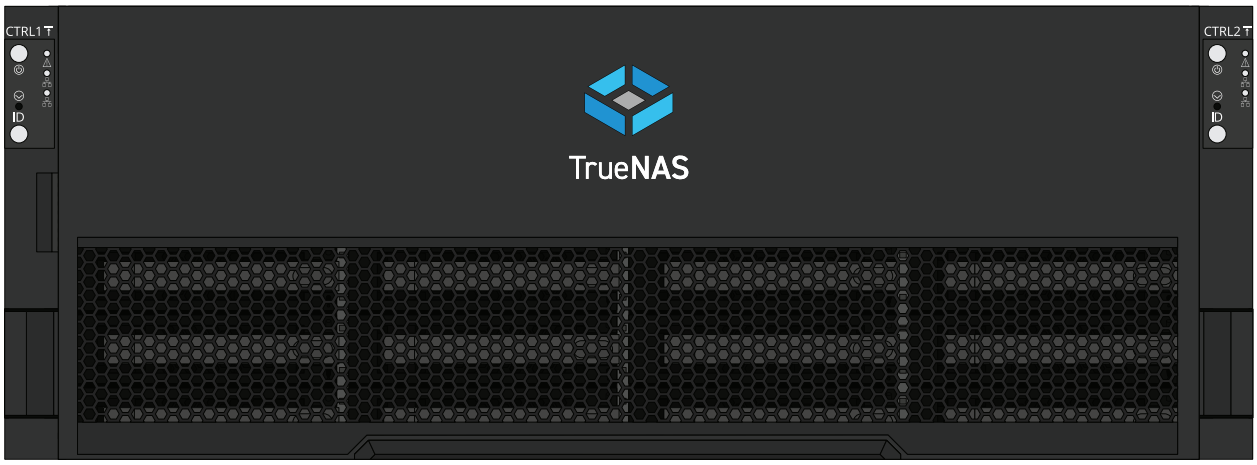
TrueNAS® M-Series User Manual

v.25111



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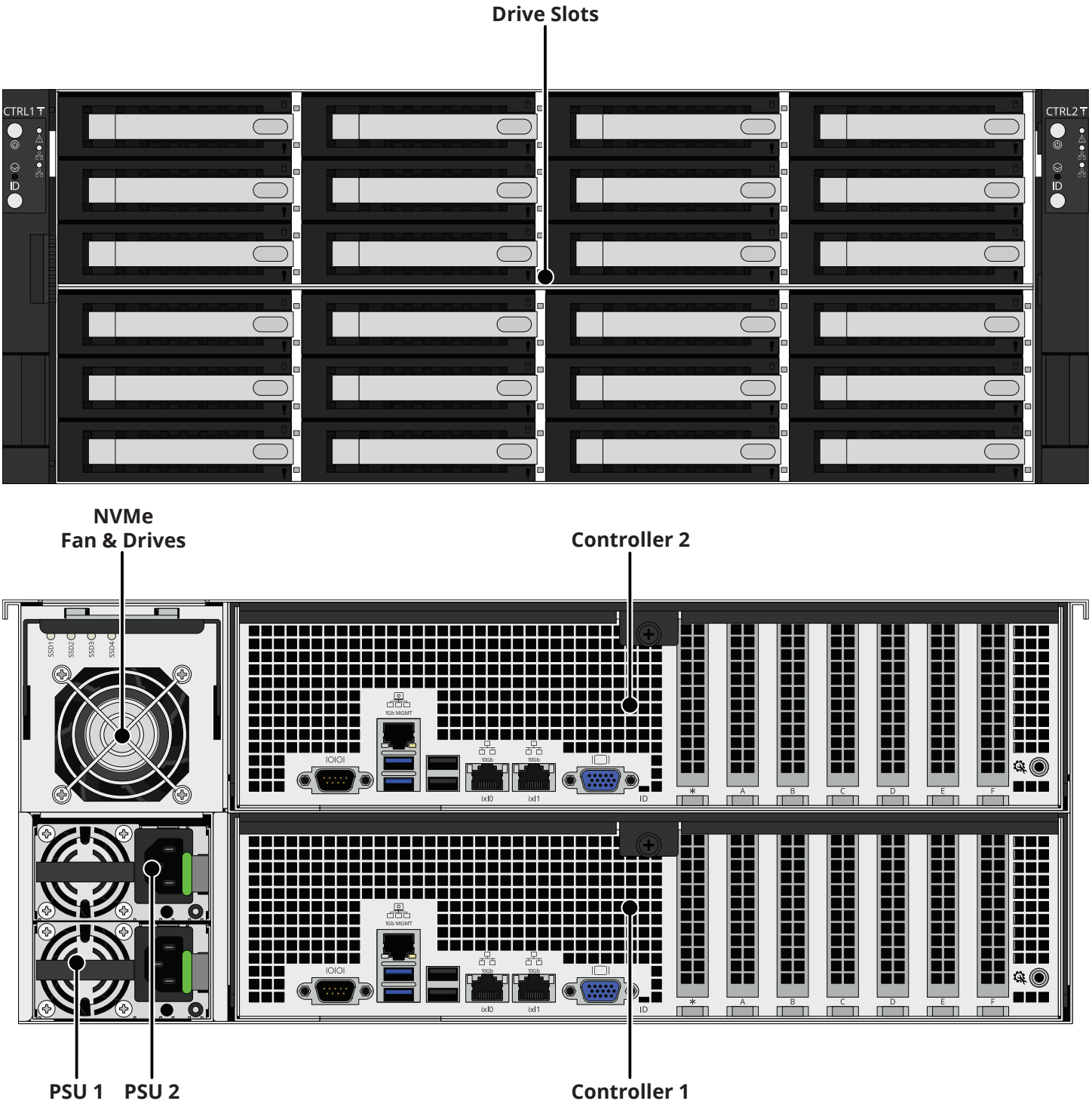
1 Introduction

The TrueNAS M-Series is a 4U, 24-bay, High-Availability storage array with redundant power supplies.

Your system comes with the TrueNAS operating system preloaded.

> **Note**
>
> TrueNAS M-Series systems have a unified chassis design that allows customers to upgrade them with more powerful controllers. Customers can upgrade an M30 to an M40, an M40 to an M50, or an M50 to an M60. Speak with an iXsystems Sales or Support Representative for more information.



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

Warning

The M-Series weighs 75 lbs unloaded and requires a minimum of **two** people to lift.

Never attempt to lift an M-Series system loaded with drives! Install the system in a rack before adding drives, and remove drives before uninstalling the system.

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.

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.

3 Recommended Tools

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

- Long #2 Phillips head screwdriver
- Tape measure
- Level

4 Specifications

M-Series Components	
Drive Count	24 3.5-inch SAS HDDs or SSDs
Cooling Fans	4
Power Supplies (200v)	2
Power Distribution Requirements	200V - 240V
Controllers	2

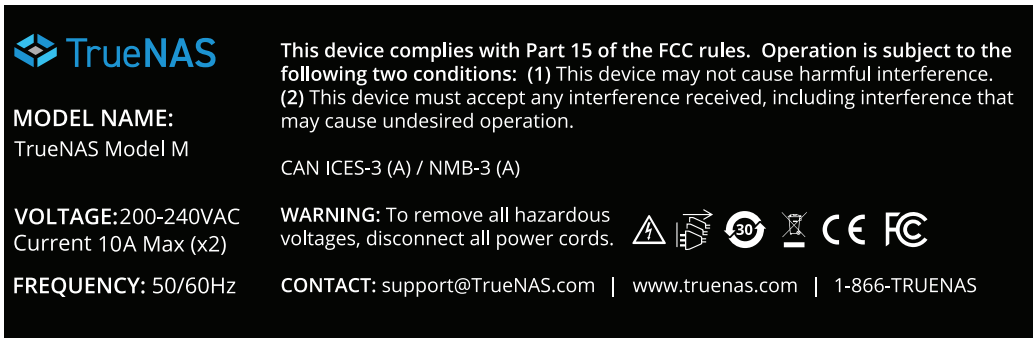
M-Series Dimensions and Weight	
Dimensions (H x W x L)	10 in x 19 in x 27 in (177.8 mm x 482.6 mm x 685.8 mm)
Length with Chassis Rail	32 in (812.8mm)
Net Weight (Fully Loaded)	117 lbs (34 kg)

M-Series Environmental Specifications	
Operating Temperature	32°F - 95°F (0°C - 35°C)
Non-Operating Temperature	-14°F - 158°F (-10°C - 70°C)
Operating Humidity (non-condensing)	5% - 95%

4.1 M-Series Models

	M30	M40	M50	M60
Max RAM	64 GB	192 GB	348 GB	768 GB
Read Cache	800 GB SAS	2.4 TB SAS or 3.2 TB NVMe	6.4 TB NVMe	12.8 TB NVMe
Write Cache	16 GB SAS	16 GB NVDIMM	16 GB NVDIMM	16 GB NVDIMM
Network Ports	2x 10/25/40 GbE 2x 10GBase-T	2x 10/25/40/100 GbE 2x 10GBase-T	2x 10/25/40/100 GbE 2x 10GBase-T	2x 10/25/40/100 GbE 2x 10GBase-T
Fibre Channel	2x 16 Gb	4x 16 Gb	4x 16 Gb or 2x 32 Gb	4x 32 Gb
Raw Max Storage	500 TB	3 PB	10 PB	25 PB
Expansion Shelves	N/A	2	8	12
Power Draw				
Single Controller	450W	825W	975W	1225W
Dual Controller	600W	950W	1150W	1450W
Heat Output	1535/2047 BTU/h	2815/3241 BTU/h	3327/3924 BTU/h	4180/4947 BTU/h

Compliance



The TrueNAS M-Series is a **network storage server** intended for use in **enterprise and data center environments**.

The apparatus is designed to be operated:
- In controlled IT environments, within the specified ranges for temperature, humidity, and supply voltage
- In properly grounded electrical installations, in accordance with local electrical codes
- In accordance with the TrueNAS software documentation, including configuration, operation, and maintenance instructions

This product is not designed or intended for:
- Use in life-support systems or other safety-critical applications where failure could result in injury or loss of life
- Use in residential consumer environments, unless explicitly installed and operated in a controlled, non-domestic IT setting
- Any application outside the conditions and purposes described in this manual and the TrueNAS software documentation

For detailed configuration and operational guidance, refer to the TrueNAS software documentation provided with the product and available from TrueNAS.

The M30, M40, and M50 is FCC/CE-marked and comply with:
- **FCC 47 CFR Part 15, Class A -** Radiated and conducted emissions limits for commercial IT equipment (EMI/EMC)
- **Low Voltage Directive (LVD) 2014/35/EU** - Electrical safety
- **Electromagnetic Compatibility (EMC) Directive 2014/30/EU -** Electromagnetic interference and immunity
- **RoHS Directive 2011/65/EU, as amended by (EU) 2015/863** - Restriction of hazardous substances
- **WEEE Directive 2012/19/EU -** Waste electrical and electronic equipment
- **BSMI requirements for information technology equipment** - Safety and EMC, as applicable

The M60 is FCC/CE-marked and comply with:
- **FCC 47 CFR Part 15, Class A -** Radiated and conducted emissions limits for commercial IT equipment (EMI/EMC)
- **Low Voltage Directive (LVD) 2014/35/EU** - Electrical safety
- **Electromagnetic Compatibility (EMC) Directive 2014/30/EU -** Electromagnetic interference and immunity
- **RoHS Directive 2011/65/EU, as amended by (EU) 2015/863** - Restriction of hazardous substances
- **WEEE Directive 2012/19/EU -** Waste electrical and electronic equipment

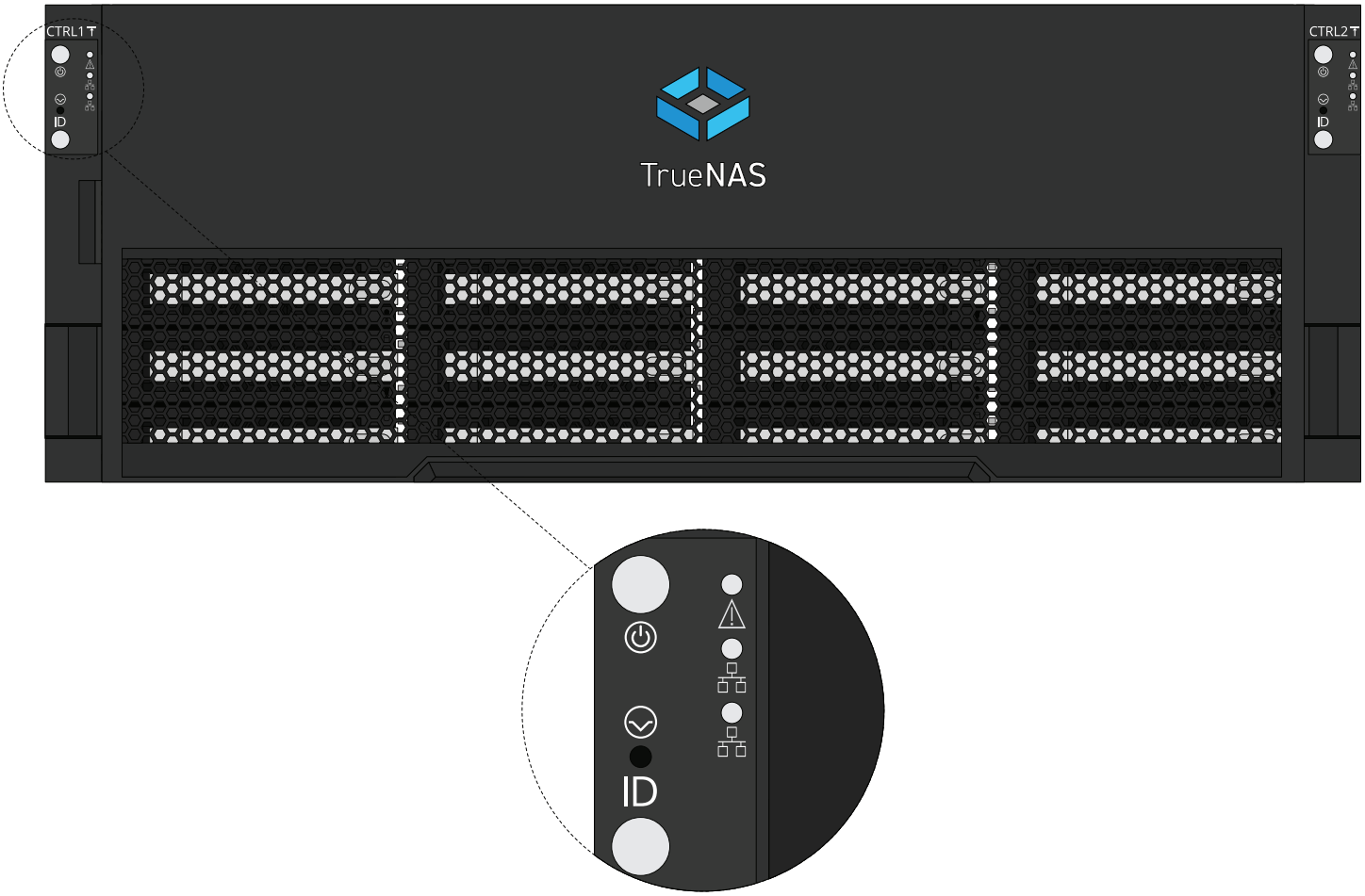
For regulatory or compliance-related queries, contact compliance@truenas.com.
EU Authorized Representative: Obelis S.A. - Boulevard Général Wahis 53, B-1030 Brussels, BELGIUM

ⓘ Important - Battery Information

This product contains a lithium coin cell (CMOS battery) used to maintain system settings. Do not dispose of the battery with household waste. Used batteries must be collected and disposed of separately in accordance with local regulations and the EU Battery Directive 2006/66/EC. The crossed-out wheeled bin symbol indicates that the battery must be taken to an appropriate collection facility for recycling.

5 Components, Ports, and Indicators

5.1 Front Indicators and Buttons

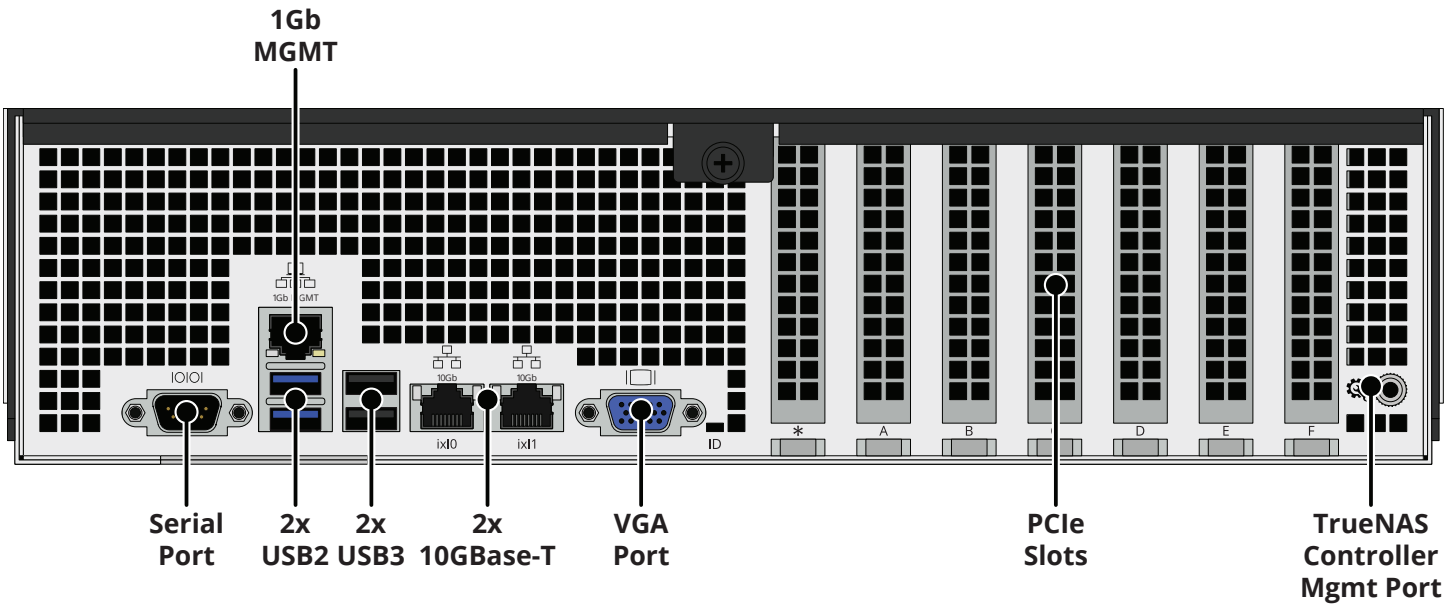


Light / Button	Function	Color and Indication
⏻	Powers the system on/off	Blue (Solid): System Ready
⌁	Resets the system	N/A
ID	Activates Locate ID	Blue (Flashing): Locate ID active
⚠	N/A	Green (Flashing): Component Fault
品	N/A	Amber (Flashing): Link Active

5.2 Drive Indicators

Light	Color and Indication
🛢	Blue (Flashing): Disk Activity
!	Amber (Solid): Drive Fault

5.3 Rear Components and Ports

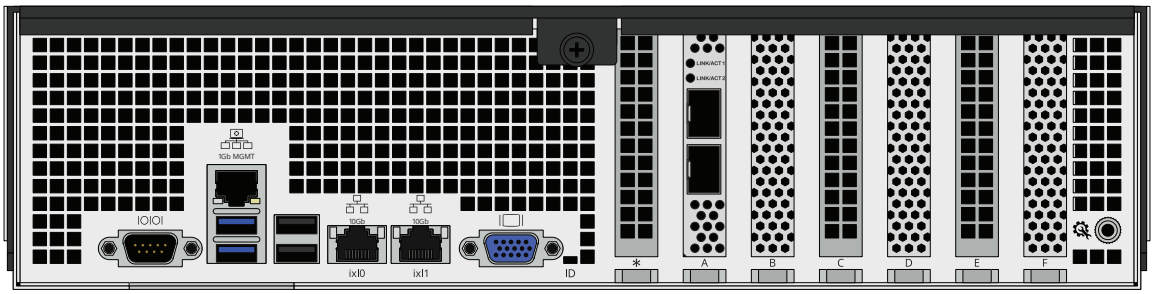


5.4 Controller Expansion Slots

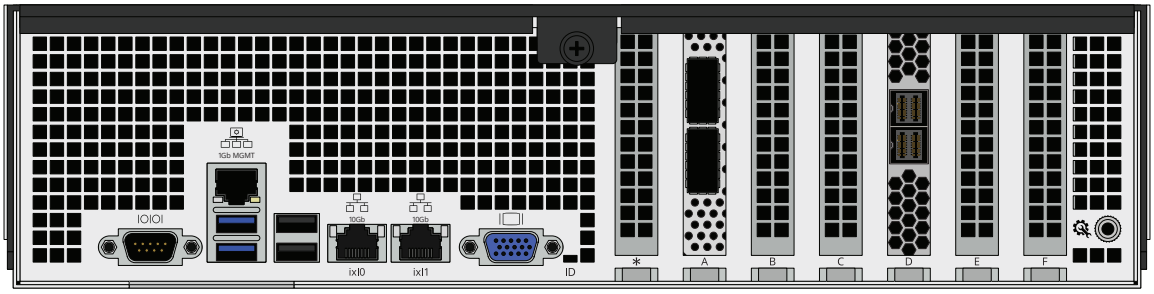
Expansion slots on the M-Series are reserved for specific cards or internal use:

	Slot A	Slot B	Slot C	Slot D	Slot E	Slot F
M30	NIC or FC	N/A	NTB	N/A	Internal SAS	Secondary NIC
M40	NIC	N/A	NTB	External SAS	Internal SAS	4x NVME Riser, NIC2, or FC
M50	NIC1	External SAS1	NIC2 or FC	External SAS2	NTB	Internal SAS
M60	NIC1	External SAS1	External SAS3, NIC2, or FC	External SAS2	NTB	Internal SAS

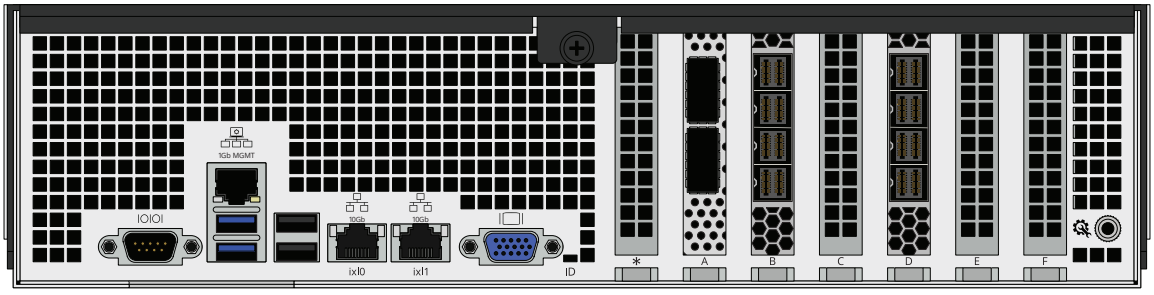
M30 Controller Expansion Slots



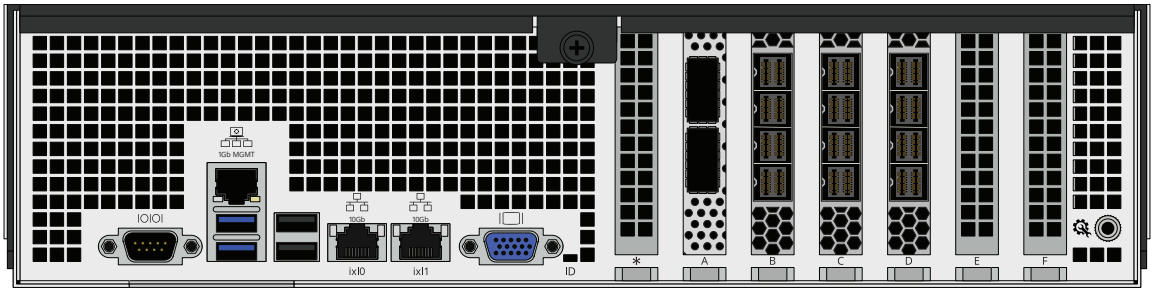
M40 Controller Expansion Slots



M50 Controller Expansion Slots



M60 Controller Expansion Slots



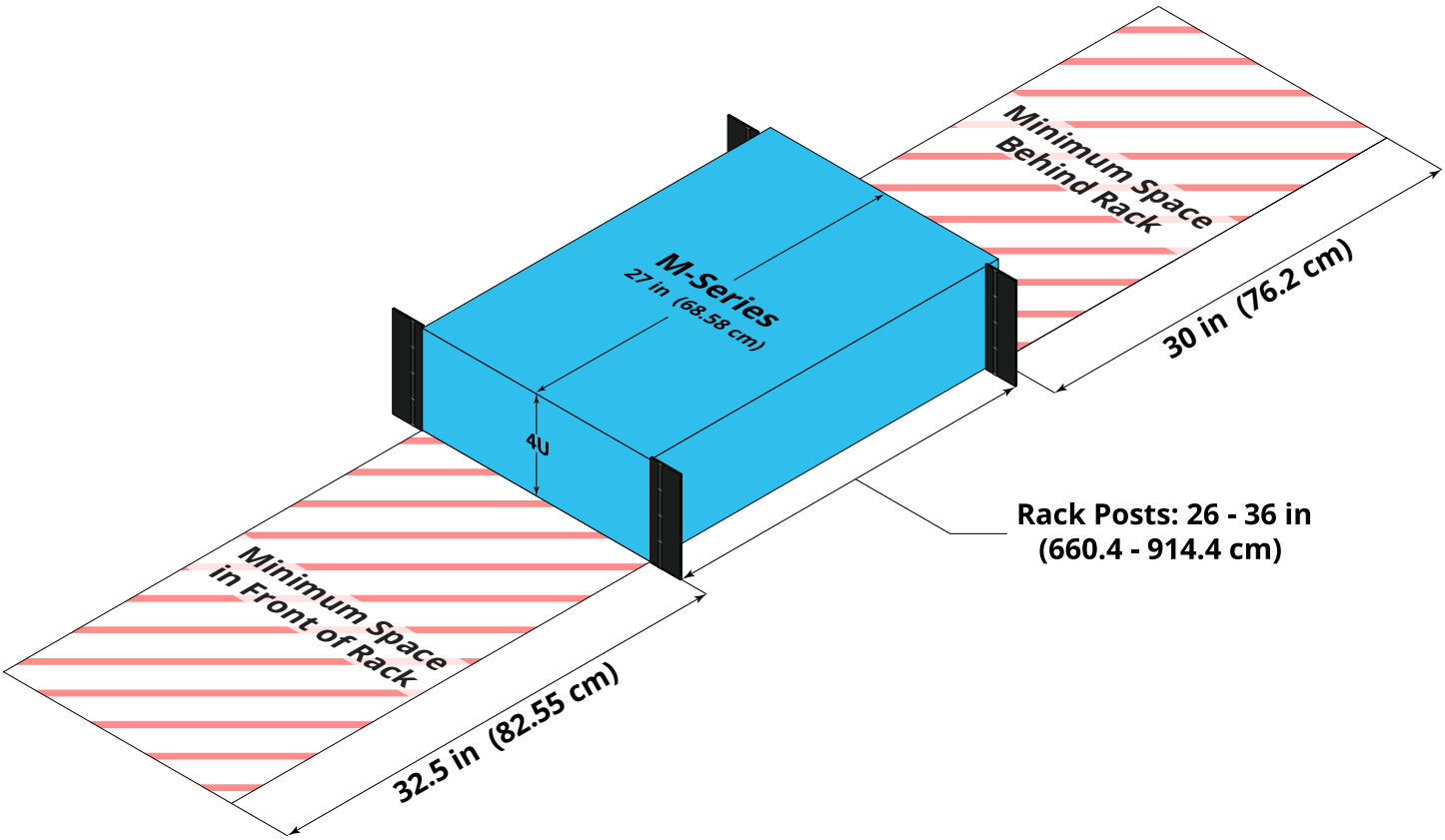
6 Space Requirements

Note - Rack Space

The M-Series requires 4U of rack space and a #2 Phillips head screwdriver to install in a rack.

