Lyve Rack R1 Installation Guide

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Revision: M
September 2021

Notices

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Revision History

Revision History	Description	Release month and year
M	Release	September 2021

Document conventions

Convention	Description
<Italic text>	Variable text. **Note**: Do not type angular brackets.
Blue	Cross-reference links
??	Website addresses
Black	Manual names
Bold text	• Keys that are pressed • Text entered into a GUI element, such as a box • GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
Courier New	Indicates file and directory names, usernames
Courier New	Indicates system output, code.
Verdana, Italic	Other document references

1 | Welcome to Seagate Lyve Rack R1!

Welcome to Lyve Rack R1! This document provides high-level information on how to install Lyve Rack. For more detailed information, refer to the documents in Table 1: Documents for understanding detailed installation procedure. To access the documents, scan the QR code with your smartphone or tablet.

Table 1: Documents for understanding detailed installation procedure

Guide	URL
Seagate 5005/4005/3005 Series Hardware Installation and Maintenance Guide (For 5U84 storage enclosure reference)	https://www.seagate.com/support/lyve-rack/maintenance-guide/
Supermicro Server Hardware Installation and Maintenance Guide	1. Go to https://www.supermicro.com/ 2. Hover over **Support**, and then click **Manuals**. 3. In the **Select Category** dropdown list, select **SuperServers**. 4. In the **Select Product Type** dropdown list, select **1U**. 5. Click **Submit Request**. 6. Locate and refer to the documents for 1U servers – **SYS-6019P-WTR** or **SYS-6019U-TRT**.

Step	Task	Topic link
1	Unboxing	2	What's in the box?
2	Hardware installation	5	Hardware installation
3	Networking and physical checklist	5.6	Lyve Rack R1 networking and physical checklist
4	Cable connection	6	Cable connection
5	Preboarding Lyve Rack	7	Pre-boarding Lyve Rack R1
6	Example information sheet	7.1	Example information sheet
7	Turn ON power	8	Turn ON power
8	Onboarding Lyve Rack	10	Onboarding Lyve Rack R1

2 | What's in the box?

You will receive the Seagate Lyve Rack system as a collection of component elements packaged on a single pallet.
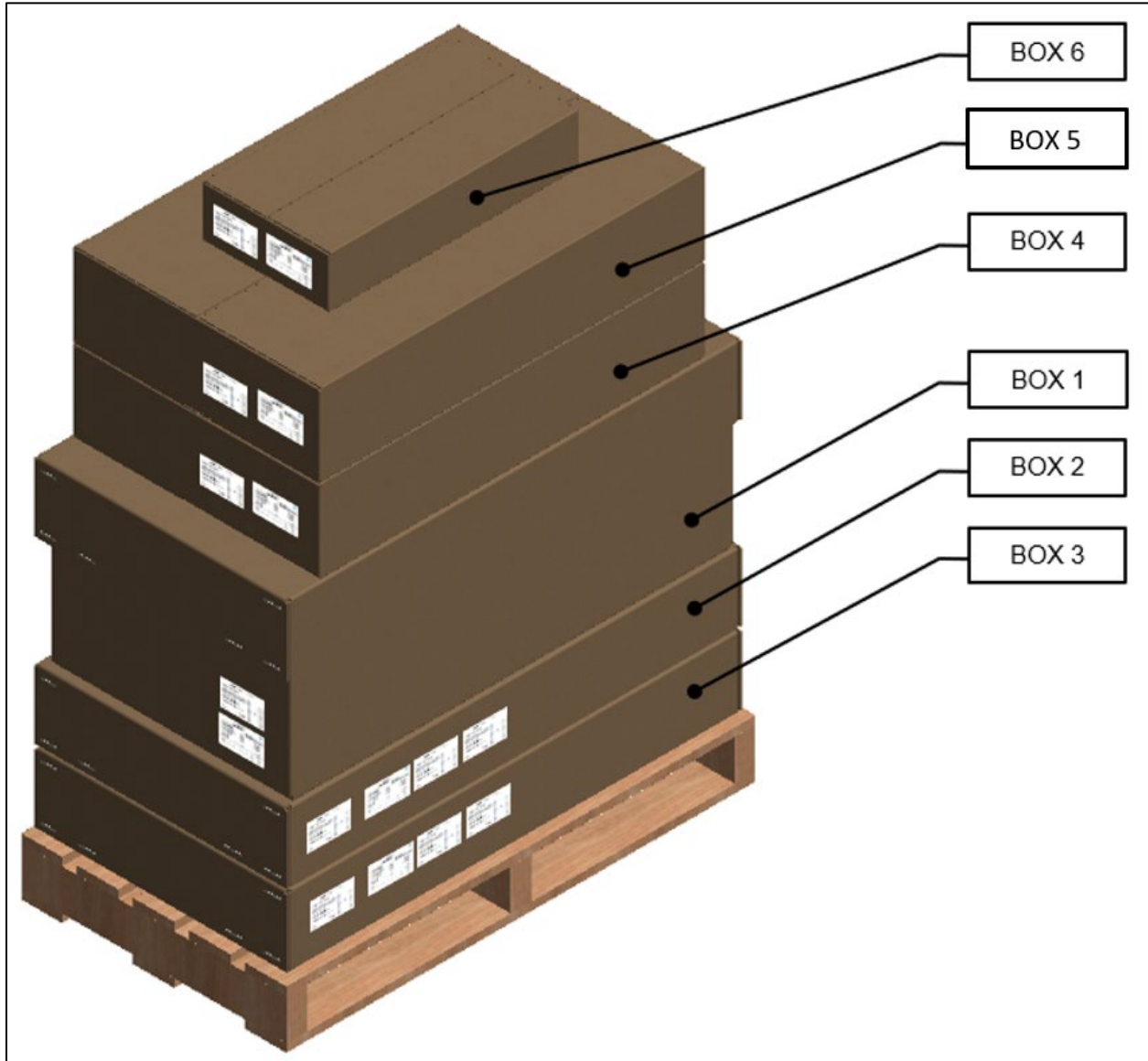
Figure 1: Seagate Lyve Rack package

Each carton shows a bundle label associating it with a specific appliance component set.

Table 2: Product package contents

Carton	Box number	Weight in kg/lb	
		Packaging	Gross
5U84 System Pack	Box 1 of 6	640/144	135/298
DDIC* 42-pack	Box 2 of 6	1.8/3.96	75.6/165.34
DDIC* 42-pack	Box 3 of 6	1.8/3.96	75.6/165.34
Server pack (Secondary server)	Box 4 of 6	11.8/26.01	18.6/41
Server pack (Primary server)	Box 5 of 6	11.8/26.01	18.6/41
Accessories Kit	Box 6 of 6	4.5/10	

*DDIC is Disk Drive in Carrier.

Since the HDDs included with the appliance are pre-configured at the factory for use with the specific 5U84 storage enclosure with which they are shipped, it is important to ensure that the 42-pack cartons (Box 2 and Box 3 as mentioned in Table 2) are not mixed up with any other 42-pack cartons received at your location.

> **Important**
> Arrange the drives in ascending order for the top and bottom tray as described in section 5.3 | 5U84 storage enclosure installation. In any future scenarios where multiple or all the drives are unplugged, this requirement must also be followed.

Table 3: Set of deliverables that are delivered to the customer describes the set of deliverables that are delivered to you making up the Lyve Rack system.

Table 3: Set of deliverables that are delivered to the customer

Item	Description	Qty
Accessories Kit	Contains cables and documentation a) SFF-8644 SAS cable b) 100GbE to 100GbE (QSFP28 to QSFP28) Direct Attach Passive Copper Cable Ethernet Black 30AWG CA-N c) C13-C14 power cord d) Documentation reference sheet e) Information Sheet	a) 8 b) 1 c) 4 d) 1 e) 1

Item	Description	Qty
	f) Notice	f) 1
Supermicro SYS-6019P-WTR OR Supermicro SYS-6019U-TRT	1U Server	2
Seagate RSS RBOD product: D5565X000000DA	5U84x HDD storage enclosure	1
Seagate HDDs: PFRUKTXDXE013-42 - 14TB PFRUKTXDXE022-42 - 16TB 1104413-01 - 18TB	Seagate 14TB, 16TB, or 18TB HDDs in carriers	84

3 | Safety and compliance

3.1 | Safe handling

- An unpopulated 5U84 enclosure can weigh up to 46kg (101lb). Use appropriate lifting methods.
- A fully populated 5U84 enclosure weighs 135kg (298lb). You must lift the 5U84 enclosure when the drawers are empty and latched closed. Do not attempt to lift the 5U84 enclosure when populated with drives.
- When closing the drawers, do so firmly, ensuring the latches are engaged.
- Use belt straps to lift the 5U84 enclosure out of the box.
- Do not try to lift the 5U84 enclosure by yourself.
- Use appropriate lifting methods. Before lifting the 5U84 enclosure:
  o Remove DDICs drive carriers from drawers and verify the drawers are closed and firmly locked.
  o Use a minimum of three people to lift the 5U84 enclosure using the lifting straps provided.
  o Avoid lifting the 5U84 enclosure using the handles on any of the CRUs because they are not designed to take the weight. Lift from underneath the main 5U84 enclosure.
- Observe the lifting hazard label affixed to the 5U84 storage enclosure.

3.2 | Safety

- This equipment is for installation in a Restricted Access Location only.
  A restricted access location is where:

  o Access can only be gained by service persons or users who have been fully instructed on the reasons for the restrictions applied to the location and on any precautions that must be taken.
  o 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.

  Caution
  If this equipment is used in a manner not specified by the manufacturer, the manufacturer warranty provided by the equipment may be impaired.

- All drives and rear modules are part of the 5U84 storage enclosure and must only be removed when a replacement can be immediately added. The system must not be run without all rear modules in place.
- Permanently unplug the enclosure before you move it or if you think that it has become damaged in any way.
- Always remove the drives, Power Supply Units (PSUs), controllers, and System fans to minimize weight before you move the enclosure.
- A safe electrical ground connection must be provided to the power supply cords.

  Important
  The enclosure MUST be grounded before applying power.

- The plug on the power supply cord is used as the main disconnect device. Ensure that the socket outlets are located near the equipment and are easily accessible.
- When powered by multiple AC sources, disconnect all power supplies for complete isolation.

- In order to comply with applicable safety, emission, and thermal requirements no covers should be removed, and rear panel must be populated with plug-in modules.
- The power connection should always be disconnected prior to insertion or removal of a PSU from the enclosure.
- Do not attempt to disassemble the rear sub-chassis from the enclosure.
- Provide a suitable power source with electrical overload protection to meet the requirements laid down in the technical specification.
- If any component of the product fails, consult Seagate support.
- For North American use, each branch circuit must be rated for 20A.
- The equipment is suitable for connection to an IT power system (Norway), when mounted in a Restricted Access Location where equipotential bonding has been applied by a service person.

Important
The optional RJ45 socket on the controller module is for Ethernet connection only and must not be connected to a telecommunications network.

Caution

- Operating temperatures inside the enclosure drawers can reach up to 60°C. Be careful while opening drawers and removing drive carriers.

- Double pole/neutral fusing in PSUs.

- Risk of explosion if the battery within the controller is replaced with an incorrect type. Dispose used batteries according to the instructions. There are no user serviceable parts within the controller.

- Due to product acoustics ear protection must be worn during prolonged exposure to the product in operation.

- To prevent over-turning, drawer interlocks stop users from opening both drawers at the same time. Do not attempt to force open a drawer when the other drawer is already open.

4 | Support

Documentation

Seagate documentation

The following documents are available to explain how to install and use the Lyve Rack product.

- Lyve Rack R1 Notice: Read This First (refer to the Accessory kit)
- Lyve Rack R1 Documentation Reference Sheet (refer to the Accessory kit)
- Lyve Rack R1 Information Sheet (refer to the Accessory kit)
- Lyve Rack R1 Installation Guide (visit www.seagate.com/support/lyve-rack)
- Lyve Rack R1 User Guide (visit www.seagate.com/support/lyve-rack)
- Lyve Rack R1 API Guide (visit www.seagate.com/support/lyve-rack)
- Lyve Rack R1 Troubleshooting Guide (visit www.seagate.com/support/lyve-rack)
- 5005/4005/3005 Series Hardware Installation & Maintenance Guide (visit www.seagate.com/support/lyve-rack)

Supermicro server documentation

1. Go to https://www.supermicro.com
2. Hover over **Support**, and then click **Manuals**.
3. In the **Select Category** dropdown list, select **SuperServers**.
4. In the **Select Product Type** dropdown list, select **1U**.
5. Click **Submit Request**.
6. Locate and refer to the documents for 1U servers – **SYS-6019P-WTR** or **SYS-6019U-TRT**.

Seagate support

Visit the Lyve Rack R1 support page at www.seagate.com/support/lyve-rack

5 | Hardware installation

5.1 | Hardware installation sequence

You must first install the rail kits, and then the remaining hardware from bottom to top.

