



Install and setup

Install and maintain

NetApp
July 01, 2024

Table of Contents

- Install and setup 1
 - Install setup workflow - AFF A1K 1
 - Prepare for install - AFF A1K 1
 - Install the hardware - AFF A1K 4
 - Cable the hardware - AFF A1K 5
 - Power on the storage system - AFF A1K 13
 - Complete storage system setup and configuration - AFF A1K 16

Install and setup

Install setup workflow - AFF A1K

Follow these workflow steps to install, set up, and deploy your AFF A1K storage system.

1

Prepare for install

To prepare for install, 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.

2

Install hardware

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

3

Cable hardware

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

4

Power on storage system

To power on your system, first power on each NS224 shelf and assign a unique shelf ID to ensure each shelf is distinct within the setup. Then, power on the controllers. Finally, use the provided securing device to secure the power cables on each power supply.

5

Complete storage system setup

To complete system setup, access the web-based interface, System Manager, by pointing a browser to the controller's IP address. A setup wizard helps you get started with cluster configuration. As an alternative, you can also use the command line interface (CLI).

Prepare for install - AFF A1K

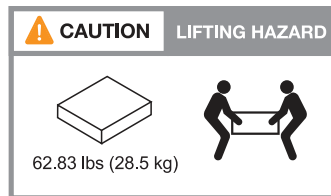
Prepare to install your AFF A1K platform.

Before you begin

- Use the [cluster setup worksheet](#) to record the values that you need when you [configure your cluster](#). If a default value is provided, you can use that value or else enter your own.
- Confirm you have all of the additional equipment and tools that you need to complete the hardware installation.
 - Phillips #2 screwdriver
 - Flashlight

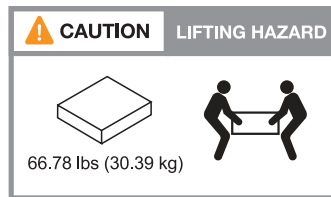
- ESD strap
- A paperclip or narrow tipped ball point pen for setting NS224 shelf IDs
- Laptop or console with a USB/serial connection
- Access to a Web browser to configure your storage system
- You should be aware of the safety concerns associated with the weight of the platform.

A fully loaded A1K platform can weigh up to 62.83 lbs (28.5 kg) and requires two people to lift or use a hydraulic lift.



- You should be aware of the safety concerns associated with the weight of the shelf.

A fully loaded shelf can weigh up to 66.78 lbs (30.29 kg) and requires two people to lift or use a hydraulic lift. Avoid removing shelf components (from the front or rear of the shelf) to reduce the shelf weight, because shelf weight will become unbalanced.



- 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.

Step 1: Prepare the site

Make sure that the site and the cabinet or rack you plan to use meet the specifications for your storage system.

Steps

1. Confirm that your site meets the environmental and electrical requirements for your platform as shown in the [NetApp Hardware Universe](#).
2. Make sure you have adequate rack space:
 - 4U in an HA configuration for the platform
 - 2U for each NS224 shelf
3. Install any required network switches near the platform.

See the [Switch documentation](#) for installation instructions and [NetApp Hardware Universe](#) for compatibility information.

Step 2: Unpack the boxes

Unpack all boxes and compare the contents to the items on the packing slip.

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

- Platform
- Shelf
- Rail kits with instructions (optional)
- Cable management device
- Bezel

Cables

- Power cords
- Network cables
- Management Ethernet cables (RJ-45 cables)
- USB-C serial port cable
- Storage cables (if additional storage is ordered)

Step 3: Register your hardware

Registering your platform provides support benefits.

Steps

1. Locate the system serial number for your platform.

You can find the number on the packing slip, in your confirmation email, or on the controller's System Management module after you unpack it.



2. Go to the NetApp Support Site at mysupport.netapp.com.
3. Register the hardware:

If you are a...	Follow these steps...
Existing NetApp customer	<ol style="list-style-type: none"> a. Sign in with your username and password. b. Select Systems > My Systems. c. Confirm that the new system serial number is listed. d. If it is not, follow the instructions for new NetApp customers.

If you are a...	Follow these steps...
New NetApp customer	<ol style="list-style-type: none"> a. Click Register Now, and create an account. b. Select Systems > Register Systems. c. Enter the product system serial number and requested details. <p>After your registration is approved, you can download any required software. The approval process might take up to 24 hours.</p>

Install the hardware - AFF A1K

The following instructions describe how to install the hardware in an empty cabinet or telco rack. Skip this step if your cabinet is pre-populated.

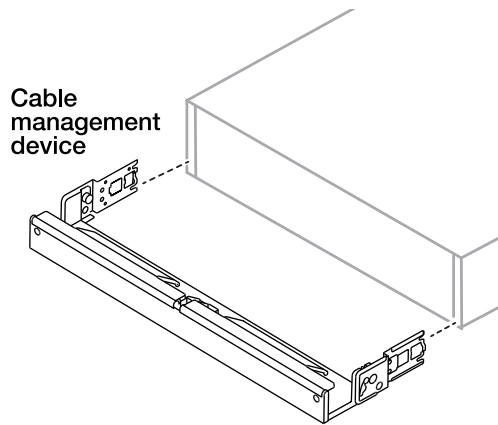
Before you begin

- You should review the [Safety Notices](#) document, and understand the precautions for moving and installing hardware.
- You should have the instructions packaged with the rail kit.
- You should be aware of the safety concerns associated with the weight of the platform and shelf.

