NEXSAN
A StorCentric Company

Nexsan BEAST Storage Systems

Installation Guide

Part Number: P0450131, Rev. B

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United Kingdom patents GB2296798B, GB2297636B, GB2466535B, GB2467622B, GB2467404B

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Use and limitations of this document

Nexsan reserves the right to make changes to this manual, as well as the equipment and software described in this manual, at any time without notice. This manual may contain links to Web sites that were current at the time of publication, but have since been moved or become inactive. It may also contain links to sites owned and operated by third parties. Nexsan is not responsible for the content of any such third-party site.

Contents

About this manual

This installation guide provides information and steps for performing the physical installation of the Nexsan BEASTBT60 Storage Systems and the Nexsan BEASTBT60X Storage Expansions.

Note While Nexsan makes every effort to ensure the accuracy of technical documentation, screen images and procedures may change after publication. In case of discrepancy, please check for the latest updates on the E-Series and BEAST Documents and Downloads page. Also, refer to the latest Release Notes.

Conventions

Here is a list of text conventions used in this document:

Convention	Description
underlined blue	Cross-references, hyperlinks, URLs, and email addresses.
boldface	Labels on the physical Nexsan Storage System or interactive items in the graphical user interface (GUI).
italics	System messages and non-interactive items in the GUI. References to software user guides.
`monospace`	Command-line interface (CLI) text or text that refers to file or directory names.
`monospace bold`	Text strings that must be entered by the user in the CLI or in text fields in the GUI.

Notes, tips, cautions, and warnings

Note Notes contain important information, present alternative procedures, or call attention to certain items.

Tip Tips contain handy information for end-users, such as other ways to perform an action.

CAUTION: In hardware manuals, cautions alert the user to items or situations which may cause damage to the Nexsan Storage System or result in mild injury to the user, or both. In software manuals, cautions alerts the user to situations which may cause data corruption or data loss.

WARNING: Warnings alert the user to items or situations which may result in severe injury or death to the user.

Contacting Nexsan

For questions about Nexsan products, please visit the Nexsan support Web page, and the E-Series and BEAST Documents and Downloads page. If you are unable to find the answer to your question there, please see our contact information below.

Service and support

Nexsan's Technical Services Group provides worldwide assistance with installation, configuration, software support, warranty, and repair for all Nexsan products. A variety of service and support programs are available to provide you with the level of coverage and availability your operation requires.

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E-Series and BEAST support:

https://helper.nexsansupport.com/esr_support

Contact:

https://helper.nexsansupport.com/contact

Related Documents

The following Nexsan product manuals contain related information:

- *Nexsan BEAST BT60 and BT60X Storage Systems FRU Removal and Replacement Guide*
- *Nexsan High-Density Storage User Guide*
- *Nexsan Snapshots and Replication User Guide*
- *Nexsan Multipathing Best Practices Guide*

Safety notices

This guide covers the Nexsan BEAST Storage Systems only. Refer to the relevant product manuals for information on other Nexsan Storage Systems or Storage Expansions and other Nexsan products mentioned in this guide.

Always observe the following precautions to reduce the risk of injury and equipment damage:

WARNING: There is a risk of ELECTRIC SHOCK if Nexsan BEAST components are removed or tampered with when a Nexsan Storage System power is on. Only a trained operator may remove certain FRUs. The Nexsan BEAST Storage System include the following FRUs:

- Power Supply modules
- RAID Controller and Expansion modules
- Disk drives
- Fan modules

- Computer components and disk drives are sensitive to static discharge. Take precautions to discharge any electrostatic charge from your person before and while handling components with your hands or any tools. Use an anti-static wrist-strap.
- Ensure correct lifting methods are used when removing the storage system from its packaging and positioning it into its required location. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- When removing the storage system from the packaging, DO NOT lift the enclosure by any plastic parts or module handles on the chassis. Doing so may cause damage to the chassis or to internal components, or both. Lift the enclosure ONLY by the bottom edges of the chassis, using safe lifting practices.
- The storage system should only be installed in a clean, dry environment. The operating temperature is 5º to 35º C (41º to 95º F), with operating relative humidity at 20 to 80%, non-condensing.
- Do not install the storage system in an enclosed cabinet or other small area without ventilation.
- When installing the storage system as a rack-mounted component, ensure that all Nexsan-supplied mounting fixtures are secure. All bolts and screws should be fully tightened. Failure to comply with this may result in the storage system not being fully supported in the rack and could lead to the product falling from the rack, causing personal injury or damage to other rack components.
- Ensure that the rack is sufficiently stable by having wall anchors and/or stabilizing legs, and that the floor supporting the rack has sufficient strength for the overall weight loading.
- The cordset specification for the Nexsan BEAST in North America is USA IEC C13 to IEC C14, rated 250V/15A. When applying power to the storage system, use ONLY the IEC power cords originally supplied with it. Do NOT use other power cords, even if they appear identical to the supplied cords.
- Only a fully-trained Service Engineer is authorized to disassemble any other part of the storage system, and then only when the storage system is powered off.
- The Nexsan BEAST Storage System has multiple power connections; as a result, you must remove all power leads to completely remove power from the storage system.
- The Nexsan BEAST Storage System does not have a power switch. Do NOT attach the power cords until the storage system is fully installed, with all disk drives in place.

Revision history

This section lists updates and new material added to the Nexsan BEAST *Installation Guide*.

P450131 Rev. B, March 2022

Updated for technical accuracy, applied new Nexsan template and branding.

P0450131 Rev. A, June 2016

Changed to new part numbering system.

NXS-SSBT-IG Rev. 02, May 2016

Updated warnings and requirements for 110V operation.

NXS-SSBT-IG Rev. 01, November 2015

First release of the *Nexsan Nexsan BEAST BT60 and BT60X Installation Guide*.

Chapter 1

Overview

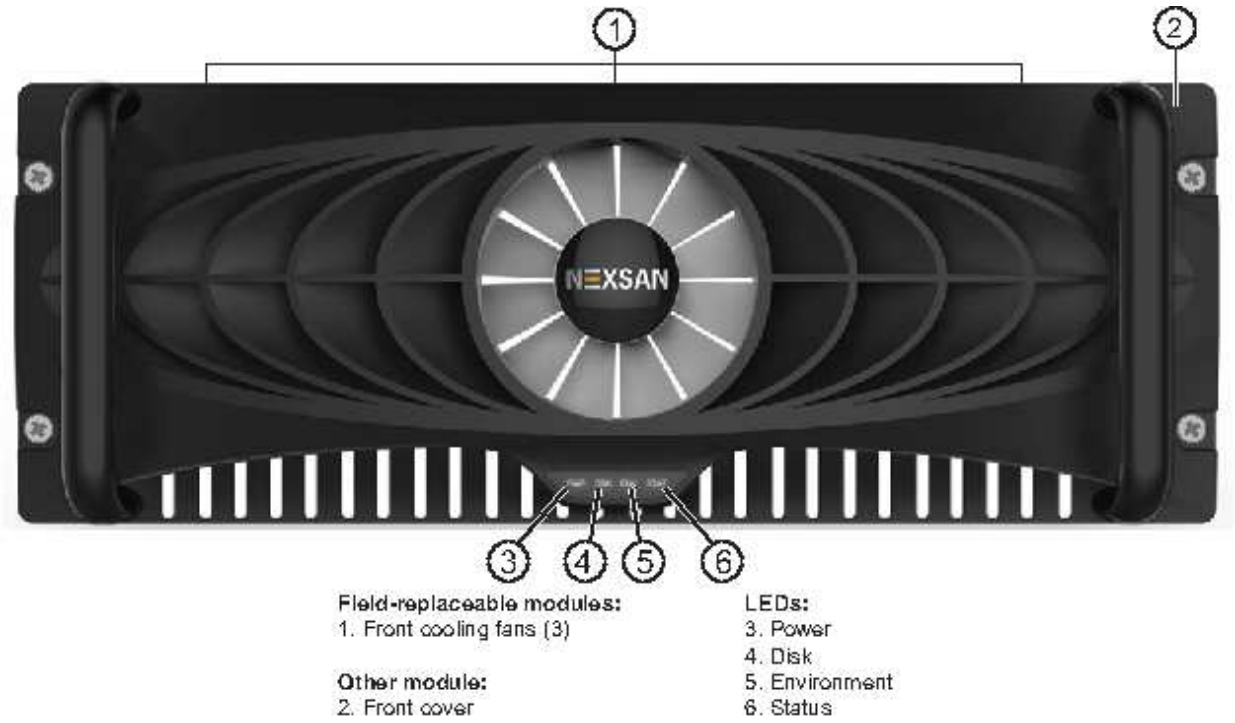
Nexsan BEAST BT60 and Nexsan BEAST BT60X 4U, rack-mountable Storage SystemsExpansions can hold up to 60 SATA data disks.

This chapter contains the following sections:

Front panel

Use this section to understand front panel components.

Figure 1-1: Nexsan BEAST front panel



Legend

Use the following tables as a legend for the front panel diagram.

Table 1-2: Field-replaceable modules

Number	Component	Description
1.	Front Cooling Fans Central Fan Tube	The front cover can be opened and the fans inside can be field-replaced in the event of failure (see the *Nexsan BEAST BT60 and BT60X FRU Removal and Replacement Guide*).

Table 1-3: Other modules

Number	Component	Description
2.	Active Drive Drawers ()	

Table 1-4: LEDs

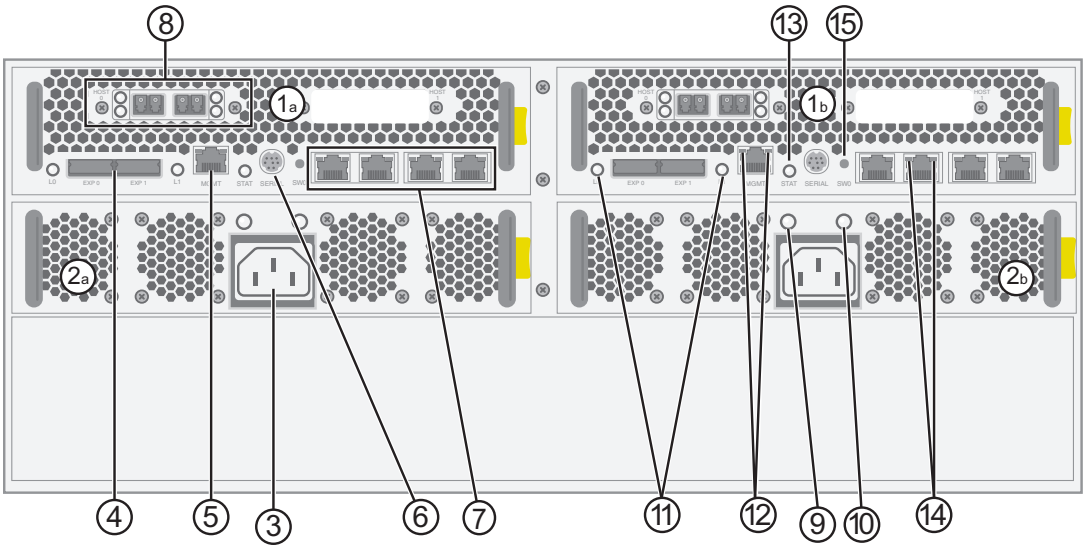
Number	Component	Description
3.	Power LED (**PWR**)	Indicates the status of power to the components in the system. Green indicates that all power levels are within specifications. Red indicates that one or more power levels are outside of specifications. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) displays details (see the *Nexsan High-Density Storage User Guide*). If the **PWR** LED on the left drive drawer is amber and all other front panel LEDs are off, this means that the Nexsan Storage System has been powered down through the GUI. It can be powered back up using the **SW0** switch (see Switches on page 9).
4.	Disk LED (**DSK**)	Indicates the status of the disk drives in the system. Green indicates that all disk drives are operating within specifications. Red indicates that one or more disk faults have been detected. The **Disk Drives** page (under *RAID Information*) in the graphical user interface (GUI) displays details (see the *Nexsan High-Density Storage User Guide*).
5.	Environment LED (**ENV**)	Indicates the temperature and fan status for the system. Green indicates that the system temperature is within specifications and that all fans are operating properly. Red indicates that the temperature exceeds specifications or that one or more fans are not operating properly. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) displays details (see the *Nexsan High-Density Storage User Guide*).
6.	Status LED (**STAT**)	Indicates overall status. Green indicates that the Nexsan Storage System is operating within specification. Red indicates a fault in the Nexsan Storage System, which could be any of the following: • A Power Supply Unit issue with the fan, temperature, or voltage • A RAID Controller issue with the temperature, voltage, battery, firmware, or other hardware The **Environmental Information** page (under *System Information*) in the graphical user interface) displays details (see the *Nexsan High-Density Storage User Guide*).

Number	Component	Description
7.	Drawer Lock:	Secures the drive drawer in place. When this lock is disengaged, the **STAT** LED turns amber.

Rear panel, BT60

Use this section to help identify rear panel components.

