Cabling

AFX

NetApp
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Cabling

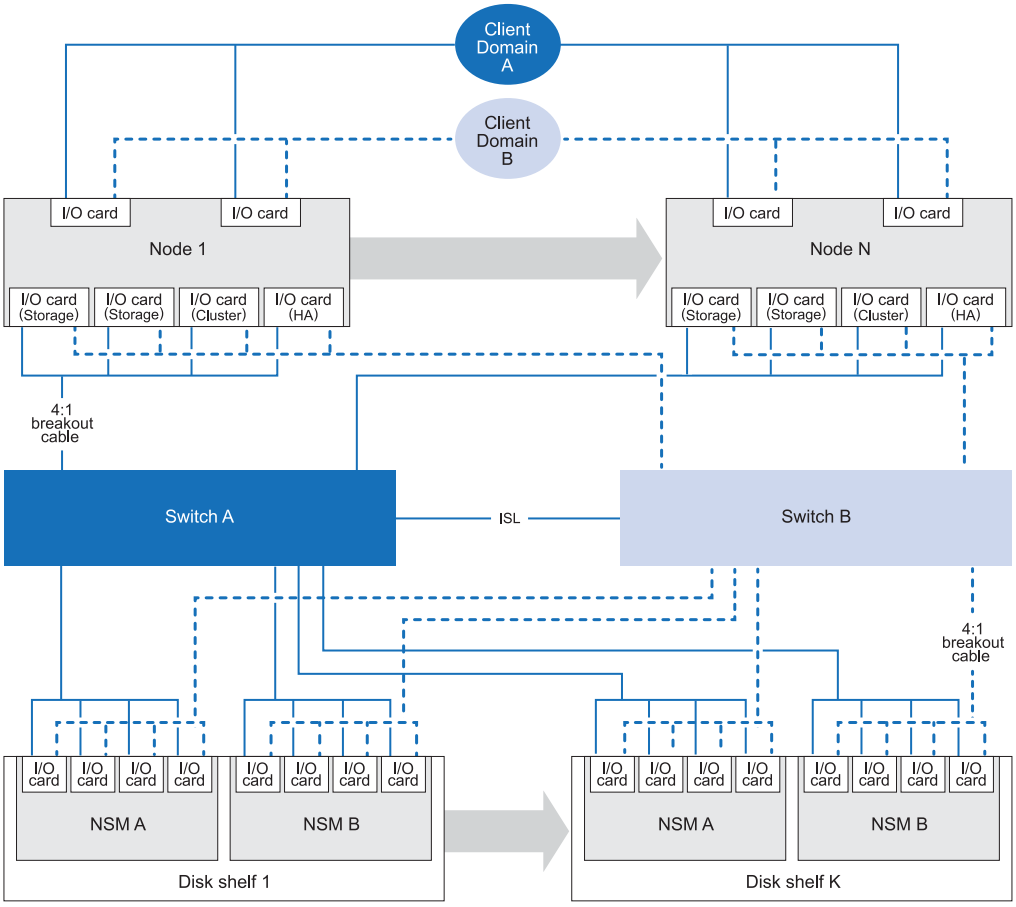
Supported configurations for your AFX 1K storage system

Learn about the supported hardware components and cabling options for the AFX 1K storage system, including compatible storage disk shelves, switches, and cable types required for proper system setup.

Supported AFX 1K cabling configuration

The initial configuration of the AFX 1K storage system supports a minimum of four controller nodes connected through dual switches to the storage disk shelves.

Additional controller nodes and disk shelves expand the initial AFX 1K storage system configuration. Expanded AFX 1K configurations follow the same switch-based cabling methodology as the schema depicted below.



Supported hardware components

Review the compatible storage disk shelves, switches, and cable types for the AFX 1K storage system.

Controller Shelf	Disk Shelf	Supported Switches	Supported Cables
AFX 1K	NX224	• Cisco Nexus 9332D-GX2B (400GbE) • Cisco Nexus 9364D-GX2A (400GbE)	• 400GbE QSFP-DD breakout to 4x100GbE QSFP breakout cable cables Breakout cables are used for 100GbE connections between the switches, controllers, and disk shelves. ◦ 100GbE cables to controller cluster and HA ports ◦ 100GbE cables to disk shelves • 2 x 400GbE cables for ISL connections between switch A and switch B • RJ-45 cables for management connections

What's next?

After reviewing the supported system configuration and hardware components, review the network requirements for your AFX 1K storage system.

Network requirements for your AFX 1K storage system

Record the required information for each network you connect to your AFX 1K storage system.