1. Install the 5U84 storage enclosure rail kit, and server rail kits in the rack.
2. Install the 5U84 storage enclosure in the rack.
3. Install the Supermicro server B in the 1U rack slot present above 5U84.
4. Install the Supermicro server A in the 1U rack slot present above server B.

It is recommended to install the Lyve Rack system in a rack such that the two 1U servers are located directly above the 5U84 storage enclosure. The upper server is designated as server A and the server closest to the 5U84 storage enclosure is designated as server B. Figure 2 shows the completed installation of the Lyve Rack system.

Figure 2: Lyve Rack system

5.2 | Hardware installation overview

The Lyve Rack solution includes the 5U84 enclosure. This section briefly introduces some of the elements.

Figure 3, Figure 4, and Figure 5 describe the rail kit, front view, and rear view of the 5U84 with all modules installed.
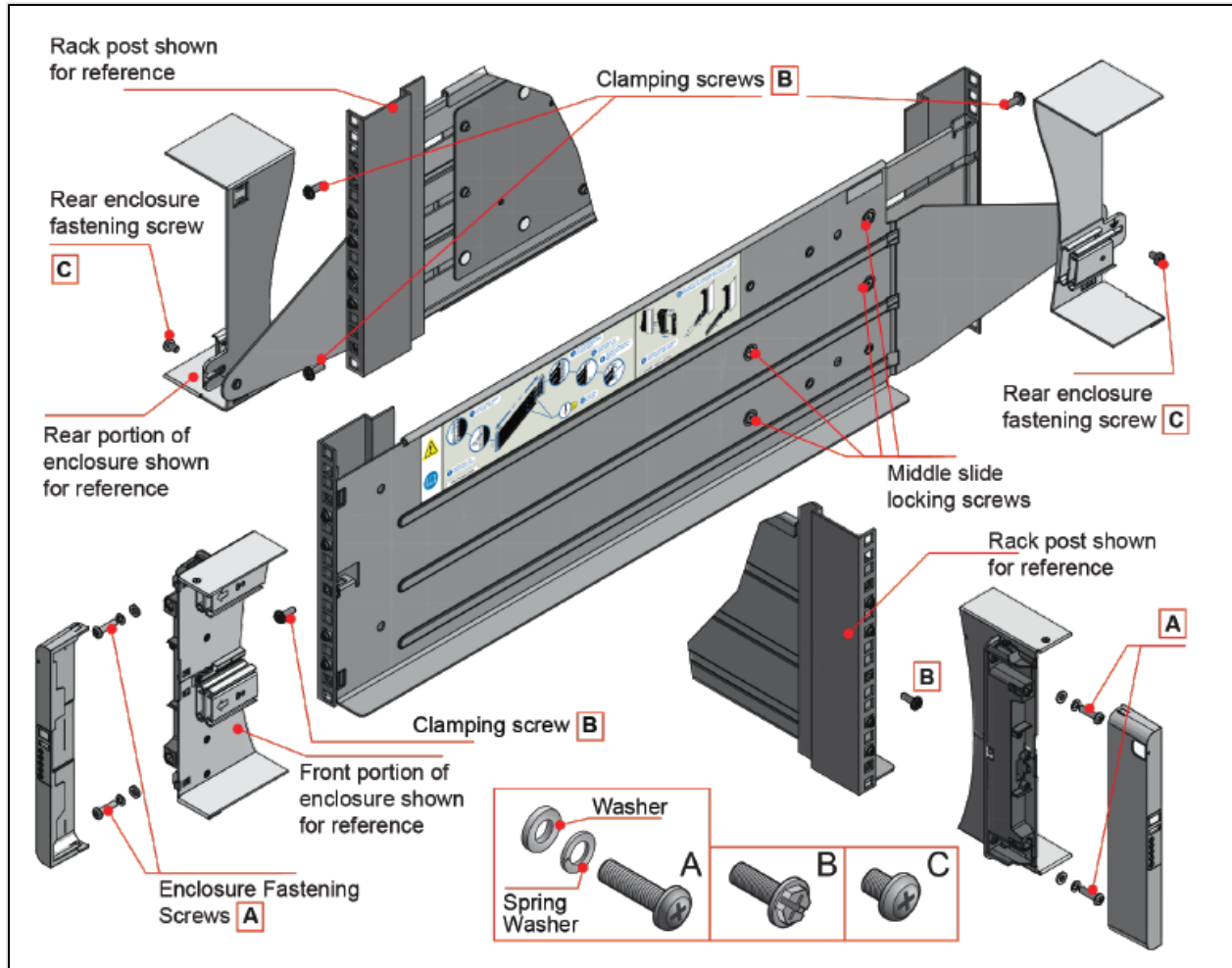
Figure 3: Mounting the system into a rack (only left rail is shown for clarity)

Figure 3 shows the left rail kit placed in a rack in an alignment with its various fasteners, along with the 5U84 enclosure and its front locking bracket. For clarity, we have not shown the entire 5U84 enclosure in the figure.

Complete left rail kit can be seen at the center of this figure. Top left and bottom right portion of the figure shows the front and rear of the central left rail illustration from a different angle.

Top left of the figure shows rear rack post along with partially visible left back rail and rear right portion of the storage enclosure.

Bottom right of the figure shows front rack post along with partially visible left front rail and front left potion of the storage enclosure along with the Locking bracket.

Two Clamping screws (B) at the back and one Clamping screw (B) at the front are used to fix the rail kit with the rack post. Two Enclosure Fastening screws (A) at the front and one Rear Enclosure Fastening screw (C) at the back are used to fix the 5U84 enclosure with the rail kit at the front and the back, respectively.

Figure 4: Front view of the 5U84 storage enclosure
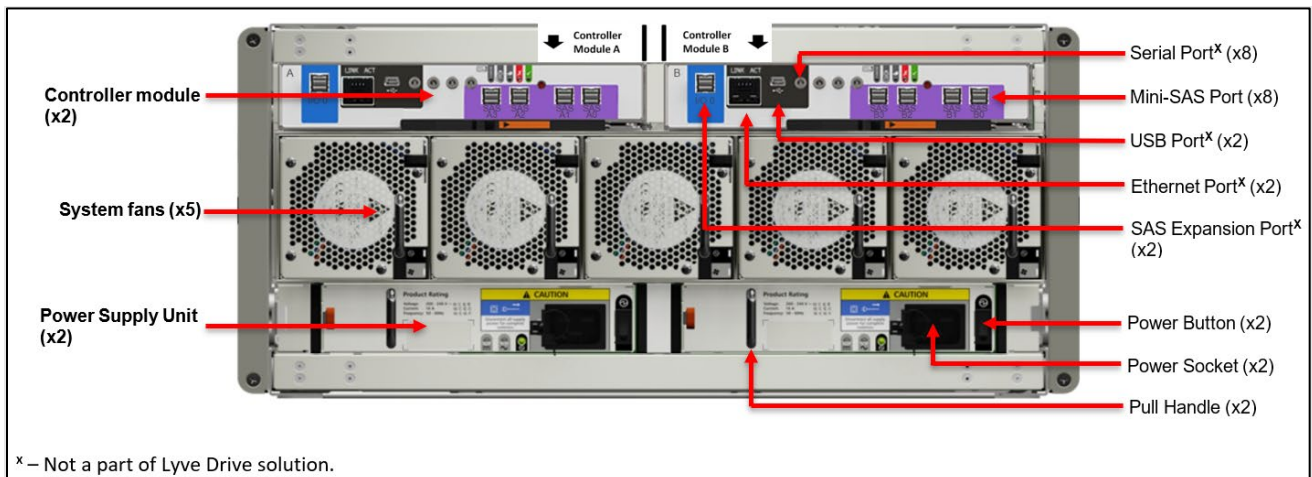
Figure 5: Rear view of 5U84 storage enclosure

5.3 | 5U84 storage enclosure installation

Follow instructions in the CHAPTER 3 INSTALLATION OF THE SEAGATE 5005/4005/3005 SERIES HARDWARE INSTALLATION AND MAINTENANCE GUIDE available at https://www.seagate.com/support/lyve-rack/maintenance-guide/

Refer to the following specific sections in the Hardware Installation and Maintenance guide that when followed, shall complete the hardware installation of the 5U84.

- CHAPTER 3 INSTALLATION → UNPACKING THE ENCLOSURE
- CHAPTER 3 INSTALLATION → RACKMOUNT RAIL KIT
- CHAPTER 3 INSTALLATION → INSTALLING THE 5U ENCLOSURE
- CHAPTER 3 INSTALLATION → POWER CORD CONNECTION
- CHAPTER 3 INSTALLATION → GROUNDING CHECKS
- CHAPTER 5 TROUBLESHOOTING AND PROBLEM SOLVING → 5U ENCLOSURE LEDS
- CHAPTER 5 TROUBLESHOOTING AND PROBLEM SOLVING → DDIC LED
- CHAPTER 6 MODULE REMOVAL AND REPLACEMENT → CRU REPLACEMENT FOR 5U CHASSIS

- Chapter 6 Module removal and replacement → Accessing drawers
- Chapter 6 Module removal and replacement → CRU replacement for 5U chassis
- Chapter 6 Module removal and replacement → Replacing a DDIC → Installing a DDIC
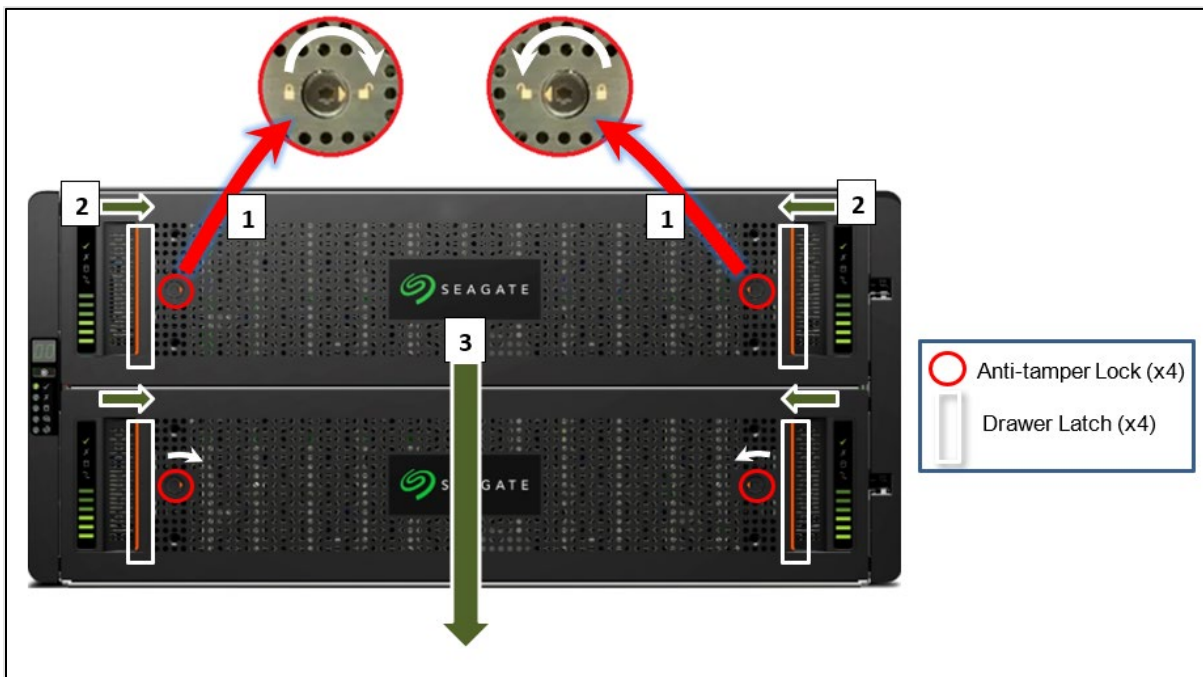
Figure 6: Front of 5U84 storage enclosure anti-tamper locks and drawer latches

To install the 5U84 storage enclosure:

1. Identify 7U of rack space preferably as low in the rack as possible to keep the center of gravity low to avoid toppling. Identify the correct orientation of the enclosure. The front of the 5U84 must have sufficient space to open the drawer outside. You must identify the front and rear side of the rack.
2. Install the rail kits for 5U84 and both servers. Installing all rail kits first helps in confined spaces. The server rail kits are in the server box and the 5U84 rail kits are in the 5U84 system pack box. Ensure the front of the rail kit is installed in alignment of the front of the rack.
3. With assistance, lift the 5U84 out from the box using the lifting straps.
4. From the rear remove all the 5U84 rear modules to reduce the weight of the enclosure. Care should be observed while handling these items to avoid static or mechanical damage. Do not touch any exposed pins or circuit boards. Do not drop any rear modules.
5. Slide the 5U84 onto the 5U84 rail kit and secure 5U84 to the rail kit to ensure it does not move when the further items are installed into it.
6. From the rear, insert the 5U84 rear modules. Insert all controllers, fan modules, and PSU modules.
7. From the front, only the drives that came on the same pallet should be installed in this 5U84 as these drives are pre-configured for this Lyve Rack. The drives must be inserted into the drive slot where they were factory preconfigured for both the top and bottom drawer according to Figure 7 and Figure 8. Note the top drawer has drive 0 on the front left and each successive row has the lowest number also on the left. Likewise, the bottom drawer has drive 42 on the front left and each successive row has the lowest number also on the left. The term "front" and "left", is from the perspective of the installer standing in front of an opened drawer.

a. Ensure anti-tamper locks of the top drawer are unlocked using the supplied T20 screwdriver.
b. Using drawer latches, push both latches of the same drawer towards the center of the drawer.
c. Slowly pull top drawer towards yourself.
d. Insert all DDICs starting from top drawer with drives at the front left of each row leaving no empty drive slots paying attention to inserting drives in ascending order.
e. Repeat until all rows on the top drawer are full. Visually re-check that the DDIC sequence numbers match the figure.
f. Close the drawer and lock it.
g. Repeat the steps a through f for the bottom drawer.

