

NetBackup Appliance Hardware Installation Guide

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NetBackup 5240

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VERITAS™

NetBackup™ 5240 Appliance Hardware Installation Guide

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Veritas Technologies LLC
500 E Middlefield Road
Mountain View, CA 94043

<http://www.veritas.com>

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Contents

Chapter 1	Hardware overview	7
	About the appliance and the storage shelves	7
	Appliance disk drives	8
	Appliance control panel	8
	Appliance rear panel	9
	Storage shelf disk drives	10
	Storage shelf control panel	11
	Storage shelf rear panel	12
	Cables	12
	About IPMI configuration	13
	Product documentation	14
Chapter 2	Preinstallation requirements	15
	Customer-provided environment and supplies	15
	Storage shelf shipping container contents	16
	Appliance shipping container contents	16
	Determining rack locations	17
	Best practices for rack installation	18
	Heat dissipation	19
	Determining SAS-3 cable length	19
	Prerequisites for IPMI configuration	20
Chapter 3	Installation procedures	23
	Installing the storage shelf rack rails	23
	Installing the storage shelf into a rack	25
	Installing the appliance rack rails	26
	Installing the appliance into a rack	31
	Understanding appliance and storage shelf connections	34
	Connecting a 4TB appliance to one storage shelf	37
	Connecting a 4TB appliance to more than one storage shelf	39
	Connecting the network cables	47
	Connecting the power cords	48
	Turning on the hardware and verifying operation	49
	Configuring the IPMI from the NetBackup Appliance Shell Menu	57

	Accessing and using the Veritas Remote Management interface	62
Appendix A	Adding one or more storage shelves to an operating 4TB appliance that does not have any storage shelves	67
	Overview	68
	Preparing the 4TB appliance	69
	Removing the appliance cover	70
	Installing the External Storage Kit components	71
	Reinstalling the appliance into the rack	85
	Storage shelf rack requirements	86
	Determining rack locations	86
	Installing the storage shelf rails	88
	Installing the storage shelf or shelves into a rack	90
	Understanding appliance and storage shelf connections	91
	Connecting one storage shelf to an appliance	95
	Connecting two storage shelves to an appliance	98
	Connecting three storage shelves to an appliance	101
	Connecting four storage shelves to an appliance	107
	Connecting the network cables	113
	Connecting the power cords	114
	Turning on the hardware and verifying operation	115
Appendix B	Adding storage shelves to an operating 4TB appliance that has at least one storage shelf attached	125
	Overview	125
	Additional storage shelf scenarios for a 4TB appliance	126
	Installing storage shelves	126
	Recabling	126
Appendix C	Adding the disk space of additional storage shelves	141
	Adding the disk space of additional storage shelves from the NetBackup Appliance Web Console	141
	Adding the disk space of additional storage shelves from the NetBackup Appliance Shell Menu	142
Index		145

Hardware overview

This chapter includes the following topics:

- About the appliance and the storage shelves
- Appliance disk drives
- Appliance control panel
- Appliance rear panel
- Storage shelf disk drives
- Storage shelf control panel
- Storage shelf rear panel
- Cables
- About IPMI configuration
- Product documentation

About the appliance and the storage shelves

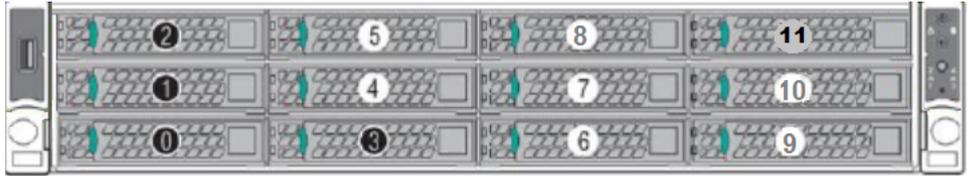
The NetBackup 5240 appliance and storage shelves provide storage capacity in several configurations. You can use the appliance by itself to achieve 4TB, 14TB, or 27TB of useable capacity. You can add storage shelves to a 4TB appliance to further increase the storage capacity.

Refer to the NetBackup 5240 Product Description at the following site for details.

NetBackup Appliance Documentation

Appliance disk drives

The front panel of the appliance contains 12 disk drives.



Slot designations are as follows. Do not rearrange the disk drives from the factory configuration.

Table 1-1 NetBackup 5240 Appliance disk drive slots

Slot	RAID configuration	Disk drive size	Appliance storage capacity	Disk drive role
0, 1	RAID 1	1TB	N/A	Boot/swap
2, 3	RAID 1	1TB	N/A	Log files
4 - 10	RAID 6	1TB, 3TB, 6TB	4TB, 14TB, 27TB	User storage data
11	RAID 6	1TB, 3TB, 6TB	N/A	Hot spare

Appliance control panel

The front panel of the NetBackup 5240 Appliance includes a small panel that is attached to the right side of the device.

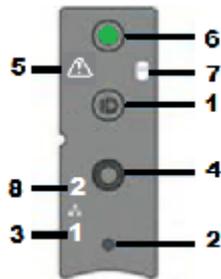
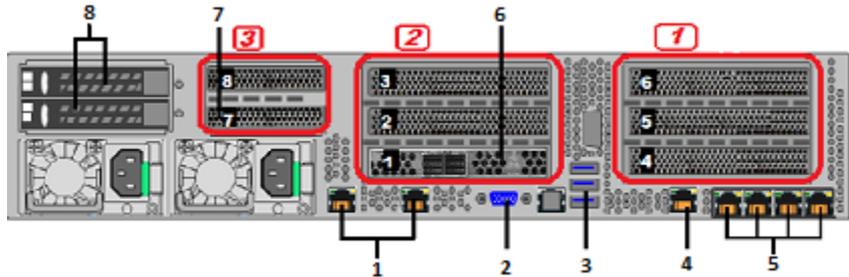


Table 1-2 Appliance control panel

Number	Component	Description
1	System ID with integrated LED	The system ID LED identifies the system for maintenance.
2	NMI button (recessed, a tool is required for use)	When the NMI button is depressed, the appliance goes into a halt state, and issues a non-maskable interrupt (NMI). This feature is useful when you perform diagnostics for a given issue where a memory dump is necessary to help determine the cause of the problem. To prevent an inadvertent system halt, the NMI button is located behind the front control panel faceplate. It is only accessible with the use of a small tipped tool, such
3	NIC-1 Activity LED	NIC-1 represents the network interface controller 1. When network links are detected on the controllers, the LEDs are activated and remain on. The LEDs blink when network activity occurs. The amount of network activity determines the rate of blinking.
4	System Cold Reset Button (recessed, a tool is required for use on non-storage models)	The System Cold Reset button restarts and re-initializes the appliance.
5	System Status LED	The System Status LED uses the colors green and amber to display the health of the appliance.
6	Power/Sleep button with integrated LED	The Power/Sleep button turns off the appliance or turns on the appliance.
7	Hard drive Activity LED	The drive activity LED indicates drive activity from the on-board hard disk controllers.
8	NIC-2 Activity LED	NIC-2 represents the network interface controller 2. When network links are detected on the controllers, the LEDs are activated and remain on. The LEDs blink when network activity occurs. The amount of network activity determines the rate of blinking.

Appliance rear panel

The rear panel of the appliance contains several default ports that are embedded. Three PCIe riser assemblies support various configurations.



The three PCIe riser assemblies outlined red are numbered, 1, 2, and 3 from right to left. Slots 1 through 8 are shown in the risers.

The following list describes the numbered ports.

1. Two copper, RJ45, 10Gb Ethernet* ports; NIC5/eth4 and NIC 6/eth5, left to right
2. VGA port
3. 3 USB ports
4. IPMI, remote management, port
5. Four copper, RJ45, 1Gb Ethernet* ports, NIC1/eth0, NIC2/eth1, NIC3/eth2, and NIC4/eth3, left to right
6. Riser Assembly 2, Slot 1, reserved for the RAID PCIe card that is required with one or more storage shelves
7. Riser Assembly 3, Slot 7, reserved for the SAS RAID HBA card that provides RAID1 support for the appliance storage disk drives
8. Two slots that are not used at this time

Note: * The embedded Ethernet ports are copper. PCIe Ethernet ports are fibre. You cannot bond the copper ports and the fibre ports to each other.

Refer to the *Veritas NetBackup 5240 Appliance Product Description* at the NetBackup Appliance Documentation page for optional port configurations.

Storage shelf disk drives

The NetBackup 5240 Storage Shelf is a 2U enclosure that contains 12 disk drives.



Disk drive carriers in the storage shelf are locked by default. If you need to replace a locked disk drive use a screwdriver with a T10 bit to unlock each carrier.



The lock is located on the left side of each carrier.

Storage shelf control panel

The left, front, of the storage shelf contains the system control panel.



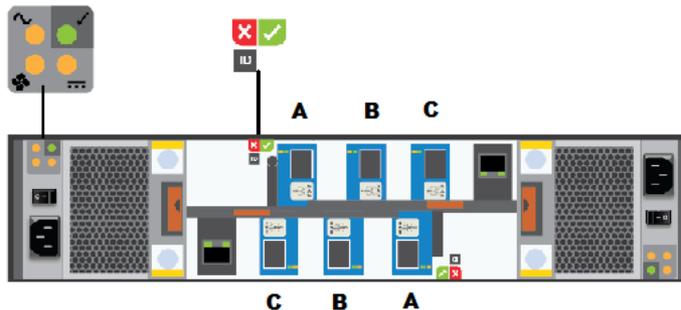
Components of the control panel include the following.

1. The Input switch enables you to set the Unit Identification display.
2. The Power On/Standby LED is amber when only standby power is available. The LED is green when system power is available.

3. The Module Fault LED is on when there is a system hardware fault. A Power Cooling Module (PCM) or an I/O module may be at fault.
4. The Logical Status LED shows a change of status or a fault, typically associated with the shelf's disk drives. This LED also indicates an issue with an internal RAID controller or external RAID controller, or with a host bus adapter.
5. The Unit Identification Display provides information to assist in the configuration of multiple storage shelves.

Storage shelf rear panel

The rear panel of the storage shelf contains two main components; two Power Cooling Modules (PCMs) and two I/O Module canisters.



The PCMs, located on the left and the right sides of the storage shelf, contain fans. The I/O module canisters are located in the center of the rear panel, one above the other. Each I/O module contains three SAS-3 ports; A, B, and C. The SAS ports connect the I/O modules to the appliance and to other storage shelves. Note that the port labels are reversed on the bottom canister. Port C is not used at this time. The PCMs and the I/O modules include LEDs.

Cables

Two power cables are shipped with each appliance and each storage shelf. 1m SAS-3 cables are shipped with each storage shelf. The one-meter cables are sufficient when the recommended cabling scheme is followed. 3m SAS-3 cables are available separately in case of need.



Use the top down, bottom up method to connect storage shelves to the appliance. The general scheme follows.

- The appliance is connected to the first storage shelf with one SAS-3 cable.
- One cable connects the first storage shelf to the next shelf.
- Subsequent storage shelves are connected until the last storage shelf is connected.
- The last storage shelf is connected to the appliance with one cable.
- The last storage shelf is also connected to the next, highest, storage shelf.
- The storage shelves are connected until the shelf closest to the appliance is connected.

About IPMI configuration

The Intelligent Platform Management Interface (or IPMI) provides management and monitoring capabilities independently of the host system's CPU, firmware, and operating system. You can configure the IPMI sub-system for your appliances. You can use the remote management port, located on the rear panel of the appliance, to connect to the IPMI sub-system.

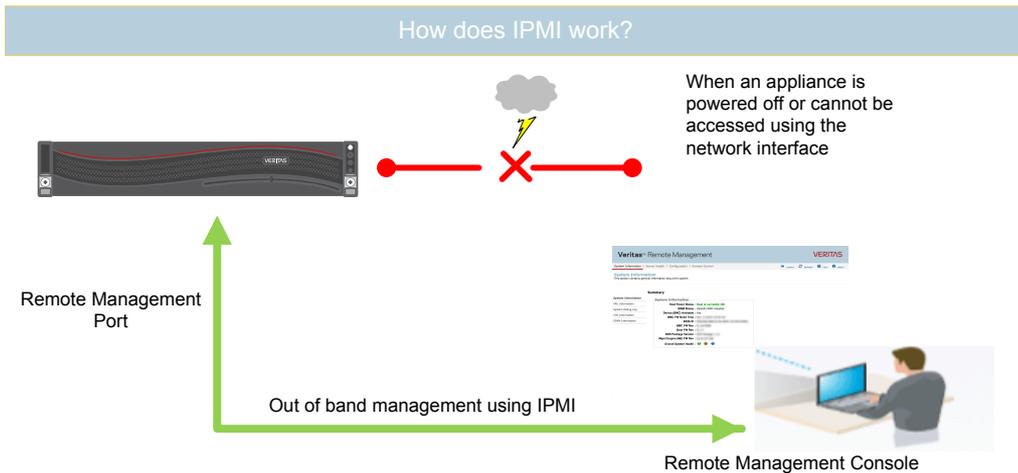
The following figure shows the remote management port (or the IPMI port) on the rear panel of a NetBackup 5240 appliance:



The IPMI is beneficial after an unexpected power outage shuts down the connected system. In case the appliance is not accessible after the power is restored, you can use a laptop or desktop computer to access the appliance remotely by using a network connection to the hardware rather than to an operating system or login

shell. This enables you to control and monitor the appliance even if it is powered down, unresponsive, or without any operating system.

The following diagram illustrates how IPMI works:



Some of the main uses of IPMI are the following:

- Manage an appliance that is powered off or unresponsive. Using the IPMI, you can power on, power off, or restart the appliance from a remote location.
- Provides out-of-band management and help manage situations where local physical access to the appliance is not possible or preferred like branch offices and remote data center.
- In case the appliance is not accessible using regular network interfaces, you can access the NetBackup Appliance Shell Menu remotely using IPMI.
- Reimage the appliance from the IPMI interface by using ISO redirection.
- Monitor hardware health of the appliance from a remote location.
- Avoid messy cabling and hardware like keyboard, monitor, and mouse (KVM) solutions.

Product documentation

Additional documentation is available at the following site.

[NetBackup Appliance Documentation page](#)

Preinstallation requirements

This chapter includes the following topics:

- Customer-provided environment and supplies
- Storage shelf shipping container contents
- Appliance shipping container contents
- Determining rack locations
- Best practices for rack installation
- Heat dissipation
- Determining SAS-3 cable length
- Prerequisites for IPMI configuration

Customer-provided environment and supplies

For best ventilation, the rack cabinet:

- Should be at least 100 cm (4 feet) from walls
- Should have at least 100 cm (4 feet) from other cabinets on the front and back of the appliance and the storage shelves

Data centers with two foot spaces in the front and in the back of the appliances are acceptable with proper cooling and ventilation.

Refer to the following section for more details.

Heat dissipation

The following describes the necessary personnel and equipment that are needed at the installation site:

- At least one person or a mechanical lift to move the appliance and the storage shelves.
- Ethernet and Fibre Channel (FC) cables to connect the appliance to your corporate network.
- A USB-keyboard and a monitor to connect to the appliance.
- A 19-inch rack with dual Power Distribution Units (PDUs) with 120VAC or 220VAC power supplies.

Storage shelf shipping container contents

The appliance and each storage shelf are shipped in separate containers. Each container includes other boxes and contents. The disk drives are installed into the appliance and the storage shelf at the factory.

The following items ship within the storage shelf box.

- Open Me First box, containing
 - Installation flip cards
 - Deployment plan that provides basic information and links to detailed information
 - Rack mounting template
- Installation poster
- Cabling poster
- Rack rails
- Two SAS-3 cables
- Two power cords
- Bezel

Appliance shipping container contents

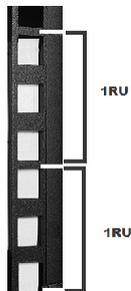
The appliance and each storage shelf are shipped in separate containers. Each container includes other boxes and contents. The disk drives are installed into the appliance and the storage shelf at the factory.

The following items ship within the appliance box.

- Open Me First box, containing:
 - Installation flip cards
 - Deployment plan that provides basic information, and links to detailed information
 - Rack mounting templates
 - Screwdriver and cable straps
- Installation poster
- Cabling poster
- Envelope containing the following:
 - USB drive(s) with factory reset files
 - Warranty and license information
- Accessory box containing rack rails
- Two power cables
- Bezel

Determining rack locations

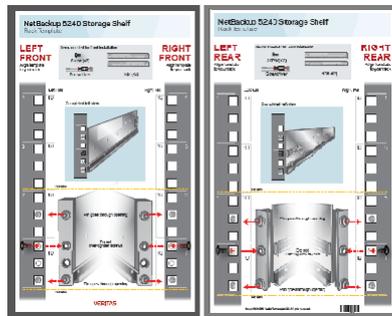
The appliance and the storage shelves are both two rack units (2RU) high. To help you identify RU spacing, many rack manufacturers typically use a system of lines and sequential numbers starting at the bottom of the rack. The front and the rear of the rack are marked the same to ensure that the rails are installed straight and level. One RU has three holes. The holes for one RU are typically marked with a line below the bottom hole and another line above the top hole.



Use the rack templates to determine the mounting locations for all devices.

To determine rack locations for the hardware

- 1 Determine the total number of rack units (RUs) that you need as follows:
 - The appliance and the storage shelves each require 2RUs of height in the rack.
 - An appliance and four storage shelves require a total of ten RUs.
- 2 Use the rack templates that are provided with the hardware to determine RU locations. The appliance and the storage shelf templates show the front and rear of each device in a rack.



- 3 Record the rack positions to help you locate them easily when mounting the hardware.

Best practices for rack installation

Prepare for the hardware installation by following these recommendations.

- The storage shelves are heavier than the appliance and should be installed as close to the bottom of the rack as possible.
- Determine device order and cabling limits.
- Be aware of the depth of the guide rails and the devices. Ensure that the distance between cabinet posts accommodates the rails, devices, cables, and extending ears.
- Physically hold a SAS cable between the intended locations for the appliance and the last storage shelf. Visually confirm that the cable is long enough.

Heat dissipation

Air flows from the front of each unit and exits from the rear of each unit. You can install the optional bezel without disruption to the airflow.

For best ventilation, the rack cabinet should:

- Be at least 100 cm (4 feet) from walls.
- Be at least 100 cm (4 feet) from other cabinets on the front and back of the appliance and the storage shelves.

Note: Data centers with two-foot spaces in the front and in the back of the appliances are acceptable with proper cooling and ventilation.

Veritas provides the following requirements to ensure sufficient cooling.

- Veritas requires that you install the system in a National Engineering Manufacturer's Association (NEMA)-certified or equivalent rack.
- A minimum of 3 inches (7.6 cm) of space must be between the front of an appliance and the cabinet door or other air block.
- A minimum of 6 inches (15.2 cm) of space must be between the rear of an appliance and the cabinet rear or other air block.
- A minimum of 1 inch (2.5 cm) of space must be between the front of a storage shelf and the cabinet door or other air block.
- A minimum of 2 inches (5.0 cm) of space must be between the rear of a storage shelf and the cabinet rear or other air block.
- Veritas strongly recommends that customers insure the appliance and the storage shelves have sufficient cooling, especially when installed in a fully enclosed rack.

Refer to the NetBackup 5240 Appliance Product Description for specifications about temperature and cooling.

NetBackup Appliance documentation

Determining SAS-3 cable length

Before you install and connect the hardware, be sure to verify that you have the correct length of the SAS-3 cables for your setup.

Each rack unit (RU) is 44.50 mm (1.752 inches) in height. The NetBackup 5240 Appliance and the NetBackup 5240 Storage Shelf are both 2RU high.

Each SAS-3 cable is 1 meter (3.28 feet) long. The 1-meter cable is long enough to connect an appliance to the fourth storage shelf when the recommended configuration is used. A 3 meter (9.84 feet) SAS-3 cable is available separately in case your rack arrangement requires more length. Contact Veritas Technical Support, if needed.

Prerequisites for IPMI configuration

Verify the following configuration prerequisites:

- 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.

Installation procedures

This chapter includes the following topics:

- Installing the storage shelf rack rails
- Installing the storage shelf into a rack
- Installing the appliance rack rails
- Installing the appliance into a rack
- Understanding appliance and storage shelf connections
- Connecting a 4TB appliance to one storage shelf
- Connecting a 4TB appliance to more than one storage shelf
- Connecting the network cables
- Connecting the power cords
- Turning on the hardware and verifying operation
- Configuring the IPMI from the NetBackup Appliance Shell Menu
- Accessing and using the Veritas Remote Management interface

Installing the storage shelf rack rails

Best practices recommend that the storage shelves are installed lower in the rack than the appliance.

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

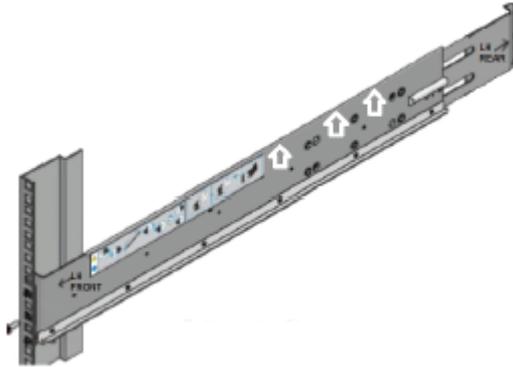
- 1 Identify the front and the rear of each rail. The following illustration shows the front of the left-hand and the right-hand rails. Red arrows show the pins that fit into the rack.



- 2 Use the rack templates to align the rails with the rack holes. Be sure to use the same holes on each side of the rack. Fold the template at the dotted yellow lines to get accurate rail and rack matching.



- 3 Place the left rail inside the rack. The rail holes should match the template. Extend the rail front and back to fit into the rack.



- 4 Insert the screw in the front and in the back of the rail, as shown in the template. Do not over-tighten the screws.
- 5 Repeat for the right rail.

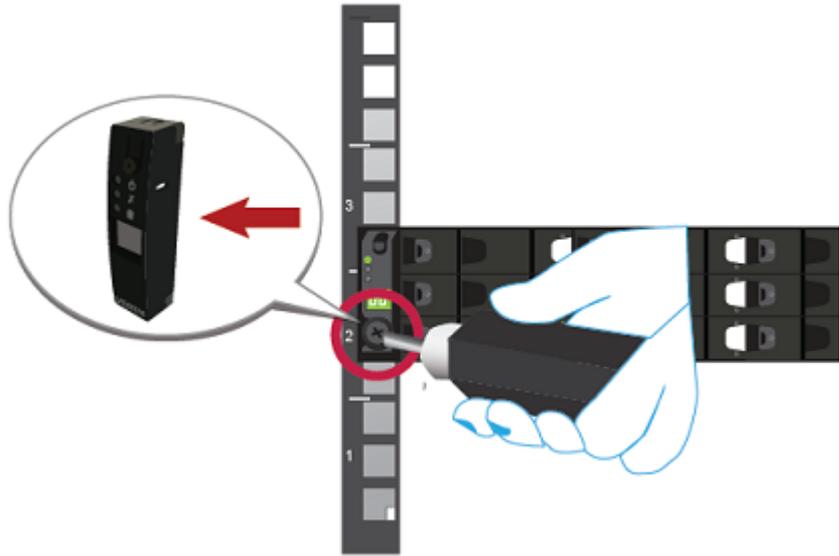
Installing the storage shelf into a rack

The storage shelf should be installed from the front of the rack.

To install a storage shelf

- 1 Use two people to lift the storage shelf.
- 2 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.
- 3 Carefully push the shelf towards the rear of the rails.

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



- 5 Insert one screw into the front of the rack, on both sides of the shelf.
- 6 Replace the end caps or attach the bezel to the front of the shelf.