The system is 27” (68 cm) long. Rack posts must be 26” - 36” (660.4 cm - 914.4 cm) apart to install the rail kit.

You must have at least 32.5” (82.55 cm) of space in front of the rack and 30” (76.2 cm) of space behind the rack.



Warning

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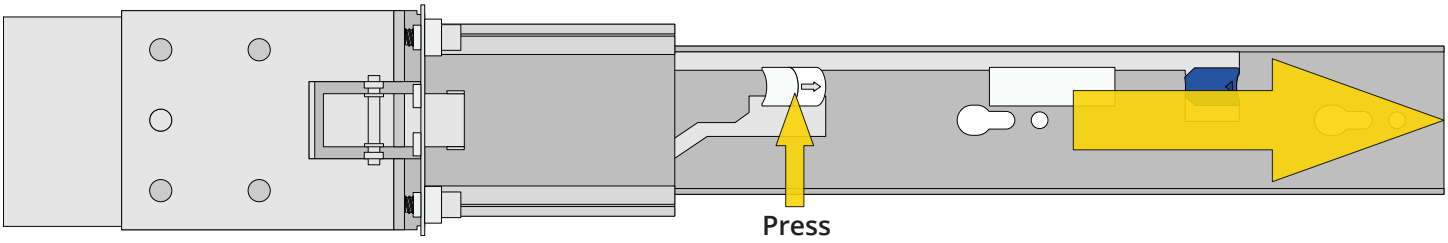
When handling rails, system components, or drives, never force movement if a component seems stuck. Gently remove the component and check for pinched cables or obstructing material before installing it again. Installing a component with excessive force can damage the system or cause personal injury.

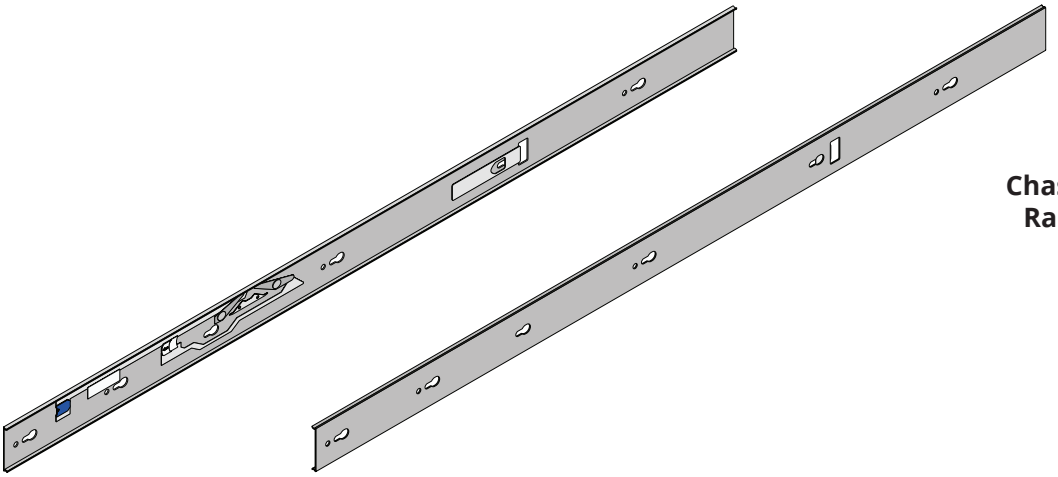
7 Racking Procedure

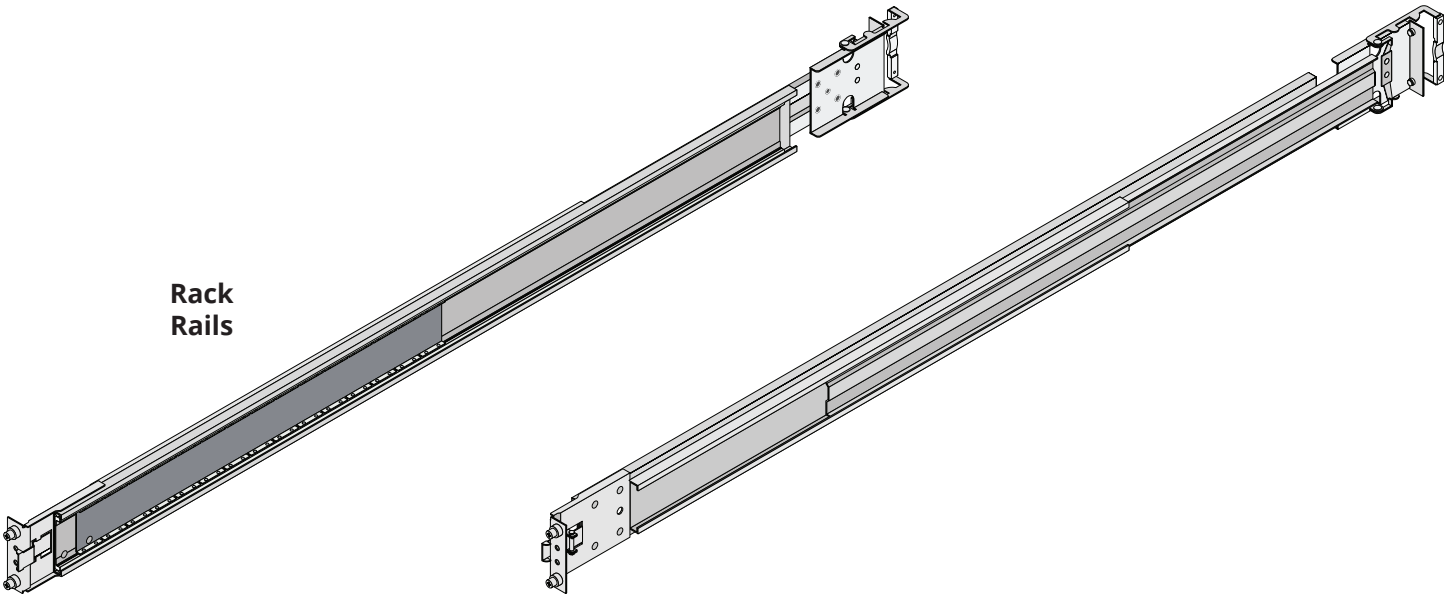
7.1 Remove Chassis Rail from Rack Rail

The rail kit separates into two pieces, the inner chassis rail and the outer rack rail.

Extend the inner rack rail until it locks in place, then slide the chassis rail out until it stops. Push the white release tab in the direction of the engraved arrow and pull the chassis rail free.

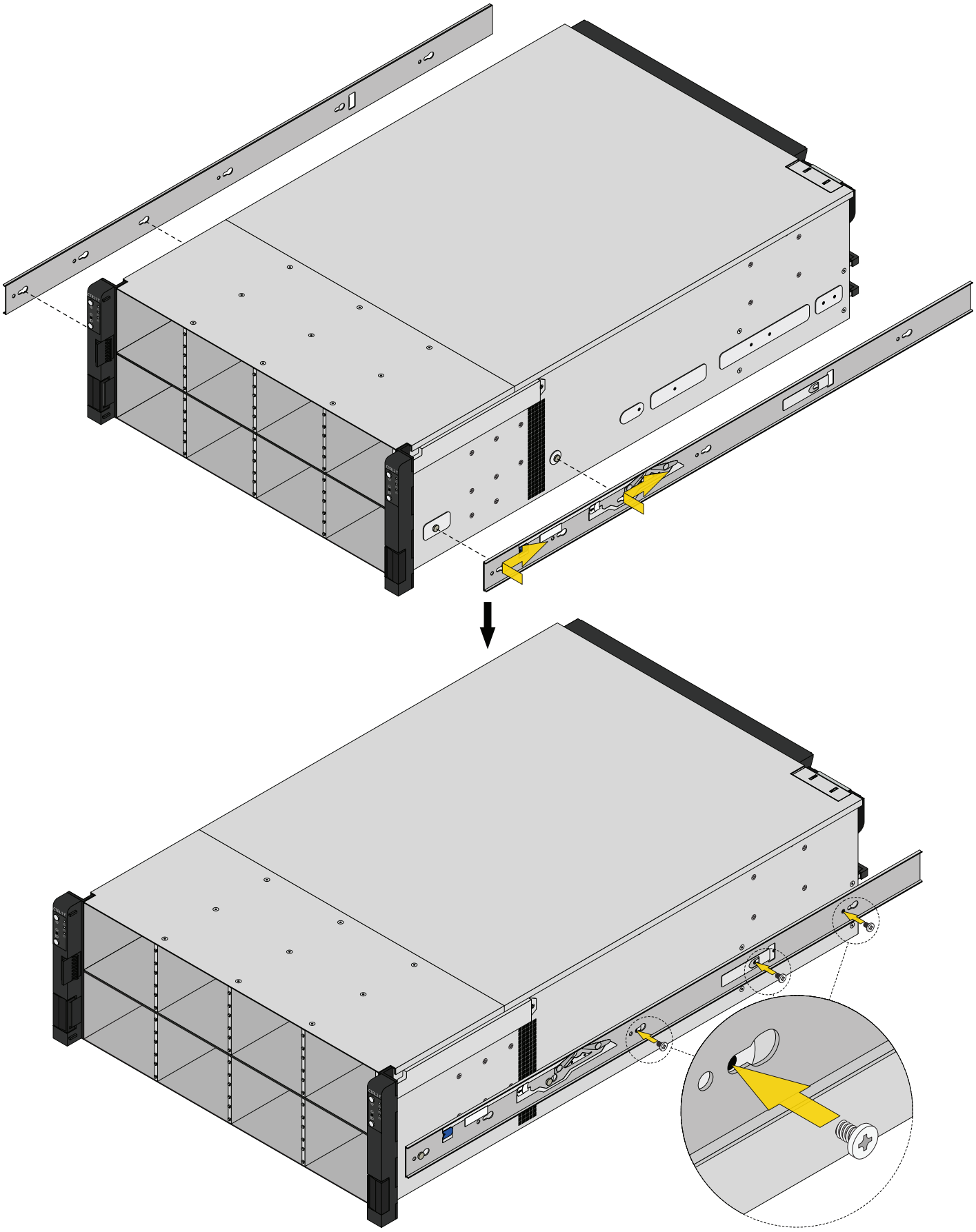






7.2 Install the Chassis Rail on the System

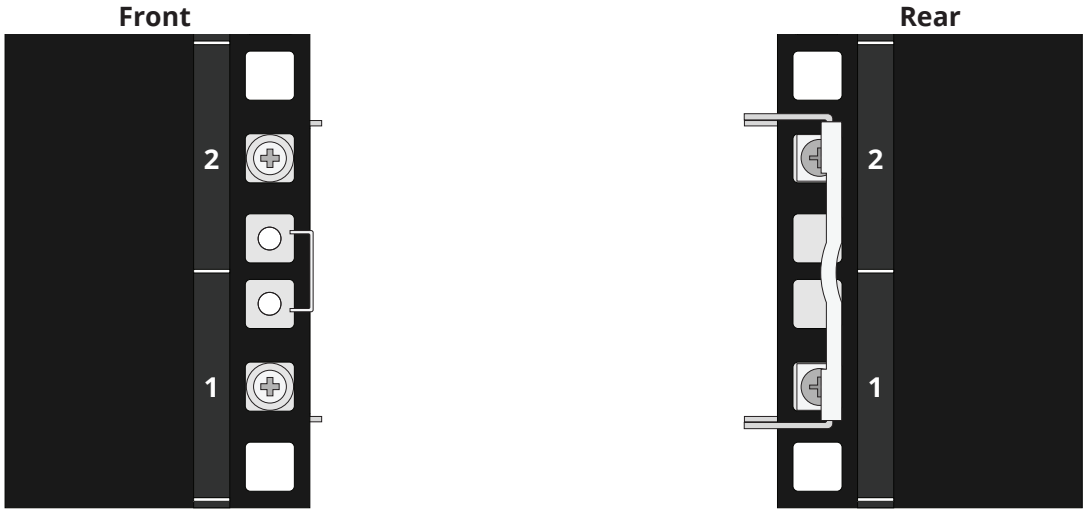
Fit the rail keyholes over the mounting pegs on the system and slide the rail toward the back of the system until it locks. Use three low-profile M4 screws to secure the rail to the chassis. Repeat the process for the other chassis rail.

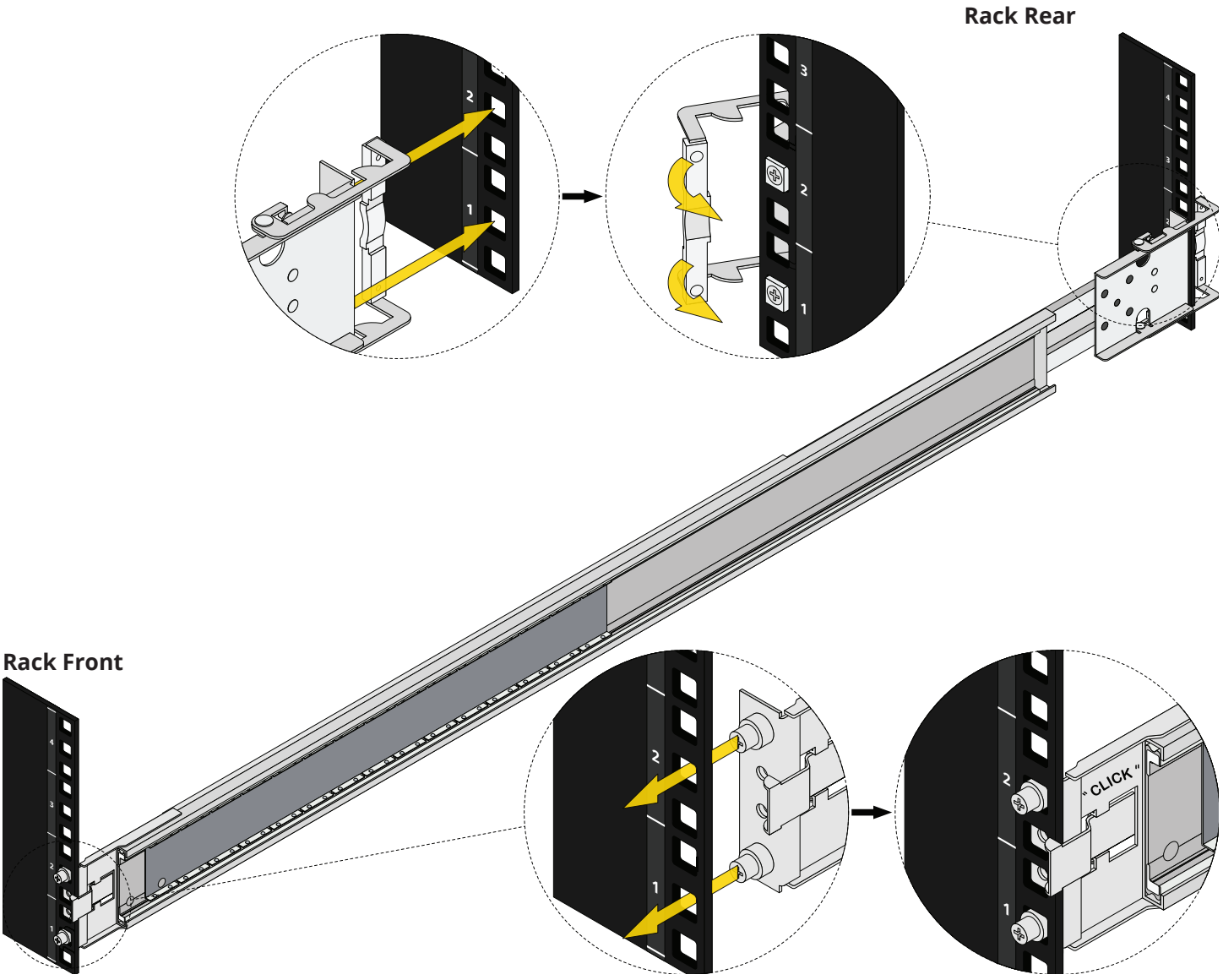


7.3 Install the Rack Rail in the Rack

Align the square rear pins with the rear rack mounting holes in the middle of the bottom 2U of rack space. Swing the gray latch handle open and pull it to extend the rail until the square pins are fully seated in the rack holes.

At the front end, align the round pins with the front rack holes and push them in until the latch clicks and locks. Ensure the rail is level, then repeat the process for the second rack rail.





7.4 Install the System in the Rack

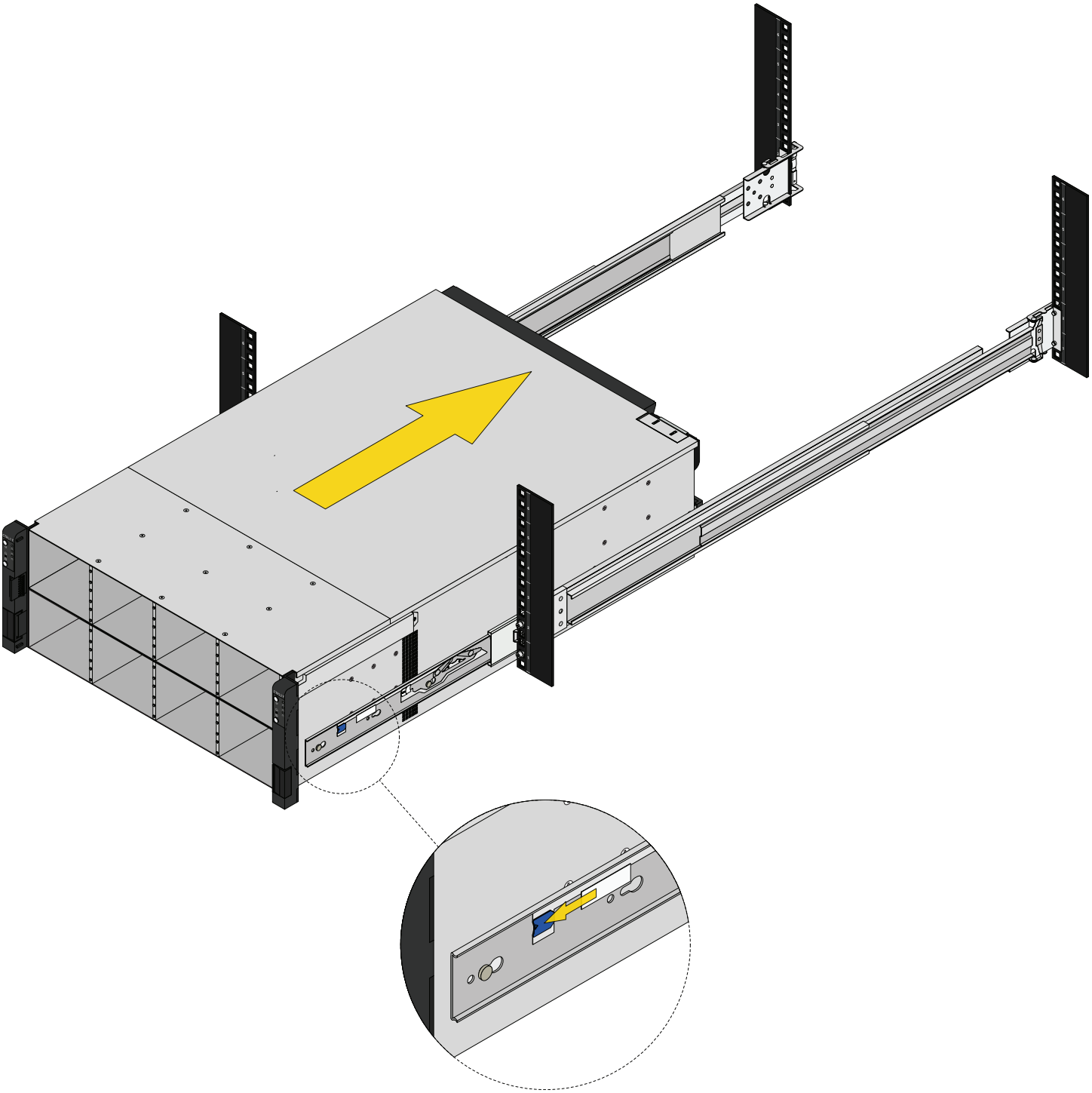
Warning - Pinch Point

The M-Series can pinch or crush fingers when sliding the rail sleeves onto the rack rails.

Extend both inner rack rails out from the rack until they lock. Team-lift the system and align the chassis rails with the rack rails.

Slide the ends of the chassis rails into the rack rails and push the system into the rack until the metal safeties click and lock.

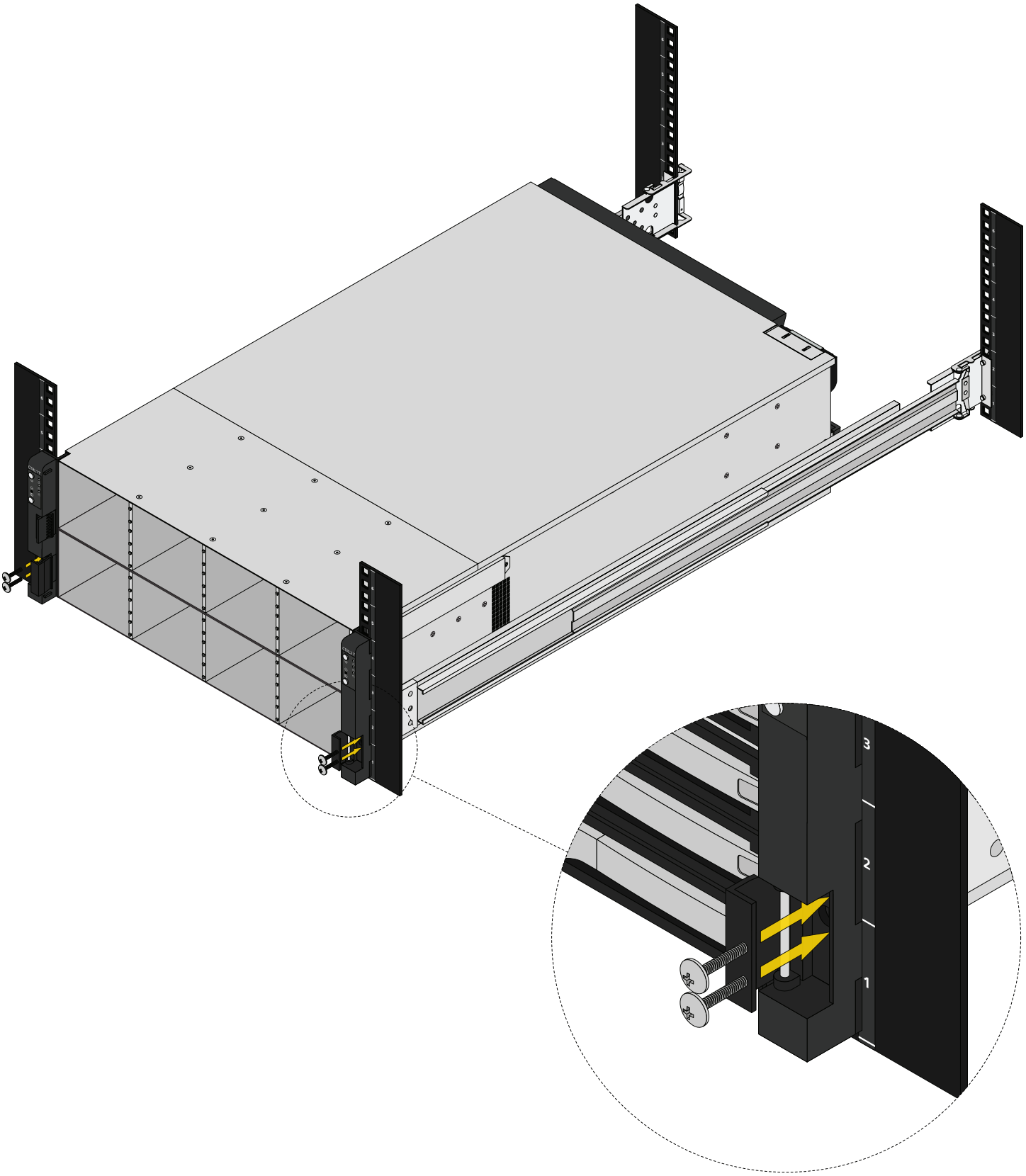
Pull the blue release tabs towards the front of the system and finish pushing the system into the rack.



