



# EMC<sup>®</sup> VNX<sup>®</sup> Series

## VNX7600<sup>™</sup> Unified Installation Guide

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# CHAPTER 1

## Introduction

Understand the audience requirements and shipping methods before you begin installation of your VNX system.

- [Audience](#).....6
- [Shipping Methods](#).....6

## Audience

Although your VNX system is customer installable, EMC recommends that the installation be performed by someone who has a general background in information technology. While prior training is not required, customers who successfully installed this product were trained as:

- EMC Proven Professionals
- Microsoft Certified Technology Specialists
- Cisco Certified Network Associates
- CompTIA A+ certified technicians

Your service provider offers a variety of installation and implementation services designed to assist you in putting your VNX system into production as quickly and efficiently as possible. Contact your sales representative to take advantage of these service offerings.

## Shipping Methods

One of two shipping methods is possible for your order. The product is shipped either:

- Completely equipped and cabled in an EMC cabinet or
- In multiple boxes for installation in a customer-provided cabinet

## Overview of installing an EMC cabinet

If your system was shipped in an EMC cabinet, the installation process involves the following steps:

### Procedure

1. Read and complete the prerequisite tasks listed in [Prepare your system on page 9](#).
2. Unpack the shipping boxes and verify the shipping contents from the packing instructions on the outside of the box as described in [Unpack your system on page 13](#).
3. Verify the cabling and connect the system to your network as described in [Cable your system on page 41](#).
4. Power up your system and verify that the system powered up correctly by checking the LEDs of the system components. This is described in [Power up on page 63](#).
5. Complete the tasks listed in [Setup on page 89](#).

## Overview of installing in a customer cabinet

If your system was shipped to be installed into a customer's cabinet, the installation process involves the following steps:

### Procedure

1. Read and complete the prerequisite tasks listed in [Prepare your system on page 9](#).
2. Unpack the shipping boxes and verify the shipping contents as described in [Unpack your system on page 13](#).
3. Remove the system from the shipping container as described within [Unpack your system on page 13](#).

4. Assemble the components in your cabinet as described in [Assemble components in your cabinet on page 21](#).
5. Cable your system as described in [Cable your system on page 41](#).
6. Power up your system by connecting power cables, and then verify that the system components powered up correctly by checking the LEDs of the system as described in [Power up on page 63](#).
7. Install and power up all additional disk-array enclosures (DAE) into your cabinet as described in [Add additional storage on page 71](#).
8. Complete the tasks listed in [Setup on page 89](#).





# CHAPTER 2

## Prepare your system

Determine what you need to install for your system using:

- [Before you begin](#) ..... 10
- [Site requirements](#) ..... 11

## Before you begin

Use this procedure to help you determine what you need to install your system.

---

### Note

Ensure that you have the latest version of the install guide and any other associated documentation. To download the most recent version of the installation guide, go to <https://mydocs.emc.com/VNX> and select **Install VNX**.

---

### Procedure

1. Set up a product support account.

If you do not already have a Product Support account, go to <https://support.emc.com> to set one up. You will need a support account for access to the latest documentation and troubleshooting information, online chat, installation and maintenance videos, utilities, and wizards.

2. Complete the planning worksheet provided at the end of this document.

To download additional copies of the worksheet, go to <https://support.emc.com>, and search support for the worksheet:

- VNX File Configuration Worksheet

3. Prepare the site.

For resource requirements, go to [Table 1 on page 11](#).

4. Download and print the VNX planned power down and power up procedures.

Planned power down of VNX systems use Unisphere. All VNX power up and power down procedures are available at <https://mydocs.emc.com/VNX>. They are also available in the *VNX System Operations Guide*.

5. Download additional VNX installation documentation (when appropriate).

EMC provides additional documentation for the installation of certain VNX systems, including:

- NEBS systems
- Dense-rack systems
- DC-powered systems
- Other unique VNX configurations

6. Consult VNX documentation (optional).

- If you are unfamiliar with the VNX system architecture, download and review the system's hardware information guide before you begin the installation. Go to <https://support.emc.com> and select **VNX Family** > *your series* > *your model* > **Documentation** > **Manuals and Guides** to find the guide.
- If you want to generate documentation specific to your system configuration, including to configure servers, update software, or add and replace hardware, go to <https://mydocs.emc.com/VNX>.

# Site requirements

**Table 1** Resource Requirements

Resource	Requirement
Power	<p>AC Power: For high availability, at least two 200-240 V AC circuits are required.</p> <p>For full power specifications, go to <a href="https://mydocs.emc.com/VNX">https://mydocs.emc.com/VNX</a> and select <b>View technical specifications</b> under the <b>About VNX</b> section.</p>
Network	Two 1-Gigabit Ethernet management connections and two customer-supplied CAT5e or better cables.
Space	<p>Cabinet vertical space:</p> <ul style="list-style-type: none"> <li>• 3U (unit) [5.25 inches, 13.3 cm] for the disk processor enclosure (DPE)</li> <li>• 1U for each Control Station</li> <li>• 2U for each blade enclosure</li> <li>• For each optional DAE</li> </ul>
Tools	Slotted or Phillips screwdriver
Management Station	<p>A Windows-based computer to run the initialization, maintenance, and management tools with:</p> <ul style="list-style-type: none"> <li>• Minimum screen resolution of 1280 x 800 and 256 colors</li> <li>• At least 500 MB free space</li> <li>• Connection on same LAN subnet as your system if you will use it to initialize the system</li> <li>• DNS/NTP server network connection to your system and the management host</li> <li>• Windows Domain Controller recommended</li> <li>• SMTP server network connection to the system and the management host</li> <li>• JRE (Supported versions are listed in the release notes.)</li> <li>• Browser (Supported versions are listed in the release notes.)</li> </ul>
Network information	<p>The management port and login information in the Planning Worksheets of this install guide. This information includes:</p> <ul style="list-style-type: none"> <li>• A static IP address for each storage processor in the system (for example, 123.45.6.7)</li> <li>• The IPv6 global prefix and gateway for each SP if your network supports the IPv6 Internet Protocol and you want to manually configure IPv6 for the management ports</li> <li>• The subnet mask of the LAN to which the system is connected</li> <li>• The default gateway address of the LAN to which the system is connected</li> </ul>

Prepare your system

# CHAPTER 3

## Unpack your system

Unpack and install the system components. Other storage (optional DAEs) will be unpacked, assembled, and cabled later.

- [Unpacking the shipping boxes](#)..... 14
- [Removing mini-rack components](#).....15

## Unpacking the shipping boxes

You will have received your system either fully assembled and cabled in an EMC cabinet, or in shipping boxes to be unpacked and installed into your own cabinet.

For damaged or missing components, notify your Sales associate immediately for replacements.

### Procedure

- If your system was shipped fully assembled and cabled in an EMC cabinet:
  - a. Follow the unpacking instructions on the outside of the box.
  - b. Go directly to [Cable your system on page 41](#) of this installation guide to verify the cabling.
- If your system was shipped in a mini rack:
  - a. Verify that you have received all of the system's components, including cables and bezels. [Table 2 on page 14](#) lists the shipping contents.

**Table 2** Example shipping contents

	Components	Accessories
<input type="checkbox"/>	Blade enclosures	<ul style="list-style-type: none"> <li>▪ Mounting screws</li> <li>▪ Bezels and bezel keys</li> <li>▪ Management cables</li> <li>▪ Power cables</li> <li>▪ Fibre cables</li> <li>▪ Adjustable rails (if more than one blade enclosure)</li> </ul>
<input type="checkbox"/>	Control Stations (CS)	<ul style="list-style-type: none"> <li>▪ Mounting screws</li> <li>▪ Bezels and bezel keys</li> <li>▪ Extension cables</li> <li>▪ IPMI cable (only available with a second CS)</li> <li>▪ Management cables</li> <li>▪ Power cables</li> <li>▪ Adjustable rails</li> </ul>
<input type="checkbox"/>	Disk processor enclosure (DPE)	<ul style="list-style-type: none"> <li>▪ Mounting screws</li> <li>▪ Bezels and bezel keys</li> <li>▪ Power cables</li> <li>▪ SAS cables</li> </ul>
<input type="checkbox"/>	Cable label kit	Cable labels for SAS cables to DAEs
<input type="checkbox"/>	Ganged rails	All ganged rails from the mini-rack
<input type="checkbox"/>	Documentation kit, including:	Environmental compliance information and notices

**Table 2** Example shipping contents (continued)

	Components	Accessories
		Right-to-Use (RTU) notices, as appropriate to the system

- b. Start the unpacking and assembling process with [Removing mini-rack components on page 15](#).

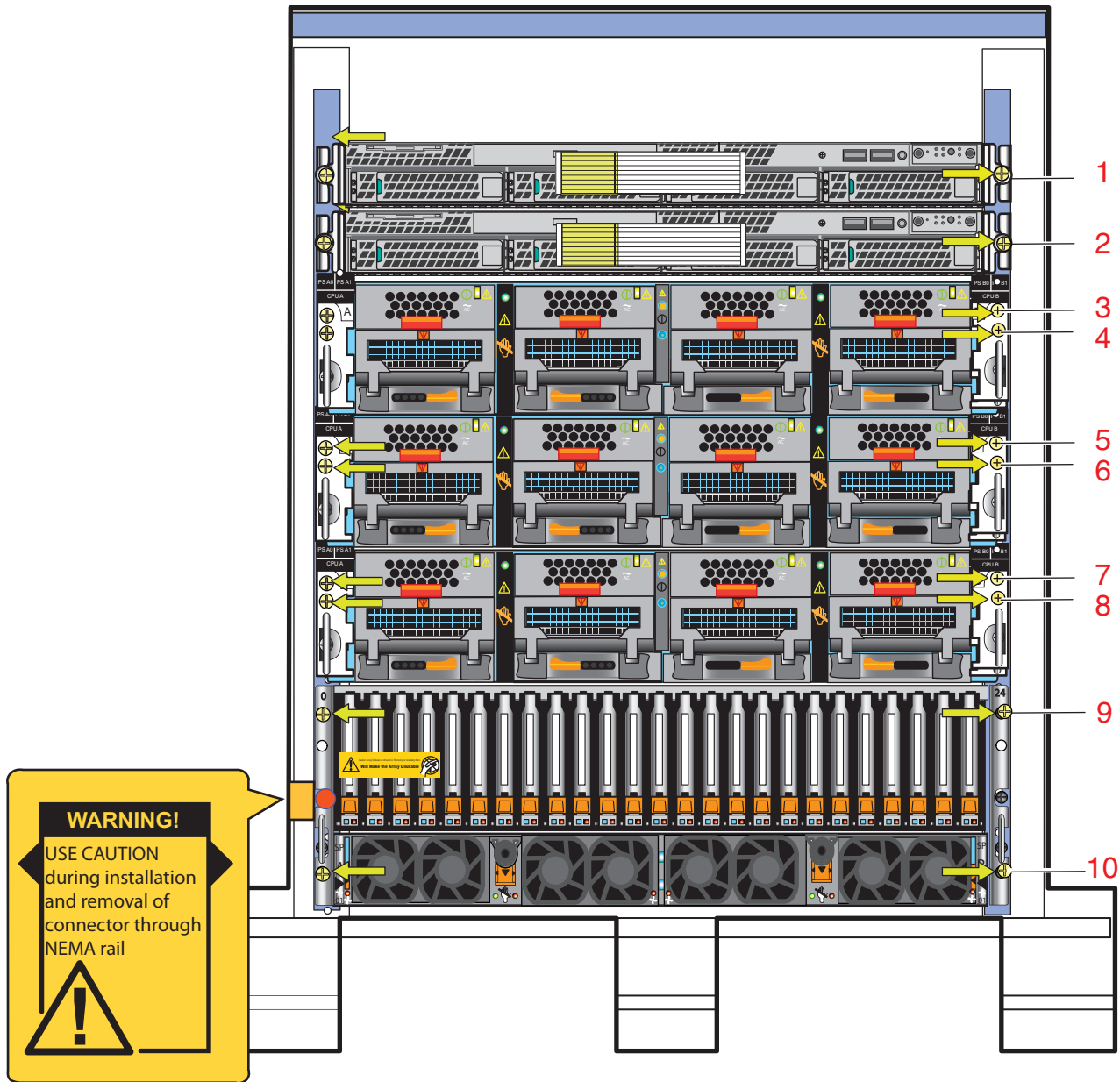
## Removing mini-rack components

To remove the mini-rack components:

### Procedure

1. Remove the Control Station information label from the front of CS0 and attach it to the inside cover of this manual. If you have a second optional Control Station (CS1), remove this Control Station information label and attach it to the inside cover of this manual.
2. Remove only the yellow screws ([Figure 1 on page 16](#)) holding the components in the mini-rack. The yellow arrows in ([Figure 1 on page 16](#)) point you to which screws to remove.
3. Retain these removed screws for later assembly of the components into a site rack.

Figure 1 Mini-rack components



**CAUTION**

Some of the components in the mini-rack are heavy and might require two people. If needed, use an appropriate lifting device (mechanical lift).

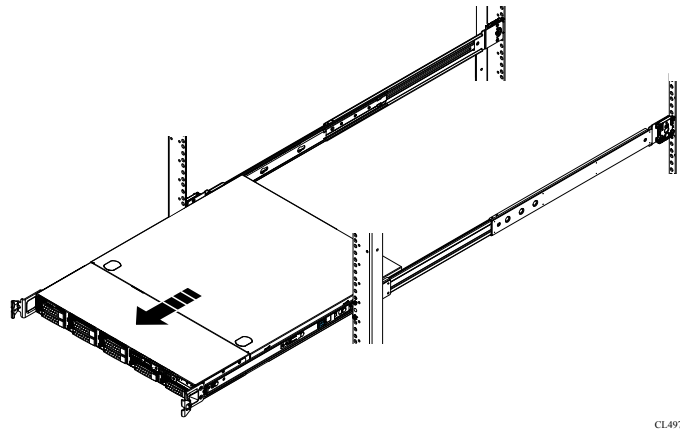
4. Starting from the top of the mini-rack, carefully slide the Control Stations (CS0 and optional CS1) out of the mini-rack.

**Note**

When you slide out the CSs, there are slide rails (inner slide rails) attached to each Control Station. Do not take these rails off. These rails will be used later when installing the Control Stations in the site rack.

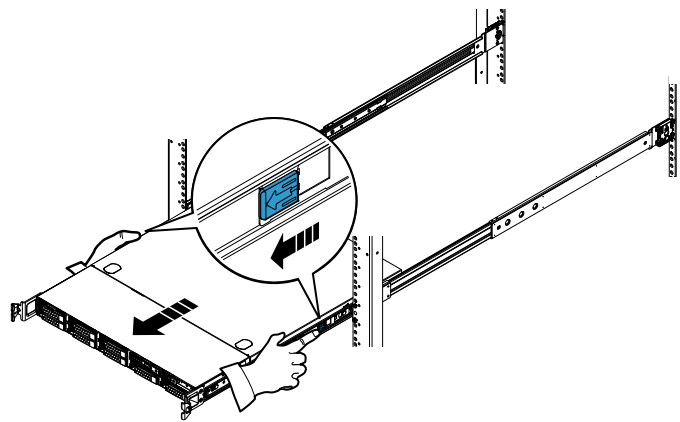
- a. Pull the Control Station forward until it locks into place as shown in [Figure 2 on page 17](#).



**Figure 2** Sliding out the Control Station

CL4970

- b. On each inner slide rail, using your finger, pull the blue tab (embossed with an arrow) toward you to release the rail lock as shown in

**Figure 3** Unlocking the inner slide rail from the outer slide rail

CL4971

- c. Slide the Control Station and the attached inner slide rails out of the mini-rack.
5. Continue to slide the remaining components out of the mini-rack and stack them in the reverse order of how they will be placed in your cabinet ([Figure 4 on page 18](#)). Be sure to place the first removed component on an antistatic floor, mat, or workbench pads.

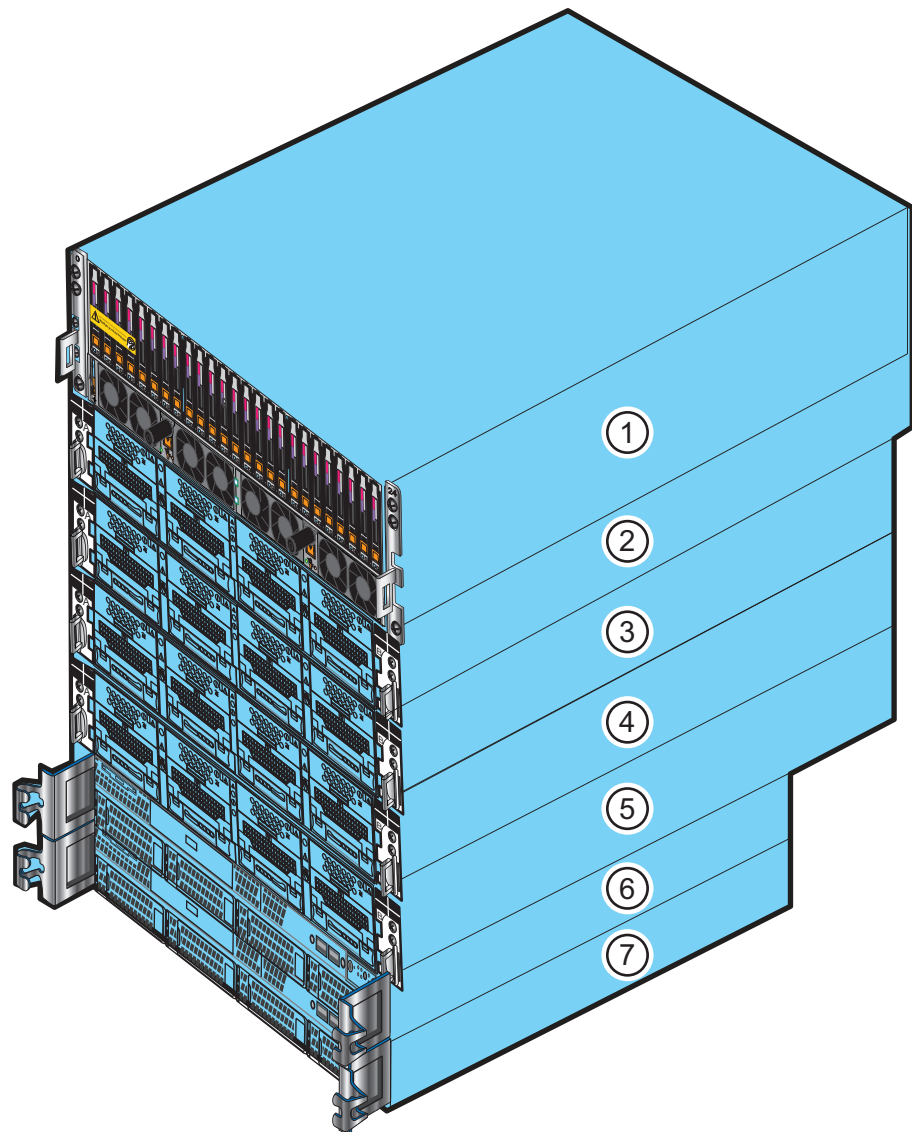
**Note**

If a fourth blade enclosure is ordered, the fourth blade enclosure will be packed in a separate box with the 2U adjustable rails. Ensure that you unpack and place the blade enclosure in the correct order for installation [Figure 4 on page 18](#).

**CAUTION**

When you install the components later (see [Assemble components in your cabinet on page 21](#)), remember that these components are not interchangeable. Ensure that you install the components in the following order: DPE, blade enclosure 0, optional blade enclosures, CS0, and CS1 (optional). Otherwise, your storage system will not operate properly.

**Figure 4** Example of mini-rack components on antistatic floor, mat, or workbench pads



- 1: Disk processor enclosure
- 2: Data Mover enclosure 0
- 3: Data Mover enclosure 1
- 4: Data Mover enclosure 2
- 5: Data Mover enclosure 3
- 6: Control Station 0
- 7: Control Station 1

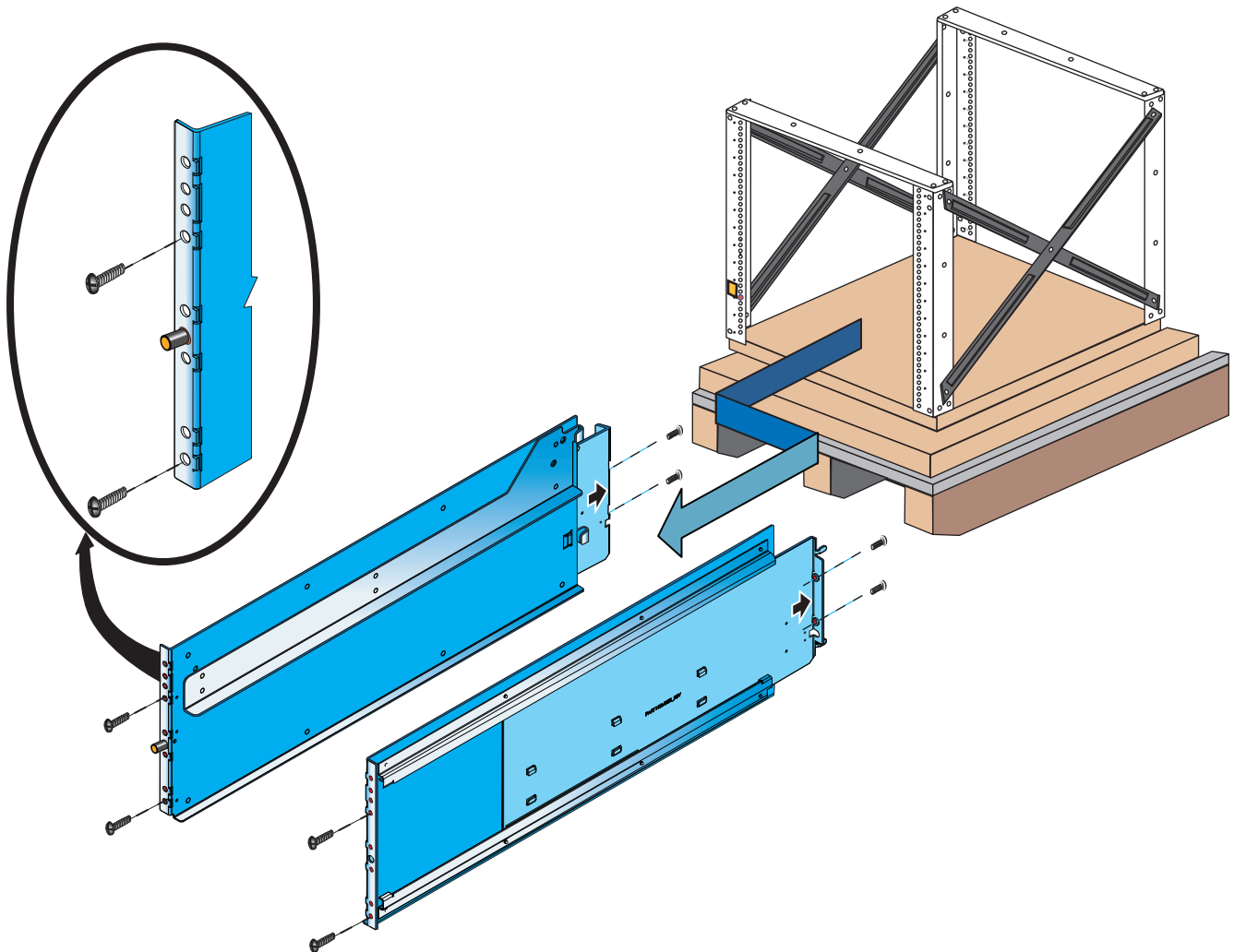
- 6. Unscrew the rear screws and remove the Control Station outer slide rails from the mini-rack.
- 7. If any optional blade enclosures are included in the mini-rack, unscrew and remove their 2U adjustable rails separately.

8. **CAUTION**

On the left ganged rail, there is a blue light power connector (see [Figure 5 on page 19](#)) protruding from the front which goes through a hole in the front channel of the mini-rack.

Unscrew the front and rear screws and remove the ganged rails from the mini-rack, out from the rear, then the front, as shown in [Figure 5 on page 19](#).

Figure 5 Removing ganged rails



9. Retain all the removed rails and screws for later assembly of the rails into a site rack.

Unpack your system

# CHAPTER 4

## Assemble components in your cabinet

If you are installing the components in a customer rack, follow the instructions in this chapter. Otherwise, go to [Cable your system on page 41](#) to verify your cabling in an EMC rack.

Assembling the components includes the following:

- [Installing rails](#)..... 22
- [Installing components](#)..... 28

## Installing rails

Begin at the bottom of the cabinet space to install the rails.

---

### Note


All rails must be aligned level, front to back and with the companion rail, left to right.

---

## Installing the ganged rails

Refer to [Figure 6 on page 23](#) while performing the procedure that follows.

### Procedure

1. Install the ganged rail into the appropriate location in the site rack (for space considerations find the lowest available space).
2. Insert the right ganged rail into the right side of the cabinet rack.
3.  **CAUTION**

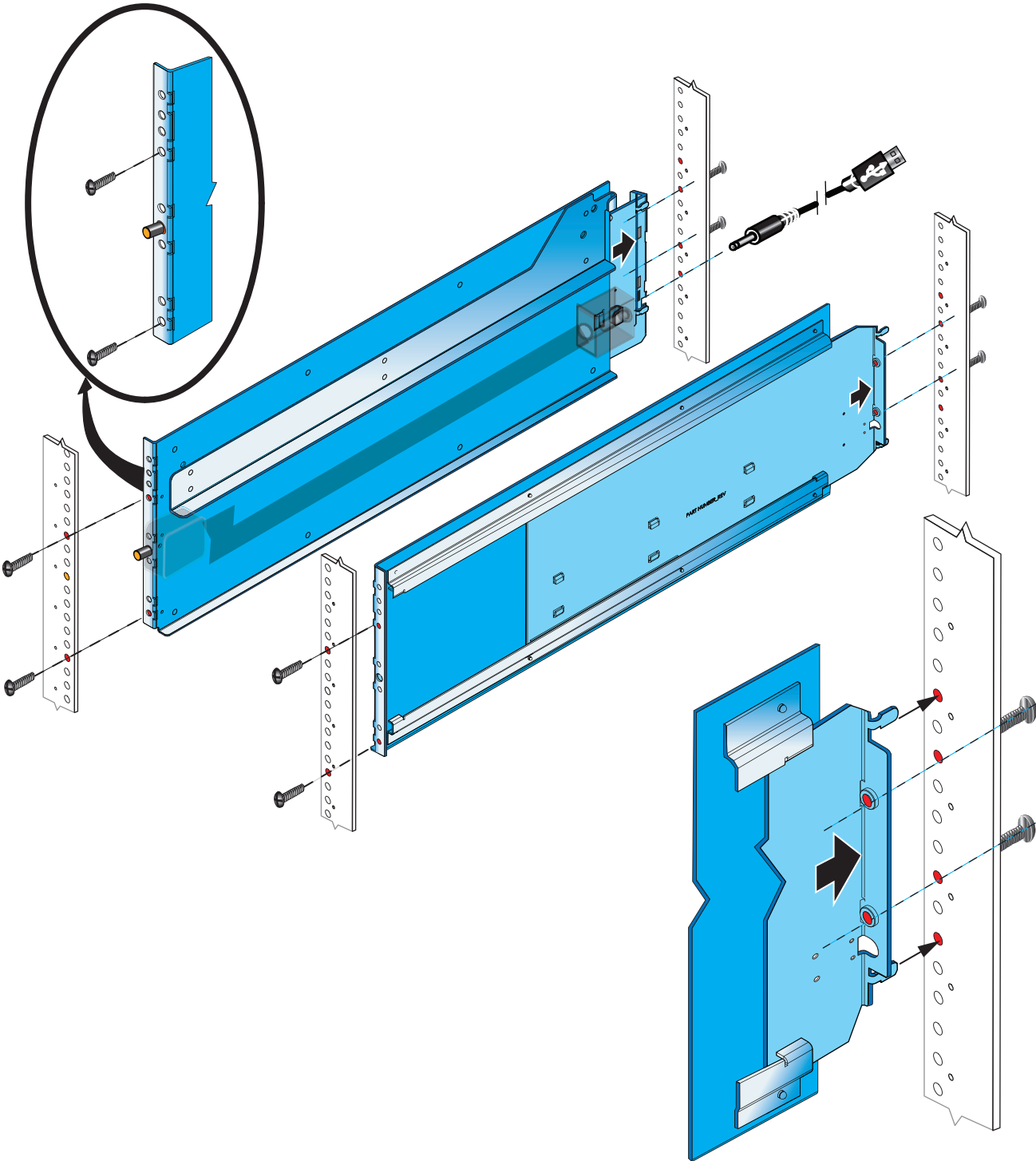
**On the left ganged rail, there is a bezel light power connector (see [Figure 6 on page 23](#)) protruding from the front of the ganged rail which goes through a hole in the front post of the cabinet rack.**

---

Carefully install the left ganged rail from the mini-rack by inserting the left ganged rail front first, then the rear.

