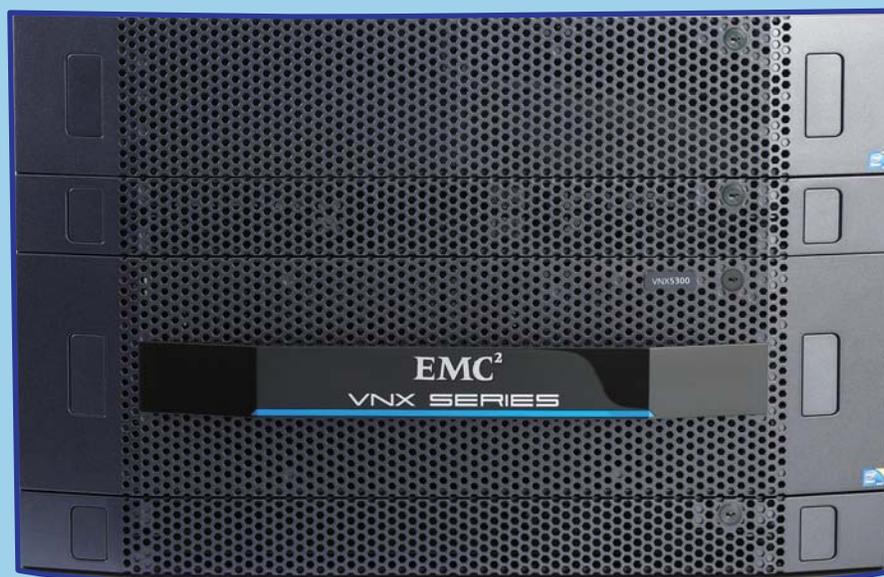


EMC[®] VNX5300[™] System Installation Guide



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About this book

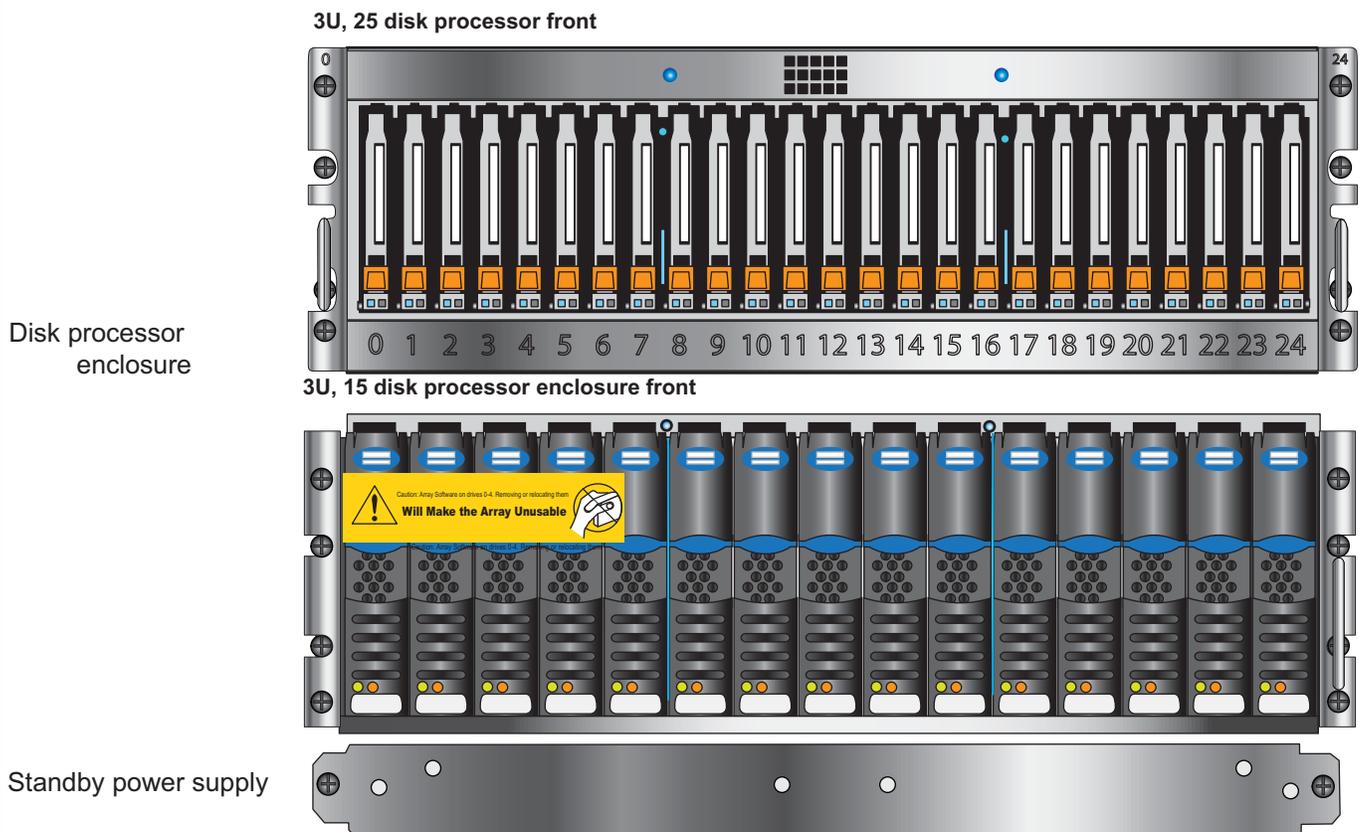
The EMC VNX5300™ and its configurations

The VNX5300 system has three configurations--different combinations of hardware, software, and resulting capabilities. They are **Block**, **File**, and **Unified** (explained and illustrated below). The configuration of your system should be indicated on the EMC Unisphere™ license in your order.

For hardware installation and configuration, there is little difference between the File configuration and the Unified configuration. As a result, in this book they have been combined.

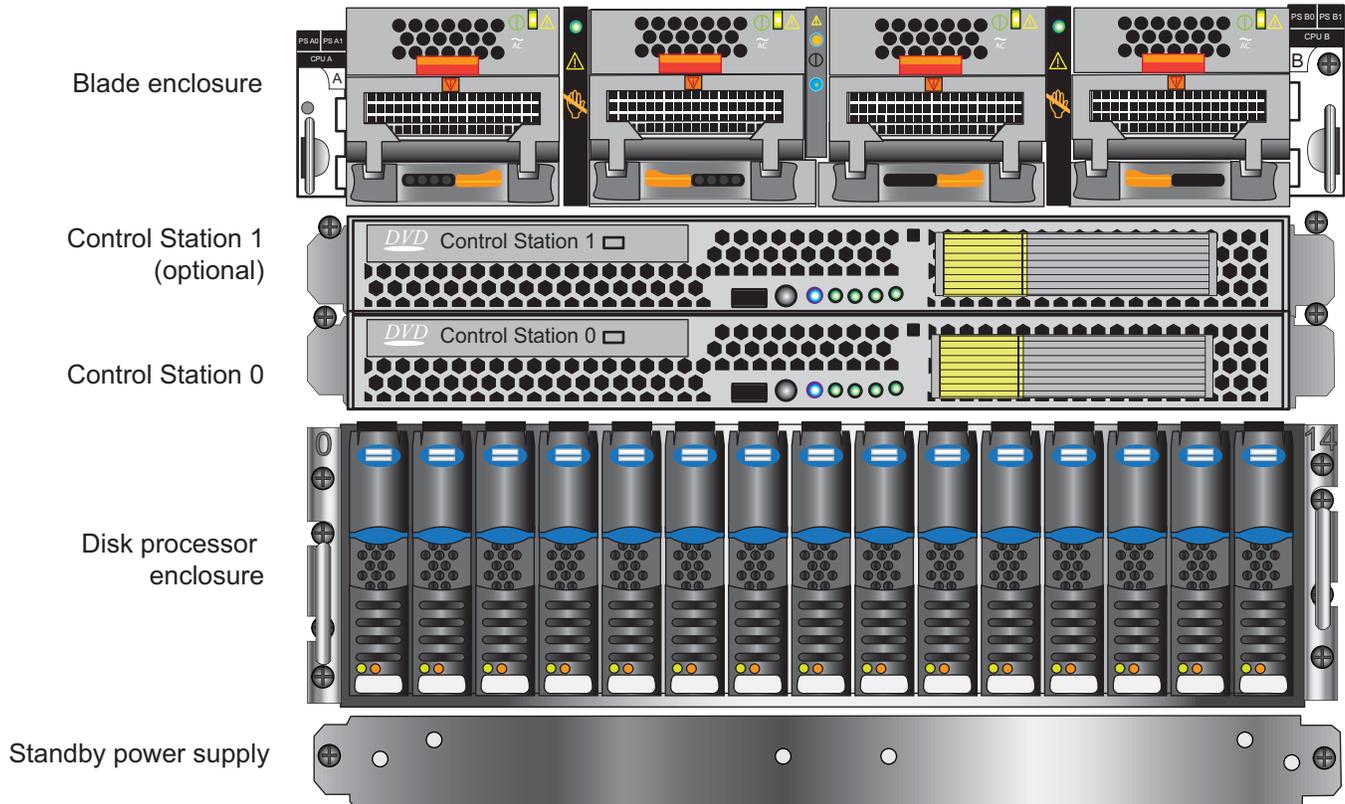
This installation guide covers both the Block configuration (starting on page 5) and the File/Unified configuration (starting on page 39). Please review the contents applicable to your configuration before starting your installation. This book includes planning worksheets, directions for unpacking, racking, and cabling the hardware, and then instructions for initializing and configuring the system. It also contains references for finding additional resources.

The **VNX5300 Block** system utilizes a Standby Power Supply and a Disk Processor Enclosure with dual Storage Processors. The Disk Processor Enclosure can be either a 15-disk enclosure or a 25-disk enclosure. It can (optionally) include disk-array enclosures for additional storage capacity. Its operating environment sets up the system for Block storage.



About this book

The **VNX5300 File** system utilizes the Standby Power Supply and Disk Processor Enclosure and includes one or two Control Stations and one or two Data Movers. Like the Block system, additional disk-array enclosures can be included for additional storage. The VNX5300 operating environment sets up its system for File storage.



As with the Block configuration, the File and Unified configurations can include either the 3U 15-disk DPE (shown) or the 3U 25-disk DPE.

The **VNX5300 Unified** system includes the same hardware components as the VNX5300 File system. They are installed in exactly the same order and in the same positions as the File system. There may be additional I/O modules in the Unified system's storage processors. In addition, the Unified configuration includes software that enables both Block and File storage.

The installation of all these configurations is covered in this manual, although **you should only need to follow the section that applies to your configuration.**

However, since the VNX5300 Block and the VNX5300 File can be upgraded to the Unified system, and thus allow you to move from either Block storage or File storage to a Unified system in the future, we urge you to plan the installation carefully. If you want to move from a Block system to a Unified system, for example, reserve 4U of cabinet space above the DPE for the additional hardware components. Moving from a File system to a Unified system does not require any additional cabinet space unless additional drives and DAEs are to be added for providing block storage.

Before you begin

VNX Block Configuration

Welcome

If you do not already have a Product Support account, go to <https://support.emc.com/products/VNX5300> and set one up immediately. You will need a support account for access to the latest documentation and troubleshooting information, online chat, installation/maintenance videos, and utilities and wizards.

Software upgrade

If you bought a software maintenance contract, you are entitled to software upgrades only after the installation and registration have successfully completed.

Site preparation

Make sure your site includes the following resource requirements:

AC power

- For high availability: At least two 110 or 240 V AC circuits are required.

Network connections

- Two 1-Gigabit Ethernet management connections
- Cabinet vertical space 3U (5.25 inches, 13.33 cm) for disk processor enclosure (DPE) and 1U for the standby power supply (SPS). A total of 4U minimum vertical space is required, plus space for any DAEs.
- Space for each optional DAE

A Windows-based computer to initialize the VNX5300 Block system with:

- At least 100 MB of free space
- Connection on same physical subnet as your VNX5300 system
- SMTP server network connection to the VNX5300 and the management host (recommended)

Planning 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.

In a server with multiple NICs or iSCSI HBAs that are connected directly to the storage system, or that are on a dedicated iSCSI network, each initiator port must be on a separate subnet.

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

IPv4 Management Port Information:

IP Address	Subnet Mask	Gateway
SP A:		
SP B:		

IPv6 Management Port Information (manual configuration only):

Global prefix:	
Gateway:	

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.

Login Information for the array administrator:

Username:	
Password:	
Storage-system serial number:	
Scope:	

NOTE: The storage-system serial number is located on the PSN tag hanging from the rear of the chassis. The number is identified as SN/Product ID.

Planning Worksheet

IPv4 address for iSCSI targets:

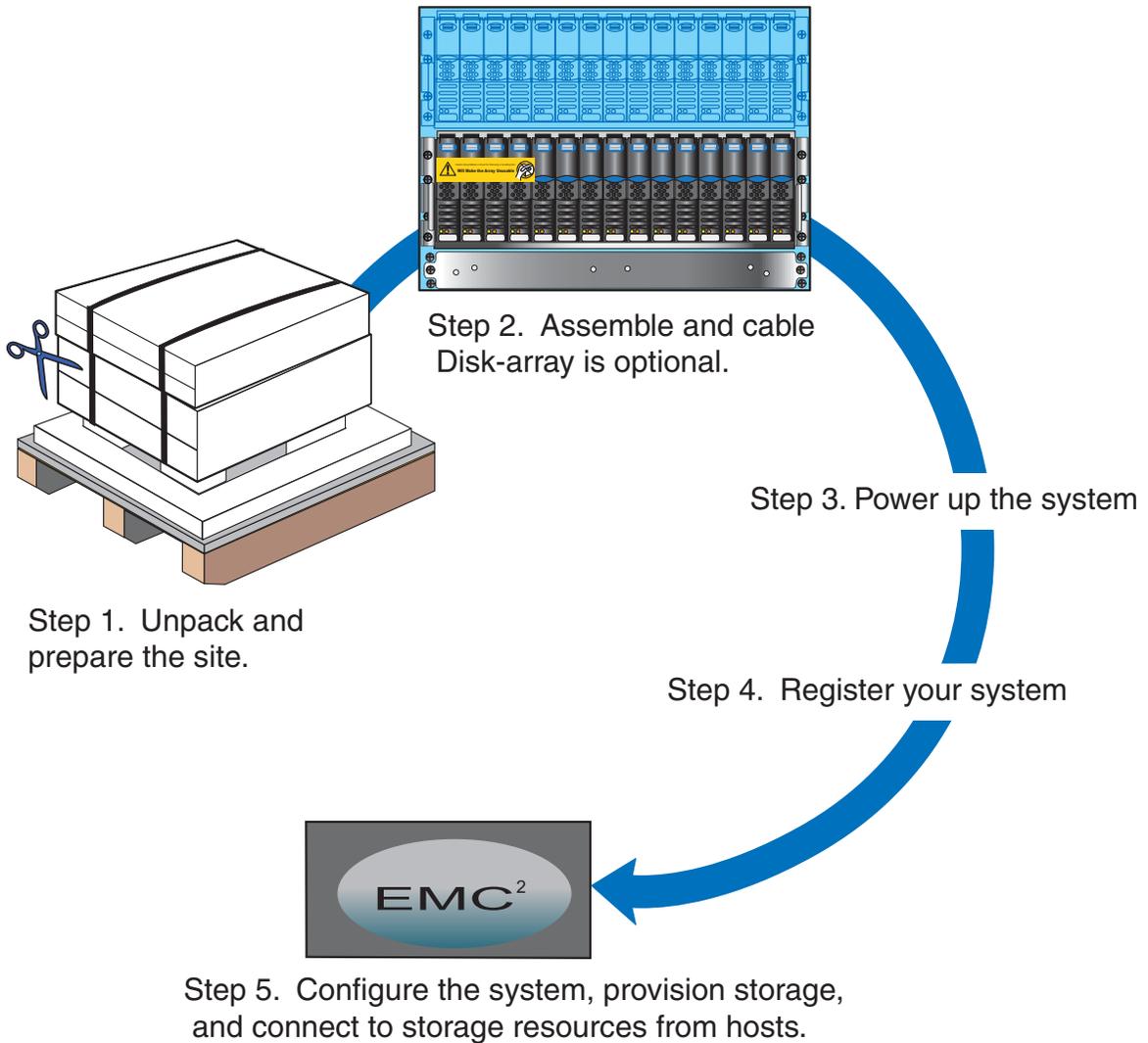
SP, slot, and port	Local port number	Target Port IP address	Subnet mask	Gateway
SPA, slot __, port 0				
SPA, slot __, port 1				
SPB, slot __, port 0				
SPB, slot __, port 1				
SPA, slot __, port 0				
SPA, slot __, port 1				
SPB, slot __, port 0				
SPB, slot __, port 1				
SPA, slot __, port 0				
SPA, slot __, port 1				
SPB, slot __, port 0				
SPB, slot __, port 1				
SPA, slot __, port 0				
SPA, slot __, port 1				
SPB, slot __, port 0				
SPB, slot __, port 1				

VNX5300 Assembly

Front view of an assembled VNX5300, shown here with a 15-disk DPE and 2 DAEs.



Installation overview steps



Installation overview steps

Your VNX5300 may arrive at the site fully installed in a cabinet. In this case, you can use this manual to verify the cabling before powering the system up.

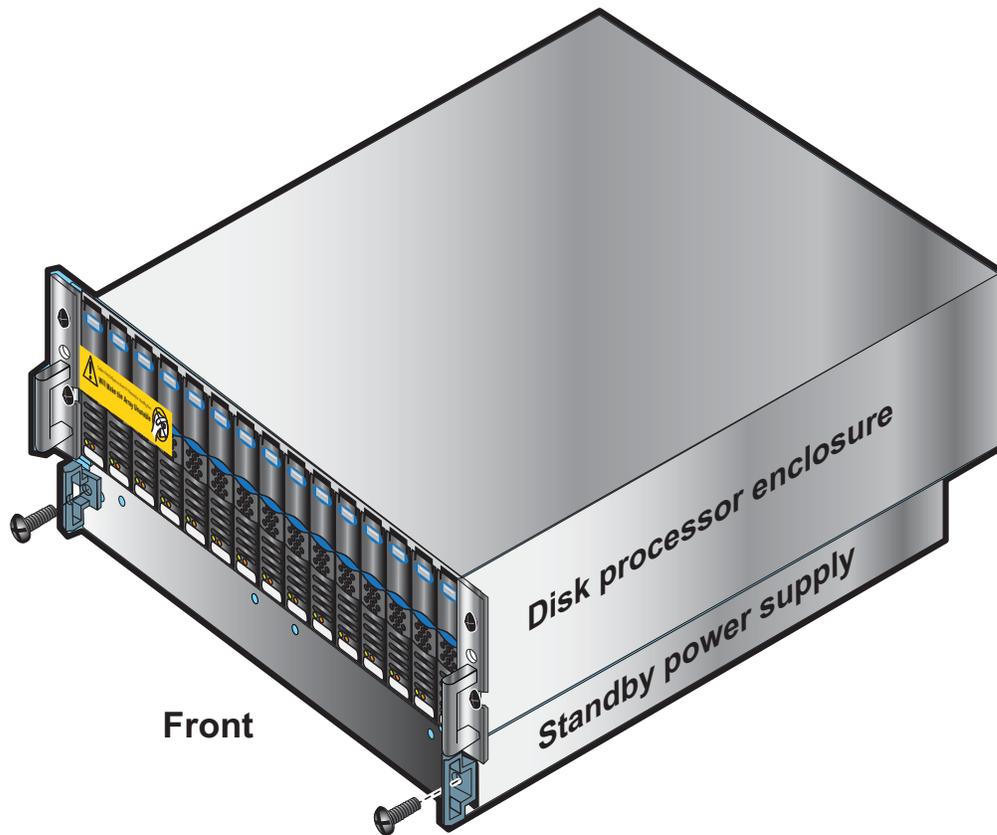
If it is to be installed in a customer-supplied cabinet, follow the instructions in this guide. Your system cabinet may vary from the illustrations shown in this document.

Installation steps:

1. Unpack the shipping boxes and ensure that the site has been prepared. Check that you have received all of the system's components, including cables and bezels.
2. Assemble the hardware and cable your VNX5300 according to the instructions in this guide. Ensure that all of your cables are seated securely and install the bezels on the front of each system component.
3. Power up the system and install any optional disk-array enclosures. Once the system is powered up, proceed to install the system software.
 - a. Use the VNX Installation Toolbox CD, which contains the documentation and utilities required for the installation of the software.
 - b. Download and run the **Unisphere Initialization Utility for Block**.
 - c. Then install and set up the **VNX ESRS IP Client** from the Toolbox.
4. Register your system with EMC. If you do not register your system now, your request for support from your service provider will be delayed.
5. Use EMC Unisphere™ to configure the system, provision storage, and connect to storage from hosts and applications on the network. Download, install, and launch the Unisphere Server Utility to connect hosts to the array.

These steps are explained in more detail in the rest of this Installation Guide.

Contents of VNX5300 packages



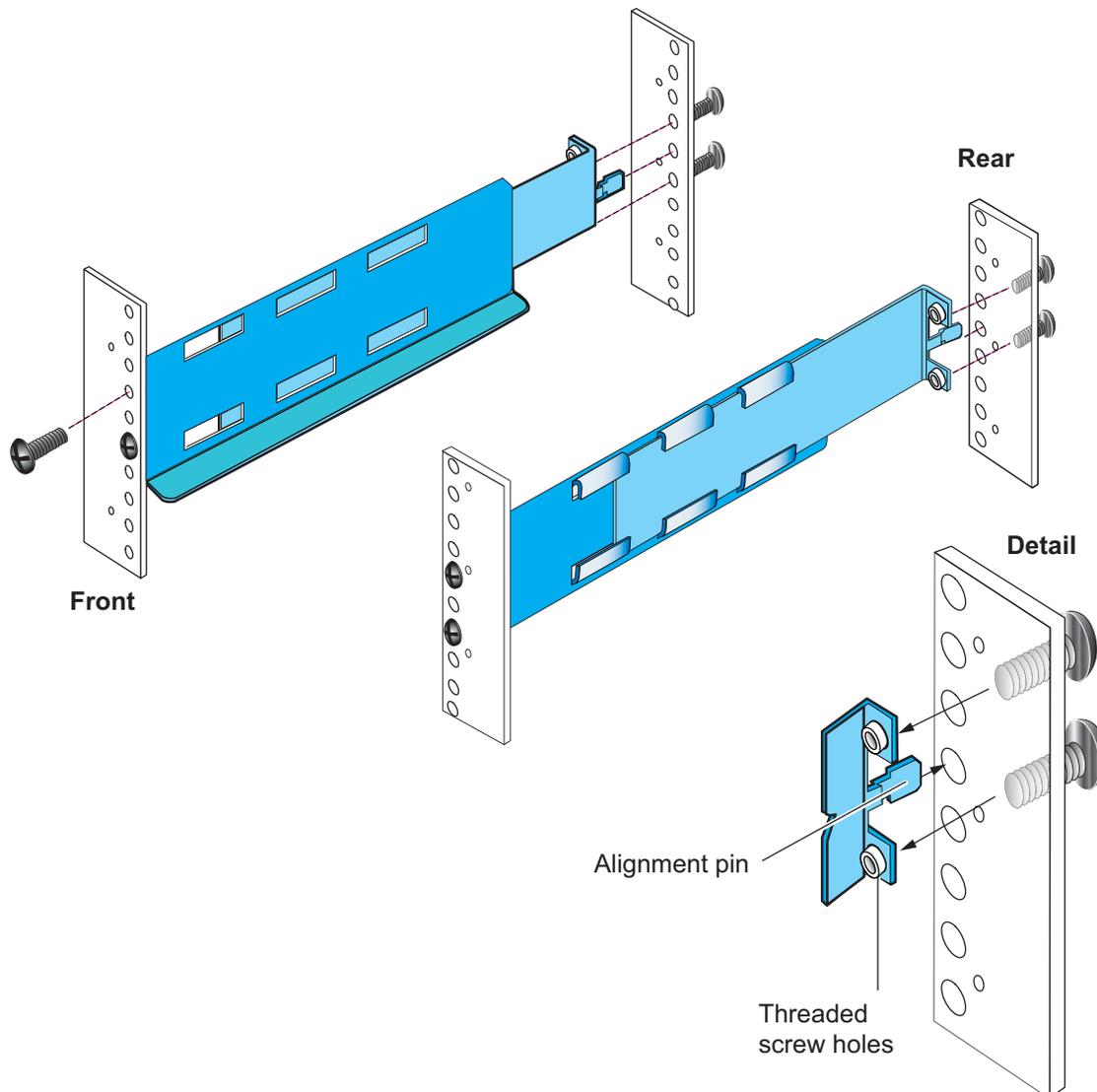
Note: The table represents components that are shipped with the VNX5300 system.

Components	Accessories	Documentation
Standby power supply (SPS)	<ul style="list-style-type: none"> • Mounting screws • Bezel • Management cable • Power cable • Rail kit 	Installation guide Cable label kit (for customer cabinet) Environmental Compliance Information and notices
Disk processor enclosure (DPE)	<ul style="list-style-type: none"> • Mounting screws • Bezel • Power cables • Rail kit 	
Disk-array enclosure (DAE) (Optional)	<ul style="list-style-type: none"> • Mounting screws • Bezel • Power cables • SAS cables • Rail kit 	

Install VNX5300 SPS rails

The rails must be aligned carefully. Two people are required to install the components. The Standby power supply (SPS) is a 1U component and uses a 1U adjustable rail kit. Start any installation at the bottom of the space allowed in your cabinet.

1. Insert the adjustable rail slide and seat the alignment pin into the rear channel of your cabinet.
2. Place the alignment pin into the hole just above a standard unit (U) marking.
3. Extend the rail and align the front of the rails as shown.
4. Insert two retention screws in the front and two retention screws in the back of each rail as shown in the illustration.



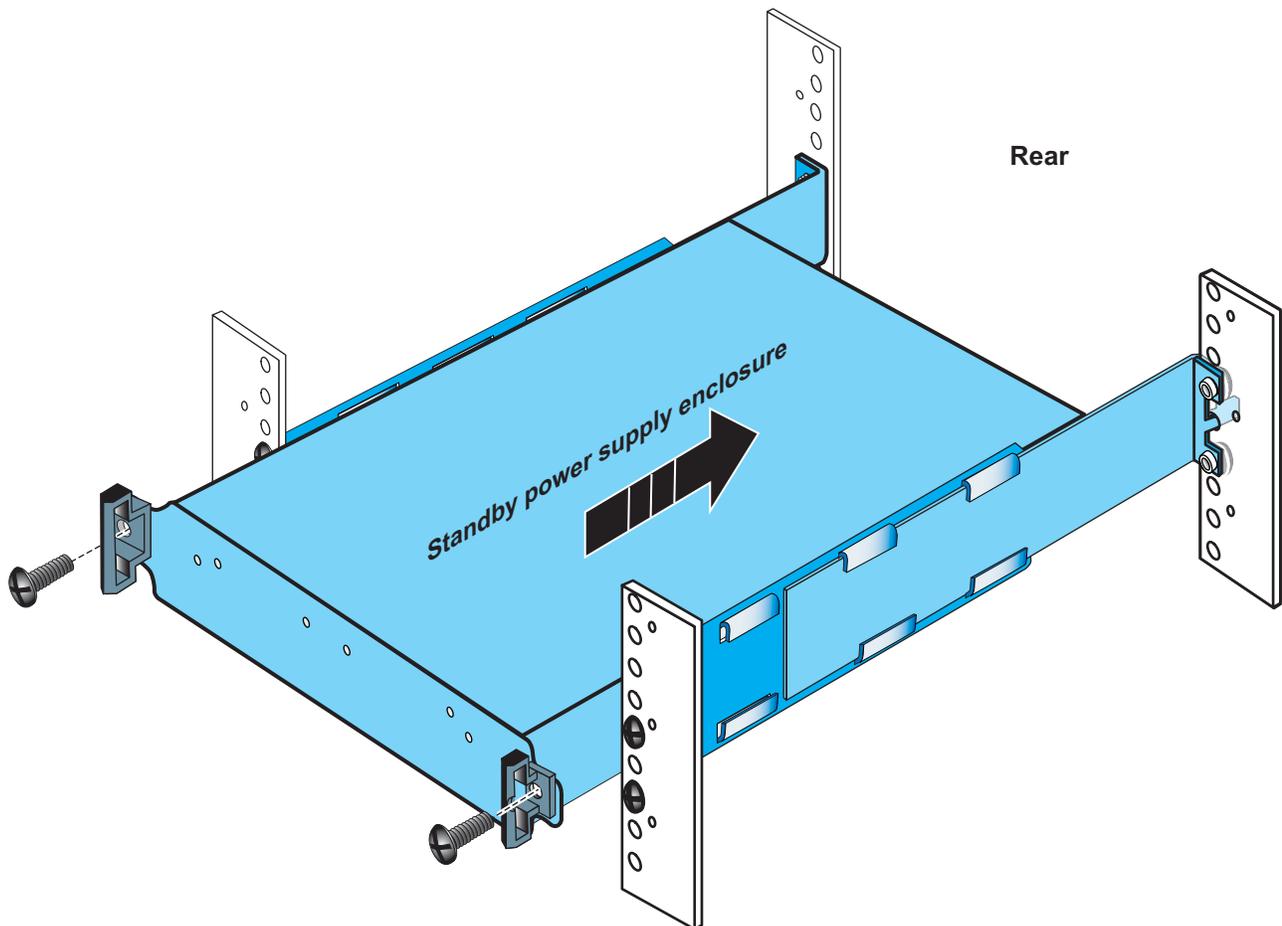
Install the VNX5300 SPS



The SPS 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.

Assistance is required when moving or installing the system. The SPS enclosure for the VNX5300 can contain either a single or dual SPS.

1. Slide the standby power supply (SPS) enclosure into the cabinet rails.
2. When the SPS is securely in place, tighten all of the screws to hold it in place in the cabinet.

