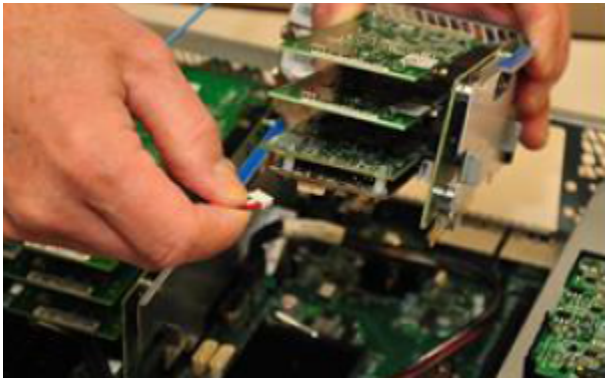
6 Firmly and evenly insert the card in the socket.

7 Use the screw you removed earlier to secure the RAID controller card in the PCIe riser assembly.

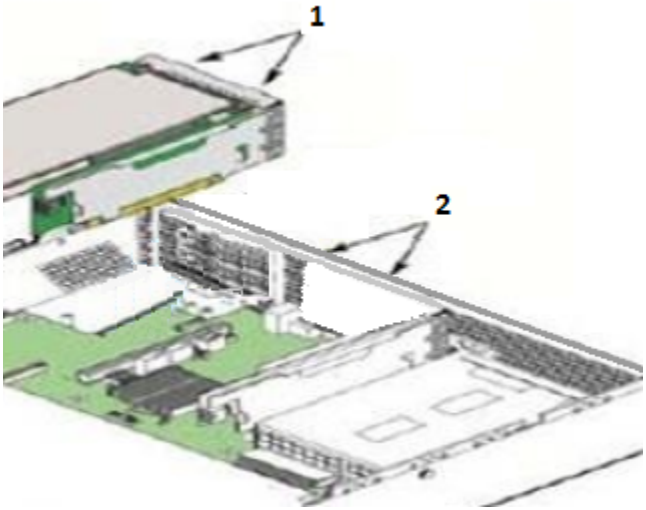
8 Connect the cable on the MFBU to the separate cable from the kit.



9 Connect the MFBU cable to the rear of the RAID controller card.

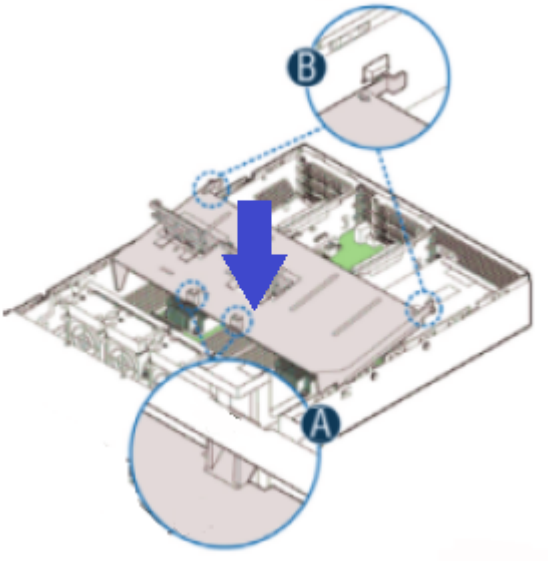


10 Reinstall the riser into the chassis.



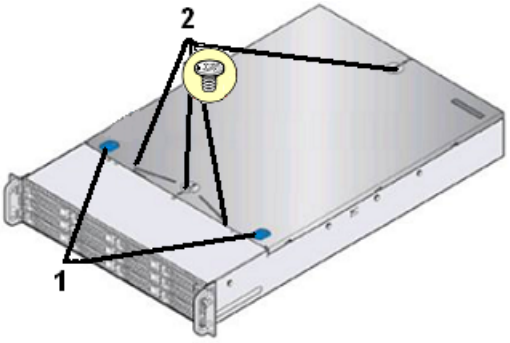
- Insert the hooks on the riser (1) into the slots on the chassis (2).
- Firmly push down on edges of the assembly to engage the mainboard connector with the riser.

11 Replace the air duct as follows:



- Align the two latches at the back of the air duct (A) behind the fans. Press the latches in to secure them in the tabs.
- Lower the front edge of the air duct to engage the two side tabs (B).

12 Replace the chassis cover as follows.



- Align the cover with the edge along the top of the chassis.
- Place the cover on the chassis so that there is about 1.5 inches of overhang.
- Use the blue tabs (1) to slide the cover forward until the cover slides into place.

- Insert the four screws (2) and secure.

13 Reinstall the appliance into the rack as needed.

- Toward the rear of the chassis, locate the levers in the extensions on both sides of the appliance.
- Push up and hold the levers to release the extension locking mechanism.
- Slide the appliance into the rack. Do not force the appliance into the rack.
- If you disconnected the data cables, reconnect them according to the labels you placed on them earlier.

Removing the protective film from the storage shelf

The 3U16 storage shelf ships with a clear, protective film on the top, bottom, and sides of the chassis. You need to remove the film before you install the storage shelf into the rack. The storage shelf does not install properly if the film is not removed. The front panel and the rear panel do not include any film.

Warning: Make sure that another person is available to help lift the storage shelf.

To remove the protective film

1 Peel the protective film from the top and the sides of the storage shelf.

2 Lift up one end of the storage shelf and peel the film from the bottom of the chassis.

3 When approximately half of the film is removed, lift the other end of the storage shelf and remove the remaining film.

Installing 3U16 storage shelves into the rack

Precautions - heavy equipment

Warning: Inappropriate handling of NetBackup components can result in serious injury, equipment damage, or both. Use appropriate practices, techniques, and tools when handling these components.

The heaviest devices in any equipment rack should be installed in the bottom of the rack. If heavy devices are installed at the top of the rack, the rack may tip over.

Injury to personnel and damage to equipment is very possible. The storage shelf is heavier than the appliance. Therefore, you must install the storage shelf in the bottom of the rack. Install the appliance higher in the rack than the storage shelves.

Storage shelf weight and dimensions:

- Weight: 32.5 kg (71.7 lbs)
- Height: 13.1 cm (5.15”)
- Width: 44.7 cm (17.6”)
- Depth: 56.1 cm (22.1”)

Installing the 3U16 storage shelf rails

The 3U16 storage shelf is shipped with left and right mounting rails. These rails install in a standard 19-inch rack. The front plates of the rails are marked left and right. Two-inch lips on the bottoms of the rails provide a shelf on which the storage system sits. Extenders that are built into the rails let you adjust the rails for the depth of the rack.

Caution: Due to the weight of the units, Veritas recommends that storage shelves be installed at or near the bottom of the rack.

Requirements

- 19-inch equipment rack
- Available 3U slot
- Six M5 screws (provided)
- Six cage nuts (provided)
- Number 2 Phillips screwdriver
- Flashlight

To install the 3U16 storage shelf guide rails

1 Determine the installation positions of the guide rails in the rack.

This list describes the numbered components in the diagram.

- 1 - Location of a screw on the rear of the storage shelf handle. Insert the screw here to connect the bottom of the rail to the rack. The shelf sits on the ledge of the rail.
- 2 - Location of a second screw to hold the storage shelf to the rack.

2 Locate the left mounting rail in the box in which the 3U16 storage shelf is shipped. The mounting plate at the front end of the rail is marked Front Left.

3 Install snap-in cage nuts in the rack as follows:

- Locate the M5 snap-in cage nuts in the package in which the storage shelf was sent.
- Identify the bottom third of the 3U section in the front and back of the rack where you want to install the storage shelf.

Note: The mounting rails are 1U high. The holes that are used to secure the rail in the rack are in the middle of that height.

- From the inside of the rack, insert snap-in cage nuts in cutouts in the front and back where you want to install the mounting rail. Make sure that the nuts are installed at the same level.

4 Orient the left mounting rail so that the lip is at the bottom and on the inside of the rack. You can adjust the length of the rail to fit the depth of the rack.

Note: The lip on the rail that supports the 3U16 storage shelf must be on the inside of the rack and at the bottom of the rail.

---

5 Align the screw holes in the rail with the snap-in cage nut that you installed in the rack

6 Insert M5 screws and tighten. Screws are shipped with the unit.

7 Repeat these steps for the right rail. Be sure that rails are installed at the same height.

Installing the 3U16 Storage Shelf into a rack

Caution: Due to the weight of the units, Veritas recommends that storage shelves be installed at or near the bottom of the rack.

Warning: A 3U16 storage shelf weighs about 71.7 lbs (32.5 kg). Use appropriate practices, techniques, and tools when handling these components to prevent harm to personnel and equipment.

To install the storage shelf into a rack

1. Verify that the guide rails are properly installed and securely fastened in the rack.
2. Insert snap-in cage nuts in cutouts on both sides of the front of the rack to secure the storage shelf. The snap-in cage nuts must align with through-holes in top third of each storage shelf when the storage shelf is installed.

3. Slide the storage shelf along the mounting rails into the rack cabinet.
4. Insert M5 screws in the through-holes in the ears of the front panel and tighten. The through-holes must align with the snap-in cage nuts installed earlier.

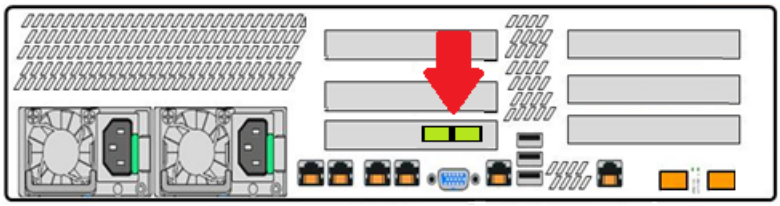
Connecting the 3U16 shelves to an appliance or to other 3U16 shelves

Connecting a 3U16 shelf to an appliance that does not have any shelves

This section describes how to connect the SAS2 cables between the NetBackup 5230 appliance and the first 3U16 storage shelf.

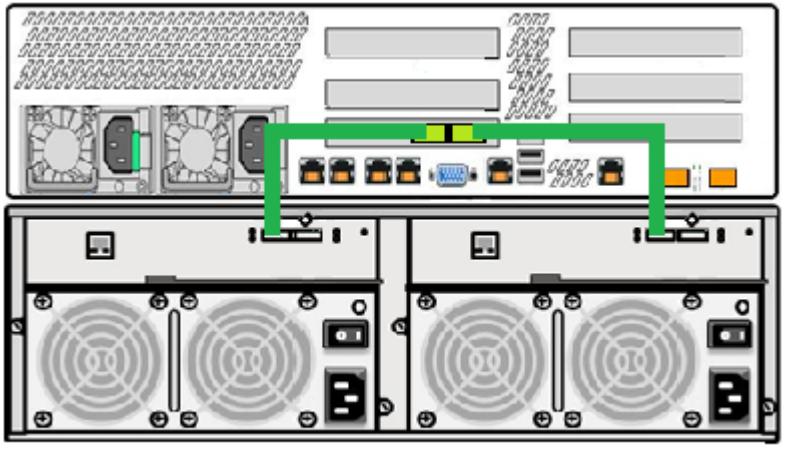
To connect a single 3U16 storage shelf to an appliance

1. Obtain the two SAS2 cables that ship with the 3U16 storage shelf.
2. Locate the RAID controller in slot 1 of the appliance. The controller has two SAS2 ports.



3 If a RAID controller card is not installed it and other components of the Expansion Storage Kit must be installed. A Veritas-authorized field technician performs the installation.

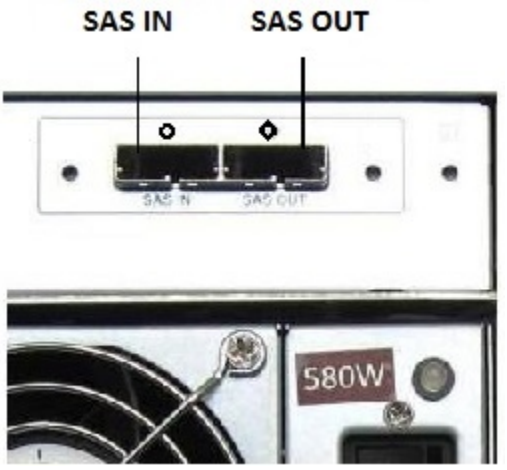
4 Use the following diagram as a reference.



5 Connect one end of a SAS2 cable to the right-hand port on the RAID controller.

6 Locate the storage shelf I/O module that is on the same side as the RAID controller connector into which you connected the SAS2 cable. The I/O module is located above the power supply and fans.

Plug the other end of the SAS2 cable into the SAS_IN port in the I/O module.



7 Plug one end of the second SAS2 cable into the second connector in the RAID controller.

8 Plug the other end of the second SAS2 cable into the second I/O module SAS_IN port.

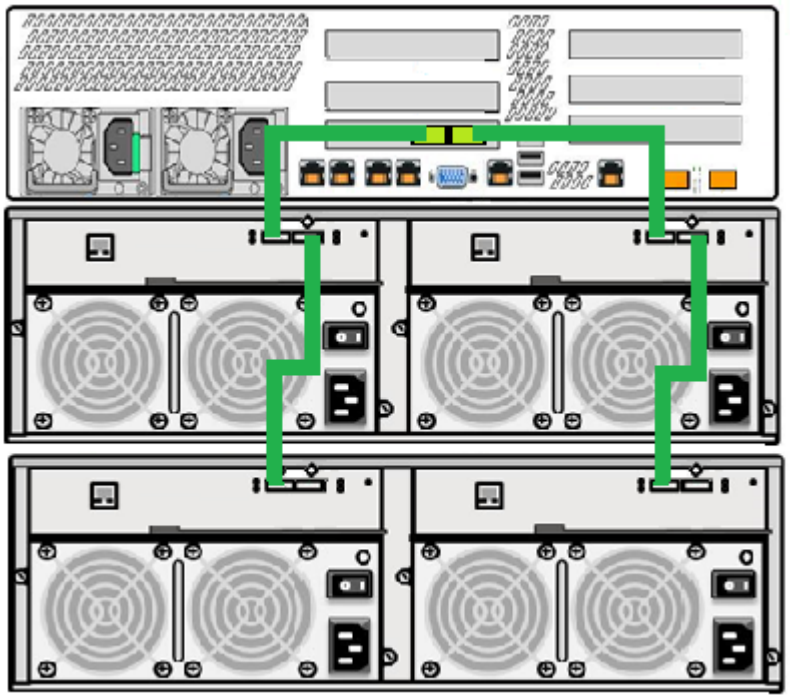
You can connect up to four storage shelves to the appliance. Refer to the following section for instructions.

