



# Customer Replaceable Unit Guide

4U60 Storage Enclosure G460-J-12  
November 2015  
1ET0161

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## Revision History

Date	Revision	Comment
October 2015	Revision 1.0	Initial version
November 2015	Revision 1.1	Updates to content

# 1 Document Summary

The following chapter defines the *scope*, *intended audience*, and *references* related to the 4U60 Storage Enclosure.

## 1.1 Scope

When there are hardware failures, it is often not necessary to replace an entire enclosure. This document provides instructions for replacing parts of an enclosure. A CRU is a unit which must be replaced by the customer. The intent of the 4U60 Storage Enclosure is to keep serviceability simple while minimizing customer downtime, system degradation, and time needed to make the replacement.

## 1.2 References

- *Installation Guide*
- *User Guide*
- *System Specification Guide*

## 2 For More Information

The following chapter identifies the contact information for support on the 4U60 Storage Enclosure.

### 2.1 Points of Contact

For further assistance with an HGST product, contact Cloud Infrastructure Business Unit (CIBU) support. Please be prepared to provide the following information: Serial Number (S/N), product name, model number, and a brief description of the issue.

**Telephone:**

Region	Telephone Numbers	Support Hours and Additional Information
United States/International	1-408-717-7766	24 hours a day, 7 days a week
North America	1-844-717-7766	24 hours a day, 7 days a week Toll-free

**Email:**

[support@hgst.com](mailto:support@hgst.com)

**Website:**

[www.hgst.com/support](http://www.hgst.com/support)

## 3 Product Overview

This chapter provides a product overview of the 4U60 Storage Enclosure.

### 3.1 Introduction

The 4U60 Storage Enclosure is a 4U, high-density Hard Disk Drive (HDD) enclosure. The enclosure is designed to house up to a full configuration of 60 Ultrastar He8 helium drives and to maximize the performance of these drives, under all operating conditions.

The system contains the following high level features:

**Table 1: High Level Features Specifications**

Hardware	Details	Number of Component
4U Storage enclosure	4U rack-mounted storage enclosure with slide rail and cable management assembly	1
Canisters Slots	2U half-width SAS Expander Canister–JBOD application (12G version)	2
Power Interface Board	Connects the power supplies to the drive board	1
Drive Board	<ul style="list-style-type: none"> <li>Connects the power supplies (with integrated fans) via power interface board, drives, and ESM.</li> <li>Fully compliant with SAS 3.0 specification for operation up to 12Gbps.</li> </ul>	1
3.5-inch HDD with carrier	<ul style="list-style-type: none"> <li><b>Configuration:</b> 60 disk drives contained within top accessible chassis.</li> <li>Hot swappable</li> <li>Two status LEDs per drive slot, Activity and Fault</li> <li>Ejector handle allows for easy installation and removal of HDDs</li> </ul>	60 Ultrastar He8 helium HDDs
Power Supply Unit (PSU)	<ul style="list-style-type: none"> <li>2U half-width dual 1+1 redundant, 1650W AC power supplies</li> <li>200 ~ 240 VAC (1650W) input, 47Hz – 63Hz</li> <li>+12V and +5V outputs with +5V standby power</li> <li>2 integrated fans powered by redundant power rail</li> <li>Compliant with 80 Plus efficiency Gold level</li> <li>+/- 5% Voltage margin control on 5V and 12V rails</li> <li>Trouble history implementation</li> <li>5v and 12v DC output at 1650W</li> </ul>	2
Fans	<ul style="list-style-type: none"> <li>N+1 redundant cooling</li> <li>any one fan can fail and the system will continue to operate</li> </ul>	4 (2 in each PSU)



## 4 Disclaimers

The following chapter describes the Regulatory Statement of Compliance, Safety Compliance, and Electromagnetic Compatibility Agency Requirements for the 4U60 Storage Enclosure.

### 4.1 Regulatory Statement

Product Name: **4U60 Storage Enclosure**

Regulatory Model: **G460-J-12**

Electromagnetic Compatibility Emissions: **Class A**

This product has been tested and evaluated as Information Technology Equipment (ITE) at accredited third-party laboratories for all safety, emissions and immunity testing required for the countries and regions where the product is marketed and sold. The product has been verified as compliant with the latest applicable standards, regulations and directives for those regions/countries. The suitability of this product for other product categories other than ITE, may require further evaluation.

The product is labeled with a unique regulatory model and regulatory type that is printed on the label and affixed to every unit. The label will provide traceability to the regulatory approvals listed in this document. The document applies to any product that bears the regulatory model and type names including marketing names other than those listed in this document.

#### 4.1.1 Restricted Access Location

The HGST 4U60 Storage Enclosure is intended for installation in a server room or computer room where at least one of the following conditions apply:

- access can only be gained by **service persons** or by **users** who have been instructed about the restrictions applied to the location and about any precautions that shall be taken and/or
- access is through the use of a **tool** or lock and key, or other means of security, and is controlled by the authority responsible for the location.

#### 4.1.2 Safety Compliance

The following table outlines how the 4U60 Storage Enclosure is designed to pass the product safety requirements:

**Table 2: Product Safety Compliance**

Country/Region	Authority or Mark	Standard	Status
Australia/New Zealand	CB report, CB certificate	AS/NZS 60950.1	TBD
Canada/North America	NRTL	CSA C22.22 No. 60950-1-07	In Progress
Customs Union/Russia, Kazakhstan, Belarus, Armenia	EAC	TR CU 004/2011	TBD
European Union	CE	EN 60950-1	In Progress
International		IEC60950, CB report and Certificate to include all country national deviations	In Progress
United States/North America	NRTL	UL 60950-1	TBD
Mexico	NYCE or NOM	NOM-019-SCFI-1998	TBD
Brazil	INMETRO	IEC 60950-1	TBD

Country/Region	Authority or Mark	Standard	Status
Taiwan	BSMI	CNS14336	TBD
Ukraine	UKrTEST or equivalent	4467-1:2005	TBD
Moldova	INSM	SM SR EN60950-1	TBD
Serbia	KVALITET	SRPS EN60950:2010	TBD
India	BIS	IS 13252 (Part 1):2010	TBD

### 4.1.3 Electromagnetic Compatibility Agency Requirements

The following table outlines how the 4U60 Storage Enclosure is being designed to comply with the Electromagnetic Compatibility agency requirements:

**Table 3: Product Electromagnetic Compatibility/Immunity Compliance**

Country/Region	Authority or Mark	Standard	Statu
Australia/New Zealand	C-tick or A-tick	AS/NZS CISPR22	s
Canada/North America	Industry Canada	ICES-003	In
Customs Union/Russia, Kazakhstan, Belarus, Armenia	EAC	TR CU 020/2011	Progress
European Union	CE	EN55022, EN55024 including EN61000-3-2, EN61000-3-3	In Progress
International		CISPR22, CISPR24	
Japan	VCCI	V-3:2014	In
United States/North America	FCC	FCC Part 15	Progress
Taiwan	BSMI	CNS13438	
Korea	MSIP	KN22, KN24	In
Ukraine	UKrTEST or equivalent	4467-1:2005	Progress
Serbia	KVALITET	CISPR22	In
Brazil	INMETRO		Progress

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## 5 Safety and Regulatory

The following chapter provides safety and regulatory information for the 4U60 Storage Enclosure.

### 5.1 Optimizing Location

Failure to recognize the importance of optimally locating your product and failure to protect against electrostatic discharge (ESD) when handling your product can result in lowered system performance or system failure.

Do not position the unit in an environment that has extreme high temperatures or extreme low temperatures. Be aware of the proximity of the unit to heaters, radiators, and air conditioners.

Position the unit so that there is adequate space around it for proper cooling and ventilation. Consult the product documentation for spacing information.

Keep the unit away from direct strong magnetic fields, excessive dust, and electronic/electrical equipment that generate electrical noise.

### 5.2 Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and/or the product packaging.

**CAUTION** Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.

**WARNING** Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.



Indicates potential hazard if indicated information is ignored.



Indicates shock hazards that result in serious injury or death if safety instructions are not followed.



Indicates do not touch fan blades, may result in injury.



Indicates disconnect all power sources before servicing.

### 5.3 Electrostatic Discharge



**CAUTION**

Electrostatic discharge can harm delicate components inside HGST products.

Electrostatic discharge (ESD) is a discharge of stored static electricity that can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Wear an ESD wrist strap for installation, service and maintenance to prevent damage to components in the product. Ensure the antistatic wrist strap is attached to a chassis ground (any unpainted metal surface). If possible, keep one hand on the frame when you install or remove an ESD-sensitive part.



Before moving ESD-sensitive parts place them in ESD static-protective bags until you are ready to install the part.

## 5.4 Rackmountable Systems

### CAUTION

**Always install rack rails and storage enclosure according to 4U60 Storage Enclosure product documentation. Follow all cautions, warnings, labels, and instructions provided within the rackmount instructions.**

Reliable earthing of rack-mounted equipment should be maintained.

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.

Observe the maximum rated ambient temperature, which is specified in the product documentation.

**For safe operation of the equipment, installation of the equipment in a rack should be such that the amount of air flow is not impeded so that the safe operation of the equipment is not compromised.**

## 5.5 Power Connections

Be aware of the ampere limit on any power supply or extension cables being used. The total ampere rating being pulled on a circuit by all devices combined should not exceed 80% of the maximum limit for the circuit.

**CAUTION** The power outlet must be easily accessible close to the unit.



Always use properly grounded, unmodified electrical outlets and cables. Ensure all outlets and cables are rated to supply the proper voltage and current.



This unit has more than one power supply connection; both power cords must be removed from the power supplies to completely remove power from the unit. There is no switch or other disconnect device.

## 5.6 Power Cords



Use only tested and approved power cords to connect to properly grounded power outlets or insulated sockets of the rack's internal power supply.

If an AC power cord was not provided with your product, purchase one that is approved for use in your country or region.

**CAUTION** To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.
- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.
- The power supply cord(s) is / are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.

## 5.7 Safety and Service



All maintenance and service actions appropriate to the end-users are described in the product documentation. All other servicing should be referred to a HGST-authorized service technician.



To avoid shock hazard, turn off power to the unit by unplugging both power cords before servicing the unit. Use extreme caution around the chassis because potentially harmful voltages are present.



When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the 4U60 Storage Enclosure.



The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.



Use caution when accessing part of the product that are labeled as potential shock hazards, hazardous access to moving parts such as fan blades or caution labels.

## 6 HGST Regulatory Statements

The following chapter provides regulatory statements for the 4U60 Storage Enclosure.

HGST Storage Enclosures are marked to indicate compliance to various country and regional standards.

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**Note:** *Potential equipment damage:* Operation of this equipment with cables that are not properly shielded and not correctly grounded may cause interference to other electronic equipment and result in violation of Class A legal requirements. Changes or modifications to this equipment that are not expressly approved in advance by HGST will void the warranty. In addition, changes or modifications to this equipment might cause it to create harmful interference.

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### 6.1 FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

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**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Any modifications made to this device that are not approved by HGST may void the authority granted to the user by the FCC to operate equipment.

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### 6.2 FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

---

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates and can radiate radio frequency energy, and if not installed and used in accordance with the 4U60 Storage Enclosure User Guide, it may cause harmful interference to radio communications.

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### 6.3 ICES-003 Class A Notice—Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



## 6.4 CE Notices (European Union), Class A ITE

Marking by the symbol indicates compliance of this system to the applicable Council Directives of the European Union, including the Electromagnetic Compatibility Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC). A “Declaration of Conformity” in accordance with the applicable directives has been made and is on file at HGST Europe.

## 6.5 Europe (CE Declaration of Conformity)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled “Digital Apparatus,” ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: “Appareils Numériques”, NMB-003 édictée par le Ministre Canadian des Communications.

## 6.6 Japanese Compliance Statement, Class A ITE

The following Japanese compliance statement pertains to VCCI EMI regulations:

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

### English translation:

This is a Class A product based on the Technical Requirement of the Voluntary Control Council for Interference by Information Technology (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take corrective actions.

## 6.7 Taiwan Warning Label Statement, Class A ITE

### 警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，  
可能會造成射頻擾動，在此種情況下，使用者會  
被要求採取某些適當的對策。

### English translation:

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

## 6.8 KCC Notice (Republic of Korea Only), Class A ITE

기종별	사용자안내문
A급 기기 (업무용 정보통신기기)	이 기기는 업무용으로 전자파허용등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

### English translation:

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find that this device is not suitable for your use, you may exchange it for a non-business device.

## 7 Core Hardware

The following chapter describes the core hardware involved with the 4U60 Storage Enclosure.

### 7.1 Qualified 4U60 Storage Enclosure Field Replaceable Units

The following components are qualified as customer replaceable units for the 4U60 Storage Enclosure:

- Power Supply Unit
- Enclosure Storage Module
- Hard Disk Drive
- Cable Management Assembly
- Power Interface Board
- MiniSAS Cable
- Expansion Cable
- Rail kit
- Chassis

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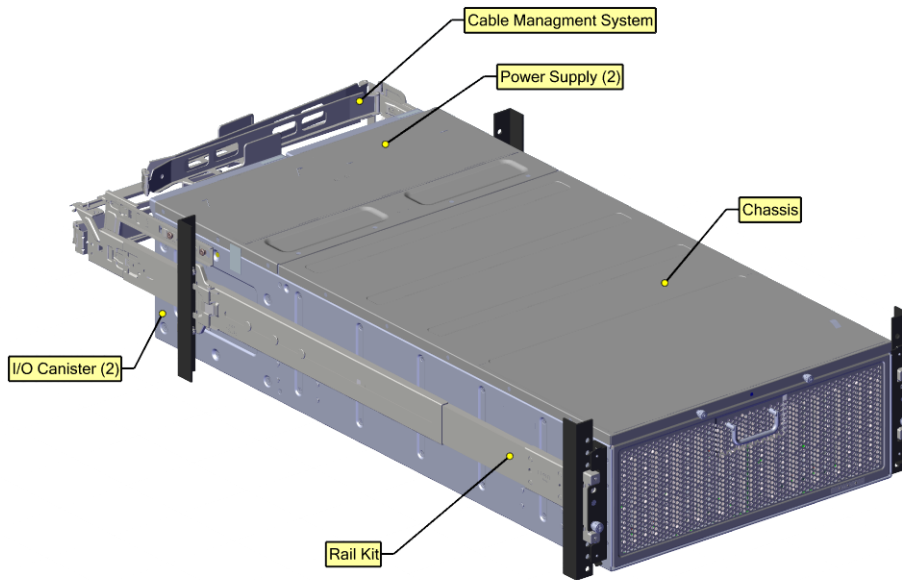
**Note:** Do not replace any components without being advised by HGST support. For support information, see: [Points of Contact](#).

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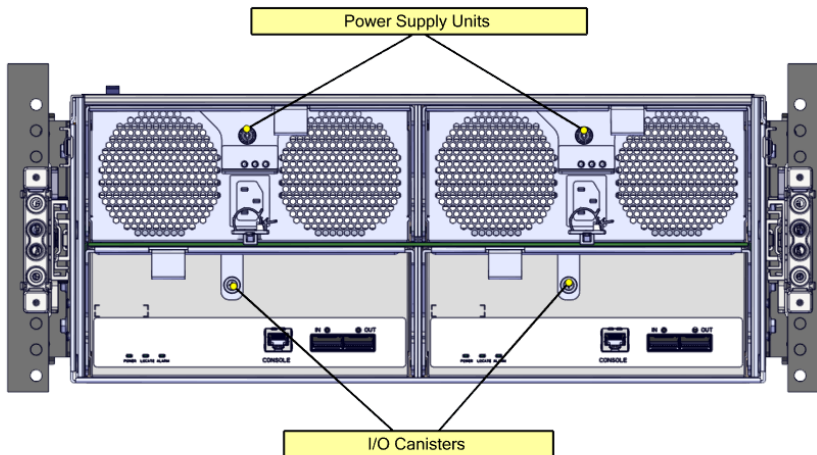
## 7.2 Identification of Assembled Enclosure

The following figure displays the major components of an assembled enclosure:

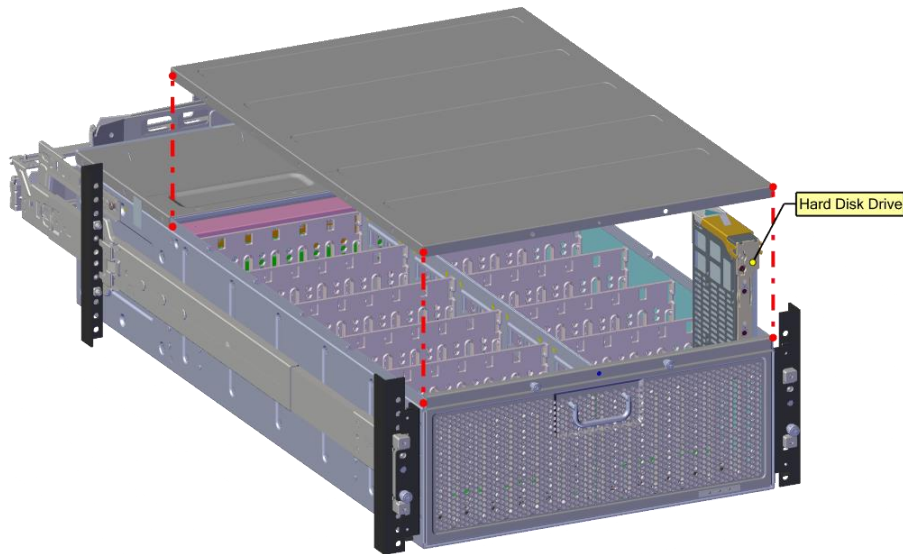
**Figure 1: Identification of Assembled Enclosure**



**Figure 2: Identification of Assembled Enclosure (Rear)**



**Figure 3: Identification of Assembled Enclosure (Hard Drive Assembly)**



## 7.3 Visual Indicator Identification

The 4U60 Storage Enclosure displays the following visual indicators:

- **Chassis**

- I 1 Green—Chassis operational
- I 1 Red—Chassis nonoperational
- I 1 Amber—Chassis locate

- Enclosure Storage Module (one set of LEDs per ESM, 2 sets total)

**Main LEDs:**

- I 1 Green—Power on
- I 1 Red—ESM Error
- I 1 Amber—ESM locate, controlled by host via SES

**QSFP+ uplink and downlink ports:**

- I On (Green)—link established with any or all SAS ports within the connector that are linked
- I Off—Loss of link on all of the SAS ports within the connector

- **PSU** (one set of LEDs per PSU, 2 sets total)

- I RYD Green—Displays the output +12V and +5V are normal with in specification
- I ACIN Green—Displays the input AC voltage is with in specification
- I ALM Amber—Displays the PSU report a fault

- **HDD**

- I 1 Green—Power on and connected
- I 1 Red—
  - Solid: HDD Error
  - Blinking: HDD Locate

## 8 4U60 Storage Enclosure Customer Replaceable Units

The following section provides replacement procedures for the 4U60 Storage Enclosure failed components.

### 8.1 Power Supply Unit Replacement Procedure

The power supply units contained in the 4U60 Storage Enclosure are designed to be redundant.

**Required Tools:**

- None

**Time Estimate for Replacement:** 3 minutes

To replace a power supply unit (PSU), do the following:

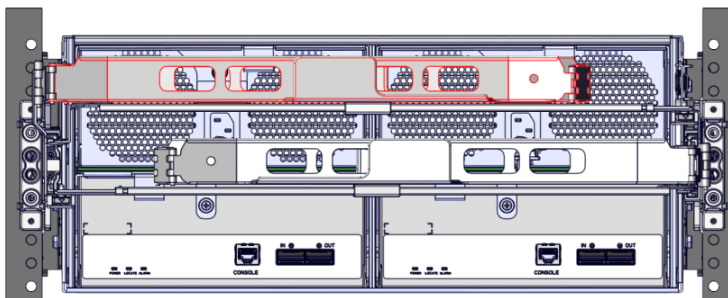
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**Note:**

- Ensure that you store all removed parts in a safe location while replacing the CRU.
  - The PSUs are hot-swappable. The enclosure does not need to be powered down in order to replace them.
- 

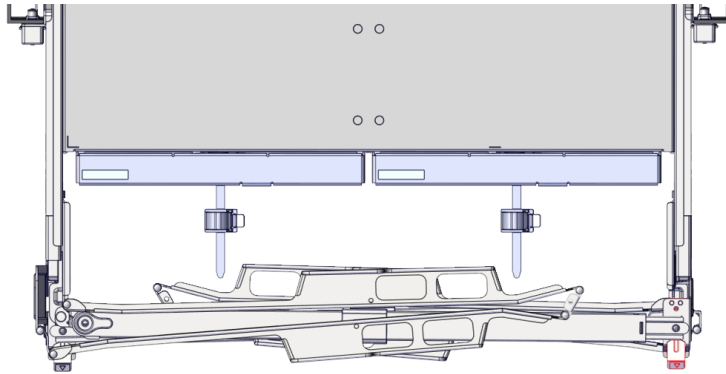
1. From the rear of the enclosure, locate the **upper** CMA arm.

**Figure 4: Upper Cable Management Assembly Arm**



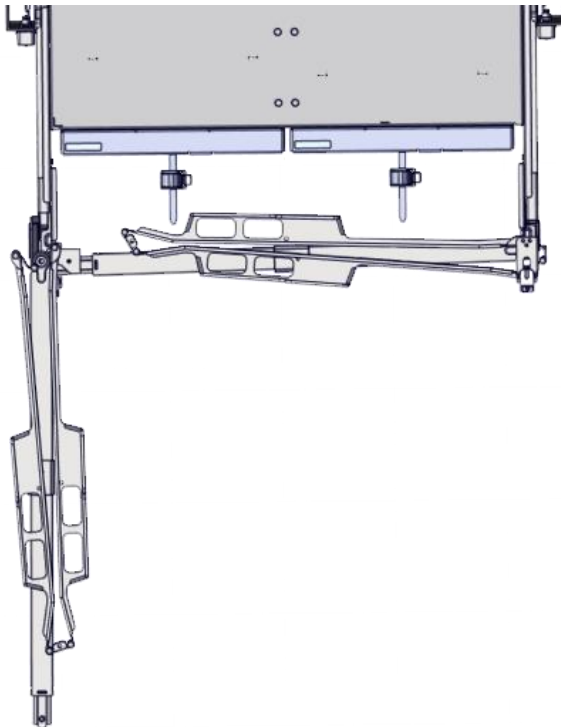
2. On the **upper** CMA arm, press down on the CMA release on the snap location.

**Figure 5: Upper Cable Management Assembly Snap Location Release**



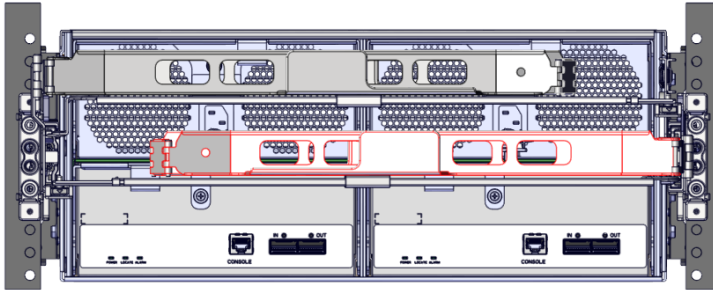
3. Swing the **upper** CMA handle away from the **lower** CMA arm.

**Figure 6: Upper Cable Management Assembly Release Handle**



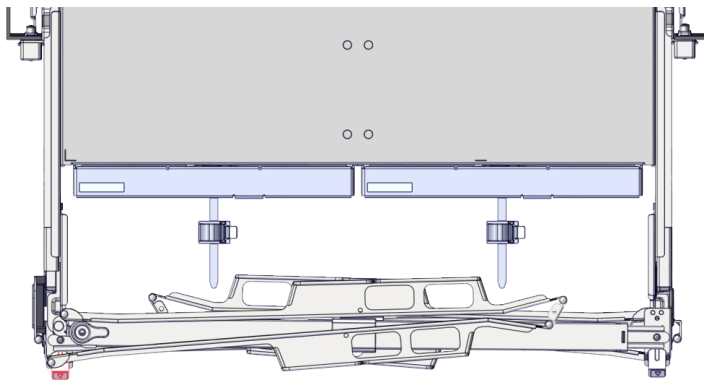
4. Locate the **lower** CMA arm.

**Figure 7: Lower Cable Management Assembly Arm**



5. On the **lower** CMA arm, press down on the CMA release on the snap location.

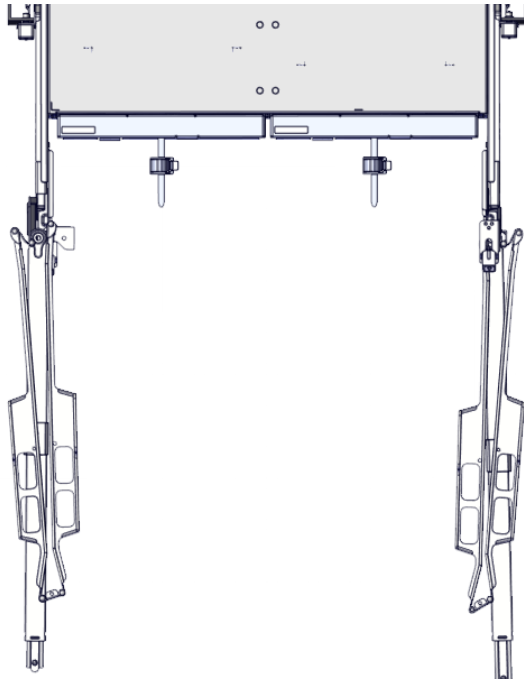
**Figure 8: Lower Cable Management Assembly Snap Location Release**





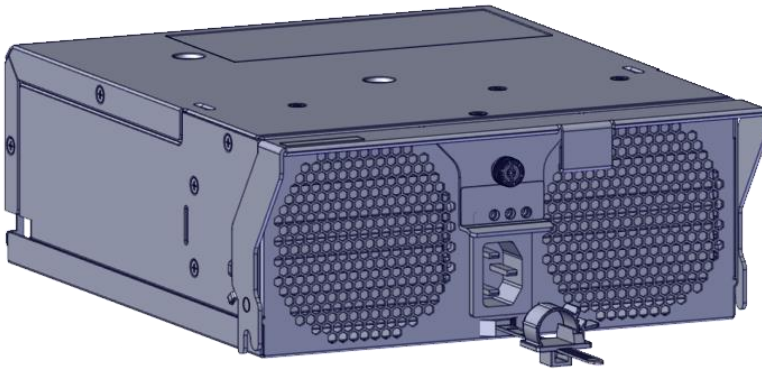
6. Swing the **lower** CMA handle away from the **upper** CMA arm.

