User Manual

SKU: SDS-3U-4i

Table of Contents

1   Preface

1.1   Advisories

Five types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury.

NOTE
Used to amplify or explain a comment related to procedural steps or text.

IMPORTANT
Used to indicate an important piece of information or special "tip" to help you

CAUTION
Used to indicate and prevent the following procedure or step from causing damage to the equipment.

WARNING
Used to indicate and prevent the following step from causing injury.

DANGER or STOP
Used to indicate and prevent the following step from causing serious injury or significant data loss

Disclaimer: We have attempted to identify most situations that may pose a danger, warning, or caution condition in this manual. However, One Stop Systems does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

1.2   Safety Instructions

Always use caution when servicing any electrical component. Before handling the One Stop Systems Expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Danger, Warning, Caution, Important, and Note.
Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer and expansion chassis.

WARNING
Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

Turn off the computer and any peripheral devices.
Disconnect the computer and peripheral power cords from their AC outlets or inlets in order to prevent electric shock or system board damage.

In addition, take note of these safety guidelines when appropriate:

To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION
Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

1.3   Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning
Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedures to reduce the risk of damage to components. One Stop Systems strongly encourages you to follow proper ESD procedures, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or are grounded.

When transporting a sensitive component, first place it in an anti-static container or packaging.

Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.

Handle components and boards with care. Do not touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

2   General Specifications

Item	Description
Dimensions	5.2" H x 17.2" (19.2" with rack ears) W x 20.0" D
CPU	Dual Intel® Xeon® Ice Lake Scalable CPUs up to 270W TDP and 40 cores LGA 4189 socket P with 3 UPI chip-to-chip bus up to 11.2GT/s
System Memory	16x 288-pin DDR4 DIMM sockets Up to 4TB DDR4-2933MHz 3DS ECC RDIMM or LRDIMM, 1.2V low profile 2933/2666/2400/2133MHz Frequencies in 64GB, 128GB and 256GB capacities each module
Expansion Slots	• 4x PCIe 4.0 x16 full height, 10.5" length, double width slots suitable for GPUs • 2 x PCIe 4.0 x16 full height, half length, single width slots 1 x PCIe 4.0 x8 full Height, half length, single width slot with x8 physical connector

Storage Subsystem	• 8x or 16x hot-swap configurable SATA-3, SAS-3 or NVMe x4 2.5" x 15mm drive carriers
	    o 12Gb SAS-3 or 6Gb SATA-3 SFF-8680 slots -or-
	    o NVMe x4 32Gb slots
	• Up to 8 SATA-3 slots use no PCIe slots
	• 8x and 16x SAS-3 slots require 1 and 2 PCIe x16 HHHL slots respectively
	• 8x and 16x NVMe x2 slots require 1 and 2 x16 PCIe HHHL slots respectively
	• Further expansion up to 4PB possible using OSS JBOF expansion systems such as the SB2000
	• 2x M.2 x4 and 2x SATA-DOM internal drive connections

Onboard Devices	2x Intel X550 10Gigabit Ethernet each with an RJ-45 Additional 25, 40 and 100Gb Ethernet, 100Gb InfiniBand or 32Gb Fiber Channel interfaces available
USB	6x USB 3.0 with 4 on rear panel, 1x header and 1x Type A internal 2x USB 2.0 (1 internal header)
Network Controllers	2x RJ45 10GBASE-T LAN from Intel® X550-AT2 1 x RJ45 Dedicated IPMI LAN port from RTL8211E
Input / Output	7.1HD Audio Header, 1 VGA port, 2 COM ports (1 rear and 1internal header) 2x Disk-on-Module ports 1x Trusted Platform Management TPM 1.2 20-pin header
BIOS	128 Mb SPI flash EEPROM with AMI BIOS Supports PnP, PCI 3.0, ACPI 1.0-4.0, USB keyboard support, UEFI 2.3.1, 1TB BAR1 max size and 256 PCI bus enumeration support
Cooling Fans	Six 40x56mm and (1) 80x38mm high powered fans mount behind front bezel and cool add-in-cards up to 300w
Chassis	Rugged and lightweight aluminum construction
Weight	45lbs
Power Supply	Dual N+1 2600-watt AC 110-240V CPRS Power Supplies Dual N+1 48V DC Input Power Supplies
Environment	Operating: *10°C to 35°C (50°F to 95°F) at 0 to 915m (3,000ft) altitude *5% to 90% non-condensing relative humidity, max dew point 21°C, max rate of change 5°C/hr Non-Operating: *-40°C to 70°C (-40°F to 158°F) *5% to 90% non-condensing relative humidity, max dew point 27°C, max rate of change 5°C/hr
Agency	Evaluated to conform to the following standards: *FCC - Verified to comply with Part 15 of the FCC Rules, Class A *Canada ICES-003, issue 4, Class A *CE Mark (EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3) *CISPR 22, Class A *MIL-STD-810G Designed to conform to the following extended standards: *NOM-019 *Argentina IEC60950-1 *Japan VCCI, Class A *Australia/New Zealand AS/NZS CISPR 22, Class A *China CCC (GB4943), GB9254 Class A, GB17625.1 *Taiwan BSMI CNS13438, Class A; CNS14336-1 *Korea KN22, Class A; KN24 *Russia/GOST ME01, IEC-60950-1, GOST R 51318.22, GOST R 51318.24, GOST R 51317.3.2, GOST R 51317.3.3 *TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)
Compliance	RoHS 3, WEEE

2.1   Features

- Dual Intel® Xeon™ Scalable Ice Lake Processors
- 20" Depth
- 2x Internal PCIe 4.0 M.2 Boot Drives
- 8 or 16 U.2/U.3 SATA/SAS/NVMe drives
- 4 x16 FH dual width plus 2 x16 FH and 1 x8 FH single width PCIe 4.0 slots
- Embedded Dual-Port 10Gb/e Network Interfaces
- System Monitoring
- AC or DC Input Power Supplies
- Resource expanded BIOS for large expansion capability
- Guaranteed to operate with all OSS expansion products

