



Spectra Verde NAS Solution

Installation Guide



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Part Number

90990108 Revision E

Revision History

Revision	Date	Description
A	December 2014	Initial release.
B	March 2015	Second release.
C	September 2015	Updated for the Verde DPE array.
D	March 2016	Updated for process change and the release of the Verde DP array.
E	September 2018	Updated document with new rack rail measurements, updated with new product name.

Note: To make sure you have the most current version of this guide check the Spectra Logic Technical Support portal at support.spectralogic.com/documentation/user-guides/.

To make sure you have the release notes for the most current version of the Verde Release Notes, check the Spectra Logic Technical Support portal at support.spectralogic.com/documentation/release-notes/. You must sign into the portal before viewing Release Notes. The release notes contain updates to the *User Guide* since the last time it was revised.

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Warnings



WARNING

Do not attempt to install a Spectra Verde archive expansion node on your own. The Verde archive expansion node can weigh up to 248.8 lb (112.9 kg) and must be installed by Spectra Logic Professional Services.



WARNING

WARNUNG Versuchen Sie nicht, eine Spectra Verde Archiv Erweiterungsknoten auf eigene Faust zu installieren. Das Verde Archiv Erweiterungsknoten kann bis zu 112,9 kg wiegen und muss von Spectra Logic Professional Services installiert werden.



WARNING

Lifting hazard. A **Spectra Verde 36-drive or 45-drive chassis with its shipping pallet** weighs between 127.4 lb (57.8 kg) and 172 lb (78 kg), depending on the number of drives included. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

Lifting hazard. The **Spectra Verde 12-drive chassis with its shipping pallet** weighs 80.5 lb (36.5 kg). Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Ein Spectra Verde 36-laufwerk und 45-laufwerk Fahrgestell mit seinen Versandpalette wiegt zwischen 57,8 kg und 78 kg, abhängig von der Anzahl der Laufwerke enthalten. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

WARNUNG Gefahren beim Heben. Die Spectra Verde 12-laufwerk Fahrgestell mit seinen Versandpalette wiegt 36,5 kg. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.



WARNING

Take care when cutting the straps securing the shipping box. The straps around the packaging are secured very tightly; the tension may cause them to whip outward when cut, which could lead to personal injury.

WARNUNG Vorsicht beim Schneiden der Bänder sichern Sie den Versandkarton. Die Riemen um die Verpackung sehr fest gesichert ist; die Spannung kann bewirken, dass sie nach außen, wenn sie geschnitten Peitsche, die zu Verletzungen führen können.



WARNING

Lifting hazard. The **Spectra Verde 36-drive and 45-drive chassis** weigh between 57 lb (25.8 kg) and 138.2 lb (62.7 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

Lifting hazard. The **Spectra Verde 12-drive chassis** weighs between 39 lb (17.7 kg) and 60.6 lb (27.5 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 36-laufwerk und 45-laufwerk Fahrgestell** wiegen zwischen 25,8 kg und 62,7 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 12-laufwerk Fahrgestell** wiegt zwischen 17,7 kg und 27,5 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

**WARNING**

If you are not installing any other equipment in the rack, install the master node near the bottom of the rack to prevent the rack from being top-heavy, which could cause personal injury.

WARNUNG Wenn Sie nicht die Installation von anderen Geräten im Rack, installieren Sie die Master-Knoten in der Nähe der Unterseite des Racks, die Zahnstange entfernt, kopflastig zu verhindern, was zu Verletzungen führen könnten.

**WARNING**

To reduce the risk of personal injury or damage to the equipment, make sure that the leveling feet are extended to the floor, so that the full weight of the rack rests on the leveling feet.

WARNUNG Um das Risiko von Verletzungen oder Beschädigungen der Geräte zu vermeiden, stellen Sie sicher, dass die NivellierungsfüÙe müssen Bodenkontakt haben, so dass das gesamte Gewicht des Racks muss auf den NivellierungsfüÙen ruht.

**WARNING**

Only extend one component at a time. A rack may tip if more than one component is extended, which could lead to personal injury.

WARNUNG Nur eine Komponente erstrecken zu einem Zeitpunkt. Ein Rack kann umkippen, wenn mehr als eine Komponente erweitert, die zu Verletzungen führen können.

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CHAPTER 1

About This Guide

This guide describes the unpacking and installation of the Spectra[®] Verde[®] NAS solution master node, which is referred to in this guide as *the master node* or *the chassis*.

This guide also describes the unpacking and installation requirements for Verde enterprise expansion node(s), which is referred to as the *expansion node* in these instructions. The expansion nodes are used in conjunction with the master node and cannot be used as a stand-alone product.

When instructions in this guide apply to both the Verde NAS solution master node and expansion nodes, *the system* is used to refer to both.

The Verde archive expansion node is installed by Spectra Logic professional services and is not covered in this guide.



WARNING

Do not attempt to install a Spectra Verde archive expansion node on your own. The Verde archive expansion node can weigh up to 248.8 lb (112.9 kg) and must be installed by Spectra Logic Professional Services.

WARNUNG Versuchen Sie nicht, eine Spectra Verde Archiv Erweiterungsknoten auf eigene Faust zu installieren. Das Verde Archiv Erweiterungsknoten kann bis zu 112,9 kg wiegen und muss von Spectra Logic Professional Services installiert werden.

INTENDED AUDIENCE

This guide is intended for data center administrators and operators who maintain and operate file storage systems. The information in this guide assumes a familiarity with computing terminology, RAID technology, SAS connectivity, and Ethernet networking. You also need to be familiar with installing, configuring, and using data file storage and archival software.

OVERVIEW

The Verde NAS solution provides high-density, network-attached storage for most major operating environments, including Microsoft® Windows® operating system, Apple® OS X® operating system, UNIX®, and Linux®.

Optimized for secondary storage, the highly versatile Verde NAS solutions have many applications, including use as:

- Network-Attached Storage (NAS) for sharing file-based information over an IP network.
- Bulk file storage for both general and digital preservation usage.
- Disk-to-disk data file storage, either alone or as part of a tiered storage solution.

Additional Publications

The following documents related to the Spectra Verde NAS solution are available on the Support Portal website at support.spectralogic.com, and from the Documentation screen on the Verde user interface.

- The *Spectra Verde NAS Solution User Guide* provides information about configuring, using and maintaining your Verde NAS solution.
- The *Spectra Verde NAS Solution Network Setup Tips* provide helpful instructions for troubleshooting common connectivity problems.
- The *Spectra Verde NAS Solution Quick Start Guide* provides basic instructions for the essential installation and configuration steps.
- The *Spectra Verde NAS Solution Command Line Interface Guide* describes how to configure, monitor, and maintain the Spectra Verde NAS solution through the command line interface.
- The *Spectra Verde NAS Solution Site Preparation Guide* provides important information that you should know before installing a Verde NAS solution in your storage environment.
- The *Spectra Verde NAS Solution Installation Guide* provides instructions for installing a Verde NAS solution.
- The *Spectra BlackPearl & Verde HotPair Installation & Configuration Guide* provides detailed information on installing and using a Verde NAS solution in a HotPair configuration.

The following documents are available after logging into your Support portal account at: support.spectralogic.com.

- The *Spectra Verde NAS Solution Release Notes and Documentation Updates* provide the most up-to-date information about the Verde NAS solution, including information about the latest software releases and documentation updates.
- The *Spectra 12- & 36-Drive Chassis Boot Drive Replacement Guide* provides instructions for replacing a failed boot drive in the system.
- The *Spectra 12-, 36- & 45-Drive Chassis Drive Replacement Guide* provides instructions for replacing a failed data drive after the system is installed.
- The *Spectra 12-, 36- & 45-Drive Chassis Fan Replacement Guide* provides instructions for replacing a failed fan in the system.
- The *Spectra 12-, 36- & 45-Drive Chassis Power Supply Replacement Guide* provides instructions for replacing a failed power supply after the system is installed.
- The *Spectra 12-Drive Chassis HBA Replacement Guide* and *Spectra 36-Drive Chassis HBA Replacement Guide* provide instructions for replacing a failed HBA in the system.
- The *Spectra 96-Drive Chassis Drive Replacement Guide* provides instructions for replacing a failed data drive in the Verde archive expansion node.
- The *Spectra 96-Drive Chassis Fan Replacement Guide* provides instructions for replacing a failed fan in the archive expansion node.
- The *Spectra 96-Drive Chassis Power Supply Replacement Guide* provides instructions for replacing a failed power supply in the archive expansion node.
- The *Spectra 96-Drive Chassis I/O Module Replacement Guide* provides instructions for replacing a failed I/O module in the archive expansion node.

Typographical Conventions

This document uses the following conventions to highlight important information:

**WARNING**

Read text marked by the “Warning” icon for information you must know to avoid personal injury.

**Caution**

Read text marked by the “Caution” icon for information you must know to avoid damaging the library, the tape drives, or losing data.

**Important**

Read text marked by the “Important” icon for information that helps you complete a procedure or avoid extra steps.

Note: Read text marked with “Note” for additional information or suggestions about the current topic.

CHAPTER 2

Installation Checklists

Use these checklists to ensure the Verde NAS solution is prepared for installation and to record important information during installation.

PREPARING FOR INSTALLATION

Status	Description
<input type="checkbox"/>	The system components have acclimated to the site's temperature for at least 24 hours in its packaging (see Acclimating the Verde NAS Solution on page 19).
<input type="checkbox"/>	The rack is prepared for installation (see Preparing the Rack on page 19).
<input type="checkbox"/>	The system components are unpacked (see Unpacking the Verde NAS Solution on page 21).
<input type="checkbox"/>	The component inventory is complete (see Inventorying the Components on page 26).

INSTALLING THE VERDE NAS SOLUTION

Status	Description
<input type="checkbox"/>	Any HBAs included in the shipment are installed in the master node (see Installing an HBA in the Master Node on page 28).
<input type="checkbox"/>	The components are installed on a sturdy work surface, or in a rack (see Installing the Verde NAS Solution in a Rack on page 35).
<input type="checkbox"/>	Additional drives are installed in the chassis (see Installing Additional Drives on page 47).
<input type="checkbox"/>	The power cords are connected (see Connecting the Power Cords on page 50).
<input type="checkbox"/>	The interface cables are connected (see Connecting the Interface Cables on page 51).
<input type="checkbox"/>	The system is powered on (see Powering On the Verde NAS Solution on page 52).
<input type="checkbox"/>	The front bezel is installed (see Installing the Front Bezel on page 54).

SYSTEM INFORMATION

System Location:	
Installation Date:	
Master Node Serial Number:	
Expansion Node Serial Number(s):	
Verde Software Version:	
Number of Drives:	
Drive Type:	
Additional Information:	

CONFIGURATION INFORMATION

Component	Description	Value
Management Interface Port IP Address	<p>By default, the management port is configured with the following address:</p> <p>IP address: 10.0.0.2 Netmask: 255.255.255.0</p> <p>You can configure the management port to use DHCP or a different static (fixed) IP address. See “Chapter 2 - Initial Configuration” in the <i>Spectra Verde NAS Solution User Guide</i> for more information.</p>	<p><input type="checkbox"/> Use DHCP <input type="checkbox"/> Use static IP address</p> <p>Management interface port IP address _____ . _____ . _____ . _____</p> <p>Subnet mask _____ . _____ . _____ . _____</p> <p>Network gateway _____ . _____ . _____ . _____</p>

Component	Description	Value
<p>Mail Recipients</p>	<p>Identify people who should automatically receive email messages about certain library conditions. See “Chapter 7 - Using AutoSupport” in the <i>Spectra Verde NAS Solution User Guide</i> for more information on setting up email messages for users.</p> <ul style="list-style-type: none"> ▪ Identify the user’s email address. ▪ Specify the types of notification(s) the system should send automatically. 	<p>Email address 1</p> <hr/> <p>Message Severities to Receive:</p> <p><input type="checkbox"/> Info</p> <p><input type="checkbox"/> Warning</p> <p><input type="checkbox"/> Error</p> <p>Email address 2 (if desired)</p> <hr/> <p>Message Severities to Receive:</p> <p><input type="checkbox"/> Info</p> <p><input type="checkbox"/> Warning</p> <p><input type="checkbox"/> Error</p>

CHAPTER 3

Preparing for Installation

This chapter outlines the requirements for receiving and unpacking Verde NAS solution components. Make sure that you complete these requirements carefully.