7.5 Secure the System to the Rack

To secure the system to the rack, install two of the long M5 screws through the retention ports on each ear.

The screw holes are behind the small doors on each ear.



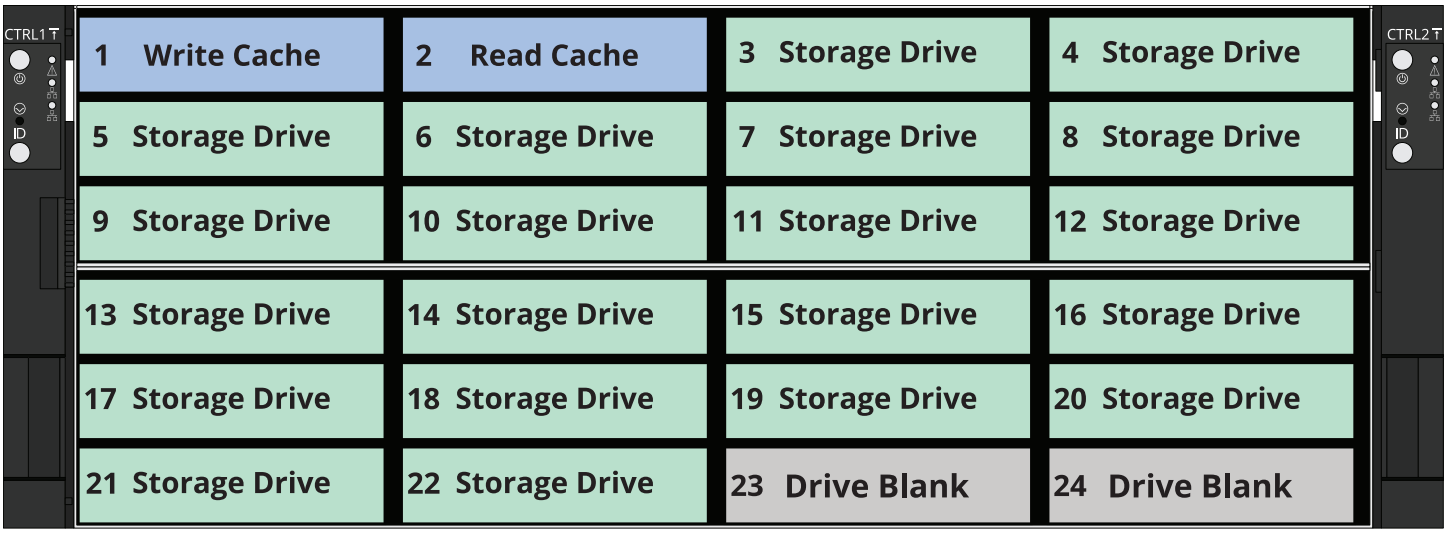
7.6 Install Drives

Tip - Description

We recommend a standard drive tray installation order to simplify support:

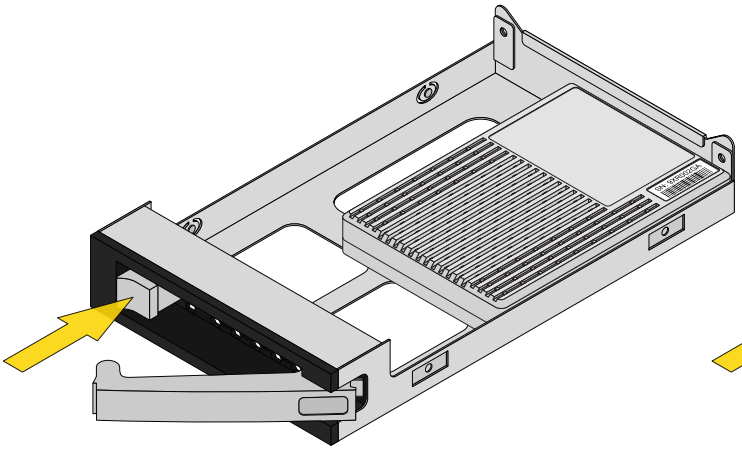
- SSD drives for write and read caches (if present)
- HDDs or SSDs for data storage
- Air baffles for remaining empty bays (if present)

Install the first drive in the top left bay. Install the next drive to the right of the first. Install remaining drives to the right across the row. After filling a row, move down to the next row and start again with the left bay.

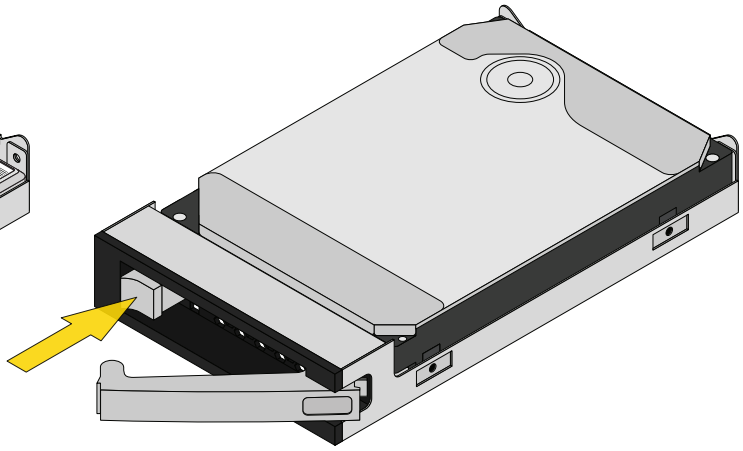


Retrieve a drive assembly and press the locking arm release on the left side of the tray. Drive trays either contain HDDs or SSDs depending on your order.

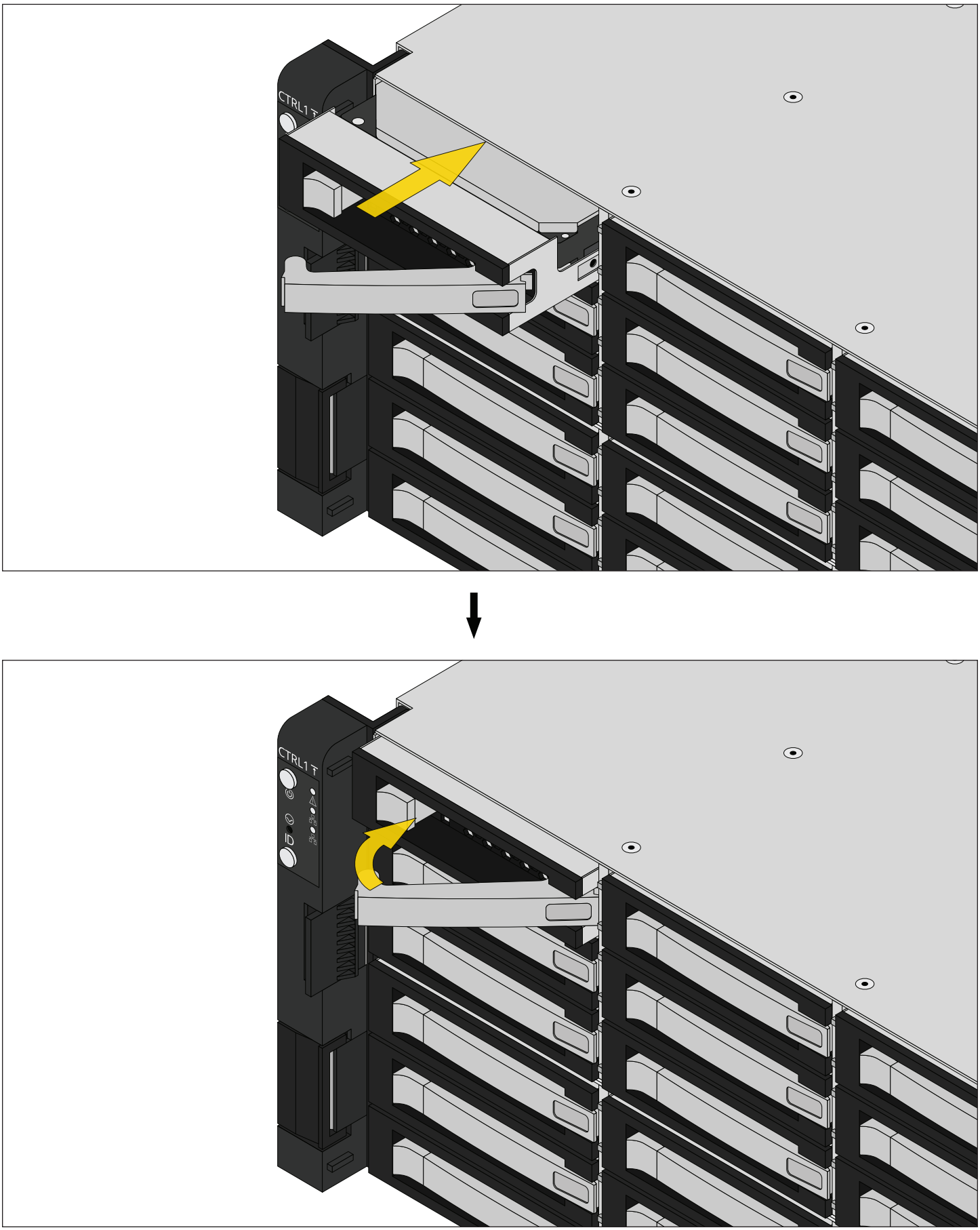
Drive Assembly with SSD



Drive Assembly with HDD

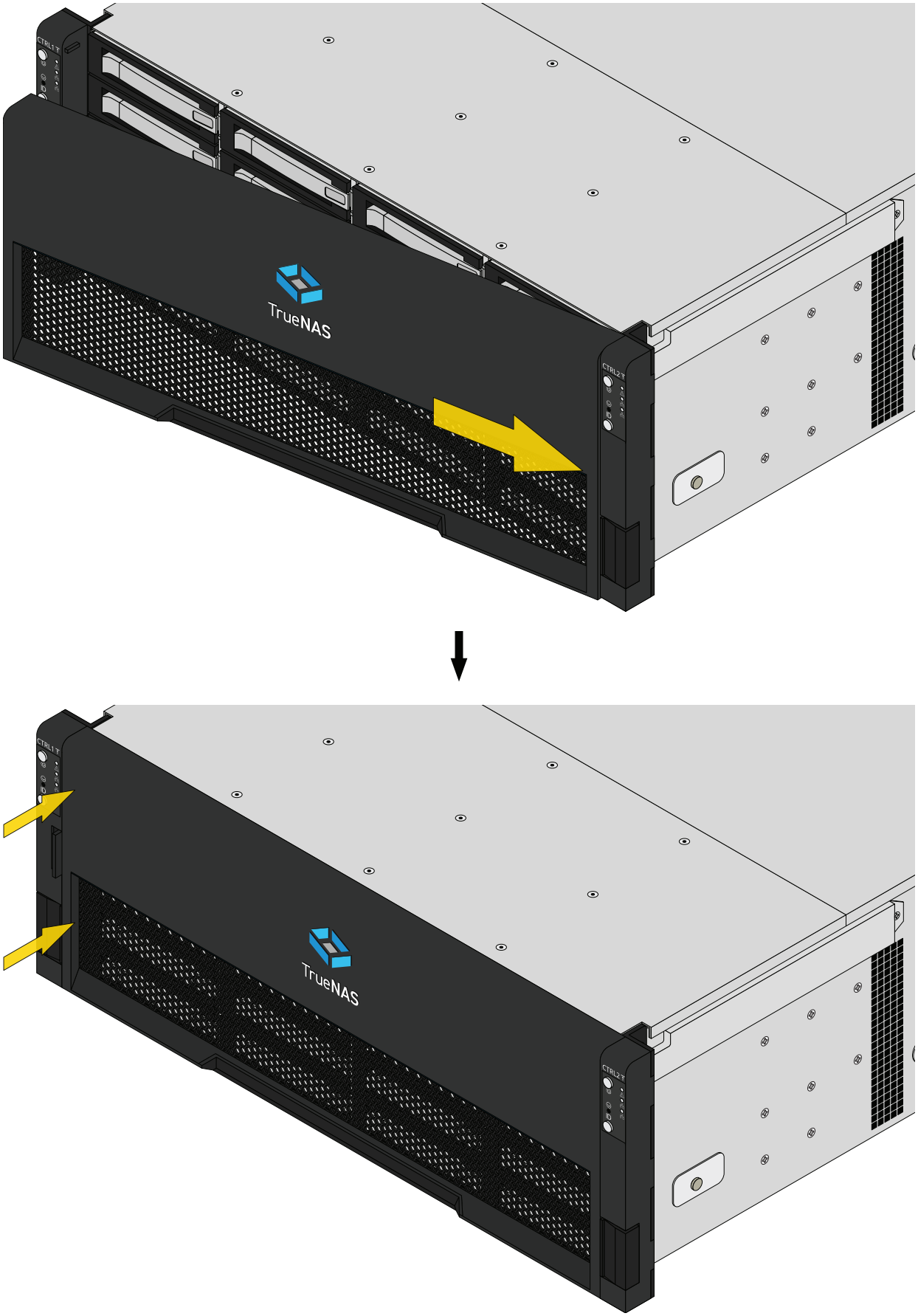


Align the drive assembly with an empty slot on the system and push it in until the locking arm begins to swing closed. Gently close the arm to fully seat the drive tray and lock it into the system.



7.7 Install the Bezel

Align the right side of the bezel with the attach points on the right ear, then push the left side of the bezel into the attach points on the left ear until it clicks and locks into place.



7.8 Install Cables

Connect ethernet network cables from your local switch or management network to the **1Gb MGMT** Out-of-Band Management (OOBM) ports and the **ixl0** ports on both controllers.

Next, connect a monitor and keyboard to the VGA and USB ports on the bottom controller (Controller 1).

If you ordered SAS cards or additional NICs with your M-Series, you can set them up now for networking.

For detailed connection diagrams and networking setups, see the M-Series HA Networking link on page 11.

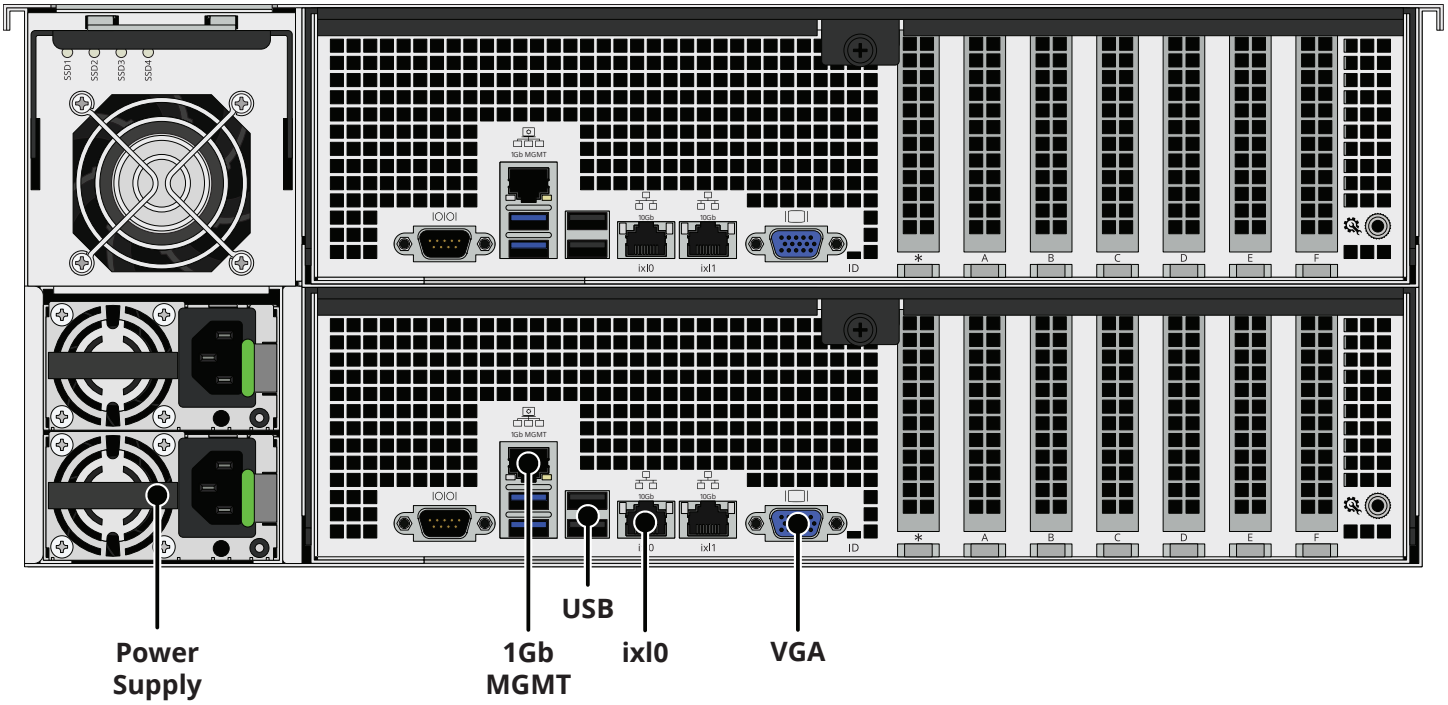
Connect the power cables into each power supply, but do not plug them into a PDU yet.

Important - AC Input Requirement

The M60 requires 200-240 VAC (Volts Alternating Current) to operate.

Warning - Grounded Connection

Always connect power cords to properly grounded connections.

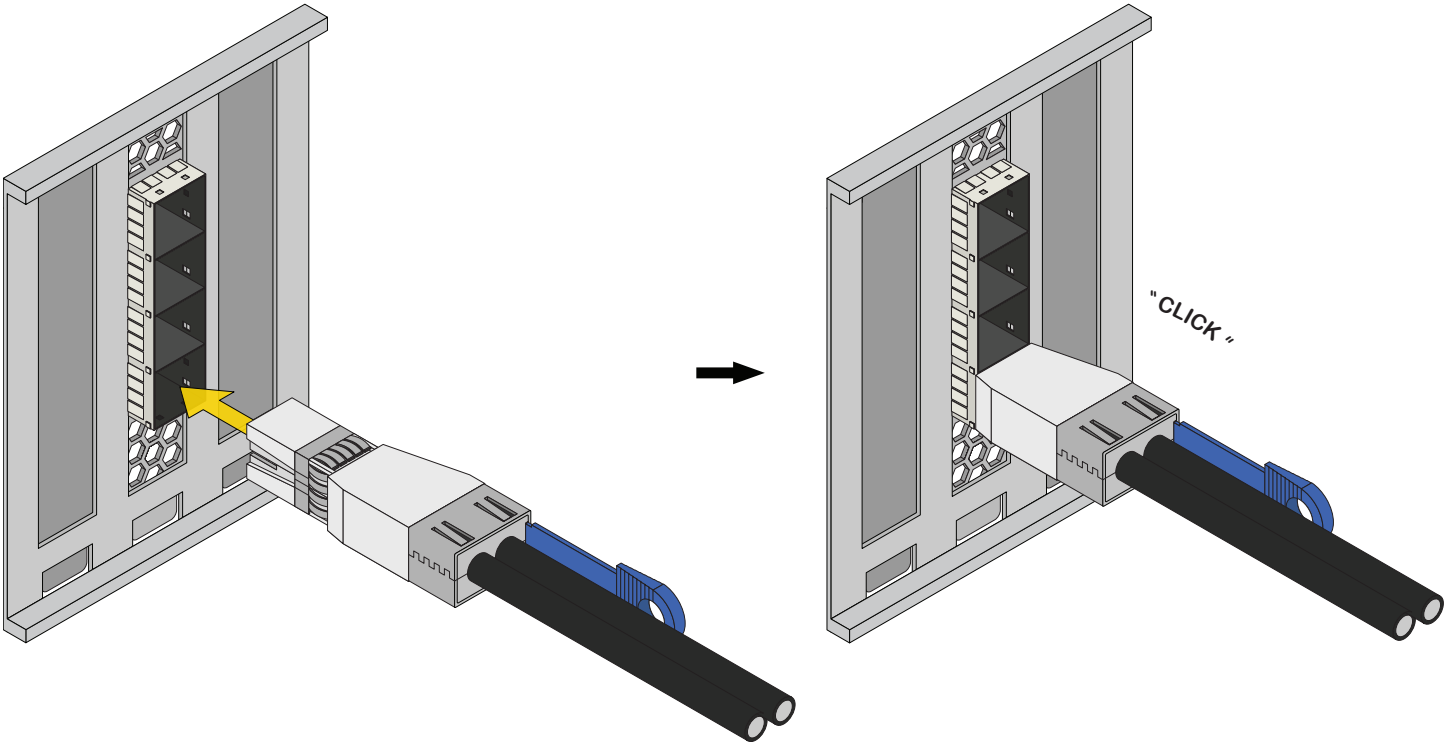


7.8.1 Connect SAS Cables

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

Line the SAS cable connector up with a SAS port on Controller 1. Ensure the blue tab on the SAS cable is on the right.

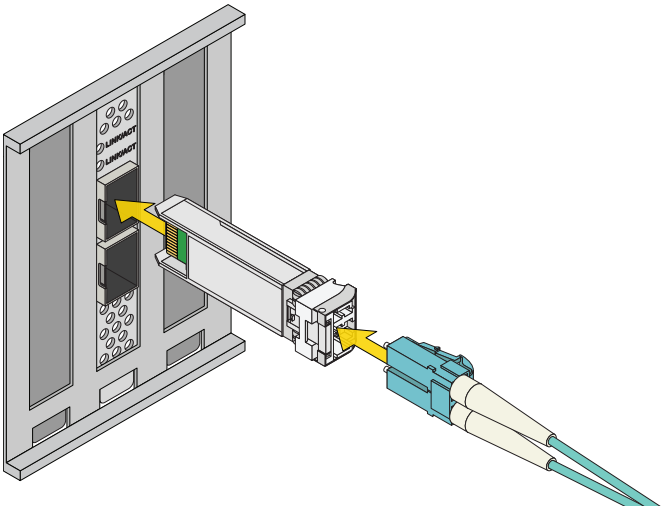
Gently push the connector into the port until it clicks. See the M-Series User Manual or your expansion shelf documentation for SAS connection diagrams before booting the M-Series.



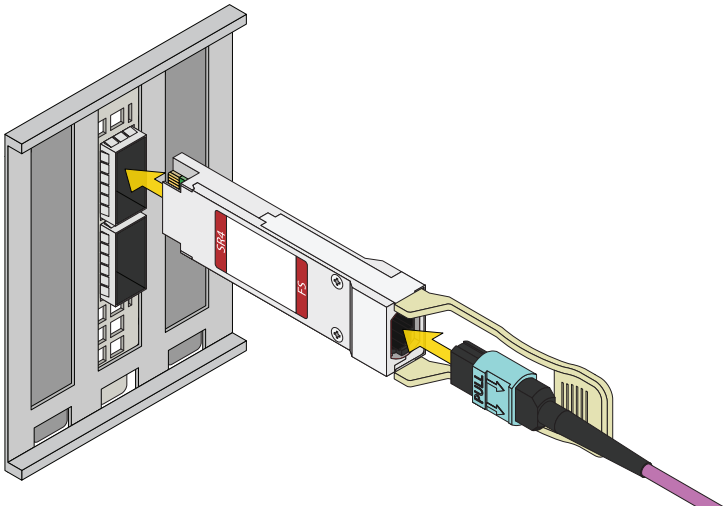
7.8.2 Connect SR and SR4 NIC Cables

Insert the SR optics into the first port on the NIC, then plug the SR cable into the back of the SR optics. Both the optics and the cable will click and lock into place when installed correctly. Repeat for remaining ports.

