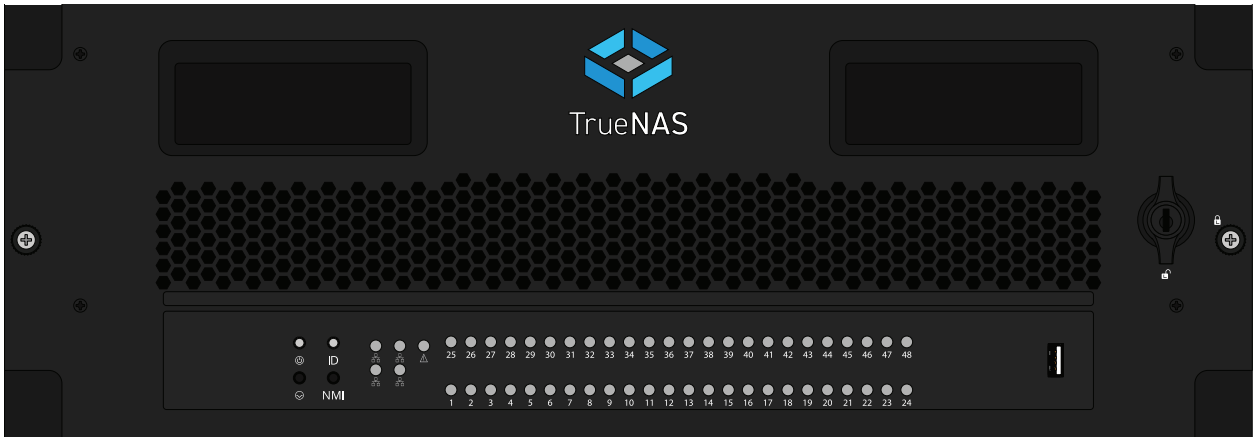
TrueNAS® R50 User Manual

v.25021



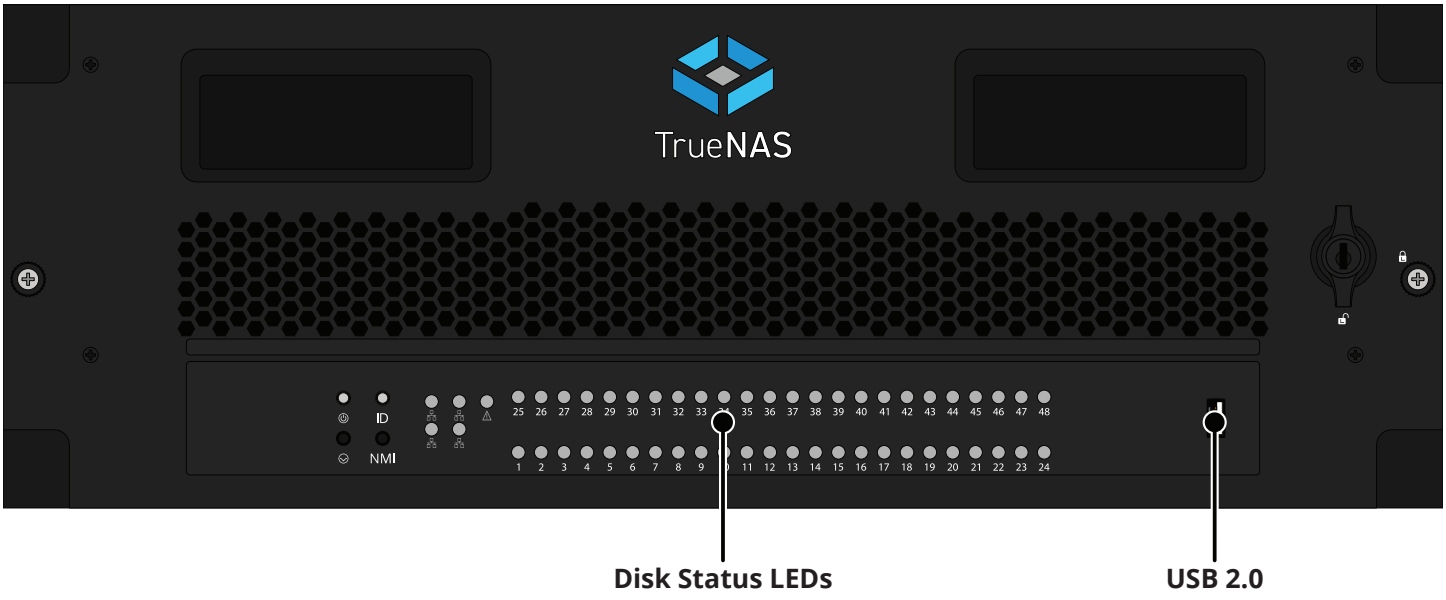
Contents

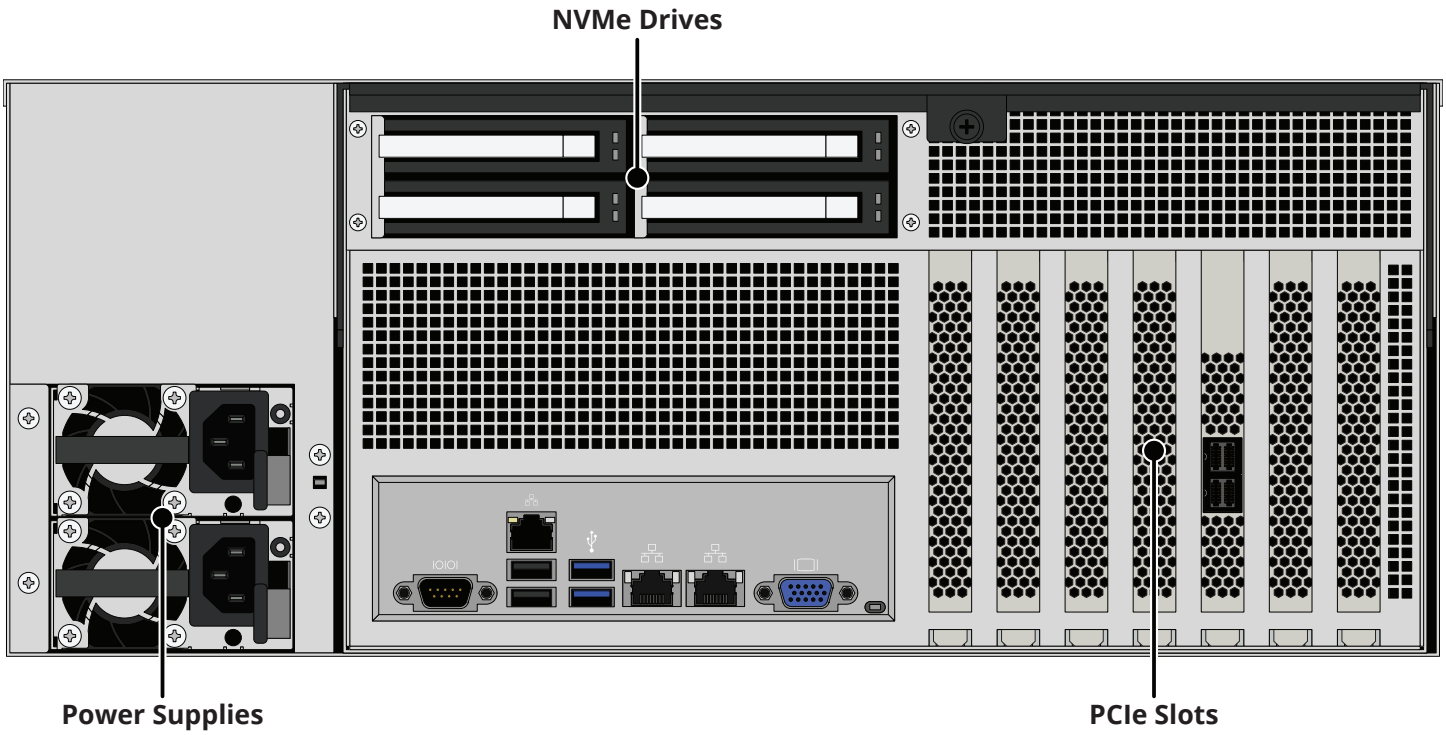
1 Introduction

The TrueNAS R50 is a 4U, 48-bay, hybrid storage array with redundant power supplies.

Your system comes with the TrueNAS operating system preloaded.

Review the safety considerations and requirements before interacting with the R50.






Drive Slots
HDD37 ~ HDD48
HDD25 ~ HDD36
HDD13 ~ HDD24
HDD 1 ~ HDD12
B
A

2 Safety

2.1 Anti-Static Precautions

Warning - Electrostatic Discharge (ESD)

Static electricity can build up in your body and discharge when touching conductive materials. Electrostatic Discharge (ESD) is harmful to sensitive electronic devices and components. Keep these safety recommendations in mind before opening the system case or handling non-hot-swappable system components.

- Turn off the system and remove power cables before opening the case or touching internal components.
- Place the system on a clean, hard work surface like a wooden tabletop. Use an ESD dissipative mat if possible to protect the internal components.
- Touch the metal chassis with your bare hand to dissipate static electricity in your body before handling any internal components, including components not yet installed in the system. We always recommend wearing an anti-static wristband and using a grounding cable.
- Store all system components in anti-static bags.

2.2 Personal Protective Equipment (PPE)

Warning - PPE

Wear proper PPE, like anti-static wrist straps and smocks before touching any sensitive equipment inside the chassis. If you are unsure how to properly replace any parts, contact iXsystems Support.

2.3 Handling the System

Hold the system from the sides or bottom whenever possible. Always be mindful of loose cabling or connectors, and avoid pinching or bumping these elements.

These instructions use “left” and “right” according to your perspective when facing the system or rack.

Warning - Damage or Injury

The R50 weighs 183 lbs fully-loaded and requires a minimum of **two** people to lift.

When handling rails, system components, or drives, never force movement if a component seems stuck. Gently remove the component and check for pinched cables or obstructing material before installing it again. Installing a component with excessive force can damage the system or cause personal injury.

3 Recommended Tools

We recommend these tools when interacting with the TrueNAS H-Series:

- Long #2 Phillips head screwdriver
- Tape measure
- Level
- Flat head screwdriver
- 16 standard M5 cage nuts (typically provided with square-hole racks)

4 Specifications

R50 Hardware	
Drive Count	48 3.5-inch SAS HDDs or SSDs + 4 2.5” (NVMe) SSDs
Cooling Fans	5
Power Supplies	2
Power Distribution Requirements	100V - 240V
Processor	6-16 cores
RAM	64 - 192 GB
Read Cache (Max)	4 x 3.2 or 4 x 15 TB NVMe SSD
Write Cache (Max)	4 x 3.2 TB NVMe SSD
Onboard Networking	2x 10 GbE
Additional Networking 1 (Optional)	2x 10/25/40/100 GbE
Additional Networking 2 (Optional)	2 or 6 x 100GBaseT or SR
Max Storage (Raw)	5 PB
Storage Expansion	2 x ES102, ES24, or ES60

R50 Dimensions and Weight	
Dimensions (H x W x L)	3.5” x 19” x 26” (89mm x 483mm x 660mm)
Net Weight (Fully Loaded)	183 lbs (83 kg)
Estimated Net Weight (Fully Unloaded)	103 lbs (47 kg)

R50 Environmental Specifications	
Operating Temperature	41°F - 95°F (5°C - 35°C)
Non-Operating Temperature	-4°F - 158°F (-20°C - 70°C)
Max Heat Output	1000 BTU/h

5 Space Requirements

Note - Rack Space

The R50 requires 4U of rack space, 16 standard M5 cage nuts, and a #2 Phillips screwdriver to install in a rack.

The system is 39” (99.06 cm) long. Rack posts must be 23” - 35.75” (58.4 cm-90.8 cm) apart to install the rail kit.

The R50 requires an EIA-310-compliant rack. The front and rear rack posts can have a four-inch (101.6mm) tolerance in four different depth configurations.

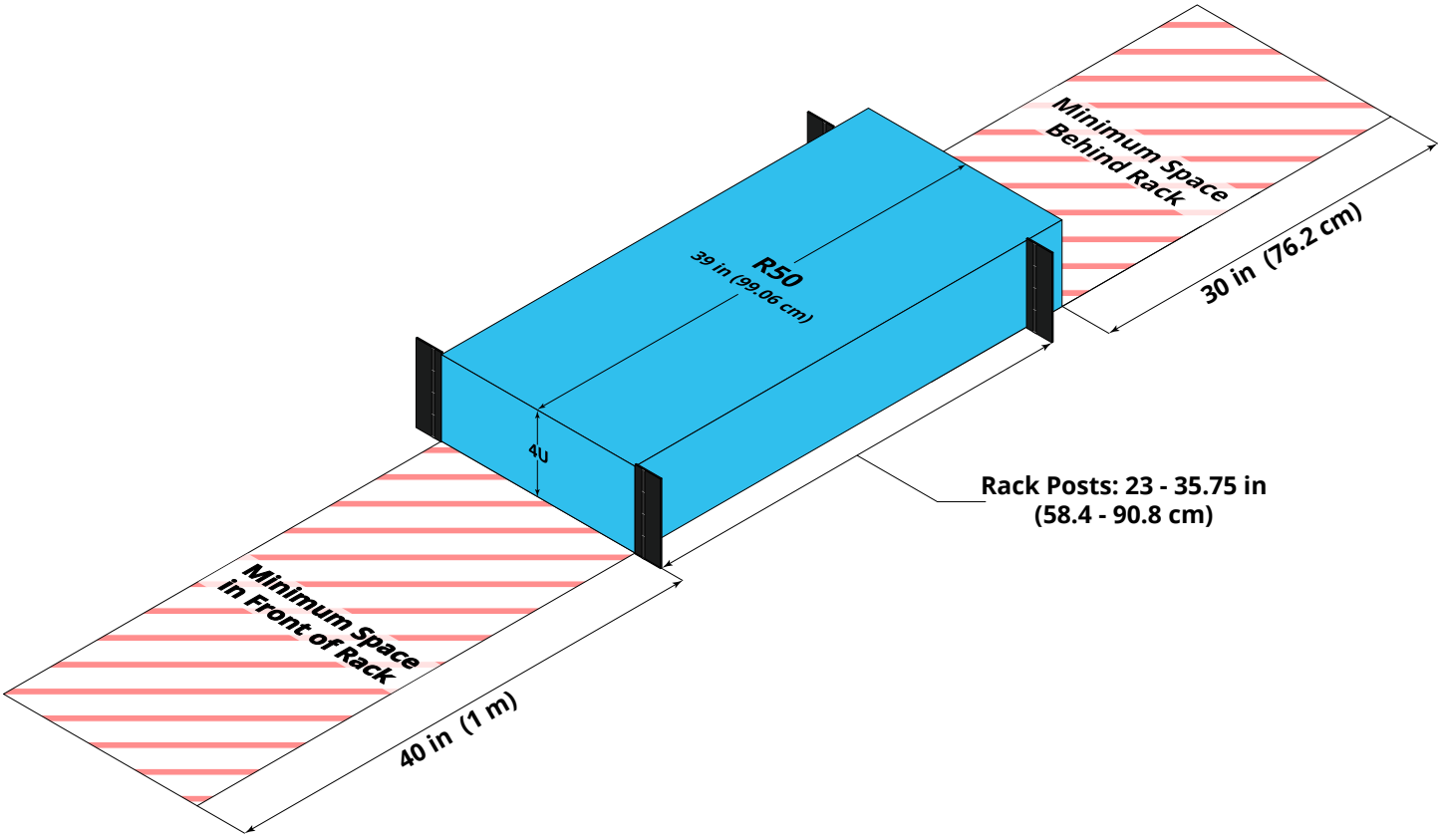
The R50 has a built-in rail system that provides access to the drive drawer. We recommend at least 40” (1 m) of space in front of the rack to account for the drive drawer fully extended with personnel servicing it.

