Install and setup

Install and maintain

NetApp
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Table of Contents

Install and setup

Installation and configuration workflow - FAS70 and FAS90

To install and configure your FAS70 or FAS90 system, you review the hardware requirements, prepare your site, install and cable the hardware components, power on the system, and set up your ONTAP cluster.

1. **Review installation requirements**

Review the equipment and tools needed to install your storage system and storage shelves and review the lifting and safety precautions.

2. **Prepare to install the FAS70 or FAS90 storage system**

To prepare to install your system, you need to get the site ready, check the environmental and electrical requirements, and ensure there's enough rack space. Then, unpack the equipment, compare its contents to the packing slip, and register the hardware to access support benefits.

3. **Install the hardware for the FAS70 or FAS90 storage system**

To install the hardware, install the rail kits for your storage system and shelves, and then install and secure your storage system in the cabinet or telco rack. Next, slide the shelves onto the rails. Finally, attach cable management devices to the rear of the storage system for organized cable routing.

4. **Cable the controllers and storage shelves for the FAS70 or FAS90 storage system**

To cable the hardware, first connect the storage controllers to your network and then connect the controllers to your storage shelves.

5. **Power on the FAS70 or FAS90 storage system**

Before you power on the controllers, power on each NS224 shelf and assign a unique shelf ID to ensure each shelf is uniquely identified within the setup, connect the laptop or console to the controller, and then connect the controllers to the power sources.

6. **Set up your cluster**

After you've powered on your storage system, you set up your cluster.

Installation requirements - FAS70 and FAS90

Review the equipment needed and the lifting precautions for your FAS70 or FAS90 storage system and storage shelves.

Equipment needed for install

To install your storage system, you need the following equipment and tools.

- Access to a Web browser to configure your storage system
- Electrostatic discharge (ESD) strap
- Flashlight
- Laptop or console with a USB/serial connection
- Phillips #2 screwdriver

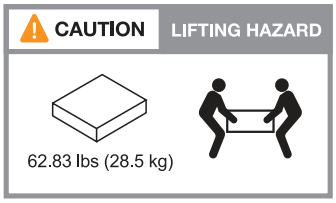
Lifting precautions

Storage systems and shelves are heavy. Exercise caution when lifting and moving these items.

Storage system weight

Take the necessary precautions when moving or lifting your storage system.

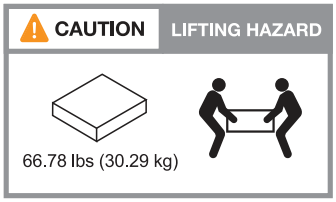
A FAS70 or FAS90 storage system can weigh up to 62.83 lbs (28.5 kg). To lift the system, use two people or a hydraulic lift.



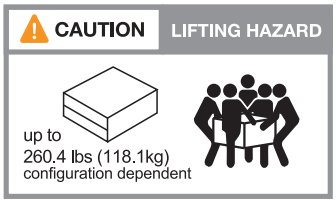
Shelf weight

Take the necessary precautions when moving or lifting your shelf.

An NS224 shelf can weigh up to 66.78 lbs (30.29 kg). To lift the shelf, use two people or a hydraulic lift. Keep all components in the shelf (both front and rear) to prevent unbalancing the shelf weight.



A DS460C shelf can weigh up to 260.4 lbs (181.1 kg). To lift the storage shelf, you might need up to five people or a hydraulic lift. Keep all components in the storage shelf (both front and rear) to prevent unbalancing the shelf weight.



Related information

- Safety information and regulatory notices

What's next?

After you've reviewed the hardware requirements, you prepare to install your FAS70 or FAS90 storage system.

Prepare to install - FAS70 and FAS90

Prepare to install your FAS70 or FAS90 storage system by getting the site ready, unpacking the boxes and comparing the contents of the boxes to the packing slip, and registering the system to access support benefits.

Step 1: Prepare the site

To install your storage system, ensure that the site and the cabinet or rack that you plan to use meet specifications for your configuration.

Steps

1. Use NetApp Hardware Universe to confirm that your site meets the environmental and electrical requirements for your storage system.
2. Make sure you have adequate cabinet or rack space for your storage system, shelves, and any switches:
   - 4U in an HA configuration
   - 2U for each NS224 storage shelf
3. Install any required network switches.

   See the Switch documentation for installation instructions and NetApp Hardware Universe for compatibility information.

Step 2: Unpack the boxes

After you've ensured that the site and the cabinet or rack that you plan to use for your storage system meet the required specifications, unpack all boxes and compare the contents to the items on the packing slip.

Steps

1. Carefully open all the boxes and lay out the contents in an organized manner.
2. Compare the contents you've unpacked with the list on the packing slip.

   You can get your packing list by scanning the QR code on the side of the shipping carton.

   The following items are some of the contents you might see in the boxes.

   Ensure that everything in the boxes matches the list on the packing slip. If there are any discrepancies, note them down for further action.

Hardware	Cables

- Bezel
- Cable management device
- Storage system
- Rail kits with instructions (optional)
- Storage shelf (if you ordered additional storage)
- Management Ethernet cables (RJ-45 cables)
- Network cables
- Power cords
- Storage cables (if you ordered additional storage)
- USB-C serial console cable

Step 3: Register your storage system

After you've ensured that your site meets the requirements for your storage system specifications, and you've verified that you have all the parts you ordered, you should register your storage system.

Steps

1. Locate the System Serial Numbers (SSN) for every controller being installed. You can find the serial numbers in the following locations:
2. You can find the serial numbers in the following locations:
    - On the packing slip
    - In your confirmation email
    - On each controller's System Management module

3. Go to the NetApp Support Site.
4. Determine whether you need to register your storage system:

If you are a…	Follow these steps…
Existing NetApp customer	a. Sign in with your username and password. b. Select **Systems** > **My Systems**. c. Confirm that the new serial numbers are listed. d. If it is not, follow the instructions for new NetApp customers.
New NetApp customer	a. Click **Register Now**, and create an account. b. Select **Systems** > **Register Systems**. c. Enter the storage system's serial numbers and requested details. After your registration is approved, you can download any required software. The approval process might take up to 24 hours.