SR

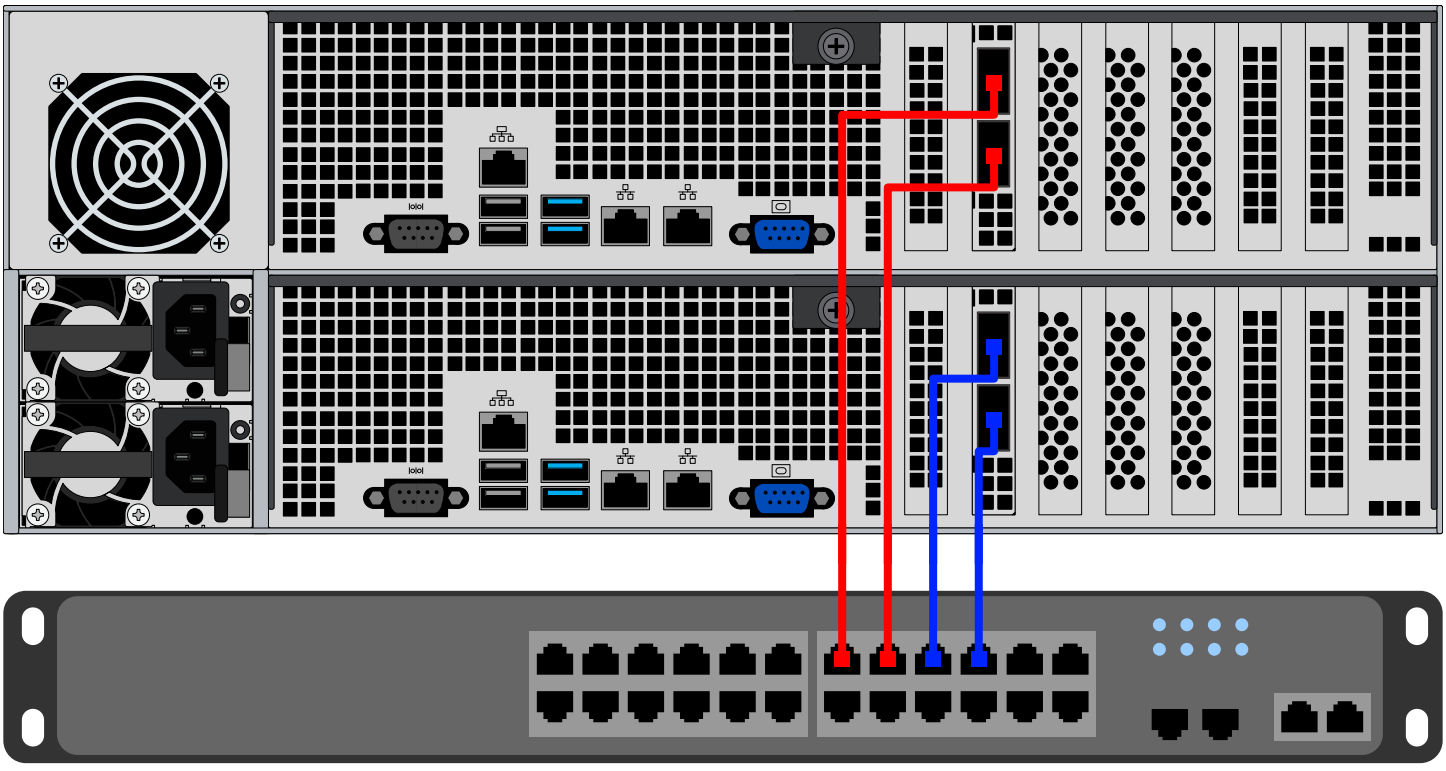


SR4



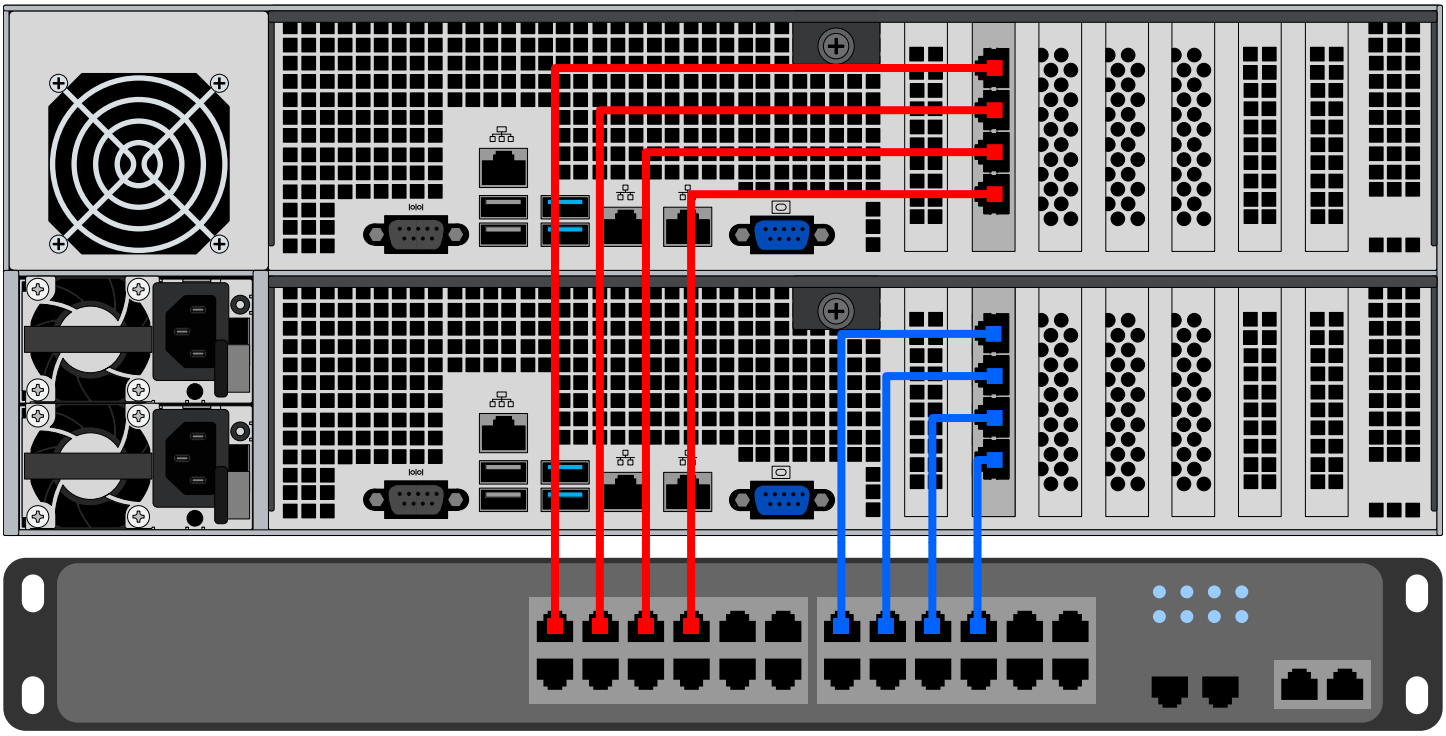
After installing the optics and cables in the NIC connect both cables to your network switch.

> **Tip**
>
> Optics orientation can vary for different switches. Look at the connectors inside the ports to orient the SR optics.



7.8.3 Connect Ethernet NIC Cables

Insert ethernet cables into each port on the NIC, then connect each cable to your network switch.



7.9 Boot the System

Plug the power cables into your PDU. The system automatically 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.

8 HA Networking

NOTICE: The example diagrams in this document are independent from one another. The NAS, logical, and switch setups differ between each configuration.

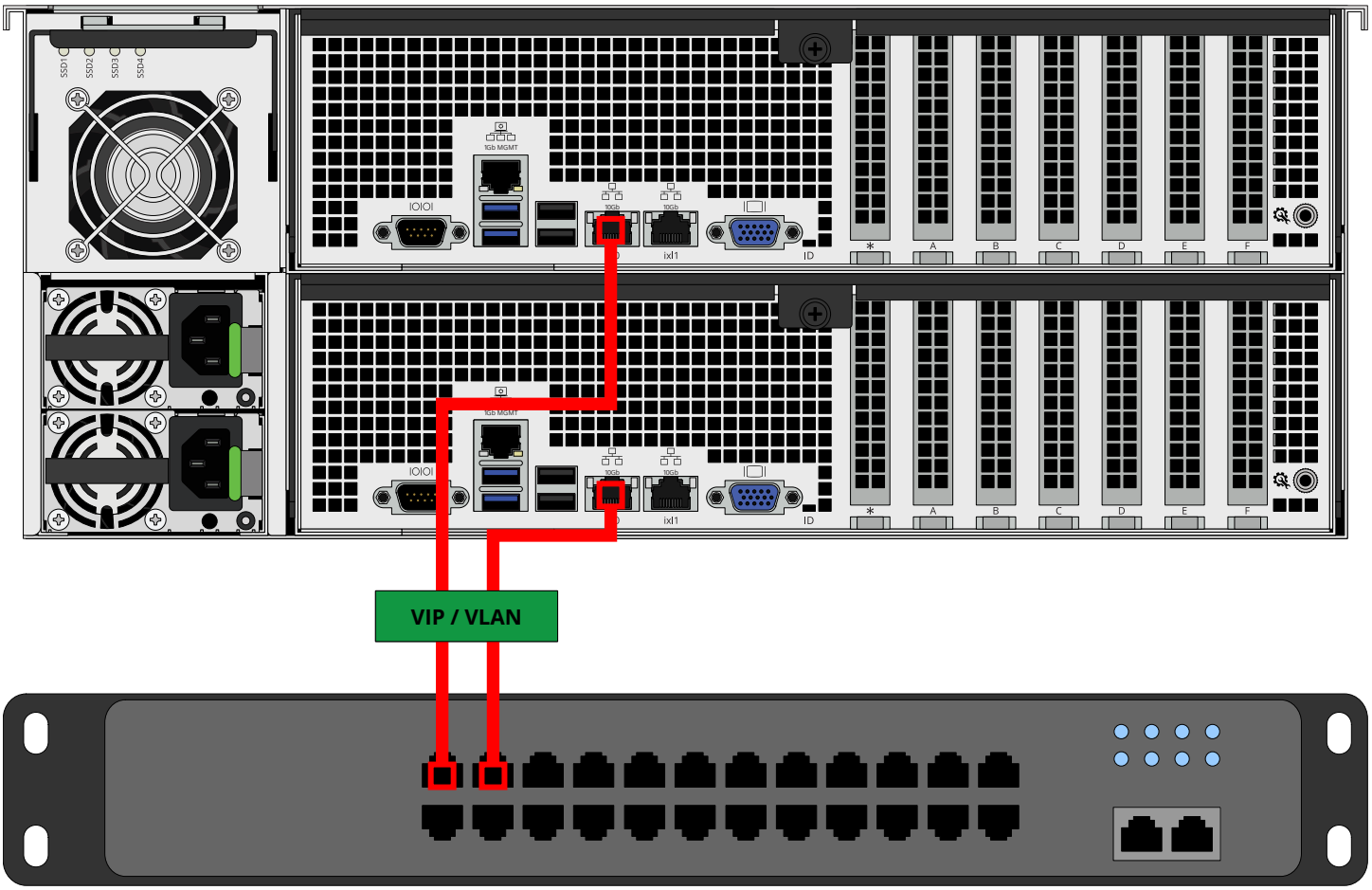
8.1 NIC Configured and Connected to Same Switch

Set up both switch ports in the same VLAN, or otherwise make them reachable from TrueNAS Web UI via the default gateway. Ports must be ablt to pass traffic between each other.

Configure **ixl0** interface on each controller and connect them to seperate ports on the same switch.

8.1.1 Example

Configure the **ixl0** interface on each controller with its own IP address, then set up a **Virtual IP (VIP)** address that they can pass traffic to each other with. TrueNAS dynamically allocates the VIP to the active controller.



8.2 Single Switch Active LACP Link Aggregation

Configure primary controller **ixl0** and **ixl1** into a LAGG group.

Configure standby controller **ixl0** and **ixl1** into another LAGG group.

You must configure each LAGG with ports of the same speed.

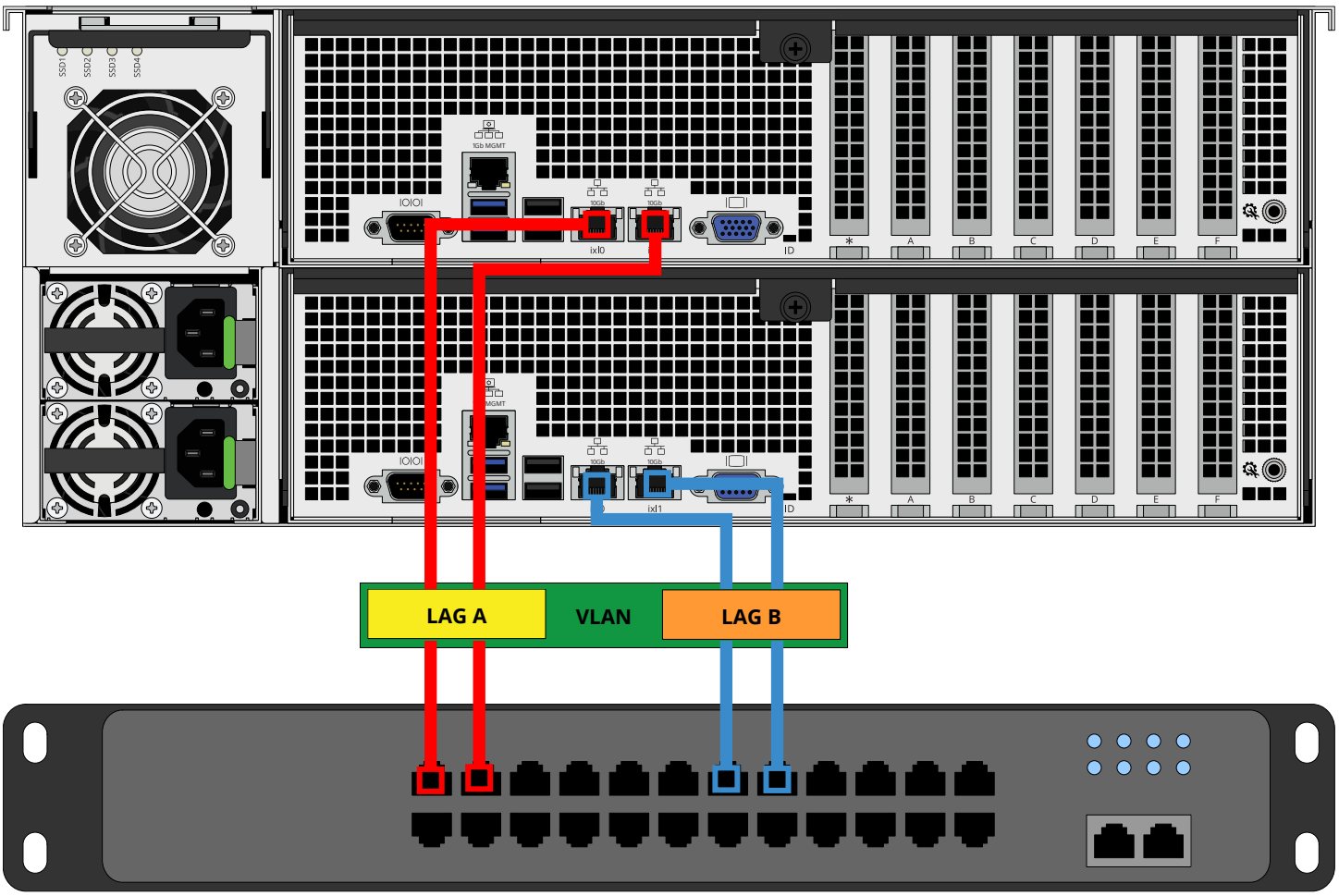
For LACP, you must configure the physical ports (ixl0 and ixl1) on each controller into the same LAGG group on a switch that uses Active LACP.

Note: When you configure LACP via the TrueNAS web UI, add ixl0 and ixl1 into the LAGG group, then apply IPs.

8.2.1 Example

Configure LACP for active and standby LAGG groups **ixl0** and **ixl1**:

1. Set **ixl0** and **ixl1** on the active controller in the same LACP LAGG group (port channel on the active controller and the switch port.)
2. Set **ixl0** and **ixl1** on the standby controller in the same LACP LAGG group (port channel on the standby controller and the switch port.)
3. Ensure both LACP LAGG groups can send multicast traffic between each other on the same VLAN.

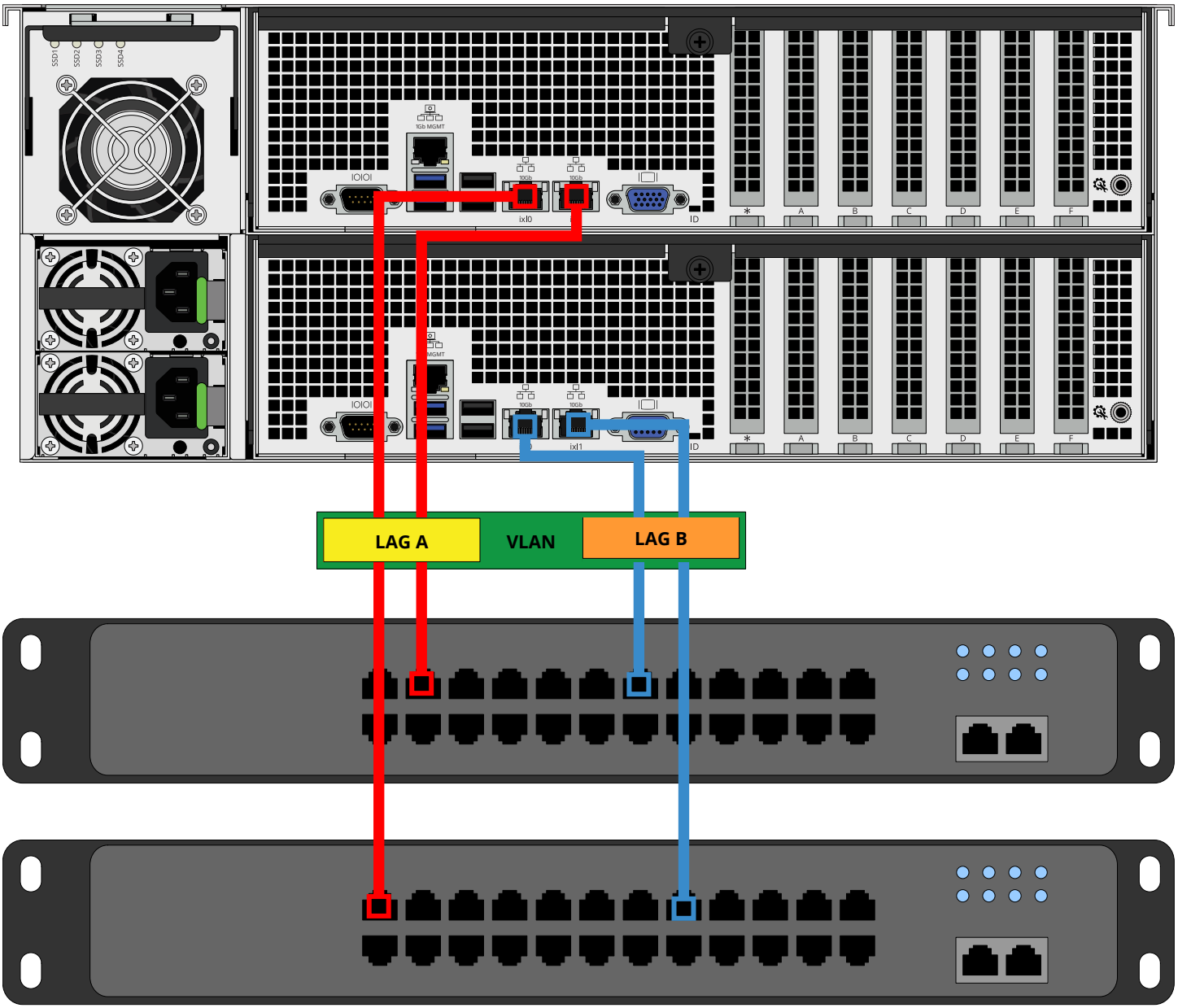


8.3 Two Switch Active LACP Link Aggregation

All of the setup methods from the 1 switch active LACP LAGG apply to the 2 switch setup with a few differences.

Both switches must support multi-chassis LAG (LAGG groups across different physical switches), since **ixl0** and **ixl1** connect to different switches for both controllers.

8.3.1 Example



8.4 Multipath

> Multipath networking is ideal for iSCSI and VMWare backend.

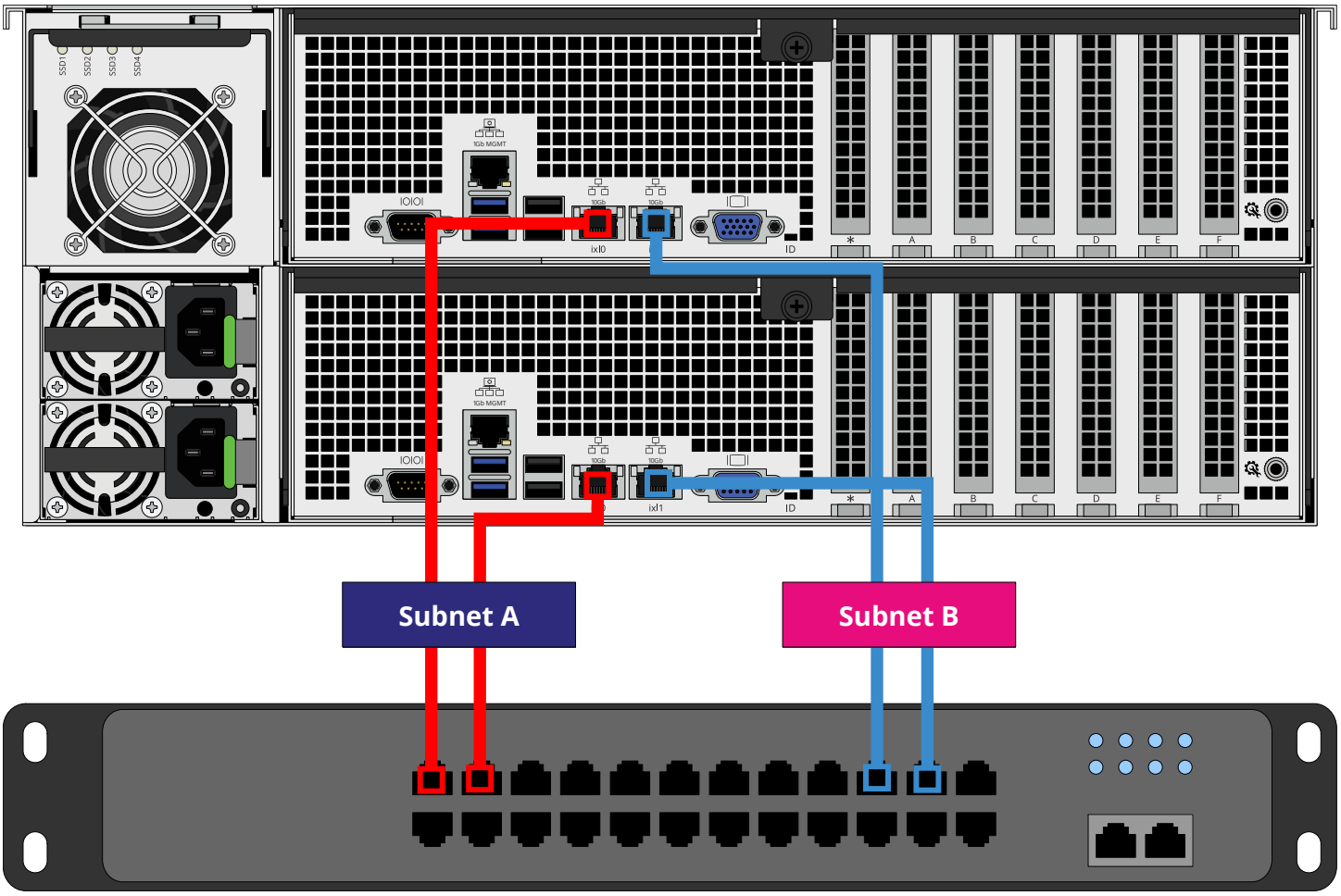
Create an interface with **ixl0** on the active controller and set IPs. Connect it to a port on the switch.

Create an interface with **ixl1** on the active controller, and **ixl0** and **ixl1** on the standby controller. Connect it to a different port on the switch.

Make sure all IPs are on different subnets.

> **Note:** TrueNAS does not allow you to configure multiple IPs on the same subnet.

8.4.1 Example



9 Storage Expansion

To set up SAS between your TrueNAS system and expansion shelves, cable the first port on the first TrueNAS controller to 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.

We do not recommend other cabling configurations. Contact TrueNAS Support if you need other cabling methods.

If your TrueNAS system has HA, reboot or failover after connecting SAS cables to sync drives between controllers.

Important

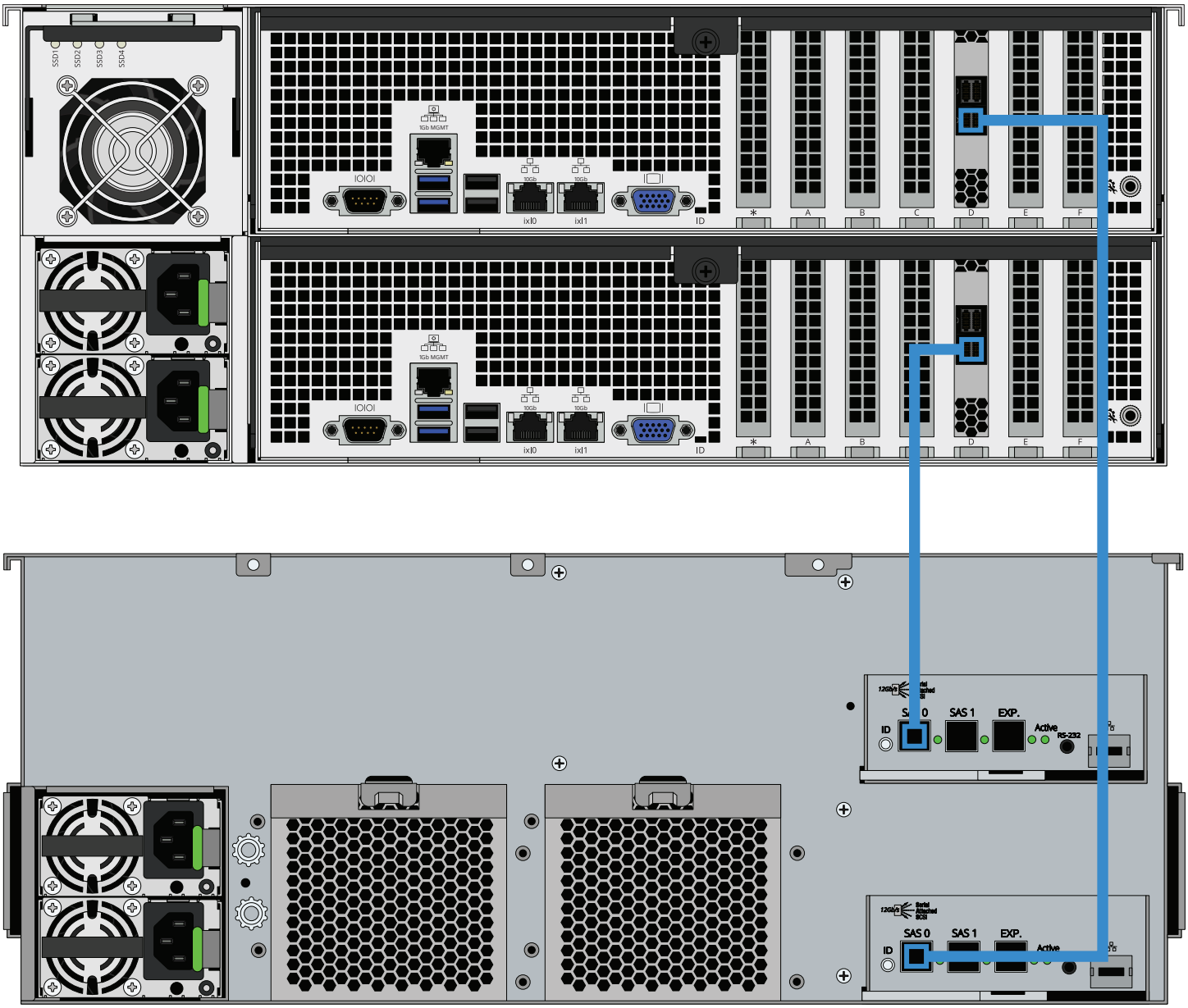
When setting up SAS connections, please adhere to the wiring examples below. Connecting expansion shelves incorrectly causes errors. Never cable a single TrueNAS controller to different controllers on one expansion shelf.