Figure 7: Populated the top drawer	*Figure 8: Populated the bottom drawer*
Populate the top drawer first. Close and lock the drawer.	Populate the bottom drawer after filling and closing the top drawer. Close and lock the drawer.

8. The anti-tamper locks do not have to be used. If they are used to lock the drawer, store the T20 screwdriver safely afterwards. Now that all DDIC and rear modules are inserted, the rack installation can progress to the next stage.

5.4 | Server installation

Depending upon your server configuration, follow instructions provided in the Server Installation chapter of SUPERMICRO SUPERSERVER USER MANUAL 6019P-WTR OR SUPERMICRO SUPERSERVER USER MANUAL 6019U-TRT to unpack and install the servers into the rack.

See Figure 2 above. The servers are not configured identically. Hence, you must first identify the server B box and rack the server directly above the 5U84 storage enclosure. After racking server B, identify server A box, and rack it directly above server B.

5.5 | Network switch and other components

If not already installed and operational, install other components needed for the Lyve Rack system setup according to their respective installation instructions. Consult with your Solution Partner or Seagate Systems Engineer for more details.

You must procure your own QSFP28 cables for the Public Data Interface connection to the high-speed switch. Either you can use a QSFP28 Y cable or two QSFP28 100GbE to 100GbE cables.
If a Y cable is used, the high-speed switch port needs to be made aware of this, by preconfiguring the high-speed switch port as a Breakout Port before attaching the Y cable to it. For example, if the high-speed switch port is a 100G, it should be configured as 2x50G. For information on how this can be done, refer to your high-speed switch user guide.

5.6 | Lyve Rack R1 networking and physical checklist

Item	Requirement	Comment	Check
Networking			
Management Networking	On the Management Switch: 1GbE or 10GbE RJ45 ports.4 ports are required. The management interfaces and management virtual IP must be on a different subnet to the High-Speed Data interfaces and the High Speed Data virtual IP. The management interfaces and the BMC interfaces on both servers could be on different subnets or VLANs (should higher protection for the BMC interface be desired). If this approach is used, the Management network must be routable to the BMC network and there must not be any IPMI filtering between these two subnets.	Some of the cables must be procured by you. All ports must be 'pingable' from the management console (i.e any system used to communicate with the LR).	

	The Management Virtual IP must be on the same subnet as the physical interfaces for the Management network. 1 x static IP is required for the Management Virtual IP. Physical interfaces for each server are configured using DHCP static allocation (aka DHCP reservation). The Information sheet supplied with each Lyve Rack R1 unit documents the pertinent MAC addresses.		
High Speed Data Networking (Public data interface)	IEEE 802.3bg (QSFP28) compatible switch 25GbE, 50GbE, or 100GbE. 1 port required if supplied Y-cable is used and the port must be configured in breakout mode. Alternatively, if it is desired to connect the servers to two separate High Speed Data Switches for redundancy, direct connect cables (not supplied) may be used. In this scenario, the ports on both switches must be configured on the same subnet. The Data Virtual IP must be on the same subnet as the physical interfaces for the Data network. The High Speed Data interfaces and the High Speed Data virtual IP must be on a different subnet to the management interfaces and management virtual IP.	Anything that supports QSFP28 connections. You must procure the 100GbE to dual 50GbE Y-cable or two 100GbE to 100GbE separate cables.	

	1 x static IP is required for the Data Virtual IP.		
	Physical interfaces for each server are configured using DHCP static allocation (see Information sheet for MAC addresses).		
	S3 data sources and clients must be routable to the subnet on which the data VIP is configured.		
DHCP server **(Optional if static IP configuration is used)**	Lyve Rack R1 currently supports DHCP server and static IP configurations. The DHCP server configuration supports: • IP allocation (static DHCP lease) based on configuring Reserved Addresses to correspond to MAC addresses (provided on information sheet). Lyve Rack R1 does not yet support configuration of Static IPs on the CORTX servers. DHCP Server must also provide the IP address of the Gateway and Domain Name Server (DNS) to be used. All IP addresses related to the same type of network including its Virtual IP address, should be configured for the same subnet. The DHCP statically assigned Management Interface address of each server and the Management VIP (floating IP) must be on the same subnet.		

	The DHCP statically assigned Public Data Interface address of each server and the Data VIP (floating IP) must be on the same subnet, but the subnet can be different to the management Interface group subnet.		
Static IP	You must be aware of IP addresses, subnet masks, and IP of the gateway.		
DNS	Fully Qualified Domain Names (FQDN) must be configured for: 1. Management VIP 2. Data VIP 3. Server A Management Interface IP 4. Server B Management Interface IP		
Physical			
Rack			
	1.0M depth, 600mm wide Industry Standard rack. HW min U = 7 Must be operated with low pressure rear exhaust installation. Back pressure not to exceed 5Pa (~0.5mm H_2O)	Custom configured or specialized racks may need a verification check to ensure HW fit. Be aware that, if fitted, inward facing vertical PDUs may cause interference with the 5U84 chassis. Please check clearances and tolerances carefully.	
Power			
Input Power Requirements:	Each Server: 2x 110-120vAC OR 2x 220-240vAC (750W ea). 5U84 Storage enclosure:	PDUs in rack strongly recommended. 4x C13-NEMA 5-15 1.5M and 4x C13-C14 1.5M cables are provided. 2x C19-C20 1.5M power cords are provided.	

Input Power Requirements: Max Input Power: Heat Dissipation:	2x 200-240V AC 50-60Hz (2200W ea) 1047W maximum continuous 3572 BTUs/hour	
Weights & Dimensions		
Servers (2) **Height** **Width** **Depth**	18.6kg / 41lb each 43mm / 1.7" 437mm / 17.2" 754mm / 29.7"	Follow racking instructions carefully. Refer to Lyve Rack R1 Installation Guide on www.seagate.com/support/lyve-rack/installation-guide/ and server documentation at: 1. Go to https://www.supermicro.com/ 2. Hover over Support, and then click Manuals. 3. In the Select Category dropdown list, select SuperServers. 4. In the Select Product Type dropdown list, select 1U. 5. Click Submit Request. 6. Locate and refer to the documents for 1U servers SYS6019P-WTR or SYS-5019P-WTR.
5U84 Storage Enclosure **Empty** **Loaded** **Height** **Width** **Depth**	64kg / 141lb 135kg / 298lb 222.3mm / 8.75" 444.5mm / 17.5" (w/ear 483mm / 19.01") 981mm / 38.63"	Follow racking instructions carefully – See Lyve Rack R1 Installation Guide on www.seagate.com/support/lyve-rack/installation-guide/ and Hardware Installation & Maintenance Guide on www.seagate.com/support/lyve-rack/maintenance-guide/ Only fit HDDs after the enclosure is installed in the rack. Refer the Lyve Rack R1 Installation Guide for details.

Operating System	Cent OS 7.8 will be pre-installed during the manufacturing process.		

6 | Cable connection

6.1 | Cables

Table below shows different cables associated with the Lyve Rack. Some of the cables must be procured by you. Cables that need to be procured by you, have "User provided" entry in its description. Verify that all listed cables are present in the appliance accessories kit, enclosure kit, and server kits.

Table 4: Lyve Rack System cables

	Description	Image	Quantity
Cables provided by Seagate in the Accessories Kit	100GbE to 100GbE (QSFP28 to QSFP28) Direct Attach Passive Copper Cable Ethernet 0.75m Black 30AWG CA-N		1
	CABLE, SAS,12G SFF-8644,1.5M SFF-8644 connector at both ends		8
	C13-C14 power cords		4

	Description	Image	Quantity
Cables that need to be procured by you	100GbE to 2x50GbE (QSFP28 to 2xQSFP28) Direct Attach Copper Splitter Cable Y cable OR 2x 100GbE to 100GbE (QSFP28 to QSFP28) Direct Attach Passive Copper Cable	 Y cable	1 OR 2
	CABLE, CAT6a LAN,3.0M - YELLOW Management cables		2
	CABLE, CAT6a,3.0M - PURPLE BMC interface cable		2

Table 5: Cables supplied with 5U84 storage enclosure

Description	Image	Quantity
Power cables mains C19-C20 R/A		2

Note
Lyve Rack provides C13-C14 power cords.

Table 6: Cables supplied with servers

Description	Image	Quantity
Power cables mains C13-NEMA 5-15. Depending on regional server accessories, the power cords supplied may be different than shown.		2 in each server kit for a total of 4

6.2 | Recommended cabling sequence

Table 7: Lyve Rack connection components

No.	Item	Image	Use
1	Management console (Laptop) (User provided)	NA	Allows the user to remotely connect the Lyve Rack R1 using CORTX Manager*.
2	GbE Ethernet cable (User provided)	NA	Allows the Management Console laptop to be connected to the Management Ethernet switch.
3	Management Ethernet Switch (User provided)	NA	Allows the Management Console laptop to be connected to CORTX Manager* and allows each server to monitor the health and manage the recovery of the partner server.

No.	Item	Image	Use
4a, 4b	Management interface cable RJ45 connector at both ends (User provided)		Allows Lyve Rack R1 to be remotely managed via the CORTX Manager* running on the Management VIP once the Cluster is configured. Also allows recovery of the partner node to be initiated.
5a, 5b	BMC interface cable RJ45 connector at both ends (User provided)		Allows each server to monitor the health and manage the recovery of its partner.
6	Data Source (User provided)	NA	Data Source is data to/from an external data store.
7	QSFP28 cable (User provided)	NA	Transfer Object Store Data to-from external Data Source to Lyve Rack.
8	High Speed Data Switch (User provided)	NA	IEEE 802.3bg (QSFP28) compatible switch 25GbE, 50GbE, 100GbE. A QSFP28 high speed data switch that allows the data source and Lyve Rack to be on the same network.
9a, 9b	Public Data Connection cables Black QSFP28 connector at both ends (Data Interface cable) (cluster VIP) (User provided) OR		Two cabling choices are supported: • **Option 1 Using Y cable** - Allows the Public Data Interface from each Server to be connected externally to the Data Source via the High-Speed Data Switch. Each server has 1x 50GbE interface that is connected via this Y cable. It is hence suggested that the high-speed switch port is a 100GbE port configured as a breakout Port (bifurcated) to allow the 1x

No.	Item	Image	Use
	2x 100GbE to 100GbE (QSFP28 to QSFP28) Direct Attach Passive Copper Cable (User provided)		50GbE ports to be connected from each server. This means Lyve Rack with two servers has 2x 50GbE = 100GbE connectivity. When the cluster is configured, the Data VIP uses this cable. • **Option 2. Using two direct cables** – In this configuration, two separate cables are used instead of Y cable. This allows the Public Data Interface from each server, for example, 2x 50GbE to be connected.
10	Private Data Connection cable Black QSFP28 connector at both ends		Allows the Private Data Interface of each server to be connected to its partner so that high speed communication, 50GbE, between the servers can be performed. Also allows each server to monitor the health of its partner.
11a, 11b, 11c, 11d & 12a, 12b, 12c, 12d	Mini-SAS HD 12G SFF-8644 cables Black SFF-8644 connector at both ends		Allows each server to store and retrieve data via 12Gbit/s SAS connections to the 5U84 storage enclosure.

* CORTX Manager is the name of the web interface that can be used to remotely manage Lyve Rack.

* A floating IP address, also known as a Virtual IP address (VIP), is an address that more than one server listens to. High availability systems such as Lyve Rack R1, use this concept to perform load balancing and improve availability to network clients.

The following is the suggested cabling sequence. Steps refer to cables in Table 7. Make sure the cables are connected to the correct port as shown in Figure 9.

