EMC® VNX® Series

VNX5200™ Block Installation Guide
300-999-786 REV 03
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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 25.
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 27.
5. Complete the tasks listed in Setup on page 47.

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. Assemble the components in your cabinet as described in Assemble components in your cabinet on page 17.
4. Cable your system as described in Cable your system on page 25.
5. 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 27.
6. Install and power up all additional disk-array enclosures (DAE) into your cabinet as described in Add additional storage on page 31.
7. Complete the tasks listed in Setup on page 47.
Introduction
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 Block 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

<table>
<thead>
<tr>
<th>Resource</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>AC Power:</td>
</tr>
<tr>
<td></td>
<td>For high availability, at least two AC circuits are required. EMC cabinets require 200-240V AC power.</td>
</tr>
<tr>
<td></td>
<td>The power requirements for the system depend upon the power supply installed in the system. See the DPE label. For further information, see your system's hardware information guide.</td>
</tr>
<tr>
<td></td>
<td>For full power specifications, go to <a href="https://mydocs.emc.com/VNX">https://mydocs.emc.com/VNX</a> and select View technical specifications under the About VNX section.</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>Two 1-Gigabit Ethernet management connections and two customer-supplied CAT5e or better cables.</td>
</tr>
<tr>
<td><strong>Space</strong></td>
<td>Cabinet vertical space:</td>
</tr>
<tr>
<td></td>
<td>• 3U (unit) [5.25 inches, 13.3 cm] for the disk processor enclosure (DPE)</td>
</tr>
<tr>
<td></td>
<td>• For each optional DAE</td>
</tr>
<tr>
<td><strong>Tools</strong></td>
<td>Slotted or Phillips screwdriver</td>
</tr>
<tr>
<td><strong>Management Station</strong></td>
<td>A Windows-based computer to run the initialization, maintenance, and management tools with:</td>
</tr>
<tr>
<td></td>
<td>• Minimum screen resolution of 1280 x 800 and 256 colors</td>
</tr>
<tr>
<td></td>
<td>• At least 500 MB free space</td>
</tr>
<tr>
<td></td>
<td>• Connection on same LAN subnet as your system if you will use it to initialize the system</td>
</tr>
<tr>
<td></td>
<td>• Windows Domain Controller recommended</td>
</tr>
<tr>
<td></td>
<td>• SMTP server network connection to the system and the management host</td>
</tr>
<tr>
<td></td>
<td>• JRE (Supported versions are listed in the release notes.)</td>
</tr>
<tr>
<td></td>
<td>• Browser (Supported versions are listed in the release notes.)</td>
</tr>
<tr>
<td><strong>Network information</strong></td>
<td>The management port and login information in the Planning Worksheets of this install guide. This information includes:</td>
</tr>
<tr>
<td></td>
<td>• A static IP address for each storage processor in the system (for example, 123.45.6.7)</td>
</tr>
<tr>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• The subnet mask of the LAN to which the system is connected</td>
</tr>
<tr>
<td></td>
<td>• The default gateway address of the LAN to which the system is connected</td>
</tr>
</tbody>
</table>
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
- Detaching the DPE from the shipping material........................................ 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 25 of this installation guide to verify the cabling.

- If your system was shipped in separate boxes and needs to be assembled in your own cabinet:
  a. Verify that you have received all of the DPE components, including cables, bezel, rail kit, and mounting screws. Table 2 on page 14 shows the shipping contents.

Table 2 DPE container contents

<table>
<thead>
<tr>
<th>Disk Processor Enclosure (DPE)</th>
<th><img src="image" alt="Disk Processor Enclosure" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting screws (4)</td>
<td><img src="image" alt="Screws" /></td>
</tr>
<tr>
<td>SAS cables (4)</td>
<td><img src="image" alt="SAS Cables" /></td>
</tr>
<tr>
<td>mini-SAS HD to mini-SAS connectors</td>
<td><img src="image" alt="Mini-SAS Connectors" /></td>
</tr>
<tr>
<td>Adjustable rail kit</td>
<td><img src="image" alt="Rail Kit" /></td>
</tr>
<tr>
<td>Rails (2)</td>
<td><img src="image" alt="Rails" /></td>
</tr>
<tr>
<td>Screws (4 per rail)</td>
<td><img src="image" alt="Screws per Rail" /></td>
</tr>
</tbody>
</table>
Table 2 DPE container contents (continued)