You must also have at least 30” (76.2 cm) of space behind the rack to install the cables.

The assist rails require another 1U of rack space underneath the R50.

Important - Damage or Injury

When handling rails, system components, or drives, never force movement if a part seems stuck or does not insert properly. Gently remove the part and check for pinched cables or obstructing material before installing it again. Installing a part with excessive force can damage the system or cause personal injury.

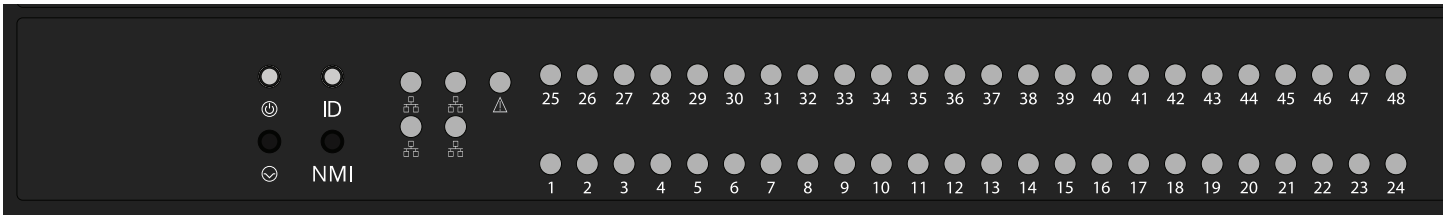


6 Buttons and LED Indicators

6.1 Front Indicators and Buttons

The R50 front panel has buttons and indicators to help control the system. It also has one USB 2.0 port.

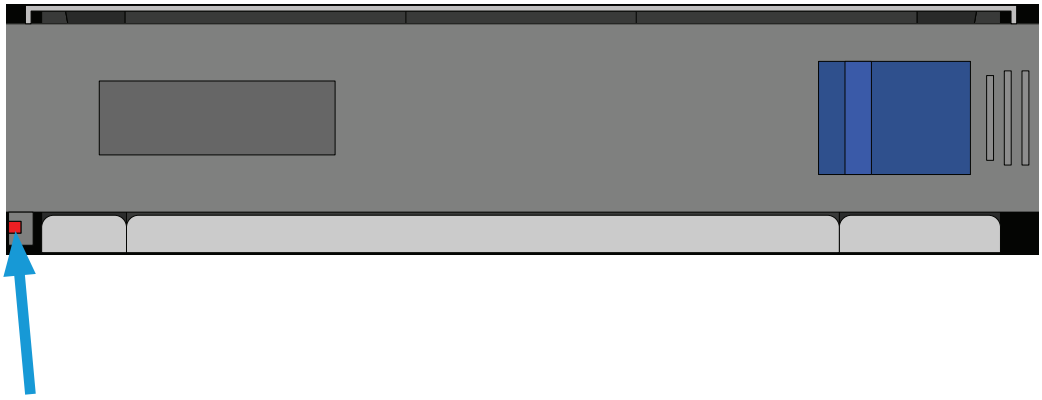
The fault indicator is on during the initial power-on self-test (POST) and turns off during normal operation. It turns on if the TrueNAS software issues an alert.



Light / Button	Function	Color and Indication
⏻	Powers the system on/off	Blue (Solid): System Ready
⌄	Resets the system	N/A
ID	Activates Locate ID	Blue (Flashing): Locate ID active
⚠	N/A	Green (Flashing): Component Fault
品	N/A	Amber (Flashing): Link Active
1 - 48	N/A	Blue (Solid): Drive Ready Blue (Flashing): Drive Activity

6.2 Drive Slot Indicators

The R50 drive slots only contain one red LED to denote drive failure.



7 Racking Procedure

7.1 Install Cage Nuts

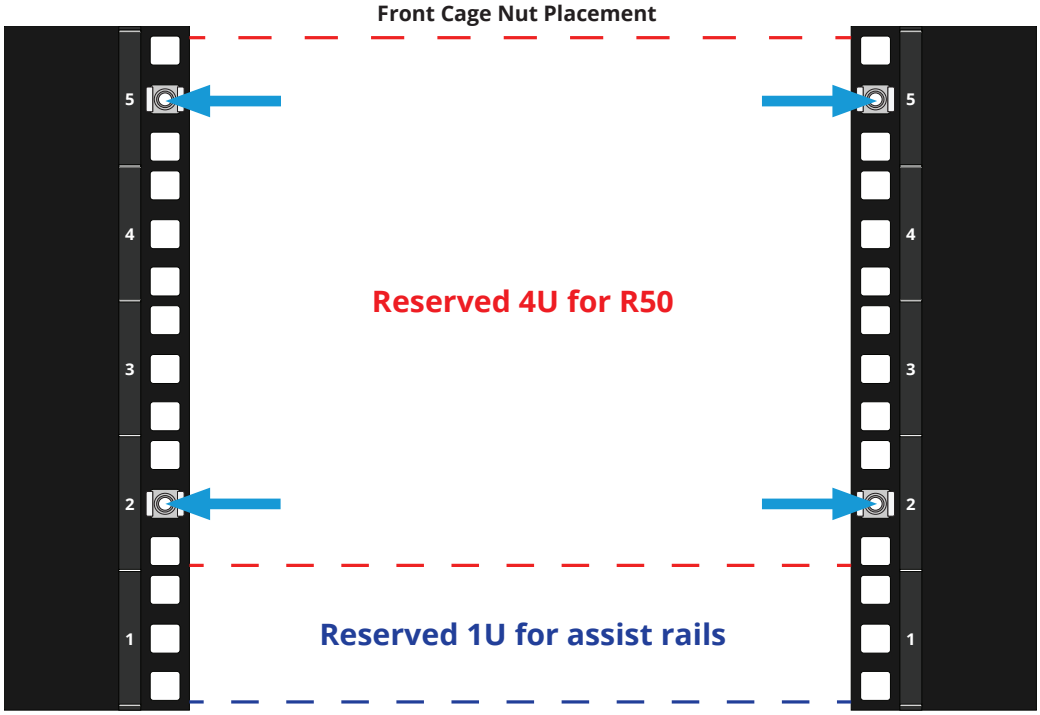
Cage nuts attach to holes in the rack posts, with the nut on the inside of the rack and “wings” pointed horizontally.

Attach four cage nuts in the rack front posts, two on each side. Place the first cage nut in the **middle of the top 1U** of the reserved 4U of rack space. Place the second cage nut **in the middle of the bottom 1U** of the reserved 4U of rack space. Place the remaining two cage nuts in the same points on the other front rack post.

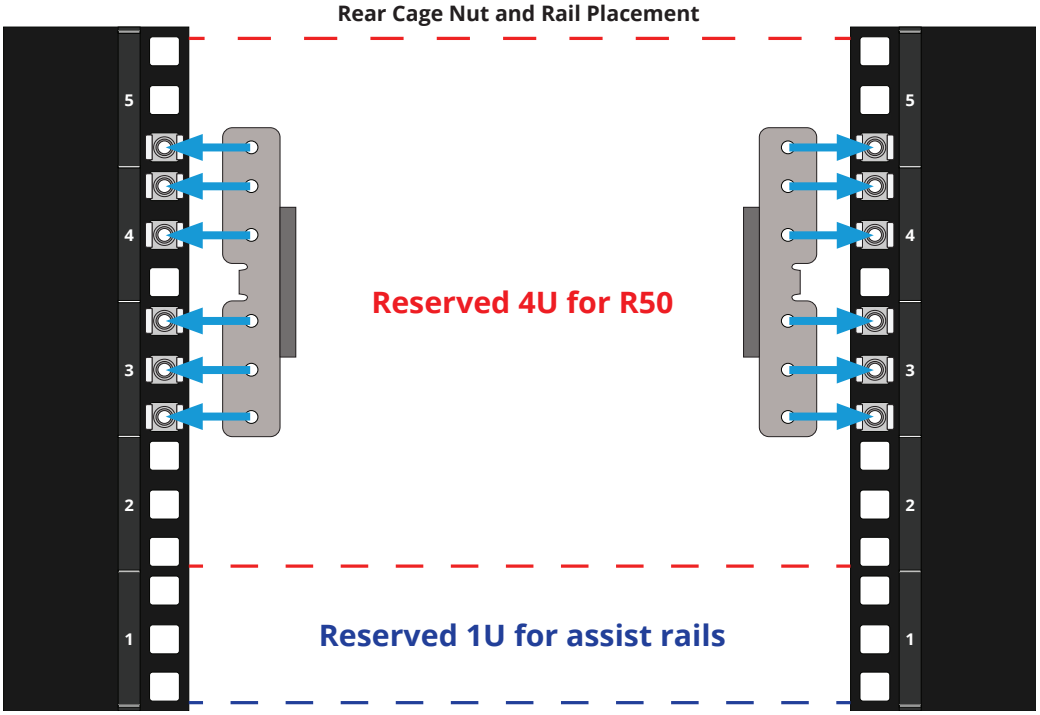
You need **six** cage nuts for each rear rack rail (**twelve total**).

Starting from the **topmost** attach-point in the reserved 4U of rack space, **skip the first two attach points** and place cage nuts in the **next three descending attach-points**. **Skip one attach-point**, then place the last three cage nuts in the **next three descending attach-points**. Repeat for the other rear rack rail.

Front Cage Nut Placement



Rear Cage Nut and Rail Placement

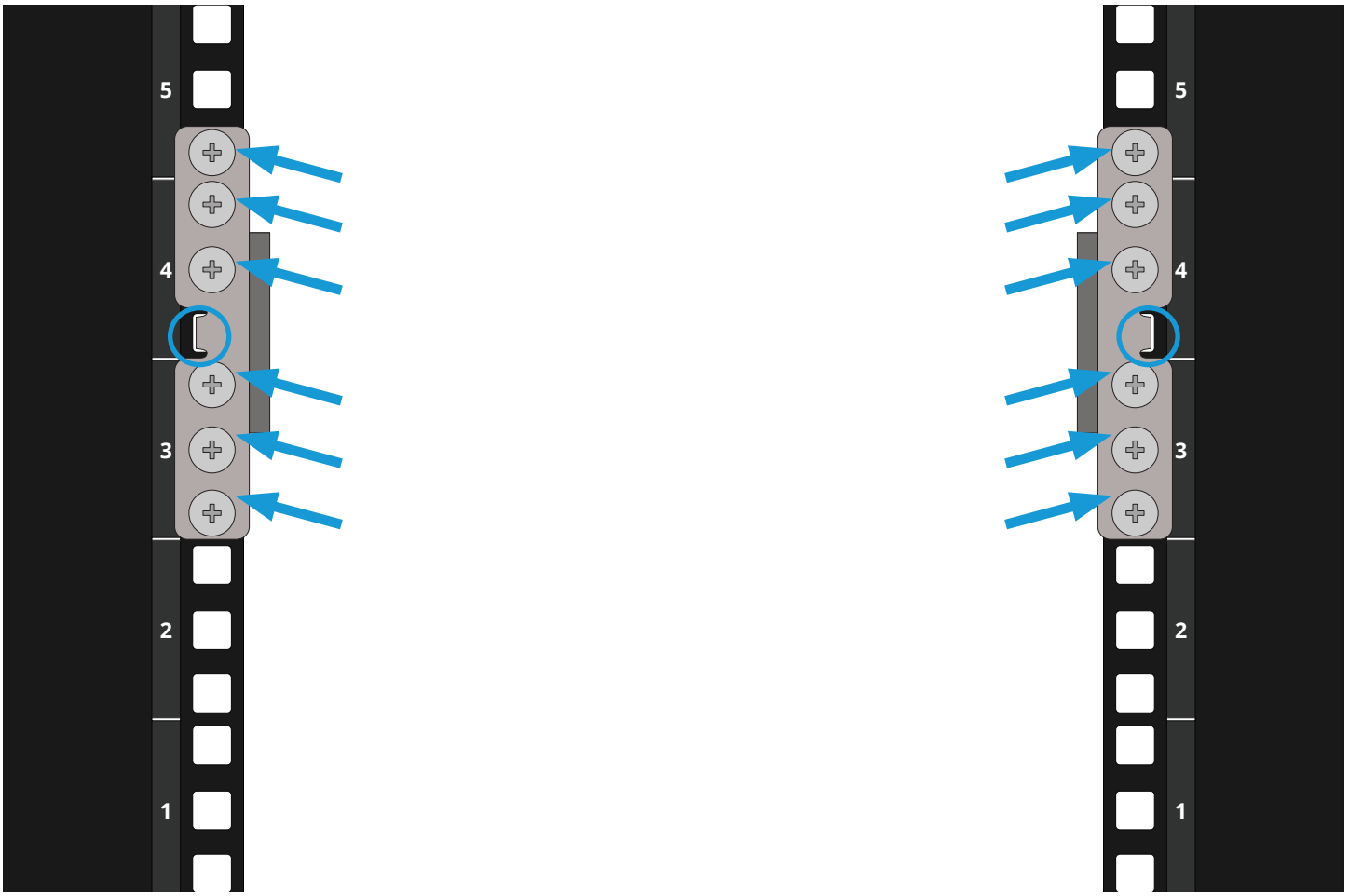


7.2 Install the Rack Rails

Remove the rack rails from the system.

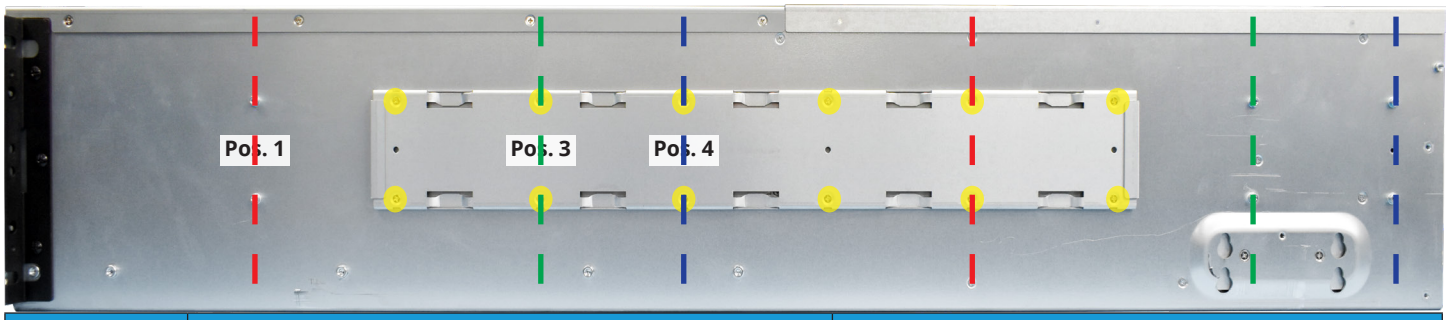
Fit a rail over the cage nuts on one rear rack post (the tab fits into the empty slot between the cage nuts) and use six **M5 × 15mm screws** to secure it to the rack.