Gather network information

Before you begin the installation of your AFX 1K storage system, gather the required network information

- Host names and IP addresses for each of the storage system controllers and all applicable switches.

  Most storage system controllers are managed through the e0M interface by connecting to the Ethernet service port (wrench icon).

  Refer to the Hardware Universe for the latest information.

- Cluster management IP address

  The cluster management IP address is a unique IP address for the cluster management interface used by the cluster administrator to access the admin storage VM and manage the cluster. You can obtain this IP address from the administrator responsible for assigning IP addresses in your organization.

- Network subnet mask

  During cluster setup, ONTAP recommends a set of network interfaces appropriate for your configuration. You can adjust the recommendation if necessary.

- Network gateway IP address

- Node management IP addresses (one per node)
- DNS domain names
- DNS name server IP addresses
- NTP server IP addresses
- Data subnet mask
- IP subnet for management network traffic.

Network requirements for Cisco switches

For Cisco Nexus 9332D-GX2B and and 9364D-GX2A switch installation and maintenance, be sure to review cabling and network requirements.

Network requirements

You need the following network information for all switch configurations.

- IP subnet for management network traffic
- Host names and IP addresses for each of the storage system controllers and all applicable switches
- Refer to the Hardware Universe for the latest information.

Cabling requirements

- You have the appropriate number and type of cables and cable connectors for your switches. See the Hardware Universe.
- Depending on the type of switch you are initially configuring, you need to connect to the switch console port with the included console cable.

What's next?

After reviewing the network requirements, you cable the controllers and storage shelves for your AFX 1K storage system.

Cable the hardware for your AFX 1K storage system

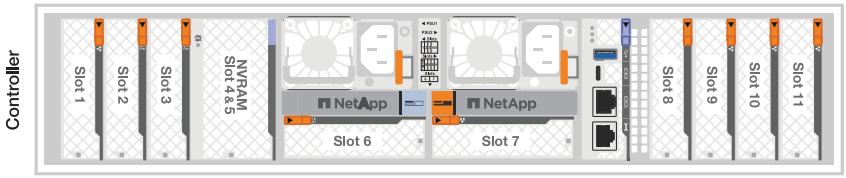
After you install the rack hardware for your AFX 1K storage system, install the network cables for the controllers, and connect the cables between the controllers and storage shelves.

Before you begin

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

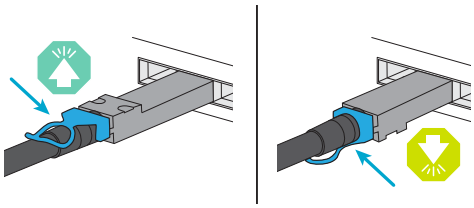
About this task

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



- The cabling graphics show arrow icons indicating 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.



The connector components are delicate and care should be taken when clicking into place.

- When cabling to an optical fiber connection, insert the optical transceiver into the controller port before cabling to the switch port.
- The AFX 1K storage system utilizes 4x100GbE breakout cables on the cluster and storage network. The 400GbE connections are made to the switch ports, and the 100GbE connections are made to the controller and drive shelf ports. Storage and HA/Cluster connections can be made to any non-ISL port on the switch.

  For a given 4x100GbE breakout cable connection to the specific switch port, you connect all four ports from a given controller to the switch over this single breakout cable.

  - 1 x HA port (slot 1)
  - 1 x cluster port (slot 7)
  - 2 x storage ports (slots 10, 11)

    All "a" ports connect to switch A, and all "b" ports connect to switch B.

Cisco Nexus 9332D-GX2B and 9364D-GX2A switch configurations to the AFX 1K storage system require 4x100GbE breakout cable connections.

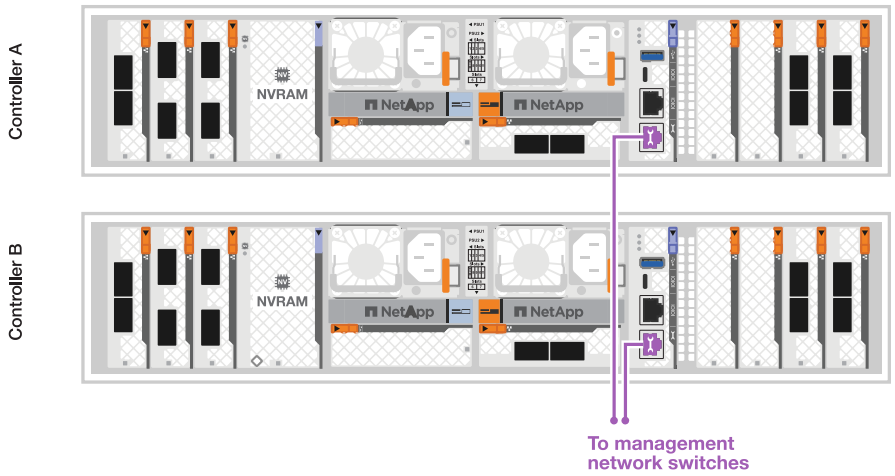
Step 1: Connect the controllers to the management network

Connect the management port on each switch to either of the management switches (if ordered) or connect them directly to your management network.