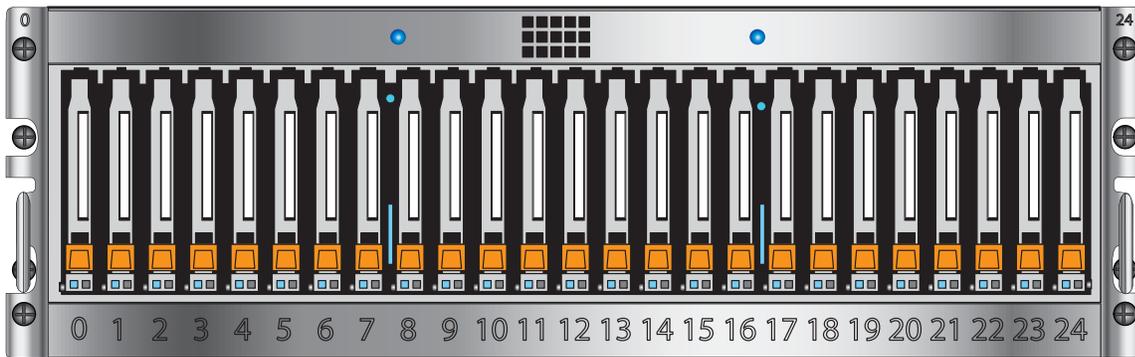


VNX5300 DPEs

Your disk processor enclosure (DPE) can either be a 3U, 25 disk DPE, or a 3U, 15 disk DPE. Either DPE will use 3U rail kit.

If optional disk-array enclosures (DAEs) are installed, they are installed above the DPE unless this space is being reserved for future File or Unified configuration hardware.

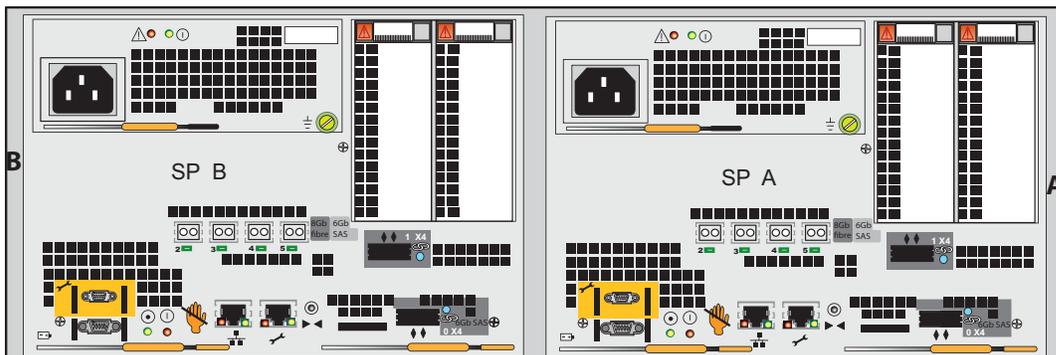
3U, 25 disk processor front



3U, 15 disk processor enclosure front



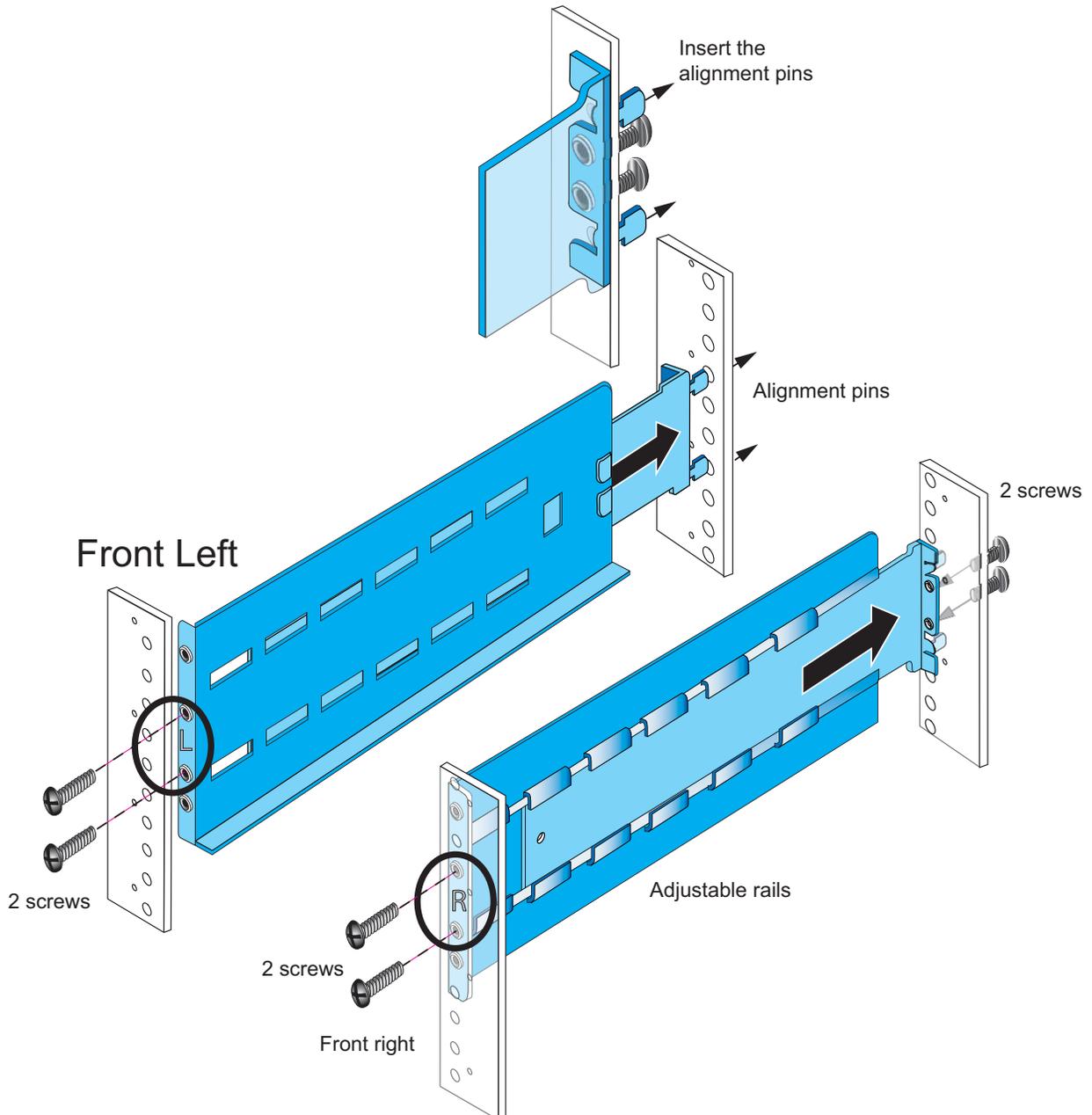
3U disk processor rear



Install the VNX5300 DPE rails

Follow these steps to install your DPE. The DPE should be installed just above the SPS. The rails must be aligned carefully. A hole in the cabinet channel above the SPS remains open. Two people are recommended to install the rails.

1. Insert the adjustable 3U rail slide and seat both alignment pins into the rear channel of your cabinet.
2. Extend the adjustable rails so that it extends to the front channel of the cabinet.
3. Align the front of the rails carefully as shown.
4. Insert two retention screws in the front and two retention screws in the back of each rail as shown.
5. Tighten the screws once the rails are aligned correctly.

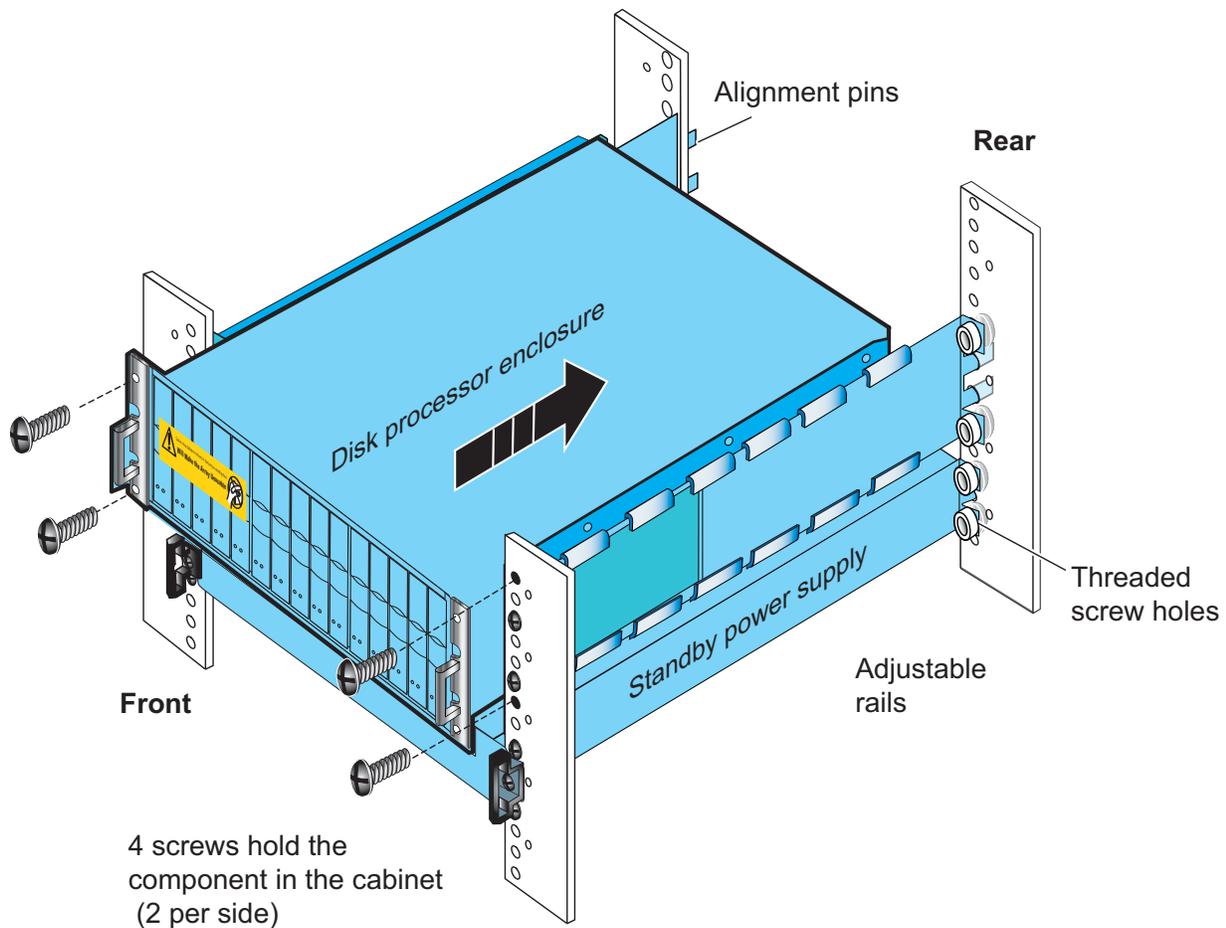


Install the VNX5300 DPE



The DPE 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.

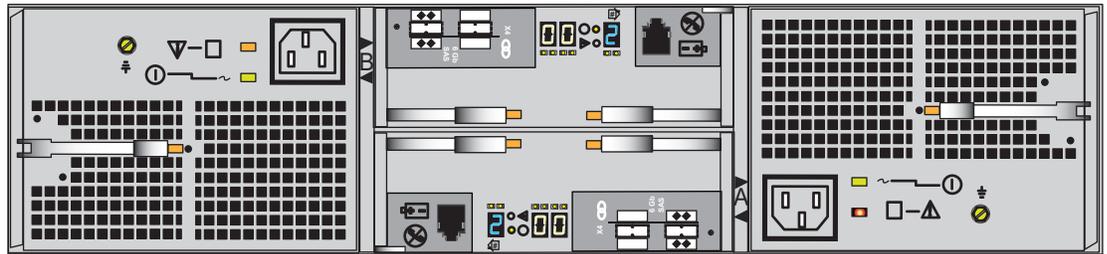
1. Slide the disk processor enclosure (DPE) into the rails in the cabinet.
2. When the DPE is in place, insert the screws from the front and tighten all of the screws.



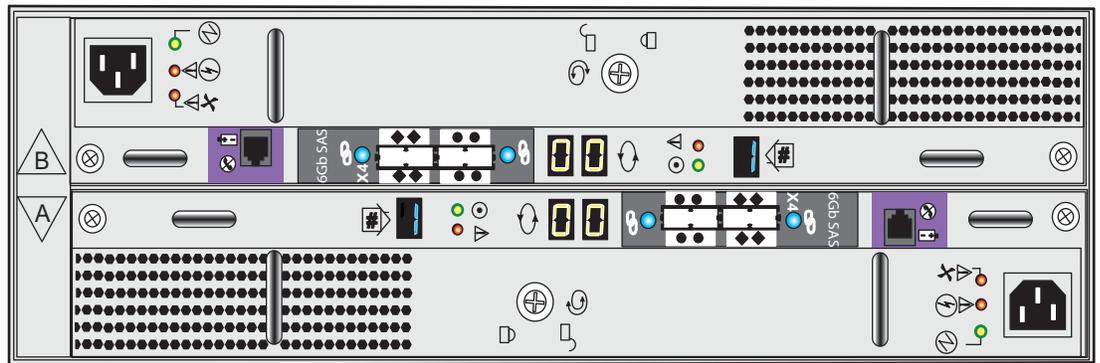
VNX5300 components

VNX5300 components rear view including optional components.

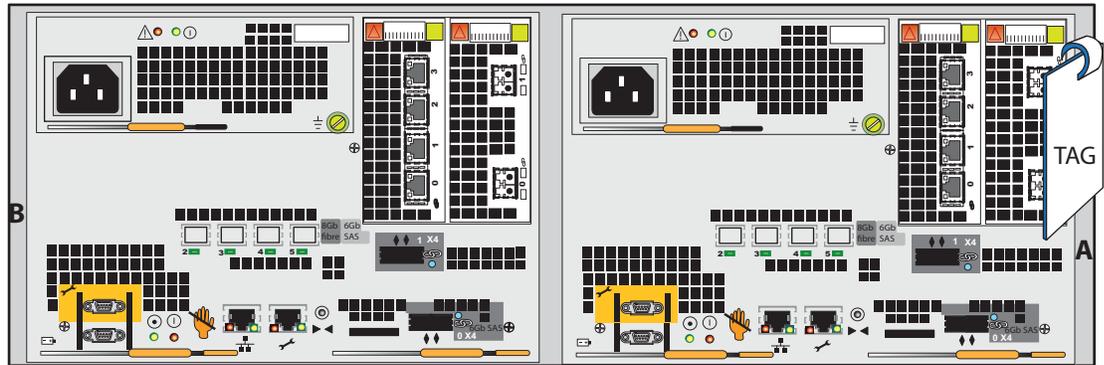
25 disk
Disk-array
enclosure
2U
(Optional)



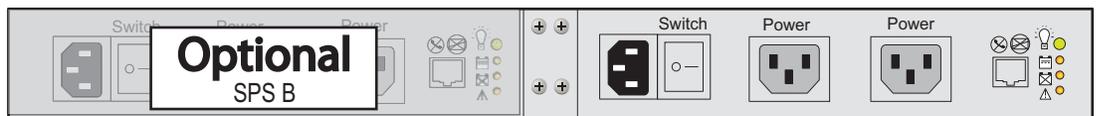
15 disk
Disk-array
enclosure
3U
(Optional)



15 or 25 disk
Disk processor
enclosure
3U

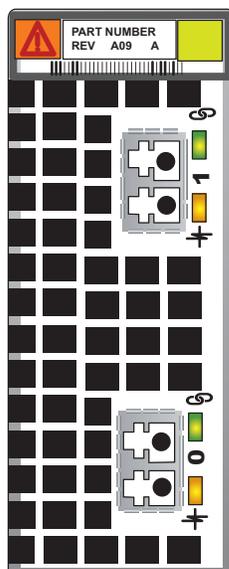
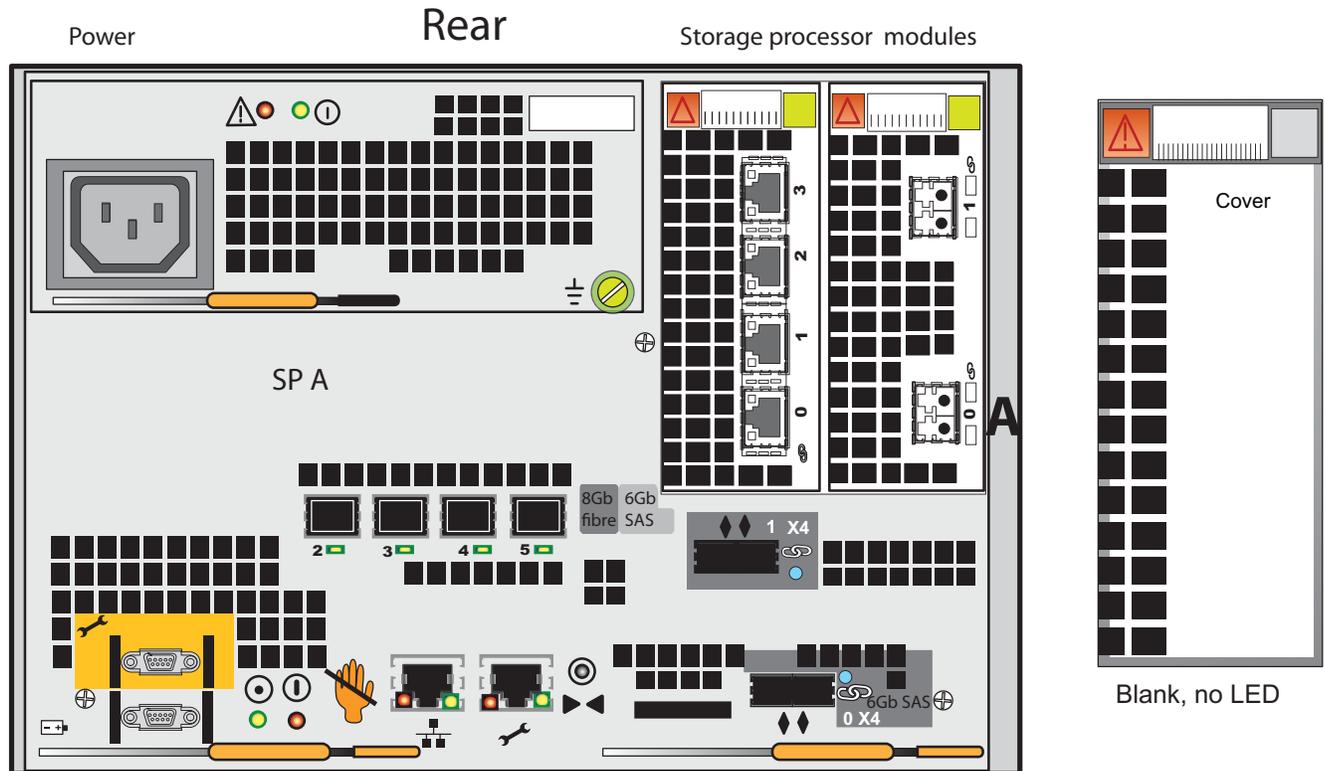


Standby power
supply
1U

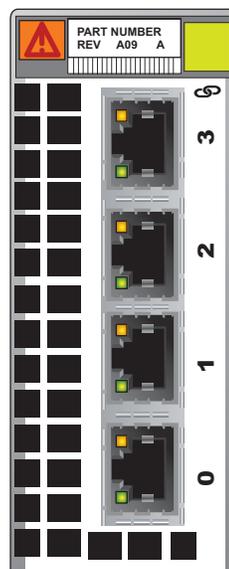


VNX5300 storage processor modules

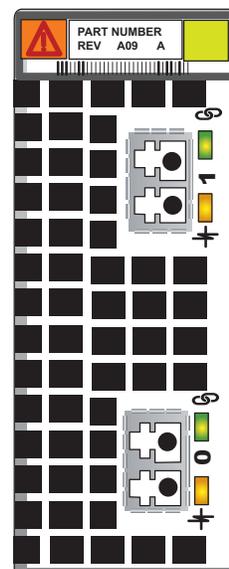
Each storage processor (SP) includes four 8Gb FC ports, two 6Gb SAS ports, and supports up to two UltraFlex I/O modules. Because the storage processors are highly available, the I/O modules should be identical in both SP A and SP B.



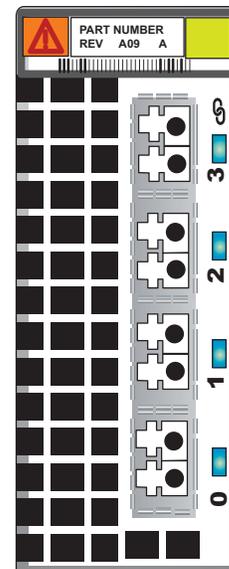
2 port
FCoE
10 Gbps



4 port iSCSI
1 Gbps



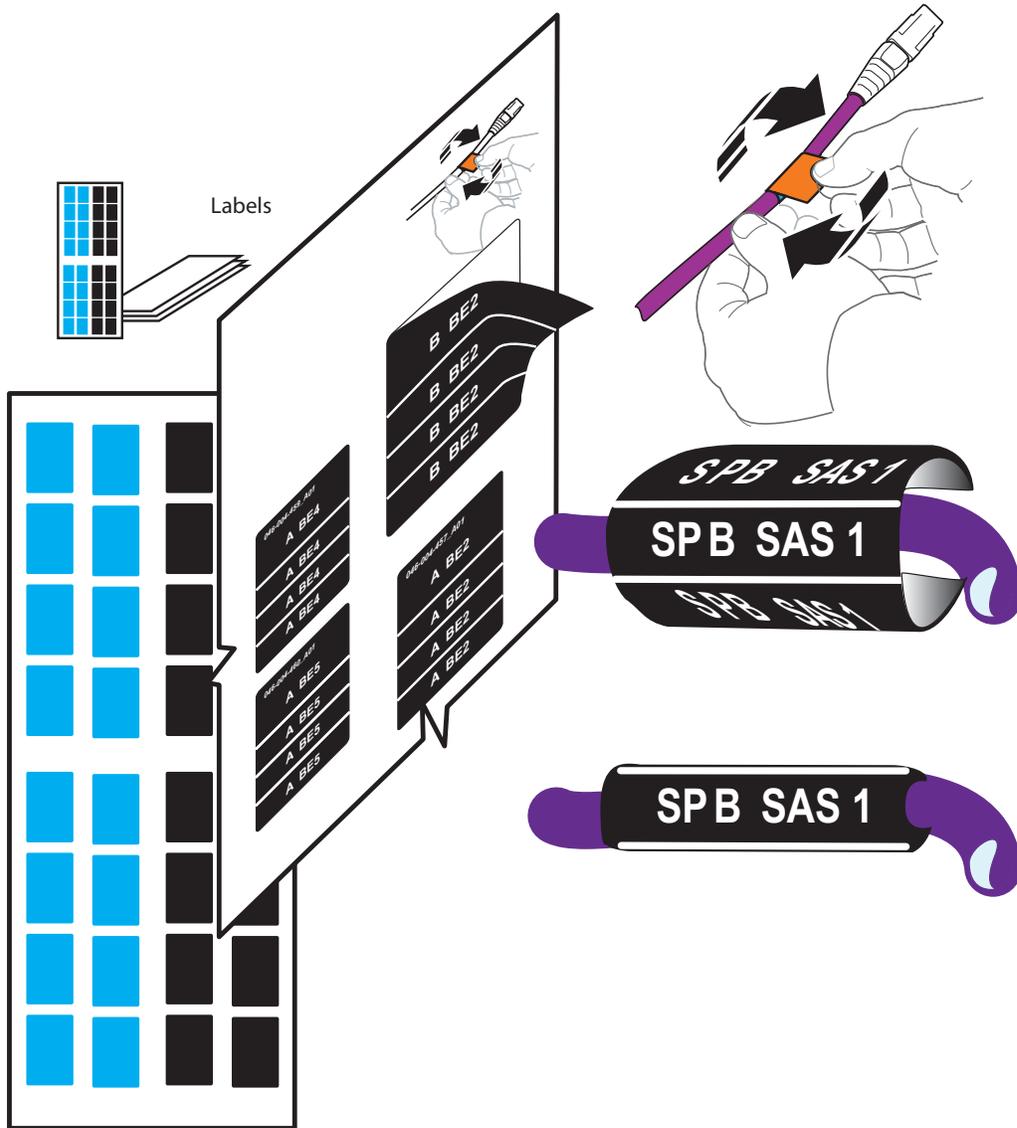
2 port iSCSI
10 Gbps



4 port
Fibre Channel
2-4-8 Gbps

For details on the hardware options, see the **VNX5300 Hardware Overview**.

Label the cables

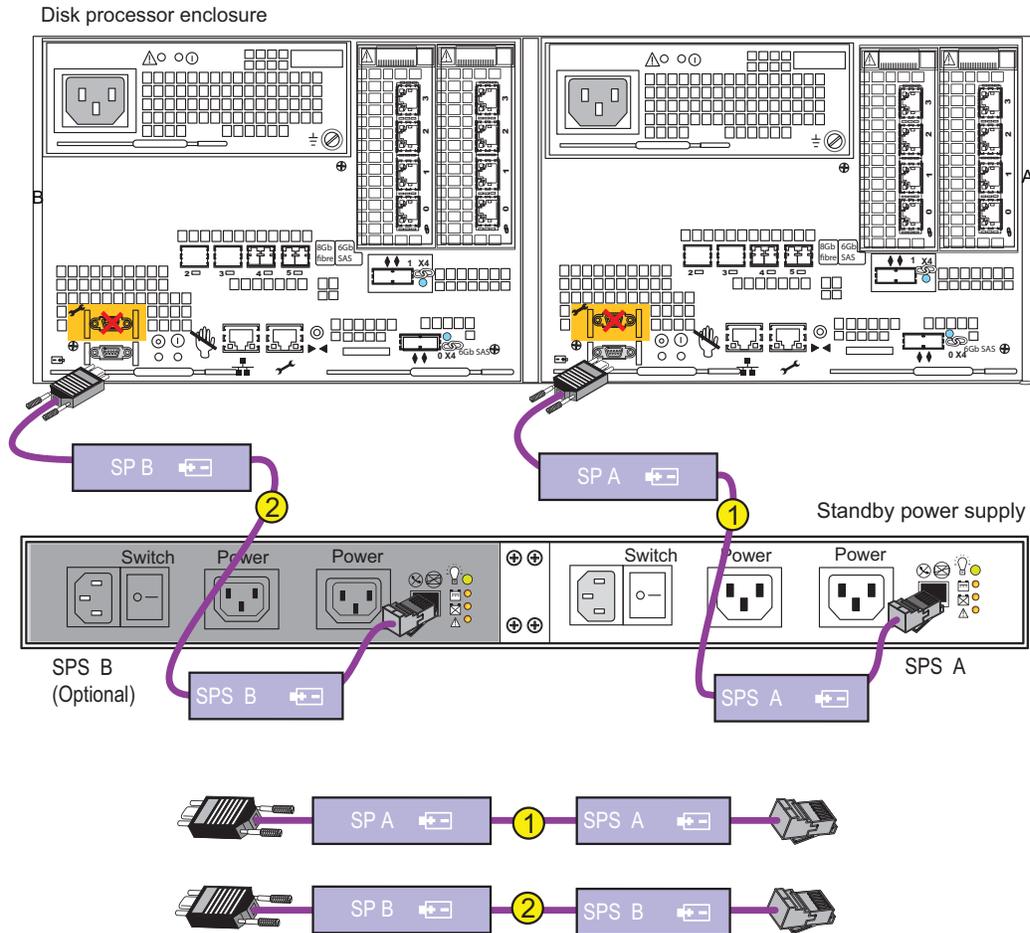


The cable labels must be attached to the appropriate cables as you assemble the system. Assemble the hardware and cable your VNX5300 according to the instructions in this guide.

Cabling the VNX5300 SPS

Cabling the standby power supply (SPS) in the VNX5300 system.

A yellow circle with a number indicates the cable number.



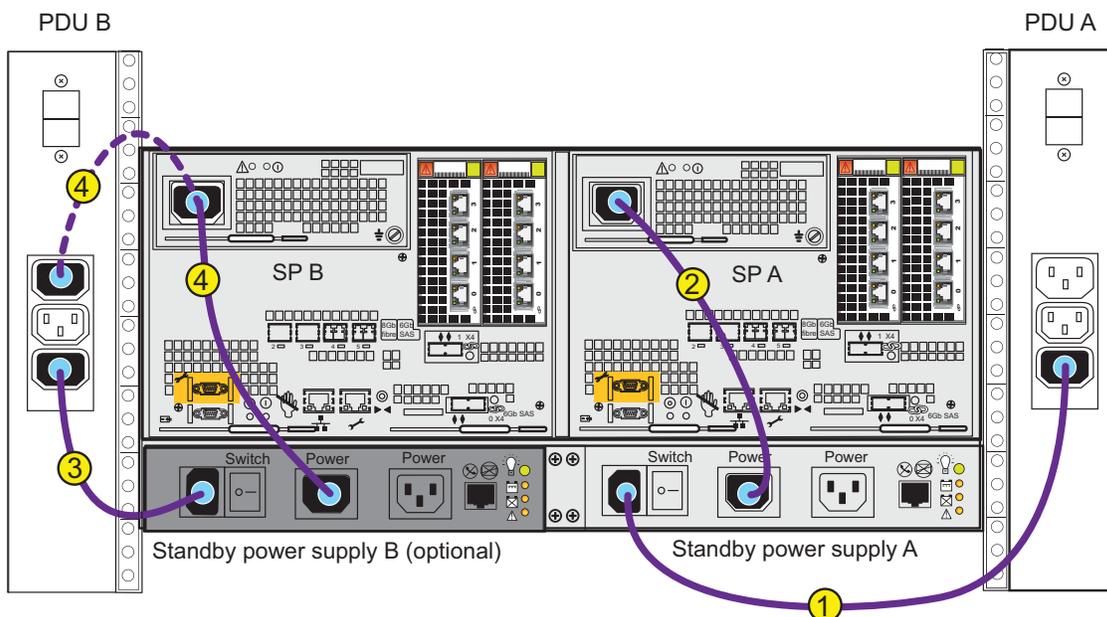
If SPS B is not in the system, cable #2 will not be included.

