

IBM System Storage



EXN3500 Storage Expansion Unit Installation and Setup Instructions

Notices

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Before you begin

This document provides installation and setup instructions for the IBM® System Storage® EXN3500 storage expansion unit, sometimes referred to as a *shelf* in this and other documents.

Additional information about the EXN3500, including a comparison of the EXN3500 with other N series storage expansion units, can be found in the *IBM System Storage EXN3500 Storage Expansion Unit Hardware and Service Guide*.

Detailed SAS and Alternate Control Path (ACP) cabling information can be found in the *IBM System Storage N series Universal SAS and ACP Cabling Guide*.

For additional information about the EXN3500 and related topics, refer to the following resources:

- *IBM System Storage N series Introduction and Planning Guide*
- *IBM Environmental Notices and User Guide*
- IBM System Storage N series support website at www.ibm.com/storage/support/nseries/

Read the safety notices

Before continuing, make sure that you have reviewed the safety notices in the documentation that came with this system. Do not plug any cables into the system, adapters, or any electrical outlets until you have reviewed the safety information and followed the procedures in this document.

Need help?

If you encounter any difficulties while setting up your system, contact IBM service and support for assistance. More information can also be found on the IBM System Storage N series support website:

www.ibm.com/storage/support/nseries/

About the IBM N series support website

The IBM System Storage N series support website requires users to register in order to obtain access to N series support content on the web. To understand how the N series support web content is organized and navigated, and to access the N series support website, go to the following publicly accessible web page:

www.ibm.com/storage/support/nseries/

This web page also provides links to AutoSupport information as well as other important N series product resources.

Software requirements

Verify that your storage system meets the following software requirements:

- For Data ONTAP 7.x releases, the minimum software requirement to support the EXN3500 is Data ONTAP 7.3.3P2 or later, except for N3400 and N3600 systems, which require Data ONTAP 7.3.4 or later. IBM recommends that you upgrade your storage system to Data ONTAP 7.3.4 or later if you are using the 7.x release family.
- For Data ONTAP 8.x 7-Mode releases, the minimum software requirement to support the EXN3500 is Data ONTAP 8.0P1 or later, except for N3400 systems, which require Data ONTAP 8.0.1 or later. IBM recommends that you upgrade your storage system to Data ONTAP 8.0.1 or later if you are using the 8.x release family.

Customer-supplied items for installation

- #2 Phillips screwdriver
- Flat-bladed screwdriver
- Antistatic electrostatic discharge (ESD) wrist strap and grounding leash

Hot-adding EXN3500s

You can hot-add an EXN3500 to any supported storage system with an existing SAS host bus adapter (HBA), or to an existing stack of EXN3500 storage expansion units. For hot-adding instructions, see the *IBM System Storage N series EXN3500 Hardware and Service Guide*.

Overview of the EXN3500 storage expansion unit

Refer to the following figures to familiarize yourself with the EXN3500 storage expansion unit.

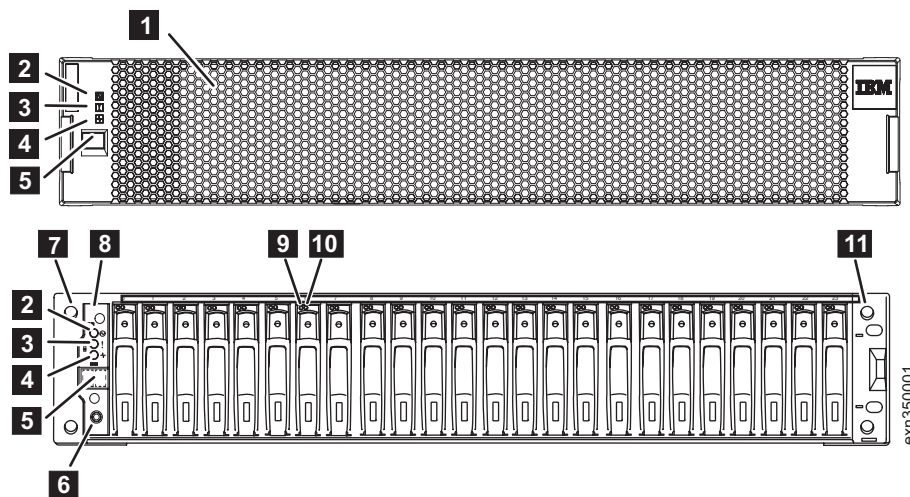


Figure 1. EXN3500 front view (shown with and without bezel)