<table>
<thead>
<tr>
<th>Power cables (2)</th>
<th><img src="image" alt="Power cables" /></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Note" /> Illustrations show standard US power cables.</td>
<td></td>
</tr>
<tr>
<td>Service cable (1)</td>
<td><img src="image" alt="Service cable" /></td>
</tr>
<tr>
<td>Bezel (1)</td>
<td><img src="image" alt="Bezel" /></td>
</tr>
<tr>
<td>Documentation kit</td>
<td>Environmental information</td>
</tr>
<tr>
<td></td>
<td>Cable label sheets</td>
</tr>
</tbody>
</table>

b. Start the unpacking and assembly process with Detaching the DPE from the shipping material on page 15.

**Detaching the DPE from the shipping material**

The DPE arrives attached to its shipping container with 6 screws, three on each side. Follow this process to remove the DPE from the shipping material.

**Procedure**

1. Using a Phillips blade screwdriver, unscrew the first of the six chassis screws to detach the DPE from the container.

**Note**

If the [horizontal] chassis screws do not unscrew easily, do not force them; instead, loosen the [vertical] pallet bolts first and try to loosen the chassis screws again.
Figure 1 Remove DPE

1. Remove DPE.

2. Repeat this process to remove the remaining chassis screws.

3. Lift or slide the chassis carefully to remove the component from the board.
   You have detached the DPE from the shipping container.
If you are installing the components in a customer rack, follow the instructions in this chapter. Otherwise, go to Cable your system on page 25 to verify your cabling in an EMC rack.

Assembling the components includes the following:

- About installing your storage-system hardware ..................................................... 18
- Installing rails ...................................................................................................... 19
- Installing components ........................................................................................ 20
About installing your storage-system hardware

This section describes how to install your storage-system hardware. In general, you should install the hardware starting at the lowest available rack/cabinet space and work up from there. EMC recommends placing the disk processor enclosure (DPE) in the lowest cabinet location first. The DPE contains dual storage processors as well as the vault drives for the system. It can also contain additional disks. Additional disk storage (optional DAEs) should be installed above the DPE.

Figure 2  Stacking location of the DPE

Note

If you may convert this system to a Unified system, EMC recommends leaving space for the additional hardware. A Unified system has additional File hardware directly above the DPE.
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 DPE rails

The DPE rails should be installed first, at the bottom of the cabinet. The left adjustable rail has a connector protruding from the front which goes through a hole in the front channel of the cabinet and will connect to light the bezel. Refer to Figure 3 on page 20 while performing the procedure that follows.

Procedure
1. Insert the adjustable 3U rail slide and seat both alignment pins into the rear channel of your cabinet.
2. Extend the rail and align the front of the rails and ensure the connector extends through a hole in the front channel.
3. Insert two retention screws in the two holes indicated in the front of each rail.
4. Insert two retention screws in the back of each rail.
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.

**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 4 on page 21.
Figure 4  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 6 on page 23 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 5 on page 22.
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 5 on page 22 can inadvertently become jammed, cut off, or block the enclosure seating.

   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 6 on page 23.

   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 6 Installing the DPE

Assemble components in your cabinet

Installing the disk processor enclosure
Assemble components in your cabinet
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.

- Attaching storage processors to the network ......................................................... 26
Attaching storage processors to the network

Before you begin

Ensure that the storage processors and the Windows host from which you initialize the storage system share the same subnet on your public LAN.

Procedure

1. Locate your two Ethernet cables.
2. Connect your public LAN using a CAT 5e or better (customer-supplied) Ethernet cable to the RJ45 port on SP A identified as **X4**. See cable 1 in Figure 7 on page 26.
3. Connect your public LAN using a CAT 5e or better (customer-supplied) Ethernet cable to the RJ45 port on SP B identified as **X4**. See cable 2 in Figure 7 on page 26.