The management port is the upper-right port located on the PSU side of the switch. The CAT6 cable for each switch needs to be routed through the pass-through panel after the switches are installed to connect to the management switches or management network.

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.

1. Connect to host network.

Step 2: Connect the controllers to the host network

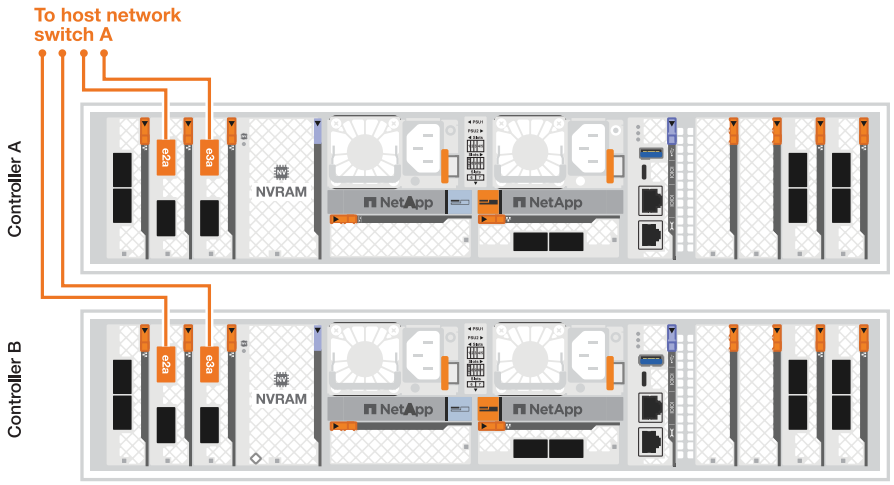
Connect the Ethernet module ports to your host network.

This procedure may differ depending on your I/O module configuration. The following are some typical host network cabling examples. See NetApp Hardware Universe for your specific system configuration.

Steps

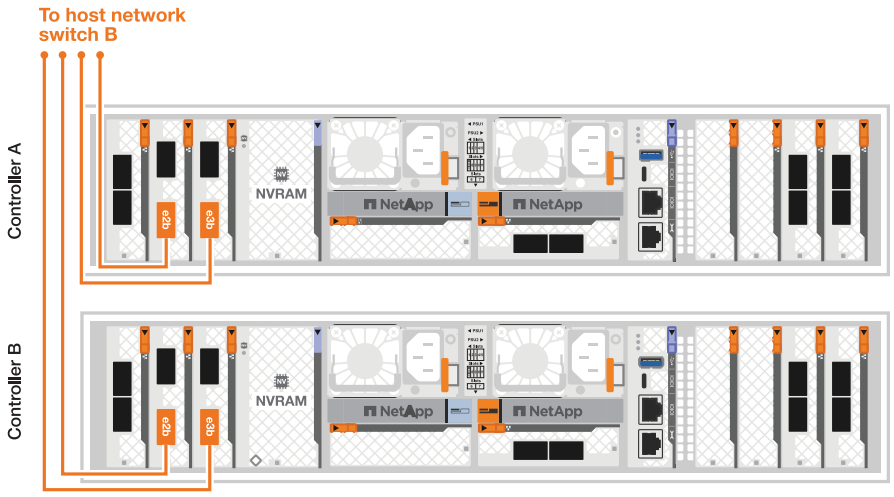
1. Connect the following ports to your Ethernet data network switch A.
    - Controller A (Example)
        - e2a
        - e3a
    - Controller B (Example)
        - e2a
        - e3a

100GbE cables



2. Connect the following ports to your Ethernet data network switch B.
   - Controller A (Example)
     - e2b
     - e3b
   - Controller B (Example)
     - e2b
     - e3b