1 EXN3500 bezel	5 Two-digit shelf ID digital display	9 Disk drive activity LED
2 Shelf power LED	6 Button for changing the shelf ID	10 Disk drive fault LED
3 Shelf fault LED	7 Left mounting flange	11 Right mounting flange
4 Shelf activity LED	8 Operator display panel	

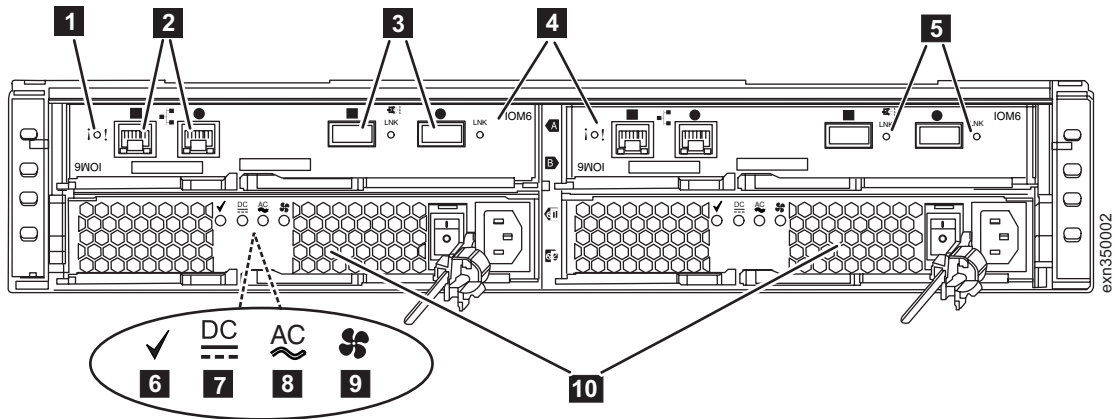


Figure 2. EXN3500 rear view

1	IOM fault LED	6	PSU OK power supply LED
2	ACP ports	7	DC fault power supply LED
3	SAS ports	8	AC fault power supply LED
4	Two I/O modules (IOM6)	9	Fan fault power supply LED
5	SAS port link LEDs	10	Two power supplies with integrated fans

Installation and setup instructions

Use these instructions to install and set up your EXN3500 storage expansion unit.

Unpacking the EXN3500

Use these instructions to unpack the EXN3500.

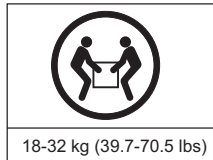
Important: If your system was shipped already assembled and cabled in a rack, go directly to the *Installation and Setup Instructions* for your N series storage system.

Note: The contents of the box might differ based on the model you purchased.

1. Verify that the EXN3500 (2857-006) shipping packages include the following items:
 - 1 EXN3500 storage expansion unit
 - 1 IBM rail kit
 - 1 electrostatic discharge (ESD) wrist strap
 - 1 set of publications
 - 2 power cords
 - Miscellaneous data cables, as ordered

CAUTION:

Use safe practices when lifting.



CAUTION:

A fully populated EXN3500 weighs 22.2 kg (49 lbs). Use two people to lift an EXN3500 into a rack. To make the unit lighter and easier to move, remove the power supplies and Input/Output modules (IOMs), noting the location of each component for reinstallation. Do not remove the disk drives or drive blank covers to reduce the weight. After the unit is installed in the rack, reinsert the power supplies and IOMs.

2. Remove the EXN3500 storage expansion unit from the carton and place it on a table.

Installing the rails in an IBM 19-inch rack

Use these instructions to install the rails on which you will mount the EXN3500.

Note: Read this document in its entirety before proceeding.