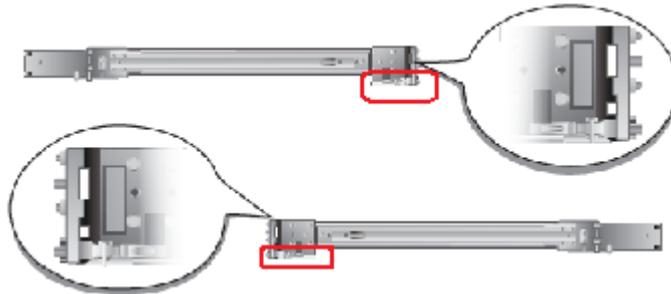
Installing the appliance rack rails

The NetBackup 5240 Appliance requires two RUs of space. Veritas recommends that you install the appliance in the space that is directly above the storage shelves.

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 appliance into the mounted rails.

To install the appliance 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. The front of the left rail is labeled A. The front of the right rail is labeled B. The labeled sides face the rack wall when the rails are installed.



The small metal extensions that are outlined in the illustration must point down, towards the floor of the rack.

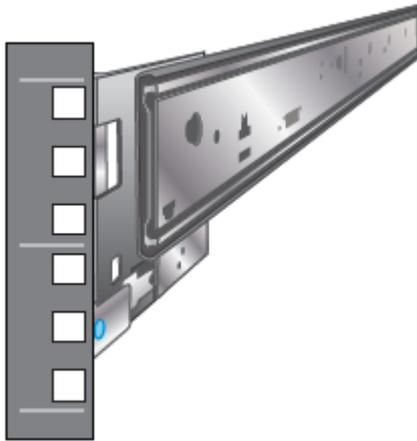
Note: The information in this document supersedes any of the information in the printed installation materials.

- 2 Use the rack templates to align the rails with the rack holes.
Fold the template along the yellow dotted lines to create an exact, physical match to the rack.

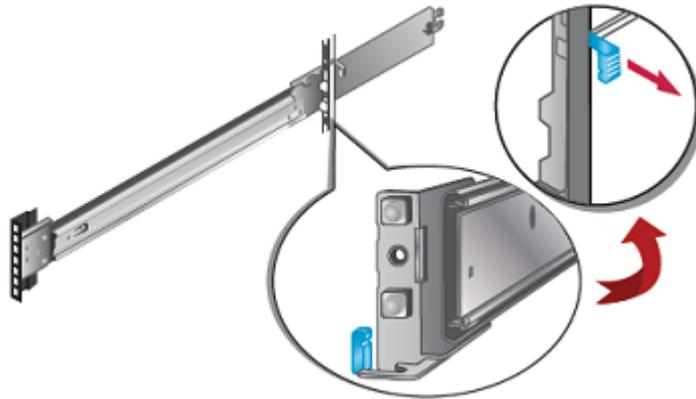


Be sure to use the same holes on each side of the rack.

- 3** Place one rail inside the rack.
 - The rack holes and the rail pins should match the template.
 - Use the same 1RU space and holes in the front and the rear of the rack.
 - Align the pins in the top holes and the bottom holes of the top RU.
 - Move the rail front and back to fit into the rack.
 - Slide the rail forward until the pins click into the rack holes.



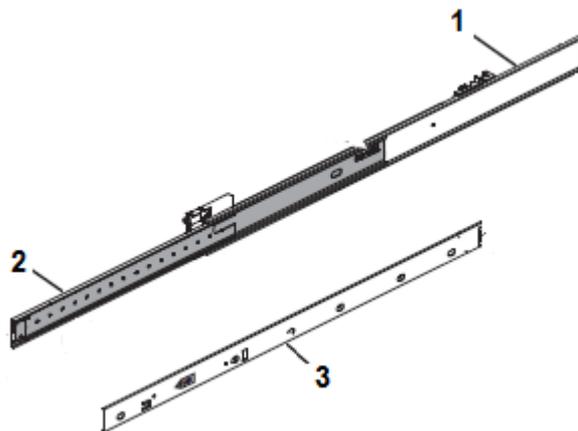
- 4** Secure the rear of the rail.
 - Push the blue lock toward the rack wall and toward the back of the rail.
 - The lock must be behind the rack post.
 - Ensure that the lock clicks into place.



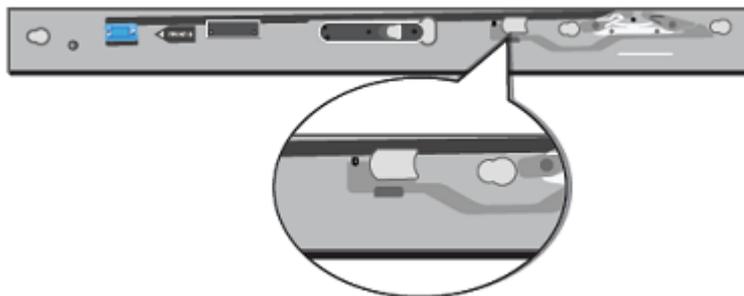
- 5** Insert a washer and a screw into the middle hole of the top RU in the rear of the rack.



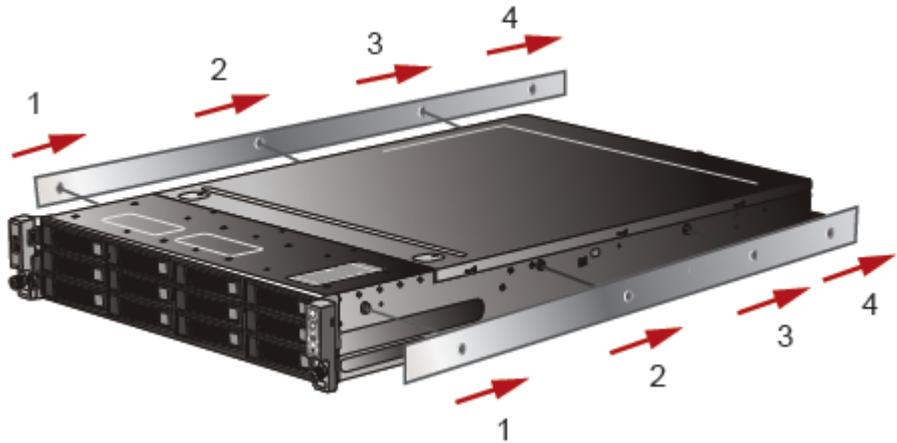
- 6** Repeat steps 3 through 5 for the other rail.
- 7** Identify the three different rails in each rail assembly.
- Components in this illustration are as follows.
- 1 - Outer rail
 - 2 - Intermediate rail
 - 3 - Inner rail



- 8** Pull the white tab forward to release the inner rail from the outer and the intermediate rail.



- 9 Separate the inner rail from the other rail components in the rack.
- 10 Attach the inner rail to the left and the right sides of the appliance at the four attachment locations.



The rails click into place when properly installed.

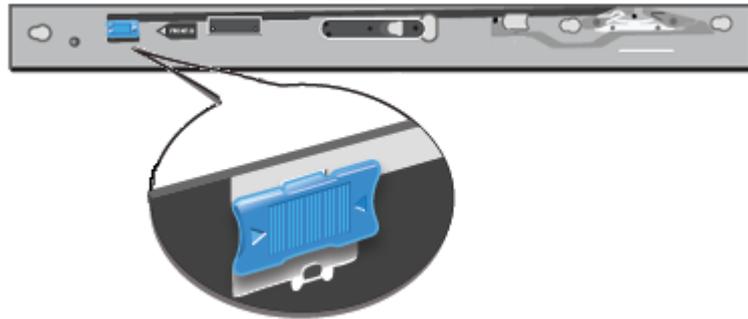
Installing the appliance into a rack

After the storage shelves and the appliance rails have been installed, you can install the appliance into the rack.

To install the appliance into the rack

- 1 Verify that the rails are securely attached.
 - Verify that the outer rail is securely attached to the rack.
 - Pull the intermediate rail forward. Ensure that the ball bearing retainer is locked forward.
 - Verify that the inner rail is securely attached to the appliance.
- 2 Place the appliance in the front of the rack.

- 3 Slide the blue tab forward to unlock the intermediate rail.

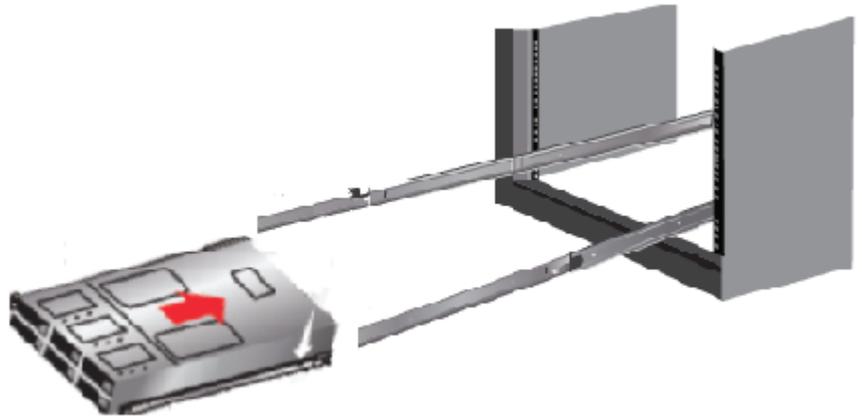


- 4 Pull the intermediate portion of rail the rail forward. Ensure that the ball bearing retainer on the intermediate rail is locked forward.

Note: You do not need to extend the rails as far as they can possibly extend. You only need sufficient space to place the appliance into the rails.



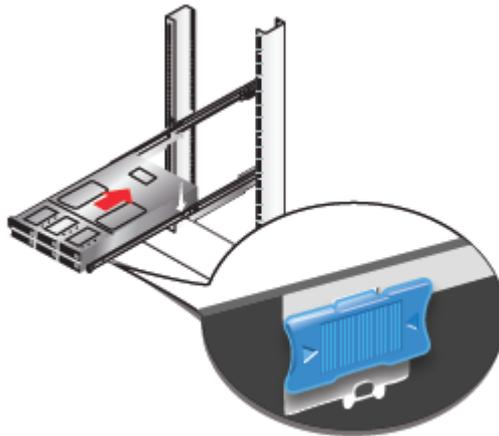
- 5 Align the appliance inner rail to the intermediate rail in the rack. Slide the appliance forward into the rack.



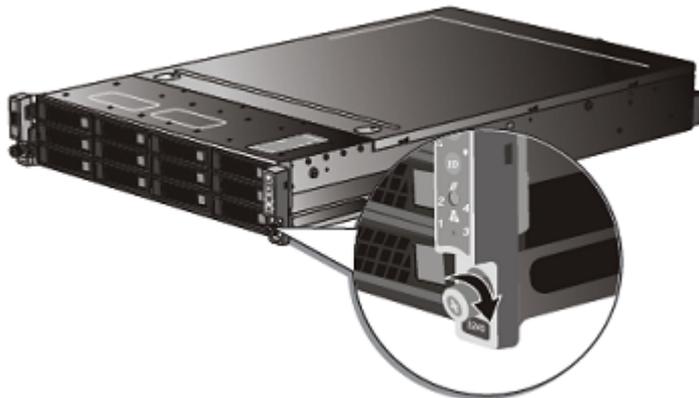
The rail has a lock mechanism that prevents the appliance from being fully pushed into the rack.

Understanding appliance and storage shelf connections

- 6 Slide the blue tab to unlock the rails and continue the sliding of the appliance into rack.



- 7 Secure the captive screws on the appliance ears.



Understanding appliance and storage shelf connections

You cannot use SAS-2 cables with the storage shelf. You must use the SAS-3 cables that are provided with each storage shelf.

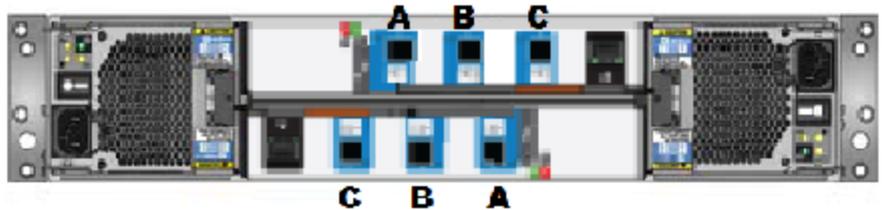


Note: The cables in the illustrations in the following sections are shown in different colors for demonstration purposes only. The actual cables are black.

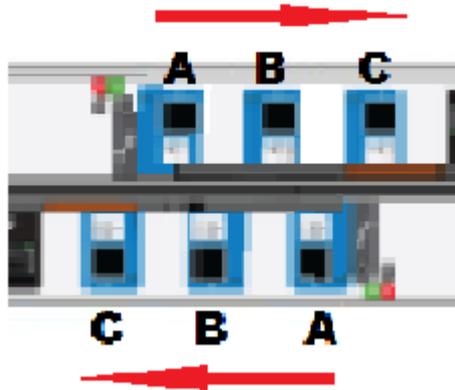
The External RAID PCIe ports on the rear panel of the appliance are in Slot 1 of Riser 2.



There are two I/O module canisters in the middle of the rear panel of the storage shelf. Each I/O module includes three SAS-3 ports.



The SAS-3 ports on the top I/O module canister are labeled A, B, and C from left to right.

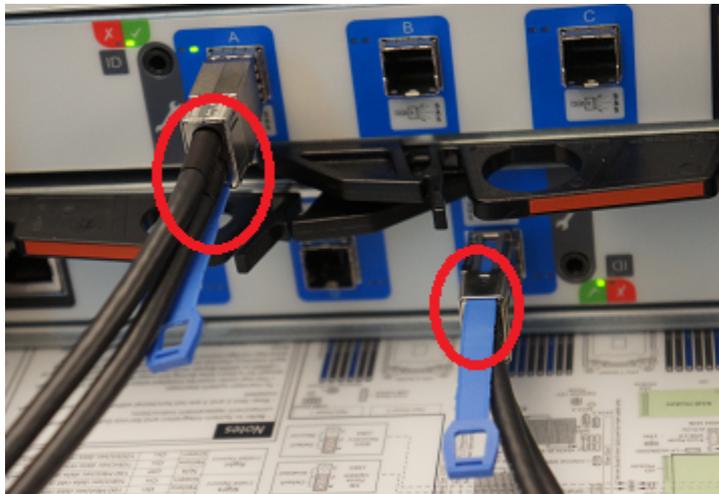


The SAS-3 ports on the bottom I/O module canister are labeled in reverse order; C, B, and A from left to right.

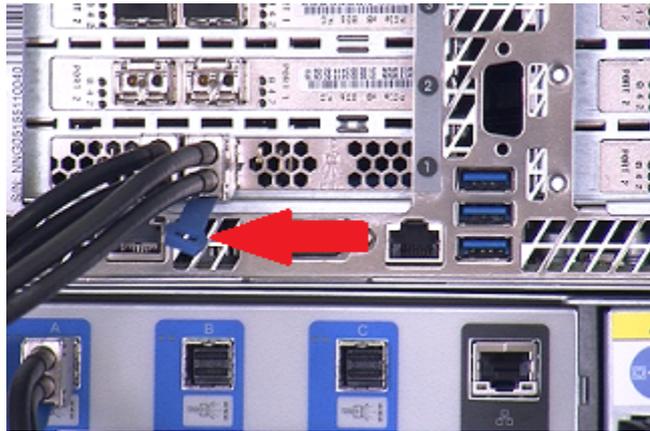
The orientation of the blue clip that is attached to the SAS-3 cable connector is very important.

Storage shelf orientation is as follows.

- The blue clip in the connector in the top I/O module of each shelf must point down.
- The blue clip in the connector in the bottom I/O module of each shelf must point up.



In the appliance the blue clips must point down.



The steps in the following sections assume that the appliance and one or more storage shelves are shipped together and installed at the same time.

Refer to the following sections as needed.

See “Connecting a 4TB appliance to one storage shelf” on page 37.

See “Connecting a 4TB appliance to more than one storage shelf” on page 39.

Connecting a 4TB appliance to one storage shelf

The steps in this section assume that the 4TB appliance and the storage shelf are shipped together and installed at the same time.

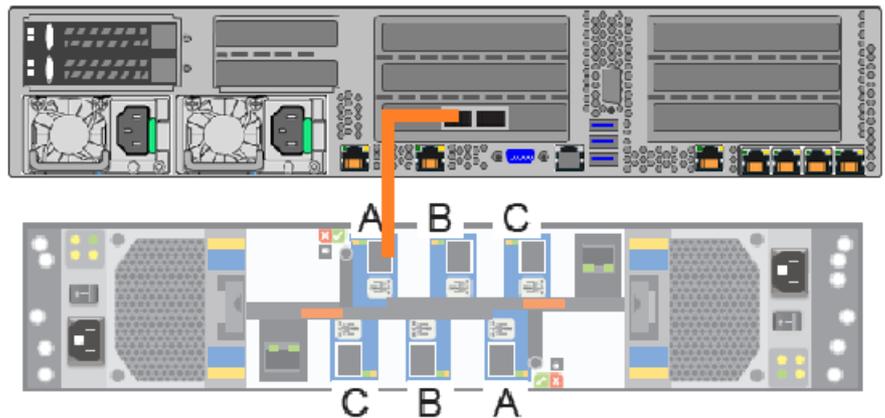
To connect a 4TB appliance to one storage shelf

- 1 Connect one end of the SAS-3 cable to the left-hand port in the External RAID PCIe card on the appliance.

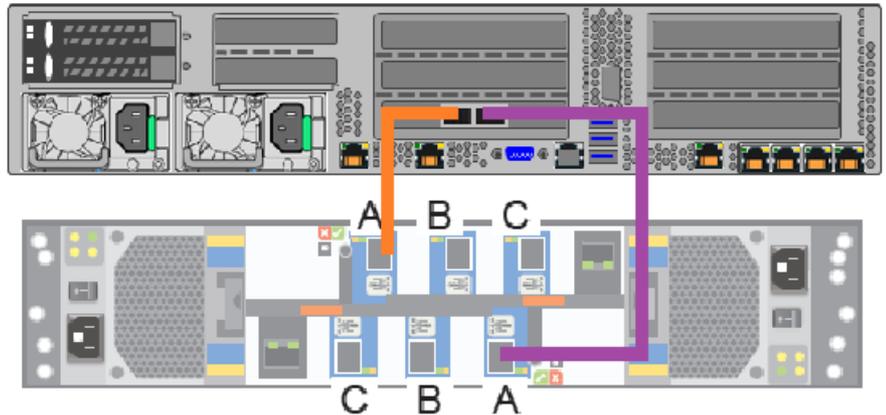


Note: Cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

- 2 Connect the other end of the cable to port A in the top canister of the storage shelf.



- 3 Connect one end of the other SAS cable to port A in the bottom canister of the storage shelf.
- 4 Connect the other end of this cable to the right-hand port in the External RAID PCIe card on the appliance.



See “Connecting the network cables” on page 47.

See “Connecting the power cords” on page 48.

Connecting a 4TB appliance to more than one storage shelf

The steps in this section assume that the 4TB appliance and the storage shelves are shipped together and installed at the same time.

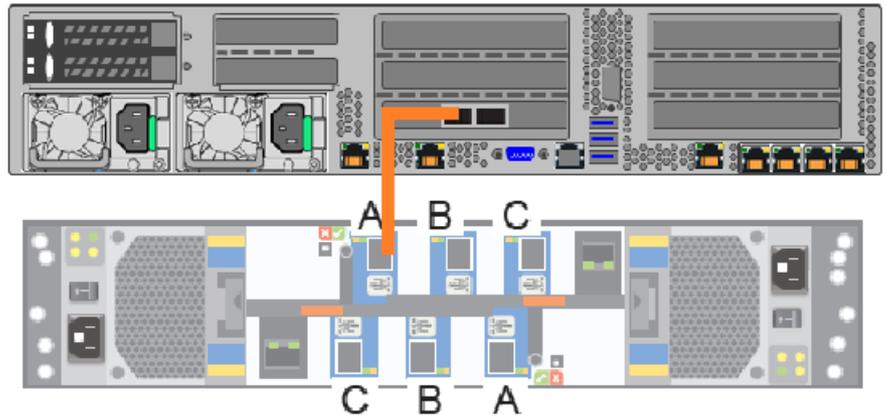
You can add one or more storage shelves to an operational 4TB appliance. Refer to one of the following Appendices for instructions.

- Appendix A - Adding one or more storage shelves to an operating 4TB appliance that does not have any storage shelves
 Overview
- Appendix B - Adding storage shelves to an operating 4TB appliance that has at least one storage shelf attached
 Overview

Connecting a 4TB appliance to more than one storage shelf

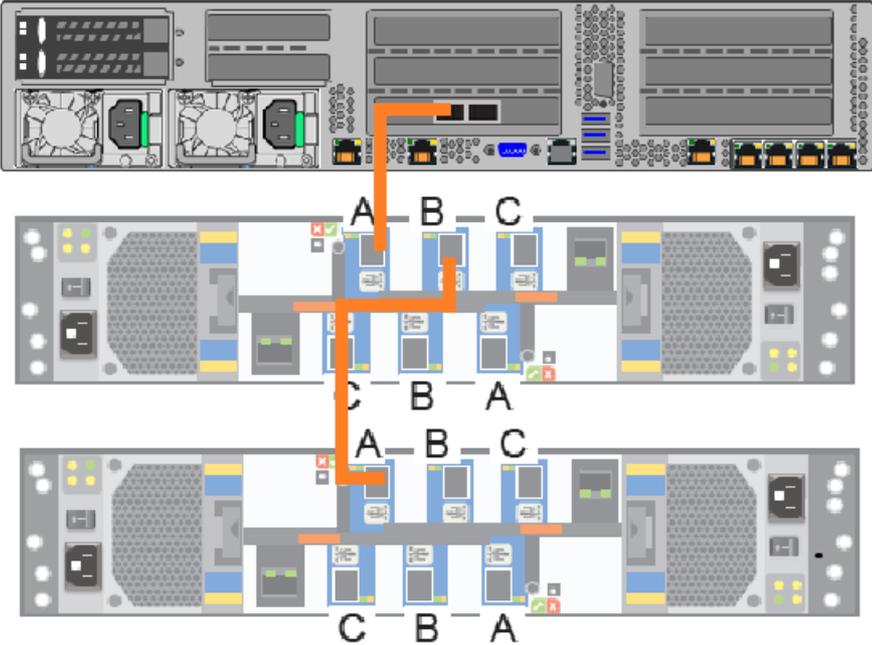
To connect the 4TB appliance to storage shelves

- 1 Connect the appliance external RAID controller left port to port A on the top canister of the storage shelf.