4. On the rear of the left ganged rail, insert the ganged rail alignment pins into the holes in the back of the rack post.
5. To hold the ganged rails in place, insert all the screws (8 places, 4 front and 4 back) previously removed from the ganged rails that were held in the mini-rack.
6. Tighten the screws.

Figure 6 Installing the ganged rails



VNX-000366

### Installing the blade enclosure 1 adjustable rails

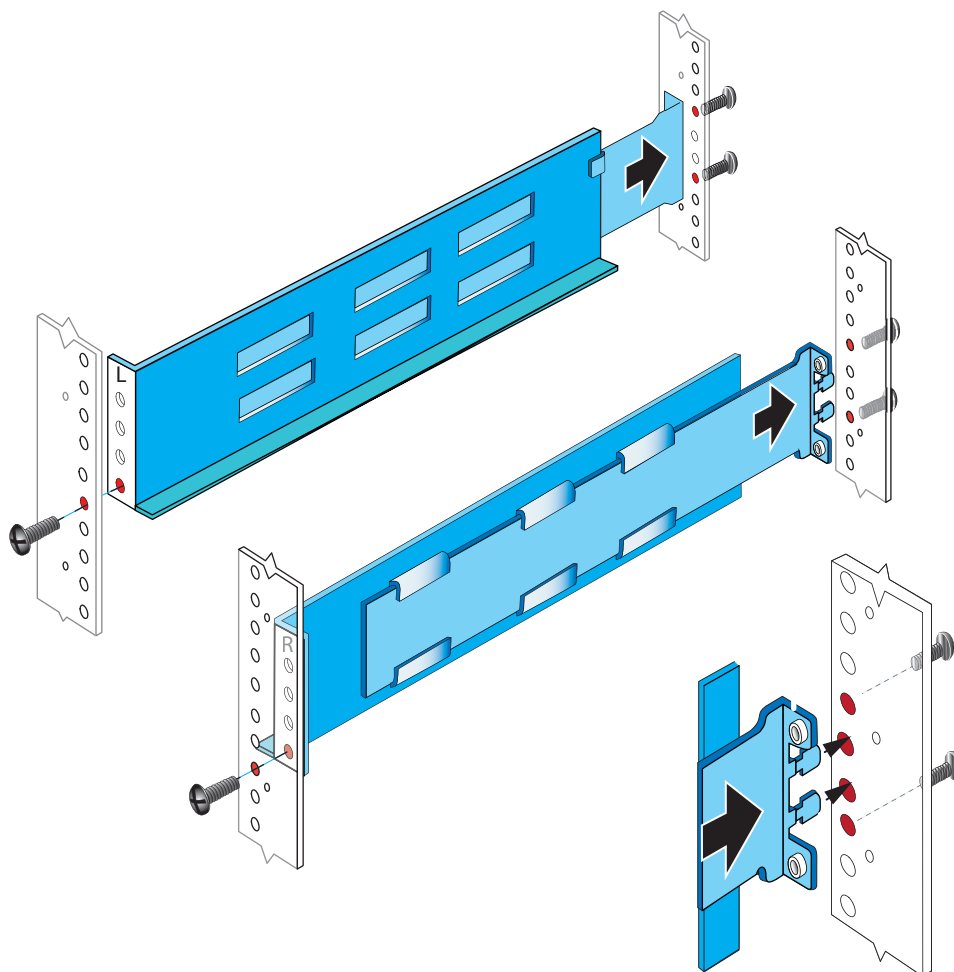
The blade enclosure 1 2U adjustable rails are installed directly above the rails for blade enclosure 0.

### Procedure

1. Install the 2U adjustable rails into the appropriate locations in the site rack as shown in [Figure 7 on page 24](#).
2. Insert the outer rail (of the adjustable rail) alignment pins (left and right sides) into the holes in the back of the rack post.
3. Extend the inner rail (of the adjustable rail) and align with the front of the rack post.
4. To hold the rails in place, insert all the screws (6 places, 2 front and 4 rear) provided separately.

Wait until all screws are in place before you fasten the screws.

**Figure 7** Installing rails for blade enclosure 1



## Installing the remaining blade enclosure adjustable rails

Install any remaining (optional) blade enclosure adjustable rails above the adjustable rails of last installed blade enclosure.

### Procedure

1. Locate the remaining blade enclosure adjustable rails.
2. Repeat the installation procedure described in the previous task to install the remaining blade enclosure adjustable rails.



## Installing the Control Station 0 outer slide rails

The Control Station 0 outer slide rails are installed directly above the last blade enclosure rails.

To install the CS0 outer slide rails:

- (Optional) Adjust the rack post hole shape on the slide rails
- Install the outer slide rail in the cabinet

## Adjusting the rail assemblies for the cabinet channel holes

The rail assemblies ship with round alignment posts at the end of the rails for cabinet channels (NEMA rails) with round holes. If your cabinet has channels with square holes, switch the rail alignment posts to square posts.

### Switching rail alignment posts

On each end of each rail assembly, switch the alignment post assembly using the procedure that follows. Refer to [Figure 8 on page 26](#) while performing the procedure.

#### Procedure

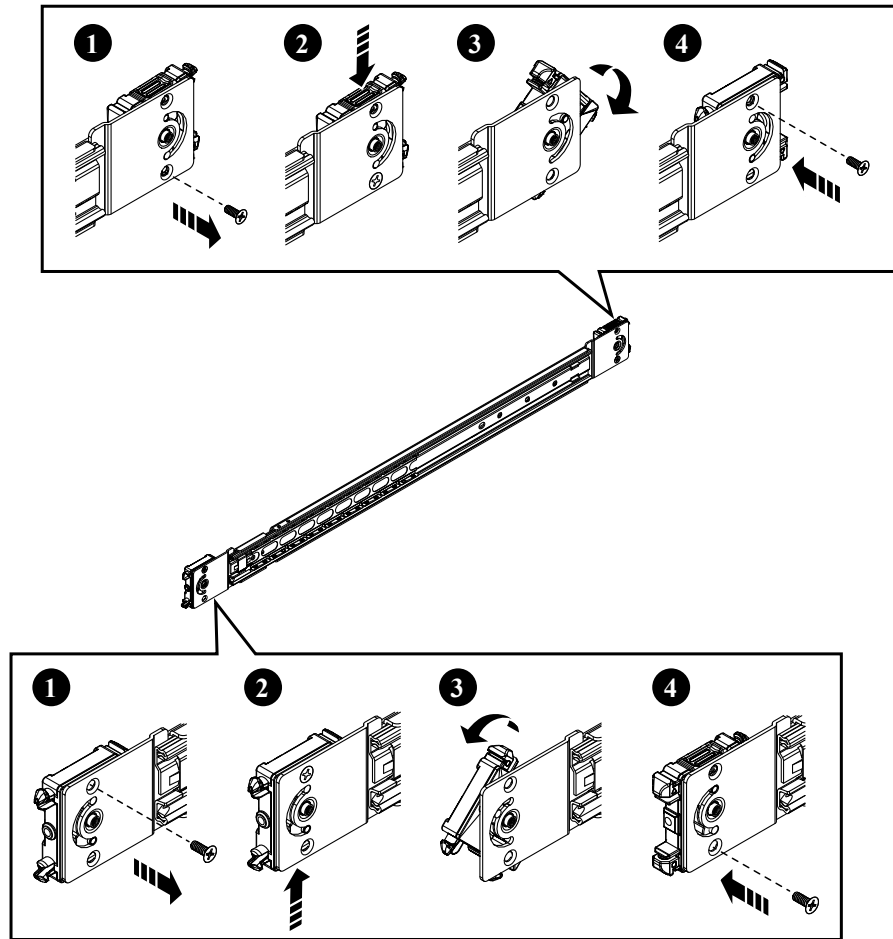
1. Remove the screw that secures the alignment post assembly.
2. Push the plastic tab on the alignment post assembly up or down, depending on the rail end, and hold the tab in.
3. Rotate the alignment post assembly either clockwise to switch from round posts to square posts or counter clockwise to switch from square posts to round posts until the assembly clicks into place.
4. Secure the alignment post assembly in place with the screw that you removed.

---

#### Note

The screw goes in the hole opposite the hole from which you removed it.

**Figure 8** Switching from round rail alignment posts to square alignment posts



CL4951

## Installing the slide rails in the cabinet

The universal rail assemblies for this server support cabinets in which the front and rear mounting channels are 24 inches to 34 inches apart. Each assembly contains a right and a left slide rail.

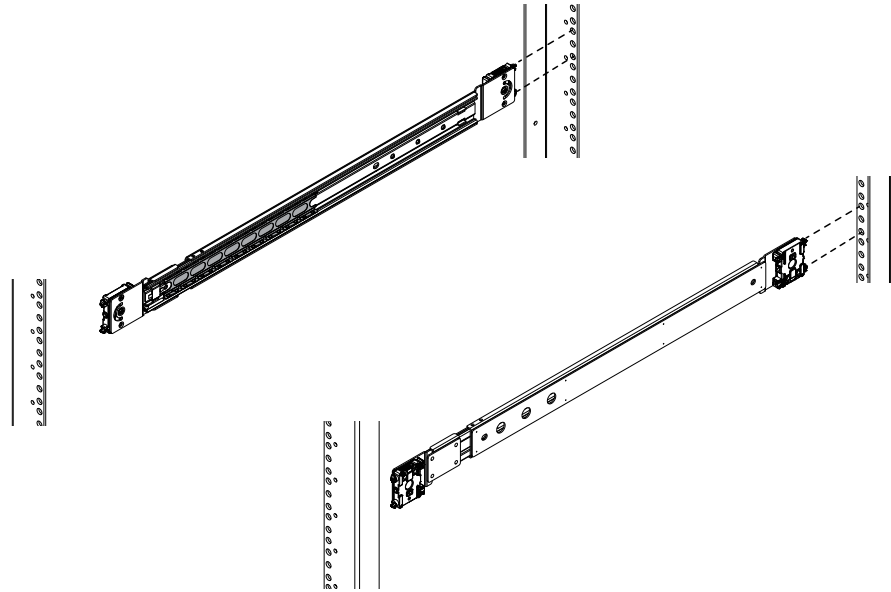
Install each slide rail in the cabinet using the procedure that follows.

### Procedure

1. From the front of the cabinet, align rail alignment posts with the rear channel holes for the selected 1 U (1.75 in) cabinet space for the server, and insert the alignment posts securely into the holes ([Figure 9 on page 27](#)).

An audible click indicates that the connection is secure.

**Figure 9** Inserting rail alignment posts into rear channel holes

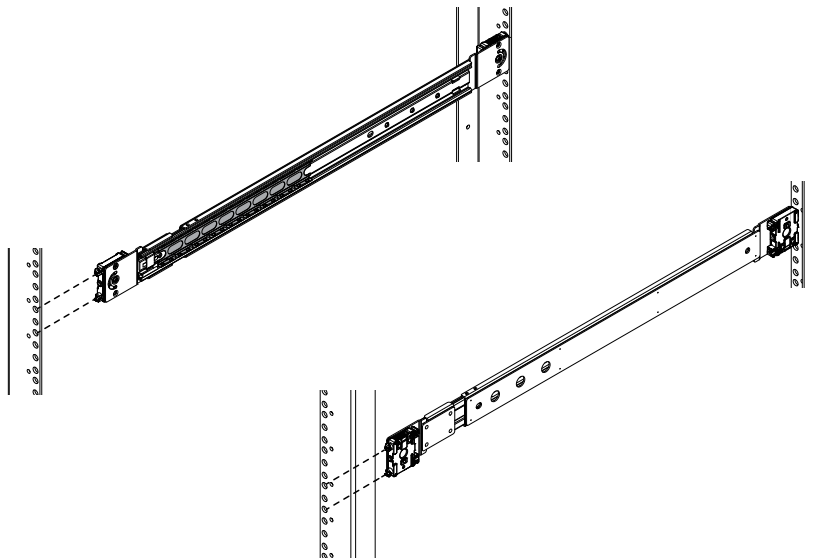


CL5090

2. Pull the slide rail forward so the front alignment posts go securely into the holes on the front channel ([Figure 10 on page 27](#)).

An audible click indicates that the connection is secure.

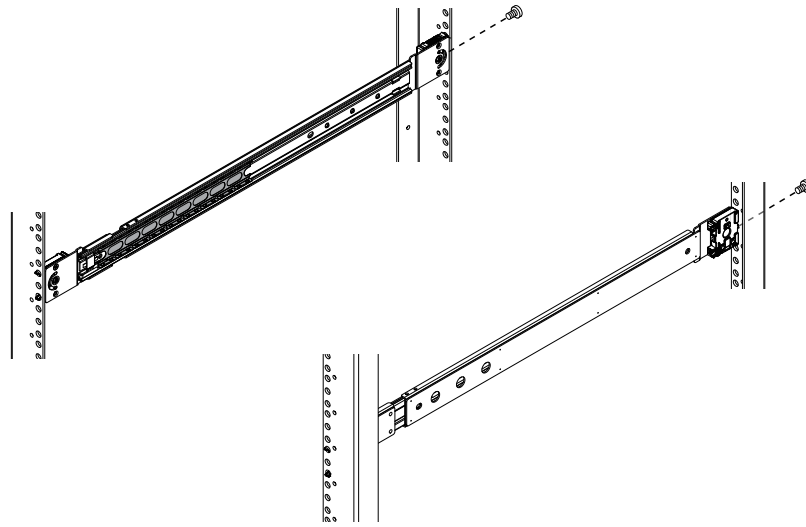
**Figure 10** Inserting rail alignment posts into front channel holes



CL5091

3. Secure the rail to the rear channel with a small stabilizer screw ([Figure 11 on page 28](#)).

**Figure 11** Installing stabilizer screws



CL4854

## Installing the Control Station 1 outer slide rails

The Control Station 1 outer slide rails are installed directly above the Control Station 0 rails.

### Procedure

1. Locate the Control Station 1 outer slide rails previously removed from the shipping rack.
2. Repeat the installation procedure described in [Installing the Control Station 0 outer slide rails on page 25](#) to install Control Station 1.

## Installing components

### **CAUTION**

Some of the components are heavy and lifting and attaching them to the rack may require two people. If needed, use an appropriate lifting device (mechanical lift).

Install the components in the appropriate order.

## Installation order of system components

Install your VNX system components in the following order:

### **CAUTION**

Components are not interchangeable. Ensure that you install the components in the following order. Otherwise, your storage system will not operate properly.

1. Disk processor enclosure
2. Blade enclosure 0
3. (optional) Blade enclosure 1
4. (optional) Blade enclosure 2

- 5. (optional) Blade enclosure 3
- 6. Control Station 0
- 7. (optional) Control Station 1

Figure 12 on page 29 shows an example of the front view of the VNX components and Figure 13 on page 30 shows an example of the rear view of the VNX components.

Your system's hardware information guide provides more detail on each of these components.

Figure 12 Front view system components

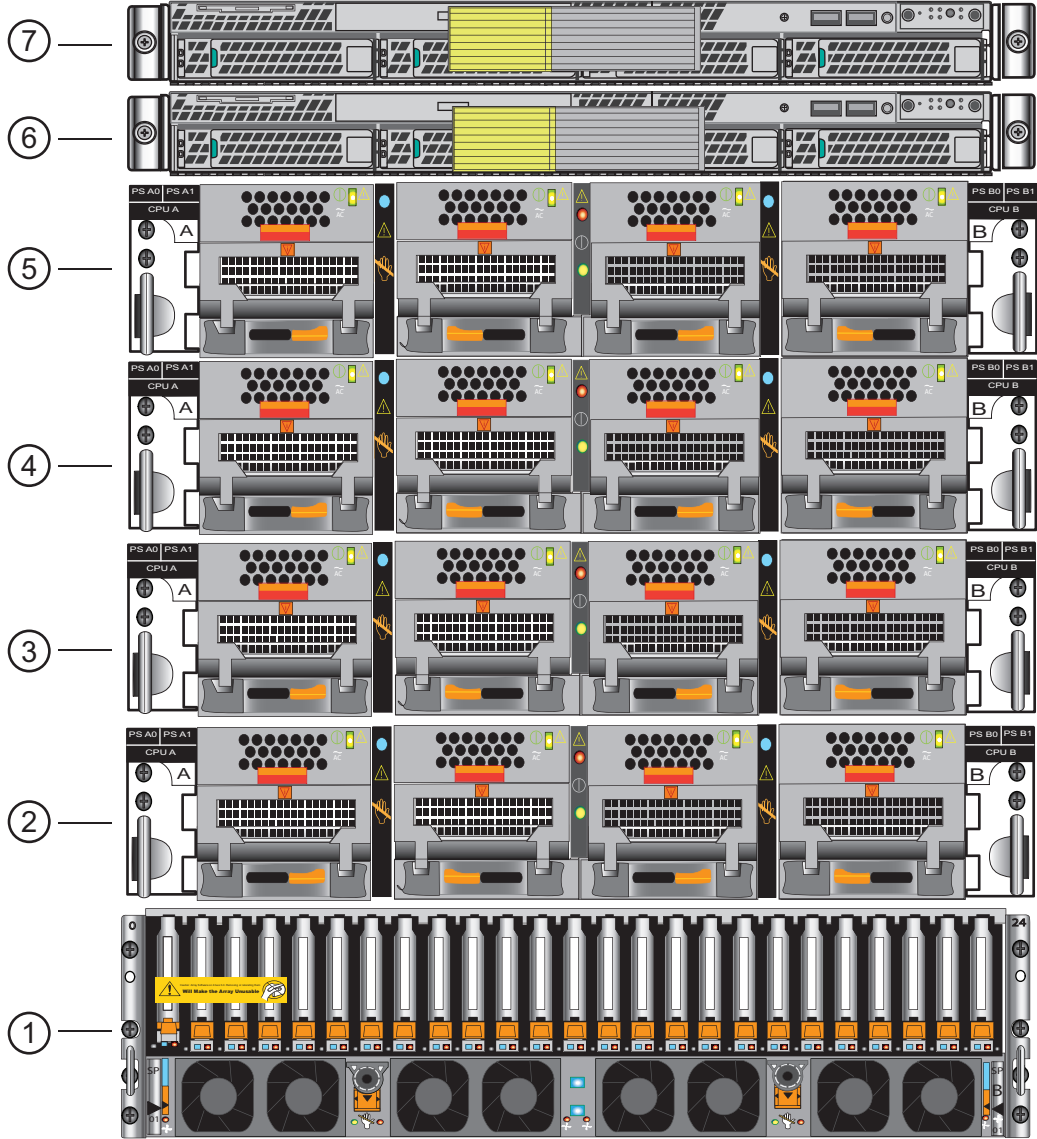
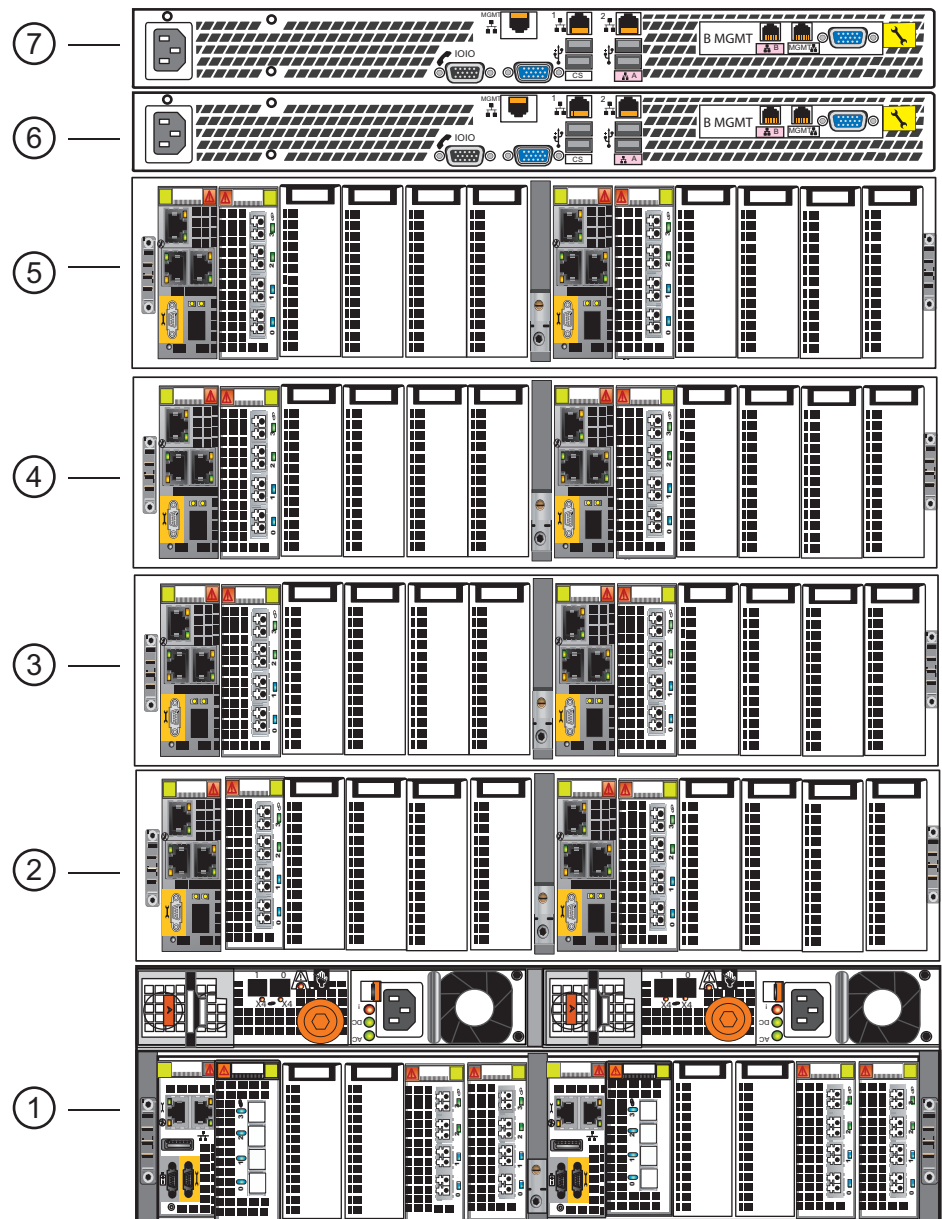


Figure 13 Rear view system components

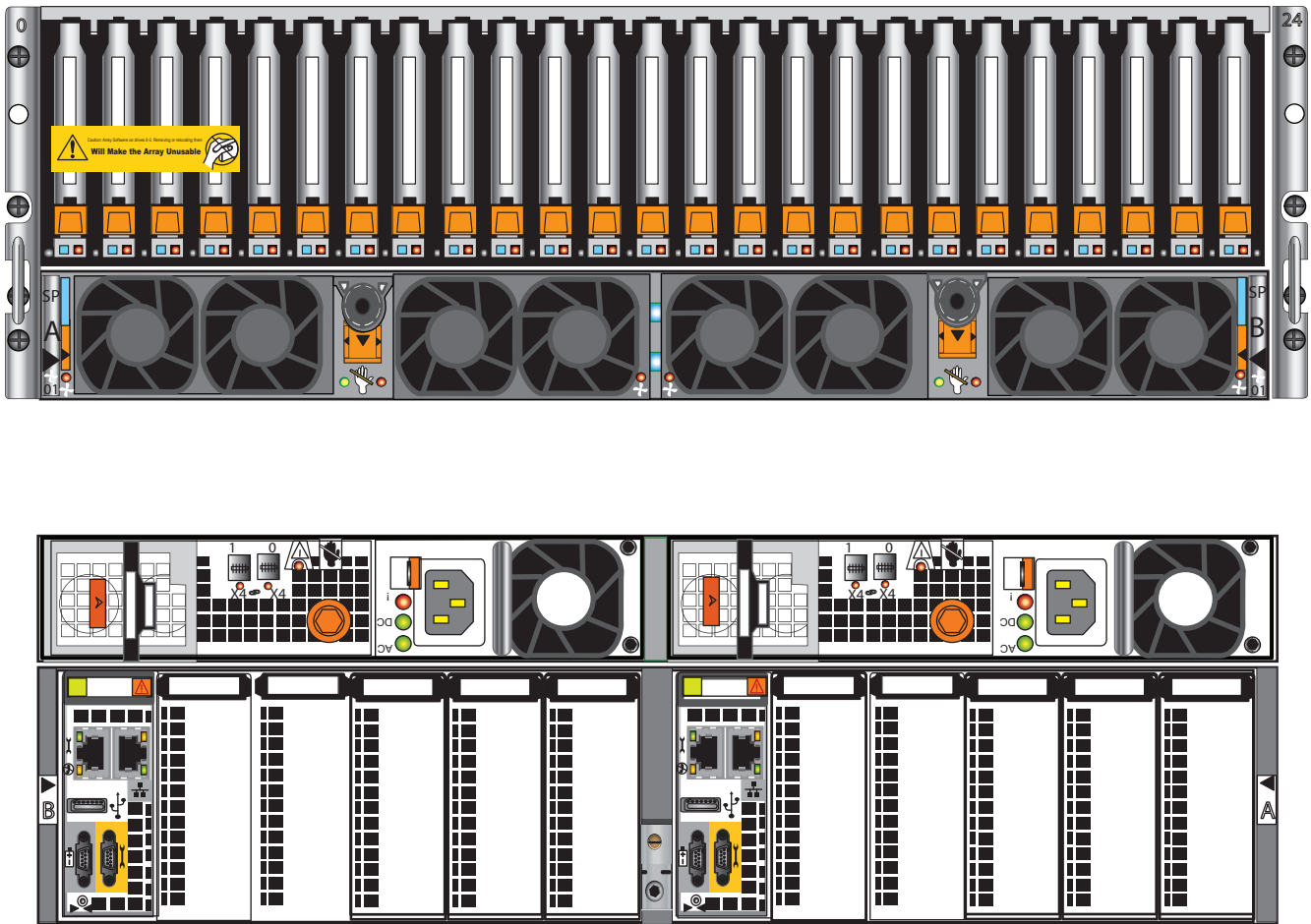


## About the 3U Disk Processor Enclosure (DPE)

The disk processor enclosure is a 3U, 25 2.5" drive DPE.

The front and rear view of the DPE are shown in [Figure 14 on page 31](#).

Figure 14 Front and rear view of DPE




---

**Note**

The DPE contains two storage processors (SP A and SP B). Each SP contains a management module and five slots for I/O modules, numbered 0-4. SP slots that do not support I/O modules are labeled.

---

## Installing the disk processor enclosure

**CAUTION**

**DO NOT** lift the DPE by its I/O module handles. Use two people to lift the DPE on each side.

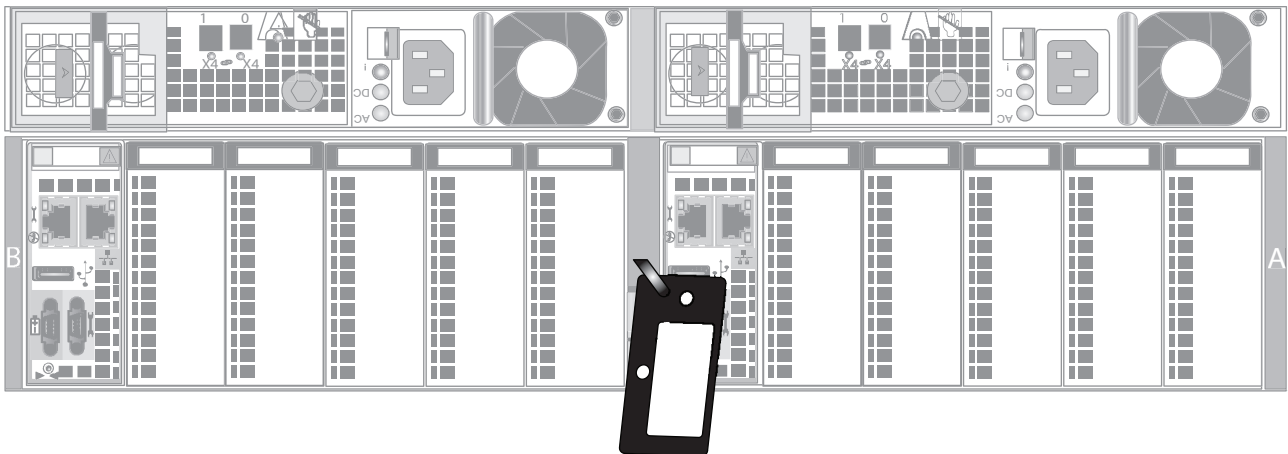
---

Refer to [Figure 16 on page 33](#) while performing the procedure that follows.