1. Loosen (but do not remove) the four rail adjustment screws on each rail, as shown in Figure 3 on page 2.

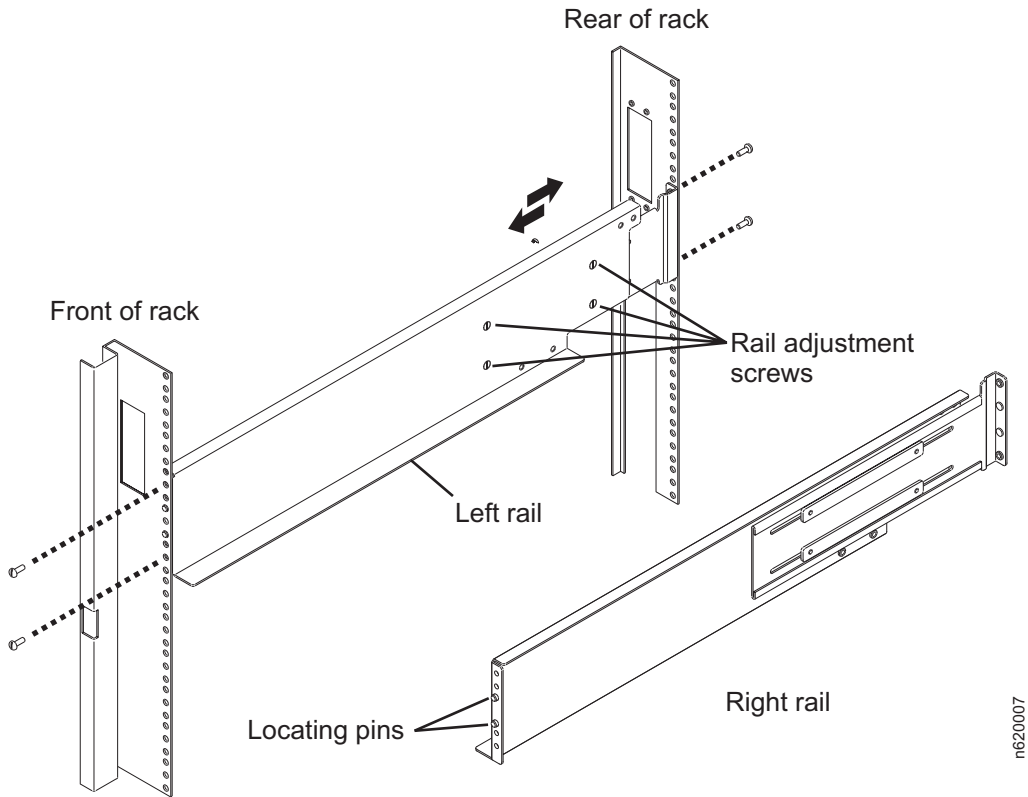


Figure 3. Installing the rails in the rack

2. Refer to Figure 4. At the front of the rack, position the right-hand rail in the rack at the appropriate EIA location. Make sure that the two locating pins seat properly in holes H3 and H4. The bottom of the rail should line up with the bottom EIA boundary.

Note: When installed, each EXN3500 will occupy a 2U space.

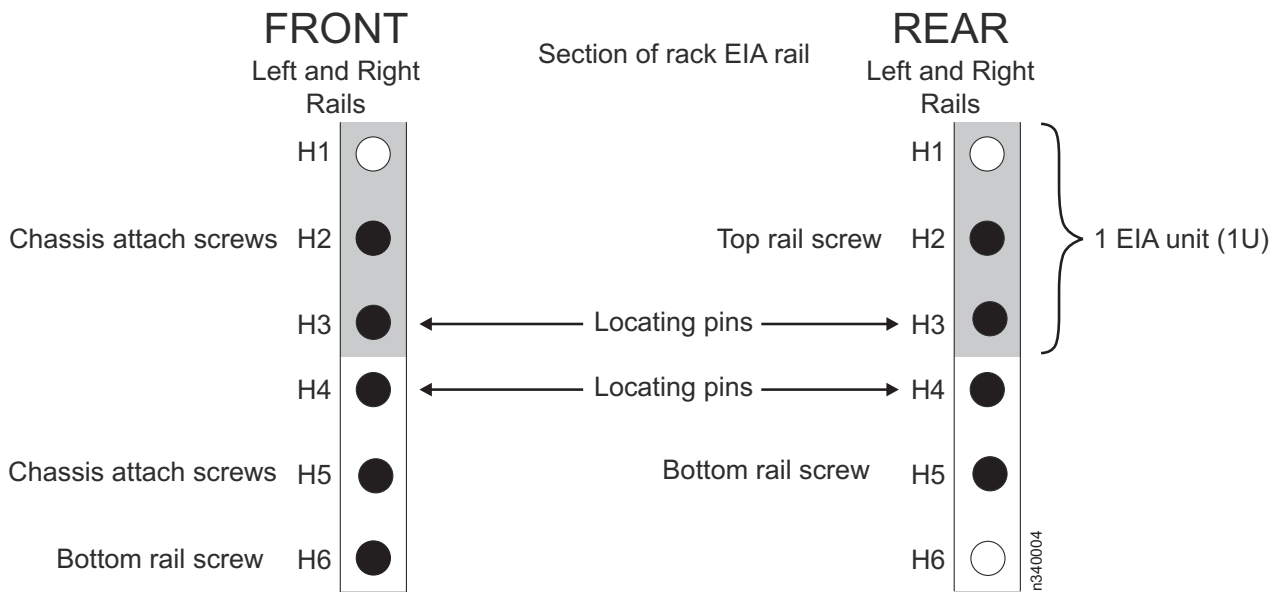


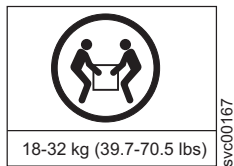
Figure 4. EXN3500 rail mounting template