Powering up the VNX5300 System

Verify that the cabinet circuit breakers are in the ON position. If you are installing the VNX5300 into an existing cabinet that contains other components, do not turn off the cabinet circuit breakers.

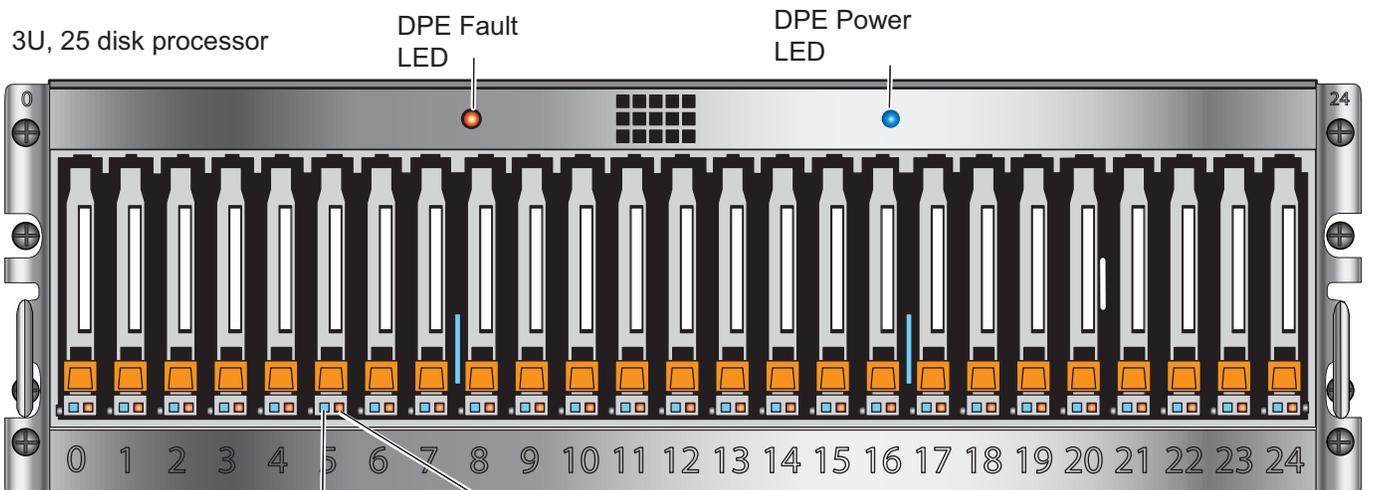
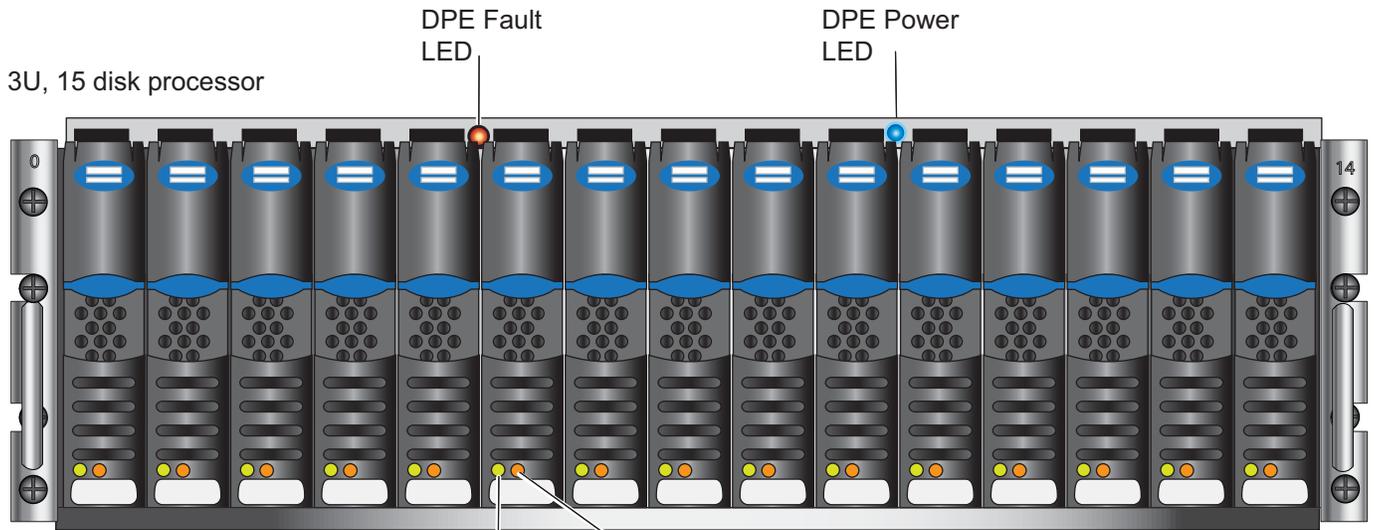
A yellow circle with a number indicates the power cable number.

1. Connect the SPS power A to power distribution unit (PDU) A. **1**
2. Connect SPS A to SP A. **2**
3. Connect optional SPS power B to PDP B. **3**
4. Connect SPS B to SP B. If (optional) SPS B is not present, connect SP B to PDU B. **4**
5. Lock each power cable in place and turn the SPS switches ON. This will bring up the system in 10-15 minutes. Monitor the system as it powers up. The LEDs will show the progression of the power. Green, blue, and amber activity lights blink during the power-on period. The LEDs will then become steady ON and the fault LEDs will be off, showing no fault. **Make sure the power-up is complete before you continue with the next task.**



Standby power supply B is optional. If SPS B is not used, dashed line 4 shows the power connection of SP B.

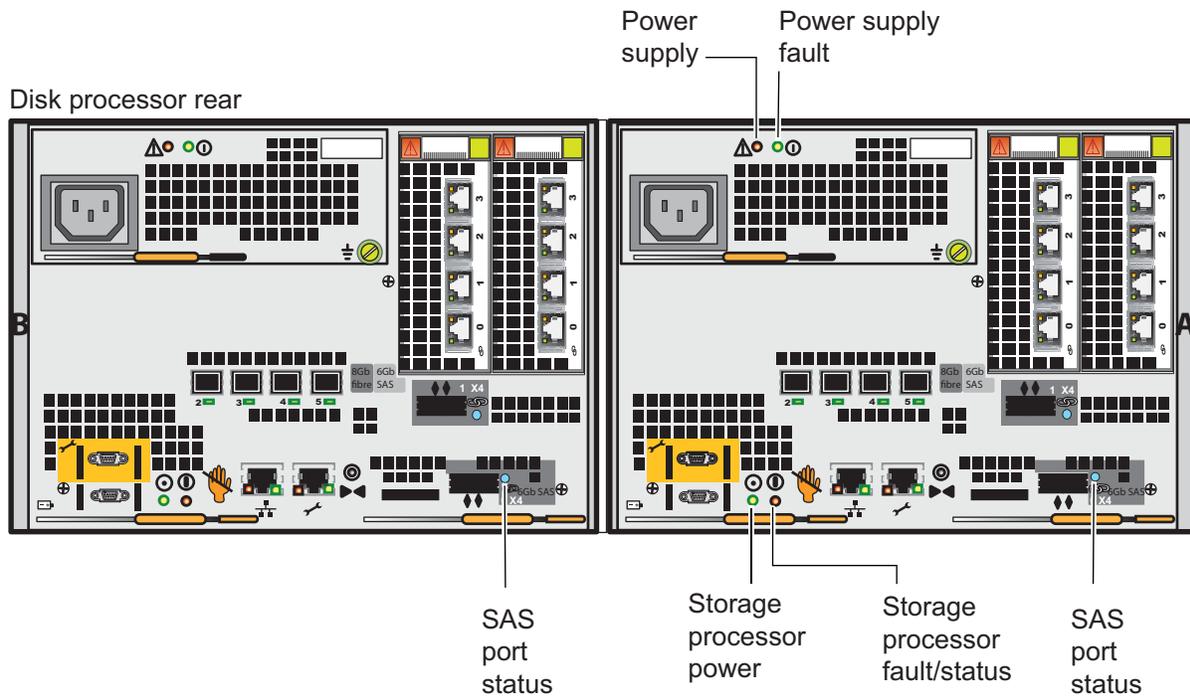
VNX5300 DPE 15 and 25 disk front LEDs



Light emitting diodes	Color	Status
Enclosure Power LED	<ul style="list-style-type: none"> Green [15-drive] Blue [25-drive] 	AC or DC is applied and all outputs are in operating range
	<ul style="list-style-type: none"> Off 	Any or all outputs or input out of range
Enclosure Fault LED	<ul style="list-style-type: none"> Off 	All outputs or input out of range
	<ul style="list-style-type: none"> Amber 	Any enclosure fault, including SP faults

The power-up should take around 10-15 minutes. If the power LEDs do not remain solid/steady green, contact your authorized service provider. If the power LEDs on each SP remain solid/steady green, replace the bezel and proceed with the next steps.

VNX5300 DPE rear LEDs



The power-up should take around 10-15 minutes.

Physical indications that the array is up and running without error:

- Power LED on SP is green
- Fault LED on SP is off
- DPE status is steady green or blue
- First 4 drives in DPE are green (for 3u-15 drive unit) or blue (for 3U 25-drive unit)

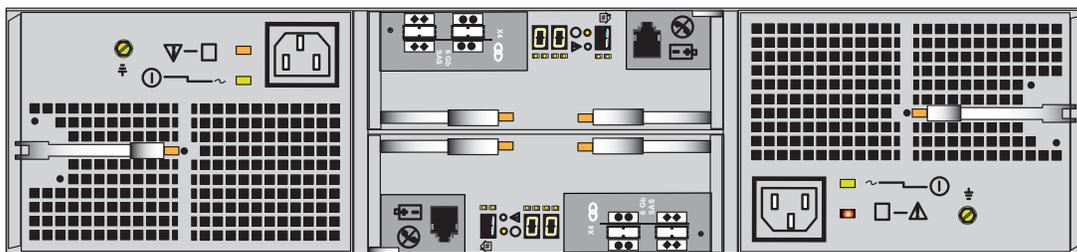
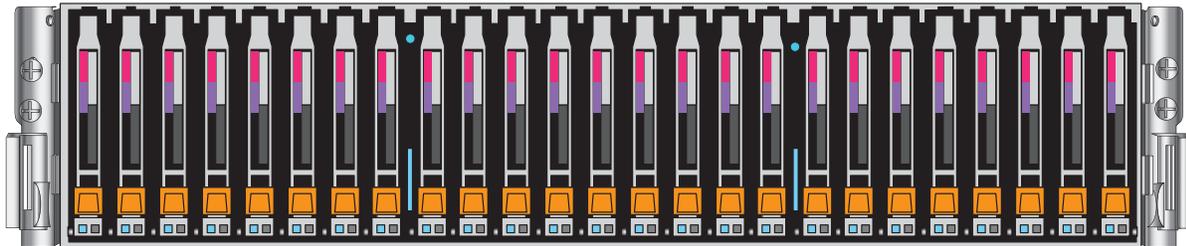
For complete information on the DPE LEDs and their activity, see the **VNX5300 Hardware Overview**.

Adding VNX5300 DAEs

DAEs are optional. They use 2U rail kit for a 2U, 25 disk DAE or 3U rail kit for a 3U, 15 disk DAE. Rails for the DAEs are installed exactly like the rails for the DPEs.

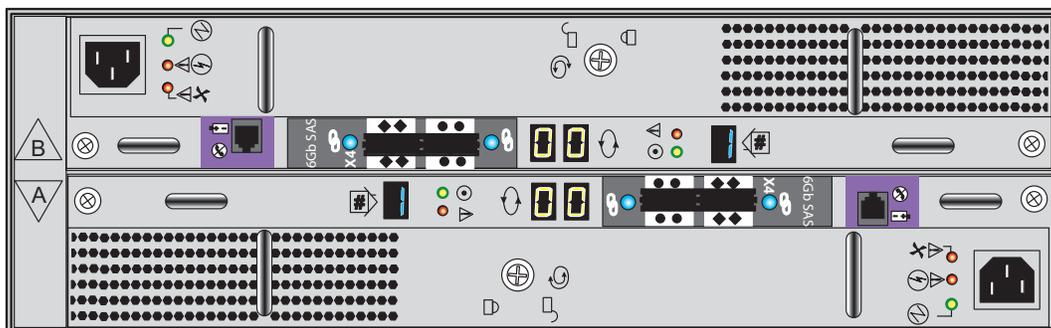
If DAEs are used they should be installed immediately above the DPE. Either type of DAE may be installed up to a total of 125 disks.

2U, 2.5 inches, 25 Disk-array enclosure front



Rear

3U, 3.5 inches, 15 Disk-array enclosure front



Rear



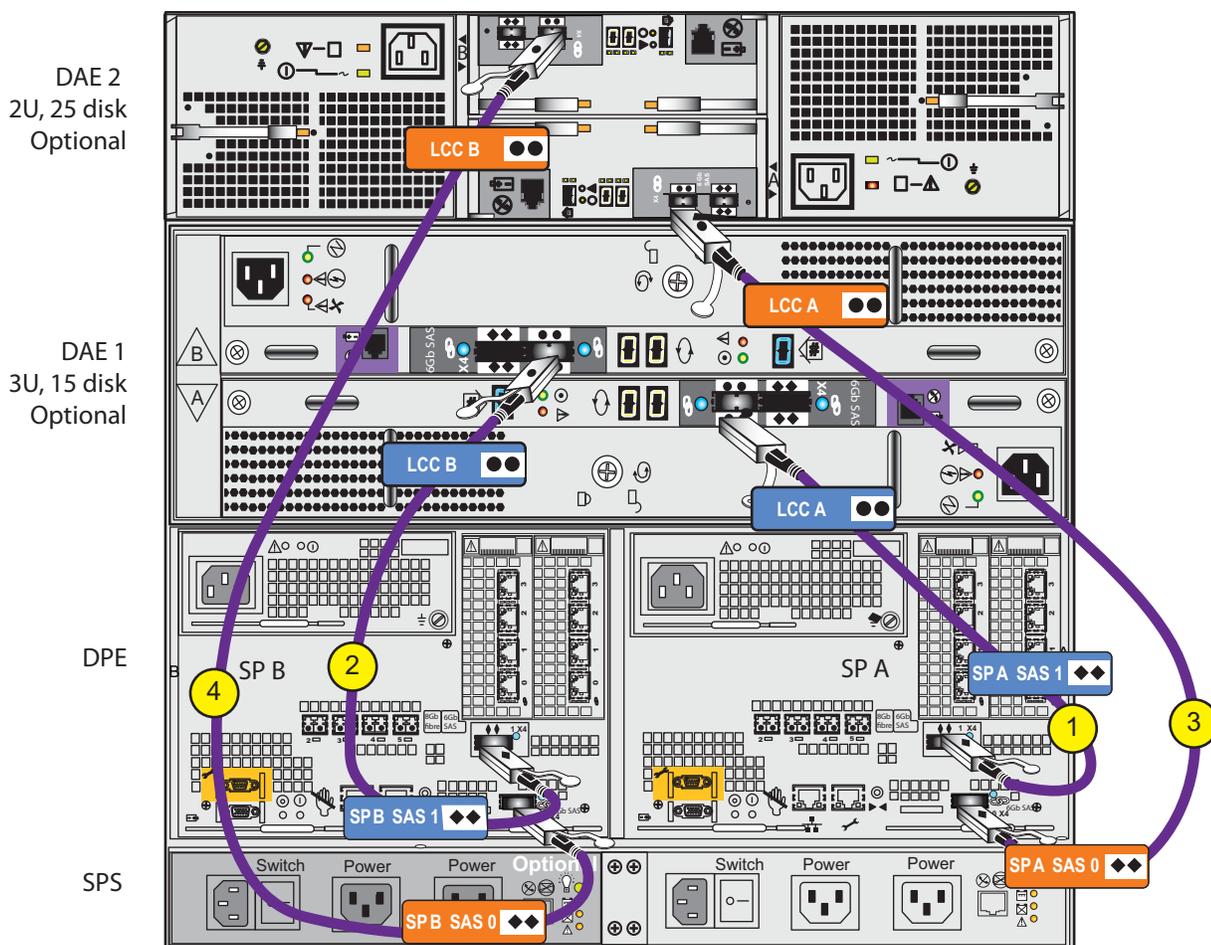
The DAE is heavy and should be installed into a rack by two people. To avoid personal injury and/or damage to the equipment, do not attempt to lift and install the enclosure into a rack without a mechanical lift or help from another person.

VNX5300 SAS cabling

Cabling between the DPE and optional DAEs uses SAS cables. The connectors on SAS cables have icons indicating each end.

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; the third DAE is connected to SAS1, and so forth. Adding additional DAEs is covered in the **VNX5300 Hardware Overview**.

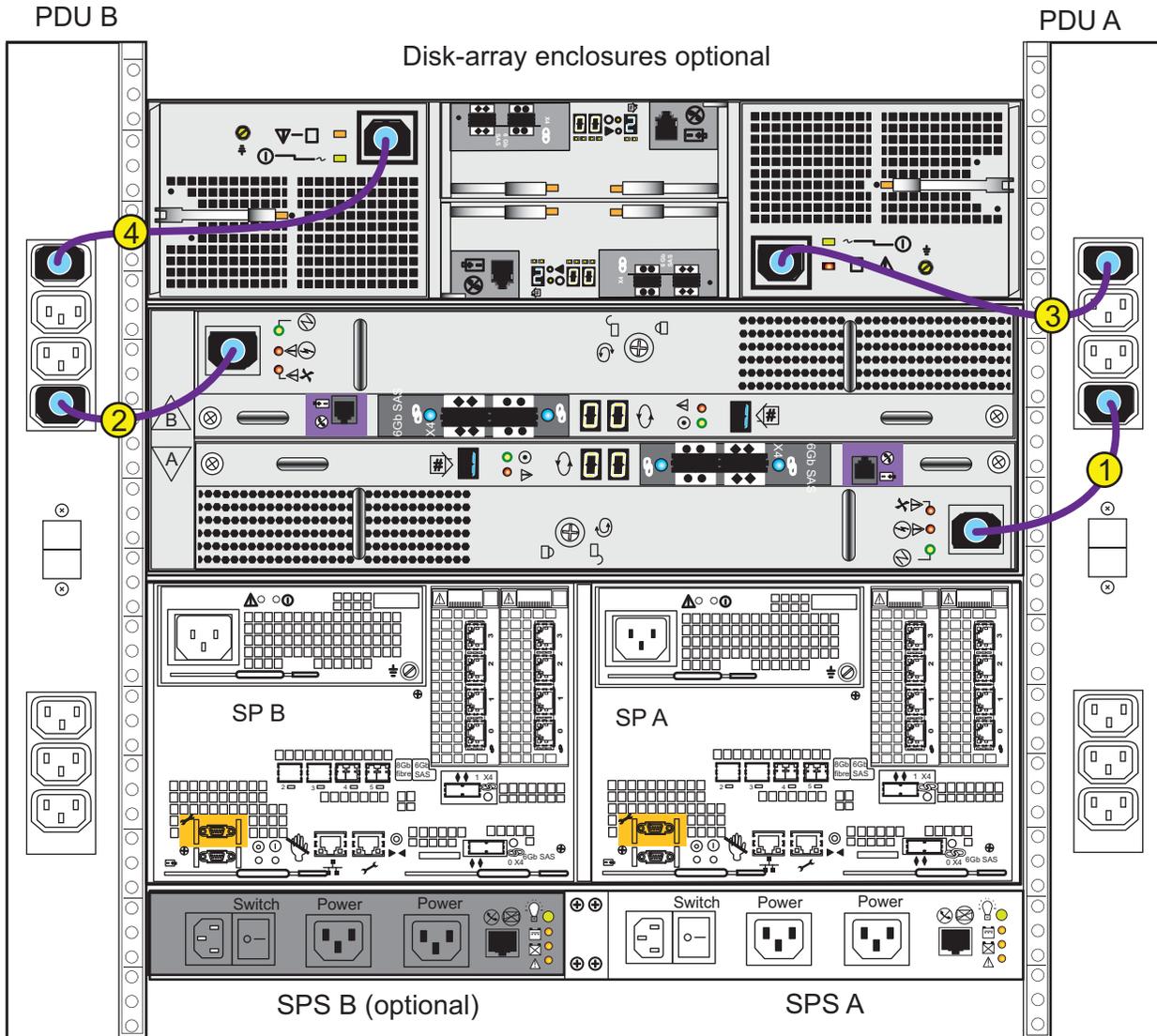
- 1 From SP A SAS 1 ◆◆ to DAE 1 LCC A ●●
- 2 From SP B SAS 1 ◆◆ to DAE 1 LCC B ●●
- 3 From SP A SAS 0 ◆◆ to DAE 2 LCC A ●●
- 4 From SP B SAS 0 ◆◆ to DAE 2 LCC B ●●



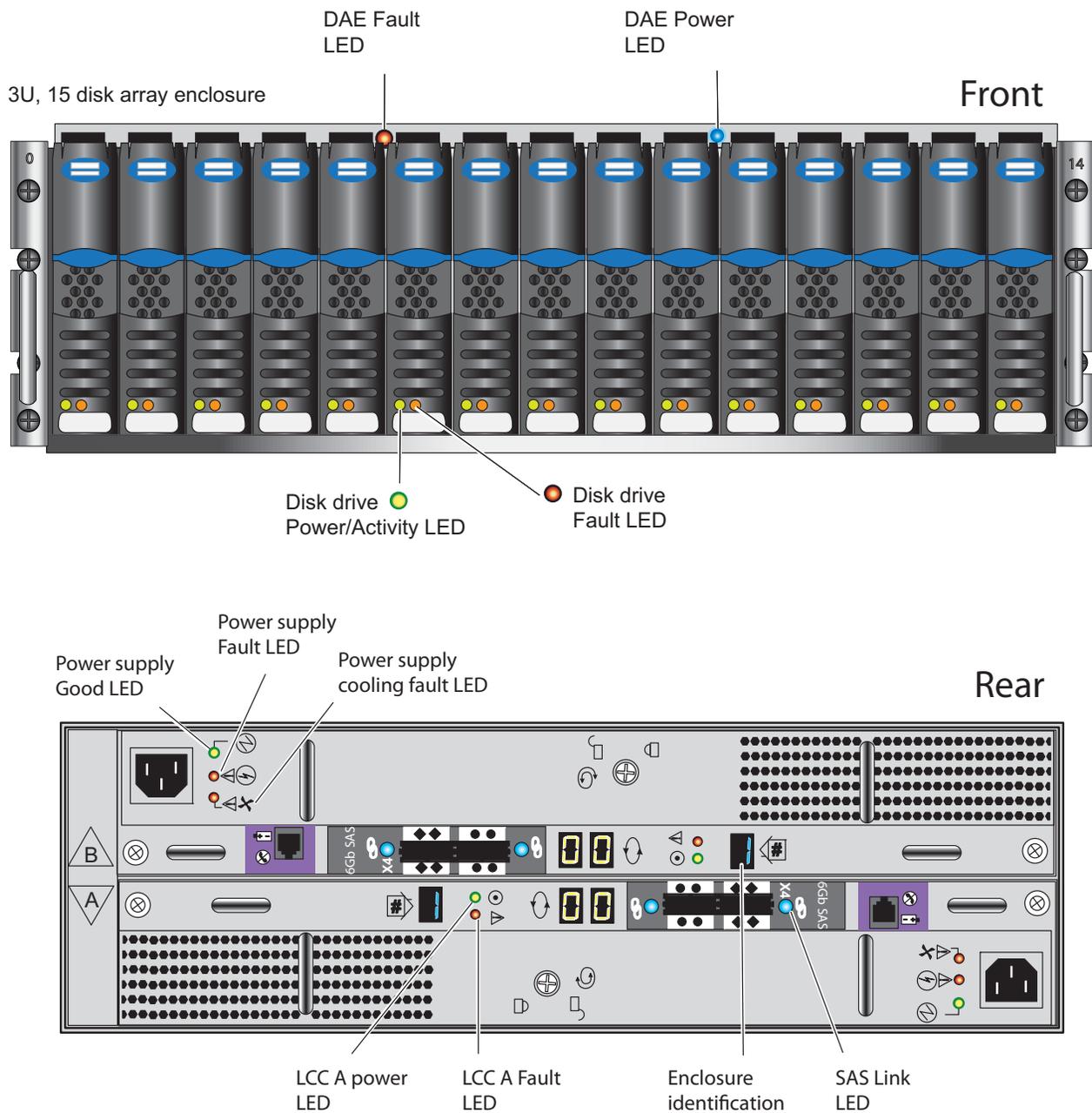
Note: On the 15-drive DAE, because LCC A and LCC B are reversed, the cable connections into LCC B and LCC A are also reversed. LCC B will have the tab up, while LCC A will have its tab down. On the 25-drive DAE the cable connections into LCC B and LCC A are identical. Both LCC B and LCC A will have the tab up.

Powering up the VNX5300 DAEs

DAE power cables should be connected directly to the power distribution units (PDUs) as shown. Once they are connected, the DAEs will begin to power up. ① ② ③ ④



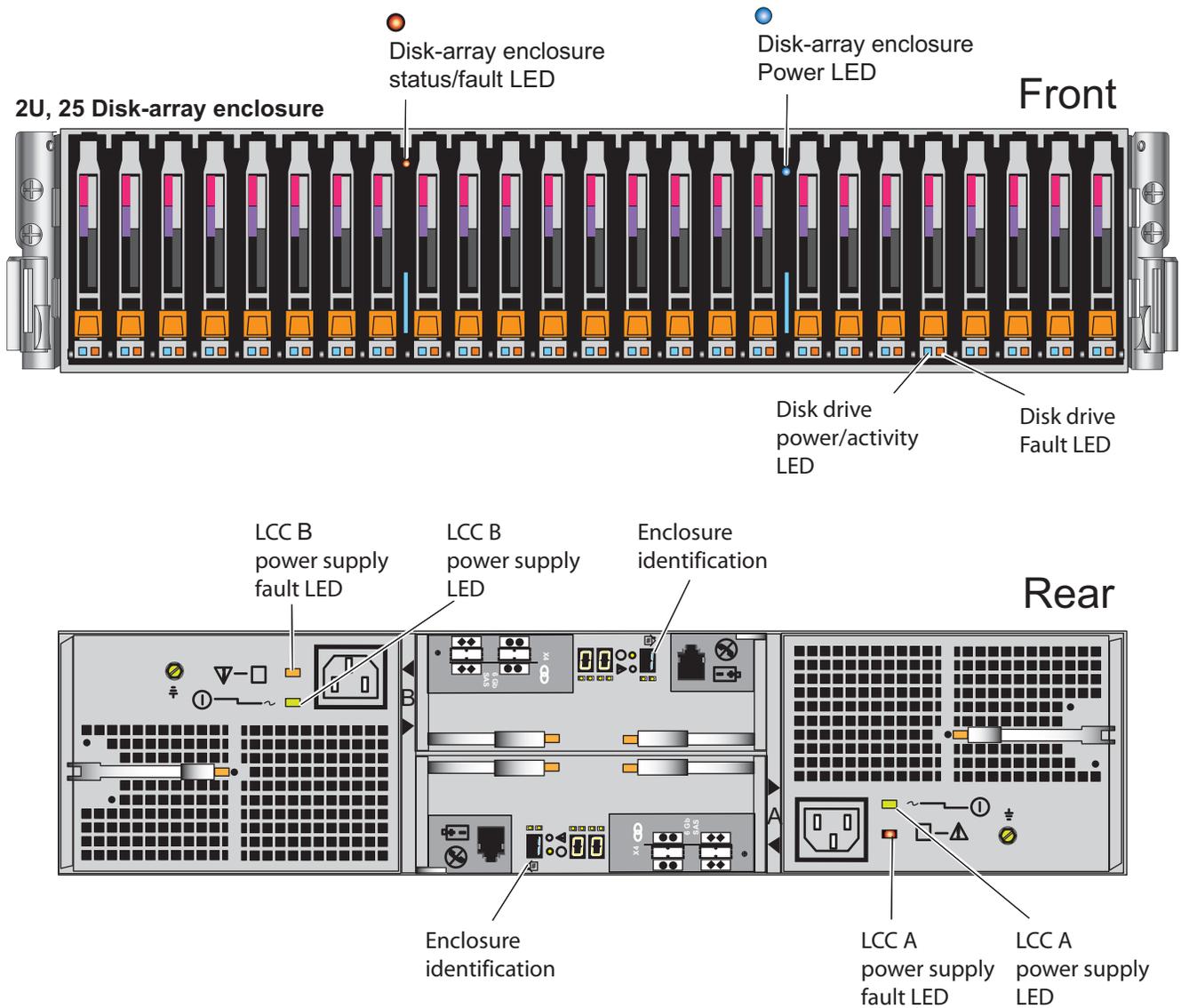
VNX5300 DAE 3U LEDs



If the power LEDs do not remain solid/steady green, contact your authorized service provider.
If the power LEDs on each DAE remain solid/steady blue/green, proceed with the next steps.

For complete information on the DAE LEDs, see the **VNX5300 Hardware Overview**.