What's next?

After you've prepared to install your FAS70 or FAS90 hardware, you install the hardware for your FAS70 or

FAS90 storage system.

Install the hardware - FAS70 and FAS90

After you prepare to install your FAS70 or FAS90 storage system, install the hardware for the system. First, install the rail kits. Then install and secure your platform in a cabinet or telco rack.

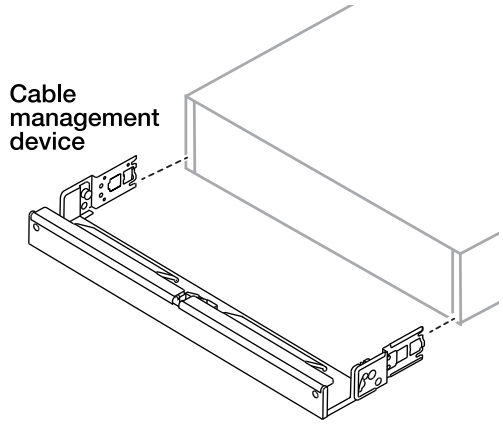
Skip this step if your cabinet is pre-populated.

Before you begin

- Make sure you have the instructions packaged with the rail kit.
- Be aware of the safety concerns associated with the weight of the storage system and shelf.
- Understand that the airflow through the storage system enters from the front where the bezel or end caps are installed and exhausts out the rear where the ports are located.

Steps

1. Install the rail kits for your storage system and shelves as needed, using the instructions included with the kits.
2. Install and secure your storage system in the cabinet or telco rack:
   a. Position the storage system onto the rails in the middle of the cabinet or telco rack, and then support the storage system from the bottom and slide it into place.
   b. Make sure that the guiding pins of the cabinet or telco rack are securley in the chassis guide slots.
   c. Secure the storage system to the cabinet or telco rack using the included mounting screws.
3. Attach the bezel to the front of the storage system.
4. Attach the cable management devices to the rear of the storage system.



5. Install and secure the shelf as needed.
   a. Position the back of the shelf onto the rails, and then support the shelf from the bottom and slide it into the cabinet or telco rack.

      If you are installing multiple shelves, place the first shelf directly above the controllers. Place the second shelf directly under the controllers. Repeat this pattern for any additional shelves.

   b. Secure the shelf to the cabinet or telco rack using the included mounting screws.

What's next?

After you've installed the hardware for your FAS70 or FAS90 storage system, you cable the hardware for your FAS70 or FAS90 storage system..

Cable the hardware - FAS70 and FAS90

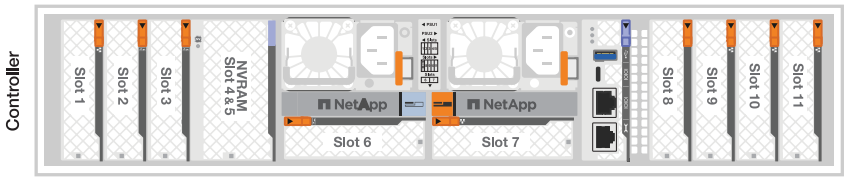
After you install the rack hardware for your FAS70 or FAS90 storage system, install the network cables for the controllers, and connect the cables between the controllers and storage shelves.

Before you begin

Contact your network administrator for information about connecting the storage system to the switches.

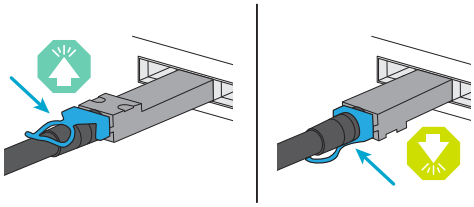
About this task

- These procedures show common configurations. The specific cabling depends on the components ordered for your storage system. For comprehensive configuration and slot priority details, see NetApp Hardware Universe.
- The I/O slots on FAS70 and FAS90 controllers are numbered 1 through 11.



- The cabling graphics have arrow icons showing the proper orientation (up or down) of the cable connector pull-tab when inserting a connector into a port.

  As you insert the connector, you should feel it click into place; if you do not feel it click, remove it, turn it over and try again.



- If cabling to an optical switch, insert the optical transceiver into the controller port before cabling to the switch port.

Step 1: Connect the storage controllers to your network

Cable the controllers to your ONTAP cluster. This procedure differs depending on your storage system model and I/O module configuration.

The cluster interconnect traffic and the HA traffic share the same physical ports.

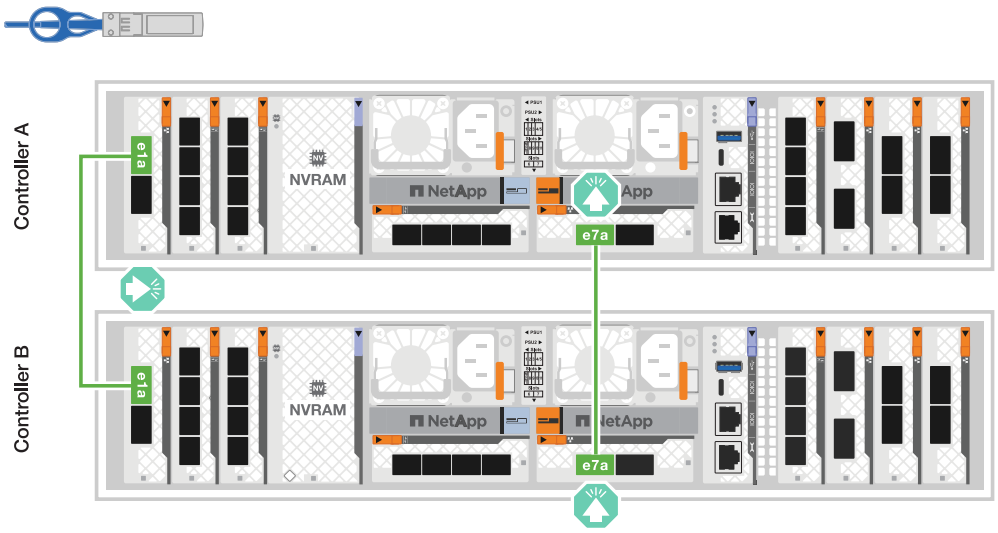
Switchless cluster cabling

Use the Cluster/HA interconnect cable to connect ports e1a to e1a and ports e7a to e7a.