**Figure 9: Lower Cable Management Assembly Release Handle**



7. Locate the failed PSU.

**Figure 10: Failed Power Supply Unit**



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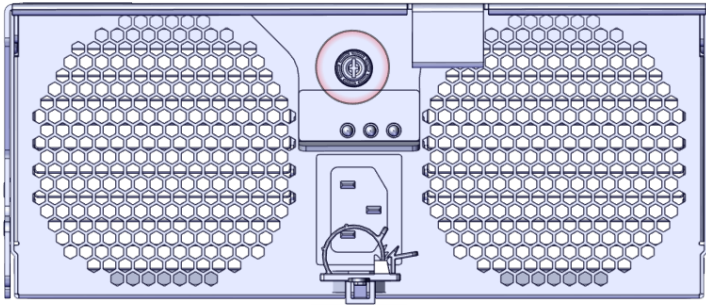
**Note:**

- Because the PSUs are hot-swappable, you **do not** have to power down the enclosure to replace a fail PSU.
  - The PSUs are redundant, so the working PSU can support the entire enclosure during the replacement procedure.
- 

8. Disconnect the power cord from the failed PSU.

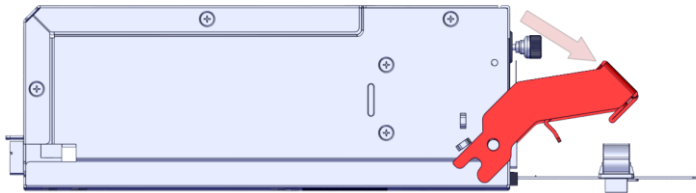
- From the PSU, turn the thumb screw counterclockwise until fully unlocked.

**Figure 11: Power Supply Thumb Screw (Counterclockwise)**



- Pull the PSU handle until the PSU is unseated from the chassis.

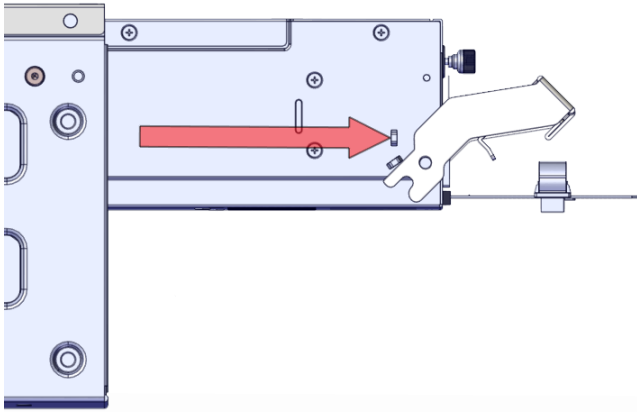
**Figure 12: Power Supply Unit Handle**



**Note:** The handle is highlighted in red.

11. Remove the PSU from the enclosure chassis.

**Figure 13: Removing the Power Supply Unit**



12. Remove the replacement PSU from all packaging.

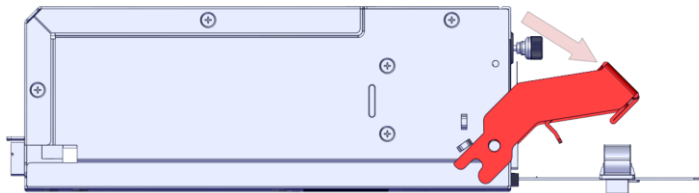
---

**Note:** It is recommended that you fully inspect the replacement PSU before installing.

---

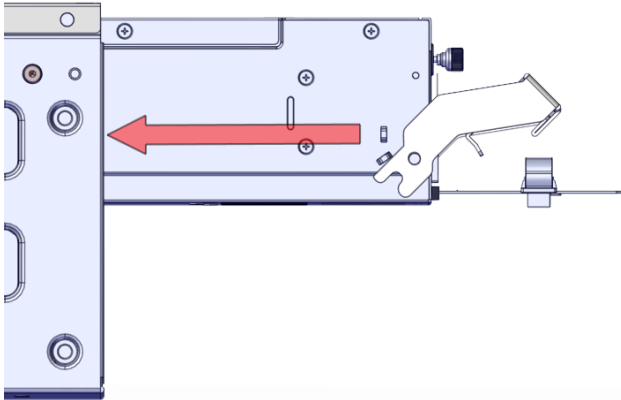
13. Ensure the PSU handle is unlocked and opened to a 45 degree angle.

**Figure 14: Power Supply Unit Unlocked Handle**



14. Push the PSU into the PSU slot until fully seated.

**Figure 15: Seated Power Supply Unit**



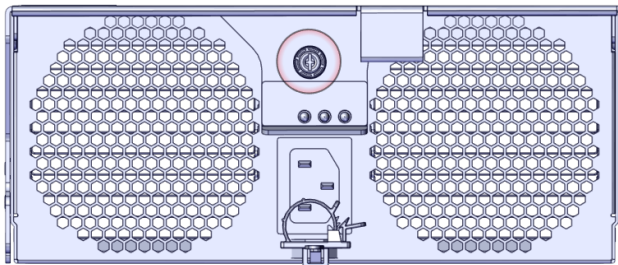
15. Press the PSU handle into the PSU until secured.

**Figure 16: Locked Handle Power Supply Unit Handle**



16. Turn the thumb screws clockwise until tight.

**Figure 17: Power Supply Unit Thumb Screw (Clockwise)**



17. Verify the PSU is properly seated and secured.
18. Connect the power cord to the new PSU.

## 8.2 Enclosure Storage Module Replacement Procedure

The power supply units contained in the 4U60 Storage Enclosure are designed to be redundant.

### Required Tools:

- None

**Time Estimate for Replacement:** 3 minutes

To replace a Enclosure Storage Module (ESM), do the following:

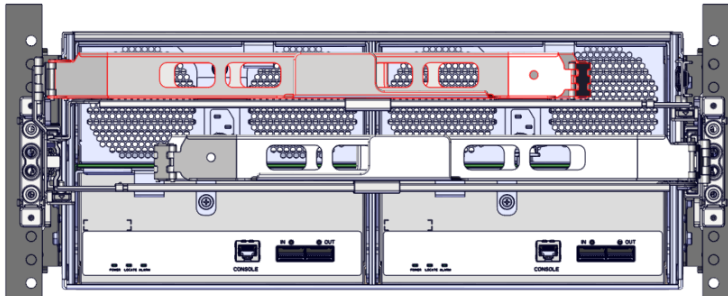
---

### Note:

- Ensure that you store all removed parts in a safe location while replacing the CRU.
  - The ESMs are hot-swappable. The enclosure does not need to be powered down in order to replace them.
- 

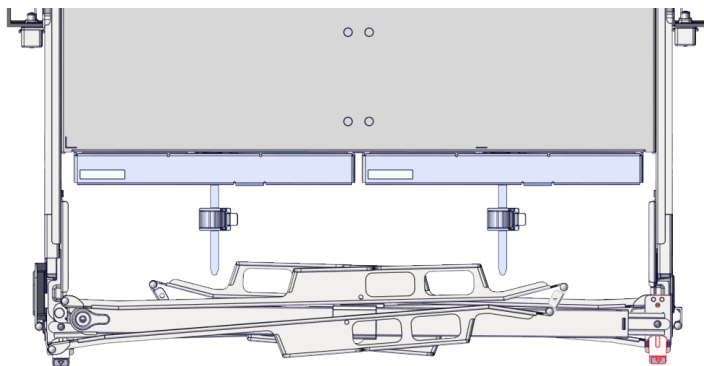
1. From the rear of the enclosure, locate the **upper** CMA arm.

**Figure 18: Upper Cable Management Assembly Arm**



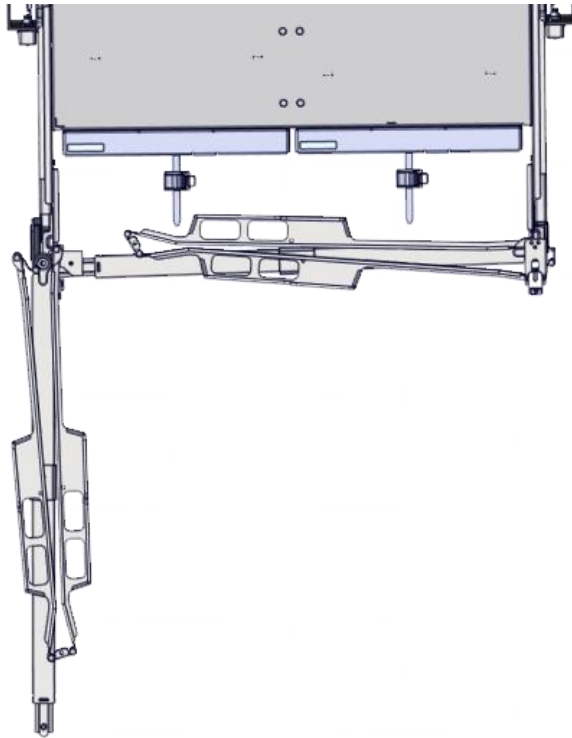
2. On the **upper** CMA arm, press down on the CMA release on the snap location.

**Figure 19: Upper Cable Management Assembly Snap Location Release**



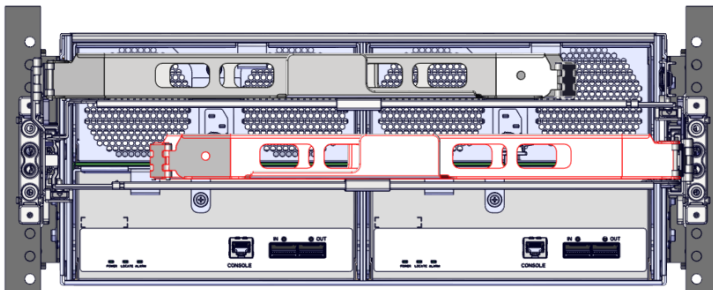
3. Swing the **upper** CMA handle away from the **lower** CMA arm.

**Figure 20: Upper Cable Management Assembly Release Handle**



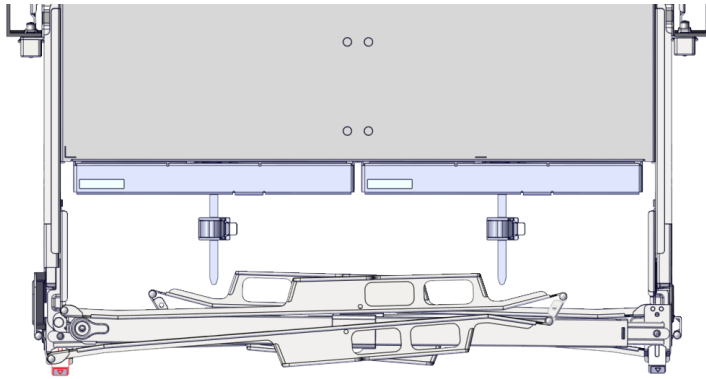
4. Locate the **lower** CMA arm.

**Figure 21: Lower Cable Management Assembly Arm**



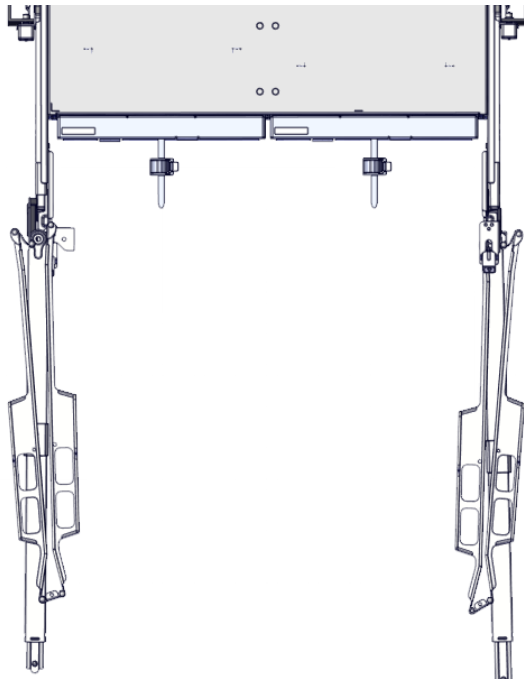
5. On the **lower** CMA arm, press down on the CMA release on the snap location.

**Figure 22: Lower Cable Management Assembly Snap Location Release**



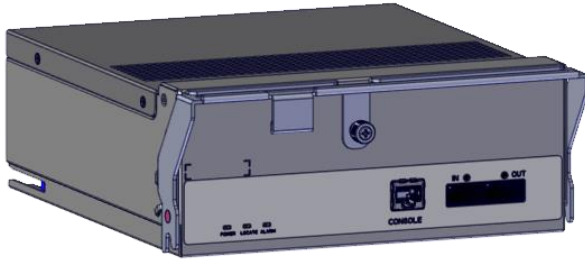
6. Swing the **lower** CMA handle away from the **upper** CMA arm.

**Figure 23: Lower Cable Management Assembly Release Handle**



7. Locate the ESM.

**Figure 24: Failed Enclosure Storage Module**



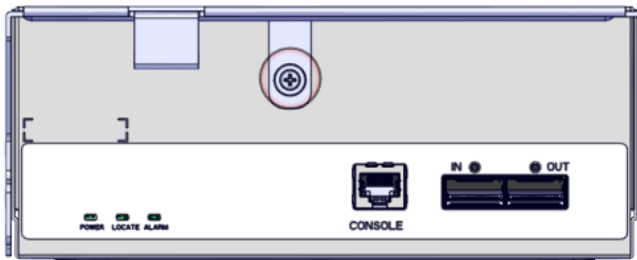
---

**Note:**

- Because the ESMs are hot-swappable, you **do not** have to power down the enclosure to replace an ESM.
- 

8. Disconnect the HD Mini-SAS cable from the ESM.
9. From the ESM, turn the thumb screw counterclockwise until fully unlocked.

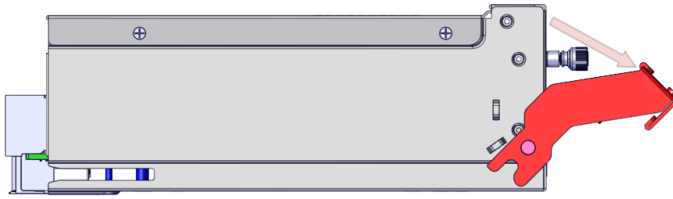
**Figure 25: Enclosure Storage Module Thumb Screw (Counterclockwise)**





10. Pull the ESM handle until the ESM is unseated from the chassis.

**Figure 26: Enclosure Storage Module Handle**



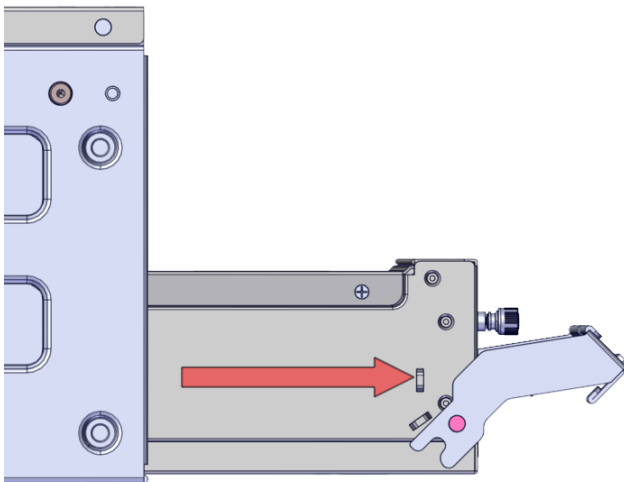
---

**Note:** The handle is highlighted in red.

---

11. Remove the ESM from the enclosure chassis.

**Figure 27: Removing the Enclosure Storage Module**



12. Remove the replacement ESM from all packaging.

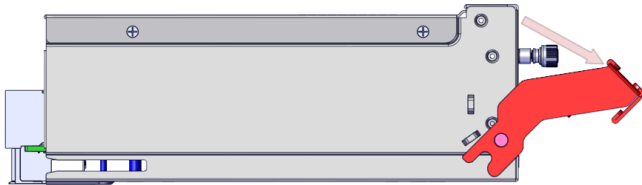
---

**Note:** It is recommended that you fully inspect the replacement ESM before installing.

---

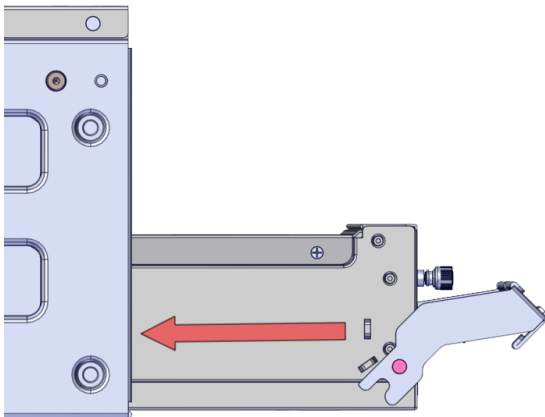
13. Ensure the ESM handle is unlocked and opened to a 45 degree angle.

**Figure 28: Enclosure Storage Module Unlocked Handle**



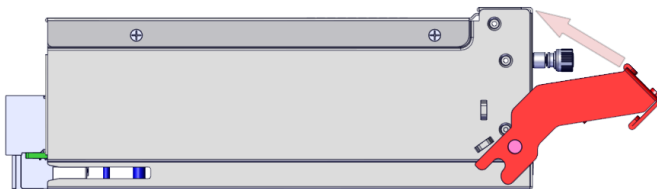
14. Push the ESM into the ESM slot until fully seated.

**Figure 29: Seated Enclosure Storage Module**



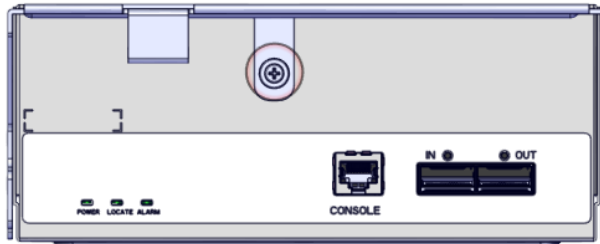
15. Press the ESM handle into the ESM until secured.

**Figure 30: Locked Enclosure Storage Module Handle**



16. Turn the thumb screws clockwise until tight.

**Figure 31: Enclosure Storage Module Thumb Screw (Clockwise)**



17. Verify the ESM is properly seated and secured.  
18. Connect the HD Mini-SAS cables to the new PSU.

### 8.3 Hard Disk Drive Replacement Procedure

**Required Tools:**

- None

**Time Estimate for Replacement:** 3 minutes

To replace a Hard Disk Drive (HDD), do the following:

**Note:**

- Ensure that you store all removed parts in a safe location while replacing the CRU.
- The HDDs are hot-swappable. The enclosure does not need to be powered down in order to replace them.

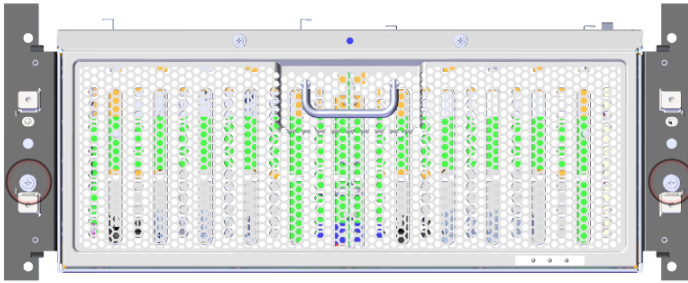
The following table displays the list of approved hard disk drives for the 4U60 Storage Enclosure:

**Table 4: 4U60 Storage Enclosure Qualified Hard Drives**

Model	Family	Capacity	Format
HUH7280xxALN60y	Ultrastar He8 helium	8TB	SAS 4KN SE
HUH7280xxALE60y	Ultrastar He8 helium	8TB	SAS 512e SE
HUH7280xxAL420y	Ultrastar He8 helium	8TB	SAS 4KN SE
HUH7280xxAL520y	Ultrastar He8 helium	8TB	SAS 512e SE

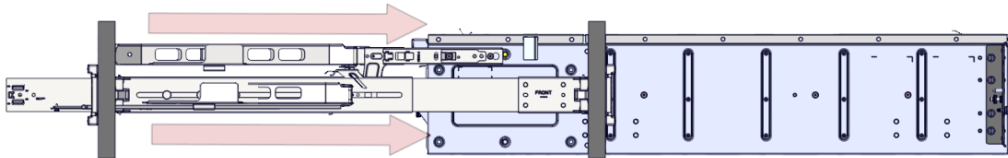
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 32: Enclosure Thumb Screws (Counterclockwise)**



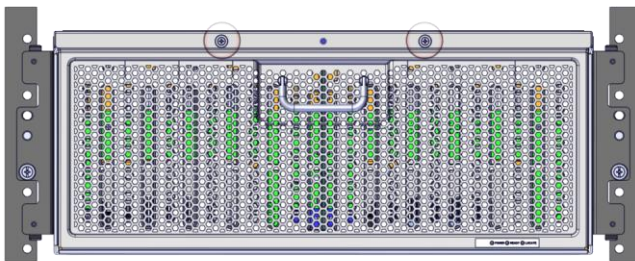
2. From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 33: Extended Enclosure**



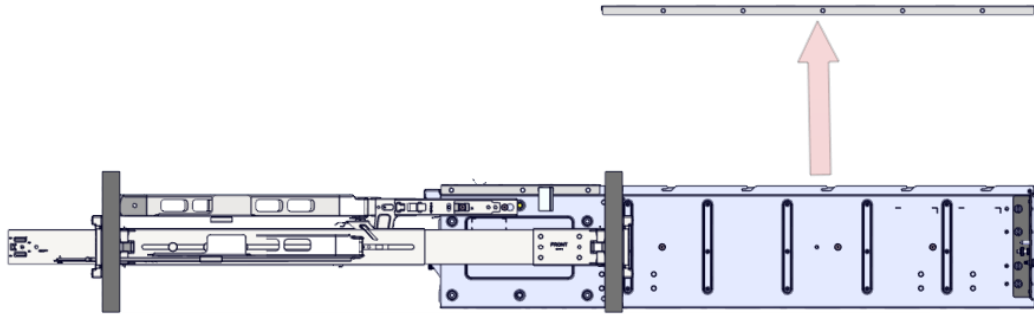
3. From the top of the enclosure, locate the thumb screws securing the lid of the enclosure.

**Figure 34: Enclosure Cover Thumb Screws (Counterclockwise)**



4. Turn the thumb screws counterclockwise until the cover is unsecured from the chassis.
5. Slide the cover towards the front of the enclosure.
6. Pull the cover off of the enclosure.

**Figure 35: Removing the Enclosure Cover**



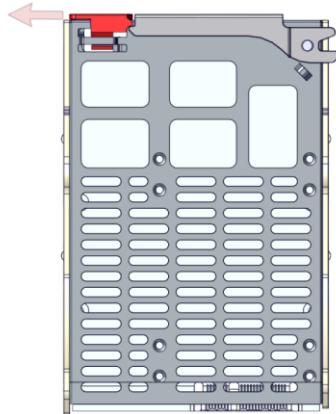
---

**Note:** To avoid damage to the cover, store in a safe location.

---

7. From the first HDD, slide the HDD carrier slider towards the rear of the enclosure.

**Figure 36: Hard Disk Drive Carrier Slider**



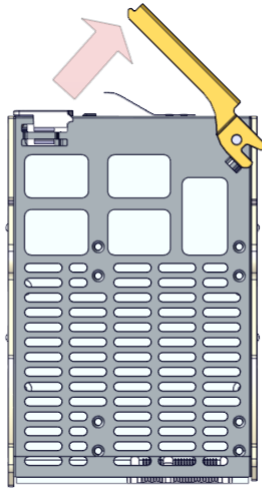
---

**Note:**

- The HDD carrier will give audible click the carrier handle will release.
  - It is highly recommended to begin with HDD **00** and work up in numerical order.
-

- Lift the HDD carrier handle until it stops.