1. Cable Server A SAS interface to Controller A using 11a and 11b.
2. Cable Server A SAS interface to Controller B using 11c and 11d.
3. Cable Server B SAS interface to Controller B using 12a and 12b.

4. Cable Server B SAS interface to Controller A using 12c and 12d.
5. Cable Server A Management Interface Cable to Management Switch using 4a.
6. Cable Server B Management Interface Cable to Management Switch using 4b.
7. Cable Server A BMC Interface Cable to Management Switch using 5a.
8. Cable Server B BMC Interface Cable to Management Switch using 5b.
9. Cable Private Data Interface Server A to Server B using 10.
10. Using a QSFP28 Y cable or two 100GbE to 100GbE QSFP28 cables:
    a. Cable Server A Public Data Interface Cable to High Speed Switch using 9a.
    b. Cable Server B Public Data Interface Cable to High Speed Switch using 9b.
    c. If Y cable is used, cable the tail of the Y cable into High Speed Switch Port that has been preconfigured as Breakout Port (bifurcated).
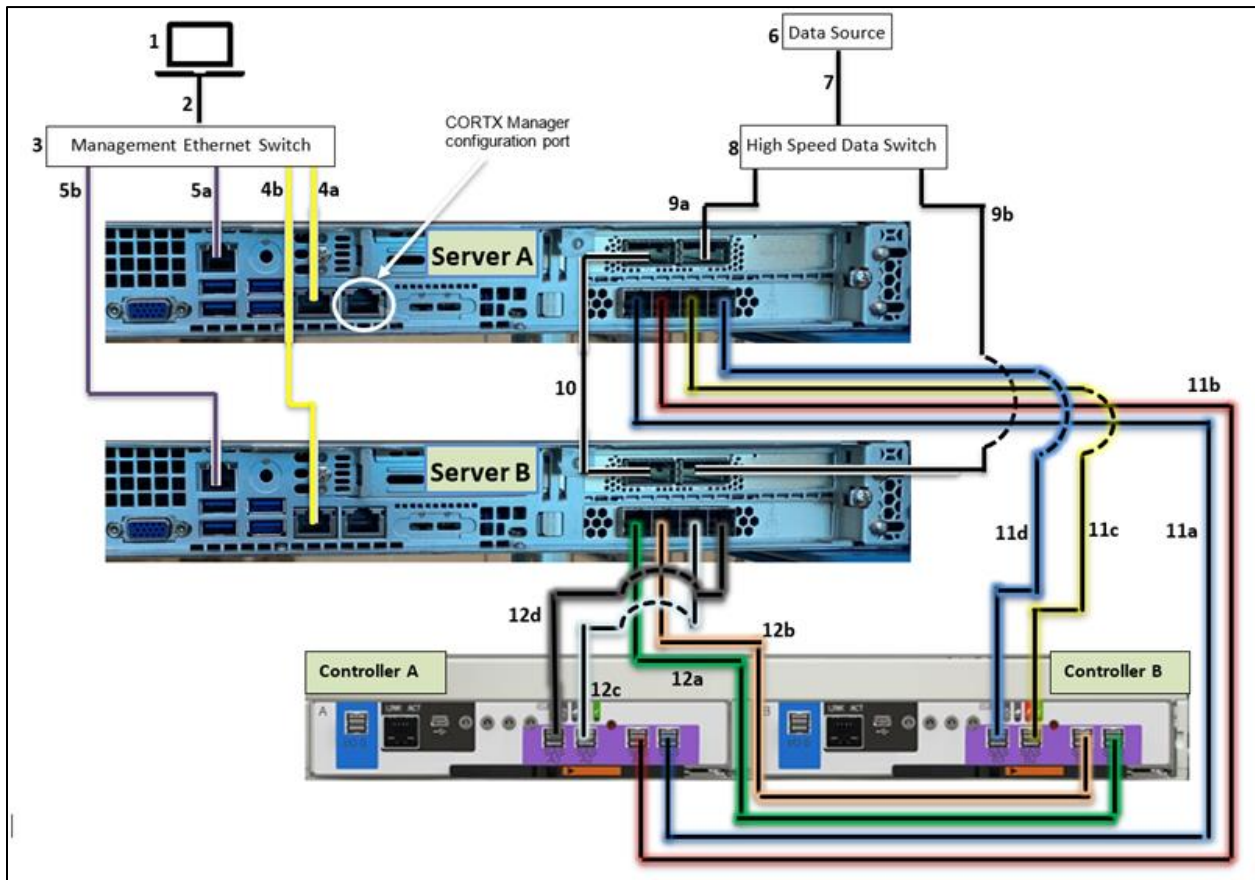
Figure 9: 6019P Server cable connections (excluding power supply)
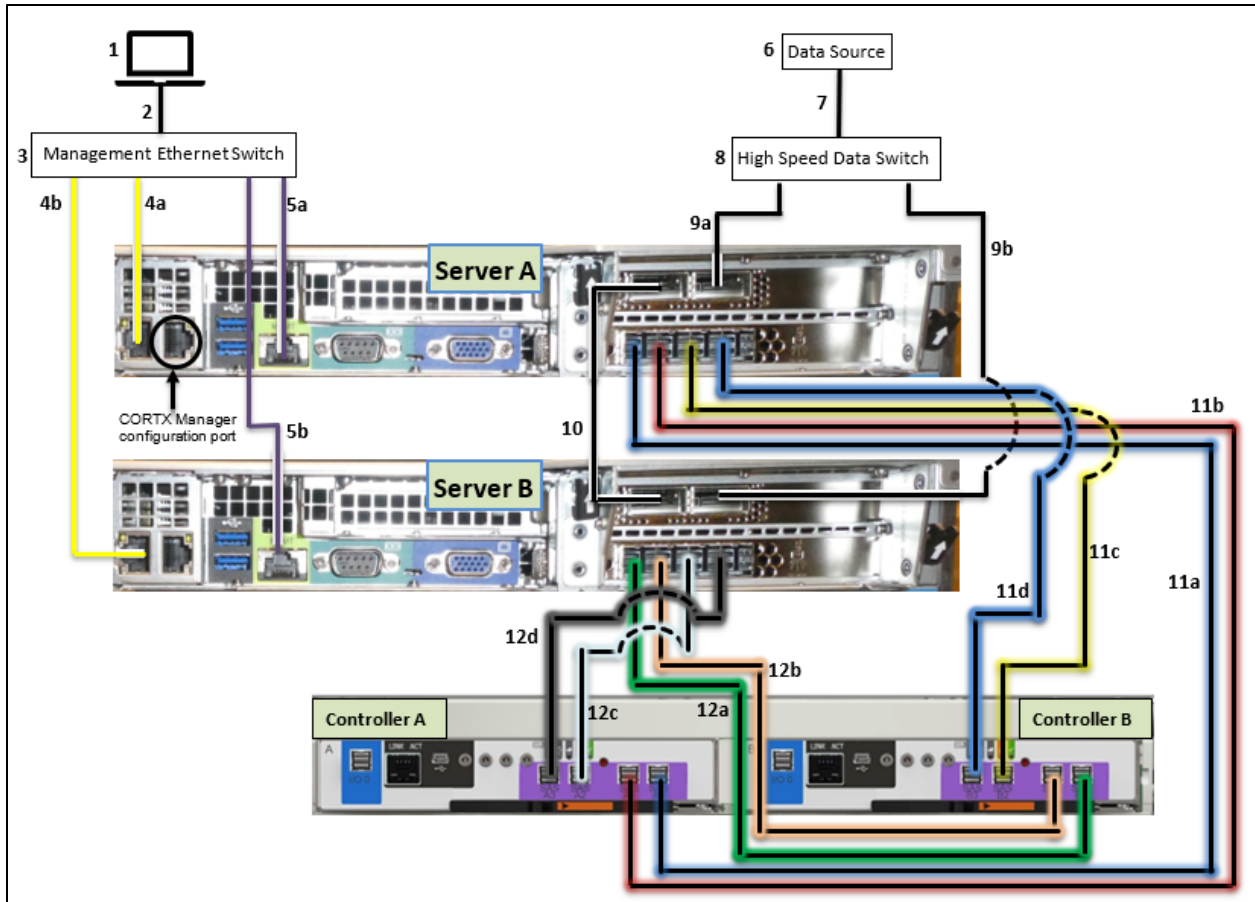
Figure 10: 6019U Server cable connections (excluding power supply)

* CORTX Manager is the name of the web interface that can be used to remotely manage Lyve Rack.

* A floating IP address, also known as a Virtual IP address (VIP), is an address that more than one server listens to. High availability systems such as Lyve Rack R1, use this concept to perform load balancing and improve availability to network clients.

6.3 | Connecting power cables to storage enclosure and servers

Connect the 5U84 storage enclosure using the C19-C20 R/A and the two servers using the C13-NEMA 5-15. Connecting to two Power Distribution Units (PDUs) each on separate power phases improves power availability. For the 5U84 storage enclosure, connect PSU 0 to PDU 1 and PSU1 to PDU 2. For both servers, connect PWS1 to PDU 1, PWS2 to PDU 2.
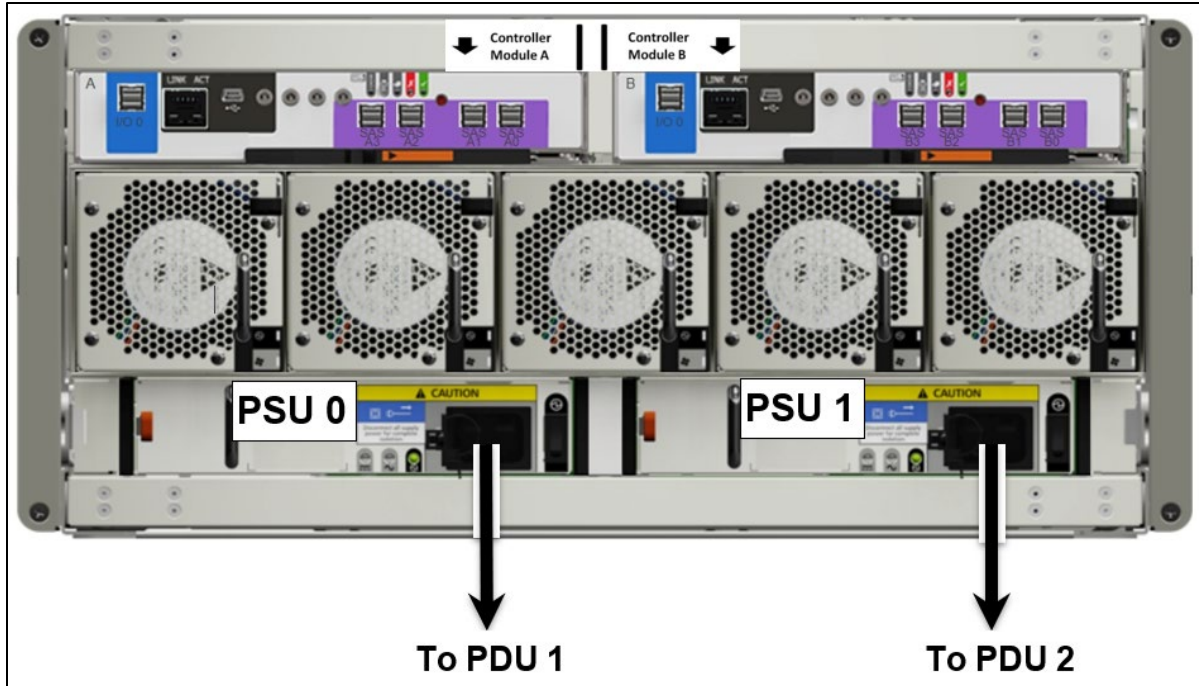
Figure 11: Storage enclosure power connections
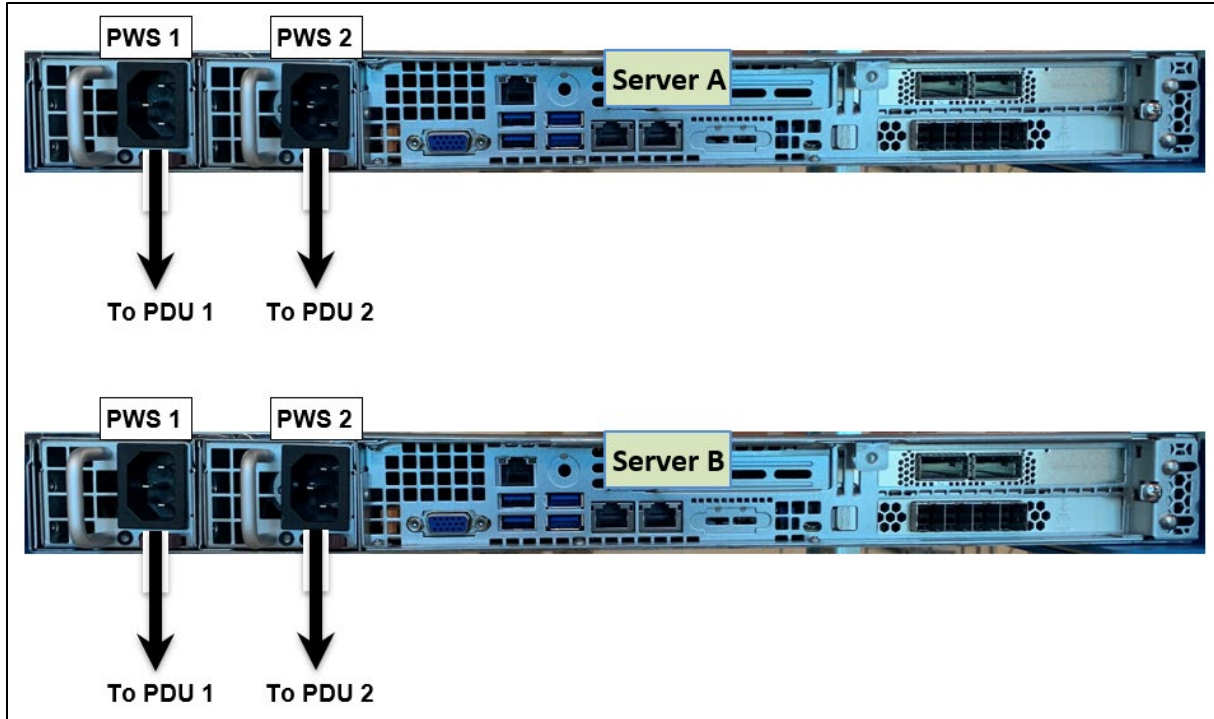
Figure 12: 6019P Server power connections
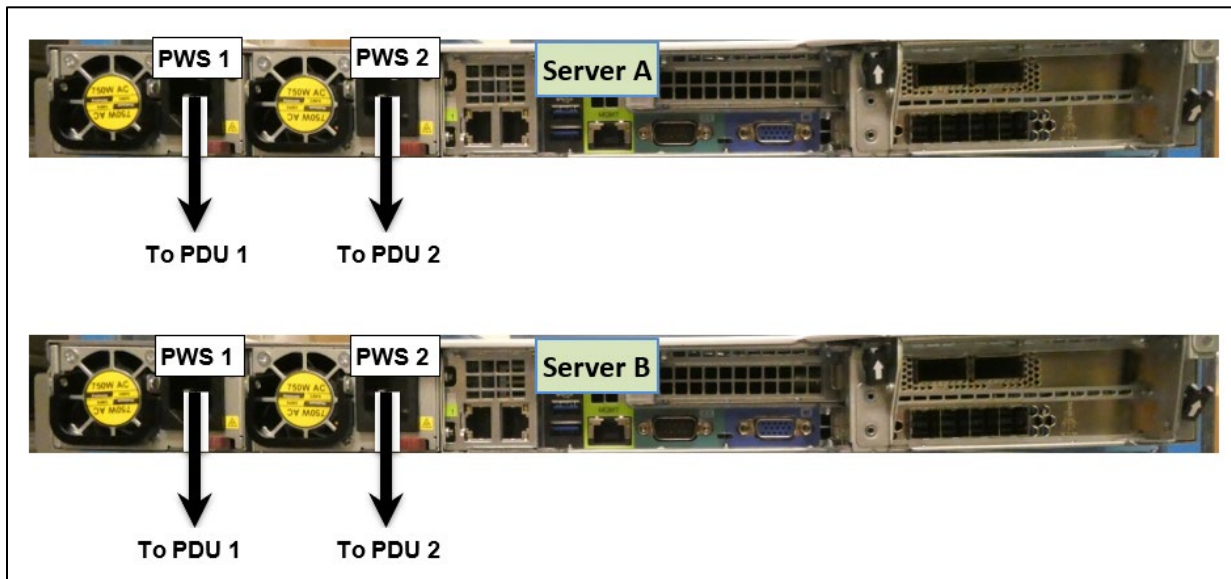
Figure 13: 6019U Server power connections