Steps

1. Install the rail kits for the platform and shelves, as needed, using the instructions included with the kits.
2. Install and secure your platform in the cabinet or telco rack:
 - a. Position the platform onto the rails in the middle of the cabinet or telco rack, and then support the platform from the bottom and slide it into place.
 - b. Secure the platform to the cabinet or telco rack using the included mounting screws.
3. Install the shelf or shelves:
 - 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 drive shelves.
 - b. Secure the shelf to the cabinet or telco rack using the included mounting screws.
4. Attach the cable management devices to the rear of the platform.



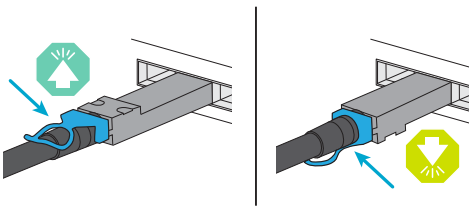
5. Attach the bezel to the front of the platform.

Cable the hardware - AFF A1K

Cable your controllers and shelves according to your specific storage system configuration.

Before you begin

Check the illustration arrow in the cabling diagrams for the proper cable connector pull-tab orientation.



- As you insert the connector, you should feel it click into place; if you do not feel it click, remove it, turn the cable head over and try again.
- If connecting to an optical to a switch, insert the SFP into the controller port before cabling to the port.

Step 1: Cable controllers to your network

Cable the controllers to your network as either a two-node switchless cluster or a switched cluster.

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. Keep in mind that the specific cabling depend on the components ordered for your storage system. For comprehensive configuration and slot priority details, see [NetApp Hardware Universe](#).

Option 1: Cable switchless cluster

Cable your switchless cluster connections.

Steps

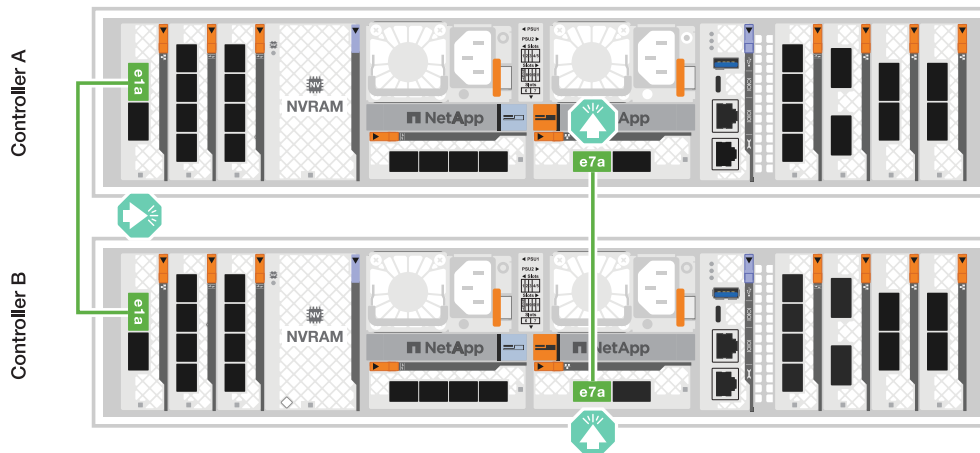
1. Cable the Cluster/HA interconnect ports e1a to e1a and e7a to e7a with the Cluster/HA interconnect cable.



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



Cluster/HA interconnect cables



2. Cable 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.

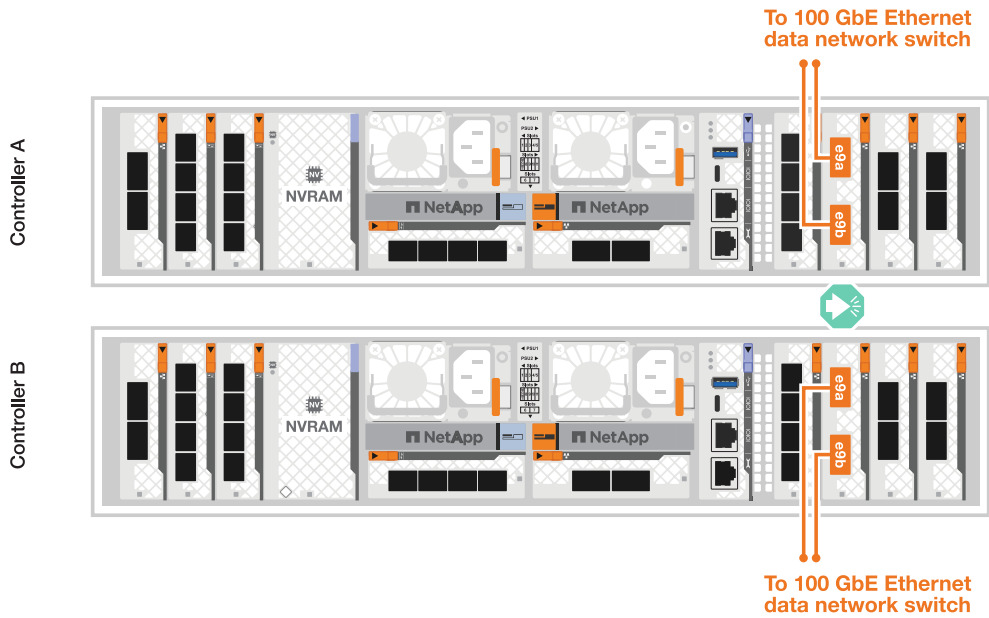
- a. Cable ports e9a and e9b to your Ethernet data network switch as shown.