Using one silver pan head M5 screw, attach the rail to the front of the rack using hole H6. Tighten this screw with a screwdriver.

3. At the rear of the rack, position the rail at the same EIA location used in step 2. Make sure that the locating pins seat properly in holes H3 and H4. Using two silver pan head M5 screws, attach the rail to the rack using holes H2 and H5. Tighten these screws with a screwdriver.
4. Tighten the four rail adjustment screws on the installed rail.
5. Repeat steps 2 through 4 for the left-hand rail.
6. Repeat steps 1 through 5 for each additional EXN3500 that you are installing in the rack, making sure to allow 2U of space for each EXN3500.

Installing the EXN3500 in the rack

Use these instructions to install the EXN3500 in the rack.



CAUTION:

A fully populated EXN3500 weighs 22.2 kg (49 lbs). Use two people to lift an EXN3500 into a rack. To make the unit lighter and easier to move, remove the power supplies and Input/Output modules (IOMs), noting the location of each component for reinstallation. Do not remove the disk drives or drive blank covers to reduce the weight. After the unit is installed in the rack, reinsert the power supplies and IOMs.

1. Ground yourself to the EXN3500 using the grounding leash that came with the system.
2. If the EXN3500 front bezel is attached to the expansion unit, carefully remove the bezel by pulling out on the rectangular openings (marked by blue stripes) on either side of the bezel.
3. From the front of the rack, set the EXN3500 onto the rails and slide it into the rack until the front mounting flange is a few inches from the rack frame. As shown in Figure 5, position the spacer plates **1** over the locating pins (holes H3 and H4) on the front left and right rails. Slowly slide the chassis into the rack until the front mounting flange of the EXN3500 is flush against the spacer plates.

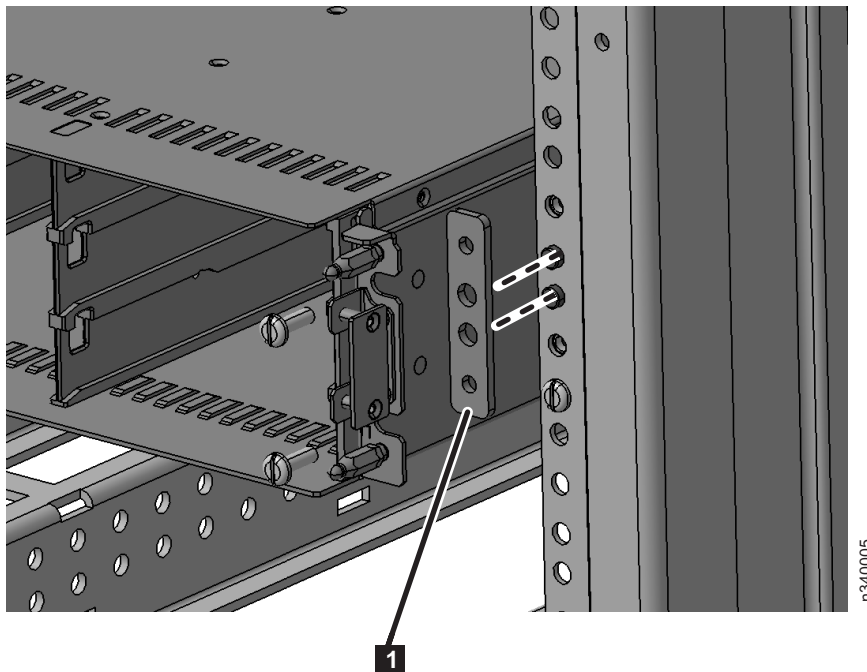


Figure 5. Mounting the EXN3500 in the rack

4. Using Figure 5 on page 3 for reference, attach the EXN3500 to the front of the rack using four silver pan head screws (two for each rail) in the H2 and H5 holes. Thread the screws through the front flange, the spacer plate, and the rack frame rail into the threaded rail nuts. Tighten the screws using a screwdriver.
5. Replace the front bezel of the EXN3500.
6. From the back of the rack, attach a rear tie-down plate **1** to the left and right rails using four M5 pan head screws (two for each rail) **2**, as shown in Figure 6.