7 | Pre-boarding Lyve Rack R1

Pre-boarding Lyve Rack R1 is a one-time process of reserving network IP addresses with the assistance of the site network administrator. The network address administration and reservation process must be completed before powering on Lyve Rack R1.

7.1 | Example information sheet

The information sheet is provided with Lyve Rack R1.

SEAGATE	Lyve Rack R1 Information Sheet DO NOT DISCARD

Lyve Drive Rack R1 Serial Number

Place PN/SN label here	Notes: 1. Dotted underline items are provided by the manufacturer and are inputs to the LRr1 installation process. Please refer to the Installation Guide. 2. Solid underline items are to be provided by the installer or customer and are required during the installation process.

CORTX Username and Password for initial setup

Username:	cortxub
Password:	

CORTX Virtual IPs

Virtual IPs	FQDN (user provided)	Static IP (user provided)
Management VIP		
Data VIP		

Server A Serial Number, FQDN, and MAC Addresses

		FQDN (user provided)	DHCP Assigned IP (user provided)
Serial Number:			
Management Interface MAC			
BMC Interface MAC		N/A	
Public Data Interface MAC		N/A	

Server B Serial Number, FQDN, and MAC Addresses

		FQDN (user provided)	DHCP Assigned IP (user provided)
Serial Number:			
Management Interface MAC			
BMC Interface MAC		N/A	
Public Data Interface MAC		N/A	

7.2 | General requirements for network configuration

Note
Refer to the *Lyve Rack R1 Information Sheet* for planning purposes.

Lyve Rack R1 requires three network domains to be configured by the customer:

- Management Network (3x IP addresses: 1 each per server and 1 floating IP address).

  Note
  Both static virtual IP and DHCP IP addresses are supported.

- BMC Network (2x IP addresses: 1 each per BMC on each server).
- High Speed Public Data Network (3x IP addresses: 1 each per server and 1 floating IP Address).
  - 2x Public Data Interface used for Lyve Rack R1 Object Store Address
  - 1x floating IP address
- Also, the following must be noted:
  - Default gateway and subnet mask for the Management and High-Speed network.
  - NTP Server address.

Lyve Rack R1 also uses a private network domain which does not require customer configuration:

- High Speed Private Data Network (2x static virtual IP addresses: 1 each per server).
  - The network address for this private network is automatically setup by Lyve Rack R1 for its internal cluster communication.

A floating IP address, also known as a Virtual IP address (VIP), is an address that more than one server listens to. High availability systems such as Lyve Rack R1, use this concept to perform load balancing and improve availability to network clients.
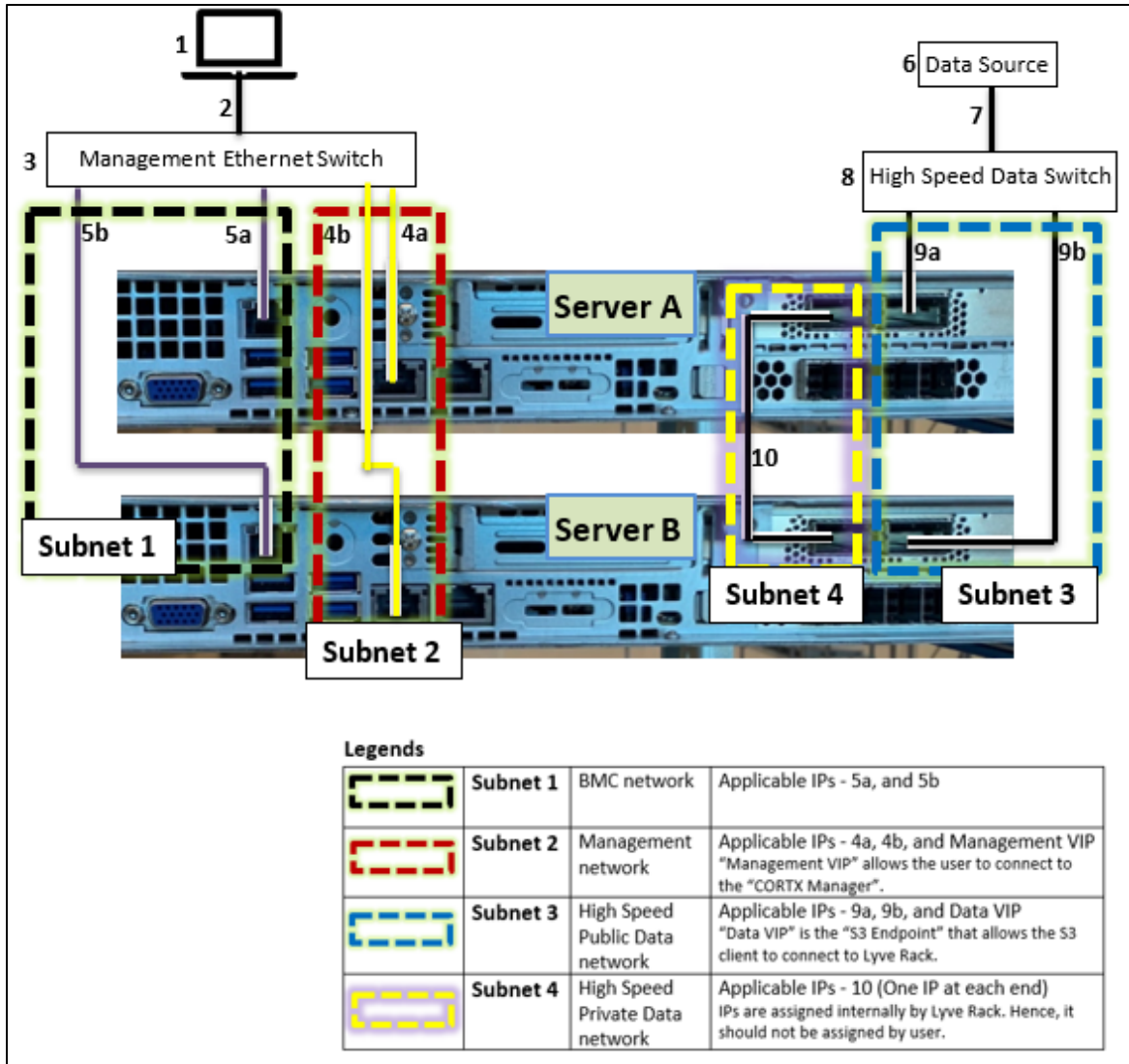
Figure 14: 6019P Server networking subnet requirements
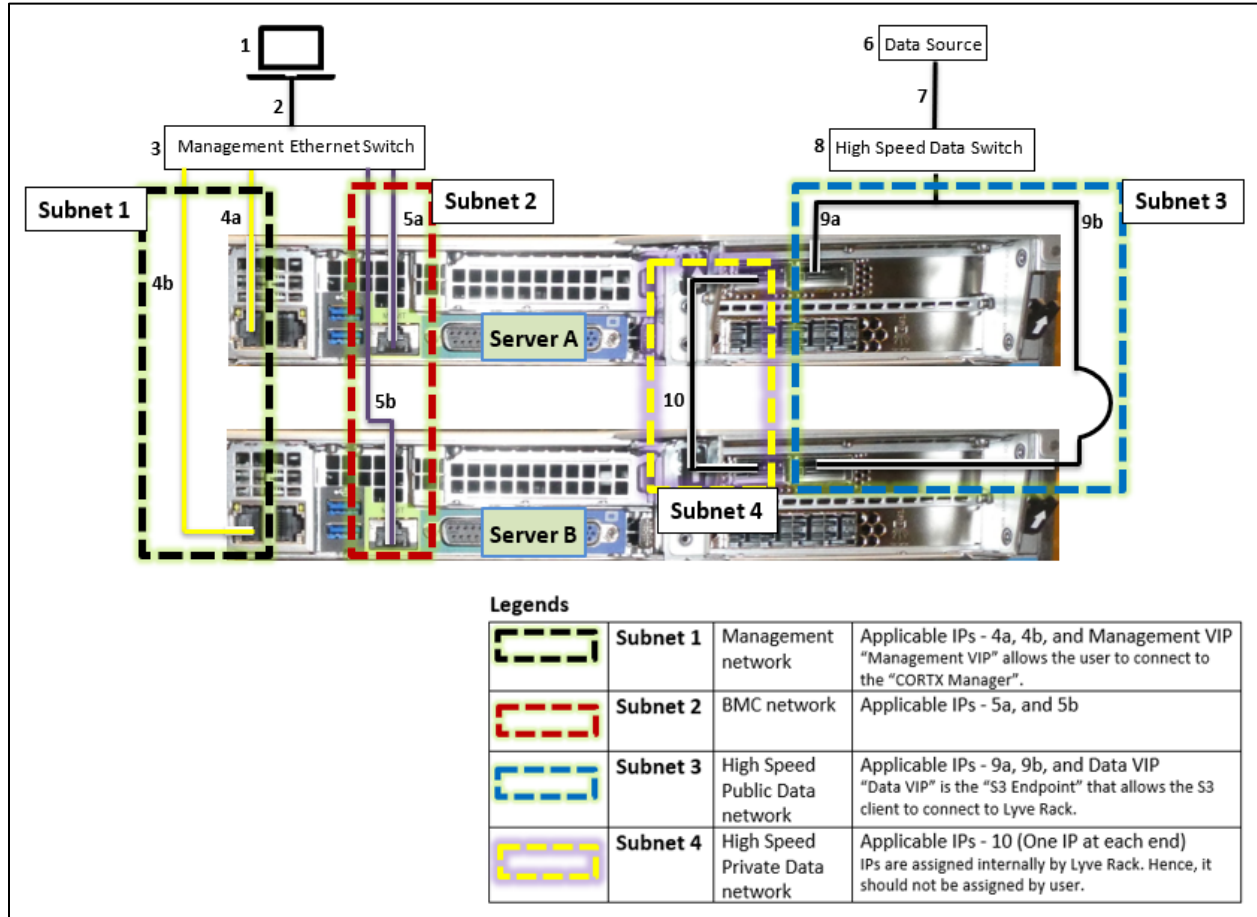
Figure 15: 6019U Server networking subnet requirements