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

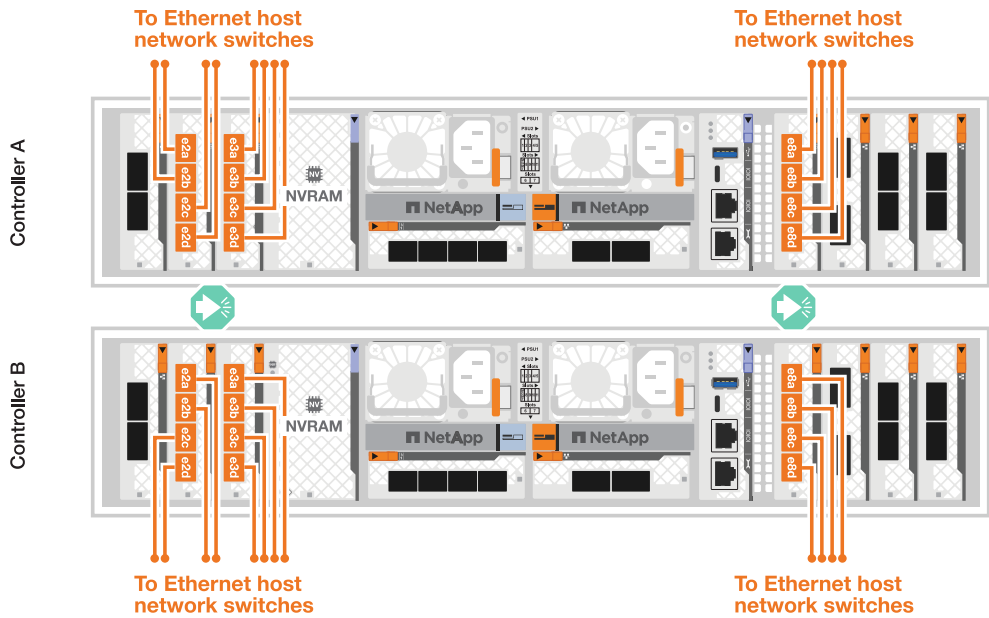
100 GbE cable





b. Cable your 10/25 GbE host network switches.

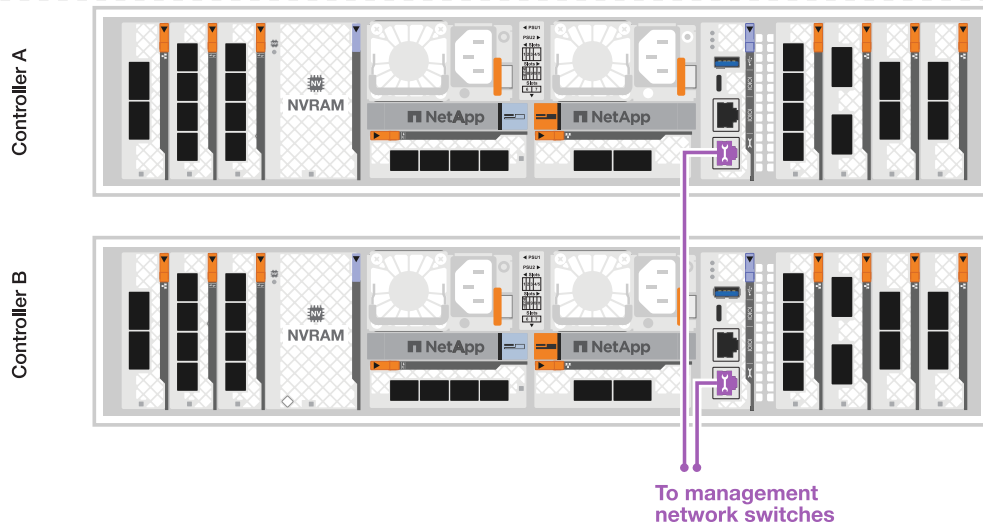
10/25 GbE Host



3. Cable the controller management (wrench) ports to the management network switches with 1000BASE-T RJ-45 cables.



1000BASE-T RJ-45 cables



i DO NOT plug in the power cords yet.

Option 2: Cable switched cluster

Cable your switched cluster connections.