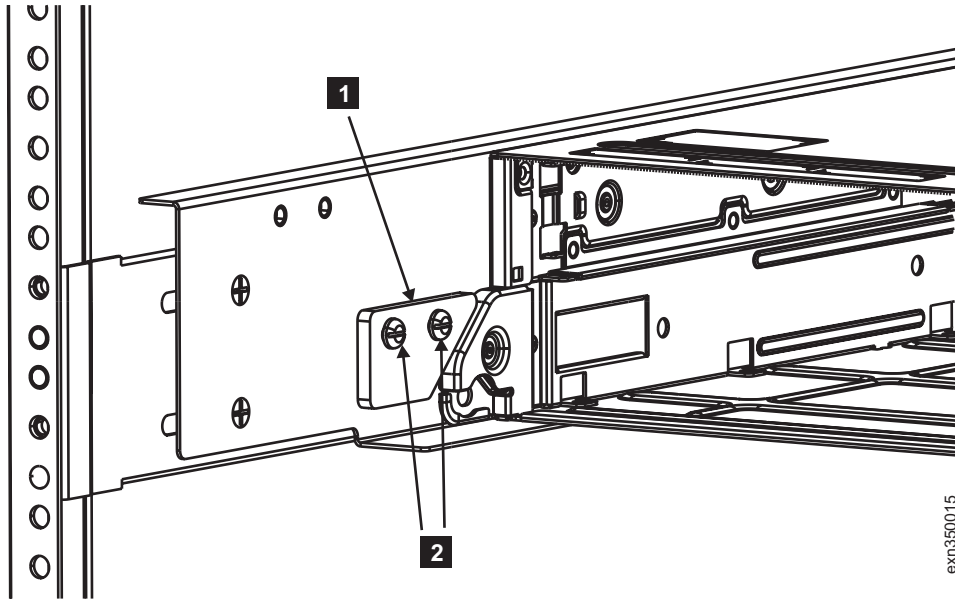


Figure 6. Attaching the rear tie-down plate

Connecting power to the EXN3500

Use these instructions to connect power to the EXN3500.

1. Make sure all power supply switches on the storage expansion unit (or units) are in the Off position.
2. Connect the power cords to each EXN3500 storage expansion unit and secure each power cord in place with the power cord retainer. Make sure that the power supply on the left side of the system is connected to a separate AC source than the power supply on the right side of the system. This ensures redundant power.

Note: You do not need to ground EXN3500s; grounding is done through the power cords.

3. Turn on power to the EXN3500 storage expansion units and wait for the disk drives to spin up.

FC/SAS Bridges for stretch or fabric-attached MetroCluster systems

See *IBM System Storage N series Introduction and Planning Guide* and *ATTO FibreBridge 6500N Installation and Operations Manual* for information about FC/SAS Bridge hardware. This document, as well as all N Series documentation, is available on the IBM N series support website, which is accessed and navigated as described in “Before you begin” on page v.

Setting the storage expansion unit shelf IDs

A unique shelf ID is required for each SAS storage expansion unit within the entire storage system.

A valid EXN3500 storage expansion unit shelf ID is 00 - 98.

Note: N3400 and N3600 systems have an internal shelf ID preset to 00, so for N3400 and N3600 configurations, valid EXN3500 shelf IDs are 01 - 98.

If your storage system has SAS and FC storage expansion units, the storage expansion unit shelf IDs do not need to be unique between the SAS and FC expansion units. (FC expansion unit shelf IDs continue to be unique within each FC loop. SAS expansion unit shelf IDs continue to be unique to all other SAS expansion units in the storage system, including the N3400 or N3600 system's internal shelf ID.)

Visually verify that the shelf ID for each storage expansion unit is unique. If not, set the shelf ID as follows. For additional details, see the *IBM System Storage EXN3500 Storage Expansion Unit Hardware and Service Guide*.

Note:

1. Remove the front bezel if you have not already removed it.
2. Press and hold the storage expansion unit shelf ID button **1** until the first digit flashes.