100GbE cables



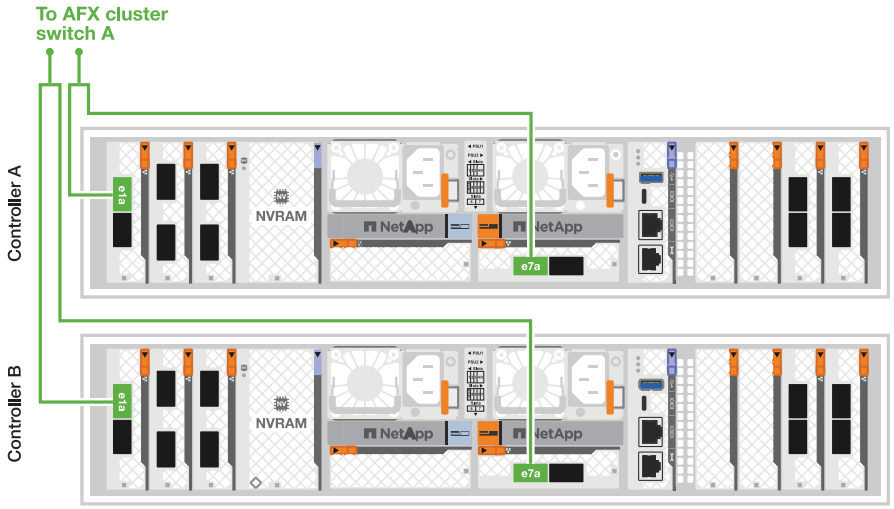
Step 3: Cable the cluster and HA connections

Use the Cluster and HA interconnect cable to connect ports e1a and e7a to switch A and e1b and e7b to switch B. The e1a/e1b ports are used for the HA connections, and the e7a/e7b ports are used for the cluster connections.

Steps

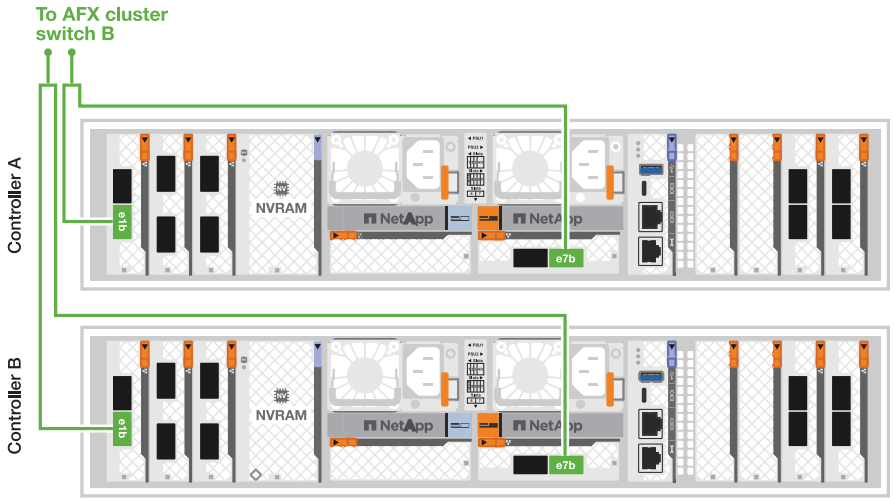
1. Connect the following controller ports to any non-ISL port on the cluster network switch A.
   - Controller A
     - e1a (HA)
     - e7a (Cluster)
   - Controller B
     - e1a (HA)
     - e7a (Cluster)

     100GbE cables



2. Connect the following controller ports to any non-ISL port on the cluster network switch B.
   - Controller A
     - e1b (HA)
     - e7b (Cluster)
   - Controller B
     - e1b (HA)
     - e7b (Cluster)

     100GbE cables

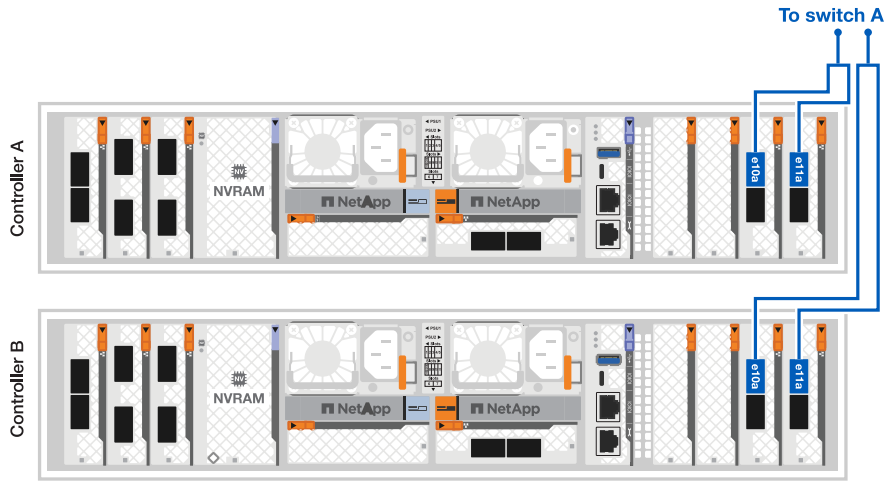


Step 4: Cable the controller-to-switch storage connections

Connect the controller storage ports to the switches. Ensure you have the correct cables and connectors for your switches. See Hardware Universe for more information.