Network Domain subnet administration requirements

- All IP addresses related to the same network domain including its Virtual IP (VIP) address must be configured for the same subnet.
- The Management Network and the Data Network must be on different subnets.
- The BMC Network may be on its own subnet or VLAN for security isolation requirements or optionally on the same subnet as the Management Network.
- The Management Network subnet must be routable in both directions to the BMC Network subnet and there must not be any IPMI firewall filtering between them if they are not on the same subnet.
- Lyve Rack R1 on the High-Speed Private Data interface uses the 192.168.0.nnn subnet. Additionally, 10.100.100.100 and 10.0.0.nnn subnet is also used by Lyve Rack R1. If the customer site is already using this subnet, it will be necessary to reconfigure the Lyve Rack R1 internal subnet. Contact Seagate Support.

Example Network Domain subnet administration settings

- The example below shows a completed Lyve Rack R1 Information Sheet (provided in the Accessories kit) showing the three network domains which all have been assigned a different subnet as per RFC 5737.

- It may be noted in the fourth IP octet, that the numerically lowest address is the VIP followed by two addresses for Server A and B respectively.

CORTX Virtual IPs			
Virtual IPs	**FQDN (user provided)**	**Static IP (user provided)**	**Cable no. See** Figure 14 **or** Figure 15**)**
Management VIP	man-0.company.com	192.0.2.10/24	4a/4b
Data VIP	s3-0.company.com	203.0.113.10/24	9a/9b

Server A Serial Number & MAC Addresses				**Associated Cable no. (See** Figure 14 **or** Figure 15**)**
Serial Number:	Q114223X9C04398	FQDN (user provided)	Assigned IP (static or DHCP; user provided)	
Management Interface MAC	00:00:6b:c8:8e:58	srvnode-a.company.com	192.0.2.11/24	4a
BMC Interface MAC	00:00:6b:c8:8e:2e	N/A	198.51.100.11/24	5a
Public Data Interface MAC	00:01:9b:6b:6c:70	N/A	203.0.113.11/24	9a

Server B Serial Number & MAC Addresses				**Associated Cable no(See** Figure 14 **or** Figure 15**)**
Serial Number:	Q114223X9C04399	FQDN (user provided)	Assigned IP (static or DHCP; user provided)	
Management Interface MAC	00:00:6b:c8:92:10	srvnode-b.company.com	192.0.2.12/24	4b
BMC Interface MAC	00:00:6b:cd:a0:25	N/A	198.51.100.12/24	5b
Public Data Interface MAC	00:01:9b:6b:6c:58	N/A	203.0.113.12/24	9b

DHCP Server requirements (When DHCP Server is used)
A DHCP Server can automatically assign IP addresses from a pool or can manually assign static virtual IP addresses based on a hardware MAC address.

- Lyve Rack R1 requires the DHCP Server to support DHCP Static Mapping (also known as static DHCP lease) which is a feature that enables the assignment of static virtual IP and gateway addresses as a response to observing a DHCP Client MAC address request.
- The DHCP server must be able to assign network addresses before Lyve Rack R1 is powered on.
- Once the DHCP server has been configured and has started assigning IP addresses, the DHCP server must not change the IP addresses.
- If any IP address needs to be changed, contact Seagate Support.

- If either Server or either High Speed Data Network interface card is replaced, contact Seagate Support to obtain assistance with Cluster network configuration.

BMC credential requirements

On each server, the BMC administrator account and credential must not be changed. This account and credential are used by Lyve Rack R1 for partner node management.

Firewall requirements

If there is a firewall setup between DHCP, DNS, and/or NTP servers and the appliance, ensure that the following ports are open to allow flow of required data to the appliance:

Table 8: List of Open ports

Service	Service Name	Protocol	Port	Network Interface	Purpose
CORTX Manager	Web Server	HTTPS	28100	Public Management Network	CORTX Manager GUI webserver port
CORTX Manager	SSH	TCP/UDP	22	Public Management Network	Execution of CORTX CLI or generating Support bundles
S3	HA proxy	HTTPS	443	Public Data Network	External S3 Endpoint port
S3	HA proxy	HTTPS	9443	Public Data Network	External IAM Endpoint port
Lyve Pilot	UDS	TCP/UDP	5000	Public Management Network	Receive Requests from Lyve Pilot
DHCP Client	DHCP	UDP	68	Public Management Network	Receives IP from DHCP server
DNS Client	DNS	TCP UDP	53	Management and Public Data Interface	Permits IP and VIP name resolution for Nodes and Clients.
NPT Client	NTP	UDP	123	Management and Public Data Interface	Permits S3 security for endpoint and Client.

7.2.1 | Data Network connectivity for Lyve Rack R1

Lyve Rack R1 is designed to be highly available when client I/O is directed to the Cluster IP over data network. The implementation relies on multicast, which has some functional implications and may not be allowed in all deployment environments. Without any special configuration of the public data switch (customer-owned), data direct to the Cluster IP will be retransmitted on all network ports. A preferred way to deploy is to configure the public data switch to group the Lyve Rack R1 node ports into the same VLAN. The results of this will be that the multicast data will be limited to those ports in the VLAN. If multicast setup is entirely precluded, the Cluster IP can be disabled, and an external load balancer used in its place to direct I/O to the nodes' data IP's directly.

Note
The load balancing approach should be made sufficiently robust so as to avoid repeatedly sending I/O to a non-responsive node (e.g., by monitoring ping or periodically confirming connections are accepted on port 443).

The following table summarizes the network deployment options:

Deployment Mode	Customer Configuration Required	Notes
Without VLAN	None	• Storage traffic directed to the Cluster IP will be broadcasted on all network ports. • Storage traffic is automatically balanced between nodes. • Down node is automatically avoided.
With VLAN	Create VLAN as described by customer switch documentation; place two Lyve Rack R1 nodes into the VLAN	• Storage traffic directed to Cluster IP will be multicast to ports within the VLAN. • Storage traffic is automatically balanced between nodes. • Down node is automatically avoided.
Customer balanced	Installation of software or hardware load balancer recommended	• I/O directed to either node's data IP will be serviced. • Load balancer (software or hardware, not included) recommended to balance I/O between two Lyve Rack nodes. • Load balancer or application logic required to avoid sending I/O to unavailable nodes • Not compatible with Lyve Pilot. Lyve Pilot requires use of Cluster IP. • Load balancer may be configured to terminate SSL connections. In such cases, contact Seagate Support to enable HTTP access on Lyve Rack.

7.3 | Management network

Management network can be configured using Static virtual IP addresses or DHCP-assigned IP addresses.

Note

Lyve Rack R1 does not support mixed mode IP configuration, that is if you chose to configure static virtual IP addresses for the management network you must configure static virtual IP addresses for the public data as well. Configuring one network using static virtual IP addresses and another as DHCP-assigned IP addresses is not supported.

Refer to the Information sheet to know the MAC addresses.

Static virtual IP configuration
User must be aware of IP addresses, subnet masks, and IP of the gateway.

DHCP configuration
Configure DHCP server to assign the same (static) IP and hostname to each provided MAC addresses instead of taking them from DHCP pool. These entries should be corresponding to:

a) Management network for the server - one IP address per server
b) BMC network for the server - one IP address per server

The total number of required IP addresses for management and BMC interfaces: four (4).

In addition to these the DHCP server should also be configured to provide optional info for:

- subnet mask
- name server
- domain name
- gateway

DNS server: Regardless of the IP configuration method, DNS server should have the mappings for the above assigned hostnames and IP addresses - both A-record and reverse lookup record.

7.4 | High-speed data network

Just as for management network, Public Data network can be configured either using static virtual IP addresses or DHCP-assigned IP addresses.

Static virtual IP configuration
User must be aware of IP addresses and IP of the gateway.

DHCP configuration
Configure DHCP server to assign same (static) IP and hostname to each provided MAC addresses instead of taking them from DHCP pool. These entries should be corresponding to:

a) Public data network for the server - one IP address per server

The total number of required IP addresses for high-speed data interfaces: two.

In addition to these the DHCP server should also be configured to provide optional info for:

- subnet mask
- gateway

DNS server: Regardless of the IP configuration method, DNS server should have the mappings for the above assigned hostnames and IP addresses - both A-record and reverse lookup record.

7.5 | Static virtual IPs

For each cluster, two static virtual IPs are required, which would be shared across both servers:

Note
Both Virtual IPs must be statically assigned regardless of the actual network configuration method for the network interfaces (DHCP-assigned IPs or statically assigned IPs).

Management VIP: A static virtual IP on management network that is reserved for a given setup. This IP is not assigned to any specific node by DHCP. However, it must be mapped to a FQDN in the DNS server entries. The Management VIP is the IP address that CORTX Manager web interface runs at. https://<*MANAGEMENT_VIP*>:28100/

Data VIP: A Static virtual IP on data network that is reserved for a given setup. This IP is not assigned to any specific node by DHCP. However, it must be mapped to a FQDN in the DNS server entries. The Data VIP is the IP address that S3 clients must use for the S3 Endpoint address of the Lyve Rack R1.
- The total number of required IP addresses for VIP interfaces: two (2).
- The total number of IP addresses required for the entire cluster: eight (8).

7.6 | Network address allocation and reservation summary

In compliance with the above requirements, the steps to allocate network address and reservation:

1. In the Lyve Rack R1 accessories box, locate the "*Lyve Rack R1 Information Sheet*". This sheet is important to the network configuration and should be kept safe.
2. With this sheet and working with the network administrator, configure the site DHCP (if chosen) and DNS Server for the IP allocations described below. It is recommended that the allocated IP addresses are written down in the spaces provided in the Information Sheet as these will be referred to later. Refer to the sample Information sheet in section 7.1 | General requirements for network configuration under Example Network Domain subnet administration settings.
   a. If a DHCP server is used, statically allocate 3x IP addresses per server, that is, a total of 6 IP addresses tied to the MAC addresses of the network interfaces shown on the Information Sheet. So, for each server:
      - 1x IP for Management Interface MAC.
      - 1x IP for BMC Interface MAC.
      - 1x IP for Public Data Interface MAC.
   b. Reserve 2x IP addresses for the Lyve Rack R1 Cluster. So, for the cluster:
      - 1x IP for Management VIP used for CORTX Manager
      - 1x IP for Data VIP used for Lyve Rack R1 Object Store Address
   c. On the DNS server, add fully qualified domain names (FQDN) entries for each of the two allocated IP addresses for the Lyve Rack R1 Cluster. So, for the cluster:
      - 1x FQDN for Management VIP used for CORTX Manager
      - 1x FQDN for Data VIP used for Lyve Rack R1 Object Store Address
      - 2x FQDN for Management Interface Addresses: 1 each per server. Ensure these host names are assigned via DHCP.

7.7 | Network checklist

Lyve Pilot to CORTX Interface (optional) requirements

Item	Requirement	Comment	Check
Lyve Pilot	Must have a routable connection to the Management VIP and Data VIP described in the networking section above.	Make sure you have the link and the login credentials for Lyve Pilot.	

CORTX Manager and S3 Client to CORTX Interface requirements

Item	Requirement	Comment	Check
SSL Certificate	CORTX Manager Web interface uses https to encrypt the web browser traffic. This is achieved by using a certificate which can be either a CORTX Manager self-signed certificate or a user provided certificate, which can be user self-signed or certificate authority (CA) signed Certificate. **Note**: S3 client and the CORTX Manager uses the same SSL Certificate.	If the CORTX Manager self-signed certificate is used, the user is asked to accept this self-signed certificate upon first connection to CORTX Manager. Optionally, the user is provided the ability to upload a user provided self-signed or user provided certificate authority (CA) signed Certificate using CORTX Manager.	