Figure 7  Attaching the SPs to the network
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 ................................................................. 28
- Verifying system status ..................................................................................... 28
Connecting or verifying power cables

Before you begin

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

The power cables are conveniently color-coded. Two colors identify the different zones (PDUs). Black power cables connect to PDU B, while gray power cables connect to PDU A. As soon as you connect the power cables, the component starts powering up automatically. This is normal. Refer to Figure 8 on page 28 when performing this procedure.

Procedure

1. Connect SP power supply A to power distribution unit (PDU) A. See cable 1 in Figure 8 on page 28.

   Figure 8  Connecting DPE power cables

2. Connect SP power B to PDU B. See cable 2.

3. Lock each power cable in place and dress the cables as appropriate.

4. Wait 15 minutes for the system to power up completely.

5. Monitor the system as it powers up.

   See Verifying system status on page 28 for information.

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 9  DPE Front LEDs

<table>
<thead>
<tr>
<th>LEDs</th>
<th>Location</th>
<th>State/Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP Fault/status</td>
<td>1</td>
<td>Off</td>
</tr>
<tr>
<td>SP Unsafe to remove</td>
<td>2</td>
<td>Off</td>
</tr>
<tr>
<td>SP Power</td>
<td>3</td>
<td>On/Solid green</td>
</tr>
<tr>
<td>DPE Power</td>
<td>4</td>
<td>On/Solid blue</td>
</tr>
<tr>
<td>DPE Fault</td>
<td>5</td>
<td>Off</td>
</tr>
</tbody>
</table>

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 9 on page 29.

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 9 on page 29.

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.
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 ............................................................ 32
- Assembling DAEs ......................................................................... 33
- Power up additional DAEs ......................................................... 43
- Verify DAE status ....................................................................... 44
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 10 on page 32 shows the 2U, 25 2.5" drive DAE type. This DAE type uses a 2U rail kit for installation into the system cabinet.

3U, 15 3.5" drive DAE

Figure 11 on page 33 shows the 3U, 15 3.5" drive DAE type. This DAE type uses a 3U rail kit for installation into the system cabinet.
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2U, 25 2.5” drive DAE (1)</td>
<td></td>
</tr>
<tr>
<td>Mounting screws (4)</td>
<td></td>
</tr>
<tr>
<td>Adjustable rail kit</td>
<td></td>
</tr>
<tr>
<td>Rails (2)</td>
<td></td>
</tr>
<tr>
<td>Screws (3 per rail)</td>
<td></td>
</tr>
<tr>
<td>Power cables (2)</td>
<td></td>
</tr>
<tr>
<td>SAS cables (2)</td>
<td></td>
</tr>
<tr>
<td>mini-SAS to mini-SAS connectors</td>
<td></td>
</tr>
<tr>
<td>Bezel (1)</td>
<td></td>
</tr>
</tbody>
</table>

Note
Illustrations show standard US power cables.
### Table 4 3U, 15 3.5" drive DAE

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3U, 15 3.5&quot; drive DAE</td>
<td>(1)</td>
</tr>
<tr>
<td>Mounting screws (4)</td>
<td></td>
</tr>
<tr>
<td>Adjustable rail kit</td>
<td></td>
</tr>
<tr>
<td>Rails (2)</td>
<td></td>
</tr>
<tr>
<td>Screws (4 per rail)</td>
<td></td>
</tr>
<tr>
<td>Power cables (2)</td>
<td></td>
</tr>
<tr>
<td>SAS cables (2)</td>
<td>mini-SAS to mini-SAS connectors</td>
</tr>
</tbody>
</table>

**Note**

Illustrations show standard US power cables.
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.

   ![Label the SAS cables](image)

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 13 on page 37 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 13 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 14 on page 38 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.
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 15 on page 39 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.
Install the 3U DAE

Refer to Figure 16 on page 40 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.
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 32.

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 17 on page 41. These are mini-SAS to mini-SAS HD cables.