Steps

1. Connect port e1a on Controller A to port e1a on Controller B.
2. Connect port e7a on Controller A to port e7a on Controller B.

Cluster/HA interconnect cables



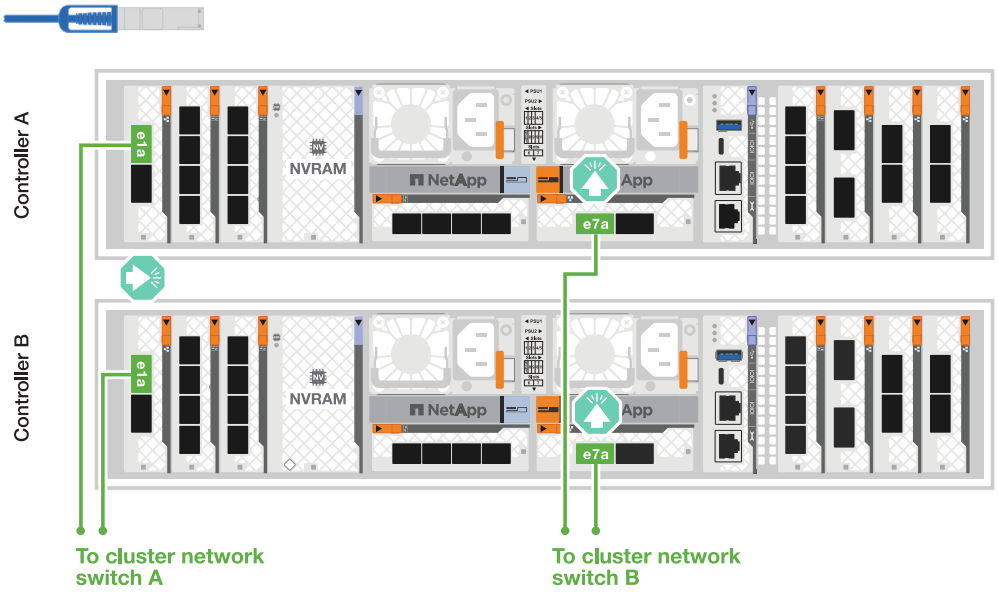
Switched cluster cabling

Use the 100 GbE cable to connect ports e1a to e1a and ports e7a to e7a.

Steps

1. Connect port e1a on Controller A and port e1a on Controller B to cluster network switch A.
2. Connect port e7a on Controller A and port e7a on Controller B to cluster network switch B.

100 GbE cable



Step 2: Cable the host network connections

Connect the Ethernet module ports to your host network.

The following are some typical host network cabling examples. See NetApp Hardware Universe for your specific system configuration.

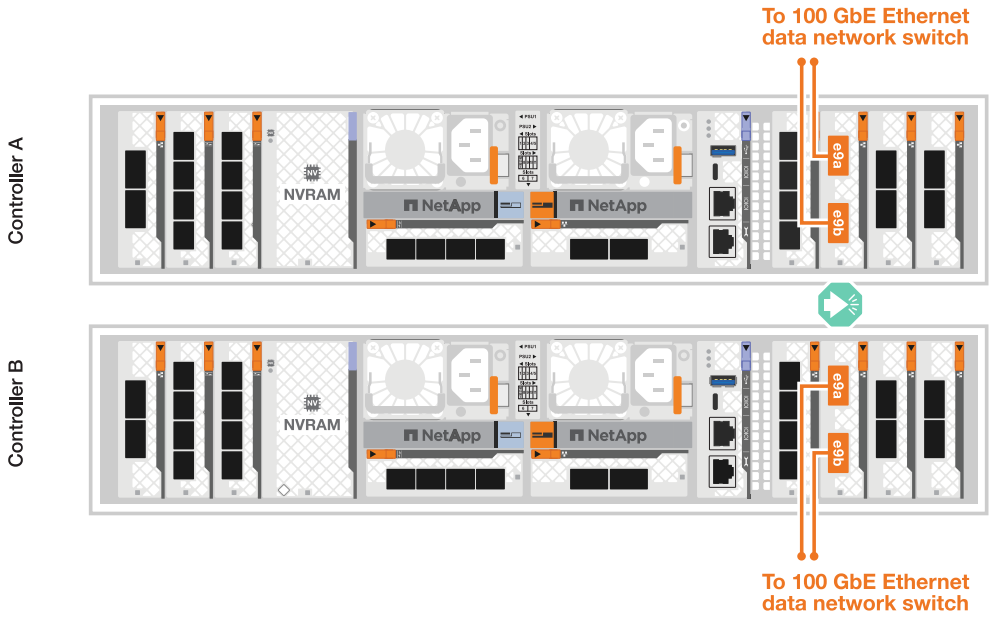
Steps

1. Connect ports e9a and e9b to your Ethernet data network switch.

   For maximum system performance for cluster and HA traffic, do not use ports e1b and e7b ports for host network connections. Use a separate host card to maximize performance.