S3 Client and CORTX Interface requirements

Item	Requirement	Comment	Check
Data VIP ("S3 Endpoint")	Must have a routable bi-directional connection to the S3 client(s) in use that supports all required ports (see list above).		
S3 "Access Key" and "Secret Key"	S3 Clients require the Access key and Secret Key to create a signature for S3 Client requests to Lyve Rack R1.	"S3 Account" creation can be performed by the CORTX "admin" user or a CORTX "user" with the "manage" role assigned. "Access Key" and "Secret Key" are created as a set in CORTX Manager when a "S3 Account" is created. These are shown one time and there is an	

Item	Requirement	Comment	Check
		opportunity to download this credential as a .csv file. The user creator must store this information securely as this information is never shown again, consistent with industry standards. The S3 Client can then use this credential when submitting a S3 Request e.g. creating a bucket associated with this credential.	
SSL Certificate	S3 Client Requests across https must be secured with a certificate. The certificate can be a CORTX Manager provided self-signed certificate, or a user provided self-signed certificate, or a user provided certificate authority (CA) signed Certificate. **Note**: S3 client and the CORTX Manager uses the same SSL Certificate.	If the CORTX Manager self-signed certificate is not used by the S3 Client, the S3 Client can use a self-signed or a certificate authority (CA) signed certificate providing it has been previously uploaded to CORTX Manager. By default, AWS CLI verifies SSL certificates as being signed by a certificate authority (CA) when communicating. Using the following option overrides the verification when self-signed certificates are used or otherwise, the S3 request is rejected. `"aws --no-verify-ssl"`	
S3 Signature Version	AWS Signature Version 2 or 4	S3 Client Requests must be signed using AWS Signature Version 2 or 4.	
NTP	Lyve Rack R1 and any S3 Clients must be time synchronized via a NTP server.	The NTP server address setting for Lyve Rack R1 is configured in CORTX Manager. This is then configured on the underlying Operating System on both servers once applied via CORTX Manager.	

Item	Requirement	Comment	Check
		Any S3 Clients attaching to Lyve Rack R1 must also have a NTP server address set using the underlying Operating System. Refer to S3 Client underlying Operating System User Guide on how to set up NTP server address. The S3 Request has a timestamp component in the signature to help prevent third parties from intercepting the request.	
DNS	Configure DNS resolution for VIPs used by Lyve Rack R1 system.	Lyve Rack R1 uses DNS for name resolution purposes. Configure DNS for Management VIP and Public Data VIP to use the FQDNs instead of the IP addresses.	

8 | Turn ON power

Note
Ensure that all equipment is connected to the appropriate power sources before starting the powering ON sequence.

8.1 | Switch ON storage enclosure

To switch ON the 5U84 storage enclosure:
- Switch ON the power on both PSUs using Power Switches (see Figure 16).

    Note
    It is not required to switch ON both PSUs simultaneously. However, it is recommended to switch ON PSU 0 followed by PSU 1.

Figure 16: 5U84 storage enclosure PSU. Power switch 'O' = OFF; 'I' = ON

Wait for five minutes to complete initialization and self-test functions. Then verify that the 5U84 storage enclosure front panel LEDs are illuminated as shown in Figure 17 and Figure 18.

Figure 17: Ops panel - Only the Power ON LED lit.

Figure 18: Drawer LED panels
(Two per drawer: left and right). Sideplane OK/Power Good LED lit
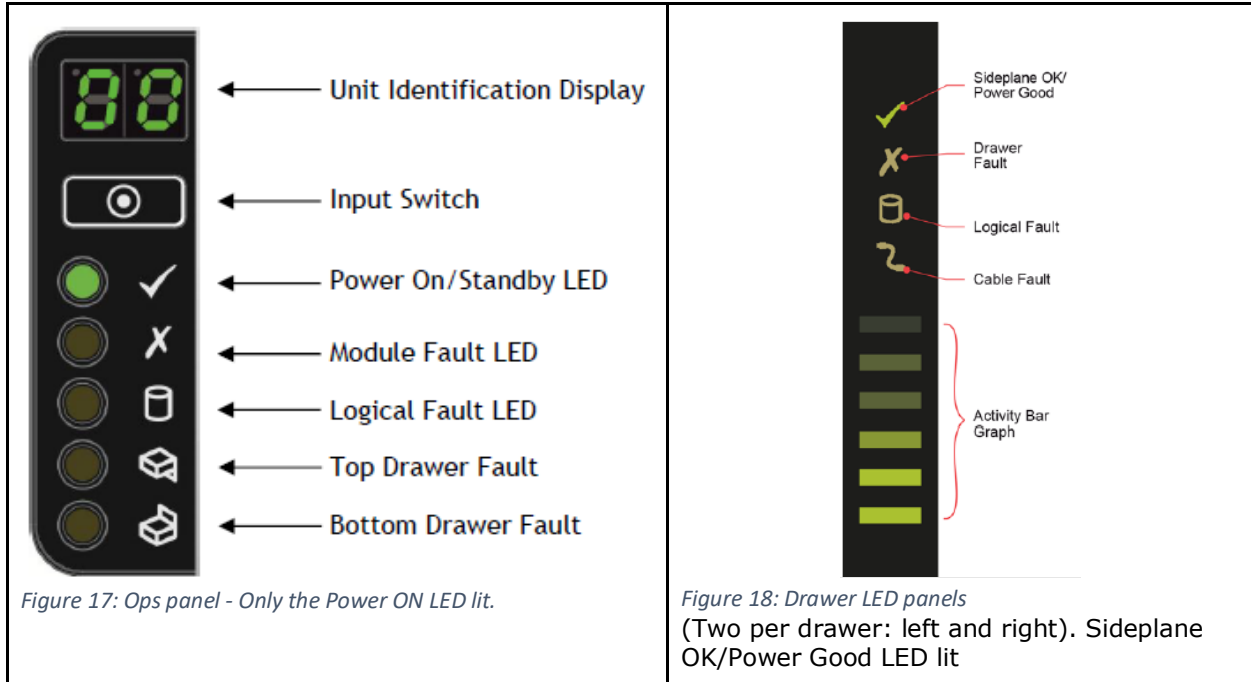
8.2 | Switch ON server

After the 5U84 storage enclosure is switched ON and the LEDs show normal operation, switch on server A and then server B.
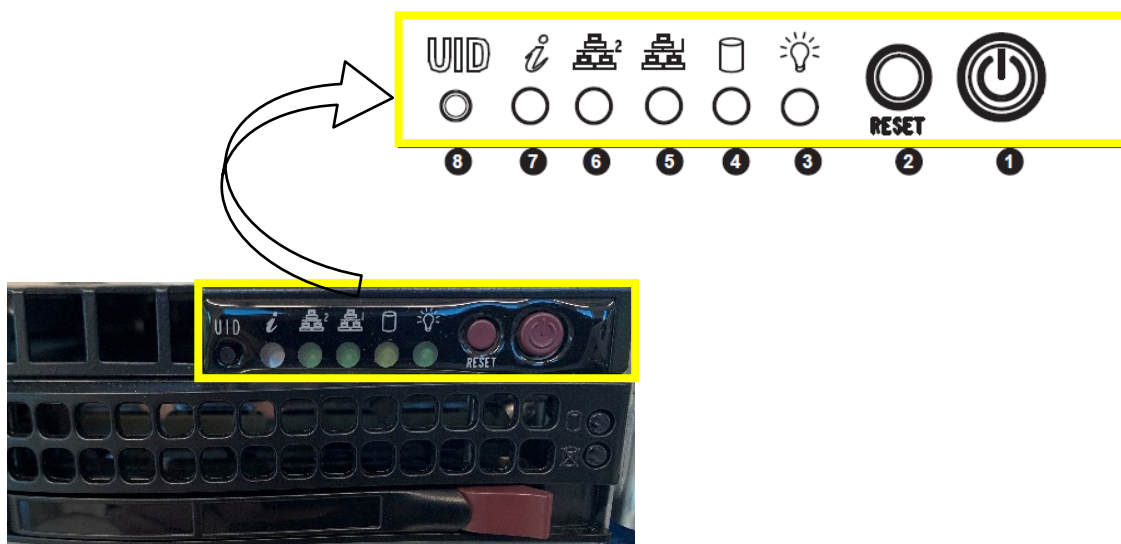
Figure 19: Different components of the server control panel present at the front

Table 9: Server control panel component description

Item number	Name	Description
1	Power button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power.
2	Reset button	Reboots the system. Do not use unless requested by support.
3	Power LED	Indicates power is being supplied to the system power supply units. This LED is illuminated when the system is operating normally.
4	HDD	Indicates activity on the storage drive when flashing.
5	NIC LED	Indicates network activity on LAN1 when flashing.
6	NIC LED	Indicates network activity on LAN2 when flashing.
7	Information LED	Alerts operator to several states, as noted in the table below.
8	UID button	Unit identifier button illuminates the Information LED with status noted below.

Table 10: Different status of information LED of the server

Status	Description
Continuously on and red	An overheat condition has occurred. (This may be caused by cable congestion.)
Blinking red (1Hz)	Fan failure. Check for an inoperative fan.
Blinking red (0.25Hz)	Power failure. Check for an inoperative power supply.
Solid blue	UID has been activated locally to locate the server in a rack environment.
Blinking blue	UID has been activated using IPMI to locate the server in a rack environment

To switch ON servers A and B:

1. Push the front panel power button to switch ON server A.
2. Push the front panel power button to switch ON server B.
3. Verify that both servers are switched ON correctly by referring to the following LED check diagram.
   - Power LED is solid green.
   - HDD LED flashes green when accessing drives.
   - LAN2 LED flashes amber to show 1Gb/s network activity (flash green for 100 Mb/s).

Figure 20: Server when switched ON. Yellow and green patterns indicate flashing

You have successfully completed hardware installation and power ON sequence of the Seagate Lyve Rack R1 system. For more information, refer to the HARDWARE MAINTENANCE AND INSTALLATION GUIDE.

9 | Cluster initialization

The high availability feature of the Lyve Rack R1 has two servers which run services that implement the nodes of the cluster.

Lyve Rack R1 cluster initialization is a one-time process of initiating cluster membership by setting up Management VIP and Data VIP.

- **Management VIP**: The floating IP address where the Management Interface is running.
- **Data VIP**: The floating IP address where the Lyve Rack R1 object store is running. In both cases, both services will respond if one node of the cluster is functioning.

Note
You must perform this process only once for initial setup.

9.1 | Prerequisites

1. Locate the *Lyve Rack R1 Information Sheet* which has the allocated IP addresses filled in.
2. Obtain a Cat-5/6 Ethernet cable.
3. Configure laptop for a static virtual IP address in 10.100.100.xxx range with subnet mask 255.255.255.0

Important
Do not use IP address 10.100.100.100. This address is reserved.

Note
Upon unboxing the Lyve Rack R1 nodes with static virtual IP for management network, the `/etc/resolv.conf` file is not updated with user provided values for DNS server and search domain values.

Workaround:
Update the resolv.conf file manually on both nodes with appropriate values.

To initialize the cluster:

1. Using Cat5/6 cable, connect laptop to the CORTX Manager configuration Port on Server A. For the port location, see Figure 14 or Figure 15.
2. On the management console laptop, connect to server A using the SSH command and IP address 10.100.100.100. Use the single-use password for the user `cortxub` from the *Lyve Rack R1 Information Sheet*. The user credentials work only on Server A.

```
ssh cortxub@10.100.100.100
```

3. Add entries for IP addresses of the management interfaces of both servers to /etc/hosts file on both servers. Follow the procedure below:
   a. Log in as superuser. Run the following command.

```
sudo bash
```

   b. Edit the /etc/hosts file on the primary server. Run the following command.

```
vim /etc/hosts
```

   c. Add the entries for the management network interfaces to the end of the file, after "#---pvt_data_end---" line.

IMPORTANT

Do not modify any other information in the file.

Example

```
127.0.0.1   localhost localhost.localdomain localhost4
localhost4.localdomain4
      ::1          localhost localhost.localdomain localhost6
localhost6.localdomain6
      #---pvt_data_start---
      192.168.0.1   srvnode-1
      192.168.0.2   srvnode-2
      #---pvt_data_end---
      10.235.169.231   node-a.mydomain.com
      10.235.169.233   node-b.mydomain.com
```

   d. Save the file.
   e. Copy /etc/hosts file to the second server. Run the following command.

```
scp -o PreferredAuthentications=publickey -o StrictHostKeyChecking=no \
            -i /root/.ssh/id_rsa_prvsnr /etc/hosts
root@192.168.0.2:/etc/hosts
```

4. Run the cluster initialization script. The cluster initialization script creates the cluster and initializes the cluster by assigning IP addresses to it. Run the following command on server A. You must wait for few minutes for the script to complete.

```
sudo force_update_hname=true
/opt/seagate/cortx/provisioner/cli/factory_ops/unboxing/init -M
<MANAGEMENT_VIP> -C <DATA_VIP>
```

5. While the script runs you will be prompted to provide the following data:

   • Type of IP address configuration (static or DHCP)

- IP addresses, subnet masks, and gateway information of each server (only for static virtual IP configuration)
- Fully qualified domain names of each server

Important
Refer to the Appendix to see an execution sequence example of the unboxing script.