Figure 1-5: Nexsan BEAST BT60 Storage System rear panel



Field Replaceable Modules:
1a. RAID Controller 0
1b. RAID Controller 1
2a. Power Supply Unit (PSU) 0
2b. Power Supply Unit (PSU) 1

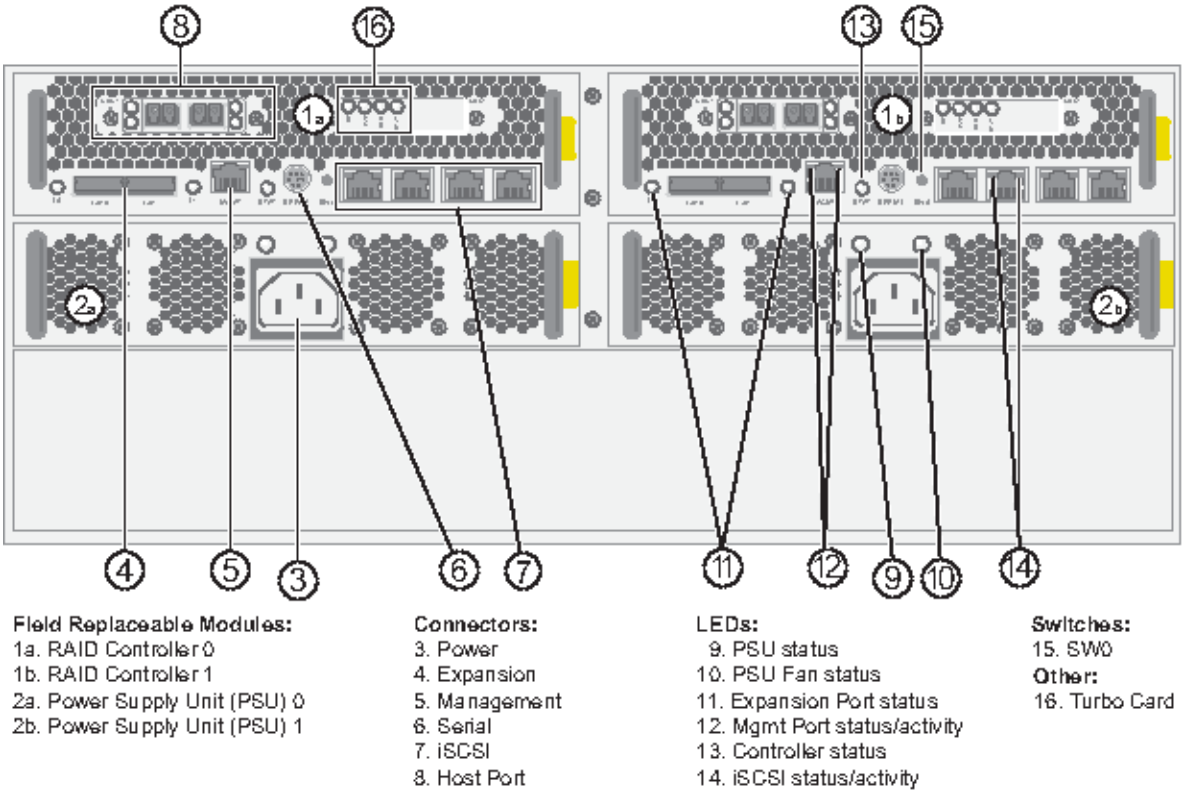
Connectors:
3. Power
4. Expansion
5. Management
6. Serial
7. iSCSI
8. Host Port

LEDs:
9. PSU status
10. PSU Fan status
11. Expansion Port status
12. Mgmt Port status/activity
13. Controller status
14. iSCSI status/activity

Switches:
15. SW0

1

Figure 1-6: Nexsan BEASTBT60 Storage System rear panel



Legend

Use the following tables as a legend for the Drive bay interior components diagram.

Field-replaceable modules

Table 1-7: Field-replaceable modules

Number	Component	Description
1.	RAID Controller(s) (1 or 2)	Each controller can be field-replaced in the event of failure (see the *Nexsan Nexsan BEAST FRU Removal and Replacement Guide*). RAID Controllers are designated Controller 0 (left) and Controller 1 (right) in the graphical user interface (GUI) (see the *Nexsan High-Density Storage User Guide*).
2.	Power Supply Units (PSUs) (2)	Each PSU can be field-replaced in the event of a PSU or PSU fan failure (see the *Nexsan Nexsan BEAST FRU Removal and Replacement Guide*).

Connectors

Table 1-8: Connectors

Number	Component	Description
3.	Power (2): 100–240VAC, 47–63Hz.	**CAUTION**: The cordset specification for the Nexsan BEAST in North America is IEC C13 to IEC C14 rated 250V/15A. When applying power to the system, use ONLY the IEC power cords originally supplied with the Nexsan Storage System. Do NOT use other power cords, even if they appear identical to the supplied cords.
4.	Two expansion ports (**EXP 0** and **EXP 1**) per RAID Controller:	Mini-SAS 26 pin I-Pass (8088) expansion connectors, each with four 6Gb/s SAS links.
5.	One Management port (**MGMT**) per RAID Controller:	Ethernet 10/100 dedicated management port (RJ45) for Web-based configuration.
6.	One **SERIAL** port per RAID Controller	Mini-DIN serial port for low-level reporting (Support use only)
7.	Four iSCSI ports (**0** through **3**) per RAID Controller	1Gb/s Ethernet ports (RJ45s) for iSCSI. If a Fibre Channel or 10Gb/s Ethernet card is installed, only ports **0** and **1** are usable.

Number	Component	Description
8.	Host ports	Depending on the RAID Controller configuration, the host port connectors are one of the following: • Two Fibre Channel ports (**0** and **1**) per HBA card; The upper LED is orange when there is a 2Gb/s connection and green when there is a 4Gb/s connection. The lower LED flashes yellow for data activity, but also lights up yellow when there is an 8Gb/s connection. When there is an 8Gb/s connection, the upper LED is off. During the power-up sequence, both Fibre Channel port LEDs are solid yellow. If both LEDs are flashing yellow, the Fibre Channel connection has been lost. • Two 1Gb iSCSI (1GbE) ports (0 and 1) per HBA card; 1Gb/s Ethernet optical SFPs or copper SFP sockets for iSCSI. The left LED illuminates green when the power is connected, and both LEDs flash green when there is activity. • Two 10Gb iSCSI (10GbE) ports (**0** and **1**) per HBA card: 10Gb/s Ethernet optical SFPs or copper SFP sockets for iSCSI. The bottom LED illuminates green when the power is connected, and the top LED flashes green when there is activity.

LEDs

Table 1-9: LEDs

Number	Component	Description
9.	PSU status LED	Indicates the status of power. Green indicates that the 12V and 3V3 outputs are within specification. Red indicates that one or the other, or both, are outside of specified limits. Orange indicates that the PSU is in standby mode. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) has more information. See the *Nexsan High-Density Storage User Guide*.
10.	PSU fan LED	Indicates the status of the PSU fans. Green indicates that all fans are operating within specifications. Red indicates that one or more fans are either running too slowly or have failed. When the PSU is in standby mode, this LED is off. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) has more information. See the *Nexsan High-Density Storage User Guide*
11.	Expansion port LEDs (**L0** and **L1**)	Indicate the connection status for each expansion port. Green indicates that the SAS cable is properly connected. Flashing amber indicates that the cable is improperly connected. If no cable is connected, this LED is off.

Number	Component	Description
12.	Management port LEDs (activity and speed)	The left LED flashes green when there is port activity. The right LED lights up green when there is a 100Mb/s connection. When there is only a 10Mb/s connection, the right LED is off.
13.	Controller status LED (**STAT**)	Indicates the status of the RAID Controller: • Solid blue indicates that the controller is operating within specifications and that there is no user data in the cache. • Solid green indicates that the controller is operating within specifications and that there is user data in the cache, which will be retained in flash memory upon power-down and then restored when the Nexsan Storage System is powered up again. • Flashing red (once per second) indicates that the controller is offline due to a fault being detected. • Flashing green (twice per second) indicates that the controller is operating in battery-backup mode and is backing up cached data to flash memory. This can take several minutes. • Alternating blue and red indicates that the controller is booting in Emergency mode (see Switches on the facing page).
14.	iSCSI port LEDs (activity and status)	The left LED illuminates green when the power is connected, and both LEDs flash green when there is activity.

Switches

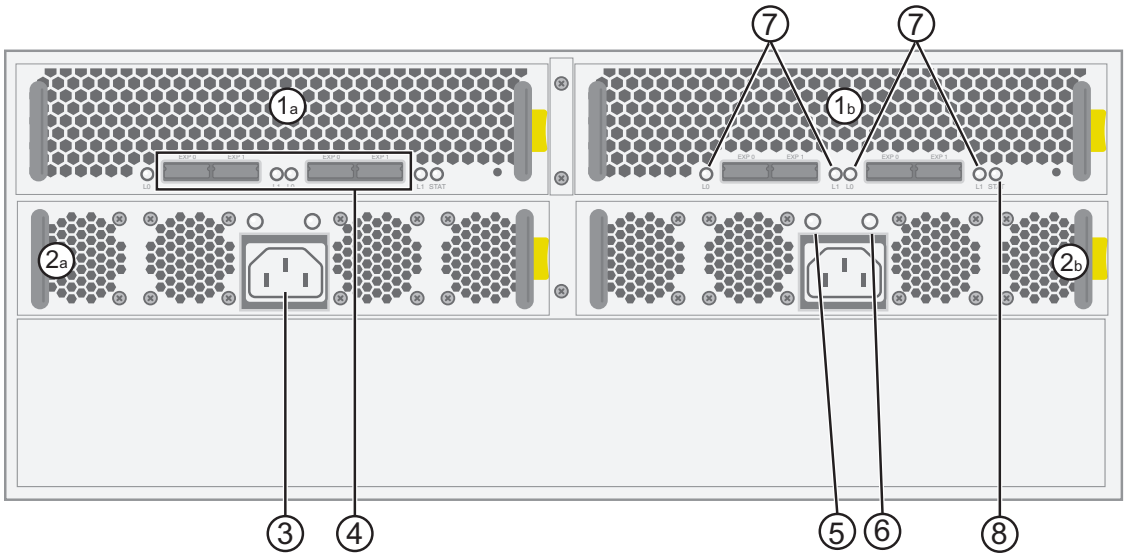
Table 1-10: Switches

15.	**SW0** Switch	This switch can be used to turn the RAID Controller off or on, boot the controller in Emergency mode, or silence an audible alarm. With the Nexsan Storage System powered on: • Briefly press the **SW0** switch to silence the audible alarm. This can also be done via the graphical user interface (GUI) (see the *Nexsan High-Density Storage User Guide*). • Press and hold both **SW0** switches for approximately 8 seconds to power down the RAID Controllers. If there is data in the cache, it will be stored in flash memory. This is the same as performing a System Shutdown via the graphical user interface (GUI) (see the *Nexsan High-Density Storage User Guide*). With the Nexsan Storage System powered off: • Press and hold the **SW0** switch on either RAID Controller for approximately 4 seconds to power up the Nexsan Storage System. Release the **SW0** switch to boot normally. • Continue pressing the **SW0** switch after the Nexsan Storage System powers up to put the RAID Controllers into Emergency mode (see the *Nexsan High-Density Storage User Guide*). Emergency mode is indicated by the controller status LED alternating between blue and red (see LEDs on page 7).

Rear panel, BT60X

Use this section to help identify rear panel components.

Figure 1-11: Nexsan BEAST BT60XStorage Expansion rear panel



Field Replaceable Modules:
1a. Expansion Controller 0
1b. Expansion Controller 1
2a. Power Supply Unit (PSU) 0
2b. Power Supply Unit (PSU) 1

Connectors:
3. Power
4. Expansion

LEDs:
5. PSU status
6. PSU Fan status
7. Expansion Port status
8. Expansion Controller status

Legend

Use the following tables as a legend for the Drive bay interior components diagram.

Field-replaceable modules

Table 1-12:

Number	Component	Description
1.	Expansion Controllers (2)	Each unit can be field-replaced in the event of failure (see the *Nexsan Nexsan BEAST BT60 and BT60X FRU Removal and Replacement Guide*).
2.	Power Supply Units (PSUs) (2)	Each unit can be field-replaced in the event of a PSU or PSU fan failure (see the *Nexsan Nexsan BEAST BT60 and BT60X FRU Removal and Replacement Guide*)

Connectors

Table 1-13: Connectors

Number	Component	Description
3.	Power (2): 100–240VAC, 47–63Hz.	**CAUTION**: The cordset specification for the Nexsan BEAST in North America is IEC C13 to IEC C14 rated 250V/15A. When applying power to the Nexsan Storage System, use ONLY the IEC power cords originally supplied with the storage system. Do NOT use other power cords, even if they appear identical to the supplied cords.
4.	Four expansion ports (**EXP IN 0** and **1**	**EXP OUT 0** and **1**) per Expansion Controller: Mini-SAS 26 pin I-Pass (8088) expansion connectors, each with four 6Gb/s SAS links.

LEDs

Table 1-14: LEDs

Number	Component	Description
5.	PSU status LED: Indicates the status of power	Green indicates that the 12V and 3V3 outputs are within specification. Red indicates that one or the other, or both, are outside of specified limits. Orange indicates that the PSU is in standby mode. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) has more information. See the *Nexsan High-Density Storage User Guide*.
6.	PSU fan LED: Indicates the status of the PSU fans	Green indicates that all fans are operating within specifications. Red indicates that one or more fans are either running too slowly or have failed. When the PSU is in standby mode, this LED is off. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) has more information. See the *Nexsan High-Density Storage User Guide*.
7.	Expansion port LEDs (**EXP IN L0** and **L1**,	**EXP OUT L0** and **L1**): Indicate the connection status for each expansion port. Green indicates that the SAS cable is properly connected. Flashing amber indicates that the cable is improperly connected. If no cable is connected, this LED is off.
8.	Controller status LED (**STAT**):	Indicates the status of the Expansion Controller: • Flashing green indicates that the controller is operating within specifications. • Flashing red indicates that the controller is restarting. • Solid red indicates that there is an issue with the Expansion Controller. The **Environmental Information** page (under *System Information*) in the graphical user interface (GUI) displays details (see the *Nexsan High-Density Storage User Guide*).