2.3   Overview
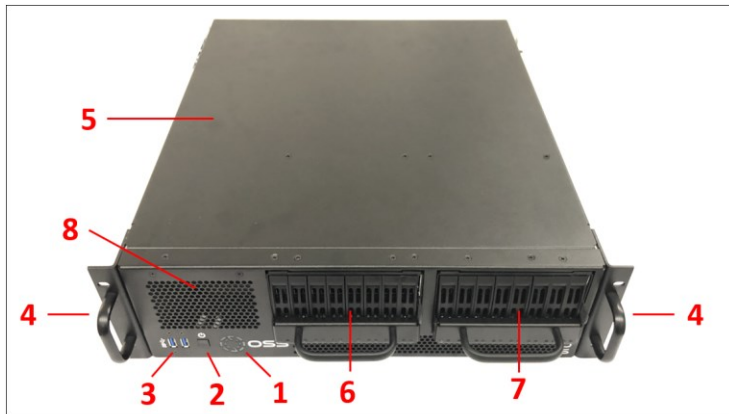
No.	Description
1	OSS LOGO & LED
2	Power Button
3	USB Ports
4	Front Rack Ears / Handles
5	Top Cover
6	Drive-Pack #1
7	Drive-Pack #2
8	Air Vent
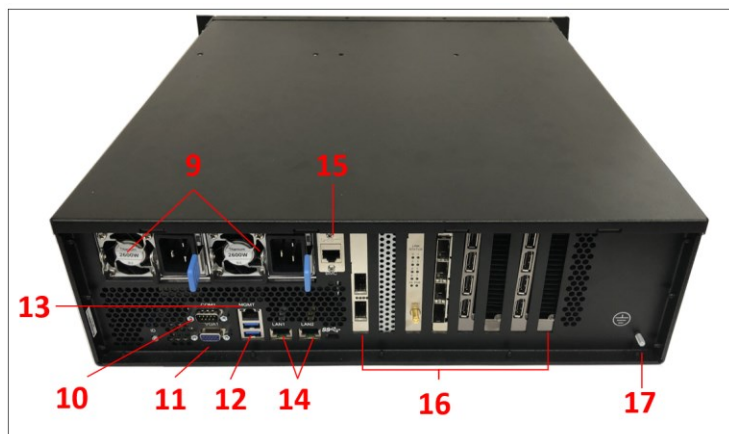
No.	Description
9	Power Supply modules
10	COM 1
11	VGA
12	USB 3.0 Ports
13	Motherboard BMC Port
14	LAN Ports
15	IPMI Port
16	Slot Panels
17	Earth Grounding
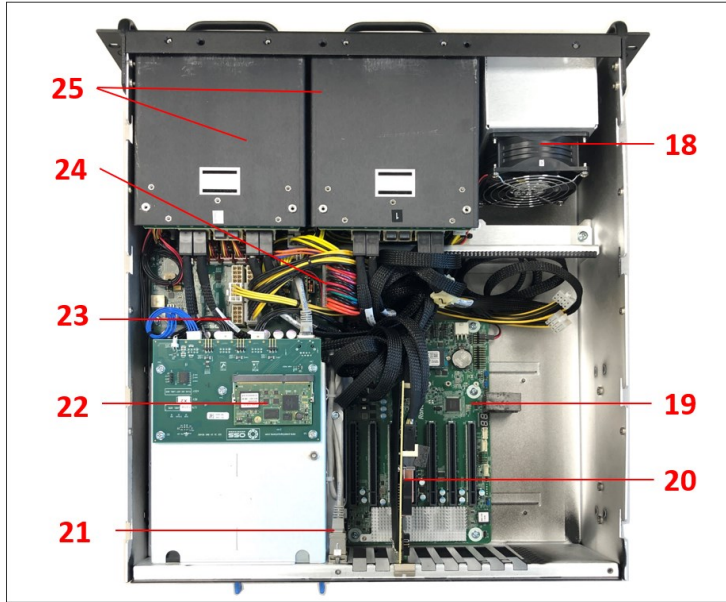
No.	Description
18	Internal Fan
19	Motherboard
20	OSS-536: Storage Drives Controller
21	Ethernet Cable: Connection to IPMI module
22	IPMI Module
23	Aux Power Connectors
24	ATX Power Connector / Cable
25	Drive Pack / Storage Housing

2.4   Motherboard Layout
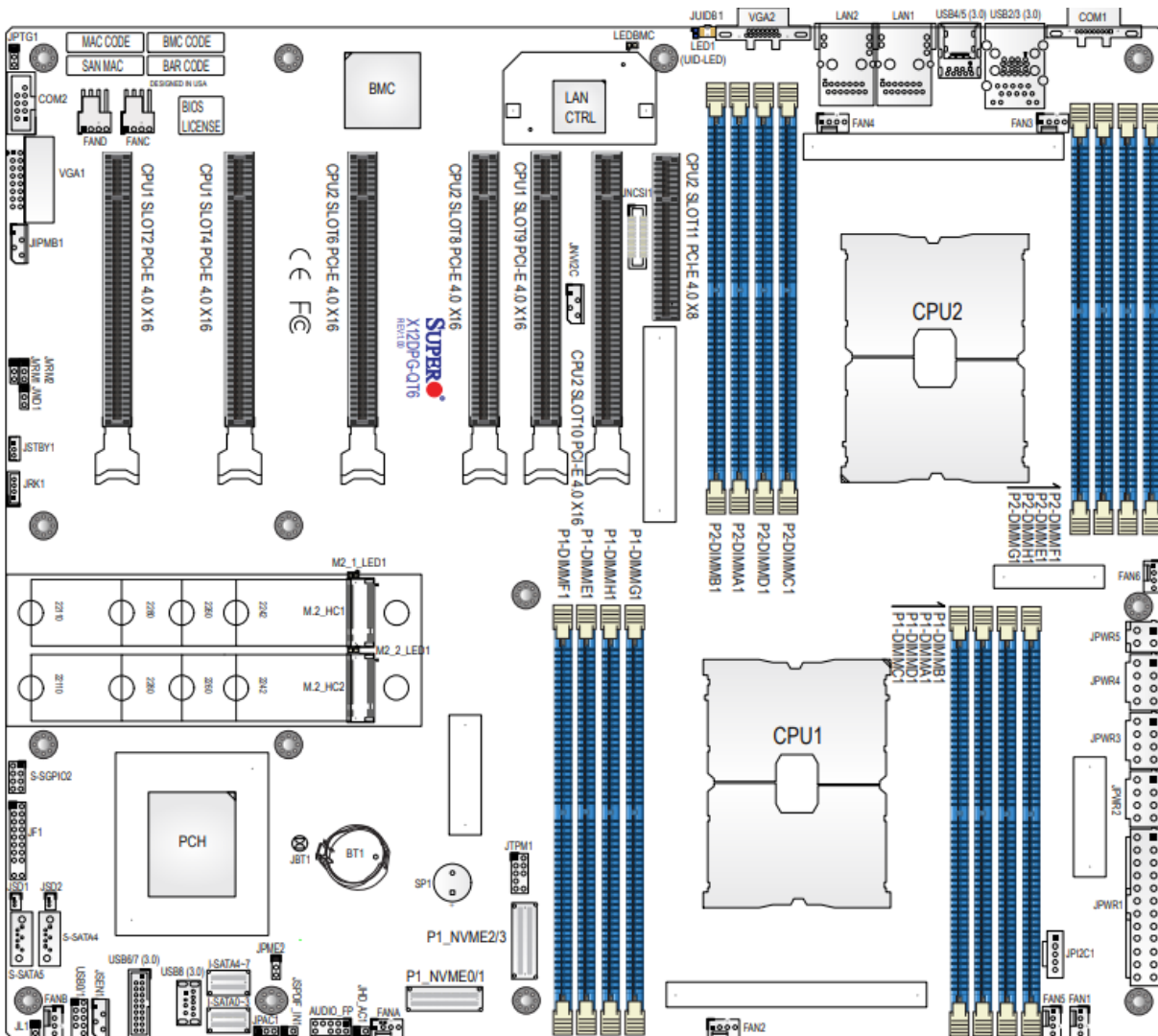
2.5   Quick Reference
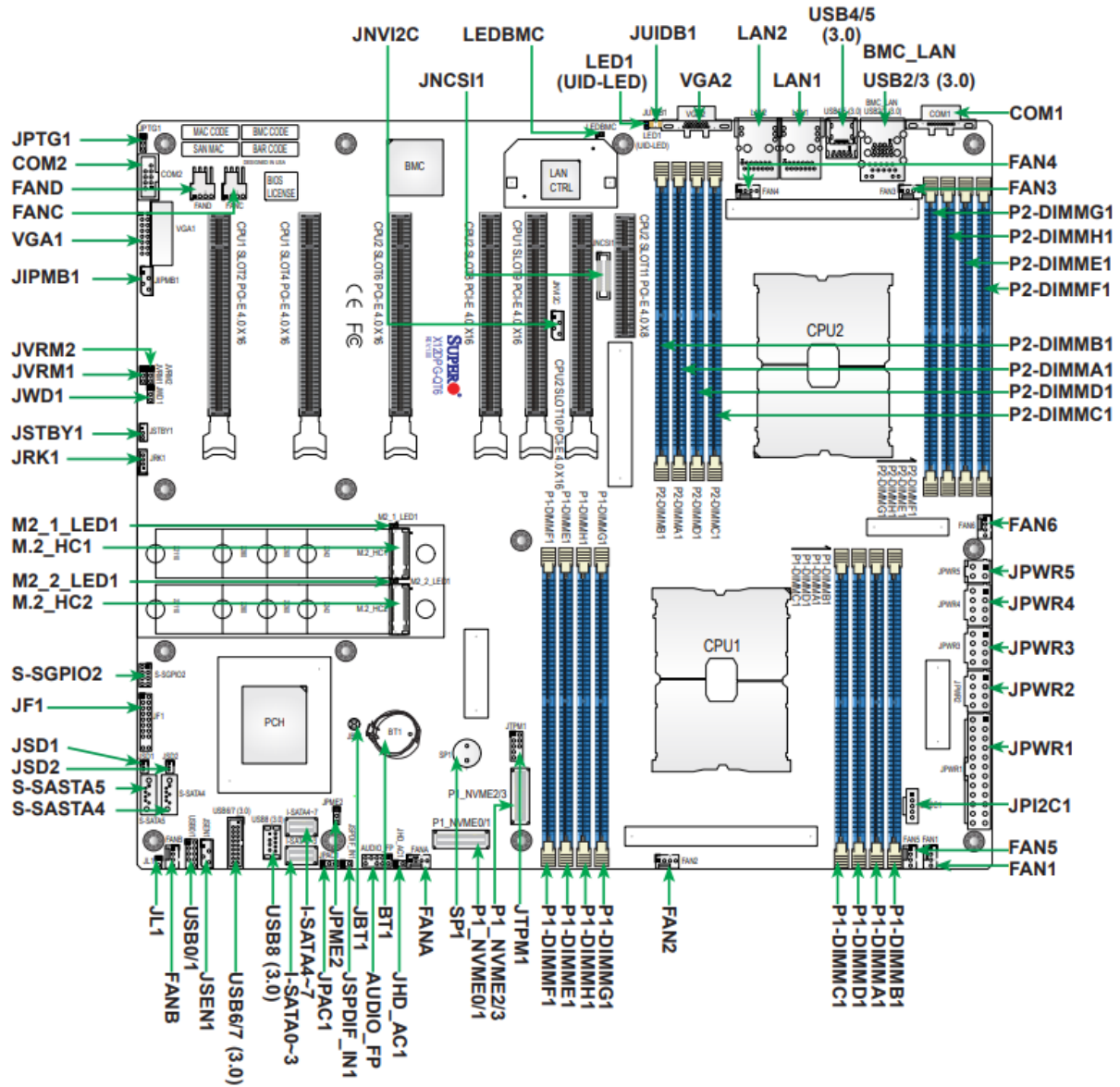
2.6   Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JHD_AC1	AC97/High Definition Audio Enable	Off (HD Enabled)
JPAC1	Audio Enable	Pins 1-2 (Enabled)
JPME2	ME Manufacturing Recovery	Pins 1-2 (Normal)
JPTG1	LAN Port Enable/Disable	Pins 1-2 (Enabled)
JVRM1	VRM SMB Clock (to BMC or PCH)	Pins 1-2 (BMC, Normal)
JVRM2	VRM SMB Data (to BMC or PCH)	Pins 1-2 (BMC, Normal)
JWD1	Watchdog Timer Reset	Pins 1-2 (Reset)