Connecting additional 3U16 storage shelves

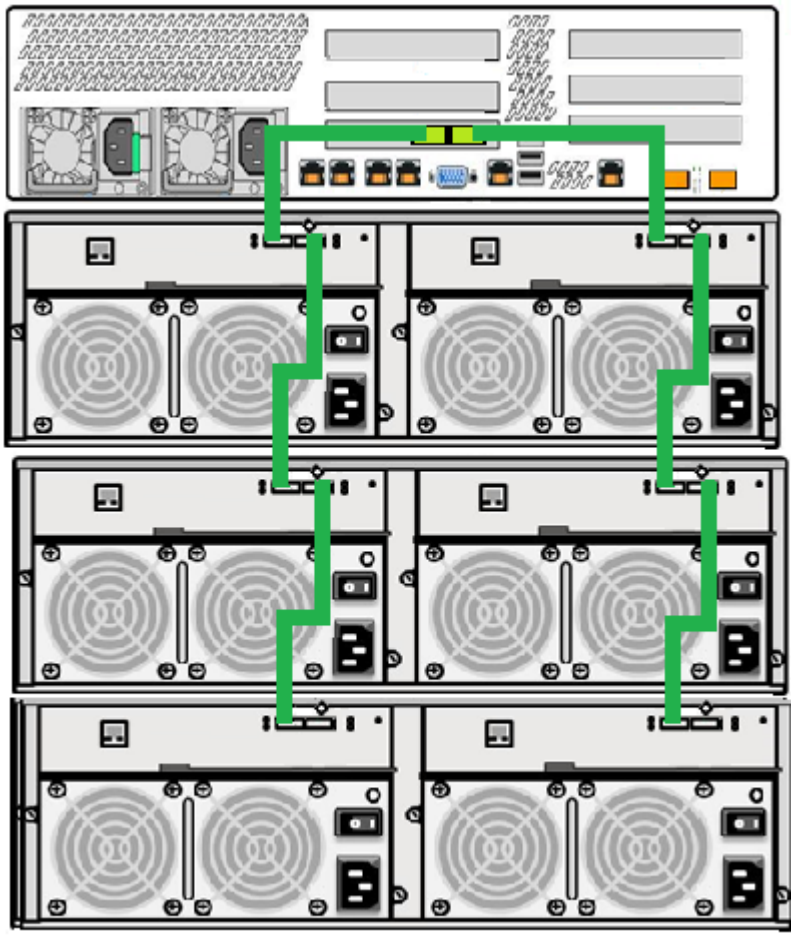
Connecting additional 3U16 storage shelves

This section describes how to connect additional 3U16 storage shelves. You can connect up to four storage shelves to one NetBackup 5230 Appliance.

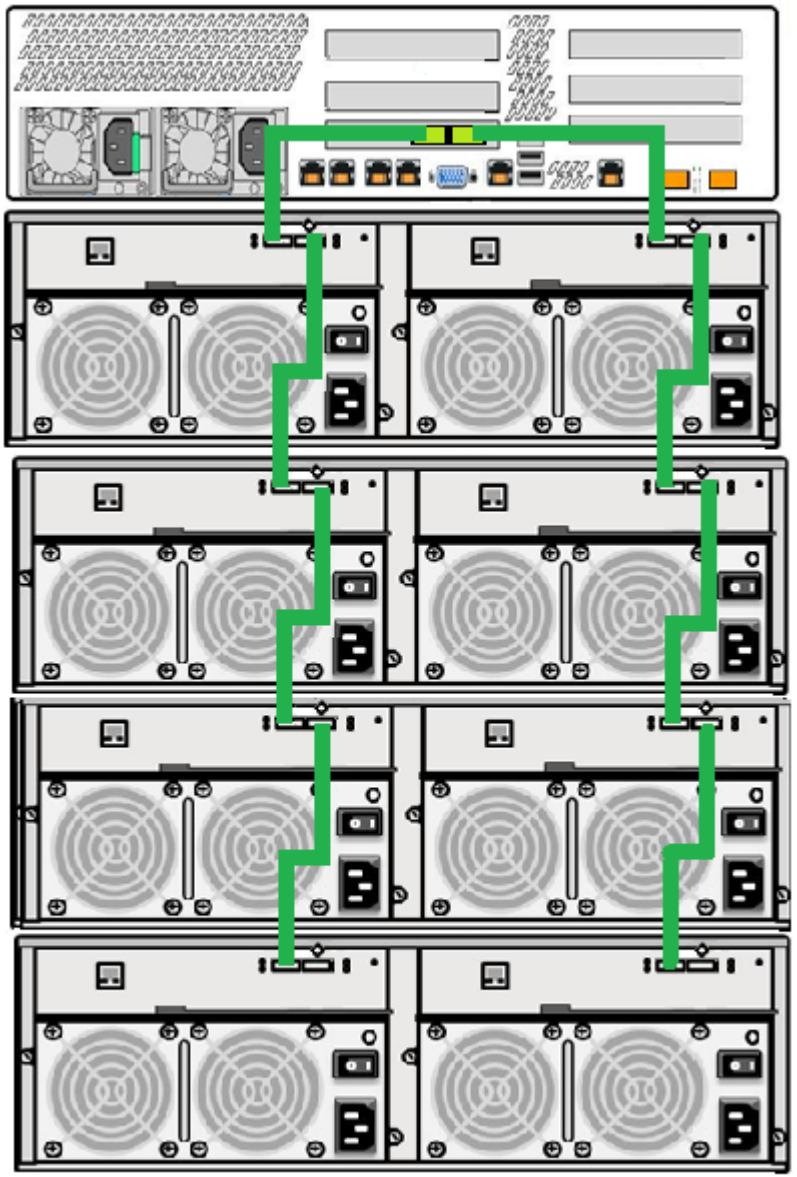
Refer to the following diagrams as needed. Detailed instructions are provided after the diagrams.



SAS2 cable



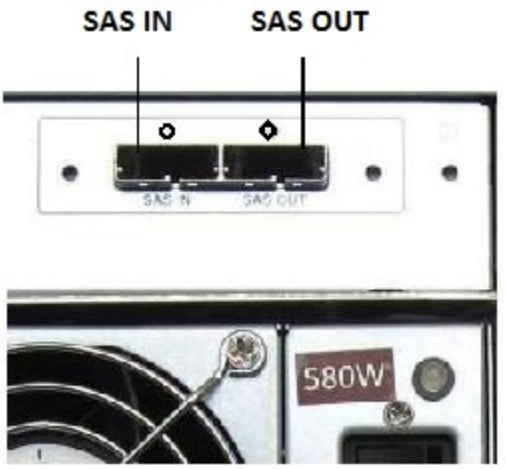
SAS2 cable



SAS2 cable

To connect additional 3U16 storage shelves

1. Locate the two SAS2 cables that are shipped with the 3U16 storage shelf.
2. Locate the SAS_IN and SAS_OUT ports on both I/O modules on the rear of the storage shelf.



3. Locate the left I/O module of the 3U16 storage shelf that is connected to the appliance.
4. Plug one end of a SAS2 cable into the SAS_OUT port in that I/O module.
5. Connect the other end of the SAS2 cable to the SAS_IN port in the left I/O module in the additional storage shelf.
6. Plug one end of another SAS2 cable into the SAS_OUT port in the right I/O module of the storage shelf that is connected to the appliance.
7. Connect the other end of the SAS2 cable to the SAS_IN port in the right I/O module in the additional storage shelf.

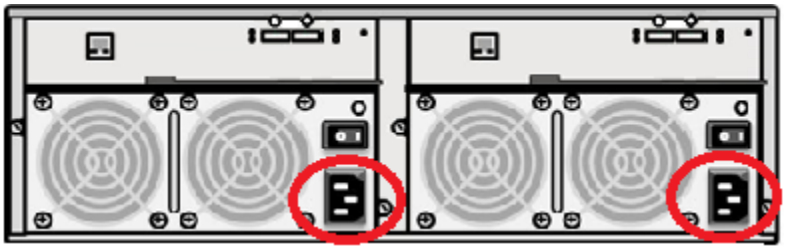
Connecting the 3U16 storage shelf and appliance power cords

Each appliance and each storage shelf contain two AC power supplies. To ensure power redundancy, connect the power supplies on each component to separate AC power sources.

Caution: Do not turn on the power to any components while connecting the power cords. The components must be turned on in a specific sequence to ensure correct communication.

To connect the power cables

1. Verify that the AC power supply input for the appliance and for the storage shelf is within one of these ranges.
   - 100 - 127 VAC at 50/60 Hz
   - 200 - 240 VAC at 50/60 Hz
2. For each shelf, obtain two power cords that are appropriate for your region and equipment.
3. Locate the power sockets in the shelf.



4. Connect one cable between each socket and a socket on the Power Distribution Unit (PDU) for your rack.

   Note: The following steps apply if you removed the appliance from the rack to install additional components.

5. Obtain two power cords for your appliance.

6 Locate the power sockets in the appliance.

7 Connect one cable between each socket and a socket on the Power Distribution Unit (PDU) for your rack.

Turning on the hardware and verifying operation

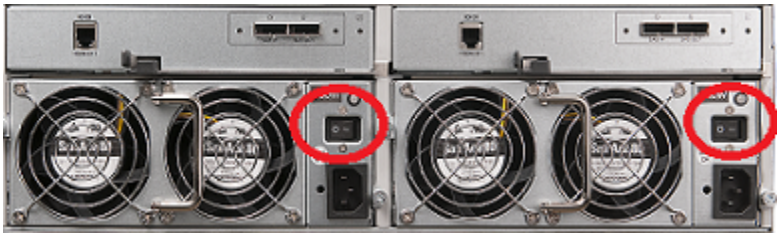
If you have turned off your appliance you must wait to turn it on again. The appliance and the attached storage shelves must be turned on in a specific order. If the hardware is not turned on correctly the appliance RAID controller may not recognize some storage units.

If you have turned off your appliance you can begin turning on storage shelves. Use the following procedure to turn on the storage shelves in the required order.

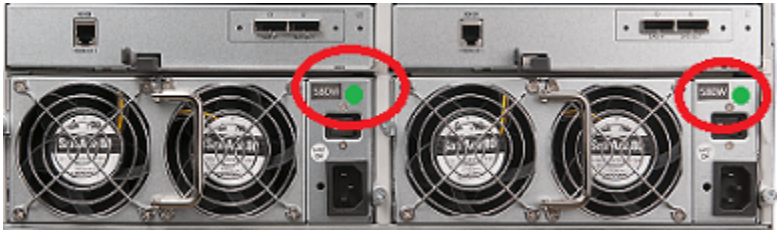
To turn on the 3U16 storage shelves

1 Start with the storage shelf that is farthest in distance from the appliance.

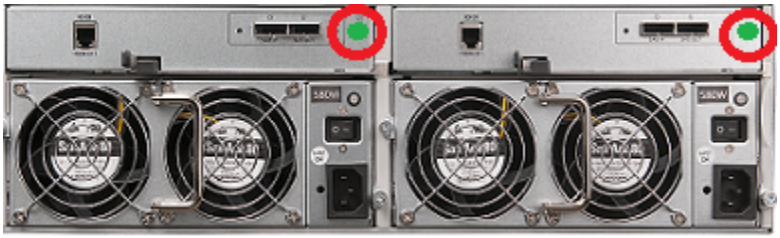
2 Flip on the power switches on each power supply on the rear of the shelf.



3 Verify that the power LED on each power module is green.



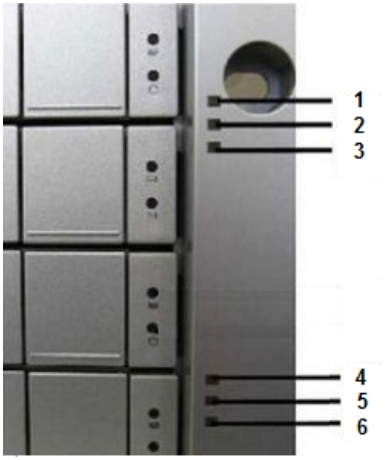
4 Locate the LEDs on each I/O module.



The following list describes the I/O module LED states.

- Not lit - off
- Solid green - ready (optimal)
- Flashes green - N/A
- Red - starting up

5 Move to the front of the storage shelf to check the system LEDs.



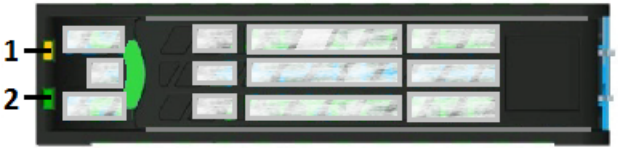
System LEDs	State	Description
1 - Power	Not lit	Off
	Solid green	On
2 - Global enclosure status	Not lit	Off
	Solid green	On
	Amber	One power supply offline
	Red	Both power supplies offline
3 - Reserved (N/A)	N/A	N/A
4 - I/O Module 1	Not lit	No activity
	Flashes green	Activity
5 - I/O Module 2	Not lit	No activity
	Flashes green	Activity
6 - Heartbeat	Not lit	System off
	Flashes green	Normal operation

6 When all of the storage shelves are operational, turn on the appliance if needed.

To turn on the appliance

1. Connect both AC power connectors on the rear panel of the appliance to two main AC power supply outlets.
2. Turn on the appliance, using the power button which is located on the right side of the front panel.

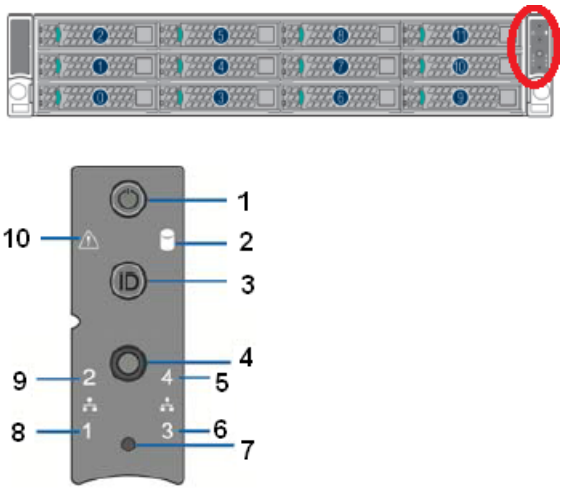
3. Determine if the appliance is running properly.
   - Check the Status LED (1), and Activity (2) LED on the installed disk drives on the front panel.