Repeat for the other rail.



7.3 Adjust the Rail Sleeve

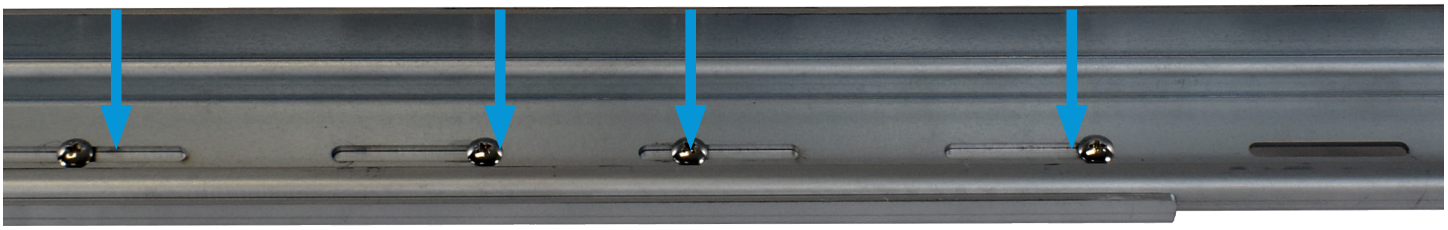
The rail sleeve uses position 2 by default. To adjust it, remove the 12 screws (yellow circles) and move the sleeve to the position that accommodates your rack depth (see table).



Position	Depth w/ Standard Ears	Depth with 40mm Optional Extended Ears
1	27.5” - 32” (69.9 cm - 81.3 cm)	27” - 30 3/8” (68.6 cm - 77.2 cm)
2 (pictured)	28 13/16” - 35 11/16” (73.2 cm - 90.6 cm)	27.5” - 34 1/8” (69.9 cm - 86.7 cm)
3	32.5” - 43 1/8” (82.6 cm - 109.5 cm)	30 15/16” - 37.5” (78.6 cm - 95.3 cm)
4	36 1/4” - 43 1/8” (92.1 cm - 109.5 cm)	34 5/8” - 41.5” (87.9 cm - 105.4 cm)

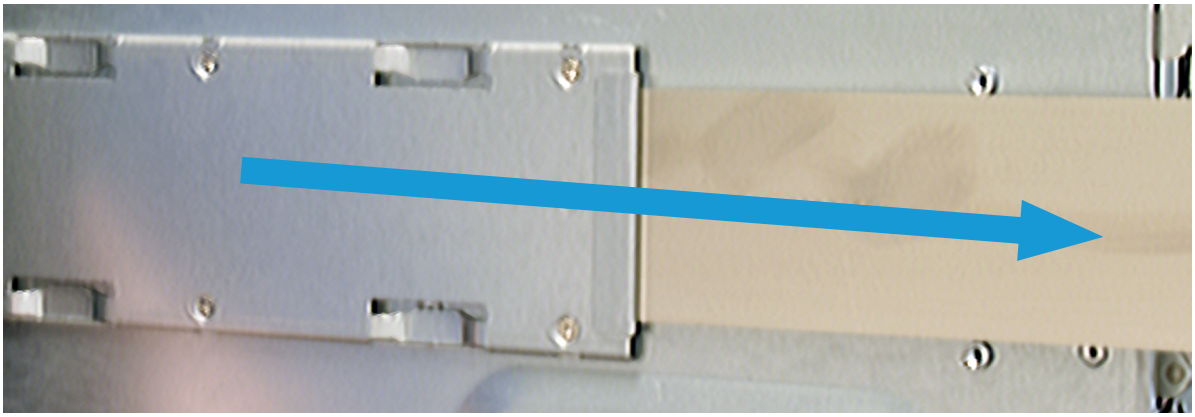
7.4 Install the Assist Rails

At the front rack post, install an assist rail front tab into the middle space of the bottom 1U, then use two of the **M5 × 10mm screws** to secure it to the rack. Extend the assist rail to the rear rack post and use two more screws to secure it. Tighten the four bolts inside the assist rail to set the length. Repeat for the other rail.



7.5 Mount the R50 in the Rack

Two people should lift the R50. Set the system onto the assist rails and align the rail sleeves with the rails. Slide the system forward until it is flush with the front of the rack.



Warning - Pinch Point

The R50 can pinch or crush fingers when sliding the rail sleeves onto the rack rails.

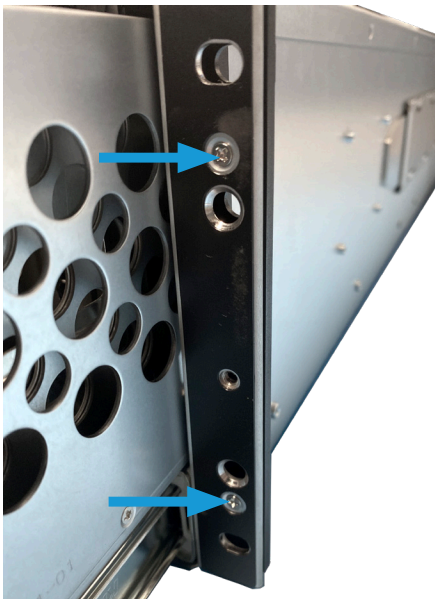
7.6 Attach the Extended Ear Brackets (Optional)

The 3rd gen R50 is longer than previous models, so it ships with extended ear brackets to secure it in short racks.

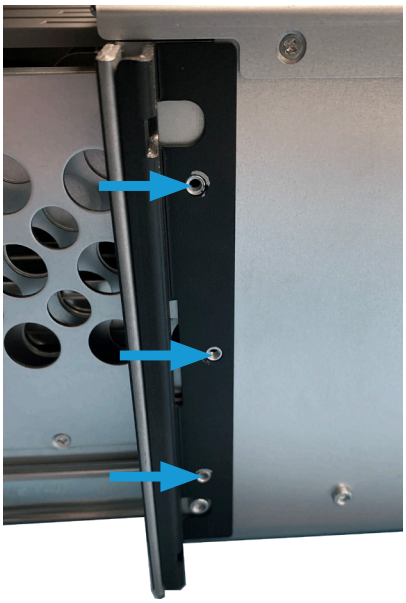
If your rack is too short, remove the five screws (two on the front, three on the side) holding each ear bracket on the R50. Remove both ear brackets from the chassis and replace them with the extended ear brackets.

Secure the extended ear brackets to the chassis using the same five screws the standard ear brackets used.

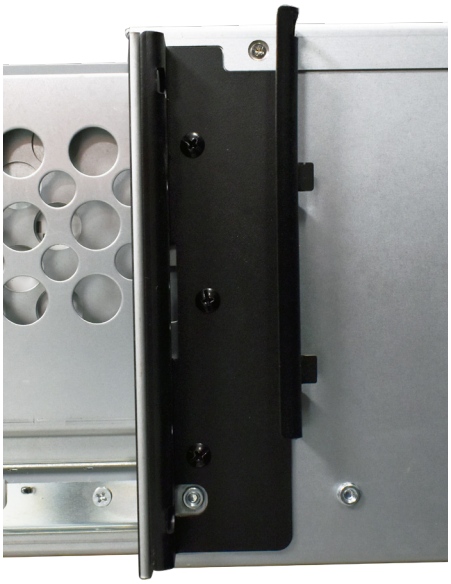
Front Screws



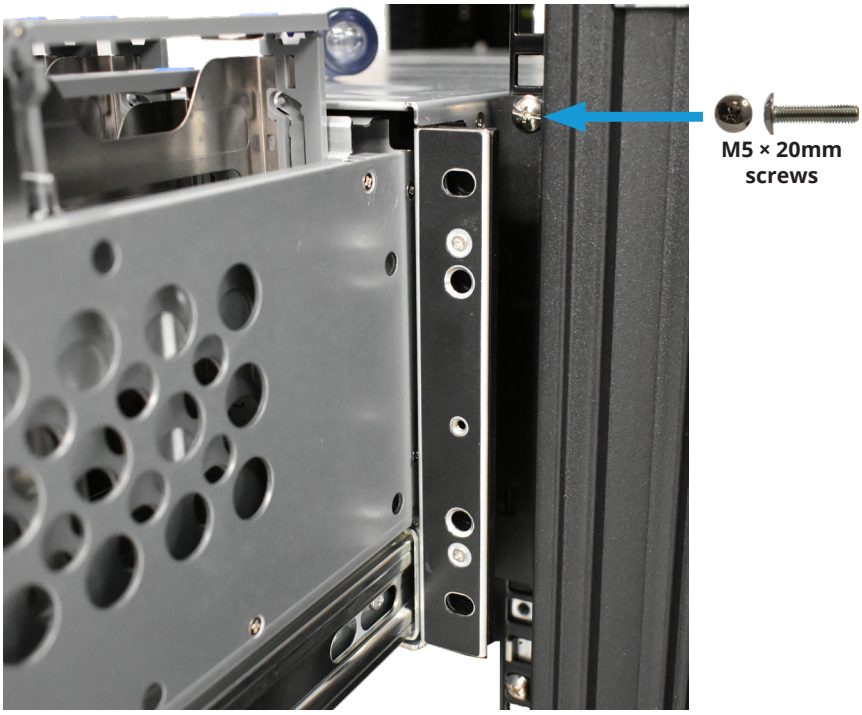
Side Screws



Extended Ear Bracket



Use four **M5 × 20mm screws** to secure each chassis ear bracket to the rack.



Once you mount the system in the rack, uninstall the assist rails from the rack.

8 Managing Drives

The R50 drive drawer sits on internal rails and slides out of the system. Hard drives install into the drawer without drive trays. The NVMe drives are on the back of the system, and use removable trays to mount drives in the system.

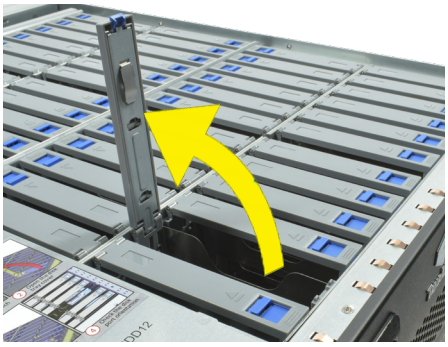
8.1 Open the Drive Drawer

Unlock the front and loosen the captive thumbscrews, then use the handles to pull the drawer out.

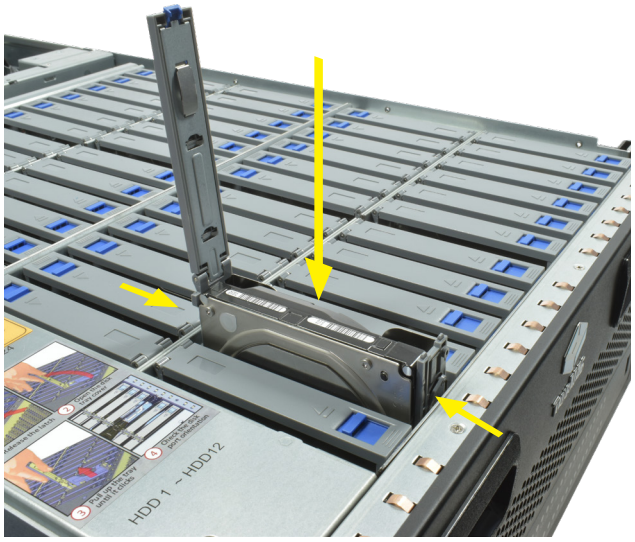
Warning: To prevent overheating, do not open the drawer for more than 1 minute with the system running.

8.2 Install Hard Drives

Push the blue release tab on a slot cover and lift. Gently grasp the inner tray and pull it up until it locks into place.

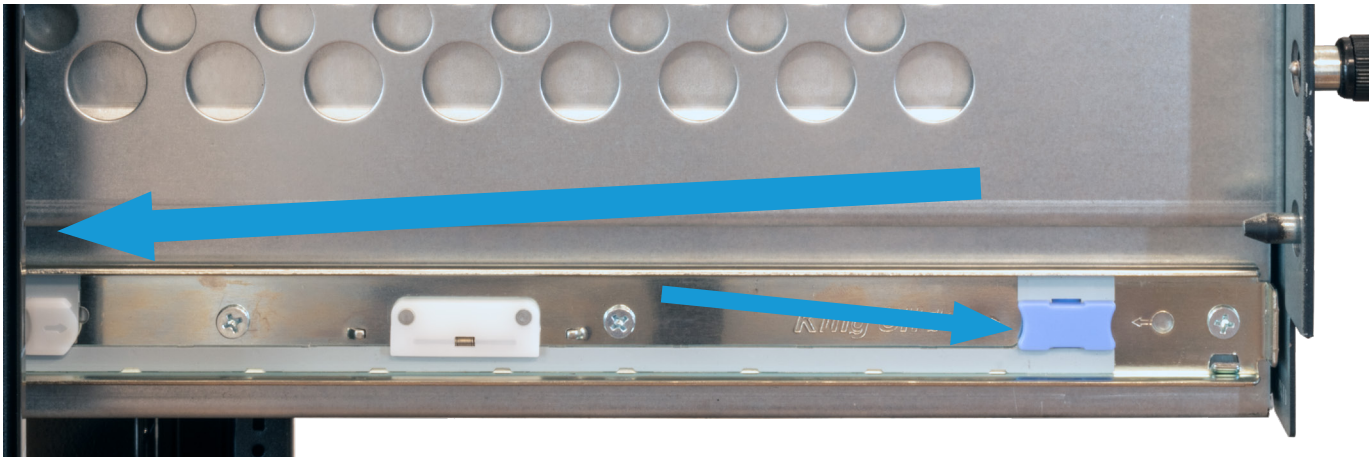


The R50 is certified to use WD Helium drives only. Align a hard drive with the connectors facing downwards into the system, then slide the drive into the slot. Squeeze the plastic release tabs on each side of the tray, then push the tray downwards to install the hard drive into the system. Close the slot cover and make sure it locks.