You can also find these diagrams in your expansion shelf user manuals on our Docs Hub.

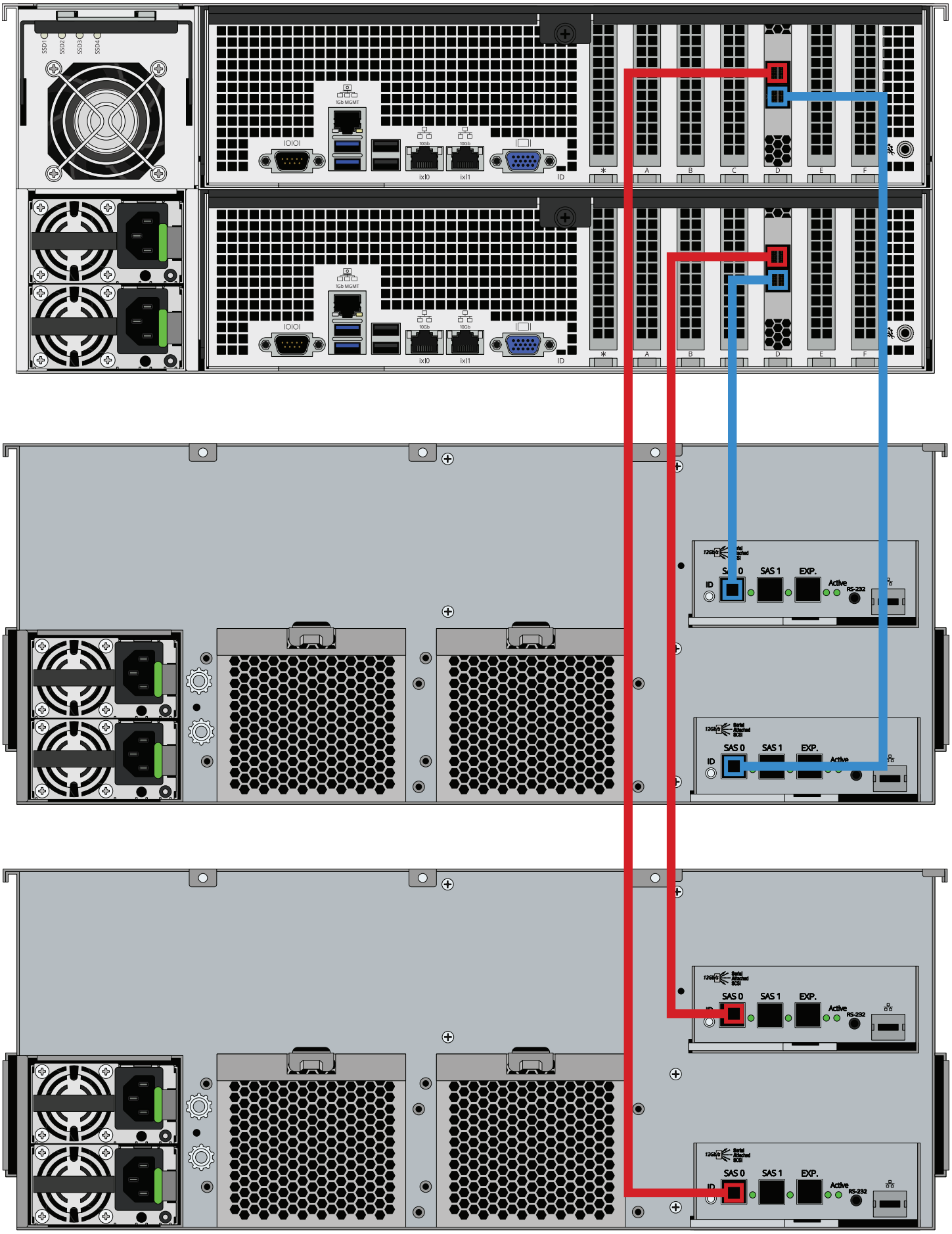
9.1 ES24

9.1.1 M40 - ES24

M40 with single ES24 Expansion Shelf

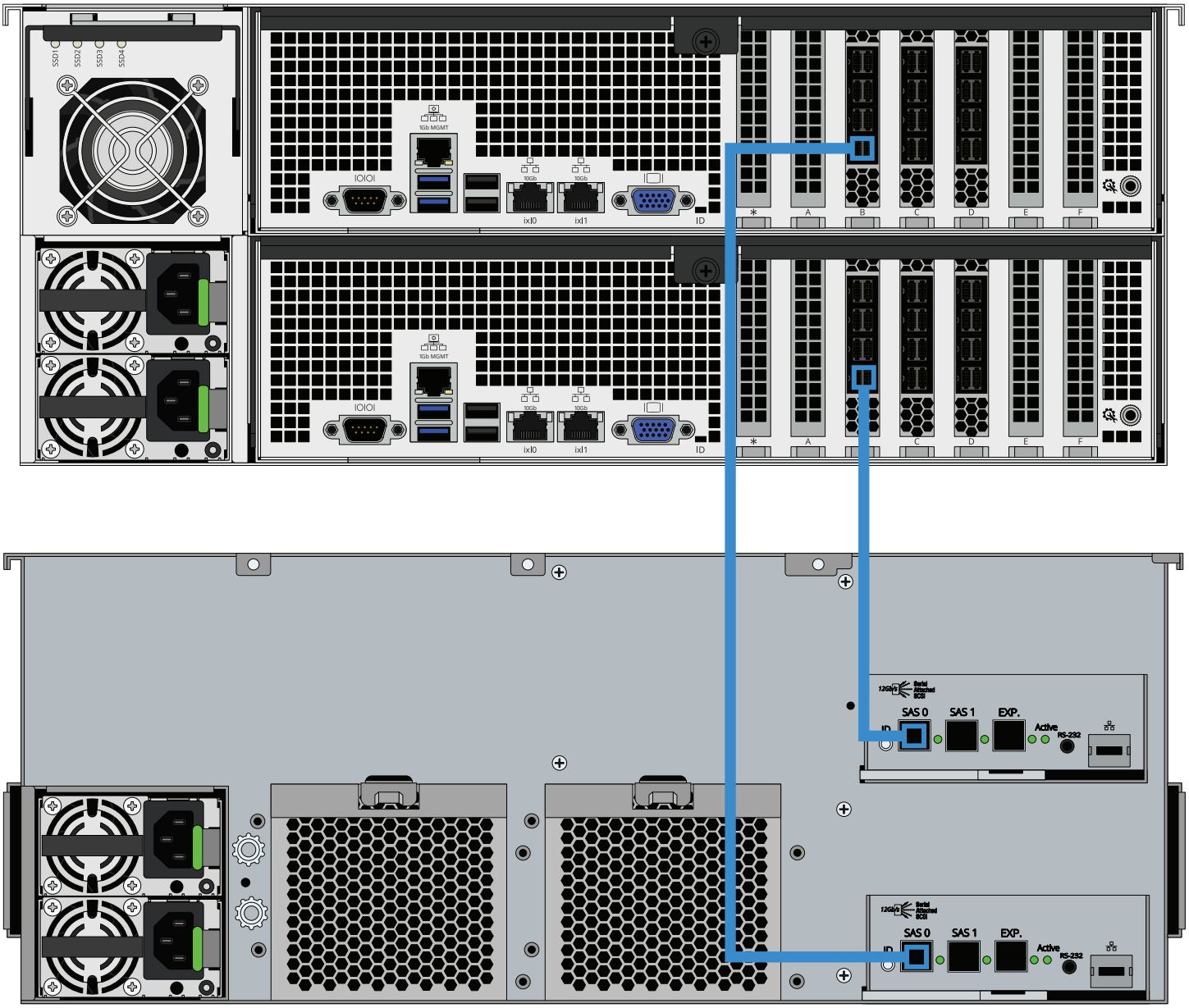


M40 with two ES24 Expansion Shelves

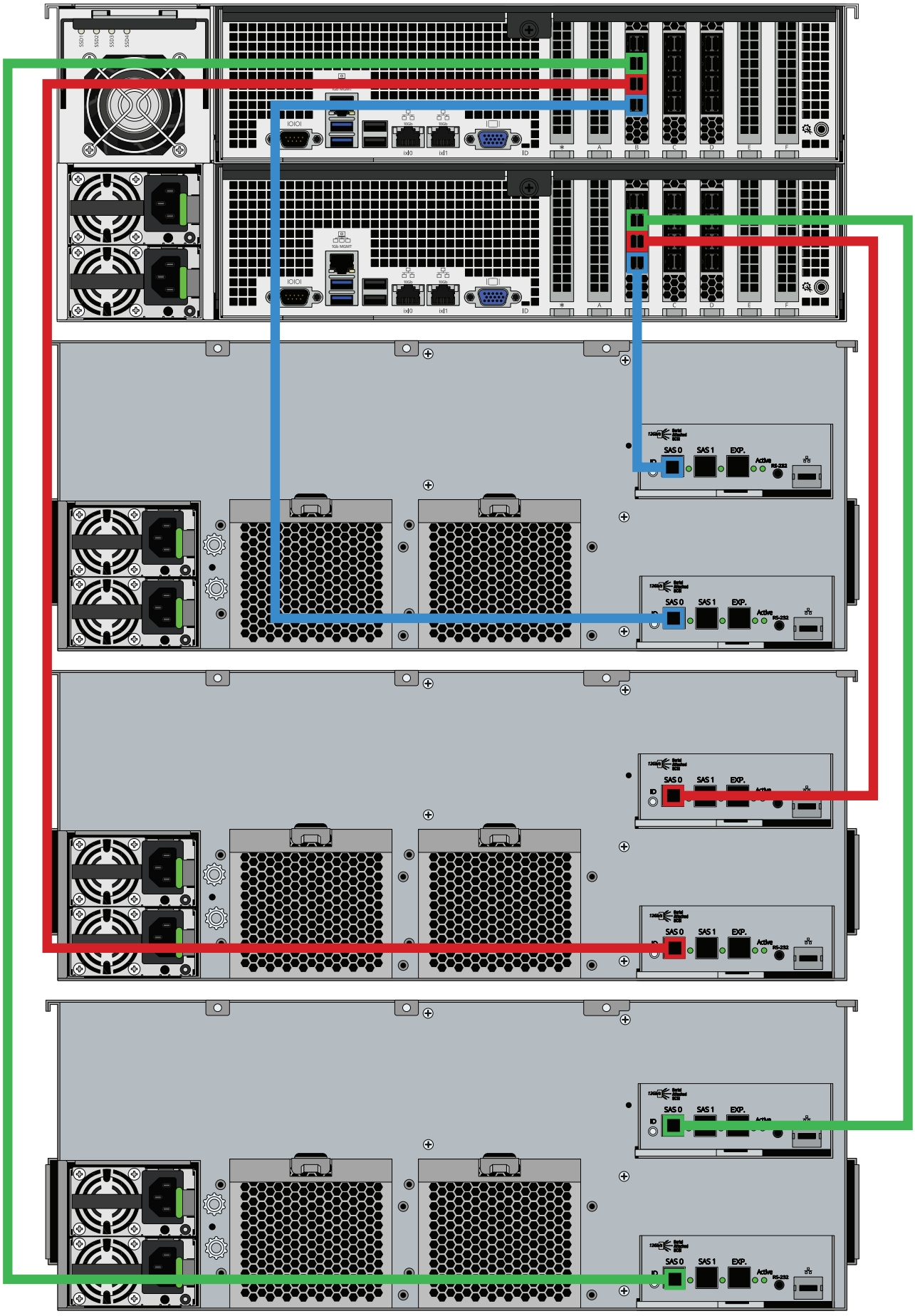


9.1.2 M50/M60 - ES24

M50/M60 with two ES24 Expansion Shelves



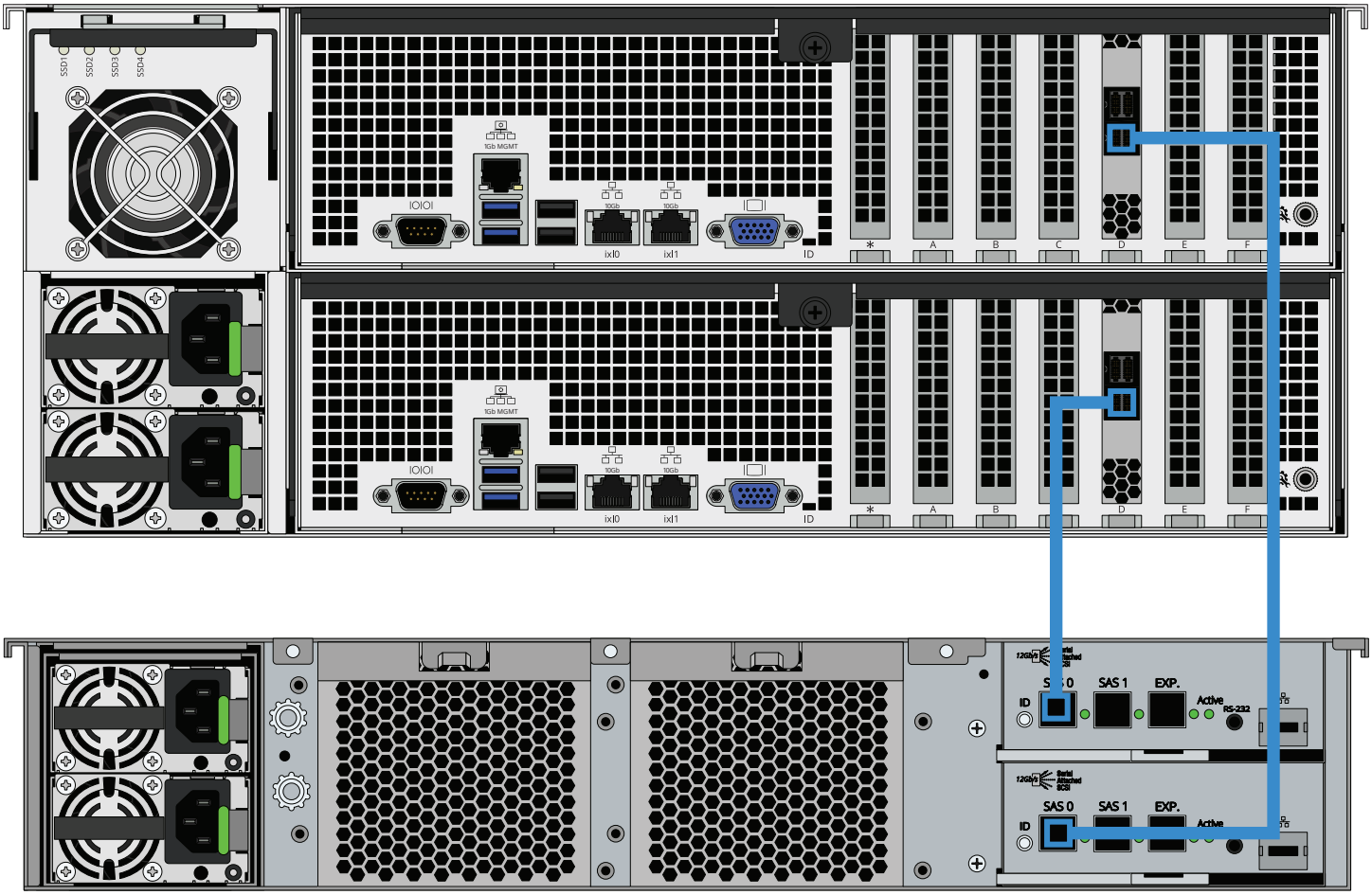
M50/M60 with three ES24 Expansion Shelves. The M50 can support up to 8 total Expansion Shelves with the use of additional SAS cards. The M60 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