   The Status LED (1) should not be lit. The following indications are possible:
   - A solid, amber, LED indicates a disk fault.
   - A blinking, amber, LED indicates that a RAID rebuild is in progress.

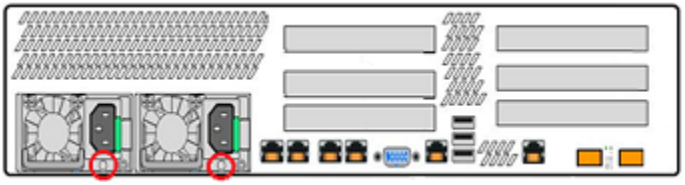
   The Activity LED (2) indicates the following:
   - The LED is not lit when the disk has spun down, although power is on.
   - The LED is solid green when there is no disk activity, although power is on.
   - The LED blinks green when the disk spins up.
   - The LED blinks green occasionally when commands are processed.

4 Review all LEDs on the front control panel.



Number	LED description
1	AC power button with integrated LED
2	Hard drive activity
3	ID button with integrated LED
4	Cold reset button (instantly restarts the appliance)
5	NIC4/eth3 activity
6	NIC3/eth2 activity
7	NMI button (This button triggers a non-maskable interrupt. All server data is lost.)
8	NIC1/eth0 activity
9	NIC2/eth1 activity
10	Status

5 Check the power supply module LEDs on the rear panel. Each module has one LED.



Appendix B

Adding 2U12 storage shelves to an operational NetBackup 5230 Appliance

This appendix includes the following topics:

About adding 2U12 storage shelves to an operational appliance

The NetBackup 5230 Appliance supports up to four storage shelves. The following scenarios define the supported and unsupported configurations.

Configurations

The following scenarios define the supported and unsupported configurations.

- You can add up to four 2U12 shelves to a standalone NetBackup 5230 Appliance that has no storage shelves attached.
- You can add 2U12 shelves to an appliance that already has at least one 3U16 shelf for a total of four shelves. In doing so, you must connect the 2U12 storage shelf to the last daisy-chained 3U16 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 storage shelf to a 3U16 storage shelf requires a SAS3-to-SAS2 cable to connect the shelves. Finally, the SAS3 data transfer rate of the 2U12 storage shelf drops to match the SAS2 data transfer rate of the 3U16 storage shelf.
- You cannot add any storage shelves to an appliance that already has four connected shelves.

Note: Veritas does not support adding additional storage shelves to an existing system without first shutting down the NetBackup 5230 Appliance and all attached storage shelves.

See “Shutting down the appliance” on page 85.

Software requirements

NetBackup 5230 appliances with software version 3.0 and later support the use of the 2U12 49TB Storage Shelf.

A software patch allows the installation of 2U12 49TB storage shelves to a NetBackup 5230 Appliance running appliance version 2.7.3. The patch is available from the following article.

https://www.veritas.com/support/en_US/article.000116670

Hardware requirements

A NetBackup 5230 Appliance that does not have storage shelves needs additional components to support the new storage shelves. The components in the NetBackup Expansion Storage Kit must be installed into the appliance. The appliance must be turned off during the installation.

Caution: Veritas service technicians must perform all tasks that involve the inside of the appliance chassis.

Note: When you add an additional storage shelf to an operational appliance, Veritas recommends that you schedule this task during low system activity.

The Expansion Storage Kit contains the following components.

- Eight, 8Gb, Dual in-line memory modules (DIMMs)
- One Maintenance Free super-cap Backup Module (MFBU) Kit
- One external RAID controller PCIe card

The procedures in this appendix explain the following tasks.

- Turning off the appliance and removing it from the rack
- Installing the Expansion Storage Kit components into the appliance
- Installing one or more storage shelves into a rack
- Connecting the appliance to a storage shelf
- Connecting the storage shelves to additional storage shelf
- Connecting the storage shelf power cords
- Turning on the hardware and verifying operation

These tasks must be performed in the order that is provided in this appendix.

Refer to the following sections for correct cable usage.

SAS2 and SAS3 cables

2U12 rear panel

SAS2 and SAS3 cables

The appliance, the 2U12 shelves, and the 3U16 shelves have various SAS ports.

- The ports in the external RAID PCIe card in the NetBackup 5230 appliance requires SAS2 compliant connectors.

- A 2U12 shelf requires SAS3 compliant connectors.
- A 3U16 shelf requires SAS2 compliant connectors.

SAS2-to-SAS3 cables have a SAS2 connector on one end and a SAS3 connector on the other end. This arrangement enables a connection between the SAS2 ports and the SAS3 ports.

Note the difference between the SAS2 and the SAS3 connectors.

- SAS2 connectors have a long connector and a small blue tab. One horizontal pin board resides inside the connector.

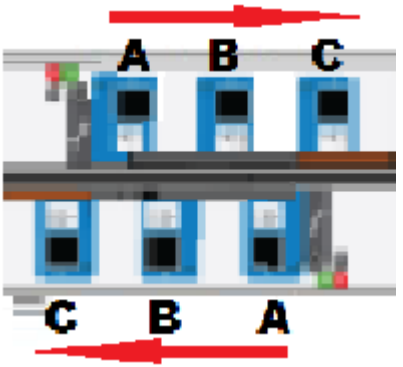
- SAS3 connectors include a short connector and a long blue tab. Two horizontal pin boards reside inside the connector.

2U12 rear panel

The rear panel of the 2U12 storage shelf includes one Power Cooling Modules (PCMs) on each side. In the middle of the rear panel are two canisters. The top and the bottom canisters connect to the appliance or to other storage shelves.

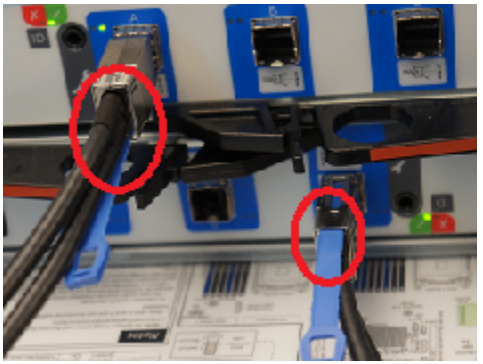
The ports in the top canister are labeled A, B, and C from left to right.

The ports in the bottom canister are labeled A, B, and C from right to left.



SAS3 cables attach to the ports in the top and the bottom canister.

The long blue tabs on the SAS3 connectors must point toward the center of the shelf.



In the top canister the tab faces down, toward the bottom canister.

In the bottom canister the tab faces up, toward the top canister.

Shutting down the appliance

This section describes how to perform a shutdown of the NetBackup 5230 Appliance. The process is designed to ensure an orderly system shutdown so that data is neither lost nor corrupted. Perform this procedure before you turn off the power switches on the unit.

Caution: Never turn off the appliance by using the power button on the control panel. Using the power button to turn off the appliance can cause data loss or corruption.

To turn off the NetBackup 5230 appliance

1. Use PuTTY to start an SSH session to access the NetBackup Appliance Shell Menu on the appliance.

   Note: You can also access the NetBackup Appliance Shell Menu using a KVM or laptop with a remote terminal emulator.

2. At the appropriate prompt, enter the host name or IP address of the appliance. The command-line interface, NetBackup Appliance Shell Menu, is launched.
3. At the login prompt, type `admin` and press `Enter`.
4. At the Password prompt, type the password that is assigned to the administrator for this application. The default password is P@ssw0rd. The Main_Menu prompt appears.
5. At the Main_Menu prompt, type `support` and press `Enter`. The Support prompt appears.
6. At the Support prompt, type `shutdown` and press `Enter`.
7. Wait for the appliance to turn off gracefully. (About five minutes.)
8. Turn off the switches on the power supplies.

Preparing the appliance to install the additional hardware

Best practices recommend removing the appliance from the rack to access the inside of the chassis. Alternatively you can pull out the appliance on its rails. Be sure that the appliance and rack are stable.

To prepare the NetBackup 5230 appliance for the installation of the hardware

1. Verify that the appliance is turned off. Refer to this section as needed.

   See "Shutting down the appliance" on page 85.

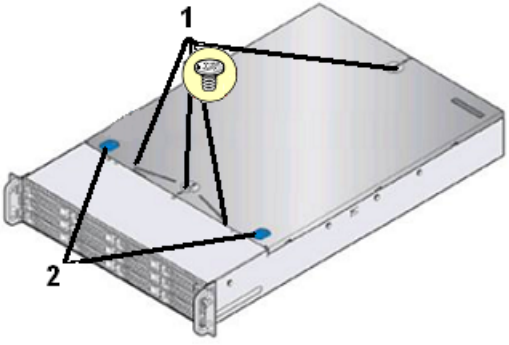
2. Slide the NetBackup 5230 appliance forward on the rails to the full extension.

   Caution: The unit weighs up to 65 lbs (29.5 kg). Make sure that sliding it forward does not destabilize the rack.

3. Use these steps if it is necessary to remove the appliance from the rack.
   - Label and disconnect all cables, including the power cords, from the rear panel of the appliance.

     Warning: If the cables are reconnected to the wrong ports, data can be corrupted or lost when the appliance is turned on.

   - Loosen the two front screws that secure the appliance in the rack and remove the appliance from the rack cabinet.
   - Place the unit on a grounded, ESD protective surface.
4. Do the following to remove the chassis cover:
   - Put on an ESD-compliant wrist strap or take other ESD-protective measures.
   - Remove the four screws (1) from the top of the chassis cover as shown in the figure.



   - Press the blue thumb grips (2) to release the locks and slide the cover back 0.5 inches (1.27 cm).

- Lift the cover off the chassis and set it aside where it cannot be damaged.

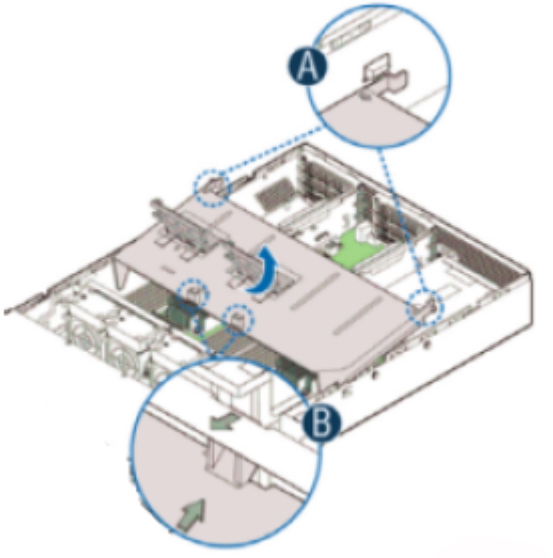
Installing the additional memory

Base NetBackup 5230 appliances are equipped with 64GB of memory. When a base unit is upgraded to use storage shelves, 64GB of additional memory must be installed. Memory is included in the upgrade kit. Additional components are not required to install additional storage shelves.

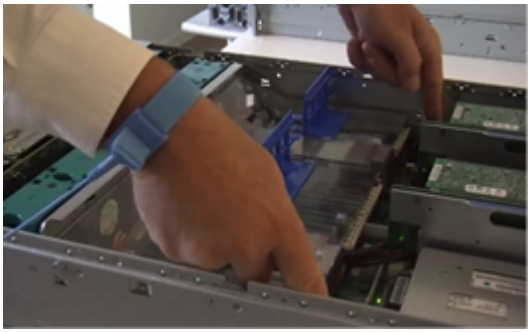
To install the memory

1 Remove the air duct as follows:

Note: The air duct is the plexiglass cover behind the fan bulkhead as shown in the following figure. The air duct has two blue latches attached.



- Locate the two, blue latches (A) that secure the back end of the air duct to the chassis. Push the latches in to release the air duct.

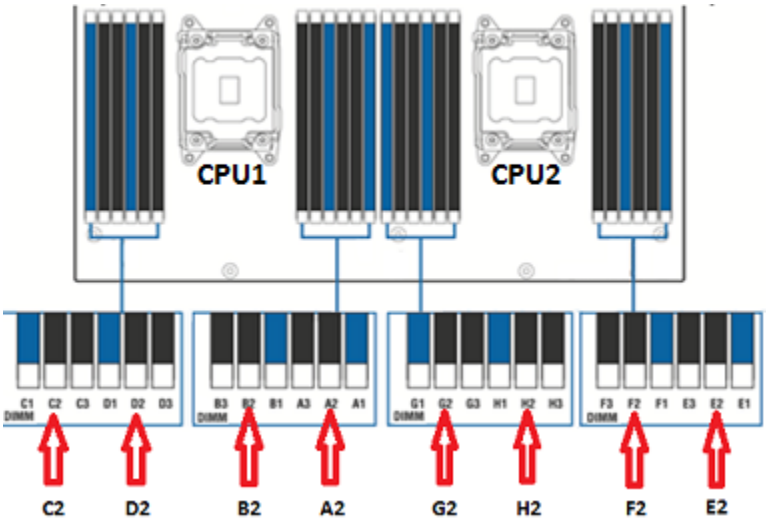


- Lift the back edge of the air duct to disengage the two tabs from the fan bulkhead (B).

- Set the air duct aside in a safe location.

2 Obtain the DIMMs from the Expansion Storage Kit.

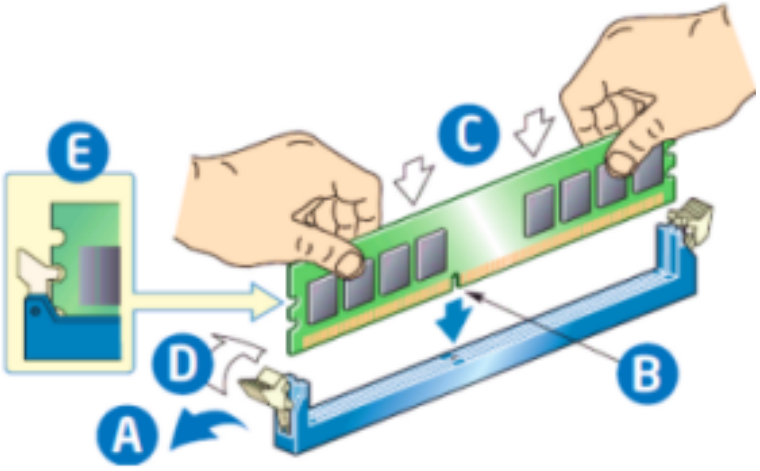
3 Locate the DIMM sockets next to the CPUs on the mainboard inside the appliance chassis.