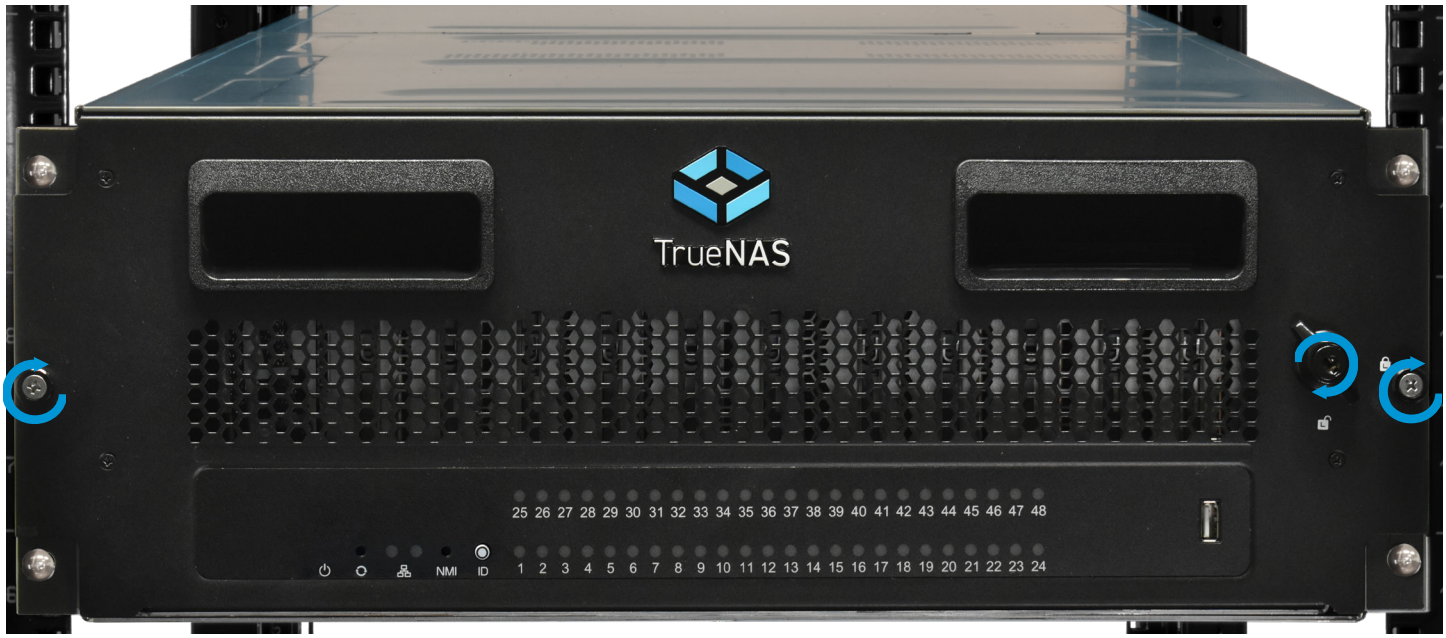


8.3 Close the Drive Drawer

Pull the blue release catches on each rail toward you, then push the drawer into the system.



To secure the drive bay and prevent it from accidentally opening, tighten the captive thumbscrews on the front of the system. You can also use the included key to lock the drive drawer and prevent unauthorized access.



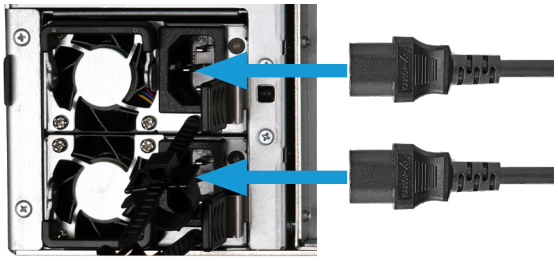
9 Install Cables

We recommend connecting the Out of Band Management port and a monitor and keyboard for the first boot so you can configure the system and view the initial TrueNAS web interface IP address. After connecting all other ports, plug in both power cables. Each system has retention clips that can prevent accidentally unplugging the system.

Warning - BIOS and IPMI Firmware

Your system is equipped with the optimal BIOS and IPMI firmware out of the box.
DO NOT UPGRADE your system's BIOS and IPMI firmware.

We recommend that IPMI be on a separate and secure network without Internet access.
Please contact support if you need to upgrade your system's BIOS or IPMI firmware.



Warning - Grounded Connection

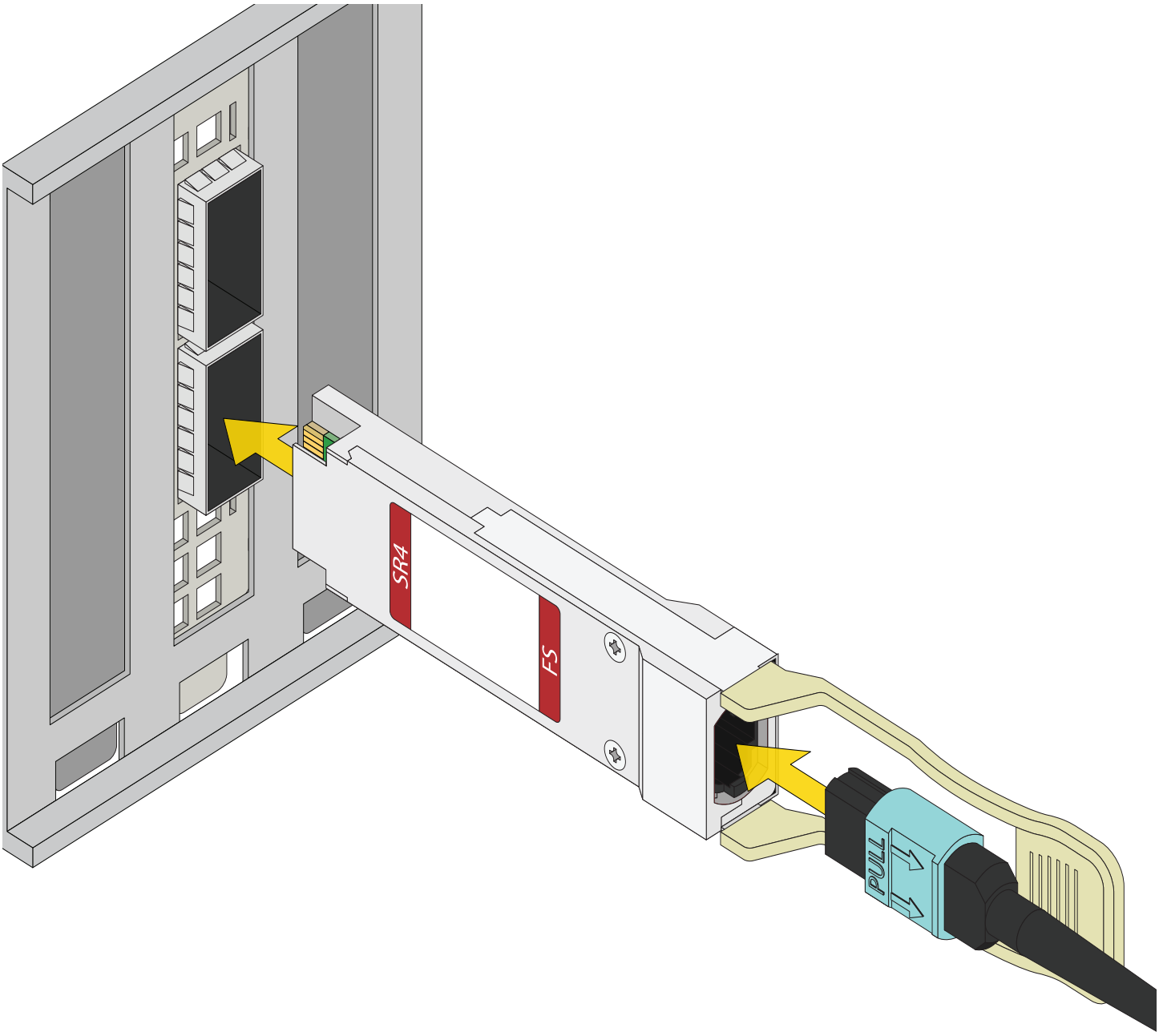
Always connect power cords to properly grounded connections.

9.5 10/40/100GbE NIC Cabling

If you ordered your system with a 10, 40, or 100GbE NIC, you can connect the SR4 cables now.

Insert SR4 optics into the bottom port with the gold connectors facing left, then plug the SR cable into the optics.

Repeat for the other port.

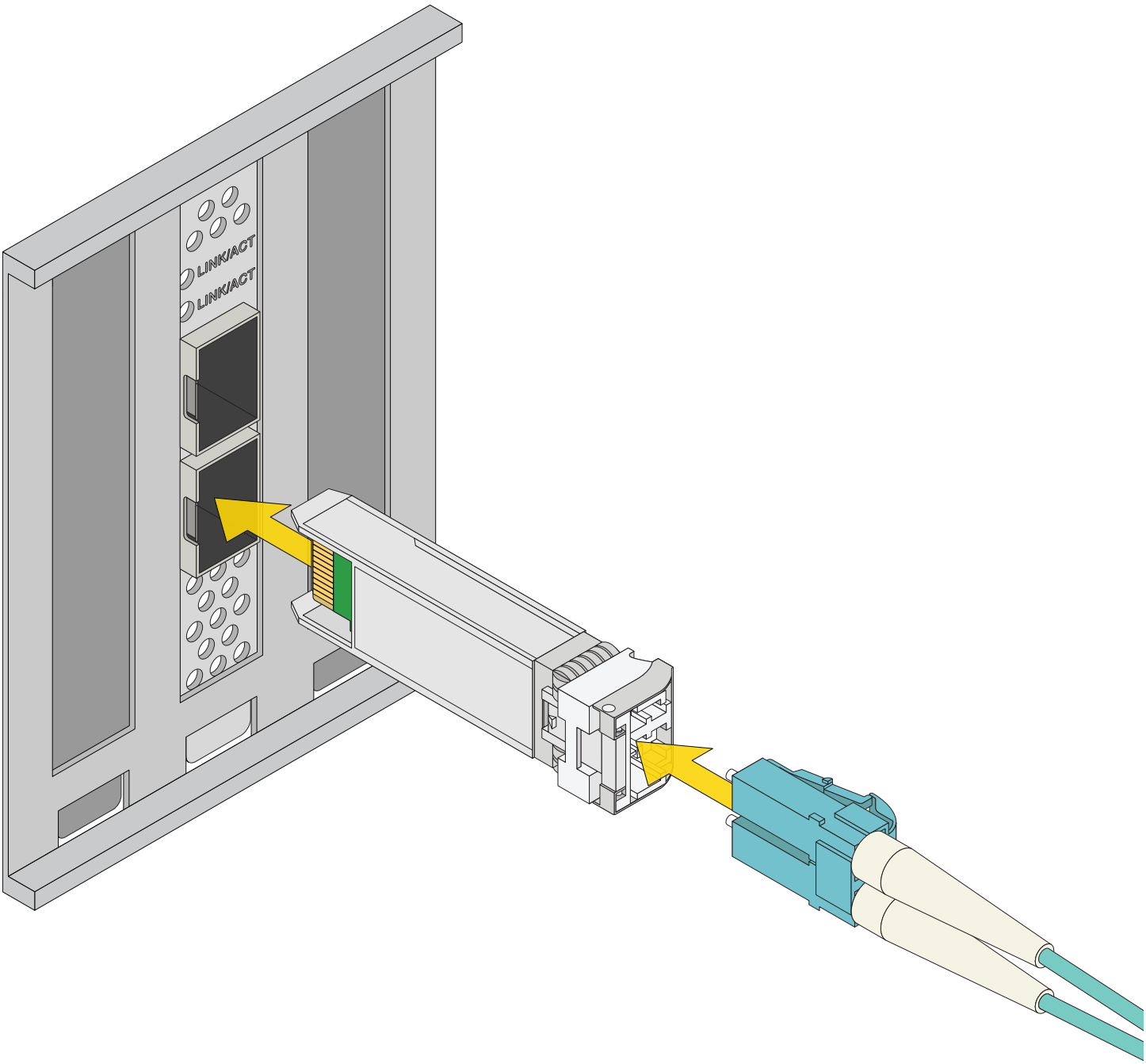


9.6 1/10/25GbE or Fibre Channel NIC Cabling

If you ordered your system with a 1, 10, or 25GbE NIC, or a Fibre Channel NIC, you can connect the SR cables now.

Insert SR optics into the bottom port with the gold connectors facing left, then plug the SR cable into the optics.

Repeat for the other port.



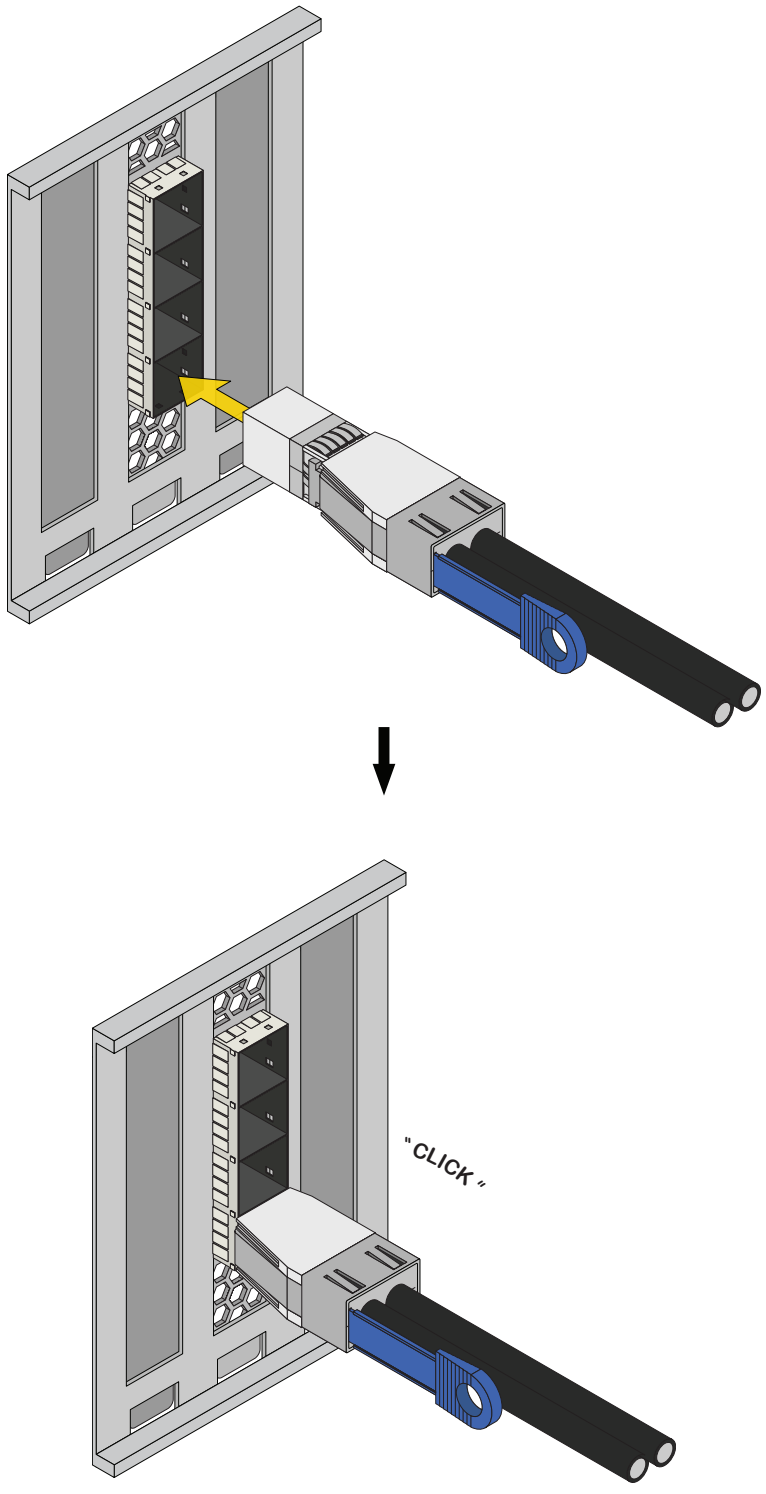
9.7 Expansion Cabling

If you ordered your system with an expansion shelf, you can set up the SAS3 cables now.

Insert a SAS cable into the bottom SAS port with the blue tab facing left, then insert the other end into the first expansion shelf IOM/expander.