**Figure 37: Hard Disk Drive Carrier Handle**



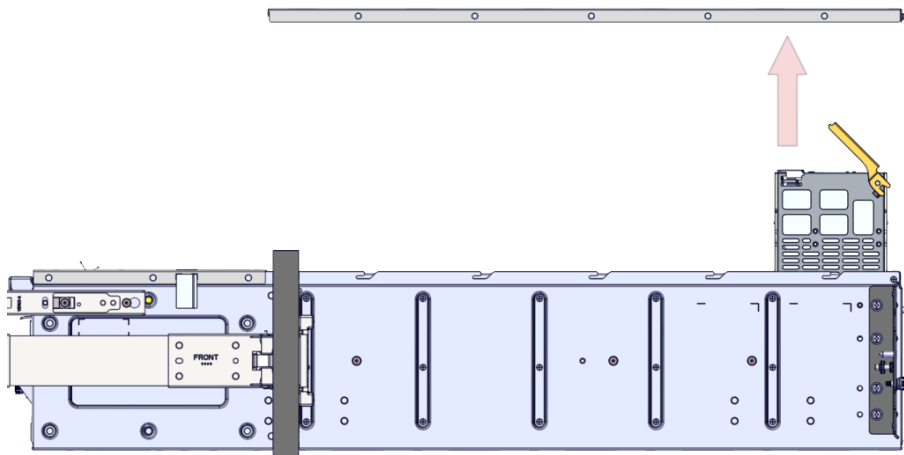
---

**Note:** The HDD carrier lid should open until about a 45 degree angle.

---

- From the carrier handle, pull the hard drive up and out of the enclosure.

**Figure 38: Removing the Hard Disk Drive**



- Unpack the replacement HDD.
- From the enclosure, locate the drive bay labeled **00**.
- Line up the HDD with the connector on the board.

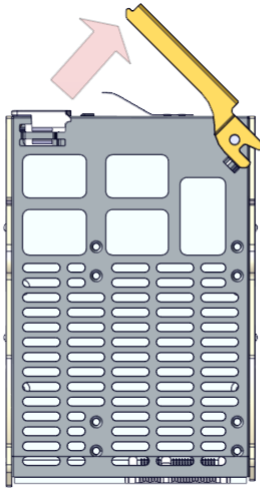
---

**Note:** Ensure that the arrow on the HDD carrier is pointing towards the rear of the enclosure.

---

- Using the HDD carrier slider button, push the HDD into the drive bay.

**Figure 39: Hard Disk Drive Carrier Handle**



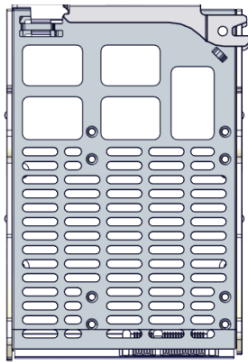
---

**Note:** The HDD carrier handle should open until about a 45 degree angle.

---

- Once the HDD stops, push the HDD carrier handle until it is latched.

**Figure 40: Latched Hard Disk Drive Carrier Handle**



---

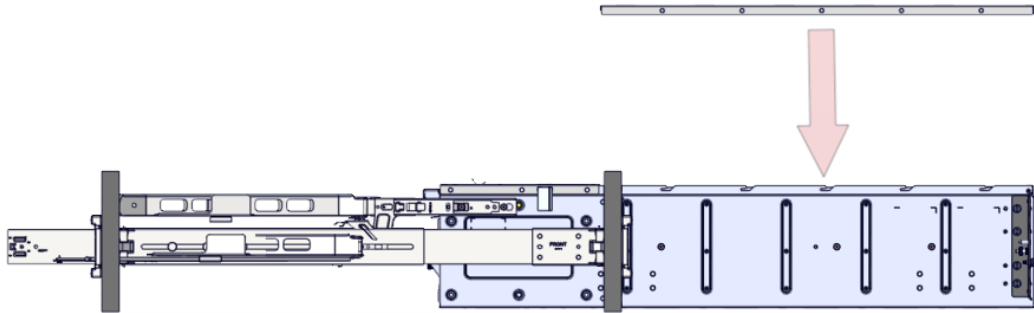
**Note:** The latch will give an audible click when properly seated.

---

- Locate the chassis cover that had been stored away.

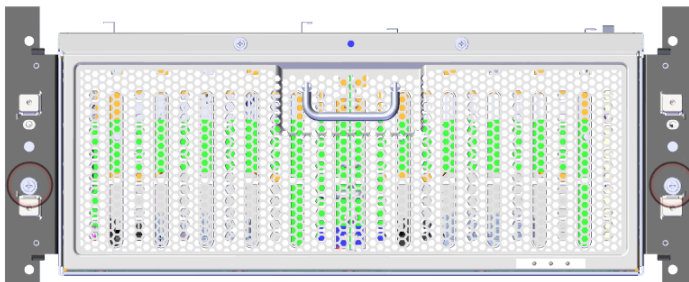
16. Place the chassis cover over the drive bay.

**Figure 41: Chassis Cover Installation**



17. Slide the chassis cover towards the rear of the chassis until fully seated.
18. From the front of the enclosure, on the chassis cover, turn the thumb screws clockwise.
19. From the front of the rack, push the enclosure into the rack until fully seated.
20. From the front of the enclosure, turn the thumb screws that secure the enclosure in the rack clockwise.

**Figure 42: Enclosure Thumb Screws (Counterclockwise)**



21. Verify that the thumb screws have been tightened until snug.

## 8.4 Cable Management Assembly Replacement Procedure

**Required Tools:**



- None

**Time Estimate for Replacement: 8 minutes**

To replace a cable management assembly (CMA), do the following:

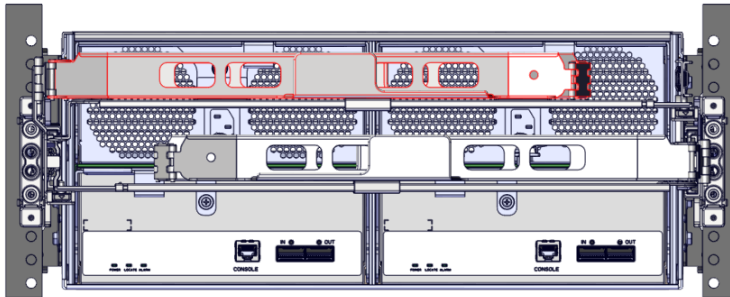
---

**Note:** Ensure that you store all removed parts in a safe location while replacing the CRU.

---

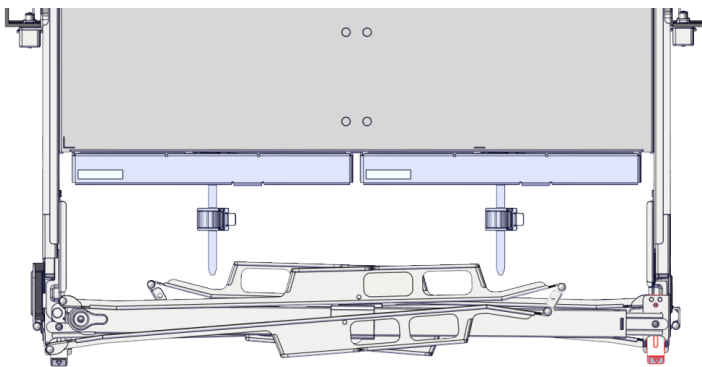
1. From the rear of the enclosure, locate the **upper** CMA arm.

**Figure 43: Upper Cable Management Assembly Arm**



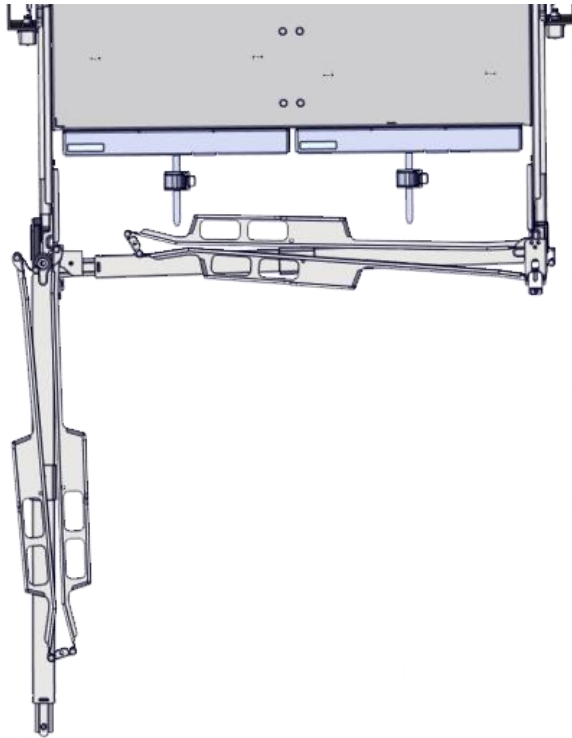
2. On the **upper** CMA arm, press down on the CMA release on the snap location.

**Figure 44: Upper Cable Management Assembly Snap Location Release**



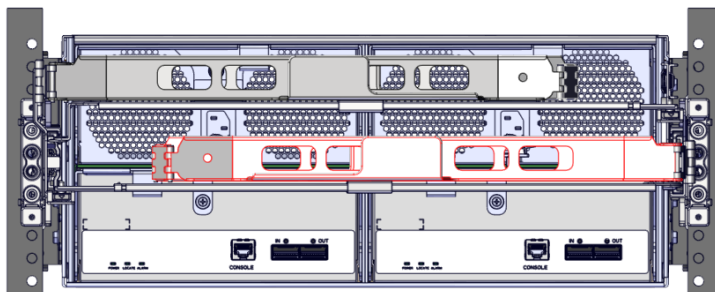
3. Swing the **upper** CMA handle away from the **lower** CMA arm.

**Figure 45: Upper Cable Management Assembly Release Handle**



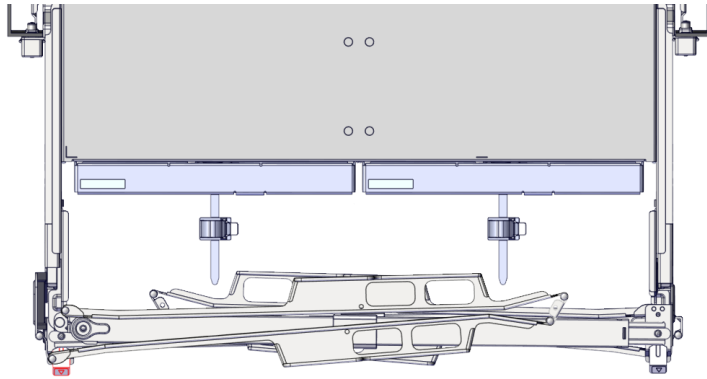
4. Locate the **lower** CMA arm.

**Figure 46: Lower Cable Management Assembly Arm**



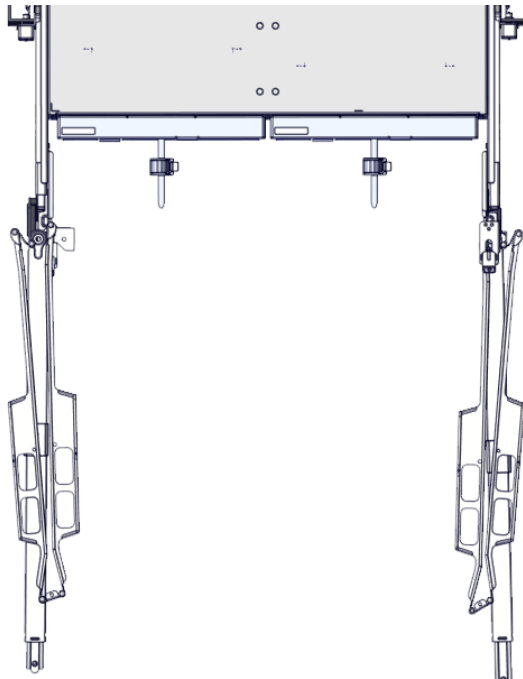
5. On the **lower** CMA arm, press down on the CMA release on the snap location.

**Figure 47: Lower Cable Management Assembly Snap Location Release**



6. Swing the **lower** CMA handle away from the **upper** CMA arm.

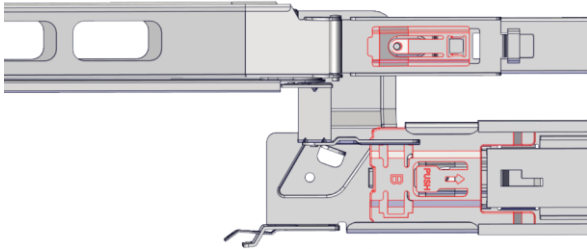
**Figure 48: Lower Cable Management Assembly Release Handle**



7. Remove the cable straps and cables from the CMA arms.

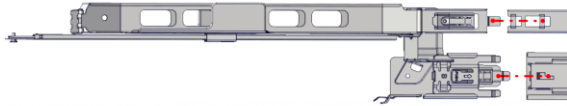
- From the inside of the **Upper** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 49: Top and Bottom Cable Management Assembly Connectors (Upper Arm)**



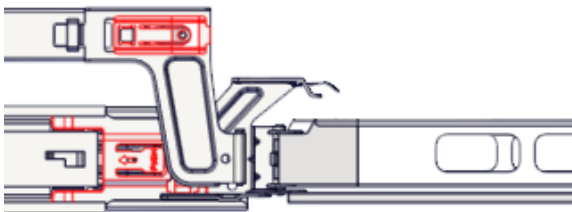
- Pull the **Upper** arm away from the rack mount rail and CMA bracket.

**Figure 50: Removing the Upper Cable Management Assembly Arm**



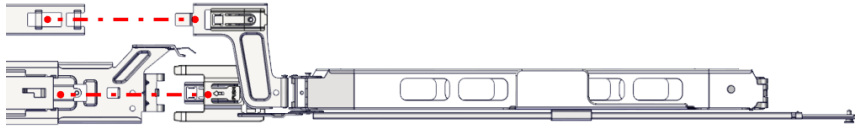
- From the inside of the **Lower** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 51: Top and Bottom Cable Management Assembly Connectors (Lower Arm)**



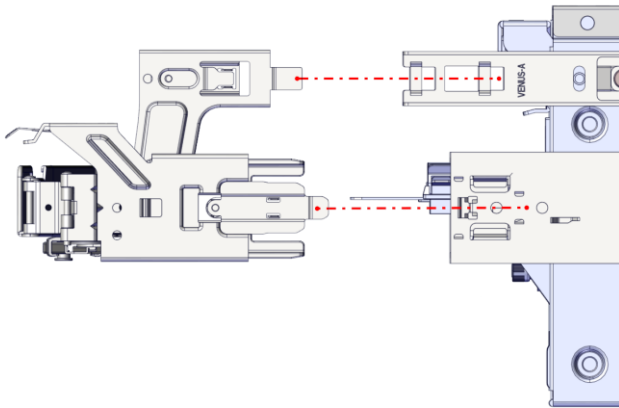
11. Pull the **Lower** arm away from the rack mount rail and CMA bracket.

**Figure 52: Removing the Lower Cable Management Assembly Arm**



12. Unpack the replacement CMA kit.
13. Locate the CMA arm labeled **Lower**.
14. Press the lower CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 53: Installing the Lower Cable Management Assembly**



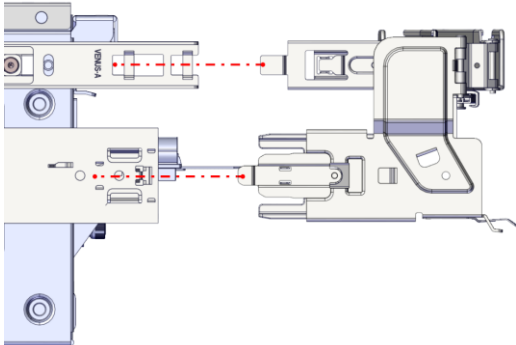
**Note:**

- The top tab should slide into the inside middle hole on the CMA bracket.
- When facing the rear of the enclosure, the lower CMA arm will be installed into the right side of the enclosure.
- When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is insert into the inside first hole on the CMA bracket.

15. Swing the CMA arm away from the enclosure.
16. Locate the CMA arm labeled **Upper**.

17. Press the upper CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 54: Installing the Upper Cable Management System**



- When facing the rear of the enclosure, the upper CMA arm will be installed into the left side of the enclosure.
  - When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is insert into the inside first hole on the CMA bracket.
18. From the rear of the enclosure, plug the power cord into the Power Supply Unit (PSU).
  19. Loosely run the power cord through the cable management assembly (CMA).

---

**Note:** By the CMA design, the cables are intended to be installed into the CMA arm on the side of the PSU or EMS.

---

20. At the elbow of the CMA, ensure you leave about two inches of slack in the power cord.
21. Using Velcro straps, attach the cable to the CMA.
22. To ensure the power cord has the proper amount of slack, push the enclosure into the rack.

---

**Note:**

- If the cables appear to be **too tight**, increase the amount of slack in the cable.
  - If the cables appear to be **too loose**, decrease the amount of slack in the cable.
- 

23. Follow the same procedure, on the opposite side, to install the remaining power cord.
24. From the rear of the enclosure, plug the HD Mini-SAS cable into the Enclosure Storage Module (ESM).
25. Loosely run the cable through the cable management assembly (CMA).

---

**Note:** By the CMA design, the cables are intended to be installed into the CMA arm on the side of the PSU or EMS.

---

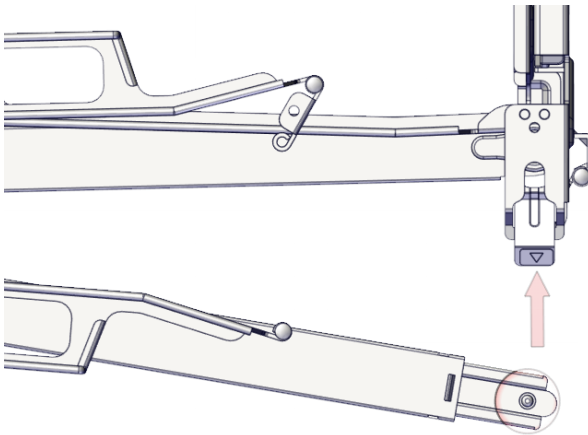
26. At the elbow of the CMA, ensure you leave about two inches of slack in the cable.
27. Using Velcro straps, attach the cable to the CMA.
28. To ensure the cable has the proper amount of slack, push the enclosure into the rack.

---

**Note:**

- If the cables appear to be **too tight**, increase the amount of slack in the cable.
  - If the cables appear to be **too loose**, decrease the amount of slack in the cable.
- 

29. Follow the same procedure, on the opposite side, to install the remaining HD Mini-SAS cable.
30. From the **Lower** cable management system arm, line up the CMA handle with the CMA snap location.

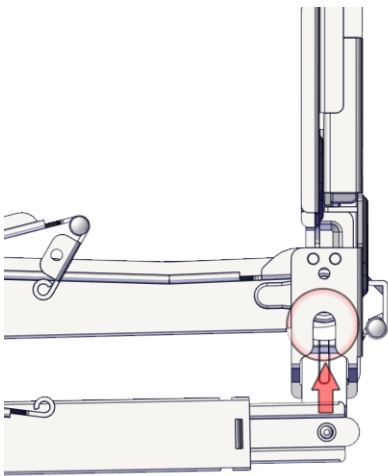
**Figure 55: Snapping the Lower CSM Handle into the Upper Snap Location**

---

**Note:** The CMA snap location for the **Lower** arm is attached to the **Upper** CMA arm.

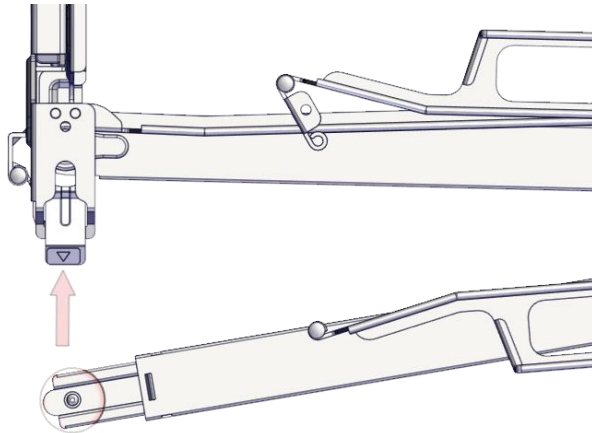
---

31. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 56: Securing the Lower CMA Handle within the Upper Snap Location**

32. From the **Upper** CMA arm, line up the CMA handle with the CMA snap location.

**Figure 57: Snapping the Upper CMA Handle into the Lower Snap Location**



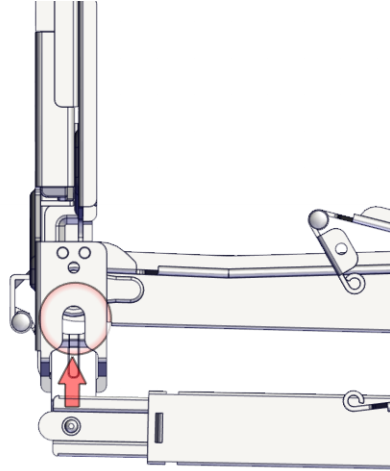
---

**Note:** The CMA snap location for the **Upper** arm is attached to the **Lower** CMA arm.

---

33. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 58: Securing the Upper CMA Handle within the Lower Snap Location**



34. Verify both arms are securely attached to the CMA bracket and rail kit.
35. Verify both CMA handles are securely attached to the CMA snap locations.

## 8.5 Power Cord Replacement Procedure

### Required Tools:

- None



**Time Estimate for Replacement: 6-7 minutes**

To replace a power cord, do the following:

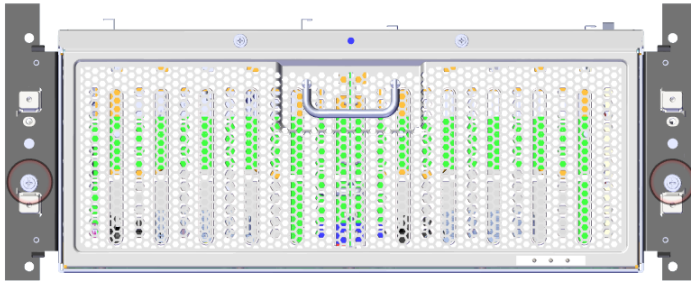
---

**Note:** Ensure that you store all removed parts in a safe location while replacing the CRU.

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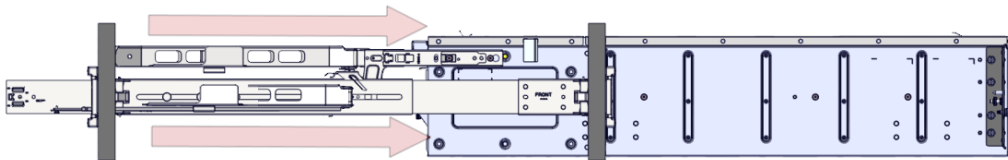
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 59: Enclosure Thumb Screws (Counterclockwise)**



2. From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 60: Extended Enclosure**



3. From the rear of the enclosure, remove the cable management straps that attach the power cord to the CMA.
4. Remove the failed power cord from the PSU.
5. Remove the power cord from the CMA.
6. From the rear of the enclosure, plug the power cord into the Power Supply Unit (PSU).
7. Loosely run the power cord through the cable management assembly (CMA).

---

**Note:** By the CMA design, the cables are intended to be installed into the CMA arm on the side of the PSU or EMS.

---

8. At the elbow of the CMA, ensure you leave about two inches of slack in the power cord.
9. Using Velcro straps, attach the cable to the CMA.
10. To ensure the power cord has the proper amount of slack, push the enclosure into the rack.

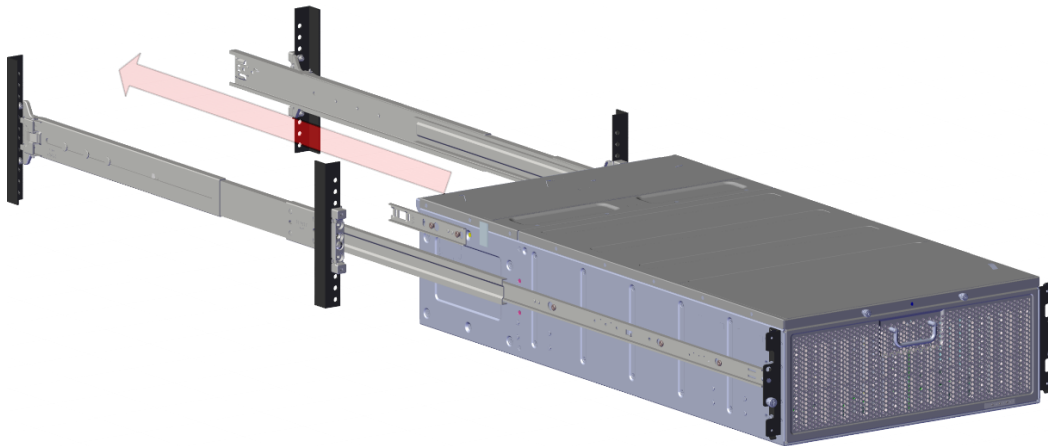
---

**Note:**

- If the cables appear to be **too tight**, increase the amount of slack in the cable.
  - If the cables appear to be **too loose**, decrease the amount of slack in the cable.
- 

11. Follow the same procedure, on the opposite side, to install the remaining power cord.
12. Push the chassis into the rack mount rails until the chassis is fully seated into the rack.

**Figure 61: Sliding the Chassis into the Rack**



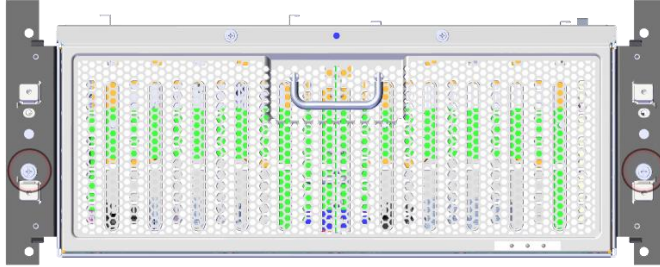
---

**Note:** If you are met with any resistance while completing this step, verify that the slide rails and rack mount rails are properly lined up.