Drive bay interior

Use this section to understand Drive bay interior components.

Figure 1-15: BEAST drive bay interior

1. Disk Drives
2. Rear Fan Assemblies
3. Drive Rails
4. Drive Status LEDs

Legend

Use the following tables as a legend for the Drive bay interior components diagram.

Table 1-16: Field-replaceable modules

Number	Module	Description
1.	Disk Drives	Up to 60 3.5" disk drives. Disk drives can be field-replaced in the event of failure (see the *Nexsan Nexsan BEAST BT60 and BT60X FRU Removal and Replacement Guide*).
3.	Rear Fan Assembly	Dual-fan assemblies located at the rear of the drive bay. Can be field-replaced in the event of failure (see the *Nexsan Nexsan BEAST BT60 and BT60X FRU Removal and Replacement Guide*).

Physical characteristics

Use this section as a reference for the physical characteristics of Nexsan Storage Systems or Nexsan Storage Expansions.

Dimensions, Nexsan BEAST

Measurement	Value
Chassis height	4U: 176mm (6.93")
Chassis length	864mm (34.02")
Chassis length, including fascia and handles	916.5mm (36.08") (a 1,070mm rack is recommended)
Chassis width, body	441.5mm (17.38")
Chassis width, overall	482.6mm (19")
Storage System weight, no drives, controllers, or PSUs	30 kg (66 lbs.)
Storage System weight, no drives	39.4 kg (86.7 lbs.)
Storage System weight, with drives	93.4 kg (205.5 lbs.)
Rack mount kit length	660mm to 813mm (26" to 32")
Rack mount kit weight	3.5 kg (7.7 lbs.)
Cable management arm weight	0.5 kg (1.1 lbs.)

Power

- Two 1,600W load-sharing, hot-pluggable, redundant PSUs.
- Nominal input voltage is 100–240VAC, 47–63Hz. Cordset specification in North America is IEC C13 to IEC C14 rated 250V/15A.
- Typical power consumption is approximately 800W (3.6A). Peak current is up to 12A.

Cooling

- Front panel: Three 120mm 12V axial fans (life 40,000 hrs).
- Internal: Six double-gang 12V axial fans (life 40,000 hrs).
- PSUs: Four 12V axial fans (life 40,000 hrs) per PSU, for a total of eight.

Materials

- Chassis, external: Galvanized sheet steel
- Chassis, internal: Galvanized sheet steel divider plates and sub-assemblies
- Fascia: ABS (blend) Thermoplastic UL 94 V.0

Environment

- Ambient operating temperature: 5°C–35°C (41°F–95°F)

Chapter 2

Getting Started

This document is designed to enable the user to install and configure the Nexsan BEAST Storage System quickly and safely. Please read this document carefully and review all of the information in this section before installing the Nexsan Storage System.

This chapter contains the following sections:

2

Taking delivery of your Nexsan BEAST Storage System

Upon receipt of your Nexsan Storage System, inspect the packaging for damage that may have been sustained in transit. If there is visible damage on the packaging, contact your shipper before proceeding.

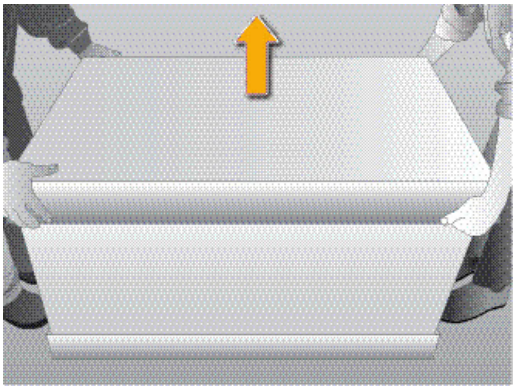
Unpack the Nexsan Storage System

Carefully unpack your Nexsan Storage System and inspect each item before installation.

To unpack the Nexsan Storage System:

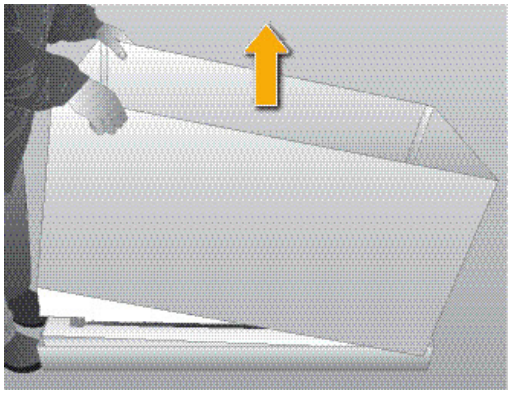
1. Carefully cut the straps holding the box closed and remove the outer lid.

Figure 2-1: Opening the outer box



2. Remove the outer packing sleeve.

Figure 2-2: Removing the outer packing sleeve



3. Open the accessory boxes and make sure that all expected contents are present.

   The accessory box should contain:

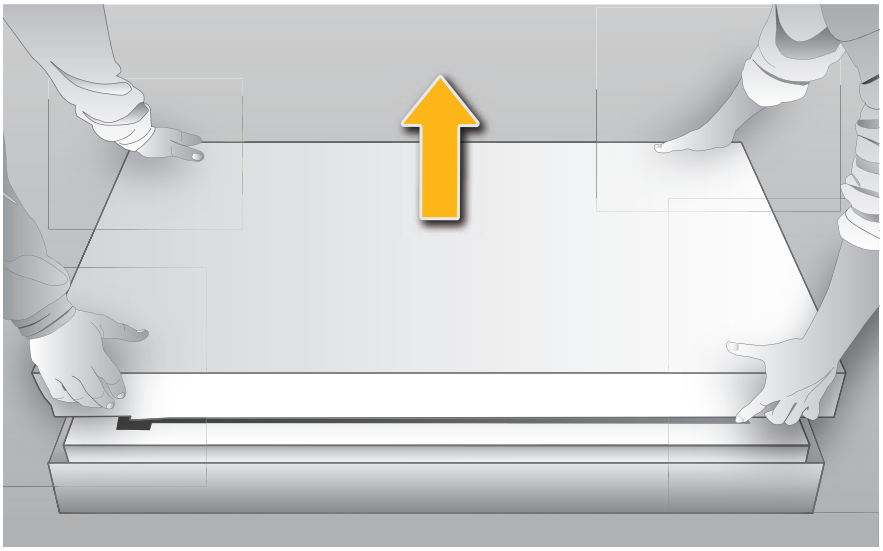
   - rack mounting hardware:
     - two (2) rail assemblies, one left and one right
     - one (1) cable management arm
     - four (4) stainless steel bolts for securing the front of each rack to the rail posts

- four (4) clip nuts and four (4) black bolts for securing the Nexsan BEAST Storage System to the rack
- five (5) hook-and-loop cable ties for securing cables in the cable management arm

- two (2) power cables
- disposable ESD strap
- (BT60 main Storage System only) one (1) serial cable per RAID Controller
- (BT60X Storage Expansion only) four (4) SAS cables
- any additional items that may have been ordered, such as Fibre Channel cables

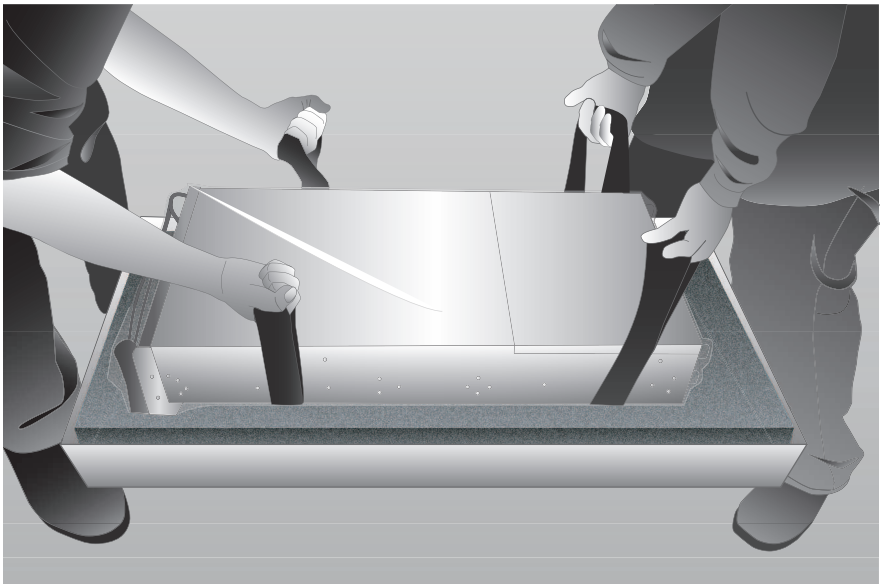
4. Set the accessory boxes aside.
5. Open the disk boxes and make sure that the proper number of disk drives is included.
6. Set the disk boxes aside.
7. Remove the foam lid covering the Nexsan BEAST Storage System.

Figure 2-3: Removing the foam lid



8. With the help of a second person, carefully lift the Nexsan BEAST enclosure out of the packaging using the lifting straps.

Figure 2-4: Removing the enclosure from the box



CAUTION: When removing the enclosure from the packaging, DO NOT lift the enclosure by any plastic parts or module handles on the chassis. Doing so may cause damage to the chassis or to internal components, or both. Lift the enclosure ONLY using the supplied lifting straps, using safe lifting practices.

Tip The packaging that the Nexsan BEAST ships in is reusable and should be retained for future re-shipment. Be sure to keep all packaging components.

Before installation

Required tools and equipment

To perform the installation, you will need the following tools and equipment:

- a suitable equipment rack (1,070mm deep recommended, see Physical characteristics on page 13) with sufficient load capacity to hold the Nexsan Storage System's weight

  Note The rails that ship with the Nexsan Storage System can accommodate a rack post depth of 660mm to 813mm (26" to 32").

- a suitable source of A/C power: 100–240VAC, 47–63Hz, 12A
- PH2 and PZ2 screwdrivers
- Ethernet cables of sufficient length to connect the **MGMT** port on each RAID controller to the local area network (LAN)

Prepare the site

Before installing the Nexsan Storage System, prepare the installation site and rack.

Note Always install the BT60X Storage Expansion in the same rack as the Nexsan Storage System to which it will be attached or in an immediately adjacent rack.

► **To prepare the site and rack for Nexsan Storage System installation:**

- Ensure that the ambient temperature at the installation site is between 5°C (41°F) and 35°C (95°F).
- Place the rack so that full, unimpeded air flow can enter the front of the Nexsan Storage System and exit the back of the Storage System.
- Ensure that the floor beneath the mounting rack has enough load-bearing capacity to support the rack and all mounted components.
- Fully stabilize the rack with wall anchors or stabilizing legs, or both, before mounting the Nexsan Storage System or any other components onto the rack.
- Ensure that the source of A/C power is near the rack and easily accessible.
- Ensure that the rack is properly grounded per the manufacturer's instructions and that proper ESD safeguards are in place.
- Ensure that the power drawn by Nexsan Storage Systems do not overload the available electrical supply (see Power on page 13). Cordset specification in North America is IEC C13 to IEC C14 rated 250V/15A.

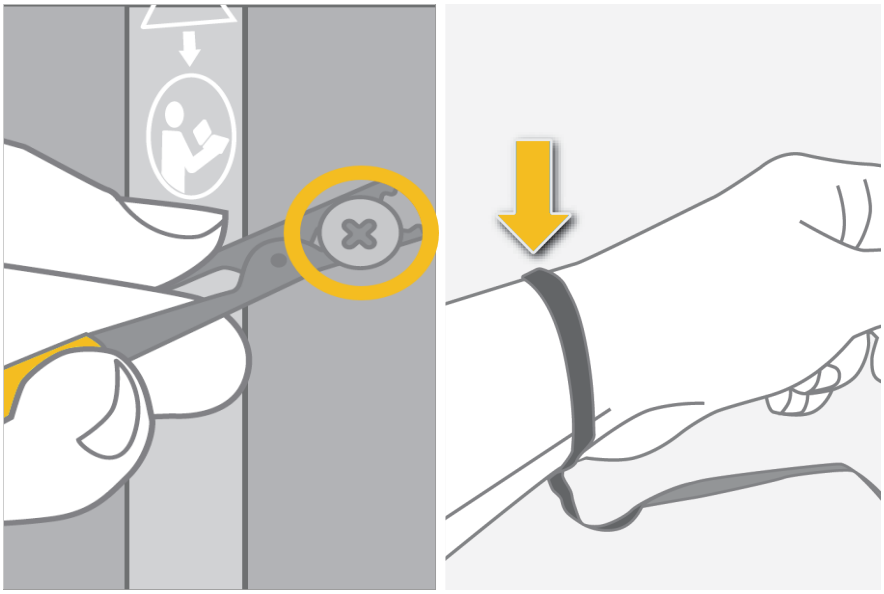
Take proper ESD precautions

CAUTION: Computer components and disk drives are sensitive to electrostatic discharge (ESD). Always ground any electrostatic charge from your person before touching components with your hands or with any tools. Always use an anti-static wrist strap (one ships with each storage system) while installing or performing maintenance on any Nexsan Storage System.

To protect the storage system from electrostatic discharge:

1. Ground any electrostatic charge from your person by touching a metal part of the rack or any properly grounded conductive object (such as the ground point at an anti-static workstation).
2. Attach the clip end of the anti-static wrist strap to the rack's ESD grounding pin or to any bare metal part of the rack (for a racked storage system) or to any proper grounding point (for an unracked storage system). Secure the loop end around your wrist.