LED	Description	Status
LED1	Unit Identifier (UID) LED	Solid Blue: Unit Identified
LEDBMC	BMC Heartbeat LED	Blinking Green: BMC Normal
M2_1_LED1, M2_2_LED1	M.2 LEDs	Blinking Green: Device Working

Connector	Description
AUDIO_FP	Front Panel Audio Header
Battery (BT1)	Onboard CMOS Battery
BMC_LAN	Dedicated BMC LAN Port
COM1	Rear I/O COM Port
COM2	Front Accessible COM Port Header
FAN1 - FAN6, FANA - FAND	CPU/System Fan Headers (FAN5: CPU1 Fan Header, FAN6: CPU2 Fan Header)
JF1	Front Control Panel Header
JIPMB1	4-pin BMC External I^2C Header
JL1	Chassis Intrusion Header
JNCSI1	NC-SI (Network Controller Sideband Interface) Connector
JNVI²C	NVMe I^2C Header
JPI²C1	Power System Management Bus (SMB) I^2C Header
JPWR1	24-pin ATX Power Connector
JPWR2, JPWR3, JPWR4	8-pin Power Connectors
JPWR5	4-pin Power Connector
JSD1, JSD2	SATA DOM Power Connectors
JSEN1	Inlet Sensor Header

Connector	Description
M.2_HC1, M.2_HC2	PCIe 4.0 x4 M.2 Slots (with support of M-Key 2242, 2260, 2280, and 22110)
P1_NVME0/1, P1_NVME2/3	PCIe 4.0 x4 SlimSAS Ports with support of four NVMe connections
I-SATA0~3, I-SATA4~7	Intel PCH SATA 3.0 Ports (with RAID 0, 1, 5, 10)
S-SATA4, S-SATA5	Intel PCH Powered S-SATA 3.0 Ports with support for SuperDOM (Disk on Module) devices
S-SGPIO2	Serial Link General Purpose I/O Connection Header (for S-SATA4/5 SuperDOM support)
SLOT2, SLOT4,SLOT9	PCIe 4.0 x16 Slots supported by CPU1
SLOT6, SLOT8, SLOT10	PCIe 4.0 x16 Slots supported by CPU2
SLOT11	PCIe 4.0 x8 Slot supported by CPU2
SP1	Internal Speaker/Buzzer
USB0/1 (2.0)	Front-accessible USB Header with support for two USB 2.0 port
USB2/3, USB4/5 (3.0)	Rear I/O USB 3.0 Ports
USB6/7 (3.0)	Front-accessible USB Header with support for two USB 3.0 port
USB8 (3.0)	Internal USB 3.0 Type-A Header
VGA1	Front VGA Header
VGA2	Rear VGA Port on the I/O back panel
VROC (JRK1)	Intel VROC Key Header for NVMe RAID support