   100 GbE cable

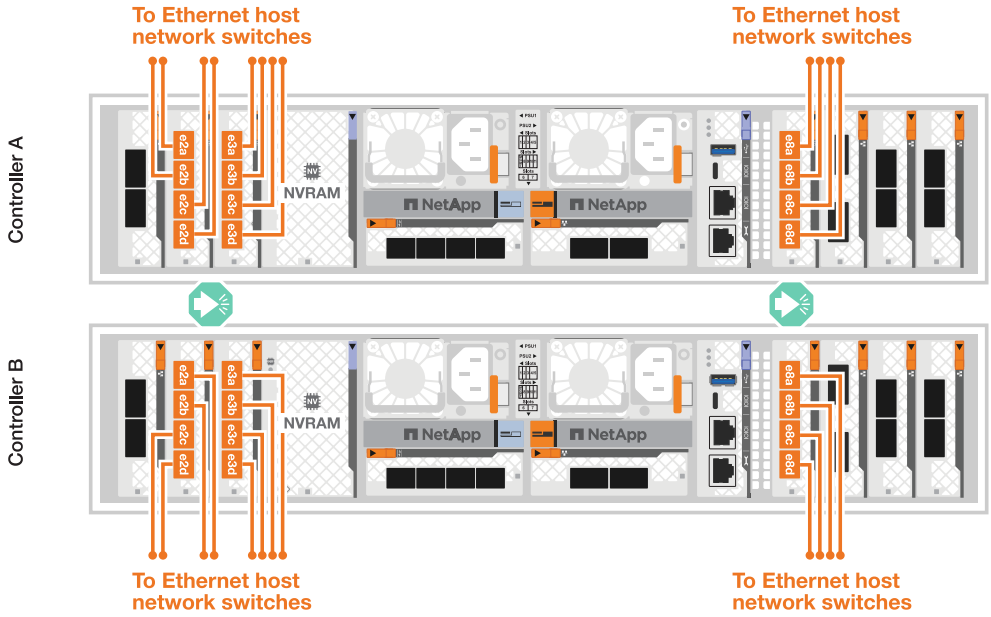
   

2. Connect your 10/25 GbE host network switches.

   4-ports, 10/25 GbE Host

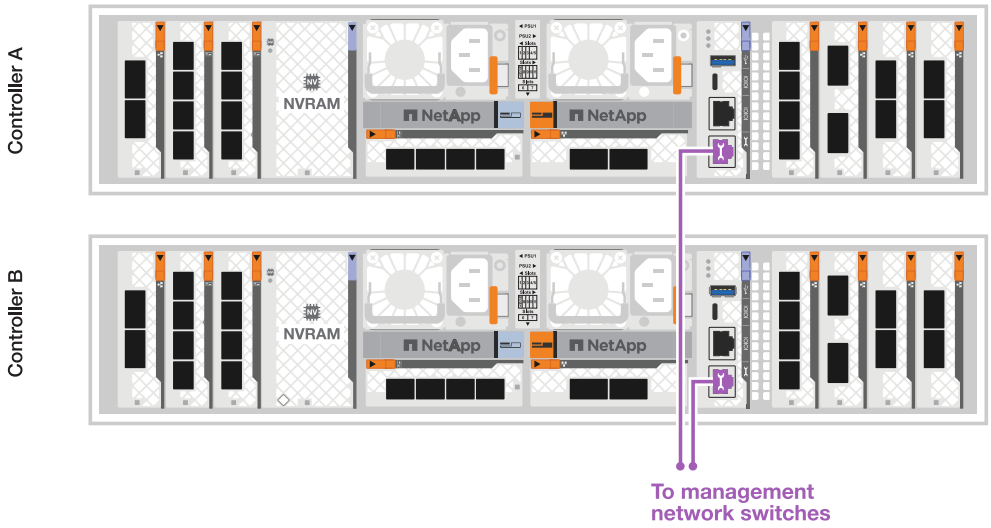
   



Step 3: Cable the management network connections

Use the 1000BASE-T RJ-45 cables to connect the management (wrench) ports on each controller to the management network switches.

1000BASE-T RJ-45 cables



Do not plug in the power cords yet.

Step 4: Cable the shelf connections

The following cabling procedures show how to connect your controllers to a storage shelf. Choose one of the following cabling options that matches your setup.

For the maximum number of shelves supported for your storage system and for all of your cabling options, see

NetApp Hardware Universe.

For additional SAS shelf cabling guidance, see SAS cabling rules and concepts - shelves with IOM12/IOM12B modules.

About this task

The FAS70 and FAS90 storage systems supports DS212C, DS224C, DS460C, and NS224 shelves with either the NSM100 or NSM100B module.

The major differences between the NS224 modules are:

- NSM100 shelf modules use built-in ports e0a and e0b.
- NSM100B shelf modules use ports e1a and e1b in slot 1.

The following NS224 cabling example shows NSM100 modules in the NS224 shelves when referring to shelf module ports.

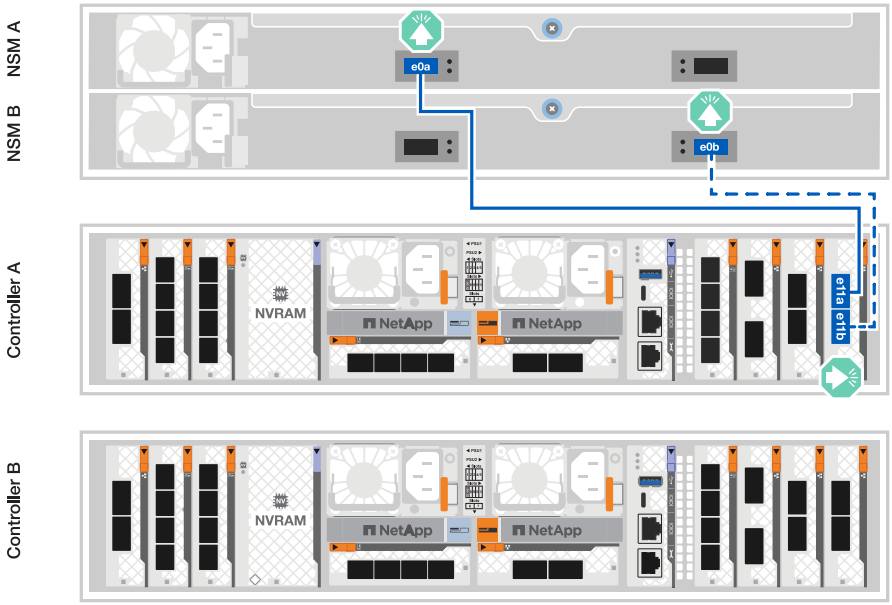
Option 1: One NS224 storage shelf

Connect each controller to the NSM modules on the NS224 shelf. The graphics show controller A cabling in blue and controller B cabling in yellow.