---

13. To secure the chassis in the seated position, press and turn the thumb screw counterclockwise until they are tight.

**Figure 62: Tightening Chassis Thumb Screws**



## 8.6 Mini-SAS Cable Replacement Procedure

### Required Tools:

- None

**Time Estimate for Replacement:** 6-7 minutes

To replace a Mini-SAS Cable, do the following:

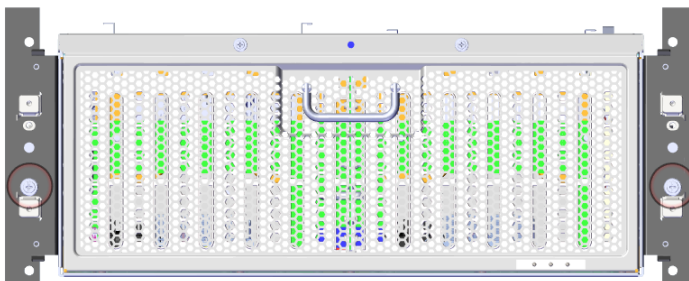
---

**Note:** Ensure that you store all removed parts in a safe location while replacing the CRU.

---

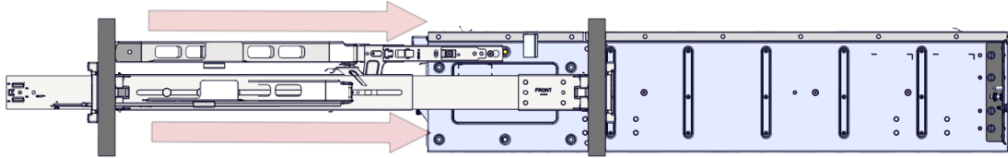
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 63: Enclosure Thumb Screws (Counterclockwise)**



- From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 64: Extended Enclosure**



- From the rear of the enclosure, remove the cable management straps that attach the HD Mini-SAS cable to the CMA.
- Remove the failed HD Mini-SAS cable from the PSU.
- Remove the HD Mini-SAS cable from the CMA.
- From the rear of the enclosure, plug the HD Mini-SAS cable into the Enclosure Storage Module (ESM).
- Loosely run the cable through the cable management assembly (CMA).

---

**Note:** By the CMA design, the cables are intended to be installed into the CMA arm on the side of the PSU or EMS.

---

- At the elbow of the CMA, ensure you leave about two inches of slack in the cable.
- Using Velcro straps, attach the cable to the CMA.
- To ensure the cable has the proper amount of slack, push the enclosure into the rack.

---

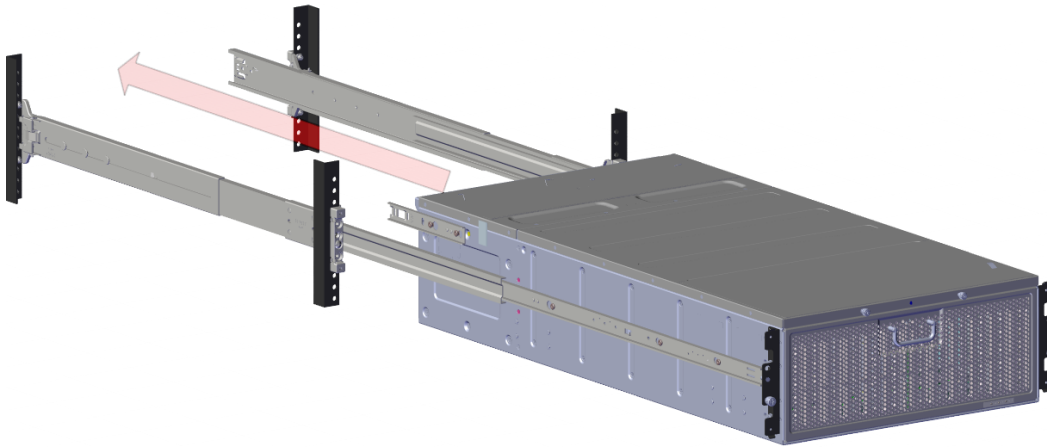
**Note:**

- If the cables appear to be **too tight**, increase the amount of slack in the cable.
  - If the cables appear to be **too loose**, decrease the amount of slack in the cable.
- 

- Follow the same procedure, on the opposite side, to install the remaining HD Mini-SAS cable.

12. Push the chassis into the rack mount rails until the chassis is fully seated into the rack.

**Figure 65: Sliding the Chassis into the Rack**



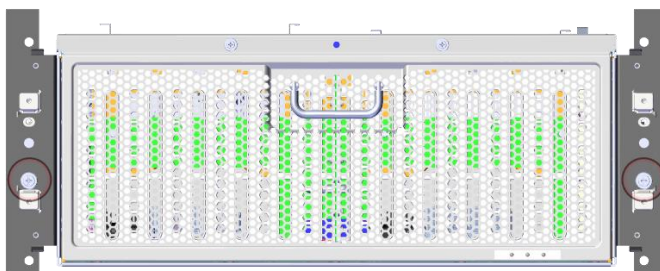
---

**Note:** If you are met with any resistance while completing this step, verify that the slide rails and rack mount rails are properly lined up.

---

13. To secure the chassis in the seated position, press and turn the thumb screw counterclockwise until they are tight.

**Figure 66: Tightening Chassis Thumb Screws**



## 8.7 Expansion Cable Replacement Procedure

### Required Tools:

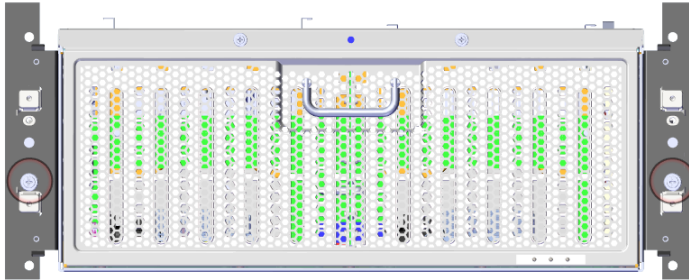
- None

**Time Estimate for Replacement: 6-7 minutes**

To replace a Expansion Cable, do the following:

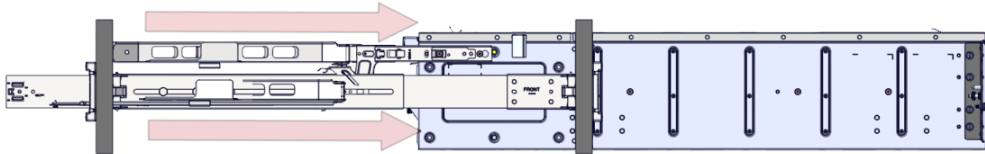
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 67: Enclosure Thumb Screws (Counterclockwise)**



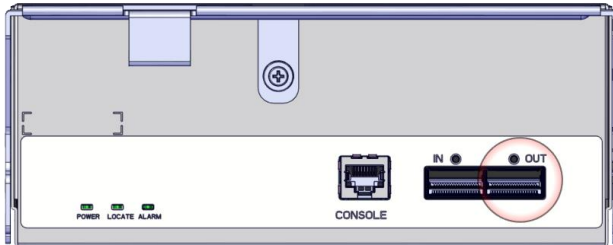
2. From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 68: Extended Enclosure**



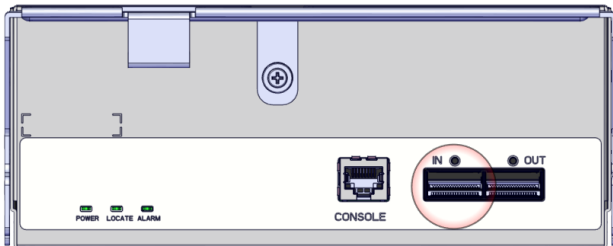
3. From the rear of the first enclosure, remove the cable from the ESM port labeled **Out**.

**Figure 69: Enclosure Storage Module (Out)**



4. Remove the cable management straps that attach the expansion cable to the CMA arms.
5. From the rear of the second enclosure, remove the cable from the ESM port labeled **In**.

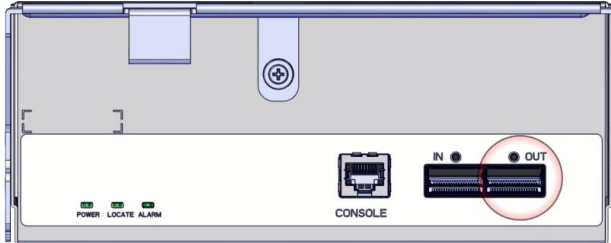
**Figure 70: Enclosure Storage Module (In)**



6. From the second enclosure, Remove the cable management straps that attach the expansion cable to the CMA arms.

7. From the rear of the enclosure, plug the expansion cable into the ESM port labeled **Out**.

**Figure 71: Enclosure Storage Module (Out)**



8. Loosely run the power cord through the cable management assembly (CMA).

---

**Note:** By the CMA design, the cables are intended to be installed into the CMA arm on the side of the PSU or EMS.

---

9. At the elbow of the CMA, ensure you leave about two inches of slack in the power cord.
10. Using Velcro straps, attach the cable to the CMA.
11. To ensure the expansion cable has the proper amount of slack, push the enclosure into the rack.

---

**Note:**

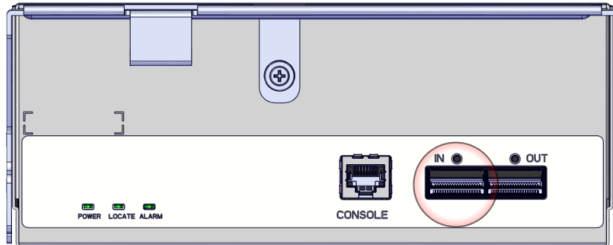
- If the cables appear to be **too tight**, increase the amount of slack in the cable.
  - If the cables appear to be **too loose**, decrease the amount of slack in the cable.
- 

12. Once the expansion cable has been run through the CMA, verify the other enclosure that you want to connect to is in range of the cable.
13. Follow the same procedure, to run the expansion cable through the second enclosure's CMA.



14. Plug the expansion cable into the port labeled **In**.

**Figure 72: Enclosure Storage Module (In)**



## 8.8 Chassis Replacement Procedure

### Required Tools:

- Number 2 Phillips-head screwdriver with torque measuring capabilities

---

**Note:** A longer screwdriver is recommended for the install of the rail kit.

---

- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

**Time Estimate for Replacement and Reinstall:** 25 minutes

To replace chassis, do the following:

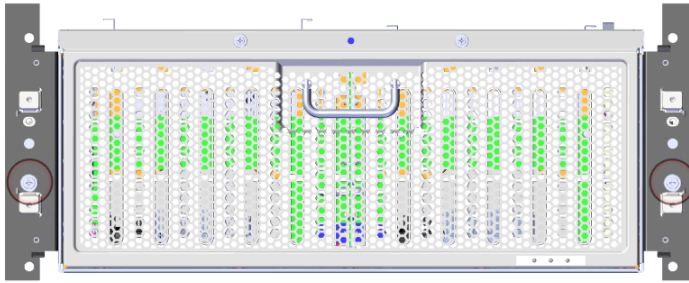
---

**Note:** Ensure that you store all removed parts in a safe location while replacing the CRU.

---

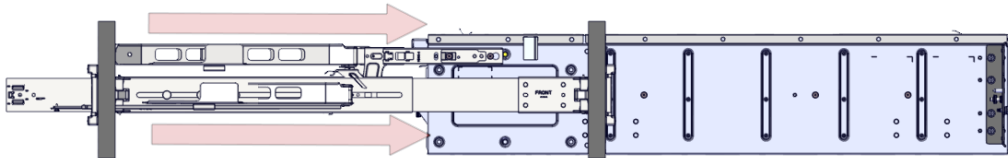
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 73: Enclosure Thumb Screws (Counterclockwise)**



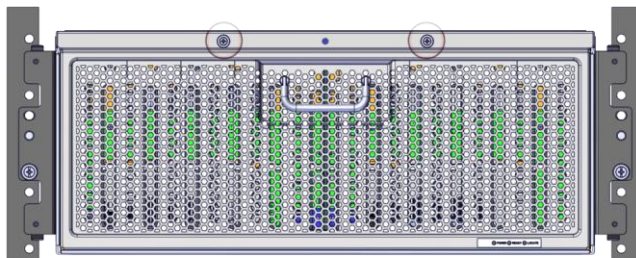
2. From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 74: Extended Enclosure**



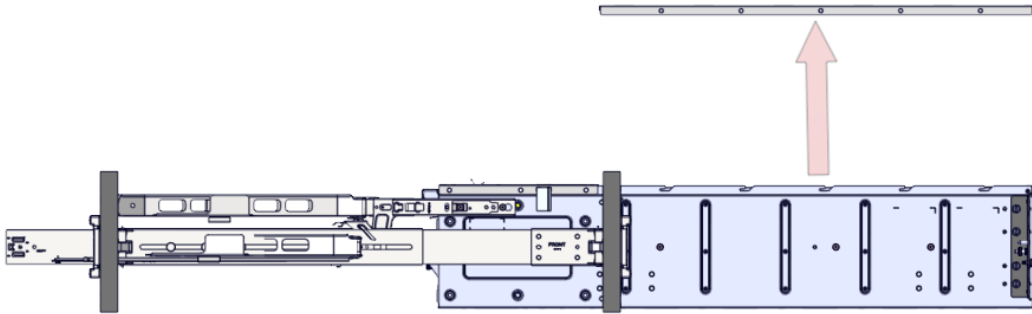
3. From the top of the enclosure, locate the thumb screws securing the lid of the enclosure.

**Figure 75: Enclosure Cover Thumb Screws (Counterclockwise)**



4. Turn the thumb screws counterclockwise until the cover is unsecured from the chassis.
5. Slide the cover towards the front of the enclosure.
6. Pull the cover off of the enclosure.

**Figure 76: Removing the Enclosure Cover**



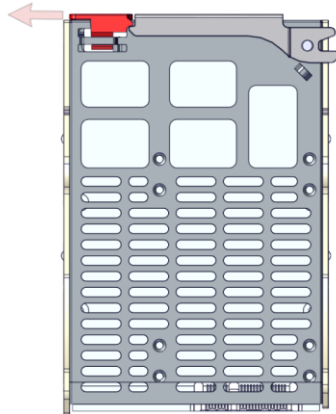
---

**Note:** To avoid damage to the cover, store in a safe location.

---

7. From the first HDD, slide the HDD carrier slider towards the rear of the enclosure.

**Figure 77: Hard Disk Drive Carrier Slider**



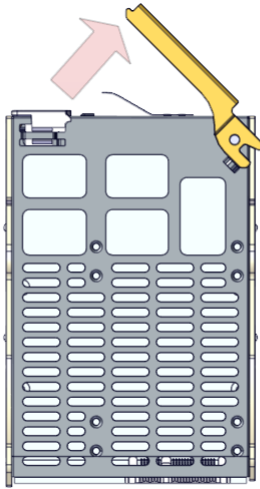
---

**Note:**

- The HDD carrier will give audible click the carrier handle will release.
  - It is highly recommended to begin with HDD **00** and work up in numerical order.
-

- Lift the HDD carrier handle until it stops.

**Figure 78: Hard Disk Drive Carrier Handle**



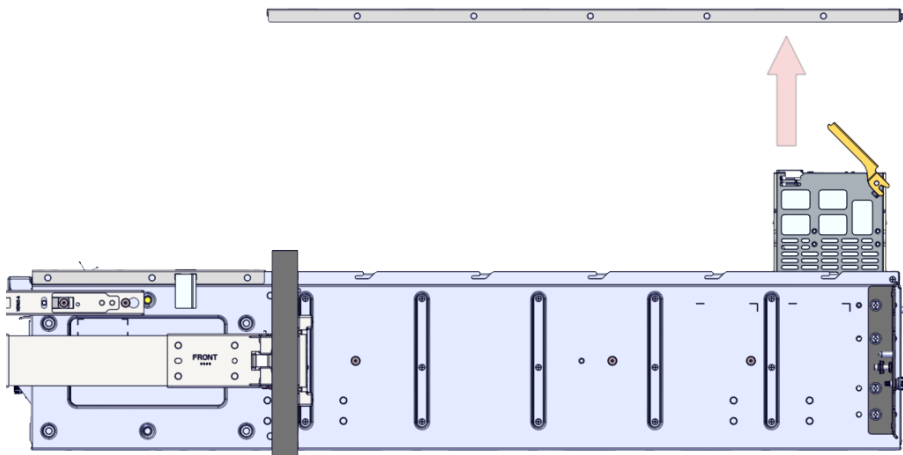
---

**Note:** The HDD carrier lid should open until about a 45 degree angle.

---

- From the carrier handle, pull the hard drive up and out of the enclosure.

**Figure 79: Removing the Hard Disk Drive**



- Store the HDDs in a safe location until you are ready to reinstall.

---

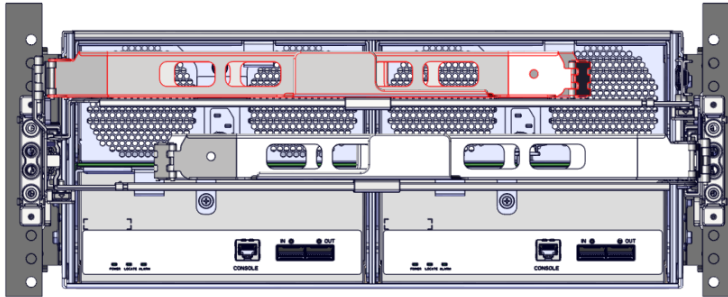
**Note:** It is highly recommended to store the HDDs in numerical order.

---

- Follow the same procedure to uninstall the remaining HDDs.

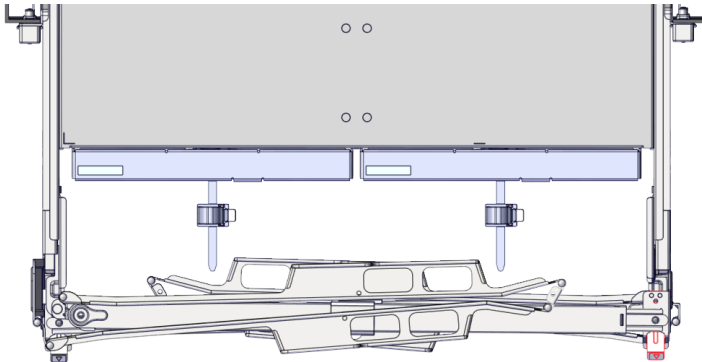
- From the rear of the enclosure, locate the **upper** CMA arm.

**Figure 80: Upper Cable Management Assembly Arm**



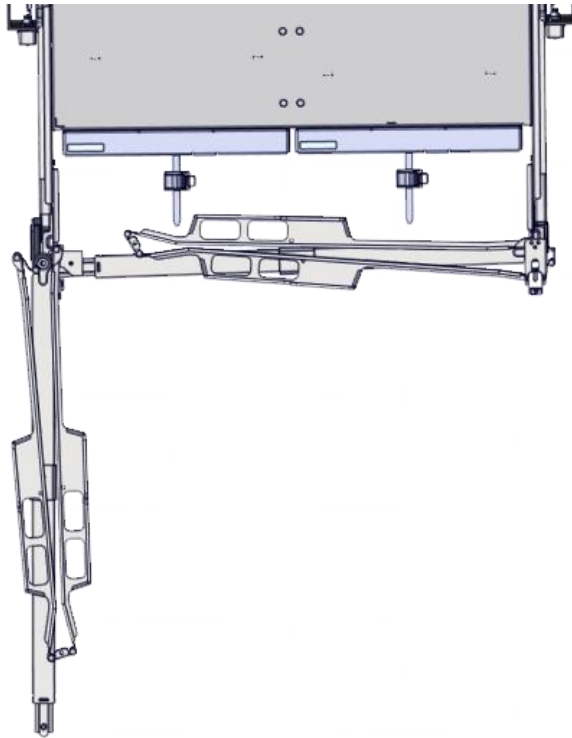
- On the **upper** CMA arm, press down on the CMA release on the snap location.

**Figure 81: Upper Cable Management Assembly Snap Location Release**



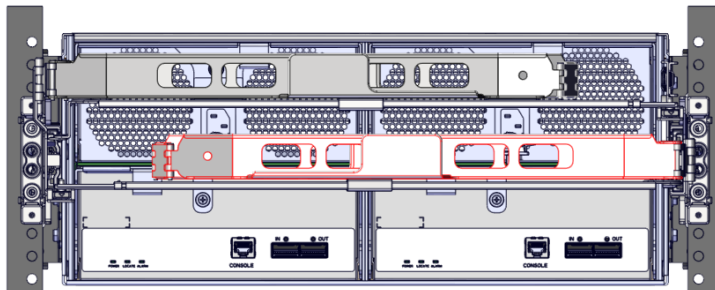
14. Swing the **upper** CMA handle away from the **lower** CMA arm.

**Figure 82: Upper Cable Management Assembly Release Handle**



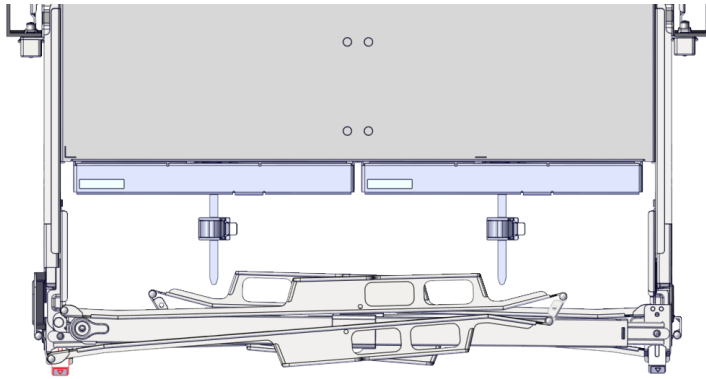
15. Locate the **lower** CMA arm.

**Figure 83: Lower Cable Management Assembly Arm**



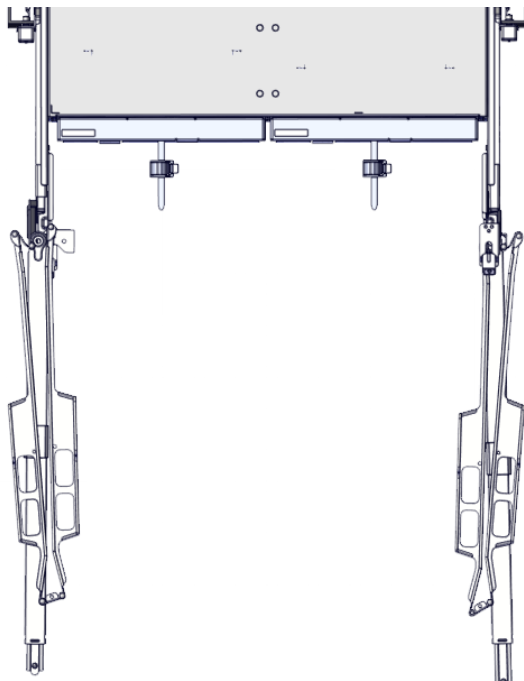
16. On the **lower** CMA arm, press down on the CMA release on the snap location.

**Figure 84: Lower Cable Management Assembly Snap Location Release**



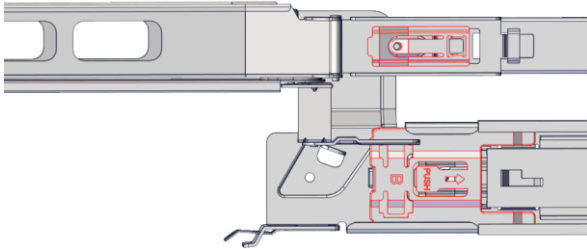
17. Swing the **lower** CMA handle away from the **upper** CMA arm.

**Figure 85: Lower Cable Management Assembly Release Handle**



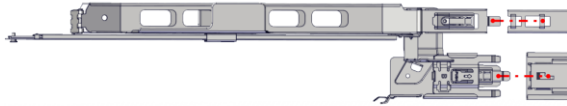
18. From the inside of the **Upper** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 86: Top and Bottom Cable Management Assembly Connectors (Upper Arm)**



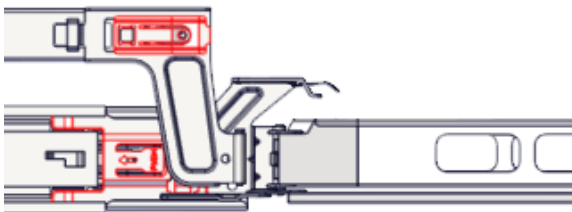
19. Pull the **Upper** arm away from the rack mount rail and CMA bracket.

**Figure 87: Removing the Upper Cable Management Assembly Arm**



20. From the inside of the **Lower** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 88: Top and Bottom Cable Management Assembly Connectors (Lower Arm)**





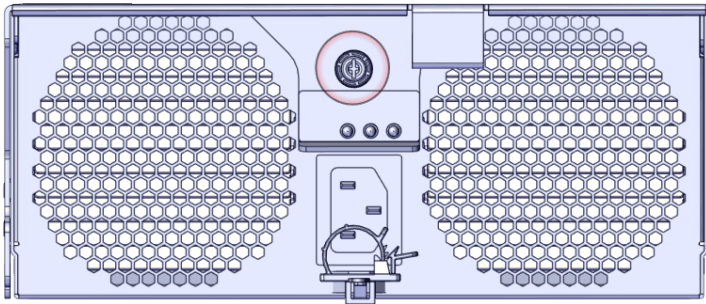
21. Pull the **Lower** arm away from the rack mount rail and CMA bracket.