2.7 Motherboard Features

|		
CPU	Supports two 3rd Gen. Intel Xeon Scalable Processors (in Socket P+ LGA 4189) with up to 38 cores per CPU and a thermal design power (TDP) of up to 270W	
Memory	Supports up to 4 TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM DDR4 (288-pin) ECC memory with speeds of 3200/2933/2666 MHz in 16 memory slots and up to 4 TB of Intel Optane PMem 200 Series with speeds of up to 3200 MHz Note 1: The Intel Optane Persistent Memory (PMem) 200 Series are supported by the 3rd Gen. Intel Xeon Scalable (83xx/63xx/53xx/4314) series processors. Note 2: Memory speed and capacity support depends on the processors used in the system.	
DIMM Size	Up to 256 GB at 1.2V Note: For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/ motherboard	
Chipset	Intel PCH C621A	
Expansion Slots	• One PCIe 4.0 x8 slot (CPU2 Slot11) • Six PCIe 4.0 x16 slots (CPU1 Slot2 / CPU1 Slot4 / CPU1 Slot9 / CPU2 Slot6 / CPU2 Slot8 / CPU2 Slot10) • Two PCIe 4.0 x4 M.2 slots (supports M-Key 2242, 2260, 2280, and 22110) • Two PCIe 4.0 x8 SlimSAS ports w/support of two connections each port (P1_NVME0/1, P1_NVME2/3)	
Network	• Two 10G Ethernet LAN ports supported by Intel X550 LAN controller •One Dedicated BMC LAN located on the rear I/O panel (via AST2600 BMC)	
Baseboard Management Controller (BMC)	ASPEED AST2600 BMC	
Graphics	Graphics controller & VGA support via ASPEED AST2600 BMC	
I/O Devices		
	Serial (COM) Port	• One (serial port on the rear I/O panel (COM1) • One front accessible serial port header (COM2)
	SATA 3.0	• Eight I-SATA 3.0 ports at 6 Gb/s (I-SATA0~3, I-SATA4~7) • Two Intel PCH powered S-SATA 3.0 Ports with support for SuperDOM (Disk on Module) devices (S-SATA4, S-SATA5)
	Video (VGA) Connections	• One VGA port on the rear I/O panel (VGA2) • One VGA header on the motherboard for front access (VGA1
Peripheral Devices	• Four USB 3.0 ports on the rear I/O panel (USB2/3, USB4/5) • One front-accessible USB header with support for two USB 2.0 ports (USB0/1) • One front-accessible USB header with support for two USB 3.0 ports (USB6/7) • One internal USB 3.0 Type-A header (USB8)	
BIOS	• AMI BIOS • ACPI 3.0 or later, PCI firmware 4.0 support, BIOS rescue hot-key, SPI dual/quad speed support, RTC (Real Time Clock) wakeup, and SMBIOS 3.0 or later	
Power Management	• ACPI power management • Power buttons override mechanism • Power-on mode for AC power recovery • Wake-on-LAN • Power supply monitoring	
System Health Monitoring	• Onboard voltage monitoring for +/-12V, +5V/+5V standby, +3.3V, and +3.3V standby • Onboard temperature monitoring for CPU, VRM, LAN, PCH, system, and memory • 7+1 CPU switch phase voltage regulator • CPU thermal trip support • Platform Environment Control Interface (PECI)	
Fan Control	• Fan status monitoring via BMC connections • Single cooling zone • Low-noise fan speed control • Ten 4-pin fan headers	
LED Indicators	• Power LED • UID/remote UID • LAN activity LED • BMC Heartbeat LED	
Dimensions	15.12" (W) x 13.2" (L) ATX (384.05 mm x 335.28 mm)	

3 Setting Up

3.1 Installation-Procedures Overview

1. Connect video cable
2. Connect mouse and keyboard
3. Connect Ethernet cable
4. Plug in power cords in the back of the unit
5. Press the front switch to power ON the unit
6. Login

3.2 Connect IO Cables

Connect keyboard, mouse, video and ethernet cables to the unit.
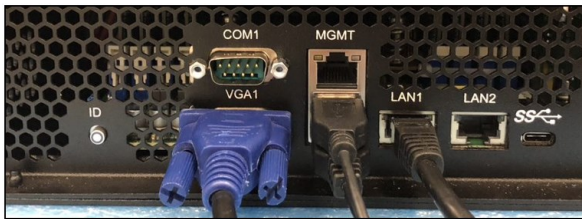
3.3 Power ON the Unit

- Connect the power cords.

- Press the front switch button to turn ON the unit.

Power Button
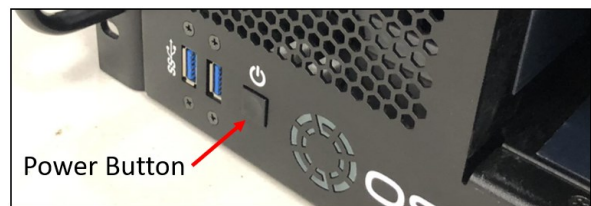
Upon powering ON the unit, the following LEDs will illuminate

- LOGO will illuminate as sold blue.
- Power supply LEDs will illuminate as solid green. Blinking green, indicates the unit is on standby mode.

Front Blue LED

Power Supply LEDs

- Front panel drive LEDs will illuminate as solid green and solid amber.

    o Solid green (presence of drive) indicates that there is a drive installed in the carrier slot.

    o Solid Amber: No Activity.   Blinking Amber: Activity

    o If only AMBER LEDs are illuminated, the IPMI module is malfunctioning, or the firmware is corrupted / not installed. Contact Technical Support for assistance, send the unit to OSS for service.

Green   Amber / Orange
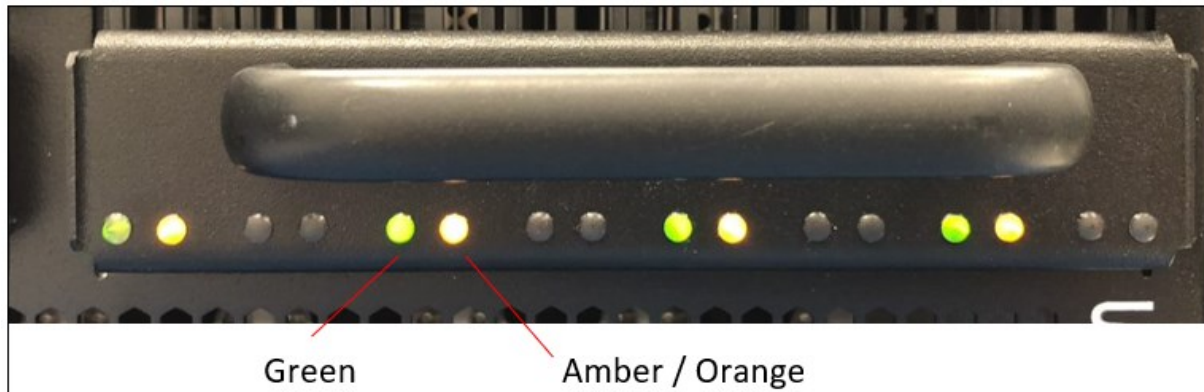
3.4   Log in

You can log in to the Linux system using the following account credentials. If your system is equipped with a pre-installed Operating System, use the following account credentials.
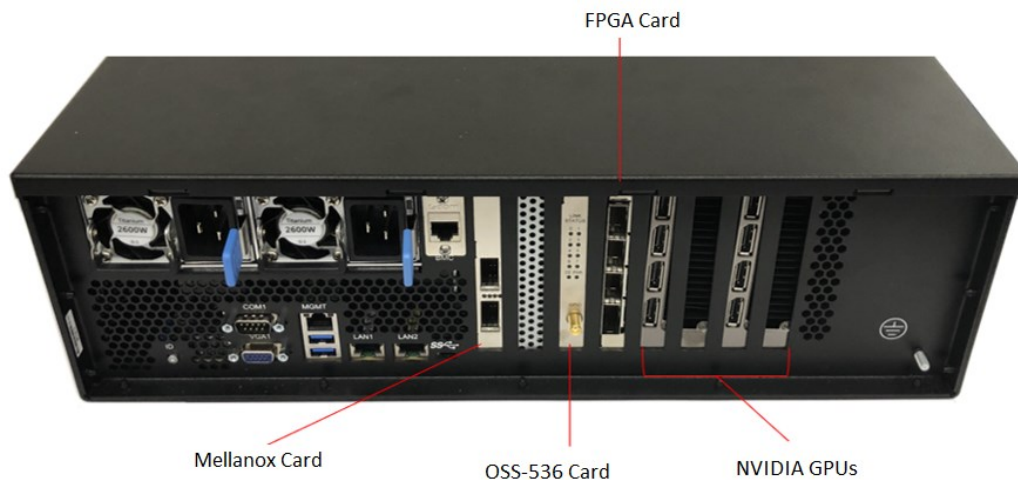
Username: oss
Password: oss#111

You can erase the existing OS in the system and install your preferred OS.

4   Verify PCIe cards / Devices

The following are the PCIe cards installed in the SDS unit. Other models may not have all the PCIe cards installed.