Topic	
Acclimating the Verde NAS Solution	(below)
Preparing the Rack	(below)
Verde NAS Solution and Verde Enterprise Expansion Node	page 20
Unpacking the Verde NAS Solution	page 21
Prepare the Unpacking Location	page 21
Unpack the Components	page 22
Inventorizing the Components	page 26

ACCLIMATING THE VERDE NAS SOLUTION

You must allow time for the Verde NAS solution to acclimate to the working environment when you move it from the loading dock.

**Caution**

When the chassis is moved from a cold storage environment to a warm operating environment, it must acclimate for at least 24 hours before opening its packaging to prevent serious condensation damage from occurring.

PREPARING THE RACK

Assemble and place an appropriate rack near the AC power outlets and network connections.

**Caution**

The rack must be located on a level, hard-surfaced floor, such as cement or tile. Do not place the rack on a carpeted floor or anywhere else that poses risk for static discharge that could damage your system or its drives.

**WARNING**

If you are not installing any other equipment in the rack, install the master node near the bottom of the rack to prevent the rack from being top-heavy, which could cause personal injury.

WARNUNG Wenn Sie nicht die Installation von anderen Geräten im Rack, installieren Sie die Master-Knoten in der Nähe der Unterseite des Racks, die Zahnstange entfernt, kopflastig zu verhindern, was zu Verletzungen führen könnten.

Verde NAS Solution and Verde Enterprise Expansion Node

Note: If the system configuration includes a Verde master node with a Verde archive expansion node, it must be installed by Spectra Logic Professional Services. See [Contacting Spectra Logic on page 9](#) to arrange installation.

The Verde 4U chassis is 7 inches (18 cm) tall and occupies 4U of rack space. The Verde 2U chassis is 3.5 inches (8.9 cm) tall and occupies 2U of rack space. Both systems fit in a standard 19-inch, 4-post rack. Keep the following in mind when selecting a rack:

- Make sure that the distance between the mounting surfaces on the front and rear posts is between 27 inches (68.6 cm) and 36 inches (91 cm).

Note: If you are using the adaptors to install the rack-mount kit in a rack with circular mounting cutouts, the distance between the front and rear posts must be at least 28.5 inches (72.4 cm), and not more than 37.5 inches (95.25 cm).

- Allow approximately 3 inches (8 cm) of additional depth at the back of the rack for cable clearance.
- If the rack has a door, allow at least 2 inches (5 cm) of clearance between the front door frame and the front mounting posts of the rack to allow the door to close over the front bezel.
- Check your rack's specifications to make sure it will accommodate the weight and depth of the Verde chassis.

Notes: ▪ Using a two-post rack is not supported.

- An enclosed 19-inch, four-post rack is available for purchase from Spectra Logic. The rack has two doors and removable side panels.
- In earthquake-prone areas, provide restraints as necessary. See the [Spectra Verde NAS Solution Site Preparation Guide](#) for more information.

UNPACKING THE VERDE NAS SOLUTION



Important

Do not unpack a Verde NAS solution if the shipping box shows signs of damage. Contact both the shipping company and Spectra Logic (see [Contacting Spectra Logic on page 9](#)) to report the problem.

The Spectra Verde NAS solution and its drives are shipped in a cardboard box attached to a pallet. The only tool needed to unpack them is a pair of scissors.

Save the box, anti-static bags, and foam packaging in case you need to move or ship the master node later.

Prepare the Unpacking Location

Move the pallet with the boxes to the location where you plan to install the Verde master node. Make sure you have adequate clearance around and above the shipping boxes so that you can safely unpack them. Have a sturdy work surface nearby that is large enough to accommodate the chassis and other components as you unpack them.

Note: If necessary, unpack the master node in the receiving area.



WARNING

Lifting hazard. A **Spectra Verde 36-drive or 45-drive chassis with its shipping pallet** weighs between 127.4 lb (57.8 kg) and 172 lb (78 kg), depending on the number of drives included. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

Lifting hazard. The **Spectra Verde 12-drive chassis with its shipping pallet** weighs 80.5 lb (36.5 kg). Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Ein Spectra Verde 36-laufwerk und 45-laufwerk Fahrgestell mit seinen Versandpalette wiegt zwischen 57,8 kg und 78 kg, abhängig von der Anzahl der Laufwerke enthalten. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

WARNUNG Gefahren beim Heben. Die Spectra Verde 12-laufwerk Fahrgestell mit seinen Versandpalette wiegt 36,5 kg. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

Unpack the Components

1. Inspect the shipping box for signs of damage.

- Notes:**
- The images in this section show the Verde 4U master node. The procedure is similar for the Verde 2U master node and the Verde enterprise expansion node.
 - The Verde 4U master node ships with ten drives installed in the chassis, the Verde 2U master node ships with twelve drives installed in the chassis. If you purchased additional drives with your order, they are shipped in a separate box.
 - The Verde enterprise expansion node ships without any drives installed. Drives for the expansion node are shipped in a separate box.

2. Use scissors to cut the straps securing the shipping box to the pallet.



WARNING

Take care when cutting the straps securing the shipping box. The straps around the packaging are secured very tightly; the tension may cause them to whip outward when cut, which could lead to personal injury.

WARNUNG Vorsicht beim Schneiden der Bänder sichern Sie den Versandkarton. Die Riemen um die Verpackung sehr fest gesichert ist; die Spannung kann bewirken, dass sie nach außen, wenn sie geschnitten Peitsche, die zu Verletzungen führen können.

3. Lift the top cover off of the shipping box.

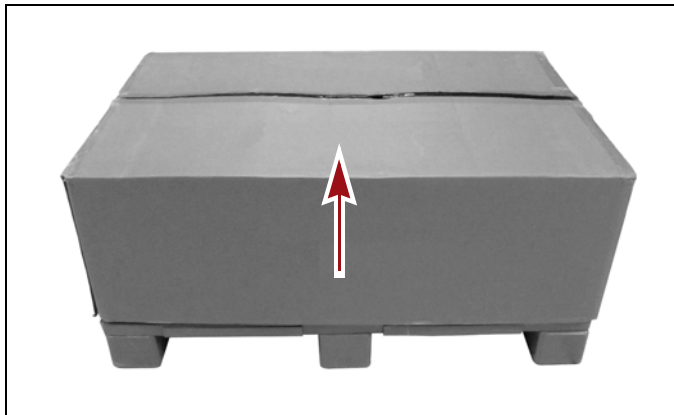


Figure 1 Lift the top cover off of the shipping box.

4. Remove the two foam pieces that protect the front bezel during shipping, and then remove the bezel.

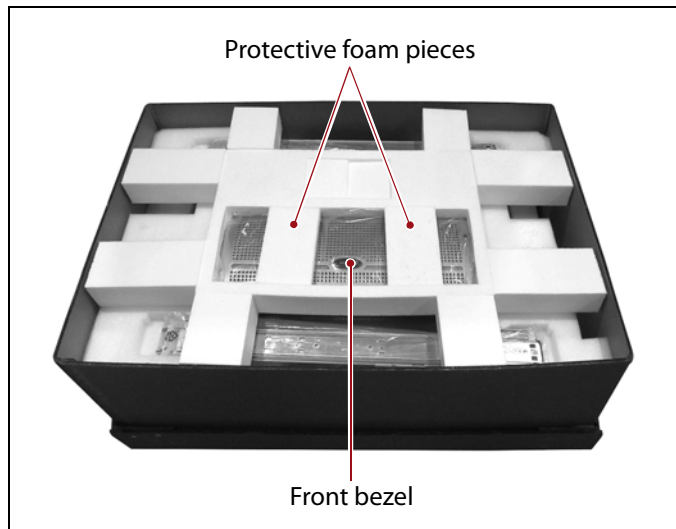


Figure 2 Remove the two protective foam pieces and the front bezel.

5. Remove the outer foam insert covering the rack mount kit and accessory box.

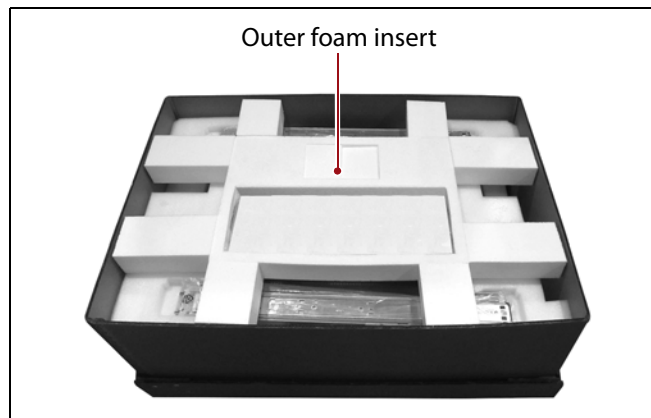


Figure 3 Remove the outer foam insert.

6. Remove the Open Me First accessory box and the rack mount kit.

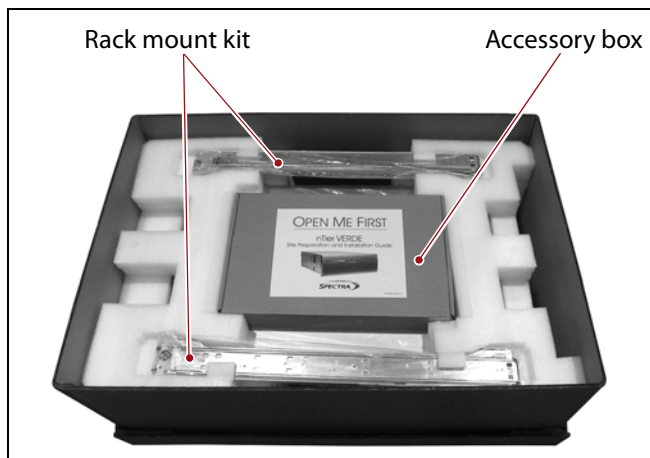


Figure 4 Remove the accessory box and rack mount kit.

7. Remove the inner foam inserts covering the Verde master node.

- Using two people, lift the chassis off of the pallet and place it on a cart or table sturdy enough to support the weight.

**WARNING**

Lifting hazard. The **Spectra Verde 36-drive and 45-drive chassis** weigh between 57 lb (25.8 kg) and 138.2 lb (62.7 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

Lifting hazard. The **Spectra Verde 12-drive chassis** weighs between 39 lb (17.7 kg) and 60.6 lb (27.5 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 36-laufwerk und 45-laufwerk Fahrgestell** wiegen zwischen 25,8 kg und 62,7 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 12-laufwerk Fahrgestell** wiegt zwischen 17,7 kg und 27,5 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.



Figure 5 Lift the master node out of the shipping box.

- Remove the plastic bag from around the chassis.

INVENTORYING THE COMPONENTS

Unpack and identify the components that shipped with the Verde master node using the following table and the packing list for reference.

Component	Description
Rack-mounting kit	Included in the main and accessory boxes. The rack-mounting kit includes all the components required to mount a Verde chassis in a standard 4-post, 19-inch (48.3 cm) rack. The main box contains the arms of the rack kit, while the accessory box contains the screws necessary to install the rack kit into the rack.
Power cords	Included in the accessory box. Two power cords are provided with the standard Verde solution configuration (for either 110 VAC or 220 VAC operation).
Documentation	Included in the accessory box. The Network Setup Tips document has helpful information to know when configuring the network connections of the Verde NAS solution. The Quick Start guide describes the essential steps for configuration.
Serial cable (<i>HotPair only</i>)	Included in the accessory box. One null modem cable is included with a HotPair configuration.

CHAPTER 4

Installation

This chapter describes the installation process for a Spectra Verde NAS solution.

The Verde archive expansion node is installed by Spectra Logic professional services and is not covered in this guide.



WARNING

Do not attempt to install a Spectra Verde archive expansion node on your own. The Verde archive expansion node can weigh up to 248.8 lb (112.9 kg) and must be installed by Spectra Logic Professional Services.

WARNUNG Versuchen Sie nicht, eine Spectra Verde Archiv Erweiterungsknoten auf eigene Faust zu installieren. Das Verde Archiv Erweiterungsknoten kann bis zu 112,9 kg wiegen und muss von Spectra Logic Professional Services installiert werden.