VNX5300 DAE 2U LEDs

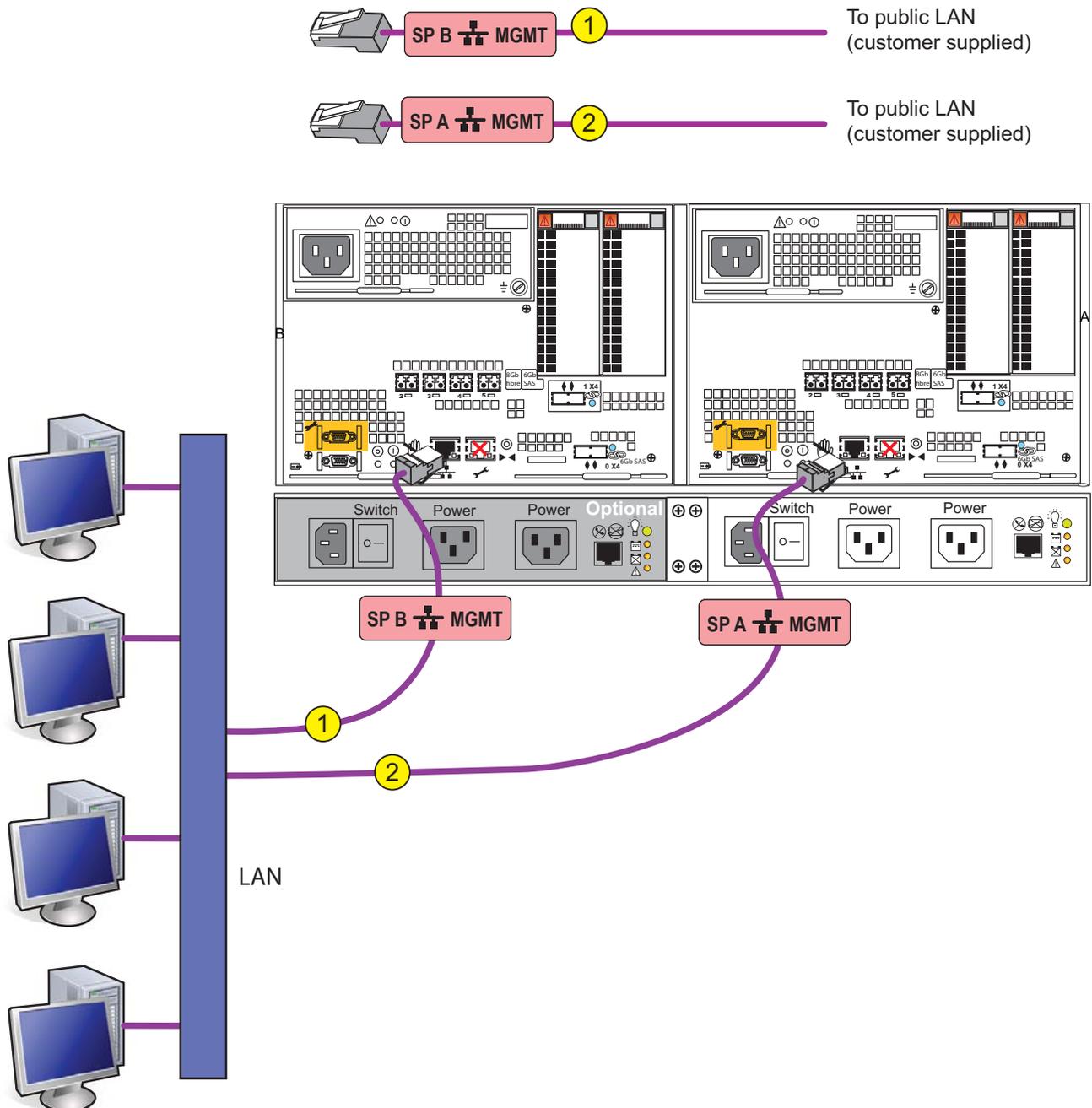


For complete information on the DAE LEDs, see the **VNX5300 Hardware Overview**.

Attach the VNX5300 to your network

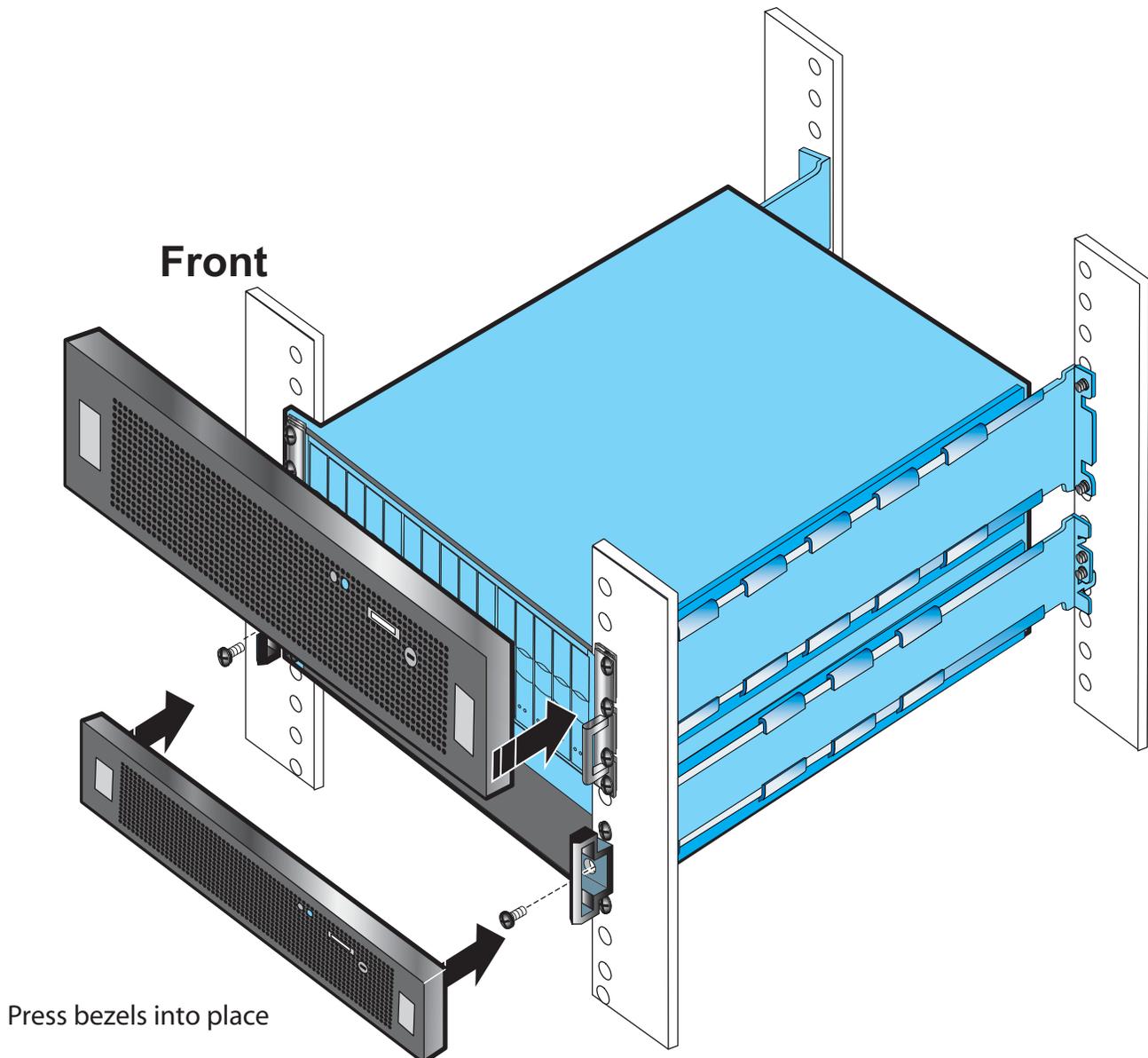
On each storage processor, use a CAT5e or better Ethernet cable to connect the RJ45 port labeled management to the network from which you will configure the VNX5300 system.

Note: The VNX5300 storage processor and the Windows host from which you initialize and configure the storage system must share the same subnet.

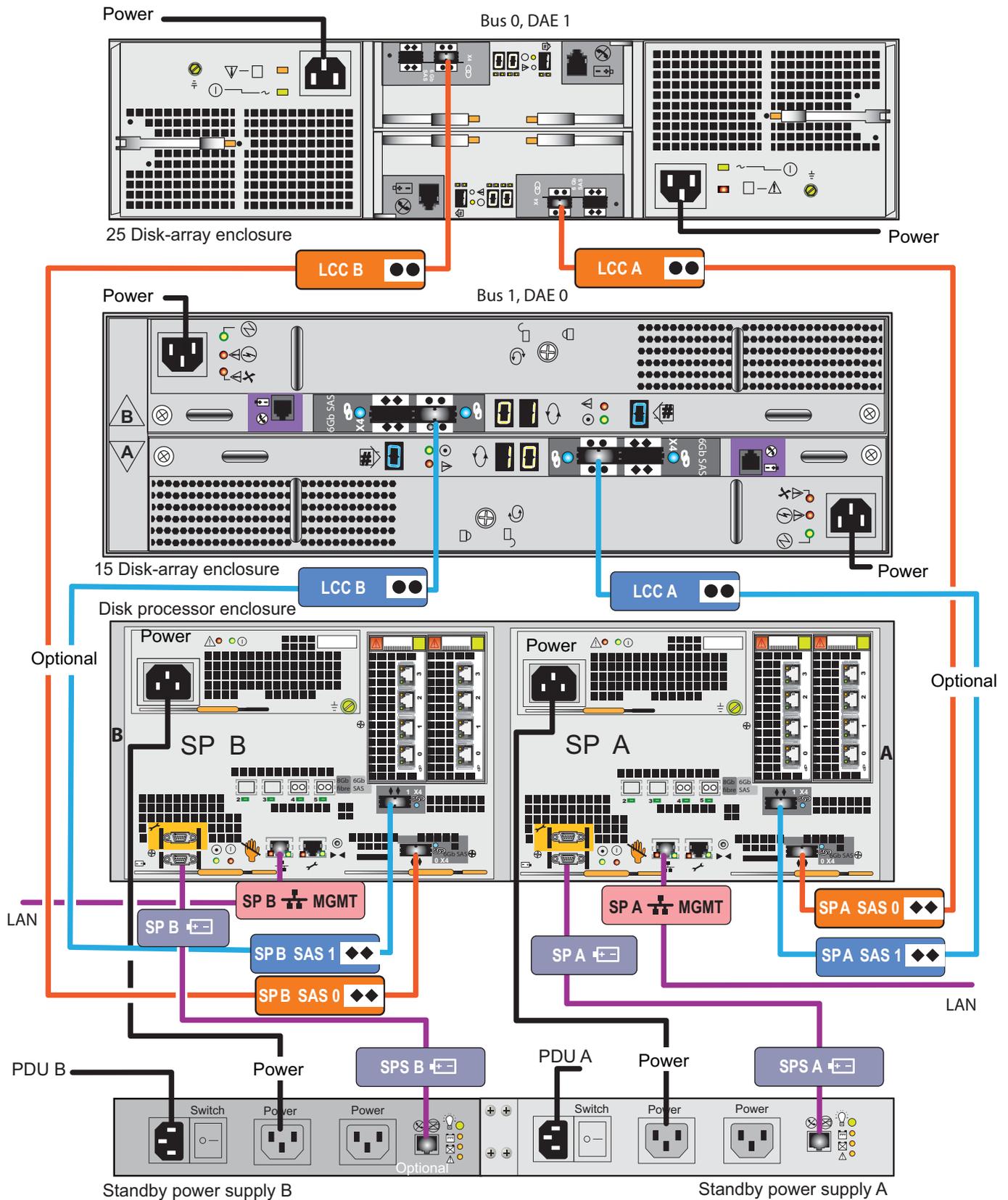


Attach the VNX5300 bezels

When all of the components have been installed, all of the screws have been tightened snugly, 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 size bezel for each component and press it into place on the front of the component.



VNX5300 cabling diagram



Initialize and enroll the storage system

If you do not have or do not wish to use internet connectivity to continue the storage-system installation, you can use the VNX Installation Toolbox CD to initialize, enroll, upgrade, and register the system.

To use the VNX Installation Toolbox, insert the CD in the server connected to the same subnet as your storage system. From the home page, specify your VNX model and configuration and select View Procedure to view the installation procedure online.

Use the **Unisphere Initialization Utility for Block** to configure the management network interfaces for the storage system's SPs. Initializing allows you to manage the system over the LAN with Unisphere software.

After you initialize your system, you can enroll for access to software downloads such as new software and patches.

Before continuing, make sure that the storage system is powered up, that each SP power light (rear of enclosure) is steady green, and that no amber lights are blinking.

1. Install the initialization utility.

On a Windows host on the *same* subnet as the storage system, download the software:

- a. From the EMC Support website, select **Support > Software Downloads**
- b. Select the appropriate initialization utility version to download and select the option to save the software to your server.
- c. Double-click the following executable file to start the installation wizard

UnisphereInitUtil-Win-32-x86-language-version-build.exe where:

language is either **en_US**, when only the English version is available, or **loc**, when the localized versions are available (including English). *version* and *build* are the version number and the build number of the software.

- d. Follow the instructions on the installation screen to install the initialization utility.

Initialize and enroll the storage system

If your server is behind a firewall, open the TCP/IP port 2162 (outgoing) and port 2163 (incoming). The initialization utility will not function properly if these ports are not opened.

2. Run the Storage System **Initialization Utility** on the host.
 - a. If the utility did not launch automatically after installation, select **Start > Programs > EMC > Unisphere Initialization** from the toolbar.
 - b. The utility automatically scans the subnet for storage systems. Uninitialized systems are identified by hardware serial number. (You recorded your hardware serial number on the worksheet in the Planning steps and worksheets found on pages 6-8.)

If the discovery operation did not find the storage system that you are installing, verify that the storage system's management ports are properly cabled to the LAN on which the host resides. The storage system and host must both reside on the same subnet.

- c. From the **Uninitialized Systems** list, select the serial number of the storage system to initialize and click **Next**.
 - d. Use your completed worksheets to provide all the information the utility requests.

When finished, the utility boots the storage system.

3. Go to the EMC Product Support site to gain access to software downloads. Be sure that your storage system is registered on the site.

Update software

Your storage system shipped from the factory with the latest version of the VNX Operating Environment software available at that time. Use the **Software Upgrade Assistant** wizard to determine whether you need to install an operating environment (OE) patch. If you purchased optional VNX SnapView™, VNX MirrorView™, or VNX SAN Copy™ software, use the wizard to install enabler software for those products.

The Software Upgrade Assistant wizard is part of the **Unisphere Service Manager**.

Install the Unisphere Service Manager

1. Download the Unisphere Service Manager (USM) from the **Support by Product > Software Downloads** page for your storage system.
 - a. On the **VNX Product** page, select your system.
 - b. Select **Unisphere Service Manager** and select the option to save the software to host or client.
 - c. In the folder where you saved the USM, double-click the executable file, and if necessary, click **Run** to start the installation wizard.
 - d. Follow the instructions that appear.
 - e. After you accept the license agreement, the wizard verifies that the server is running the supported Java Runtime Environment (JRE) version.
 - If the server is running an earlier version of the JRE, select **Yes** when asked if you want to continue with the installation. The installation wizard prompts you to download and install the latest version of the JRE from the Sun website.
 - If the server is running a later version of the JRE, the installation wizard asks if you want to continue with the installation. Select **Yes** to continue or **No** to quit the installation.
- Note:** If you select **Yes**, the USM may not work properly with a later JRE version. If you select **No**, and manually remove the later version of the JRE, other applications that require this version may not work properly.
2. When the installation is complete, click **Done**.

Update software and register your system

Installing a VNX OE patch or software enabler

1. Start the **Unisphere Service Manager**.
2. Log in to your storage system.
3. Select **Software > System Software**, and then click **Prepare for Installation** (Step1).
4. In the welcome page, select **Download software only**. The wizard determines the revision of software installed on the system and notifies you of any required patches or newer releases.
5. Select and download any software that you want to install, and click **Finish**.
6. Select **Install Software** to install any patches or software that you downloaded in the previous step, and to install any enablers that you ordered with your system.
7. Once you have checked for updates and installed software, proceed to the next step.

Register your storage system

The Storage System Registration Wizard sends site and configuration information to your service provider. We strongly recommend that you run the wizard now as follows:

1. Verify that the client is connected to both the storage system and to the internet.
2. If the Unisphere Service Manager (USM) is not open, start it now. After logging in to your system, select the **Registration** tab and click **Register Storage System** to start the Storage System Registration Wizard.
3. Follow the wizard prompts to complete the registration.

What next?

We recommend that you set up either iSCSI or Fibre Channel environments and confirm its error-free operation. Complete information on setting up these environments is available online in the customized documentation available for this storage system.

VNX5300 Block Checklist

This procedure assumes you have just completed all the steps in the Installation Guide up to this stage. This means that you have already installed, cabled, and powered up the system. Once you have done that, proceed to the following:

Initialize the storage system

On the Windows management station, put the VNX Installation Toolkit CD in and run it. To initialize the system, download and install the Unisphere Initialization Utility. The latest version of this utility is available from the EMC Product Support site, although a version is also on the CD. Follow the online instructions to discover and assign IP addresses to the storage system.

Update storage system software

The storage system comes pre-installed with the latest version of VNX OE software available at the time of shipment. To see if any patches or newer releases have been made available since shipment, or to install any enabler software that you ordered with your system, do the following:

- Download and install the **Unisphere Service Manager**, also on the Toolkit CD. It automatically checks if newer versions are available when you start to run it.
- Select and download the software that you want to install, and click **Finish** to close the wizard.
- Launch the Install Software wizard to install any available patches or software that you downloaded in the previous step, and to install any enablers that you ordered with your system.

Register the storage system

Run the Storage System **Registration wizard** in the **Unisphere Service Manager** to register for service with your service provider. That wizard asks you a few questions about the storage system installation site and support contacts. The wizard then sends this information to the service provider along with basic storage system configuration details. This process of transferring the data to the service provider is completely automated so that your service provider can receive data over the Internet or by encrypted email.

In order to install a server do the following:

Install HBAs, drivers, and required patches

On the server, install HBAs, the appropriate drivers, and any required driver updates (such as service packs, hotfixes, or patches). Additional documentation for this step is available at www.emc.com/vnxsupport.

Install path management software [Optional]

Install PowerPath on the server. If you have supported path management software other than PowerPath, install it on the server as described in the software documentation.

Install the Unisphere Server Utility

Install the Unisphere Server Utility on each host that will be attached to the storage system. You have the option to launch the Windows version of the Unisphere Server Utility after installation from the Toolkit CD. For other operating system versions, see the **Software Downloads** site for the VNX family.

VNX5300 Block Checklist

- Cable the server to the storage system**

Use fibre optic (FC) cables to connect the storage system data ports and servers. For servers connected through a switch, create zones. After connecting the storage system and server HBAs together with a switch, create single initiator zones following your switch vendor documentation. Single initiator zones contain only one HBA and one or more storage system data ports. For additional information on cabling, see the Server information at www.emc.com/vnxsupport.
- Register server connections**

On each server with a Fibre Channel host bus adapter, run the **Unisphere Server Utility** to register the HBAs with the storage system.
- Set up the management software**

Commit the storage system software, if that has not already been done.
- Allocate storage to server**

Create RAID groups/pools and LUNs and then present them to the server in its storage group. Then you can make the LUNs visible to the server.
- Verify server High Availability and storage system health**

Ensure that Unisphere indicates that all storage system components are working properly. Using the Unisphere Server Utility, verify the server's high availability.
- Register your contact and storage system information with Support**

Register the storage system with your service provider and install **VNX ESRS IP Client**. Set up and test the ConnectHome process.

Before you begin

VNX5300 File and Unified Configurations

Welcome

If you do not already have a Product Support account, go to <https://support.emc.com/products/VNX5300> and set one up immediately. You will need a support account for access to the latest documentation and troubleshooting information, online chat, installation/maintenance videos, and utilities and wizards.

Software upgrade

If you bought a software maintenance contract, you are entitled to software upgrades only after the installation and registration have successfully completed.

Site preparation

Make sure your site includes the following resource requirements

AC power

- For high availability: At least two 110 or 240 V AC circuits are required.

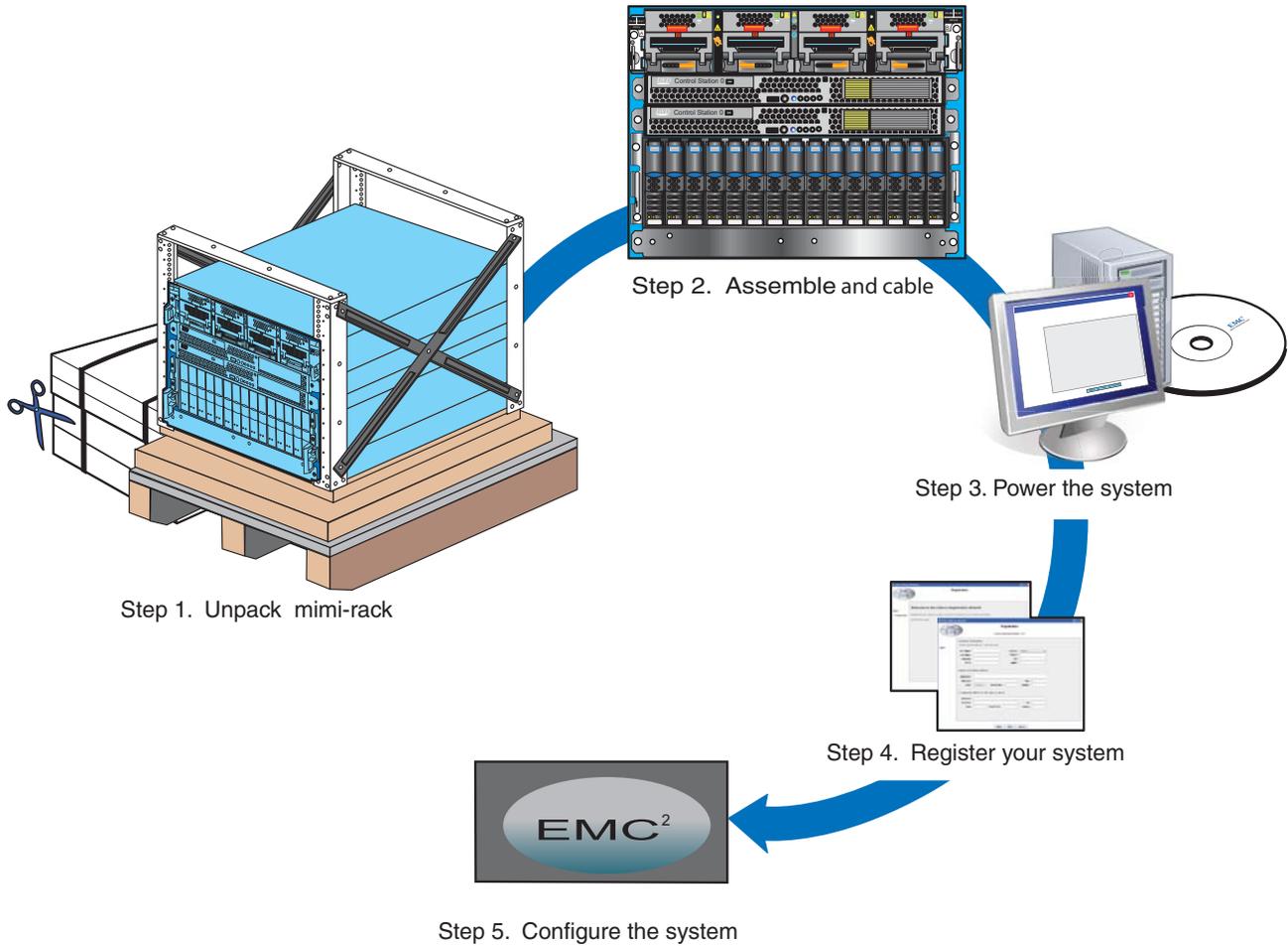
Network connections

- One or two 1-Gigabit Ethernet management connections (depending on 1 or 2 Control Stations)
- Cabinet vertical space 3U (5.25 inches, 13.33 cm) for disk processor enclosure (DPE), 1U for each Control Station (CS), 2U for the blade enclosure (BE), and 1U for the standby power supply (SPS). A total of 8U minimum vertical space is required, plus space for any DAEs.
- Space for each optional DAE, either 2U or 3U

A Windows-based computer to run the connection, utility, and initialize the VNX5300 with:

- At least 100 MB of free space
- Connection on same LAN subnet as your VNX5300.
- DNS/NTP server network connection to the VNX5300 and the management host
- Windows Domain Controller recommended
- SMTP server network connection to the VNX5300 and the management host

Installation overview



Installation overview steps

Your VNX5300 may arrive at the site fully installed in a cabinet. In this case, you can use this manual to verify the cabling before powering the system up.

If it is to be installed in a customer-supplied cabinet, follow the instructions in this guide. Your system cabinet may vary from the illustrations shown in this document.

Installation steps:

1. Unpack the shipping boxes and ensure that the site has been prepared. Check that you have received all of the system's components, including cables and bezels.
2. Assemble the hardware and cable your VNX5300 according to the instructions in this guide. Ensure that all of your cables are seated securely and install the bezels on the front of each system component.
3. Power up the system and install any optional disk-array enclosures. Once the system is powered up, proceed to install the system software.
 - a. Use the VNX Installation Toolbox CD, which contains the documentation and utilities required for the installation of the software.
 - b. Download and run the VNX Installation Assistant for File or Unified.
 - c. Then install and set up the VNX ESRS IP Client from the Toolbox.
4. Register your system with EMC. You can register using the VNX Installation Assistant or download the Registration Wizard from the EMC Support site. If you do not register your system now, your request for support from your service provider will be delayed.
5. Use Unisphere to configure the system, provision storage, and connect to storage from hosts and applications on the network. For customized information on setting up your storage array and connecting to hosts, see the EMC Support site.

These steps are explained in more detail in the rest of this Installation Guide.

VNX Installation Assistant for File/Unified Worksheet

Complete this worksheet and use the information to install, using the VNX Installation Assistant for File/Unified. Download the latest version of the VNX Installation Assistant for File/Unified from the Support section of the EMC Online Support site. *Getting Started with VNX Installation Assistant for File/Unified* provides more information on the VNX Installation Assistant for File and Unified pre-configuration and provisioning processes.

Note: If you want to configure the IPv6 addresses for the Control Station (Control Station address, DNS, or NTP) or for the Data Movers (DNS or NTP), use the VNX Installation Assistant for File/Unified for the initial installation and then refer to the *Configuring and Managing Networking on VNX* technical module and *EMC VNX Command Line Interface Reference for File* to complete the IPv6 additions.

The VNX Installation Assistant for File/Unified pre-populates values based on auto-discovery from your Windows client. Shaded fields below are values that will be auto-discovered based on your system and network environment; if auto-discovery fails, you need to provide the information manually.

- Record the appropriate Control Station public LAN settings.

Field	Value
Primary hostname	
Primary IP address	
(For second Control Station only) Secondary hostname	
(For second Control Station only) Secondary IP address	
Netmask	
Gateway	
DNS domain	
Primary DNS server	
Secondary DNS server	
NTP server	
Time Zone	

- The passwords for the root user, NAS administrator (nasadmin) and System administrator (sysadmin) for backend array access are default factory values and should be changed as soon as possible for security reasons. The passwords can be changed during the VNX Installation Assistant for File/Unified installation process or later, from within Unisphere.

root_password (default value = nasadmin)	
NAS Administrator (default value = nasadmin)	
System Administrator for backend array access (default value = sysadmin)	

VNX Installation Assistant for File/Unified Worksheet

3. The appropriate blade public LAN settings are auto-discovered.

DNS domain	
Primary DNS server	
Secondary DNS server	
NTP server	

Note: These settings apply to all primary blades.

4. Record the storage processor public LAN IP addresses.

Note: Public IP addresses for your storage processors are required for use with the Unisphere for Block Service Taskbar for routine array maintenance and upgrades. In addition, for VNX for File systems where Unisphere for Block licenses are in place, Navisphere can be used to manage storage for external host connectivity, and the VNX for File. However, we recommend users manage VNX for File storage using the Provisioning Wizard capability within the VNX Installation Assistant or within Unisphere. The IP addresses must be on the same subnet as the Control Station.

SP A IP address	
SP B IP address	

5. If applicable, configure service provider/customer notification information.

Note: The dial-in modem number is the phone number for the line that connects to the modem. This is the local number that is used by the service provider to dial into your system.

Note: Email will not work without a DNS server.

Service provider/ customer notification	Email Server (recommended)
	Recipient Email Addresses (optional)
Site information	Site ID (optional) (party name)
	Dial-in Modem # (optional)

6. Check the boxes of the licenses that you have purchased.

<input type="checkbox"/> CIFS (Windows)	
<input type="checkbox"/> NFS (Linux)	

At this point, the installation and pre-configuration portions of VNX Installation Assistant for File/Unified are complete.

Provisioning Wizard Worksheet

Complete this worksheet and use the information here to provision storage, create an NFS export, create a CIFS (Windows) share, or set up your MPFS system (for MPFS-supported systems only) using the Provisioning Wizard.

Note: The Provisioning wizards can be launched and used as often as necessary to provision storage, to create an NFS export, create a CIFS (Windows) share, and set up your MPFS system (for MPFS-supported systems only).

Provision unused disks

If you want to provision storage using the Provisioning Wizard, complete this section. Storage provisioning involves creating RAID groups and LUNs.

Network Configuration

Blade name	
IP Address to be assigned to the newly-created interface	
Netmask address	
MTU (optional; default is 1500)	
VLAN ID (optional; default is 0)	

Network Device

Network device name	
Create and use new network device	
Network device settings	
Device name	
Ports	

Provisioning of the storage available through the VNX depends on individual site requirements. You can perform provisioning via the Provisioning Wizard or Unisphere. You can also add additional storage and perform additional provisioning later. See the documentation and videos available on the VNX product page on the EMC Support site.

Provisioning Wizard Worksheet

Create NFS export

If you want to create an NFS (UNIX/Linux) export using the Provisioning Wizard, complete this section.