1. OSS-536 card (storage controller card)
2. One or two NVIDIA GPUs
3. One Mellanox card (optional)

To check the OSS storage controller card (OSS-536): lspci -vvv | grep 02b2

```
[root@localhost ~]# lspci -vvv | grep 02b2
03:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
05:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
07:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
09:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
0b:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
0c:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
0d:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
0e:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
0f:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
10:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
11:00.0 System peripheral: Broadcom / LSI Device 02b2 (rev b0)
[root@localhost ~]#
```

To check the NVIDIA GPUs: #nvidia-smi. See output below

```
[root@localhost ~]# nvidia-smi
Fri Dec 10 14:24:33 2021
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 470.86       Driver Version: 470.86       CUDA Version: 11.4     |
|-------------------------------+----------------------+----------------------+
| GPU  Name        Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|                               |                      |               MIG M. |
|===============================+======================+======================|
|   0  NVIDIA RTX A6000    Off  | 00000000:82:00.0 Off |                  Off |
| 30%   28C    P8     4W / 300W |      0MiB / 48685MiB |      0%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+
|   1  NVIDIA RTX A6000    Off  | 00000000:C1:00.0 Off |                  Off |
| 30%   34C    P8    21W / 300W |      0MiB / 48685MiB |      0%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                                  |
|  GPU   GI   CI        PID   Type   Process name                  GPU Memory |
|        ID   ID                                                   Usage      |
|=============================================================================|
|  No running processes found                                                 |
+-----------------------------------------------------------------------------+
[root@localhost ~]#
```

To check on the NVME drive: #nvme -list. See sample output below.

```
root@localhost:~
[root@localhost ~]# nvme -list
Node            SN                   Model                                    Namespace Usage                      Format           FW Rev
--------------- -------------------- ---------------------------------------- --------- -------------------------- ---------------- --------
/dev/nvme0n1    81P0A00XT5L8         KCD6FLUL15T3                             1         279.84  GB /  15.36  TB    512   B +  0 B    0105
/dev/nvme1n1    81P0A014T5L8         KCD6FLUL15T3                             1         279.93  GB /  15.36  TB    512   B +  0 B    0105
/dev/nvme2n1    81P0A00WT5L8         KCD6FLUL15T3                             1         279.83  GB /  15.36  TB    512   B +  0 B    0105
/dev/nvme3n1    81P0A011T5L8         KCD6FLUL15T3                             1         279.91  GB /  15.36  TB    512   B +  0 B    0105
/dev/nvme4n1    BTLJ118301T51P0FGN   INTEL SSDPE2KX010T8                      1           1.00  TB /   1.00  TB    512   B +  0 B    VDV10131
[root@localhost ~]#
```

To check on Mellanox: #lspci | grep Mellanox

```
[root@switch11 ~]# lspci | grep Mellanox
81:00.0 Ethernet controller: Mellanox Technologies MT27500 Family [ConnectX-3]
[root@switch11 ~]#
```
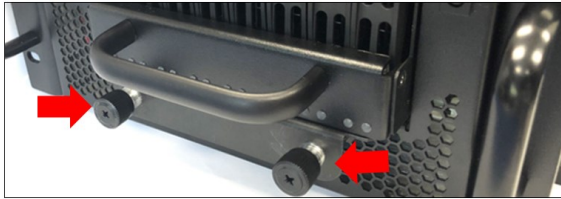
5 Storage Drive Installation

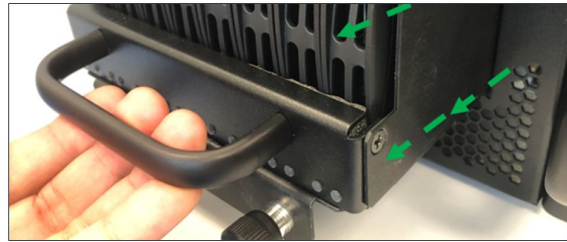## 5.1 Remove Drive Pack

⚠️ **Caution**   Turn OFF the storage expansion unit prior to installation of the Drive pack.
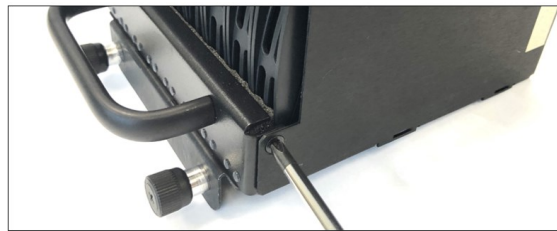
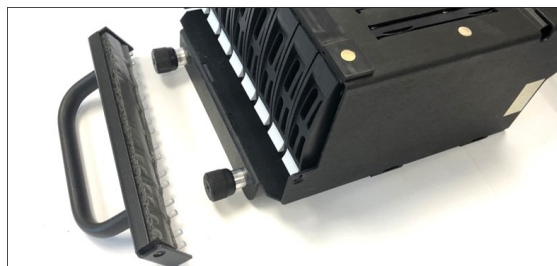Turn the Thumbscrew counterclockwise to loosen the Drive pack.

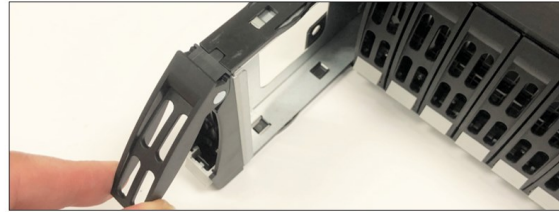Grab the Drive pack front handle and gently pull the Drive pack away from the enclosure.

Set the Drive pack on a solid surface. Remove the mounting screw on each side.

Mounting Screw   Mounting Screw

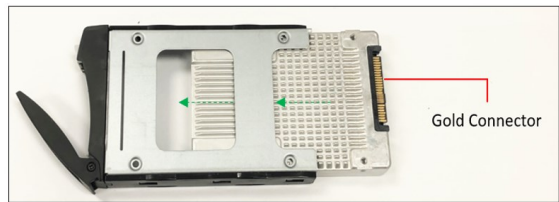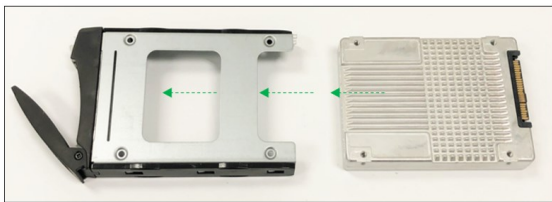Dismount the handle to access the drive trays.

Press the eject button, grasp the handle, and gently pull the drive tray out.

5.2   Install Storage Drive

Place the hard drive tray on a flat, stable surface such as a desk, table, or work bench. Slide the hard drive into the tray with the gold-connector facing upward, see photos below.

Carefully align the mounting holes between the hard drive and the tray. Secure the hard drive with all four screws.