Topic	
Installation	page 28
Installing an HBA in the Master Node	page 28
Gather Materials and Tools	page 28
Ensure ESD Protection	page 29
Install an HBA	page 29
Installing the Verde NAS Solution in a Rack	page 35
Before You Begin	page 35
Install the Outer Rail	page 38
Install the Outer Rail Using Adaptors	page 40
Install the Inner Rails	page 43
Slide the Chassis into the Rack	page 45
Installing Additional Drives	page 47
Connecting the Power Cords	page 50
Connecting the Interface Cables	page 51
Powering On the Verde NAS Solution	page 52
Installing the Front Bezel	page 54
Next Steps	page 54

INSTALLATION

Use the information in this section to install a Verde chassis, or if you need to move and reinstall the chassis. If you do not have to install an HBA, continue to [Installing the Verde NAS Solution in a Rack on page 35](#).

INSTALLING AN HBA IN THE MASTER NODE

The Verde master node ships with the 10 GigE HBA installed, if one was purchased with your order. If there are one or more SAS or 40 GigE HBAs included with the shipment, use the instructions in this section to install them.

Gather Materials and Tools

Required

- A grounded anti-static wristband
- A #2 Phillips screwdriver
- One or more 40 GigE HBA from Spectra Logic (*PN 90999713, not shown*)
- One or more SAS HBA from Spectra Logic (*PN 90999693 or 90999719*)

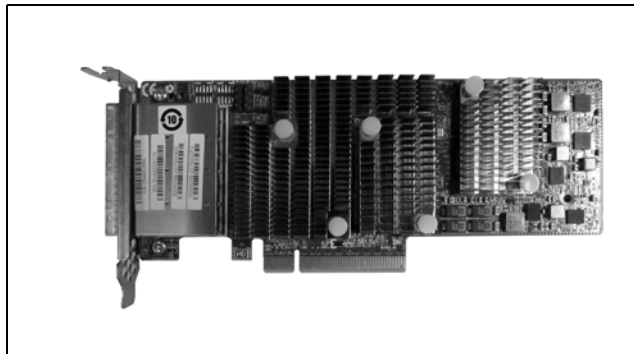


Figure 6 The SAS HBA.

Note: The SAS card you receive may look different than the one pictured above.

Recommended

- An anti-static mat
- A static protection wristband or grounding footstrap

Ensure ESD Protection

The installation environment for the system must be free of conditions that could cause electrostatic discharge (ESD). To protect the system from ESD, follow these procedures when installing the system:

- Place a static protection mat on the work surface used while installing system components. Use a 1-megohm resistor to ground the static protection mat.
- Wear a static protection wristband or grounding footstrap whenever you handle system components that have been removed from their anti-static bags. Connect the wristband to the static protection mat or to other suitable ESD grounding.

Note: Keep all electronic components in anti-static bags when not in use.

Install an HBA

1. Remove the cover.

Verde 4U Master Node

- a. Using a #2 Phillips screwdriver, remove the four screws that secure the cover to the chassis. Three screws are located on the sides of the chassis, while one is located on the top.
- b. Slide the cover toward the rear of the chassis to remove it.

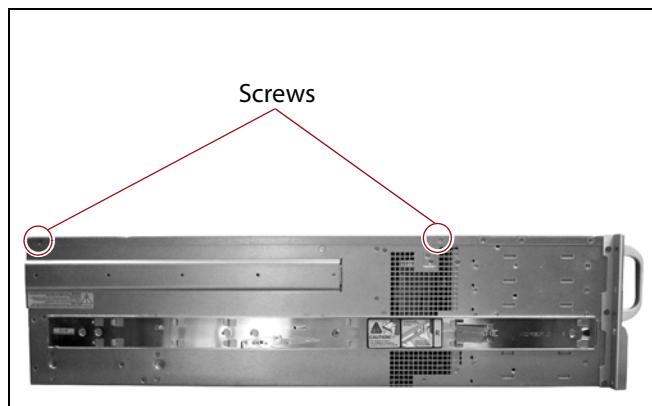


Figure 7 Remove the screws on the left-hand side of the chassis.

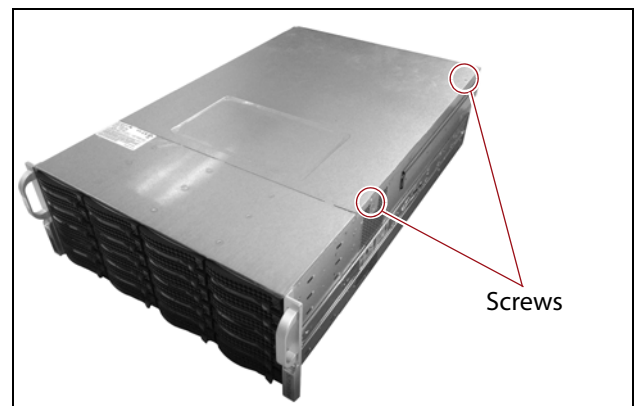


Figure 8 Remove the screws on the right-hand side and top of the chassis.

Verde 2U Master Node

Press down on the two release latches and slide the cover toward the rear of the chassis to remove it.

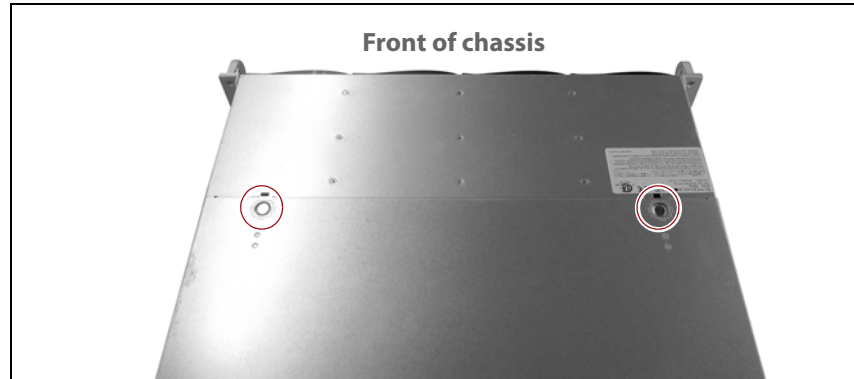


Figure 9 Release latches on the Verde 2U master node.

2. Set the cover aside.
3. Locate the slot where you want to install an HBA in the chassis.

Verde 4U Master Node

Note: The Verde 4U master nodes ship with a 10 GigE HBA installed in slot 1.

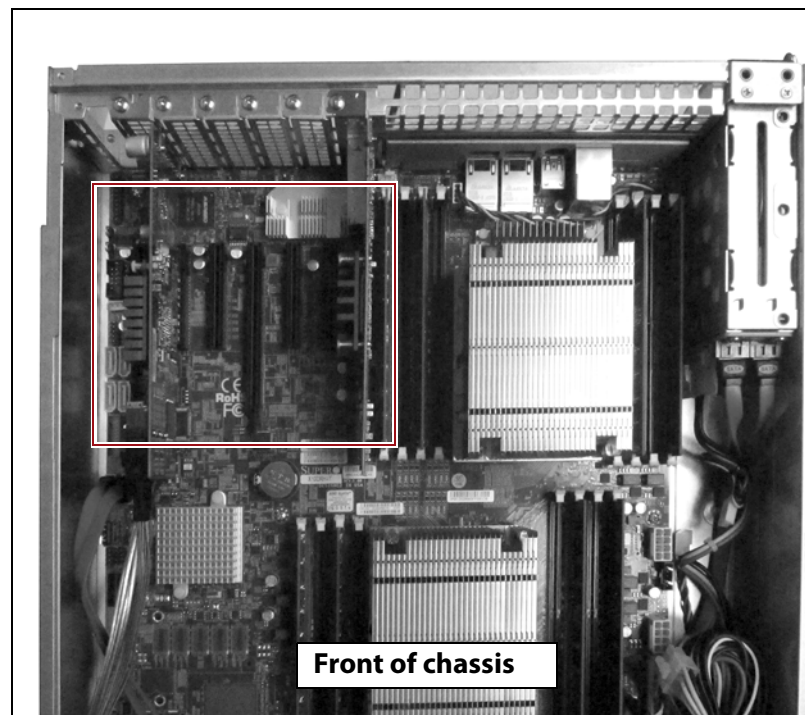


Figure 10 HBA locations in the Verde 4U master node.

Verde 2U Master Node

- Notes:**
- Because the Verde 2U master node only has a single CPU, only three of the seven PCI slots are active. Make sure you install the HBA into one of the indicated slots, which are labeled on the motherboard as slots 1, 2, and 3.
 - Depending on your order configuration, a 10 GigE HBA may occupy slot 3.
 - If you have a Verde 1.0 chassis, which can be identified by the presence of four RJ45 ports on the rear panel, see the [Spectra Verde 12-Drive Chassis HBA Replacement Guide](#) for instructions on which motherboard slots to use when installing an HBA.

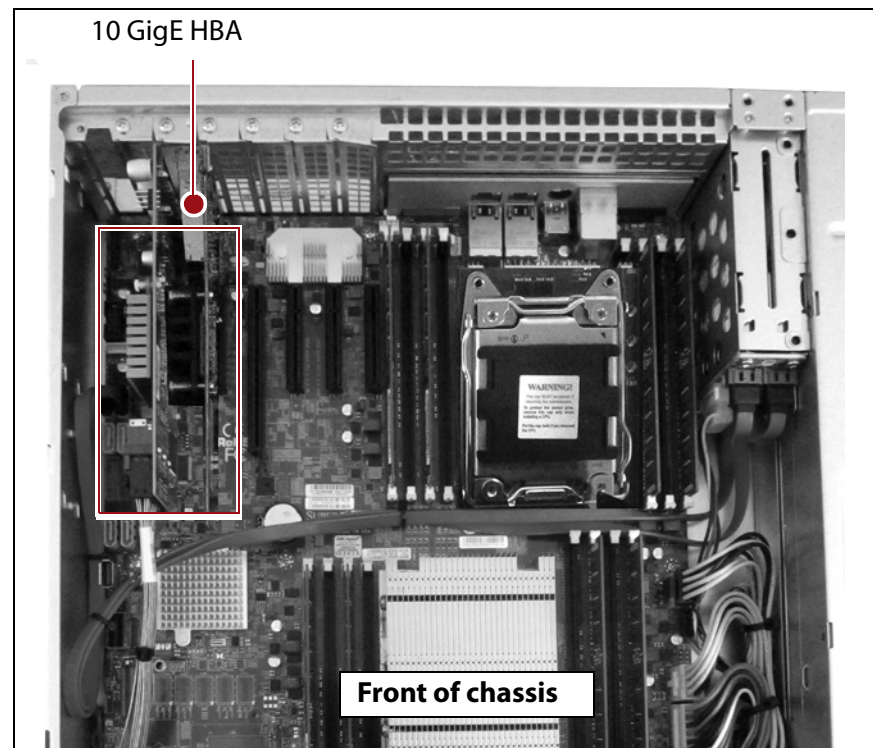


Figure 11 HBA locations in the Verde 2U master node.

4. Using a #2 Phillips screwdriver, remove the single screw that secures the PCI blanking plate to the chassis.

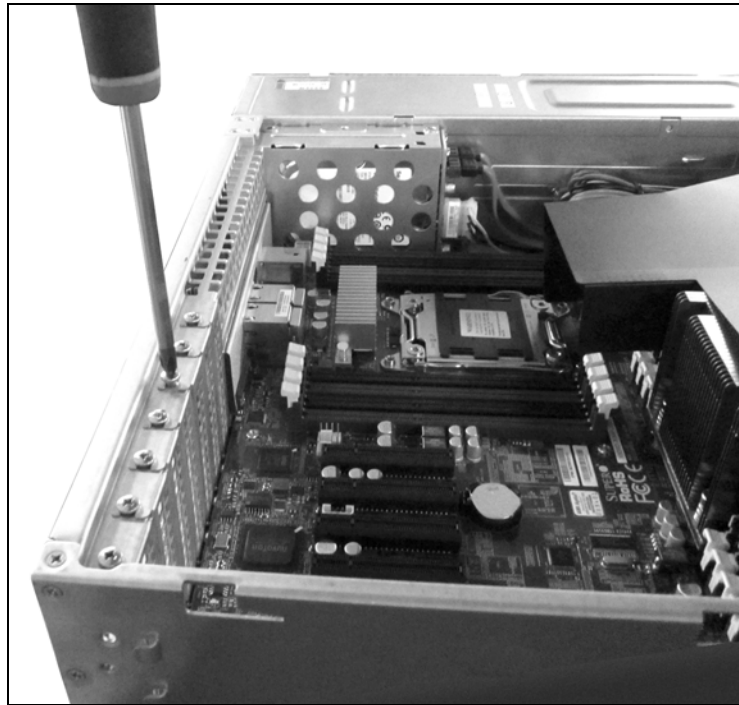


Figure 12 Remove the PCI blanking plate screw.