Figure 2-5: Attaching and putting on the anti-static wrist strap



CAUTION: Do not attach the anti-static wrist strap to any powder-coated part of the equipment rack or storage system. The powder coating can interfere with the transmission of current, resulting in improper grounding which can allow a static charge to build.

3. When working on unracked storage systems or components, place the storage system or component on an anti-static surface.

Prepare the Nexsan BEAST Storage System

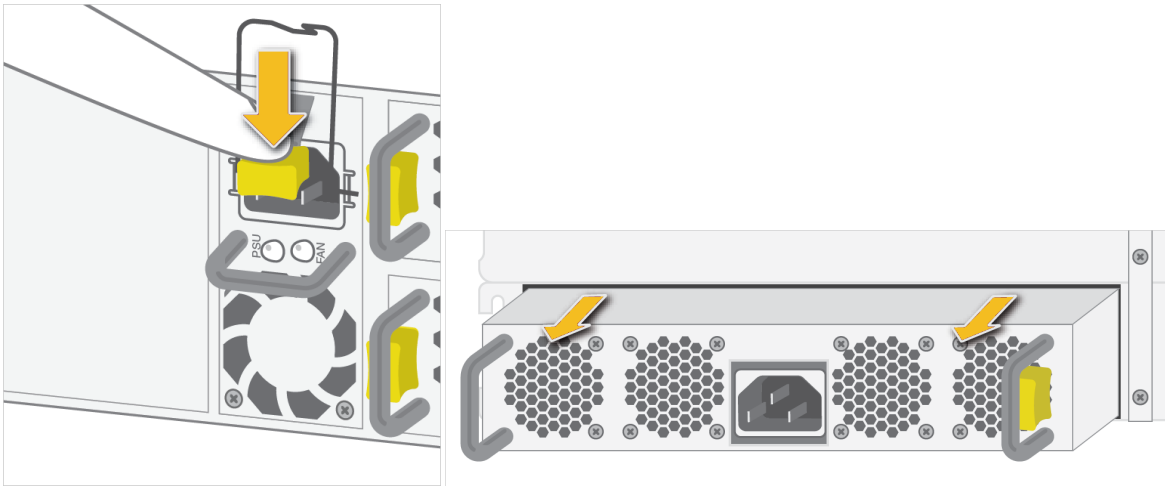
Before installation, prepare the Nexsan BEAST Storage System.

CAUTION: Computer components and disk drives are sensitive to electrostatic discharge (ESD). Always ground any electrostatic charge from your person before touching components with your hands or with any tools. Always use an anti-static wrist strap (one ships with each Nexsan Storage System) while installing or performing maintenance on any Nexsan Storage System. See Take proper ESD precautions on the previous page for detailed instructions.

To prepare the Nexsan BEAST Storage System for installation:

1. Ground yourself with the included anti-static wrist strap (see Take proper ESD precautions on the previous page).
2. Remove the two PSUs from the Nexsan Storage System. Press the spring lock tab inward, then carefully remove the PSU from the Nexsan Storage System. Support the weight of the PSU with your free hand while removing it.

Figure 2-6: Removing the PSU

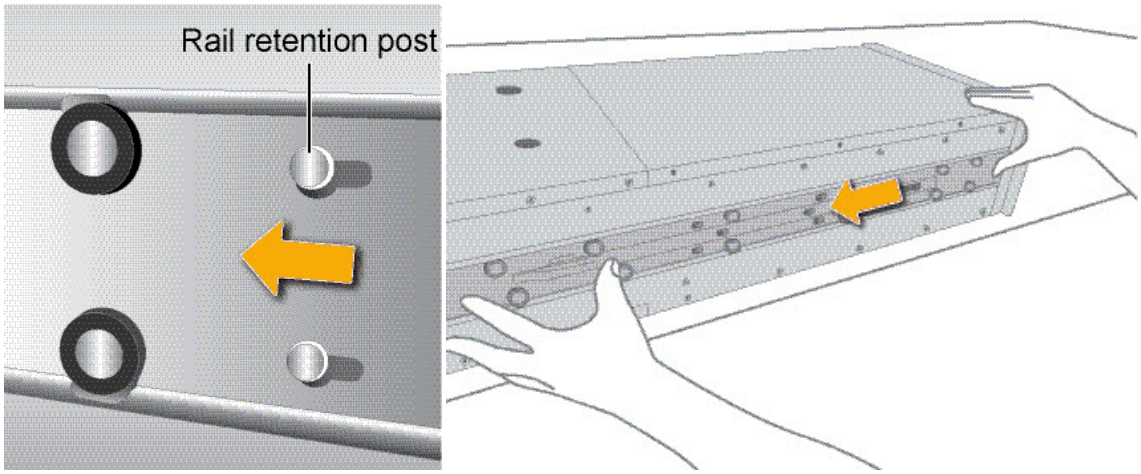


Set the PSUs aside.

3. Separate the inner and outer rails by extending them until the latches engage, sliding the rail latch tabs to disengage the latches, then pulling the two rails (inner and outer) apart.

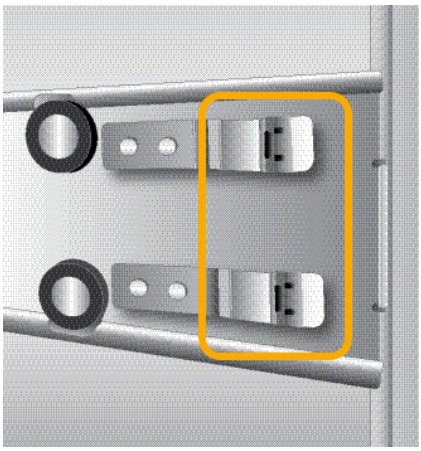
4. Attach the inner (chassis) rails to the sides of the Nexsan BEAST Storage System:
   a. Align the left rail over the chassis rail retention posts and slide it backward.

Figure 2-7: Attaching the inner rail



   b. Make certain that the retention clips are firmly attached to the forward retention posts.

Figure 2-8: Retention clips attached to rail retention posts



   c. Repeat for the right rail.

Note If you are installing more than one BEAST Storage System, keep each Nexsan Storage System's disk drives with the storage system they shipped with so as to avoid installing them into the wrong storage system (disks are pre-configured for the specific storage system at the factory).

Chapter 3

Installing the Nexsan BEAST Storage System

This chapter contains the following sections:

Prepare the rack and rails

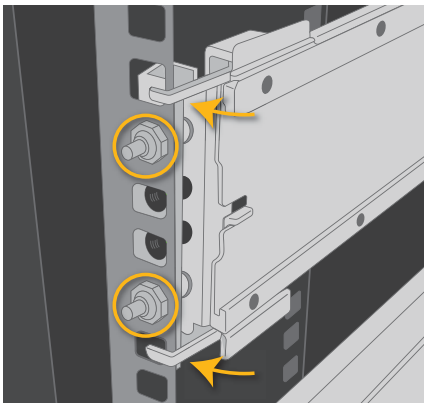
Notes:

- The Nexsan BEAST rack rails can be used in either a square-hole or a round-hole rack. There is no difference in the installation procedure between the two.
- The rails that ship with the Nexsan Storage System can accommodate a rack post depth of 660mm to 813mm (26" to 32").
- It is recommended that Nexsan BEAST Storage Systems be installed low in the rack. A Nexsan BEAST Storage System, when fully extended on its rails, can overbalance a rack if it is placed too high up.

To prepare the rack:

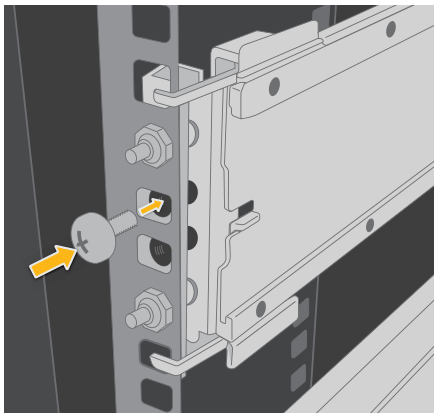
1. Attach each rail to the rack, front and rear:
   a. Align the front rack alignment posts on the each rail to the proper holes on the front of the rack, then clip the retention hooks around the rack post.

Figure 3-1: Clipping the left rail to the rack post, front



   b. Do the same for the back of each rail.
   c. Using the supplied bolts, bolt the front and back of each rail to the rack.

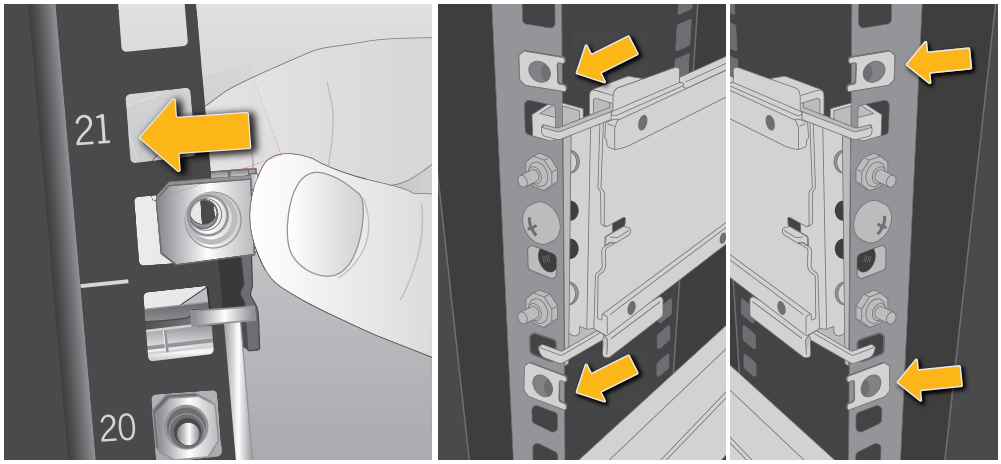
Figure 3-2: Bolting the left rail to the front rack post



Note The rails should be installed into the middle 2U of the 4U of rack space where you wish to install the BEAST. For example, if you want the BEAST to occupy U slots 18 through 21, install the rails into U slots 19 and 20.

2. On the front of the rack, attach the cage nuts above and below each rail.

Figure 3-3: Attaching cage nuts



The mounting rails are now ready to receive the Beast RAID Storage System.

Mount the Nexsan BEAST Storage System

CAUTION: Computer components and disk drives are sensitive to electrostatic discharge (ESD). Always ground any electrostatic charge from your person before touching components with your hands or with any tools. Always use an anti-static wrist strap (one ships with each Nexsan Storage System) while installing or performing maintenance on any Nexsan Storage System. See Take proper ESD precautions on page 20 for detailed instructions.

CAUTION: The Nexsan Storage System is heavy and requires two people to lift it and slide it onto the mounting rails. Do NOT attempt to mount it onto the mounting rails by yourself.

3

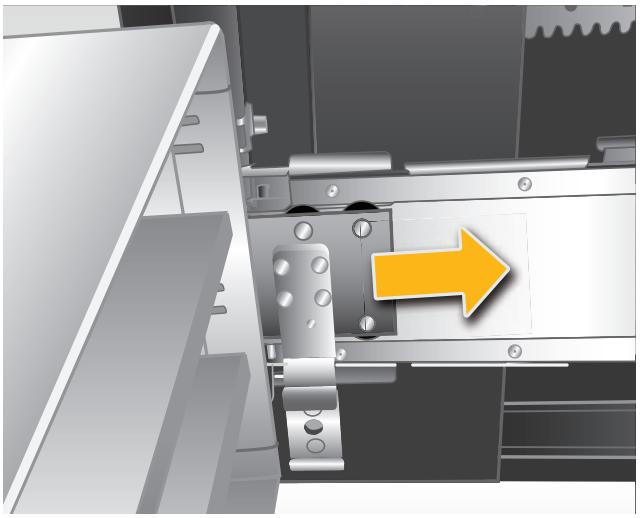
To mount the Nexsan Storage System on the mounting rails:

1. Ground any electrostatic charge from your person by touching a metal part of the rack. Both people lifting the Nexsan Storage System must do this.
2. Attach one end of the anti-static wrist strap to a bare metal part of the rack. Secure the other end around your wrist. Both people lifting the Nexsan Storage System must do this. See Take proper ESD precautions on page 20.

   Note Do not use the lifting straps for this procedure. The lifting straps should be removed from the bottom of the Nexsan Storage System before mounting the Nexsan Storage System on the rails.

3. With the help of a second person, carefully lift the Nexsan Storage System so that the inner rails on the chassis line up with the outer rails on the rack.

Figure 3-4: Lining up the inner and outer rails



CAUTION: Only support the Nexsan Storage System by placing hands under the metal chassis. Do NOT attempt to lift the Nexsan Storage System by any plastic parts or module handles.

4. Slide the chassis inward until the side rail latches click into place.
5. Pull the rail latch tab on each side of the Nexsan Storage System forward to disengage the rail latches, then slide the Nexsan Storage System the rest of the way into the rack.