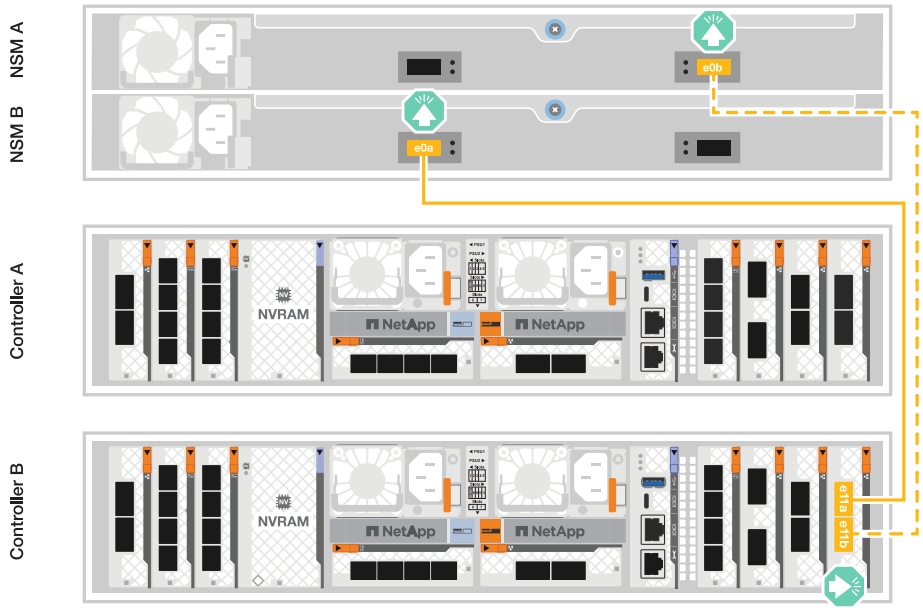
100 GbE QSFP28 copper cables

Steps

1. On controller A, connect the following ports:
   a. Connect port e11a to NSM A port e0a.
   b. Connect port e11b to port NSM B port e0b.



2. On controller B, connect the following ports:
   a. Connect port e11a to NSM B port e0a.
   b. Connect port e11b to NSM A port e0b.



Option 2: Two NS224 storage shelves

Cable each controller to the NSM modules on both NS224 shelves. The graphics show controller A cabling in blue and controller B cabling in yellow.

100 GbE QSFP28 copper cables

Steps

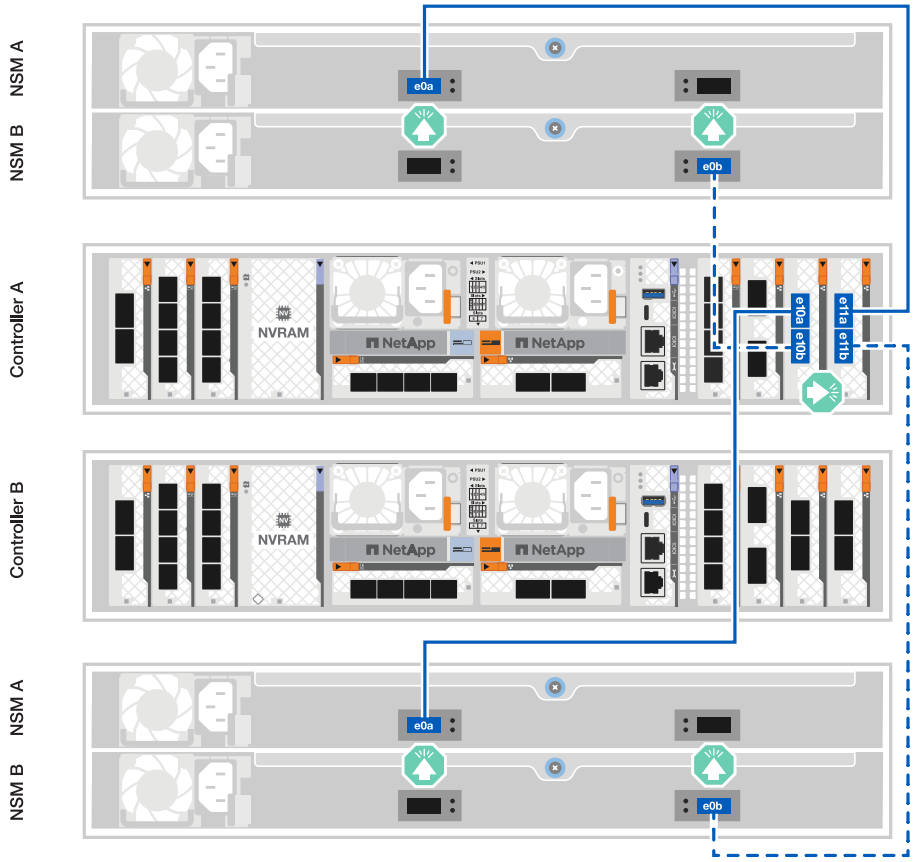
1. On controller A, connect the following ports:

    a. Connect port e11a to shelf 1 NSM A port e0a.

    b. Connect port e11b to shelf 2 NSM B port e0b.