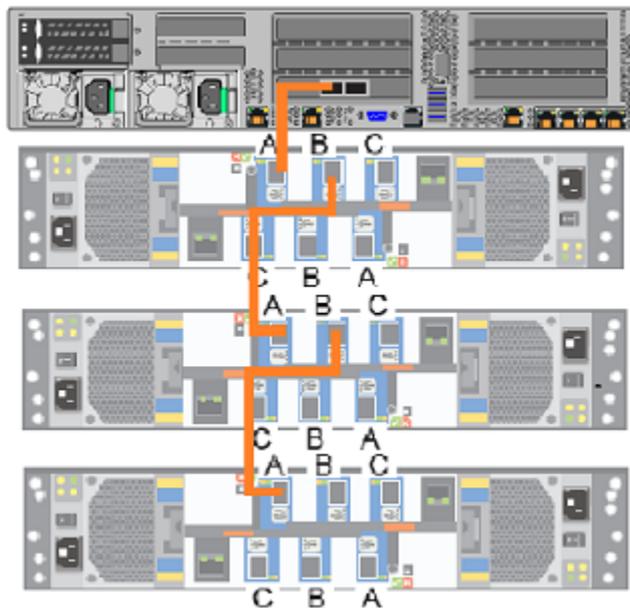


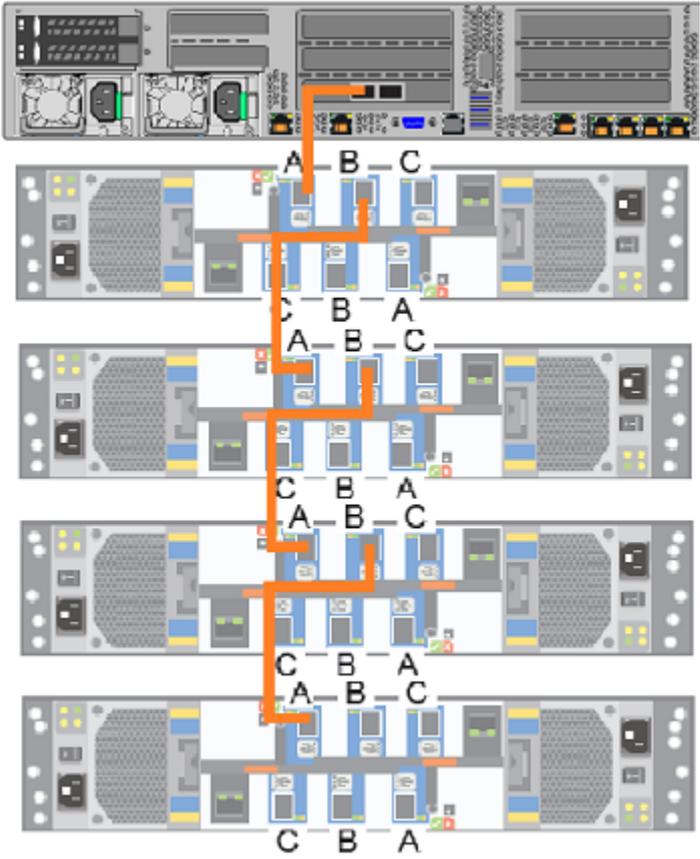
- 2 Connect each storage shelf top canister port B to next storage shelf top canister port A.

Follow the diagrams until all storage shelf top canisters are connected.



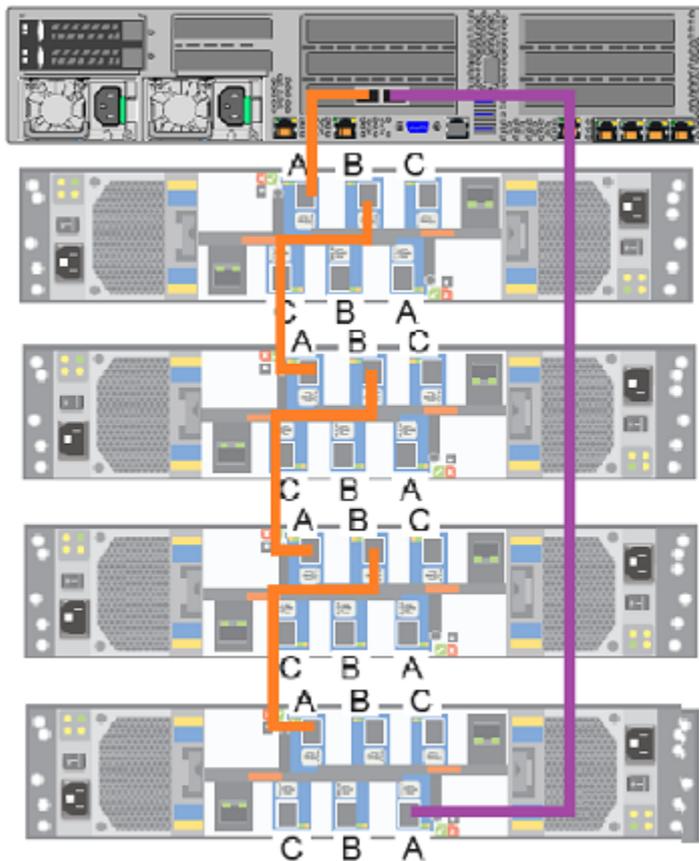
Connecting a 4TB appliance to more than one storage shelf



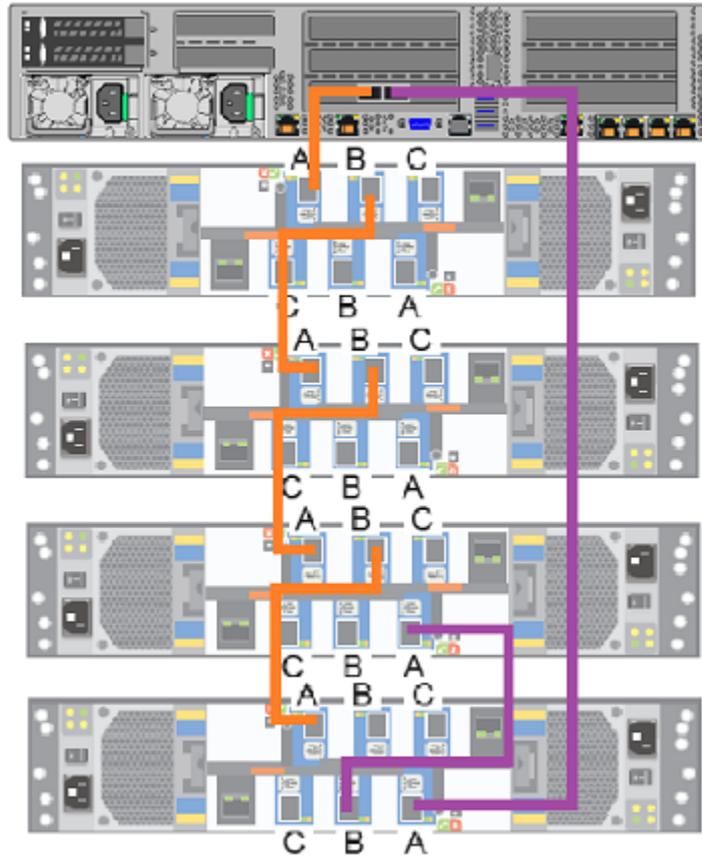


Connecting a 4TB appliance to more than one storage shelf

- 3 Connect the appliance external RAID card right port to the last storage shelf bottom canister port A.



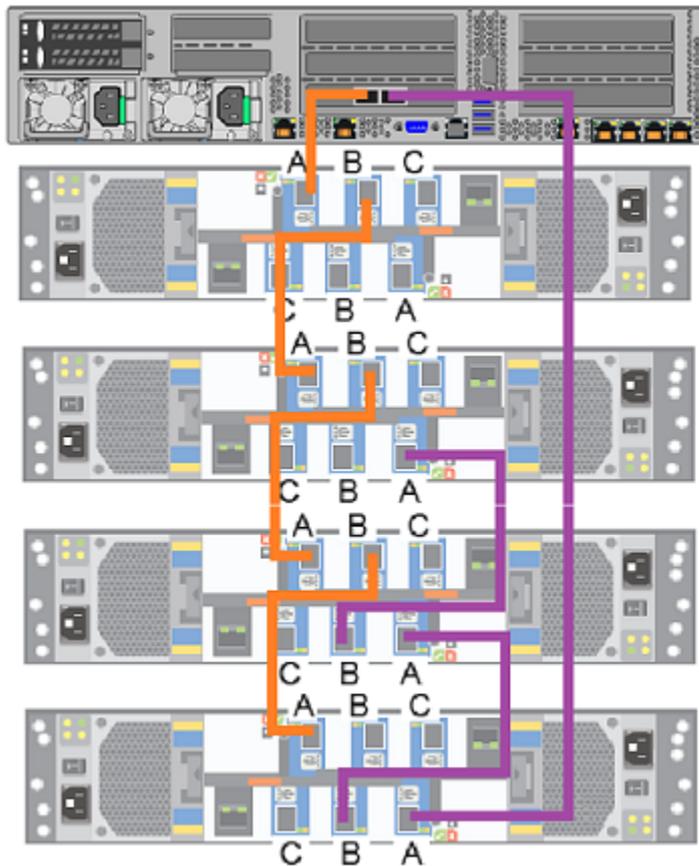
- Starting with the last storage shelf, connect the storage shelf bottom canister port B to the next storage shelf bottom canister port A.



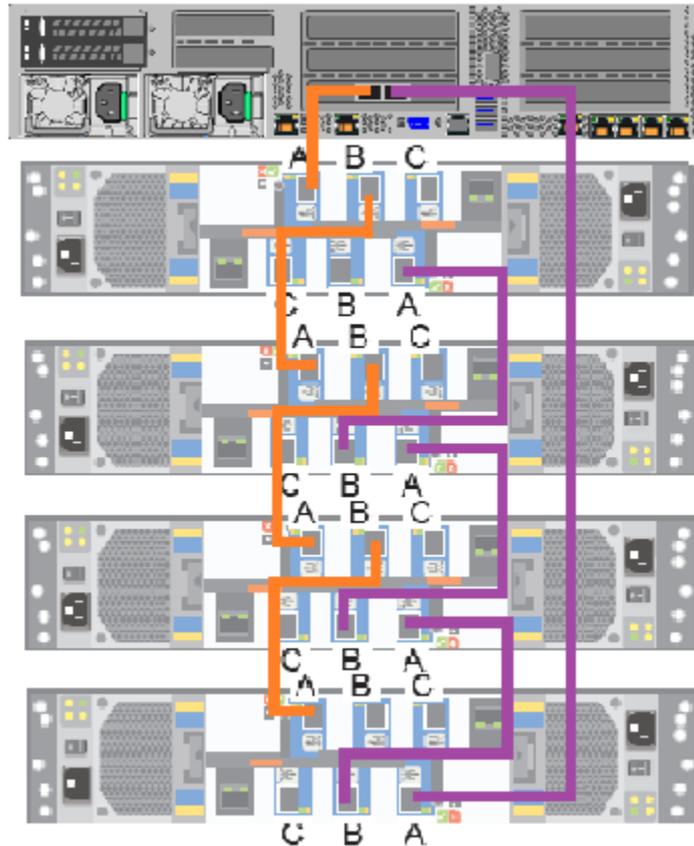
- Connect another cable to the shelf that is second from the bottom. Use port B on the lower canister of that shelf.

Connecting a 4TB appliance to more than one storage shelf

- 6 Connect the other end of the cable to the shelf that is third from the bottom. Use port A on the lower canister of that shelf.



- 7 Continue until the all storage shelf bottom canisters are connected.



See “Connecting the network cables” on page 47.

See “Connecting the power cords” on page 48.

Connecting the network cables

The networking ports are accessed on the rear panel of the device. The remote management port is for use by Veritas Technical Support staff or by approved field service technicians. The following picture shows the layout of the network ports. It includes the four 1 Gb Ethernet ports on the right and the two 10 Gb Ethernet ports on the left. The remote management (IPMI) port is located to the left of the 1 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. NIC1 (eth0) is typically not connected to your network environment.

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

Note: You cannot bond the copper 1 GbE or the 10-GbE ports that are installed in the appliance chassis with fibre ports on PCIe 10-GbE cards.

See “Connecting the power cords” on page 48.

Connecting the power cords

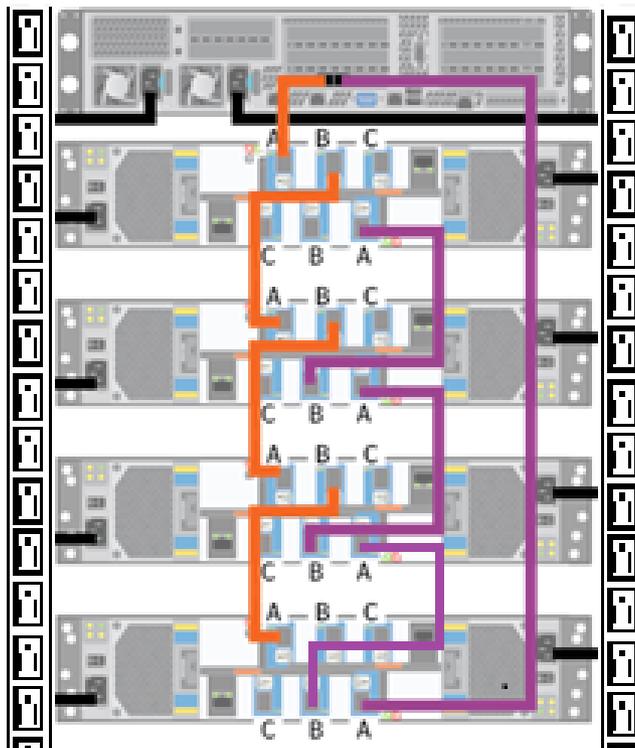
Each appliance and each storage shelf contain two AC power supplies. To ensure power redundancy, connect the power supplies on each component to separate AC power sources.

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 device, obtain two power cords that are appropriate for your region and equipment.

- 3 Connect one cable to one PDU strip.
- 4 Connect the other cable to the other PDU strip.



See “Turning on the hardware and verifying operation” on page 49.

Turning on the hardware and verifying operation

The appliance and the storage shelves must be turned on in a specified order. If the hardware is not turned on correctly the appliance RAID controller may not recognize some storage units.

Turning on the hardware and verifying operation

To turn on the 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.



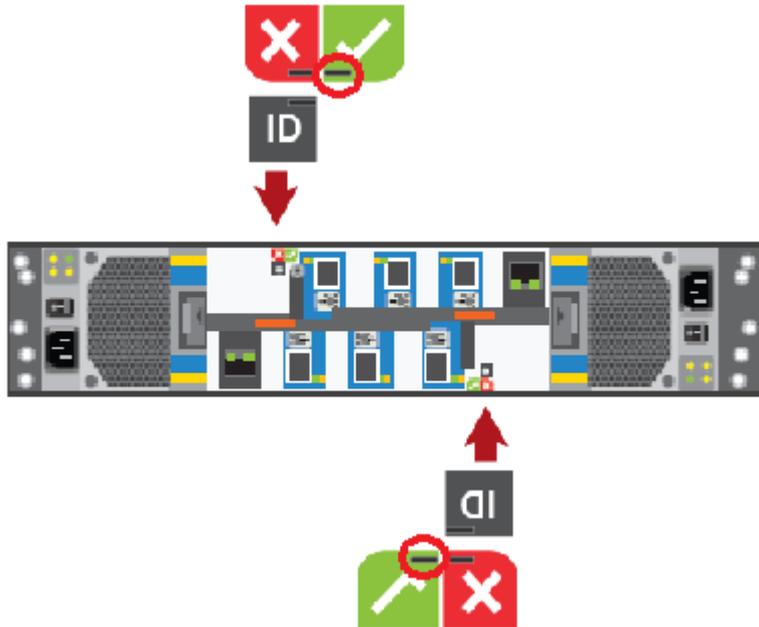
3 Verify that the power LED on each power module is green.



The LED icons are explained in the following table.

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

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

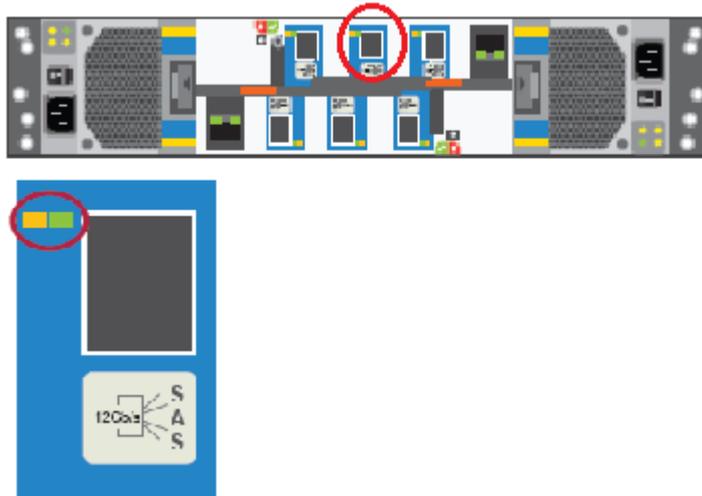


The LED in the red area with the white X-mark indicates an I/O module canister fault when the LED is amber.

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.

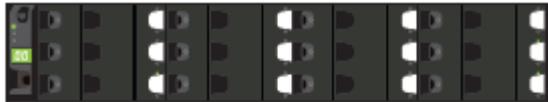
The following table describes the SAS port LEDs. Note that the combination of both LEDs provides the status.

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.

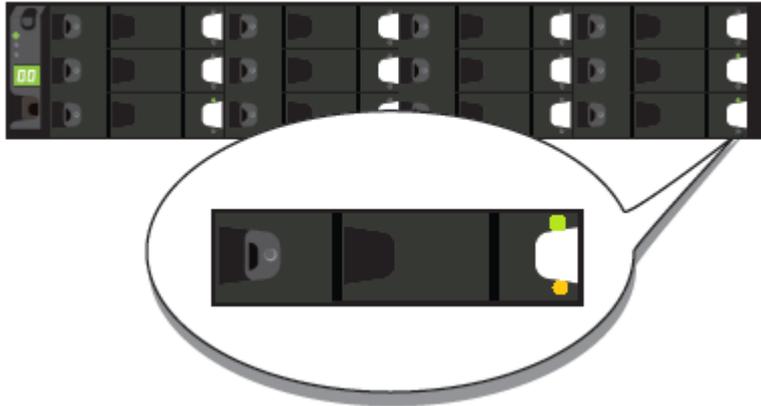
Turning on the hardware and verifying operation

- 7 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 ID readout is 00. You are not required to change this number.

- 8** Check the LEDs on each disk drive carrier.



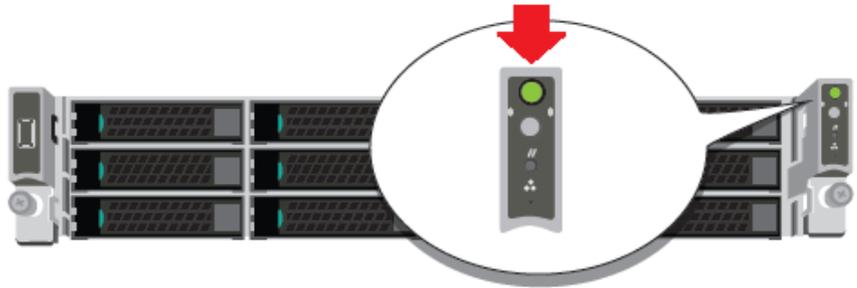
The following table describes the disk drive carrier LEDs. Note that the combination of both LEDs provides the status.

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.

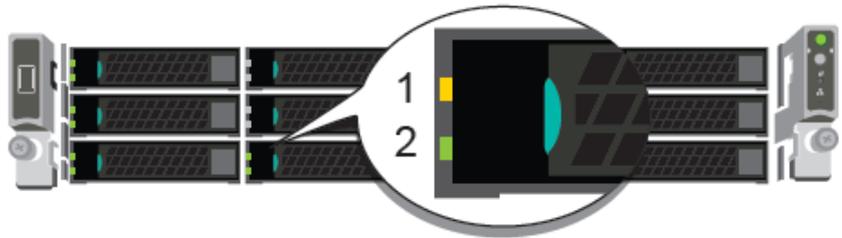
- 9** Repeat these steps for each storage shelf. Let each shelf initialize before you turn on the next shelf. Initialization should take 2 minutes to 3 minutes.
- 10** When all of the storage shelves are operational, turn on the appliance.

To turn on the appliance

- 1 Verify that all connected storage shelves function correctly. Use the LED information in the procedure that explains how to turn on the storage shelves.
- 2 On the front, right, side of the appliance press the Power button.



- 3 Verify that the bottom LED in all 12 disk drive slots are green.



The following table provides details of the disk drive LEDs.

LED number, name, and location	States	Description
1, Status LED, top	Off	No fault
	Solid amber	Disk fault
	Blinking amber	A RAID rebuild is in progress
2, Activity LED, bottom	Off	Power is on and the disk has spun down
	Solid green	Power is on but there is no disk activity
	Blinking green	Power is on and the disk is spinning up
	Blinks green occasionally	Commands are processing

- 4 On the bottom, left, rear of the appliance, verify that the LED on each power supply is green.



- 5 Proceed to the next section to configure remote management.

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 20.

For configuring the IPMI, you must connect to the appliance first. You can connect to the appliance in the following ways:

- Using a keyboard and a monitor
- Using a laptop

Based on how you want to connect to the appliance, you can configure the IPMI by using one of the following procedures:

See “To configure IPMI port by using a keyboard and monitor” on page 58.

See “To configure the IPMI by using the eth0 port” on page 60.

To configure 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.

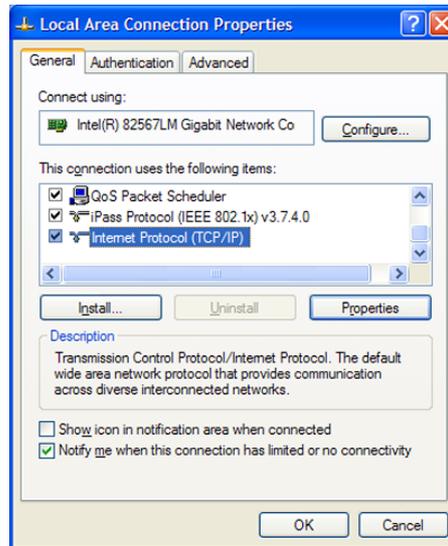
Note: The eth4 (NIC5) and eth5 (NIC6) ports on a 5240 appliance require Cat 6 cables.

- 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.

To configure the IPMI by using the eth0 port

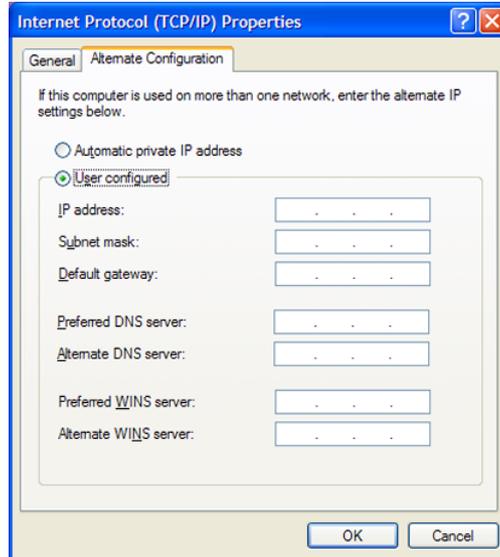
- 1 Verify that the appliance is turned on.
Connect a laptop to the NIC1 (eth0) port on the rear panel of the appliance by using an Ethernet cable.
- 2 Open the **Local Area Connection Properties** dialog box by right-clicking on the local area connection and selecting **Properties**.



On the **General** tab, select **Internet Protocol (TCP/IP)** and then click **Properties**.

Note: This step may differ for specific OS versions. Check your OS documentation for reference.

- 3 In the **Internet Protocol (TCP/IP) Properties** dialogue window, click the **Alternate Configuration** tab.



- 4 From the **Alternate Configuration** tab, make sure the **User Configured** option is selected.

In the **IP address** field, enter the following addresses:

- Type the eth0 port IP address (default **192.168.229.nnn**), where **nnn** is any number from 2 to 254, except 233.

In the **Subnet mask**, enter **255.255.255.0**.

Click **OK**.

- 5 Test the connection by using the following method:

- Open a secure shell (SSH) connection to 192.168.229.233 using an SSH client. Once the NetBackup Appliance Shell Menu opens with a user name and password prompt, you have successfully connected to the appliance for initial configuration.

- 6 When the NetBackup Appliance Shell Menu appears, log on using the user name and password for the appliance

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

- 7 Go to the `Main_Menu > Support view`.