Blade name	
Export name	
Allocate storage from (select from dropdown)	
Export size (MB, GB, or TB)	
Host access read-only export	
Read-only hosts	
Read/Write hosts	
Root hosts	
Access hosts	

Create/Attach CIFS share

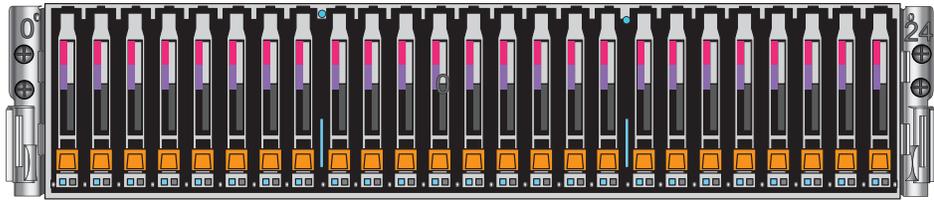
If you want to create a CIFS (Windows) share or attach to an existing CIFS share using the Provisioning Wizard, complete this section.

Blade name	
Share name	
Allocate storage from (select from dropdown)	
Share size (MB, GB, or TB)	
Local drive	
NTP server	
Blade default gateway	
CIFS server domain (Windows NT4, Windows 2000 and Windows 2003)	
DNS server IPs (Windows 2000 and Windows 2003)	
Domain admin user name (Windows 2000 and Windows 2003)	
Domain admin password (Windows 2000 and Windows 2003)	
Organizational unit (Windows 2000 and Windows 2003)	
Workgroup (Standalone)	
Local admin password	
Interfaces	

VNX5300 components

Front

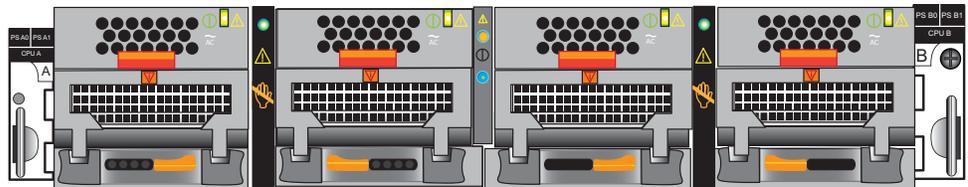
Disk-array enclosure
(DAE)
(optional)



DAE
(optional)



Blade enclosure



Control Station 1
(optional)



Control Station 0

Disk processor
enclosure



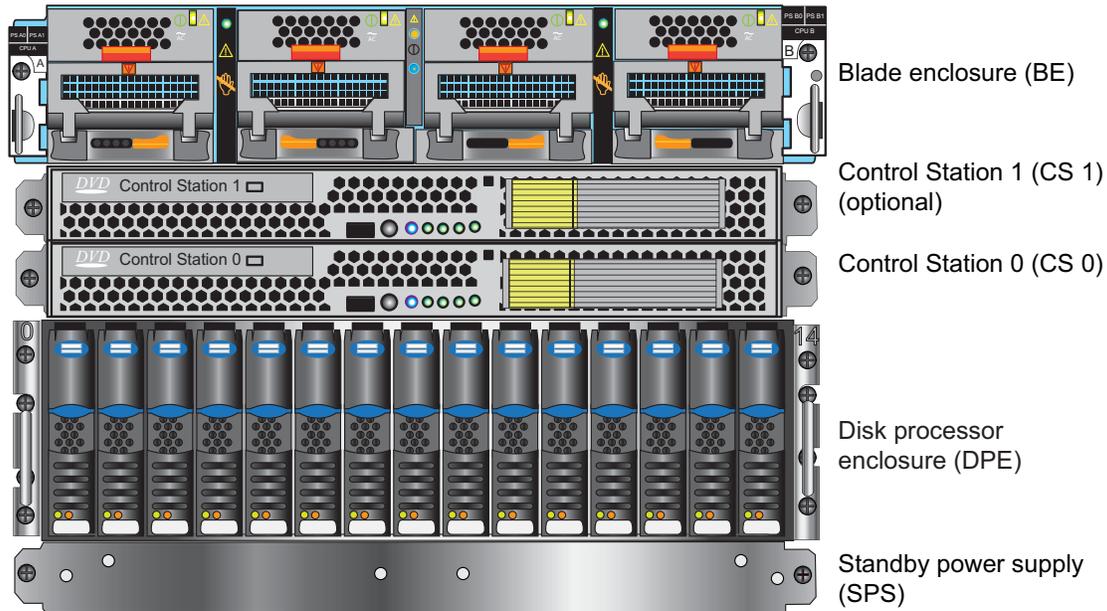
Standby power supply



Front view of the VNX5300, shown with a 15-disk Disk Processor Enclosure, 2 Control Stations, and 2 disk-array enclosures.

Contents of the mini-rack

Front view of the components shown here with 2 Control Stations and without bezels.



Note: The table represents components that are shipped with the VNX5300.

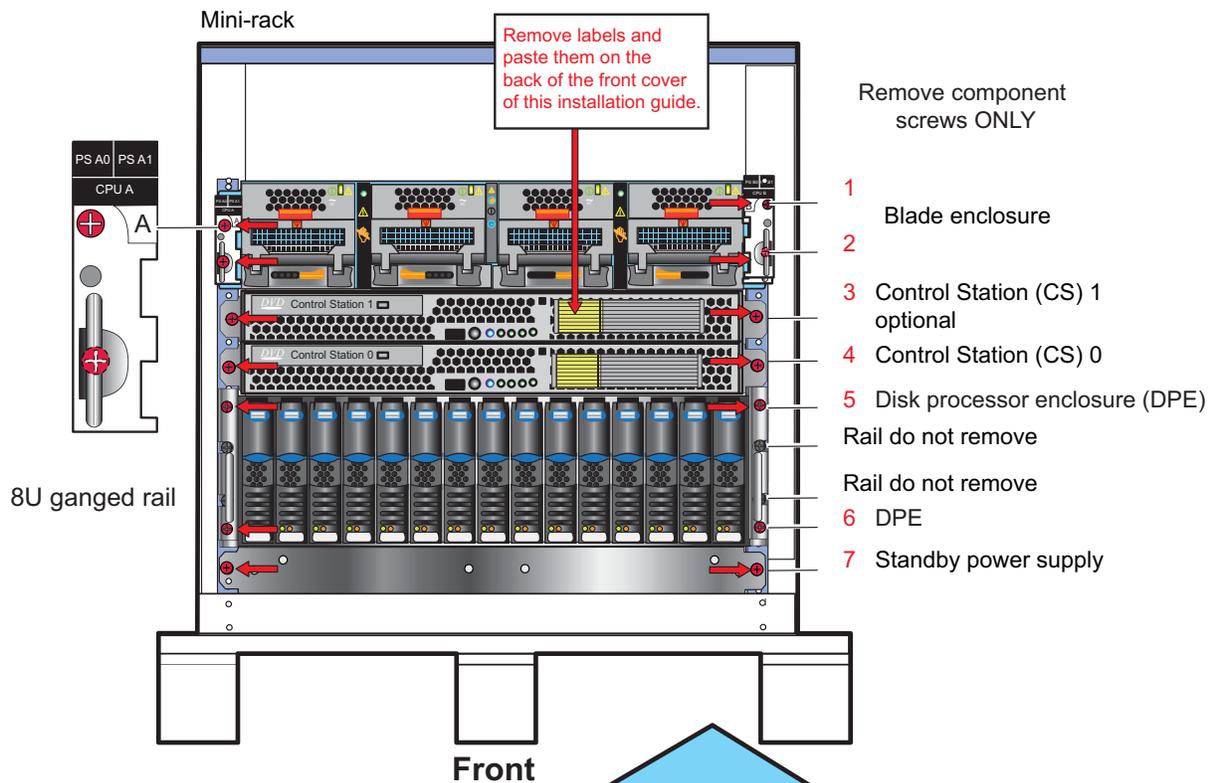
Components	Accessories	Documentation
Blade enclosure (BE)	<ul style="list-style-type: none"> • Mounting screws • Bezel • Power cables • Management cables • Storage processor cables 	Installation guide Cable label kit (for customer cabinet) Environmental Compliance Information and notices
Disk-array enclosure (DAE) (optional)	<ul style="list-style-type: none"> • Mounting screws • Bezels • Power cables 	
1 or 2 Control Stations (CS)	<ul style="list-style-type: none"> • Mounting screws • Bezels • Power cables • Extension cables • Management cables • IPMI • LAN cable 	
Disk processor enclosure (DPE)	<ul style="list-style-type: none"> • Mounting screws • Bezels • Power cables • Storage processor cables • Management cables 	
Standby power supply	<ul style="list-style-type: none"> • Mounting screws • Bezels • Management cable • Power cable • Storage processor cables 	

Contents of VNX5300 mini-rack



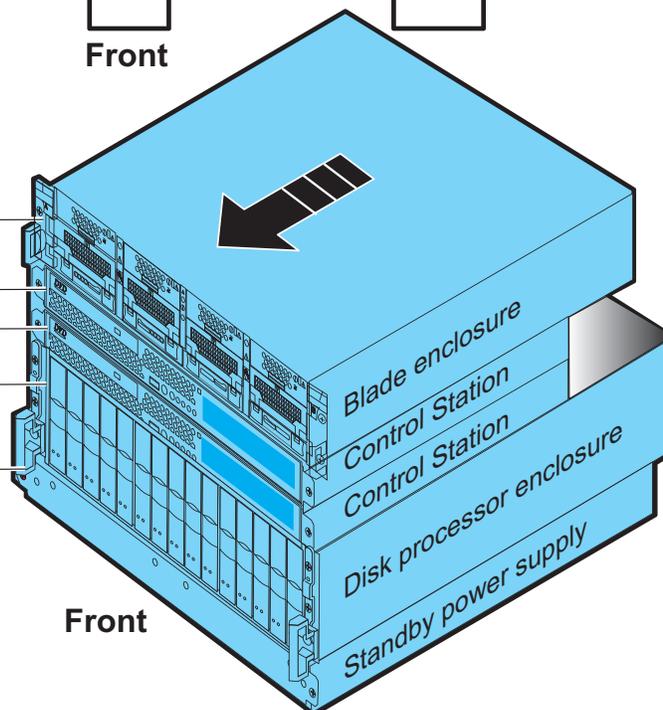
Two people are required to remove the components. Only remove screws holding the components in place at this time. Do not remove the screws holding the ganged rails in place; this may cause damage to the components. Remove the components one at a time.

1. Using a Phillips-head screwdriver, remove the component screws from both sides. Keep the removed screws to install the components in the site rack.
2. Remove the components; once you have removed the screws holding them in the mini-rack. Carefully set aside each component as it is removed from the shipping container.



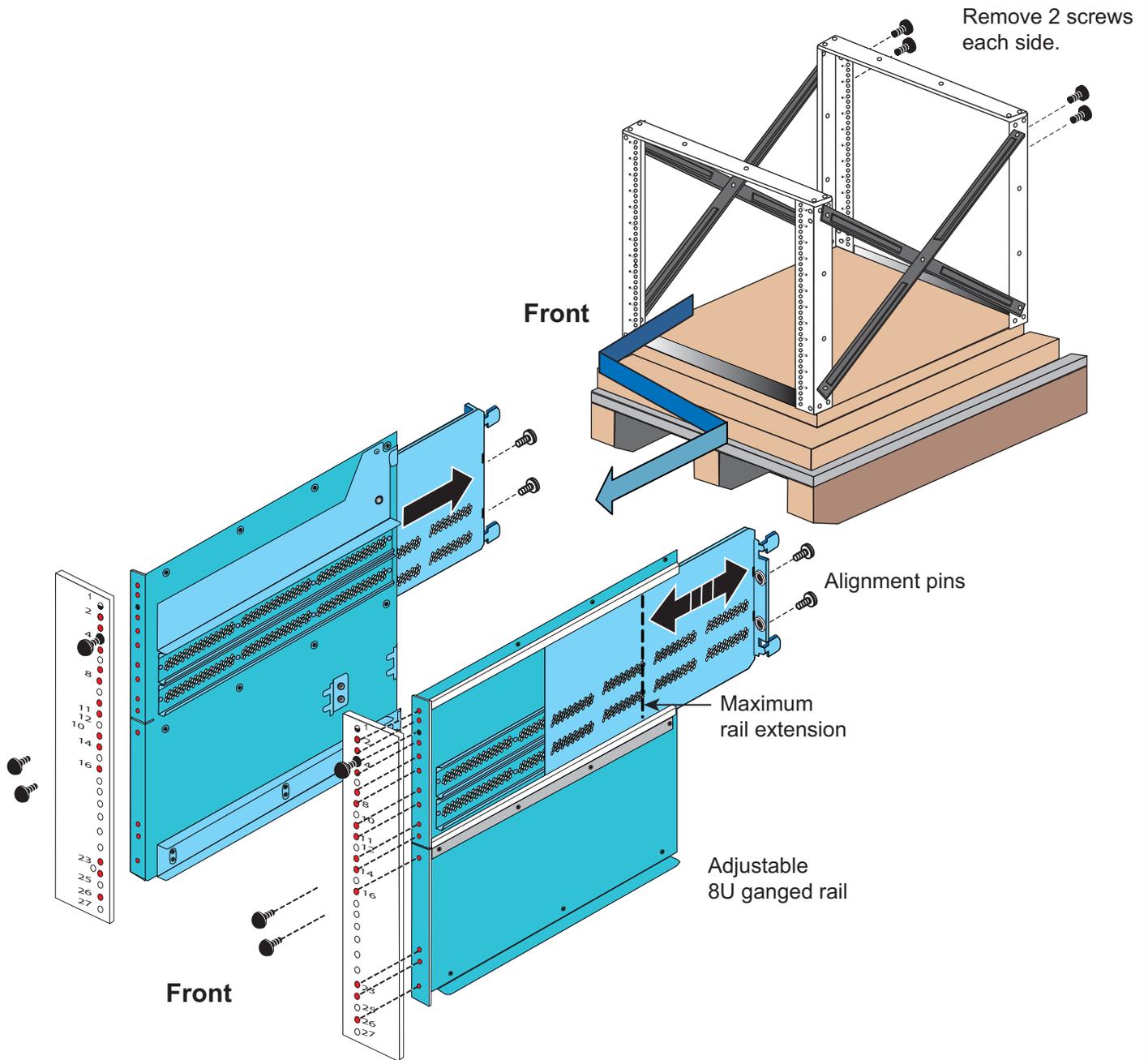
Remove components top to bottom.

- 1 Blade enclosure
- 2 Control Station 1 (optional)
- 3 Control Station 0
- 4 Disk processor enclosure
- 5 Standby power supply

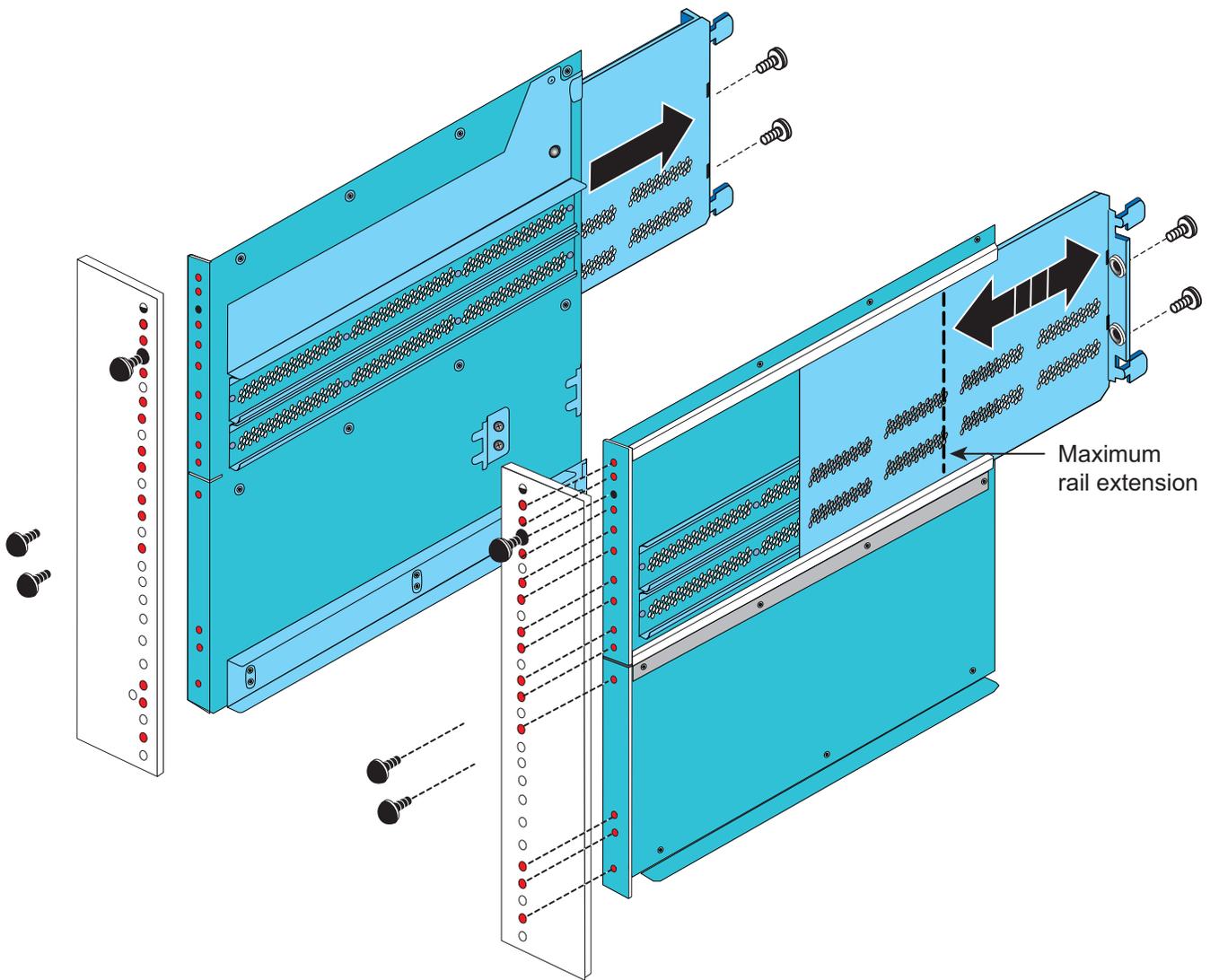


Remove 8U ganged rail

3. After the components have been carefully set aside, remove the screws holding the 8U ganged rail in the mini-rack.
4. Remove the ganged rail from the shipping container.



Ganged rail details



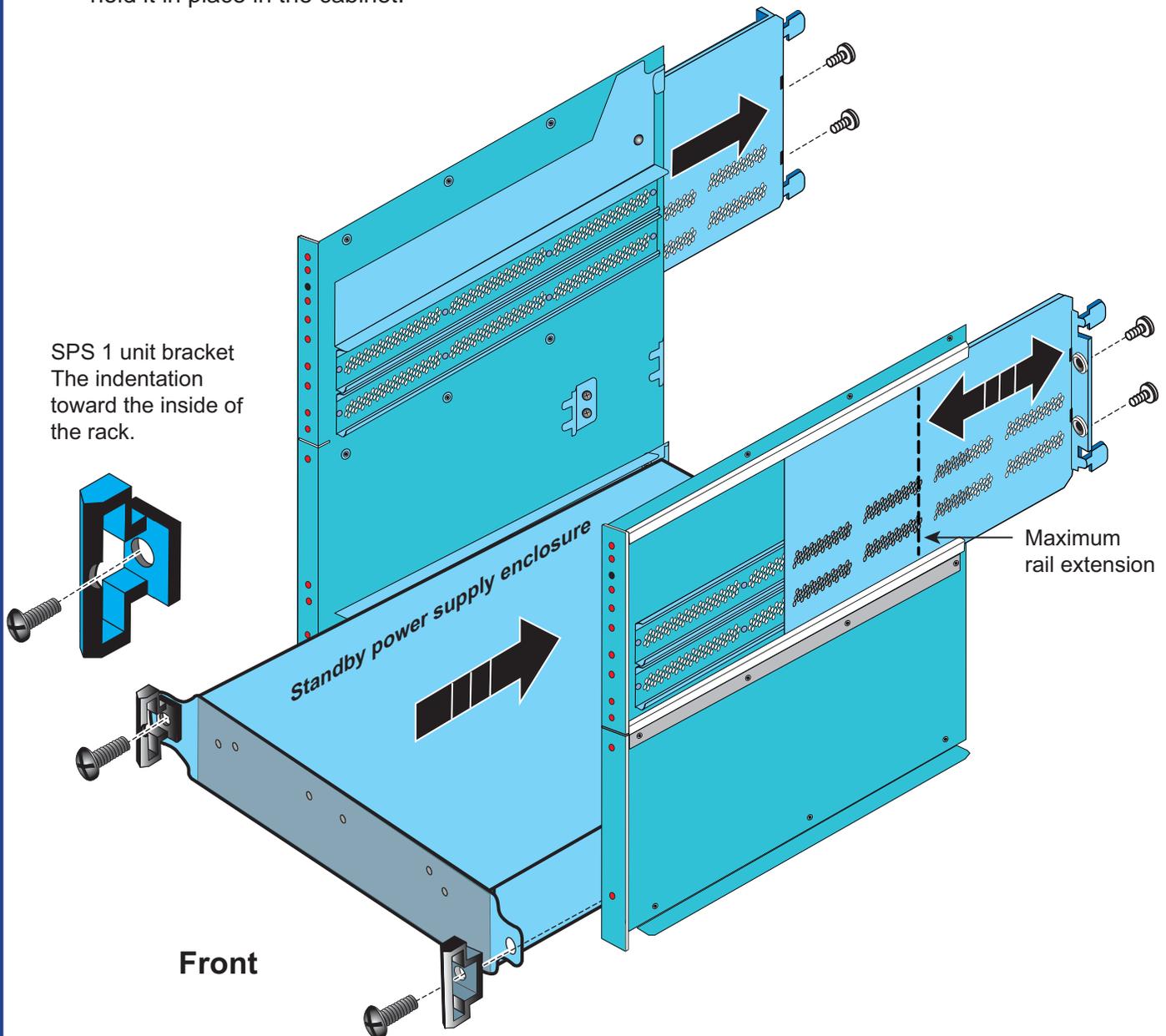
Install the VNX5300 SPS



The SPS 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.

Assistance is required when moving or installing the VNX5300.

1. Slide the standby power supply (SPS) enclosure into the bottom slot of the ganged rails.
2. When the SPS is securely in place, insert one screw on each side and hand-tighten them to hold it in place in the cabinet.

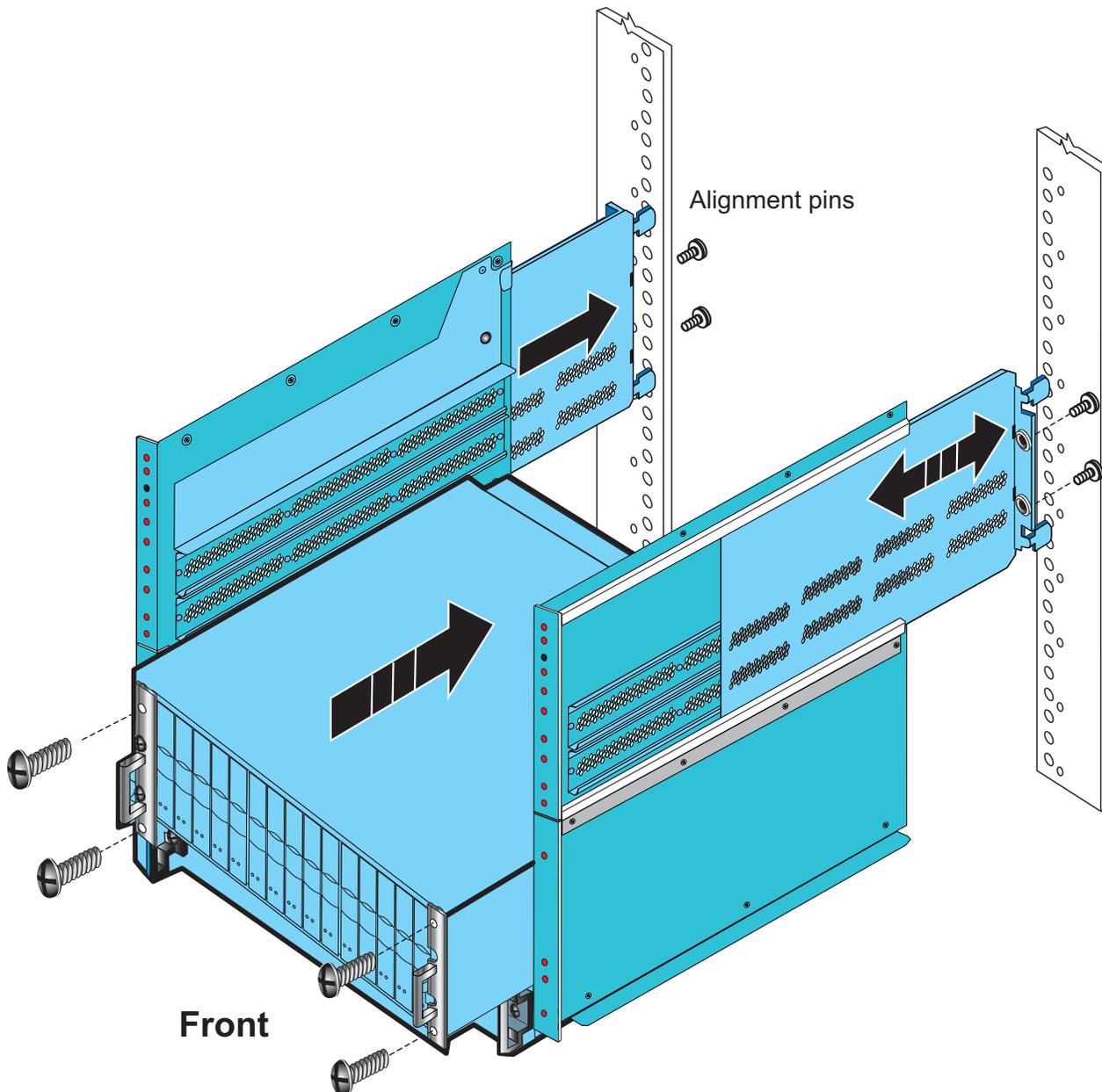


Install DPE component



Two people are required to install the components. Starting from the bottom of the ganged rail install one component at a time.

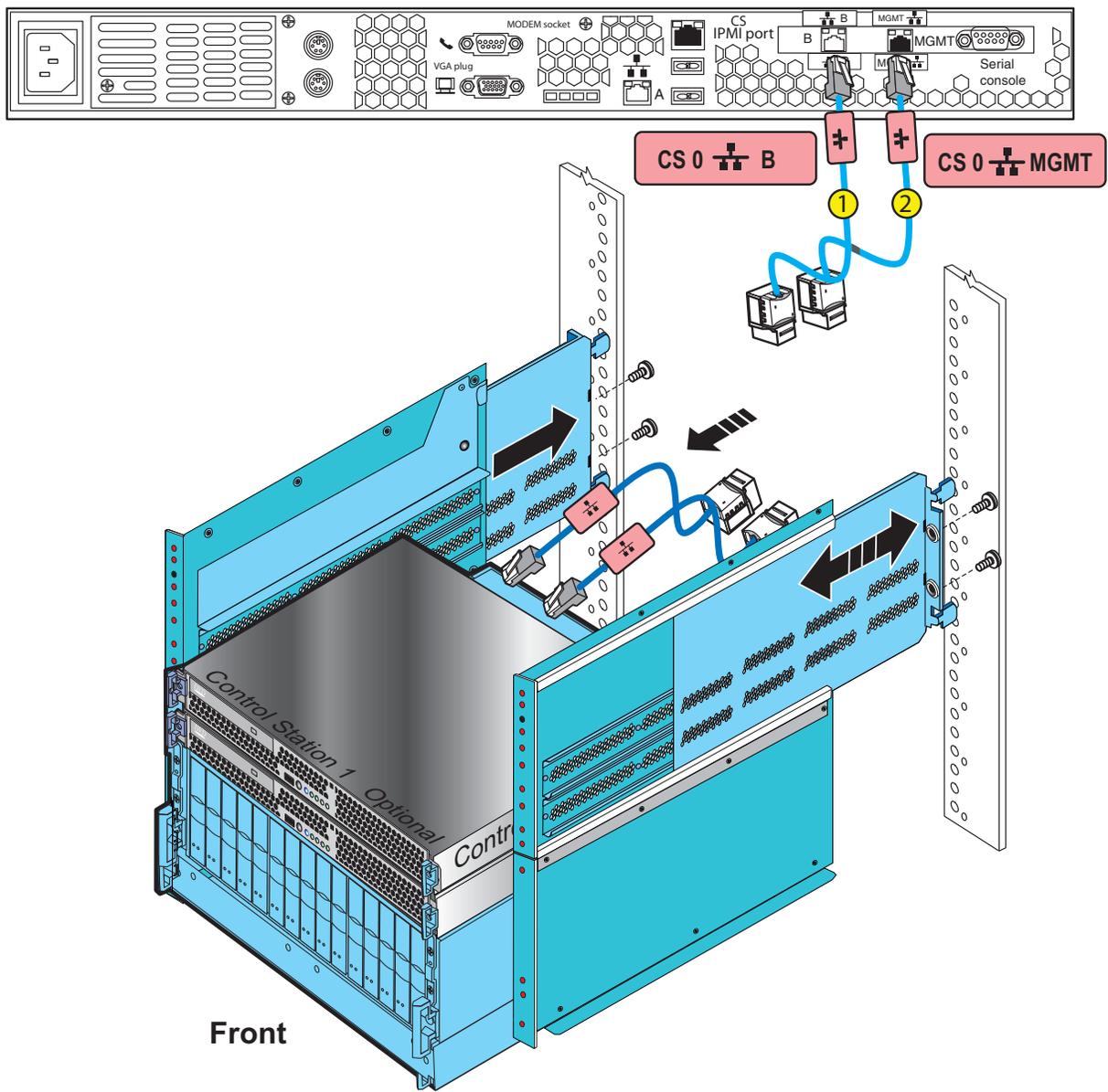
1. The Disk Processor Enclosure is 3U in height. It goes into the next available space in the ganged rails. Slide the DPE into the slot above the SPS.
2. Install the screws holding the component in place. *Do not fully tighten the components screws until all of the components are in place.*



Install the CS and extension cables

1. Slide Control Station 0 into the slot above the DPE.
2. Install the screws holding the Control Station in place. *Do not fully tighten the component screws until all of the components are in place.*
3. Install the extension cables after the Control Station has been installed into the ganged rail.
4. Repeat steps 1-3 if CS1 is shipped with the order. Otherwise, leave this 1U space empty.