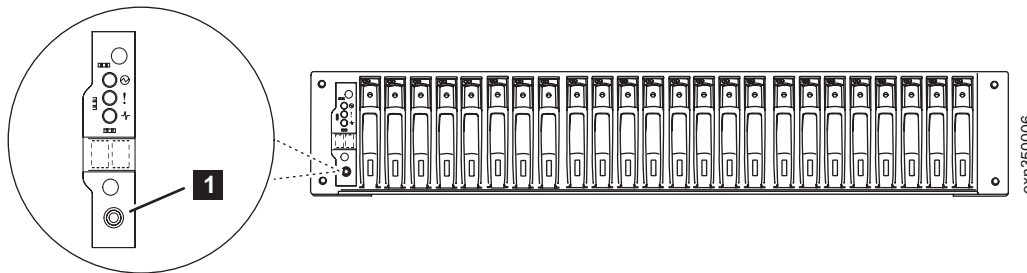


Figure 7. Shelf ID button

3. Press the button until the correct number is displayed.
4. Repeat steps 2 and 3 for the second digit.
5. Press and hold the button until the second number stops flashing.
Both numbers start flashing and the operator display panel fault LED illuminates in about five seconds.
6. Power-cycle the EXN3500 to make the new expansion unit shelf ID take effect.
7. Replace the front bezel.

Cabling the EXN3500

Use these instructions to cable the EXN3500.

The ACP and SAS ports on the EXN3500 Input/Output modules are designated as circle and square ports (not In and Out ports). See the *IBM System Storage EXN3500 Storage Expansion Unit Hardware and Service Guide* for a comparison between SAS and Fibre Channel storage expansion units and for more information about the EXN3500.

Attention:

- If you are using HBAs, they must be installed in the storage system before you cable the system.
- Always cable SAS connections first, and then cable ACP connections.

1. Cable the N series controllers.

Refer to the *Installation and Setup Instructions* for the N series storage system to which you are connecting the EXN3500.

2. Cable the storage expansion units.

The illustrations in “Cabling a single-controller NAS or iSCSI configuration” and “Cabling a high availability NAS or iSCSI configuration” on page 8 show the steps for cabling two common configurations.

Note: In the descriptions of these configurations, references to the *first* and *last* disk shelves in a stack are to the first, or closest, shelf in a SAS stack, which makes the first connections to the N series controller, and to the last, or ending, shelf in a stack.

For SAS and ACP cabling rules, and for more cabling configurations, see the *IBM System Storage N series Universal SAS and ACP Cabling Guide*.

Alternate Control Path (ACP) capability

For maximum storage availability and stability, storage systems with EXN3500 storage expansion units have the option to use the ACP capability. ACP is a protocol that enables Data ONTAP to manage and control the EXN3500 storage subsystem. It uses a separate network from the data path so it can independently perform recovery whenever certain interruptions are detected in the data path.

To use the ACP capability, you must cable the ACP ports on the EXN3500s and connect the EXN3500s to the dedicated network interface on each N series storage system controller. At system setup, you enable the ACP functionality by configuring ACP parameters. If your storage system does not have a dedicated onboard network interface for ACP, you dedicate one at system setup.

Standard ACP cabling rules apply to all N series storage systems and can be found in the *IBM System Storage N series Universal SAS and ACP Cabling Guide*.

Attention: ACP cabling requires CAT6 Ethernet LAN cables.

ACP functionality, configuration, and enabling information can be found in the *Data ONTAP Storage Management Guide*.

Note: If at initial storage system setup you choose not to use the ACP capability, you can use it later by cabling the ACP connections and enabling ACP by running setup again.

Cabling a single-controller NAS or iSCSI configuration

This task illustrates how to cable a single-controller NAS or iSCSI configuration with two quad-port SAS HBAs supporting two stacks of expansion units with dual-path connectivity.