Figure 3-5: Disengaging the side rail latches and sliding the Nexsan Storage System into the rack

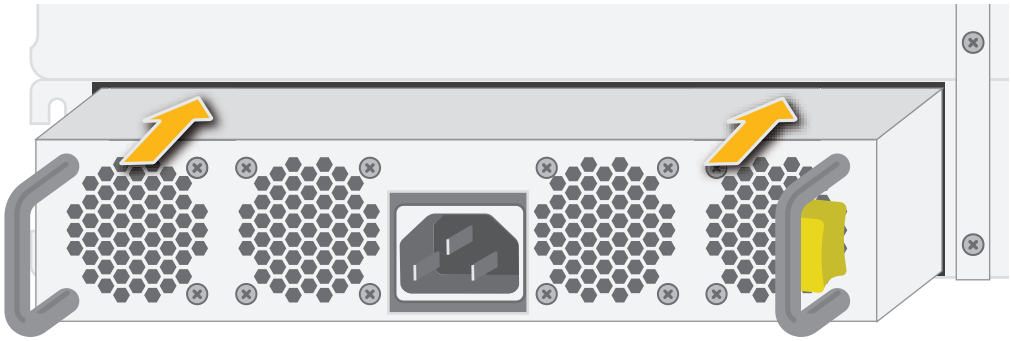
Restore the power supply units

CAUTION: Computer components and disk drives are sensitive to electrostatic discharge (ESD). Always ground any electrostatic charge from your person before touching components with your hands or with any tools. Always use an anti-static wrist strap (one ships with each Nexsan Storage System) while installing or performing maintenance on any Nexsan Storage System. See Take proper ESD precautions on page 20 for detailed instructions.

To insert the two PSUs into the back of the unit:

1. Make sure that the PSU is right side up. The spring lock tab should be on the right (see Front panel on page 2).
2. Insert the PSU into the slot and carefully slide it back until the spring lock tab clicks into place.

Figure 3-6: Sliding the PSU into place



3. Repeat steps 1 and 2 for the second PSU.

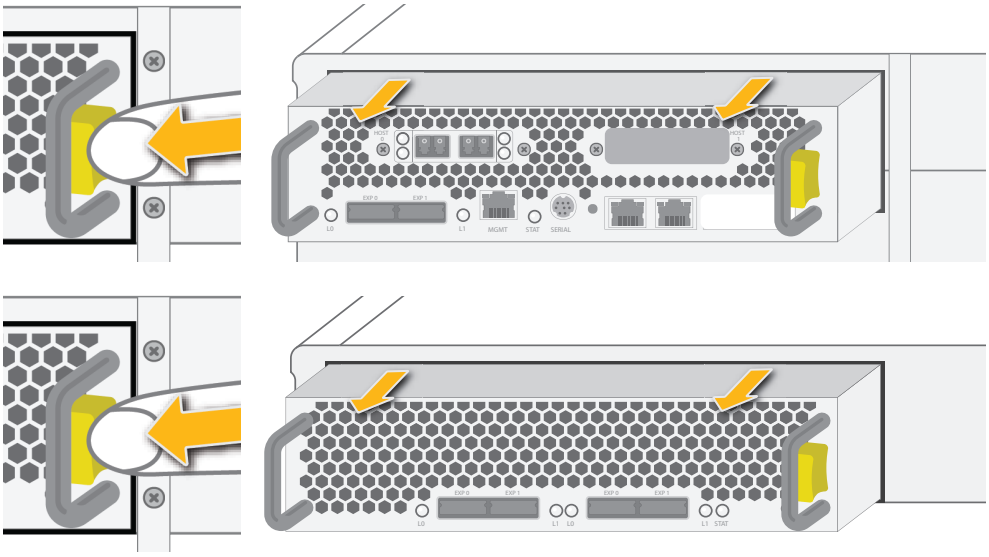
   Note Do not connect the power cords to the PSUs at this time.

Reseat the controllers

To reseat the controllers:

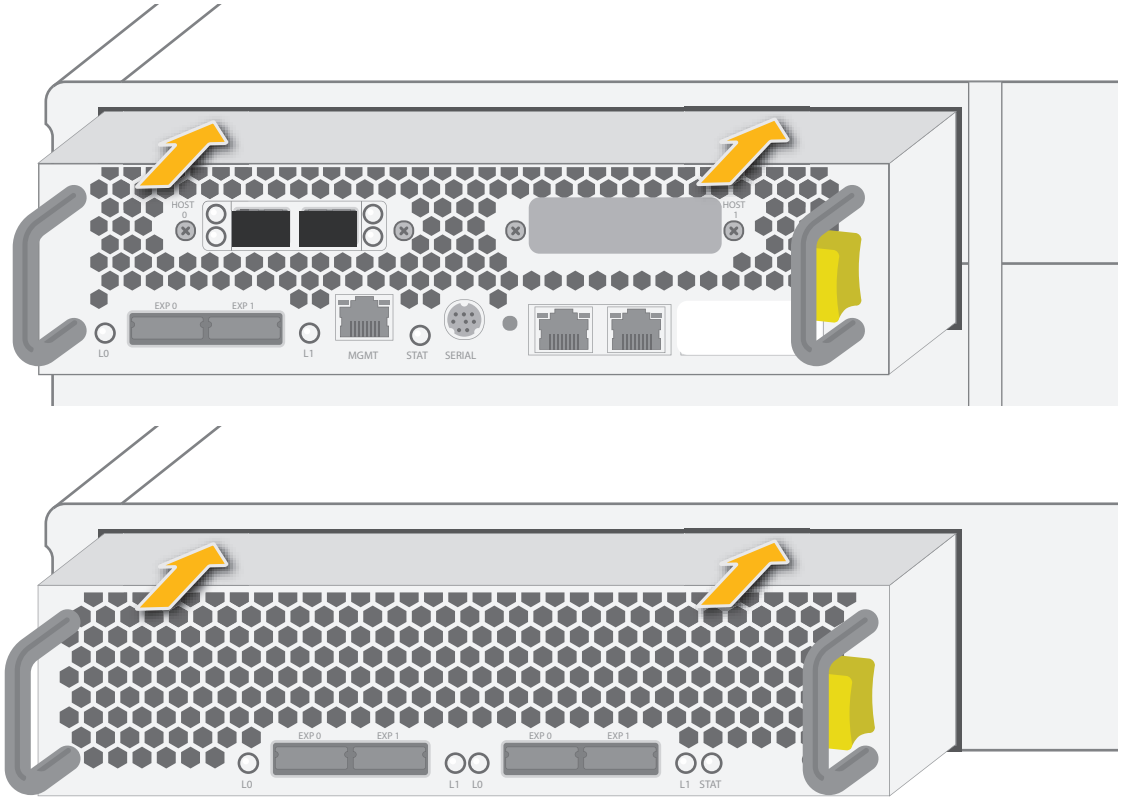
1. Press spring lock tab away from edge of the controller, then pull it out slightly.

Figure 3-7: Disengaging the controller
(top: RAID controller; bottom: expansion controller)



2. Push the controller back into the enclosure the spring lock tab clicks into place.

Figure 3-8: Pushing the controller into place
(top: RAID controller; bottom: expansion controller)



3. Repeat steps 1 and 2 for the second controller.

Attach the cable management arm

The cable management arm is necessary to ensure that communication and power cables do not get pinched, stretched, or unplugged when the Nexsan BEAST Storage System is slid forward or back on the mounting rails.

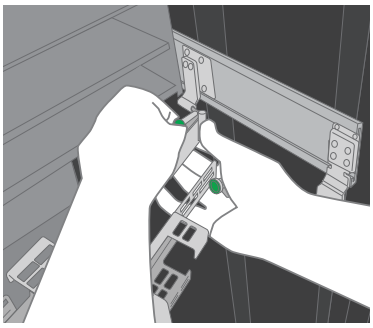
CAUTION: Leave plenty of slack in all cables going through the cable management arm to prevent damage to the cables or to the management arm itself.

Note The cable management arm can be mounted on either the left or right side.

► To attach the cable management arm

1. Attach the green connector post to the inner rail

Figure 3-9: Attaching the cable management arm to the inner rail



2. Attach the green connector post on the other end of the cable management arm to the outer rail.

Figure 3-10: Attaching the cable management arm to the outer rail (left); cable management arm installed (right)

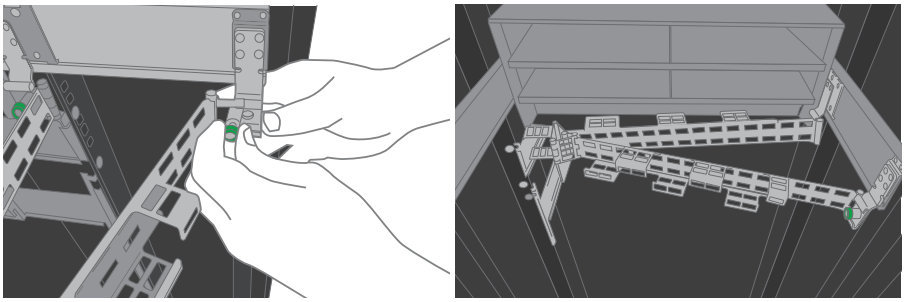
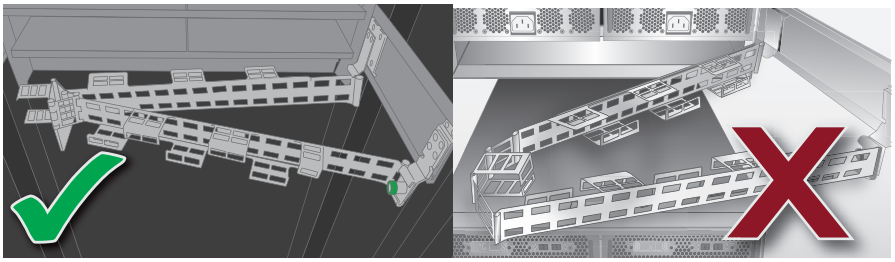


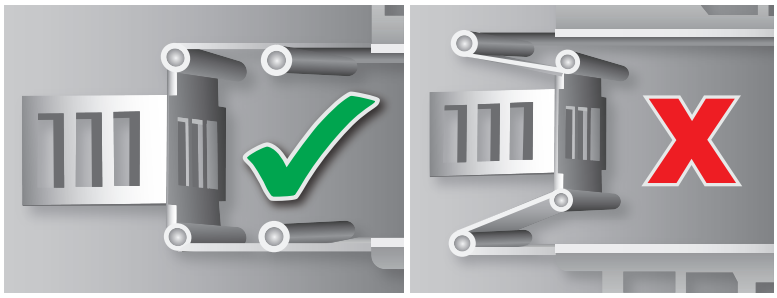
Figure 3-11: Cable management arm orientation, correct (left) and incorrect (right)

CAUTION: Make certain that you mount the cable management arm with the solid part on the INSIDE and the hooked guides on the OUTSIDE (as shown below). Mounting the arm in the wrong orientation can result in damage to the arm or the Storage System cables.



CAUTION: If the cable management arm is installed and operated without cables fitted, the linkages in the middle of the assembly must be in the outward position when closed rather than pivoted inward (as shown below). Failure to comply with this may result in damage to the CMA if it is operated without cables fitted.

Figure 3-12: Cable management arm, middle link, correct (left) and incorrect (right)



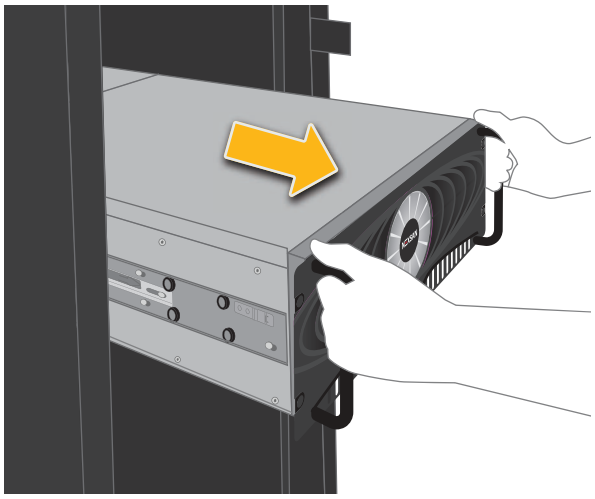
Load the disk drives

CAUTION: Computer components and disk drives are sensitive to electrostatic discharge (ESD). Always ground any electrostatic charge from your person before touching components with your hands or with any tools. Always use an anti-static wrist strap (one ships with each Nexsan Storage System) while installing or performing maintenance on any Nexsan Storage System. See Take proper ESD precautions on page 20 for detailed instructions.

To load the disk drives into the Nexsan Storage System drive drawers:

1. Carefully slide the Nexsan Storage System for ward on the rails until the side rail latches click into place.

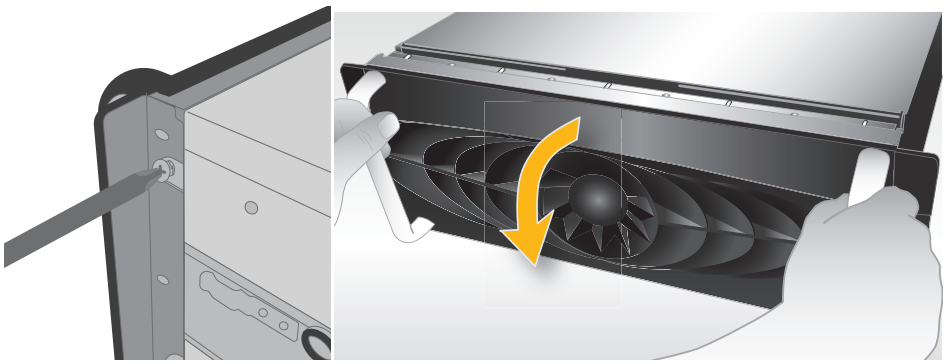
Figure 3-13: Sliding the Nexsan Storage System forward



CAUTION: Do not lean on or place any heavy object on the Nexsan Storage System while it is extended forward. Doing so may damage the drawer slide mechanism or overbalance the rack.