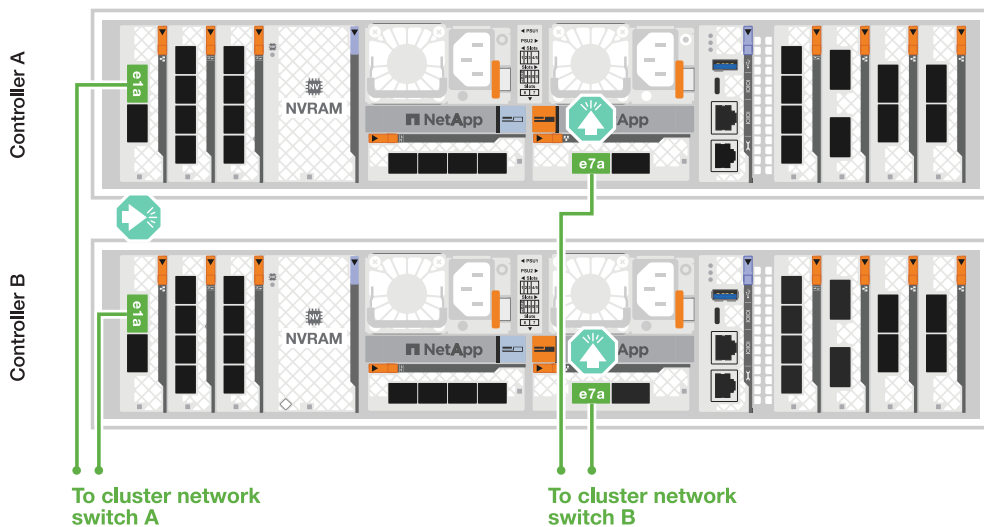
Steps

1. Make the following cabling connections:

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

- a. Cable port e1a on Controller A and port e1a on Controller B to cluster network switch A.
- b. Cable port e7a on Controller A and port e7a on Controller B to cluster network switch B.

100 GbE cable



2. Cable the Ethernet module ports to your host network.

The following are some typical host network cabling examples. See [NetApp Hardware Universe](#) for

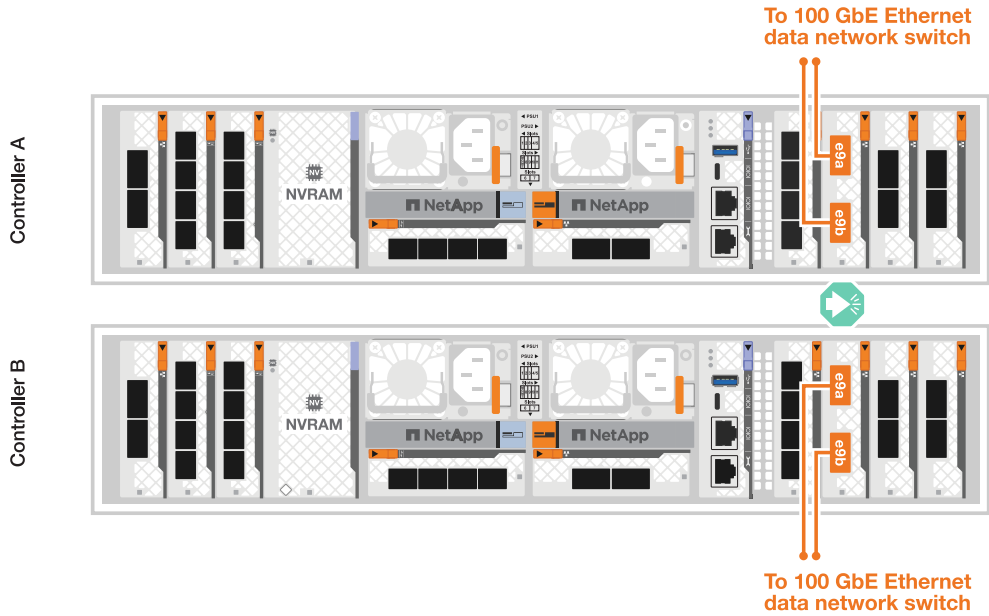
your specific system configuration.

- a. Cable ports e9a and e9b to your Ethernet data network switch as shown.



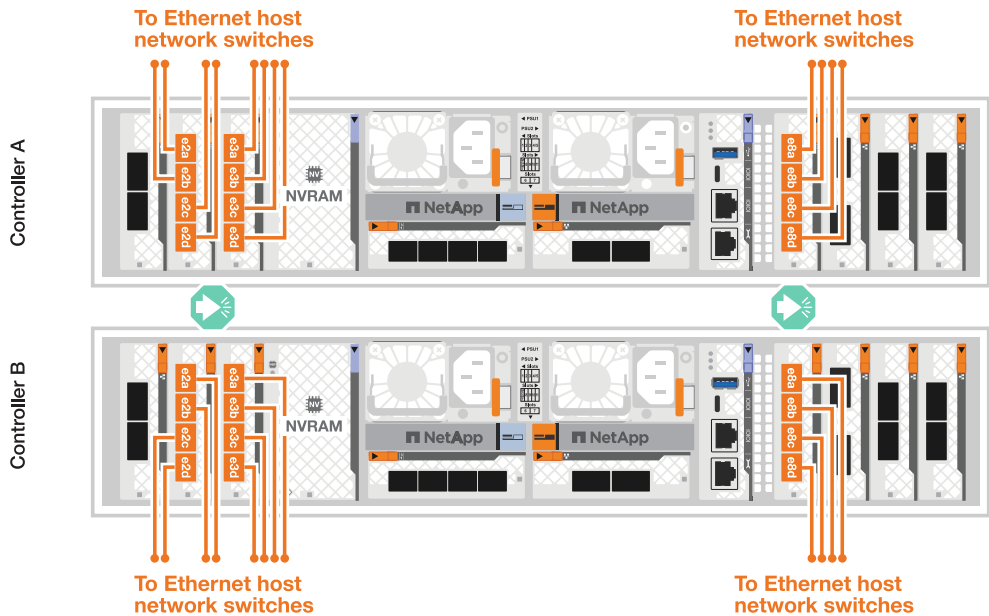
For maximum system performance for cluster and HA traffic, it is a best practice to not use ports e1b and e7b ports for host network connections. Use a separate host card to maximize performance.