- 8 Enter the following command to configure the IPMI port:

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

Where *IP address* is the new IP address for the IPMI port. The Subnet mask and Gateway enable connectivity between your network computer and the IPMI port.

The IPMI 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
```

- 9 Type `Exit` and press Enter to log out of the NetBackup Appliance Shell Menu.
- 10 Use a Cat5 or a Cat6 cable to connect the remote management port to the network.
- 11 Make sure you can reach the Veritas Remote Management Console over the network by using the new address in a web browser.
- 12 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 Manager. You can use Veritas Remote Manager to log on to the NetBackup Appliance Shell Menu.

Note: Alert configuration is not supported using the Veritas Remote Manager. 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:

Logged out. Please log in again to access the device.

Username

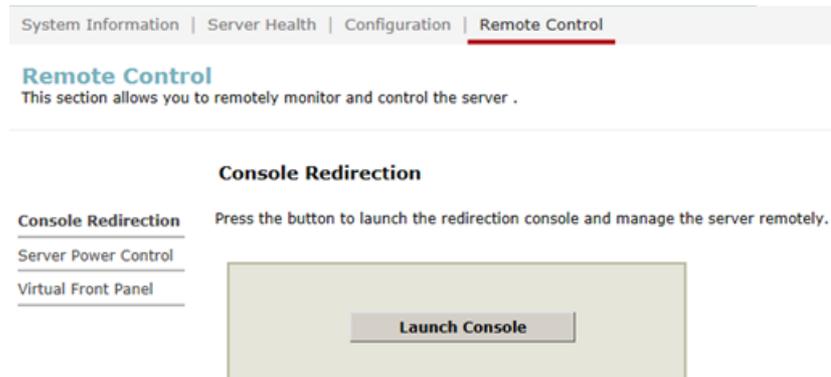
Password

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

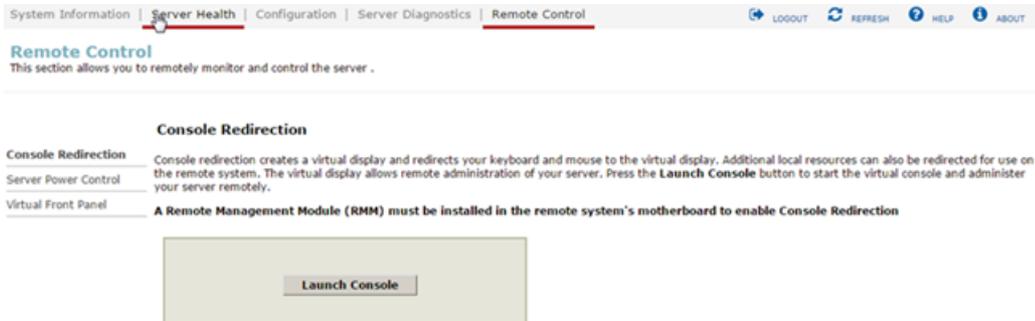
Click **Login**.

- 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.



The following figure shows the interface for a 5240 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>

- 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.

Adding one or more storage shelves to an operating 4TB appliance that does not have any storage shelves

This appendix includes the following topics:

- Overview
- Preparing the 4TB appliance
- Removing the appliance cover
- Installing the External Storage Kit components
- Reinstalling the appliance into the rack
- Storage shelf rack requirements
- Determining rack locations
- Installing the storage shelf rails
- Installing the storage shelf or shelves into a rack
- Understanding appliance and storage shelf connections
- Connecting one storage shelf to an appliance

- Connecting two storage shelves to an appliance
- Connecting three storage shelves to an appliance
- Connecting four storage shelves to an appliance
- Connecting the network cables
- Connecting the power cords
- Turning on the hardware and verifying operation

Overview

Several procedures are involved in the process of adding one or more storage shelves to a 4TB appliance that does not have any storage shelves at all.

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

The 4TB appliance needs additional components to support the external storage shelves. The NetBackup 5240 External Storage Kit contains the following required hardware 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.

- Installing the External 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.

Preparing the 4TB appliance

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

Shut down the appliance properly and disconnect it from AC power sources. A soft shutdown informs the NetBackup Appliance operating system to stop and close all active processes. After the operating system stops all of the processes, the appliance turns itself off.

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

To perform a soft shutdown of the appliance

- 1 Log on to the NetBackup Appliance Shell Menu.
- 2 Enter `Support > Shutdown`.
- 3 Verify that the appliance is completely turned off. All LEDs are off. Fans are not running.
- 4 Remove the power cords that connect the appliance to the rack Power Distribution Units (PDUs).

The following procedure explains the process of removing the appliance from the rack.

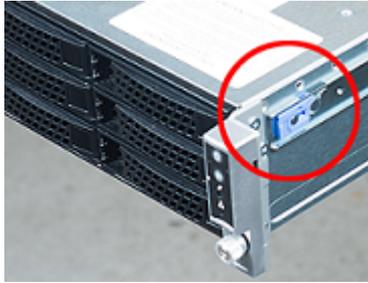
To remove the appliance from the rack

- 1 Verify that the appliance is off and that the power cords have been disconnected from the power sources.
- 2 Remove the front bezel of the appliance.
- 3 Locate and unscrew the two screws on the edges of the front panel that secure the appliance to the rack.



- 4 Slide the chassis fully forward out of the rack until the rail guides lock.

- 5 With the rails fully extended and locked, locate the blue tabs at the front of the rail assemblies.



- 6 With a person on each side, place a hand underneath the unit.
- 7 Pull the blue tabs back to release the front studs in the chassis rails.
- 8 Lift the front end to release the front studs from the cutouts in the guide rails.
- 9 Place your free hands under the back of the chassis for support.
- 10 Pull the appliance straight out of the rack.
- 11 Lift the appliance and place it on a secure surface.

Removing the appliance cover

The appliance cover must be removed to install the components of the External Storage Kit.

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

To remove the cover

- 1 Remove the three screws at the top edge of the chassis cover.



- 2 Loosen the two elastic screws at the rear of the chassis cover.



- 3 Slide the cover toward the rear of the chassis and lift the cover up to remove it.
- 4 Set the cover aside where it cannot be damaged.
- 5 Proceed to install the storage kit components into the appliance.

Installing the External Storage Kit components

This section explains the process of installing the three components of the External Storage Kit into the appliance. Note that there are three separate procedures, one for each type of component. Install the hardware in the order that the procedures are presented.

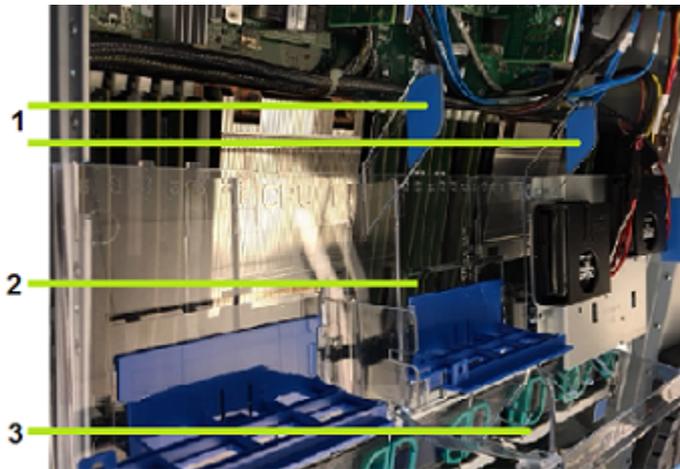
Caution: Veritas service personnel must perform all tasks that involve the inside of the appliance chassis.

To install the DIMMs

- 1 Put on a grounded ESD-compliant wrist strap or take other ESD-preventive measures.

Note: The static discharged by human bodies can damage static-sensitive components on the boards. When installing and maintaining the equipment, you must observe appropriate electrostatic safety precautions to prevent personnel injuries or device damage.

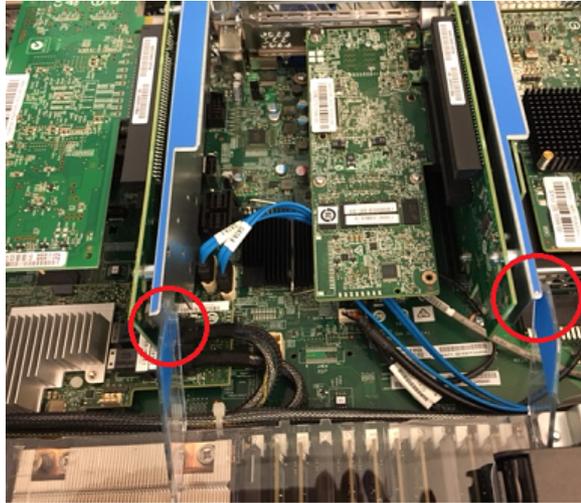
- 2 Locate the air duct.



The following table defines the air duct and related components.

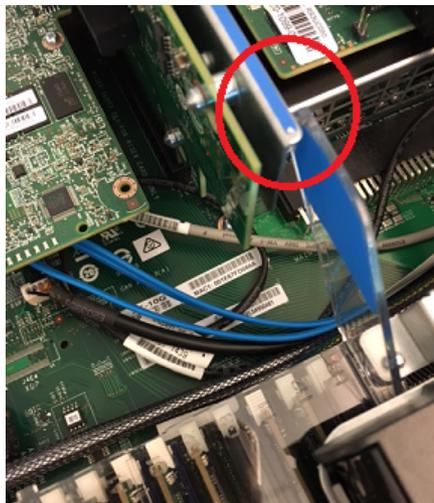
Number	Description
1	Air duct arms (qty 2)
2	Air duct (qty 1)
3	Fans (qty 6)

- 3 Locate the air duct arms which have small clear tabs on the ends. The tabs fit under the blue lifting frames of the riser assemblies.



- 4 Standing at the front of the appliance, press both arms slightly to the right. Do not break the arms or the tabs.

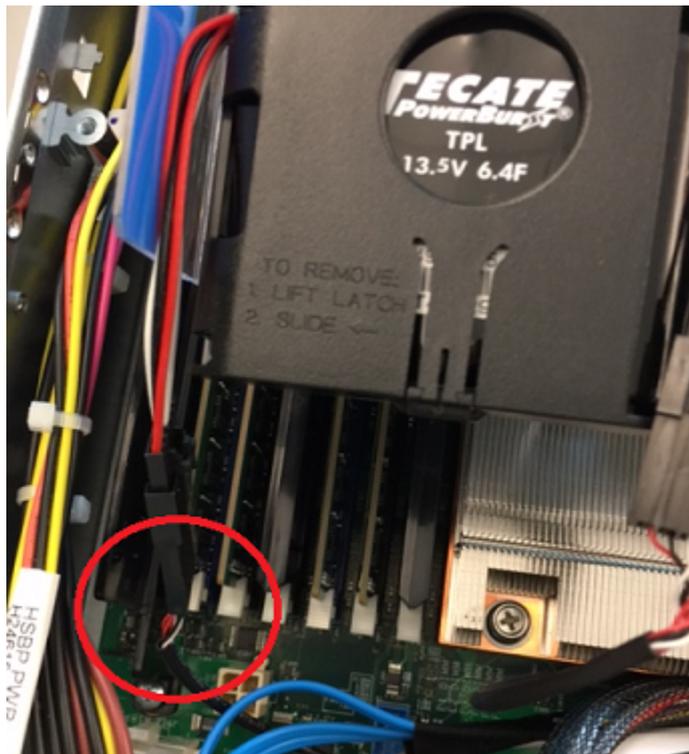
The clear tabs disengage from under the blue frames.



- 5 Locate the Maintenance Free Battery Unit (MFBU) that is attached to a metal plate on the air duct.

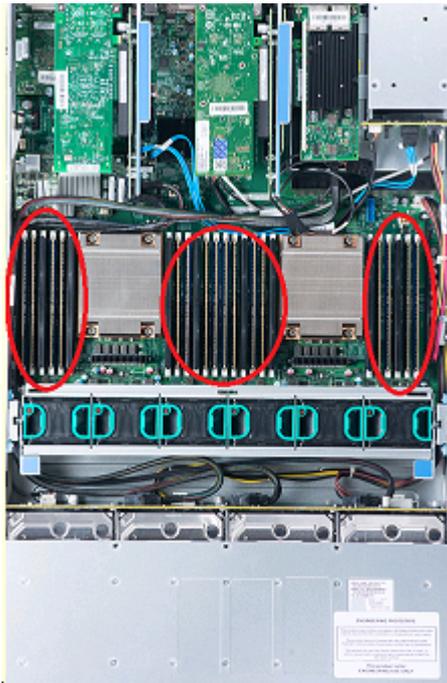


- 6 Disconnect the MFBU battery cable from the cable on the SAS HBA card in Riser Assembly #3.



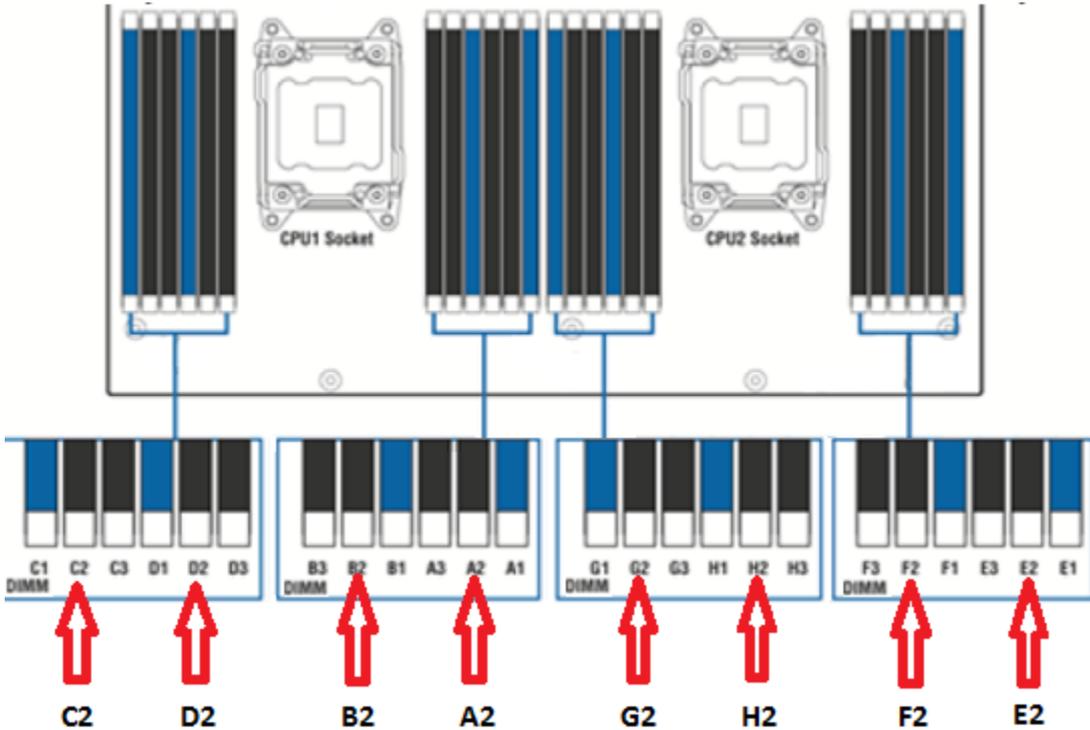
- 7 Label the cable on the main board so that you can accurately reconnect it later.
- 8 Lift the rear of the duct up and towards the rear of the appliance. The MFBU remains attached to the air duct.
- 9 Lift the duct out completely and set it aside in a safe location.
- 10 Locate the DIMMs.

The DIMMs are located on either side and in the middle of the two CPU heat sinks. Some DIMM sockets are empty.



Each DIMM socket has an identifier on the main board that consists of a two-digit alphanumeric character that indicates the channel and socket for each DIMM. Socket identifiers have the format A1, A2, B1, B2, C1, C2, etc. The letter defines the channel and the number indicates the socket.

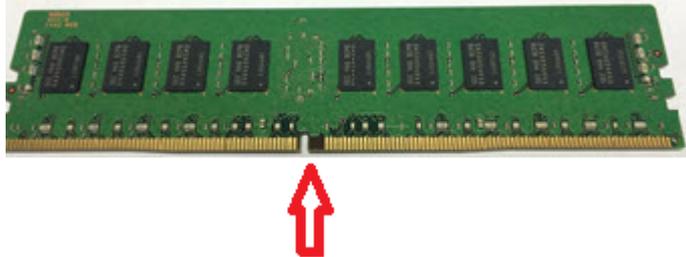
- 11 Look for the identifier on the main board near the socket for each DIMM. The following diagram shows the configuration of the DIMM sockets as viewed from the front of the appliance. The six fans are located between the DIMMs and the front of the appliance.