Place the Drive pack on a solid surface in a vertical position. When installing 8 drives, start installing the drive tray from the far-end right drive slot. This would give you visibility on the board slot during the drive tray installation.
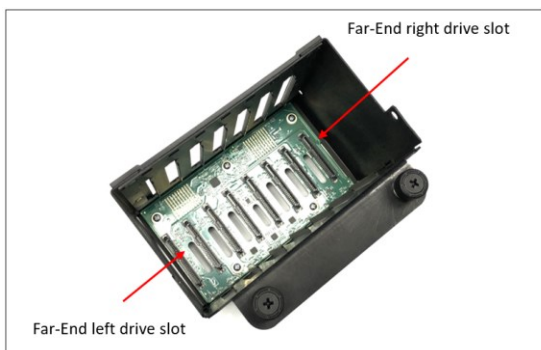
Slowly insert the drive tray and check proper alignment between the drive connectors
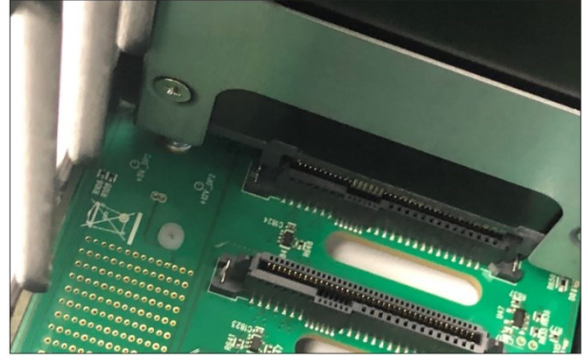
and the drive slot.
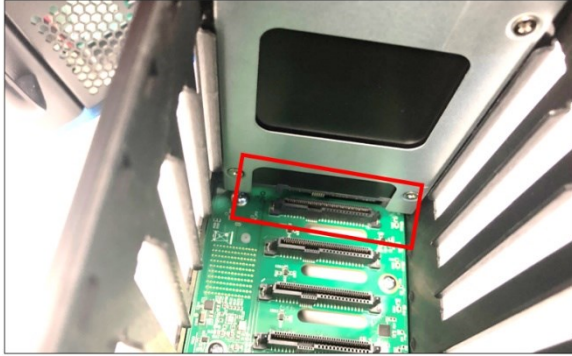
Make sure the drive connector is fully seated in the drive slot, see photo below
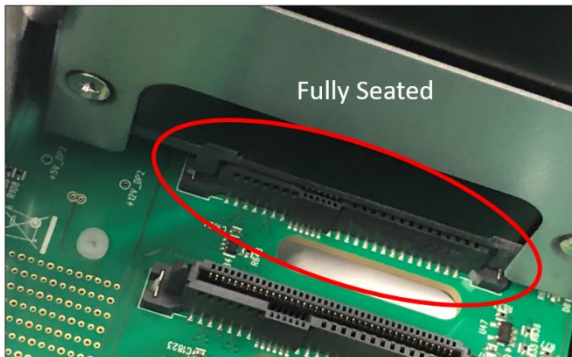
Push the drive tray into the hard drive bay as illustrated below, until the drive tray clicks into the locked position.
Using the thumb, push against the lower part of the hard drive handle.

5.3   Reinstall the Drive pack

Reinstall the front handle and secure it (with two mounting screws, one per side).
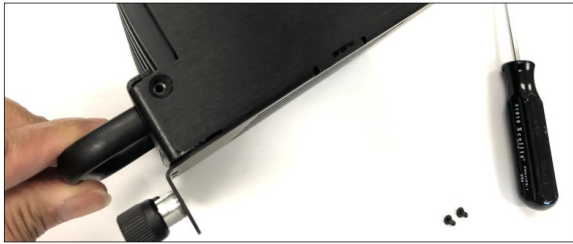
Push the Drive pack into the enclosure. Turn both thumbscrews clockwise to secure.

6   Front Panel Drive LEDs

These indicator LEDs will come UP when drives are detected or when slot is populated with a drive.

- If there is no IPMI module installed, the drive front LEDs will only illuminate solid amber.
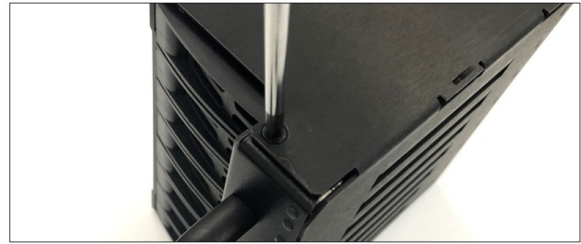

- If the SDS unit is equipped with IPMI, the drive front LEDs will illuminate as solid blue and amber, see photo below.
- If the system is equipped with IPMI module and only AMBER LEDs are illuminated, this is an indication that the IPMI module is not working correctly or the IPMI software is corrupted. Contact OSS Technical Support for assistance, you may need to send the unit back to One Stop Systems for service.

6.1   LED Color Definition

- Solid green (presence of drive) indicates that there is a drive installed in the carrier slot.
- Solid Amber: No activity.
- Blinking Amber: There is activity

7   Drive Slot & Bracket LINK Status LEDs

In the SDS unit, there are two Drive Packs installed.

- A drive pack is a single removal container that can accommodate from single to eight storage drives.

- Each drive pack has 8 drive slots.

- A drive slot is an individual slot on a board where the storage drive is physical inserted or installed.

- The drive slot is tied to a "Bracket LINK STATUS LEDs" on the OSS-536 board, see photo below.
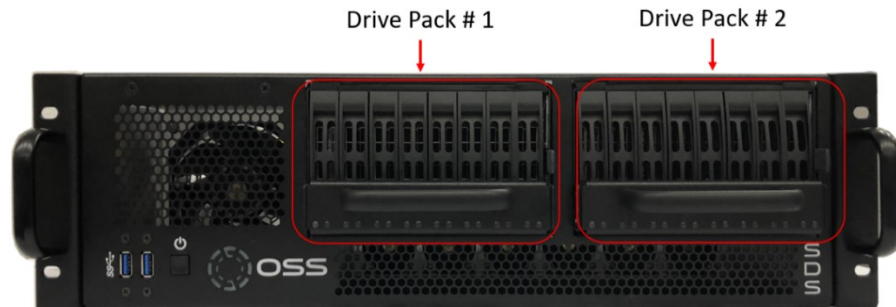
Photo below shows the OSS-536 board in the SDS appliance.
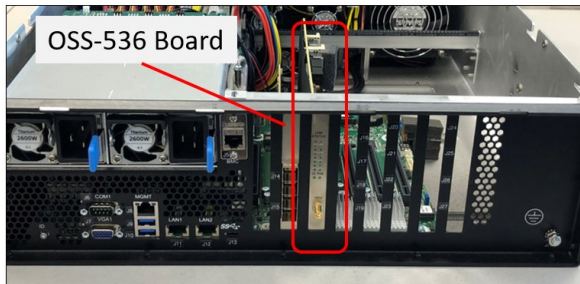
Photos below show the location of the Bracket LINK STATUS LEDs.
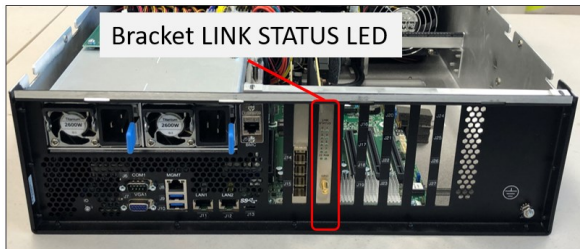
The following photo represents the LINK STATUS LED of the controller card, visible and accessible from the back of card bracket. These LEDs will illuminate when drive slots are occupied with storage devices.

- Slots are numbered 1 to 8, from left to right.
- On both "Drive Packs # 1 and 2", the storage drive slots are connected to the bracket LINK STATUS LED.