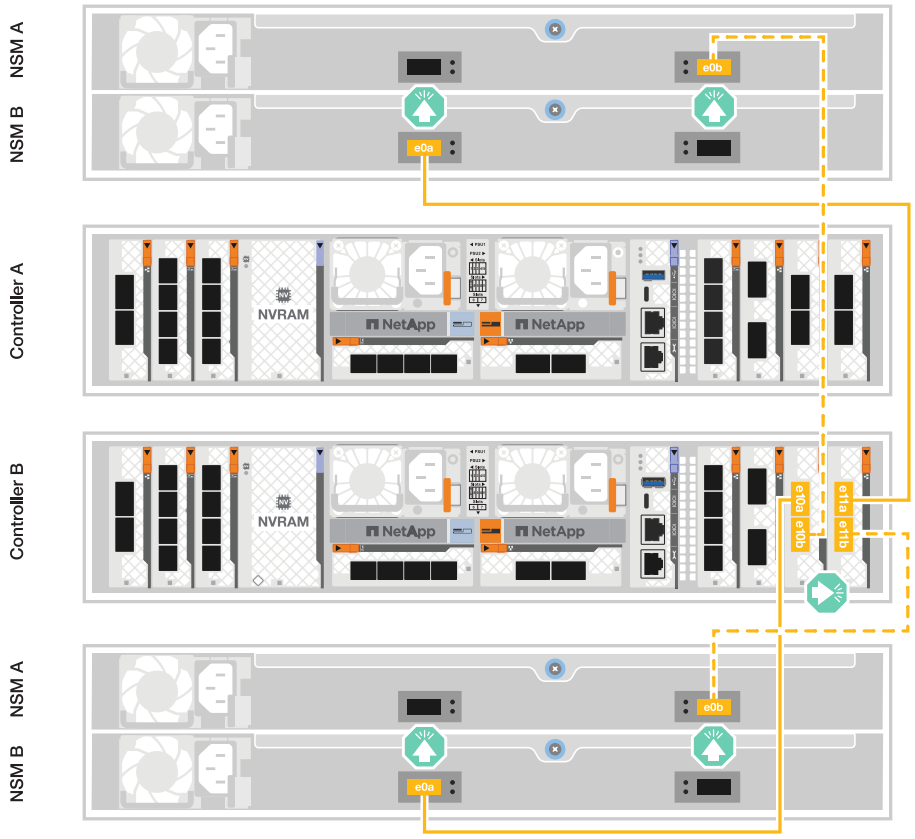
    c. Connect port e10a to shelf 2 NSM A port e0a.

    d. Connect port e10b to shelf 1 NSM A port e0b.



2. On controller B, connect the following ports:

   a. Connect port e11a to shelf 1 NSM B port e0a.
   b. Connect port e11b to shelf 2 NSM A port e0b.
   c. Connect port e10a to shelf 2 NSM B port e0a.
   d. Connect port e10b to shelf 1 NSM A port e0b.



Option 3: Two DS460C shelves

Cable each controller to the IOM modules on both DS460C shelves. The graphics show controller A cabling in blue and controller B cabling in yellow.

mini-SAS HD cable

Steps

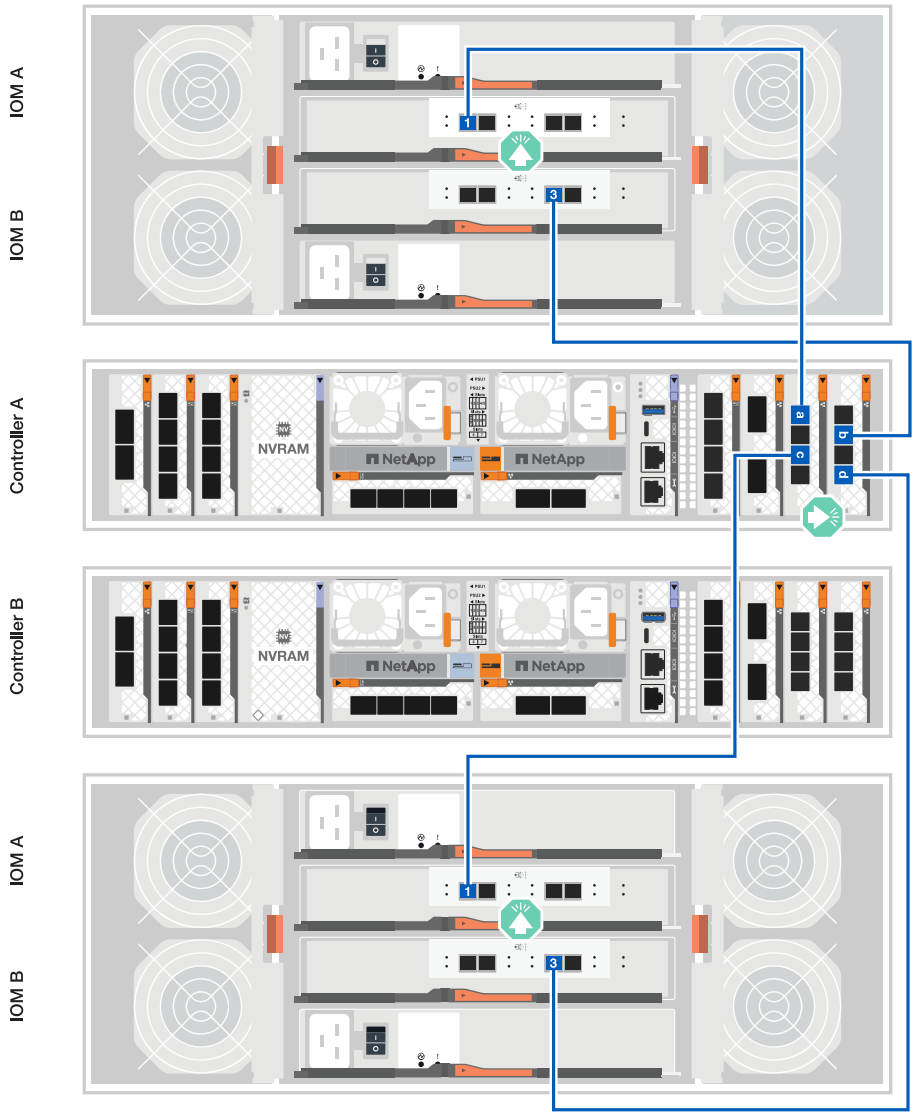
1. On controller A, cable the following connections:

    a. Connect port e10a to shelf 1 IOM A port 1.