5. Remove the HBA from its packaging.
6. Orient the HBA so that the card bracket faces the rear of the chassis and the edge connector is oriented down.

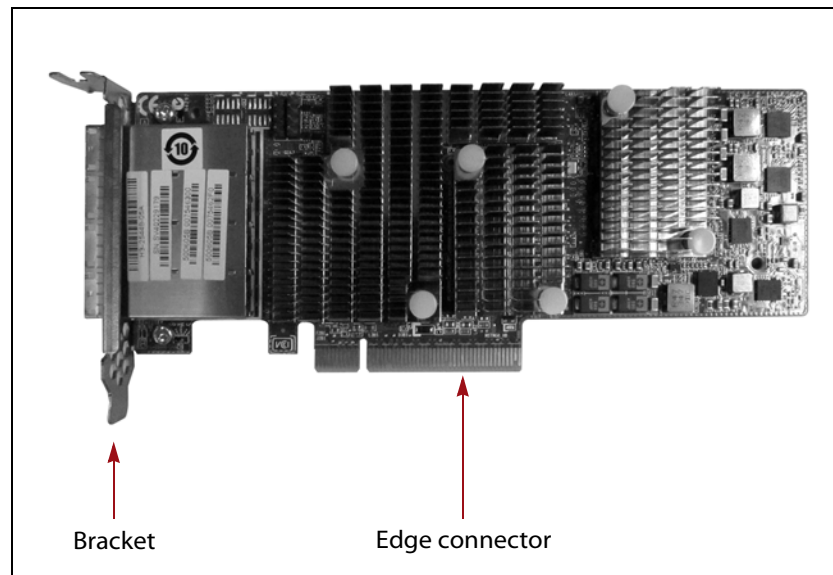


Figure 13 The SAS HBA.

7. Guide the connectors on the HBA through the slot on the rear of the chassis.

**Caution**

Be careful not to damage the connectors on the HBA as you guide them through the slot on the rear of the chassis.

8. Press down on the HBA to secure it in the socket on the motherboard. The card will fit firmly in the socket.

Note: This image shows the 10 GigE HBA. The SAS HBA is installed in a similar manner.

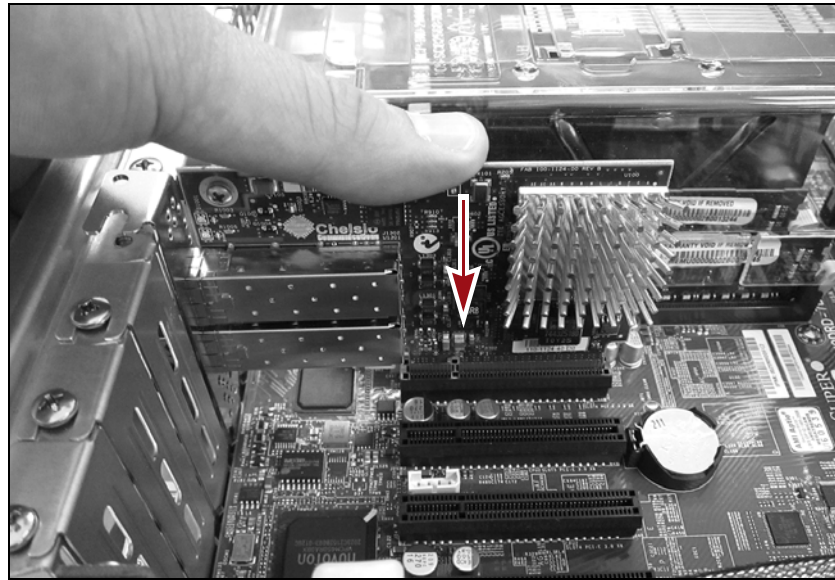


Figure 14 Install the HBA.

9. Using a #2 Phillips screwdriver, install the bracket screw to secure the HBA to the chassis (see [Figure 12 on page 32](#)).
10. Repeat [Step 3 on page 30](#) through [Step 9](#) for any additional HBA(s) that need to be installed.

11. Install the cover.**Verde 4U Master Node**

- a. Orient the cover over the chassis with the tabs facing toward the front of the chassis.

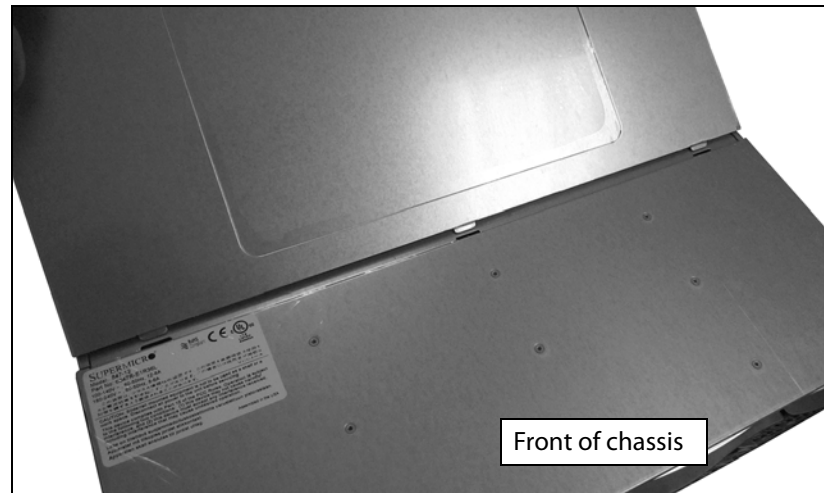


Figure 15 Orient the cover with the tabs facing toward the front of the chassis.

- b. Insert the tabs into the slots in the chassis and rotate the cover down.
- c. Using a #2 Phillips screwdriver, install the four screws to secure the cover to the chassis (see [Figure 7](#) and [Figure 8](#) on page 29).

Verde 2U Master Node

- a. Position the cover on top of the chassis with the hooks of the release latches facing toward the front of the chassis.

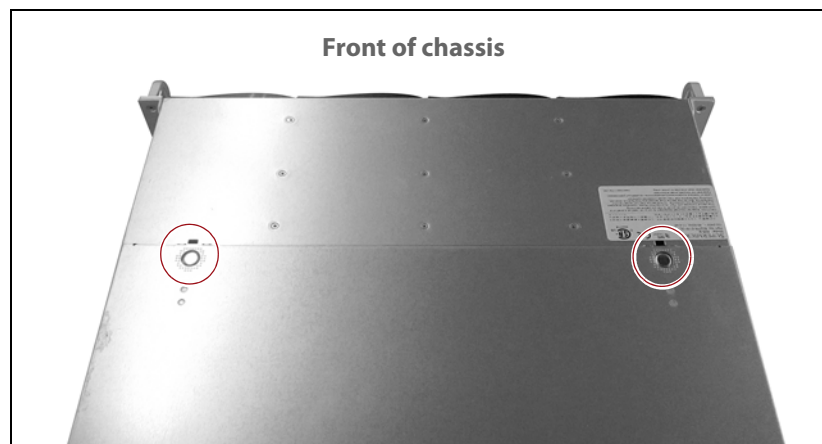


Figure 16 Release latches on the Verde 2U master node.

- b. While holding down the release latches, slide the cover toward the front of the chassis until it locks in place.

INSTALLING THE VERDE NAS SOLUTION IN A RACK

Install the Verde NAS solution in a standard 4-post, 19-inch (48.3-cm) rack. The Verde master nodes occupy either 2 units (2U) or 4 units (4U) of rack space, depending on which model was ordered. The Verde enterprise expansion node occupies 4 units (4U) of rack space. If you do not want to install the master node in a rack, continue with [Installing Additional Drives on page 47](#).



WARNING




If you are not installing any other equipment in the rack, install the master node near the bottom of the rack to prevent the rack from being top-heavy, which could cause personal injury.





WARNUNG Wenn Sie nicht die Installation von anderen Geräten im Rack, installieren Sie die Master-Knoten in der Nähe der Unterseite des Racks, die Zahnstange entfernt, kopflastig zu verhindern, was zu Verletzungen führen könnten.

Before You Begin

Before you install a Verde chassis in a rack:

- Have on hand:
 - #2 Phillips screwdriver, magnetic if available
 - Level (recommended)
- Identify the location in the rack where you will install the system.
- Unpack the rack-mount kit and identify the components listed in the following table.

Component	# Required	Use
 <p>Inner rack rails</p>	2	Inner rack rails attach to the sides of the Verde chassis.
 <p>Outer rack rails</p>	2	Outer rack rails attach to the posts of the rack. The chassis-mounted inner rack rails will slide into the outer rack rails.
 <p>Inner rail screws</p>	2 or 4	Secure the inner rack rail to the chassis <ul style="list-style-type: none"> ▪ The Verde 4U chassis uses two screws. ▪ The Verde 2U chassis uses four screws.

Component	# Required	Use
 <p>Outer rail screws</p>	8	Attach the rail assemblies to the rack (8).
 <p>Washers</p>	8	Used with the outer rail screws to attach the rail assemblies to the rack (8).
 <p>Chassis screws</p>	2	Secure the chassis to the rack (2).
 <p>Circular cut-out rack adaptors</p>	4 (optional)	Optional adaptors attach to the ends of the outer rack rails, allowing the rack kit to be installed in a circular cut-out rack.

Separate the Rails

If necessary, remove the inner rack rail section from the outer rack rail.

1. Orient the rack rail with the open end to the left and the inner rail facing you (see [Figure 17](#)).

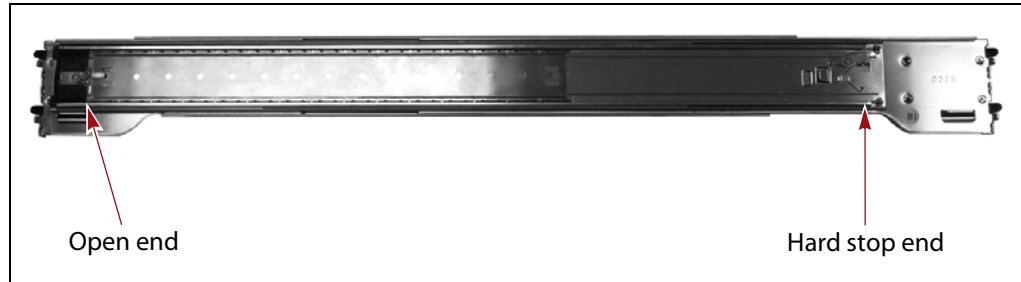


Figure 17 Location of the hard stop and open ends of the outer rack rail.

2. Push the end of the inner rail near the hard stop towards the open end of the outer rail until the self-locking latch engages.

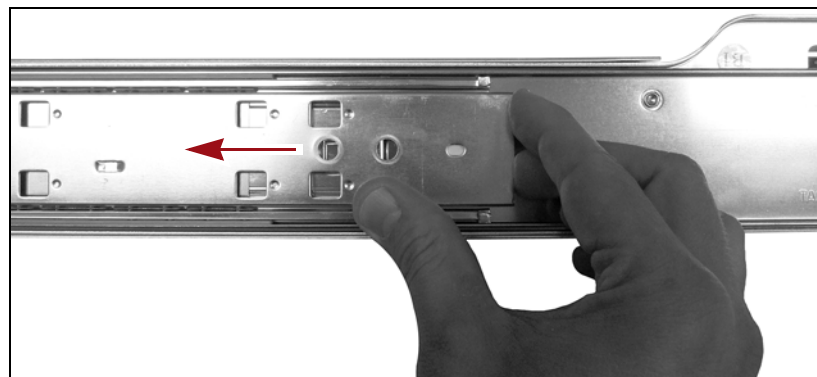


Figure 18 Extend the inner rail beyond the outer rail.