**Procedure**

1. Locate the Product ID/SN from the product serial number tag (PSNT) located on the back of the DPE as shown in [Figure 15 on page 32](#).

**Figure 15** PSNT tag on the rear of the DPE



2. Record this number to use when you register the product during system setup steps.
3. Slide the disk processor enclosure (DPE) into the rails in the cabinet all the way into the cabinet until the rail stops (or tabs) in the back seat the enclosure at the correct depth, and the front of the enclosure is flush with the front of the cabinet or rack posts.

---

**Note**

Be careful when you slide the enclosure into the rails. The PSNT tag on the middle of the enclosure as shown in [Figure 15 on page 32](#) can inadvertently become jammed, cut off, or block the enclosure seating.

---

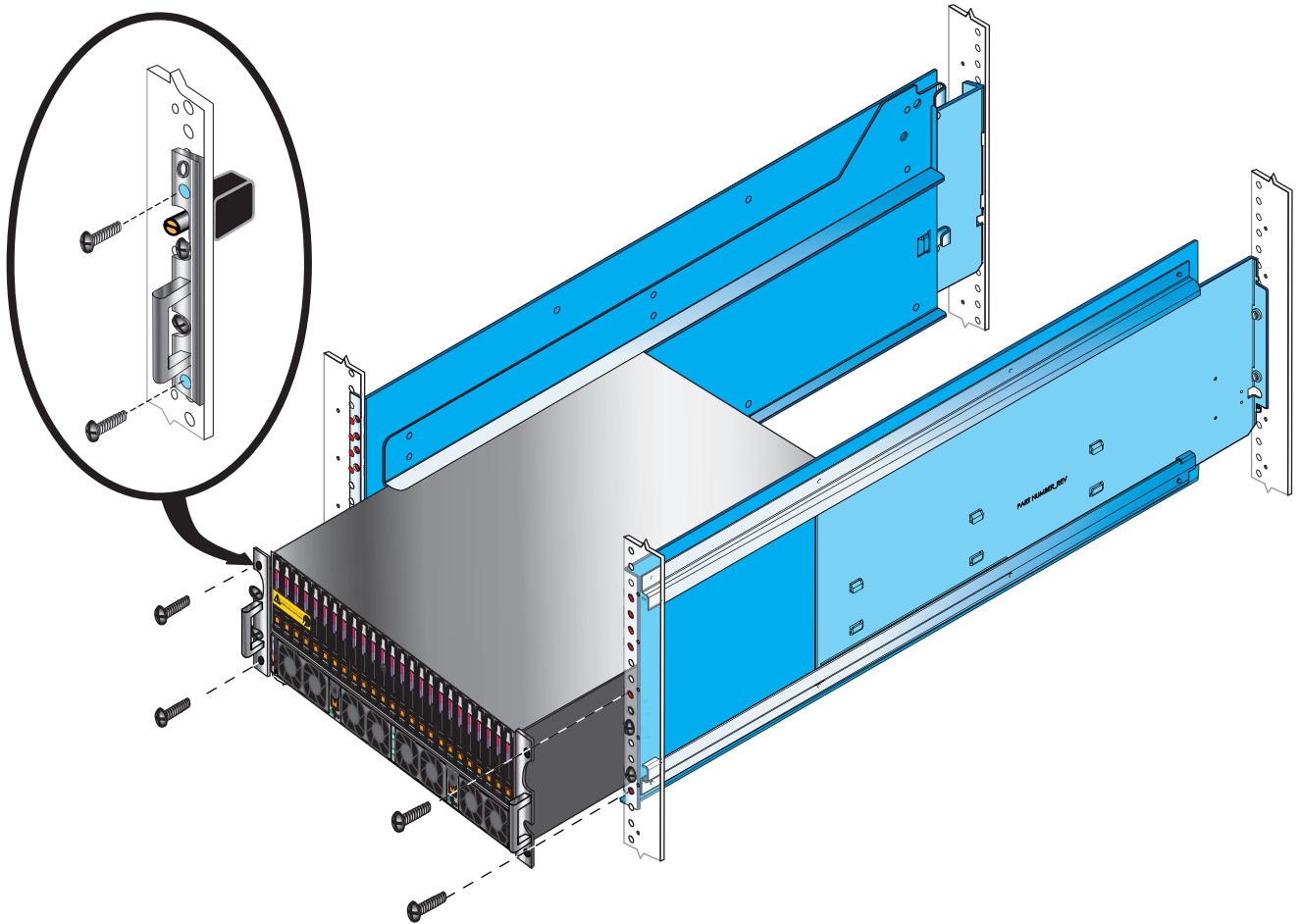
Position the DPE in the bottom (first slot) of the ganged rails.

Ensure that the enclosure is fully seated in the cabinet. The rail stops in the back will seat into the back of the enclosure at the correct depth, and the front of the enclosure will be flush with the cabinet face.

4. When the DPE is in place, insert and tighten all of the screws as shown in [Figure 16 on page 33](#).

It may be easier to install the screws working in a diagonal pattern, such as bottom left and top right, bottom right and top left, through the DPE, the cabinet or rack post, and then into the rail.



**Figure 16** Installing the DPE

## Installing blade enclosure 0

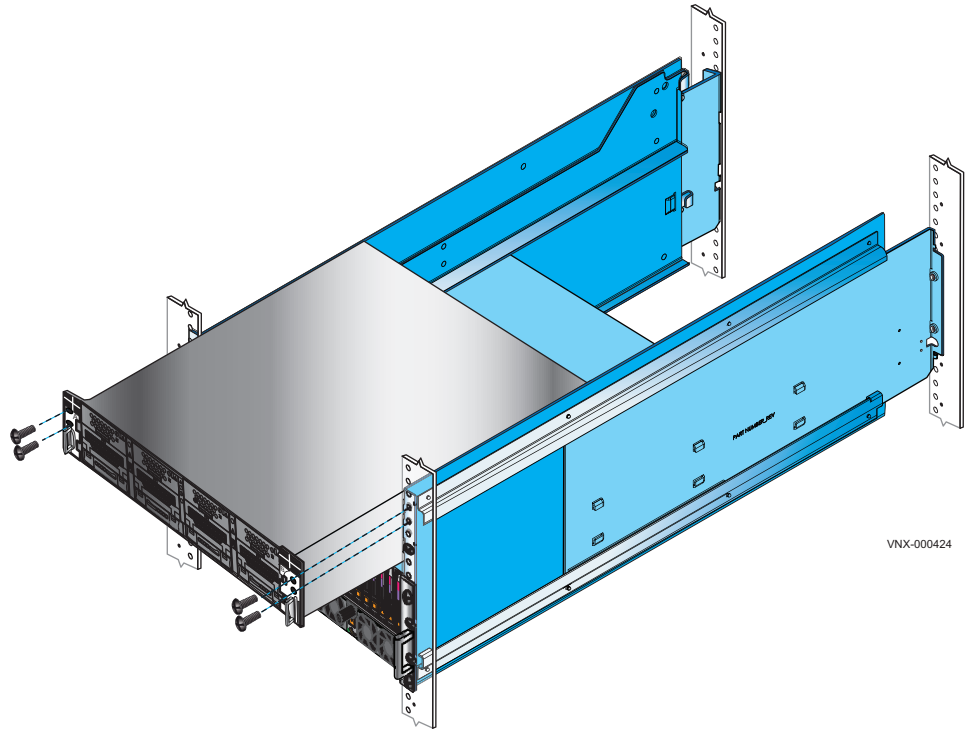
### Note

Do not lift the blade enclosure by its I/O module handles. Use two people to lift the BE on each side.

### Procedure

1. Slide blade enclosure 0 above the DPE into the ganged rails by inserting the component into the tabs at the rear of the rails as shown in [Figure 17 on page 34](#).
2. Insert the four screws previously removed from the mini-rack (but do not fasten) in a diagonal pattern (bottom left, top right, bottom right, and top left) through the blade enclosure, the cabinet or rack post, and then into the ganged rails as shown in [Figure 17 on page 34](#).

**Figure 17** Installing blade enclosure 0

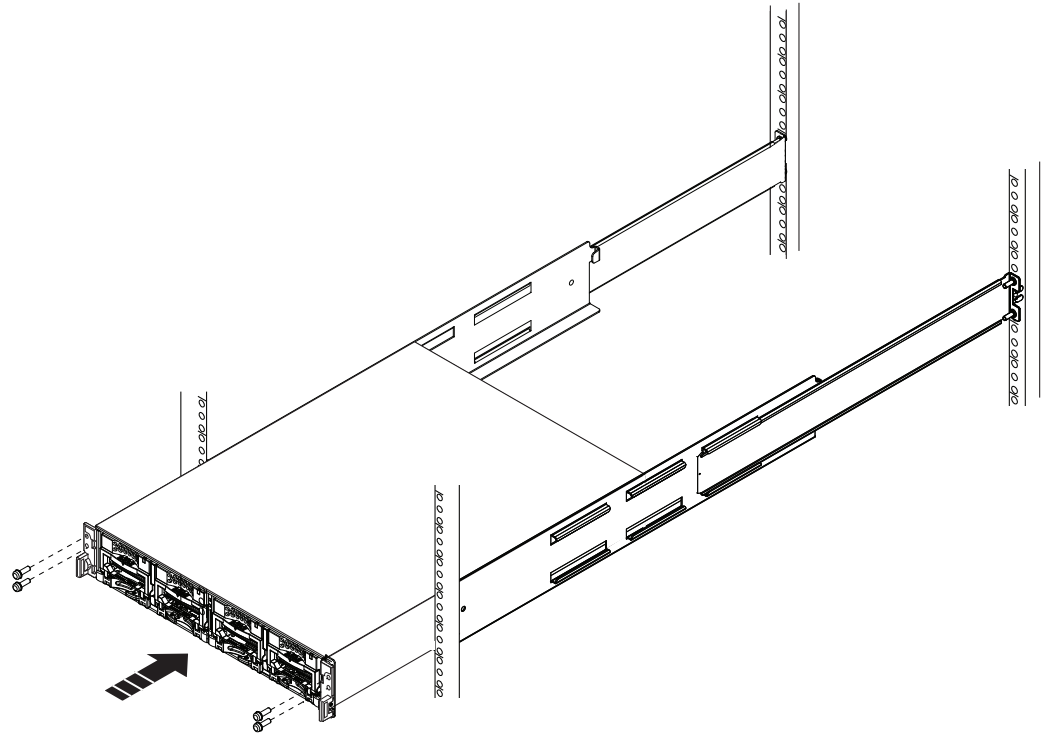


## Installing blade enclosure 1

Refer to [Figure 18 on page 35](#) while performing the procedure.

### Procedure

1. Slide blade enclosure 1 above blade enclosure 0 into the adjustable rails by inserting the component into the tabs at the rear of the rails.
2. Insert the four screws previously removed (but do not fasten) in a diagonal pattern (bottom left, top right, bottom right, and top left) through the blade enclosure, the cabinet or rack post, and then into the rail.

**Figure 18** Installing blade enclosure 1

## Installing the remaining (optional) blade enclosures

Install any remaining (optional) blade enclosures into the adjustable rails directly above the last installed blade enclosure.

### Procedure

1. Locate the remaining blade enclosures.
2. Repeat the installation procedure described in the previous task to install the remaining blade enclosures.

## Install Control Stations and the extension cables

The primary Control Station (CS0) will slide into the slot above the last installed blade enclosure.

---

### Note

Ensure that you install the primary Control Station (CS0) before installing CS1. Refer to the location of CS0 when you removed it as shown in [Installation order of system components on page 28](#).

---

## Installing the server on the rails in the cabinet

### **CAUTION**

The enclosure is heavy and should be installed into or removed from a rack by two people. To avoid personal injury and/or damage to the equipment, do not attempt to lift and install the enclosure into a rack without a mechanical lift and/or help from another person.

L'armoire étant lourde, sa mise en place sur une rampe nécessite deux personnes. Afin de ne pas vous blesser et/ou endommager le matériel, n'essayez pas de soulever et d'installer l'armoire sur une rampe sans avoir recours à un relevage mécanique et/ou à l'aide d'une autre personne.

Das Gehäuse ist schwer und sollte nur von zwei Personen in einem Rack installiert werden. Zur Vermeidung von körperlichen Verletzungen und/oder der Beschädigung des Gerätes, bitte das Gehäuse nicht ohne die Hilfe einer zweiten Person anheben und einbauen.

Il contenitore è pesante e dev'essere installato nel rack da due persone. Per evitare danni personali e/o all'apparecchiatura, non tentare di sollevare ed installare in un rack il contenitore senza un sollevatore meccanico e/o l'aiuto di un'altra persona.

Debido a su considerable peso, la instalación del compartimento en el bastidor deben realizarla siempre dos personas. Para evitar daños personales o en el equipo, el compartimento no debe levantarse ni instalarse en el bastidor sin la ayuda de un elevador mecánico o de otra persona.

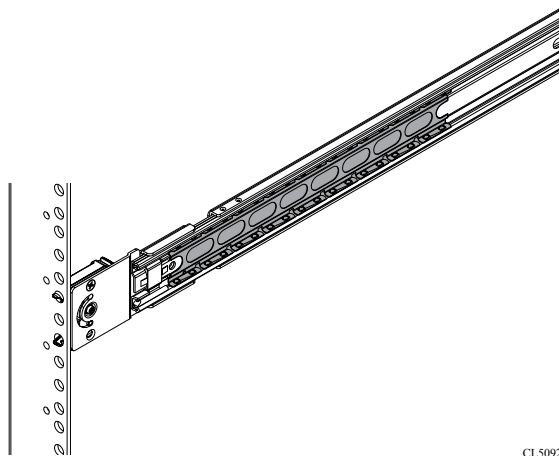
本設備相當沉重，安裝置機架時應由兩人搬動。切勿在未經機械搬動車和(或)他人協助的情況下，獨自搬動和安裝本設備，以免受傷和(或)損壞設備。

---

### Procedure

1. On each slide rail bring the ball bearing retainer assembly fully to the front, so it rides onto the security knob ([Figure 19 on page 36](#)).

**Figure 19** Correct location for ball bearing retainer assembly



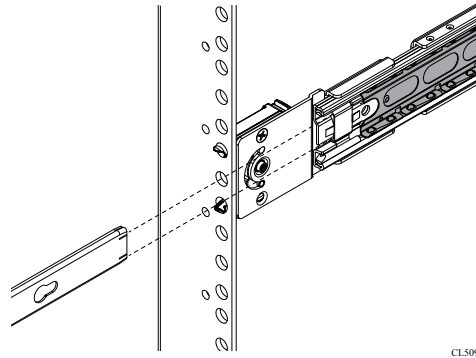
CL5092

2. From the front of the cabinet, align the inner rails attached to the server with the white plastic guide block on the front inside of each slide rail ([Figure 20 on page 37](#)).

**Note**

For clarity [Figure 20 on page 37](#) shows the inner rail without the server attached.

**Figure 20** Aligning the inner rail with white plastic guide block

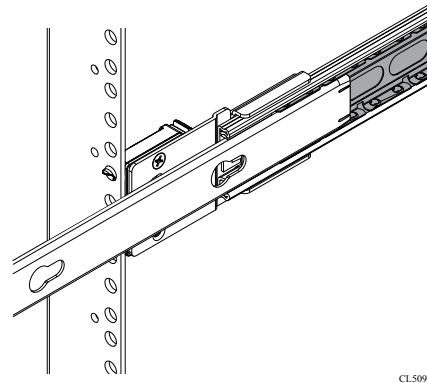


- Slide the server into the cabinet so the inner rails extends over the plastic guide blocks and the first part of the ball bearing retainer assemblies ([Figure 21 on page 37](#)).

**Note**

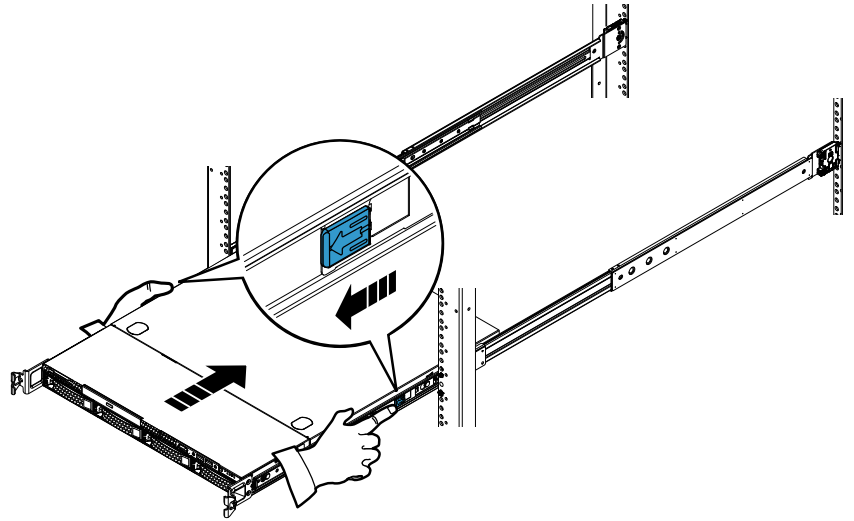
For clarity [Figure 21 on page 37](#) shows the inner rail without the server attached.

**Figure 21** Inner rail over the first part of ball bearing retainer assembly



- Once the inner rails are properly engaged with the ball bearing retainer assemblies, push the server into the cabinet until the slide rails are engaged and locked.  
An audible click indicates that the slide rails are engaged and locked.
- On the outside of each rail assembly, slide the blue disconnect tab forward to unlock the server, and push the server completely into the cabinet ([Figure 22 on page 38](#)).

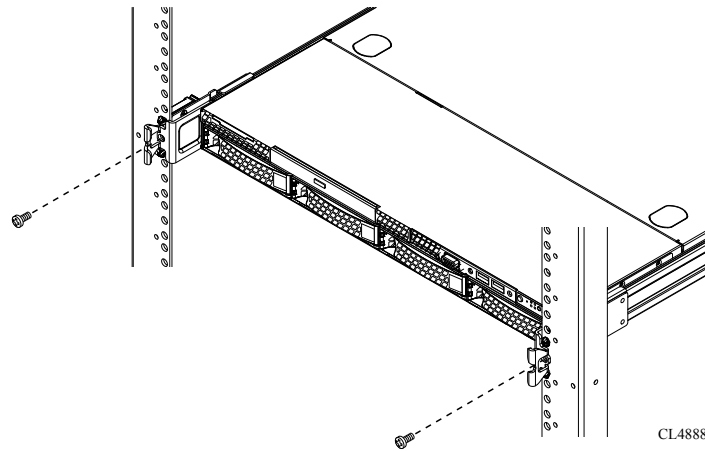
**Figure 22** Inserting the server in the cabinet



CL4886

6. To further secure the rail assembly and server in the cabinet, insert and tighten a small stabilizer screw directly behind each bezel latch (Figure 23 on page 38).

**Figure 23** Installing the stabilizer screws

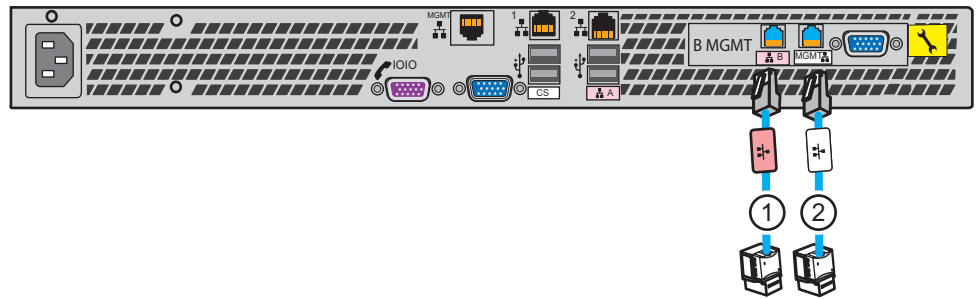


CL4888

## Connect Control Station extension cables

### Procedure

1. Connect the CS0 extension cables. Refer to Figure 24 on page 39. Extension cables are labeled CS0.
  - a. Connect the CS0 B extension cable to the RJ-45 connector, labeled **B** on the CS (see cable 1).
  - b. Connect the CS0 MGMT extension cable to the RJ-45 connector, labeled **MGMT** on the CS (see cable 2).

**Figure 24** Installing the Control Station extension cables

2. If a secondary Control Station (CS1) is shipped with the order, connect the CS1 extension cables. Extension cables are labeled CS1.
  - a. Connect the CS1 B extension cable to the RJ-45 connector, labeled **B** on the CS (see cable 1 in [Figure 24 on page 39](#)).
  - b. Connect the CS1 MGMT extension cable to the RJ-45 connector, labeled **MGMT** on the CS (see cable 2).

Assemble components in your cabinet



# CHAPTER 5

## Cable your system

Some cables for your system have pre-attached cable labels. Labels are provided for SAS cables. There are no labels for power cables and customer-supplied cables.

- [Cabling Control Station, modem, and public LAN](#).....42
- [Cabling storage processors to blades](#)..... 45
- [Cabling SPs to the blade management modules](#)..... 54

## Cabling Control Station, modem, and public LAN

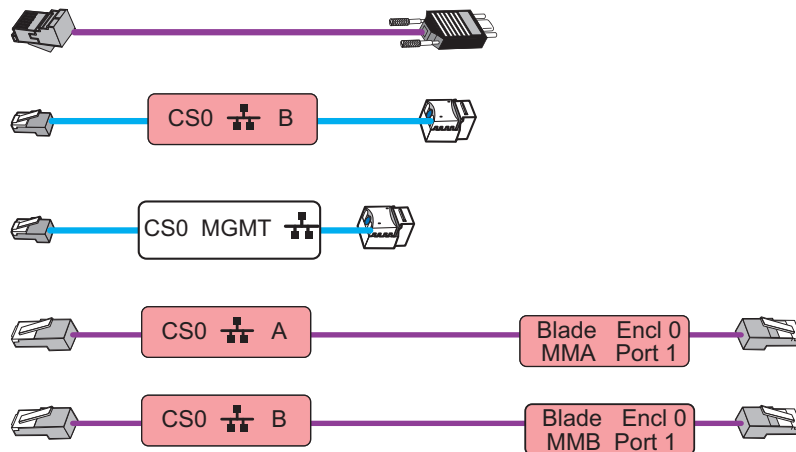
Your system might contain one or two Control Stations. If you have one CS, it is called the primary Control Station or CS0. If you have a second or optional CS, it is called the secondary Control Station or CS1.

### Cabling CS0

#### Procedure

1. If you have not removed the labels from the front of CS0 and CS1 (if applicable), remove them now and attach to the inside front cover of this document.
2. Locate the cables shown in [Figure 25 on page 42](#). You already connected extension cables (labeled CS0 B and CS0 MGMT) when you installed the Control Station.

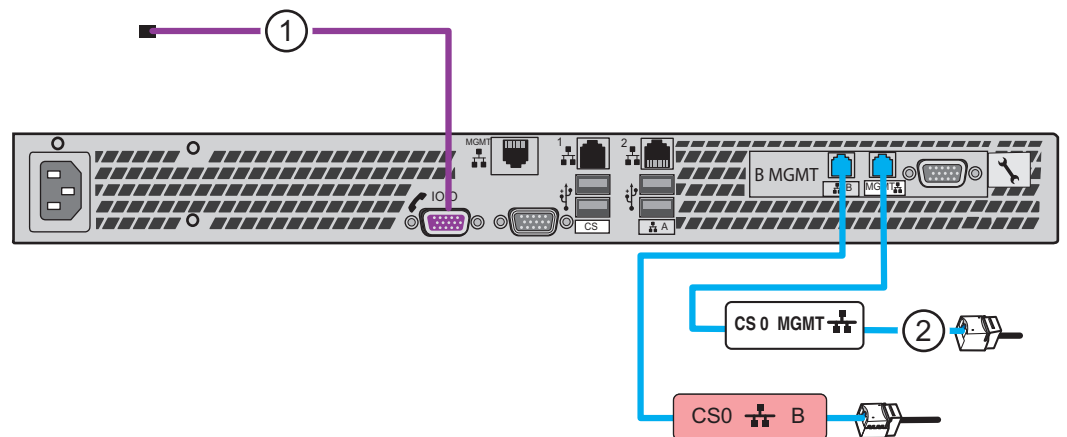
**Figure 25** CS0 cables



3. Connect the CS0 to your network environment:

Refer to [Figure 26 on page 42](#) while performing the procedure that follows.

**Figure 26** Cabling CS0 to modem and public LAN

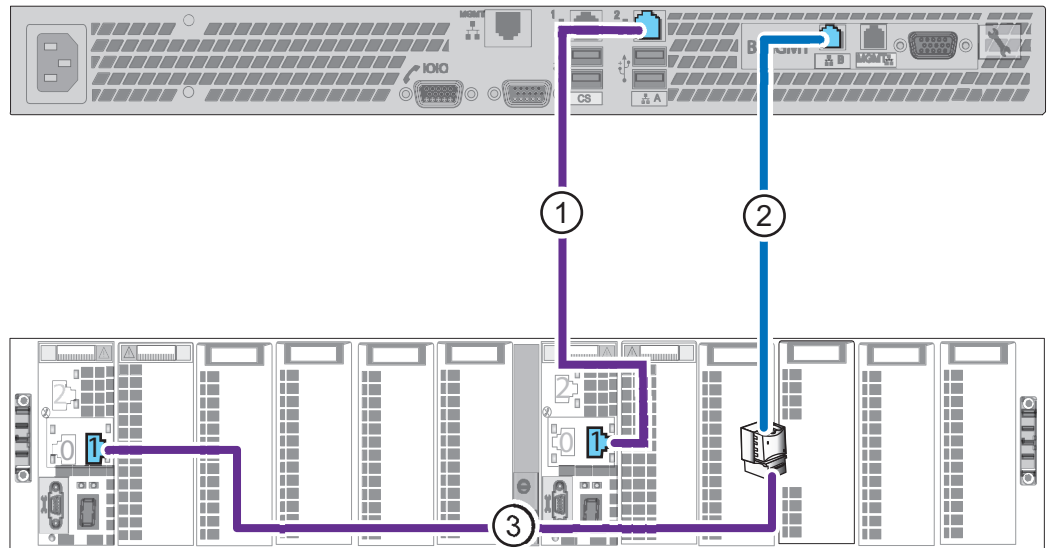


- a. Connect your public LAN using a CAT5e or better Ethernet cable (customer supplied) to the CS0 MGMT extension cable (cable 2).

- b. Connect CS0 to the customer modem, if applicable (cable 1).
- 4. Connect CS0 to blade enclosure 0:

Refer to [Figure 27 on page 43](#) while performing the procedure that follows.

**Figure 27** Cabling CS0 to blade enclosure 0



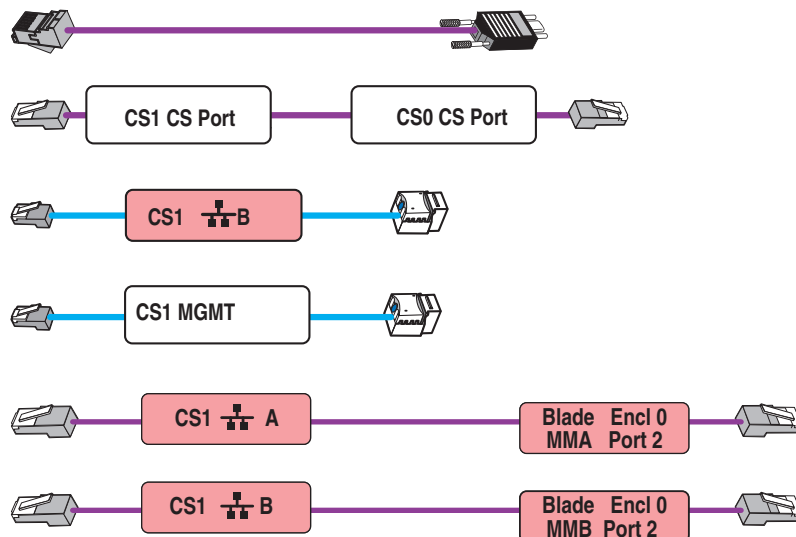
- a. Connect CS0 A cable to Blade Enclosure 0 MMA port 1 (cable 1).
- b. Connect CS0 B cable to Blade Enclosure 0 MMB port 1 (cables 2 and 3).