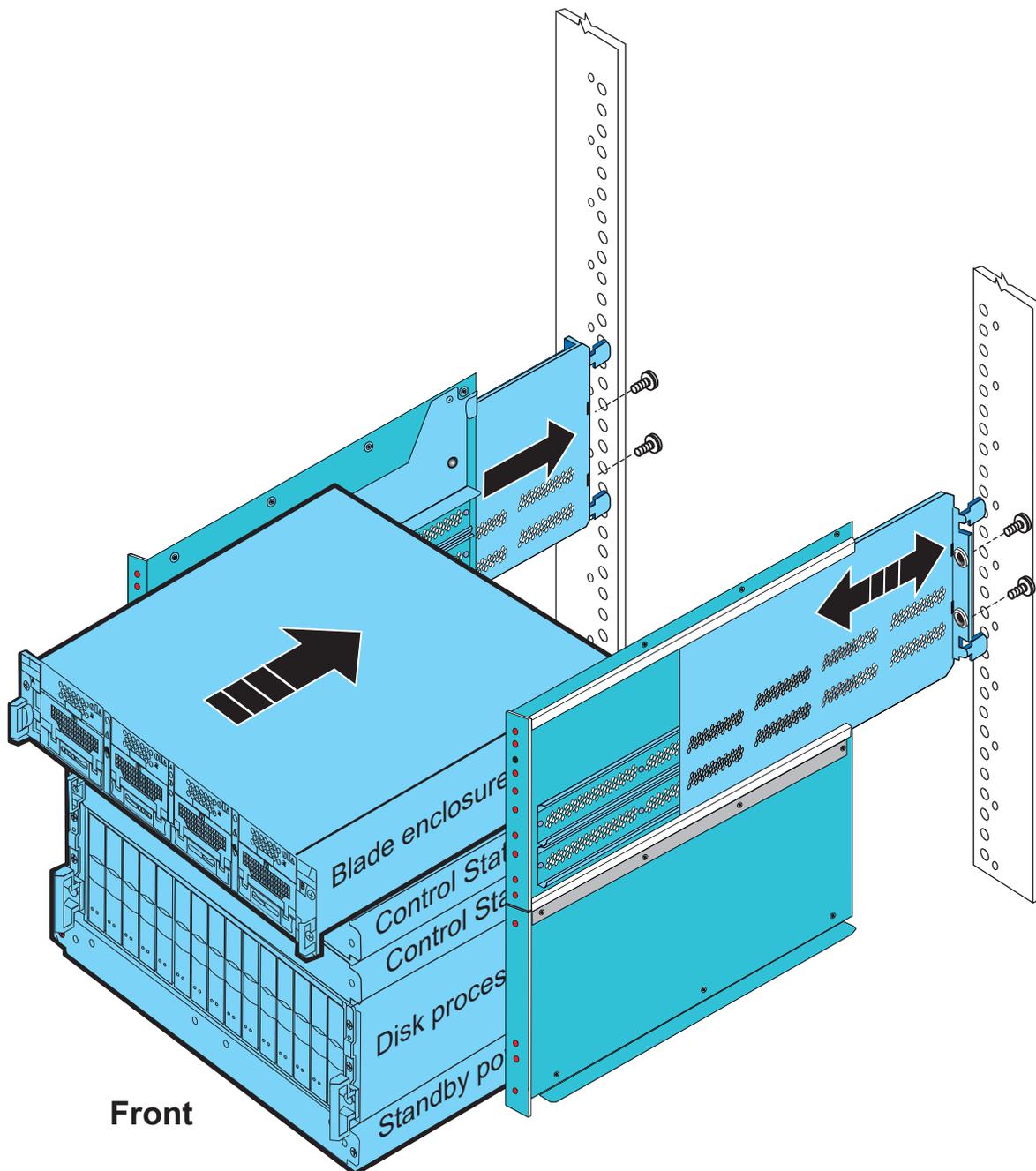
Control Station 0 Rear



Install the blade enclosure

CAUTION Two people are required to install the components.

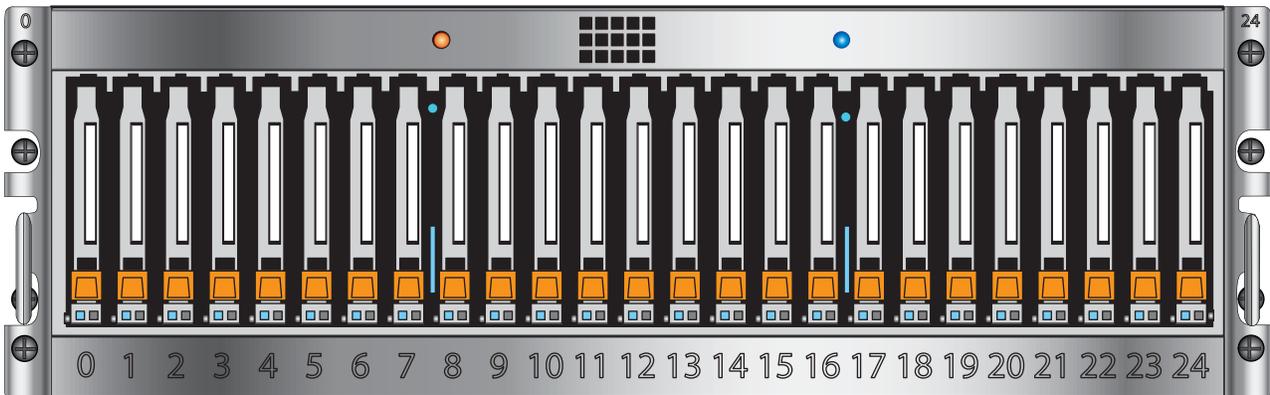
1. The blade enclosure is a 2U component at the top of the ganged rail. Install the blade enclosure above the Control Stations.
2. Install the screws holding the blade enclosure in place. Tighten all the screws holding the components into the cabinet.



VNX5300 DPEs

There are two types of disk processor enclosures (DPEs). The disk processor enclosure can be either a 3U 25 disk DPE, or a 3U 15 disk DPE.

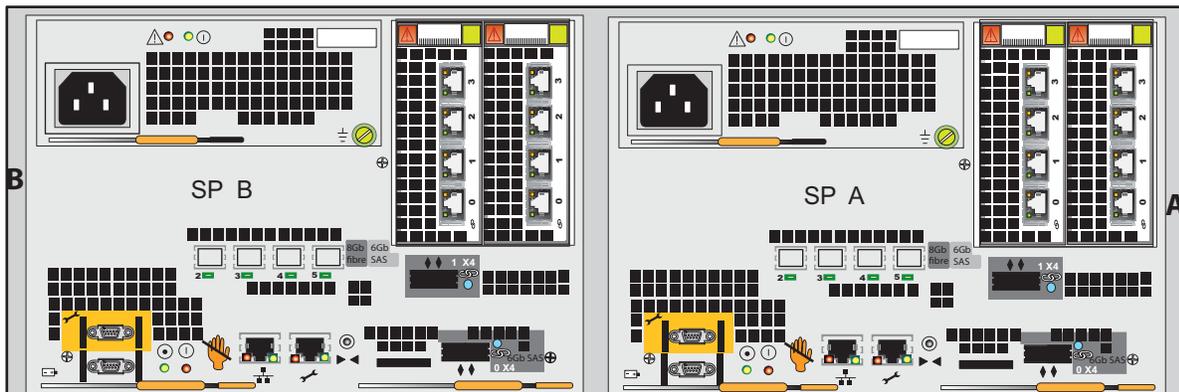
3U 25 Disk processor enclosure Front



3U 15 Disk processor enclosure Front



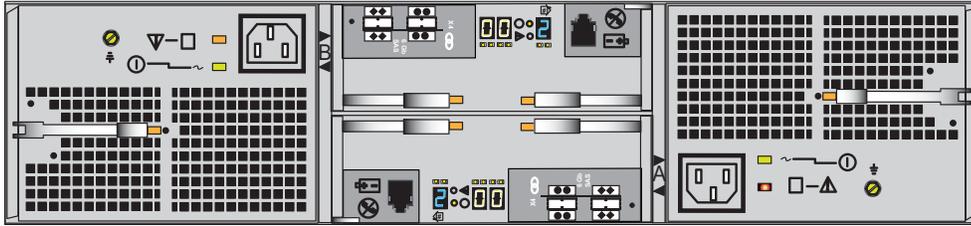
3U Disk processor enclosure Rear



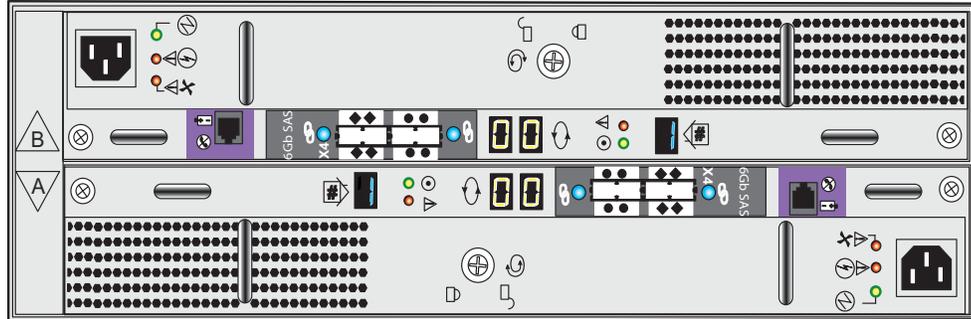
VNX5300 components

VNX5300 File or Unified configuration components rear view including optional components.

25 disk
Disk-array
enclosure
2U

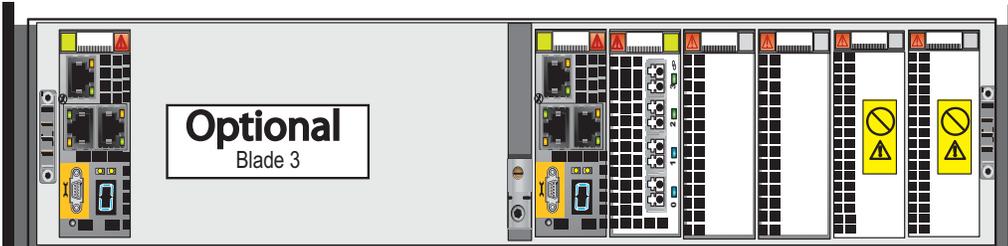


15 disk
Disk-array
enclosure
3U



8U ganged rail

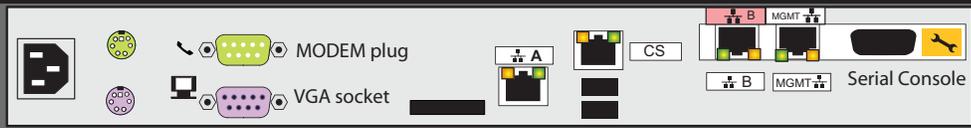
Blade enclosure
2U



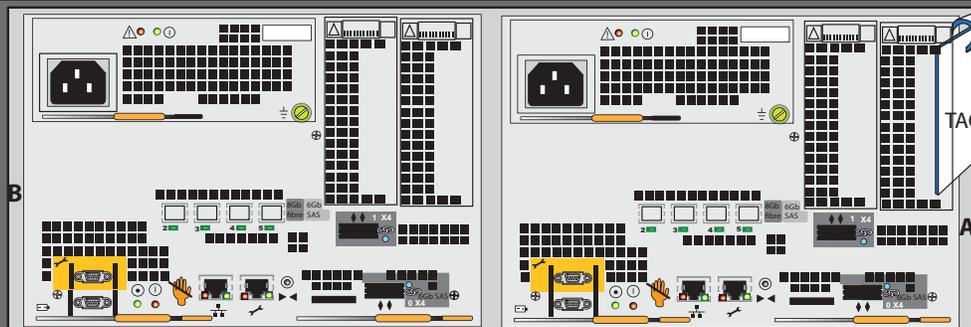
Control Station
(optional)
1U



Control Station
1U



15 or 25 disk
Disk processor
enclosure
3U



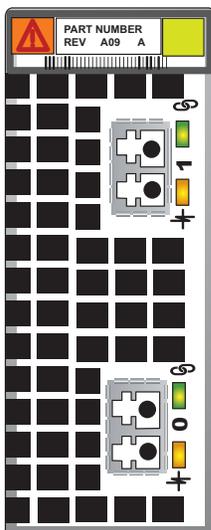
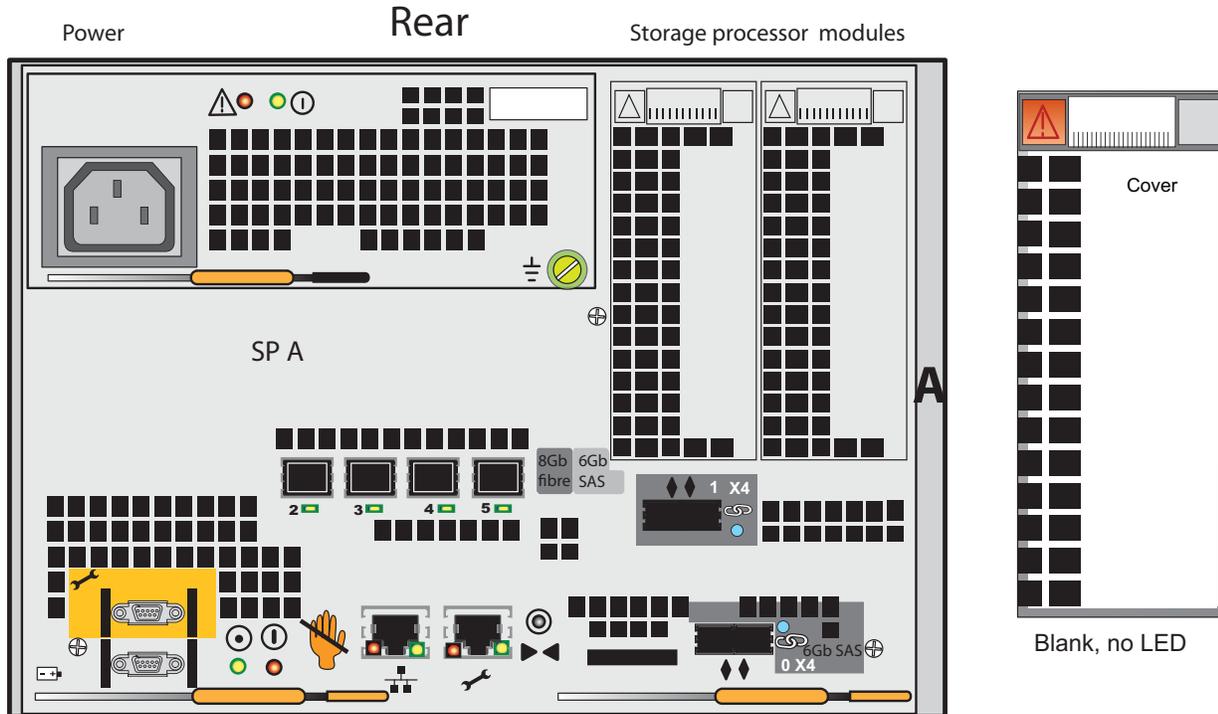
Standby power
supply
1U



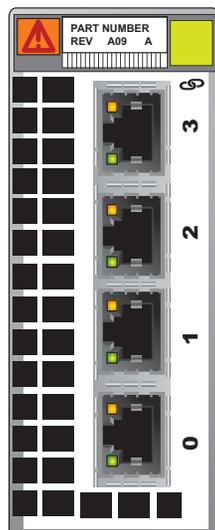
VNX5300 storage processor modules

Each storage processor (SP) includes 4x8Gb FC ports, 2x 6Gb SAS ports and can use a variety of UltraFlex I/O modules.

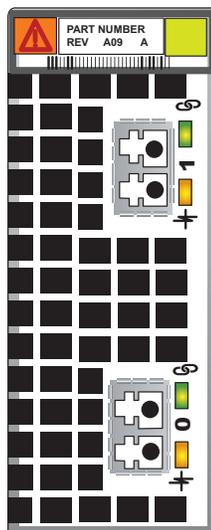
Because the Storage Processors are highly available, the I/O modules should be identical in both SP A and SP B.



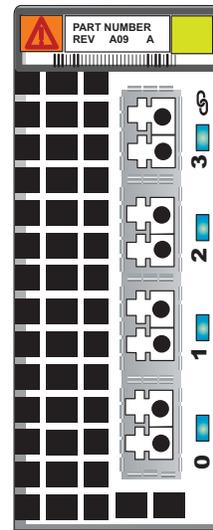
2 port
FCoE
10 Gb



4 port iSCSI
Copper
1 GbE



2 port iSCSI
10 GbE

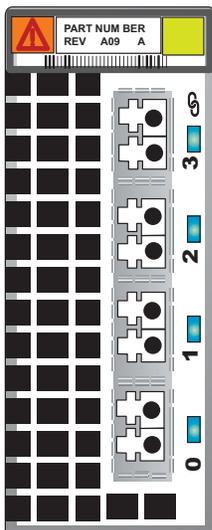
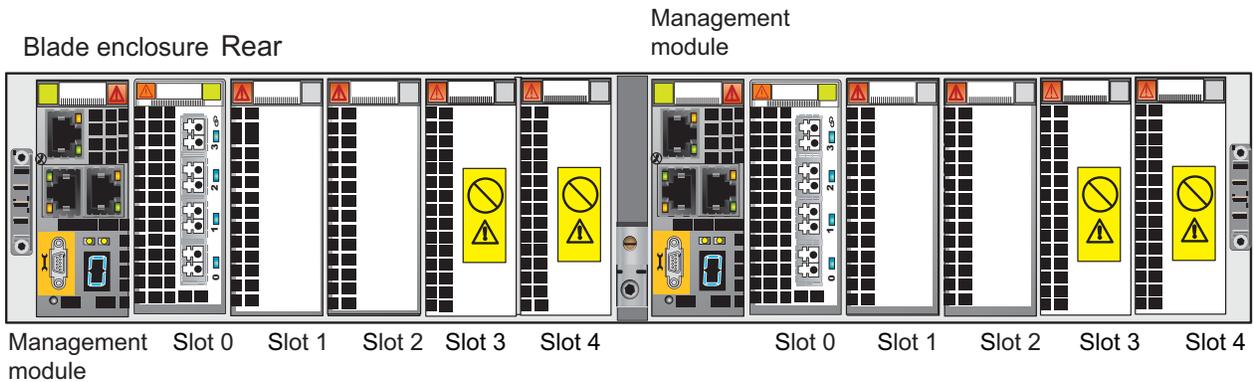


4 port
Fibre Channel
2-4-8 Gb

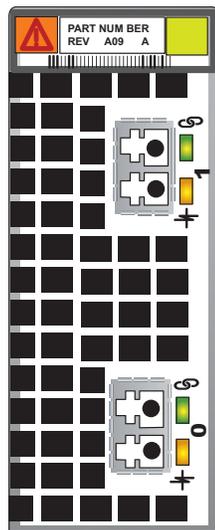
For details on the I/O module options, see the **VNX5300 Hardware Overview**.

VNX5300 blade modules

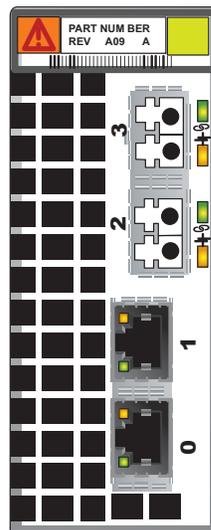
The data movers in the VNX5300 can support up to 3 I/O modules. Slot 0 is populated with a 4-port FC I/O module. Slots 1-2 can be used for an assortment of UltraFlex I/O modules. Because blades should be configured for failover, the blades should have the same I/O modules in the same slots.



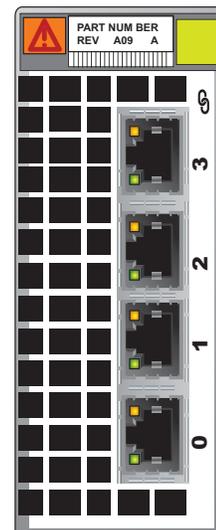
4 port
Fibre Channel
2-4-8 Gb



2 port
10 GbE



4 ports
2 port optical
2 port copper
1 GbE



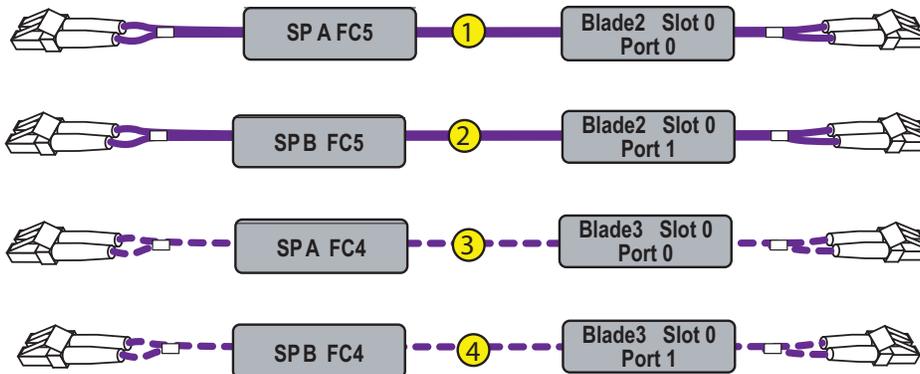
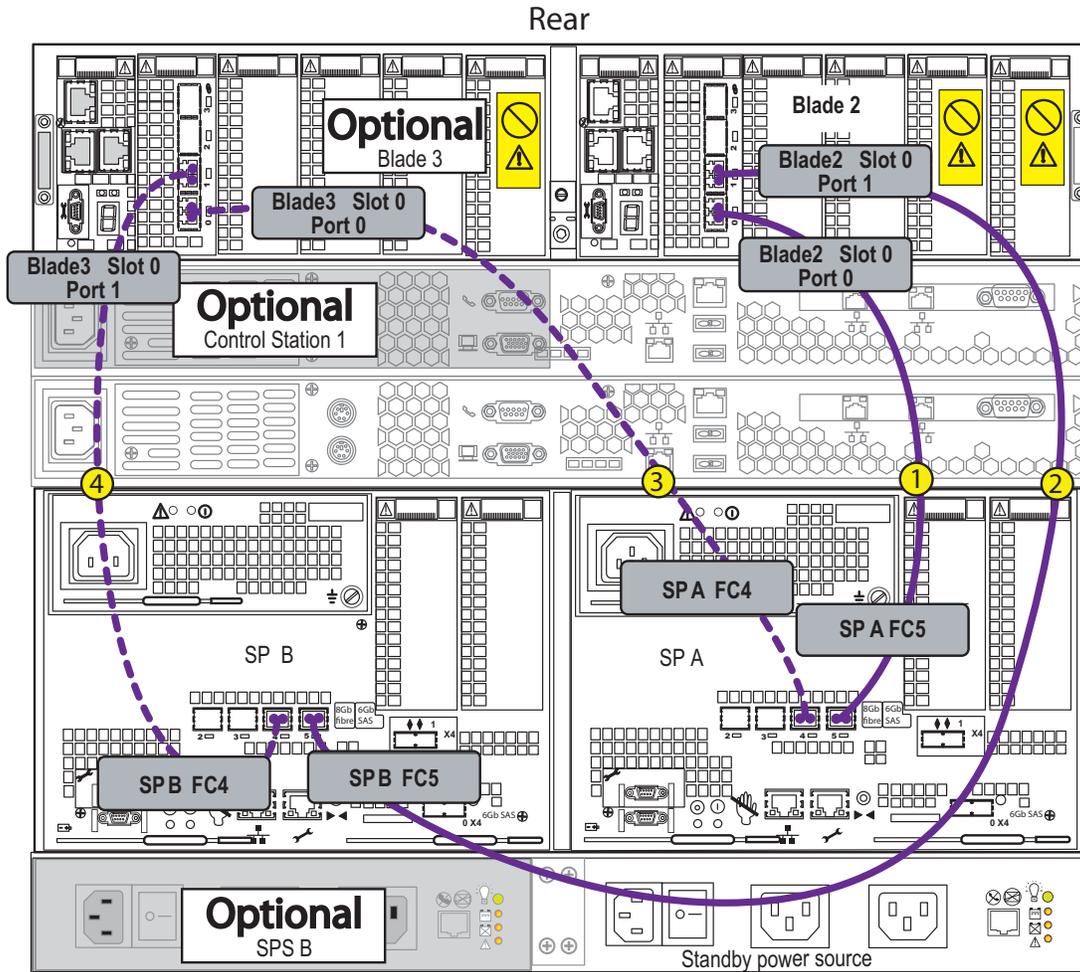
4 ports
Copper
1 GbE

For details on the I/O module options, see the **VNX5300 Hardware Overview**.

Connect SP and blades

A yellow circle with a number indicates the cable number.

Cable the storage processor to blade enclosure 0 as shown using Fibre Channel cables.



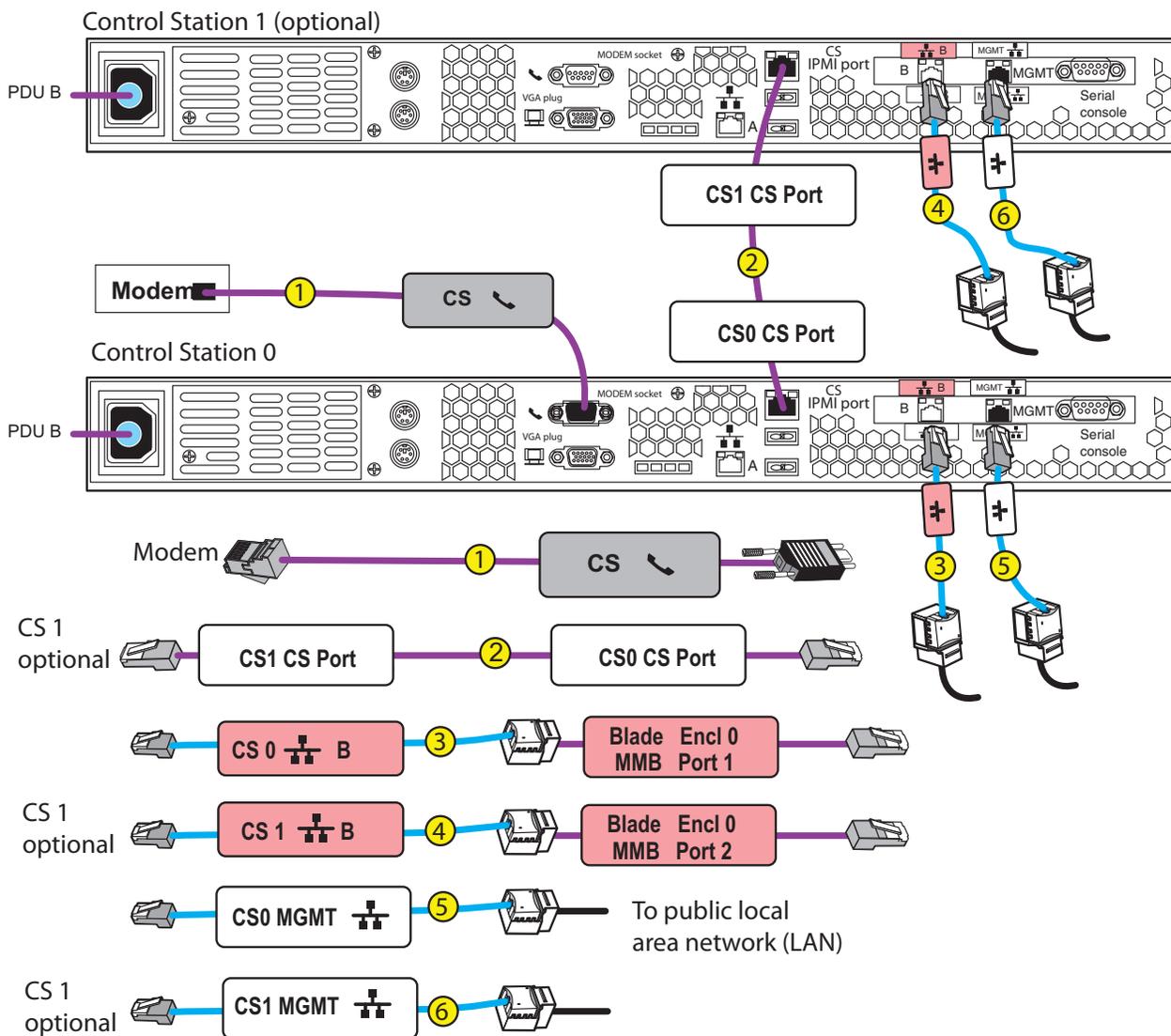
Connect Control Station cables

A yellow circle with a number indicates the cable number.

Cabling the VNX5300 with two Control Stations.