3. Flip the rail assembly over so the outer rail is on top and the self-locking latch is facing you (see [Figure 19](#)).
4. Press the self-locking latch toward the closest edge of the inner rail and then fully extract the inner rail from the outer rail.

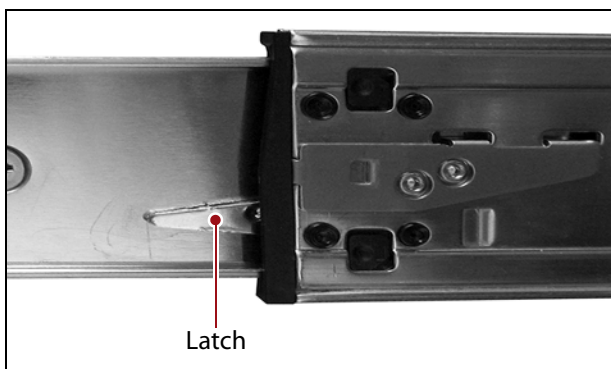


Figure 19 Self-locking latch.

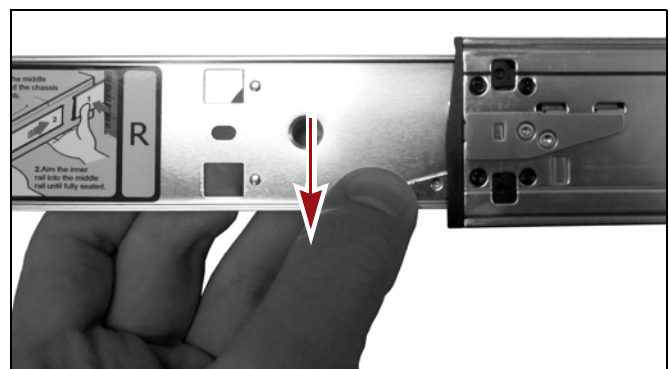


Figure 20 Press the latch toward the closest outer edge.

Install the Outer Rail

If you are installing the rack kit in a circular cut-out rack, skip to [Install the Outer Rail Using Adaptors on page 40](#).

1. Determine the position of the rack mount kit in the rack. [Figure 21](#) and [Figure 22](#) show the relationship of the rack kit position in the rack and the resulting position of the chassis.

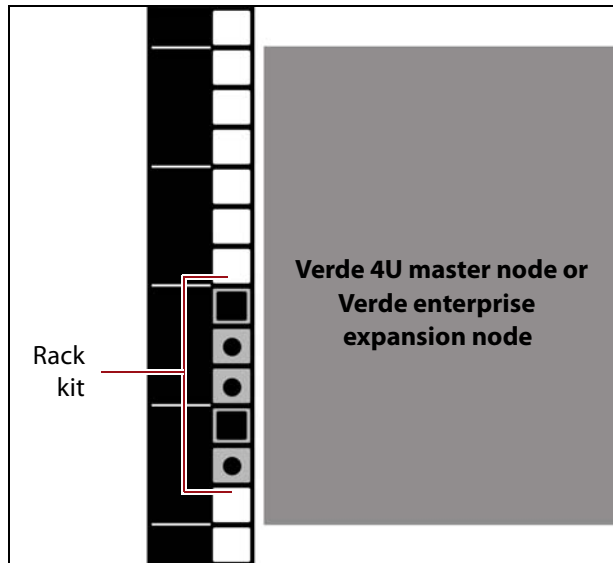


Figure 21 Relationship between rack kit position and the position of the 4U chassis.

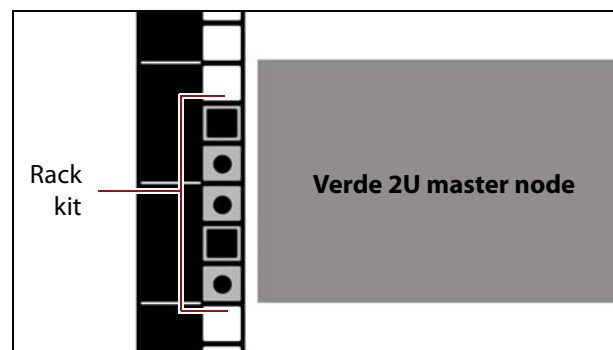


Figure 22 Relationship between rack kit position and the position of the 2U chassis.

2. Position the outer rack rail at the desired height in the rack with the open end facing the front of the rack. Make sure the mounting hooks are behind the cut-outs in the posts and face down.
3. Insert the mounting hooks on the open end of the rail into the cut-outs in the front of the rack. This action also depresses the black tabs used to lock the rail in to the rack.

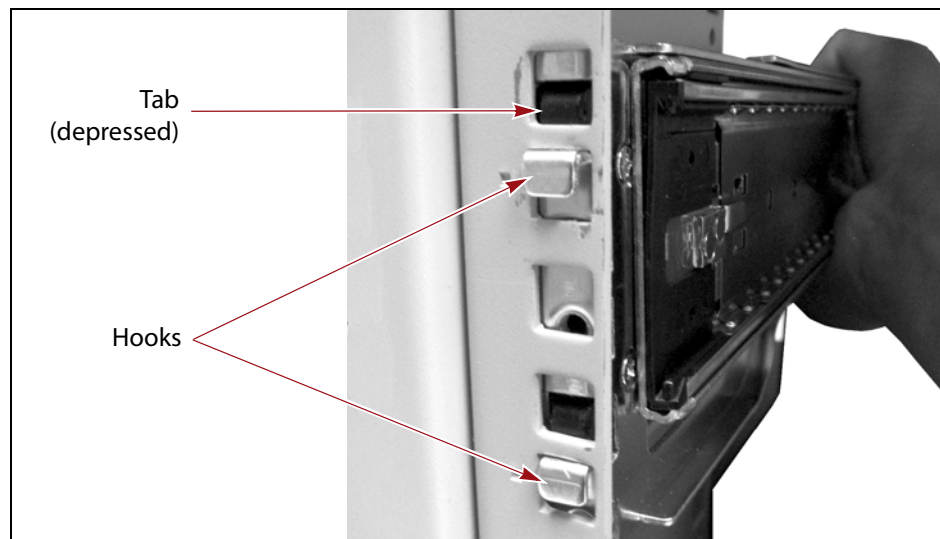


Figure 23 Insert the mounting hooks through the cut-outs in the rack.

4. Press the outer rail down to lock the mounting hooks to the rack. The black tabs will pop through the holes in the front of the rack and lock in place with an audible click.

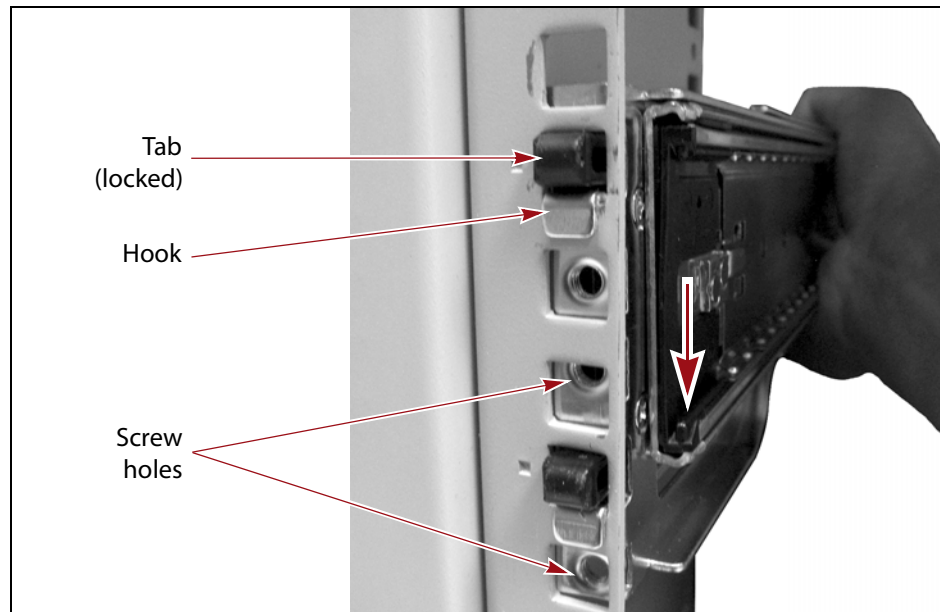


Figure 24 Press the rail down to lock it into place.

5. Repeat [Step 2 on page 38](#) through [Step 4](#) to attach the rear mounting hooks of the outer rack rail to the rear post of the rack.
6. Use a level to make sure that the outer rack rail is level.
7. Using a #2 Phillips screwdriver, secure the outer rail to the rack.
 - a. Install two outer rail screws and washers in the holes above and below the bottom mounting hook in the front mounting bracket to secure the rail to the front post (see [Figure 24](#)).
 - b. Install two screws and washers in the upper and lower holes to secure the back of the outer rail to the rear post.
8. Repeat [Step 2 on page 38](#) through [Step 7](#) to attach the second outer rail to the other side of the rack.
9. Use a level to make sure the installed rails are level in relation to each other.
10. Continue to [Install the Inner Rails on page 43](#).

Install the Outer Rail Using Adaptors

If you are installing the rack kit in a circular cut-out rack, you will need to install the four included adaptors on the ends of both outer rails.

1. Position the outer rail so that the inner side is facing upward.
2. The adaptors used on the front of the outer rail are different from the ones used on the back of the rail. Use adaptors labeled “A” for the front of the outer rails, and adaptors labeled “B” for the back of the rails.

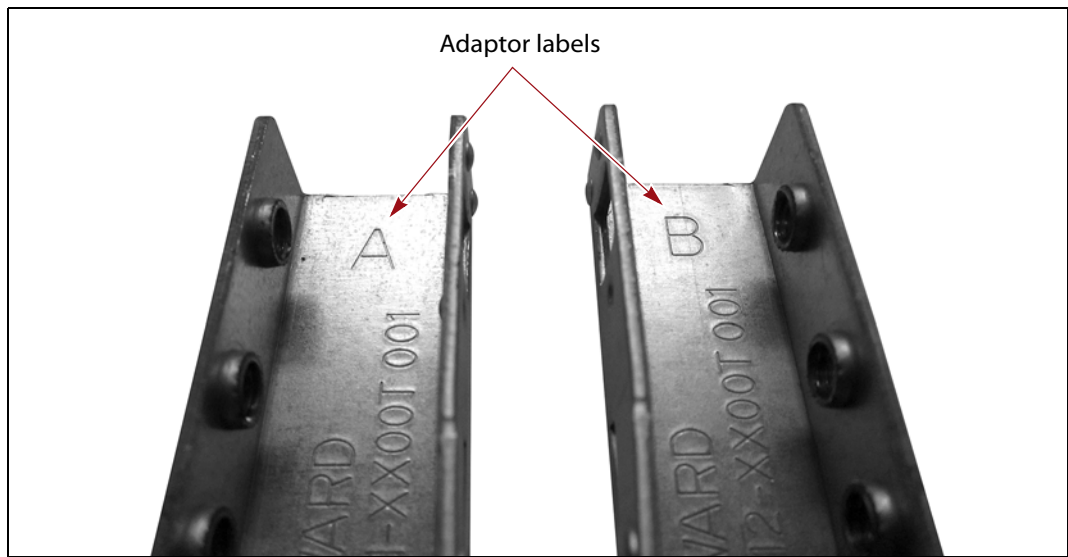


Figure 25 Location of the adaptor labels.

3. Position the adaptor with the label side facing upward, and the square gaps in the side of the adaptor facing toward the end of the outer rail.