100 GbE cable



- b. Cable your 10/25 GbE host network switches.

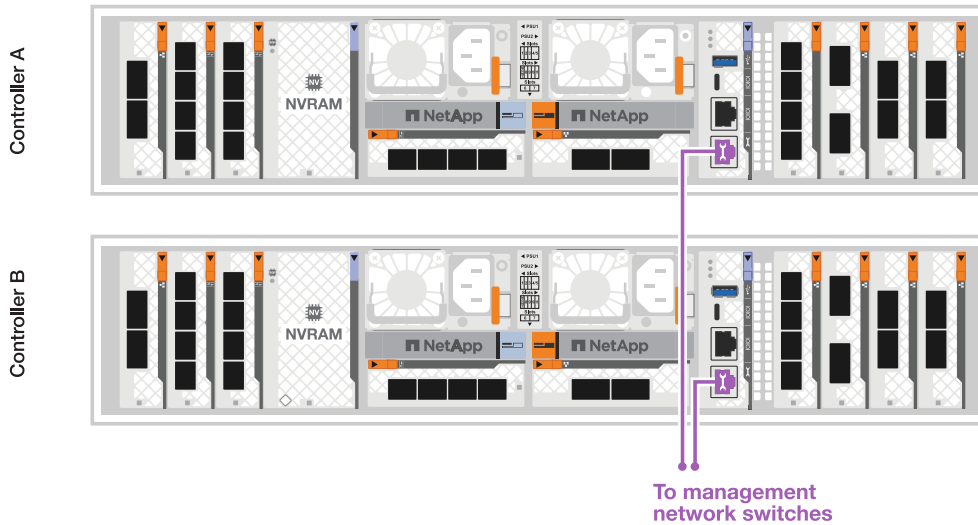
4-ports, 10/25 GbE Host



3. Cable the controller management (wrench) ports to the management network switches with 1000BASE-T RJ-45 cables.



1000BASE-T RJ-45 cables



DO NOT plug in the power cords yet.

Step 2: Cable controllers to shelves

Cable your controllers to the shelf or shelves.

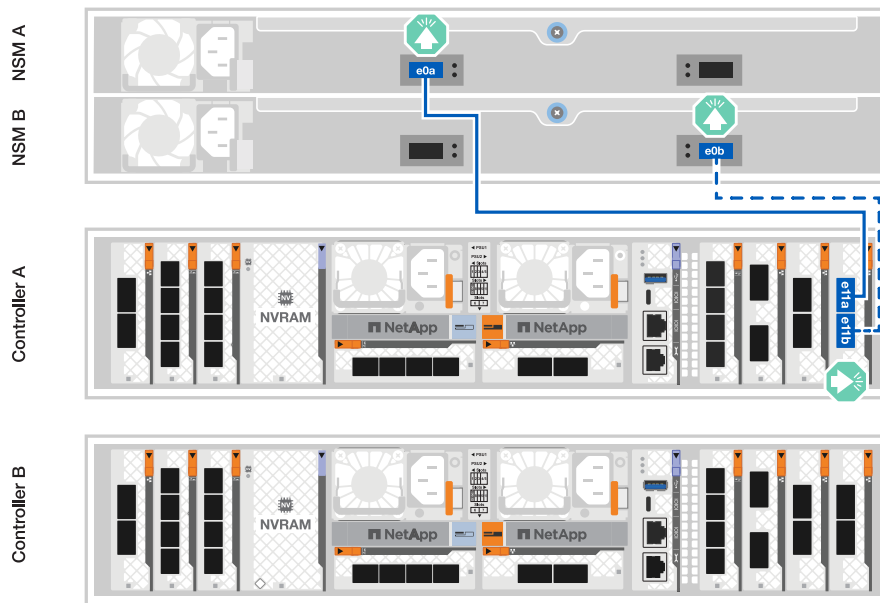
These procedures show how to cable your controllers to one shelf and to two shelves. You can directly connect up to four shelves to your controllers.

Option 1: Cable to one NS224 shelf

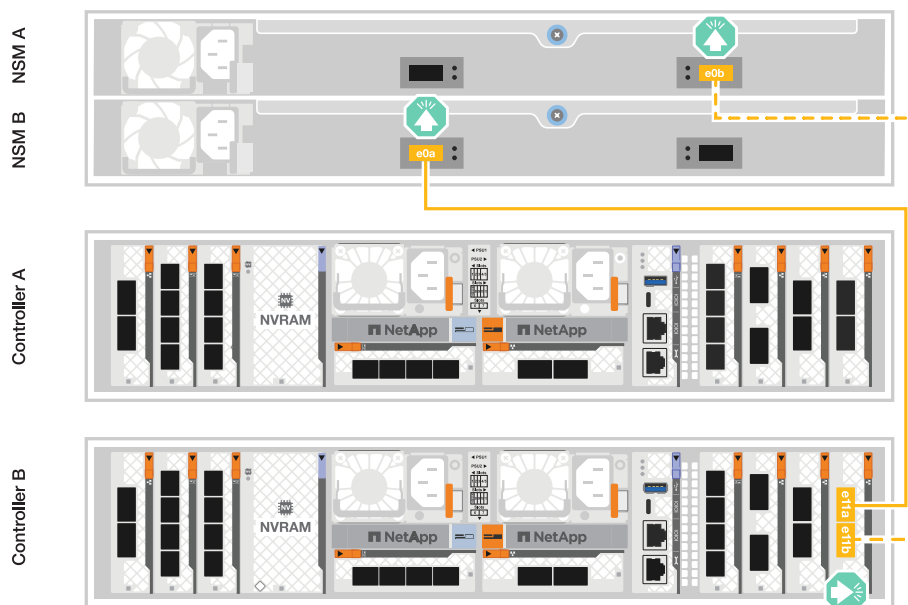
Cable each controller to the NSM modules on the NS224 shelf. The graphics show cabling from each of the controllers: Controller A cabling in blue and Controller B cabling in yellow.