    b. Connect port e10c to shelf 2 IOM A port 1

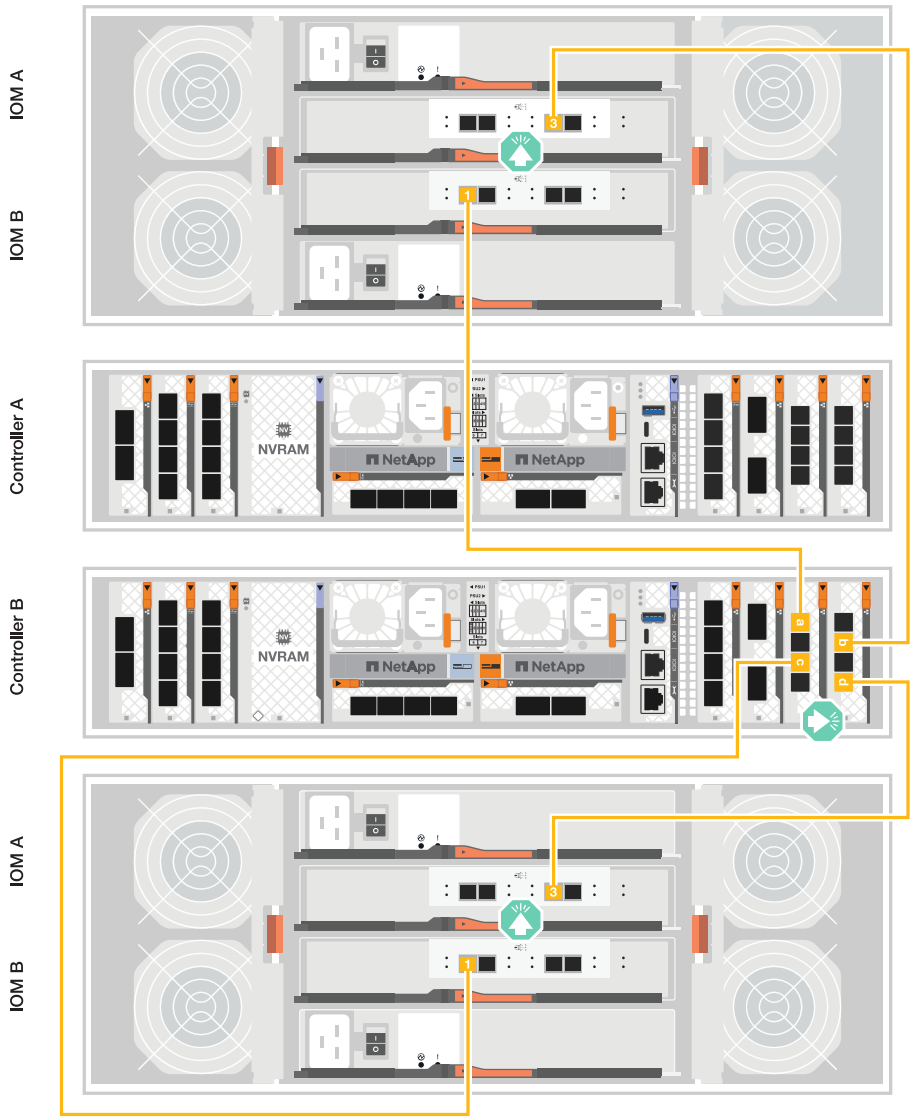
    c. Connect port e11b to shelf 1 IOM B port 3.

    d. Connect port e11d to shelf 2 IOM B port 3.



2. On controller B, cable the following connections:

   a. Connect port e10a to shelf 1 IOM B port 1.
   b. Connect port e10c to shelf 2 IOM B port 1.
   c. Connect port e11b to shelf 1 IOM A port 3.
   d. Connect port e11d to shelf 2 IOM A port 3.



What's next?

After you've cabled the hardware for your FAS70 or FAS90 system, you power on the FAS70 or FAS90 storage system.

Power on the storage system - FAS70 and FAS90

After you install the rack hardware for your FAS70 0r FAS90 storage system and install the cables for the controllers and storage shelves, you should power on your storage shelves and controllers.

Step 1: Power on the shelf and assign shelf ID

Option 1: NS224 shelves

Each shelf is distinguished by a unique shelf ID. This ID ensures that the shelf is distinct within your storage system setup.

Before you begin

Make sure you have a paperclip or narrow tipped ball point pen for setting NS224 storage shelf IDs.

About this task

- A valid shelf ID is 01 through 99.

  If you have internal shelves (storage), which are integrated within the controllers, they are assigned a fixed shelf ID of 00.

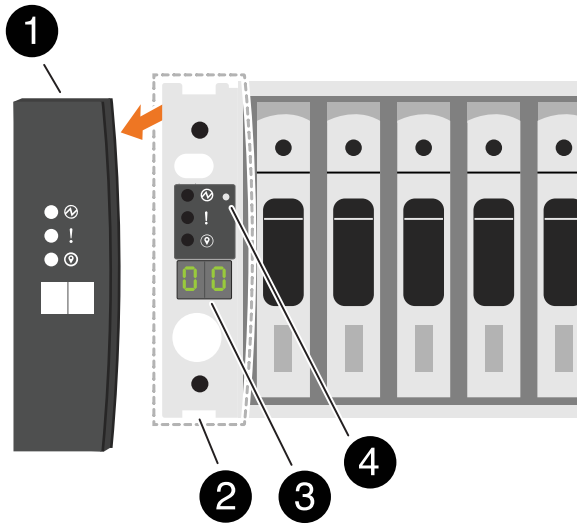
- You must power cycle a shelf (unplug both power cords, wait the appropriate amount of time, and then plug them back in) for the shelf ID to take effect.

Steps

1. Power on the shelf by connecting the power cords first to the shelf, securing them in place with the power cord retainer, and then connecting the power cords to power sources on different circuits.

   The shelf powers on and boots automatically when plugged into the power source.

2. Remove the left end cap to access the shelf ID button behind the faceplate.



1	Shelf end cap
2	Shelf faceplate
3	Shelf ID number
4	Shelf ID button

3. Change the first number of the shelf ID:

a. Insert the straightened end of a paperclip or narrow tipped ball point pen into the small hole to press the shelf ID button.

b. Press and hold the shelf ID button until the first number on the digital display blinks, and then release the button.

   It can take up to 15 seconds for the number to blink. This activates the shelf ID programming mode.

   > If the ID takes longer than 15 seconds to blink, press and hold the shelf ID button again, making sure to press it in all the way.

c. Press and release the shelf ID button to advance the number until you reach the desired number from 0 to 9.

   Each press and release duration can be as short as one second.

   The first number continues to blink.

4. Change the second number of the shelf ID:

   a. Press and hold the button until the second number on the digital display blinks.

      It can take up to three seconds for the number to blink.

      The first number on the digital display stops blinking.

   b. Press and release the shelf ID button to advance the number until you reach the desired number from 0 to 9.

      The second number continues to blink.