A blank card is installed in each memory socket that is not currently used.

4 Install the new DIMM cards in slots A2, B2, C2, D2, E2, F2, G2, and H2 as follows:

- In each slot that requires new memory, remove the blank DIMM card. Open the retaining clips at each end of the socket and remove the blank card. (A)

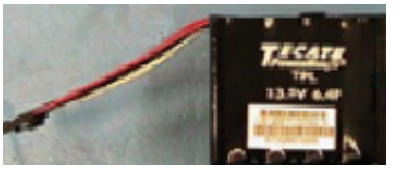


- Grasp an expansion DIMM card by the edges and remove it from the anti-static package. Do not touch the components or gold fingers on the card.
- Position the DIMM card over a socket. Align the notch on the bottom edge of the DIMM card with the key in the DIMM socket. (B)
- Push the card straight down (C).
- Slide the side retaining clips towards the card (D).
- Verify that the retaining clips are inserted properly (E).

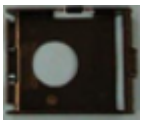
Installing the additional Maintenance Free Backup Unit (MFBU)

To install the MFBU

1. Put on an ESD-compliant wrist strap or take other ESD-protective measures.
2. Remove the following components from the Expansion Storage Kit.
   - MFBU (battery)

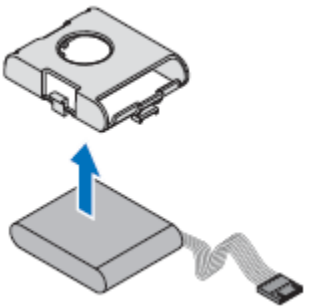


- MFBU case



- MFBU cable

3 Insert the MFBU into the case. Do not damage or twist the wires that are attached to the MFBU.



4 View the appliance from the front left side.

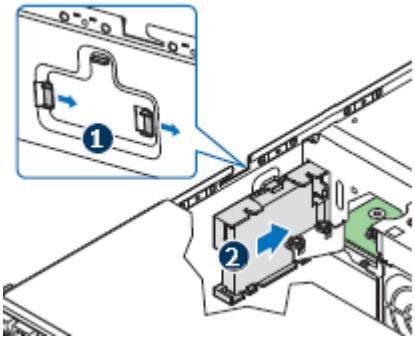
5 Locate the fan on the left side of the chassis.

6 Remove the air baffle that is located near the fans as needed.

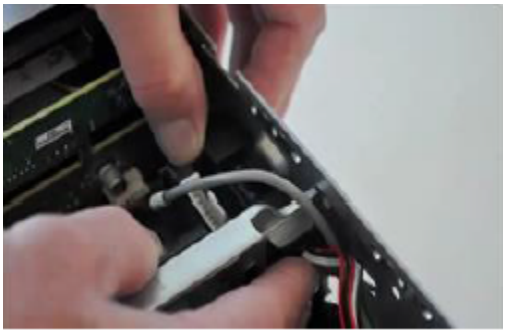
7 Remove the fan on the far left.

8 Attach the MFBU cable to the MFBU. The other end of the cable attaches to the external RAID card when it is installed.

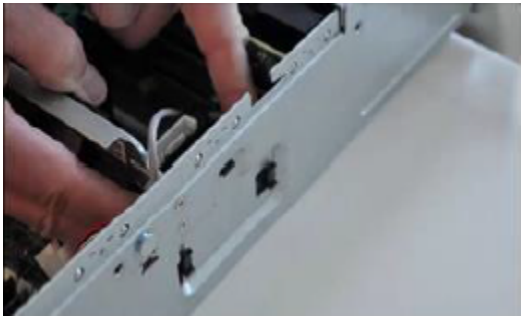
9 Position the MFBU against the chassis side wall (1) and through the opening in the fan bulk-head (2).



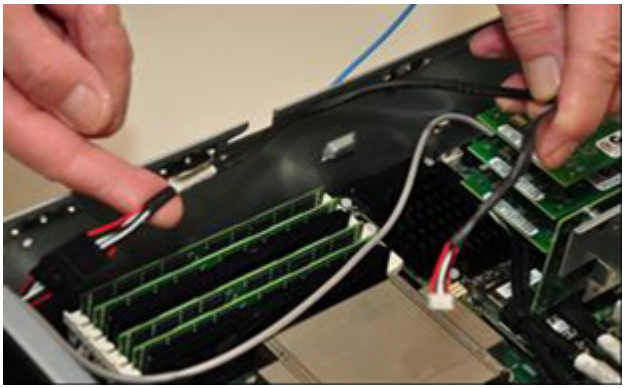
10 Align the tabs on the MFBU case with the mounting holes in the chassis.



11 Slide the MFBU case towards the front of the appliance until the tabs engage with the mounting holes.



12 Route the MFBU cable along the side of the chassis towards the rear of the appliance.



13 Proceed to the next section to install the external RAID PCIe card and to connect it to the MFBU cable.

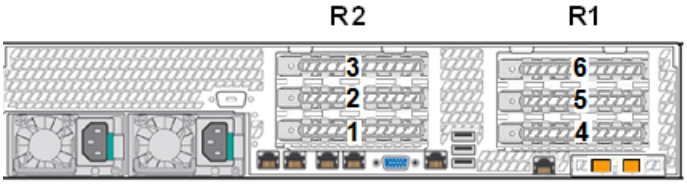
See “Installing the external RAID controller card” on page 93.

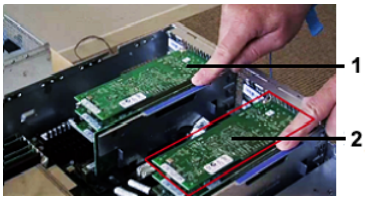
Installing the external RAID controller card

This section describes how to install the external RAID controller card.

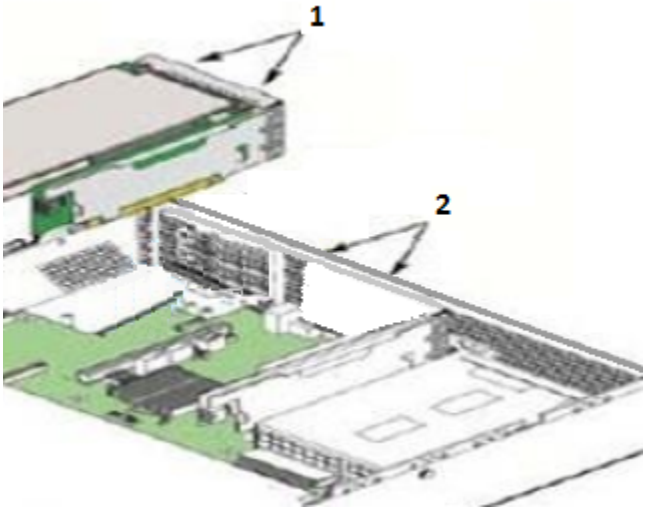
To install the RAID controller card

1. Put on an ESD wrist strap or take other ESD precautions.
2. Locate PCIe riser assembly R2 and slot 1. Riser 2 is located next to the power supply.





3. Remove the PCIe riser assembly as follows.
   - Disengage the two hooks (1) from the chassis slots (2) that secure the riser 2 assembly to the chassis.

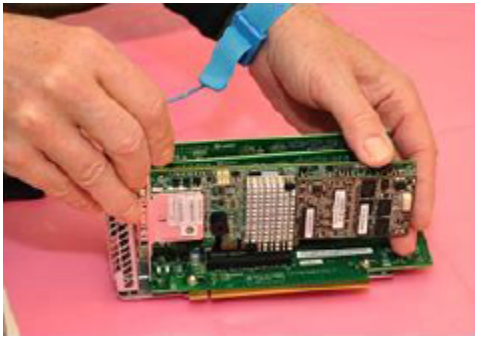


- Grasp the riser assembly with both hands. With firm even pressure lift it out of the connector on the mainboard.

- Slot 1 is on the bottom of the riser. Remove the screw that secures slot 1 to the riser assembly.
- Remove the metal cover plate from slot 1.

4 Remove the RAID controller card from the Expansion Storage Kit.

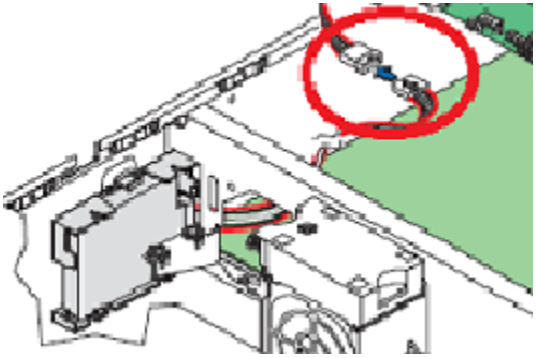
5 Align the edge connector on the card with the bottom PCIe-card socket (or slot 1). The edge connector is keyed to install one way only.



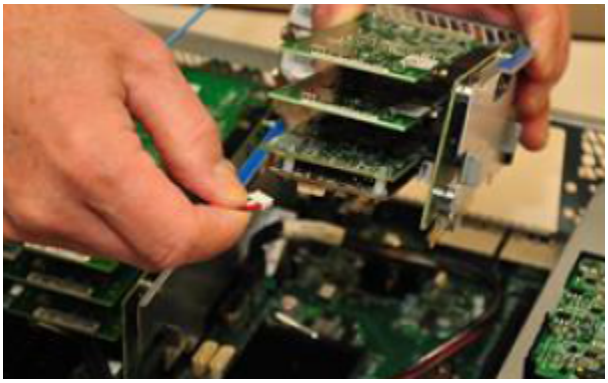
6 Firmly and evenly insert the card in the socket.

7 Use the screw you removed earlier to secure the RAID controller card in the PCIe riser assembly.

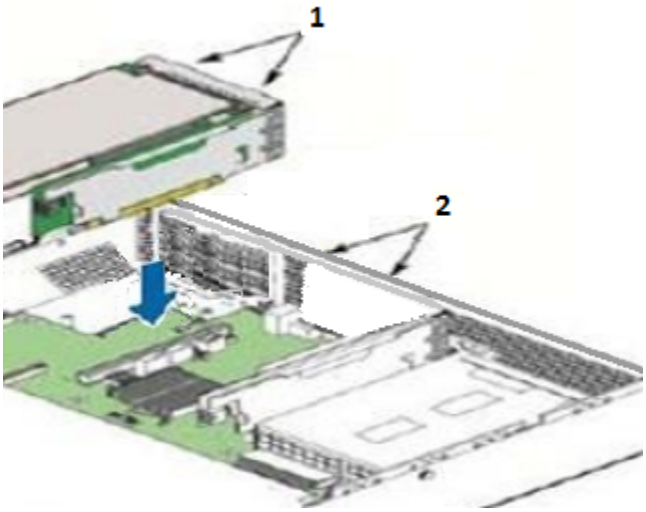
8 Connect the cable on the MFBU to the separate cable from the kit.



9 Connect the MFBU cable to the rear of the RAID controller card.

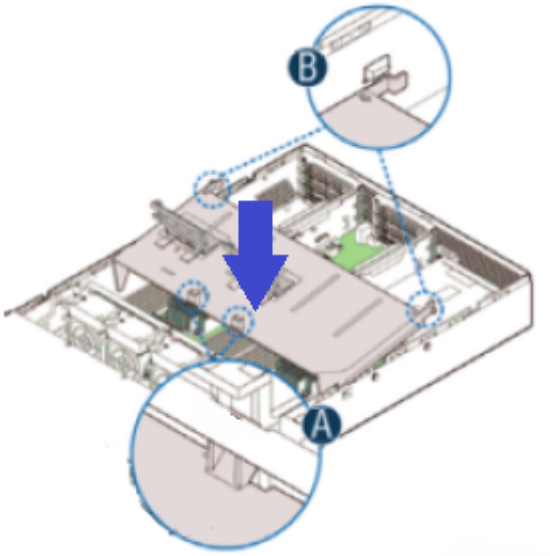


10 Reinstall the riser into the chassis.



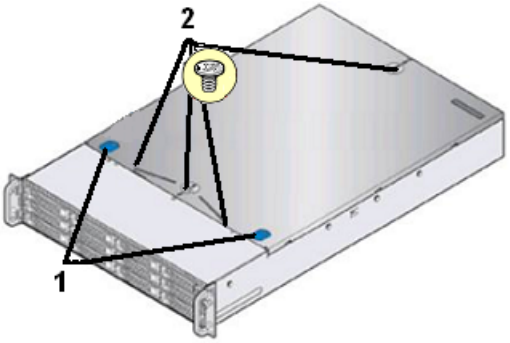
- Insert the hooks on the riser (1) into the slots on the chassis (2).
- Firmly push down on edges of the assembly to engage the mainboard connector with the riser.

11 Replace the air duct as follows:



- Align the two latches at the back of the air duct (A) behind the fans. Press the latches in to secure them in the tabs.
- Lower the front edge of the air duct to engage the two side tabs (B).

12 Replace the chassis cover as follows.



- Align the cover with the edge along the top of the chassis.
- Place the cover on the chassis so that there is about 1.5 inches of overhang.
- Use the blue tabs (1) to slide the cover forward until the cover slides into place.
- Insert the four screws and secure.

13 Reinstall the appliance into the rack as needed.

- Toward the rear of the chassis, locate the levers in the extensions on both sides of the appliance.
- Push up and hold the levers to release the extension locking mechanism.
- Slide the appliance into the rack. Do not force the appliance into the rack.
- If you disconnected the data cables, reconnect them according to the labels you placed on them earlier.

Installing 2U12 storage shelves into the rack

Warning: Inappropriate handling of NetBackup components can result in serious injury, equipment damage, or both. Use appropriate practices, techniques, and tools when handling these components. The heaviest devices in any equipment rack should be installed in the bottom of the rack. If heavy devices are installed at the top of the rack, the rack may tip over. Injury to personnel and damage to equipment is very possible. The storage shelf is heavier than the appliance. Therefore, you must install the storage shelf in the bottom of the rack. Install the appliance higher in the rack than the storage shelves.

Be sure to install all 2U12 shelves after 3U16 are installed closest to the appliance.