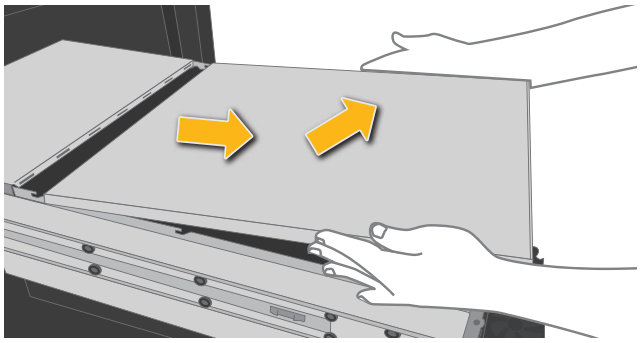
2. Unbolt and lower the front panel of the Nexsan Beast Storage System.

Figure 3-14: Unbolting the Beast front panel (one bolt on each side) and lowering it



3. Remove the chassis lid by pulling it forward, then lifting up.

Figure 3-15: Removing the drive bay lid



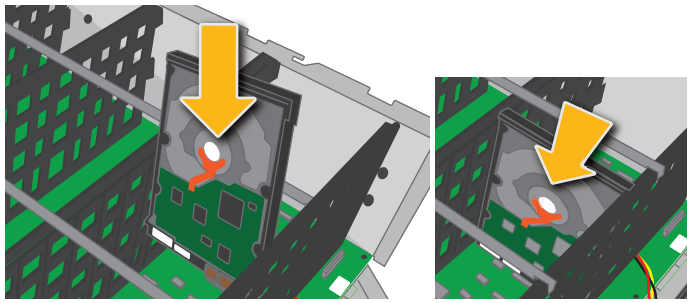
CAUTION: Disk drives are shock sensitive. Perform all actions involving disk drives carefully to avoid damage and data loss.

4. Remove the disks from the disk boxes, gripping them by the guides on the sides of each disk.

   Note Do not remove disks from their boxes by pulling on the ejection handles.

5. Using the drive guides to help you orient the disks, carefully load each disk drive into a drive slot. Make sure that each disk is fully seated and that the drive ejection handles are flat against each drive.

Figure 3-16: Loading a disk drive



CAUTION: Be sure that you load all drives so that their connectors line up with the connectors on the PCB and with their labels facing left. The drive holders are keyed so that inserting them in their correct orientation is easy. Do NOT force a drive into its slot if you encounter significant resistance.

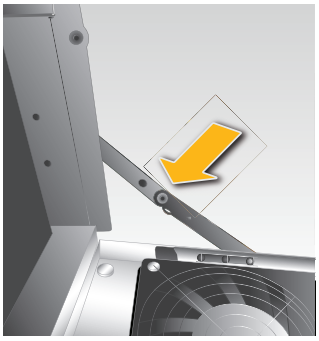
CAUTION: Do NOT allow disks to drop freely onto the connectors on the PCB. Doing so can cause significant damage to the disk or to the connectors, or both.

CAUTION: Wherever possible, always load disk drives in rows of 15 across the width of the drive drawer, starting in the front. Leaving gaps between disk drives decreases cooling efficiency and may result in some disk drives overheating.

6. Replace the drive bay lid.

7. Release the front panel retainer arms by pressing down on the hinges.

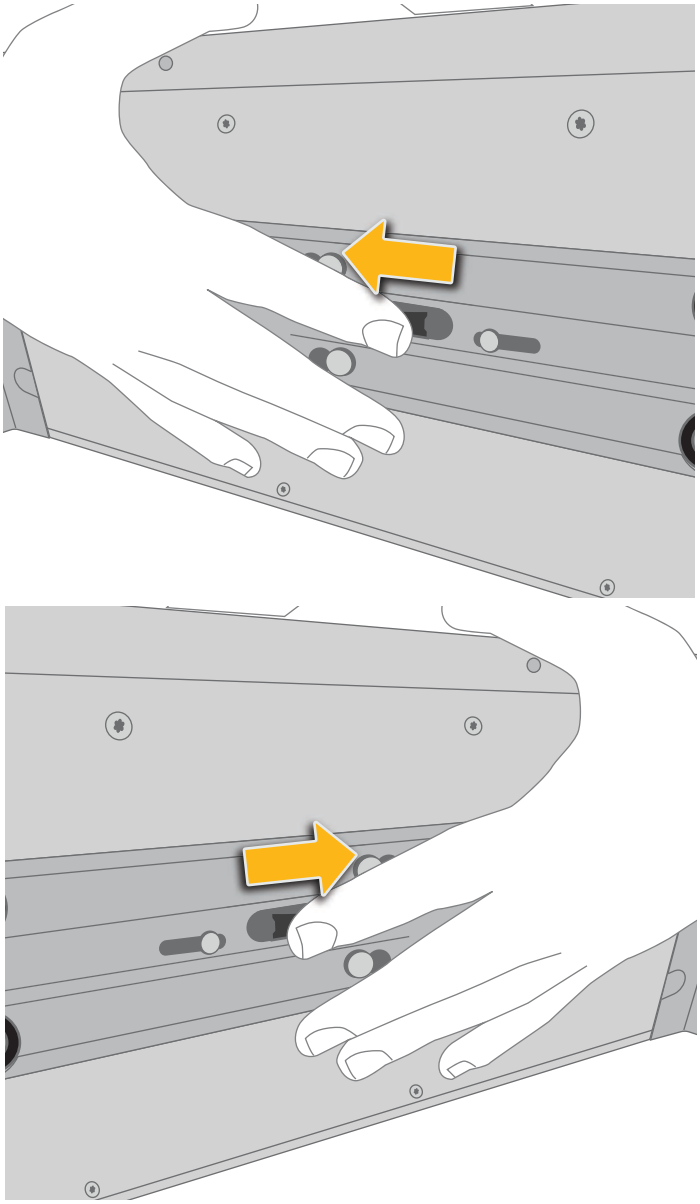
Figure 3-17: Releasing the retainer arms



8. Raise the front panel and bolt it back into place.

9. Pull the side rail latch tabs to disengage the latches.

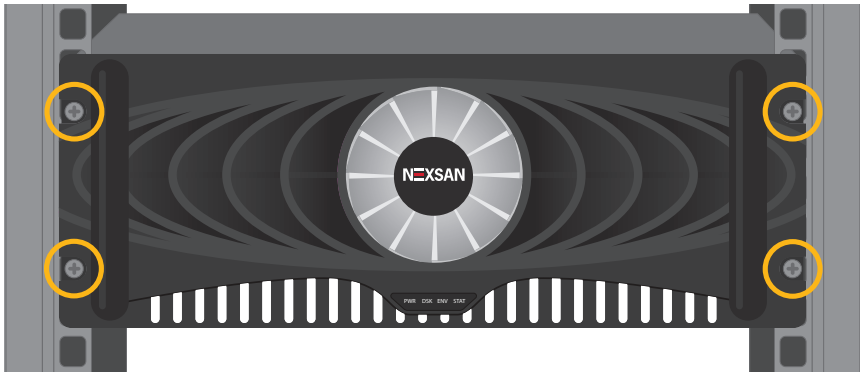
Figure 3-18: Disengaging the side rail latches



10. Carefully slide the Nexsan Storage System back into the rack.

11. Using the supplied bolts, bolt the Storage System to the rack front.

Figure 3-19: Bolting the Nexsan BEAST Storage System to the rack



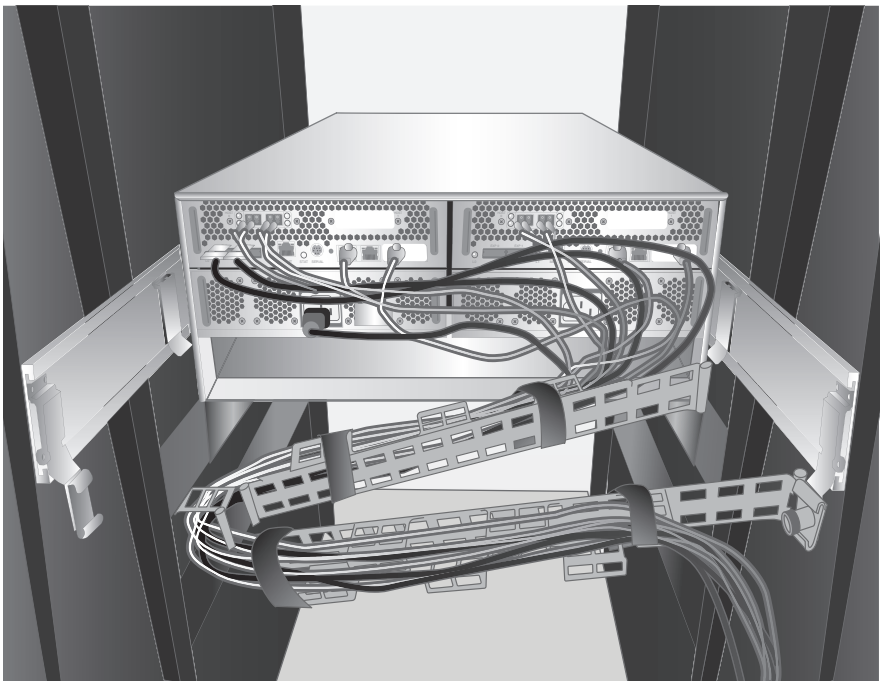
Attach BT60 Storage System to LAN and SAN

Connect all necessary communication cables to the RAID Controller (or Controllers) on the rear of the BT60 main Storage System (seeRear panel, BT60 on page 4).

To connect communication cables:

1. Connect the Storage System to your local area network (LAN) by attaching 1000Mb/s Ethernet cable to the Management (**MGMT**) port. This enables you to access the Storage System's graphical user interface (GUI).
2. Connect the Storage System to your storage area network (SAN) by one of the following methods:
   - If you have a 1Gb iSCSI network, attach 1000Mb/s Ethernet cables to the iSCSI ports (**Net 0** and **1**, or **0** through **3** if no host port option is installed) (see Connectors on page 1).
   - If you have a Fibre Channel network, attach either 8Gb/s or 16Gb/s fibre optic or twisted-pair copper cables to the Fibre Channel ports (see Host Port Options on page 1).
   - If you have a 10GbE iSCSI network, attach 10,000Mb/s fibre optic or twisted-pair copper cables to the 10Gb Ethernet iSCSI ports (see Host Port Options on page 1).
3. Run all cables through the cable management arm and secure them with the included hook-and-loop cable ties.

Figure 3-20: Cables in the cable management arm



Power on the Nexsan BEAST Storage System

CAUTION: The cordset specification for the Nexsan BEAST BT60 in North America is IEC C13 to IEC C14 rated 250V/15A. When applying power to the Storage System, use ONLY the IEC power cords originally supplied with it. Do NOT use other power cords, even if they appear identical to the supplied cords.

CAUTION: The Nexsan BEAST BT60 does not have power switches. The only way to apply power to the Storage System is to attach the power cords. Do NOT attach the power cords until the Storage System is fully installed, with all disk drives in place and all connections to the local area network (LAN) and storage area network (SAN) connected.

CAUTION: Ensure that the A/C power socket/outlet is near the equipment and easily accessible.

To power on the Nexsan BEAST Storage System:

1. Plug the two supplied power cords into the sockets in each power supply unit. See Rear panel, BT60 on page 4.
2. Run the power cords through the cable management arm and secure them with the included hook-and-loop cable ties.
3. Connect each power cord to A/C power.
4. If necessary, press and hold one of the two **SW0** switches on the rear of the Nexsan Storage System for approximately 4 seconds to initiate the power-up sequence. See Switches on page 9.

   Note While the Nexsan Storage System is powering up, the storage system's fans spin up to full speed, then throttle back. This process is audible and is expected behavior.

Note If the audible alarm sounds when the Nexsan Storage System is first powered on, this may be because the controller batteries are discharged. Press either **SW0** switch on the rear of the storage system to silence the alarm. The battery should reach full charge after approximately eight hours of the storage system being plugged in.

3

Attach a Nexsan Storage Expansion to a Nexsan Storage System

The Nexsan BEAST BT60X requires Nexsan BEAST BT60to provide RAID functionality and host or network connectivity. Up to two Nexsan Storage Expansions can be connected to a single Nexsan Storage System by "daisy-chaining" the two Storage Expansions together. Storage expansions should be mounted in the same rack as the Nexsan Storage System they'll be connected to, or in an immediately adjacent rack (see Prepare the site on page 19).

Note A Nexsan BT60X Storage Expansion can only be attached to a BT60 main Storage System.

Hot-add Nexsan Storage Expansions to a powered-up Nexsan Storage System

Connecting the Nexsan BEAST BT60X Nexsan Storage Expansion requires the SAS cables that shipped with the Nexsan Storage System. See Unpack the Nexsan Storage System on page 16.

CAUTION: The cordset specification for the Nexsan BEAST BT60X in North America is IEC C13 to IEC C14 rated 250V/15A. When applying power to the Nexsan Storage System, use ONLY the IEC power cords originally supplied with it. Do NOT use other power cords, even if they appear identical to the supplied cords.