**Figure 89: Removing the Lower Cable Management Assembly Arm**



22. Unpack the replacement CMA kit.
23. From the PSU, turn the thumb screw counterclockwise until fully unlocked.

**Figure 90: Power Supply Thumb Screw (Counterclockwise)**



24. Pull the PSU handle until the PSU is unseated from the chassis.

**Figure 91: Power Supply Unit Handle**



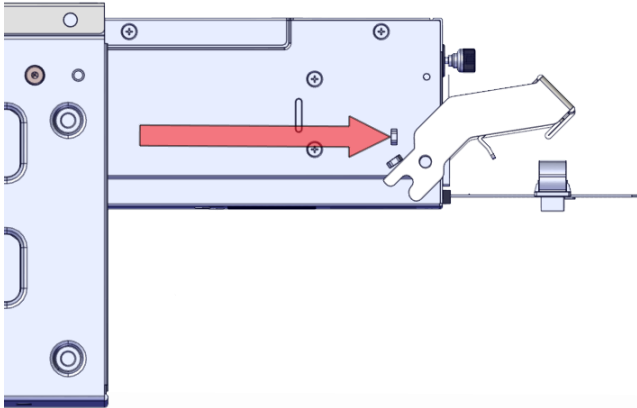
---

**Note:** The handle is highlighted in red.

---

25. Remove the PSU from the enclosure chassis.

**Figure 92: Removing the Power Supply Unit**



26. Follow the same procedure to uninstall the remaining PSU.  
27. Locate the ESM.

**Figure 93: Failed Enclosure Storage Module**



---

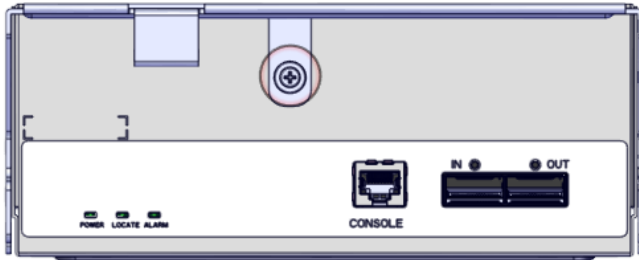
**Note:**

- Because the ESMs are hot-swappable, you **do not** have to power down the enclosure to replace an ESM.
- 

28. Disconnect the HD Mini-SAS cable from the ESM.

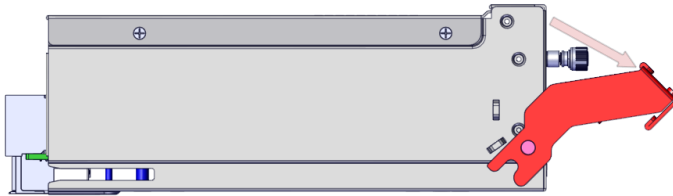
29. From the ESM, turn the thumb screw counterclockwise until fully unlocked.

**Figure 94: Enclosure Storage Module Thumb Screw (Counterclockwise)**



30. Pull the ESM handle until the ESM is unseated from the chassis.

**Figure 95: Enclosure Storage Module Handle**



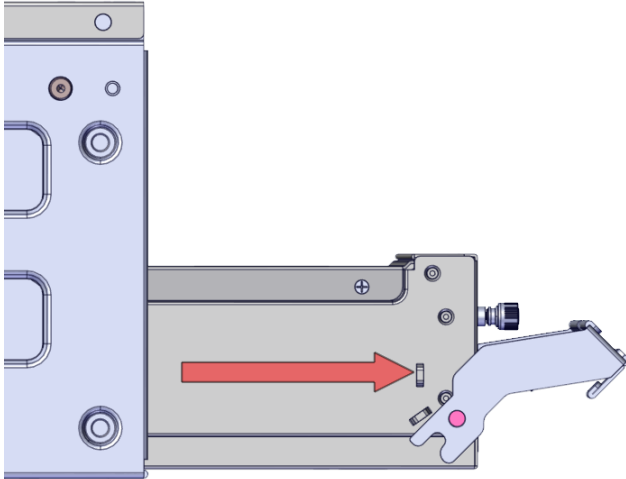
---

**Note:** The handle is highlighted in red.

---

31. Remove the ESM from the enclosure chassis.

**Figure 96: Removing the Enclosure Storage Module**



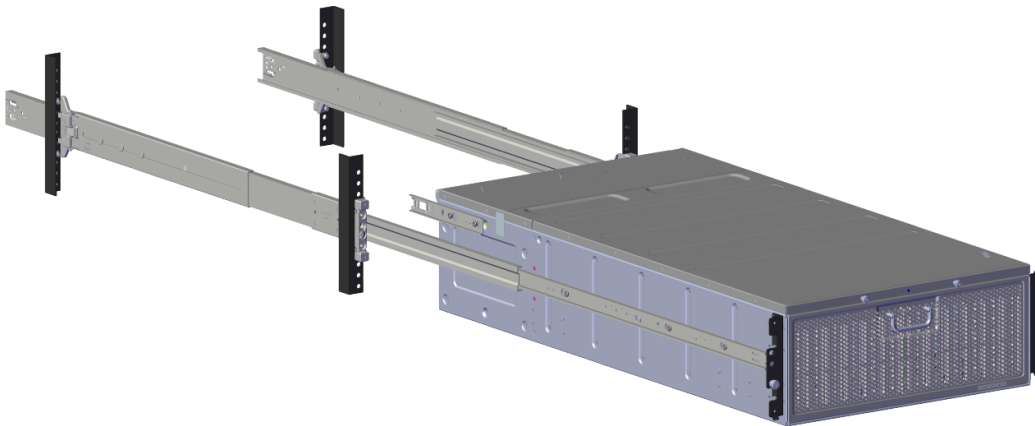
32. Follow the same procedure to uninstall the remaining ESM.
33. From the front of the rack, pull the enclosure until the rails lock at the maximum extension.

---

**Note:** There is a red line marking the maximum extension of the chassis while it is locked in. Once you have the chassis extended past that line, it is unlocked from the rack mount rails.

---

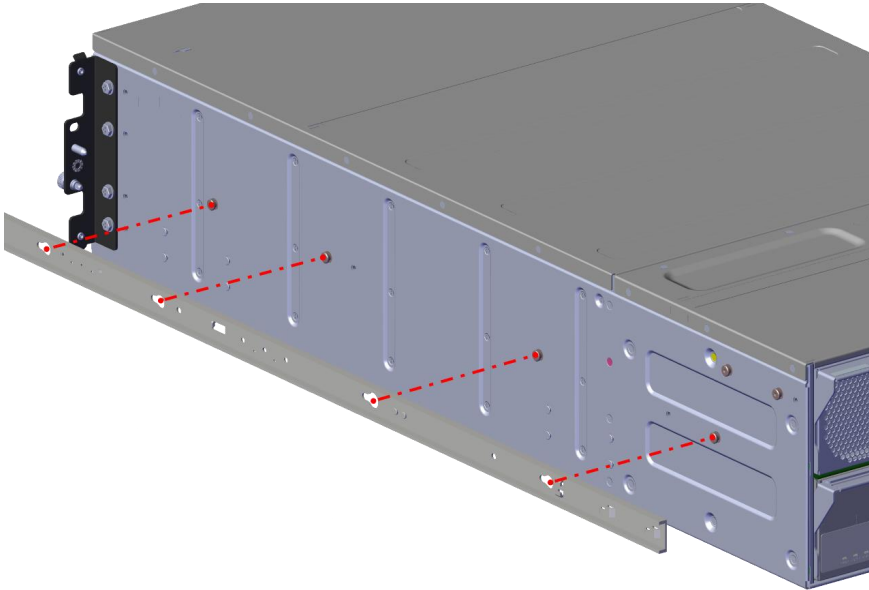
**Figure 97: Enclosure Maximum Extension**



34. On the inner rails, slide the white slider towards the front of the enclosure.
35. Completely remove the enclosure from the rack.

36. Using a the number 2 Philips head screw driver, remove the **2** screws that hold the inner rail to the chassis.

**Figure 98: Removing the Inner Rail**



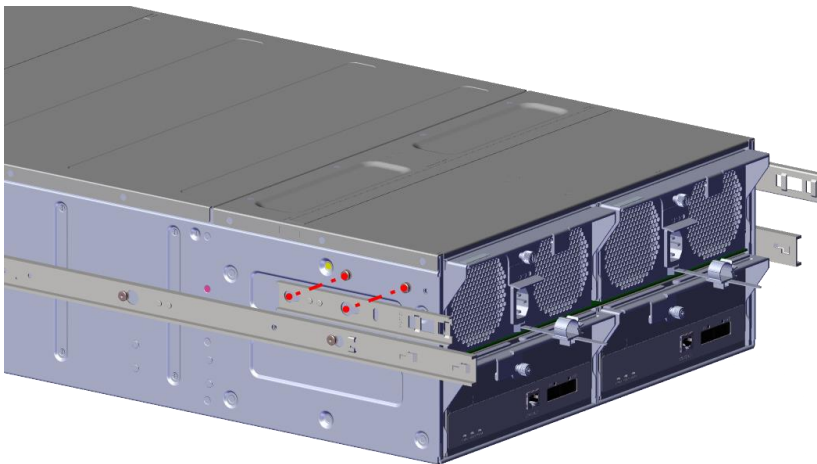
---

**Note:** Each side contains **2** screw for a total of **4** screws.

---

37. Using a the number 2 Philips head screw driver, remove the screw that hold the CMA bracket to the chassis.

**Figure 99: Removing the Cable Management Assembly**



---

**Note:** Each side contains **1** screw for a total of **2** screws.

---

To reinstall the enclosure, see: [Reinstalling the Chassis](#) on page 68.

## 8.8.1 Reinstalling the Chassis

### Required Tools:

- Number 2 Phillips-head screwdriver with torque measuring capabilities

---

**Note:** A longer screwdriver is recommended for the install of the rail kit.

---

- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

To reinstall the chassis, do the following:

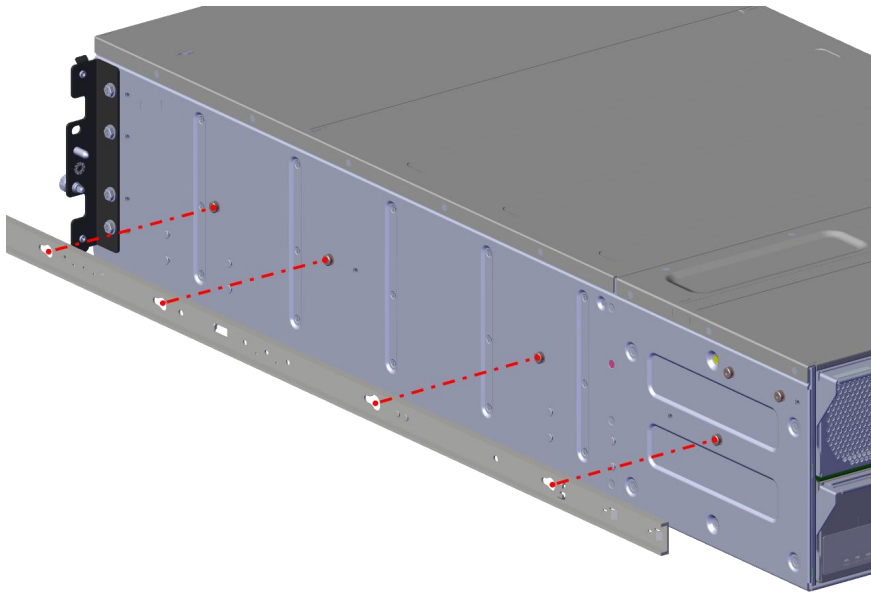
1. Unpack and prepare the replacement chassis.
2. Verify that you have all of the parts you removed from the failed chassis.
3. Line up the inner rail over the lower set of T-standoffs.

---

**Note:** Ensure the inner rail stamp marked **Front** is pointing towards the front of the enclosure.

---

**Figure 100: Lining up the Inner Rail**



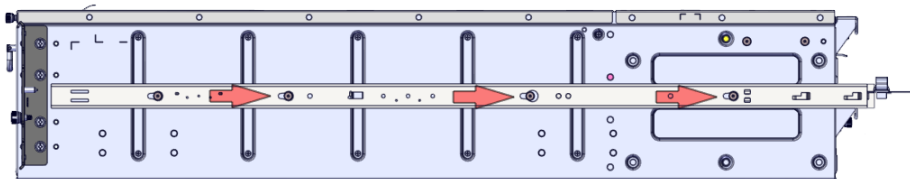
4. To lock the inner rail into place, slide the inner rail towards the rear of the chassis.

---

**Note:** The clip closest to the rear of the chassis will make an audible click when you slide the rail into place.

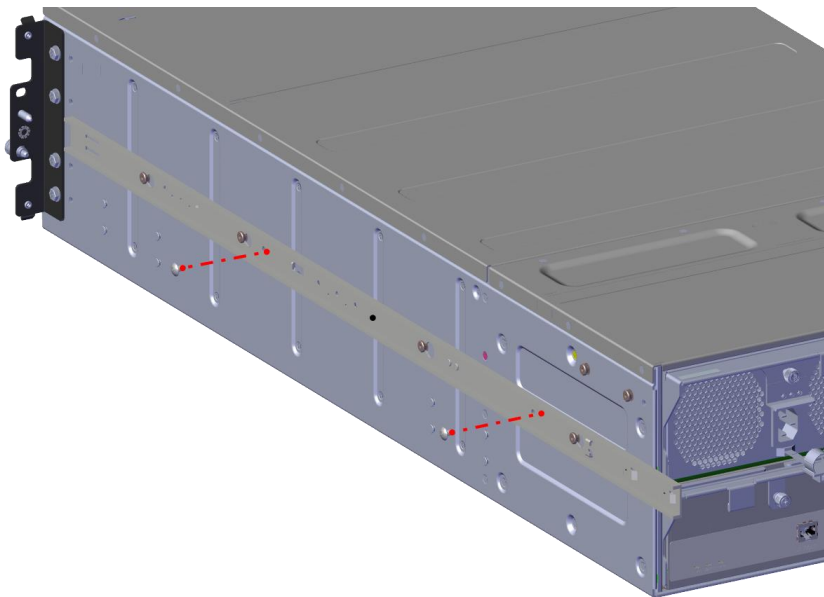
---

**Figure 101: Locking Inner Rail**



5. Using the **M4 truss-head** screws, attach the inner rail to the chassis.

**Figure 102: Attaching the Inner Rail**



---

**Note:** Each side contains **3, M4 truss-head** screws.

---

6. Verify that the screws have been tightened until snug.
7. Follow the same procedure to install the remaining inner rail.

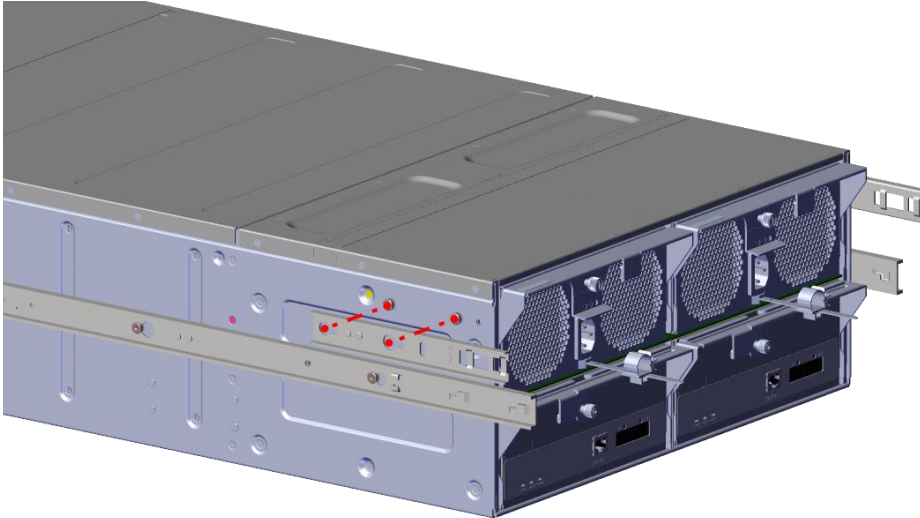
---

**Attention:** The remaining parts of rack mount rails will be used in a later portion of the installation. Please store in a safe place until needed.

---

8. On the chassis, line up the CMA bracket over the upper set of T-standoffs.

**Figure 103: Lining up the Cable Management System Brackets**

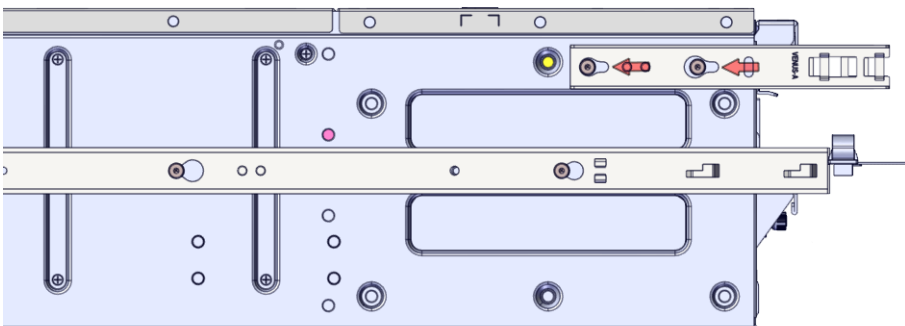


9. Press the CMA bracket into the chassis wall and slide the inner rail towards the front of the chassis.

**Note:** The clip closest to the rear of the chassis will make an audible click when you slide the rail into place.

---

**Figure 104: Locking the Cable Management System Brackets**

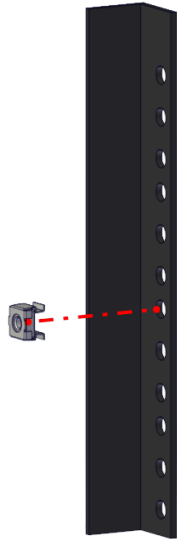


10. Follow the same procedure to install the remaining CMA bracket.



11. Determine the 4U location in which you would like to install the enclosure.
12. From the inside of the rack frame, clip the cage nuts into the holes in which you will install the rack mount rails over.

**Figure 105: Installing Cage Nuts**



---

**Note:** Ensure that the holes line up with those on the rack mount rails. The holes are one on top of the other.

---

---

**Attention:** The unit also ships with slide on cage nuts that may be used if the rack frame only contains round holes.

---

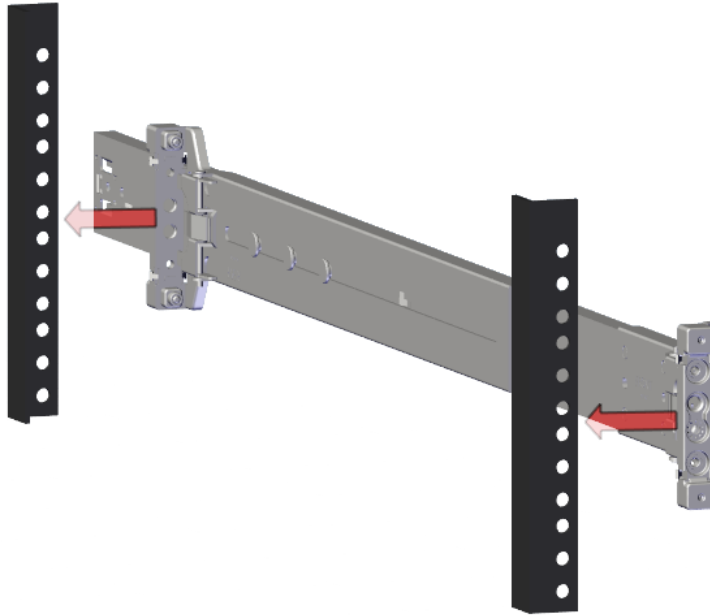
13. On the rack mount rails, locate the end labeled **FRONT**.
14. Line up the front of the rack mount rail with the 4U location you prefer to install the enclosure.

---

**Note:** The rack mount rails may be elongated by simply sliding the rear portion of the rail.

---

**Figure 106: Lining Up the Rack Mount Rails**



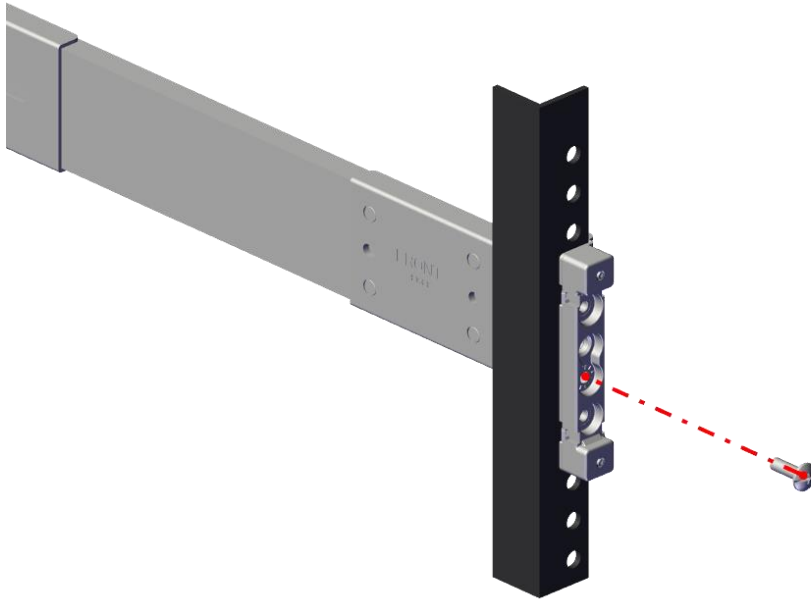
15. Snap the front and rear ends into the rack over the cage nuts.

**Figure 107: Snapping the Rack Mount Rails into the Rack**

16. Using a level, verify that the rack mount rail is level.

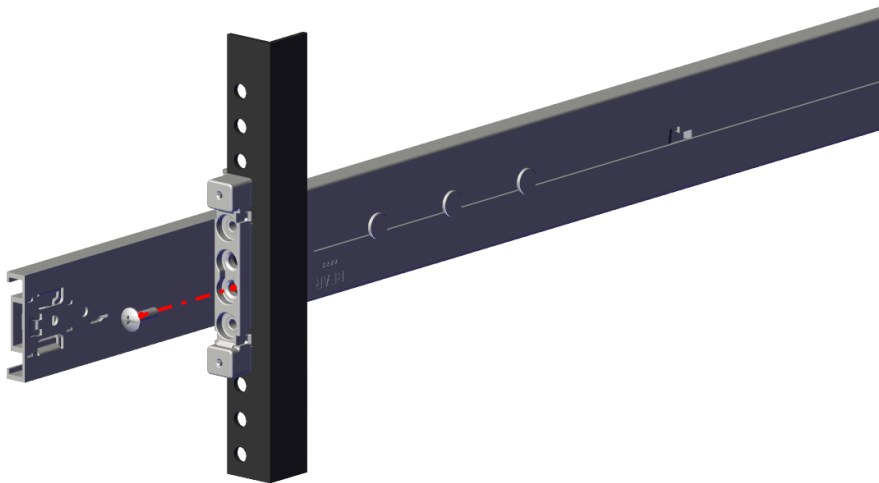
17. From the front of the rack, attach the rack mount rail into place using **one Hex flange Phillips head screw**.

**Figure 108: Attaching the Rack Mount Rails (Front)**



18. From the rear of the rack, attach the rack mount rail into place using **one Hex flange Phillips head screw**.

**Figure 109: Attaching the Rack Mount Rails (Rear)**



19. Using a level, verify that the rack mount rail is level.
20. Verify that the screws have been tightened until snug.
21. Follow the same procedure to install the remaining rack mount rail.

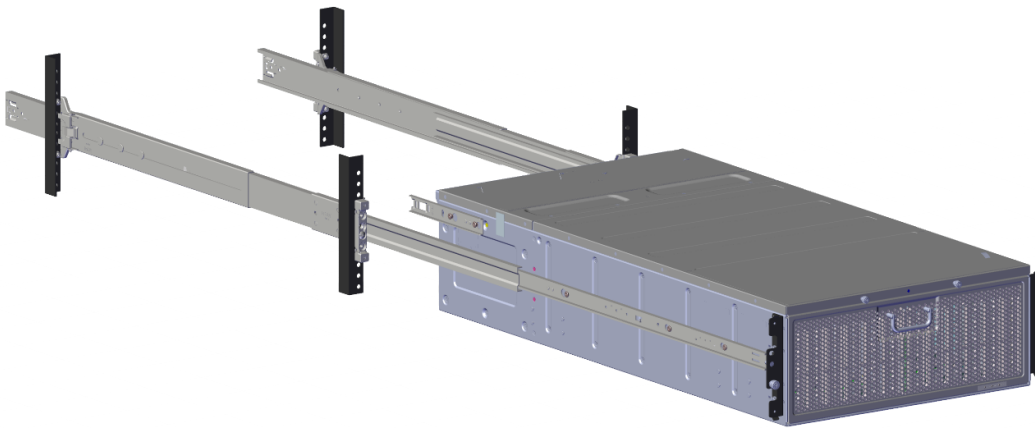
22. From the rack, fully extend the rack mount rails.

**Figure 110: Fully Extended Rack Mount Rails**



23. Line up the slide rails on the chassis with the extended rack mount rails.

**Figure 111: Lining up the Chassis on the Rack Mount Rails**



24. Push the chassis until you hear an audible click.  
The inner rails are locked into the rack mount rails.
25. From the side of the rack mount rails, slide the blue button and push the chassis towards the rack.