Storage shelf weight and dimensions

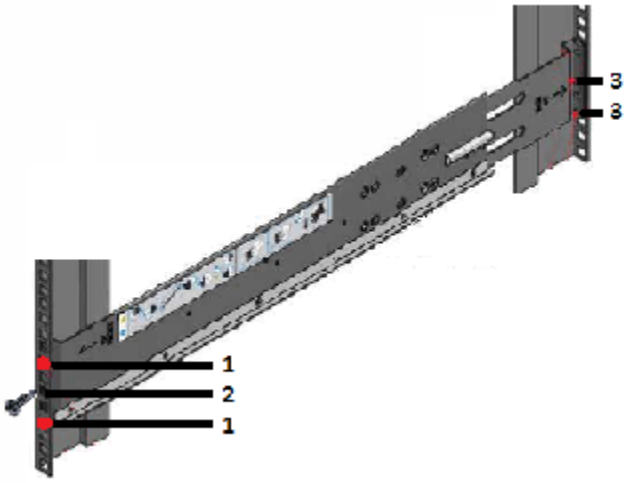
- Weight: 28 kg (62 lbs)
- Height: 8.89 cm (3.5") (approximately 2U)
- Width: 48.3 cm (19")
- Depth: 63.0 cm (24.8")

There must be a minimum depth of 76 cm (30 in.) between the front of the rack and the rear of the rack. Veritas recommends that two people install the rails; one person at the back of the rack and one at the front. Veritas also recommends that two people lift and place the storage shelf into the mounted rails.

To install storage shelf rails

1. Identify the front and the rear of each rail. The following illustration shows the front of the left-hand and the right-hand rails. Red arrows show the pins that fit into the rack.

2. Align the rails with the rack holes. Be sure to use the same holes on each side of the rack.
3. Place the left rail inside the rack. Extend the front and back of the rail to fit into the rack.



4. Secure the front pins (1) and the rear pins (3).
5. Insert the screw (2) in the front of the rail. Do not over-tighten the screws.
6. Repeat for the right rail.

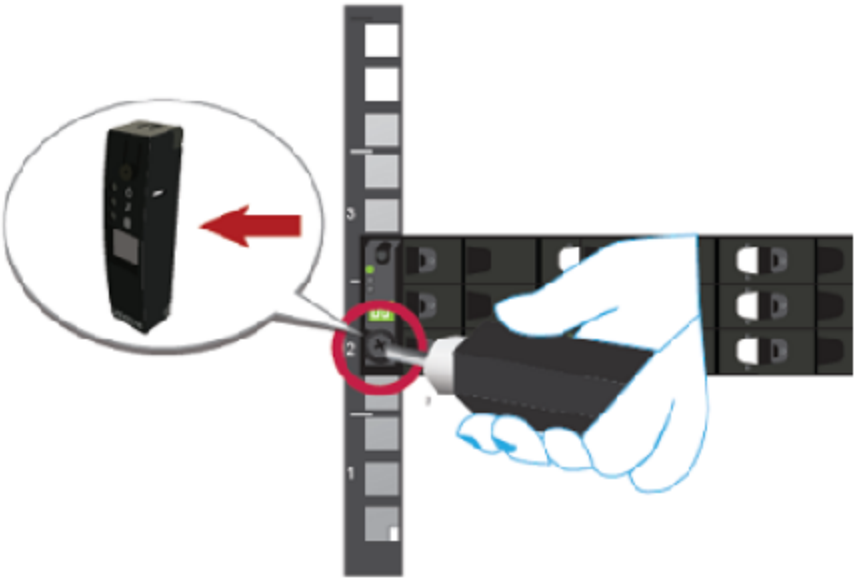
7 Install the storage shelf from the front of the rack.

8 Use two people to lift the shelf.

9 Slide the rear of the shelf into the front of the rails. Be sure that the shelf is straight and even inside the rack. Do not force the shelf to fit.

10 Carefully push the shelf towards the rear of the rails.

11 Remove the cap from the left and the right sides of the front of the shelf, if they are attached.



12 Insert one screw into the front of the rack, on both sides of the shelf.

13 Replace the end caps or attach the bezel to the front of the shelf.

Connecting the 2U12 shelves to an appliance or other storage shelves

You can connect 2U12 shelves to an operational appliance or to existing 2U12 or 3U16 shelves. Use the details in the following topics.

Connecting a 2U12 shelf to an appliance that does not have any shelves

Connecting 2U12 shelves to an existing 2U12 shelf

Connecting 2U12 shelves to one existing 3U16 shelf

Connecting 2U12 shelves to two existing 3U16 shelves

Connecting one 2U12 shelf to three existing 3U16 shelves

Be sure to follow supported configurations.

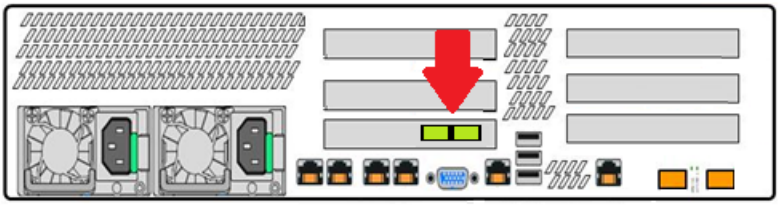
- You can install up to four storage shelves with one NetBackup 5230 Appliance.
- Any 3U16 storage shelves must be installed in front of any 2U12 shelves.
- Cable connections follow standard daisy chain protocols.

Connecting a 2U12 shelf to an appliance that does not have any shelves

This section describes how to connect the SAS2-SAS3 cables between the NetBackup 5230 appliance and the one 2U12 storage shelf.

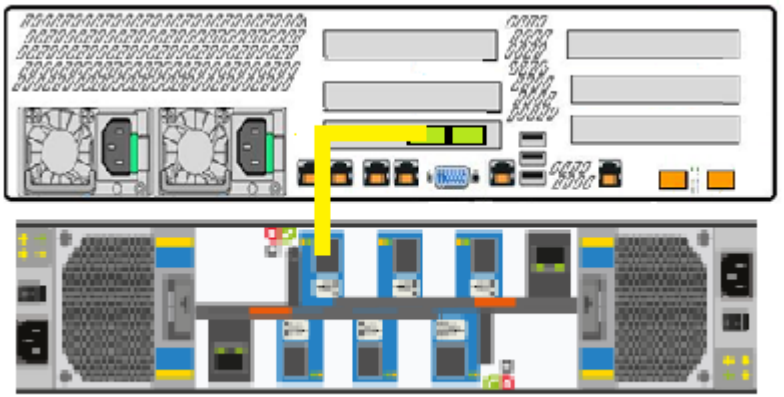
To connect a single 3U16 storage shelf to an appliance

1. Obtain the two SAS2-SAS3 cables that ship with the 2U12 storage shelf.
2. Locate the RAID controller in slot 1 of the appliance. The controller has two SAS2 ports.



3. Connect the SAS2 end of one cable to the left port in the RAID controller.

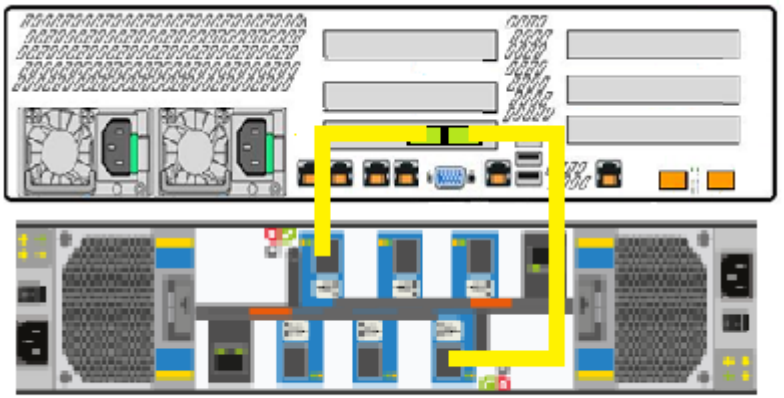
4 Connect the SAS3 end of the same cable to port A in the top canister of the 2U12 storage shelf. Port A is the leftmost port on the top canister.



SAS2-SAS3 cable

5 Connect the SAS2 end of the second cable to the right port in the RAID controller.

6 Connect the SAS3 end of the same cable to port A in the bottom canister of the 2U12 storage shelf. Port A is the rightmost port on the bottom canister.

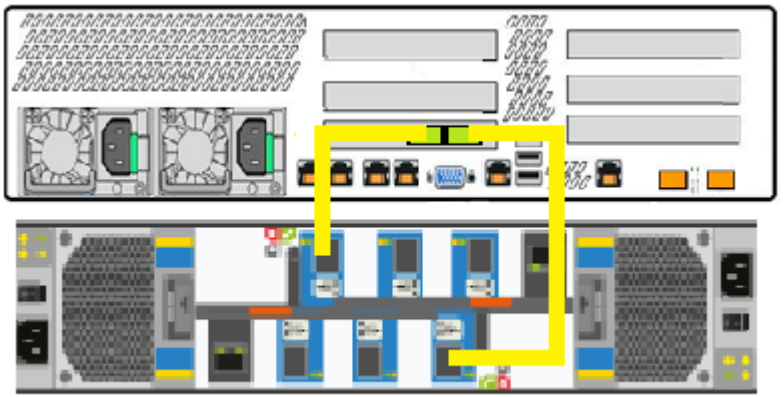


SAS2-SAS3 cable

Connecting 2U12 shelves to an existing 2U12 shelf

To connect an existing 2U12 storage shelf to a new 2U12 storage shelf

1. Verify that you have a NetBackup 5230 appliance and a 2U12 storage shelf with the correct cabling as shown.



   The SAS2 connectors attach to the appliance.

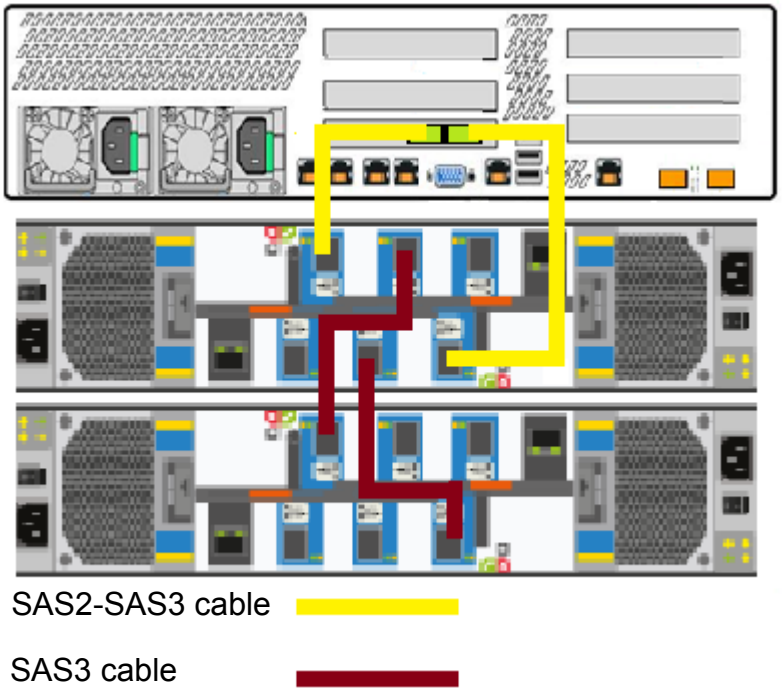
   The SAS3 connectors attach to the storage shelf.

2. Verify that the SAS3 connectors in the storage shelf are inserted in port A in the top and the bottom canister.

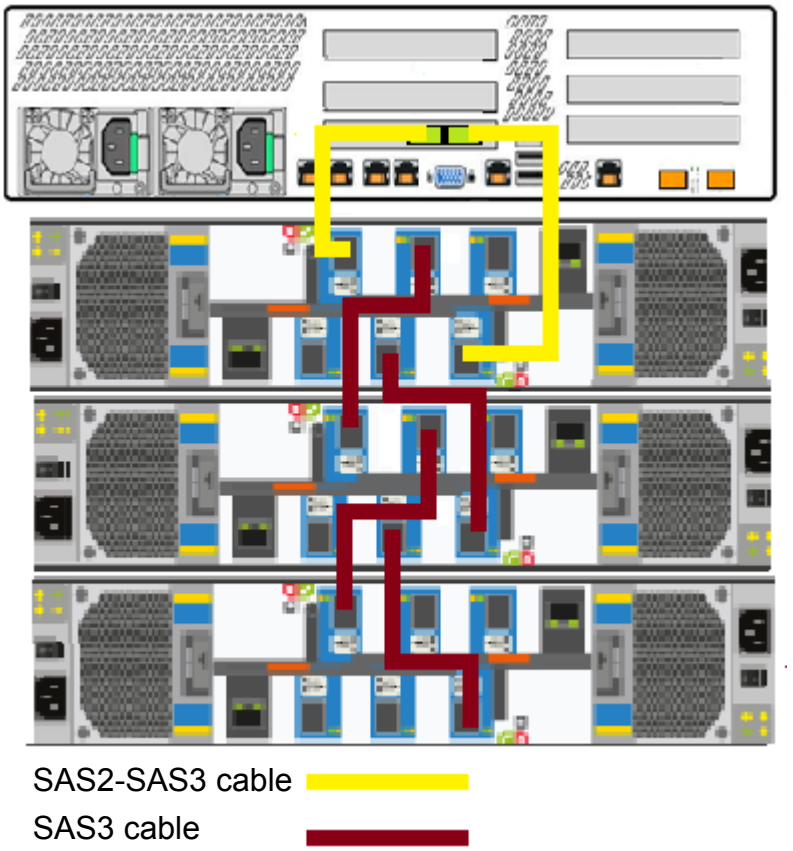
3. Obtain two SAS3 cables.