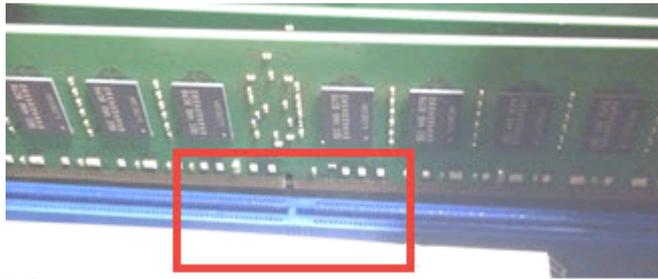
- 12 Locate the empty DIMM slots that require the addition of a DIMM. DIMMs C2, D2, B2, A2, G2, H2, F2 and E2 are indicated with red arrows in the illustration.
- 13 Start with socket C2, on the left side.
- 14 Open the retaining clips at each end of the socket.
- 15 **Caution:** Always hold the edges of the DIMM. Do not touch the front or the back of the DIMMs.

Lift one DIMM from its ESD-compliant wrapper.

- 16** Locate the gap in the connector edge of the DIMM as shown.



- 17** Locate the key in the DIMM socket and hold the DIMM over the socket. Align the gap in the bottom edge of the card and the key in the socket.



- 18** Align the edges of the DIMM with the grooves in the posts at both ends of the socket.
- 19** Insert the DIMM card into the socket.
- 20** Push down evenly and firmly until the retaining clips snap into place. Make sure that the clips are firmly in place.
- 21** Repeat these steps for the remaining seven DIMMs. The remaining slots that require additional DIMMs are D2, B2, A2, G2, H2, F2, and E2.
- 22** Do not replace the air duct or the cover at this time.
- 23** Refer to the next procedure to install the external RAID PCIe card MFBU.

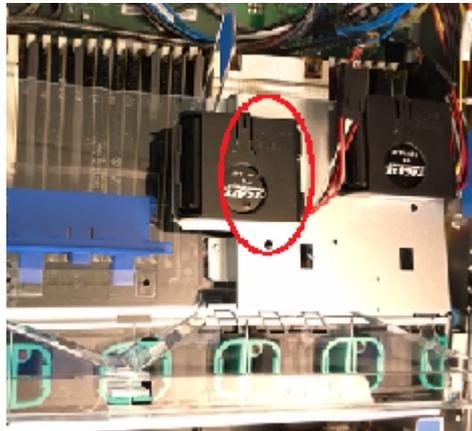
To install an external RAID PCIe card MFBU

- 1** Put on an ESD-compliant wrist strap or take other ESD-protective measures.
- 2** Obtain the External Storage Kit.
- 3** Remove the MFBU Kit.
- 4** Remove the black plastic case from the kit.

- 5 Install the MFBU into the case. Be sure that the cable wires are not twisted or damaged.



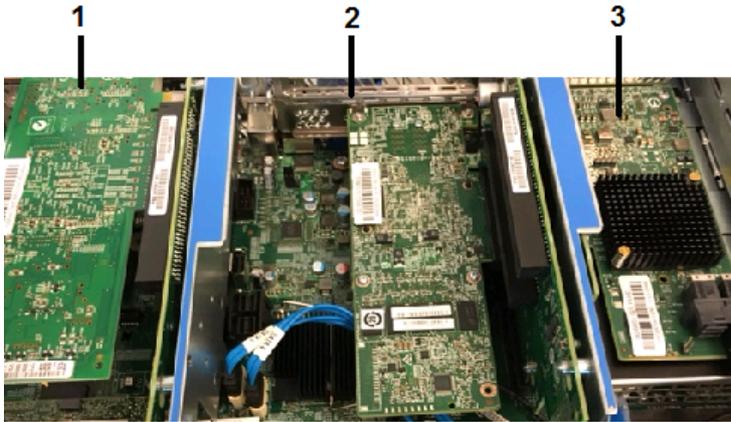
- 6 Retrieve the plastic air duct that you removed earlier.
- 7 Install the MFBU onto the metal bracket on the air duct. Make sure that the MFBU snaps in evenly.



- 8 Be sure that the cable on the MFBU points toward the rear of the appliance and to the PCIe riser assemblies

To install an External RAID PCIe card

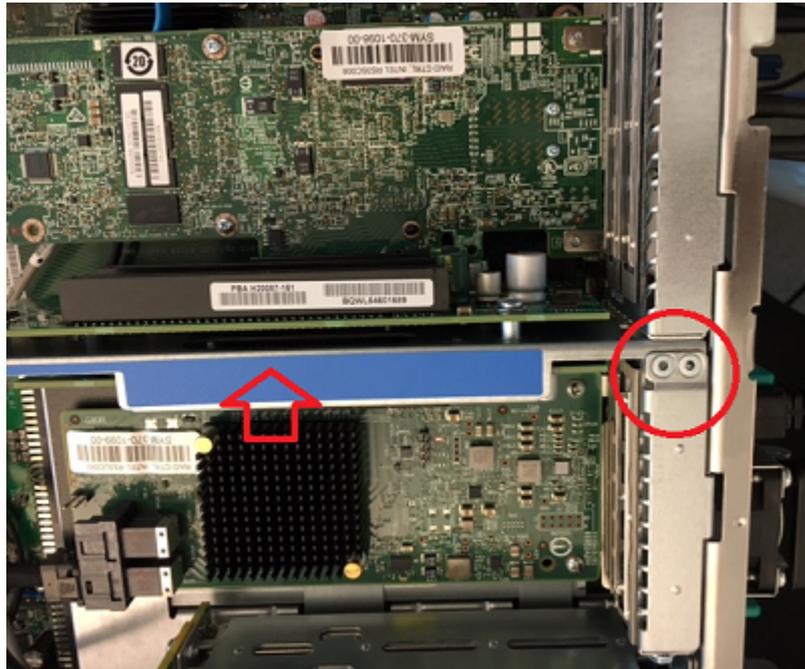
- 1 Locate PCIe Riser Assemblies #2 and #3.



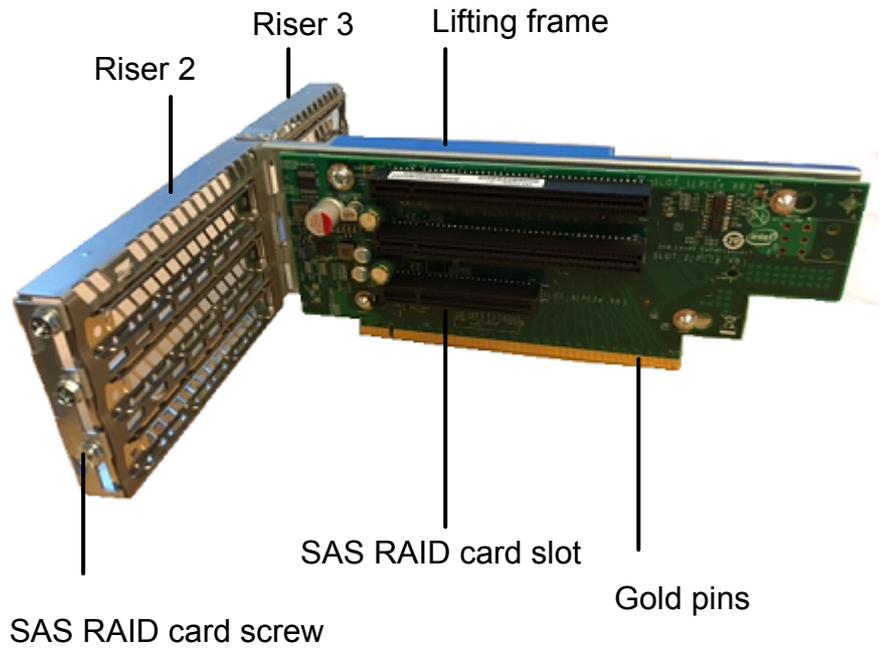
- 2 Disconnect the cable that is connected to the SAS HBA card in slot 7. Label the port where the cable is connected.



- 3 Locate the two rivets that hold Risers 2 and 3 together. These risers are removed from the chassis as one unit. The circled rivets in the picture show the connection site of the two risers. Do not separate the risers.



- 4 Hold the blue frame (indicated by the arrow) and lift it up from the main board.
- 5 Be careful not to damage any PCIe cards or HBA cards that are already installed in riser 2 and riser 3.
- 6 Locate three components of riser 2.
 - The screw that secures the External RAID PCIe card in riser 2.
 - The socket in slot 1 on riser 2 into which the External RAID PCIe card is inserted.
 - The gold pins at the bottom of the riser which fit into the socket on the main board.



- 7 Remove the screw in slot 1 of riser 2.
- 8 Align the connector on the PCIe card with the bottom socket (Slot 1) on riser 2. The edge connector is designed to install one way only.

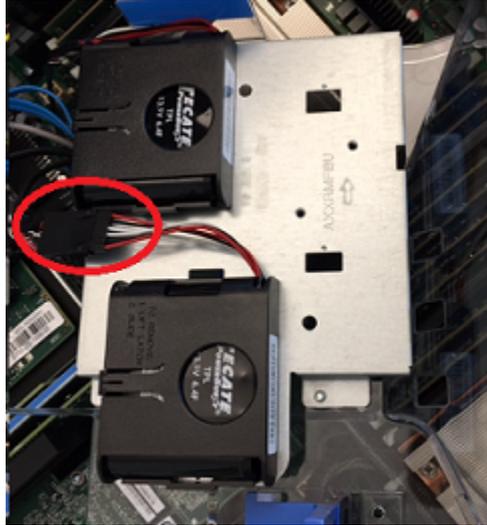
- 9 Firmly and evenly insert the card into the socket.



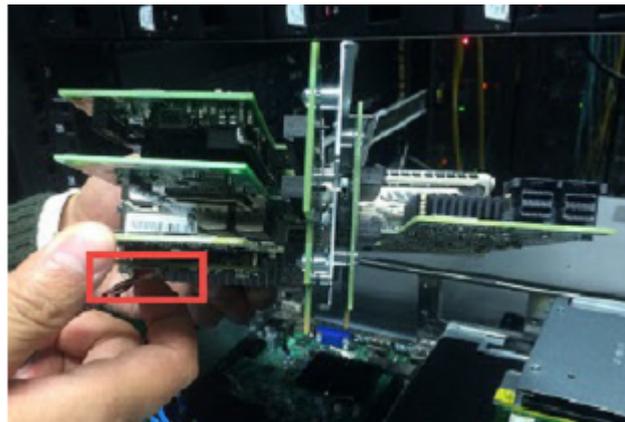
- 10 Screw the PCIe card into the PCIe riser assembly frame.



- 11 Locate the cable from the MFBU that you installed onto the air duct.



- 12 Connect the cable to the small white connector on the underside of the External RAID PCIe card.



- 13 Reinstall the PCIe riser 2 and 3 unit.
- Align the gold pin connectors of the riser unit with the socket in the main board.
 - Press the riser down straight and firmly into the socket.

- The top of the risers should not be higher than the rear of the appliance chassis.

14 Reconnect the cable from the SAS HBA in slot 7 to the first MFBU.

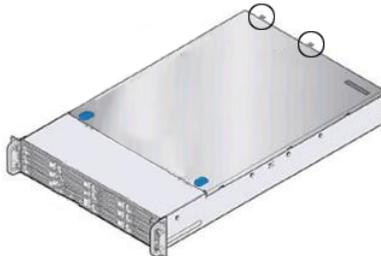


15 Replace the air duct. Be sure that the small clear tabs on the air duct arms sit firmly under the blue lifting frames.

16 Replace the chassis cover.

- 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.
- Slide the cover forward until the edge slides under the lip of the enclosure.
- Secure the cover by doing one of the following:

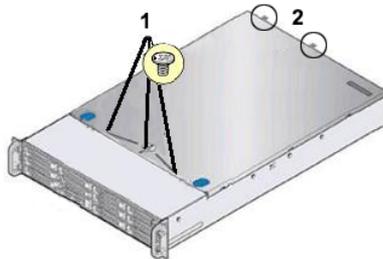
If the cover looks like this



Do the following:

- Tighten the two thumb screws (circled) on the rear panel.

If the cover looks like this



Do the following:

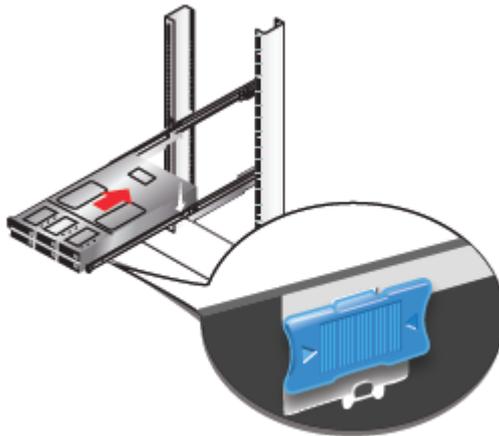
- 1 Insert the three screws on top and tighten.
- 2 Tighten the two thumb screws (circled) on the rear panel.

Reinstalling the appliance into the rack

When you have completed the installation of additional components, replace the appliance into the rack.

To reinstall the appliance

- 1 Pull the rack rails forward until they are extended far enough that you can place the appliance into the rails.
- 2 Carefully align the appliance rails with the rack rails. Slide the blue tab on the outer rail and push the appliance into the rack until it locks



- 3 Secure the two captive screws on the edges of the front panel of the appliance.



- 4 Reconnect the data cables and the power cables according to the labels you placed on them earlier.

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

Storage shelf rack requirements

For best ventilation, the rack cabinet:

- Should be at least 100 cm (4 feet) from walls.
- Should have at least 100 cm (4 feet) from other cabinets on the front and back of the appliance and the storage shelves.
- Data centers with two-foot spaces in the front and in the back of the appliances are acceptable with proper cooling and ventilation

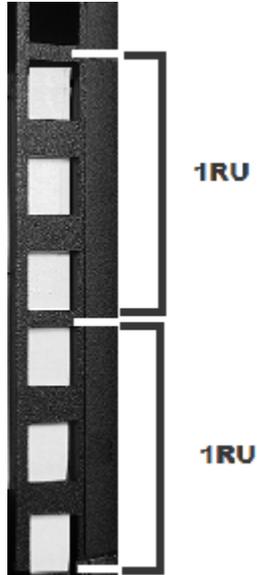
The following list describes the necessary personnel and equipment that customers must supply at the installation site:

- At least one person or a mechanical lift to move the appliance and the storage shelves.
- Ethernet and Fibre Channel (FC) cables to connect the appliance to your corporate network.
- A USB-keyboard and a monitor to connect to the appliance.
- A 19-inch rack with dual Power Distribution Units (PDUs) with 120VAC or 220VAC power supplies.

Determining rack locations

The appliance and the storage shelves are both two rack units (2RU) high. To help you identify RU spacing, many rack manufacturers typically use a system of lines and sequential numbers starting at the bottom of the rack. The front and the rear of the rack are marked the same to ensure that the rails are installed straight and

level. One RU has three holes. The holes for one RU are typically marked with a line below the bottom hole and another line above the top hole.

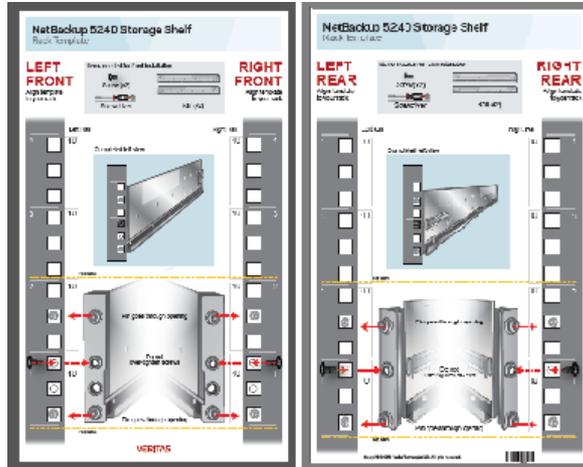


Next, use the rack templates that ship with the storage shelves to determine the mounting locations.

To determine rack locations for the storage shelves

- 1** A storage shelf is 2RU high. Multiply the number 2 by the number of shelves that you plan to install.
- 2** Use the rack templates that are provided with the hardware to determine RU locations. The templates show the front and rear of a storage shelf in a rack.

- 3 Fold the template along the yellow dotted lines to match the rack holes exactly.



- 4 Record the rack shelf positions to help you locate them easily when mounting the hardware.
- 5 Next, assess the SAS cables to be sure that you have the correct lengths for your installation.

The following procedure provides information to help you verify that you have the correct lengths of SAS cable.

To determine SAS cable requirements

- 1 Note that each rack unit (RU) is 44.50 mm (1.752 inches) in height. The NetBackup 5240 Appliance and the NetBackup 5240 Storage Shelf are both 2RU high.