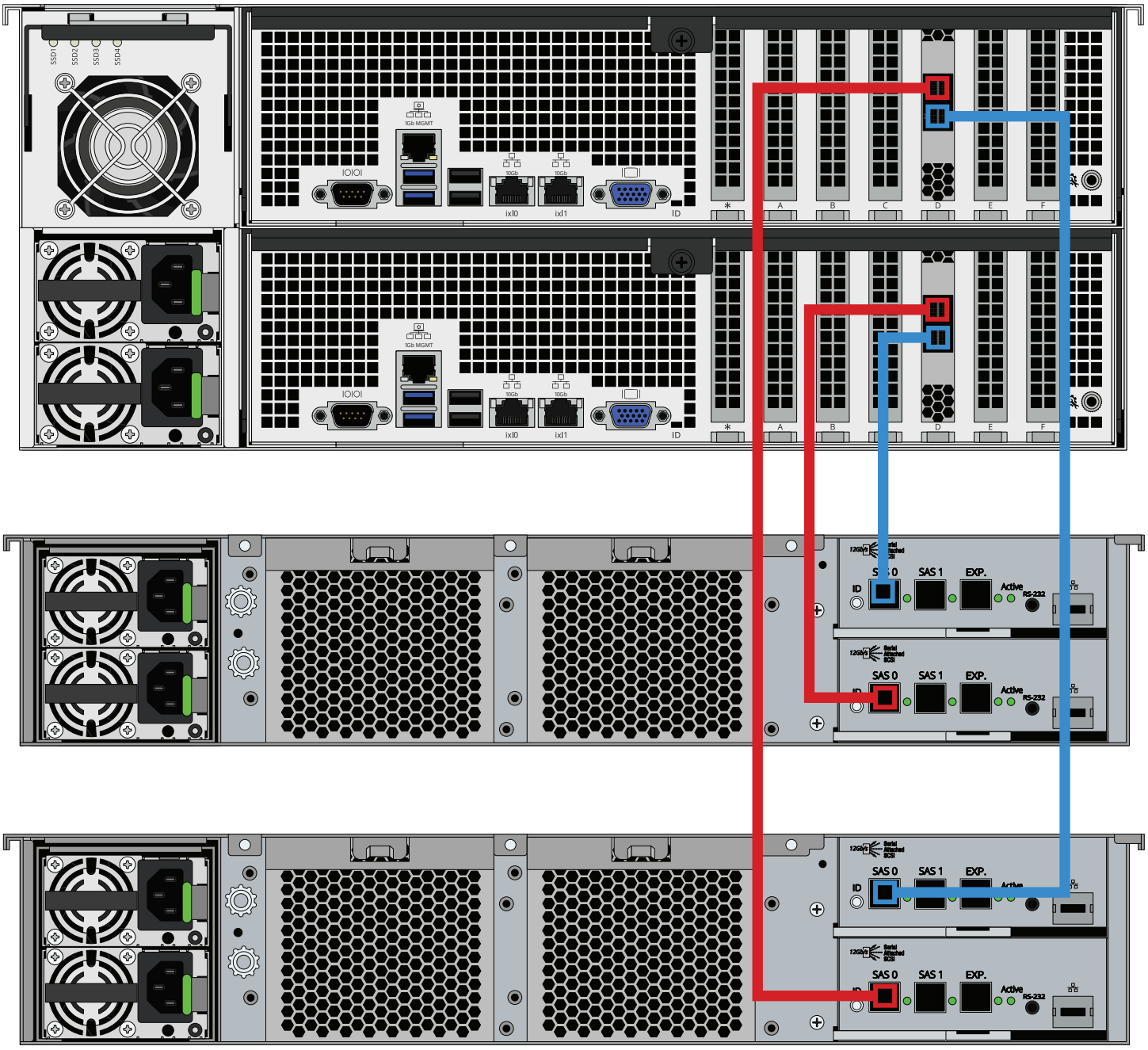
9.2 ES24F

9.2.1 M40 - ES24F

M40 with single ES24F Expansion Shelf

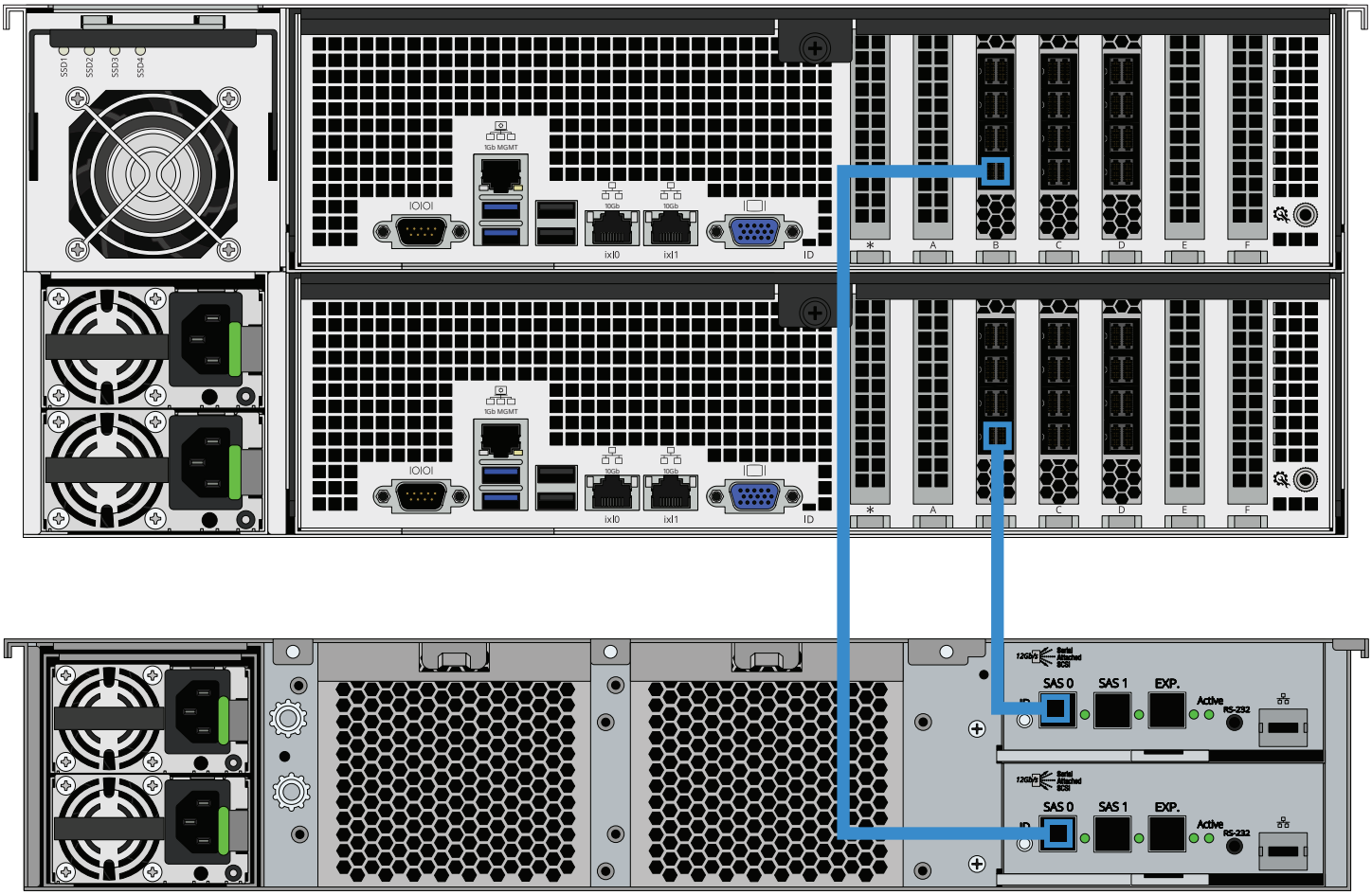


M40 with two ES24F Expansion Shelves

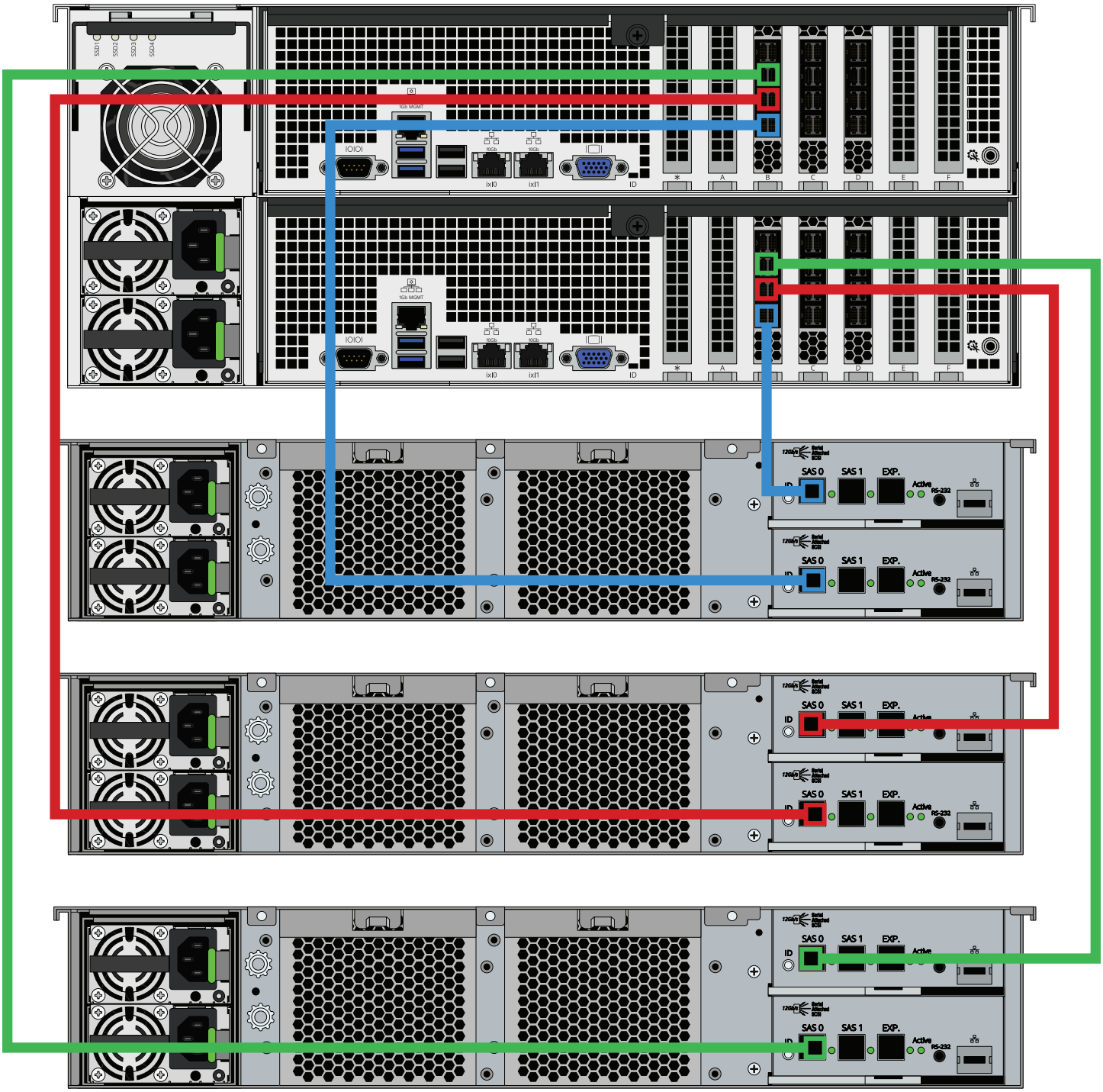


9.2.2 M50/M60 - ES24F

M50/M60 with two ES24F Expansion Shelves



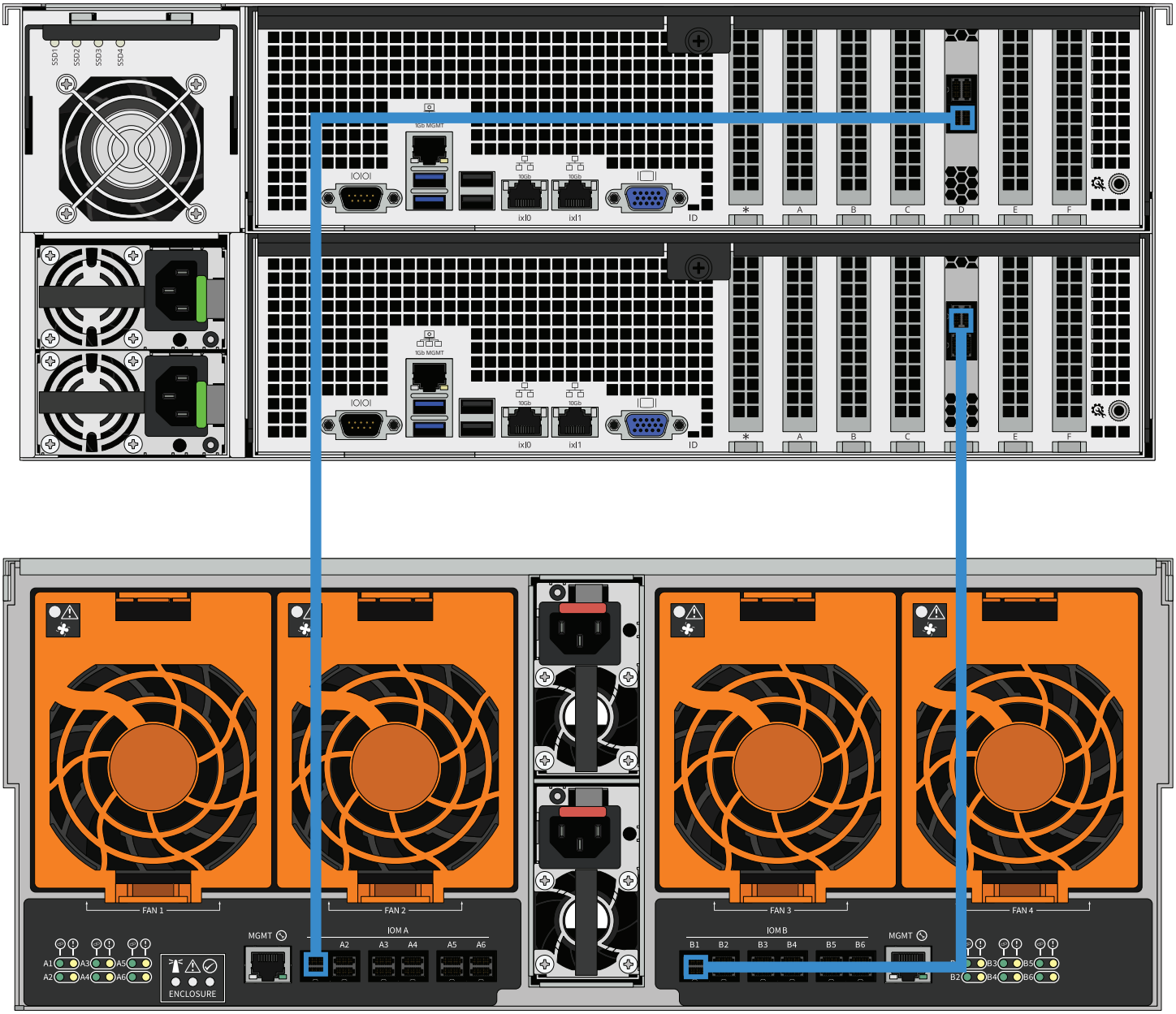
M50/M60 with three ES24F Expansion Shelves. The M50 can support up to 8 total Expansion Shelves with the use of additional SAS cards. The M60 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



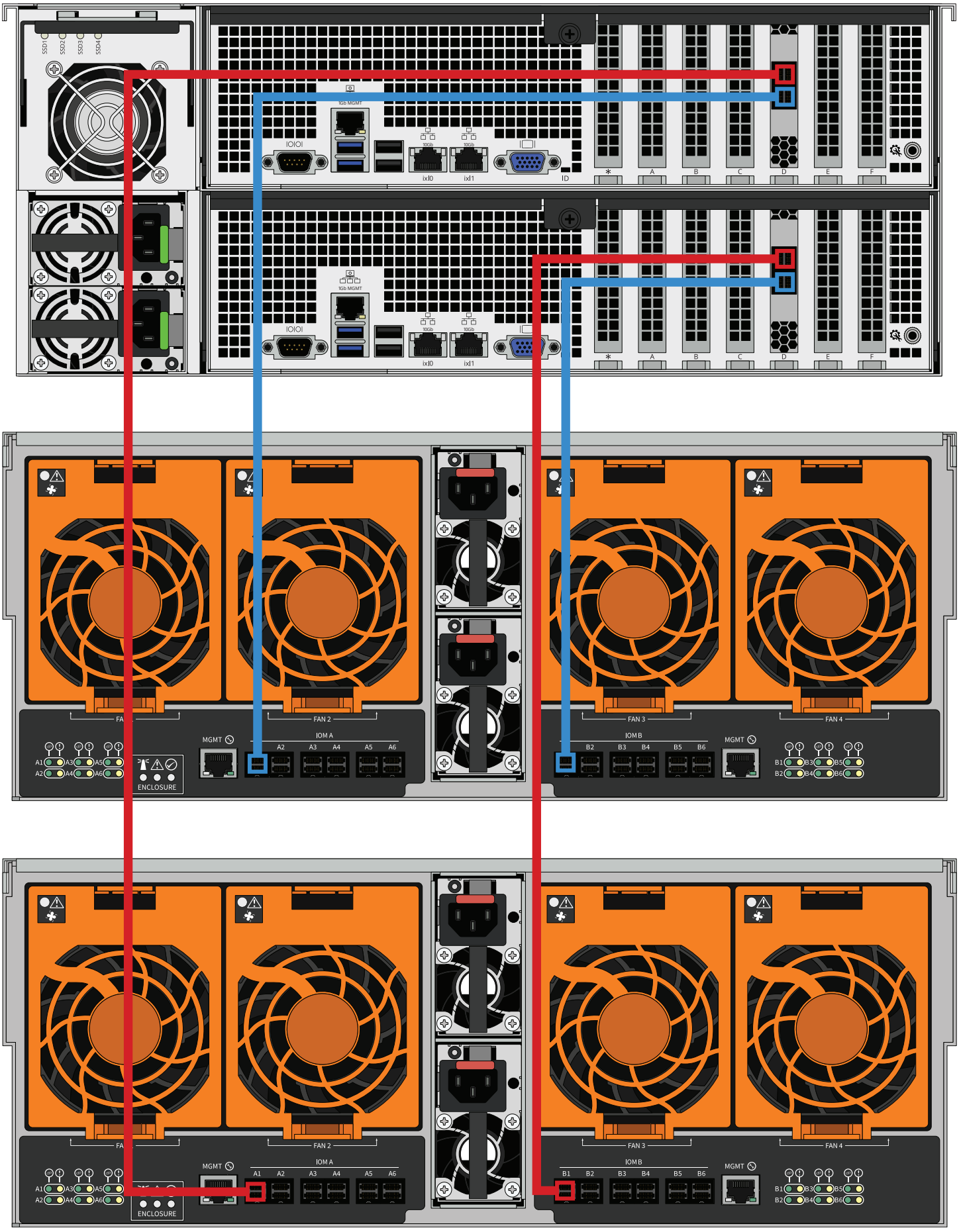
9.3 ES60 Gen 2

9.3.1 M40 - ES60 Gen 2

M40 with a single ES60 Gen 2 Expansion Shelf

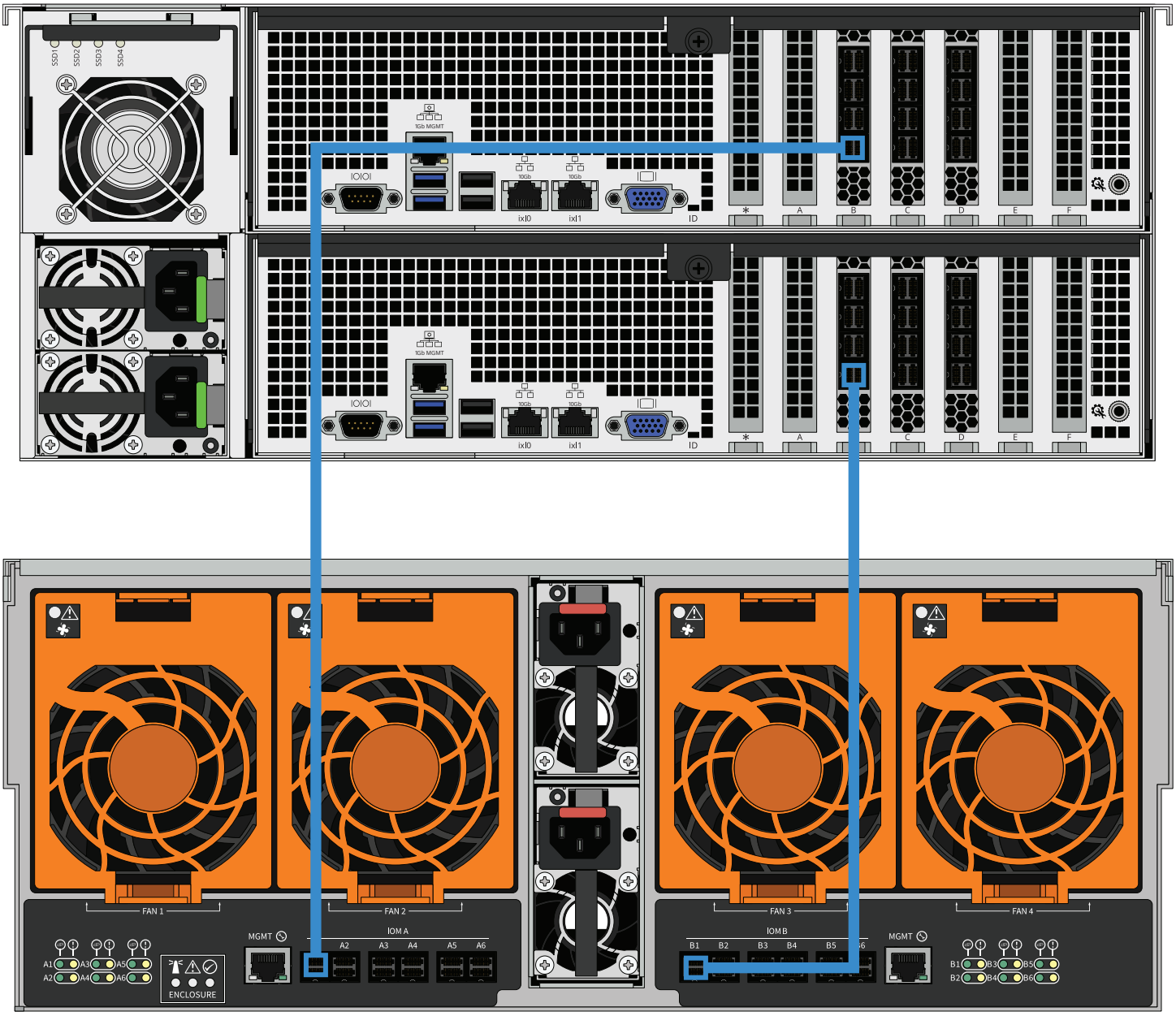


M40 with two ES60 Gen 2 Expansion Shelves

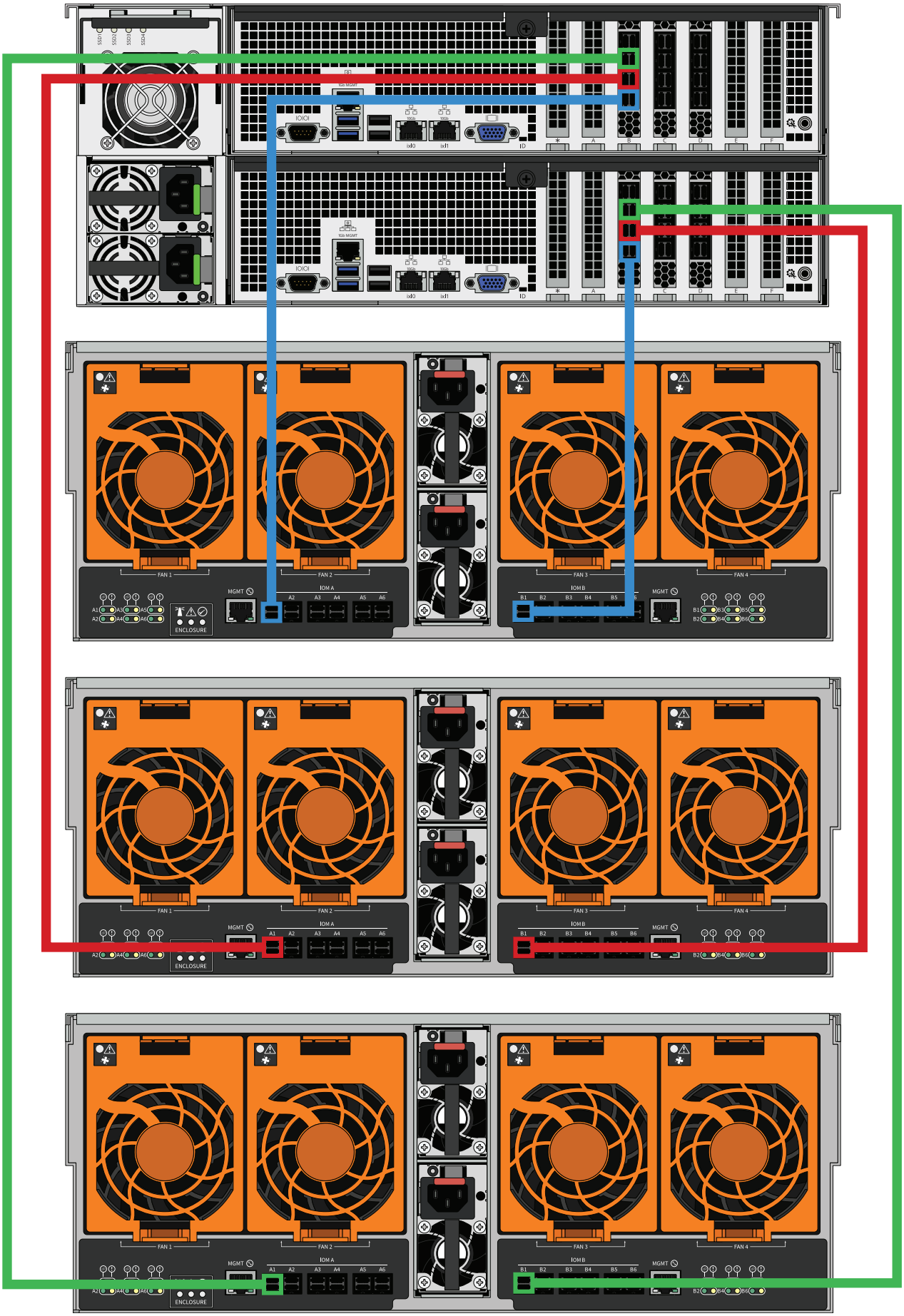


9.3.2 M50/M60 - ES60 Gen 2

M50/M60 with a single ES60 Gen 2 Expansion Shelf



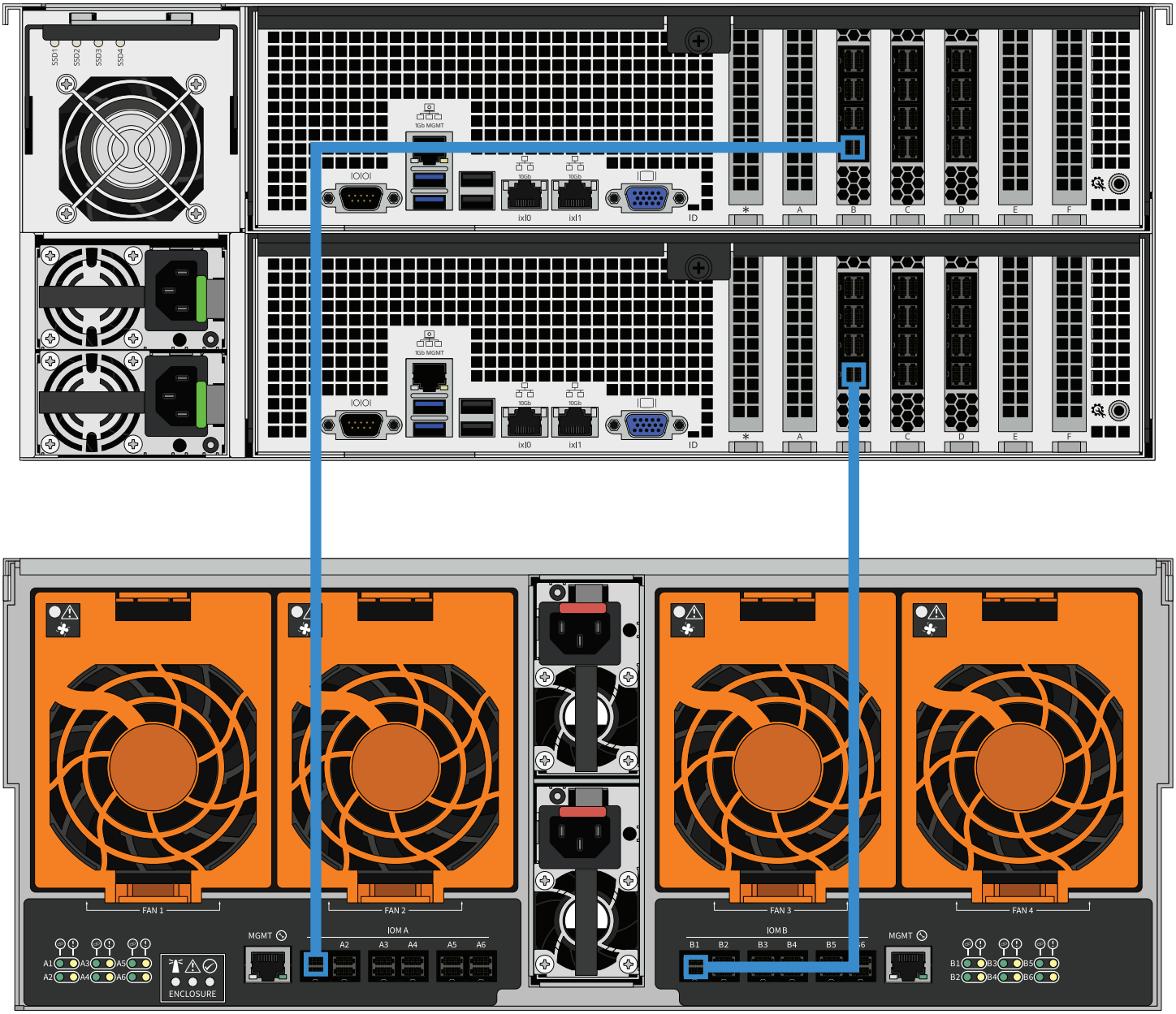
M50/M60 with three ES60 Expansion Shelves. The M50 can support up to 8 total Expansion Shelves with the use of additional SAS cards. The M60 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



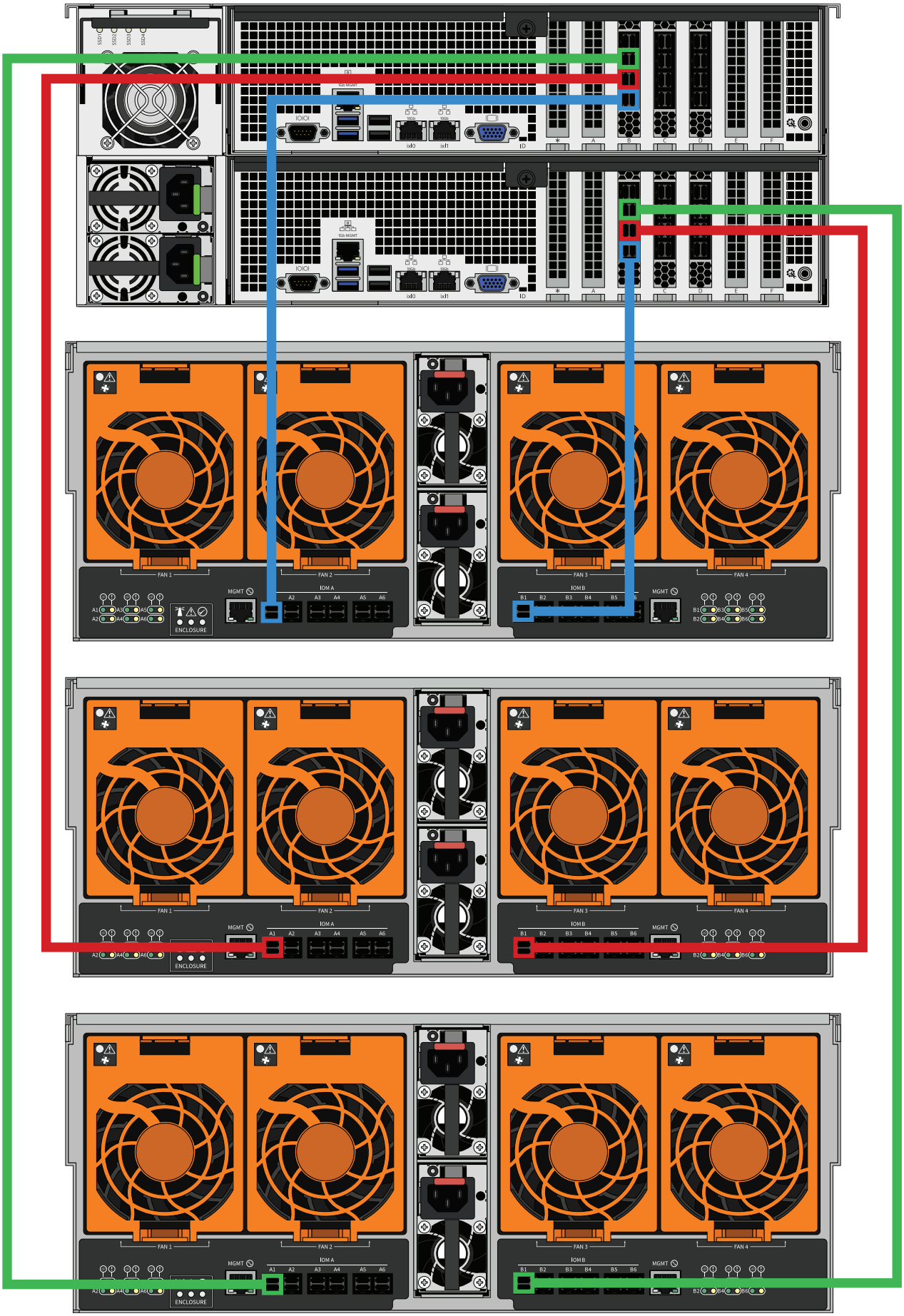
9.4 ES102 Gen 1

9.4.1 M60 - ES102 Gen 1

M60 with a single ES102 Gen1 Expansion Shelf



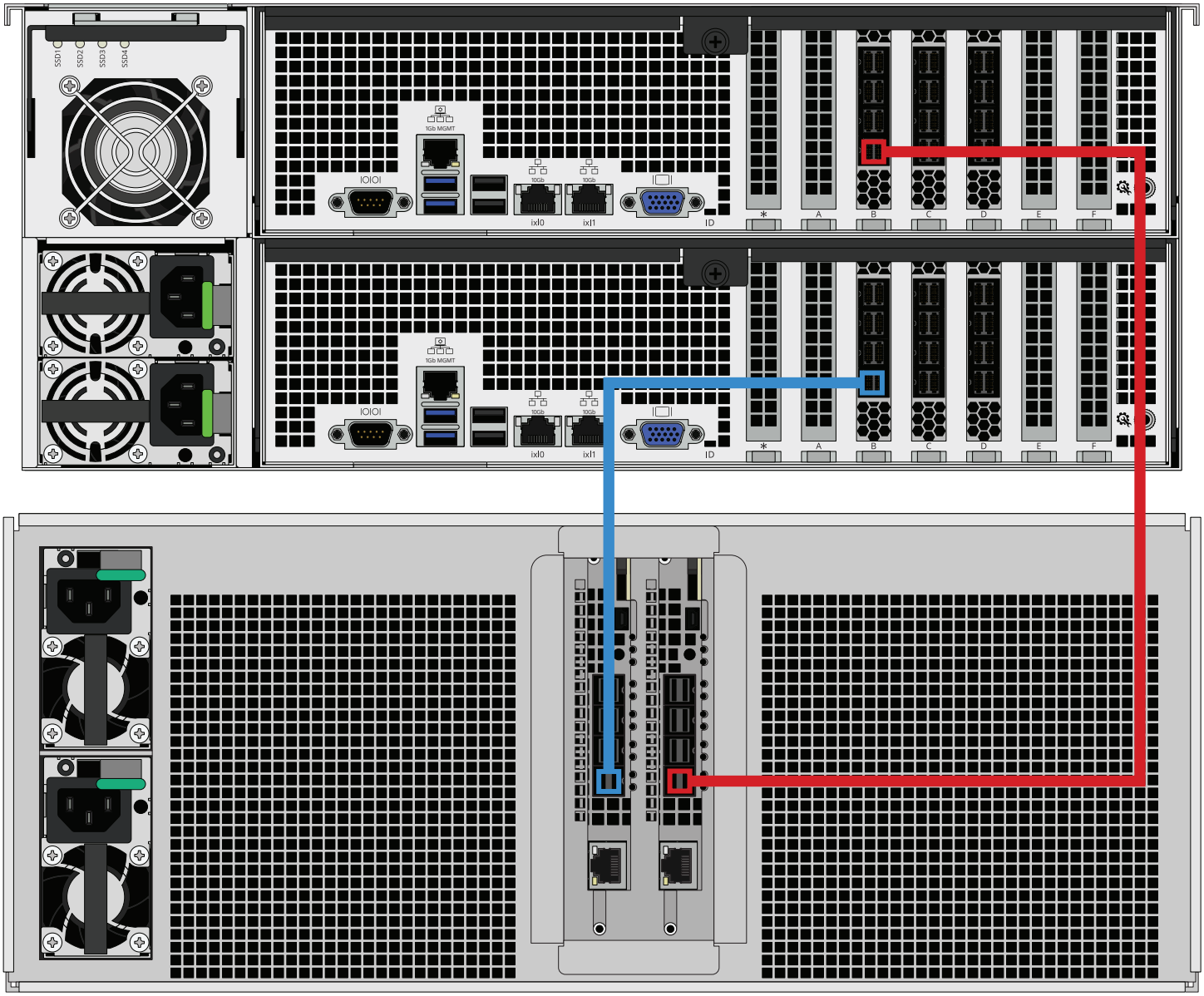
M60 with three ES102 Gen 1 Expansion Shelves. The M60 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