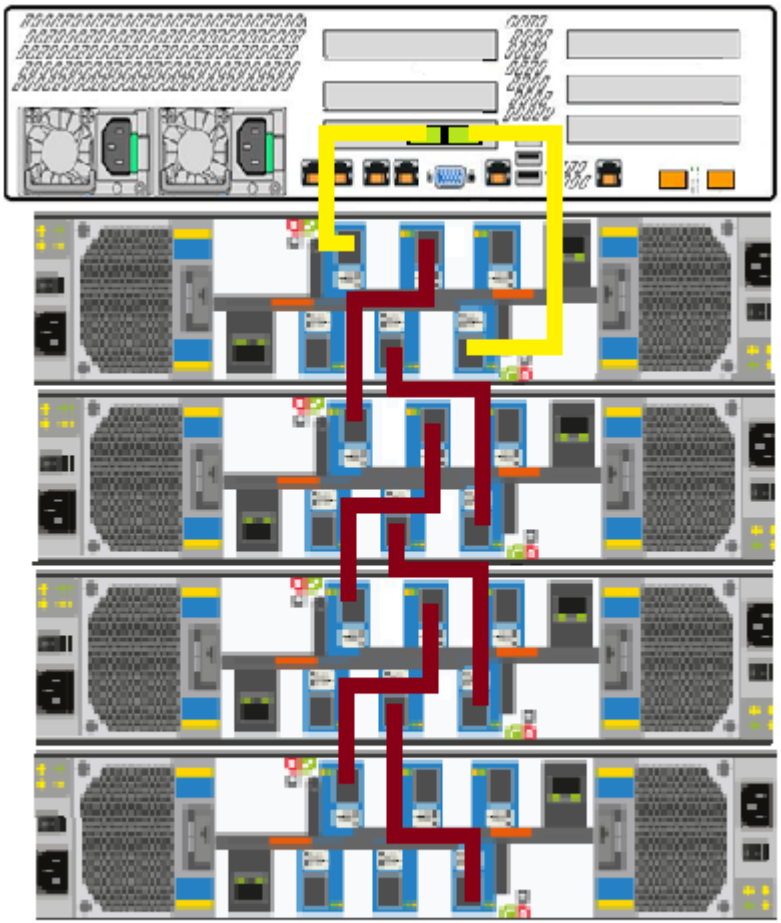
4 In the existing shelf, connect port B in the top canister to port A in the top canister of the new shelf.

In the existing shelf, connect port B in the bottom canister to port A in the bottom canister of the new shelf.



5 Use the same scenario to connect up to four 2U12 storage shelves with SAS3 cables, as shown.

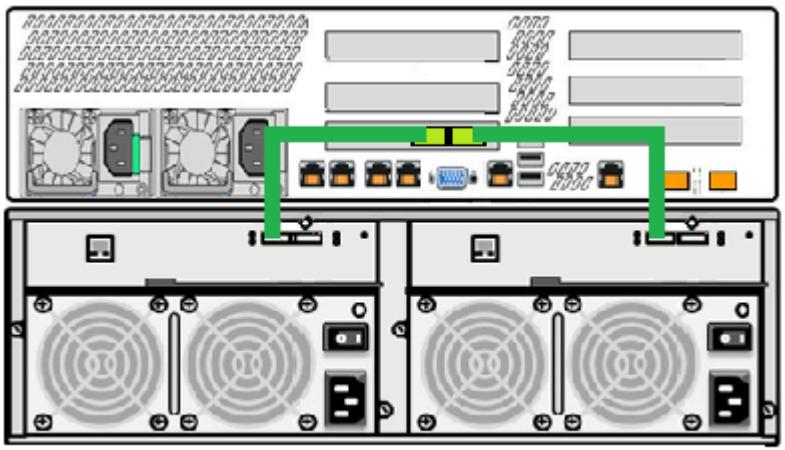



SAS2-SAS3 cable
SAS3 cable

Connecting 2U12 shelves to one existing 3U16 shelf

To connect an existing 3U16 storage shelf to a new 2U12 storage shelf

1 Verify that you have a NetBackup 5230 appliance and a 3U16 storage shelf with the correct cabling as shown.

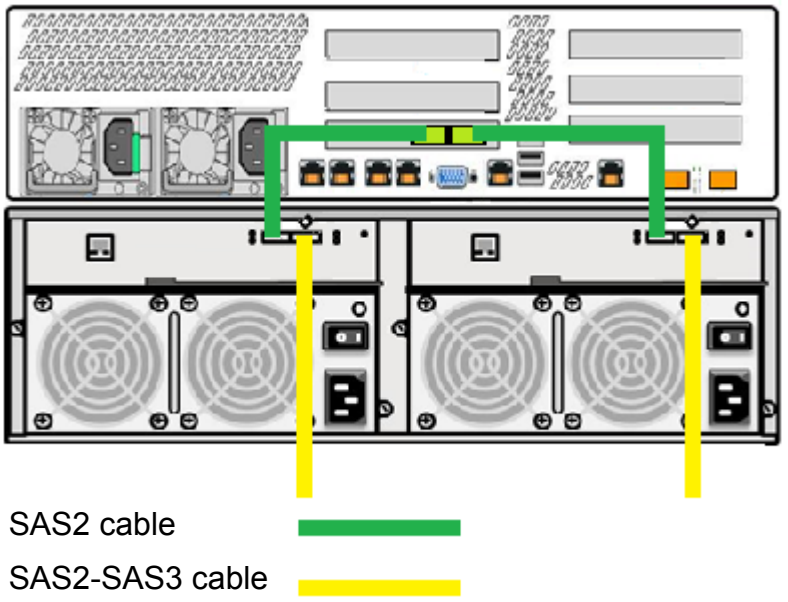


SAS2 connectors attach the appliance to the 3U16 storage shelf.

2 Obtain two SAS2-SAS3 cables.

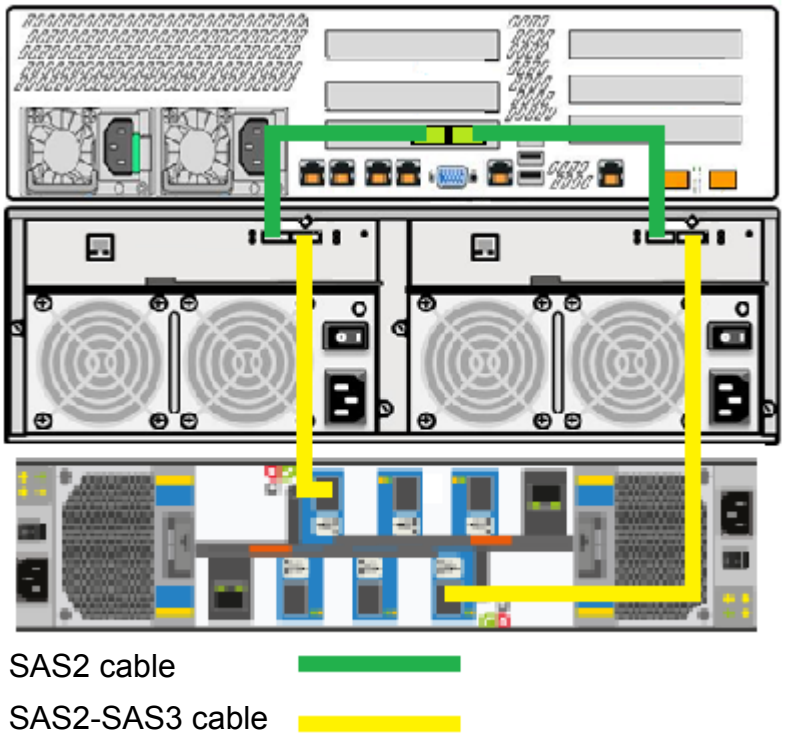
3 Identify the SAS_OUT ports on each I/O module in the 3U16 storage shelf. A diamond shape identifies the SAS_OUT ports.

4 Connect the SAS2 connectors on the SAS2-SAS3 cables to the SAS_OUT ports on the 3U16 storage shelf.



5 Identify port A in the top and the bottom canister of the 2U12 storage shelf. Note that the port labels A, B, and C are reversed in the two canisters.

6 Connect the SAS3 connectors of the SAS2-SAS3 cables to port A in the top and the bottom canister of the 2U12 storage shelf.

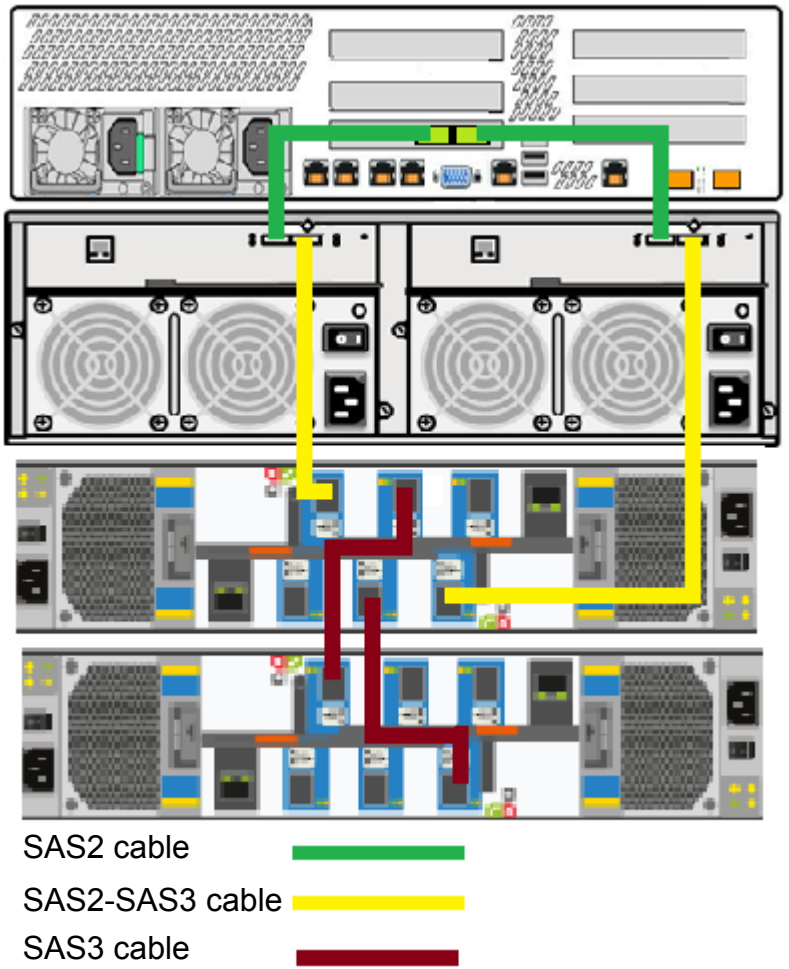


You can add two additional 2U12 storage shelves to this configuration. You cannot have more than four storage shelves of any type attached to the appliance.

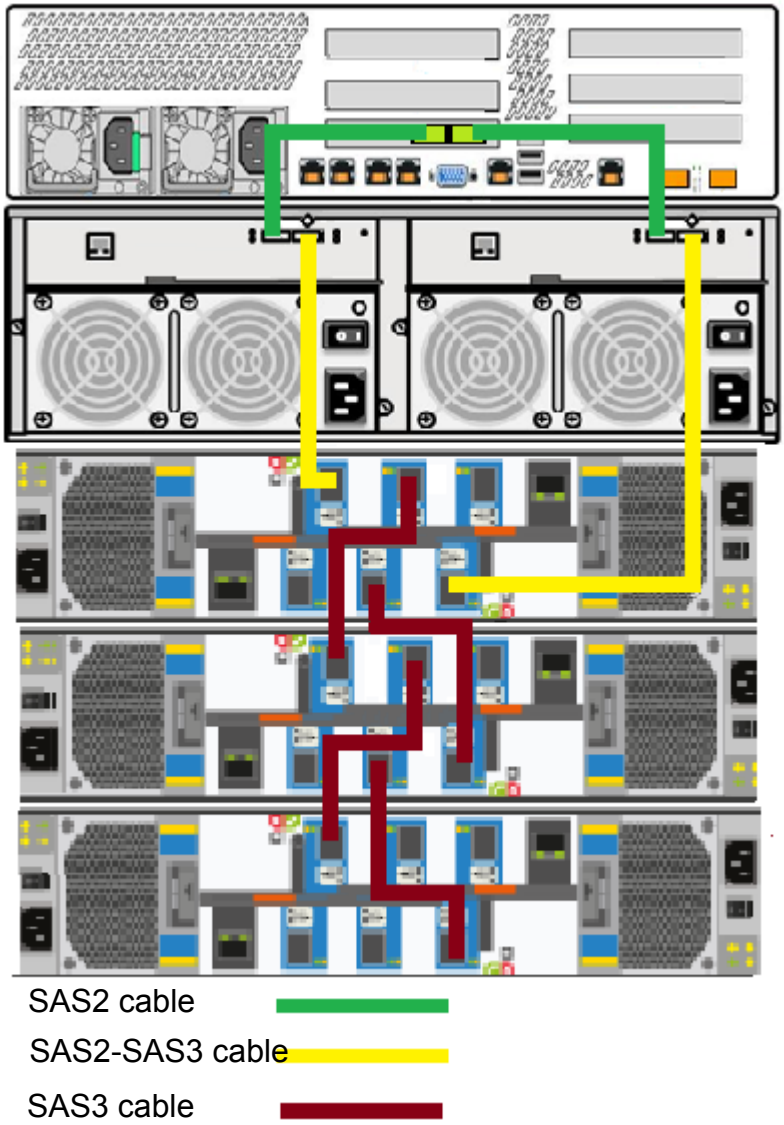
7 Obtain two SAS3 cables.

8 From the first 2U12 shelf, connect port B in the top canister to port A in the top canister of the new shelf.

From the first 2U12 shelf, connect port B in the bottom canister to port A in the bottom canister of the new shelf.



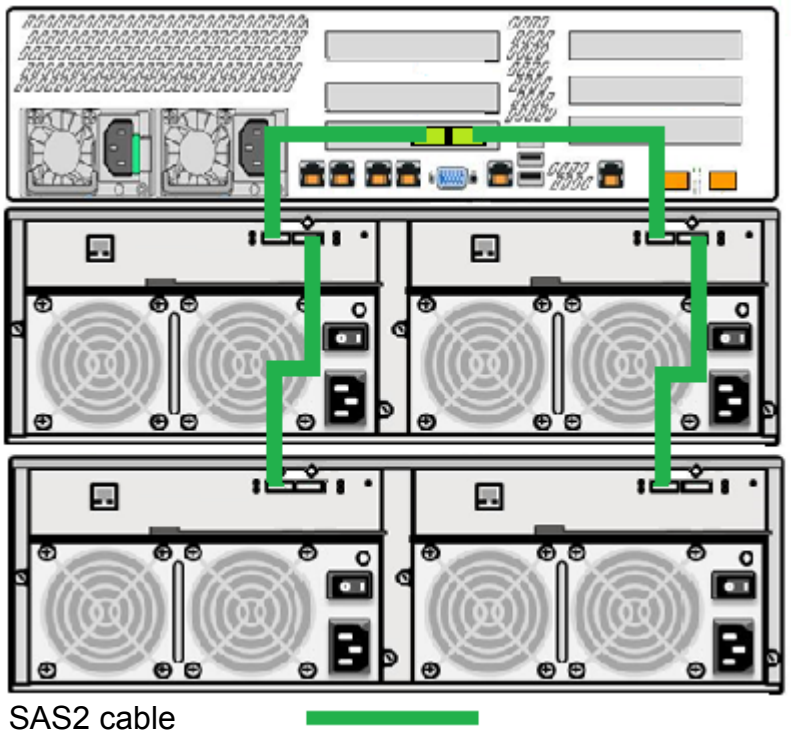
9 Use the same cabling scenario to add a third 2U12 shelf.