If you have a second expansion shelf, insert a SAS cable into the next R50 SAS port with the blue tab facing left, then insert the other end into the first expansion shelf IOM/expander on the second shelf.

Refer to the SAS Connections section or refer to your expansion shelf documentation for connection diagrams.



10 Boot the System

After plugging the power cables into outlets, the system powers on and boots into TrueNAS.

When booted, the system console displays the TrueNAS web UI IP address, which is either preconfigured according to customer guidelines or automatically generated with DHCP.

Enter the IP address into a browser on a computer on the same network to access the web user interface.

See your welcome email or the password stickers on each controller at the rear of the unit for login credentials.

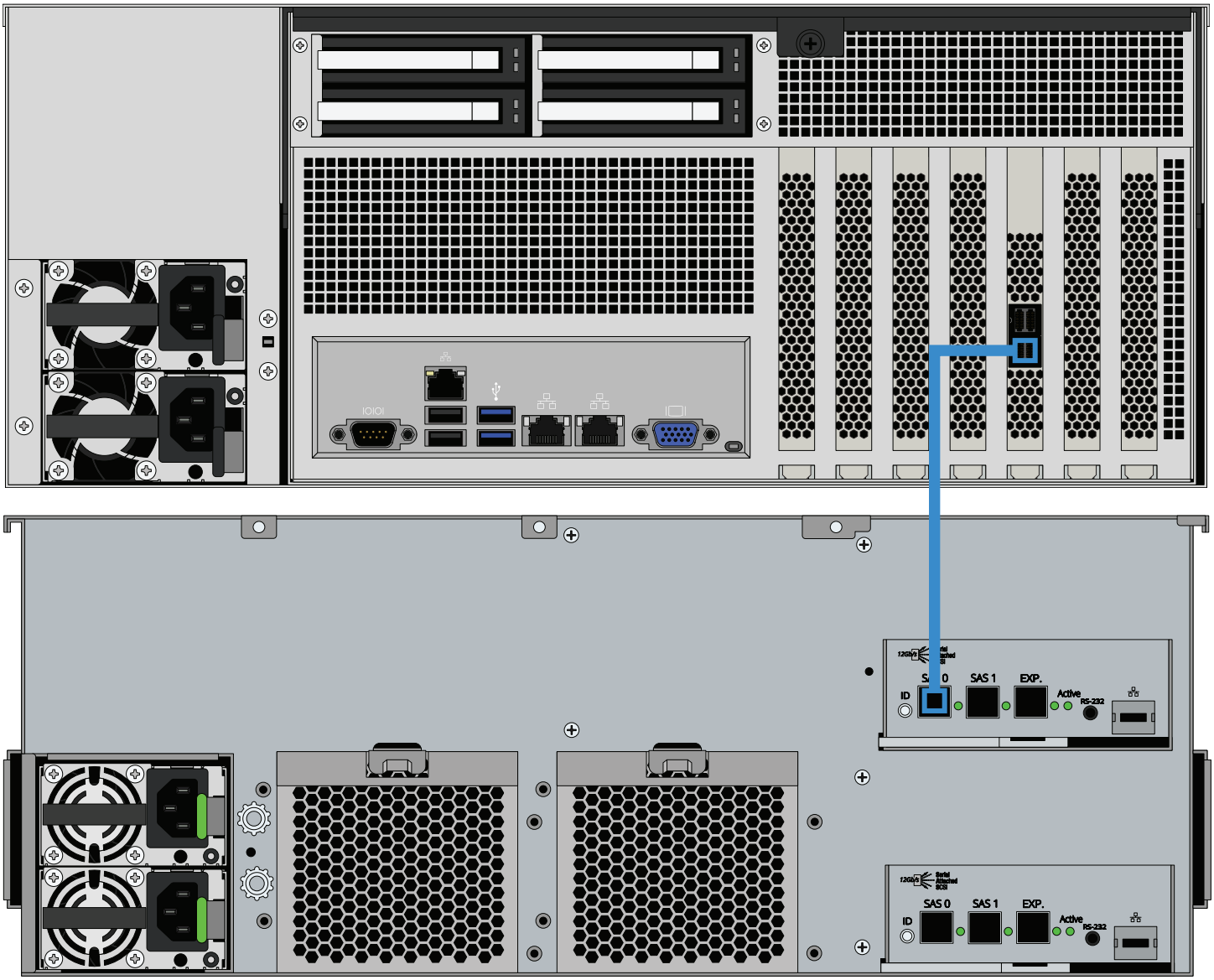
11 SAS Connections

⚠ Important - SAS Configuration

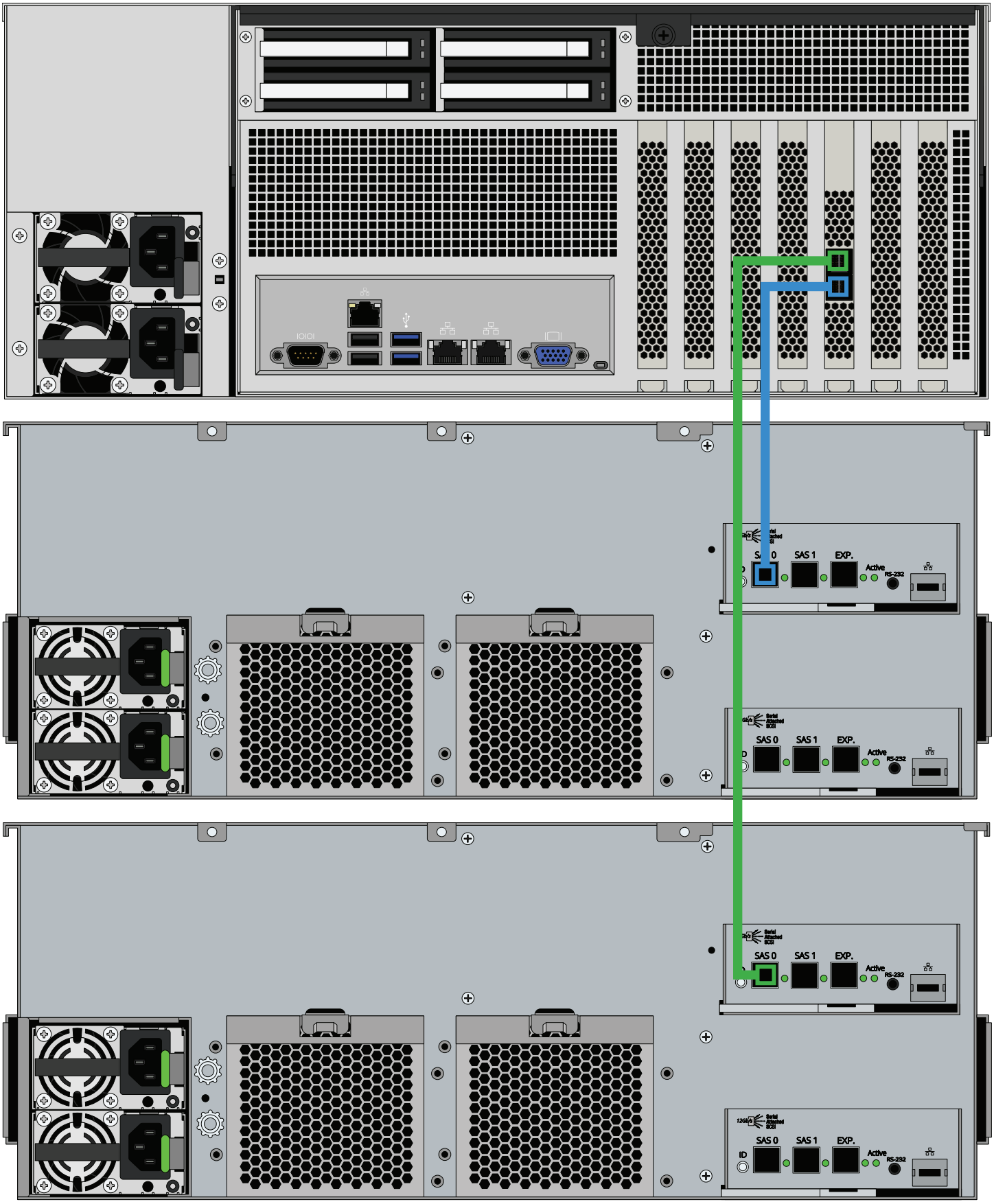
When setting up SAS connections, please adhere to the wiring example below. Connecting Expansion Shelves incorrectly causes errors. Never cable a single controller to different IOMs/expanders on the same shelf.

11.1 ES24

R50 with a single ES24 Expansion Shelf

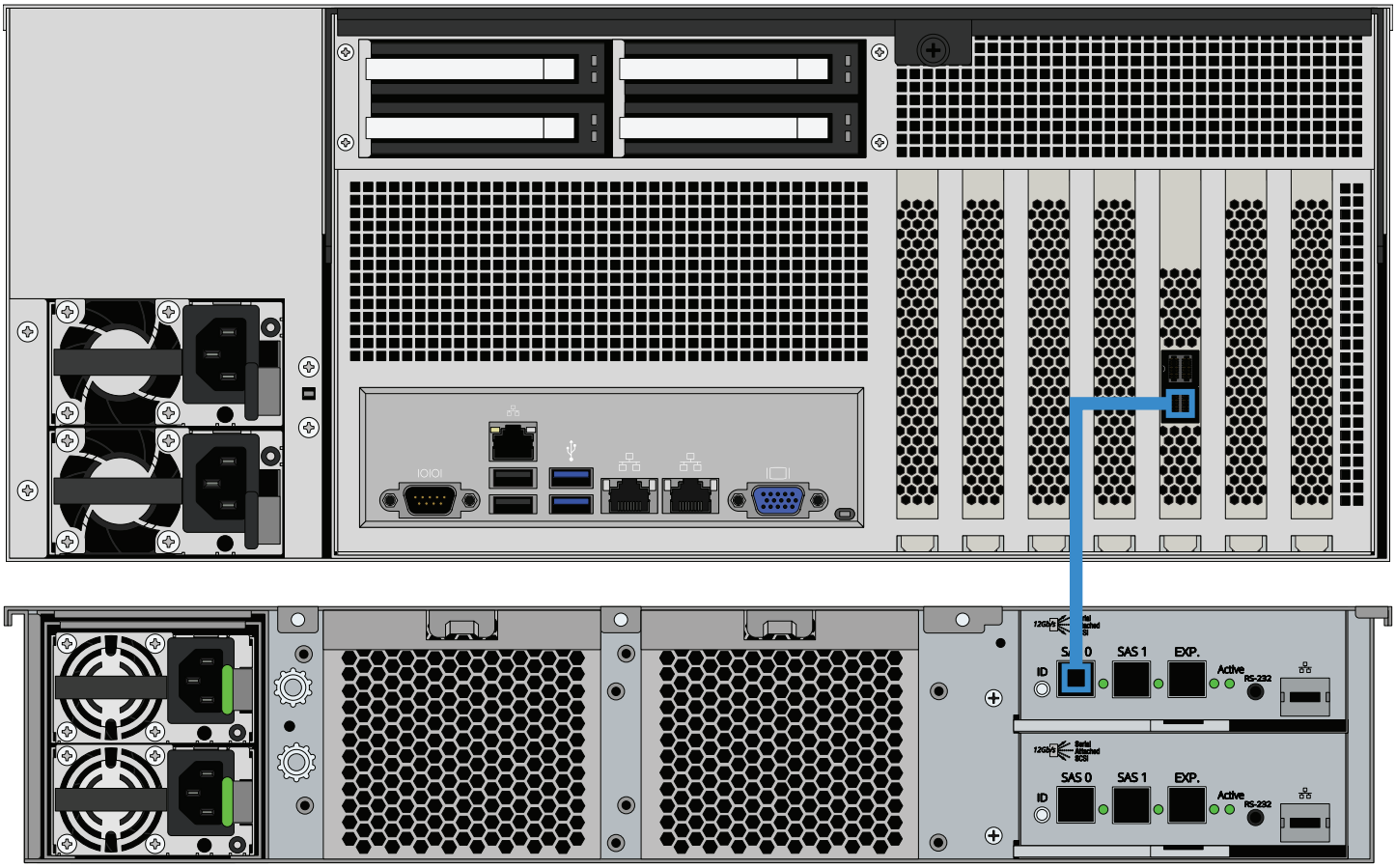


R50 with two ES24 Expansion Shelves

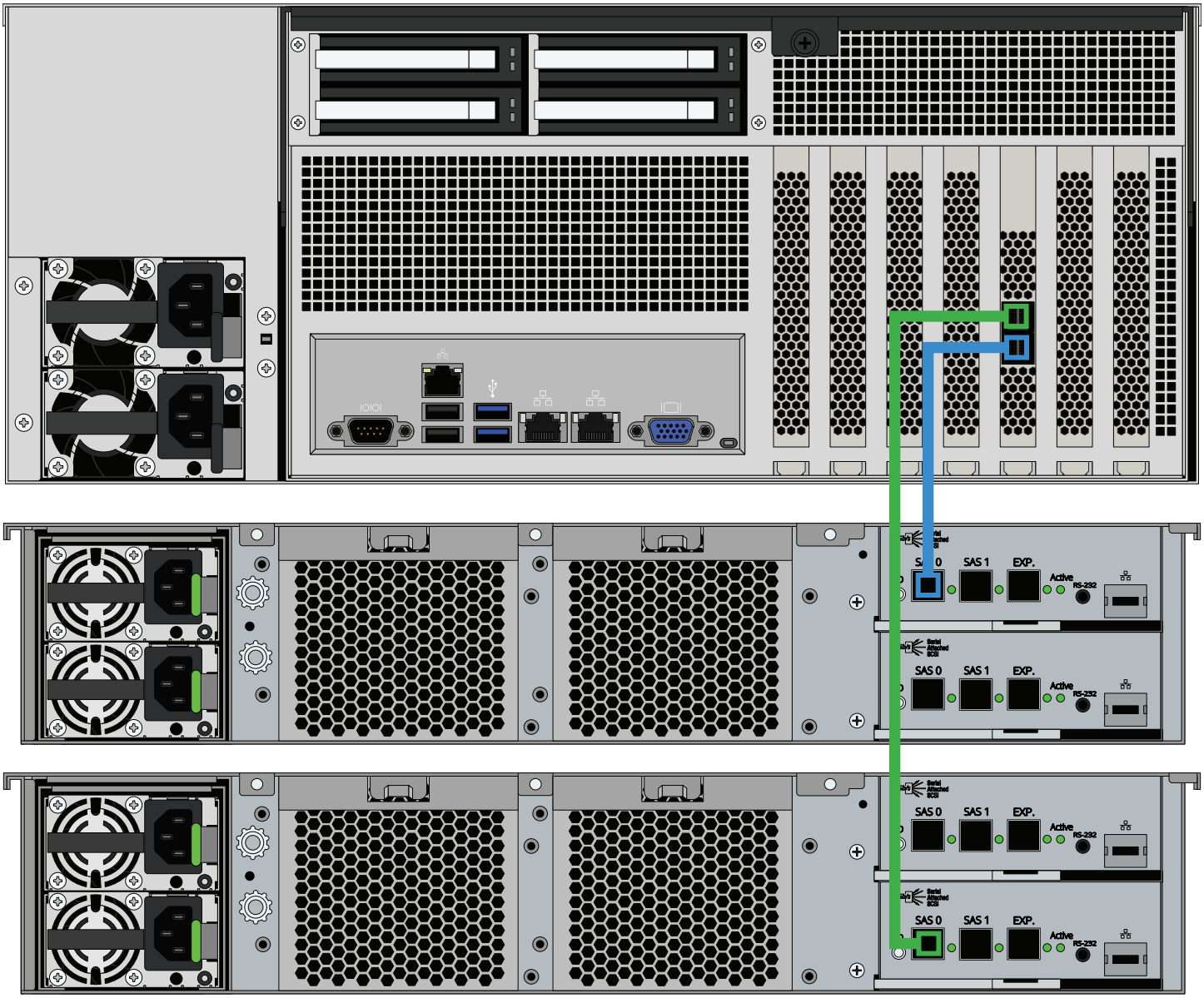


11.2 ES24F

R50 connected to one ES24F shelf.