- 2 SAS cables are 1 meter (3.28 feet) or 3 meter (9.84 feet) long. The 1-meter cable is long enough to connect an appliance to the fourth storage shelf, assuming that the recommended configuration is used.

Verify that your cables are long enough to connect all of the devices.

- 3 Order the 3m cable if the 1m cable is not long enough.

Installing the storage shelf rails

Best practices recommend that the storage shelves are installed lower in the rack than the appliance.

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.

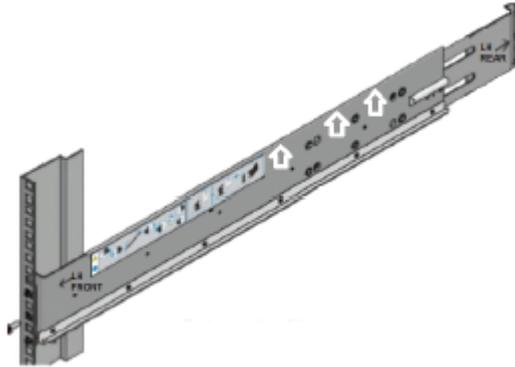
To install storage shelf rails into a rack

- 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 Use the rack templates to align the rails with the rack holes.
- 3 Fold the templates along the dotted yellow lines to match the holes in the rack. Be sure to use the same holes on each side of the rack.

- 4 Place the left rail inside the rack. The rack holes should match the rail pins. Extend the rail front and back to fit into the rack.



- 5 Insert the screw in the front and in the back of the rail, as shown in the template. Do not over-tighten the screws.
- 6 Repeat for the right rail.

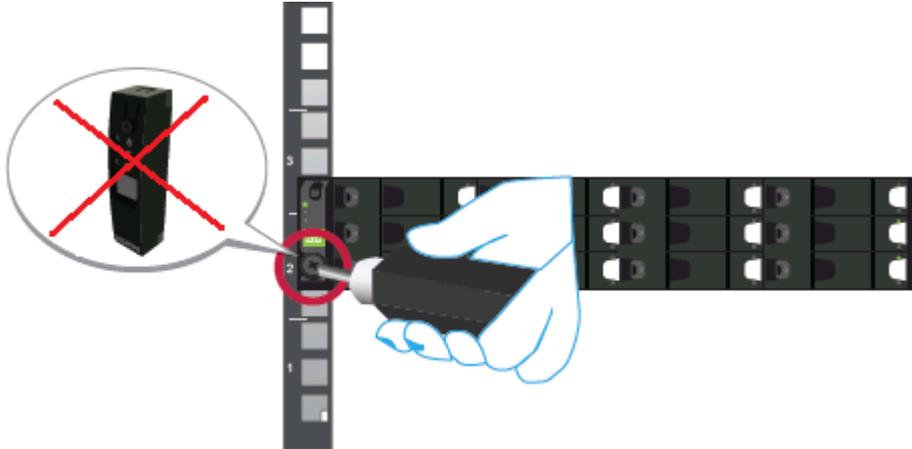
Installing the storage shelf or shelves into a rack

The storage shelf should be installed from the front of the rack.

To install a storage shelf

- 1 Use two people to lift the storage shelf.
- 2 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.
- 3 Carefully push the shelf towards the rear of the rails.

- 4 Verify that the end cap is not attached to the left and the right sides of the front of the shelf.



- 5 Insert one screw into the rack, on the left and the right front of the shelf.
- 6 Replace the end caps or attach the bezel to the front of the shelf.

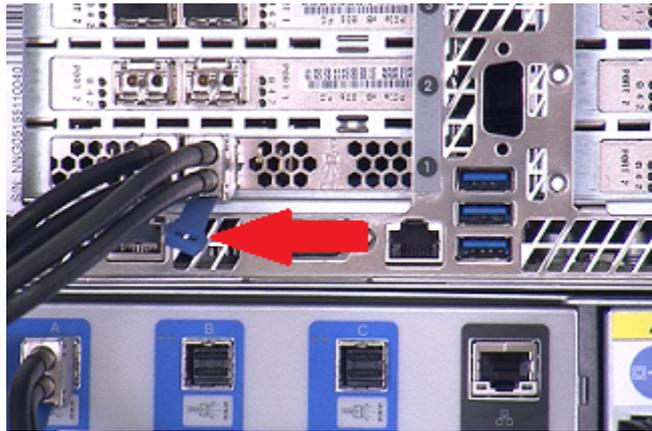
Understanding appliance and storage shelf connections

You cannot use SAS-2 cables with the storage shelf. You must use the SAS-3 cables that are provided with the product.

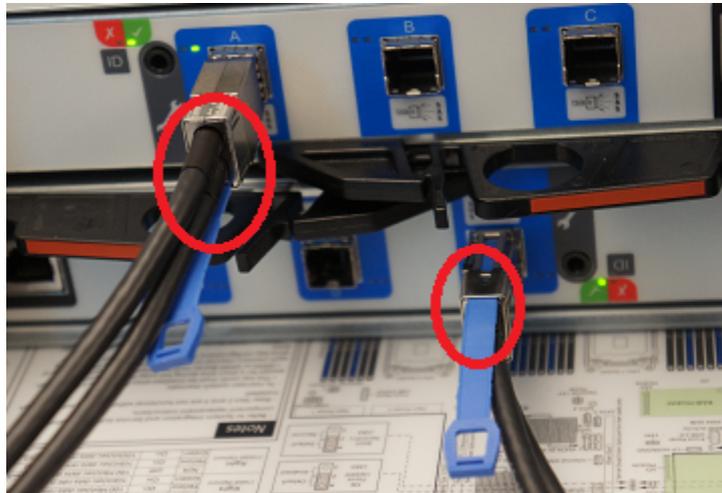


The blue clip on each SAS-3 connector must be oriented correctly as follows:

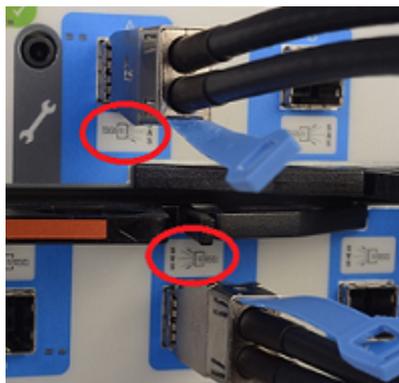
- Both SAS-3 connectors in the ports in the External RAID PCIe card of the appliance must be installed with the blue clip pointing down.



- The connector in the top I/O module canister of each storage shelf must have the blue clip pointing **down**.
- The connector in the bottom I/O module canister of each storage shelf must have the blue clip pointing **up**.



- The SAS connector blue clip should face towards the SAS label on each port in the storage shelf.

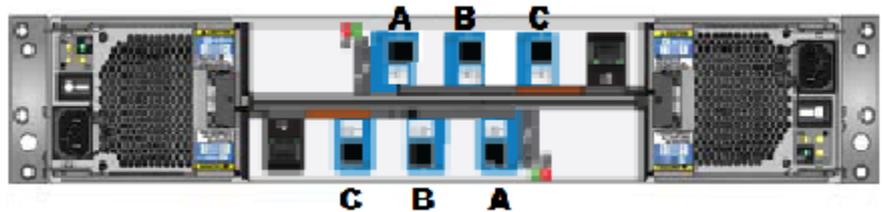


To locate the SAS-3 ports on the appliance and on the storage shelf

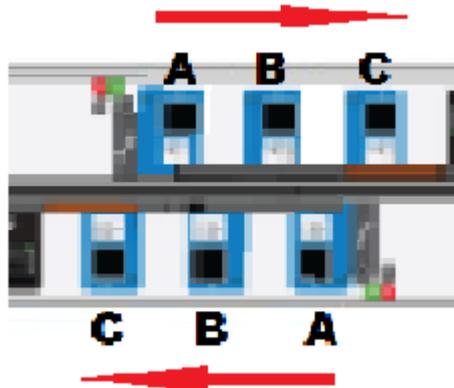
- 1 Locate the two External RAID PCIe ports on the rear panel of the appliance.
The RAID card is in Riser Assembly 2, Slot 1.



The SAS ports on the top I/O module canister are labeled A, B, and C from left to right.



The SAS ports on the bottom I/O module canister are labeled C, B, and A from left to right.



- 2 Select one of the following sections that describe the complete connection of one, two, three, and four shelves.

See “Connecting one storage shelf to an appliance” on page 95.

See “Connecting two storage shelves to an appliance” on page 98.

See “Connecting three storage shelves to an appliance” on page 101.

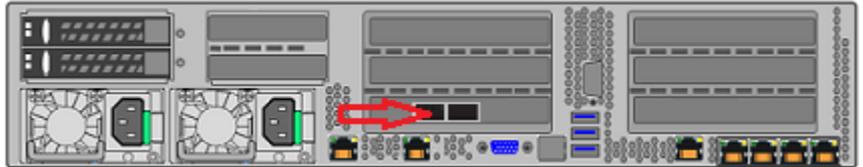
See “Connecting four storage shelves to an appliance” on page 107.

Connecting one storage shelf to an appliance

Note: The cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

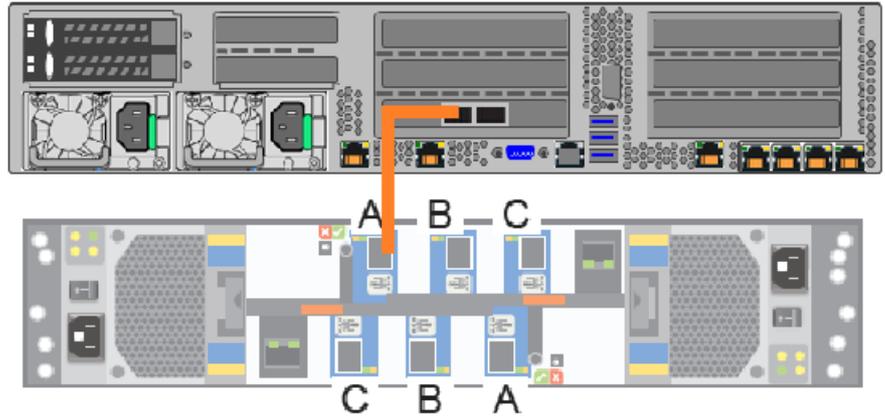
To connect one storage shelf to the appliance

- 1 Connect a SAS-3 cable to the left RAID port in the appliance.



- 2 Be sure that the blue clip on the cable connector in the appliance port points down.

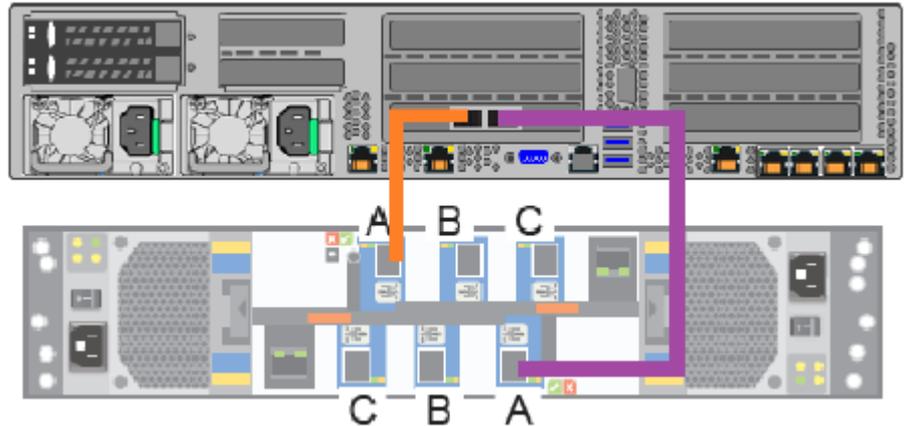
- 3 Connect the other end of the cable to port A in the top I/O module of the storage shelf.



- 4 Be sure that the blue clip on the end of the connector in the storage shelf points down.



- 5 Attach another SAS-3 cable between port A on the bottom I/O module and the right port on the appliance RAID card.



- 6 Be sure that the blue clip on the connector in the bottom I/O module in storage shelf points up.



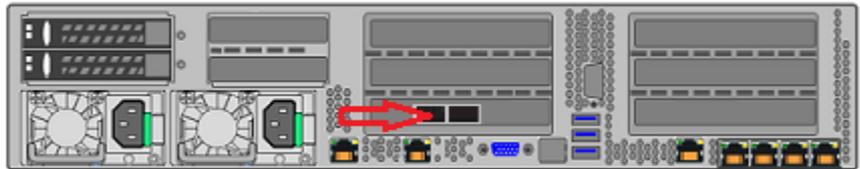
- 7 Be sure that the blue clip on the connector in the appliance points down.
Next, connect network and power cables. Turn on the storage shelves and the appliance per the required sequence. Verify that all units are functioning correctly.

Connecting two storage shelves to an appliance

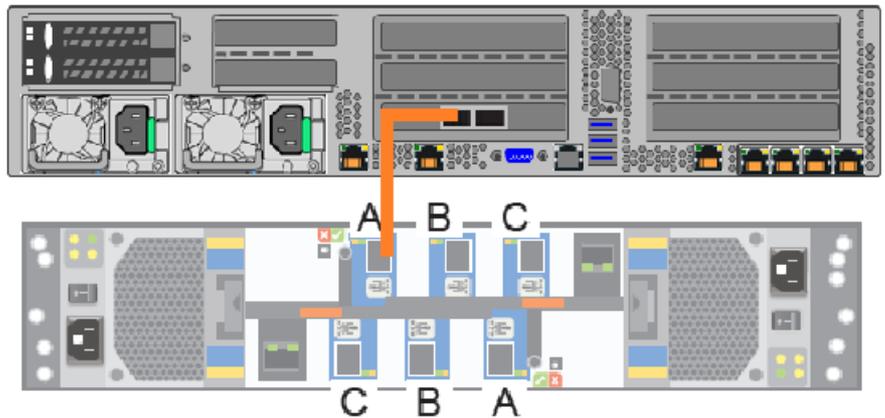
Note: The cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

To connect two storage shelves to the appliance

- 1 Connect a SAS-3 cable to the left RAID port in the appliance.

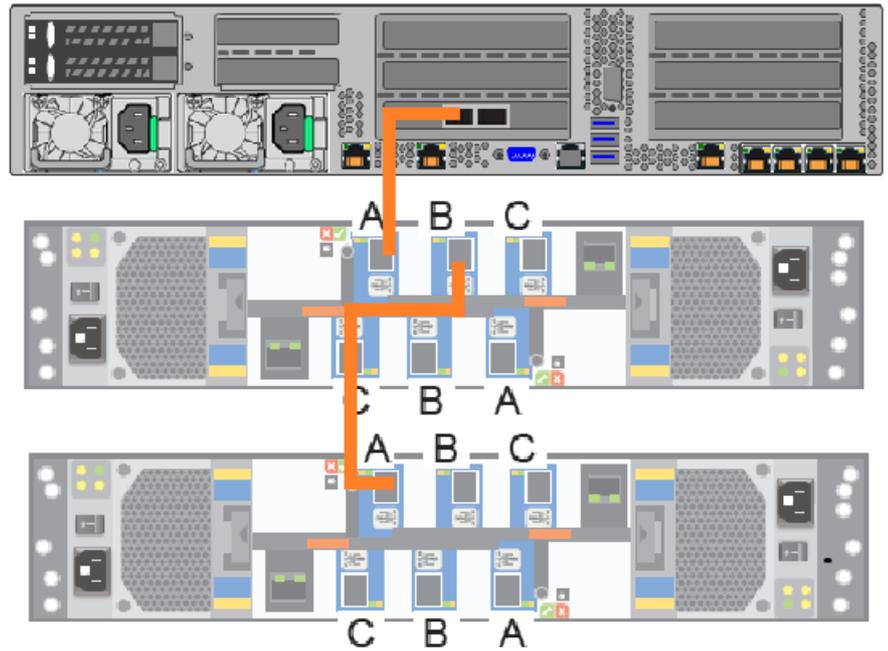


- 2 Be sure that the blue clip on the connector in the appliance port points down.
- 3 Connect the other end of this cable to port A in the top I/O module of the storage shelf.



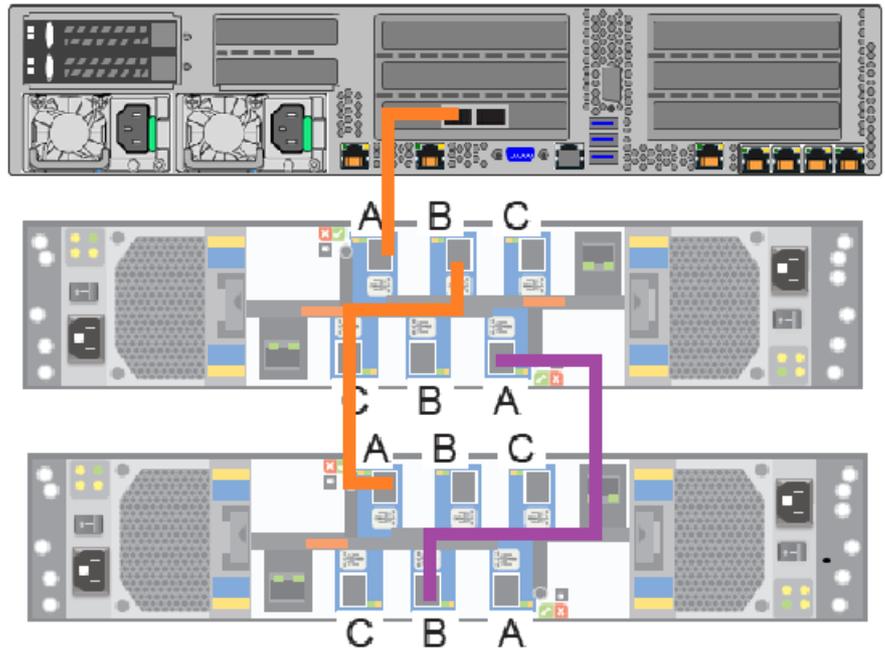
- 4 Be sure that the blue clip on the connector in port A points down.

- 5 Connect another SAS-3 cable to port B in the top I/O module of the first storage shelf. Connect the other end of this cable to port A in the top I/O module in the second storage shelf.



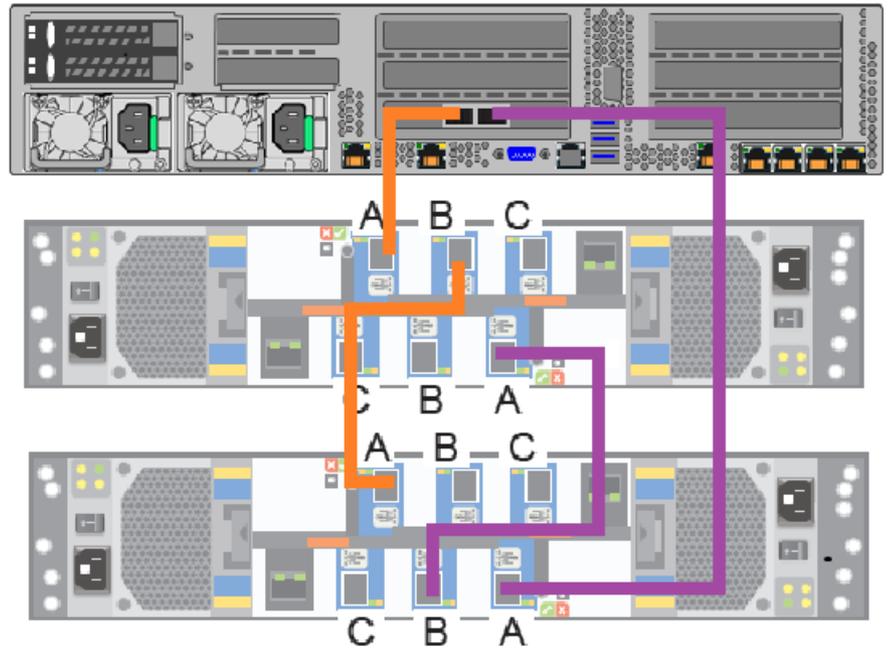
- 6 Be sure that the blue clip on the connectors in these ports point down.

- 7 In the bottom I/O module in the second shelf, connect a SAS-3 cable to port B.



- 8 Be sure that the blue clip on the connector in this port points up.
- 9 In the bottom I/O module of the first shelf, connect the other end of the cable to port A.
- 10 Be sure that the blue clip on the connector in this port points up.

- 11 In the bottom I/O module of the second shelf, connect another SAS-3 cable to port A.
- 12 Be sure that the blue clip on the connector in this port points up.



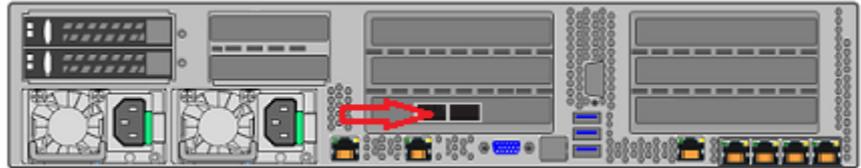
Next, connect network and power cables. Turn on the storage shelves and the appliance per the required sequence. Verify that all units are functioning correctly.

Connecting three storage shelves to an appliance

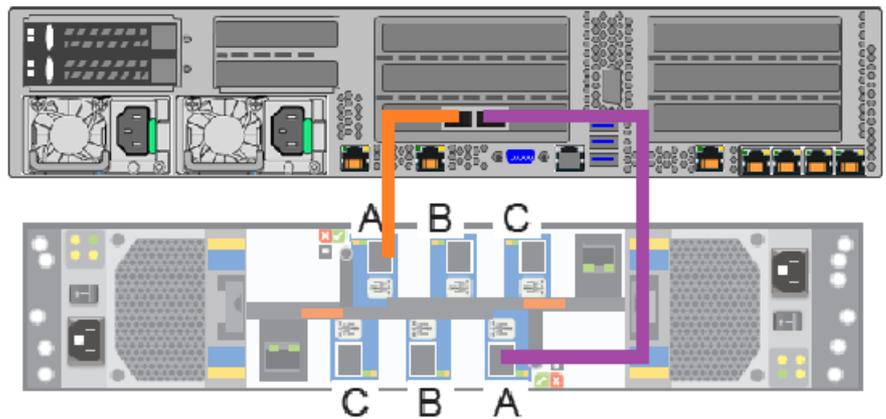
Note: The cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

To connect three storage shelves to an appliance

- 1 Connect a SAS-3 cable to the left RAID port in the appliance.



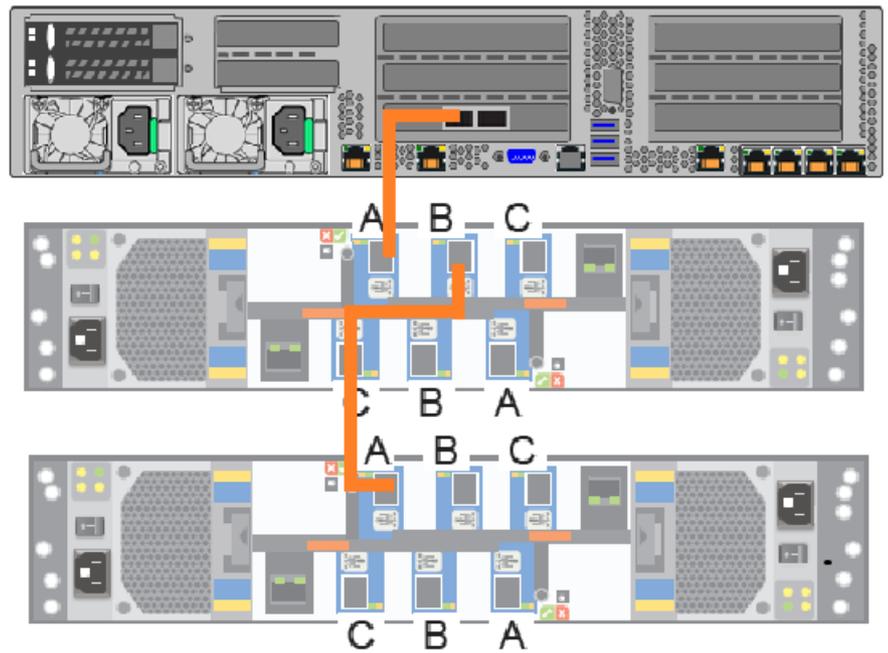
- 2 Be sure that the blue clip on the connector in the appliance port points down.
- 3 Connect the other end of this cable to port A in the top I/O module of the storage shelf.



- 4 Be sure that the blue clip on the connector in port A points down.

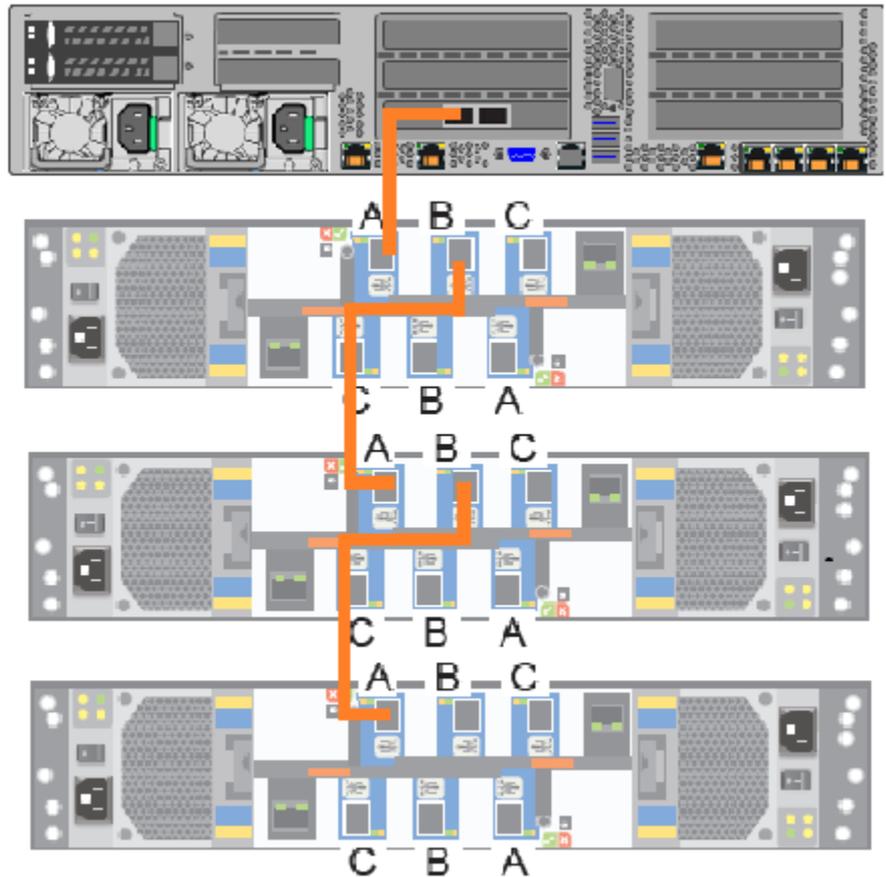


- 5 Connect another SAS-3 cable to port B in the top I/O module of the first storage shelf. Connect the other end of the cable to port A in the top I/O module in the second storage shelf.



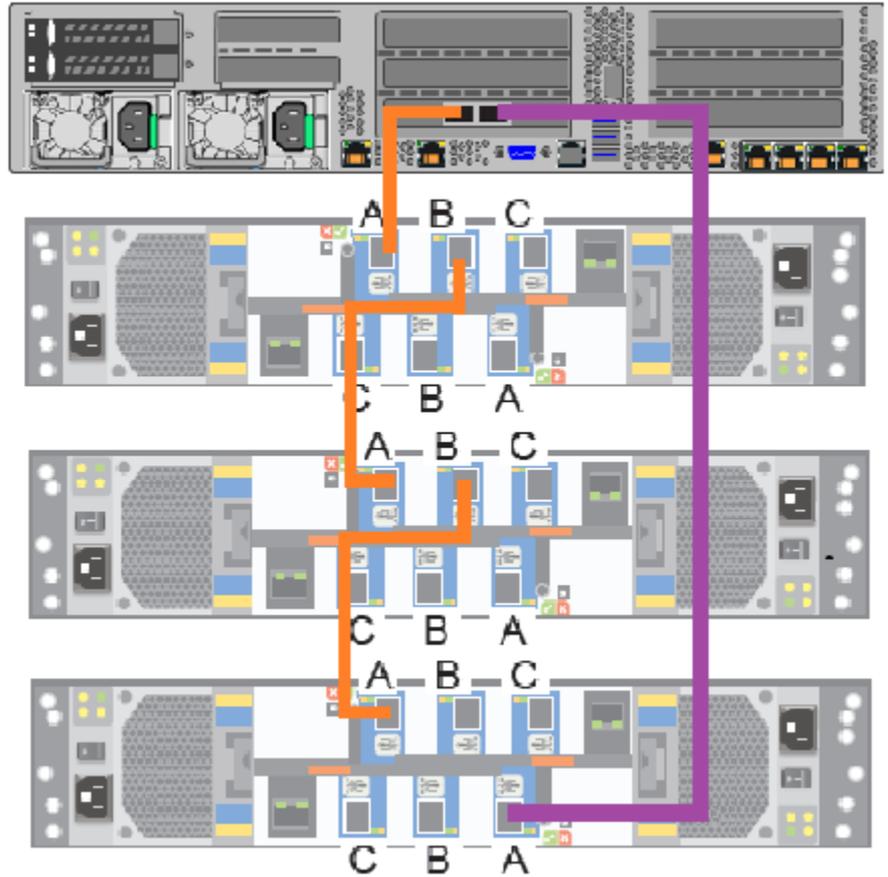
- 6 Be sure that the blue clip on the connectors in these ports point down.

- 7 Connect a SAS-3 cable to port B of the top I/O module in the second shelf. Connect the other end of the cable to port A in the top I/O module in the third shelf.



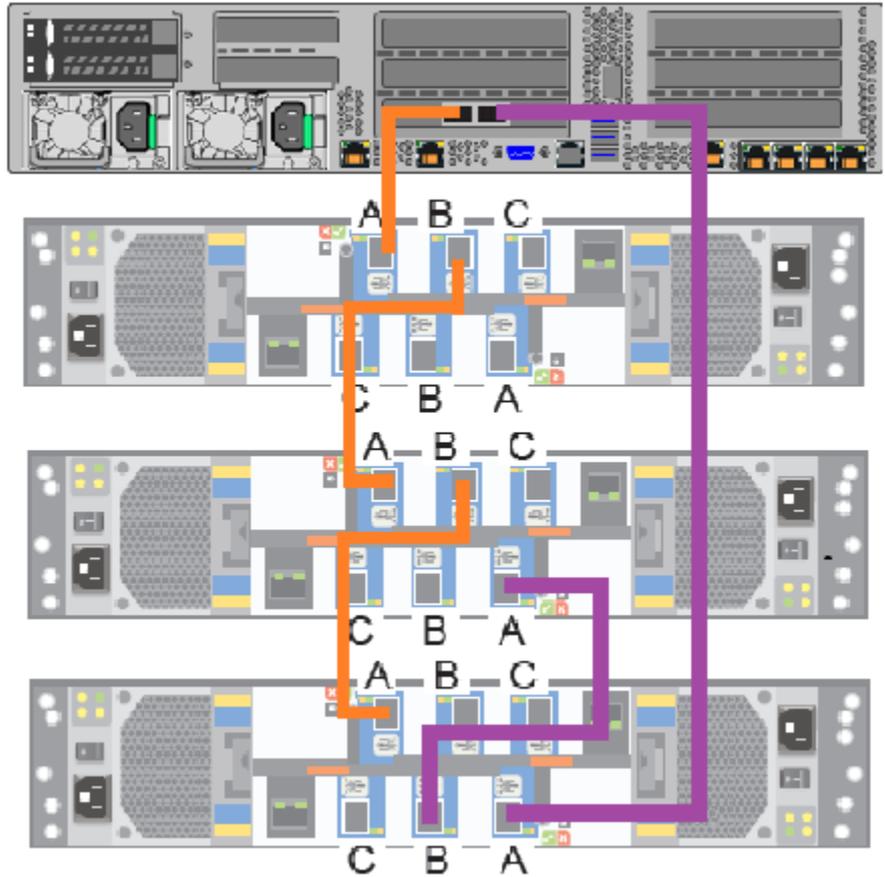
- 8 Be sure that the blue clip on the connectors in these ports point down.

- 9 Connect a SAS-3 cable to port A of the bottom I/O module in the third shelf. Connect the other end of the cable to the right port in the appliance External RAID PCIe card.

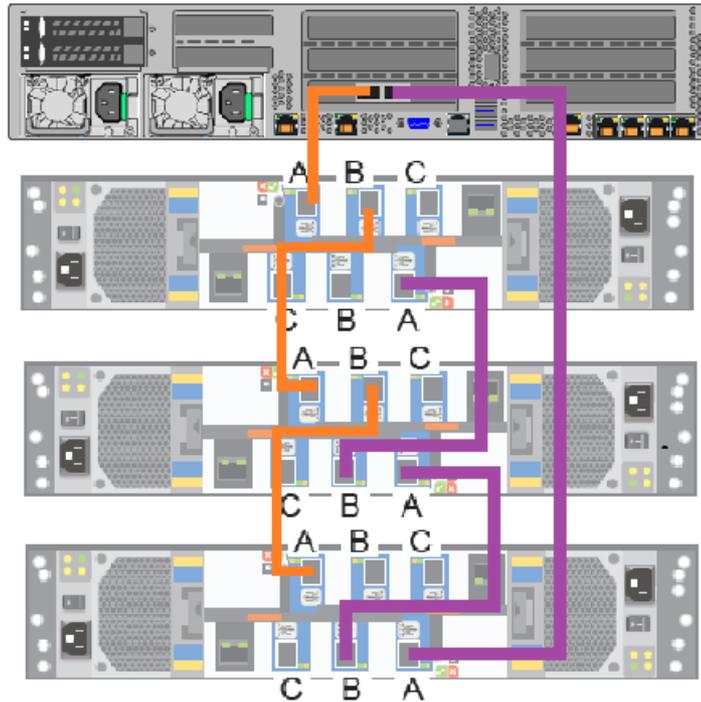


- 10 Be sure that the blue clip on the connector in port A points up. The blue clip in the appliance port connector should point down