Steps

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



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

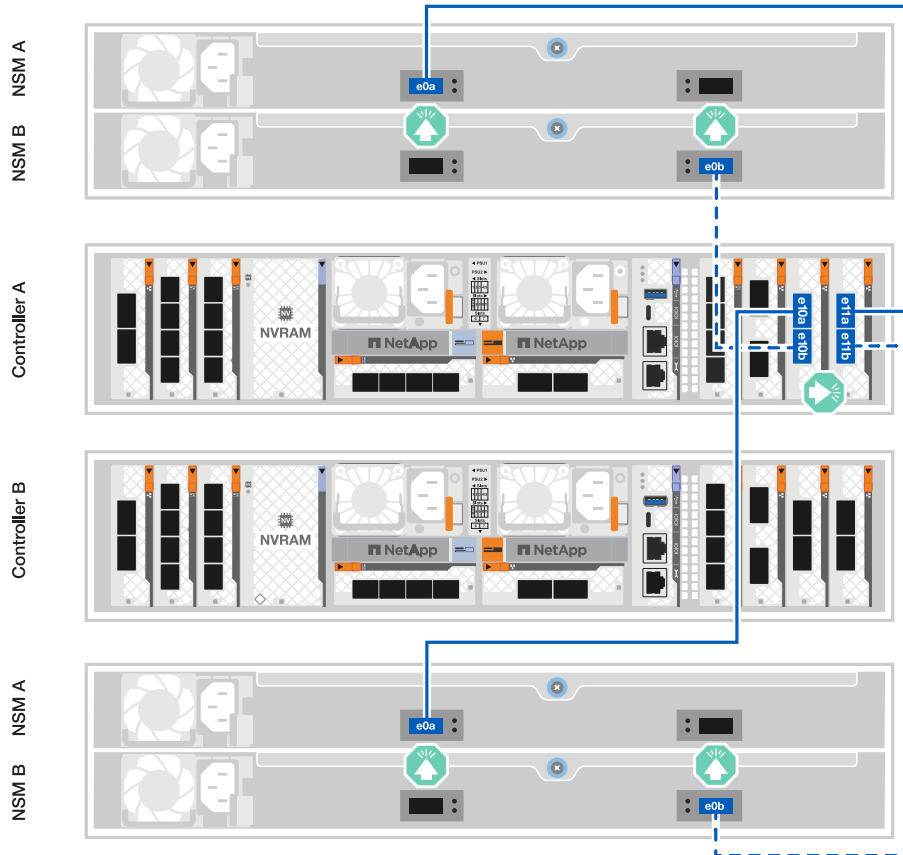


Option 2: Cable to two NS224 shelves

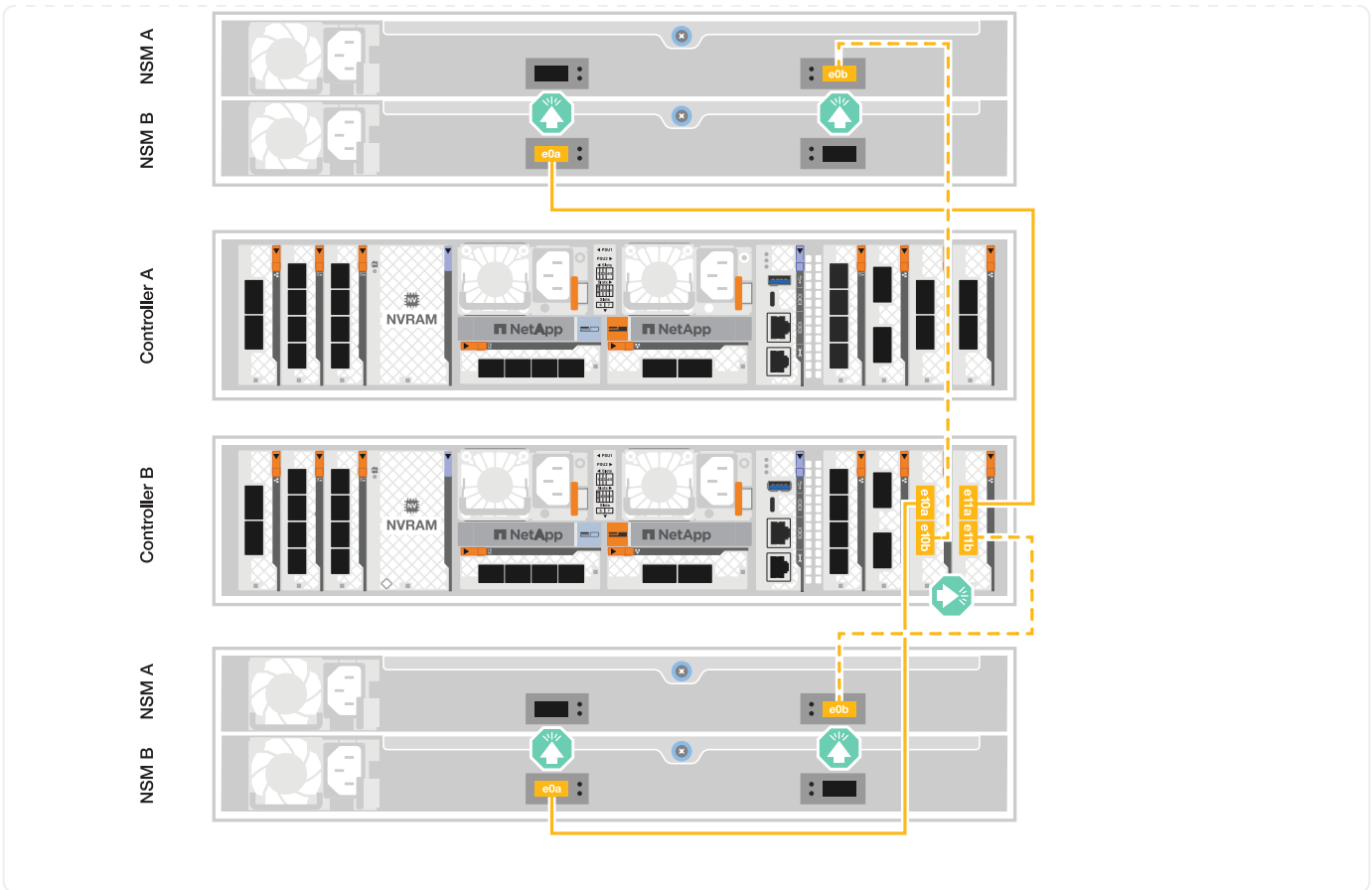
Cable each controller to the NSM modules on both NS224 shelves. The graphics show cabling from each of the controllers: Controller A cabling in blue and Controller B cabling in yellow.

Steps

1. On controller A, cable the following connections:
 - 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, cable the following connections:
 - 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.



Power on the storage system - AFF A1K

After connecting the network and any shelf cables, you are ready to apply power to the controllers and shelves.

Step 1: Power on the shelf and assign shelf ID

In ONTAP storage systems, each NS224 shelf is distinguished by a unique shelf ID. This ID ensures that the shelf is distinct within your storage system setup. By default, shelf IDs are assigned as '00' and '01', but you may need to adjust these IDs to maintain uniqueness across your storage system.

About this task