   **Figure 17** 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 18** 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 19 on page 42** 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 42 through 5 on page 42, 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 17 on page 41. 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 19** 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.

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 20 on page 43 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.

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 21 on page 44 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.
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 22 on page 44.
2. If any fault LEDs are on, or if any power LEDs are flashing, contact your authorized service provider.

<table>
<thead>
<tr>
<th>LEDs</th>
<th>Location</th>
<th>State/Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAE Fault/Status</td>
<td>1</td>
<td>Off/On/Amber</td>
<td>OK Fault has occurred</td>
</tr>
</tbody>
</table>
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 23 on page 45.

2. If any fault LEDs are on, or if any power LEDs are flashing, contact your authorized service provider.

Figure 23 3U, 15 3.5" drive DAE LEDs
Figure 23  3U, 15 3.5” drive DAE LEDs (continued)

<table>
<thead>
<tr>
<th>LEDs</th>
<th>Location</th>
<th>State/Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk drive Status/Activity</td>
<td>4</td>
<td>On/Blue</td>
<td>OK</td>
</tr>
</tbody>
</table>
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 ................................................................. 48
- Initialize your storage system ................................................................. 48
- Update the storage system software and register your system ................. 49
- Check system events ............................................................................. 50
- Install ESRS and configure ConnectHome .............................................. 51
- Configure servers for VNX systems ....................................................... 51
- Provision storage .................................................................................. 51
- Attach bezels ....................................................................................... 52
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](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 55 in the initialization process.

**Downloading the Unisphere Storage System Initialization Wizard**

**Procedure**

1. Go to [https://support.emc.com](https://support.emc.com) and select your system model > Downloads.
2. Download the Unisphere Storage System Initialization Wizard.

**Note**

If your host is behind a firewall, open UDP port 2162 (outgoing) and port 2163 (incoming). These ports are used by the initialization utility. If these ports are not opened, the initialization utility will not function properly.

3. Double-click the downloaded executable and follow the steps in the wizard to install the utility.
4. On the Install Complete screen, make sure that the Launch Unisphere Storage System Initialization Wizard checkbox is selected.
5. Click Done.

The initialization utility opens. Follow the online instructions to discover and assign IP addresses to your storage system.

If you encounter any issues during initialization:

- Go to [https://mydocs.emc.com/VNX](https://mydocs.emc.com/VNX) and click Before you begin to read about known issues and suggestions.
- Go to https://support.emc.com, select VNX Series, click Search Support, and enter the specific failure message into the EMC Knowledgebase for possible resolution and corrective action.

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.

Install ESRS and configure ConnectHome
You can ensure that your system communicates with your service provider by installing the EMC Secure Remote Support (ESRS).
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. If neither of these is used, EMC recommends setting up ESRS on the Storage Processors. This can be done through Unisphere.

NOTICE
You will need the information from the worksheet in this publication.

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.
5. Follow the instructions for the ESRS implementation you choose.
6. Set up ESRS and test the ConnectHome process.

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.

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 24 on page 53.
Figure 24  Connecting the power to the rail for the bezel

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 25 on page 54. 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 53 and 3 on page 53 for the remaining bezels.
Figure 25 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.

- **VNX Block Configuration Worksheet** ................................................................. 56
VNX Block 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.

Table 5 IPv4 Management Port Information

<table>
<thead>
<tr>
<th>SP A</th>
<th>SP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>Subnet Mask</td>
</tr>
</tbody>
</table>

**Note**

Do not use 128.221.1.248 through 128.221.1.255, 192.168.1.1, or 192.168.1.2 for an IPv4 IP address.