## Cabling CS1 (optional)

### Procedure

- 1. Locate the cables shown in [Figure 28 on page 43](#). You already connected extension cables (labeled CS1 B and CS1 MGMT) when you installed the Control Station.

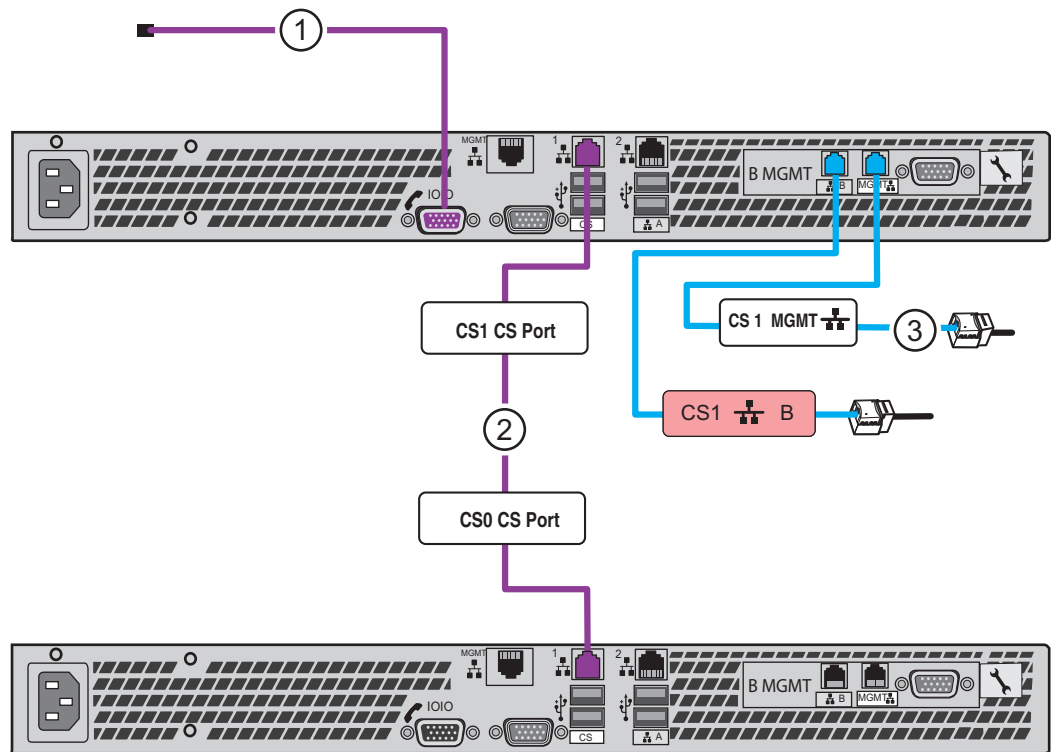
**Figure 28** CS1 cables



- 2. Connect the CS1 to your network environment:

Refer to [Figure 29 on page 44](#) while performing the procedure that follows.

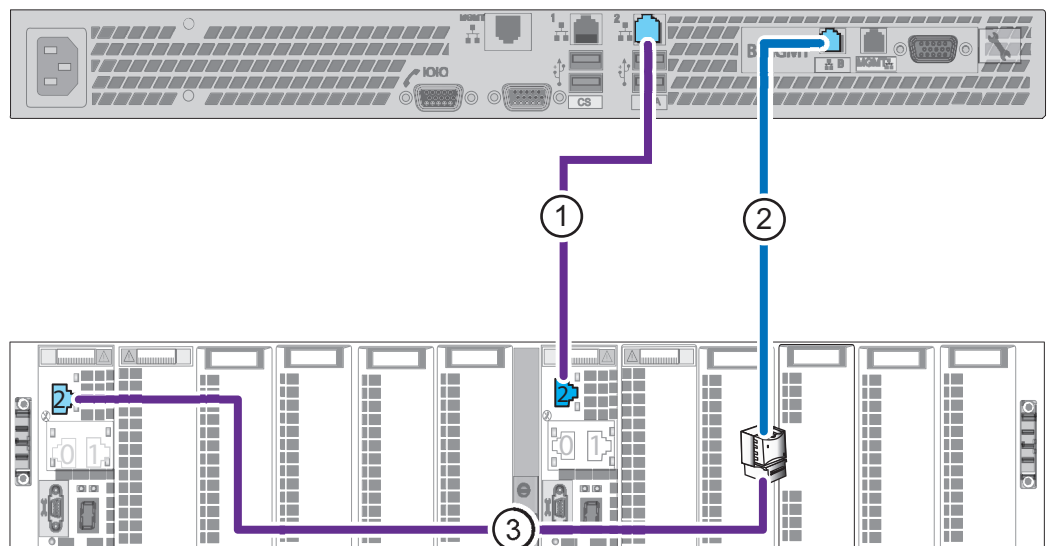
**Figure 29** Cabling CS1 to modem and public LAN



- a. Connect CS1 to the customer modem, if applicable (cable 1).
  - b. Connect CS1 Intelligent Platform Management Interface (IPMI) to CS0 (cable 2).
  - c. Connect your public LAN using a CAT5e or better Ethernet cable (customer supplied) to the CS1 MGMT extension cable (cable 3).
3. Connect CS1 to blade enclosure 0:

Refer to [Figure 30 on page 44](#) while performing the procedure that follows.

**Figure 30** Cabling CS1 to blade enclosure 0



- a. Connect CS1 A cable to Blade Enclosure 0 MMA port 2 (cable 1).

- b. Connect CS1 B cable to Blade Enclosure 0 MMB port 2 (cables 2 and 3).

## Cabling storage processors to blades

Your system has two storage processors (SP A and SP B). You will connect each SP to each equipped blade.

### **CAUTION**

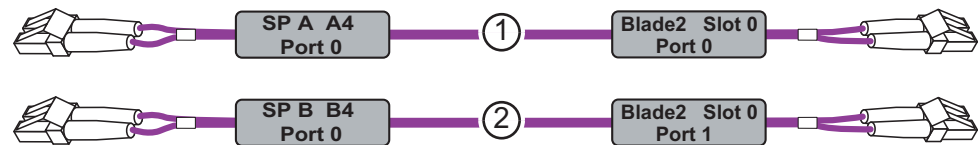
If you are connecting Fibre cables, ensure that you remove the dust caps from the cables before installation.

## Cabling storage processors to blade 2

### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 2.

Figure 31 FC Cables



Refer to [Figure 32 on page 46](#) when completing this task.

### Procedure

1. Connect SP A slot A4 port 0 to blade 2 slot 0 port 0 as shown in [Figure 32 on page 46](#). See cable 1.
2. Connect SP B slot B4 port 0 to blade 2 slot 0 port 1. See cable 2.

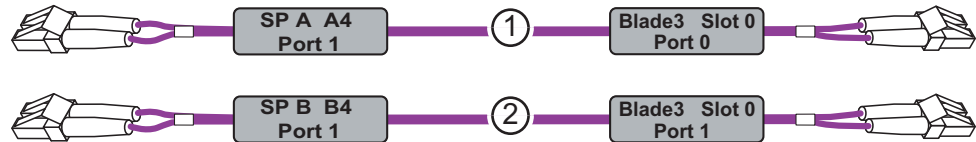
**Figure 32** Cable storage processors to blade enclosure 0



### Cabling storage processors to blade 3

#### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 3.



Refer to [Figure 33 on page 47](#) when completing this task.

#### Procedure

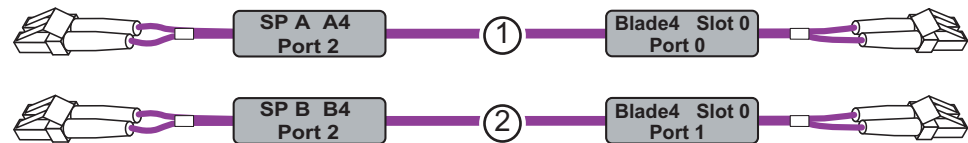
1. Connect SP A slot A4 port 1 to blade 3 slot 0 port 0. See cable 1.
2. Connect SP B slot B4 port 1 to blade 3 slot 0 port 1. See cable 2.

**Figure 33** Cable storage processors to blade 3

## Cabling storage processors to blade 4

### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 4.



Refer to [Figure 34 on page 48](#) when completing this task.

### Procedure

1. Connect SP A slot A4 port 2 to blade 4 slot 0 port 0 as shown in [Figure 34 on page 48](#). See cable 1.
2. Connect SP B slot B4 port 2 to blade 4 slot 0 port 1. See cable 2.

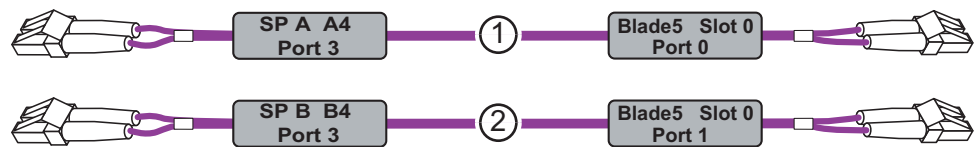
**Figure 34** Cable storage processors to blade 4



## Cabling storage processors to blade 5

### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 5.



Refer to [Figure 35 on page 49](#) when completing this task.

### Procedure

1. Connect SP A slot A4 port 3 to blade 5 slot 0 port 0. See cable 1.
2. Connect SP B slot B4 port 3 to blade 5 slot 0 port 1. See cable 2.



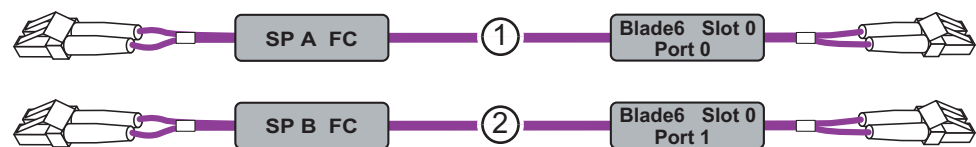
Figure 35 Cable storage processors to blade 5



## Cabling storage processors to blade 6

### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 6.

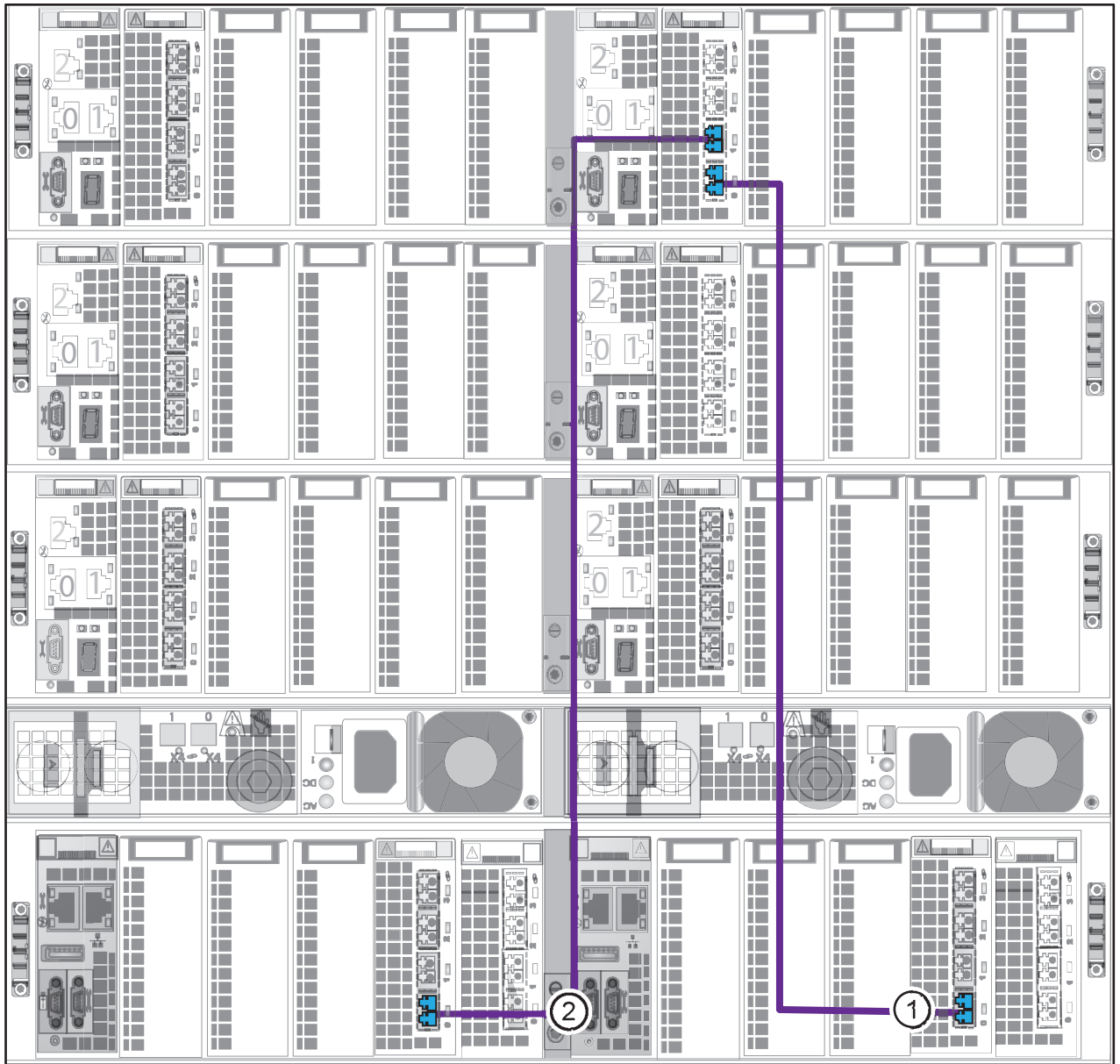


Refer to [Figure 36 on page 50](#) when completing this task.

### Procedure

1. Connect SP A slot A3 port 0 to blade 6 slot 0 port 0. See cable 1.
2. Connect SP B slot B3 port 0 to blade 6 slot 0 port 1. See cable 2.

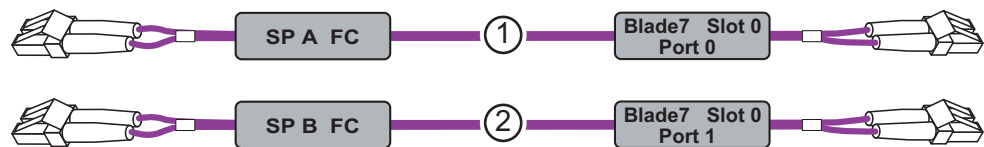
**Figure 36** Cable storage processors to blade 6



## Cabling storage processors to blade 7

### Before you begin

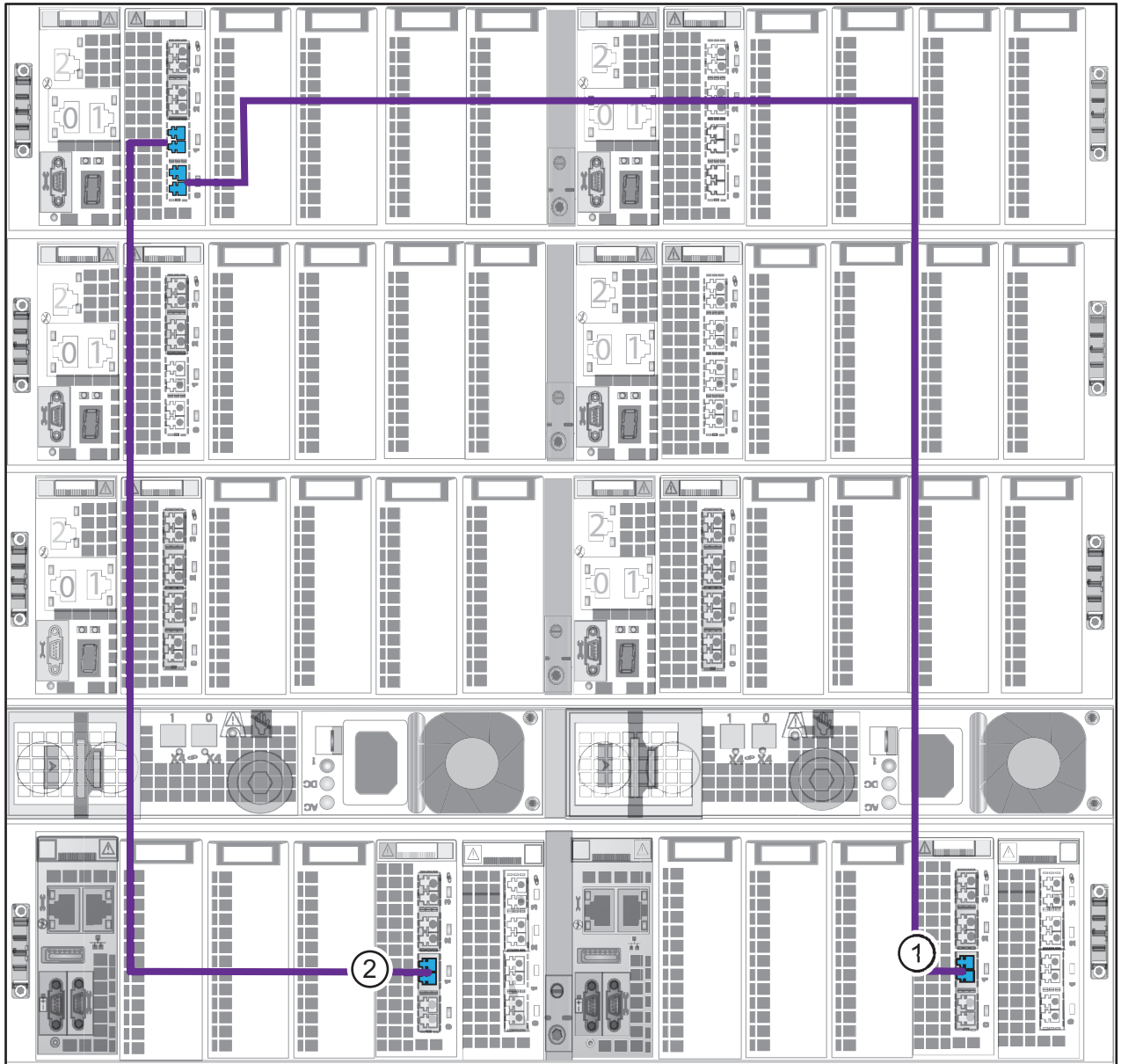
If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 7.



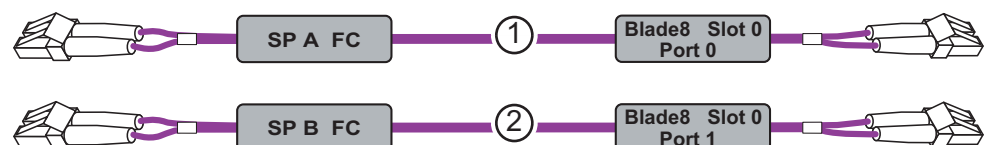
Refer to [Figure 37 on page 51](#) when completing this task.

**Procedure**

1. Connect SP A slot A3 port 1 to blade 7 slot 0 port 0. See cable 1.
2. Connect SP B slot B3 port 1 to blade 7 slot 0 port 1. See cable 2.

**Figure 37** Cable storage processors to blade 7**Cabling storage processors to blade 8****Before you begin**

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 8.

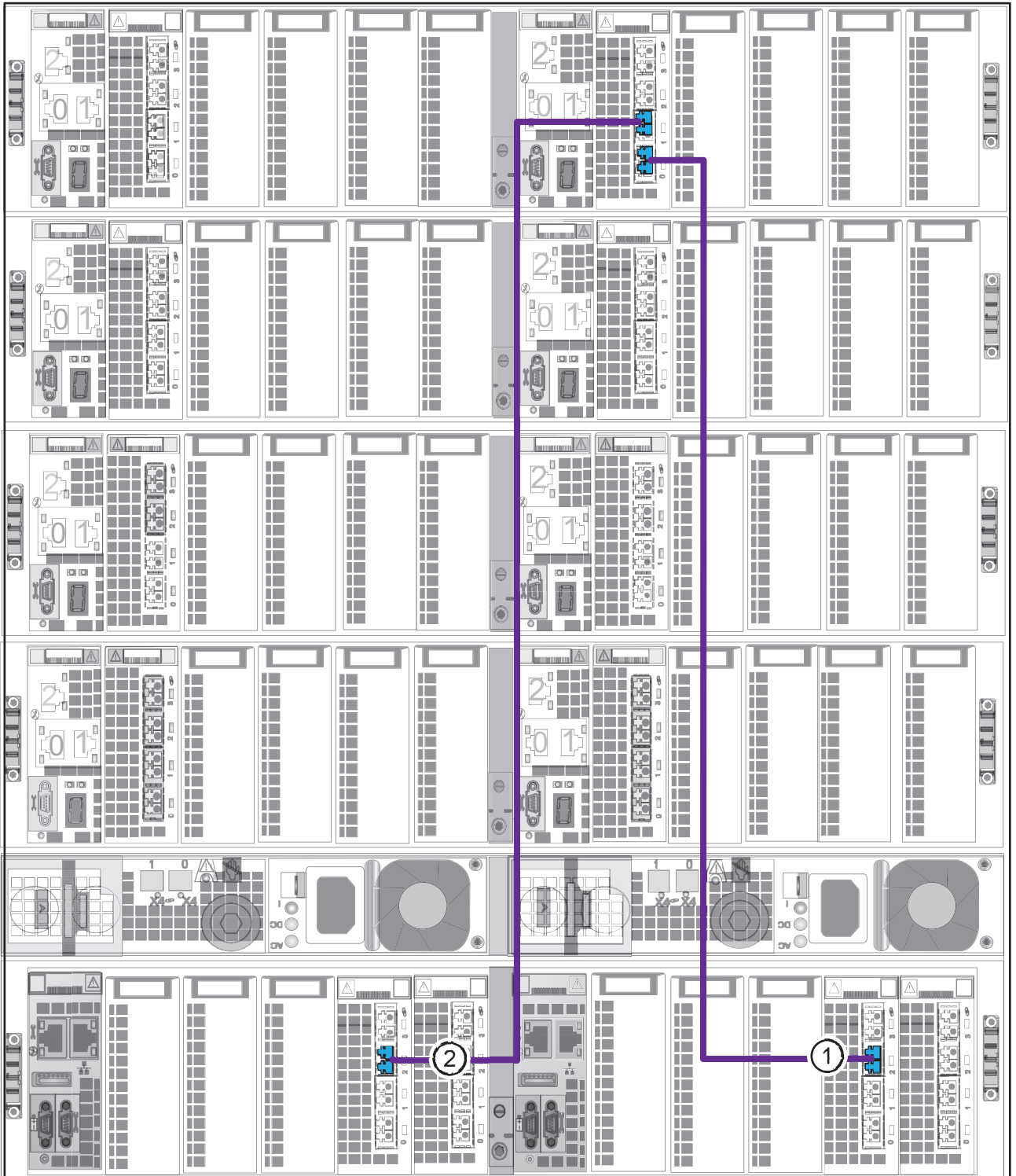


Refer to [Figure 38 on page 52](#) when completing this task.

**Procedure**

1. Connect SP A slot A3 port 2 to blade 8 slot 0 port 0. See cable 1.
2. Connect SP B slot B3 port 2 to blade 8 slot 0 port 1. See cable 2.

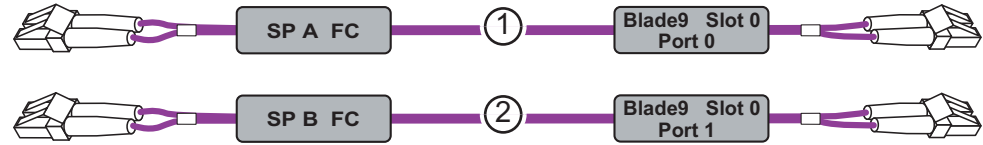
**Figure 38** Cable storage processors to blade 8



## Cabling storage processors to blade 9

### Before you begin

If your VNX shipped un-cabled, locate the Fibre Channel cables required to connect blade 9.

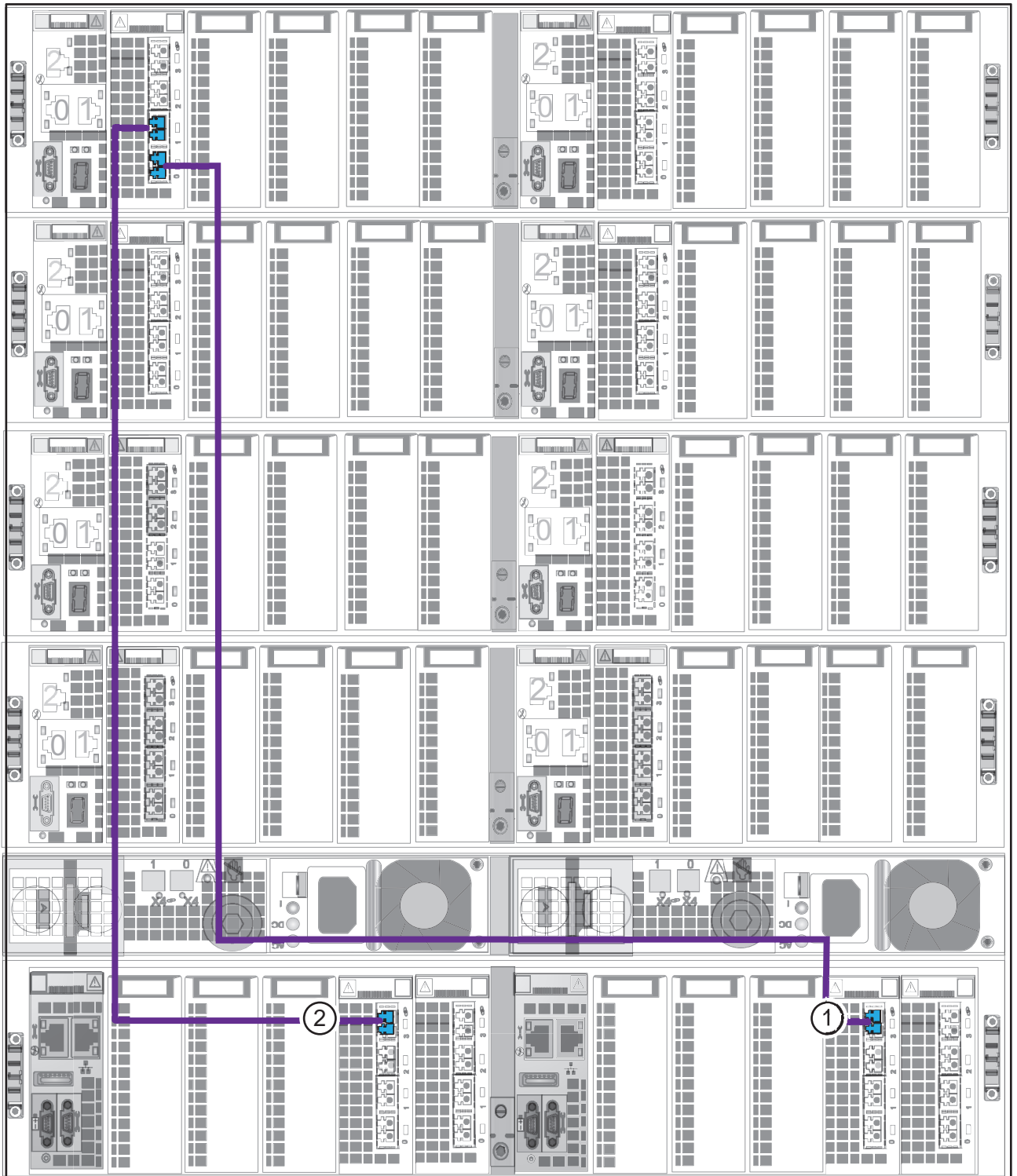


Refer to [Figure 39 on page 54](#) when completing this task.

### Procedure

1. Connect SP A slot A3 port 3 to blade 9 slot 0 port 0. See cable 1.
2. Connect SP B slot B3 port 3 to blade 9 slot 0 port 1. See cable 2.