1. Connect the Control Station 0 (CS0) to the customer modem. 1
2. Connect Control Station 0 (CS0) IPMI to CS1. 2
3. Connect CS0 MGMT B extension cable to MGMT CS0. 3
4. Connect CS1 MGMT B extension cable to MGMT B (optional). 4
5. Connect CS 0 MGMT extension cable to local area network (LAN). 5
6. Connect CS1 MGMT B extension cable to LAN (optional). 6

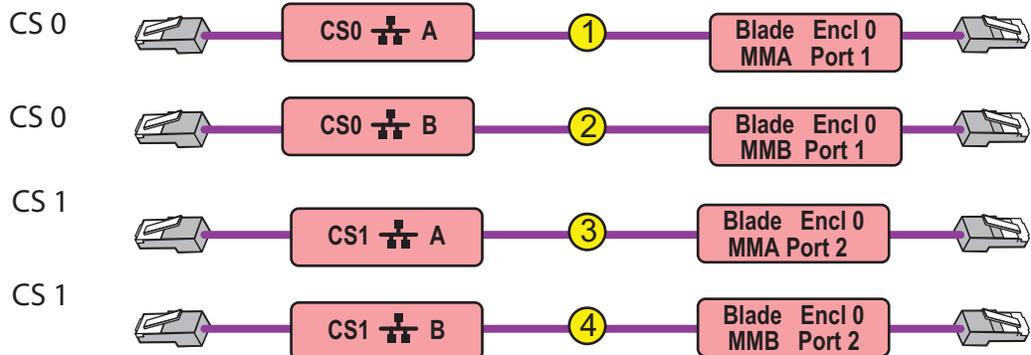
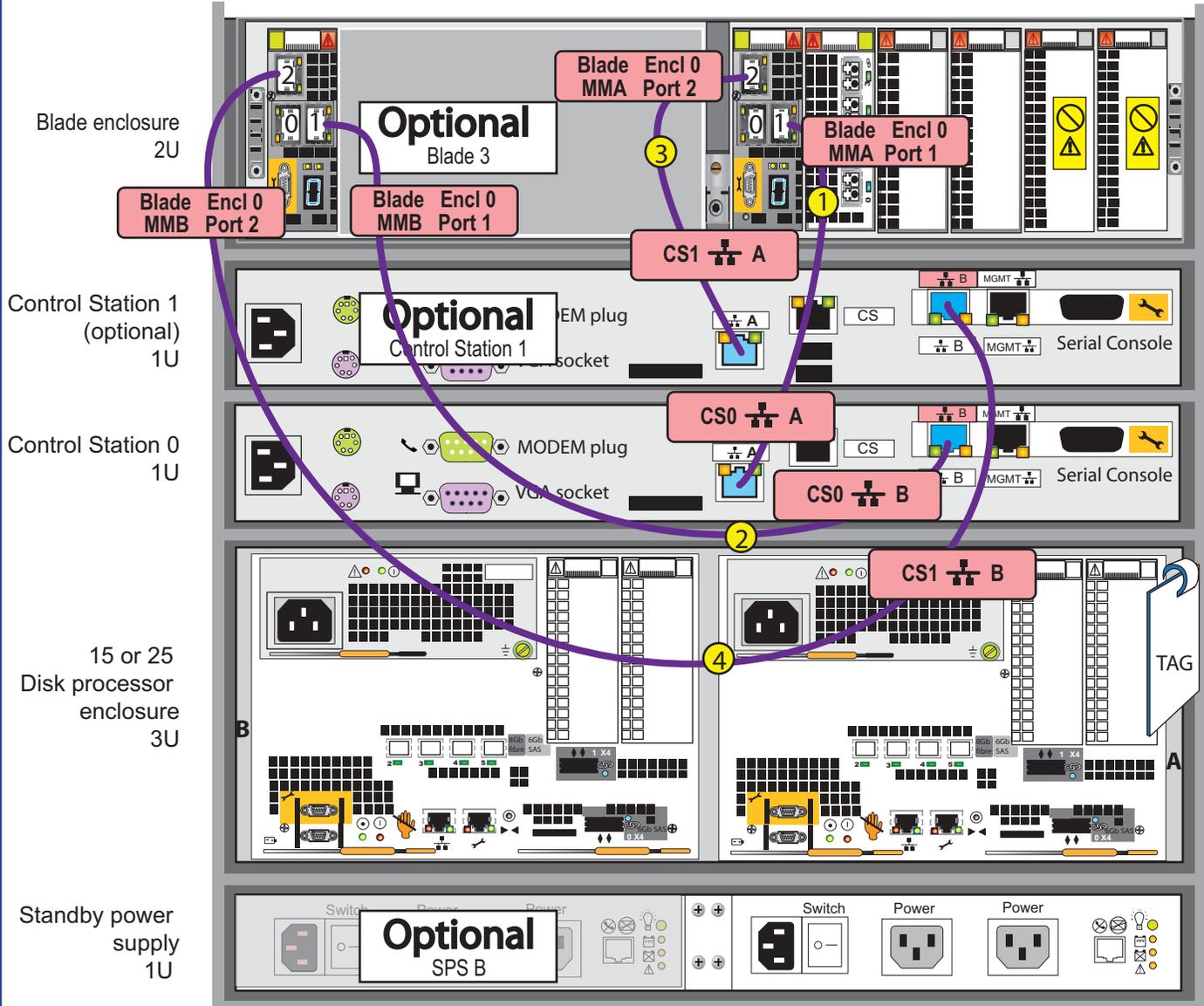
If Control Station 1 is not installed you will not need CS1 extension cables or cables 2, 4, and 6.



Connect the Control Stations to blade enclosure

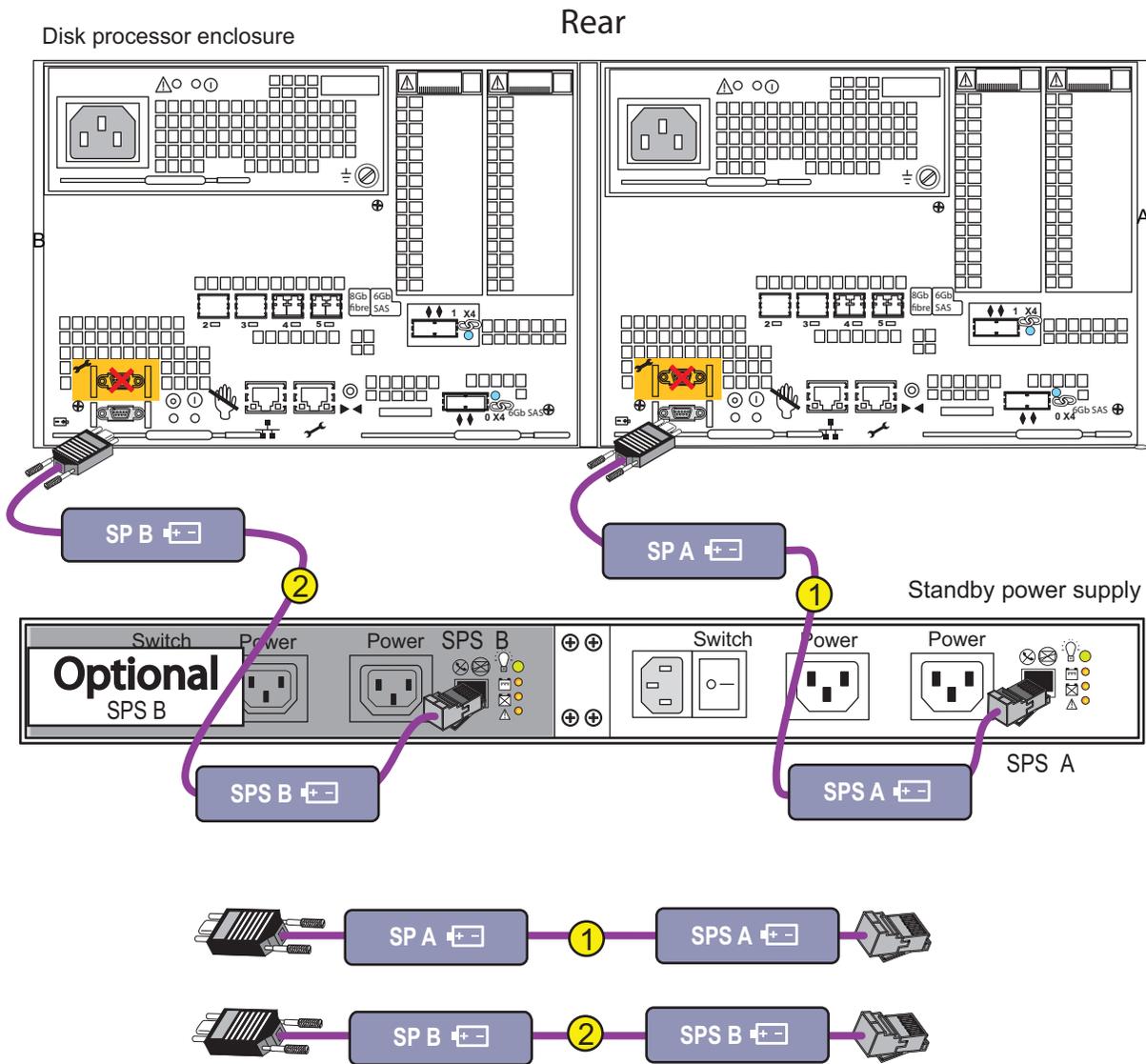
Cable the Control Station to blade enclosure 0. Refer to the numbered cable shown and labeled.

8U ganged rail rear



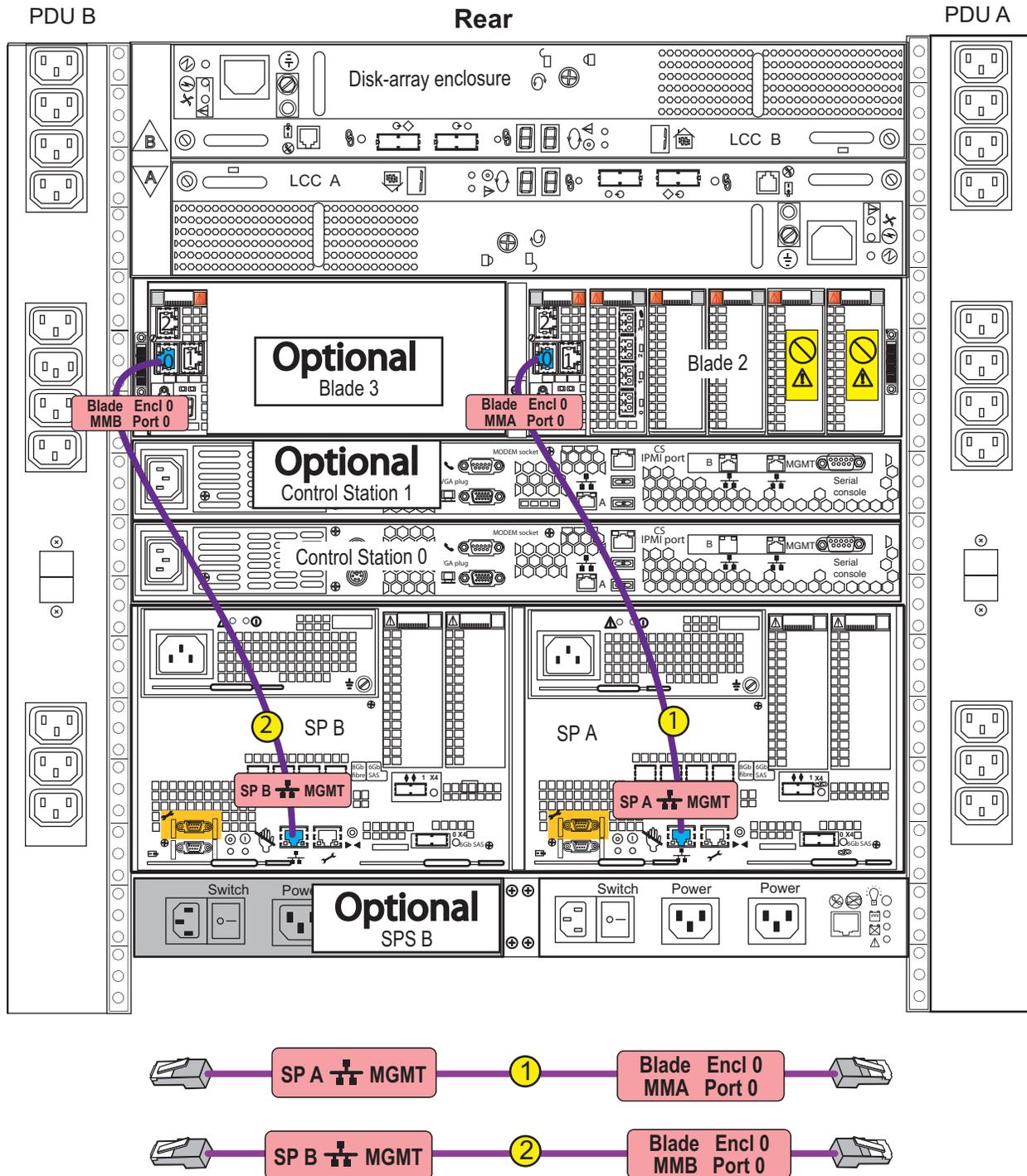
Connect the SPS to SP

Cabling the standby power supply (SPS) to the storage processor (SP) in the VNX5300 system.



Connect the SP to management modules

Cabling the storage processor (SP) to the standby power supply (SPS) in the VNX5300 system. A blade enclosure always contains 2 management modules. Both management modules will be cabled and powered.



Powering up the VNX5300 System

Power Up procedure for VNX5300.

Note: Verify that the cabinet circuit breakers are in the ON position. If you are installing the VNX5300 into an existing cabinet that contains other components, do not turn off the cabinet circuit breakers. Ensure that the switch for the Standby Power Supplies are turned OFF.

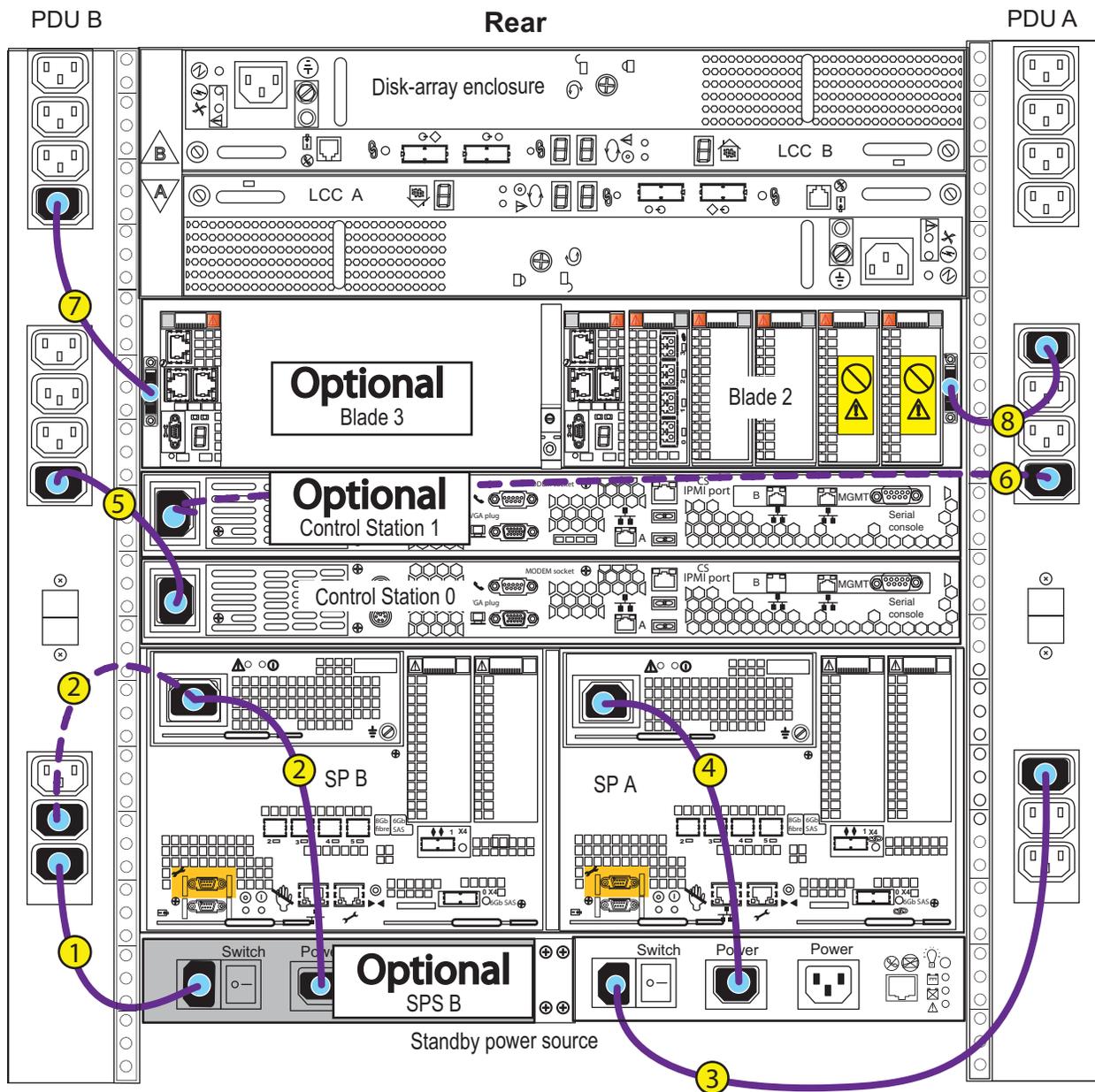
Connect the power cables as follows:

1. Connect standby power supply B (SPS B) to power distribution panel (PDU B). 
2. Connect SPS B to storage processor (SP) B. 
3. Connect SPS A to PDU A. 
4. Connect SPS A to SP A. 
5. Connect Control Station (CS) 0 to PDU B. 
6. Connect CS 1 to PDU A. 
7. Connect the blade enclosure side B to PDU B. 
8. Connect the blade enclosure side A to PDU A. 
9. Lock each power cable in place and turn on the SPS power switches.

Your VNX5300 will power up. It may take from 10 to 15 minutes to power up completely.

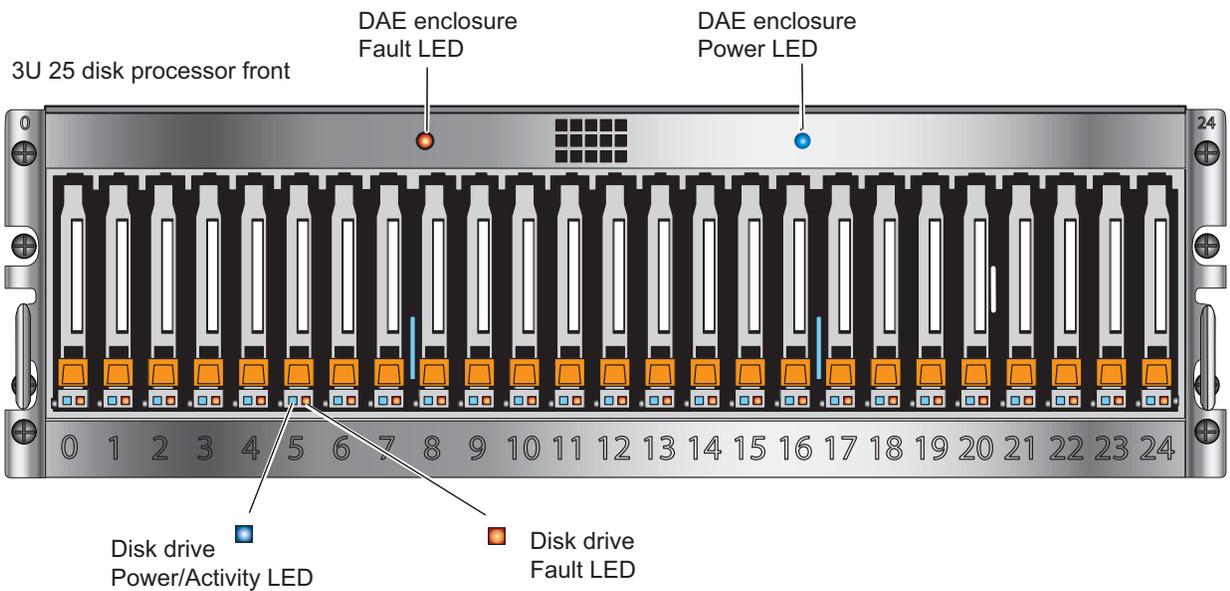
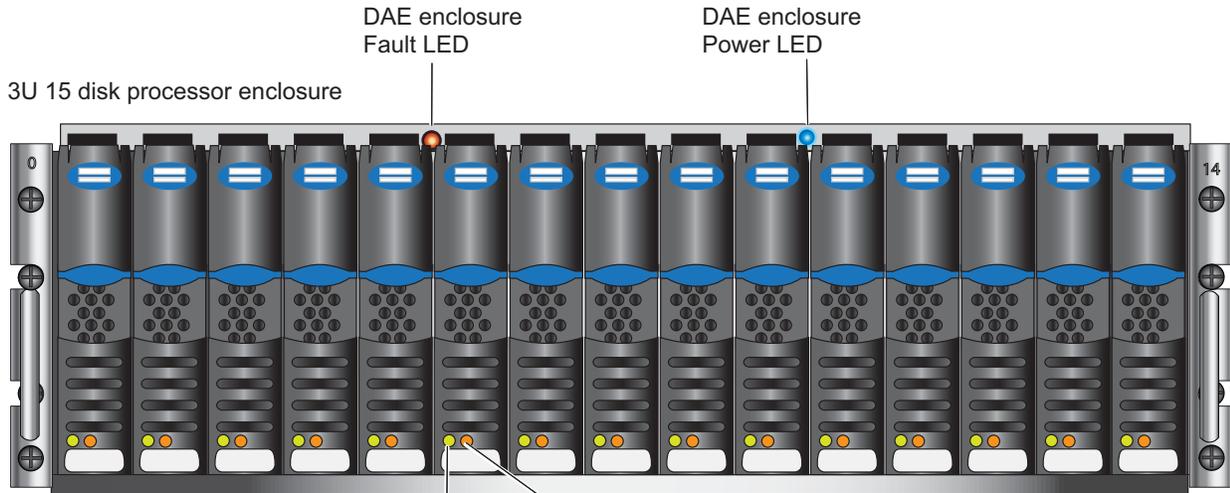
Powering up the VNX5300 System

Note: While your VNX5300 is powering up, observe the LEDs on the front and rear of your components. Be aware that colors, flashing, and steady LEDs indicate different conditions.



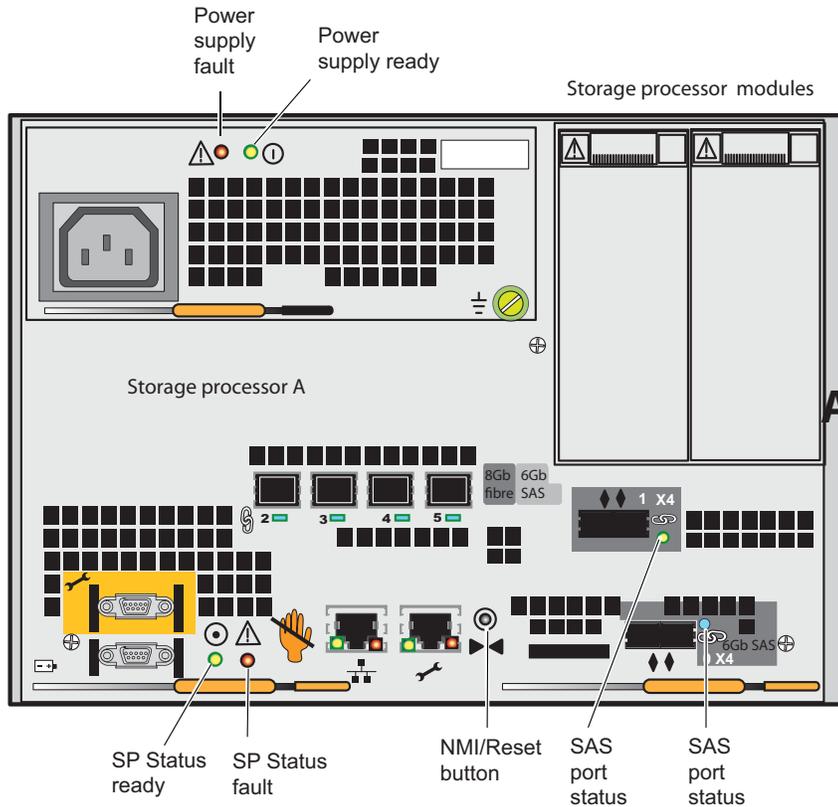
If the optional SPS B is not present cable 1 will not be present and cable 2 will connect to PDU B.

VNX5300 DPE 15 and 25 disk front LEDs



If the power LEDs do not remain solid/steady green, contact your authorized service provider.
If the power LEDs on each SP remain solid/steady green, replace the bezel and proceed with the next steps.

VNX5300 DPE rear LEDs



The power-up should take around 10-15 minutes.
Physical indications that the array is up and running without error:

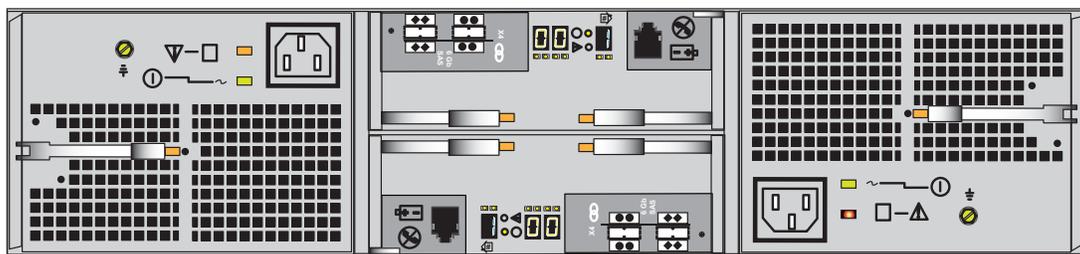
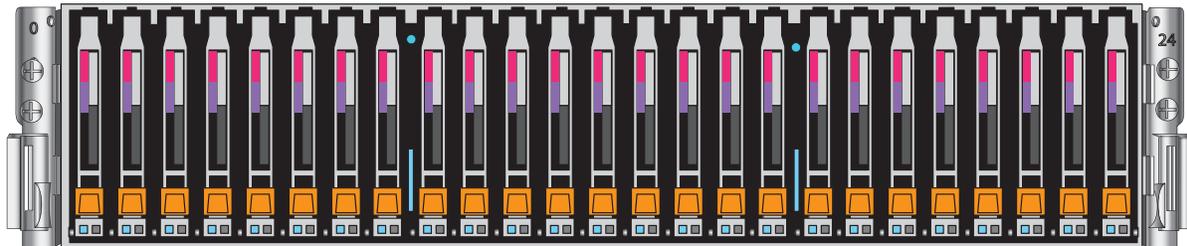
Light emitting diodes	Color	Status
Power Supply Ready LED	• Green	AC or DC is applied and all outputs are in operating range
	• Off	Any or all outputs or input out of range
Power Supply Fault LED	• Off	All outputs or input out of range
	• Amber	Any or all outputs are out of range while unit is not in shut-down mode
	• Blinking	12V off because no power detected
6G SAS Link LED	• Blue	Port linked at 6Gbps and all 4 lanes
	• Green	Port linked at 1.5 Gbps, 3Gbps or 6 Gbps without all 4 lanes
	• Off	No link

VNX5300 DAEs

DAEs are optional. If you have a DAE, it can either be a 2U, 25 disk DAE or a 3U, 15 disk DAE. The DAEs use 2U rail kit for a 2U, 25 disk DAE or 3U rail kit for a 3U, 15 disk DAE.

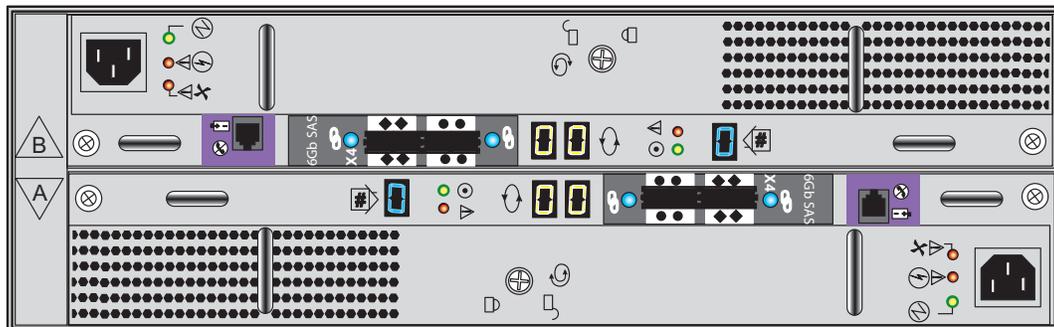
If additional DAEs are ordered the DAEs should be installed immediately above the blade enclosure. Either type of DAE may be installed.