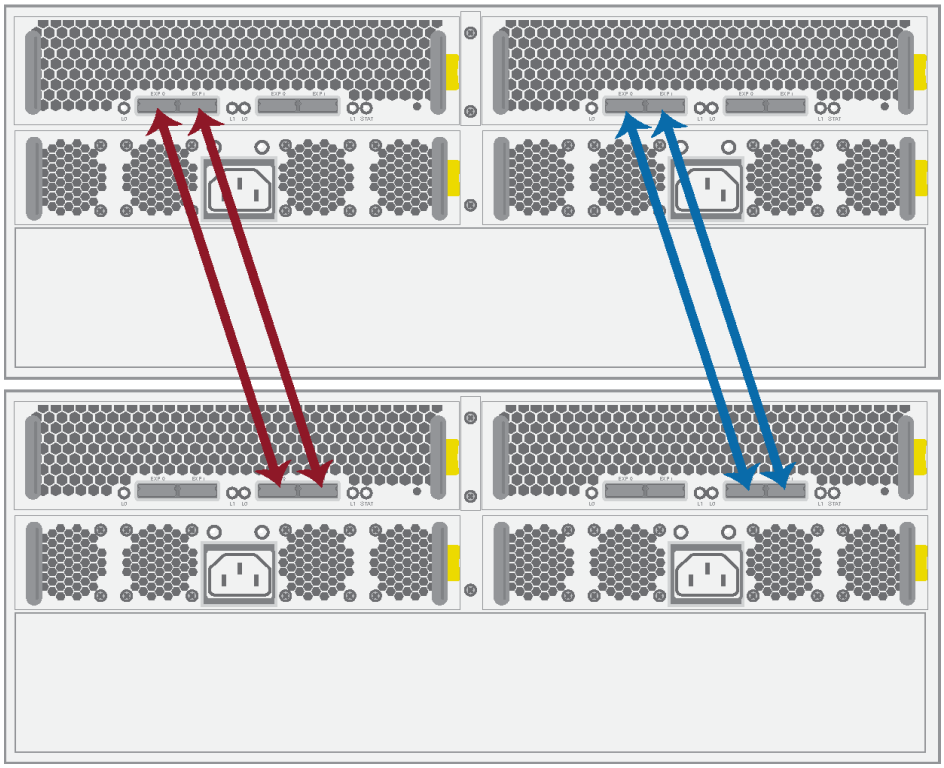
CAUTION: The Nexsan BEAST BT60X does not have power switches. The only way to apply power to the Nexsan BEAST BT60X is to attach the power cords. Do NOT attach the power cords until the Nexsan Storage System is fully installed, with all disk drives in place and all connections to the local area network (LAN) and storage area network (SAN) connected.

CAUTION: Ensure that the A/C power socket/outlet is near the equipment and easily accessible.

▶ To hot-add a Nexsan Storage Expansion to a running system:

1. (Two Nexsan Storage Expansions only) Connect the two Nexsan Storage Expansions to each other:

Figure 3-21: Connecting the two Nexsan Storage Expansions together



   a. Insert one SAS cable into the **EXP OUT 0** port on the left expansion controller of the first Nexsan Storage Expansion.

   b. Insert the other end of the SAS cable into the **EXP IN 0** port on the left Expansion Controller of the second Nexsan Storage Expansion.

   c. Repeat steps a and b, connecting the **EXP OUT 1** port of the left controller of the first Nexsan Storage Expansion to the **EXP IN 1** port of the left controller of the second Nexsan Storage Expansion.

   d. Repeat steps a through c to connect the right expansion controllers of the Nexsan Storage Expansions.

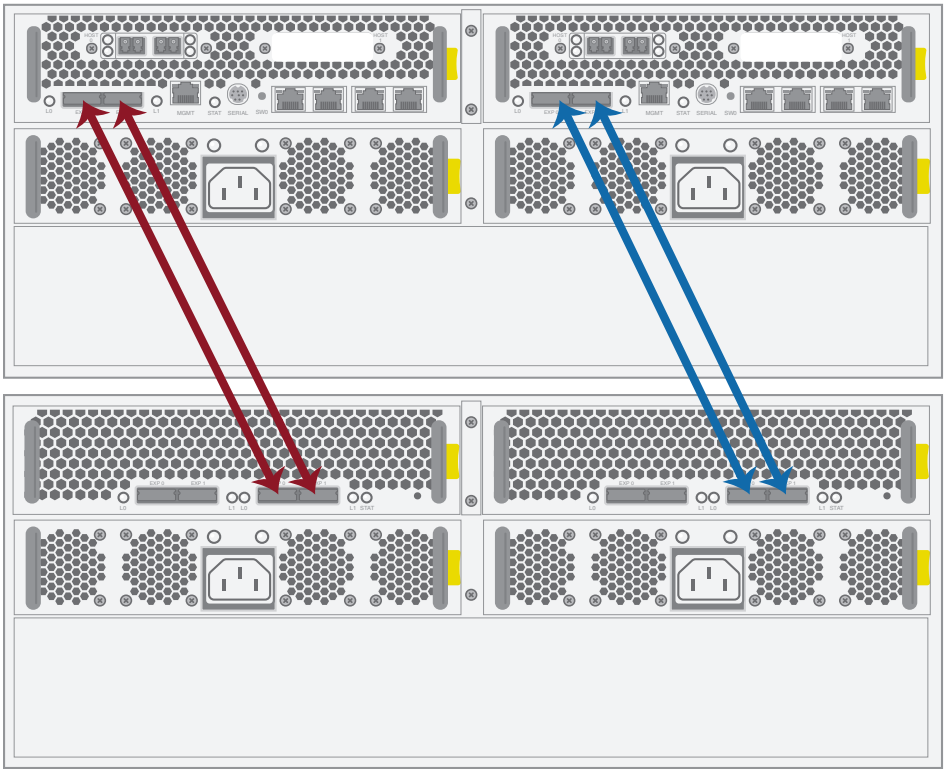
CAUTION: 1. Expansion Controller 0 on the first Nexsan Storage Expansion MUST be connected to Expansion Controller 0 on the second Nexsan Storage Expansion, and

2. Expansion Controller 1 on the first Nexsan Storage Expansion MUST be connected to Expansion Controller 1 on the second Nexsan Storage Expansion.

2. Attach the first Nexsan Storage Expansion to the Nexsan Storage System.

   Note If you are attaching to an Nexsan E60P or Nexsan E48P, be sure to attach the cables to the two leftmost expansion ports.

Figure 3-22: Nexsan BEAST BT60 to BT60X connection diagram



   a. Insert one SAS cable into the **EXP 0** port on the left RAID Controller of the Nexsan Storage System.

   b. Insert the other end of the SAS cable into the **EXP IN 0** port on the left Expansion Controller of the Nexsan Storage Expansion.

   c. Repeat steps a and b, connecting the **EXP 1** port of the left RAID controller to the **EXP IN 1** port on the left Expansion Controller.

   d. Repeat steps a through c to connect the right RAID controller to the right Expansion Controller.

CAUTION: RAID Controller 0 MUST be connected to Expansion Controller 0, and RAID Controller 1 MUST be connected to Expansion Controller 1.

3. Using the supplied power cords, connect each PSU on each Nexsan BEAST BT60X Nexsan Storage Expansion to main power.

   Note While the Nexsan Storage System is powering up, the storage system fans spin up to full speed, then throttle back. This process is audible and is expected behavior.

4. Wait approximately 5 minutes for the firmware in the Nexsan Storage System to properly configure the connections to the Nexsan Storage Expansion (or Nexsan Storage Expansions).
5. After 5 minutes, verify through the graphical user interface (GUI) that the Nexsan Storage Expansions and all of their disk drives are recognized by the Nexsan Storage System and that no errors are reported.

   Note If either of the **EXP IN** LEDs are flashing amber, you must remove the power cords from the Nexsan Storage Expansions, correct the cabling (see steps 3 and 4), and then reapply power to the Storage Expansions. If any **EXP IN** LEDs are still flashing amber, contact Technical Support. See About this manual on page v for phone numbers and e-mail addresses.

Attach Nexsan Storage Expansions to a powered-down system

▶ **To attach a Nexsan Storage Expansion to a powered-down Nexsan Storage System:**

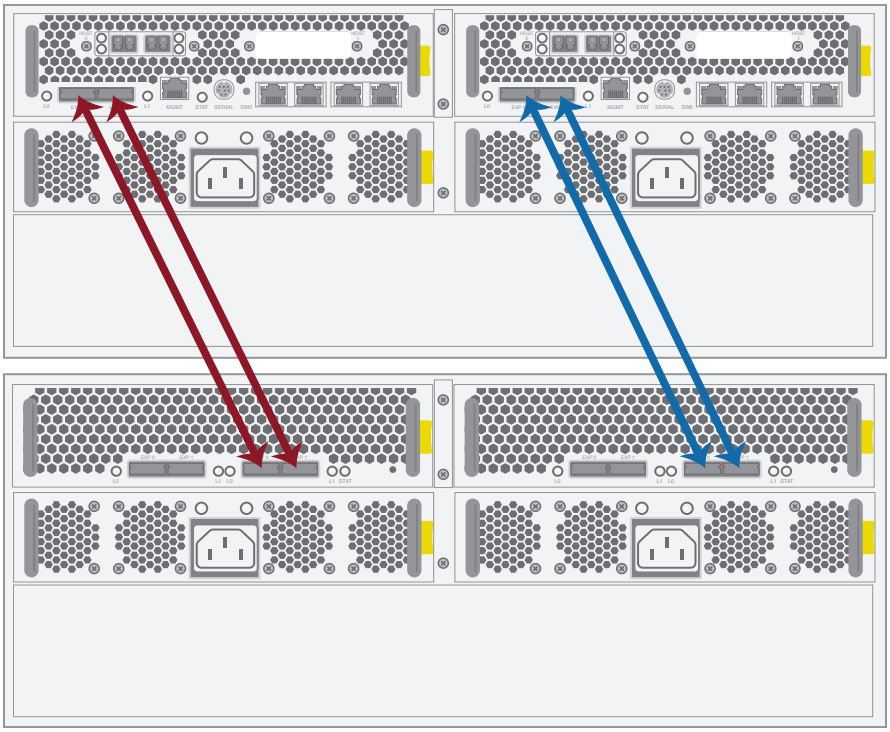
1. If necessary, power down the Nexsan Storage System:
   a. Access the main Nexsan Storage System's graphical user interface (GUI).
   b. Click the **System Admin** button on the left, then click the **Reboot** tab.
   c. On the **Reboot System** screen, select **System Shutdown**, select the confirmation check box, and then click **Execute NOW**.

      The Nexsan Storage System shuts down all internal systems. The **STAT** LEDs on both RAID Controllers turn off. All front panel LEDs turn off except for the left **PWR** LED, which turns amber. The fans, however, still run.
   d. Wait approximately one minute, then remove the power cords from the sockets on both PSUs.

   The Nexsan Storage System is now ready to be attached to the Nexsan Storage Expansion.
2. Using the supplied SAS cables, attach the Nexsan Storage Expansion to the Nexsan Storage System as follows:

   Note Connecting the Nexsan Storage Expansion requires the SAS cables that shipped with the Nexsan Storage System. See Unpack the Nexsan Storage System on page 16.

Figure 3-23: Nexsan BEAST BT60 to Nexsan BEAST BT60X connection diagram



a. Insert one SAS cable into the **EXP 0** port on the RAID Controller of the Nexsan Storage System.

b. Insert the other end of the SAS cable into the **EXP IN 0** port on the Expansion Controller of the Nexsan Storage Expansion.

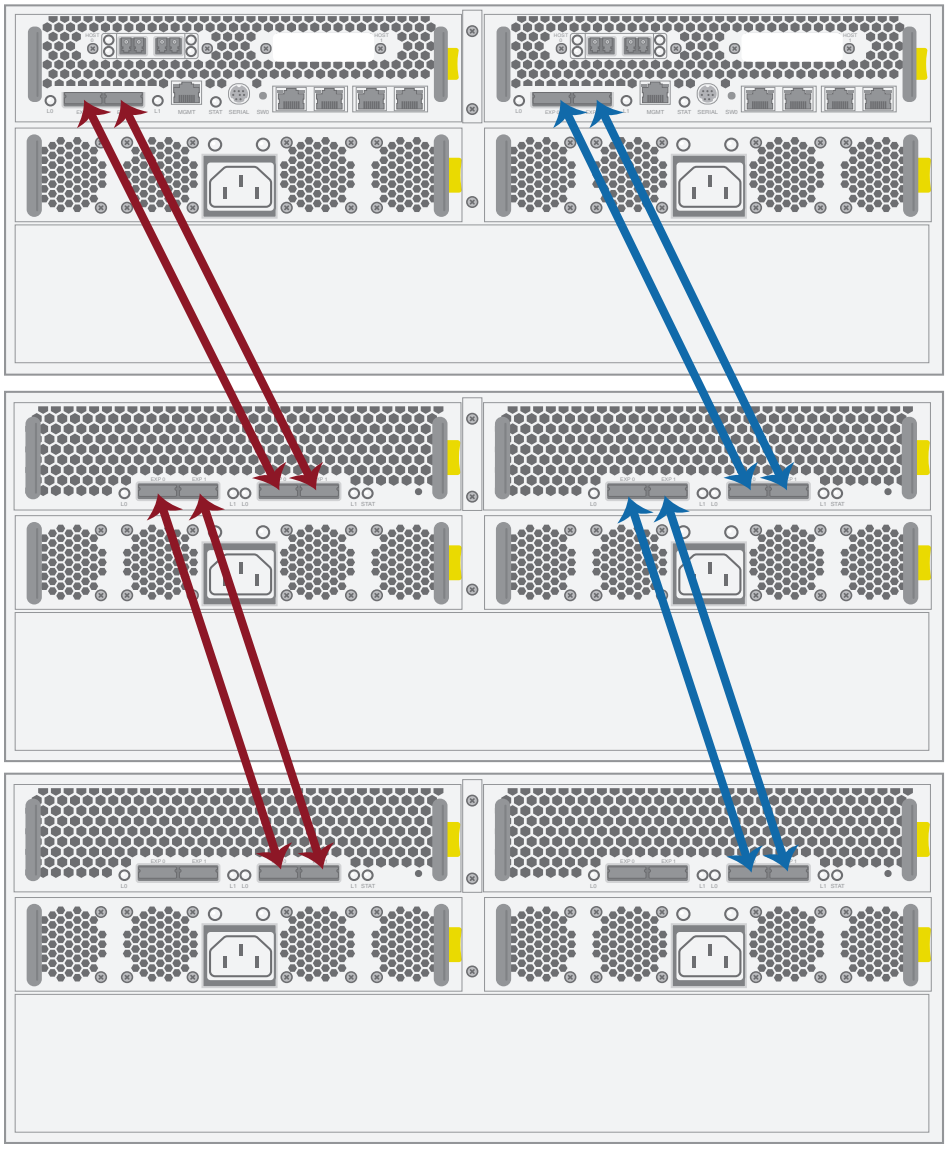
c. Repeat steps a and b, connecting the **EXP 1** port of the RAID controller to the **EXP IN 1** port on the Expansion Controller.

d. Repeat steps a through c to connect the RAID controller to the Expansion Controller.