Figure 39 Cable storage processors to blade 9



## Cabling SPs to the blade management modules

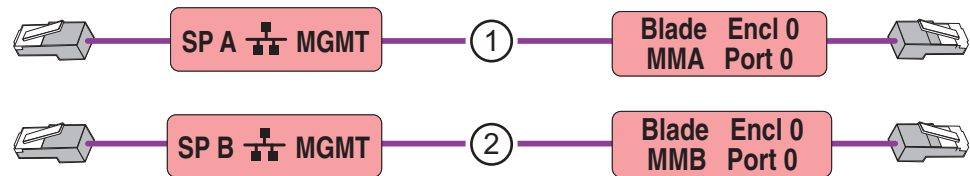
When cabling your system, the cables from the SP management modules always connect to the highest numbered blade enclosure at port 0.

## Cabling for one blade enclosure

### Before you begin

Locate the cables as shown in [Figure 40 on page 55](#).

**Figure 40** Blade enclosure cables



Refer to [Figure 41 on page 55](#) when completing this task.

### Procedure

1. Connect SP A MGMT to blade enclosure 0 MMA port 0. See cable 1.
2. Connect SP B MGMT to blade enclosure 0 MMB port 0. See cable 2.

**Figure 41** Cabling SPs to blade enclosure 0

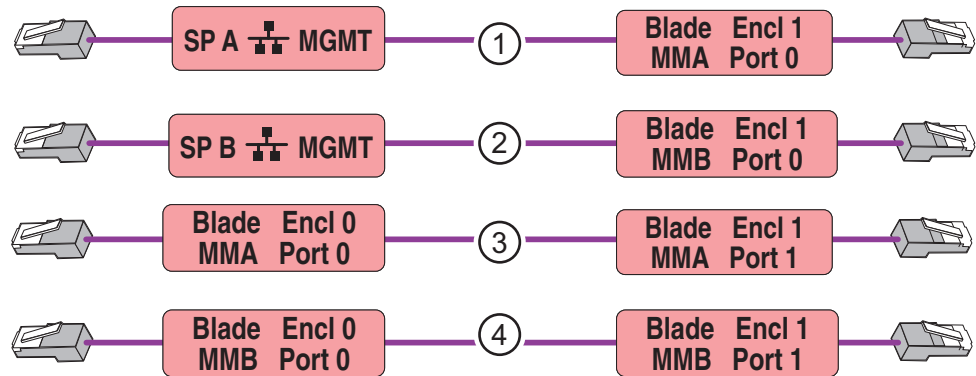


## Cabling for two blade enclosures

### Before you begin

Locate the cables as shown in [Figure 42 on page 56](#).

**Figure 42** Blade enclosure cables



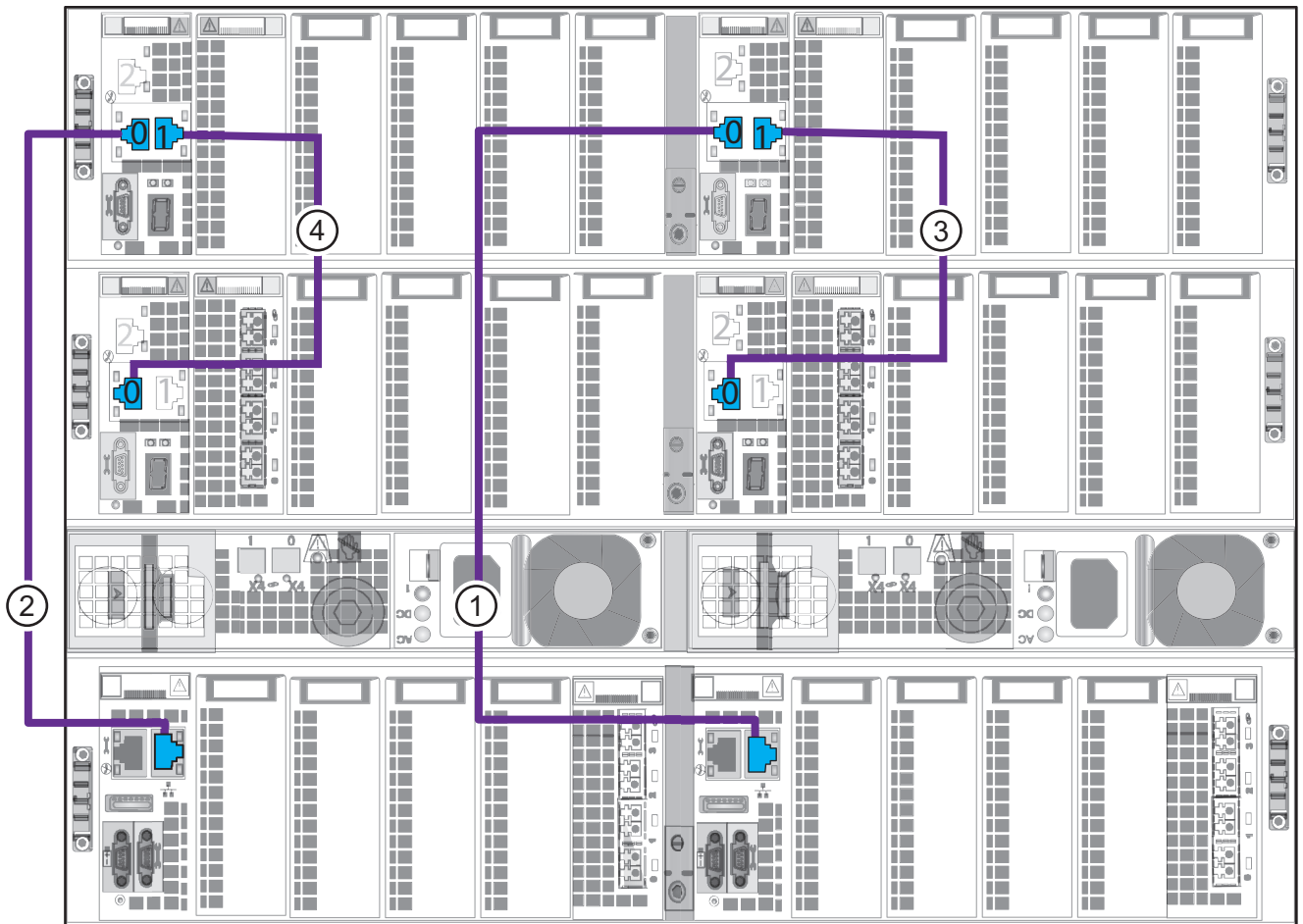
Refer to [Figure 43 on page 57](#) when completing this task.

**Procedure**

1. Connect SP A MGMT to the highest blade enclosure, which is blade enclosure 1 port 0 on the A. See cable 1.
2. Connect SP B MGMT the highest blade enclosure, which is blade enclosure 1 port 0 on the B side. See cable 2.
3. Cross-connect blade enclosure 0 MMA port 0 to blade enclosure 1 MMA port 1 on the A side. See cable 3.
4. Cross-connect blade enclosure 0 MMB port 0 to blade enclosure 1 MMB port 1 on the B side. See cable 4.



Figure 43 Cabling SPs to two blade enclosures

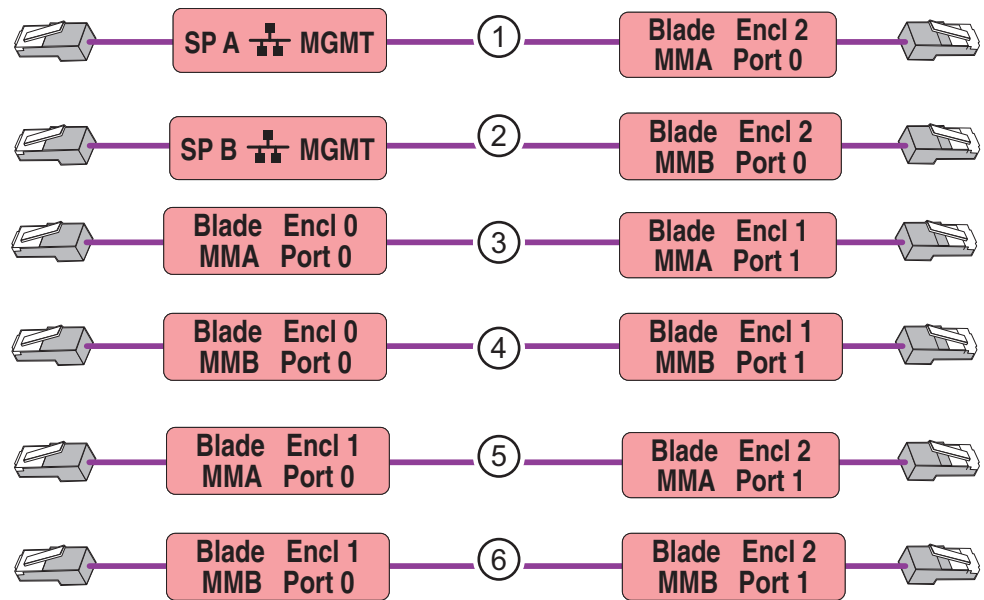


## Cabling for three blade enclosures

### Before you begin

Locate the cables as shown in [Figure 44 on page 58](#).

**Figure 44** Blade enclosure cables

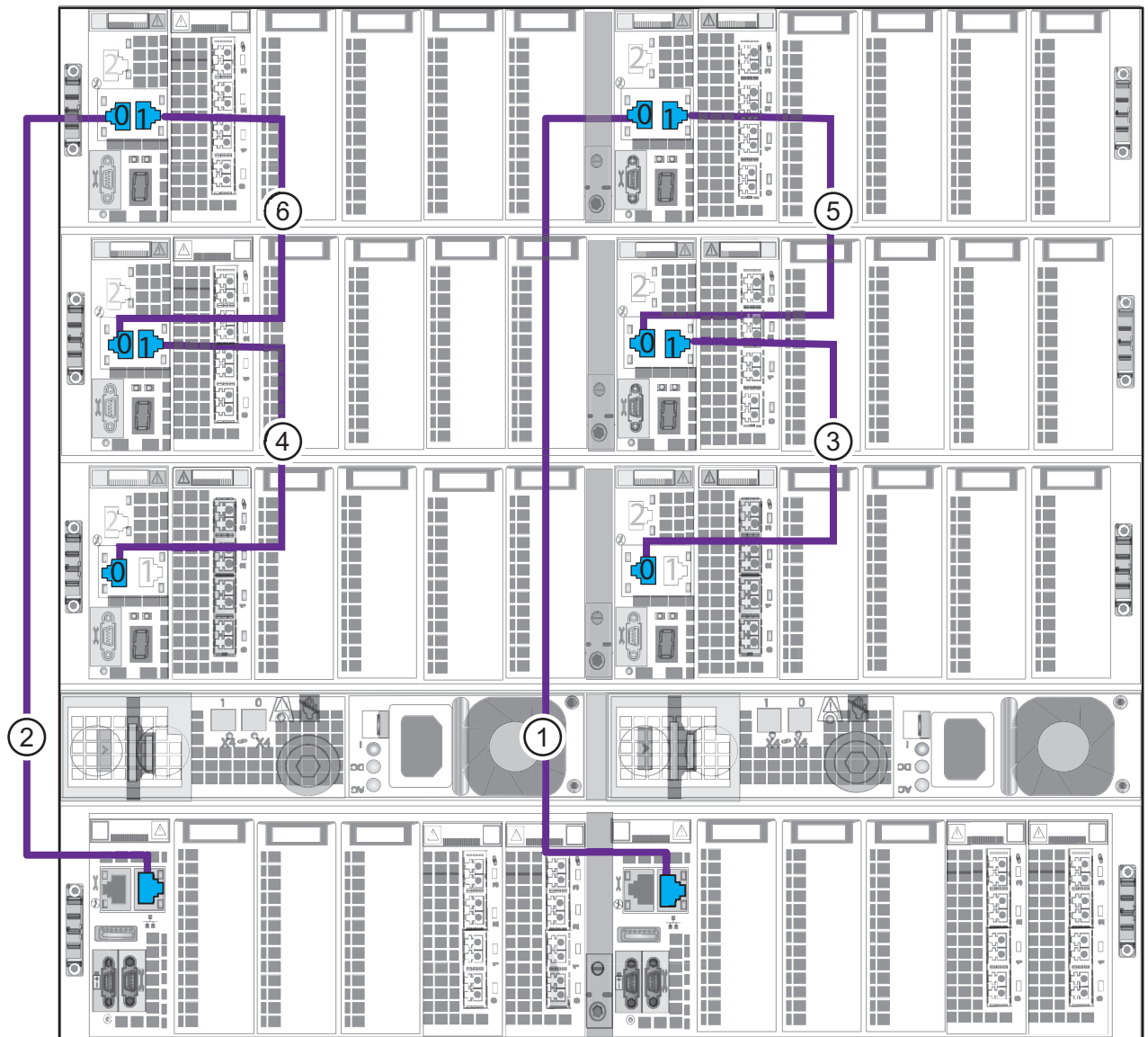


Refer to [Figure 45](#) on page 59 when completing this task.

**Procedure**

1. Connect SP A MGMT to the highest blade enclosure, which is blade enclosure 2 MMA port 0 on the A side. See cable 1.
2. Connect SP B MGMT the highest blade enclosure, which is blade enclosure 2 MMB port 0 on the B side. See cable 2.
3. Cross-connect blade enclosure 0 MMA port 0 to blade enclosure 1 MMA port 1 on the A side. See cable 3.
4. Cross-connect blade enclosure 0 MMB port 0 to blade enclosure 1 MMB port 1 on the B side. See cable 4.
5. Cross-connect blade enclosure 1 MMA port 0 to blade enclosure 2 MMA port 1 on the A side. See cable 5.
6. Cross-connect blade enclosure 1 MMB port 0 to blade enclosure 2 MMB port 1 on the B side. See cable 6.

Figure 45 Cabling SPs to three blade enclosures

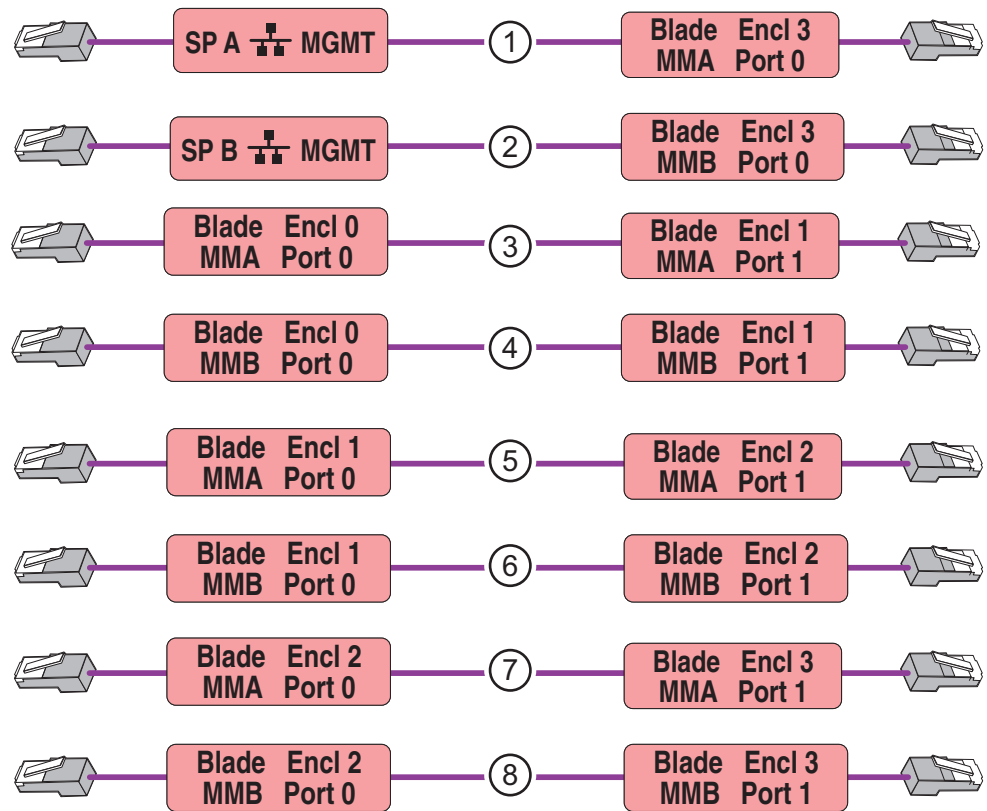


## Cabling for four blade enclosures

### Before you begin

Locate the cables as shown in [Figure 46 on page 60](#).

**Figure 46** Blade enclosure cables

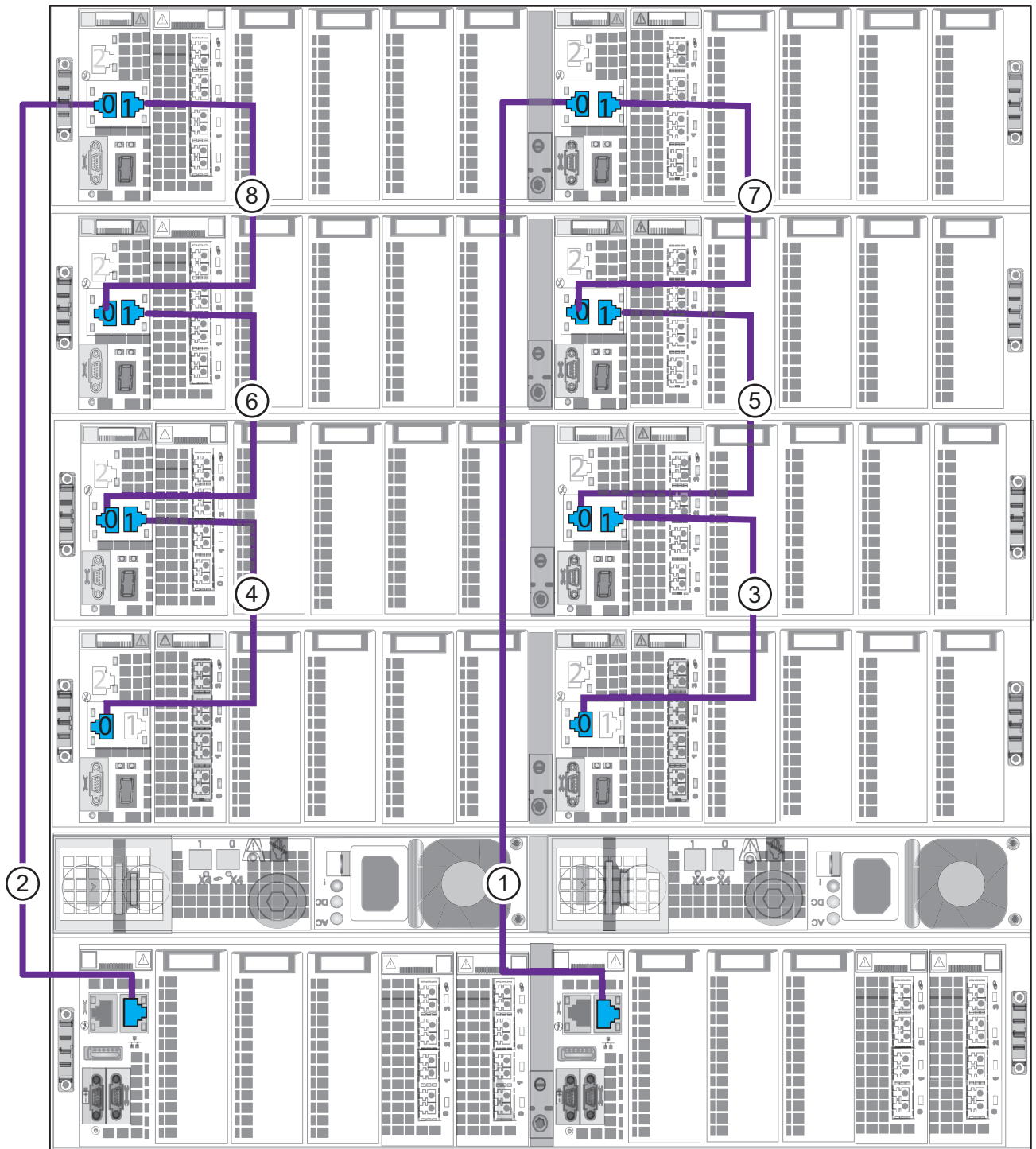


Refer to [Figure 47 on page 61](#) when completing this task.

**Procedure**

1. Connect SP A MGMT to the highest blade enclosure, which is blade enclosure 3 MMA port 0 on the A side. See cable 1.
2. Connect SP B MGMT the highest blade enclosure, which is blade enclosure 3 MMB port 0 on the B side. See cable 2.
3. Cross-connect blade enclosure 0 MMA port 0 to blade enclosure 1 MMA port 1 on the A side. See cable 3.
4. Cross-connect blade enclosure 0 MMB port 0 to blade enclosure 1 MMB port 1 on the B side. See cable 4.
5. Cross-connect blade enclosure 1 MMA port 0 to blade enclosure 2 MMA port 1 on the A side. See cable 5.
6. Cross-connect blade enclosure 1 MMB port 0 to blade enclosure 2 MMB port 1 on the B side. See cable 6.
7. Cross-connect blade enclosure 2 MMA port 0 to blade enclosure 3 MMA port 1 on the A side. See cable 7.
8. Cross-connect blade enclosure 2 MMB port 0 to blade enclosure 3 MMB port 1 on the B side. See cable 8.

Figure 47 Cabling SPs to four blade enclosures



Cable your system

# CHAPTER 6

## Power up

This chapter describes how to verify or connect power cables and verify system status after powering up the equipment.

- [Connecting or verifying power cables](#)..... 64
- [Connecting or verifying the gray power cables for PDU A](#)..... 64
- [Connecting or verifying the black power cables for PDU B](#)..... 65
- [Verifying system status](#)..... 67

## Connecting or verifying power cables

### Before you begin

Ensure that the cabinet circuit breakers are in the On position, all necessary PDU switches are switched On, and the power is connected.

On the rear of the cabinet, the power cables connected to PDU A are colored gray and the power cables for connecting to PDU B are colored black. While the cabling order does not matter so long as all the cables are connected properly, they have been separated according to PDU (A or B).

As soon as you connect the power cables, the component starts powering up automatically. This is normal. Refer to [Verifying system status on page 67](#) for correct LED status.

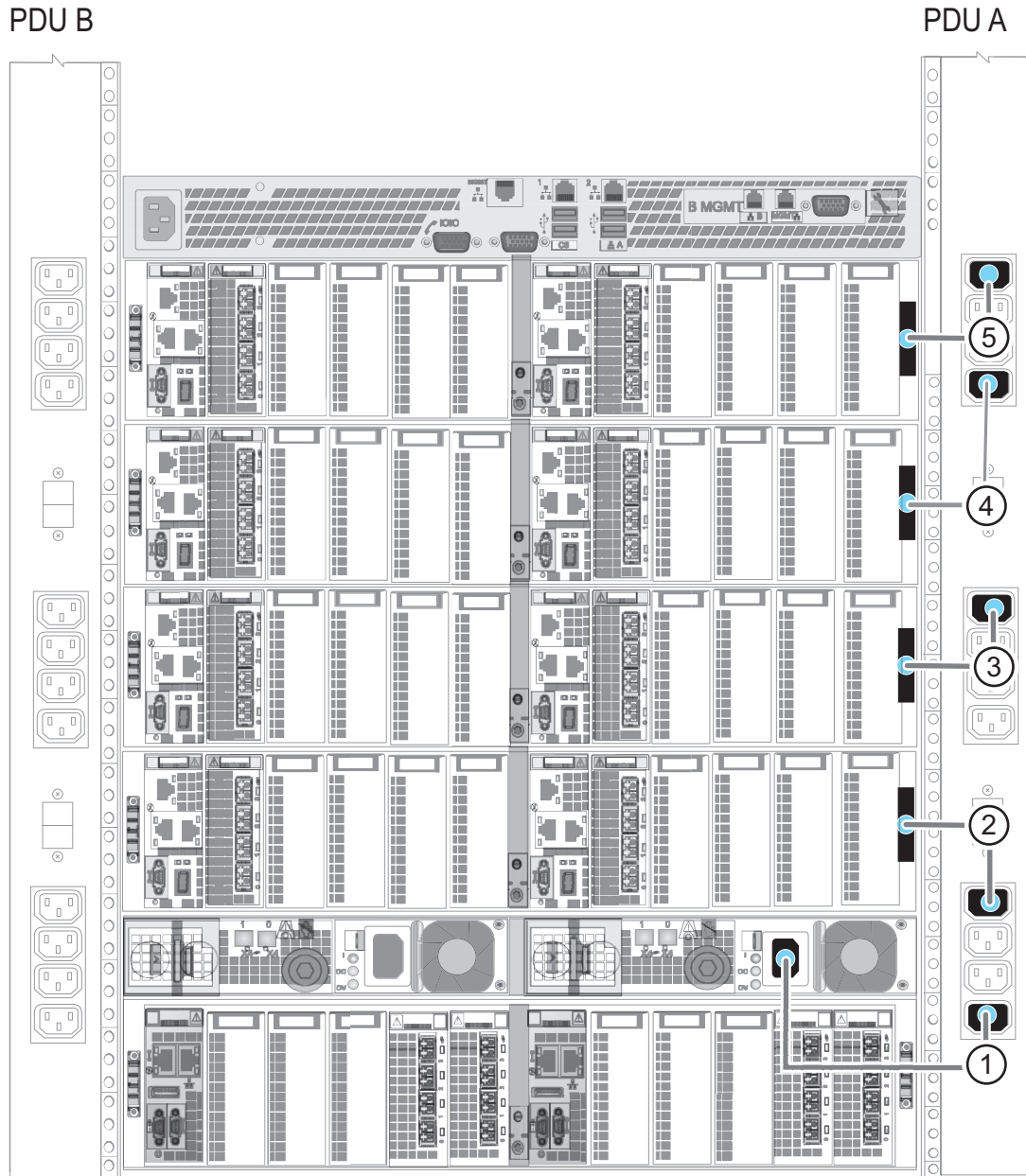
## Connecting or verifying the gray power cables for PDU A

Verify or connect the power cables as shown in [Figure 48 on page 65](#). Ensure that all the power cables are locked in place.

### Procedure

1. From SP A to PDU A. See cable 1 in [Figure 48 on page 65](#).



**Figure 48** Connecting the gray power cables for PDU A

2. From blade enclosure 0 (A side) to PDU A. See cable 2.
3. From blade enclosure 1 (A side) to PDU A. See cable 3.
4. From blade enclosure 2 (A side) to PDU A. See cable 4.
5. From blade enclosure 3 (A side) to PDU A. See cable 5.

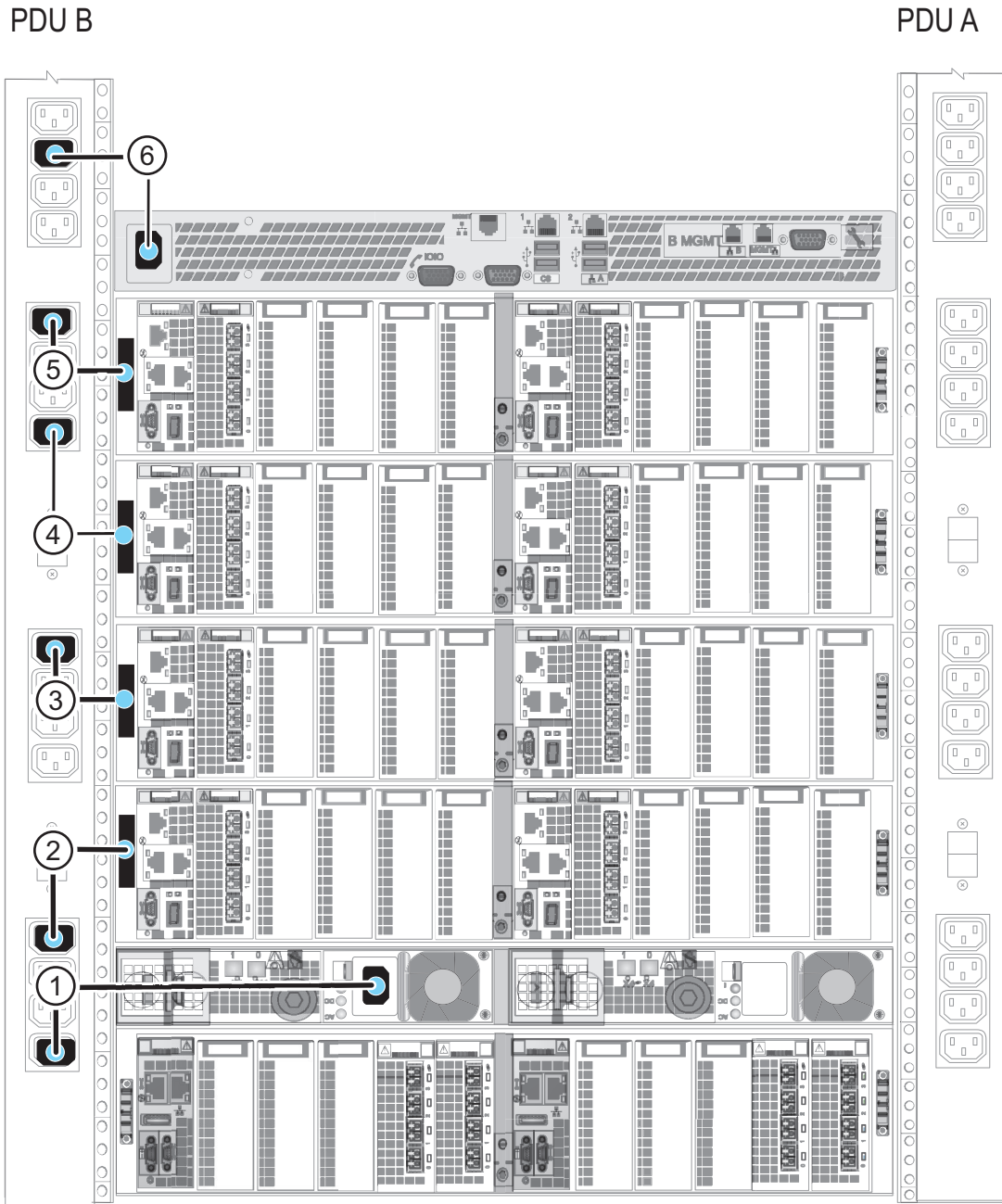
## Connecting or verifying the black power cables for PDU B

Verify or connect the power cables as shown in [Figure 49 on page 66](#). Ensure that all the power cables are locked in place.