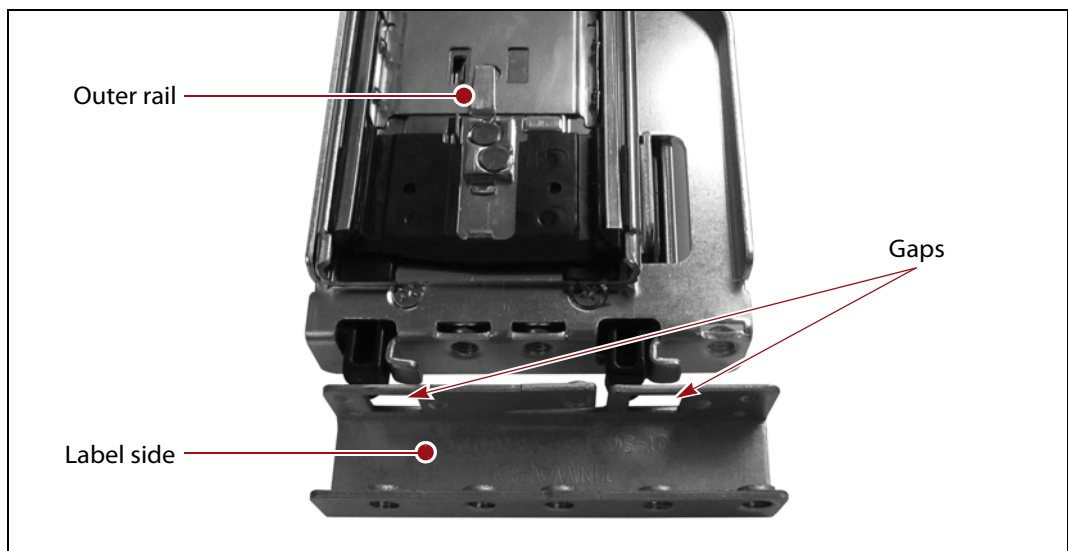


Figure 26 Position the adaptor with the label side facing up and the gaps facing the outer rail.

4. Press the adaptor in toward the outer rail, which depresses the black plastic tabs on the outer rail, and then slide the adaptor to the left to lock it in place.

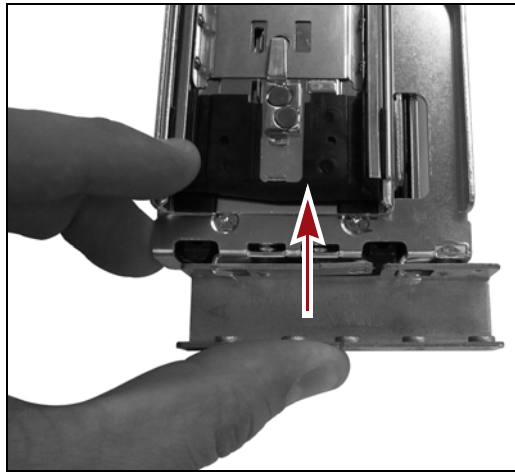


Figure 27 Press the adaptor in toward the outer rail.

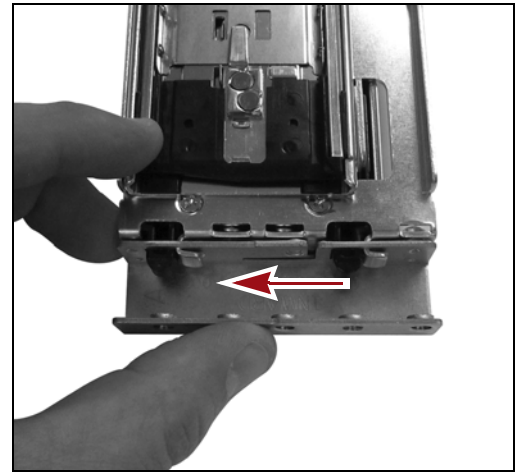


Figure 28 Slide the adaptor to the left to lock it in place.

5. Repeat [Step 3](#) through [Step 4](#) as needed to install the remaining adaptors.
6. Determine the position of the rack mount kit in the rack. [Figure 29](#) and [Figure 30](#) show the relationship of the rack kit position in the rack and the resulting position of the chassis.

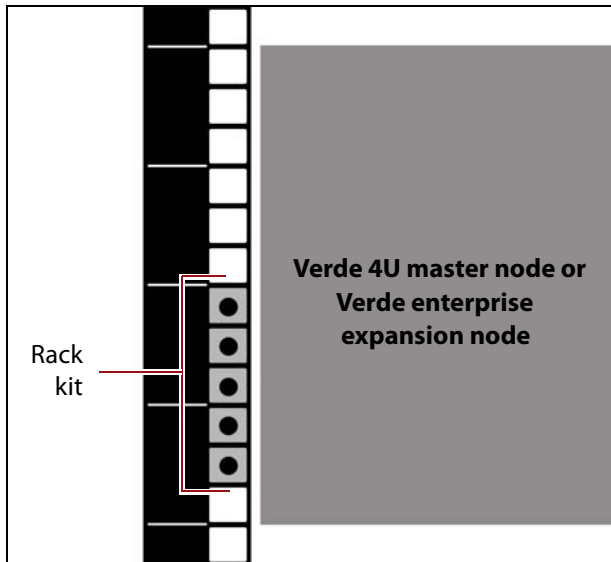


Figure 29 Relationship between rack kit position and the position of the 4U chassis.

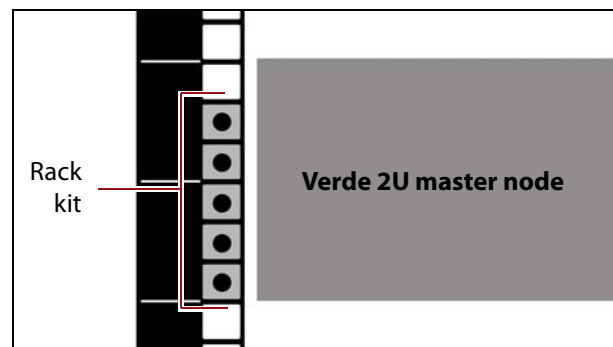


Figure 30 Relationship between rack kit position and the position of the 2U chassis.

7. Position the outer rack rail at the desired height in the rack with the open end facing the front of the rack. Make sure the inner side of the outer rack rail is facing toward the inside of the rack.

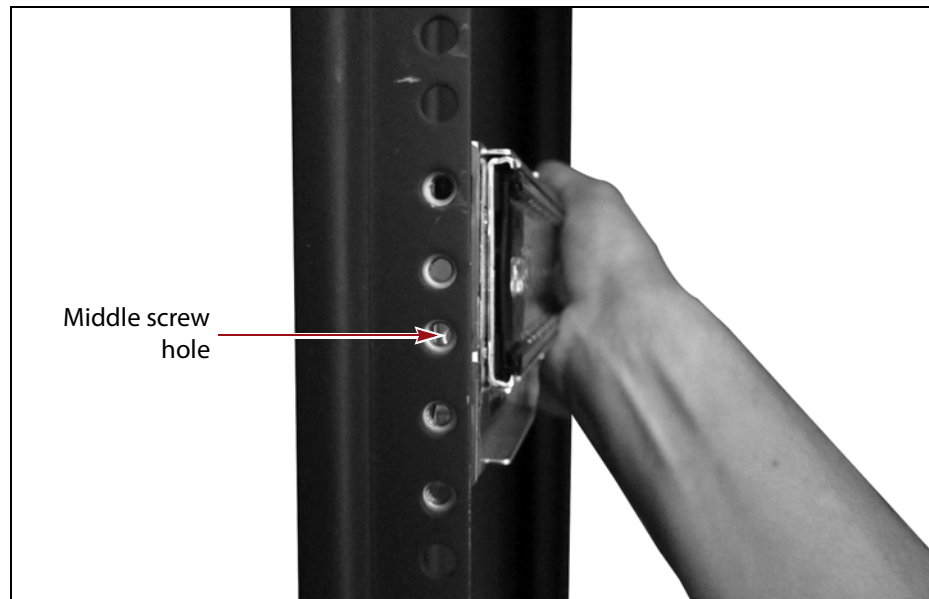


Figure 31 Position the outer rail.

8. Using a #2 Phillips screwdriver, secure the outer rail to the rack.
 - a. Install two outer rail screws and washers in the middle and lowest screw holes in the front mounting bracket to secure the rail to the front post.
 - b. Install two screws and washers in the upper and lower holes to secure the back of the outer rail to the rear post.
9. Repeat [Step 1 on page 40](#) through [Step 8](#) to attach the second outer rail to the other side of the rack.
10. Use a level to make sure the installed rails are level in relation to each other.
11. Continue to [Install the Inner Rails on page 43](#).

Install the Inner Rails

1. Orient the inner rail with the self locking latch facing you and the black plastic tab on the end of the rail oriented toward the front of the chassis.
2. Position the inner rack rail over the hooks extending out from the side of the chassis. The rail is keyed to only fit one way.

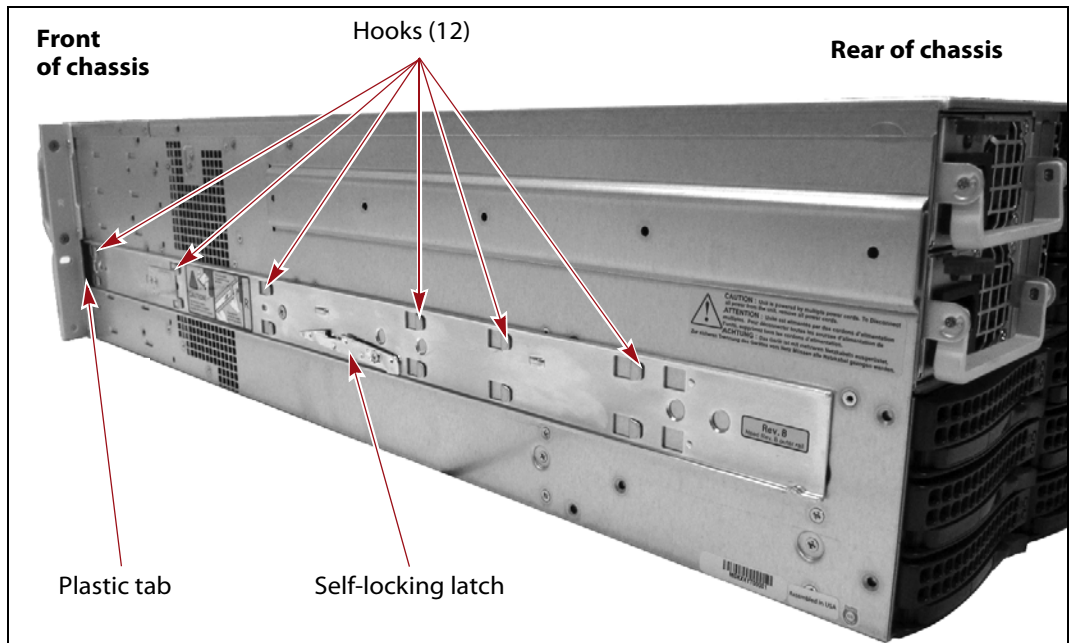


Figure 32 Install the inner rail (Verde 4U chassis shown).

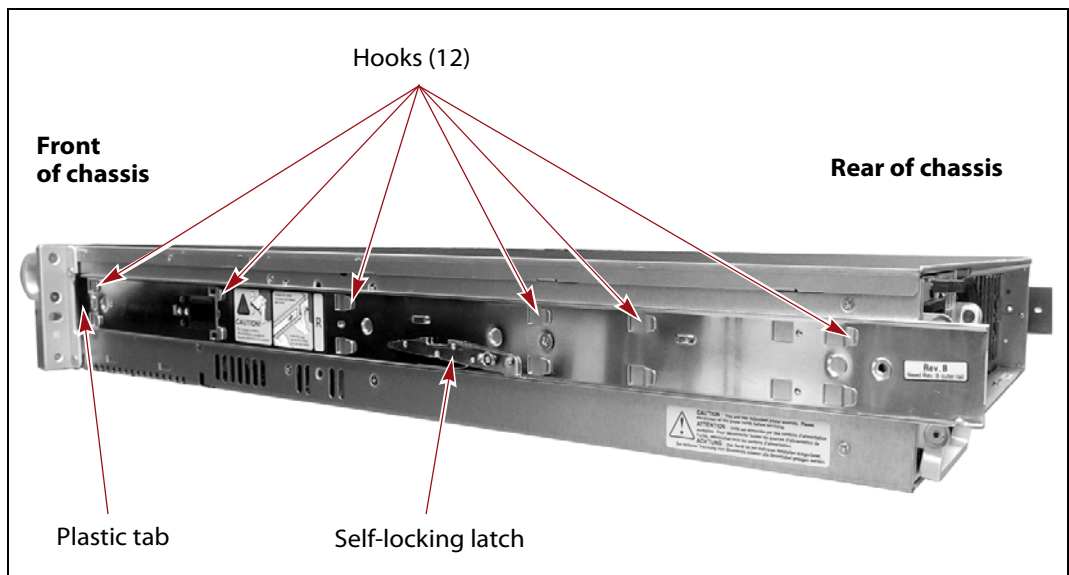


Figure 33 Install the inner rail (Verde 2U chassis shown).