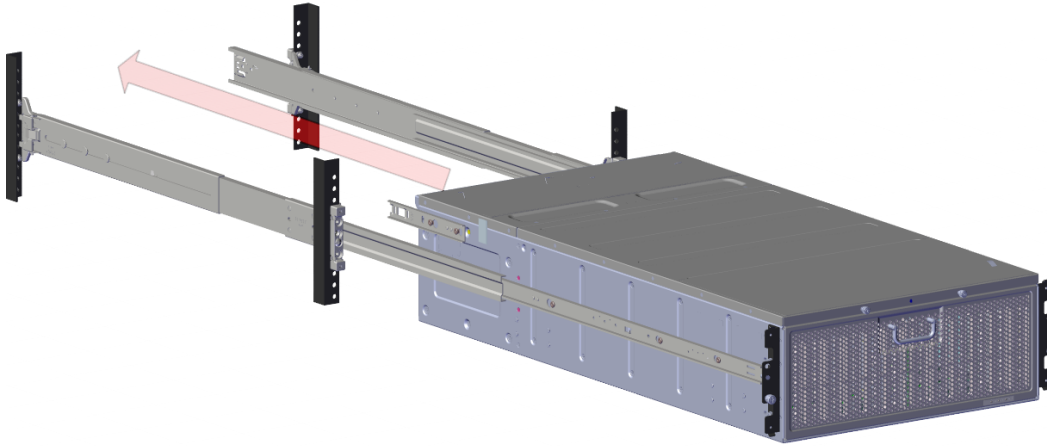
---

**Note:**

- Ensure you slide the blue button on both rails.
  - The blue button can be slid either towards the front or rear to unlock the rack mount rails.
- 

26. Push the chassis into the rack mount rails until the chassis is fully seated into the rack.

**Figure 112: Sliding the Chassis into the Rack**



---

**Note:** If you are met with any resistance while completing this step, verify that the slide rails and rack mount rails are properly lined up.

---

27. From the enclosure, locate the drive bay labeled **00**.

28. Line up the HDD with the connector on the board.

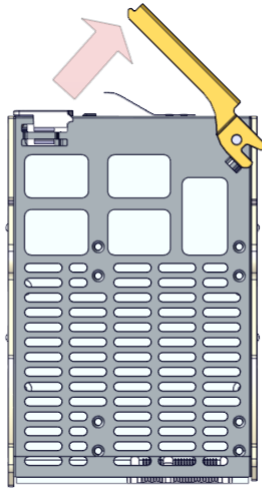
---

**Note:** Ensure that the arrow on the HDD carrier is pointing towards the rear of the enclosure.

---

- Using the HDD carrier slider button, push the HDD into the drive bay.

**Figure 113: Hard Disk Drive Carrier Handle**



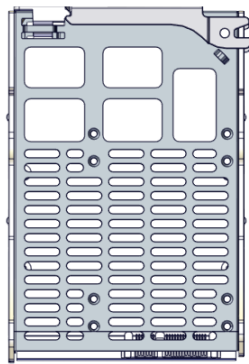
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**Note:** The HDD carrier handle should open until about a 45 degree angle.

---

- Once the HDD stops, push the HDD carrier handle until it is latched.

**Figure 114: Latched Hard Disk Drive Carrier Handle**



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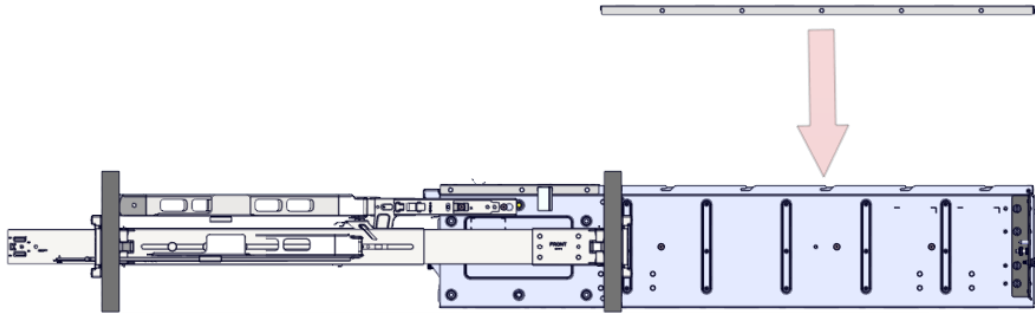
**Note:** The latch will give an audible click when properly seated.

---

- Locate the chassis cover that had been stored away.

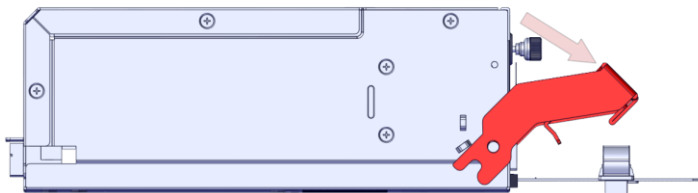
32. Place the chassis cover over the drive bay.

**Figure 115: Chassis Cover Installation**



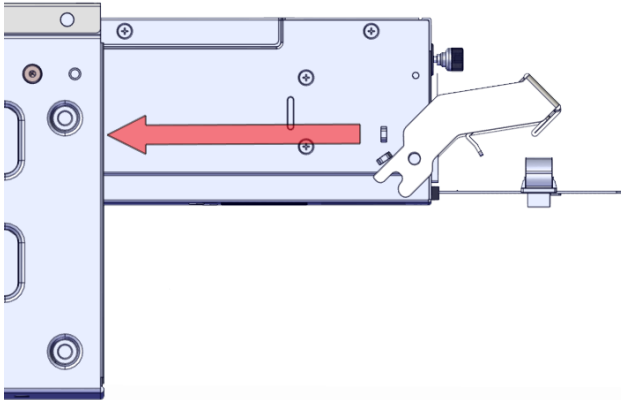
33. Slide the chassis cover towards the rear of the chassis until fully seated.
34. From the front of the enclosure, on the chassis cover, turn the thumb screws clockwise.
35. Ensure the PSU handle is unlocked and opened to a 45 degree angle.

**Figure 116: Power Supply Unit Unlocked Handle**



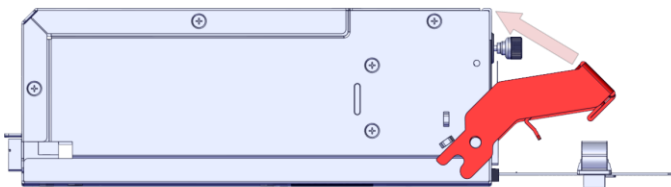
36. Push the PSU into the PSU slot until fully seated.

**Figure 117: Seated Power Supply Unit**



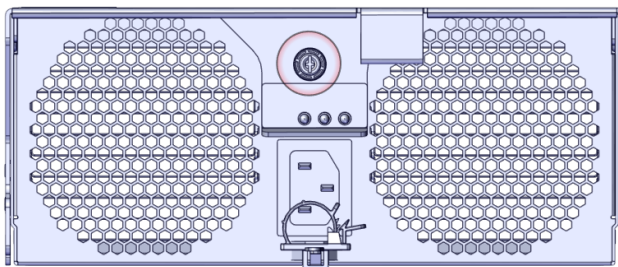
37. Press the PSU handle into the PSU until secured.

**Figure 118: Locked Handle Power Supply Unit Handle**



38. Turn the thumb screws clockwise until tight.

**Figure 119: Power Supply Unit Thumb Screw (Clockwise)**

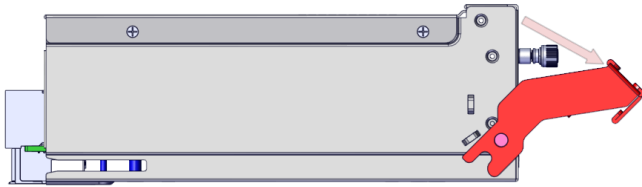


39. Verify the PSU is properly seated and secured.



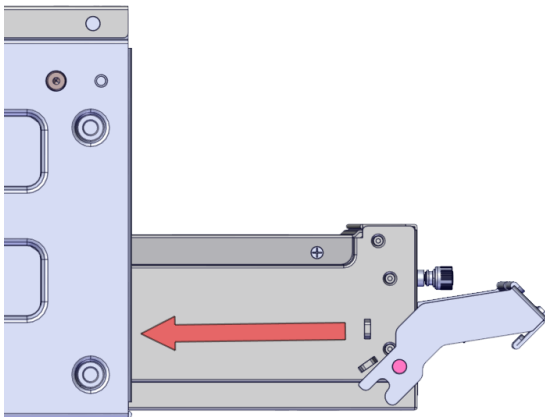
40. Ensure the ESM handle is unlocked and opened to a 45 degree angle.

**Figure 120: Enclosure Storage Module Unlocked Handle**



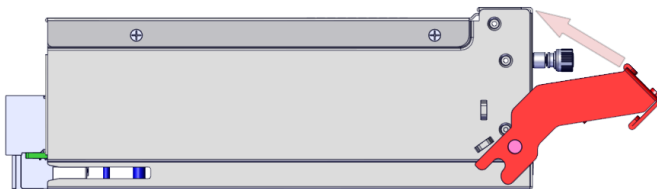
41. Push the ESM into the ESM slot until fully seated.

**Figure 121: Seated Enclosure Storage Module**



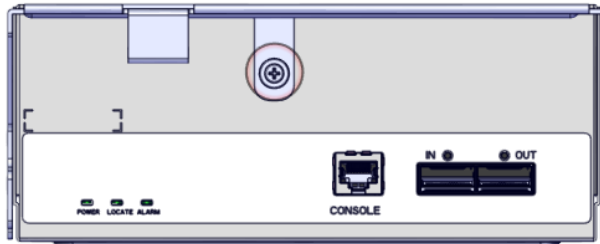
42. Press the ESM handle into the ESM until secured.

**Figure 122: Locked Enclosure Storage Module Handle**



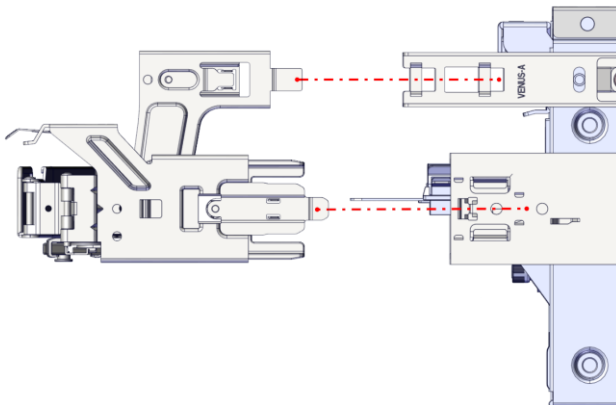
43. Turn the thumb screws clockwise until tight.

**Figure 123: Enclosure Storage Module Thumb Screw (Clockwise)**



44. Verify the ESM is properly seated and secured.
45. Locate the CMA arm labeled **Lower**.
46. Press the lower CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 124: Installing the Lower Cable Management Assembly**



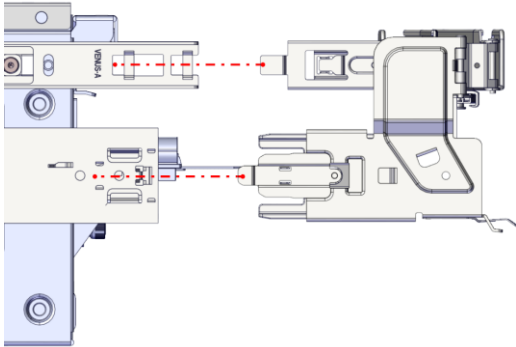
**Note:**

- The top tab should slide into the inside middle hole on the CMA bracket.
- When facing the rear of the enclosure, the lower CMA arm will be installed into the right side of the enclosure.
- When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is inserted into the inside first hole on the CMA bracket.

47. Swing the CMA arm away from the enclosure.
48. Locate the CMA arm labeled **Upper**.

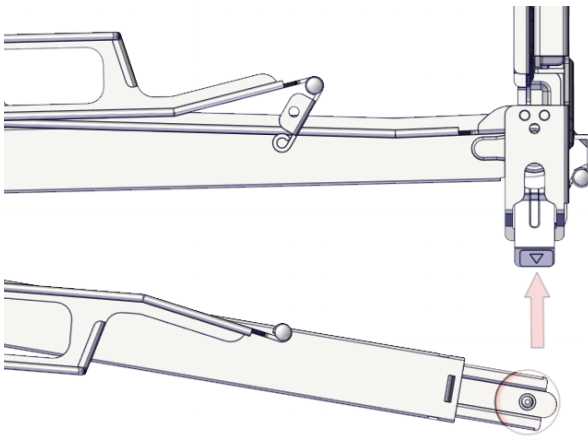
49. Press the upper CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 125: Installing the Upper Cable Management System**



- When facing the rear of the enclosure, the upper CMA arm will be installed into the left side of the enclosure.
  - When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is insert into the inside first hole on the CMA bracket.
50. From the **Lower** cable management system arm, line up the CMA handle with the CMA snap location.

**Figure 126: Snapping the Lower CSM Handle into the Upper Snap Location**



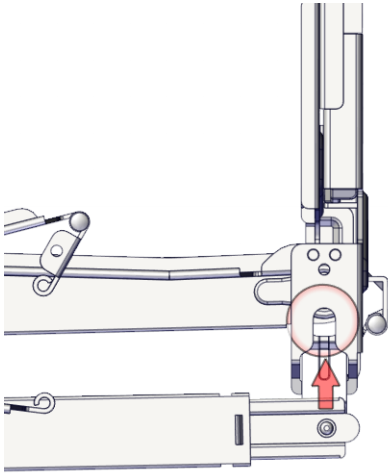
---

**Note:** The CMA snap location for the **Lower** arm is attached to the **Upper** CMA arm.

---

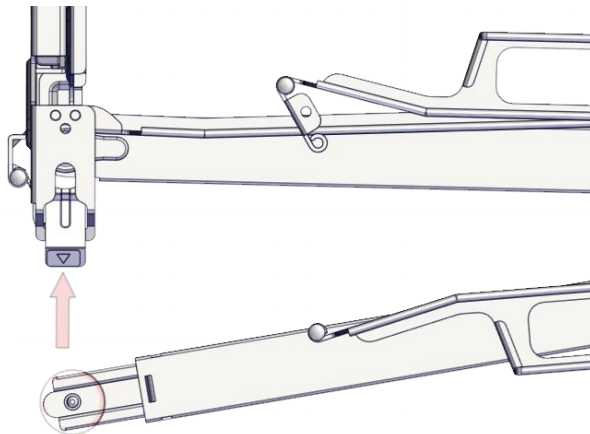
51. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 127: Securing the Lower CMA Handle within the Upper Snap Location**



52. From the **Upper** CMA arm, line up the CMA handle with the CMA snap location.

**Figure 128: Snapping the Upper CMA Handle into the Lower Snap Location**



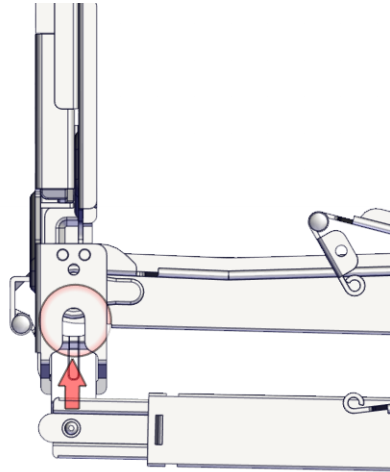
---

**Note:** The CMA snap location for the **Upper** arm is attached to the **Lower** CMA arm.

---

53. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 129: Securing the Upper CMA Handle within the Lower Snap Location**



54. Verify both arms are securely attached to the CMA bracket and rail kit.  
55. Verify both CMA handles are securely attached to the CMA snap locations.

## 8.9 Rail Kit Replacement Procedure

### Required Tools:

- Number 2 Phillips-head screwdriver with torque measuring capabilities

---

**Note:** A longer screwdriver is recommended for the install of the rail kit.

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- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

**Time Estimate for Replacement and Reinstall:** 35 minutes

To replace the rail kit, do the following:

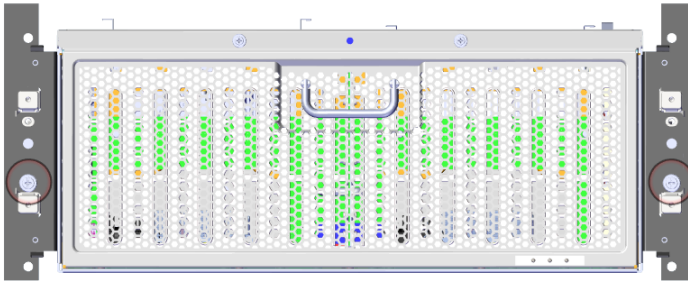
---

**Note:** Ensure that you store all removed parts in a safe location while replacing the CRU.

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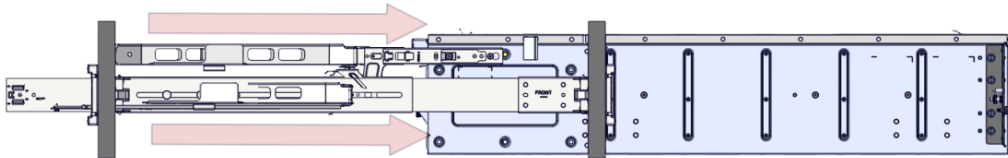
1. From the enclosure, turn the thumbscrews that secure the enclosure in the rack counterclockwise.

**Figure 130: Enclosure Thumb Screws (Counterclockwise)**



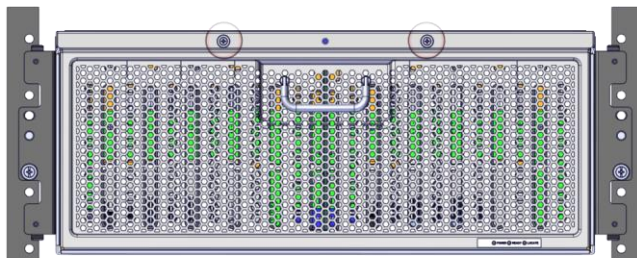
2. From the enclosure handle, pull the enclosure out until the rail kit is fully extended.

**Figure 131: Extended Enclosure**



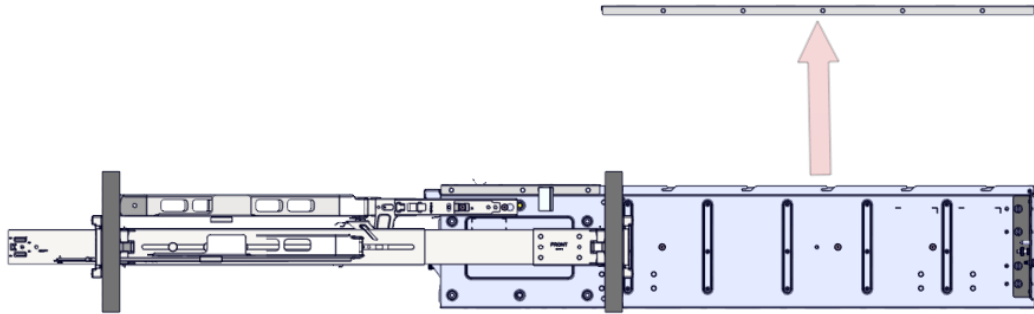
3. From the top of the enclosure, locate the thumb screws securing the lid of the enclosure.

**Figure 132: Enclosure Cover Thumb Screws (Counterclockwise)**



4. Turn the thumb screws counterclockwise until the cover is unsecured from the chassis.
5. Slide the cover towards the front of the enclosure.
6. Pull the cover off of the enclosure.

**Figure 133: Removing the Enclosure Cover**



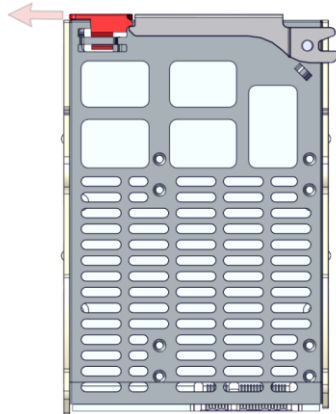
---

**Note:** To avoid damage to the cover, store in a safe location.

---

7. From the first HDD, slide the HDD carrier slider towards the rear of the enclosure.

**Figure 134: Hard Disk Drive Carrier Slider**



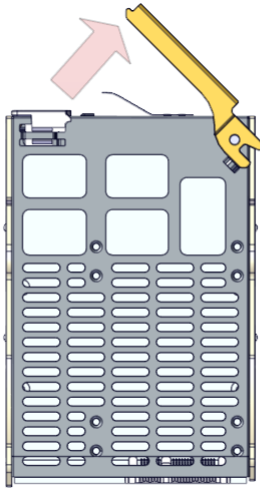
---

**Note:**

- The HDD carrier will give audible click the carrier handle will release.
  - It is highly recommended to begin with HDD **00** and work up in numerical order.
-

- Lift the HDD carrier handle until it stops.

**Figure 135: Hard Disk Drive Carrier Handle**



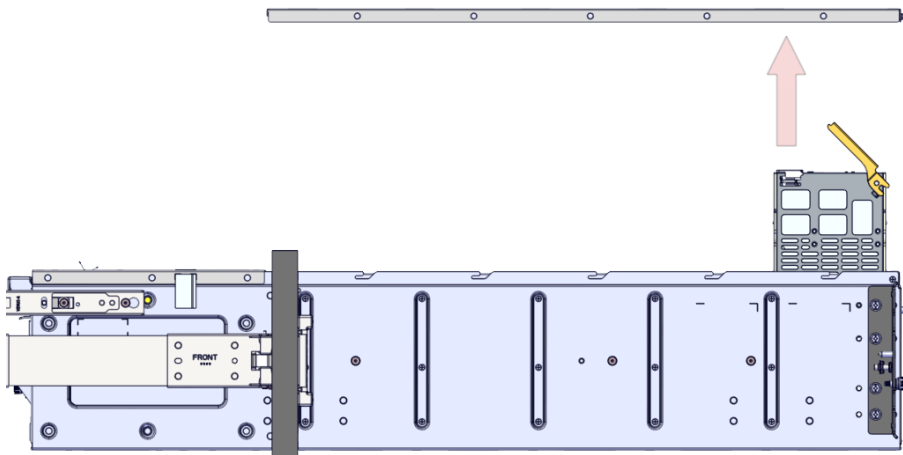
---

**Note:** The HDD carrier lid should open until about a 45 degree angle.

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- From the carrier handle, pull the hard drive up and out of the enclosure.

**Figure 136: Removing the Hard Disk Drive**



- Store the HDDs in a safe location until you are ready to reinstall.

---

**Note:** It is highly recommended to store the HDDs in numerical order.

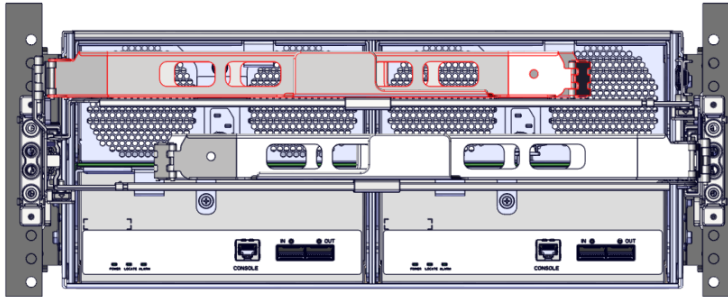
---

- Follow the same procedure to uninstall the remaining HDDs.



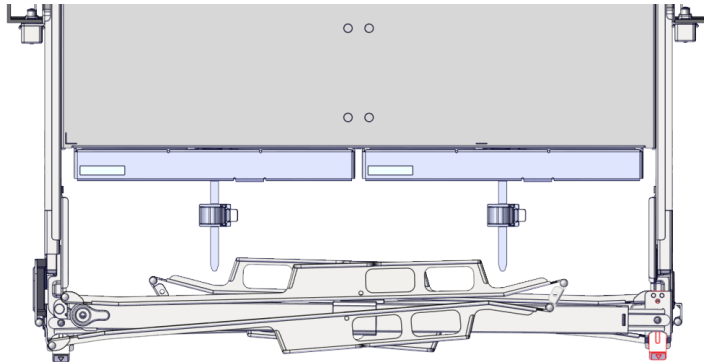
- From the rear of the enclosure, locate the **upper** CMA arm.

**Figure 137: Upper Cable Management Assembly Arm**



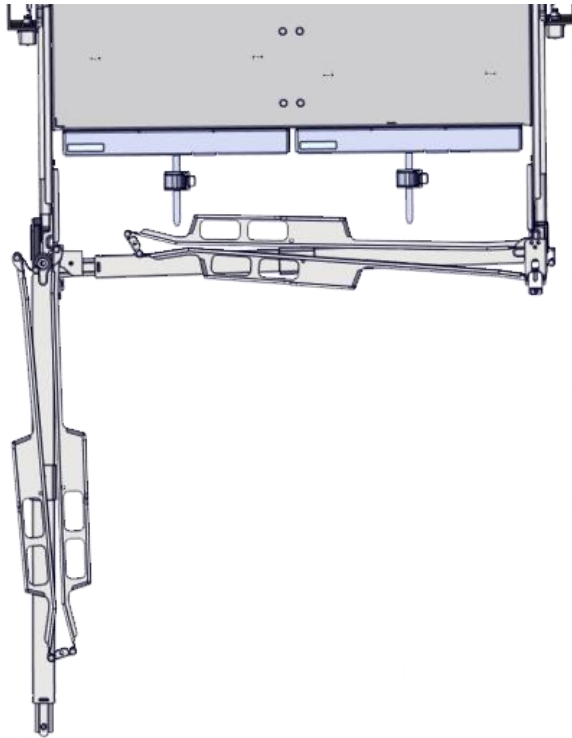
- On the **upper** CMA arm, press down on the CMA release on the snap location.