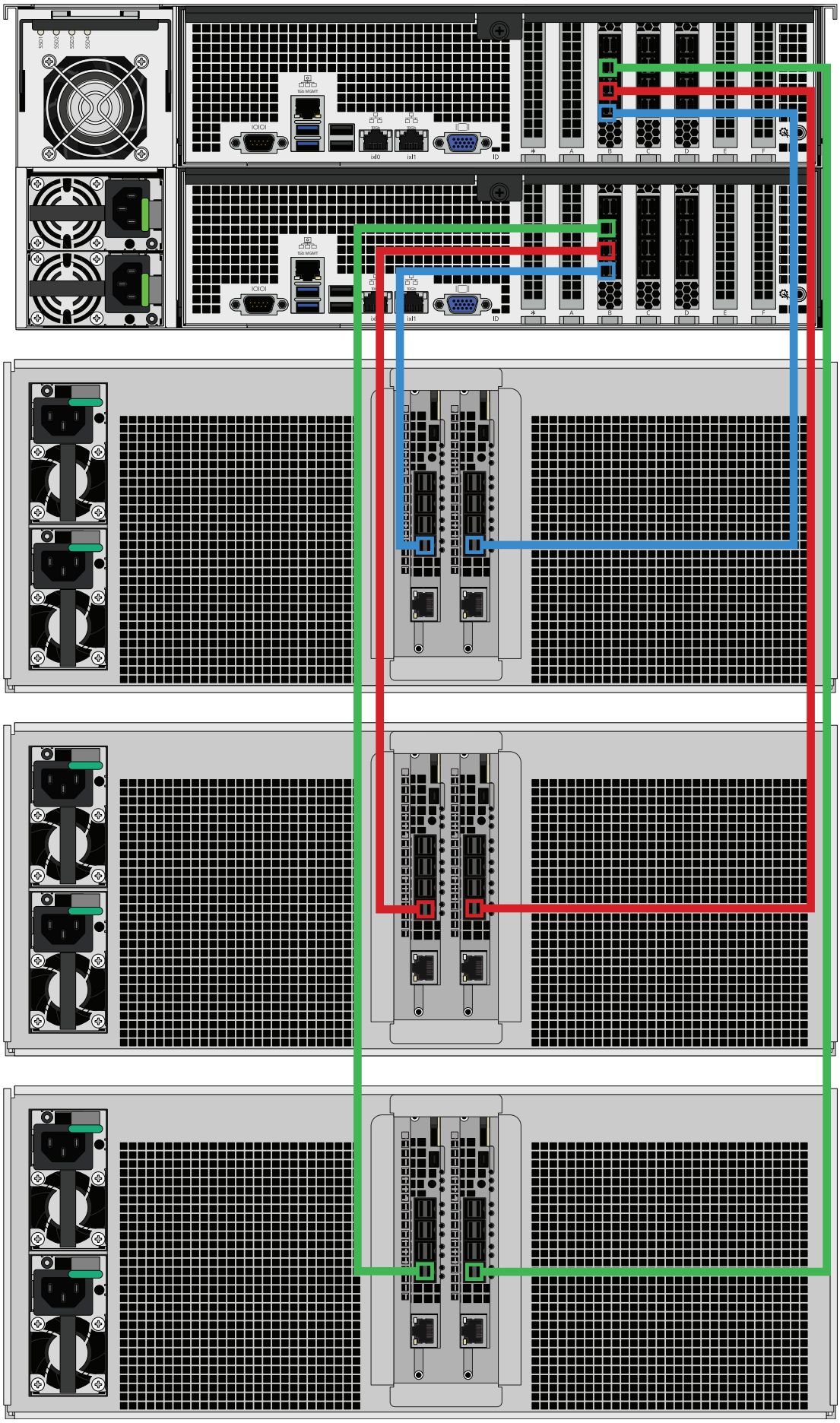
9.5 ES102 Gen 2

9.5.1 M60 - ES102 Gen 2

M60 with a single ES102 Gen 2 Expansion Shelf:



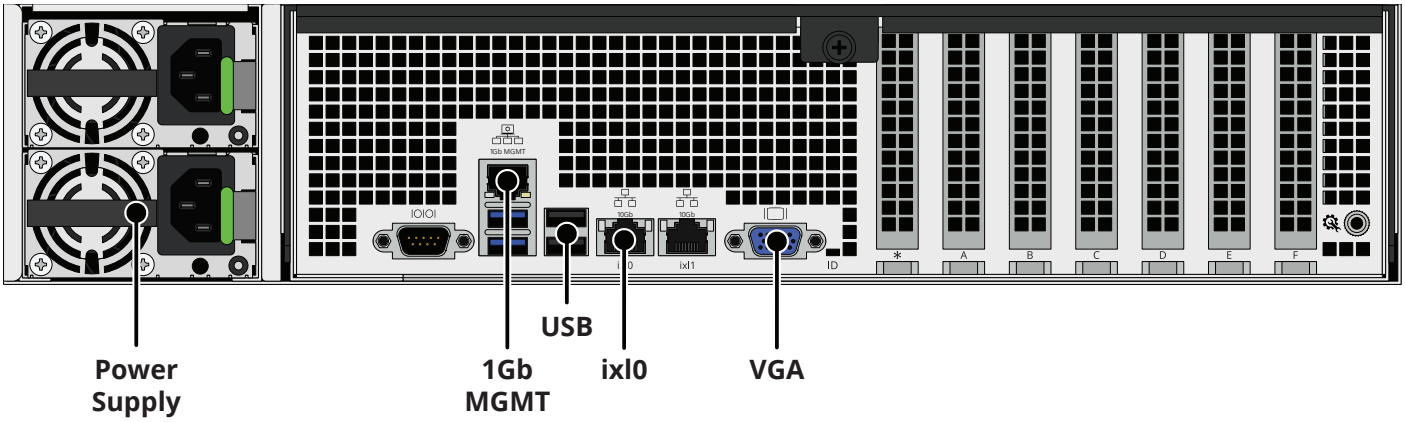
M60 with three ES102 Expansion Shelves. The M60 supports up to 12 Expansion Shelves using additional SAS cards.



10 Unracking Procedure

10.1 Uninstall Cables

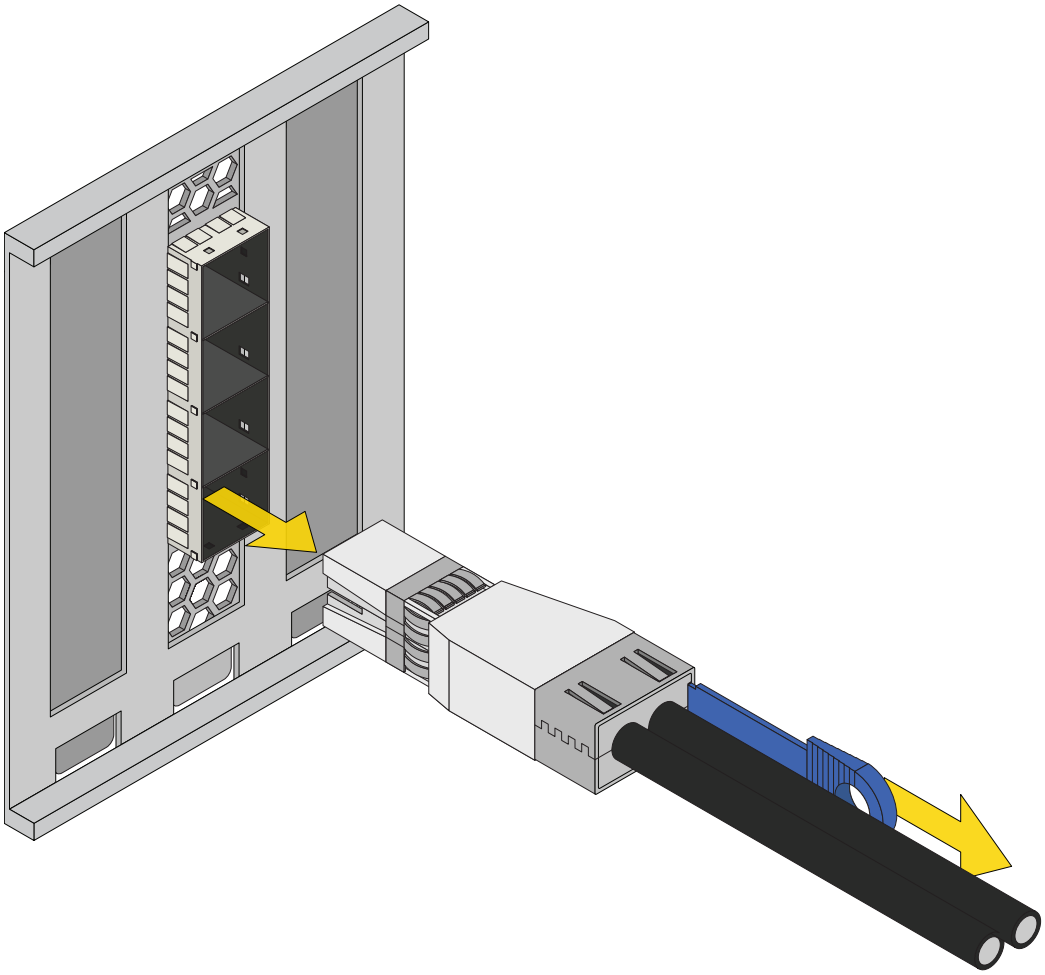
Disconnect both power cables from the PSUs, then disconnect all USB and networking cables.



10.1.1 Disconnect SAS Cables

If your system has expansion shelves, you can remove the SAS3 cables now.

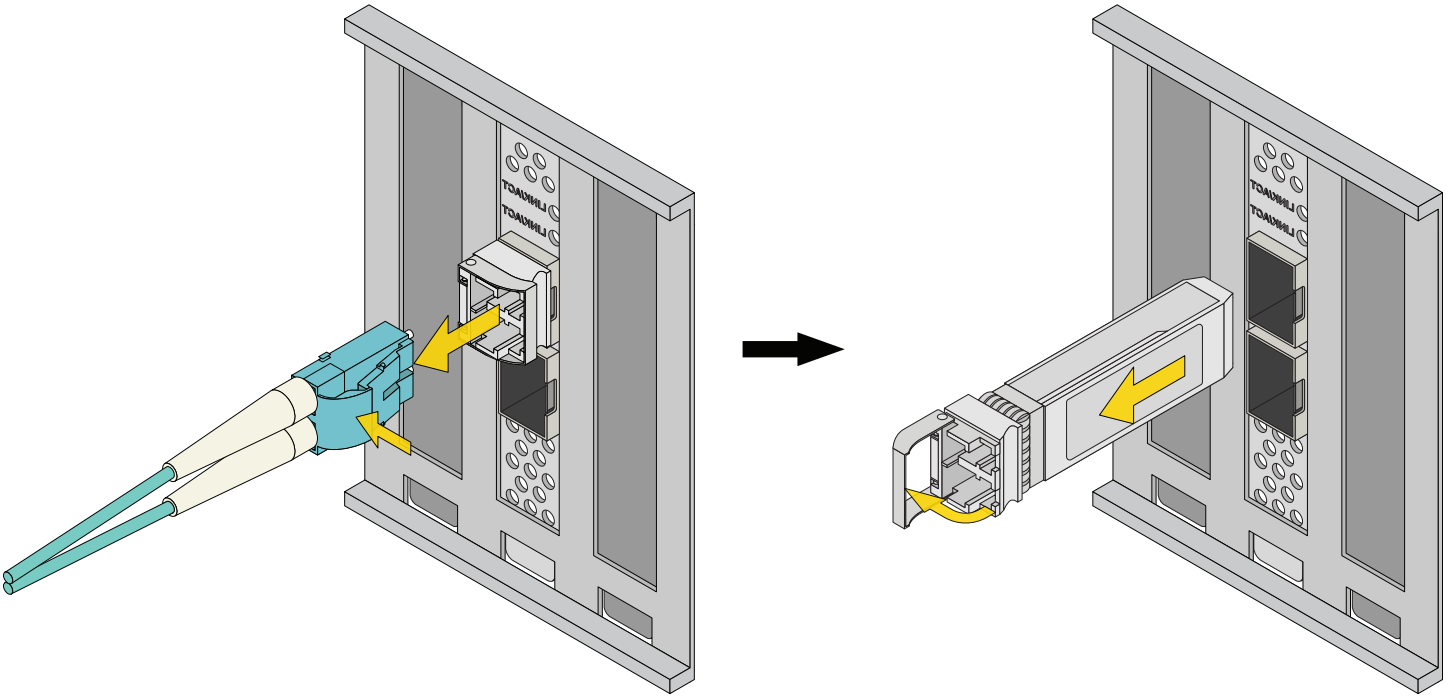
Pull the blue tab on top of the SAS cable to release it from the SAS port.



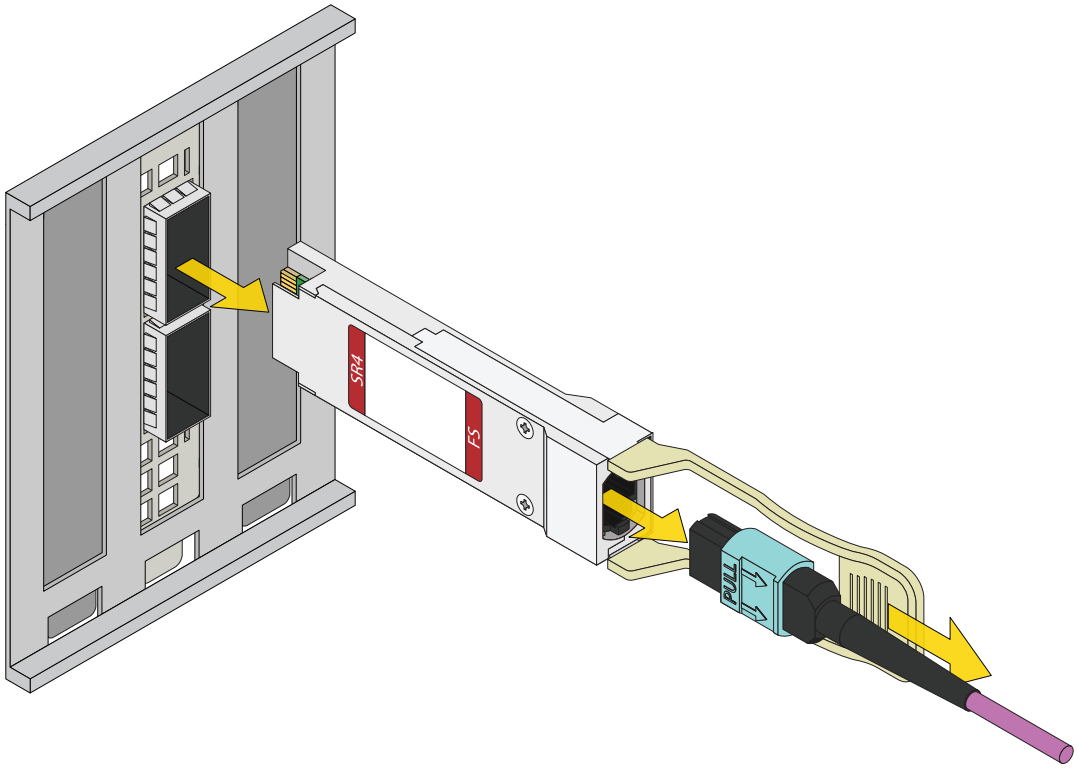
10.1.2 Disconnect SR and SR4 NIC Cables

Insert the SR optics into the first port on the NIC, then plug the SR cable into the back of the SR optics. Both the optics and the cable will click and lock into place when installed correctly. Repeat for remaining ports.

SR

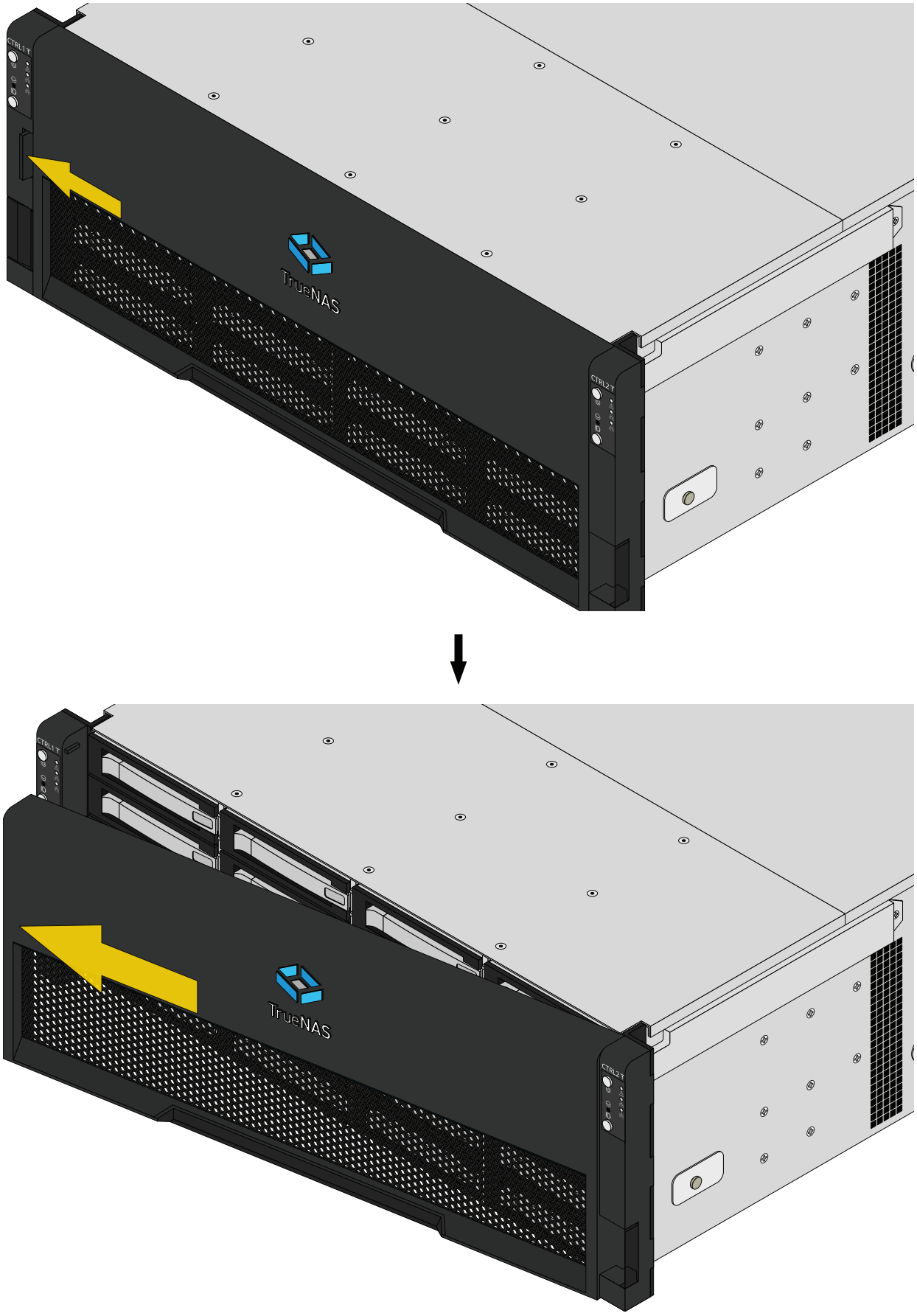


SR4



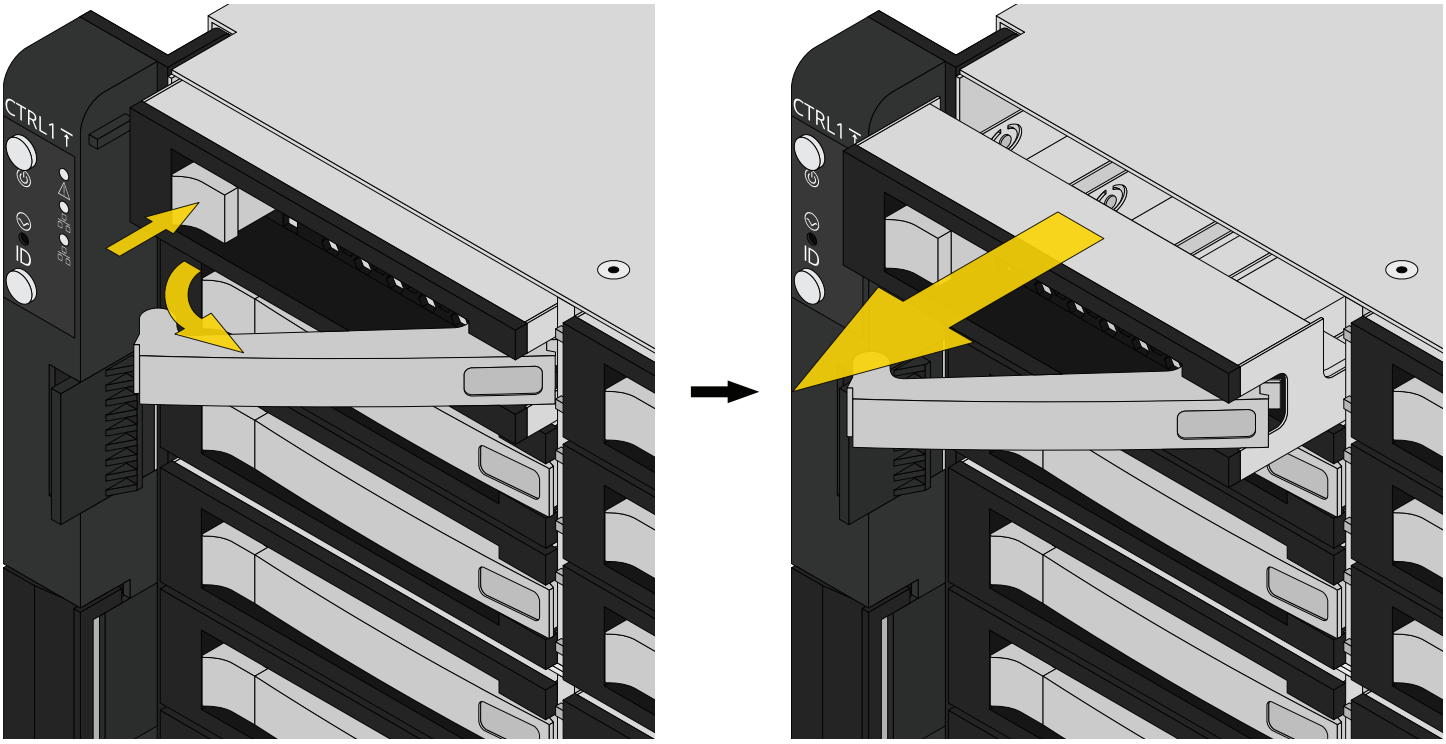
10.2 Remove Bezel

Push the locking latch on the left ear to release the bezel. Pull the left side away from the system, then remove the bezel from the system.