### Procedure

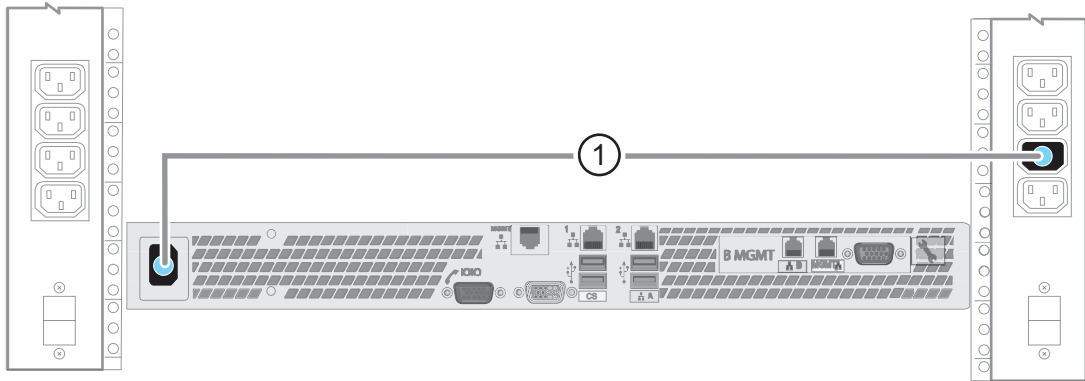
1. From SP B to PDU B. See cable 1 in [Figure 49 on page 66](#).

**Figure 49** Connecting the black power cables for PDU B



2. From blade enclosure 0 (B side) to PDU B. See cable 2.
3. From blade enclosure 1 (B side) to PDU B. See cable 3.
4. From blade enclosure 2 (A side) to PDU A. See cable 4.
5. From blade enclosure 3 (A side) to PDU A. See cable 5.
6. From CS0 to PDU B. See cable 6.
7. Wait 15 minutes for the system to power up completely.
8. If the optional CS1 is installed as shown in [Figure 50 on page 67](#) wait until [step 7 on page 66](#) completes and the SP Fault LED is turned off, then connect CS1 to PDU A.

**Figure 50** Connecting the gray power cable to CS1



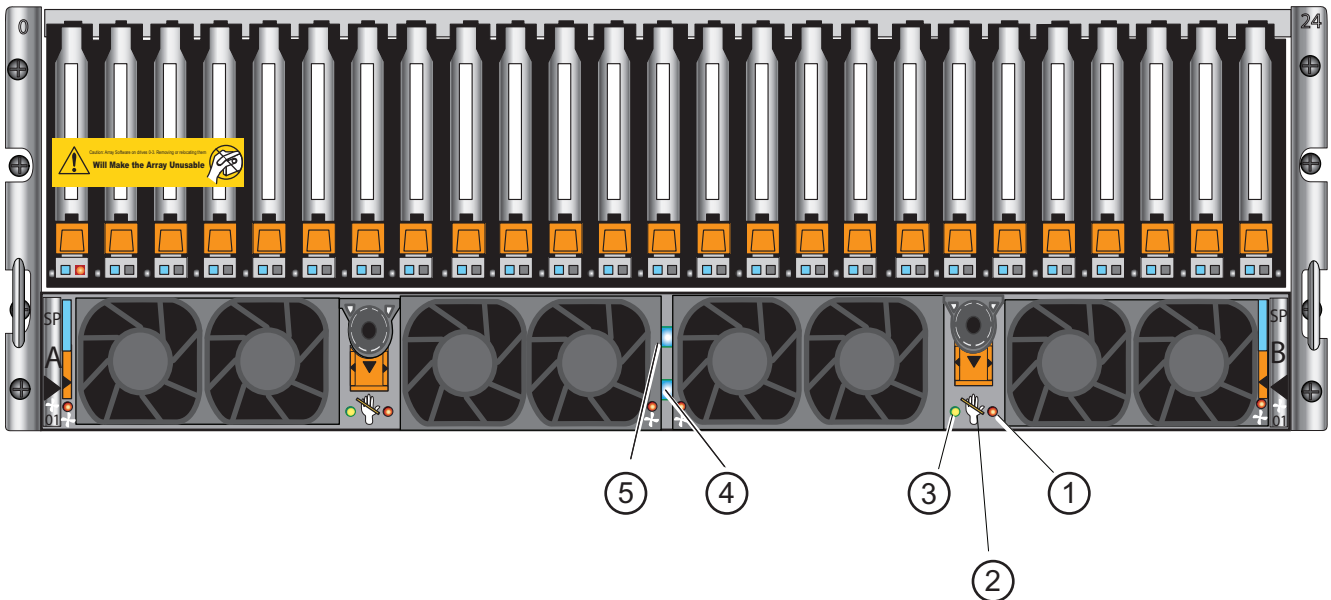
## Verifying system status

While your system powers up, the software goes through a number of stages causing LED activity lights to blink. You can verify that your system powered up correctly and completely after 15 minutes. The hardware information guide for your system provides details on all LEDs.

### Verify DPE status

Ensure that the DPE is powered up correctly using the physical indicators on the enclosure. The hardware information guide for your system provides more information on all the LEDs.

**Figure 51** DPE Front LEDs



LEDs	Location	State/Color
SP Fault/status	1	Off
SP Unsafe to remove	2	Off

**Figure 51** DPE Front LEDs (continued)

LEDs	Location	State/Color
SP Power	3	On/Solid green
DPE Power	4	On/Solid blue
DPE Fault	5	Off

**Procedure**

1. Verify that the DPE Power LED located on the front is solid blue and the DPE Fault is off as shown in [Figure 51 on page 67](#).
2. Verify that the SP Power LEDs on both SP A and SP B are solid green and the SP Fault/Status LEDs are off as shown in [Figure 51 on page 67](#).

**Note**

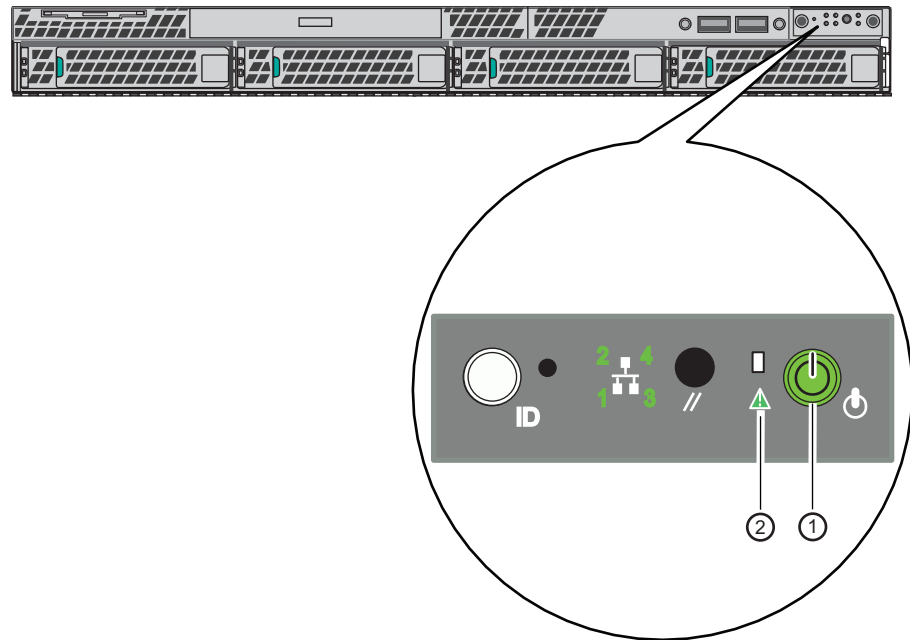
If any fault LEDs are on, or if any power LEDs remain flashing after approximately 15 minutes of operation, contact your authorized service provider.

3. Ensure the power-up is complete before you continue with the next task.

## Verifying Control Station status

Ensure that each Control Station is powered up correctly using the physical indicators on each enclosure. The hardware information guide for your system provides more information on all the LEDs.

**Figure 52** Control Station LEDs



LEDs	Location	State/color
Control Station power	1	On/green
Control Station status/fault	2	On/green

**Figure 52** Control Station LEDs (continued)

**Procedure**

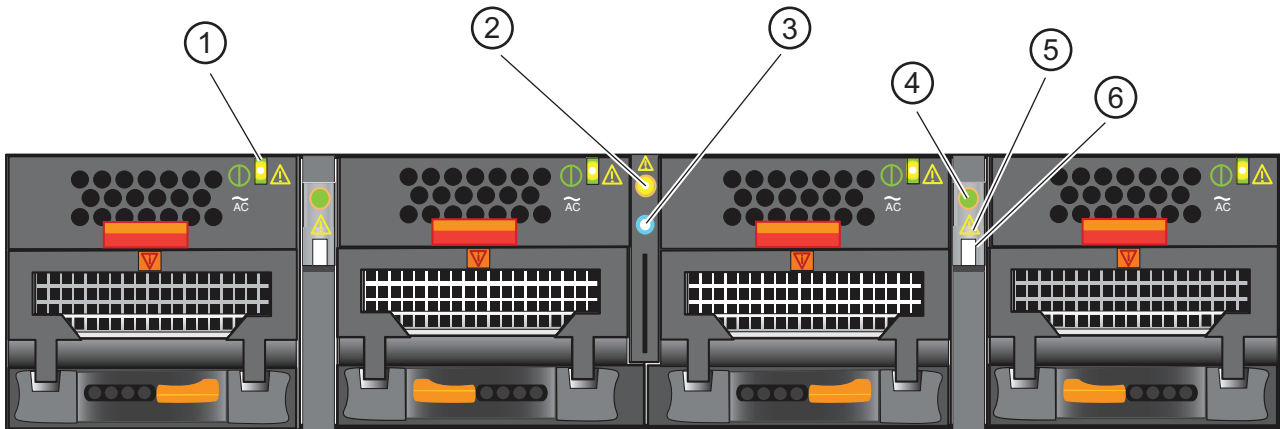
1. Verify that the Control Station status LED, located on the front, is solid green.
2. Verify that the Control Station power LED is solid green.

If any fault LEDs are on, or if any power LEDs remain flashing after approximately 15 minutes of operation, contact your authorized service provider.

**Verifying blade enclosure status**

Ensure that each blade enclosure is powered up correctly using the physical indicators on each enclosure. The hardware information guide for your system provides more information on all the LEDs.

**Figure 53** Blade enclosure LEDs



LEDs	Location	State/color
Blade power supply power/fault	1	On/green
Blade enclosure fault	2	Off
Blade enclosure power	3	On/blue or green
Blade CPU [A and B] Power	4	On/green
Blade CPU [A and B] Fault	5	Off
Blade CPU [A and B] Unsafe to remove	6	Off

**Procedure**

1. Verify the blade enclosure power LED is on.
2. Verify that the blade enclosure fault LED is off.
3. Verify that the blade power supply power/fault LED is on.
4. Verify that the blade CPU power LEDs are on.
5. Verify that the blade CPU fault LEDs are off.

Power up

# CHAPTER 7

## Add additional storage

This VNX storage system provides SAS ports for connection to additional storage. Disk-array enclosures can be added up to the disk limit for the system and connected to these SAS ports in loops. Add any ordered disk-array enclosures to your system at this time.

- [Disk-array enclosure types](#) ..... 72
- [Assembling DAEs](#) ..... 73
- [Power up additional DAEs](#) ..... 84
- [Verify DAE status](#) ..... 85

## Disk-array enclosure types

DAEs are optional components that add extra storage.

If DAEs are used, the DAEs should be installed immediately above the last installed system component in the cabinet. The arrangement of the DAEs in a cabinet may depend upon a number of factors. The hardware information guide for your system provides additional information on DAE assembling and arrangement.

---

### Note

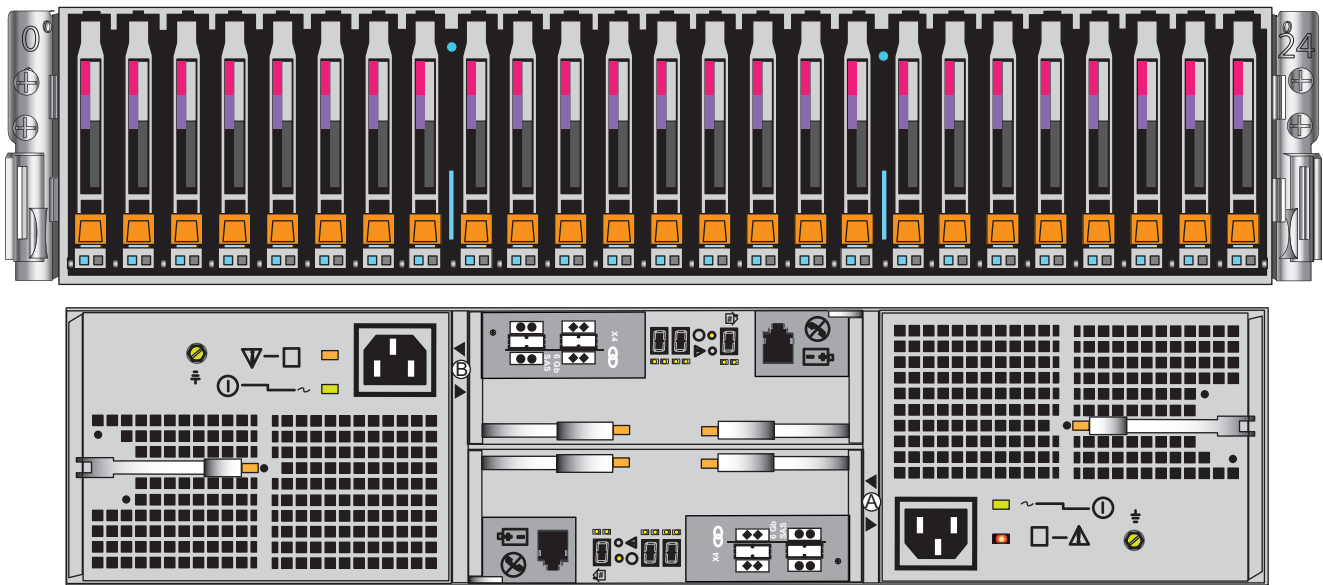
The 4U 60 drive DAE and the 3U 120 drive DAE are not included here. They require a deep rack and a Services engagement.

---

### 2U, 25 2.5" drive DAE

[Figure 54 on page 72](#) shows the 2U, 25 2.5" drive DAE type. This DAE type uses a 2U rail kit for installation into the system cabinet.

**Figure 54** 2U, 25 2.5" drive DAE



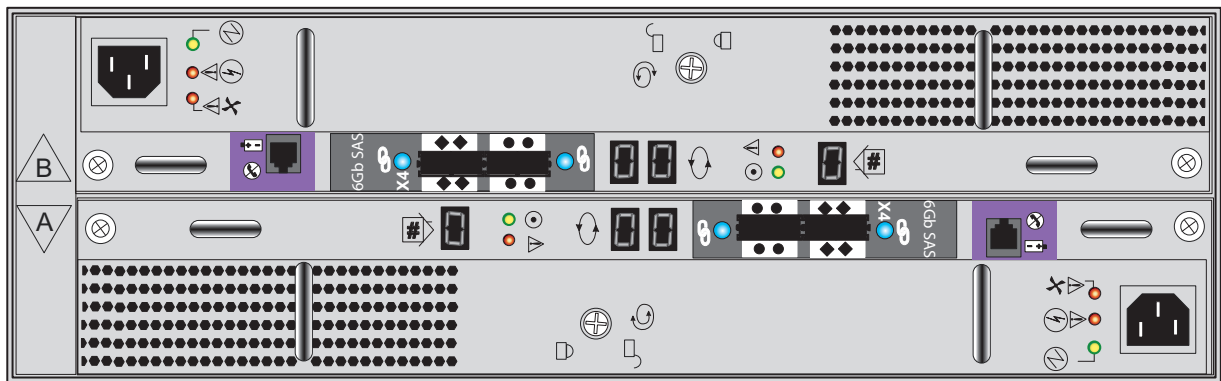
VNX-000227

### 3U, 15 3.5" drive DAE

[Figure 55 on page 73](#) shows the 3U, 15 3.5" drive DAE type. This DAE type uses a 3U rail kit for installation into the system cabinet.



Figure 55 3U,15 3.5" drive DAE



VNX-000266

## Assembling DAEs

### ⚠ CAUTION

The DAE is heavy and should be installed into a rack by two people. To avoid personal injury and/or damage to the equipment, do not attempt to lift and install the enclosure into a rack without a mechanical lift or help from another person.

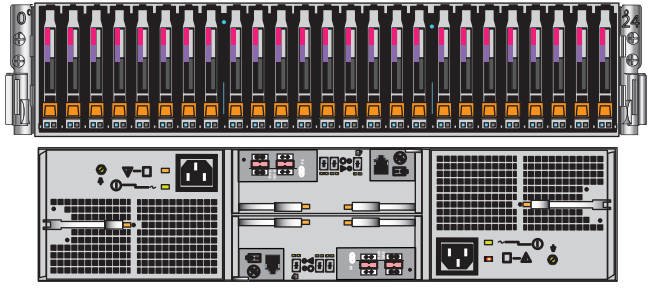
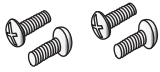
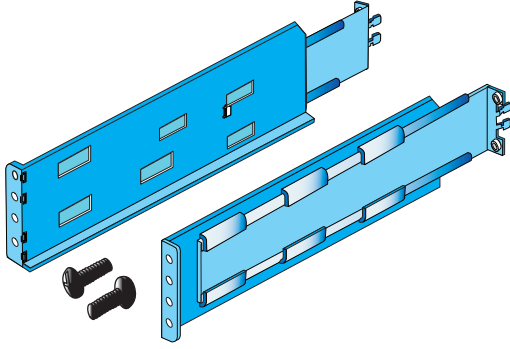
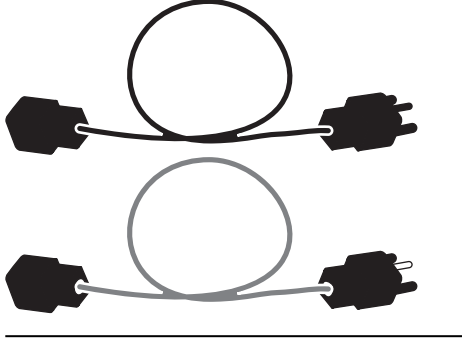

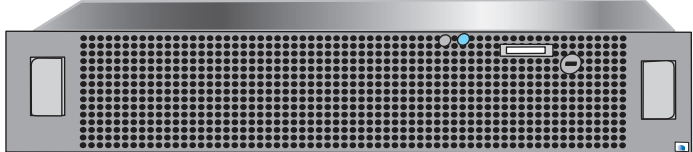
## Unpacking DAEs

### Procedure

1. Unpack the shipping containers.
2. Verify the contents.

For damaged or missing components, notify your Sales associate immediately for replacements.

**Table 3** 2U, 25 2.5" drive DAE

<p>2U, 25 2.5" drive DAE (1)</p>	
<p>Mounting screws (4)</p>	
<p>Adjustable rail kit  Rails (2) Screws (3 per rail)</p>	
<p>Power cables (2)</p>	 <p><b>Note</b> Illustrations show standard US power cables.</p>
<p>SAS cables (2)  mini-SAS to mini-SAS connectors</p>	
<p>Bezel (1)</p>	

**Table 4** 3U, 15 3.5" drive DAE

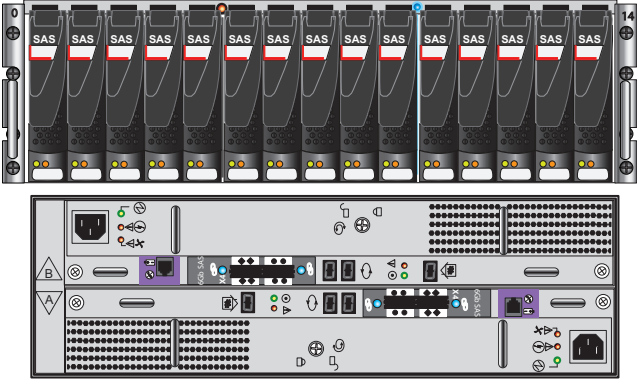
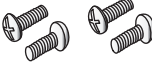
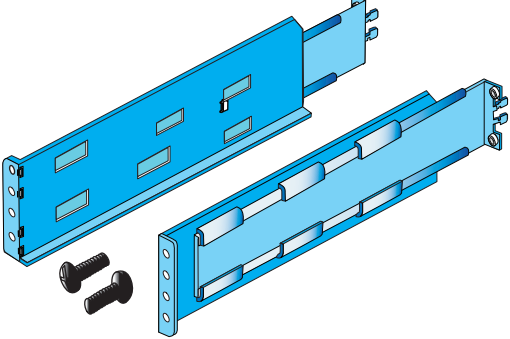
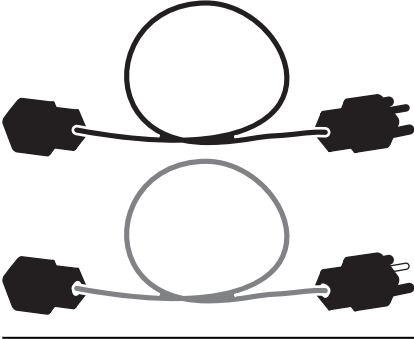

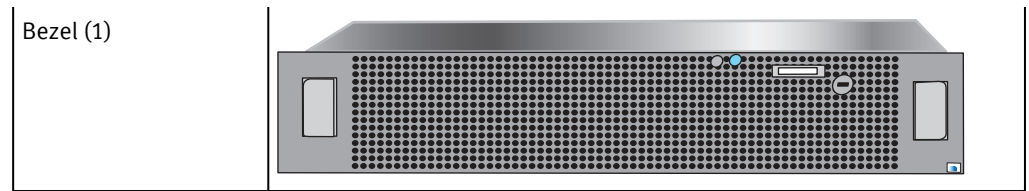
<p>3U, 15 3.5" drive DAE (1)</p>	
<p>Mounting screws (4)</p>	
<p>Adjustable rail kit  Rails (2) Screws (4 per rail)</p>	
<p>Power cables (2)</p>	 <p><b>Note</b> Illustrations show standard US power cables.</p>
<p>SAS cables (2)  mini-SAS to mini-SAS connectors</p>	

Table 4 3U, 15 3.5" drive DAE (continued)

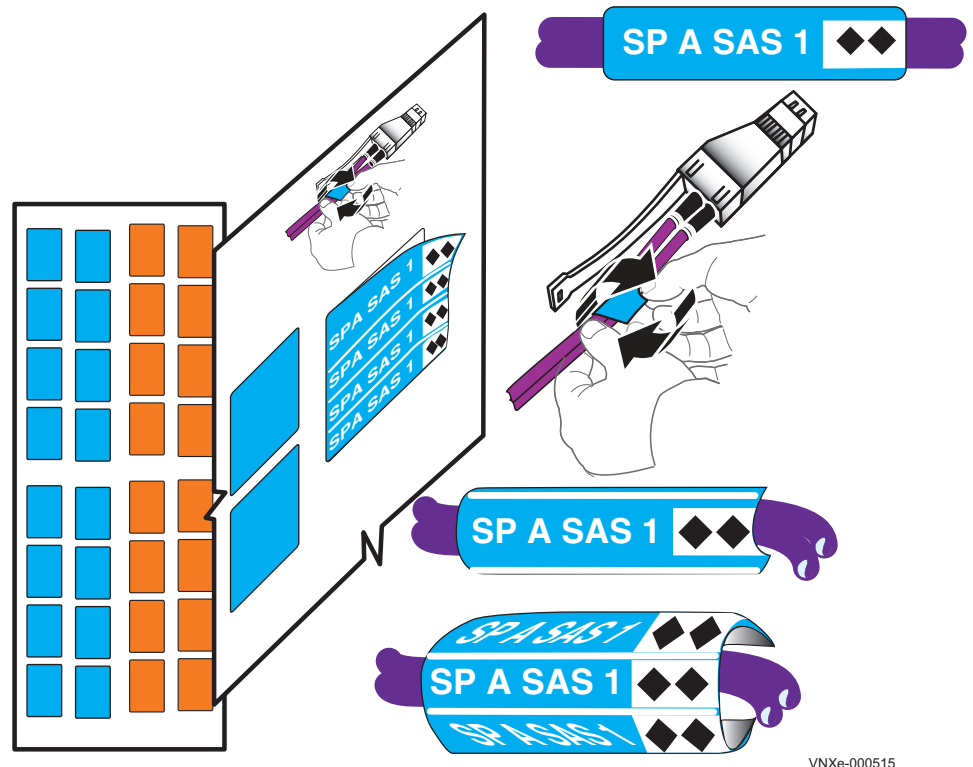


## Label the SAS cables

### Procedure

1. Locate a pair of SAS cables and the cable label sheets.
2. Attach the cable labels by matching the icons on the connectors with the icons on the labels.

Figure 56 Attach labels to the SAS cables



3. Continue for all the SAS cables for your system.

## Installing DAE rails

Follow these procedures to install the DAE rails into the system cabinet.

When arranging DAEs in your cabinet, you should consider rack space, I/O load balancing across the disks, and convenience. For more on racking and cabling options, see your VNX hardware information guide.

## Install 2U DAE rails

The following procedure shows you how to install 2U DAE rails.

### Procedure

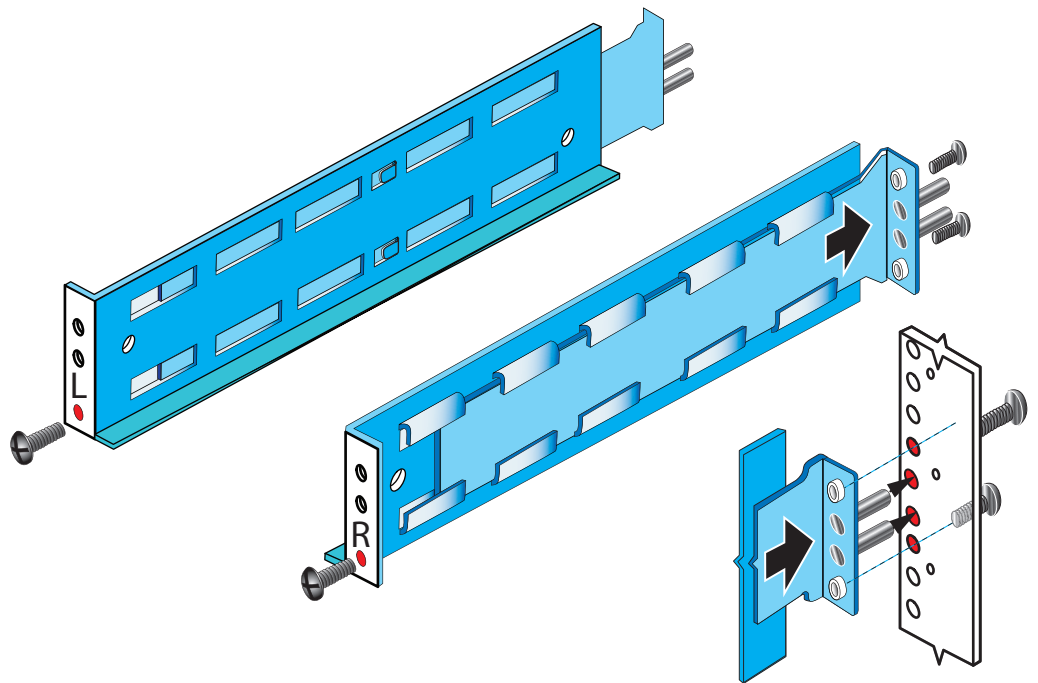
1. Install the 2U DAE rails into the cabinet.