1. Connect the following storage ports to any non-ISL port on switch A.
   - Controller A
     - e10a
     - e11a
   - Controller B
     - e10a
     - e11a

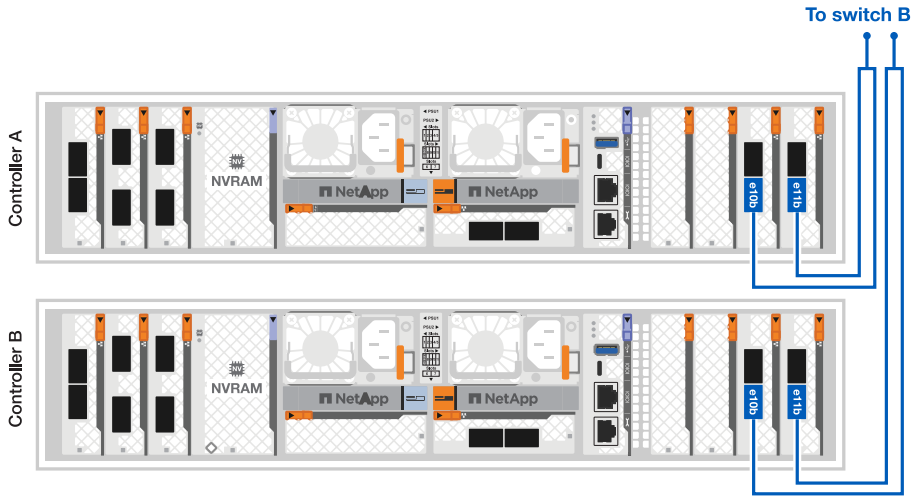
100GbE cables



2. Connect the following storage ports to any non-ISL port on switch B.

- Controller A
  - e10b
  - e11b
- Controller B
  - e10b
  - e11b

100GbE cables



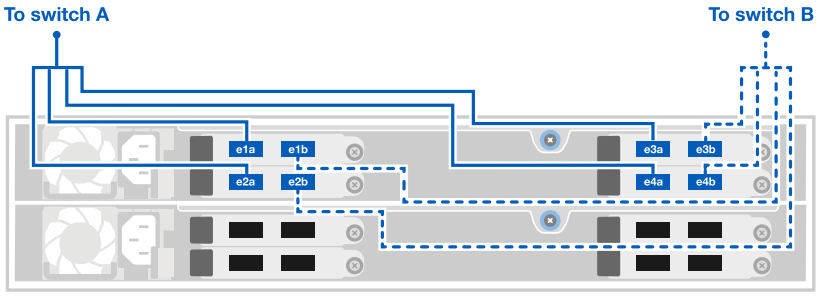
Step 5: Cable the shelf-to-switch connections

Connect the NX224 storage shelves to the switches.

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

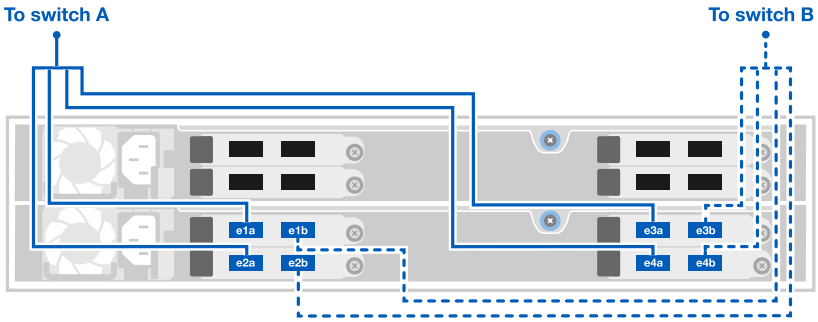
1. Connect the following shelf ports to any non-ISL port on switch A and switch B for module A.
   - Module A to switch A connections
     - e1a
     - e2a
     - e3a
     - e4a
   - Module A to switch B connections
     - e1b
     - e2b
     - e3b
     - e4b

     100GbE cables



2. Connect the following shelf ports to any non-ISL port on switch A and switch B for module B.
   - Module B to switch A connections
     - e1a
     - e2a
     - e3a
     - e4a
   - Module B to switch B connections
     - e1b
     - e2b
     - e3b
     - e4b

100GbE cables



What's next?

After cabling the hardware, power on and configure the switches.

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