**Figure 138: Upper Cable Management Assembly Snap Location Release**



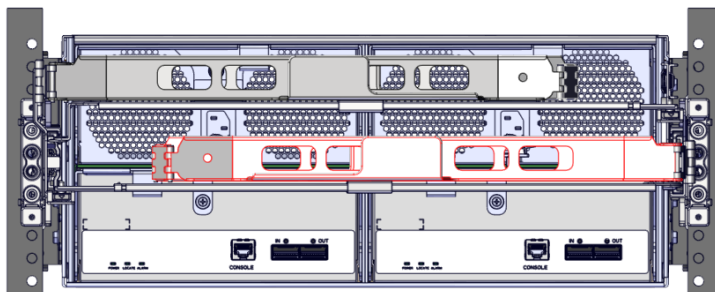
14. Swing the **upper** CMA handle away from the **lower** CMA arm.

**Figure 139: Upper Cable Management Assembly Release Handle**



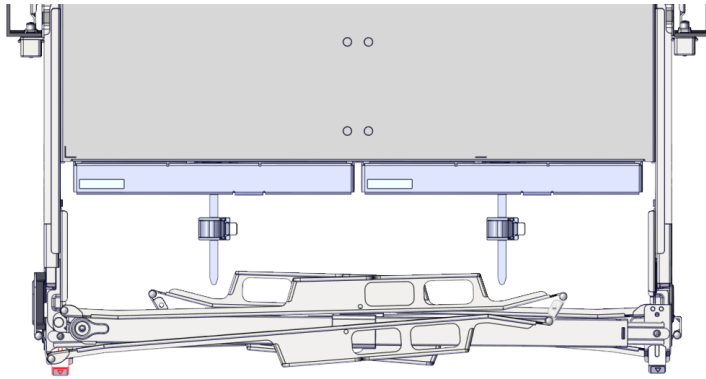
15. Locate the **lower** CMA arm.

**Figure 140: Lower Cable Management Assembly Arm**



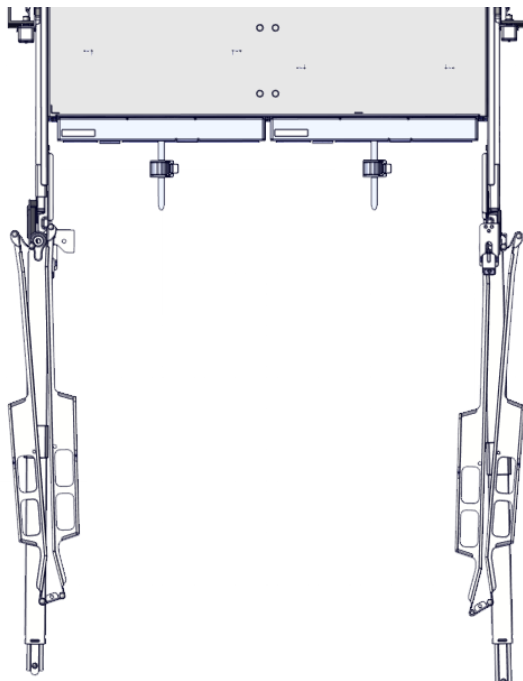
16. On the **lower** CMA arm, press down on the CMA release on the snap location.

**Figure 141: Lower Cable Management Assembly Snap Location Release**



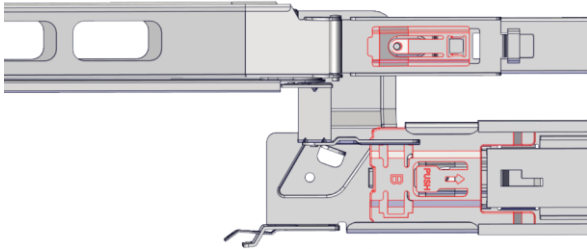
17. Swing the **lower** CMA handle away from the **upper** CMA arm.

**Figure 142: Lower Cable Management Assembly Release Handle**



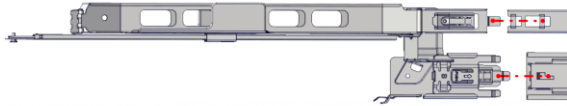
18. From the inside of the **Upper** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 143: Top and Bottom Cable Management Assembly Connectors (Upper Arm)**



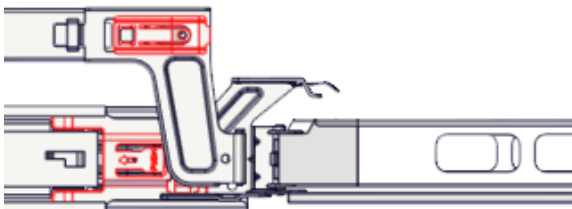
19. Pull the **Upper** arm away from the rack mount rail and CMA bracket.

**Figure 144: Removing the Upper Cable Management Assembly Arm**



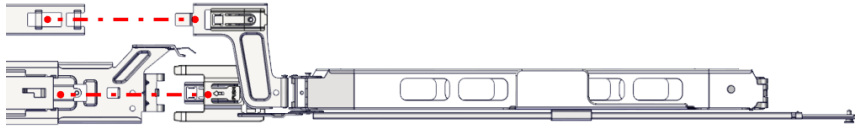
20. From the inside of the **Lower** arm, on the top and bottom CMA connectors, press the release buttons.

**Figure 145: Top and Bottom Cable Management Assembly Connectors (Lower Arm)**



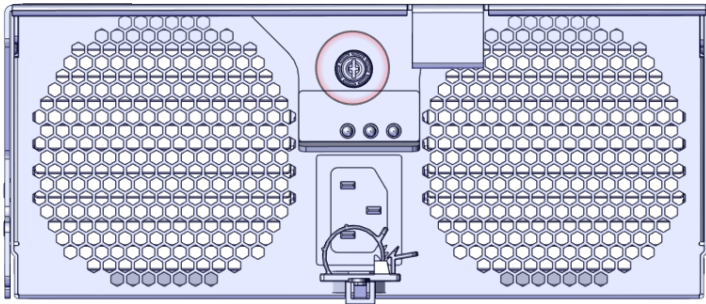
21. Pull the **Lower** arm away from the rack mount rail and CMA bracket.

**Figure 146: Removing the Lower Cable Management Assembly Arm**



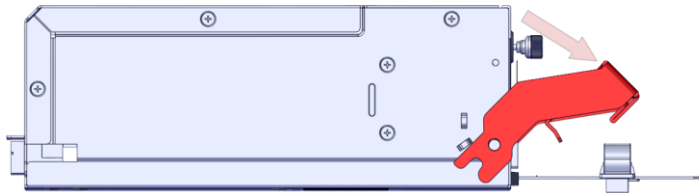
22. Unpack the replacement CMA kit.
23. From the PSU, turn the thumb screw counterclockwise until fully unlocked.

**Figure 147: Power Supply Thumb Screw (Counterclockwise)**



24. Pull the PSU handle until the PSU is unseated from the chassis.

**Figure 148: Power Supply Unit Handle**



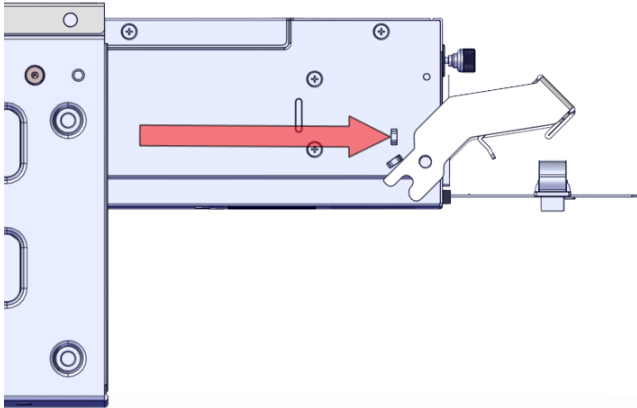
---

**Note:** The handle is highlighted in red.

---

25. Remove the PSU from the enclosure chassis.

**Figure 149: Removing the Power Supply Unit**



26. Follow the same procedure to uninstall the remaining PSU.  
27. Locate the ESM.

**Figure 150: Failed Enclosure Storage Module**



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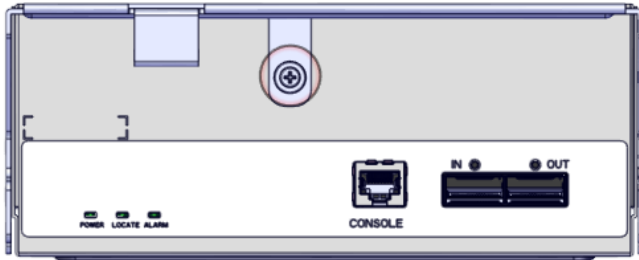
**Note:**

- Because the ESMs are hot-swappable, you **do not** have to power down the enclosure to replace an ESM.
- 

28. Disconnect the HD Mini-SAS cable from the ESM.

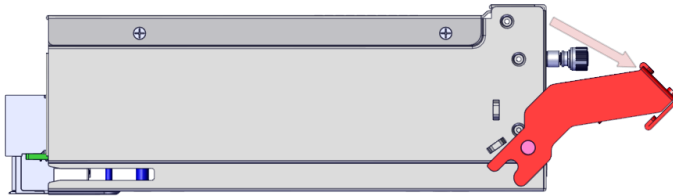
29. From the ESM, turn the thumb screw counterclockwise until fully unlocked.

**Figure 151: Enclosure Storage Module Thumb Screw (Counterclockwise)**



30. Pull the ESM handle until the ESM is unseated from the chassis.

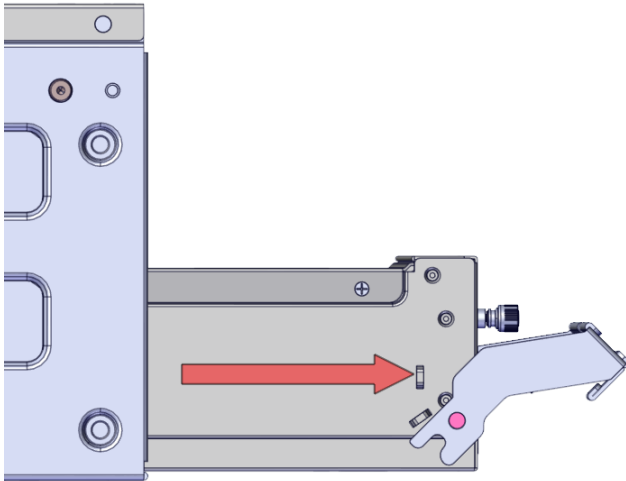
**Figure 152: Enclosure Storage Module Handle**



**Note:** The handle is highlighted in red.

31. Remove the ESM from the enclosure chassis.

**Figure 153: Removing the Enclosure Storage Module**



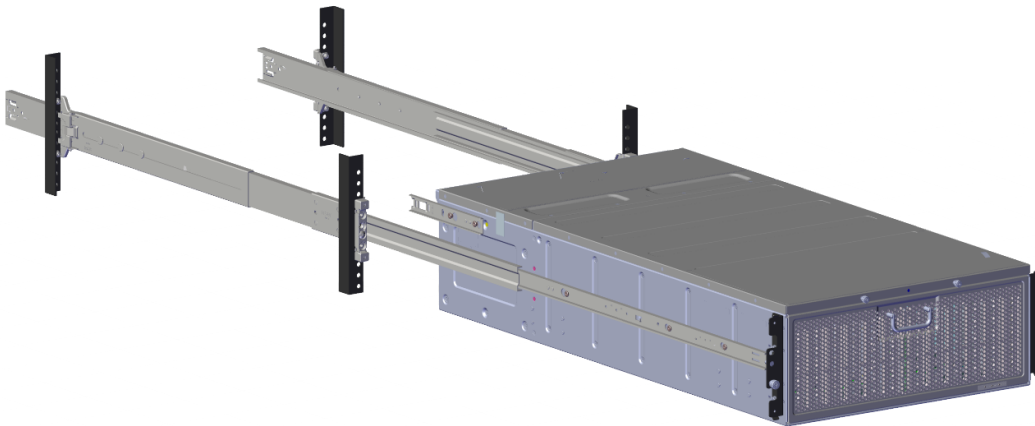
32. Follow the same procedure to uninstall the remaining ESM.
33. From the front of the rack, pull the enclosure until the rails lock at the maximum extension.

---

**Note:** There is a red line marking the maximum extension of the chassis while it is locked in. Once you have the chassis extended past that line, it is unlocked from the rack mount rails.

---

**Figure 154: Enclosure Maximum Extension**

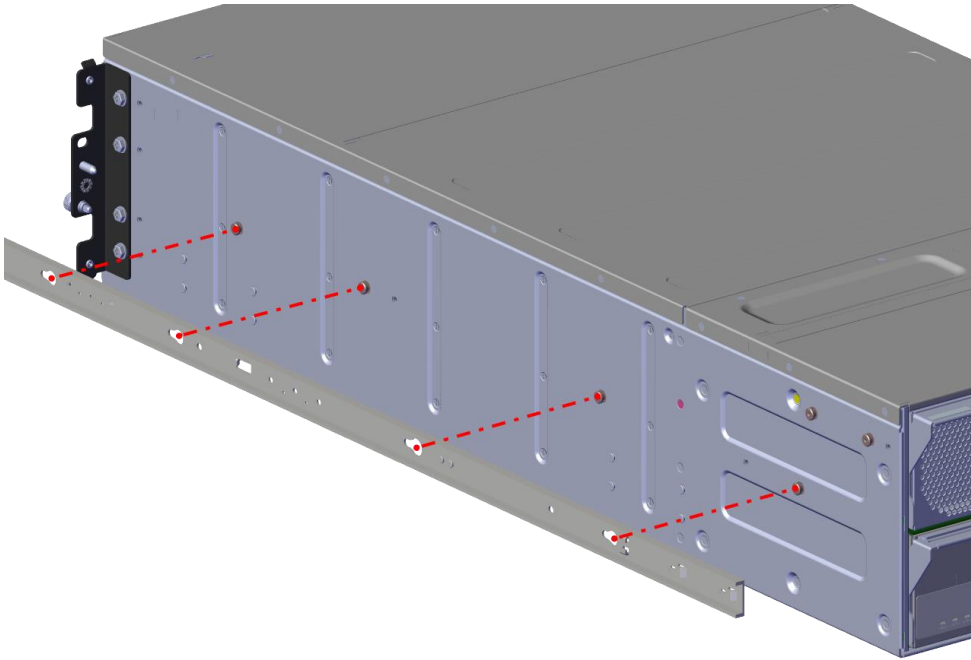


34. On the inner rails, slide the white slider towards the front of the enclosure.
35. Completely remove the enclosure from the rack.



36. Using a the number 2 Philips head screw driver, remove the **2** screws that hold the inner rail to the chassis.

**Figure 155: Removing the Inner Rail**



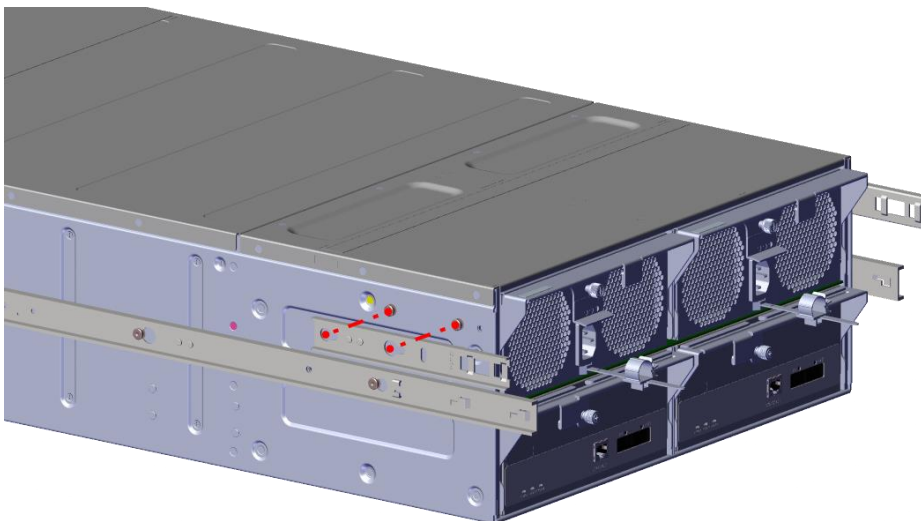
---

**Note:** Each side contains **2** screw for a total of **4** screws.

---

37. Using a the number 2 Philips head screw driver, remove the screw that hold the CMA bracket to the chassis.

**Figure 156: Removing the Cable Management Assembly**



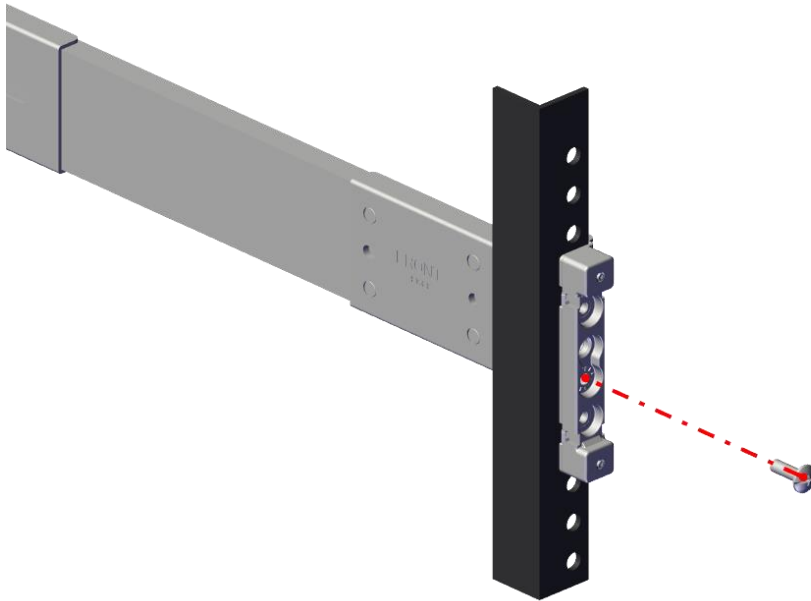
---

**Note:** Each side contains **1** screw for a total of **2** screws.

---

38. Using a the number 2 Philips head screw driver, remove the rack mount rails from the rack.

**Figure 157: Removing the Front Rack Mount Rails**



---

**Note:** Each side contains **4** screw for a total of **8** screws.

---

To reinstall the enclosure with rail kit, see: [Reinstalling the 4U60 Storage Enclosure](#) on page 96.

### 8.9.1 Reinstalling the 4U60 Storage Enclosure

**Required Tools:**

- Number 2 Phillips-head screwdriver with torque measuring capabilities

---

**Note:** A longer screwdriver is recommended for the install of the rail kit.

---

- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

To reinstall the enclosure, do the following:

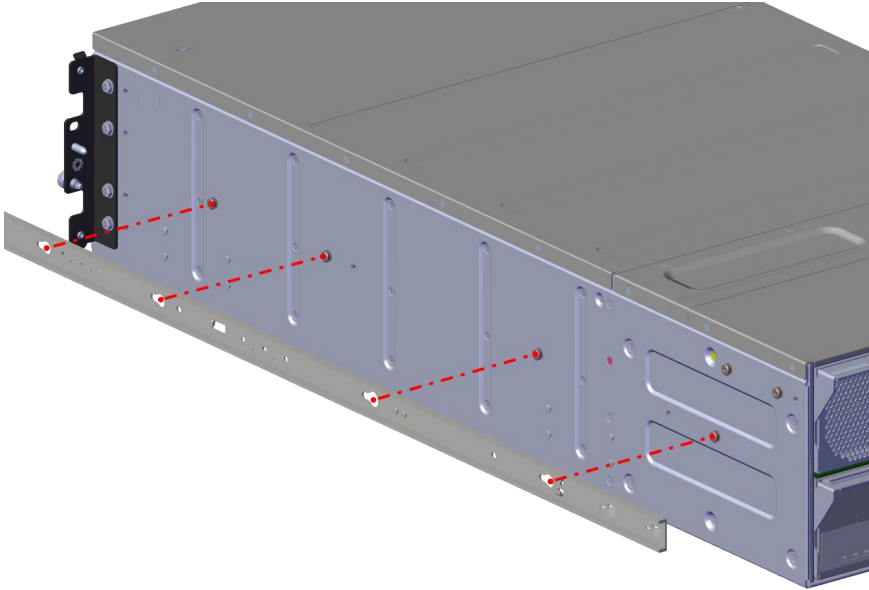
1. Line up the inner rail over the lower set of T-standoffs.

---

**Note:** Ensure the inner rail stamp marked **Front** is pointing towards the front of the enclosure.

---

**Figure 158: Lining up the Inner Rail**



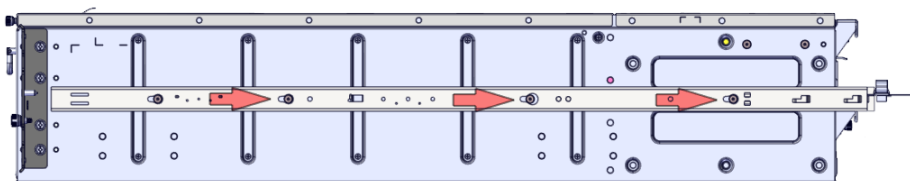
2. To lock the inner rail into place, slide the inner rail towards the rear of the chassis.

---

**Note:** The clip closest to the rear of the chassis will make an audible click when you slide the rail into place.

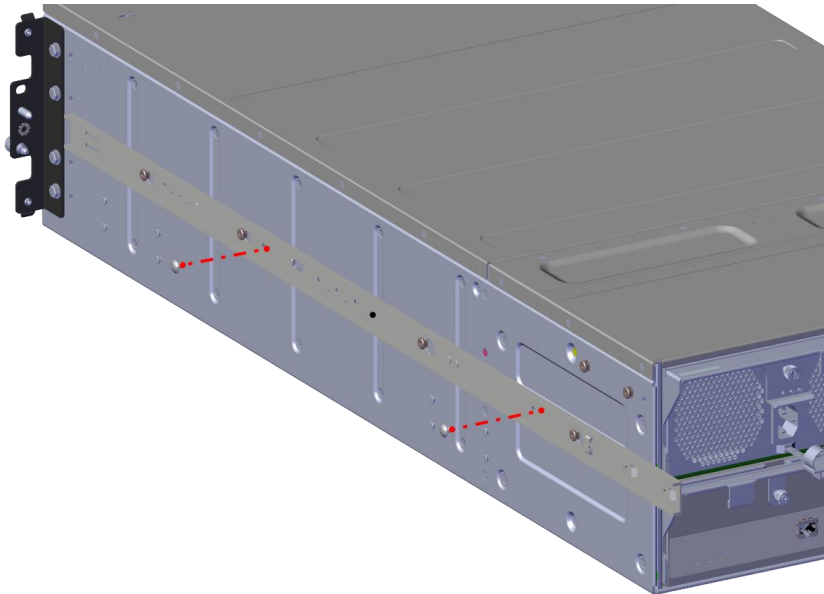
---

**Figure 159: Locking Inner Rail**



3. Using the **M4 truss-head** screws, attach the inner rail to the chassis.

**Figure 160: Attaching the Inner Rail**



---

**Note:** Each side contains **3, M4 truss-head** screws.

---

4. Verify that the screws have been tightened until snug.
5. Follow the same procedure to install the remaining inner rail.

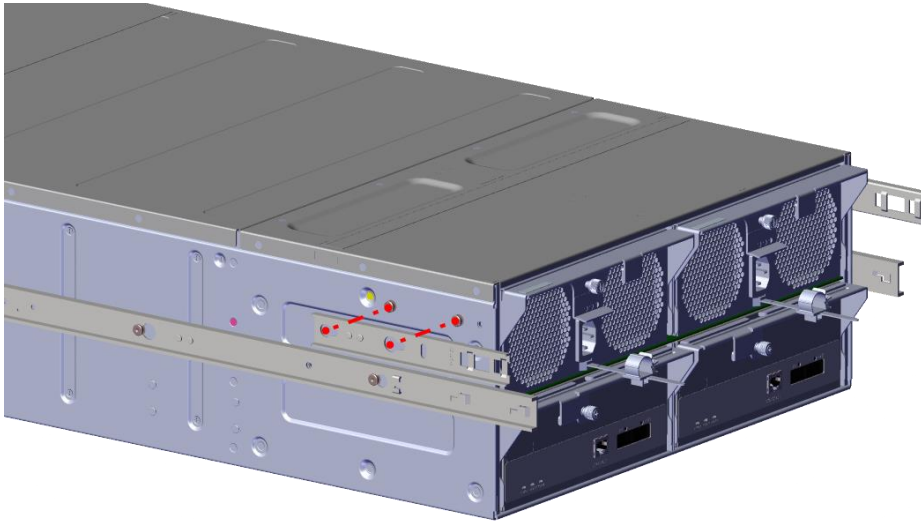
---

**Attention:** The remaining parts of rack mount rails will be used in a later portion of the installation. Please store in a safe place until needed.