2U 25 Disk-array enclosure front



Rear

3U 15 Disk-array enclosure front

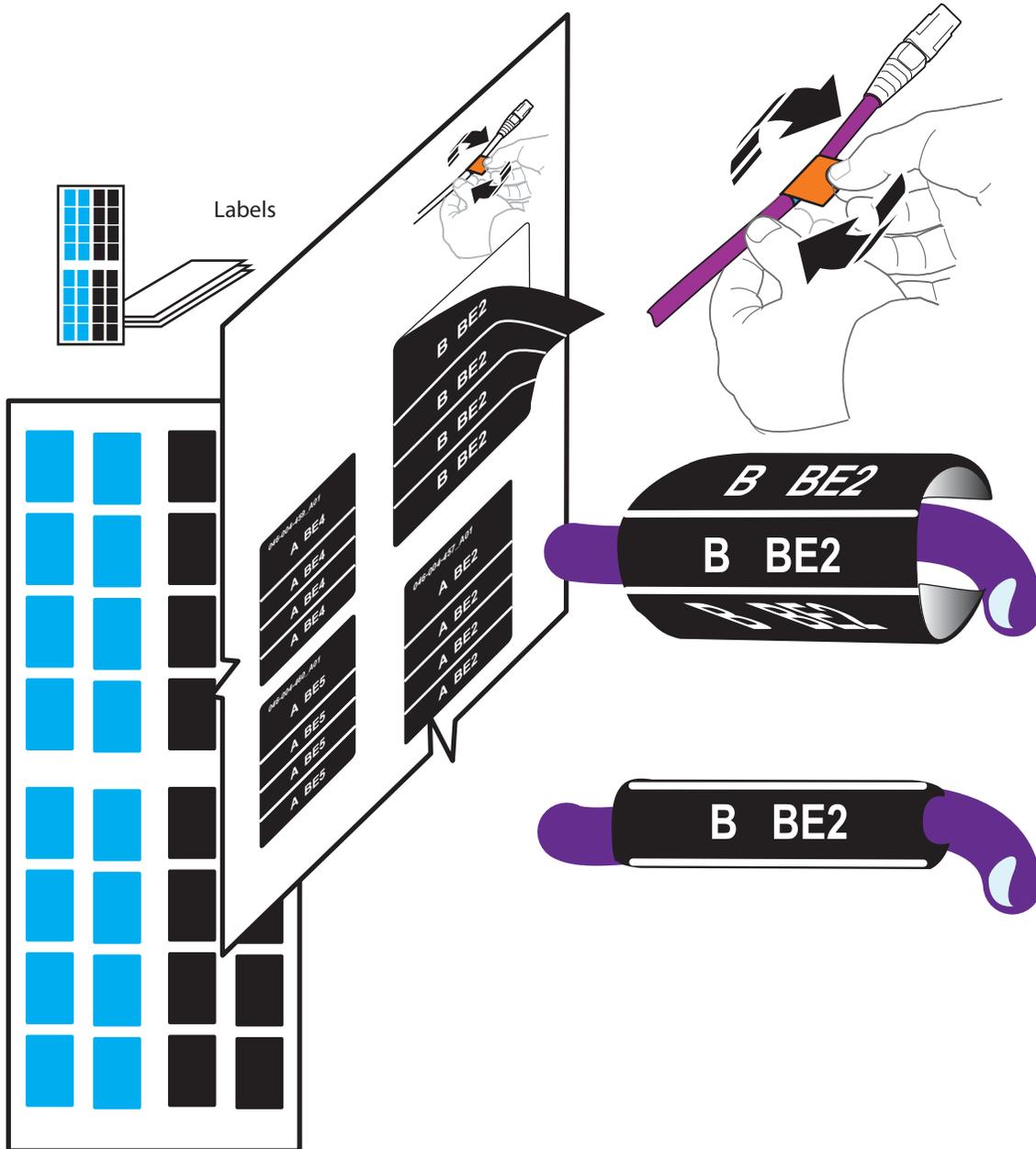


Rear



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.

Label the cables



The cable labels must be attached to the appropriate cables as you assemble the system. Assemble the hardware and cable your VNX5300 according to the instructions in this guide.

Connect SAS DPE and DAE

Cabling between the DPE and optional DAEs uses SAS cables. The connectors on SAS cables have icons indicating each end.

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; the third DAE is connected to SAS1, and so forth.

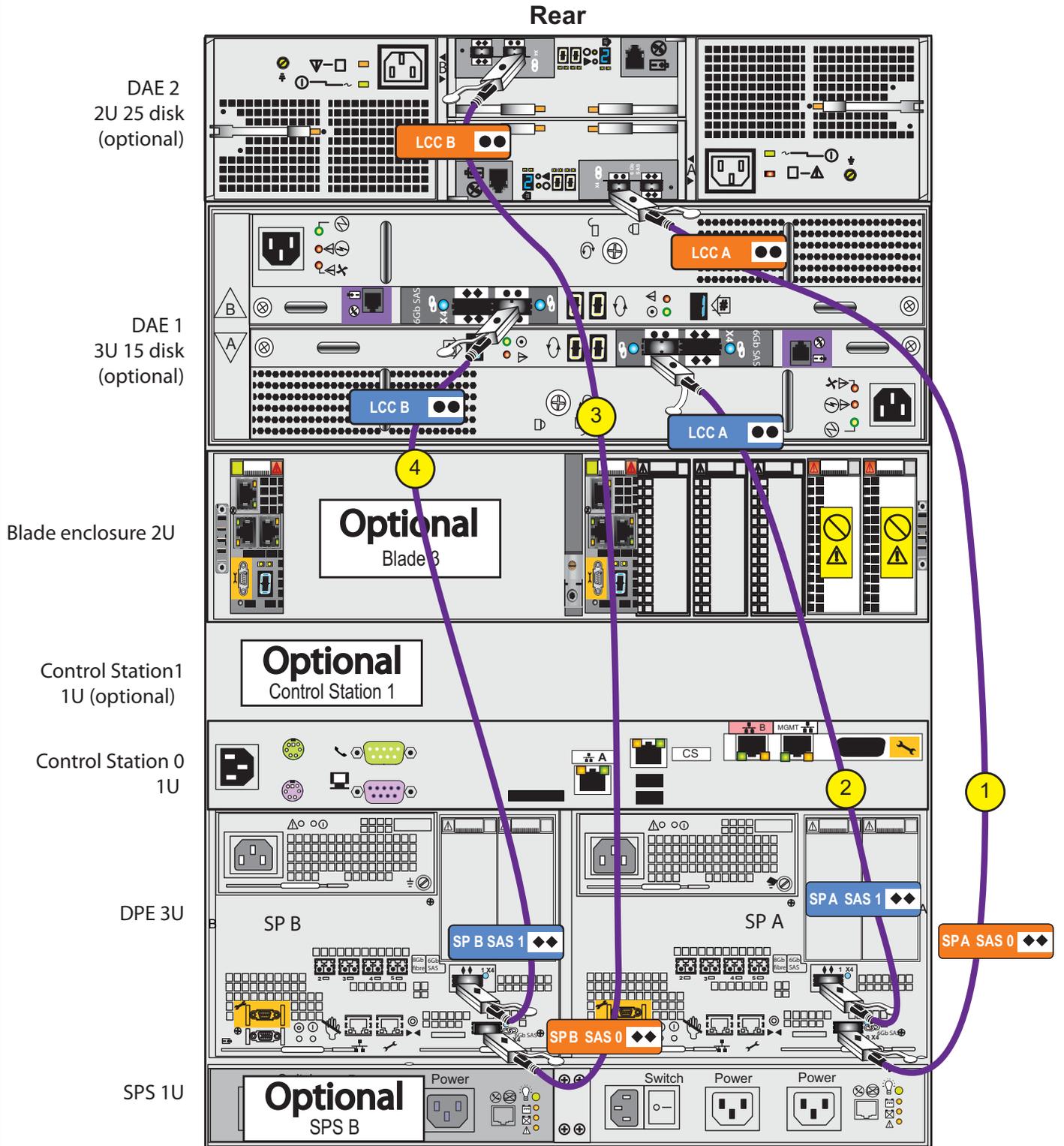
To add additional DAEs, see the cabling directions in the **VNX5300 Hardware Overview**.



- 1 From SP A port 0 ◆◆ to DAE 2 LCC A ●●
- 2 From SP A port 1 ◆◆ to DAE 1 LCC A ●●
- 3 From SP B port 0 ◆◆ to DAE 2 LCC B ●●
- 4 From SP B port 1 ◆◆ to DAE 1 LCC B ●●

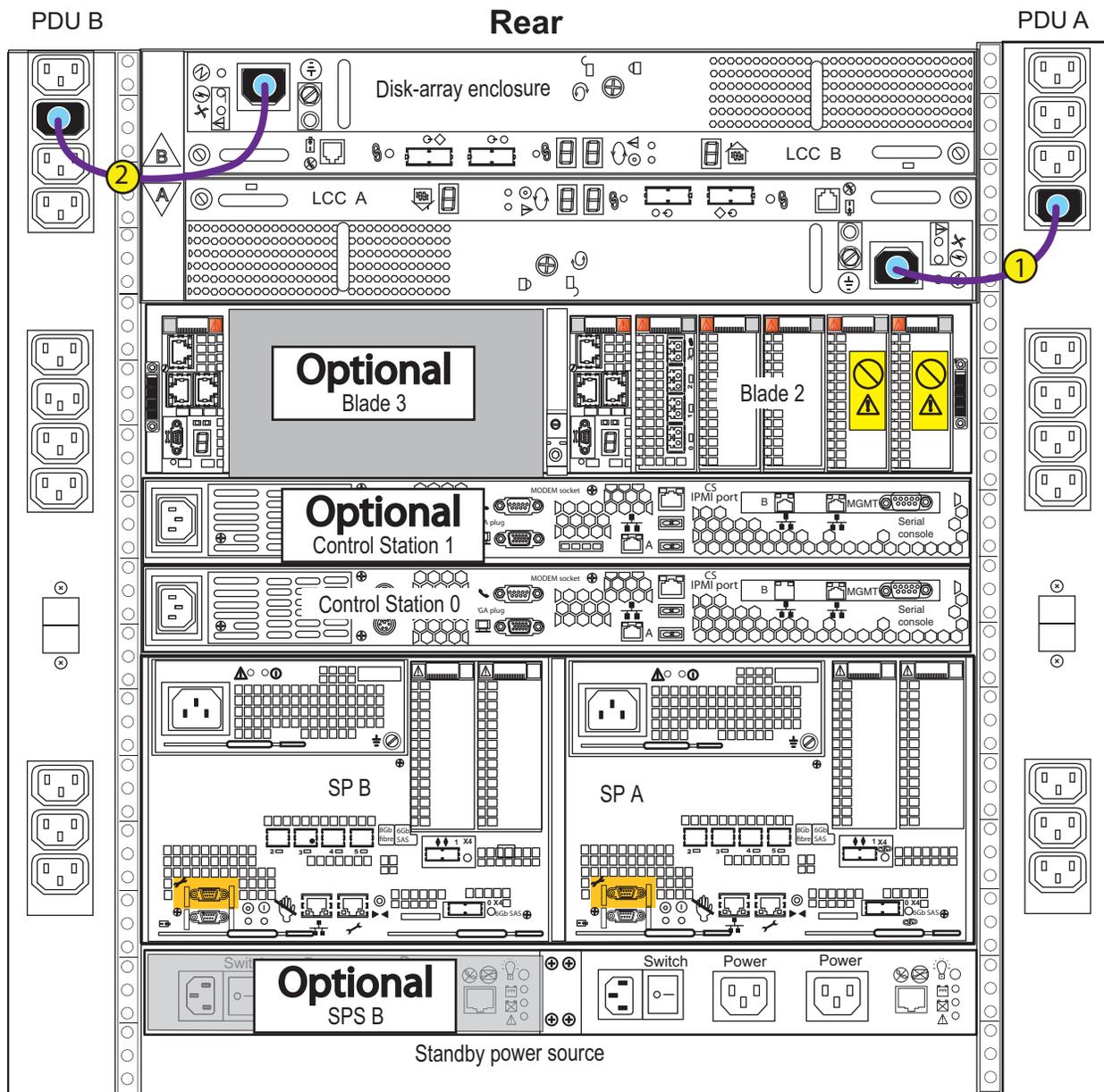
Note: On the 15-drive DAE, because LCC A and LCC B are reversed, the cable connections into LCC B and LCC A are also reversed. LCC B will have the tab up, while LCC A will have its tab down. On the 25-drive DAE the cable connections into LCC B and LCC A are identical. Both LCC B and LCC A will have the tab up.

Connect SAS DPE and DAE

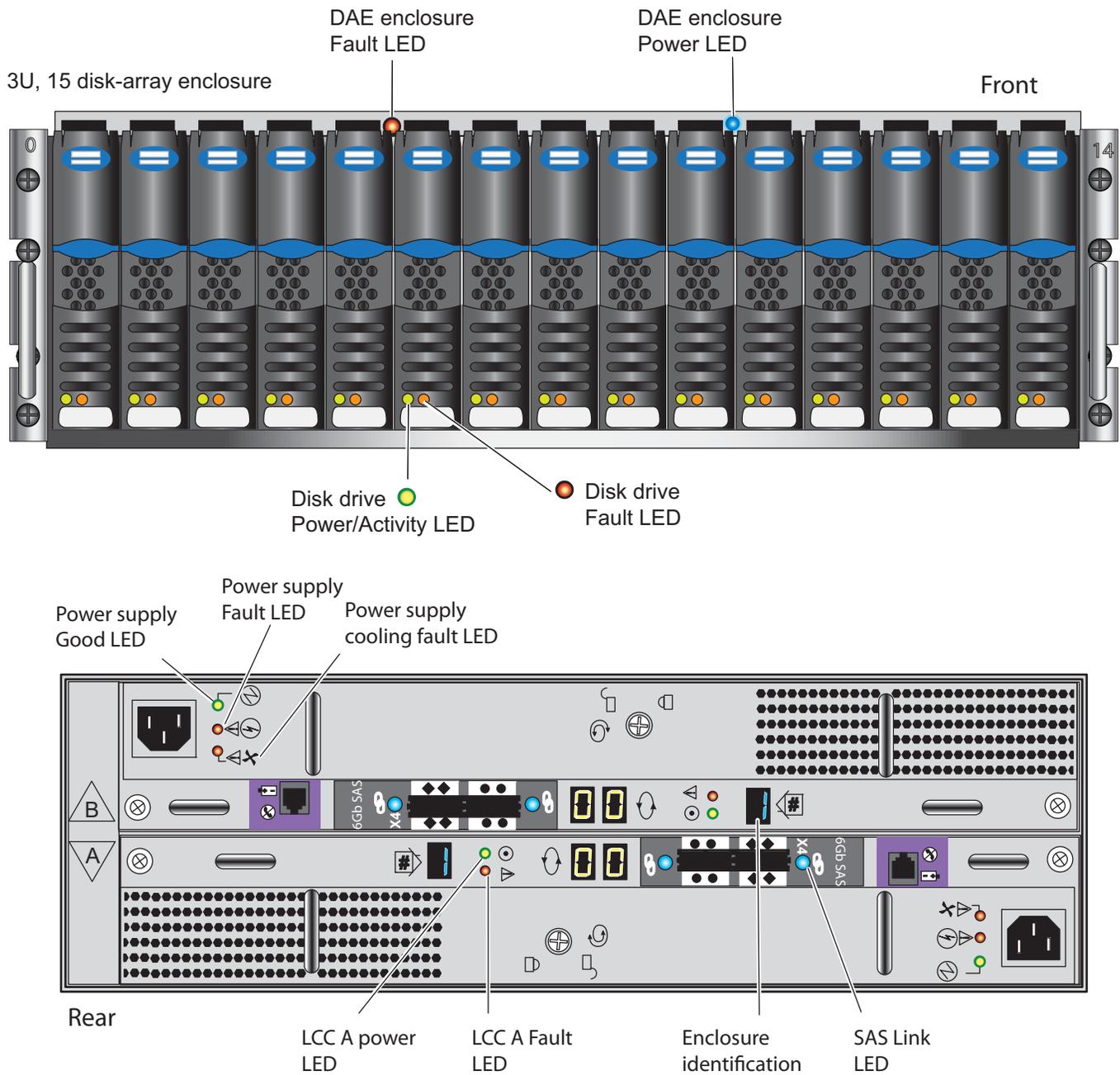


Powering up the VNX5300 DAEs

DAE power cables should be connected directly to the power distribution units (PDUs) as shown. Once they are connected, the DAE will begin to power up. ① ②



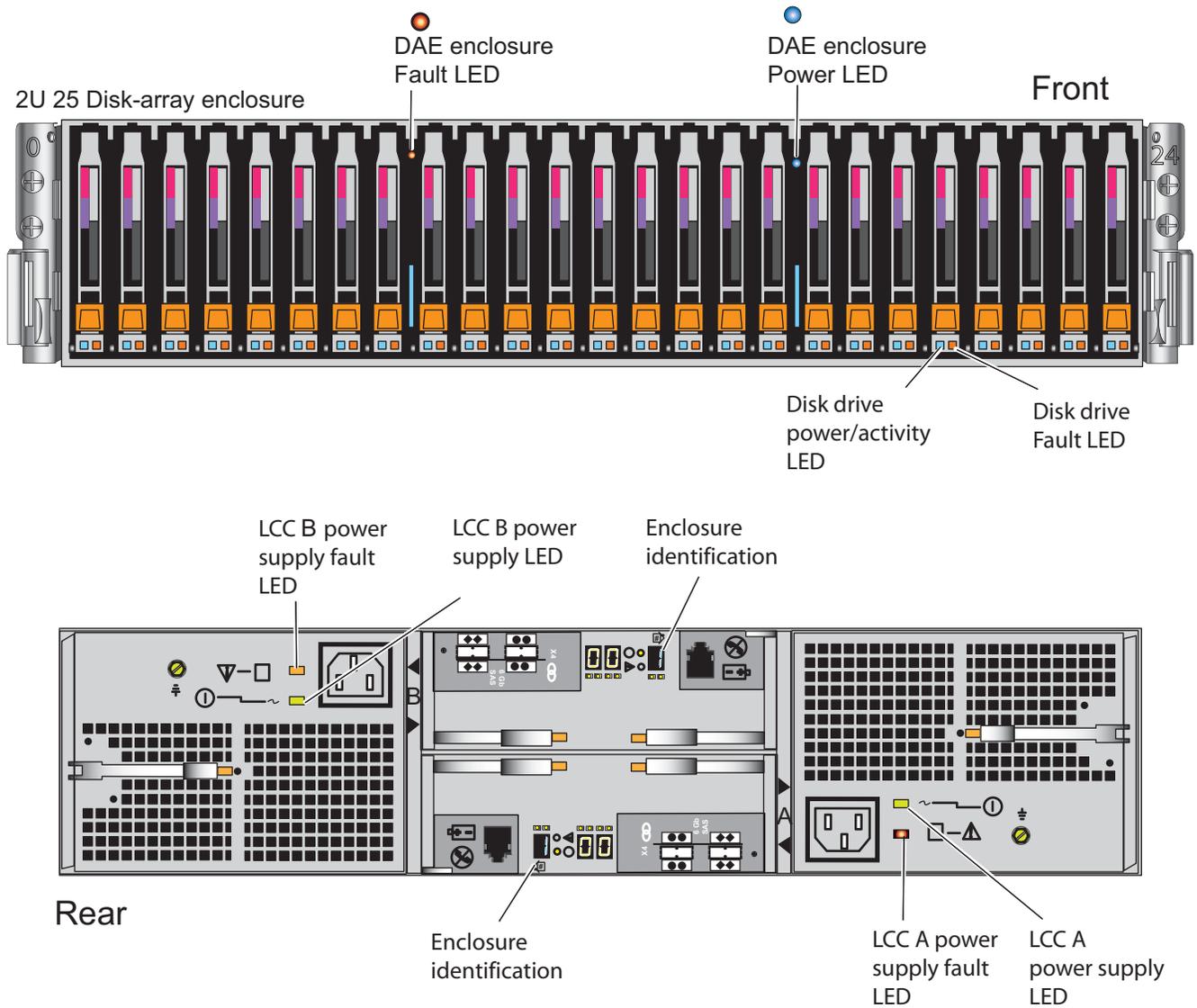
VNX5300 DAE 3U LEDs



If the power LEDs do not remain solid/steady green, contact your authorized service provider. If the power LEDs on each SP remain solid/steady green, replace the bezel and proceed with the next steps.

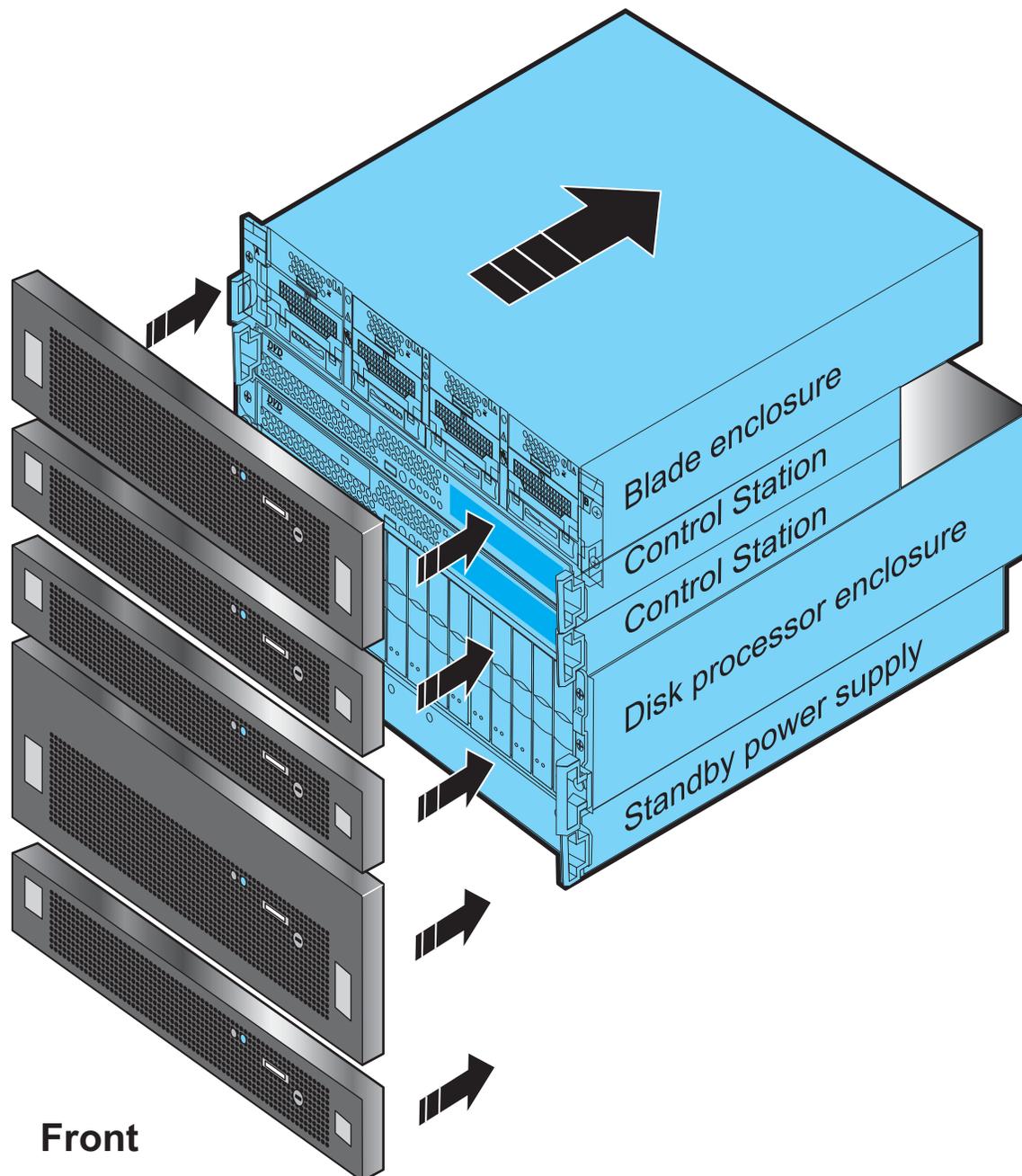
VNX5300 DAE 2U LEDs

Note: While your VNX5300 is powering up, observe the LEDs on the front and rear of your components. Be aware that colors, flashing, and steady LEDs indicate different conditions.



VNX5300 bezels

1. Ensure that the screws holding the components in place are firmly tightened.
2. After all the components are installed and the cabling is securely in place, snap on the bezels.



Connecting and configuring your system

This procedure assumes you have just completed all the steps in the Installation Guide up to this stage. This means that you have already installed, cabled, and powered up the system. Once you have done that, proceed to the following:

Initialize the storage system

On the Windows management station, put the **VNX Installation Toolbox** CD in and run it. To initialize the system, download and install the **VNX Installation Assistant for File/Unified**. The latest version of this utility is available from the EMC Product Support site, although a version is also on the CD. Select **Install** and follow the online instructions to discover and assign IP addresses to the storage system.

Register the storage system

At the end of the **VNX Installation Assistant for File/Unified** utility, you have the opportunity to register for service with your service provider. The Registration Wizard asks you a few questions about the storage system installation site and support contacts. The wizard then sends this information to the service provider along with basic storage system configuration details. This process of transferring the data to the service provider is completely automated so that your service provider can receive data over the Internet or by encrypted email.

Update your storage system software

The storage system comes pre-installed with the latest version of VNX OE software available at the time of shipment. To see if any patches or newer releases have been made available since shipment, or to install any enabler software that you ordered with your system, do the following:

- Download and install the **Unisphere Service Manager**, also on the Toolbox CD. It automatically checks if newer versions are available when you start to run it.
- Select and download the software that you want to install, and click **Finish** to close the wizard.
- Launch the Install Software wizard to install any available patches or software that you downloaded in the previous step, and to install any enablers that you ordered with your system.

For Unified systems, in order to install a server, do the following:

Install HBAs, drivers, and required patches

On the server, install HBAs, the appropriate drivers, and any required driver updates (such as service packs, hotfixes, or patches). Complete documentation is available from www.emc.com/vnxsupport.

Install path management software

Install PowerPath on the server. If you have supported path management software other than PowerPath, install it on the server as described in the software documentation. Complete documentation is available from www.emc.com/vnxsupport.

Install the Unisphere Server Utility

Install the **Unisphere Server Utility** on each host that will be attached to the storage system. You have the option to launch the Windows version of the **Unisphere Server Utility** after installation from the Toolbox CD. For other operating system versions, see the **Software Downloads** site for the VNX family.

Connecting and configuring your system

- Cable the server to the storage system**

Use fibre optic (FC) cables to connect the storage system-data ports and servers. For servers connected through a switch, create zones. After connecting the storage system and server HBAs together with a switch, create single initiator zones following your switch vendor documentation. Single initiator zones contain only one HBA and one or more storage system data ports. For additional information on cabling, see the Server information on www.emc.com/vnxsupport.
- Register server connections**

On each server with a Fibre Channel host bus adapter, run the **Unisphere Server Utility** to register the HBAs with the storage system.
- Set up the management software**

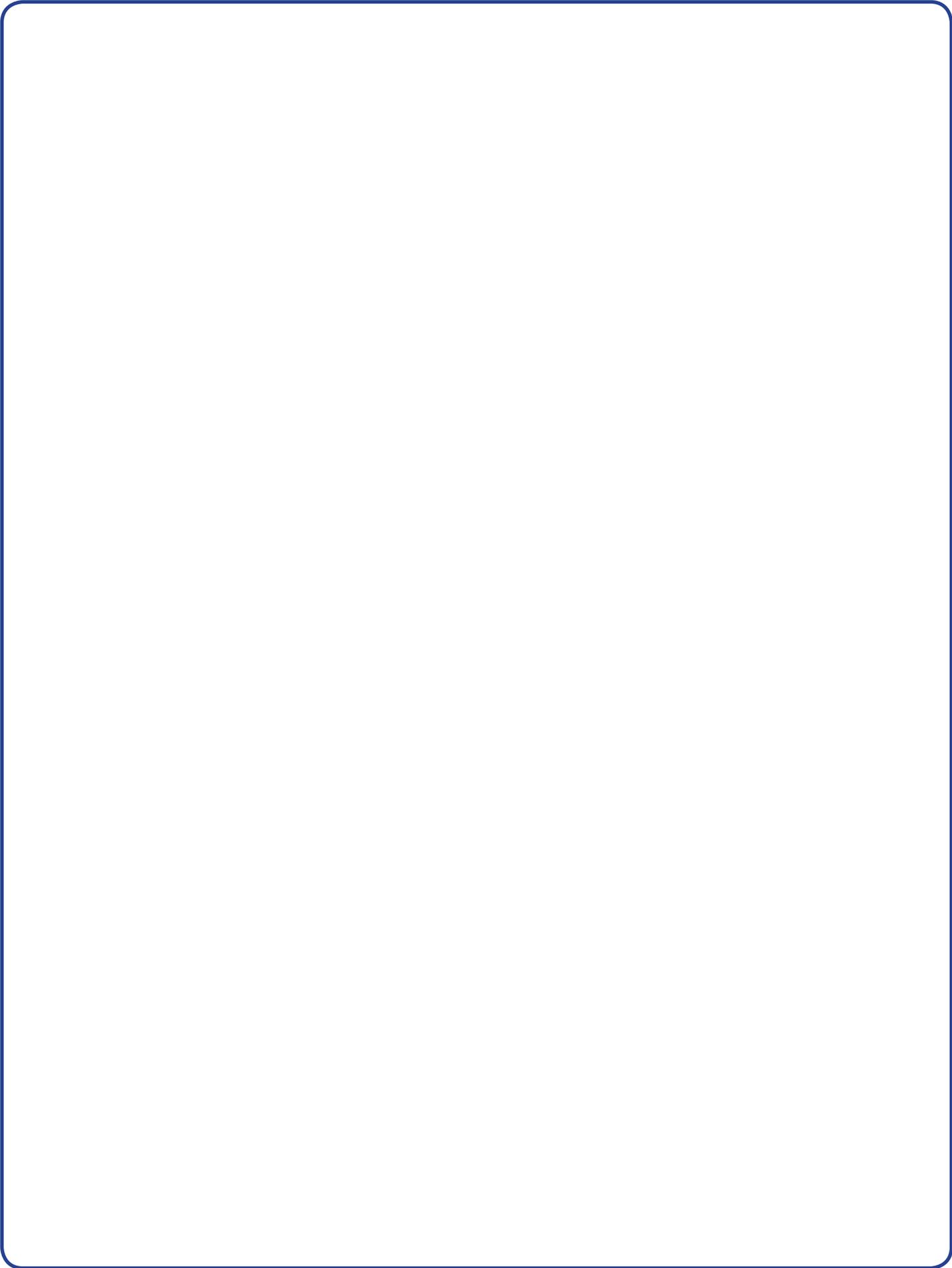
Commit the storage system software, if that has not already been done.
- Allocate storage to server**

Use Unisphere to create RAID groups/pools and LUNs and then present them to the server in its storage group. Then you can make the LUNs visible to the server.
- Verify server High Availability and storage system health**

Ensure that Unisphere indicates the all storage system components are working properly. Using the Unisphere Server Utility, verify the server's high availability.
- Register your contact and storage system information with Support**

Download, install, and run the **VNX ESRS IP Client** from the VNX Toolbox CD. This sets up one mechanism for contacting support and registering the system for support.





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