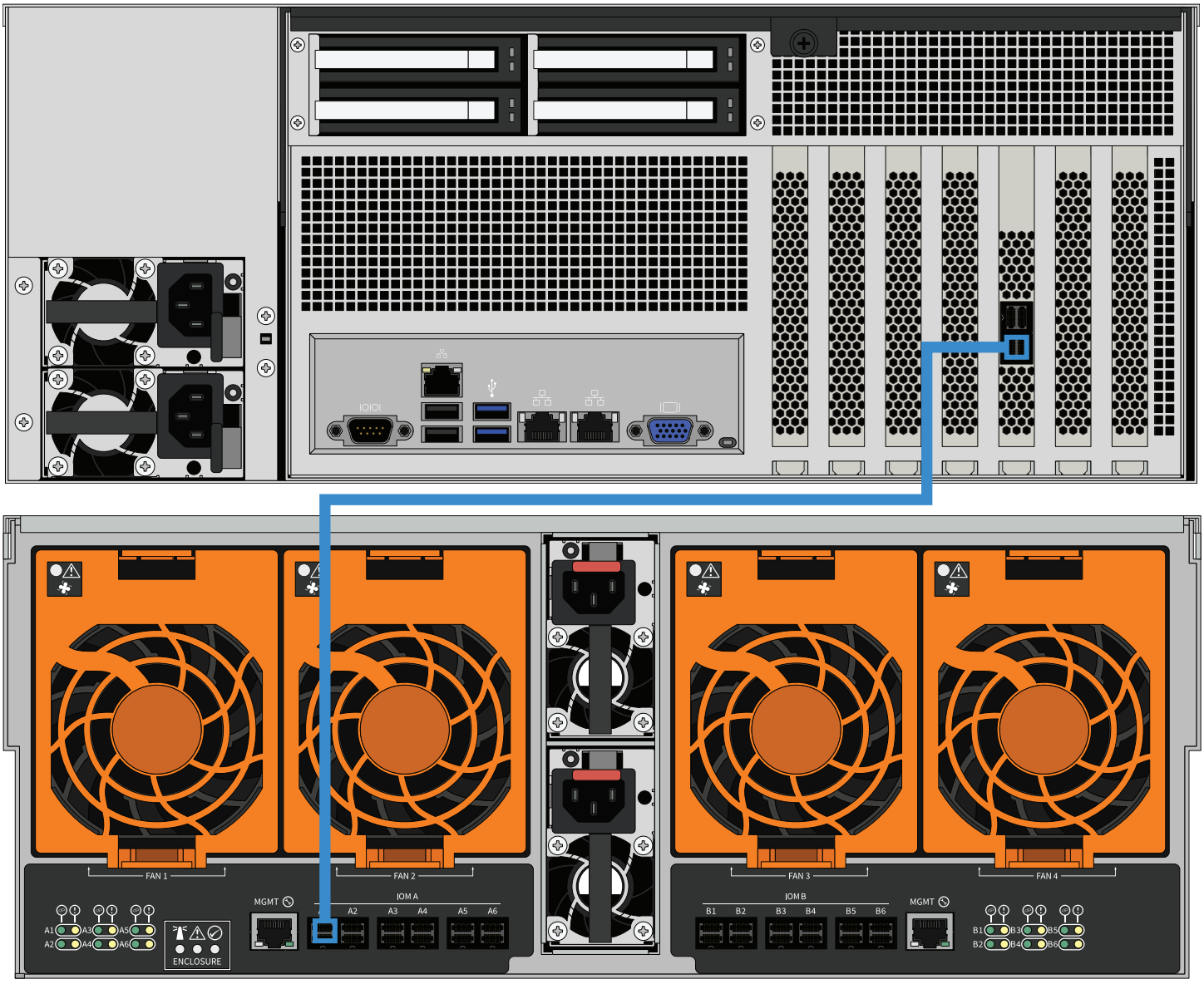


R50 with two ES24F Expansion Shelves

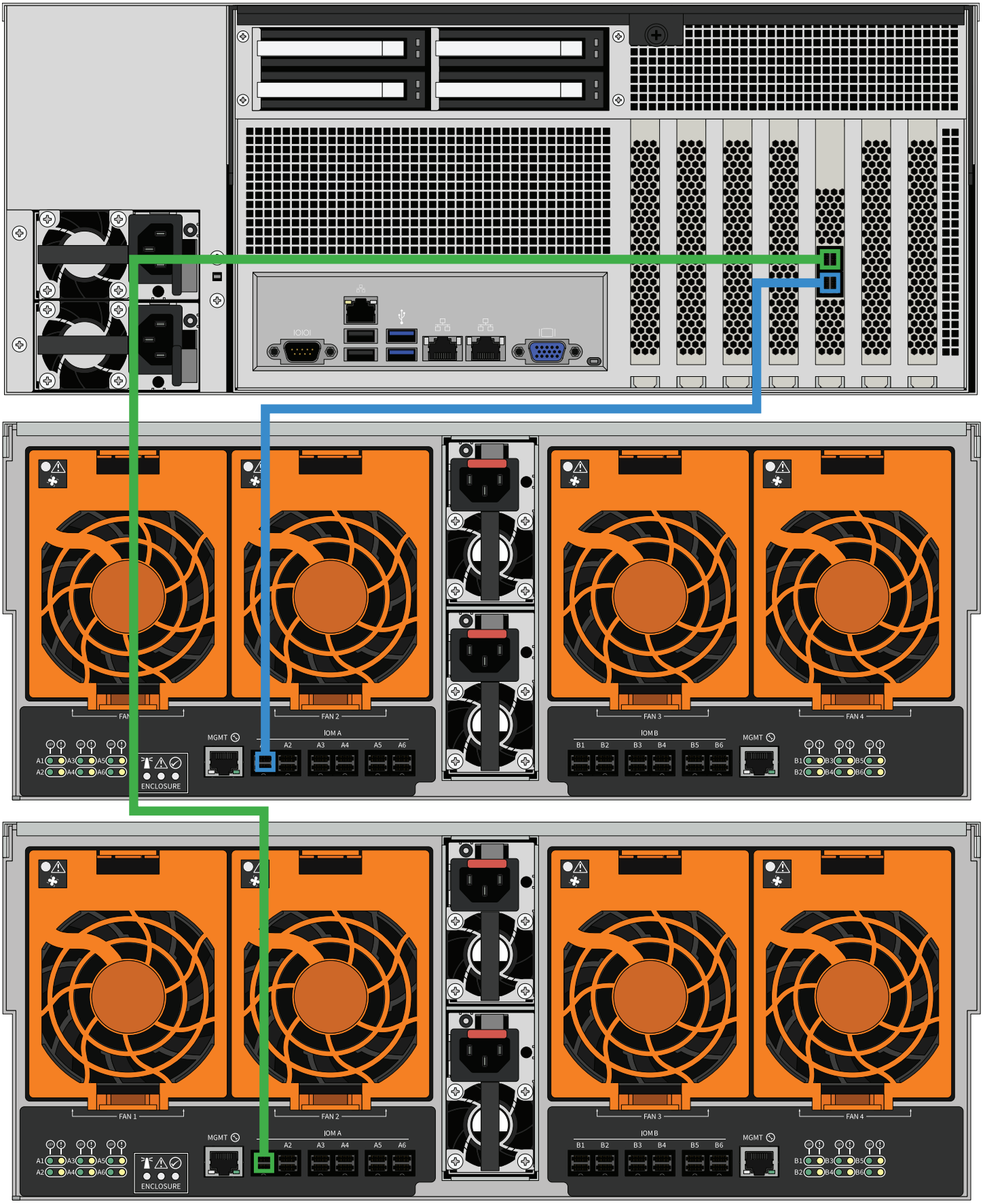


11.3 ES102 Gen 1 and ES60 Gen 2

R50 with a single ES102 Gen 1 or ES60 Gen 2 Expansion Shelf

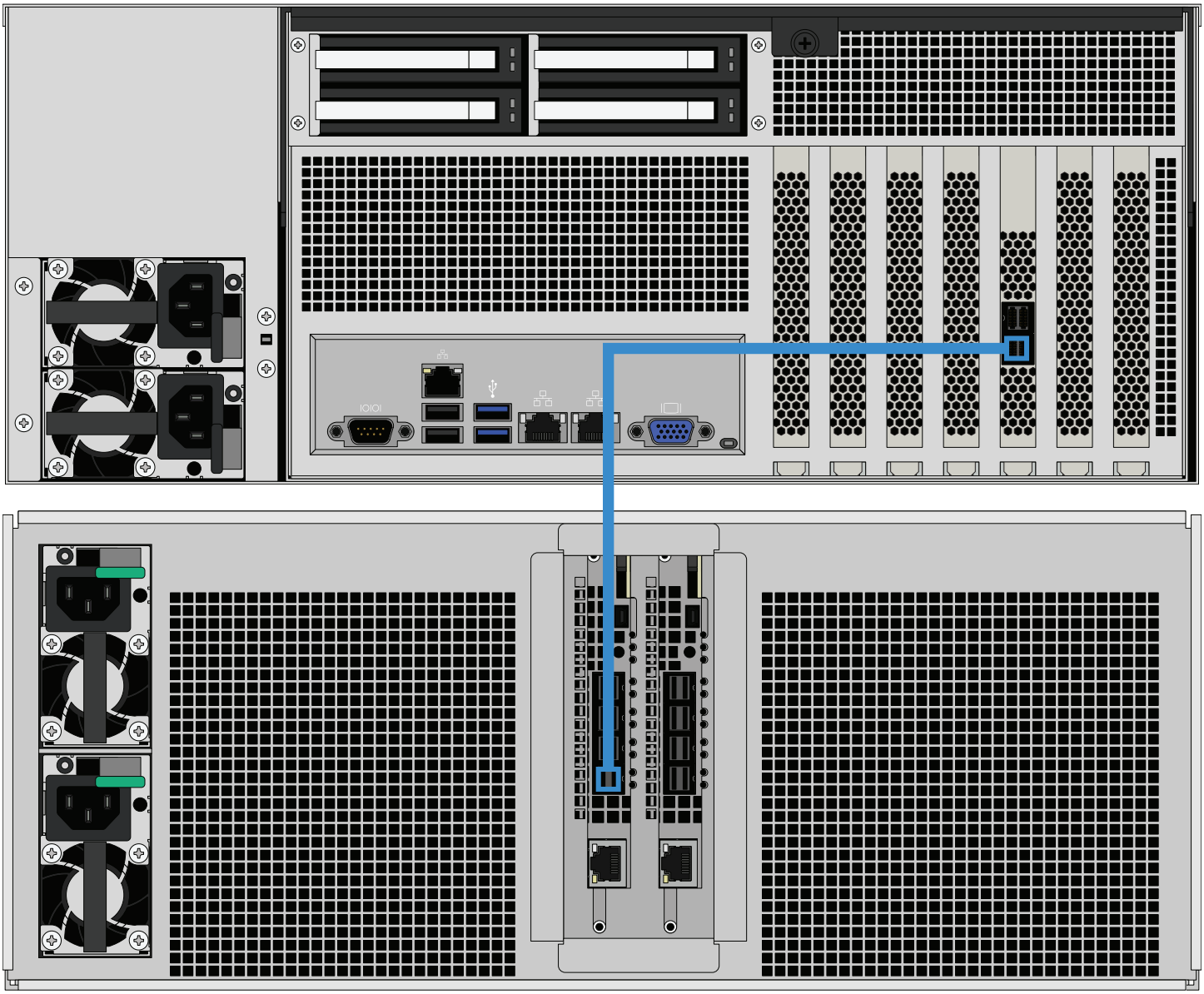


R50 with two ES102 Gen 1 or ES60 Gen 2 Expansion Shelves

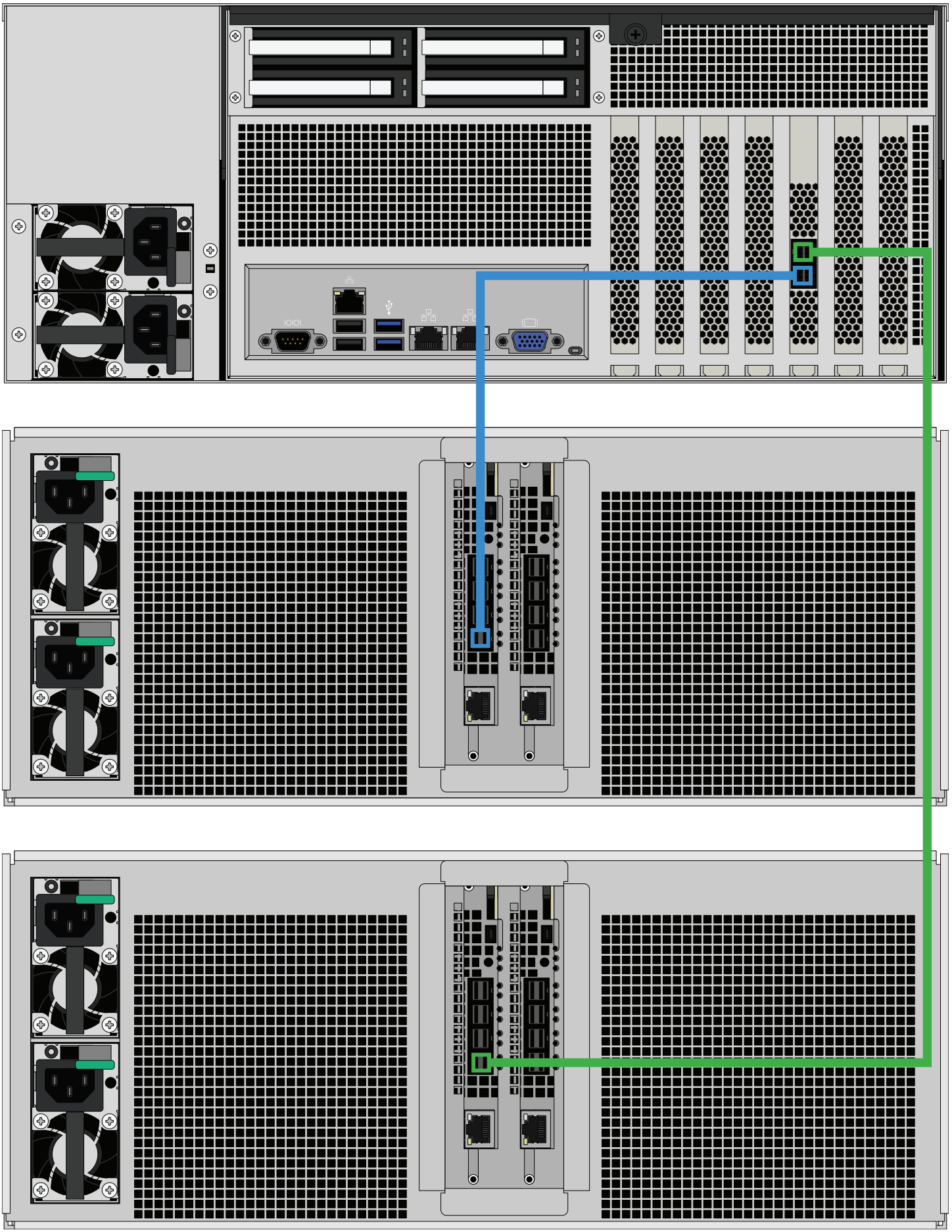


11.4 ES102 Gen 2

R50 with a single ES102 Gen 2 Expansion Shelf



R50 with a single ES102 Gen 2 Expansion Shelf



12 Unracking Procedure

12.1 SAS Cable Uninstallation Overview

To disconnect SAS cabling from your TrueNAS system and expansion shelves, unplug the cable from the port on the first TrueNAS controller and the first port on the first expansion shelf IOM/expander. High Availability (HA) systems require another cable from the first port on the second TrueNAS controller to the first port on the second expansion shelf controller, so make sure you unplug these connections if applicable.