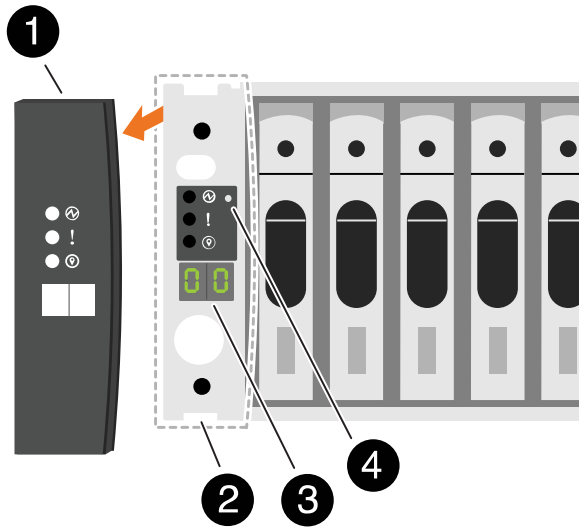
- A valid shelf ID is 00 through 99.
- You must power cycle a shelf (unplug both power cords, wait the appropriate amount of time, and then plug them back in) for the shelf ID to take effect.

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 access 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.
- b. Press and hold the 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 button again, making sure to press it in all the way.

- c. Press and release the 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 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 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 on the ODP 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.

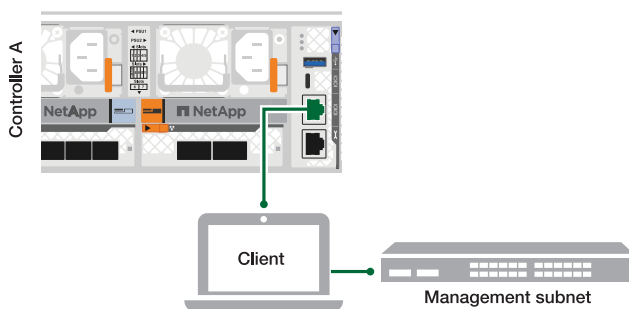
Step 2: Power on the controllers

1. Connect your laptop to the serial console port so you can monitor the boot sequence when power is applied to the controllers.
 - a. Set the serial console port on the laptop to 115,200 baud with N-8-1.

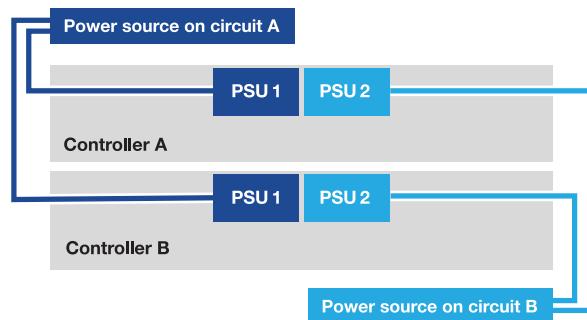


See your laptop's online help for instructions on how to configure the serial console port.