Table 6 IPv6 Management Port Information (optional; manual configuration only)

| Global prefix | Gateway |

Table 7 Login information for the storage system administrator

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td>User choice</td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td>User choice</td>
<td></td>
</tr>
<tr>
<td>Storage-system serial number</td>
<td>The serial number is located on the PSNT tag hanging from the rear of the storage processors. The number is identified as SN/Product ID.</td>
<td></td>
</tr>
<tr>
<td>Scope</td>
<td>Global or Local</td>
<td></td>
</tr>
</tbody>
</table>

Table 8 IPv4 address for iSCSI targets

<table>
<thead>
<tr>
<th>SP, slot and port</th>
<th>Local port number</th>
<th>Target port IP address</th>
<th>Subnet mask</th>
<th>Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA, slot __, port 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 8 IPv4 address for iSCSI targets (continued)

<table>
<thead>
<tr>
<th>SP, slot and port</th>
<th>Local port number</th>
<th>Target port IP address</th>
<th>Subnet mask</th>
<th>Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA, slot __, port 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA, slot __, port 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPB, slot __, port 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note

VNX supports both dual-port and quad-port iSCSI I/O modules.

Table 9 IP address for each iSCSI NIC or HBA port (iSCSI initiator)

<table>
<thead>
<tr>
<th>Server and Port</th>
<th>Initiator IP Address</th>
<th>Subnet Mask</th>
<th>Default gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
Table 9 IP address for each iSCSI NIC or HBA port (iSCSI initiator) (continued)

<table>
<thead>
<tr>
<th>Server and Port</th>
<th>Initiator IP Address</th>
<th>Subnet Mask</th>
<th>Default gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

ESRS Setup
You can ensure that your system communicates with your service provider by installing the EMC Secure Remote Support (ESRS). There are multiple implementations for ESRS.

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.

Note
ESRS depends on the DNS setting on the Storage Processor. To configure ESRS, the DNS should already be configured.

Table 10 Content required for ESRS setup

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VNX System Storage Processor</td>
<td>Select the system SP to manage ESRS support</td>
<td></td>
</tr>
<tr>
<td>EMC Support Credentials Account login</td>
<td>Use these credentials to configure ESRS. When you create an initial EMC Online Support account, your account may have limited “Lite Touch” privileges and may not be associated with a company profile. Unless your company has an established profile with EMC Online Support, the account is created with an email address, user name and password, but without company affiliation. When you create the account, you receive a confirmation email message containing a validation link. You can click the link, log into the EMC Online Support website, activate your account, and then configure ESRS.</td>
<td></td>
</tr>
</tbody>
</table>
Table 10 Content required for ESRS setup (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proxy Server Settings</td>
<td>If the monitor station connects to the Internet through a proxy server, you must indicate this during the ESRS installation and provide the IP address, port, and protocol (HTTPS or SOCKS) for the proxy server.</td>
<td></td>
</tr>
<tr>
<td>Protocol to be used (HTTPS or SOCKS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proxy Server IP address or network name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port number of the proxy server</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proxy server login credentials</td>
<td>You must supply login credentials for the proxy server. You must supply both the username and password for authentication.</td>
<td></td>
</tr>
<tr>
<td>Username</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy Manager for ESRS</td>
<td>If you use a policy manager you need to supply the address and port.</td>
<td></td>
</tr>
<tr>
<td>Policy Manager Address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy Manager Port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proxy server for policy manager</td>
<td>If you use a proxy server for the policy manager, you need to supply the protocol (HTTP or SOCKS), proxy address, port, and login credentials.</td>
<td></td>
</tr>
<tr>
<td>Protocol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proxy address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Username</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manage ConnectEMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERS Priority</td>
<td>Select ESRS priority as Disabled, Primary, or Secondary.</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Set up email protocol for ESRS.</td>
<td></td>
</tr>
<tr>
<td>Priority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email (SMTP) Server</td>
<td>[Required; max length=30.]</td>
<td></td>
</tr>
<tr>
<td>Subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recipient Address(es)</td>
<td>[Required; max length=120 characters, comma separated if multiple addresses.]</td>
<td></td>
</tr>
<tr>
<td>Sender Address</td>
<td>[Required; max length=30.]</td>
<td></td>
</tr>
</tbody>
</table>
### Table 10 Content required for ESRS setup (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture Configuration Data Settings</td>
<td>Settings to capture the array configuration and send the file via ConnectEMC.</td>
<td></td>
</tr>
<tr>
<td>Period Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Capture Schedule</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capture Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schedule</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>