1. Daisy-chain the SAS ports, as shown in Figure 8 on page 7.

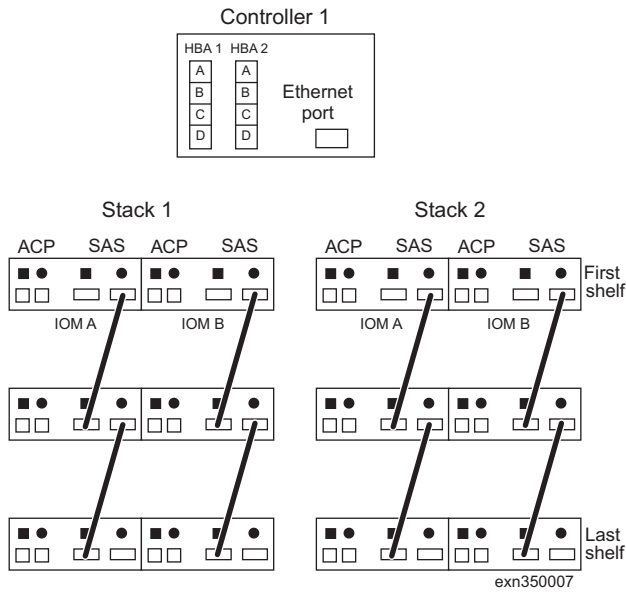


Figure 8. Daisy-chain the SAS ports

2. Cable the first shelf SAS connections as shown in Figure 9.

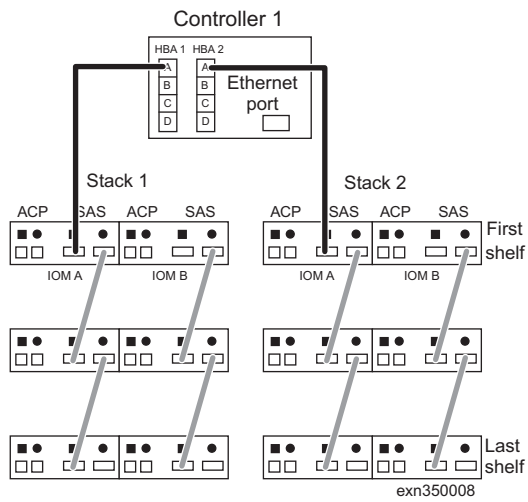


Figure 9. Cable the first SAS connections

3. Cable the last shelf SAS connections as shown in Figure 10 on page 8.

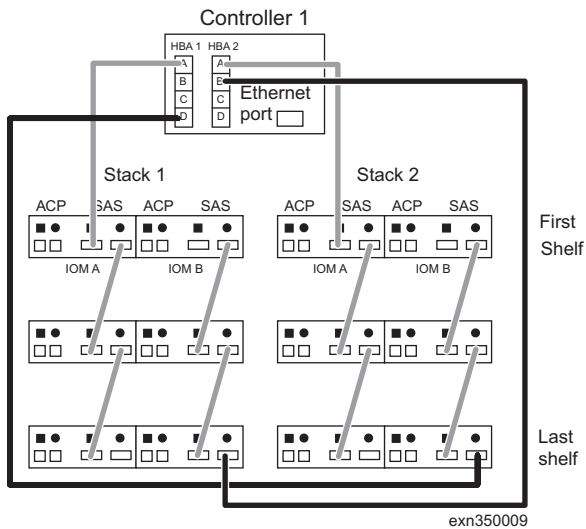


Figure 10. Cable the last SAS connections

4. Cable the ACP connections as shown in Figure 11.

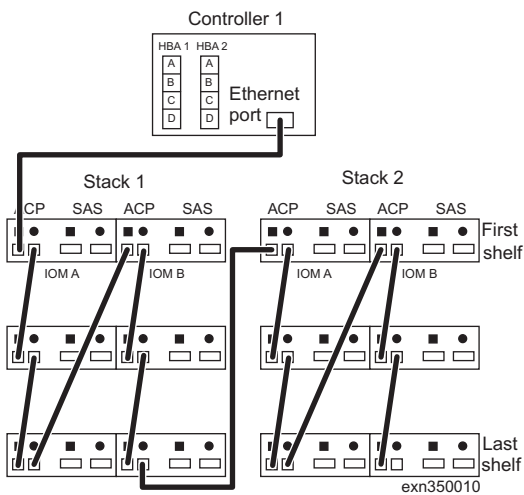


Figure 11. Cable the ACP connections

Cabling a high availability NAS or iSCSI configuration

This task illustrates how to cable an active/active (or high availability) NAS or iSCSI configuration with two quad-port SAS HBAs supporting two stacks of expansion units with multipath connectivity.