As shown from the photo below, **Drive Pack #1**, when drive slots (2, 4, 6 & 8) are occupied with storage devices, LINK STATUS LEDs 0, 1, 2 and 3 are illuminated as solid green.
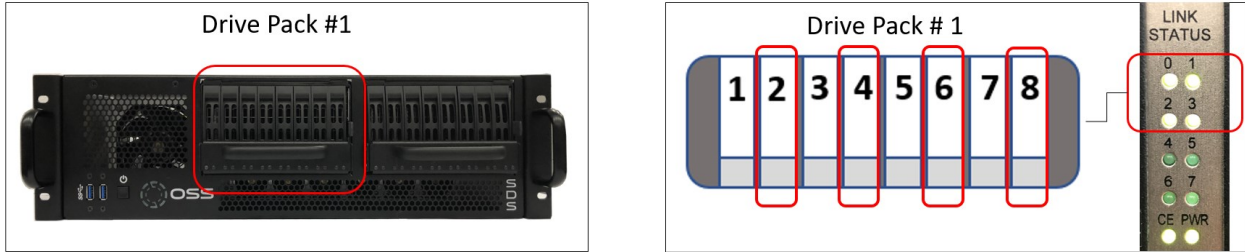
Drive Pack #1:

- Drive slot 2 is tied to LINK STATUS LED 0
- Drive slot 4 is tied to LINK STATUS LED 1
- Drive slot 6 is tied to LINK STATUS LED 2
- Drive slot 8 is tied to LINK STATUS LED 3
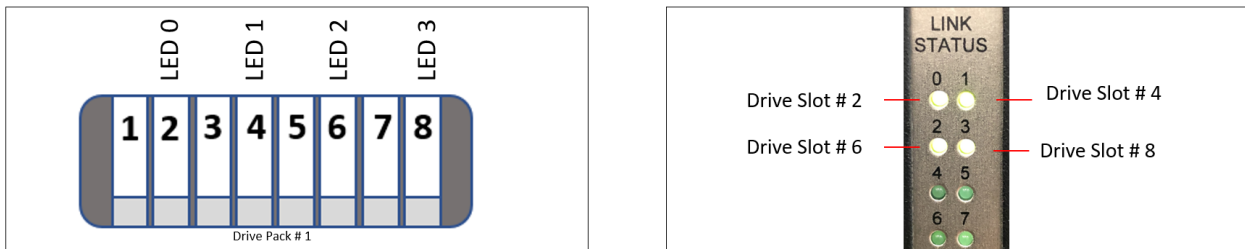
NOTES: Storage drive slots 1, 3, 5 and 7 are not connected to the LINK STATUS LED. No LINK STATUS LED associated with these drive slots will illuminate when drive is present except the LED located on the front

As shown from the photo below, **Drive Pack #2**, when drive slots (2, 4, 6 & 8) are occupied with storage devices, LINK STATUS LEDs 4, 5, 6 and 7 are illuminated as solid green.

Drive Pack #2   Drive Pack # 2
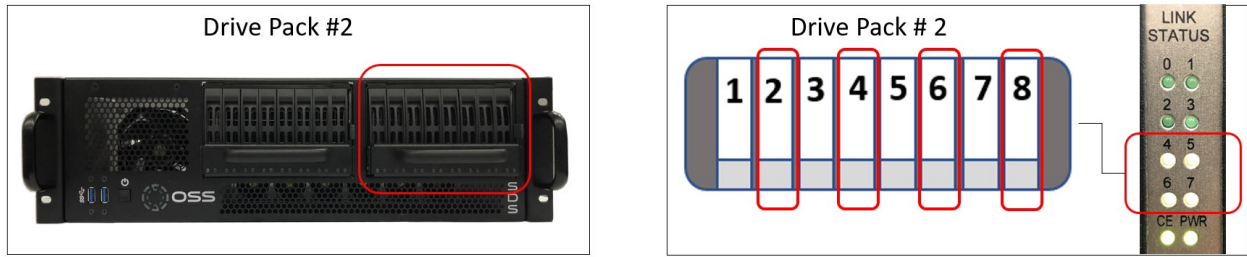
Drive Pack #2:

- Drive slot 2 is tied to LINK STATUS LED 4
- Drive slot 4 is tied to LINK STATUS LED 5
- Drive slot 6 is tied to LINK STATUS LED 6
- Drive slot 8 is tied to LINK STATUS LED 7

Photos below show individual drive slot on Drive Pack # 2 and their corresponding LINK STATUS LED.
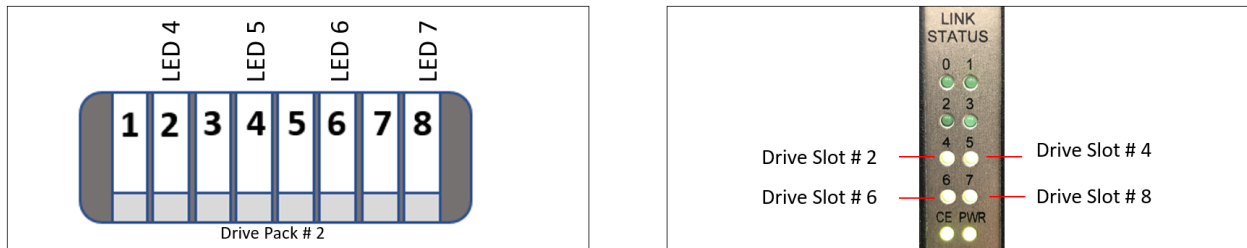
NOTES: storage drive slots 1, 3, 5 and 7 are not connected to the LINK STATUS LED. No LINK STATUS LED associated with these drive slots will illuminate when drive is present except the LED located on the front.

8   How to Access Motherboard BMC Web Interface

To Access the BMC web interface of the motherboard, follow the instructions below.

Plug in an Ethernet cable to the MGMT port, see photo below
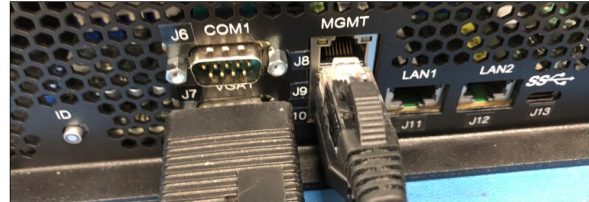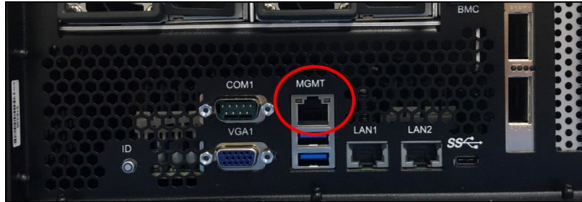
Power up the SDS system, during boot up, the BMC IP address will show up on the screen, see photo below as an example.
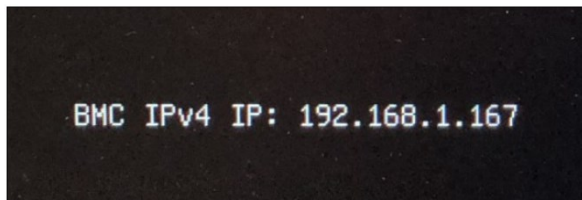
Start the internet browser and enter the BMC IP address, for example 192.168.1.124. The below login page should appear.
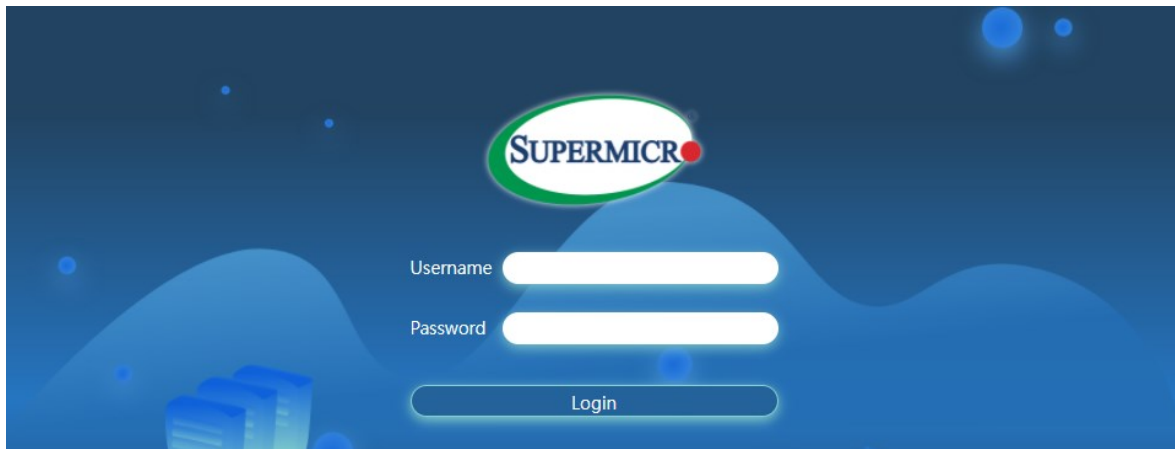
The default username is ADMIN, and the password is ADMIN.