5. Lock in the desired number and exit the programming mode by pressing and holding the shelf ID button until the second number stops blinking.

   It can take up to three seconds for the number to stop blinking.

   Both numbers on the digital display start blinking and the amber LED illuminates after about five seconds, alerting you that the pending shelf ID has not yet taken effect.

6. Power-cycle the shelf for at least 10 seconds to make the shelf ID take effect.

   a. Unplug the power cord from both power supplies on the shelf.

   b. Wait 10 seconds.

   c. Plug the power cords back into the shelf power supplies to complete the power cycle.

      A power supply is powered on as soon as the power cord is plugged in. Its bicolored LED should illuminate green.

7. Replace the left end cap.

Option 2: SAS shelves

Each shelf is distinguished by a unique shelf ID. This ID ensures that the shelf is distinct within your storage system setup.

About this task

- A valid shelf ID is 01 through 99.

  If you have internal shelves (storage), which are integrated within the controllers, they are assigned a fixed shelf ID of 00.

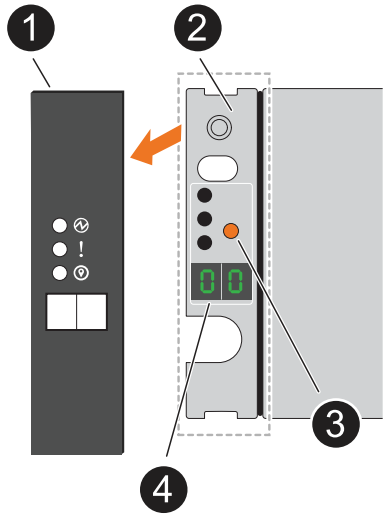
- You must power cycle a shelf (turn off the power switch on each of the power supplies of the SAS shelf, wait the appropriate amount of time, and then switch the power back on) for the shelf ID to take effect.

Steps

1. Power on the shelf by connecting the power cords first to the shelf, securing them in place with the power cord retainer, connecting the power cords to power sources on different circuits, and then turning on the power switch on each of the power supplies (at the rear of the shelf).

   The shelf powers on and boots automatically when powered on.

2. Remove the left end cap to access the orange shelf ID button on the faceplate.



1	Shelf end cap
2	Shelf faceplate
3	Shelf ID button
4	Shelf ID number

3. Change the first number of the shelf ID:
   a. Press and hold the shelf ID button until the first number on the digital display blinks, and then release the button.

      It can take up to 15 seconds for the number to blink. This activates the shelf ID programming mode.

If the ID takes longer than 15 seconds to blink, press and hold the shelf ID button again, making sure to press it in all the way.

b. Press and release the shelf ID button to advance the number until you reach the desired number from 0 to 9.

   Each press and release duration can be as short as one second.

   The first number continues to blink.

4. Change the second number of the shelf ID:
   a. Press and hold the button until the second number on the digital display blinks.

      It can take up to three seconds for the number to blink.

      The first number on the digital display stops blinking.

   b. Press and release the shelf ID button to advance the number until you reach the desired number from 0 to 9.

      The second number continues to blink.

5. Lock in the desired number and exit the programming mode by pressing and holding the shelf ID button until the second number stops blinking.

   It can take up to three seconds for the number to stop blinking.

   Both numbers on the digital display start blinking and the amber LED illuminates after about five seconds, alerting you that the pending shelf ID has not yet taken effect.

6. Power-cycle the shelf for at least 10 seconds to make the shelf ID take effect.
   a. Turn off the power switch on each of the power supplies.
   b. Wait 10 seconds.
   c. Turn on the power switch on each of the power supplies to complete the power cycle.

      When a power supply is powered on, the bicolored LED should illuminate green.

7. Replace the left end cap.

Step 2: Power on the controllers

After you've powered on your shelves and assigned them unique IDs, power on the storage controllers.

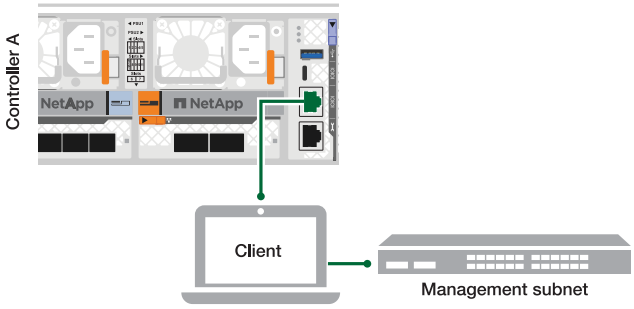
Steps

1. Connect your laptop to the serial console port. This will allow you to monitor the boot sequence when the controllers are powered on.
   a. Set the serial console port on the laptop to 115,200 baud with N-8-1.

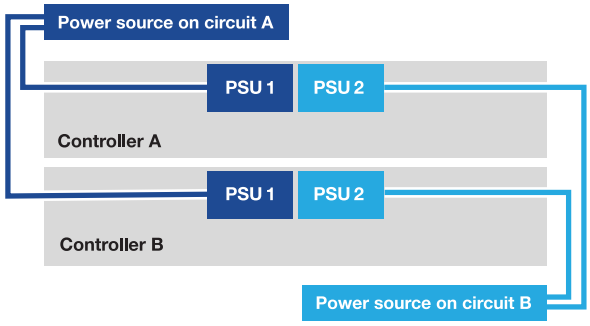
      See your laptop's online help for instructions on how to configure the serial console port.

b. Using the console cable provided with your storage system, connect one end of the console cable to your laptop and the other end to the serial console port on controller A.

c. Connect the laptop to the switch on the management subnet.



2. Assign a TCP/IP address to the laptop, using one that is on the management subnet.
3. Plug the two power cords into the controller power supplies, and then connect them to power sources on different circuits.



   - The system begins to boot. Initial booting might take up to eight minutes.
   - The LEDs flash on and the fans start, which indicates that the controllers are powering on.
   - The fans might be very noisy when they first start up. The fan noise during start-up is normal.
4. Secure the power cords using the securing device on each power supply.

What's next?

After you've turned on your FAS70 or FAS90 storage system, you set up your cluster.

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