3. While pressing the inner rail against the side of the chassis, slide the inner rail towards the front of the chassis to engage the mounting hooks.

- Using a #2 Phillips screwdriver, secure the rail to the chassis using one screw for the 4U chassis, and two screws for the 2U chassis.

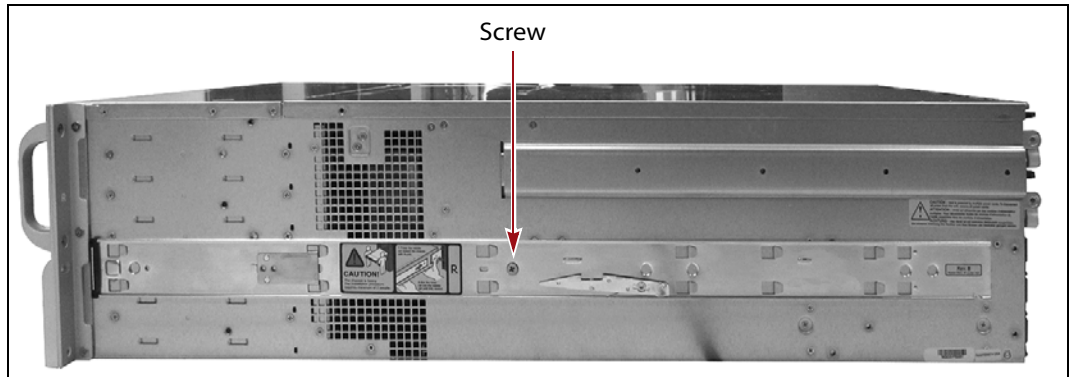


Figure 34 Install the inner rail screw on the Verde 4U chassis.



Figure 35 Install the inner rail screws on the Verde 2U chassis.

- Repeat [Step 1](#) on page 43 through [Step 4](#) for the other side.

Slide the Chassis into the Rack



WARNING

Lifting hazard. The **Spectra Verde 36-drive and 45-drive chassis** weigh between 57 lb (25.8 kg) and 138.2 lb (62.7 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

Lifting hazard. The **Spectra Verde 12-drive chassis** weighs between 39 lb (17.7 kg) and 60.6 lb (27.5 kg), depending on the number of drives installed. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 36-laufwerk und 45-laufwerk Fahrgestell** wiegen zwischen 25,8 kg und 62,7 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.

WARNUNG Gefahren beim Heben. Die **Spectra Verde 12-laufwerk Fahrgestell** wiegt zwischen 17,7 kg und 27,5 kg, abhängig von der Anzahl der installierten Laufwerke. Verwenden Sie Hebehilfen und richtige Hebetechnik mit Unterstützung beim Umgang mit schwerem Gerät.



WARNING

Only extend one component at a time. A rack may tip if more than one component is extended, which could lead to personal injury.

WARNUNG Nur eine Komponente erstrecken zu einem Zeitpunkt. Ein Rack kann umkippen, wenn mehr als eine Komponente erweitert, die zu Verletzungen führen können.

1. Pull the center section of the outer rails out of the rack until they are fully extended (see [Figure 36 on page 46](#)).

2. Position the chassis in front of the rack rails and lift it so that the inner rails are at the same height as the extended sections of the outer rails attached to the rack.

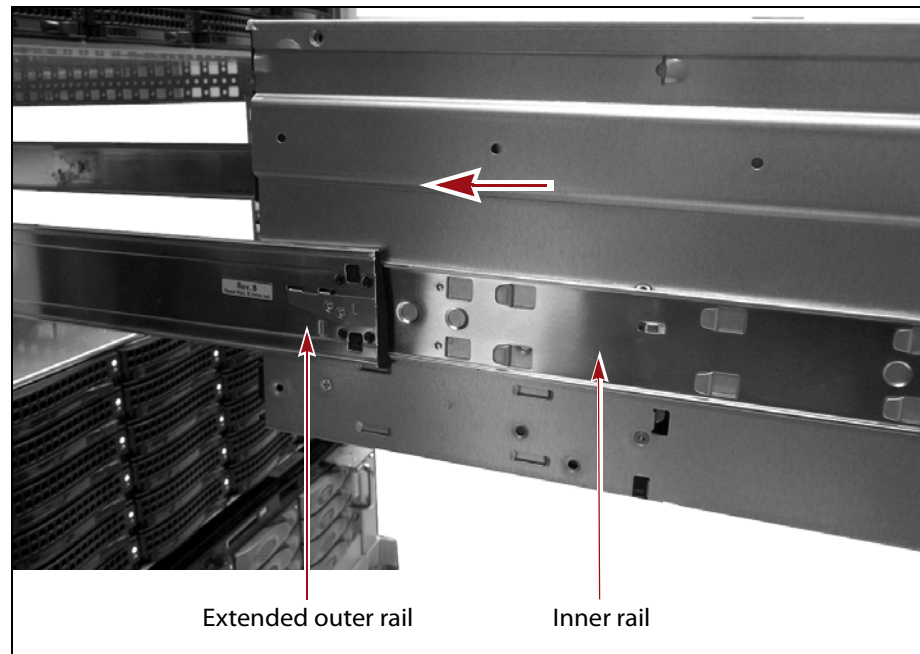


Figure 36 Extend outer rails and slide chassis into rack.

3. Slide the chassis into the rack until the self-locking latches engage.
4. While supporting the front of the chassis with one hand or a lift, press the self-locking latches on both inner rails downward. Push the chassis the rest of the way into the rack until the mounting brackets on the front of the chassis are flush with the front posts of the rack.

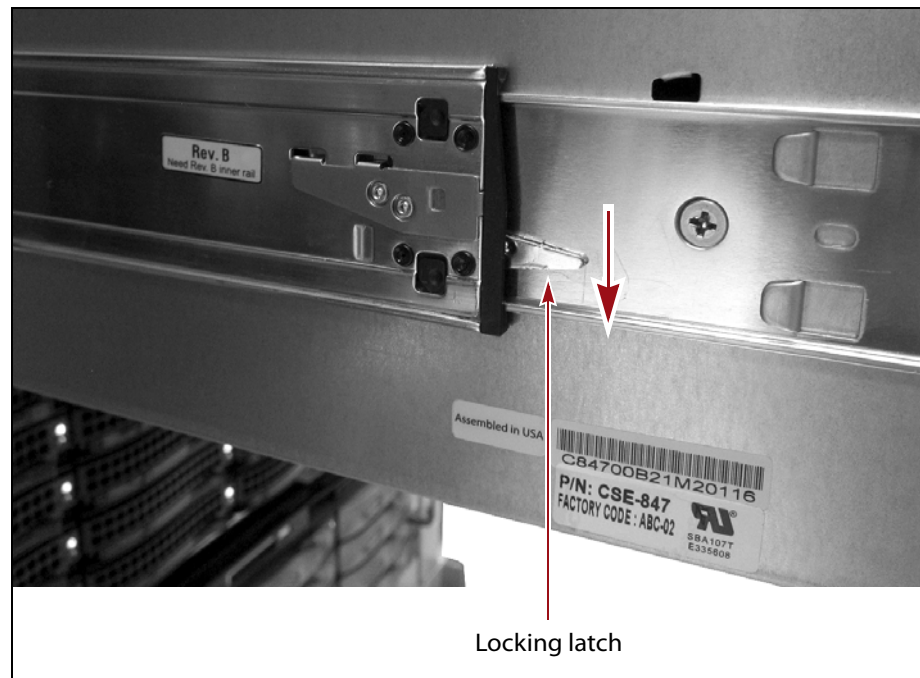


Figure 37 Press the self-locking latch downward.

5. Using a #2 Phillips screwdriver, install one chassis screw into the hole in the mounting bracket on each side of the chassis to secure the chassis to the rack. Do not over-tighten the screw.

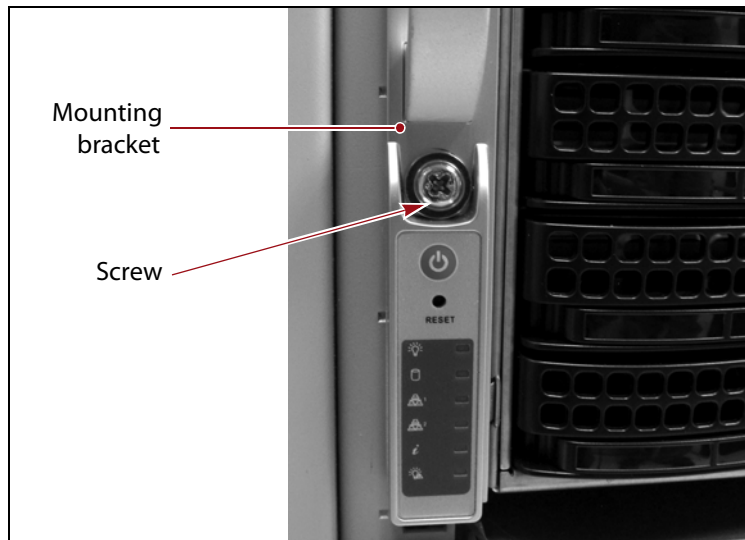


Figure 38 Secure the chassis to the rack.

INSTALLING ADDITIONAL DRIVES

The Verde 2U master node ships with all twelve drives installed.

The Verde 4U master node ships with 10 drives installed in the front of the chassis. The Verde expansion node ships without drives installed. If you purchased additional drives with your order, they ship in a separate box. Install the additional drives before you begin using the system. If you do not have additional drives to install, continue with [Connecting the Power Cords](#) on page 50.

Install additional drives in to the Verde 4U chassis until you have installed every additional drive, or the chassis is full. Install any additional drives in Verde expansion nodes.

The drives used in the Verde NAS solution are mounted on drive sleds that ensure proper data and electrical connection with the backplane inside the Verde chassis. Only install drives that you purchase from Spectra Logic.



Caution

Any damage to a Verde NAS solution caused by failure to protect it from electrostatic discharge (ESD) voids the products's warranty. To protect the drives from damage:

- Wear an anti-static wristband, properly grounded, throughout the procedure. If a wristband is not available, touch a known grounded surface, such as the unpainted metal chassis.
- Leave the drive in its anti-static bag until you are ready to install it.
- Do not place a drive that is not in an anti-static bag, on any metal surfaces.

Remove the Empty Drive Sled

Use the following steps to remove an empty drive sled.

1. Put on an anti-static wristband and attach it to an anti-static mat or an unpainted metallic surface. Continue to wear the wristband throughout the entire procedure.

2. Locate the empty drive bays where you want to install the drives.

- Notes:**
- For the Verde 4U master node, do not install a drive in slot 1, which is the top left drive in the front of the chassis. This slot is reserved for the Visual Status Beacon control sled.
 - For the Verde expansion node, if the expansion node includes an active bezel, do not install a drive in slot 1, which is the top left drive in the front of the chassis. This slot is reserved for the Visual Status Beacon control sled. If the expansion node includes a passive bezel, you may install a drive into slot 1.
 - The images below show a normal drive sled in slot 1 for clarity.

3. Slide the drive sled locking tab to the right to release the drive sled handle.

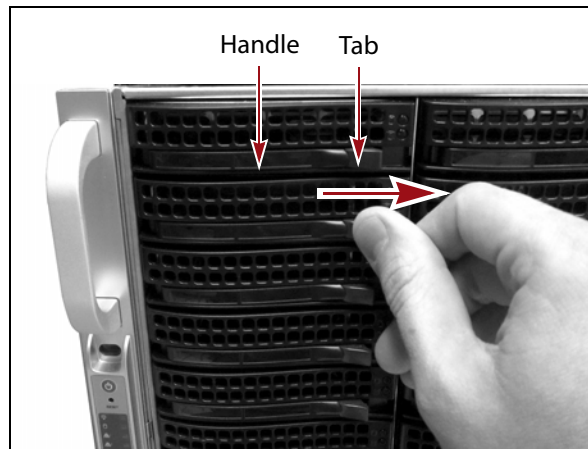


Figure 39 Slide the tab to the right to release the sled handle.