- 11 Connect a SAS-3 cable from port B of the bottom I/O module in the third shelf to port A in the bottom I/O module in the second shelf.



- 12 Be sure that the blue clips on the connectors in both ports point up.
- 13 Connect a SAS-3 cable to port B of the bottom I/O module in the second shelf. Connect the other end of the cable to port A on the bottom I/O module in the first shelf.



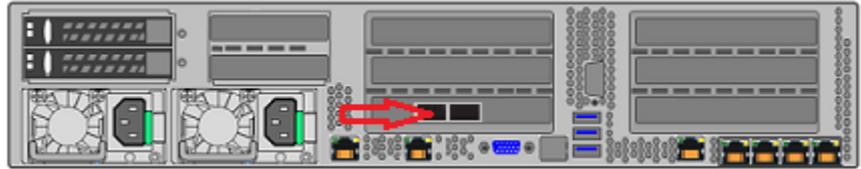
Next, connect network and power cables. Turn on the storage shelves and the appliance per the required sequence. Verify that all units are functioning correctly.

Connecting four storage shelves to an appliance

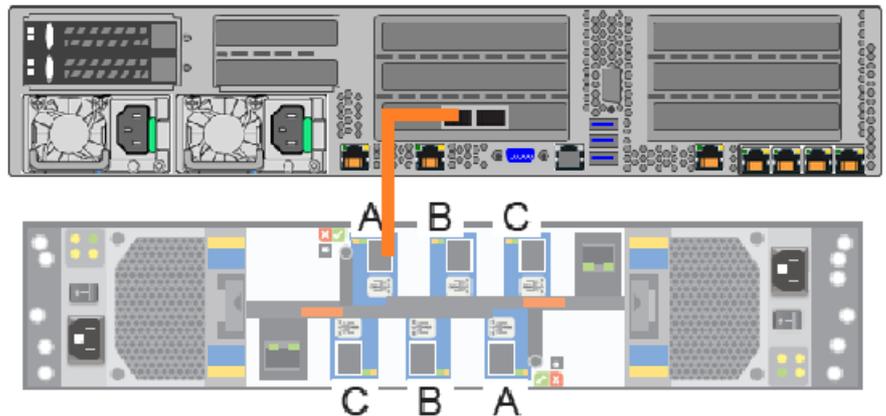
Note: The cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

To connect four storage shelves to an appliance

- 1 Connect a SAS-3 cable to the left port in the appliance External RAID PCIe card.

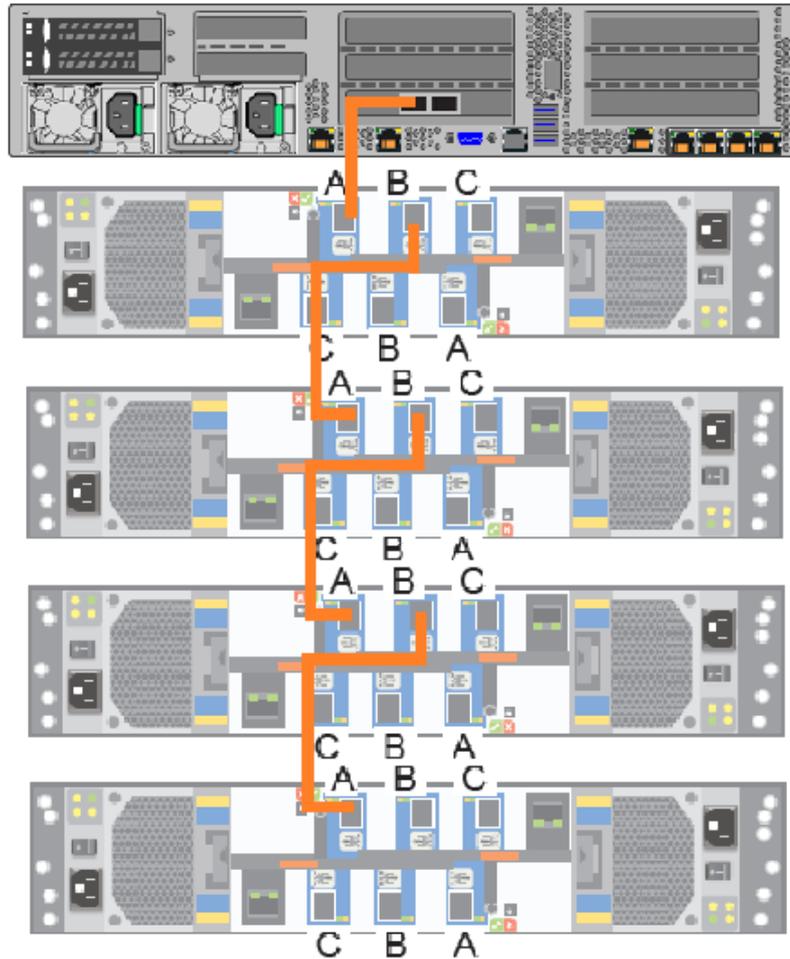


- 2 Be sure that the blue clip in this port points down.
- 3 Connect the other end of the SAS-3 cable to port A in the top I/O module of the first storage shelf.



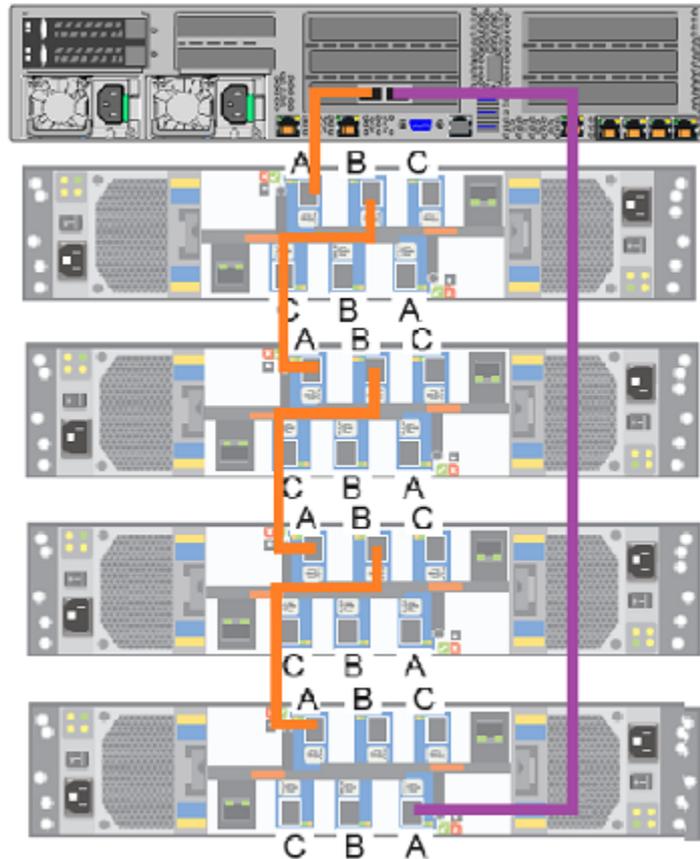
- 4 Be sure that the blue clip in this port points down.

- 5 Connect SAS-3 cables between the remaining four storage shelves.



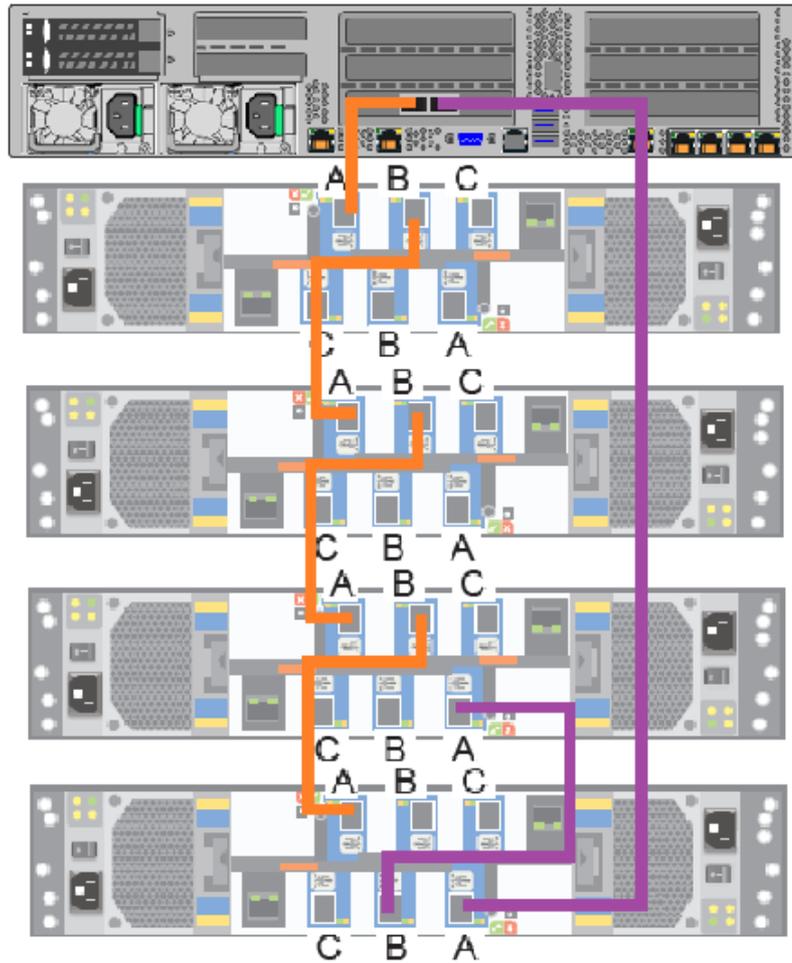
- 6 Be sure that the blue clip in the connectors in these ports point down.

- 7 Connect a SAS-3 connector to port A in the bottom of the I/O module in the fourth shelf.



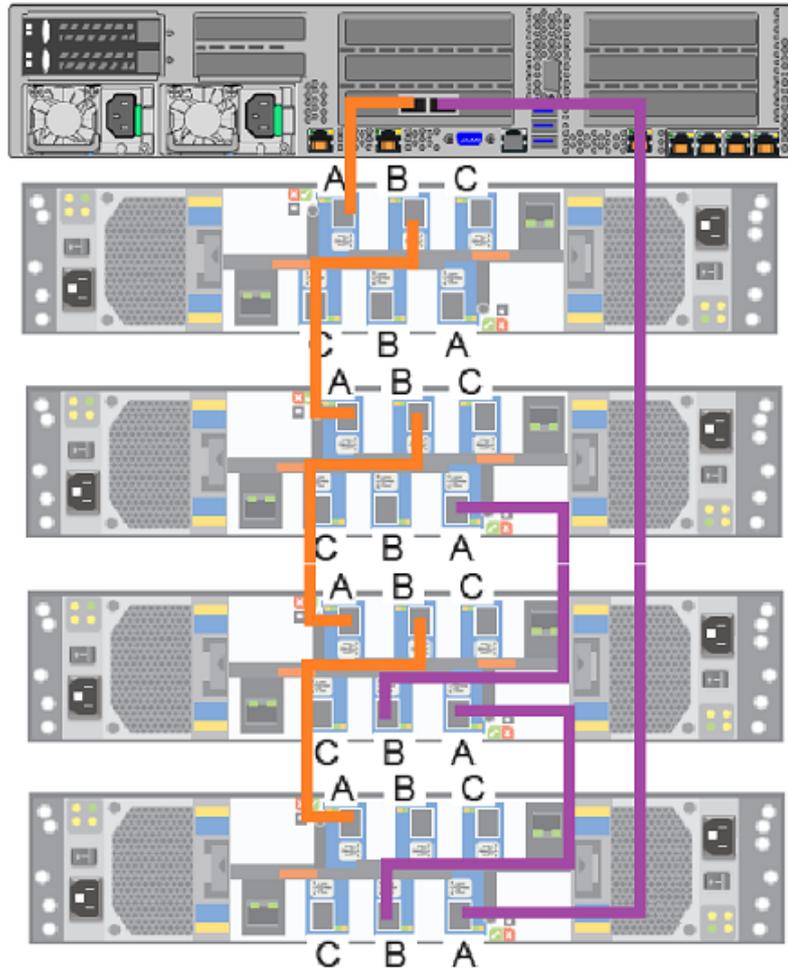
- 8 Be sure that the blue clip on the connector in this port points up.
- 9 Connect the other end of the cable to the right port in the appliance External RAID PCIe card.
- 10 Be sure that the blue clip on the connector in this port points down.

- 11 Connect a SAS-3 cable to port B in the bottom I/O module of the fourth shelf. Connect the other end of the cable to port A in the bottom I/O module of the third shelf.



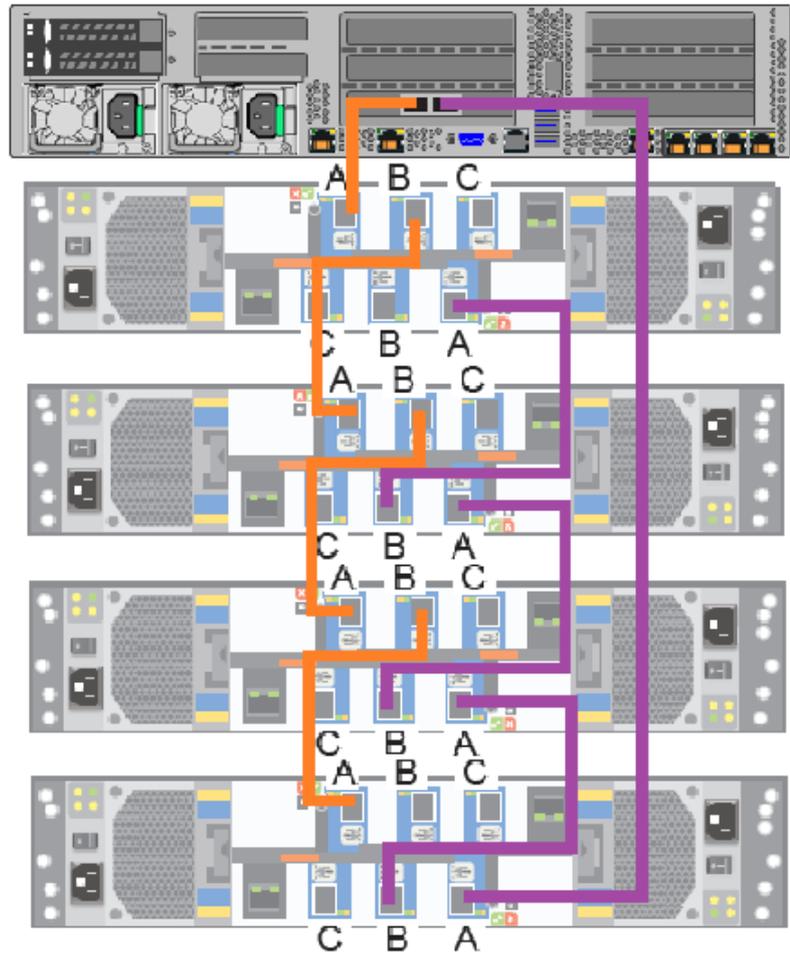
- 12 Be sure that the blue clips on these connectors point up.

- 13** Connect port B in the bottom I/O module of the third shelf to port A in the bottom I/O module in the second shelf.



- 14** Be sure that the blue clips on these connectors point up.

- 15 Connect port B the bottom I/O module of the second shelf to port A in the bottom I/O module in the first shelf.



- 16 Be sure that the blue clips on these connectors point up.

Next, connect network and power cables. Turn on the storage shelves and the appliance per the required sequence. Verify that all units are functioning correctly.

Connecting the network cables

The networking ports are accessed on the rear panel of the device. The remote management port is for use by Veritas Technical Support staff or by approved field

service technicians. The following picture shows the layout of the network ports. It includes the four 1 Gb Ethernet ports on the right and the two 10 Gb Ethernet ports on the left. The remote management (IPMI) port is located to the left of the 1 Gb Ethernet ports.



Note: You cannot bond the copper 1 GbE or the 10-GbE ports that are installed in the appliance chassis with the ports on PCIe 10-GbE cards.

Connecting the power cords

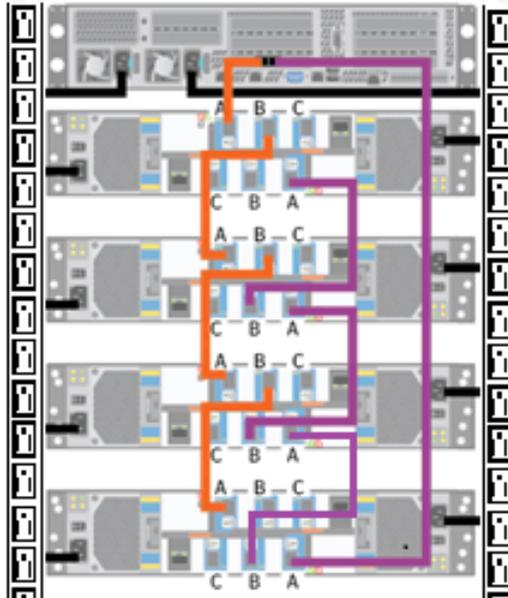
Each appliance and each storage shelf contain two AC power supplies. To ensure power redundancy, connect the power supplies on each component to separate AC power sources.

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 device, obtain two power cords that are appropriate for your region and equipment.

- 3 Connect one cable to one PDU strip that is next to one power connector on the storage shelf.
- 4 Connect the other cable to the other PDU strip that is next to the other power connector on the storage shelf.

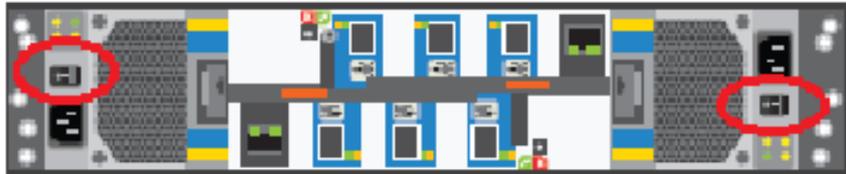


Turning on the hardware and verifying operation

The appliance and the storage shelves must be turned on in a specified order. If the hardware is not turned on correctly the appliance RAID controller may not recognize some storage units.

To turn on the 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.



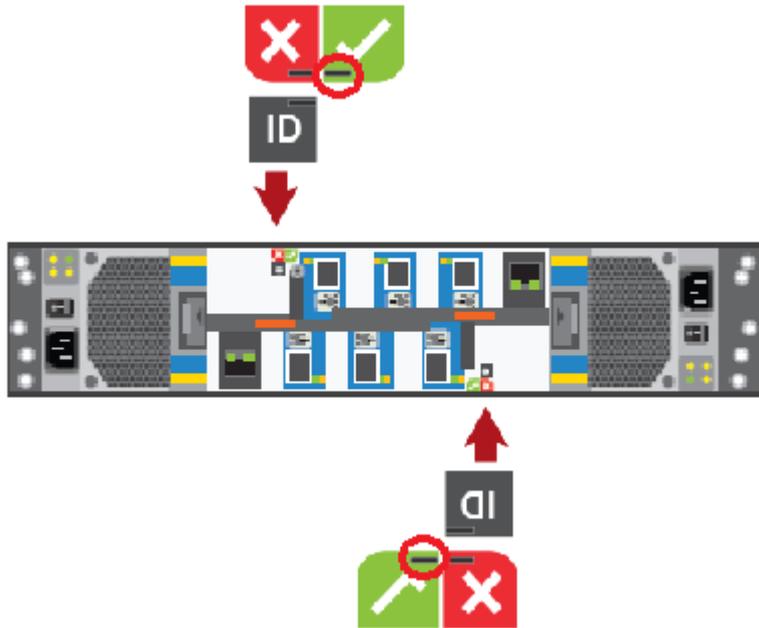
- 3 Verify that the power LED on each power module is green.



The LED icons are explained in the following table.

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

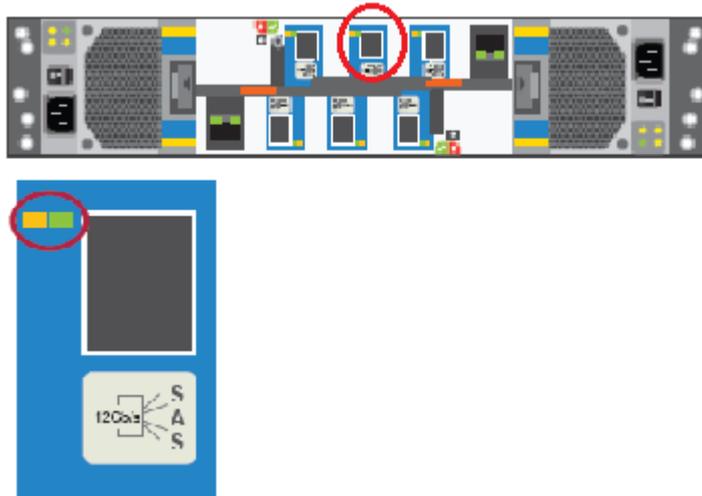
- 4 Locate the LEDs on each I/O module canister.



LED indications are as follows.

- The LED in the red area with the white X-mark indicates an I/O module canister fault when the LED is amber.
- 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 farthest from each SAS port.

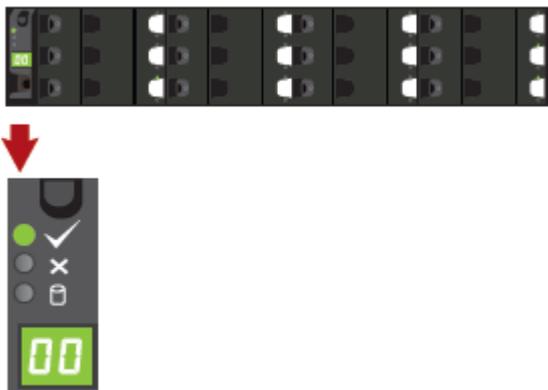
The Activity LED is closest to each SAS port.

The following table describes the SAS port LEDs. 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.

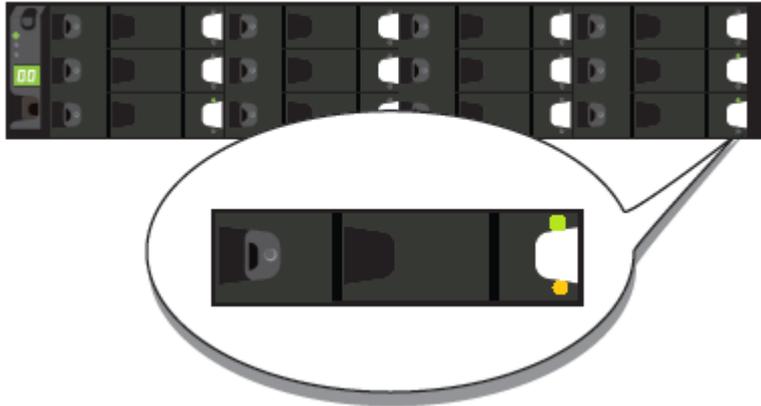
6 Move to the front of the storage shelf.

- 7 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 ID readout is 00. You are not required to change this number.

- 8 Check the LEDs on each disk drive carrier.



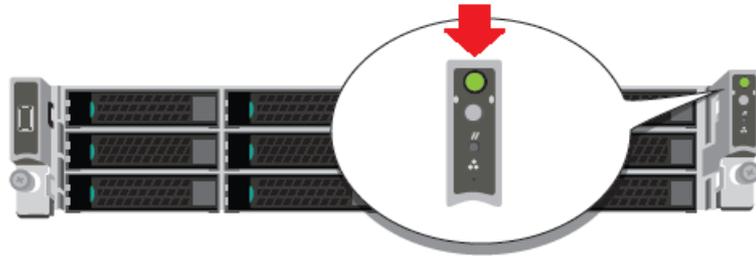
The following table describes the disk drive carrier LEDs. The combination of both LEDs provides the status.

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.

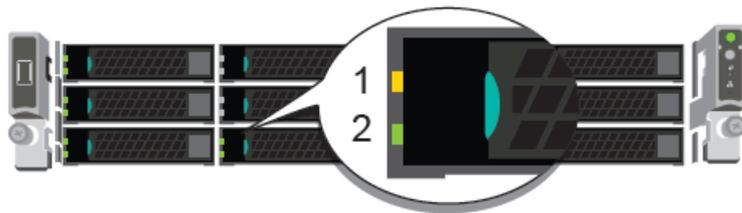
- 9 Repeat these steps for each storage shelf. Let each shelf initialize before you turn on the next shelf. Initialization should take 2 minutes to 3 minutes.
- 10 When all of the storage shelves are operational, turn on the appliance.

To turn on the appliance

- 1 Verify that all connected storage shelves function correctly. Use the LED information in the procedure that explains how to turn on the storage shelves.
- 2 On the front, right, side of the appliance press the Power button.



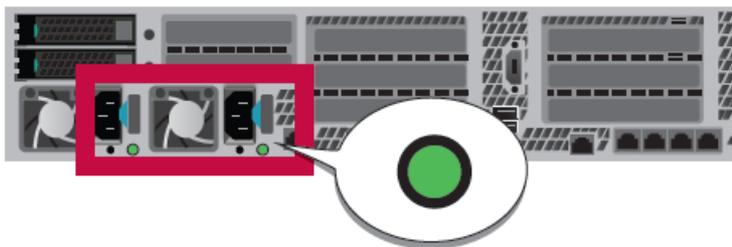
- 3 Verify that the bottom LED in all 12 disk drive slots are green.



The following table provides details of the appliance disk drive LEDs.

LED number, name, and location	States	Description
1, Status LED, top	Off	No disk fault
	Solid amber	Disk fault
	Blinking amber	A RAID rebuild is in progress
2, Activity LED, bottom	Off	Power is on and the disk has spun down
	Solid green	Power is on but there is no disk activity
	Blinking green	Power is on and the disk is spinning up
	Blinks green occasionally	Commands are processing

- 4 On the bottom, left, rear of the appliance, verify that the LED on each power supply is green.



- 5 Proceed to the next section to configure remote management.

124 | Adding one or more storage shelves to an operating 4TB appliance that does not have any storage shelves
Turning on the hardware and verifying operation

Adding storage shelves to an operating 4TB appliance that has at least one storage shelf attached

This appendix includes the following topics:

- Overview
- Additional storage shelf scenarios for a 4TB appliance
- Installing storage shelves
- Recabling

Overview

A NetBackup 5240 4TB Appliance operates with up to four external storage shelves. If your 4TB appliance has at least one storage shelf that is connected and running properly you can add more shelves for a total of four shelves.

Adding storage shelves to a 4TB appliance that already has storage shelves differs from the process of adding shelves to an appliance that has zero shelves. An appliance with an existing shelf already includes sufficient components to support more storage shelves. The following tasks are not required.

- You do not need to turn off the appliance or any existing storage shelves.
- You do not need to open the appliance chassis and install additional components.