CAUTION: RAID Controller 0 MUST be connected to Expansion Controller 0, and RAID Controller 1 MUST be connected to Expansion Controller 1.

3. If present, connect the second Nexsan Storage Expansion to the first Nexsan Storage Expansion.

Figure 3-24: Nexsan BEAST BT60 to two Nexsan BEAST BT60X Storage Systems connection diagram



a. Insert one SAS cable into the **EXP OUT 0** port on the expansion controller of the first Nexsan Storage Expansion.

b. Insert the other end of the SAS cable into the **EXP IN 0** port on the Expansion Controller of the second Nexsan Storage Expansion.

c. Repeat steps a and b, connecting the **EXP OUT 1** port of the controller of the first Nexsan Storage Expansion to the **EXP IN 1** port of the controller of the second Nexsan Storage Expansion.

d. Repeat steps a through c to connect the expansion controllers of the Nexsan Storage Expansions.

CAUTION: Expansion Controller 0 on the first enclosure MUST be connected to Expansion Controller 0 on the second enclosure, and Expansion Controller 1 on the first enclosure MUST be connected to Expansion Controller 1 on the second enclosure.

4. Power up all Nexsan Storage Systems:

CAUTION: The cordset specification for the in North America is IEC C13 to IEC C14 rated 250V/15A. When applying power to the Nexsan Storage System, use ONLY the IEC power cords originally supplied with it. Do NOT use other power cords, even if they appear identical to the supplied cords.

CAUTION: The does not have power switches. The only way to apply power to the is to attach the power cords. Do NOT attach the power cords until the Nexsan Storage System is fully installed, with all disk drives in place and all connections to the local area network (LAN) and storage area network (SAN) connected.

CAUTION: Ensure that the A/C power socket/outlet is near the equipment and easily accessible.

   a. Using the two supplied power cords, connect each PSU on the last Nexsan Storage Expansion in the chain to main power.

   b. (Two Nexsan Storage Expansions only) Wait for the two LEDs above the power sockets on each PSU of the last storage expansion to light up green, then connect each PSU on the middle storage expansion to main power.

      Note While the Nexsan Storage System is powering up, the storage system's fans spin up to full speed, then throttle back. This process is audible and is expected behavior.

   c. Wait for the two LEDs above the power sockets on each PSU of the first Nexsan Storage Expansion light to up green, then connect each PSU on the to main power.

      Note You may need to press and hold one of the two **SW0** switches on the rear of the Nexsan Storage System for 4 seconds to initiate the power-up sequence.

   d. Wait approximately 5 minutes for the firmware in the Nexsan Storage System to properly configure the connections to the Nexsan Storage Expansion (or Nexsan Storage Expansions).

   e. After 5 minutes, verify through the graphical user interface (GUI) that the Nexsan Storage Expansions and all of their disk drives are recognized by the Nexsan Storage System and that no errors are reported.

      Note If either of the **EXP IN** LEDs are flashing amber, you must remove the power cords from the Nexsan Storage Expansions, correct the cabling (see steps 3 and 4), and then reapply power to the storage expansions. If any **EXP IN** LEDs are still flashing amber, contact Technical Support. See About this manual on page v for phone numbers and e-mail addresses.

Set up the Nexsan Storage System

When the Nexsan Storage System has finished booting up, follow the instructions in "Chapter 1, Basic Setup" of the *Nexsan High-Density Storage User Guide* to get your BEAST Storage System configured and running.

Note The default IP addresses for the RAID controllers in a dual-controller system are 10.11.12.13 and 10.11.12.14. In a single-controller system, the default IP address is 10.11.12.13. It is very important, however, that you change these IP addresses by following the instructions under "Initial Network Address Setup" in Chapter 1 of the *Nexsan High-Density Storage User Guide*.

Glossary

A

antistatic wrist strap
: An anti-static device used to prevent electrostatic discharge (ESD) by safely grounding a person working on electronic equipment. Also called an ESD strap or a grounding bracelet.

array
: A linked group of one or more physical, independent hard disk drives. See also RAID.

B

bit
: The smallest unit of digital data, representing a 0 or a 1. Abbreviated “b”.

byte
: A unit of data that is 8 bits long. Often used for alphanumeric characters. Abbreviated “B”.

C

cache
: Reserved areas of memory that are used to speed up instruction execution, data retrieval, and data updating. In Nexsan Storage Systems, a memory unit in the RAID controller that temporarily holds user data.

D

daisy-chain
: The attachment of hardware to a computing system by connecting each component to another similar component rather than directly to the computing system that uses the component. Only the last component in the chain directly connects to the computing system. For example, up to two Nexsan E-Series expansion units can be daisy-chained to the back of one Nexsan E-Series main storage unit.

E

electrostatic discharge
: The sudden and momentary electric current that flows between two objects at different electrical potentials caused by direct contact or induced by an electrostatic field. Potentially harmful to electronic components.

ESD
: See electrostatic discharge.

ESD strap
: See anti-static wrist strap.

Ethernet
: A system for connecting a number of computer systems to form a local area network (LAN), with protocols to control the passing of information and to avoid simultaneous transmission by two or more systems. Supports data transfer rates of 10, 100, 1,000, and 10,000 megabits per second (Mb/s). 10, 100, and 1,000Mb/s networks are often referred to as 10BASE-T, 100BASE-T, and 1000BASE-T, respectively. 10,000Mb/s networks are usually referred to as 10Gb Ethernet or 10GbE.

Expansion Controller
: A module of Nexsan E-Series expansion units (Nexsan E18X/XV, E32XV, E48X/XV, and E60X/XV) that connects via SAS to a Nexsan Storage System's RAID controller.

F

FC port
: See Fibre Channel port.

FCC
: The Federal Communications Commission; the United States federal agency that regulates electromagnetic emissions.

Fibre Channel
: A gigabit (Gb) speed network technology primarily used for storage networking and the current standard connection type for storage area networks (SANs). Despite its name, Fibre Channel signaling can run on both twisted-pair copper wire and fibre-optic cables.

Fibre Channel port
: Any entity that actively communicates over a Fibre Channel network. Usually implemented in a device such as disk storage or a Fibre Channel switch. Depending on the system, the Fibre Channel ports on Nexsan Storage Systems can support 2Gb/s, 4Gb/s, 8Gb/s, or 16Gb/s connections.

Fibre Channel switch
: A network switch compatible with the Fibre Channel protocol. Enables the creation of a Fibre Channel network, which is currently the core component of most storage area networks (SANs).

FRU (Field Replaceable Unit)
: A module within a Nexsan Storage System or Nexsan Storage Expansion that can be replaced on site. Consult Nexsan Support for details.

G

Gb
: Gigabit. Approximately one billion (1,000,000,000) bits.

GB
: Gigabyte. Approximately one billion (1,000,000,000) bytes. Used to describe the storage capacity of hard disk drives. A gigabyte is usually computed as 109 (1,000,000,000) bytes, but can also be computed as 230 (1,073,741,824) bytes (often called a "binary gigabyte" and abbreviated GiB).

Gb/s
: Gigabits (Gb) per second. Used to describe the speed of network data transmission.

GB/s
: Gigabytes (GB) per second. Used to describe the speed of network data transmission. 1 GB/s is eight times faster than 1Gb/s.

gigabit interface converter
: A standard for transceivers, commonly used with Gigabit (Gb) Ethernet and Fibre Channel, with a hot-swappable electrical interface. Gigabit interface converter ports can support a wide range of physical media, from copper to optical fibre, at lengths of up to hundreds of kilometers.

graphical user interface
: A type of user interface that enables users to interact with electronic devices using images rather than text commands. Nexsan Storage Systems use a graphical user interface for system configuration.

grounding bracelet
: See anti-static wrist strap.

GUI
: See graphical user interface.

H

hot-plug
: To insert a new piece of hardware into a computerized system while the system is running. See also hot-swap.

hot-swap
: To replace a failed or faulty component of a computerized system while the system is running. See also hot-plug.

I

I/O
: Input/Output. The communication between an information processing system (such as a computer or a Nexsan Storage System RAID controller), and the outside world (either an operator or another information processing system). Inputs are the signals or data received by the system, and outputs are the signals or data sent from it.

IEC
: The International Electrotechnical Commission. Prepares and publishes international standards for all electrical, electronic, and related technologies.

interconnect service module
: A module of the Nexsan E-Series storage units that provides connectivity between all modules in the chassis.

IP address
: Internet Protocol address. A numerical label assigned to each device (such as a computer, printer, or Nexsan Storage System) on a computer network that uses TCP/IP for communication.

iSCSI
: Internet Small Computer System Interface. A transport protocol that provides for the SCSI protocol to be carried over a TCP/IP network.

ISM
: See Interconnect Service Module.

L

LAN
: See local area network.

LED
: Light Emitting Diode. LEDs are used for indicator lights on the front and back of Nexsan Storage Systems.

local area network
: A computer network that links devices within a small geographic area, such as a building or group of adjacent buildings.

M

Mb
: Megabit. Approximately one million (1,000,000) bits.

Mb/s
: Megabits (Mb) per second. Used to describe the speed of network data transmission.

P

PCIe
: Peripheral Component Interconnect Express. A computer expansion card standard designed to replace the older Peripheral Component

Interconnect (PCI), PCI-eXtended (PCI-X), and Accelerated Graphics Port (AGP) standards.

power supply unit
: A module that regulates electrical power to the components of Nexsan Storage Systems.

PSU
: See power supply unit.

R

rack
: A metal frame designed to hold hardware devices.

rack-mounted
: Attached to a rack.

rack mount
: Hardware for attaching devices to a rack.

RAID
: Redundant Array of Independent Disks. A system using multiple hard drives organized into a single logical unit for the sharing or replication of data in order to increase data integrity, fault-tolerance, and throughput. Also referred to as a RAID set. RAIDs are organized into RAID levels, which describe their architecture and configuration.

RAID Controller
: A hardware device, software program, or combination of the two which manages the physical disk drives in a RAID and presents them as a single logical unit to attached devices. The RAID Controllers in Nexsan Storage Systems are hardware modules. Nexsan RAID Controllers also provide connections for system administration and configuration.

RAID level
: A numeric indicator of the architecture used by a RAID. RAIDs can be built using any combination of striping, mirroring, and parity. The levels are numbered from 0 through 6. Some RAID levels can also be combined, and these configurations are usually referred to with a two-digit number. For example, RAID 10 = RAID 1 + RAID 0.

rail
: A type of rack mount that enables a device to be easily slid into and back out of a rack.

S

SAN
: See storage area network.

SAS
: Serial Attached SCSI. A serial version of the SCSI interface. A point-to-point architecture that uses a disk controller with four or more channels that operate simultaneously. Each full-duplex channel, known as a SAS port, transfers data at 1.5Gb/s, 3Gb/s, or 6Gb/s in each direction. SAS also supports Serial ATA (SATA) drives, which can be mixed with SAS drives in a variety of configurations.

SATA
: Serial Advanced Technology Attachment. A connection standard for fixed and removable hard disk drives.

SCSI
: Small Computer System Interface. A collection of standards and proposed standards for input/output (I/O) communication, primarily intended for connecting storage subsystems or devices to hosts.

SFP
: Small Form-factor Pluggable. A type of gigabit interface converter (GBIC) in a compact form factor. The Fibre Channel ports or 10Gb iSCSI ports on Nexsan storage devices are SFPs.

SSD
: Solid State Disk. A high-performance storage device that contains no moving parts.

storage area network
: An architecture that provides for attachment of remote computer storage devices to servers in such a way that the devices appear as locally attached to the operating system.

T

TB
: Terabyte. Approximately one trillion (1,000,000,000,000) bytes. Used to describe the storage capacity of hard disk drives. A terabyte is usually computed as 1012 (1,000,000,000,000) bytes, but can also be computed as 240 (1,099,511,627,776) bytes (often called a “binary terabyte” and abbreviated TiB).

TCP/IP
: Transmission Control Protocol/Internet Protocol. The set of communications protocols used for the Internet and other similar networks. TCP provides reliable delivery of messages between networked computers. IP uses numeric IP addresses to join network segments.

U

U
: Unit. The standard unit of measure for designating the vertical usable space, or height, of racks. 1U is equal to 1.75 inches. A device that is described as being 1U in height may be shorter than 1.75 inches, but, due to the design of most racks, will still take up 1.75 inches of rack space.

W

WAN
: See wide area network.

wide area network
: A telecommunication network that covers a broad area or that links across metropolitan, regional, or national boundaries. Wide area networks are used to connect local area networks and other types of networks together, so that users and computers in one location can communicate with users and computers in other locations.

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