- b. Connect the console cable to the laptop, and connect the serial console port on the controller using the console cable that came with your platform.
- c. Connect the laptop to the switch on the management subnet.



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



- The platform begins to boot. Initial booting may 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 loud when they first start up. The loud fan noise during start-up is normal.
3. Secure the power cables using the securing device on each power supply.

Complete storage system setup and configuration - AFF A1K

After you have installed your hardware, use the ONTAP software to configure and manage your storage system.

Step 1: Gather cluster information

If you have not already done so, gather the information you will need to configure your cluster, such as your cluster management interface port and IP address.

Use the [cluster setup worksheet](#) to record the values that you need during the cluster setup process. If a default value is provided, you can use that value or else enter your own.

Step 2: Discover your cluster network

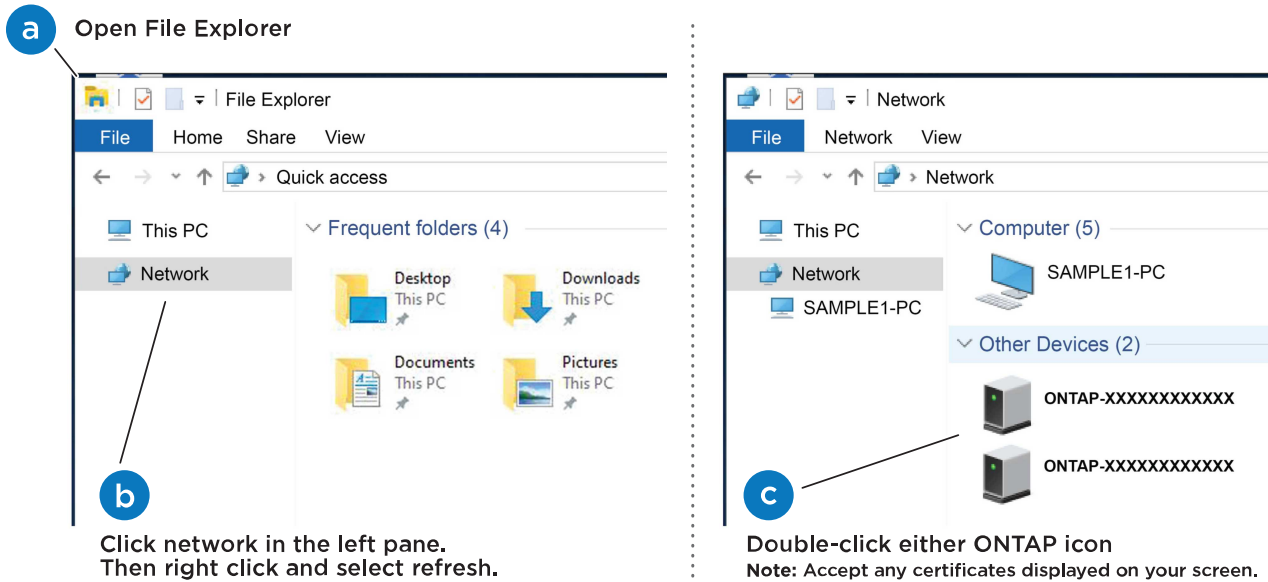
The discovery process enables you to discover your storage system controllers on the network.

Option 1: Network discovery is enabled

If you have network discovery enabled on your laptop, you can complete platform setup and configuration using automatic cluster discovery.

Steps

1. Connect your laptop to the management switch and access the network computers and devices.
2. Select an ONTAP icon listed to discover:



- a. Open File Explorer.
- b. Click **Network** in the left pane.
- c. Right-click and select **refresh**.
- d. Double-click either ONTAP icon and accept any certificates displayed on your screen.



XXXXX is the platform serial number for the target node.

System Manager opens.

Option 2: Network discovery is not enabled


If network discovery is not enabled on your laptop, complete the configuration and setup using the ONTAP command line interface (CLI) Cluster Setup wizard.

Before you begin

Make sure your laptop is connected to the serial console port and the controllers are powered on. See [Power on the controllers](#) for instructions.

Steps

Assign an initial node management IP address to one of the nodes.

If the management network has DHCP...	Then...
Configured	Record the IP address assigned to the new controllers.
Not configured	<p>a. Open a console session using PuTTY, a terminal server, or the equivalent for your environment.</p> <div style="display: flex; align-items: center; margin: 10px 0;">  <p>Check your laptop or console's online help if you do not know how to configure PuTTY.</p> </div> <p>b. Connect to the console of the first node.</p> <p>The node boots, and then the Cluster Setup wizard starts on the console.</p> <p>c. Enter the node's management IP address when prompted by the Cluster Setup wizard.</p>

Step 3: Configure your cluster

NetApp recommends that you use System Manager to set up new clusters. See [Configure ONTAP on a new cluster with System Manager](#) for setup instructions.

System Manager provides a simple and easy workflow for cluster set up and configuration including assigning a node management IP address, initializing the cluster, creating a local tier, configuring protocols and initial provisioning of attached storage.



After your cluster is initialized, download and run [Active IQ Config Advisor](#) to confirm your setup.

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.