1. Daisy-chain the SAS ports, as shown in Figure 12 on page 9.

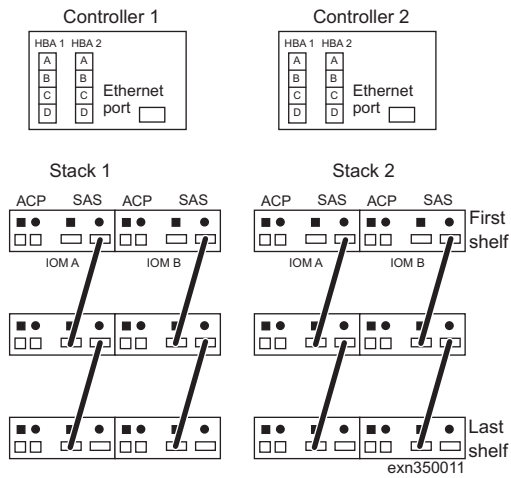


Figure 12. Daisy-chain the SAS ports

2. Cable the first SAS shelf connections, as shown in Figure 13.

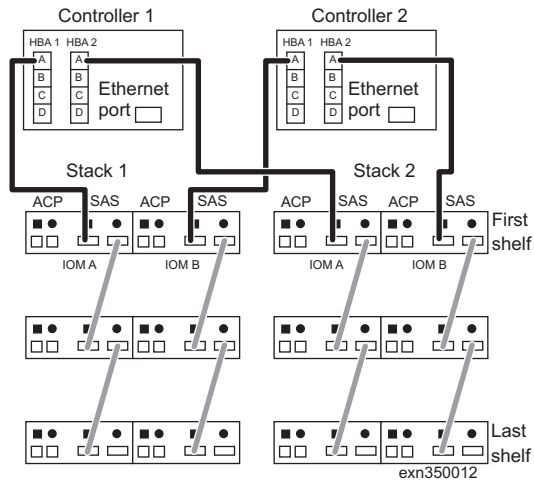


Figure 13. Cable the first SAS shelf connections

3. Cable the last shelf SAS connections, as shown in Figure 14 on page 10.

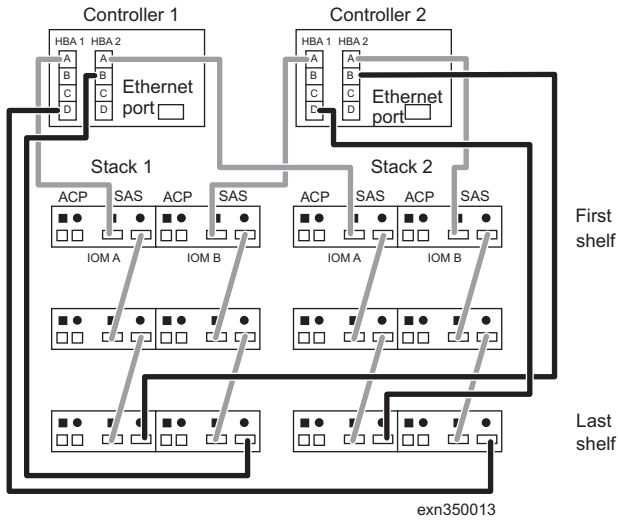


Figure 14. Cable the last shelf SAS connections

4. Cable the ACP connections, as shown in Figure 15.

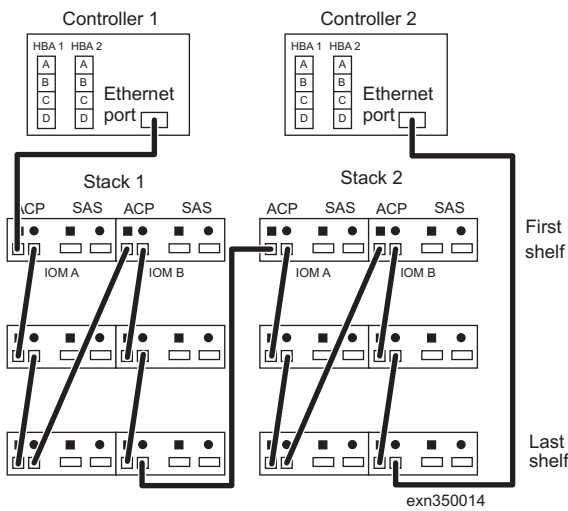


Figure 15. Cable the ACP connections

Cabling a fabric-attached MetroCluster configuration

See *Configuring a MetroCluster with SAS disk shelves and FibreBridge 6500N and ATTO FibreBridge 6500N Installation and Operations Manual* for information on installing, hot-adding, converting HA pairs to fabric-attached MetroClusters, and replacing FC/SAS bridges. This document, as well as all N series documentation, is available on the IBM N series support website, which is accessed and navigated as described in “Before you begin” on page v.

Booting the system

See the *Installation and Setup Instructions* that came with your N series storage system for instructions on booting your storage system for the first time.

To take advantage of the ACP capability, you can enable it at setup or later. See the *Data ONTAP Software Setup Guide* for the setup worksheet and other setup information.



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