---

6. After processing is complete and the cluster is created, run the following command to validate if the cluster is functional:

```
sudo pcs status
```

The command must display all the cluster resources' status as `started`. The status must not display `failure`.

```
Example exert

…
s3server-c2-7 (systemd:s3server@0x7200000000000001:0x7d): Started srvnode-2
s3server-c2-8 (systemd:s3server@0x7200000000000001:0x80): Started srvnode-2
s3server-c2-9 (systemd:s3server@0x7200000000000001:0x83): Started srvnode-2
s3server-c2-10 (systemd:s3server@0x7200000000000001:0x86): Started srvnode-2
s3server-c2-11 (systemd:s3server@0x7200000000000001:0x89): Started srvnode-2
mero-free-space-mon (systemd:mero-free-space-monitor): Started srvnode-1
Master/Slave Set: sspl-master [sspl]
Masters: [ srvnode-2 ]
Slaves: [ srvnode-1 ]
Resource Group: csm-kibana
kibana-vip (ocf::heartbeat:IPaddr2): Started srvnode-2
kibana (systemd:kibana): Started srvnode-2
csm-web (systemd:csm_web): Started srvnode-2
csm-agent (systemd:csm_agent): Started srvnode-2
uds (systemd:uds): Started srvnode-2
stonith-c1 (stonith:fence_ipmilan): Started srvnode-2
stonith-c2 (stonith:fence_ipmilan): Started srvnode-1

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
[root@mfg-cortx-node1 boxing]#
```

7. If there are any failures, identify the resource that is shown as a failure. Use the following command to perform a cluster resource cleanup.

```
pcs resource cleanup <resource_name>
```

If the above procedure does not work, then verify that all the Lyve Rack R1 cables are plugged in properly and that the link/activity LEDs are ON. Check whether any fault LEDs are lit. If you

cannot find and resolve the fault, contact Seagate Support with the *Lyve Rack R1 Information Sheet* ready for reference.

8. To finish verifying the cluster, on the management console laptop, open a command shell and ping the cluster floating IP addresses (the Management VIP and Data VIP addresses in the *Lyve Rack R1 information Sheet*). These two addresses should now respond as the Cluster is functional.

10 | Onboarding Lyve Rack R1

Complete the onboarding process, which involves the following steps to configure the system for use:

Step	Title	Topic link
1	Create administrator account	10.1	Configuring admin user
2	Upload SSL certificate	10.2	Uploading SSL certificate
3	Configure DNS resolver settings	10.3	Configuring DNS resolver settings
4	Configure network time protocol settings	10.4	Configuring network time protocol
5	Configure notifications	10.5	Configuring notifications
6	Verify configurations	10.6	Verifying onboarding configuration

Use the CORTX Manager web interface to perform configuration. To access CORTX Manager in a web browser, go to https://<MANAGEMENT_VIP>:28100/#/preboarding/welcome

10.1 | Configuring admin user

This procedure creates the following users, with same credentials.

1. CORTX Manager admin user
2. Linux user

You can create the above users only once, while setting up the system. The CORTX Manager admin user has all the permissions of the CORTX Manager. To log in to the system using SSH, you must use the credentials of the Linux user.

Note
SSH login field is case sensitive.
Changing the CORTX Manager admin user password affect Linux user credentials and vice versa.

To create an admin user:

1. In the **Admin Username** field, enter a username. The username is not case sensitive.
2. Enter a new password in the **Password** field and repeat it in the **Confirm password** field, and then click **Apply and continue.**
   You must log in with the admin user and password to continue onboarding configuration.

10.2 | Uploading SSL certificate

An SSL certificate is used on a HTTPS connection to encrypt the communication from an S3 Client or your web browser to CORTX Manager. By default, CORTX Manager uses a CORTX Manager provided self-signed certificate. Alternatively, you can upload a user-provided self-signed certificate or a user provided certificate authority (CA) signed certificate. This step can be done during onboarding or afterwards.

To upload SSL certificate:

1. Click **Choose File** to browse and select the appropriate SSL certificate, and then click **Upload certificate**.
2. Click **Continue** to open the **Management network settings** page.

10.3 | Configuring DNS resolver settings

> **Caution**
> Be careful while configuring DNS resolver settings. If you enter wrong information, some functions may not work. You will not be able to update the information later.

To configure DNS resolver settings:

1. On the **DNS resolver settings** page, enter values for **DNS Server** and **Search Domain**.
2. Click **Apply and Continue** to open the **Network time protocol** (**NTP)** page.

10.4 | Configuring network time protocol

Lyve CORTX and any S3 Clients must be time synchronized via an NTP server. CORTX Manager allows the setting of the NTP server address and a time zone. The time zone on CORTX Manager does not have to match the S3 Client(s). Once the CORTX Manager setting is applied, the setting is then configured on both servers in Lyve CORTX.

To configure network time protocol:

1. On the **Network time protocol (NTP)** page, enter the NTP server address and select the time zone.
   The selected time zone is used by the system.
2. Click **Apply and Continue** to open the **Notifications settings** tab.

10.5 | Configuring notifications

The system offers an option to configure notifications. It is strongly recommended that you configure at least one email address to receive system notifications. You can configure the system to receive notifications such as system updates, or alerts through email using the Simple Network Management Protocol (SNMP).

The following table lists supported and unsupported email configurations.

Table 11: Supported and unsupported email configurations

Type	Supported/Unsupported
By encryption:	
No encryption	Supported
SSL/TLS	Supported
STARTTLS	Supported
By authentication:	
SMTP servers which support/require authentication	Supported
SMTP servers which do not support authentication	Unsupported

To configure notifications:

1. On the **Notifications** page, select the **Email** check box, and then click **Continue**.
2. Enter values for **SMTP server**, **Sender email**, **Protocol**, **SMTP port**, **Sender password**, and **Confirm password**.
3. In the **Receiver email addresses**, you can enter multiple email addresses separated by comma (,).
4. Click **Send test email** to verify the email configuration. If you do not receive test email on the configured email addresses, then check the email configuration.
5. Click **Apply and Continue** to open the **Summary** page.

10.6 | Verifying onboarding configuration

The Summary page displays all the onboarding configurations. You can verify the configurations and if required, go back to a page to change the configurations. After verifying the configurations, the system moves to the new IP address added during the configuration. You must use the new IP address to access the system.

To verify the configurations:
- Review the configurations, and then click **Continue**.
  The **Confirmation** pop-up displays the new IP address of the system. You must use the new IP address to access the system.

The installation of Lyve Rack system is now complete. To start using the system, see the *Lyve Rack R1 User Guide*.

Appendix

Initial configuration of Lyve Rack R1

Using DHCP configuration

```
sudo sh /opt/seagate/cortx/provisioner/cli/factory_ops/unboxing/init -C
172.16.8.3 -M 10.235.168.101
```

        a. DHCP
        b. Static
        c. Quit

Choose a network configuration for management network: 1

1 selected. Proceeding with DHCP configuration for Management Network.

===

Setting Management Network to DHCP

===

You have selected to proceed with DHCP based configuration for management network interface.

Do you wish to proceed? (y/n): y

Preparing cluster pillar for setting management network configuration to DHCP.

===

Setting Public Data Network to DHCP

===

You have selected to proceed with DHCP based configuration for public data network interface.

Do you wish to proceed? (y/n): y

Preparing cluster pillar for setting public data network configuration to DHCP.

Using Static virtual IP configuration

```
sh /opt/seagate/cortx/provisioner/cli/factory_ops/unboxing/init -M
10.230.255.5 -C 172.16.8.5
```

1. DHCP
2. Static
3. Quit

Choose a network configuration for management network: 2

2 selected. Proceeding with Static IP configuration for Management Network.

==

Setting Management Network to Static

==

You have selected to proceed with static IP based configuration for management network interface.

Management IP for eno1 on Server-A: **10.230.244.178**

Management IP for eno1 on Server-B: **10.230.244.160**

Gateway IP for Management interfaces on both nodes: **10.230.240.1**

DNS search domain for both nodes: **colo.seagate.com**

DNS server IP for both nodes: **10.230.240.51**

Netmask for Management interfaces on both nodes [255.255.252.0]: **255.255.240.0**

****

You have provided the following information:

Management IP for interface eno1 on Server-A: 10.230.244.178

Management IP for interface eno1 on Server-B: 10.230.244.160

Gateway IP for both servers: 10.230.240.1

Netamsk for both servers: 255.255.240.0

Search domain for both servers: colo.seagate.com

Netamsk for both servers: 255.255.240.0   [480/606]

Search domain for both servers: colo.seagate.com

DNS server IP for both servers: 10.230.240.51

****

Given the above information,

   we shall now proceed to configure Management Network interface with static IP

   and related configuration.

Do you wish to proceed? (y/n): y

Preparing cluster pillar for setting management network configuration to static on srvnode-1

==

Setting Public Data Network to Static IP based configuration

===

You have selected to proceed with static IP based configuration for public data network interface.

Public Data IP for enp175s0f0 on Server-A: **172.16.0.116**

Public Data IP for enp175s0f0 on Server-B: **172.16.0.117**

Gateway IP for Public Data interfaces on both nodes [Optional]:

Netmask for Public Data interfaces on both nodes [255.255.252.0]: **255.255.0.0**

****

You have provided the following information:

   Public Data IP for interface enp175s0f0 on Server-A: 172.16.0.116

You have provided the following information: [416/606]

Public Data IP for interface enp175s0f0 on Server-A: 172.16.0.116

Public Data IP for interface enp175s0f0 on Server-B: 172.16.0.117

Gateway IP for both servers:

Netmask for both servers: 255.255.0.0

****

Given the above information,

    we shall now proceed to configure Public Data Network interface with static IP

    and related configuration.

Do you wish to proceed? (y/n): y

Preparing cluster pillar for setting public data network configuration to Static IP.

==

Setting BMC Network Information for Static IP

==

BMC IP for Server-A: **10.230.244.191**

BMC IP for Server-B: **10.230.250.15**

Gateway IP for BMC interfaces on both nodes: **10.230.240.1**

Netmask for BMC network on both servers [255.255.252.0]: **255.255.240.0**

****

You have provided the following information:

    BMC IP for Server-A: 10.230.244.191

    BMC IP for Server-B: 10.230.250.15

    Gateway IP for BMC interfaces on both nodes: 10.230.240.1

    Netmask for BMC network on both servers: 255.255.240.0

****

Netmask for BMC network on both servers: 255.255.240.0
[352/606]

****

Given the above information,

  the process shall proceed with Static IP based NW configuration for BMC interfaces

Do you wish to proceed? (y/n): y

****

BMC LAN settings on srvnode-A have been updated to:

****

Setting BMC Network Information for Static IP on 192.168.0.2

****

BMC LAN settings on srvnode-B have been updated to:

****

==

Do you wish to proceed? (y/n): y

****

    Unboxing the Cortx Lyve Drive Rack

****

The hostname needs to be changed for Server A

The hostname needs to be changed for Server B

Enter new hostname for server A (press enter to keep default [cortx-node-a]):
smc1-m11.colo.seagate.com

Enter new hostname for server B (press enter to keep default [cortx-node-b]):
smc2-m11.colo.seagate.com

New hostnames provided by user for Server A: smc1-m11.colo.seagate.com

New hostnames provided by user for Server B: smc2-m11.colo.seagate.com

Do you want to proceed with these host names? (y/n): y

Proceeding to set the provided hostnames...

****

****

Server A [smc1-m11.colo.seagate.com] --> Server B [smc2-m11.colo.seagate.com]: Reachable

Server B [smc2-m11.colo.seagate.com] --> Server A [smc1-m11.colo.seagate.com]: Reachable

Ensure cluster is in healthy state

****

Performing HA cluster health-check.

****

Checking nodes online.

****

Configuring Cortx RAS services on server A..................................Ok.

Configuring Cortx RAS services on server B.................................Ok.

Configuring CSM services on Server B......................................Ok.

Configuring CSM services on Server A......................................Ok.

****************** **Run next steps manually** **********************

1. **Check if all IP addresses are assigned as expected**

   $ sudo ip a

   NOTE: run this on both servers.

2. **Check if system has been assigned a hostname:**

   $ sudo salt '*' cmd.run hostname

   NOTE: run this from Server A (Primary server)

3. **Check if Cortx cluster is up and all services are Started, run:**

   $ sudo pcs status

   $ sudo pcs status

   NOTE: All the resources/services should be listed as started.

*********************** SUCCESS!!! ************************************

Lyve Drive Rack Cortx cluster is successfully initialized!!

****