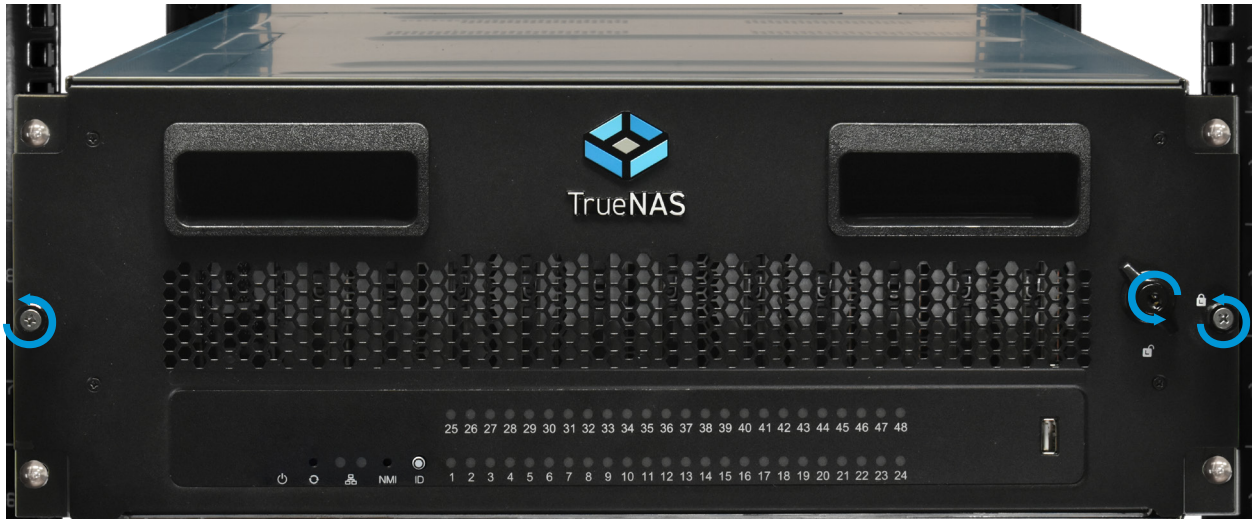
12.2 Uninstall Cables

Disconnect both power cables from the PSUs, then disconnect all USB and networking cables.

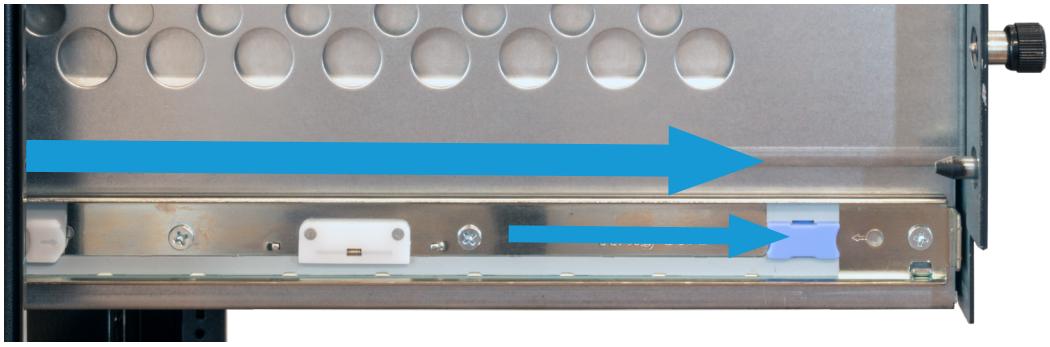
If you chose to connect the Out of Band Management port to a monitor and keyboard, disconnect now. After disconnecting all other ports, unplug in both power cables.

12.3 Open the Drive Drawer

To open the drive bay, tighten the captive thumbscrews on the front of the system. You can also use the included key to unlock the drive drawer.

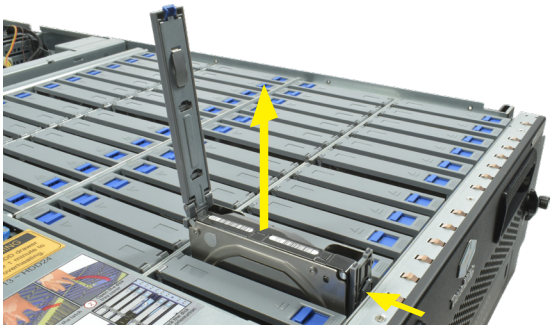


Pull the blue release catches on each rail toward you, then pull the drawer out of the system.



12.4 Remove Hard Drives

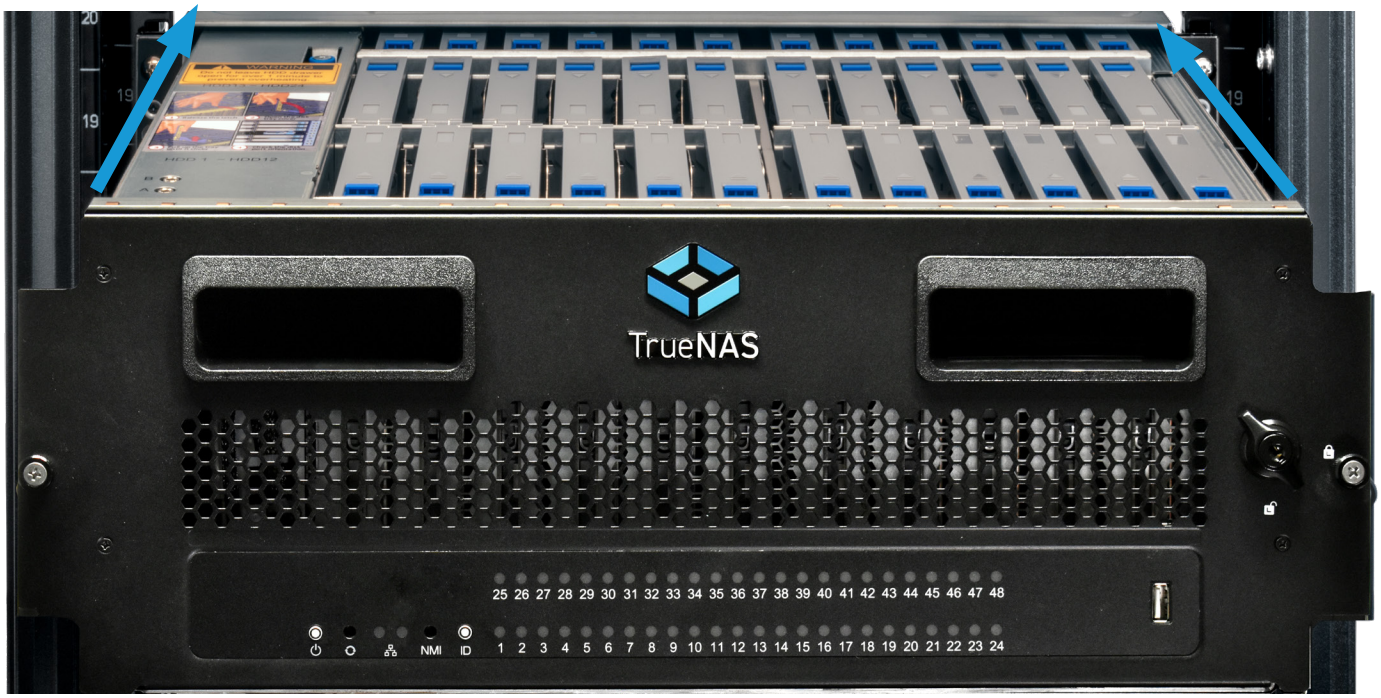
Squeeze the plastic release tabs on each side of the tray, then pull the tray upwards to remove the hard drive from the system. Close the slot cover and make sure it locks.



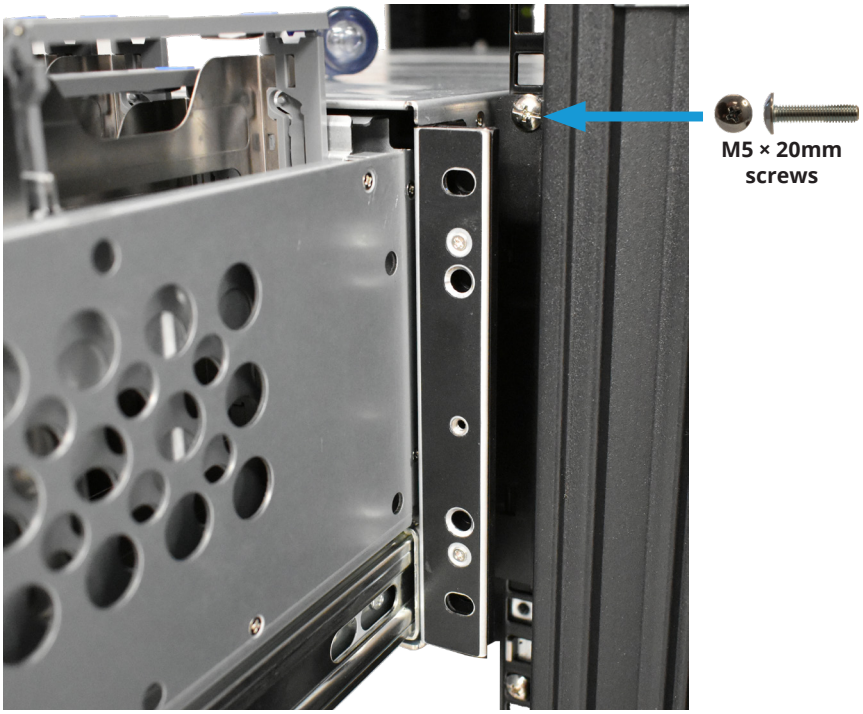
12.5 Close the Drive Drawer

Push the drawer into the chassis. Then, lock the front and tighten the captive thumbscrews.

Warning: To prevent overheating, do not open the drawer for more than 1 minute with the system running.

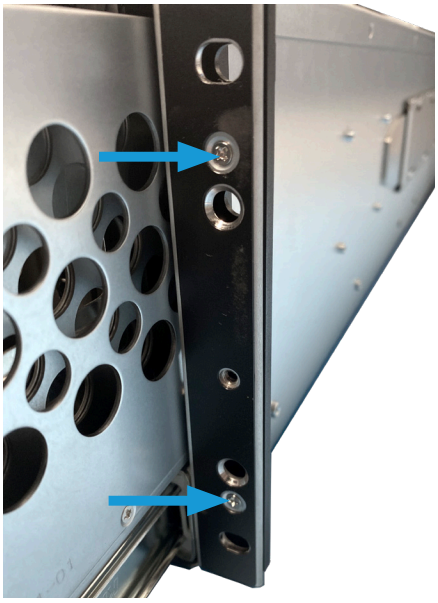


12.6 Remove the Extended Ear Brackets (Optional)

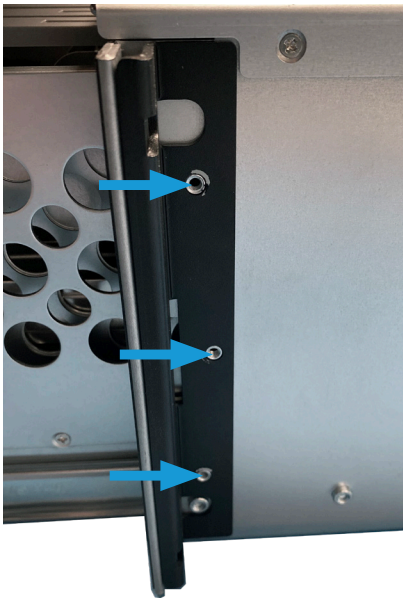


Remove the extended ear brackets to the chassis by unscrewing the same five screws the standard ear brackets used.

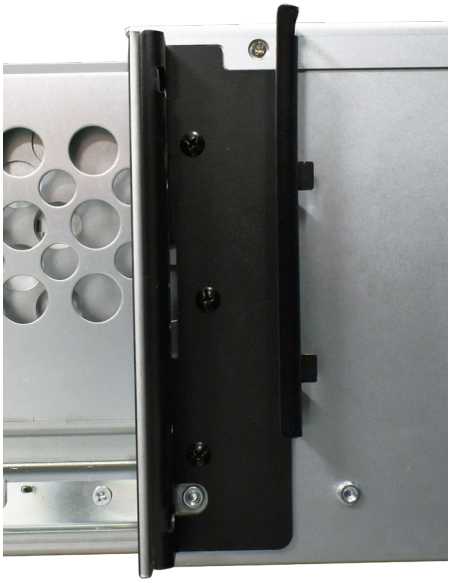
Front Screws



Side Screws



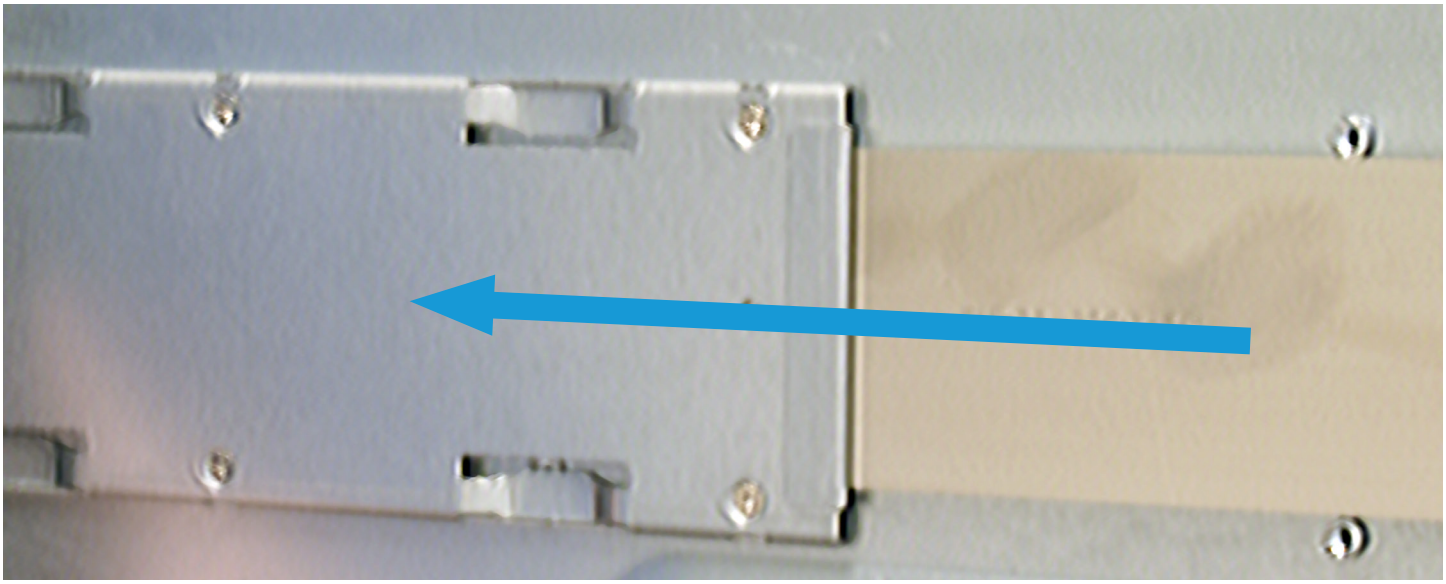
Extended Ear Bracket



Loosen the four **M5 × 20mm screws** to remove each chassis ear bracket from rack.