4. Slide the sled completely out of the chassis. If the sled does not slide easily by pulling on the handle, grasp the sides of the sled and pull the sled out of the chassis.

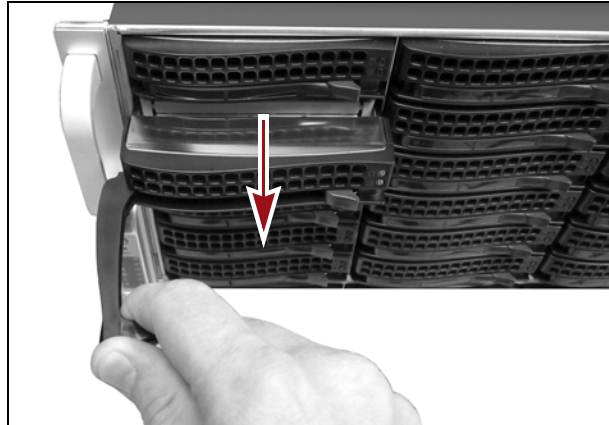


Figure 40 Pull the sled out of the chassis.

5. Dispose of the empty sled in accordance with your company's guidelines.

Install the Drives

1. Drives are shipped installed in a drive sled. Slide the locking tab on the front of the drive sled to the right to release the handle.
2. With the drive handle in the open position, slide the drive sled into the chassis until the front of the drive sled is flush against the chassis. The drive sled slides in easily; do not force it.



Figure 41 Install the drive into the chassis.

3. When the drive sled is in position, push the handle inward and to the right until the locking tab secures it in place. An audible click indicates that the drive sled is locked into position.

CONNECTING THE POWER CORDS

Use the following steps to connect the power cords to the Verde master node. The figure below shows the Verde 4U master node. Power connectors on the Verde 2U master node, and the Verde enterprise expansion node are in similar locations.

! Important Do not connect power cords to a Verde archive expansion node at this time.

1. Connect a power cord to each of the power supply connectors.

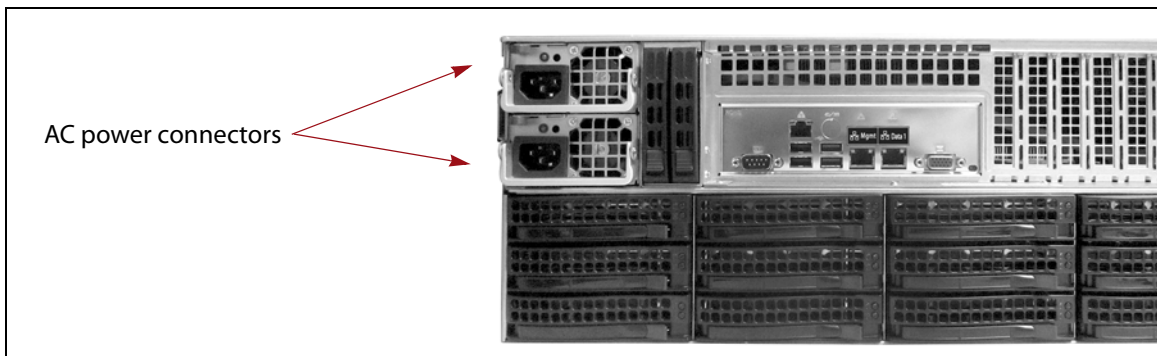


Figure 42 Connect the power cords to the power supplies (Verde 4U master node shown).

2. Plug the other end of each cord into an AC power outlet.

CONNECTING THE INTERFACE CABLES

Connect the remaining cables to the system. [Figure 43](#) shows the location of the connectors. The locations of the connectors are similar on the Verde 4U master node and the Verde 2U master node.

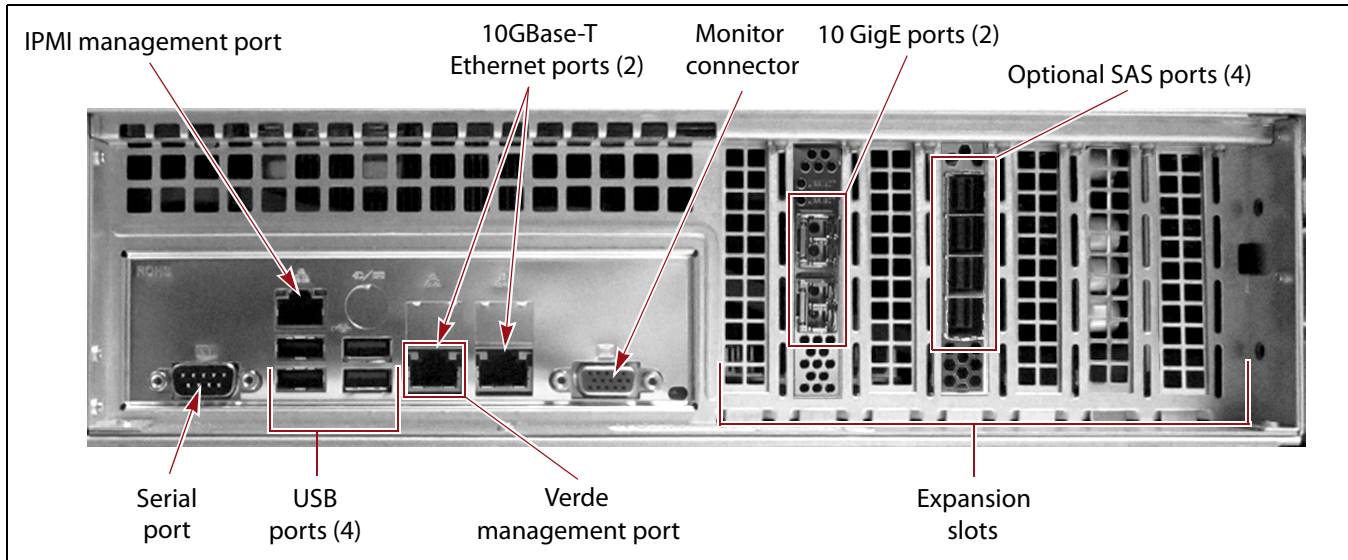


Figure 43 The Verde master node rear panel components.

- Notes:**
- The types of connections available depend on your configuration.
 - See the *BlackPearl and Verde HotPair Install Guide* for information on connecting cables for a HotPair configuration.

Use the following steps to connect the interface cables to the Verde master node.

1. Connect a Category 5 Ethernet cable to the Verde management port on the rear panel. Connect the other end of the cable to an active network over which a computer can access the system. This connection is used to access the web interface.

Note: The Verde management port is used to access the web interface and cannot be used for data transfer. Use a separate Ethernet port for data traffic.

2. Connect an Ethernet cable from your network switch to the appropriate connector (10GBase-T or 10 GigE) on the rear panel of the master node (see [Figure 43](#)). This connection provides host access to the RAID storage on the master node. If you plan to configure link aggregation, connect additional cables as needed.

3. If your configuration includes a Verde enterprise expansion node, connect an included SAS cable from any port on the four port SAS card in the Verde master node, to the **Front Primary In** connector on the expansion node. Connect a second cable from the master node to the **Rear Primary In** connector on the expansion node.

- Notes:**
- When inserting cables into one of the four ports on the SAS card in the master node, make sure the cable is fully seated by feeling for two clicks as you insert the cable.
 - The Verde archive expansion node is installed by Spectra Logic professional services and is connected to your Verde master node during installation.

POWERING ON THE VERDE NAS SOLUTION

Use the instructions in this section to power on a Verde NAS solution. During the power-on sequence, the Verde NAS solution initializes all of its installed components and starts the Verde web server.

Verde Archive Expansion Nodes

If your configuration includes one or more Verde archive expansion nodes, power on the expansion node(s) before powering on the master node. To power on a Verde archive expansion node, plug both power cables on the Verde archive expansion node into power outlets near the rear of the chassis. The Verde archive expansion node immediately powers on. Wait approximately four minutes while the expansion node initializes before powering on a Verde master node.

Verde Master Nodes and Verde Enterprise Expansion Nodes

To power on a Verde master node, remove the front bezel, and then gently press the power button on the front panel. If your configuration includes both a Verde master node and one or more enterprise expansion nodes, power on all chassis together. The power LED illuminates indicating that power is on. See [System Status LEDs on page 126](#) for more information.

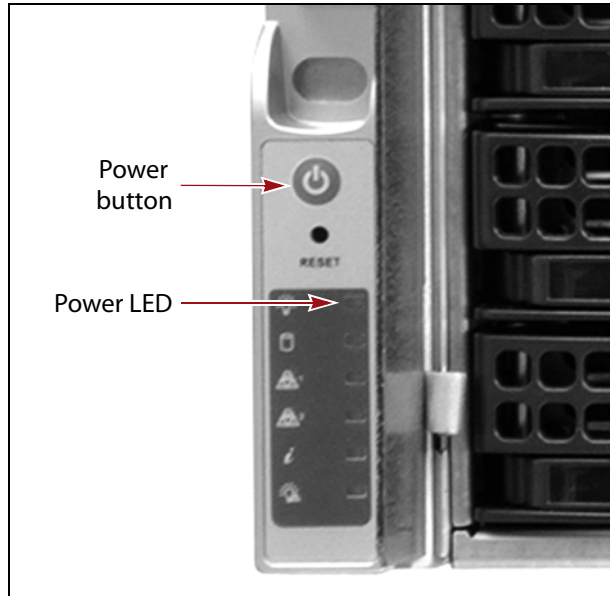


Figure 44 Press the power button.

Wait while the Verde NAS solution completes its power-on sequence, which takes approximately four minutes, depending on the configuration.

Note: Do not use the system's front panel power button to power off the master node. See the *Spectra Verde NAS Solution User Guide* to reboot or shut down the system.

INSTALLING THE FRONT BEZEL

The front bezel attaches to the chassis using magnets.

1. Orient the front bezel so the Visual Status Beacon light bar is closest to the top and the Spectra logo is not upside down.

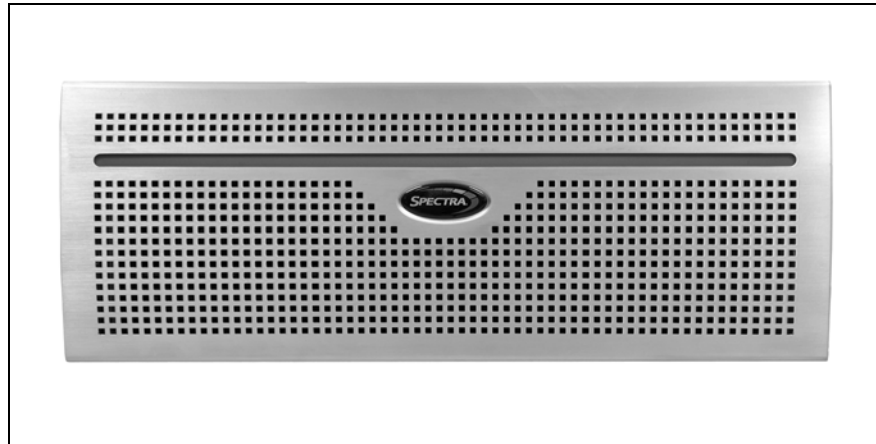


Figure 45 The front bezel.

2. Install the front bezel over the front of the chassis. The magnets hold it in place.

NEXT STEPS

Your Verde NAS solution is now installed. For information about configuring and using the system, read the following chapters in the *Spectra Verde NAS Solution User Guide*:

- Read “Initial Configuration” to learn about the required steps to configure the Verde NAS solution.
- Read “Configuring Network Attached Storage” to learn about configuring storage pools and sharing volumes.
- Read “Configuring a Verde NAS Solution” to learn how to configure network connections and other settings.
- Read “Monitoring a Verde NAS Solution” to learn about day-to-day monitoring and operation.
- If you purchased a HotPair Verde NAS solution, read the *BlackPearl and Verde HotPair Install Guide* for information about configuring a HotPair Verde NAS solution.