The DAE rails should be installed above the topmost component in the cabinet. The rails must be aligned carefully so that they are level front to back and with the companion rail left to right.

Refer to [Figure 57 on page 77](#) while performing the procedure that follows.

- a. Insert the adjustable rail slide and seat both alignment pins into the rear channel of your cabinet.
  - b. Extend the rail and align the front of the rails.
2. Insert one screw in the lowest hole of the front and two in the back of each rail.

**Figure 57** Installing 2U DAE rails



### Install 3U DAE rails

The following procedure shows you how to install 3U DAE rails.

#### Procedure

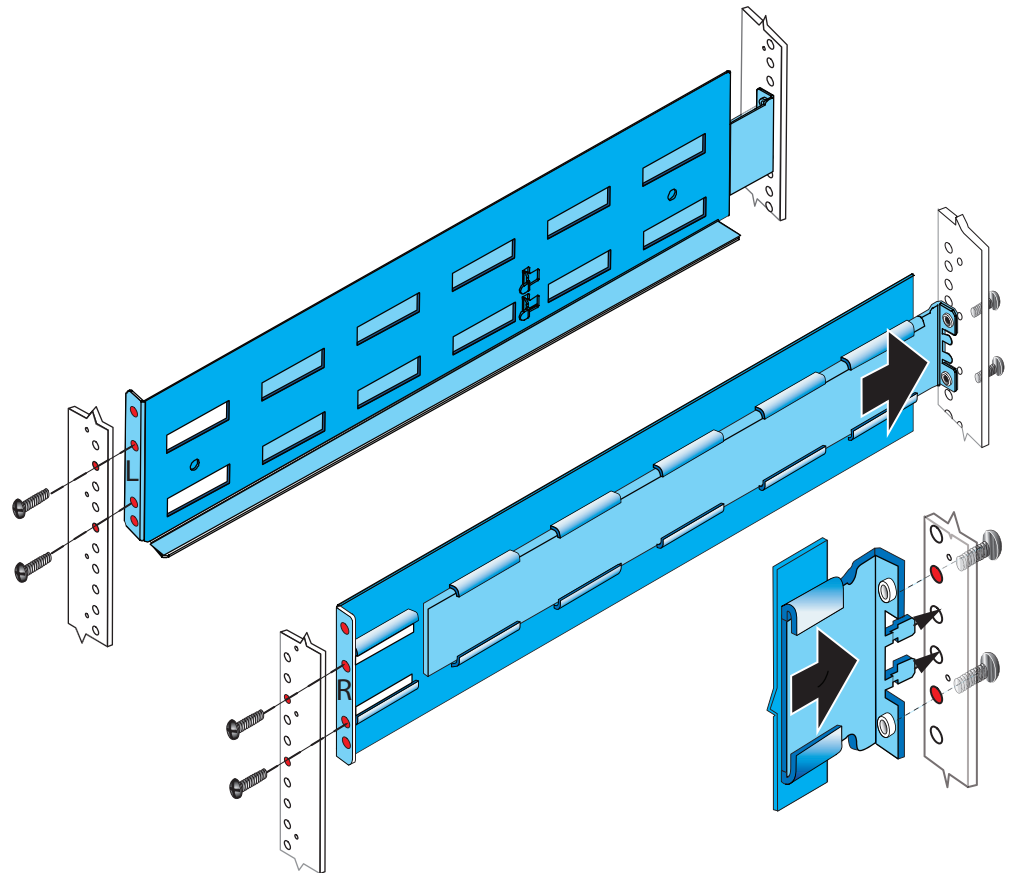
1. Install the 3U DAE rails into the cabinet.

The DAE rails should be installed above the topmost component in the cabinet. The rails must be aligned carefully so that they are level front to back and with the companion rail left to right.

Refer to [Figure 58 on page 78](#) while performing the procedure that follows.

- a. Insert the adjustable rail slide and seat both alignment pins into the rear channel of your cabinet.
  - b. Extend the rail and align the front of the rails.
2. Insert two screws in the middle two holes of the front and two retention screws in the back of each rail.

**Figure 58** Installing 3U DAE rails



## Installing DAEs

Use the following procedures to install any optional DAEs in to the cabinet.

### Note

The 4U 60 drive DAE and the 3U 120 drive DAE are not shown because they are not customer installable.

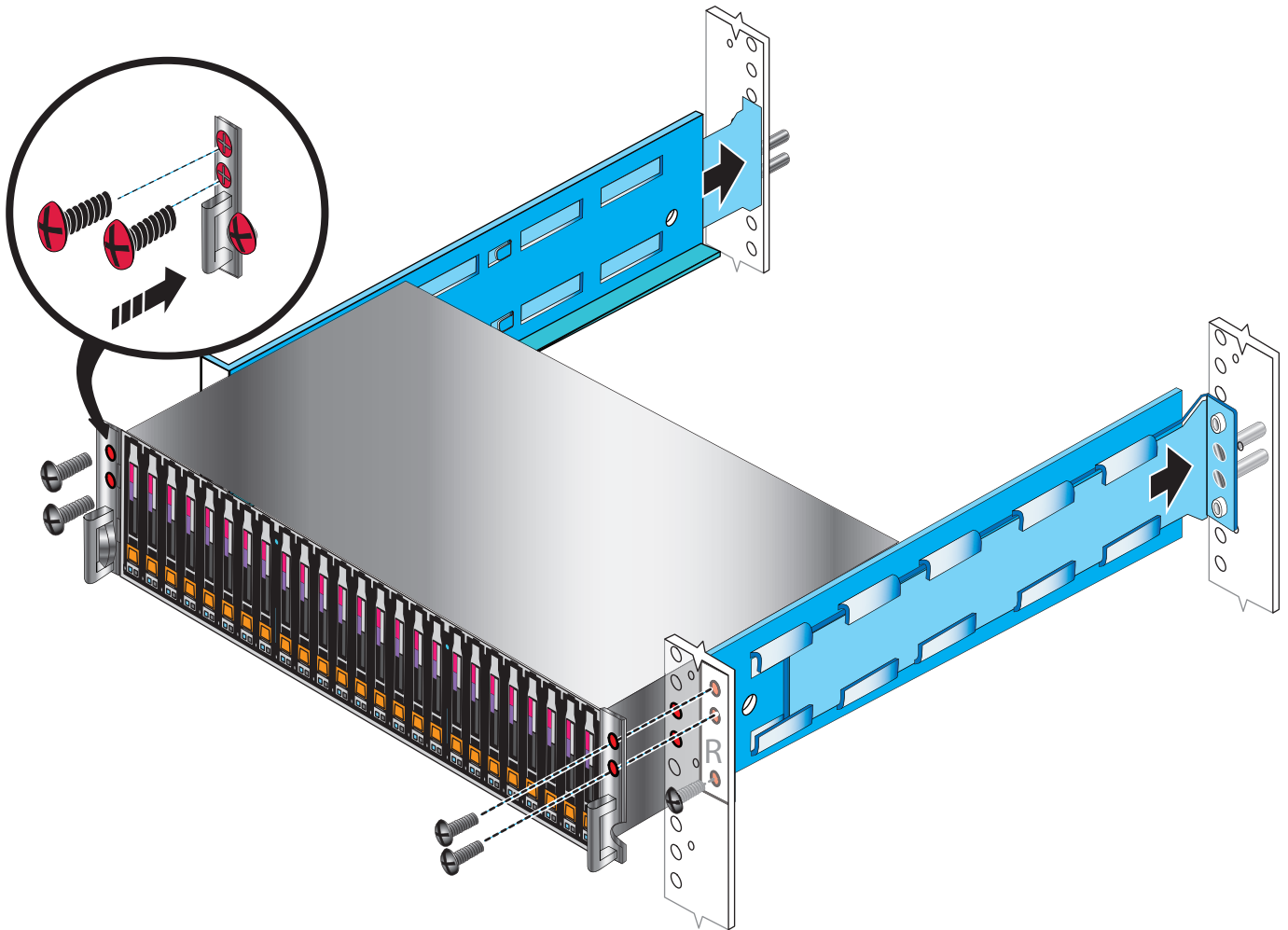
### Install the 2U DAE

Refer to [Figure 59 on page 79](#) when installing a 2U DAE.

#### Procedure

1. Slide the disk-array enclosure (DAE) into the DAE rails in the cabinet.  
Ensure that the enclosure is fully seated in the cabinet. The rail stops in the back will seat into the back of the enclosure at the correct depth, and the front of the enclosure will be flush with the cabinet face.
2. When the DAE is in place, insert and tighten all of the screws.  
It may be easier to install the screws working in a diagonal pattern, such as bottom left and top right, bottom right and top left.

Figure 59 Installing a 2U DAE in the rails



## Install the 3U DAE

Refer to [Figure 60 on page 80](#) when installing a 3U DAE.

### Procedure

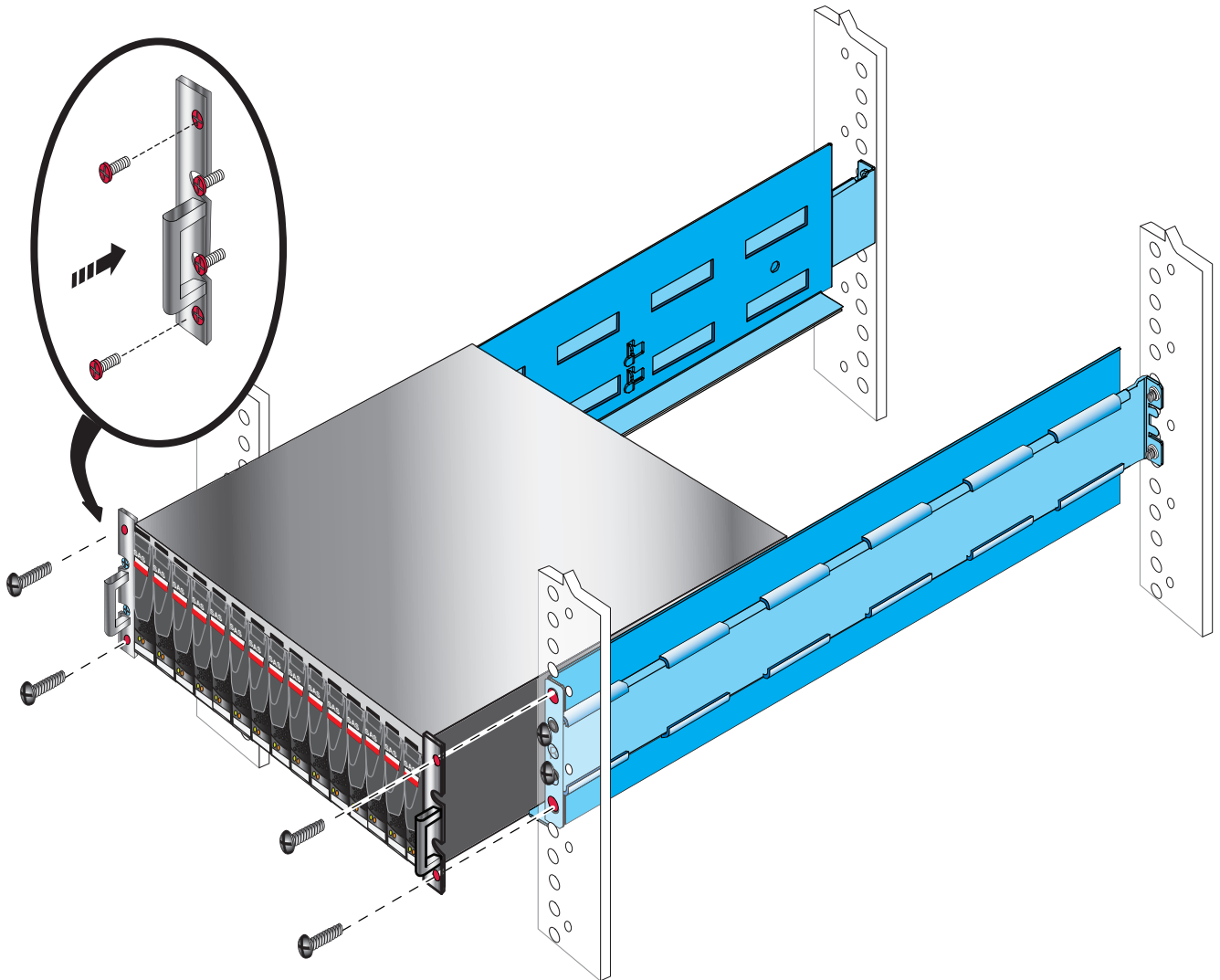
1. Slide the disk-array enclosure (DAE) into the DAE rails in the cabinet.

Ensure that the enclosure is fully seated in the cabinet. The rail stops in the back will seat into the back of the enclosure at the correct depth, and the front of the enclosure will be flush with the cabinet face.

2. When the DAE is in place, insert and tighten all of the screws.

It may be easier to install the screws working in a diagonal pattern, such as bottom left and top right, bottom right and top left.

Figure 60 Installing a 3U DAE in the rails



## Connecting additional DAEs to your VNX system

After installing the additional DAE components into the cabinet, connect these additional DAEs to the VNX system.

### Connect SAS DPE and DAE cables

In this example, two DAEs are being added. This example illustrates connecting one DAE to each of the ports available on the DPE. Each DAE has two Link Control Cards (LCC), designated A or B, as shown in [Disk-array enclosure types on page 72](#).

---

#### Note

The cables between the DPE ports and LCC ports on DAEs are 2-meter mini-SAS HD to mini-SAS.

---

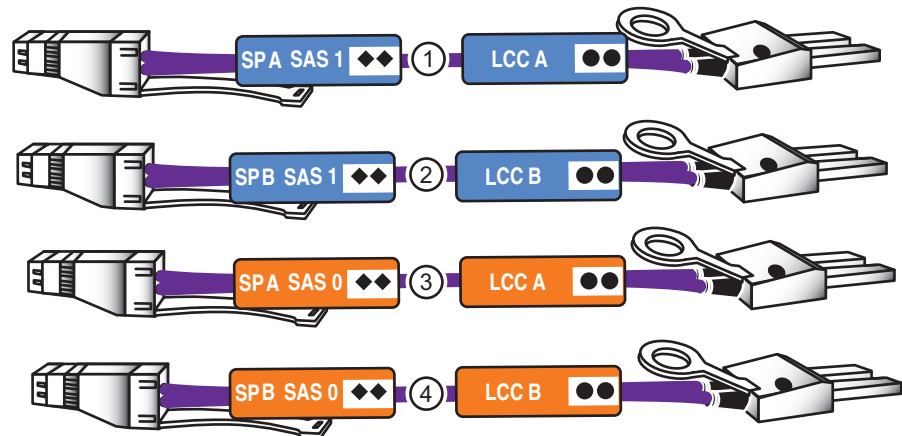
EMC provides a cable installation educational video entitled *Mini-SAS HD Cable Connectivity* on Edutube under VNX. You must have Powerlink access to view the video.



## Procedure

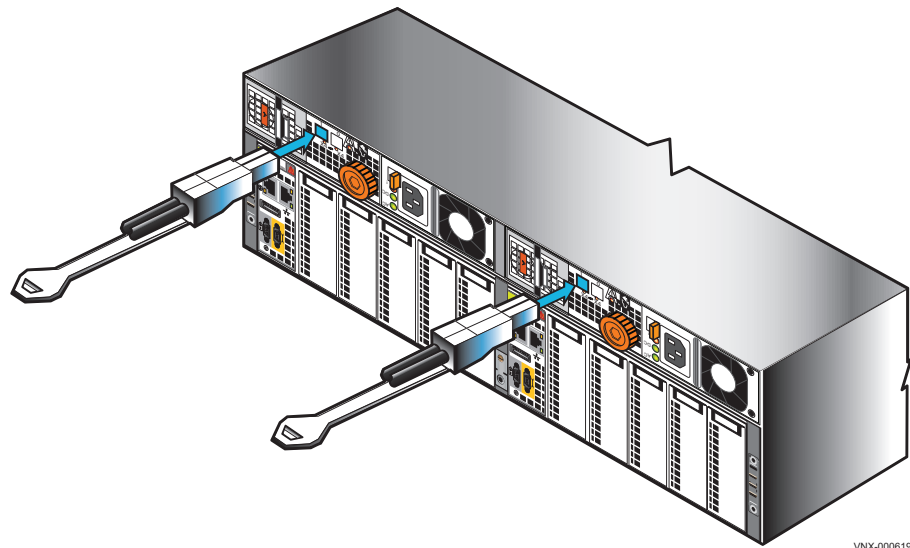
1. Locate one pair of cables for each DAE as shown in [Figure 61 on page 81](#). These are mini-SAS to mini-SAS HD cables.

**Figure 61** SAS cables for the first two DAEs



The SAS ports on the DPE are labeled 0 and 1. Port 0 is connected internally to the SAS expander that connects all the internal DPE disks. Since Port 0 is already connected internally to the DPE disks, the first DAE is connected to Port 1 to balance the load on the SAS ports. The second DAE is connected to Port 0.

**Figure 62** Connecting the mini-SAS HD cable ends to the SAS ports



The release tabs are down for the mini-HD connections to both ports 0 and 1, both sides.

Additional DAEs can be added to each loop. Each BE loop can support up to 10 DAEs or 250 disks, subject to the maximum number of disks for the system.

### Note

Your VNX hardware information guide provides examples of how to cable DAEs in your VNX for interleaved or stacked environments.

[Figure 63 on page 82](#) shows two different kinds of DAEs, one 2U DAE and one 3U DAE. Your system may differ. The steps to follow are the same, no matter what kinds of DAEs you have in your system.

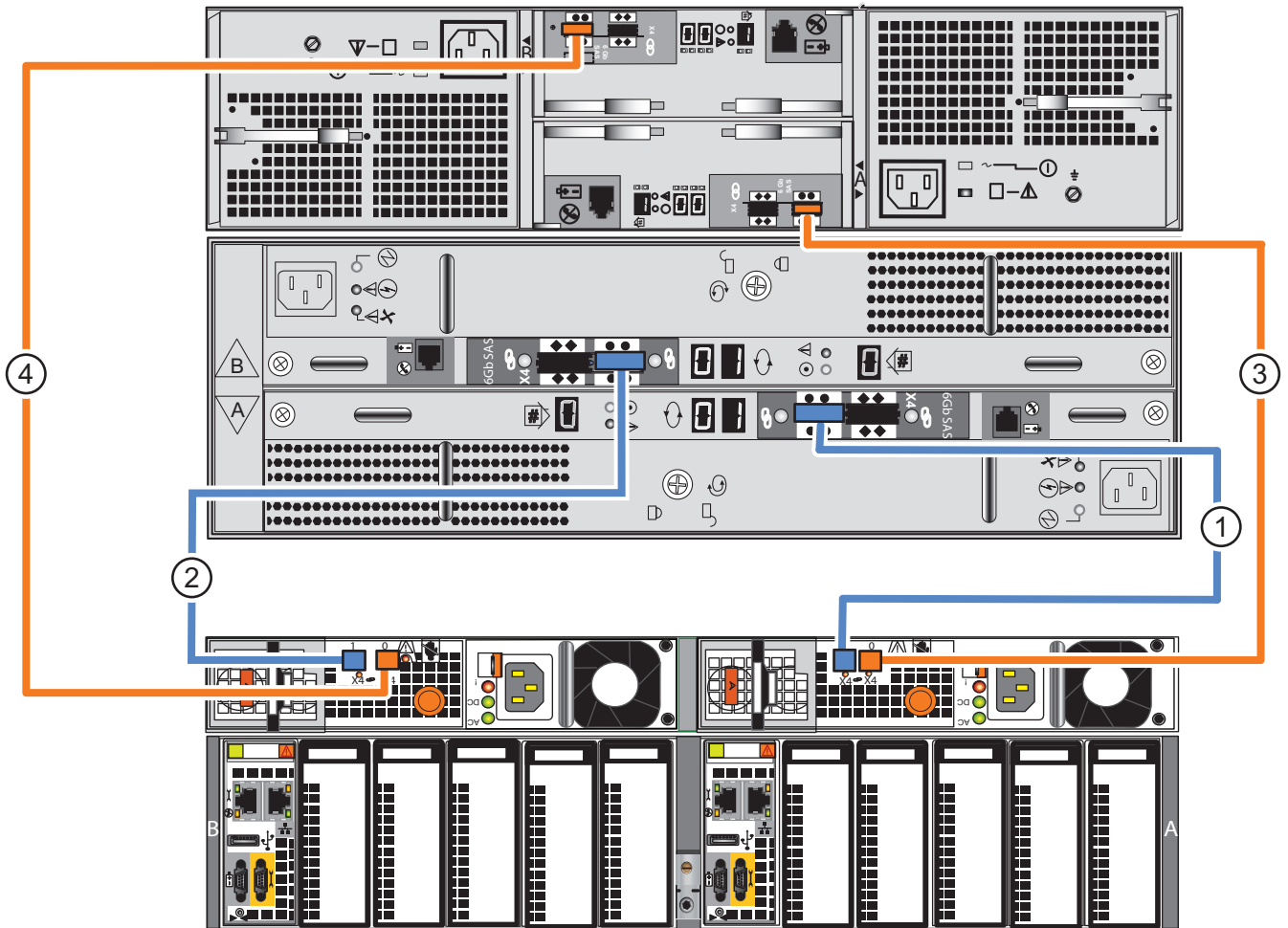
**Note**

Cabling to the 4U 60 drive DAE and the 3U 120 drive DAE are not shown because they are not customer-installable.

For steps 2 on page 82 through 5 on page 82, connect the following cables from the SAS ports of the DPE to the LCC ports marked with double circles (●●) on the DAEs. The cable ends to the LCC are marked with single circles (●) on the cable connectors as shown in Figure 61 on page 81. Ensure that the cables lock into place.

2. Connect SP A SAS 1 to DAE 1 LCC A (●●). See cable 1.
3. Connect SP B SAS 1 to DAE 1 LCC B (●●). See cable 2.
4. Connect SP A SAS 0 to DAE 2 LCC A (●●). See cable 3.
5. Connect SP B SAS 0 to DAE 2 LCC B (●●). See cable 4.

**Figure 63** Cabling the first two DAEs to the storage processors



**NOTICE**

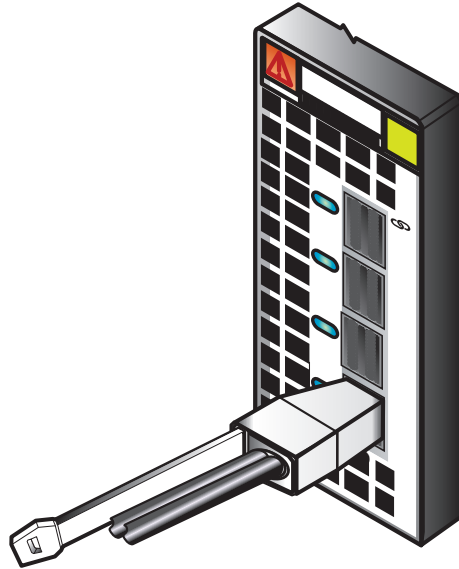
Identify the cables by the cable labels and the connectors. The cables and ports are not colored. Bus 0 is identified with orange labels. Bus 1 uses blue labels.

Additional DAEs, up to the system maximum, can be added by extending the loop, connecting cables from LCC A and B of a DAE (◆◆) to the appropriate LCC ports (●●) of an additional DAE. Cables from DAE to DAE on these loops are mini-SAS to mini-SAS

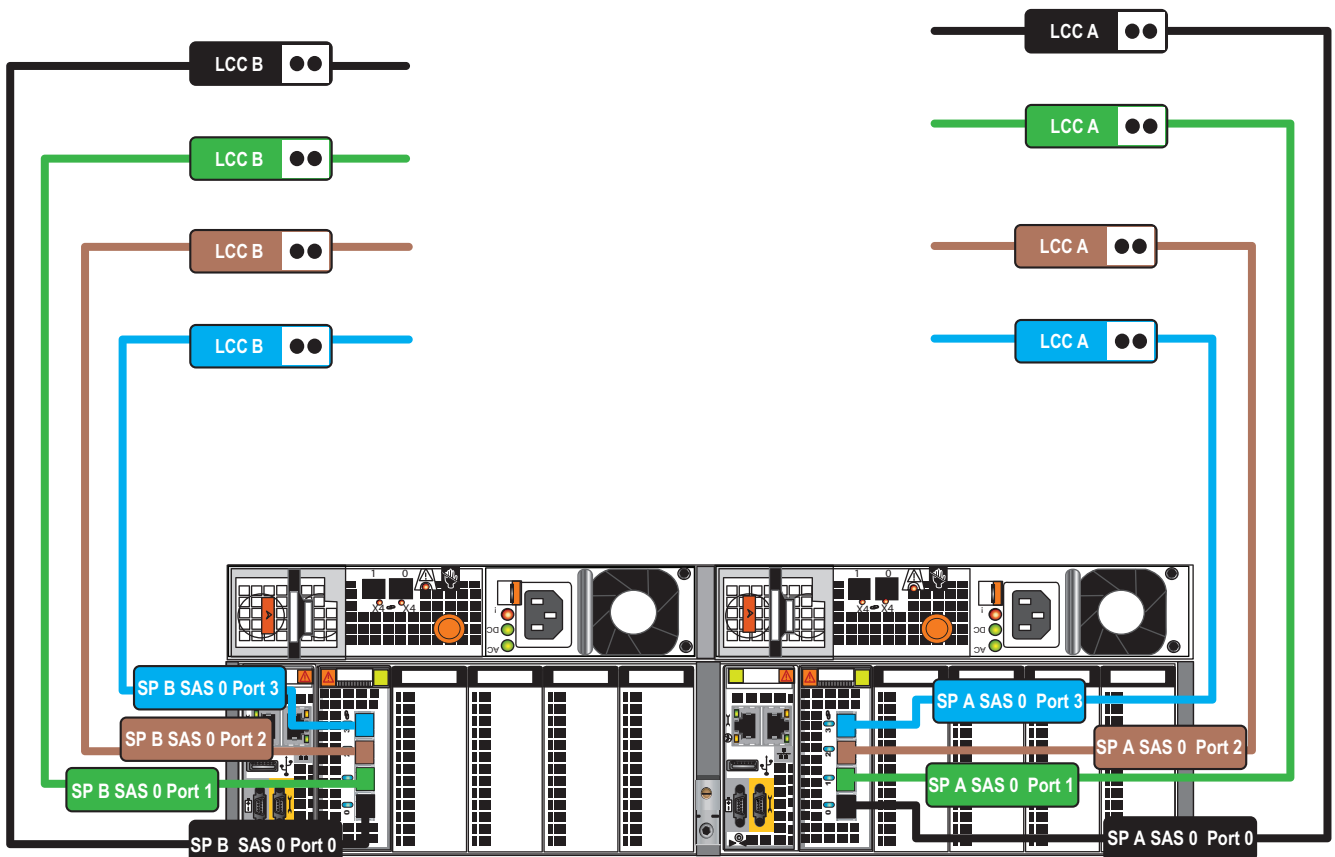
cables. Each BE loop can support up to 10 DAEs. For more details on additional DAE cabling, see your VNX hardware information guide.

Your VNX also supports an optional 4-port SAS I/O module in slot 0 of each SP, allowing for up to four more loops. For connections to the additional four loops, see [Figure 65 on page 83](#).

**Figure 64** Connecting the mini-HD cable ends to the SAS ports of the I/O module



**Figure 65** SAS cabling for the SAS I/O module



## Power up additional DAEs

The DAE power cables are conveniently color-coded. Two colors identify the different zones (PDUs):

- Gray power cables connect to PDU A
- Black power cables connect to PDU B

The DAE power cables should be connected directly to the PDUs.