---

6. On the chassis, line up the CMA bracket over the upper set of T-standoffs.

**Figure 161: Lining up the Cable Management System Brackets**



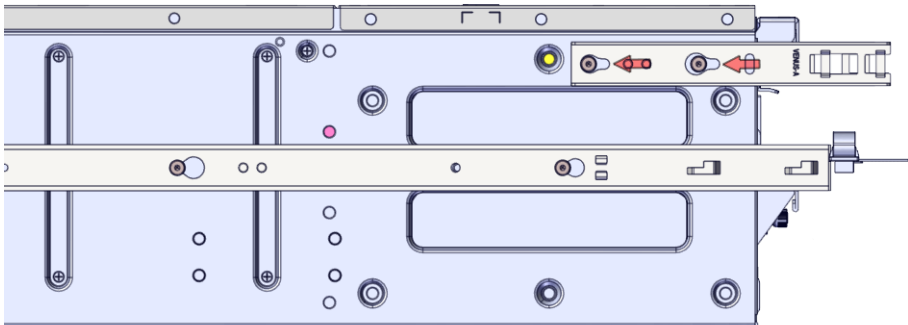
7. Press the CMA bracket into the chassis wall and slide the inner rail towards the front of the chassis.

---

**Note:** The clip closest to the rear of the chassis will make an audible click when you slide the rail into place.

---

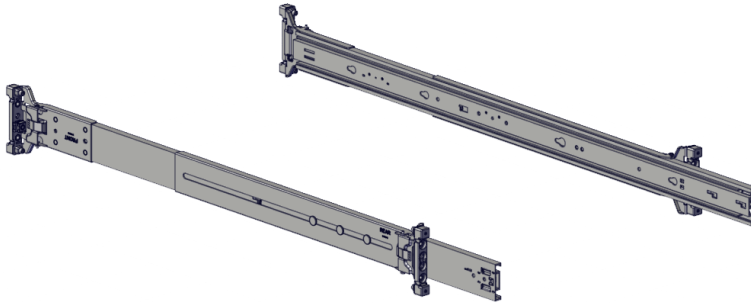
**Figure 162: Locking the Cable Management System Brackets**



8. Follow the same procedure to install the remaining CMA bracket.

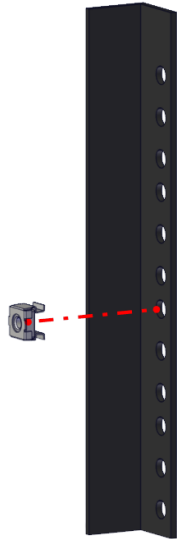
9. Remove the rail kit from the box and unpack hardware contained within the packaging.

**Figure 163: Rail Kit**



10. Determine the 4U location in which you would like to install the enclosure.
11. From the inside of the rack frame, clip the cage nuts into the holes in which you will install the rack mount rails over.

**Figure 164: Installing Cage Nuts**



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**Note:** Ensure that the holes line up with those on the rack mount rails. The holes are one on top of the other.

---

---

**Attention:** The unit also ships with slide on cage nuts that may be used if the rack frame only contains round holes.

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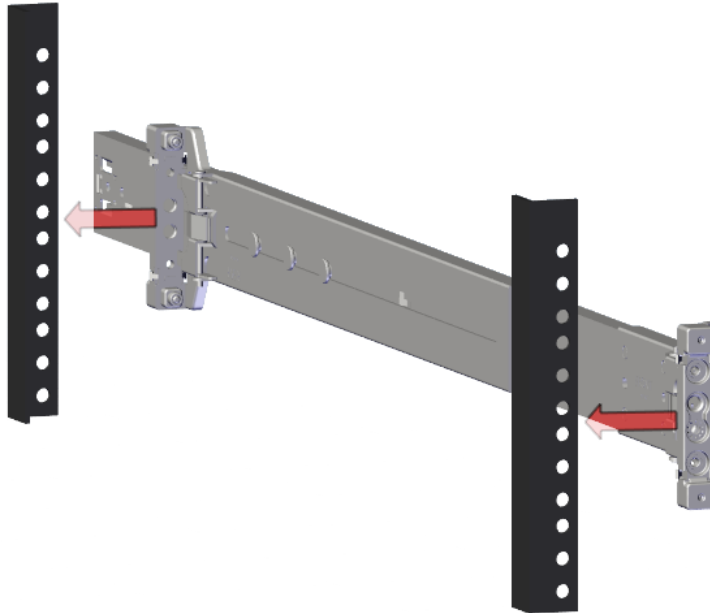
12. On the rack mount rails, locate the end labeled **FRONT**.
13. Line up the front of the rack mount rail with the 4U location you prefer to install the enclosure.

---

**Note:** The rack mount rails may be elongated by simply sliding the rear portion of the rail.

---

**Figure 165: Lining Up the Rack Mount Rails**



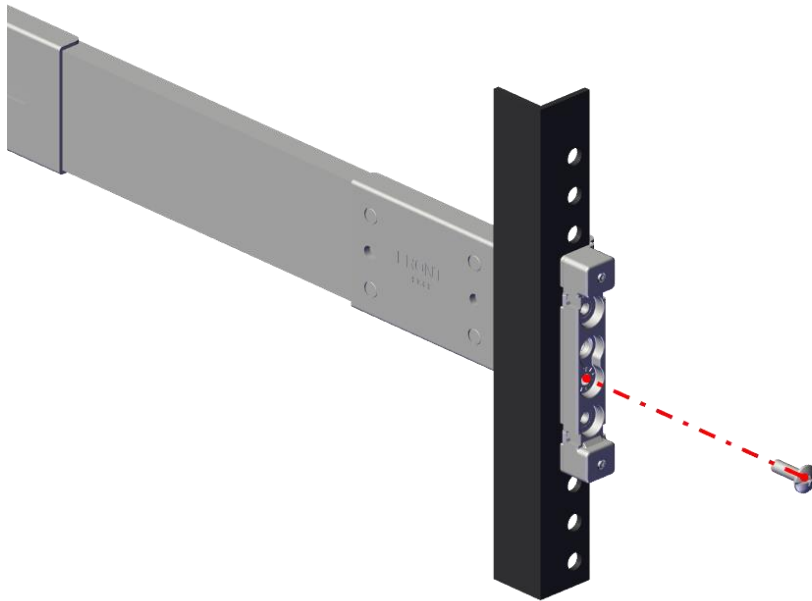
14. Snap the front and rear ends into the rack over the cage nuts.

**Figure 166: Snapping the Rack Mount Rails into the Rack**

15. Using a level, verify that the rack mount rail is level.

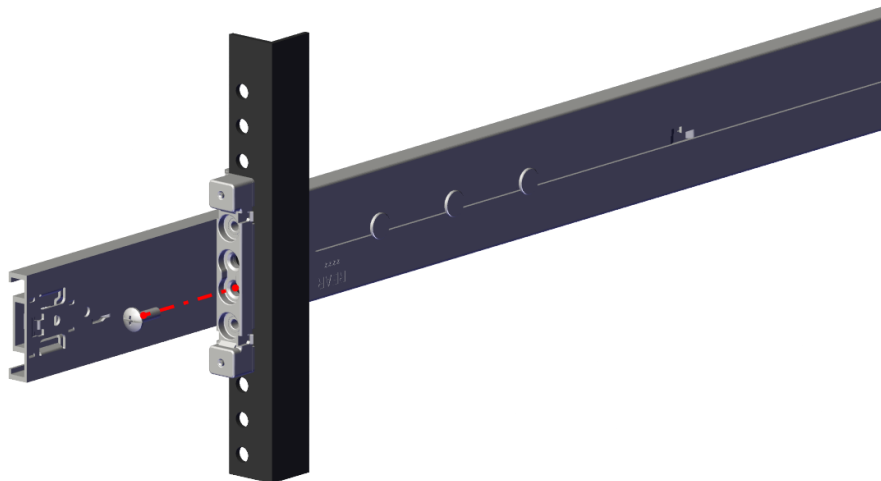
16. From the front of the rack, attach the rack mount rail into place using **one Hex flange Phillips head screw**.

**Figure 167: Attaching the Rack Mount Rails (Front)**



17. From the rear of the rack, attach the rack mount rail into place using **one Hex flange Phillips head screw**.

**Figure 168: Attaching the Rack Mount Rails (Rear)**



18. Using a level, verify that the rack mount rail is level.
19. Verify that the screws have been tightened until snug.
20. Follow the same procedure to install the remaining rack mount rail.



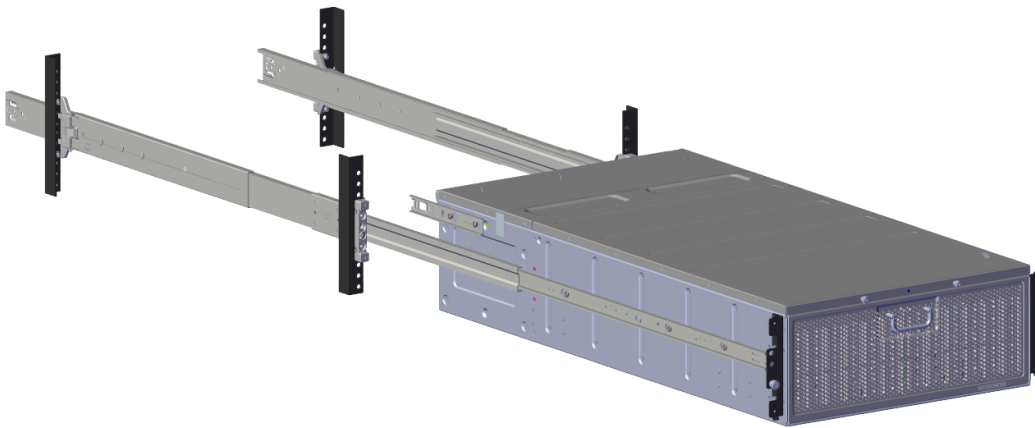
21. From the rack, fully extend the rack mount rails.

**Figure 169: Fully Extended Rack Mount Rails**



22. Line up the slide rails on the chassis with the extended rack mount rails.

**Figure 170: Lining up the Chassis on the Rack Mount Rails**



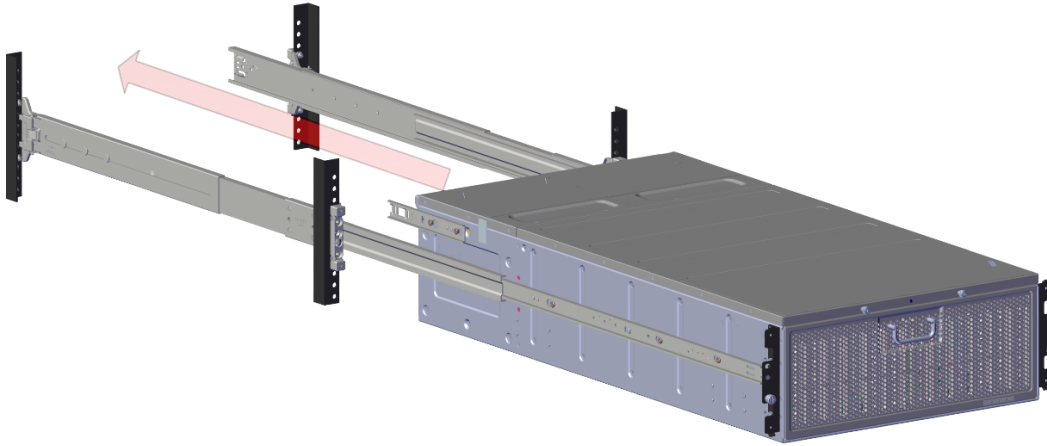
23. Push the chassis until you hear an audible click.  
The inner rails are locked into the rack mount rails.
24. From the side of the rack mount rails, slide the blue button and push the chassis towards the rack.

**Note:**

- Ensure you slide the blue button on both rails.
  - The blue button can be slid either towards the front or rear to unlock the rack mount rails.
- 

25. Push the chassis into the rack mount rails until the chassis is fully seated into the rack.

**Figure 171: Sliding the Chassis into the Rack**



---

**Note:** If you are met with any resistance while completing this step, verify that the slide rails and rack mount rails are properly lined up.

---

26. From the enclosure, locate the drive bay labeled **00**.
27. Line up the HDD with the connector on the board.

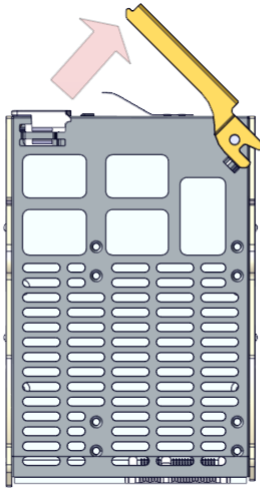
---

**Note:** Ensure that the arrow on the HDD carrier is pointing towards the rear of the enclosure.

---

- Using the HDD carrier slider button, push the HDD into the drive bay.

**Figure 172: Hard Disk Drive Carrier Handle**



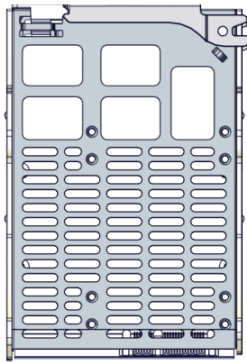
---

**Note:** The HDD carrier handle should open until about a 45 degree angle.

---

- Once the HDD stops, push the HDD carrier handle until it is latched.

**Figure 173: Latched Hard Disk Drive Carrier Handle**



---

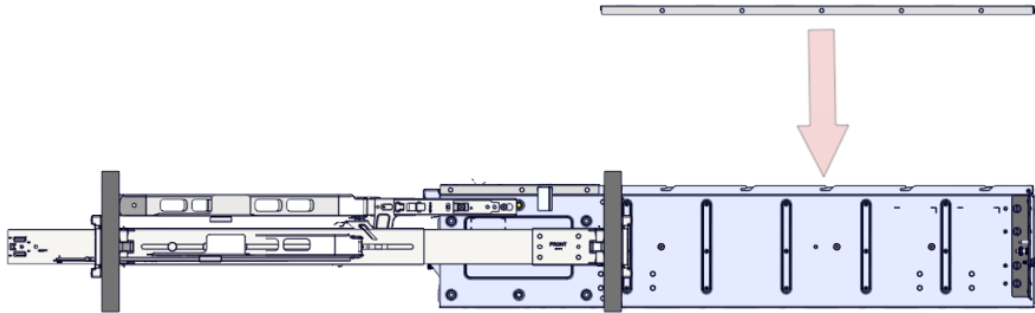
**Note:** The latch will give an audible click when properly seated.

---

- Locate the chassis cover that had been stored away.

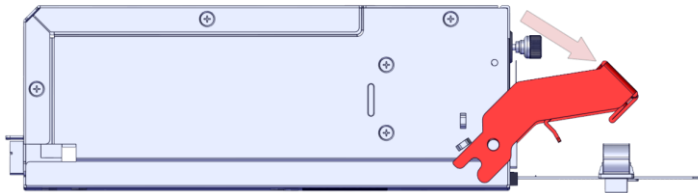
31. Place the chassis cover over the drive bay.

**Figure 174: Chassis Cover Installation**



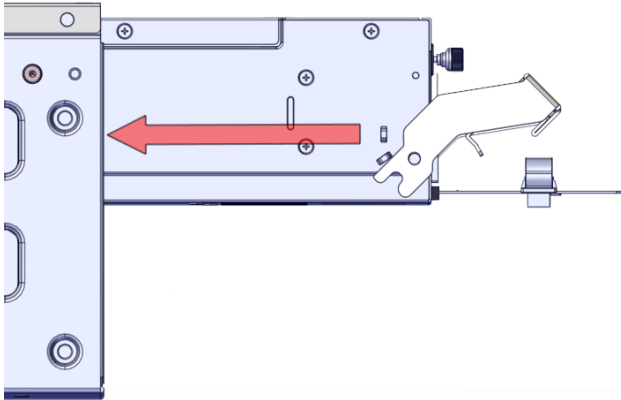
32. Slide the chassis cover towards the rear of the chassis until fully seated.
33. From the front of the enclosure, on the chassis cover, turn the thumb screws clockwise.
34. Ensure the PSU handle is unlocked and opened to a 45 degree angle.

**Figure 175: Power Supply Unit Unlocked Handle**



35. Push the PSU into the PSU slot until fully seated.

**Figure 176: Seated Power Supply Unit**



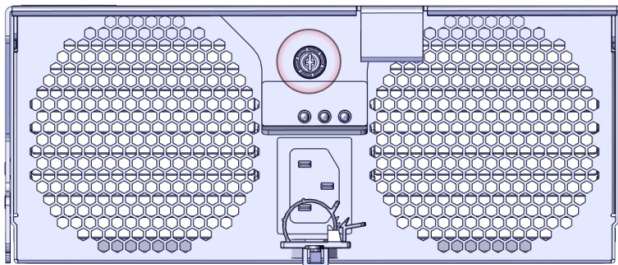
36. Press the PSU handle into the PSU until secured.

**Figure 177: Locked Handle Power Supply Unit Handle**



37. Turn the thumb screws clockwise until tight.

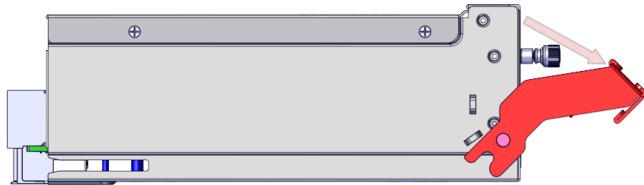
**Figure 178: Power Supply Unit Thumb Screw (Clockwise)**



38. Verify the PSU is properly seated and secured.

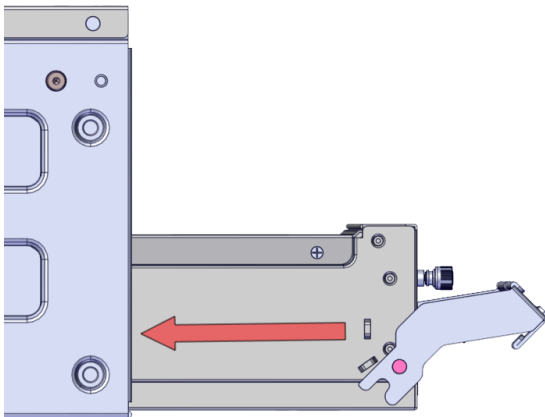
39. Ensure the ESM handle is unlocked and opened to a 45 degree angle.

**Figure 179: Enclosure Storage Module Unlocked Handle**



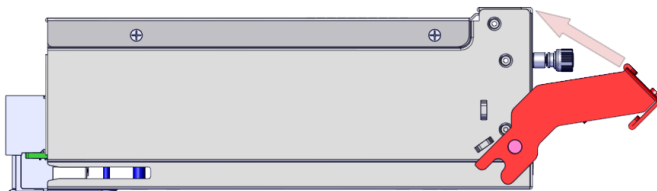
40. Push the ESM into the ESM slot until fully seated.

**Figure 180: Seated Enclosure Storage Module**



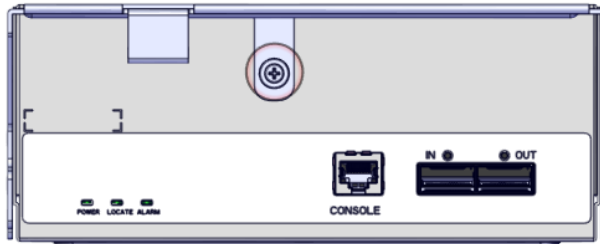
41. Press the ESM handle into the ESM until secured.

**Figure 181: Locked Enclosure Storage Module Handle**



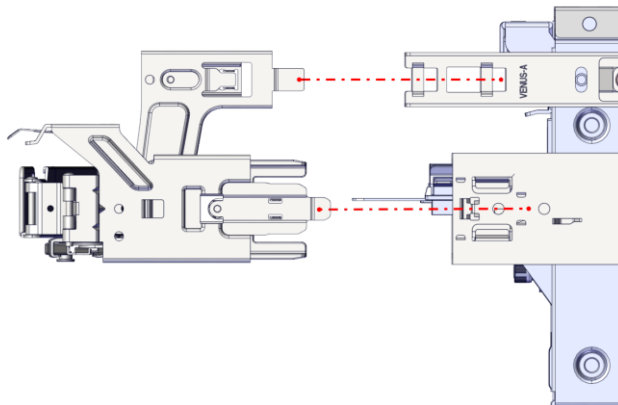
42. Turn the thumb screws clockwise until tight.

**Figure 182: Enclosure Storage Module Thumb Screw (Clockwise)**



43. Verify the ESM is properly seated and secured.
44. Locate the CMA arm labeled **Lower**.
45. Press the lower CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 183: Installing the Lower Cable Management Assembly**



---

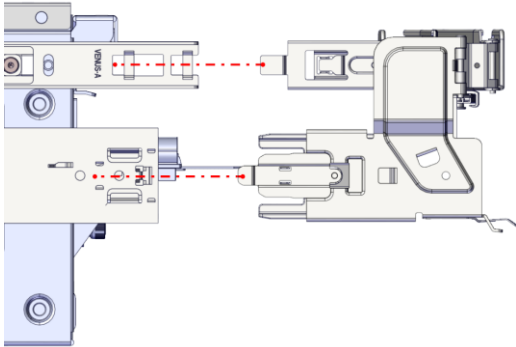
**Note:**

- The top tab should slide into the inside middle hole on the CMA bracket.
  - When facing the rear of the enclosure, the lower CMA arm will be installed into the right side of the enclosure.
  - When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is inserted into the inside first hole on the CMA bracket.
- 

46. Swing the CMA arm away from the enclosure.
47. Locate the CMA arm labeled **Upper**.

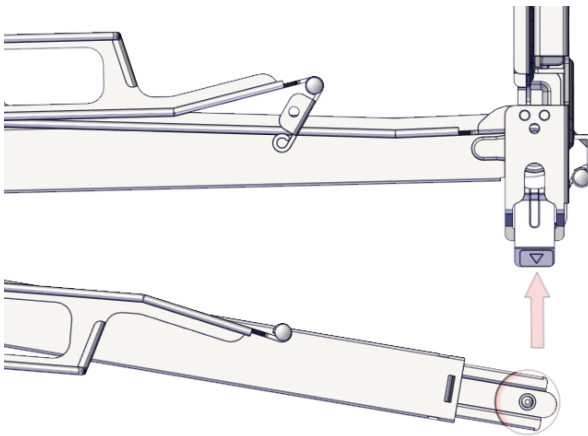
48. Press the upper CMA into the slide rail and CMA bracket on the chassis until you hear an audible click from the top and bottom inserts.

**Figure 184: Installing the Upper Cable Management System**



- When facing the rear of the enclosure, the upper CMA arm will be installed into the left side of the enclosure.
  - When attaching the upper portion of the CMA, ensure that the front tab is inserted into the inside middle hole and the second tab is insert into the inside first hole on the CMA bracket.
49. From the **Lower** cable management system arm, line up the CMA handle with the CMA snap location.

**Figure 185: Snapping the Lower CSM Handle into the Upper Snap Location**



---

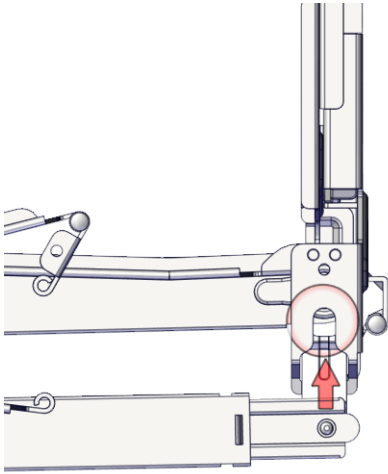
**Note:** The CMA snap location for the **Lower** arm is attached to the **Upper** CMA arm.

---



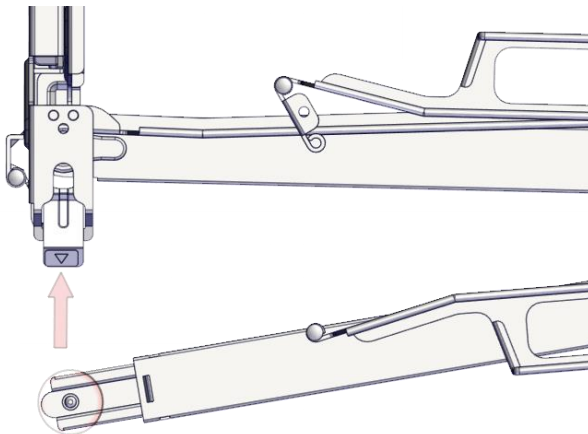
50. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 186: Securing the Lower CMA Handle within the Upper Snap Location**



51. From the **Upper** CMA arm, line up the CMA handle with the CMA snap location.

**Figure 187: Snapping the Upper CMA Handle into the Lower Snap Location**



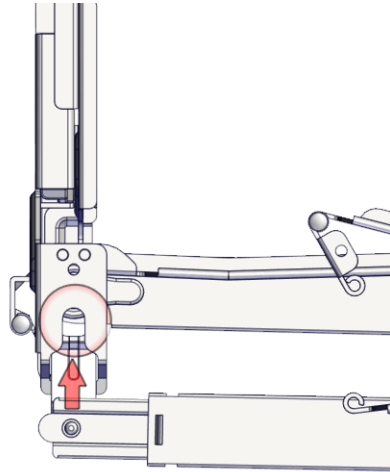
---

**Note:** The CMA snap location for the **Upper** arm is attached to the **Lower** CMA arm.

---

52. Press the CMA handle firmly into the snap location until you hear an audible click.

**Figure 188: Securing the Upper CMA Handle within the Lower Snap Location**



53. Verify both arms are securely attached to the CMA bracket and rail kit.
54. Verify both CMA handles are securely attached to the CMA snap locations.

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