Connecting 2U12 shelves to two existing 3U16 shelves

To connect two existing 3U16 storage shelves to new 2U12 storage shelves

1 Verify that you have a NetBackup 5230 appliance and two 3U16 storage shelves with the correct cabling as shown.

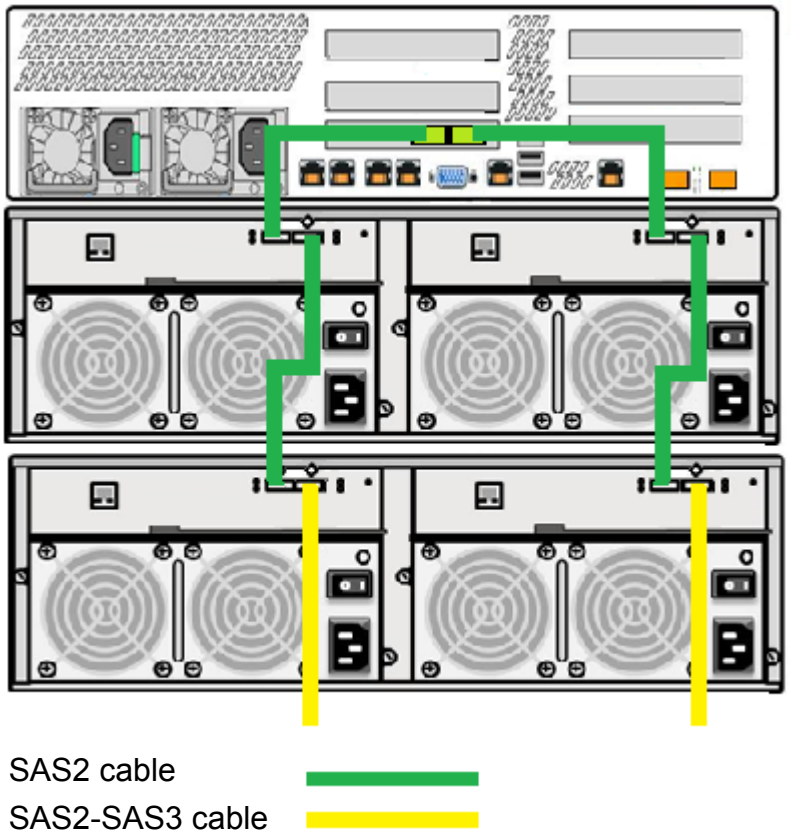


SAS2 connectors connect the appliance and the 3U16 storage shelves.

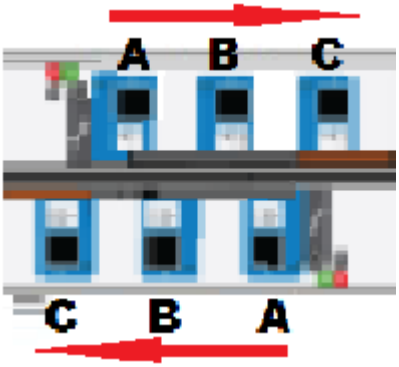
2 Obtain two SAS2-SAS3 cables.

3 Identify the SAS_OUT ports on each I/O module in the 3U16 storage shelf. A diamond shape identifies the SAS_OUT ports.

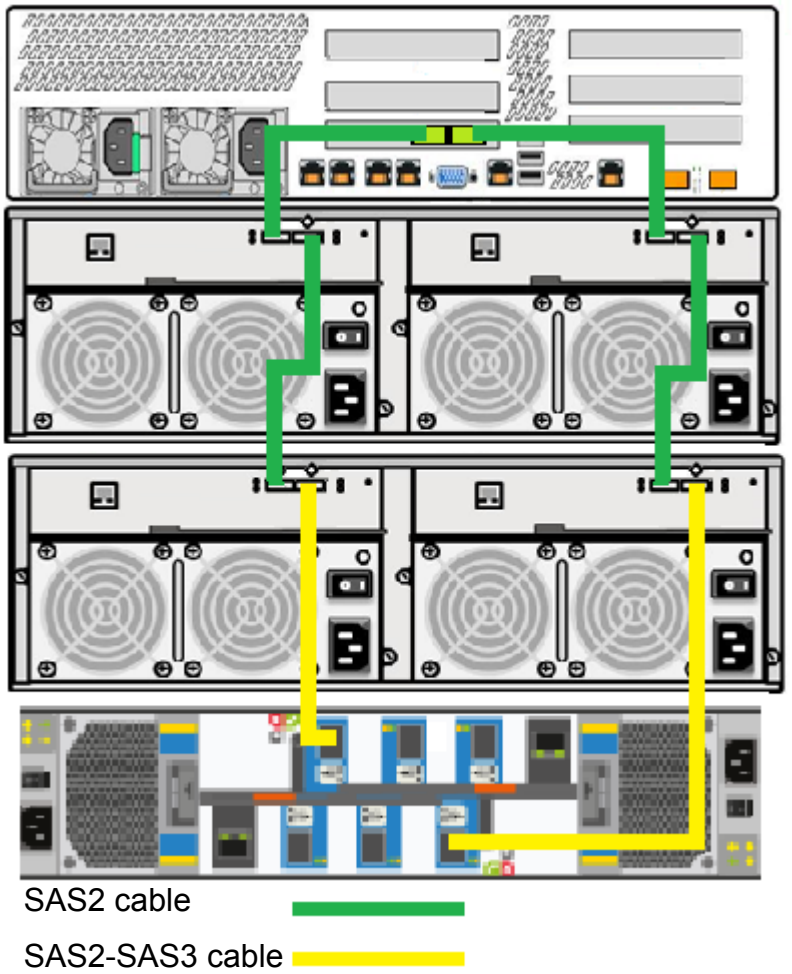
4 Connect the SAS2 connectors on the SAS2-SAS3 cables to the SAS_OUT ports on the 3U16 storage shelf.



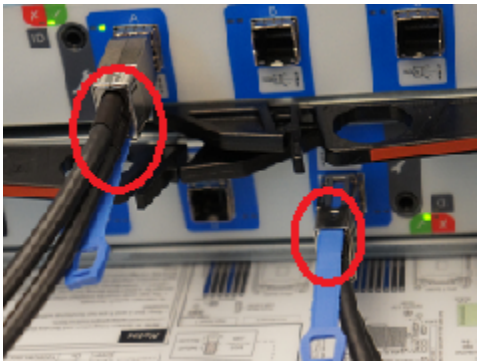
5 Identify port A in the top and the bottom canister of the 2U12 storage shelf. Note that the port labels A, B, and C are reversed in the two canisters.



6 Connect the SAS3 connectors of the SAS2-SAS3 cables to port A in the top and the bottom canister of the 2U12 storage shelf.

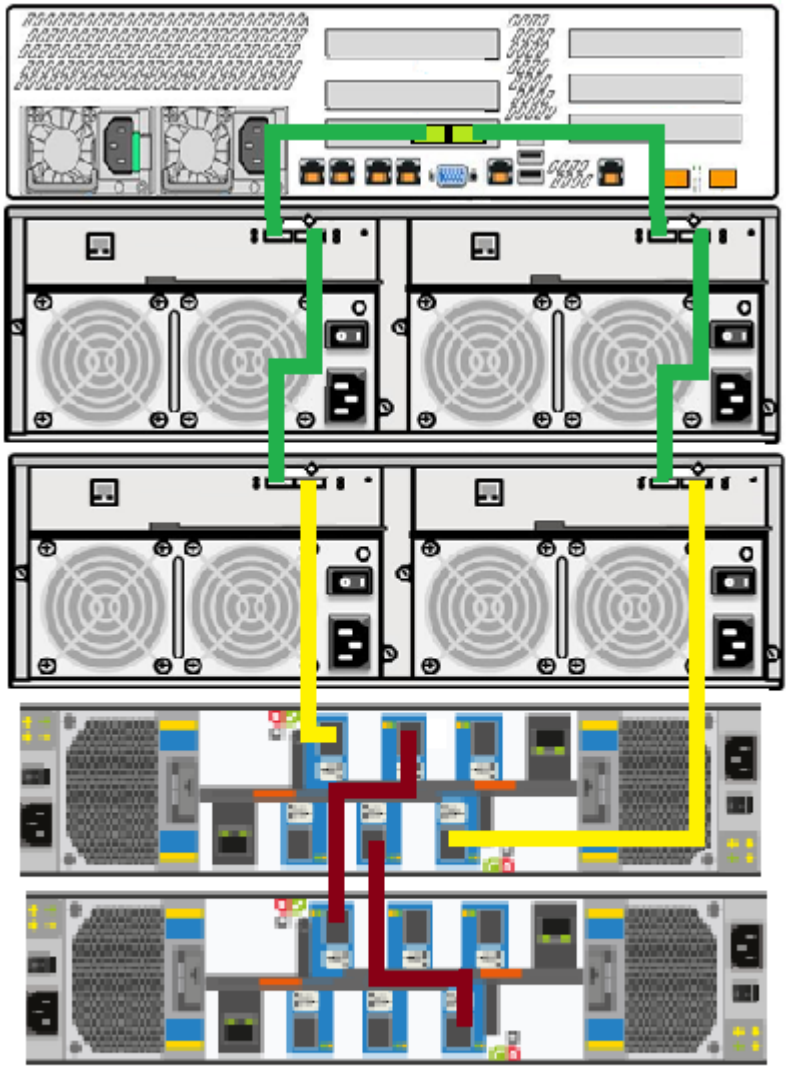


7 Ensure that the long blue tabs on the SAS3 connectors point toward the center of the 2U12 shelf.



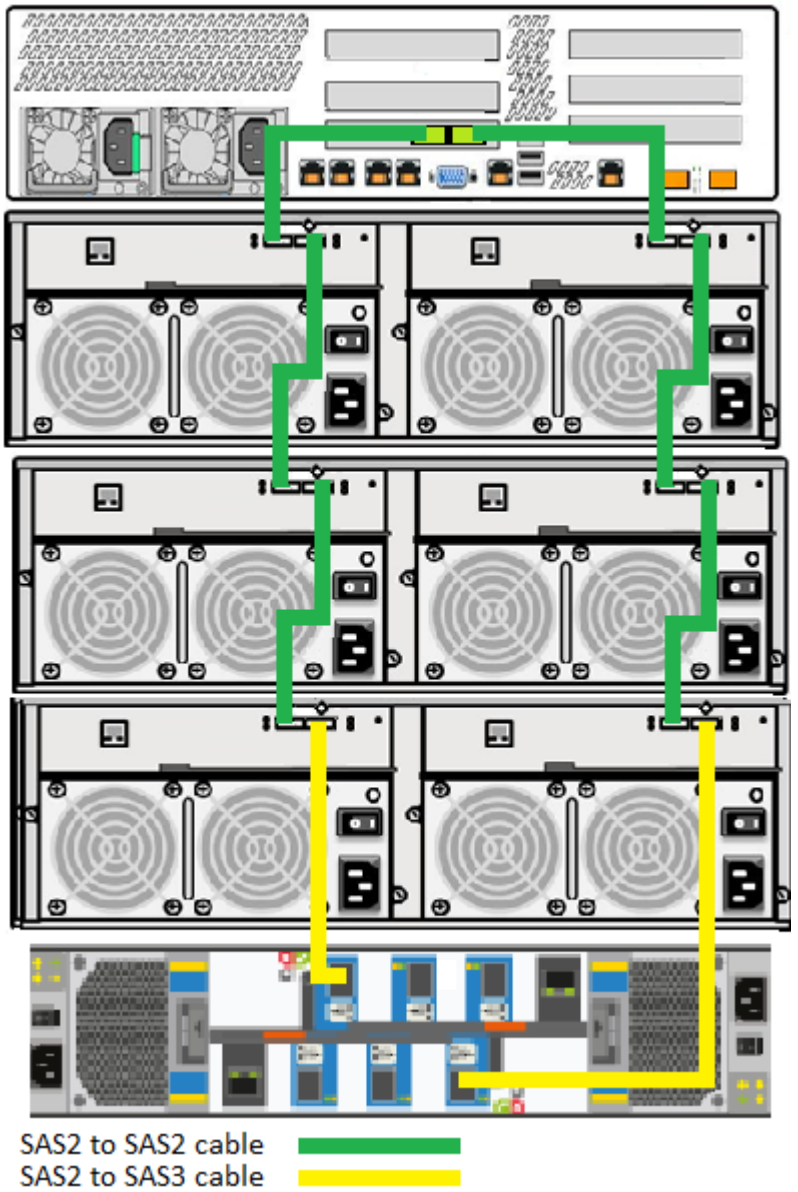
8 If you plan to connect a second 2U12 shelf, obtain two SAS3 cables.

- In the first 2U12 shelf, connect port B in the top canister to port A in the top canister of the new 2U12 shelf.
- In the first 2U12 shelf, connect port B in the bottom canister to port A in the bottom canister of the new 2U12 shelf.


SAS2 cable
SAS2-SAS3 cable
SAS3 cable

Connecting one 2U12 shelf to three existing 3U16 shelves

A NetBackup 5230 Appliance that already has three storage shelves only supports one additional storage shelf. The following diagram shows one 2U12 shelf and three 3U16 shelves.



Connecting the 2U12 storage shelf and appliance power cords

Each appliance and each storage shelf contain two AC power supplies. To ensure power redundancy, connect the power supplies on each component to separate AC power sources.

Caution: Do not turn on the power to any components while connecting the power cords. The components must be turned on in a specific sequence to ensure correct communication.

To connect the power cables

1. Verify that the AC power supply input for the appliance and for the storage shelf is within one of these ranges.
   - 100 - 127 VAC at 50/60 Hz
   - 200 - 240 VAC at 50/60 Hz
2. For each shelf, obtain two power cords that are appropriate for your region and equipment.
3. Locate the power sockets in the shelf.