### Connect 2U, 25-drive DAE power cables

#### Before you begin

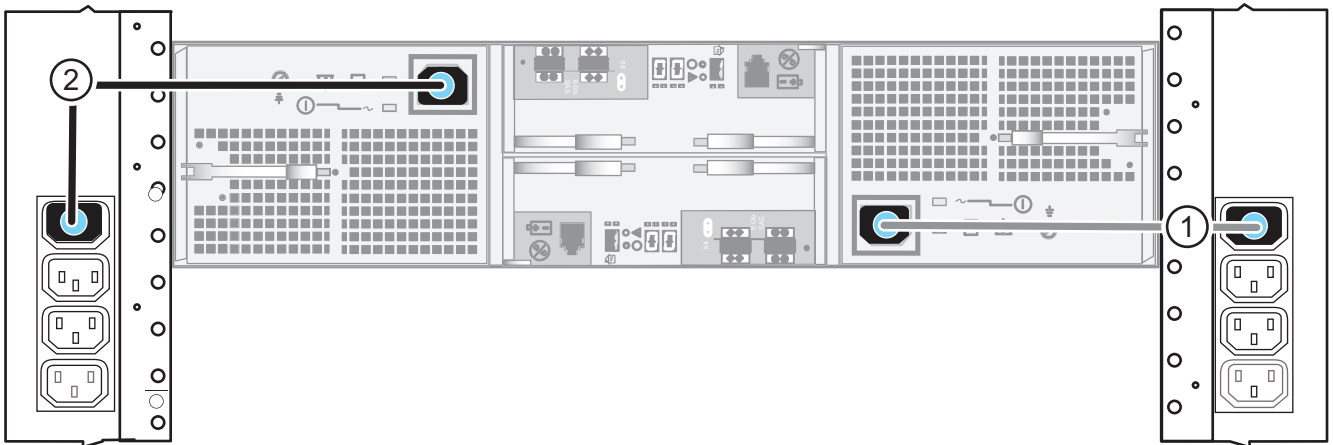
Ensure that the cabinet circuit breakers are still on and the PDUs are powered on.

Refer to [Figure 66 on page 84](#) while performing the procedure to power up each 2U DAE included in your system.

#### Procedure

1. Connect or verify that the A-side DAE power cable is connected to PDU A. See cable 1.
2. Connect or verify that the B-side DAE power cable is connected to PDU B. See cable 2.

**Figure 66** Power up a 2U DAE



### Connect 3U, 15-drive DAE power cables

#### Before you begin

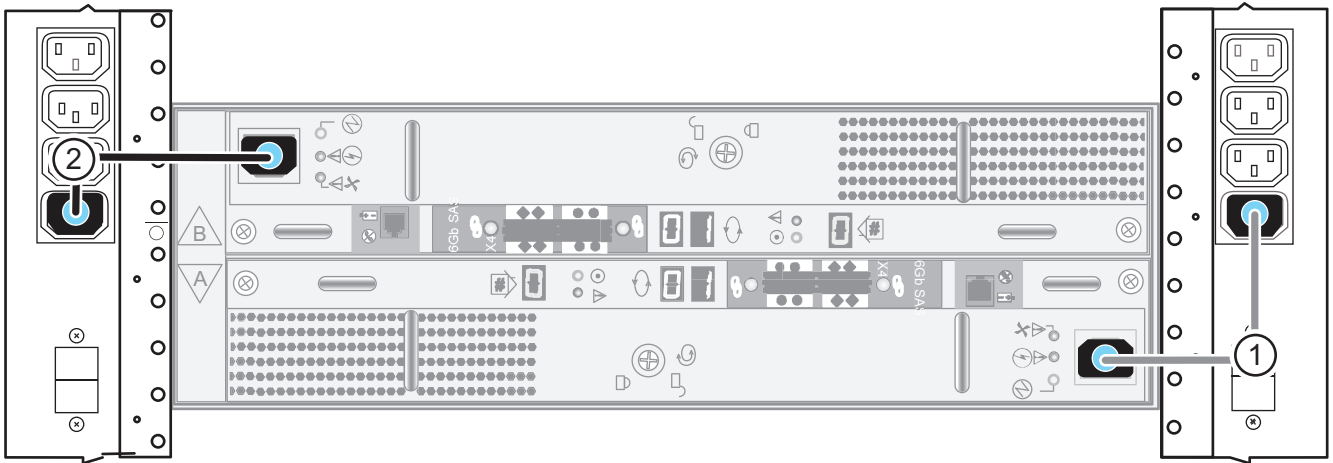
Ensure that the cabinet circuit breakers are still on and the PDUs are powered on.

Refer to [Figure 67 on page 85](#) while performing the procedure to power up each 3U DAE included in your system.

#### Procedure

1. Connect or verify that the A-side DAE power cable is connected to PDU A. See cable 1.
2. Connect or verify that the B-side DAE power cable is connected to PDU B. See cable 2.

Figure 67 Power up a 3U DAE



## Verify DAE status

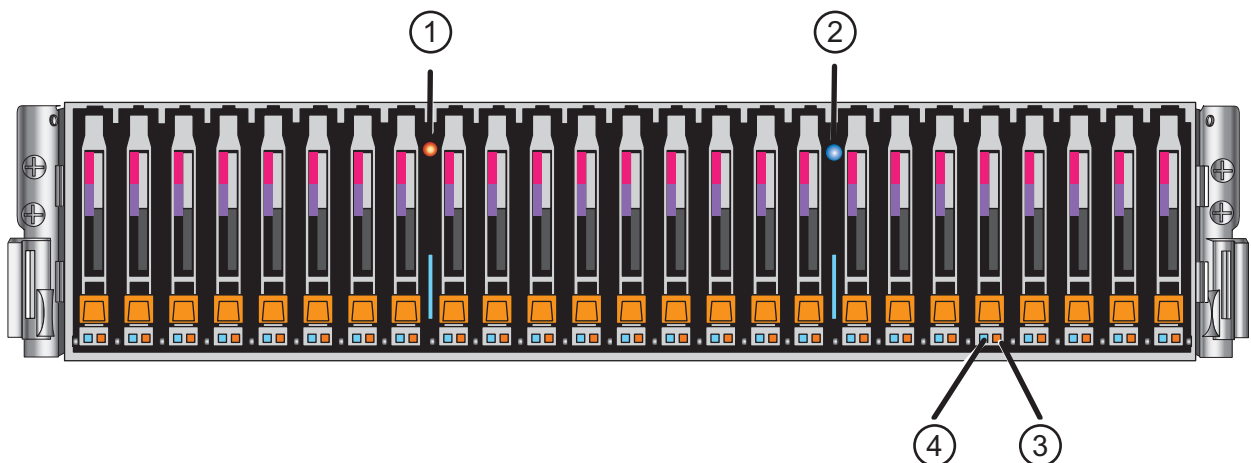
Ensure that the optional DAEs powered up correctly using the physical indicators on each enclosure. The hardware information guide for your system provides more information on all the LEDs.

### Verify 2U, 25 2.5" drive DAE status

#### Procedure

1. Verify that the status of the 2U DAE Power LED located on the front is solid blue and the DAE Fault/Status is off as shown in [Figure 68 on page 85](#).
2. If any fault LEDs are on, or if any power LEDs are flashing, contact your authorized service provider.

Figure 68 2U, 25 2.5" drive DAE LEDs



LEDs	Location	State/Color	Description
DAE Fault/Status	1	Off On/Amber	OK Fault has occurred

**Figure 68** 2U, 25 2.5" drive DAE LEDs (continued)

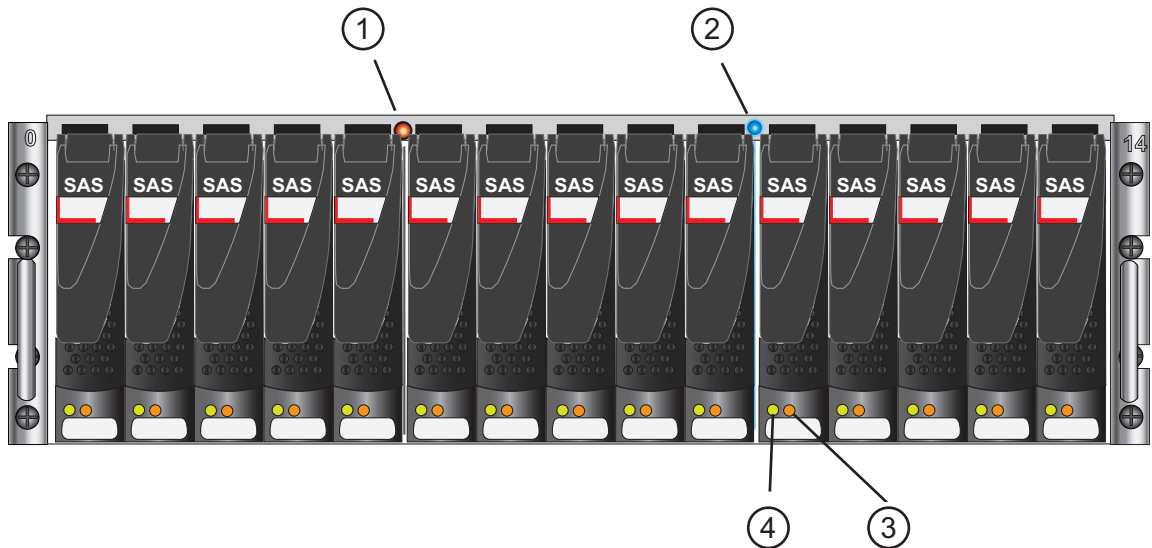
LEDs	Location	State/Color	Description
DAE Power	2	On/Blue	OK
Disk drive Fault	3	Off On/Amber	OK Fault has occurred
Disk drive Status/Activity	4	On/Blue	OK

## Verify 3U, 15 3.5" drive DAE status

### Procedure

1. Verify that the status of the 3U DAE Power LED located on the front is solid blue and the DAE Fault/Status LED is off as shown in [Figure 69 on page 86](#).
2. If any fault LEDs are on, or if any power LEDs are flashing, contact your authorized service provider.

**Figure 69** 3U, 15 3.5" drive DAE LEDs



LEDs	Location	State/Color	Description
DAE Fault/Status	1	Off On/Amber	OK Fault has occurred
DAE Power	2	On/Blue	OK
Disk drive Fault	3	Off On/Amber	OK Fault has occurred

**Figure 69** 3U, 15 3.5" drive DAE LEDs (continued)

LEDs	Location	State/Color	Description
Disk drive Status/Activity	4	On/Blue	OK

Add additional storage



# CHAPTER 8

## Setup

After you have completed all of the installation steps, continue to set up your system by performing these post-installation tasks:

- [Connect a management station](#) ..... 90
- [Initialize your storage system](#) ..... 90
- [Update the storage system software and register your system](#) ..... 92
- [Check system events](#) ..... 93
- [Configure servers for VNX systems](#) ..... 94
- [Provision storage](#) ..... 94
- [Attach bezels](#) ..... 94

## Connect a management station

You must connect a management station to your system directly or remotely over a subnetwork. This computer will be used to set up your system and must be on the same subnet as the storage system to complete the initialization.

### NOTICE

Check to see if there is security software running on your workstation/laptop such as Cisco Security Agent or McAfee Host Intrusion Prevention Service that may prevent the uninitialized system from being detected. If there is, disable it (Windows Services) and rerun the Initialization tool.

---

Information on different types of Unisphere management stations is available in the document *Setting up a Unisphere Management Station for the VNX Series* on <https://mydocs.emc.com/VNX>.

In the section **Additional VNX documentation**, select the **Related documentation for VNX for Block OE 5.33 and VNX for File OE 8.1**. The document is available under **VNX Management**.

## Initialize your storage system

Download the latest version of the VNX installation utilities from the Support website. The sequence for the installation and information about the utilities used is described below.

### NOTICE

You will need the information from the [Planning Worksheets on page 97](#) in the initialization process.

## Download, install, and run the VNX Installation Wizard

In the initialization phase of your storage system the VNX Installation Assistant (VIA) is used.

The VIA helps you to:

- Configure system settings for the Control Stations, storage array, and blades
- Set up ESRS support
- Check your cable connections

### NOTICE

You will need the information from the [VNX File configuration worksheet on page 98](#) in the initialization process.

### Procedure

1. Download and install VNX Installation Assistant for File/Unified (VIA).

#### Note

EMC recommends that you use the version of this utility that matches the VNX File OE release.

To download VIA from the EMC Support page (<https://support.emc.com>):

- a. Click on the **Support** tab at the top and select **Support by product** from the drop down that appears.
  - b. Enter your VNX model in the **Find by product** text box, and click the magnifier (search) tool.
  - c. At the top of the page, select **Downloads**, and then scroll down the page until you find the VIA download.
  - d. Download and install VIA.
2. Launch VIA.  
The Welcome screen appears.
  3. Click **Next**.  
The Select Configuration Profile screen appears.
  4. From Configuration Profile Name, select **New Configuration**, and click **Next**.  
VIA discovers the Primary Control Station MAC address over the public LAN. In a dual Control Station configuration, only the Primary Control Station broadcasts its MAC address.
  5. Follow the instructions to discover and assign IP addresses to your VNX system.
  6. Continue to the Remote support screen. The ESRS option is selected by default.

---

#### Note

ESRS support is recommended and preferred over Email Home. If you choose ESRS, you must select an ESRS option. If you already have an ESRS Gateway Server, this system can be monitored through it. If you already have an IP Client, this system can be added to it. ESRS on the Control Station is the recommended option.

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If you encounter any issues during initialization:

- For more information and support on VIA, go to: <https://mydocs.emc.com/VNX> and select **Before you begin > VNX Issues and Recommended Actions** and click **Next**. Then, select your VNX model, and click **Next** to get a list of known issues and resolutions for VIA.
- Go to <https://support.emc.com>. On the EMC Support page, click on the **Support** tab at the top, in the **Search Support** text box, enter the words **vnx series**, and click the magnifier (search) tool. On the page that appears, under the **Scope by resource** drop down, click **Knowledgebase**, and then click the magnifier (search) tool. Scroll down the page to find the specific failure message for possible resolution and corrective action.

## Downloading ESRS documentation and setting up ESRS

### Procedure

1. Go to <https://mydocs.emc.com/VNX>.
2. Under VNX tasks, select **Initialize and register VNX for block and configure ESRS**.
3. Select the appropriate options for your configuration.
4. Select **Install and Configure ESRS** to generate a customized version of *EMC Secure Remote Support for VNX* document.
5. Follow the instructions for the ESRS implementation you choose.
6. Set up ESRS and test the ConnectHome process.

## Update the storage system software and register your system

The storage system comes pre-installed with the latest version of VNX Operating Environment (OE) software available at the time of shipment. The Unisphere Service Manager (USM) is a collection of tools that helps you update, install, register, and maintain your system hardware and software. Use USM to check for and install an updated version of the VNX OE software and register your storage system.

### Downloading USM documentation

#### Procedure

1. Go to <https://support.emc.com> to *your model* > **Documentation** to download *Downloading and Installing USM*.
2. For additional information on using USM, go to <https://mydocs.emc.com/VNX>.
3. Under **VNX tasks**, select **Update VNX software**.
4. Select appropriate settings for your configuration to generate a customized procedure.

### Downloading and installing the Unisphere Service Manager

If you do not already have USM installed on your Windows management station, download and install the latest version:

#### Procedure

1. From the <https://support.emc.com>, select *your system* > **Downloads**.  
The Downloads page appears.
2. From download list, select the **Unisphere Service Manager** link and save the software to your host or management station.
3. In the folder where you saved the USM, double-click the executable (.exe) file.
4. Follow the instructions that appear.
5. When the installation is complete, click **Done**.  
Unisphere Service Manager opens.
6. Click **Login**.
7. Connect to your system by entering the host name or IP address and click **Connect**.

### Downloading the latest version of the VNX operating environment software (optional)

EMC recommends downloading and installing the latest version of the operating environment.  
This task is optional.

#### Procedure

1. Select **Software** > **System Software**.
2. Run the **Prepare for Installation** wizard to check for an updated version of the VNX OE.
3. If an updated version is available, then run the **Install Software** wizard to install the update.

## Running the storage system registration wizard

The **USM Storage System Registration Wizard** will collect system information and send it to your service provider using a secure channel.

For all VNX systems running version 7.1 or later, or for any version of a VNX for Block system, complete the following steps to register your system:

### Procedure

1. Start the Unisphere Service Manager (USM) by doing either one of the following:
  - Click the **Unisphere Service Manager** icon on your desktop, or
  - Select **Start > All Programs** or **Start > Programs**, then select **EMC > Unisphere > Unisphere Service Manager > Unisphere Service Manager**; or mouse over to the left bottom corner of the taskbar and click **Start**, then right-click **Desktop > All Apps > EMC > Unisphere > Unisphere Service Manager > Unisphere Service Manager**.
2. Log into the system to be registered.
 

You must log into the system to be registered before proceeding; otherwise, the system will not appear in the list of systems.
3. Select the system to register from the list of systems.
4. Select **Registration > Register storage system**. This will launch the **Storage System Registration Wizard**, which will walk you through the necessary steps.

## Check system health

You can run a quick and real-time check on the connectivity, management, and storage component status of your VNX system.

The health check checks network connectivity, management service status, Storage Processor status, Hot Spare status, disk faults, disk status, whether VNX OE for Block has been committed, and hardware component faults.

You can also use USM to:

- Install and update Firmware
- Install language packs (if purchased)
- Install software enablers (if purchased)

### Checking system health

To check the system health:

#### Procedure

1. From within the USM, go to the **System** tab of the **Tools** section.
2. Select **Health Check**.
3. Log out of USM and close it.

## Check system events

Log in to Unisphere to confirm the health of your system and to check system alerts, event logs, and statistics.

**Procedure**

1. Open a browser and enter the IP address of SP A.
2. Use the sysadmin credentials to log in to Unisphere.

You may be prompted by certificate-related warnings. Accept all certificates as "Always Trust".

3. Select your storage system and select **System > Monitoring and Alerts**.

If any alerts or warnings are listed in that screen or your dashboard, see the Unisphere online help for that event.

## Configure servers for VNX systems

**Procedure**

1. Go to <https://mydocs.emc.com/VNX> and from the VNX Server Tasks list, select an appropriate task such as:
  - Attach server
  - Install or update software (VNX for Block)
  - Verify Server high availability, using Unisphere Server Utility
2. Follow the prompts to generate customized documentation for server tasks.

## Provision storage

Provisioning storage includes:

- Creating RAID groups/storage pools
- Creating LUNs
- Assigning LUNs to the host servers in its storage group

To provision storage:

**Procedure**

1. Launch Unisphere and select your system.
2. Select **Storage**.
3. From the task list, under **Wizards**, select **LUN Provisioning Wizard**. Use this wizard to create LUNs and, optionally, assign the LUNs to a host/server system.

For more information on these tasks, follow the instructions in the Unisphere online help.

## Attach bezels

When all of the components have been installed, all of the screws have been tightened, and all of the cables have been installed securely into the proper ports, return to the front of the site rack and select the correct bezel for the component and press the bezel into place on the front of the component.

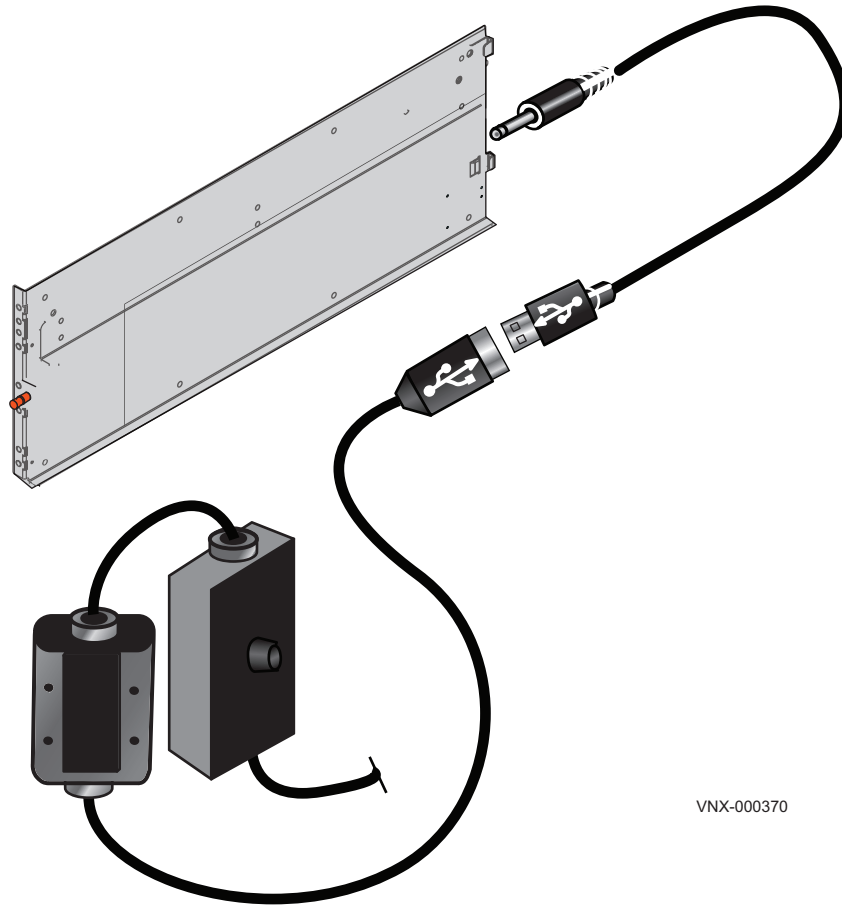
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**Note**

The left rail has a connector which protrudes through the cabinet channel holes. The cable kit includes a cable to connect from the rear of the rail to the cabinet power. See [Figure 70 on page 95](#).

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**Figure 70** Connecting the power to the rail for the bezel



VNX-000370

**Procedure**

1. Locate the bezel for each installed component.
2. On the front of the rack or cabinet, position and align each bezel to the front-mounting brackets on the corresponding component.
3. Press the bezel into the bracket until it clicks into place as shown in the example in [Figure 71 on page 96](#). Bezels have a lock built in to them, so you can opt to lock the bezels in place with the key provided. To lock the bezel, insert the key and turn it one quarter turn clockwise.
4. Repeat steps [2 on page 95](#) and [3 on page 95](#) for the remaining bezels.

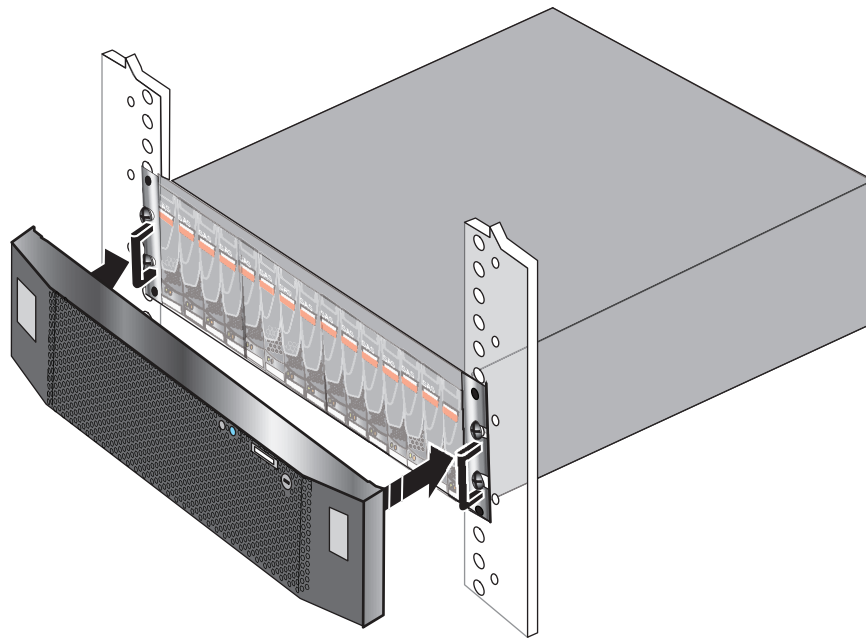
**CAUTION**

Ensure that you install the 1U front bezel on the Control Station. The 1U front bezel for the Control Station has a lock on the front of the bezel and is labeled 1U bezel on the back of the bezel.

**DO NOT** install the 1U filler panel. The 1U filler panel does not have a lock on the front of the bezel and is labeled 1U filler on the back of the filler panel. The 1U bezel has inlets on the bezel all the way through the bezel to allow cooling air to be drawn through the front and circulated to the Control Station.

If airflow through the rack and the Control Station that occupy it is blocked or restricted, or if the ambient air being drawn into the rack is too warm, an overtemperature condition within the rack and the Control Station that occupies it can occur causing the Control Station to fail.

**Figure 71** Attaching a bezel





# APPENDIX A

## Planning Worksheets

**NOTICE**

These worksheets are for VNX hardware and software only and do not cover other network connections or requirements from other software.

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- [VNX File configuration worksheet](#)..... 98

## VNX File configuration worksheet

With your network administrator, determine the IP addresses and network parameters you plan to use with the storage system, and record the information on the following worksheet. You must have this information to set up and initialize the system.

You manage the storage system through a dedicated LAN port on each storage processor. These ports must share a subnet with the host you use to initialize the system. After initialization, any host on the same network and with a supported browser can manage the system through the management ports.

Record network information for your system on the worksheets on the next pages. Your network administrator should provide most of this information. For more information, refer to your configuration planning guide.

To download the latest version of the VNX Installation Assistant for File/Unified, go to the <https://support.emc.com> and select **Support**. Search for VNX Installation Assistant.

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### Note

The VNX Installation Assistant for File/Unified auto-discovers and pre-populates certain values based on the system and network environment of your Windows client. Ensure you verify and fill these values in to the Value column by recording the results of the auto-discovery.

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**Table 5** Control Station public LAN settings

Field	Value	Comments
CS0 Primary hostname		
CS1 Secondary hostname		
CS0 Primary IP address		If you want to configure IPv6 addresses for the Control Station address, use the VNX Installation Assistant for File/Unified for the initial installation, and then refer to the <i>Configuring and Managing Networking on VNX</i> technical module and the <i>EMC VNX Command Line Interface Reference for File</i> to complete the IPv6 additions.
CS1 Secondary IP address		
Netmask		Auto-discovered (optional). Enter this information into the Value column of this table.
Gateway		Auto-discovered (optional). Enter this information into the Value column of this table.
DNS domain		Auto-discovered (optional). Enter this information into the Value column of this table.
Primary DNS server		Auto-discovered (optional). Enter this information into the Value column of this table.
Secondary DNS server		Auto-discovered (optional). Enter this information into the Value column of this table.

**Table 5** Control Station public LAN settings (continued)

Field	Value	Comments
NTP server		As a Best Practice, EMC recommends that your Control Stations be configured with the Network Time Protocol (NTP) service. The NTP service will be automatically configured on the Control Station if you select this box in the GUI.
Time Zone		Required

**Table 6** Public IP addresses for SP A and SP B

Field	Value	Comments
SP A IP address		Type the public IP addresses for the storage processors (SP) you want to use to communicate with the VNX from the public network. These IP addresses must be on the same subnet as the Control Station IP address and should not be in use by any other host on the network.
SP B IP address		

**Table 7** Passwords

Field	Value	Comments
root password	nasadmin (default)	Passwords are default factory values and should be changed as soon as possible for security reasons. Passwords can be changed during the VNX Installation Assistant for File/Unified installation process or from within Unisphere.
nas admin password	nasadmin (default)	

**Table 8** Blade public LAN settings

Field	Value	Comments
DNS domain		Auto-discovered (required). These settings apply to all primary blades. If you want to configure the IPv6 addresses for the blades (DNS or NTP), first use the VNX Installation Assistant for File/Unified for the initial installation and then refer to the <i>Configuring and Managing Networking on VNX</i> technical module and <i>EMC VNX Command Line Interface Reference for File</i> to complete the IPv6 additions.
Primary DNS server		

**Note**  
The values auto-discovered for the secondary DNS server are optional.

**Table 9** Service Provider/Customer Notification

Field	Value	Comments
Email Server		(Optional) Email will not work without a DNS server.
Site Information:		
Recipient Email Addresses		(Optional)
Site ID		(Optional) third-party name
Dial-in-Modem #		(Optional) This is the local number that is used by the service provider to dial into your system.

**Table 10** Licenses

Field	Value	Comments
-	<input type="checkbox"/> CIFS (Windows)	Required. Check the boxes of the licenses you have purchased.
-	<input type="checkbox"/> NFS (UNIX or Linux)	
-	<input type="checkbox"/> Replicator V2	
-	<input type="checkbox"/> File Level Retention	
-	<input type="checkbox"/> Snapsure	



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