10.3 Remove Drives

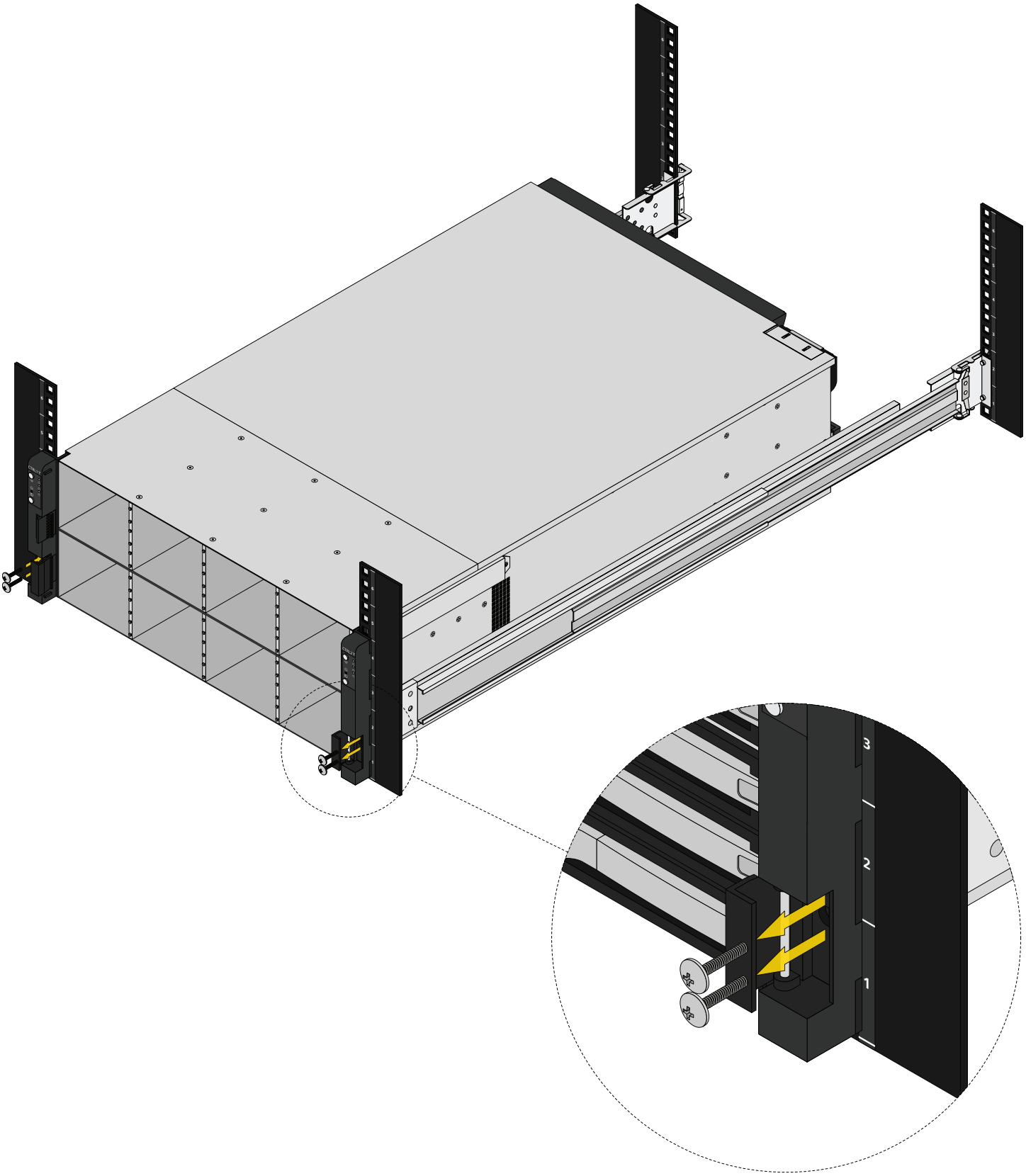
Press the locking arm release on the left side of a tray. Swing the locking arm out until it stops, then pull the tray out of the system.



10.4 Remove M5 Rack Screws

Remove both of the long M5 screws through the retention ports on each ear.

The screws are behind the small doors on each ear.



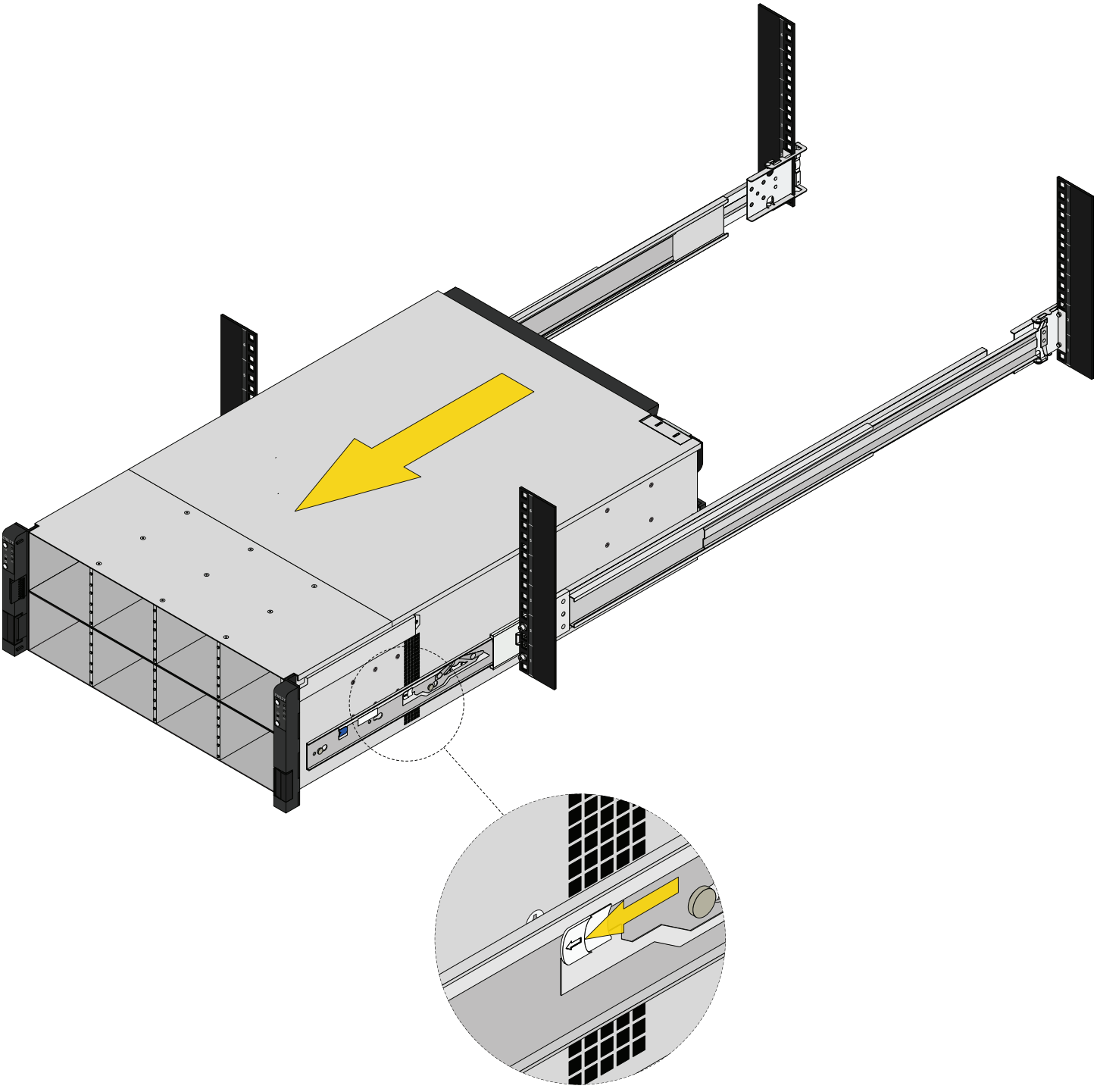
10.5 Remove the System from the Rack

Warning

The M-Series requires two people to safely lift in and out of a rack. Do not install drives until after you mount the M-Series in the rack. Remove all drives before taking the M-Series out of the rack.

Pull the system out of the rack until the metal safeties click and lock.

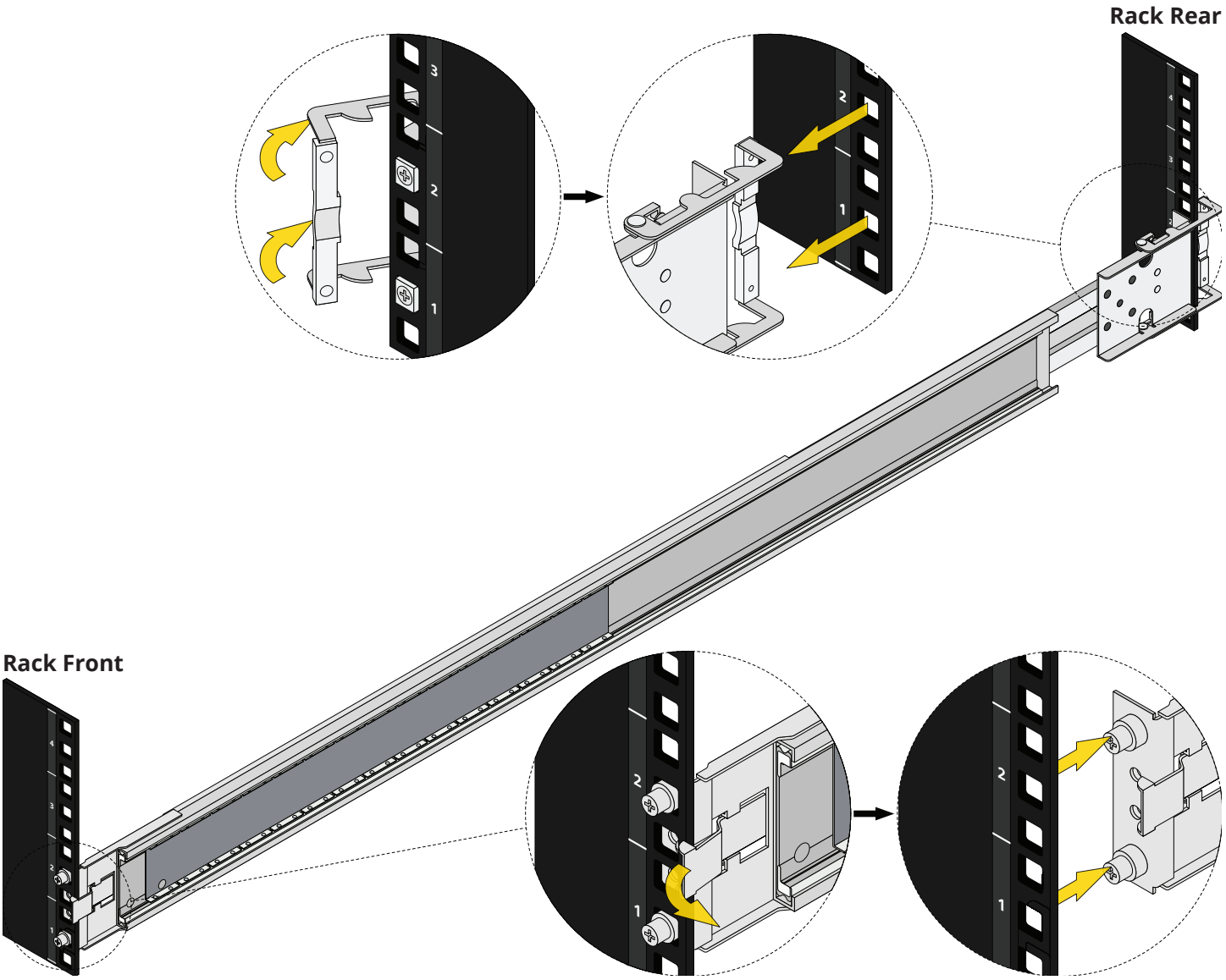
Pull the white release tabs towards the front of the system and finish pulling the system out of the rack.



10.6 Install the Rack Rail in the Rack

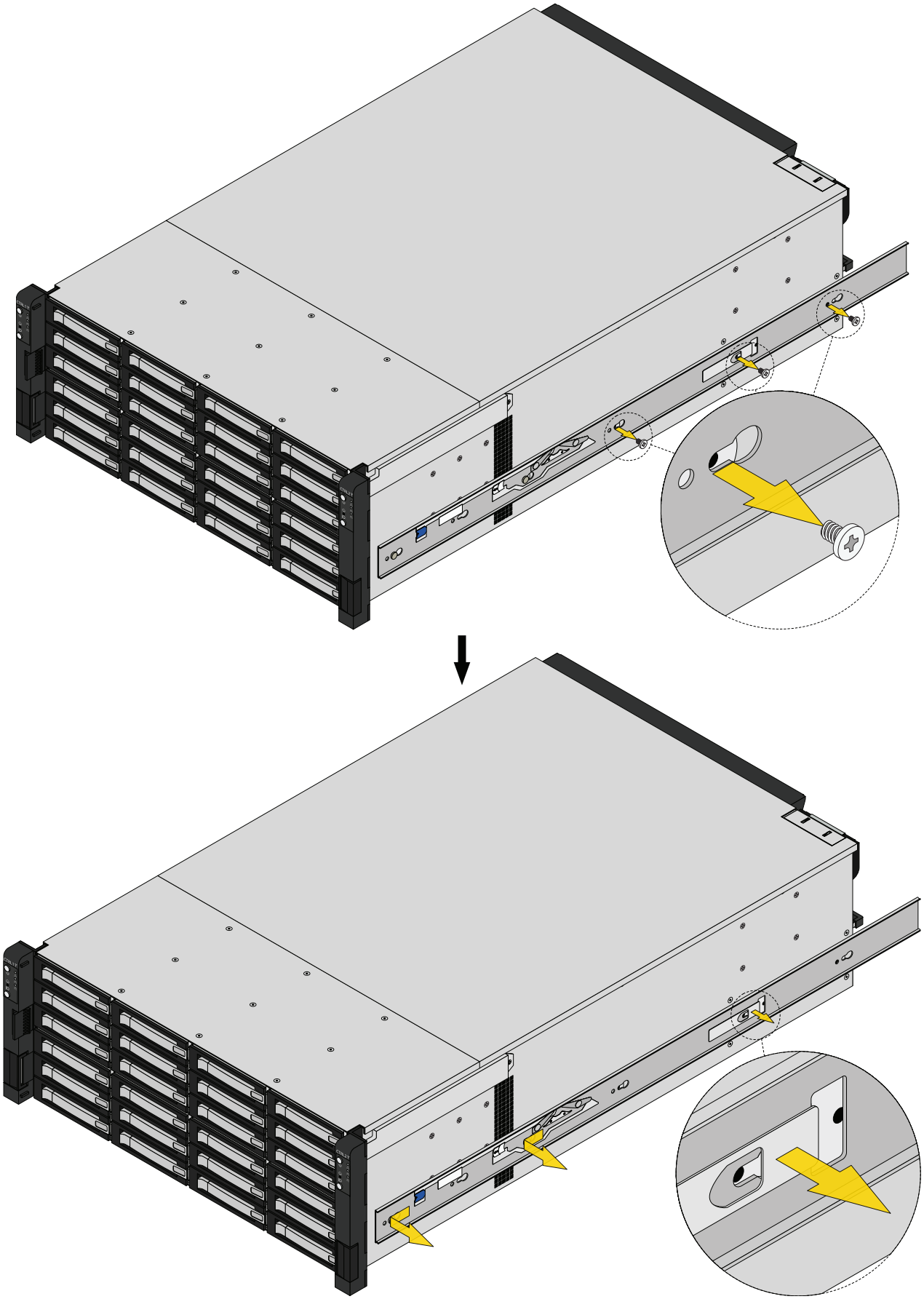
At the rear rack post, swing the gray latch handle open and pull it away from the rack until the square pegs are out of the rack mounting holes.

At the front end, push the locking latch away from the rack post, then pull the rail free from the rack.



10.7 Remove the Chassis Rail from the System

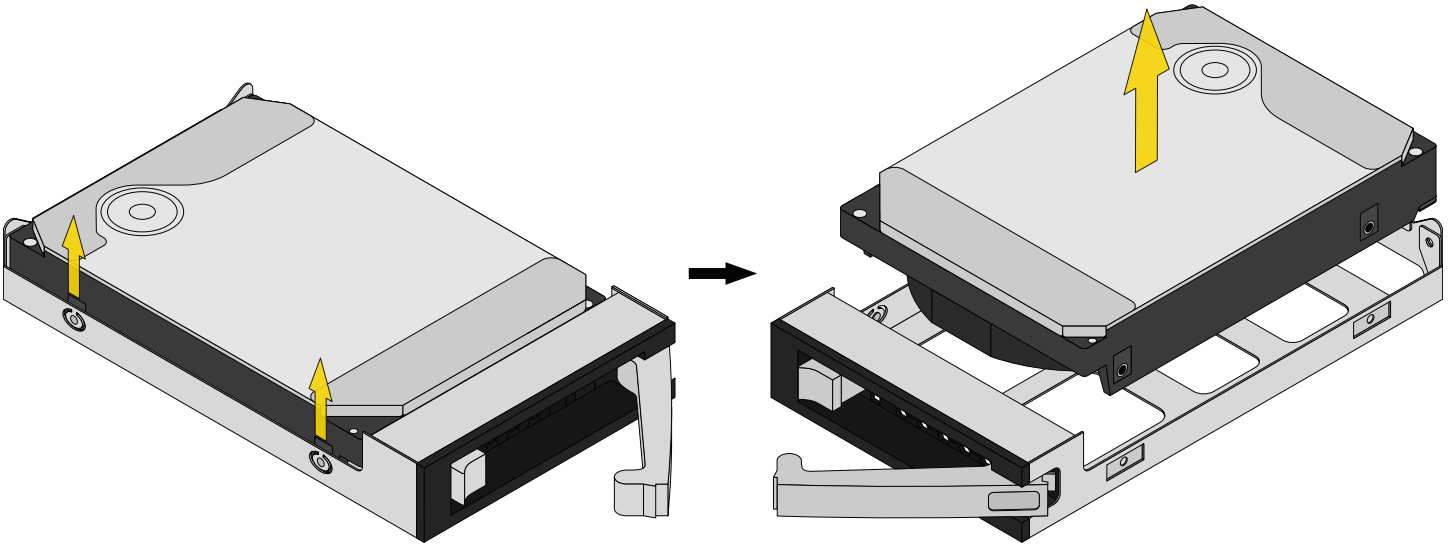
Remove the round M4 screws from the chassis rails, then pull the retention latches away from the chassis rails and slide them toward the front of the system. Pull the chassis rails over the mounting pegs and away from the system.



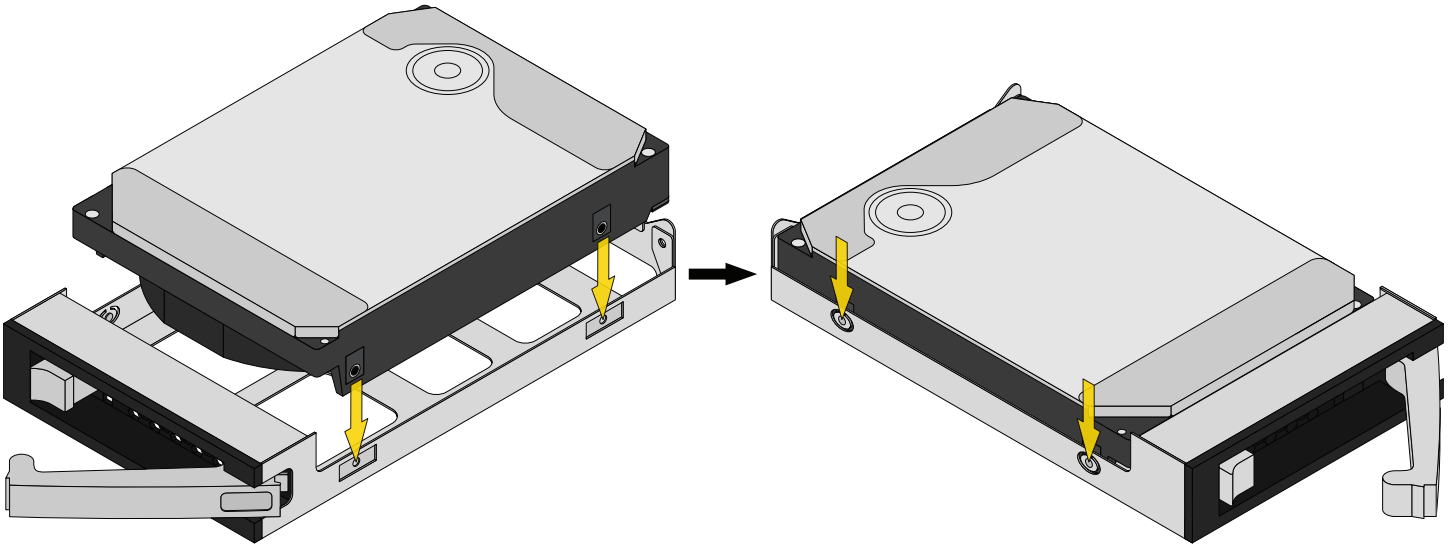
11 Drive Replacement

11.1 HDDs

To remove an HDD from a tray, push the side attached to the flexible pegs from underneath the tray, then lift the drive out.

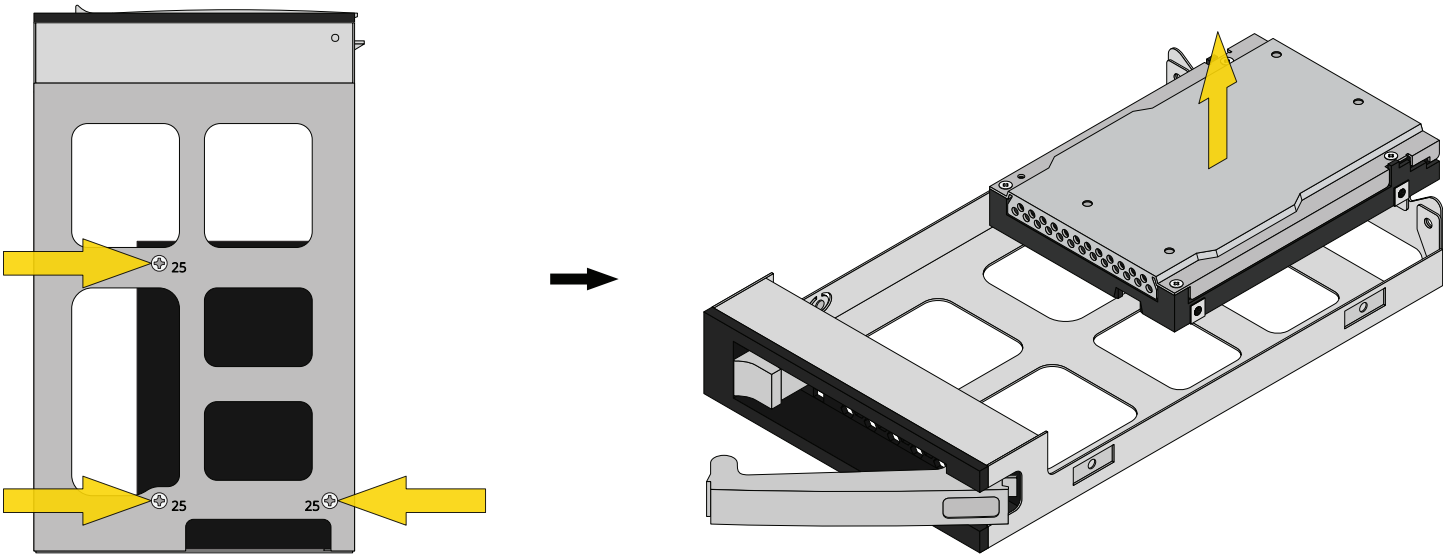


To install a drive in a tray, ensure the drive connectors point out the back of the tray and push the drive side screw holes into the fixed retention pegs on one side of the tray. Push the other side of the drive down into the flexible retention pegs to secure the drive.

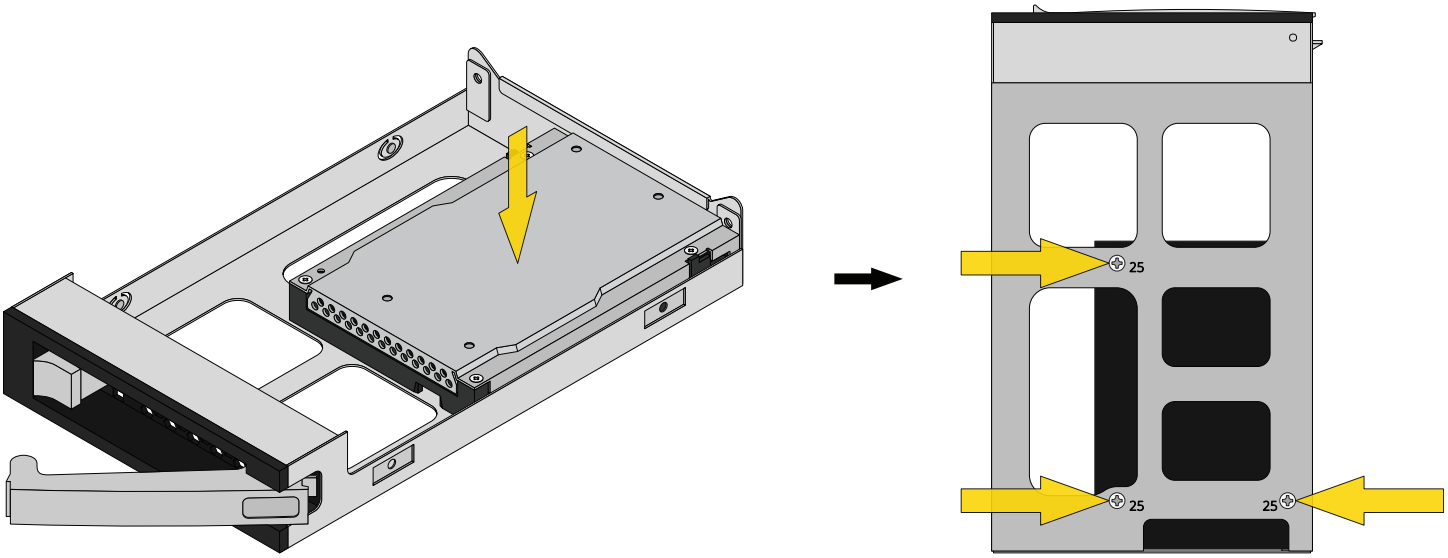


11.2 SSDs

To remove an SSD from a tray, remove the three 2.5” SSD screws from the bottom of the tray, then remove the drive from the tray.



To install an SSD in a tray, ensure the drive connectors point out the back of the tray, then lower the drive into the tray. Install three 2.5” SSD screws to secure the drive to the tray.



12 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/

13 Contact Us

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

Contact Method	Contact Options
Web	https://www.truenas.com/support
Email	support@truenas.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)
Address	iXsystems, Inc. dba TrueNAS - 541 Division St, Campbell, CA 95008, USA