4. Connect one cable between each socket and a socket on the Power Distribution Unit (PDU) for your rack.

   Note: The following steps apply if you removed the appliance from the rack to install additional components.

   ---

5. Obtain two power cords for your appliance.

6 Locate the power sockets in the appliance.

7 Connect one cable between each socket and a socket on the Power Distribution Unit (PDU) for your rack.

Turning on the hardware and verifying operation

If you have turned off your appliance you must wait to turn it on again. The appliance and the attached storage shelves must be turned on in a specific order. If the hardware is not turned on correctly the appliance RAID controller may not recognize some storage units.

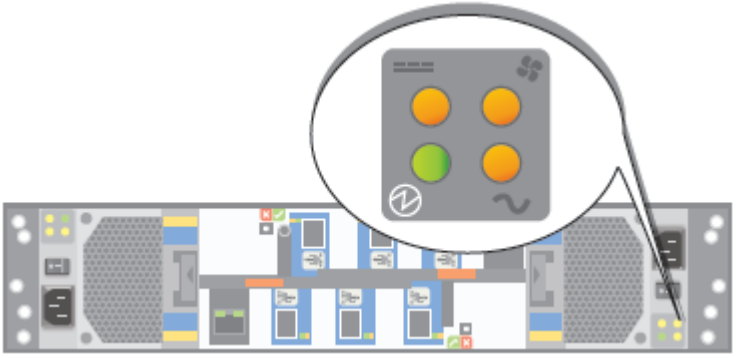
If you have turned off your appliance you can begin turning on storage shelves. Use the following procedure to turn on the storage shelves in the required order.

To turn on the 2U12 storage shelves

1 Start with the storage shelf that is farthest in distance from the appliance.

2 Flip on the power switches on each power supply on the rear of the storage shelf.

3 Verify that the power LED on each power module is green.



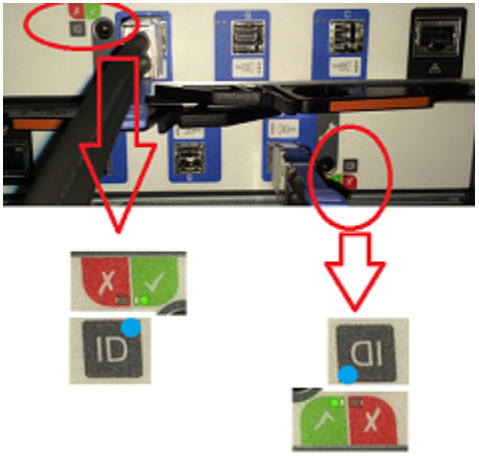
The LED icons are explained in the following table.

LED	Description
	Green = power cooling module ok
	Amber = AC power fault
	Amber = Fan fault
	Amber = DC power fault

The following table provides LED status details about the fans, AC and DC power, and the power cooling modules (PCMs).

Status	PCM Ok (Green)	Fan fault (Amber)	AC power fault (Amber)	DC power fault (Amber)
No AC power in either PCM	Off	Off	Off	Off
No AC power in a specific PCM	Off	Off	On	On
AC power present in a PCM	On	Off	Off	Off
PCM fan out of tolerance	On	Off	Off	On
PCM fault (over temp., over voltage, over current)	Off	On	Off	Off
Standby mode	Flashing	Off	Off	Off
PC firmware download	Off	Flashing	Flashing	Flashing

4 Locate the LEDs on each I/O module canister.

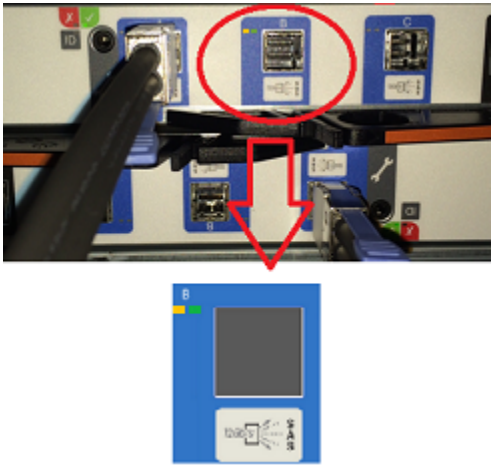


The LED in the red area with the white X-mark is amber when there is a fault in the I/O module canister.

The LED in the ID area is blue when each module is identified.

The LED in the green area with a white checkmark is green when functions are normal.

5 Locate the SAS port LEDs.



Note: The illustration shows the LEDs for port B in the top I/O module. The LEDs for all six ports are the same.

The Fault LED is the LED that is farthest from the SAS port.

The Activity LED is the LED that is closest to the SAS port.

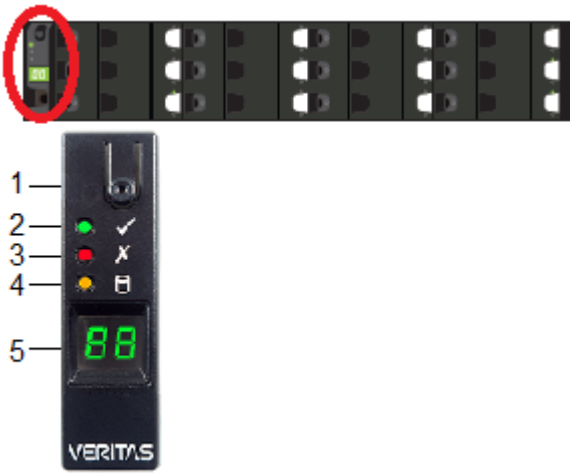
The following table describes the SAS port LEDs.

Note that the combination of both LEDs provides the status.

Status	Activity (green) LED	Fault (amber) LED
No cable present	Off	Off
Cable present, no activity	On	Off
Cable present, all links active	Blinking if one or more disk drives are active.	Off
Critical fault	Off	On
Non-critical fault	Blinking if one or more disk drives are active.	Blinking at a rate of one second on, and one second off.

6 Move to the front of the storage shelf.

7 Identify the control panel LEDs and components.



The following table describes the 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) (Red)	The Module Fault LED illuminates when there is a system hardware fault. The fault may be associated with a fault 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.

Number	Item	Description
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.

8 Verify that the Power on/Standby LED is green.

If the Power LED or the other two LEDs are amber, escalate the issue.

The default Unit ID display is 88. You are not required to change this number.

The following table provides details of the control panel LEDs.

System power (Green or Amber)	Module fault (Amber)	Logical fault (Amber)	Associated LEDs and alarms	Status
On (Amber)	Off	Off	None	Standby power present, the overall power failed or turned off
On (Green)	On (Amber)	N/A	Single beep, then double beep	Control panel power is on, in test state (5 seconds)
On (Green)	Off	Off	None	Power is on, all functions are good
On (Green)	On (Amber)	N/A	Power Cooling Module (PCM) fault LEDs Fan fault LEDs	Any PCM fault, fan fault, or an over or under temperature issue
On (Green)	On (Amber)	N/A	I/O module LED	Any I/O module fault
On (Green)	On (Amber)	N/A	None	Enclosure logical fault
On (Green)	Flashing	N/A	Module fault LED located on an I/O module	Unknown I/O module type installed (Invalid or mixed)

System power (Green or Amber)	Module fault (Amber)	Logical fault (Amber)	Associated LEDs and alarms	Status
On (Green)	Flashing	N/A	Array in a failed or degraded state	Drive failure has occurred to cause loss of availability or redundancy
On (Green)	N/A	On	Array in a failed or degraded state	Drive failure has occurred, to cause loss of availability or redundancy
On (Green)	N/A	Flashing	Arrays in an impacted state	Array operating background function
On	Flashing	N/A	State Event System (SES) state S1	Enclosure ID setting is different from "start of day" setting

9 Check the LEDs on each disk drive carrier.

The following table describes the disk drive carrier LEDs. Note that the combination of both LEDs provides the 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
Device identity.	On	Blinks at a rate of one second on and one second off.
Drive slot fault.	Off	On
Drive fault. Power control circuit fault.	On	On
Possible drive fault.	On	Blinks at a rate of one second on and one second off.

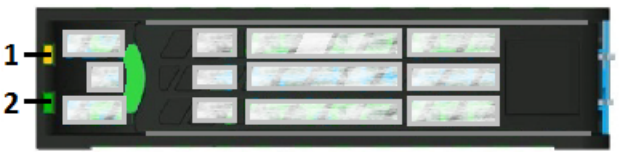
10 Repeat these steps for each storage shelf. Let each shelf initialize before you turn on the next shelf. Initialization should take 2 minutes to 3 minutes.

11 When all of the storage shelves are operational, turn on the appliance if needed.

To turn on the appliance

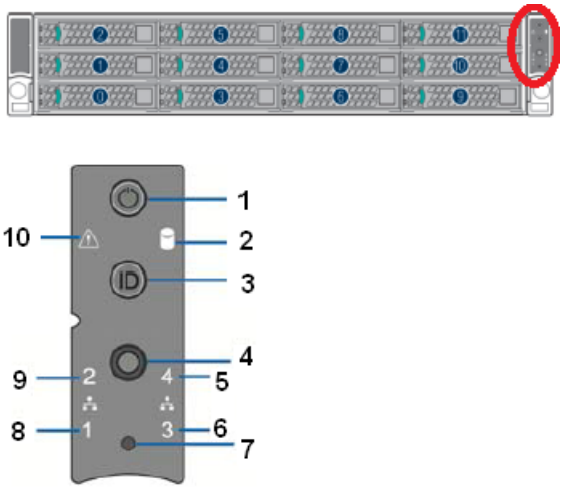
1. Connect both AC power connectors on the rear panel of the appliance to two main AC power supply outlets.
2. Turn on the appliance, using the power button which is located on the right side of the front panel.

3. Determine if the appliance is running properly.
   - Check the Status LED (1), and Activity (2) LED on the installed disk drives on the front panel.



     The Status LED (1) should not be lit. The following indications are possible:
     - A solid, amber, LED indicates a disk fault.
     - A blinking, amber, LED indicates that a RAID rebuild is in progress.

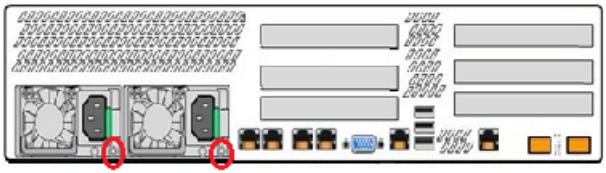
     The Activity LED (2) indicates the following:
     - The LED is not lit when the disk has spun down, although power is on.
     - The LED is solid green when there is no disk activity, although power is on.
     - The LED blinks green when the disk spins up.
     - The LED blinks green occasionally when commands are processed.
   - Review all LEDs on the front control panel.



Number	LED description
1	AC power button with integrated LED
2	Hard drive activity
3	ID button with integrated LED
4	Cold reset button (instantly restarts the appliance)
5	NIC4/eth3 activity
6	NIC3/eth2 activity
7	NMI button (This button triggers a non-maskable interrupt. All server data is lost.)
8	NIC1/eth0 activity
9	NIC2/eth1 activity

Number	LED description
10	Status

4 Check the power supply module LEDs on the rear panel. Each module has one LED.



Appendix C

Adding new disk space to the appliance configuration

This appendix includes the following topics:

Adding the disk space of additional storage shelves from the NetBackup Appliance Web Console

The following procedure describes how to add new storage shelf disk space to a NetBackup appliance using the NetBackup Appliance Web Console.

To add new storage shelf disk space to a NetBackup appliance using the NetBackup Appliance Web Console

1. Launch the NetBackup Appliance Web Console and verify that the new storage devices appear on the **Monitor > Hardware** page. If the new storage devices do not appear, check the cable connections and make sure that the power is on.
2. Click **Manage** > **Storage**.
3. Select the **Disks** tab.
4. Click the **Click here to scan for new disks** option.
5. In the **Do you want to scan for new disk?** dialog box, click **OK** to start the scan.

6 When the scan is complete, click **OK** to refresh the **Disk** tab.

In the **Disk** column, a new ID should appear for the new storage shelf units. The new entries should have the following attributes:

- **Type = Expansion**.
- **Status = New Available**

7 In the **Status** column, next to **New Available**, click **Add** to activate the storage in the RAID.

8 In the **Confirmation** dialog box, click **Yes** to start a scan.

When the process completes, the following message should appear:

Storage operation completed. Succeeded.

9 Click **OK** to refresh the system.

After the system refreshes, the **Disks** tab should show the following attributes for the new storage shelf units:

- **Type = Expansion**
- **Status = In Use**
- **Unallocated = *n* TB**
  Where *n* is the usable volume or disk space available in the new storage shelf.

Adding the disk space of additional storage shelves from the NetBackup Appliance Shell Menu

The following procedure describes how to add new storage shelf disk space to a NetBackup appliance using the NetBackup Appliance Shell Menu.

To add new storage shelf disk space to a NetBackup appliance using the NetBackup Appliance Shell Menu

1 Use PuTTY to start an SSH session to access the NetBackup Appliance Shell Menu.

Note: You can also connect a laptop, keyboard and monitor, or KVM to the appliance to access the NetBackup Appliance Shell Menu.

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2 Log on to the NetBackup Appliance Shell Menu. The **Main_Menu** prompt appears.

3 Go to the **Monitor** view as follows:

Type `Monitor` and press `Enter`.

4 Type **Hardware ShowHealth** and press **Enter**. Verify that the new storage devices appear. If the new storage devices do not appear, check the cable connections and make sure that the power is on.

5 At the prompt, type **return** to return to the **Main** menu.

6 Perform a scan as follows:

- At the **Main_Menu** prompt, enter `Manage` and press `Enter`.
- Enter `Storage` and press `Enter`.
- Enter `Scan` and press `Enter`.

The scan takes a couple of minutes to complete.

7 Navigate to the **Storage** view.

From the Storage menu, enter **Add** and press **Enter**. It displays the disks that are in a **New Available** state and can be added. Copy a disk ID that is displayed.

8 At the prompt, enter **add < *disk ID* >** and press **Enter**. < *disk ID* > is the disk ID that you copied. Repeat step 7 and 8 to add each disk ID that is displayed.

9 View the available storage space as follows:

- Navigate to the **Storage** menu.
- At the prompt, enter **Show Disk** and press **Enter**. The status of the newly added disks is displayed as **In Use** and space in the Unallocated column is the disk space available for the new disk.

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