- You do not need to remove the appliance from the rack.

Additional storage shelf scenarios for a 4TB appliance

You can have up to four storage shelves with the NetBackup 5240 4TB Appliance. You may already have one, two, three, or four storage shelves connected to your appliance. The following options are available.

- If you already have one storage shelf you can add one, two, or three shelves.
- If you already have two storage shelves you can add one or two shelves.
- If you already have three storage shelves you can add one shelf.

If you already have four storage shelves you cannot add any more shelves at this time.

Installing storage shelves

The installation of storage shelves in a rack does not differ from other installation scenarios. Refer to the following sections for detailed instructions. Read all of the information before starting. Perform the tasks in the order that is provided.

Storage shelf rack requirements

Determining rack locations

Installing the storage shelf rails

Installing the storage shelf or shelves into a rack

Understanding appliance and storage shelf connections

Recabling

When one or more storage shelves are added to an appliance that already has at least one storage shelf you need to reroute one existing cable connection. You also need to install the new cables that ship with the additional storage shelf or shelves. Each storage shelf ships with two 1-meter SAS-3 cables.

The following procedures provide instructions to add storage shelves to an appliance that already has one, two, or three existing shelves.

See “To connect additional shelves to a 4TB appliance that already has one operating shelf” on page 128.

See “To connect additional shelves to an appliance that already has two operating shelves” on page 132.

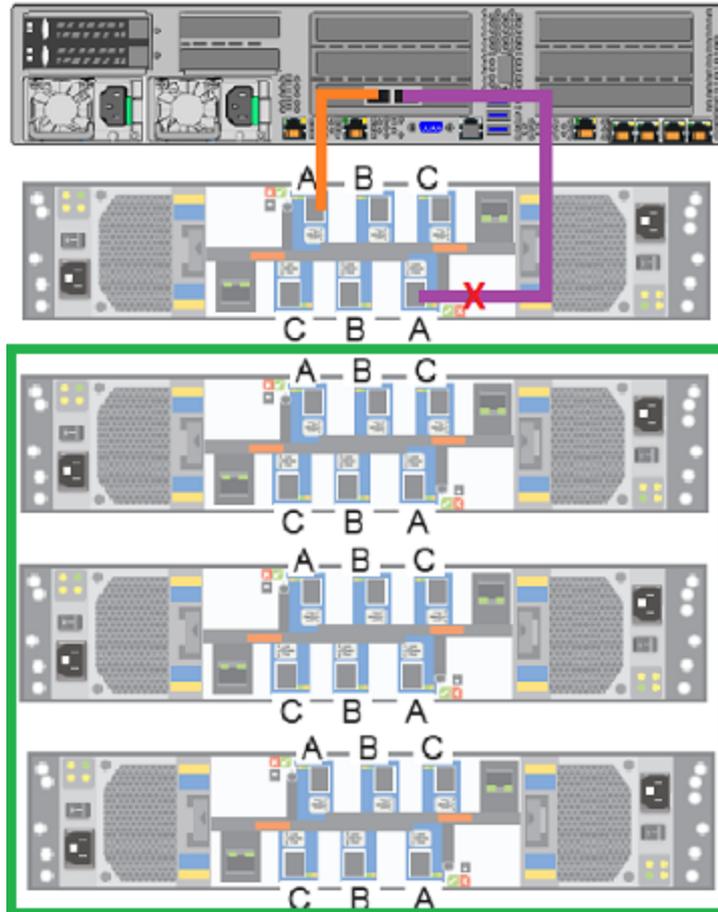
See “To connect a storage shelf to an appliance that already has three storage shelves” on page 136.

Note: The cables in the following diagrams are shown in different colors for demonstration purposes only. The actual cables are black.

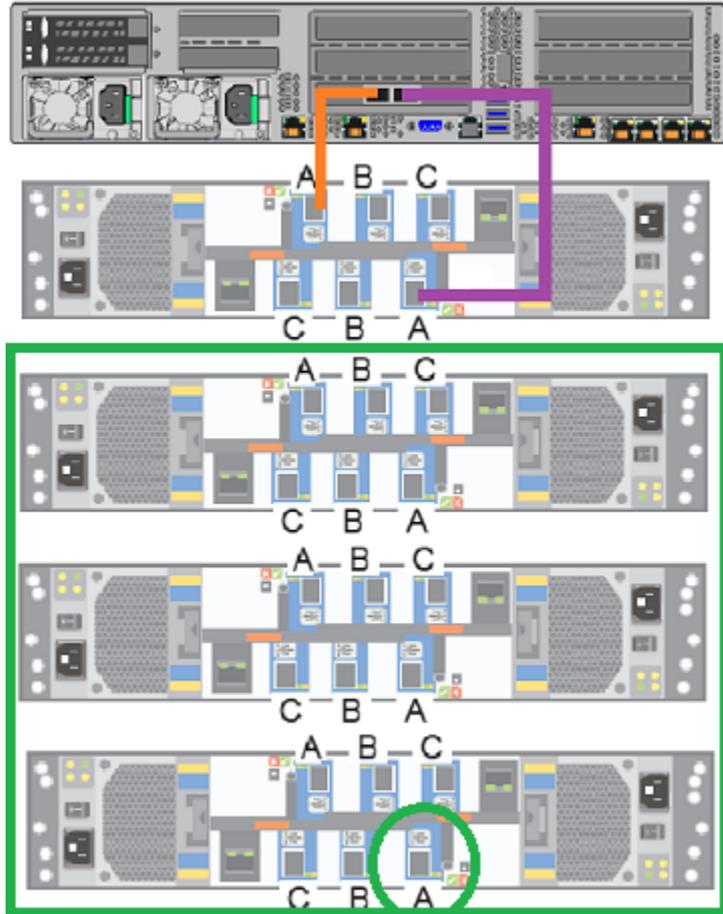
A green box outlines the storage shelves that are added to the existing devices.

To connect additional shelves to a 4TB appliance that already has one operating shelf

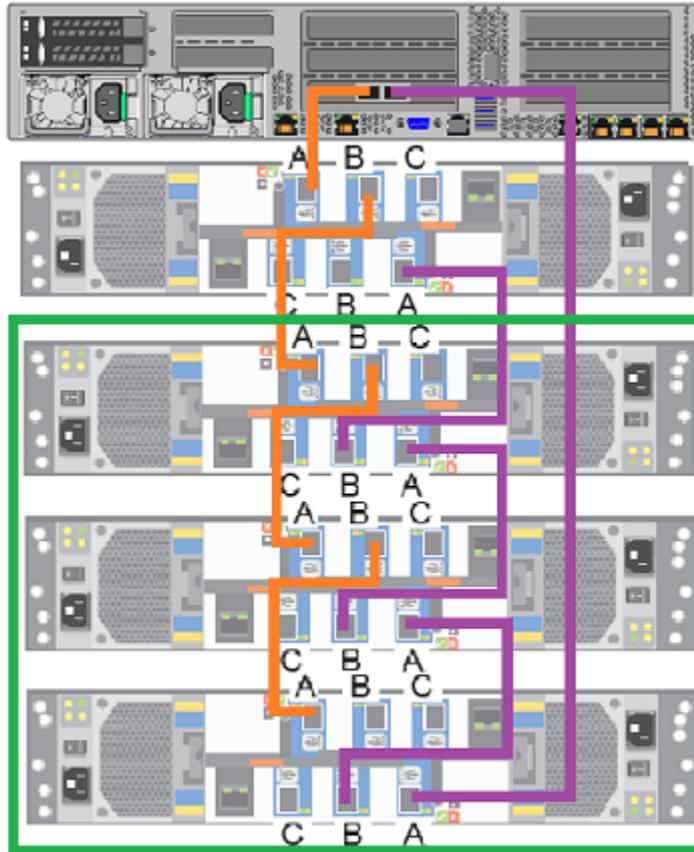
- 1 Remove the connector from the port that is marked with a red X.



- 2 Reconnect the cable to the port that is marked with a green circle.



- 3 Connect the two new SAS-3 cables that ship with each storage shelf, as shown. If you want to see more cabling details refer to the following section.
Connecting a 4TB appliance to more than one storage shelf



- 4 Connect power cords between the new storage shelves and separate Power Distribution Units (PCUs) in the rack.
- 5 Turn on the storage shelf that is farthest from the appliance. Let the shelf initialize for a few minutes.

6 Turn on the other storage shelves, in sequence. Do not turn on all of the shelves at once.

7 Verify that the new shelves function correctly.

Refer to the following section for details.

Turning on the hardware and verifying operation

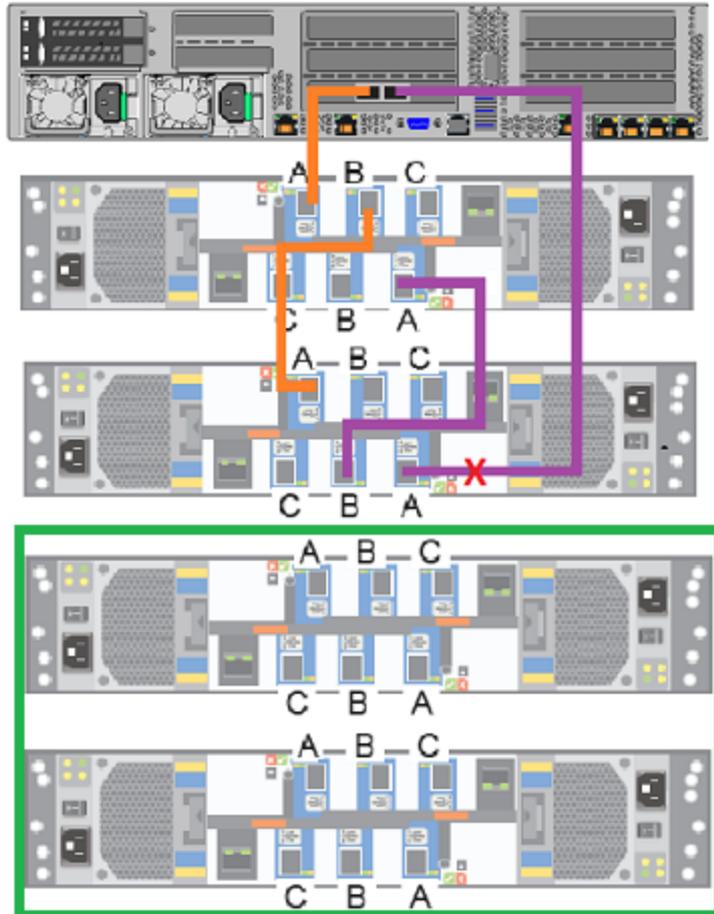
Refer to one of the following sections to add the additional disk space.

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

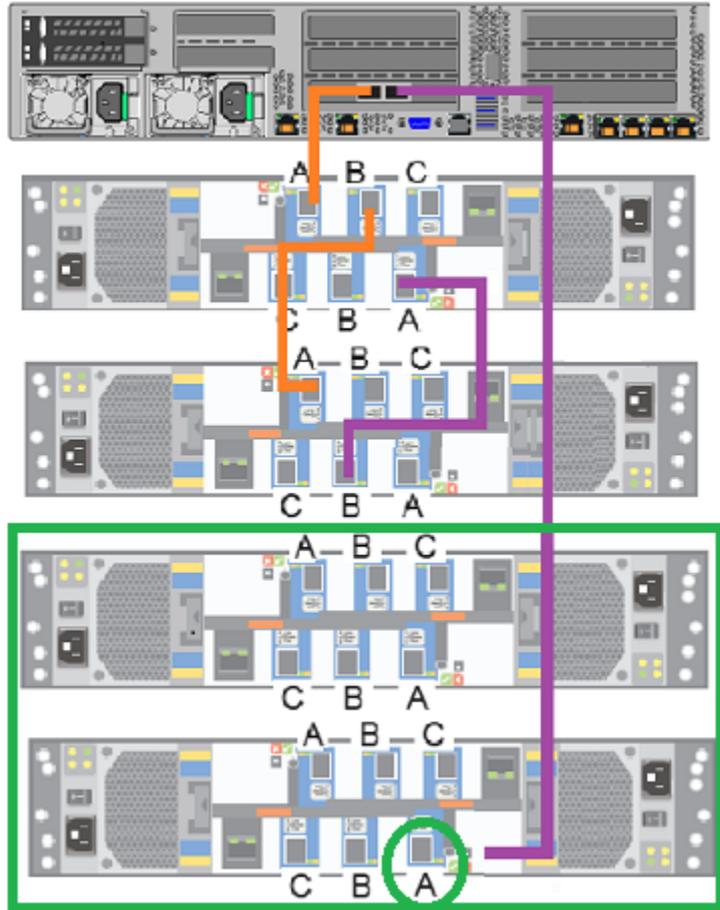
Adding the disk space of additional storage shelves from the NetBackup Appliance Shell Menu.

To connect additional shelves to an appliance that already has two operating shelves

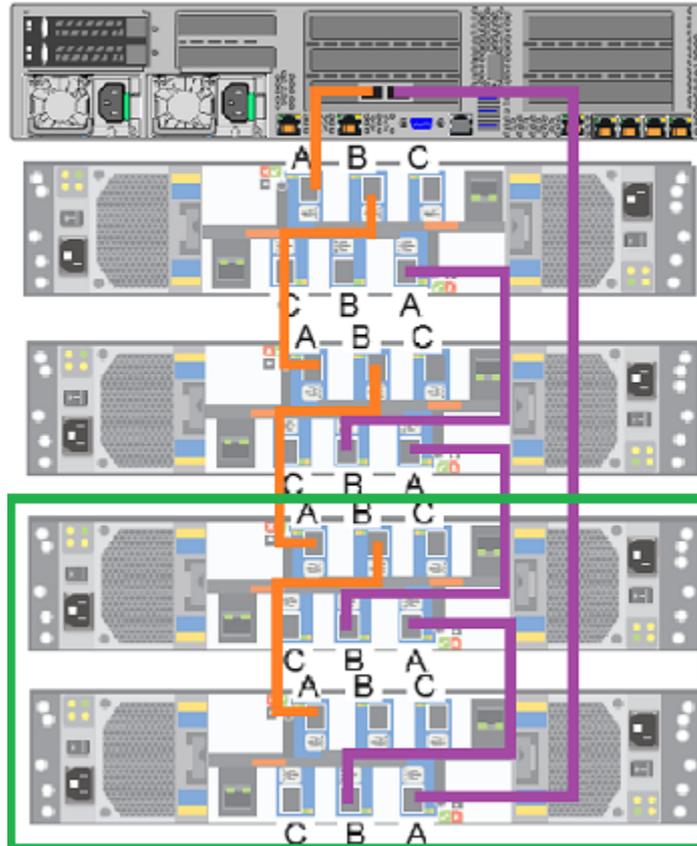
- 1 Remove the connector from the port that is marked with a red X.



- 2 Reconnect the cable to the port that is marked with a green circle.



- 3 Connect the two new SAS-3 cables that ship with each storage shelf, as shown. If you want to see more cabling details refer to the following section.
Connecting a 4TB appliance to more than one storage shelf



- 4 Connect power cords between the new storage shelves and separate Power Distribution Units (PCUs) in the rack.
- 5 Turn on the storage shelf that is farthest from the appliance. Let the shelf initialize for a few minutes.

6 Turn on the other storage shelves, in sequence. Do not turn on all of the shelves at once.

7 Verify that the new shelves function correctly.

Refer to the following section for details.

Turning on the hardware and verifying operation

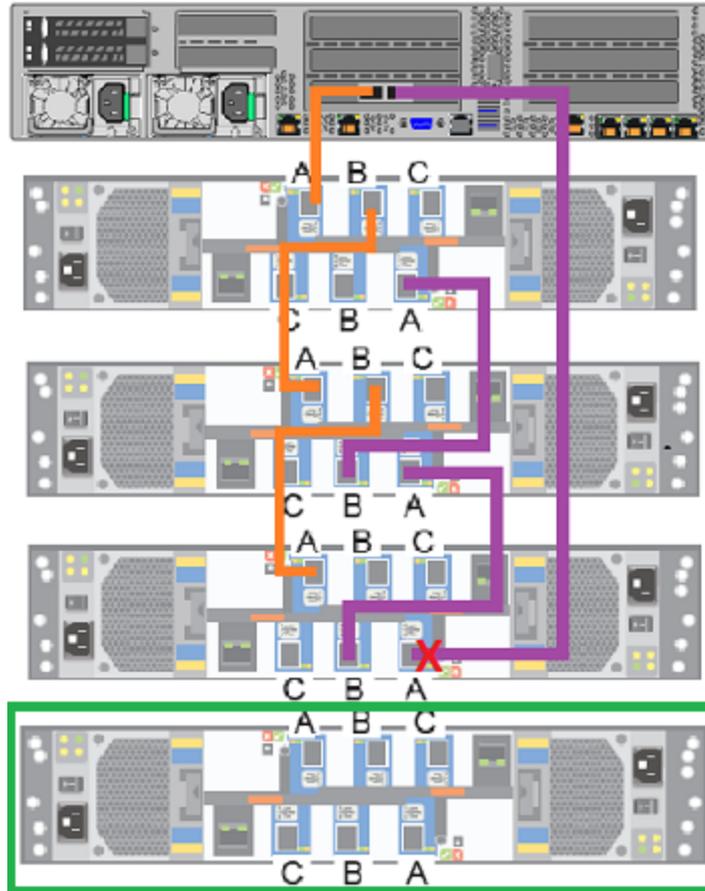
Refer to one of the following sections to add the additional disk space.

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

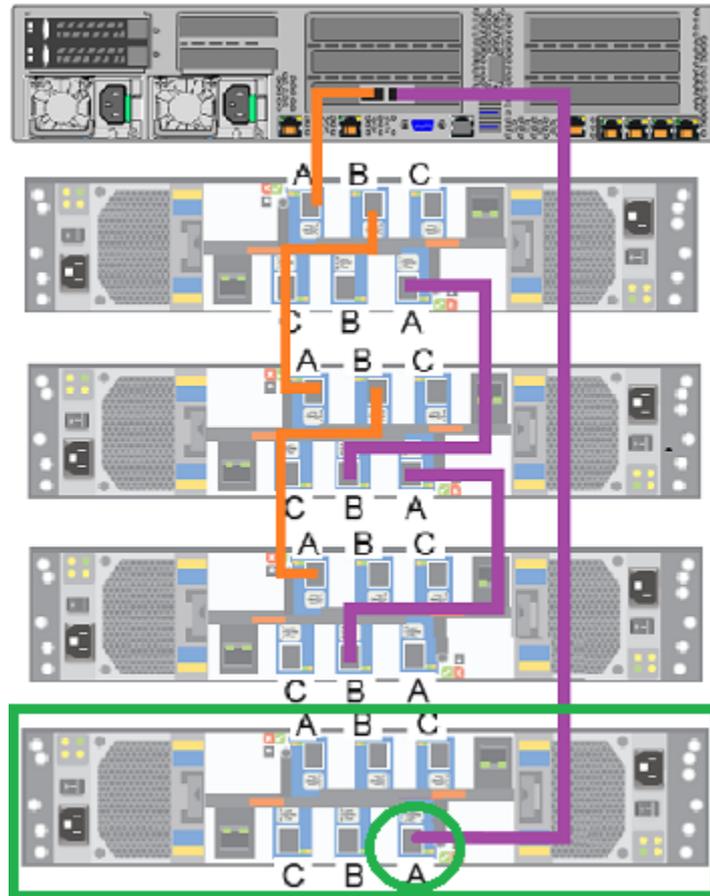
Adding the disk space of additional storage shelves from the NetBackup Appliance Shell Menu.

To connect a storage shelf to an appliance that already has three storage shelves

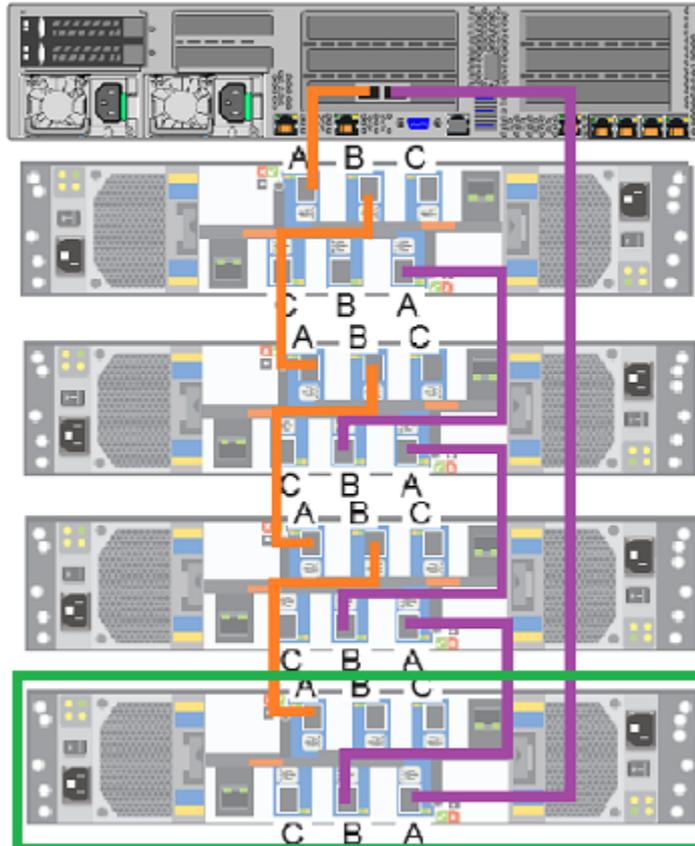
- 1 Remove the connector from the port that is marked with a red X.



- 2 Reconnect the cable to the port that is marked with a green circle.



- 3 Connect the two new SAS-3 cables that ship with each storage shelf, as shown.
If you want to see more cabling details refer to the following section.
Connecting a 4TB appliance to more than one storage shelf



- 4 Connect power cords between the new storage shelf and separate Power Distribution Units (PCUs) in the rack.
- 5 Turn on the new storage shelf. Let the shelf initialize for a few minutes.
- 6 Verify that the new shelf functions correctly.
Refer to the following section for details.
Turning on the hardware and verifying operation
Refer to one of the following sections to add the additional disk space.

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

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

140 | Adding storage shelves to an operating 4TB appliance that has at least one storage shelf attached
Recabling

Adding the disk space of additional storage shelves

This appendix includes the following topics:

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

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.

- 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.

Index

A

- add disk space of additional storage shelf
 - from NetBackup Appliance Shell Menu 142
 - from NetBackup Appliance Web Console 141
- airflow 19
- appliance
 - cabling
 - more than one storage shelf 39
 - network ports 47
 - one storage shelf 37
 - power cords 48
 - disk drive slots 8
 - eth0/NIC1 IP address 48
 - ethernet ports, bonding 48
 - height 17, 26
 - LEDs
 - control panel 8
 - disk drives 56
 - power supplies 57
 - RAID ports 35
 - rails
 - attaching inner rails 31
 - blue latch 34
 - extending intermediate section 32
 - front 27
 - rear 28
 - rear panel 10
 - remote management port IP address 57
 - SAS ports, blue clip orientation 36
 - shipping container contents 16

B

- best practices
 - heat dissipation 19
 - internal chassis access 69
 - rack installation 18

C

- cabling
 - scheme 13

- cabling (*continued*)
 - verifying SAS-3 length 19
- configure
 - IPMI 57

D

- documentation 14

H

- heat dissipation 19

I

- IP address
 - eth0/NIC1 port 48
 - remote management port 57
- IPMI configuration 57
 - about 13
 - prerequisites 20
 - with laptop 60

O

- Open Me First box 16–17

R

- rack cabinet requirements 15
- rack templates 18

S

- SAS-3 cables
 - blue clip orientation 36
 - description 34
 - using 19
- storage shelf
 - control panel 11
 - disk drive
 - lock 11
 - slots 10
 - height 17

storage shelf *(continued)*

LEDs

disk drive carriers 55

I/O modules 52

power 54

power module 51

SAS ports 53

rails 24

rear panel 12

SAS-3 ports

blue clip orientation 36

location 35

shipping container contents 16

T

turning on hardware

appliance power button 56

sequence 49

storage shelf switches 50