12.7 Unmount the R50 in the Rack

Two people should lift the R50. Remove the system from the assist rails.

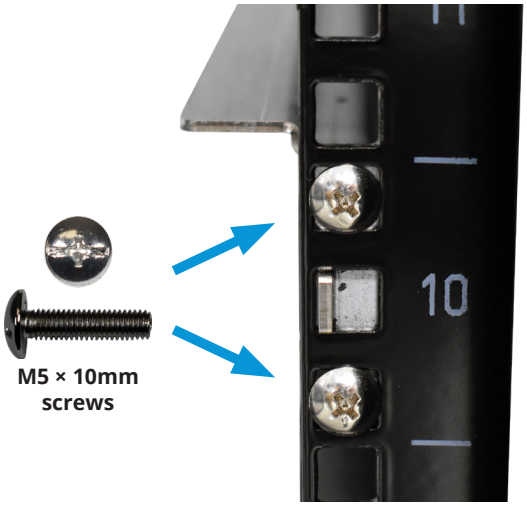


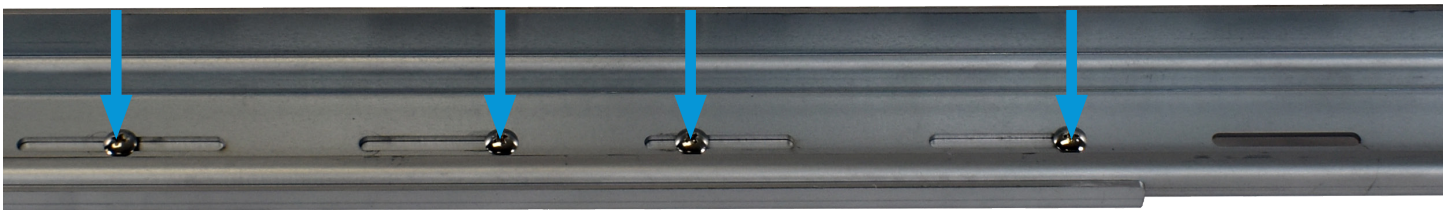
Warning - Pinch Point

The R50 can pinch or crush fingers when sliding the rail sleeves off of the rack rails.

12.8 Uninstall the Assist Rails

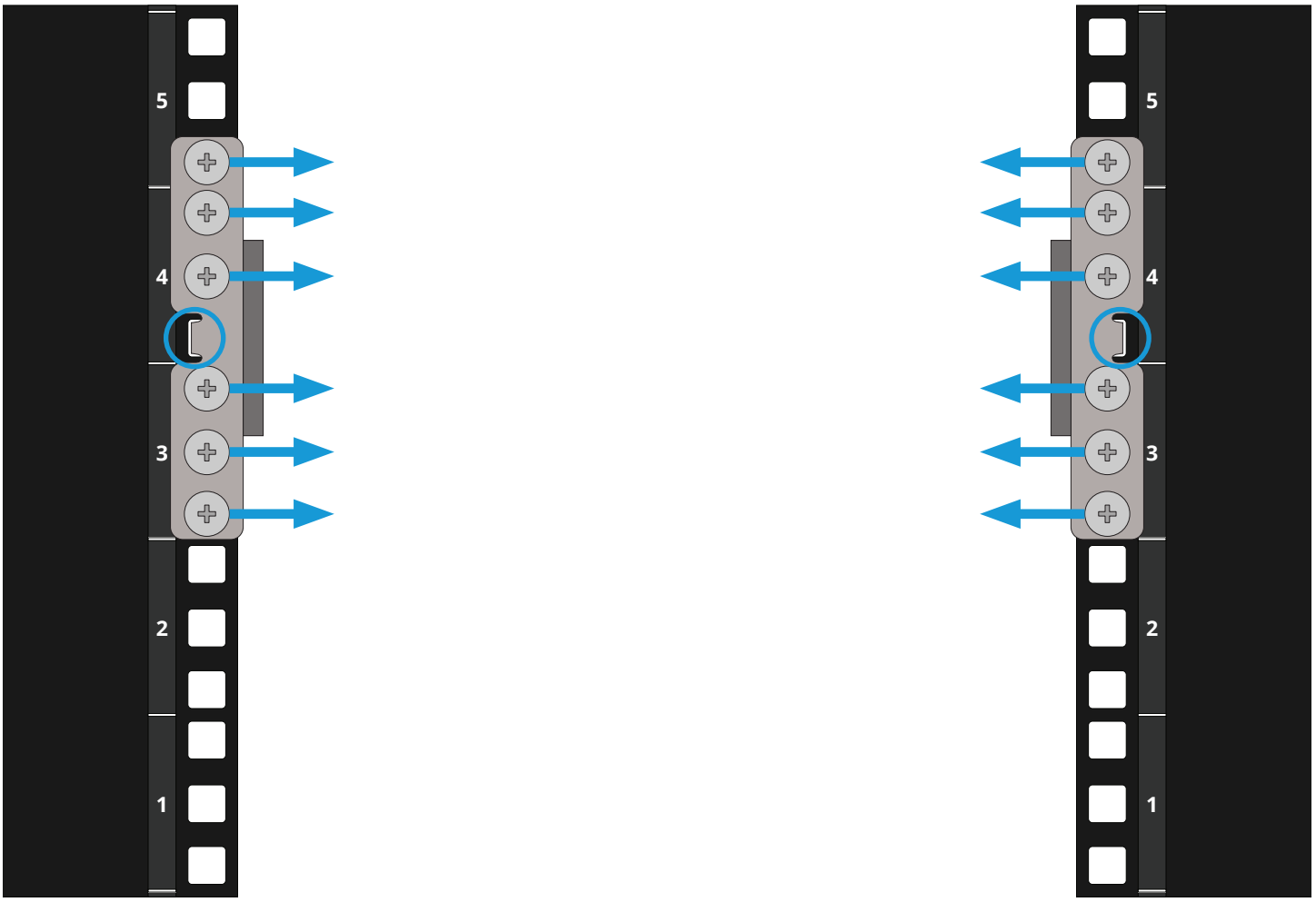
At the front rack post, uninstall an assist rail front tab into the middle space of the bottom 1U, then unscrew the two **M5 × 10mm screws** used to secure it to the rack. Retract the assist rail to the rear rack post and use loosen the other two screws. Loosen the four bolts inside the assist rail to reset the length. Repeat for the other rail.





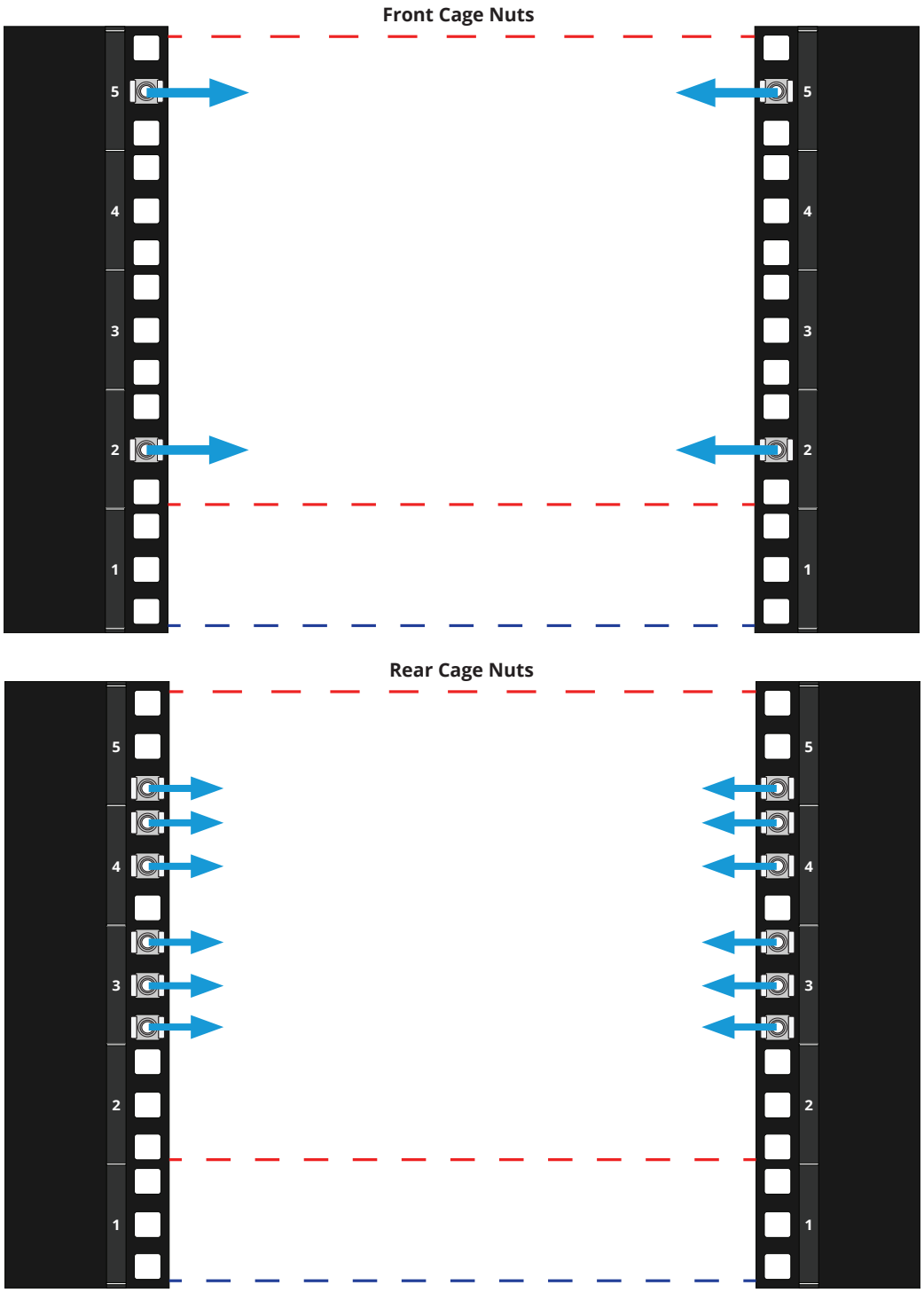
12.9 Uninstall the Rack Rails

Remove the rack rails from the system. Remove the six **M5 × 15mm screws** used to secure the rack rail to the rack. Repeat for the other rail.



12.10 Uninstall Cage Nuts

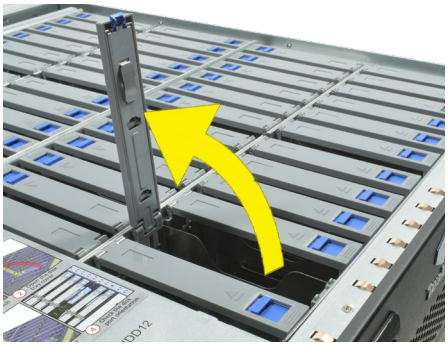
Remove the four cage nuts in the rack front posts, two on each side. Repeat for the other rear rack rail.

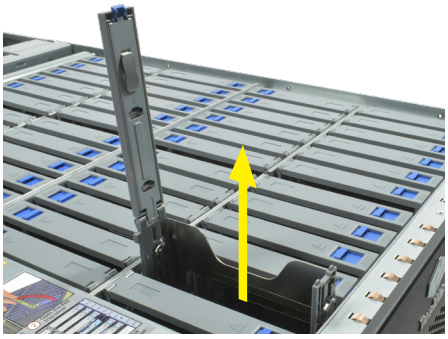


13 Drive Replacement

13.1 HDDs

Push the blue release tab on a slot cover and lift. Gently grasp the inner tray and pull it up until it locks into place.





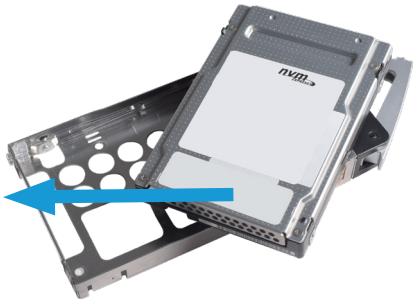
13.2 Remove NVMe Trays

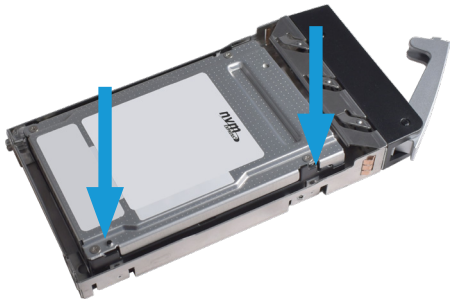
> NVMe drives are hot-swappable, but the R50 won't add the drive until after a power cycle.

To remove an NVMe tray, press the release catch and gently pull the tray until it is out of the system.

13.3 Remove NVMe Drives

To remove an NVMe drive, push on it from underneath until it pops out of the side retention pegs. You may have to gently bend the tabs opposite the posts to get the drive out.





14 Additional Resources

The TrueNAS Documentation Hub has complete software configuration and usage instructions. Click **Guide** in the TrueNAS web interface or go directly to:

https://www.truenas.com/docs

Additional hardware guides and articles are in the Documentation Hub's Hardware section:

https://www.truenas.com/docs/hardware

The TrueNAS Forums provide opportunities to interact with other TrueNAS users and discuss their configurations:

https://forums.truenas.com/

15 Contact Us

Having issues? Please contact TrueNAS Enterprise Support to ensure a smooth resolution.

Contact Method	Contact Options
Web	https://support.ixsystems.com
Email	support@iXsystems.com
Telephone	Monday-Friday, 6:00AM to 6:00PM Pacific Standard Time: • US-only toll-free: **1-855-473-7449** option 2 • Local and international: **1-408-943-4100** option 2
Telephone	Telephone After Hours (24x7 Gold Level Support only): • US-only toll-free: **1-855-499-5131** • International: **1-408-878-3140** (International calling rates will apply)