- If unable to login using ADMIN as password, check the motherboard inside the system, the password is on a sticker on the motherboard, see example photo below.
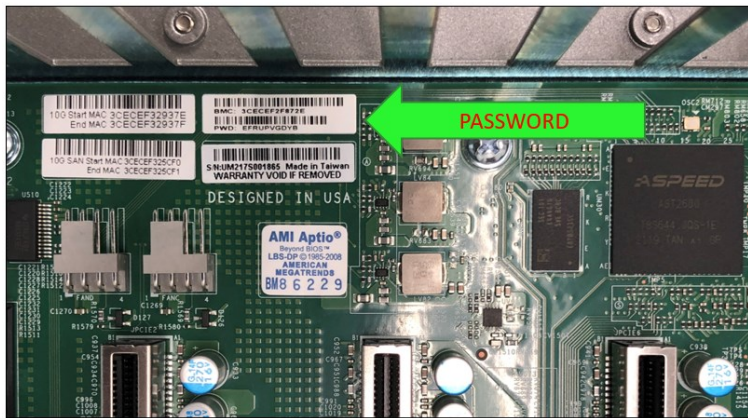
- If asked about running the latest Java (TM) Runtime Environment select 'Cancel'

From here you can find various configuration settings, logs, and server health reports. Here we will just focus on some Server Health options.

Server Health

- Senor Reading - This page displays system sensor information, including readings and status of the hardware components.
- Event Log - Shows the hardware events of the system
- Power consumption - This page displays Power consumption information, including Maximum, Minimum and Average Power consumption in the last hour, day, and week.
- Power Source - show the current readings of power supplies. Also shows the temperature from the power supplies

For more information regarding the SuperMicro SMT IPMI interface and settings click the below link:

https://www.supermicro.com/products/nfo/IPMI.cfm

Login as "Admin," password is "Admin"

9   Configuring the BMC in the BIOS

1. Turn ON the system. When powering up the unit hit the DEL key on the keyboard number pad to enter the BIOS.

2. Once in the BIOS navigate to the IPMI option with the arrow keys.

3. Select the BMC Network Configuration and press Enter.

4. Select Update IPMI LAN Configuration, press Enter and select YES.

5. Configure the Address Source for DHCP or Static.

    a. Note: If you select static configure the IP address, subnet mask, and default gateway. Those fields should go to zeros before you configure them.

```
                                    IPMI

BMC Network Configuration                              Select to configure LAN
                                                       channel parameters
IPMI LAN Selection              [Failover]             statically or
IPMI Network Link Status:       Shared LAN             dynamically(by BIOS or
Update IPMI LAN Configuration   [Yes]                  BMC). Unspecified option
Configuration Address Source    [Static]               will not modify any BMC
Station MAC Address             00-25-90-fe-d0-03      network parameters during
Station IP Address              0.0.0.0                BIOS phase
Subnet Mask                     0.0.0.0
Gateway IP Address              0.0.0.0
```

6. Connect an Ethernet cable to the IPMI LAN Port located on the back of the unit. Connect the other end of the cable to your network.

7. Save BIOS setting and restart / exit.

8. During boot up, the splash screen will flash the BMC IP address.

BMC IP: 192.168.1.124

PEI--IPMI Initialization..   00
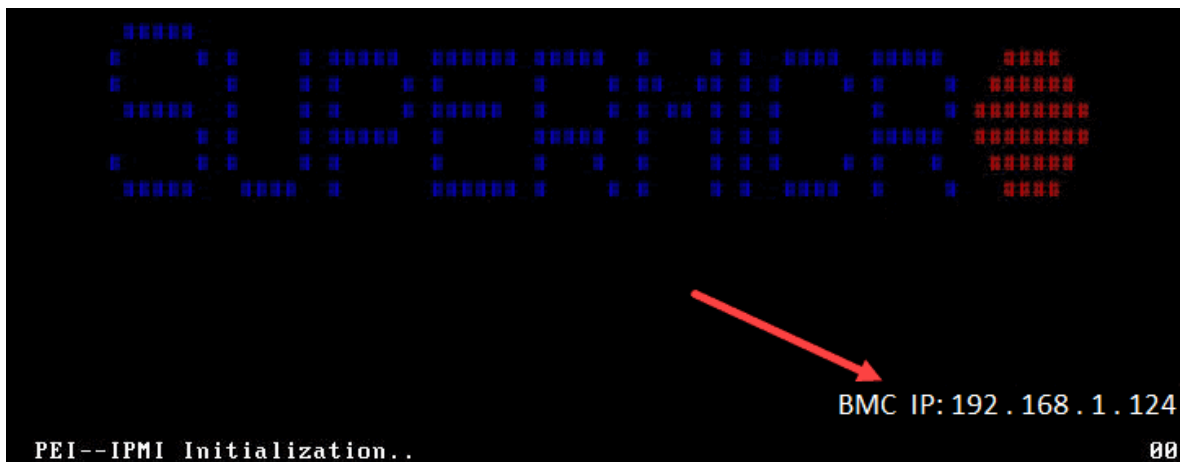
10   How to Remove Power Supply Module

This section will demonstrate on how to dismount or detach the power supply.

1. Disconnect the power cord from the power supply
2. Grasp the power-supply handle.
3. Press the blue release latch (from right to left) and hold it.
4. Pull the power supply out of the bay.
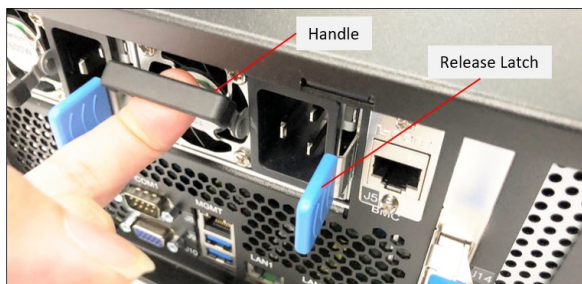
11   How to Remove Top Cover

Remove the screws located on each side of the panel, see photos below.
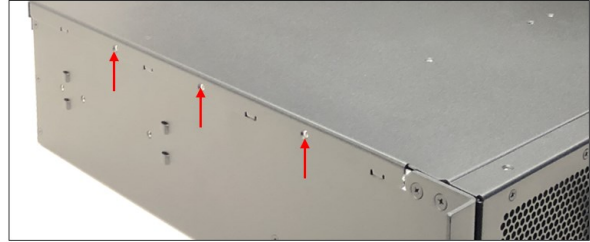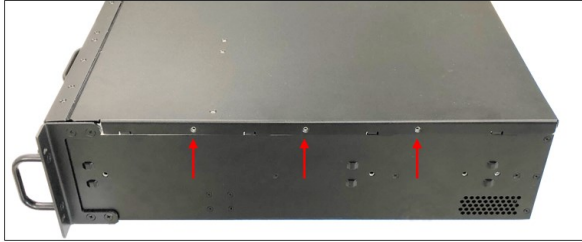
Remove the screws located on the top front-end of the lid, see photos below.
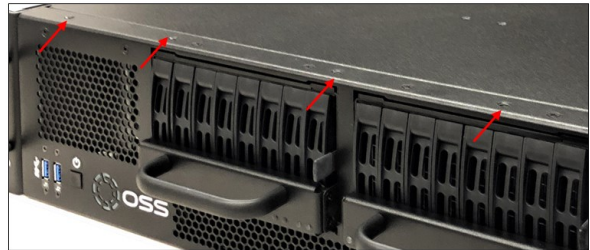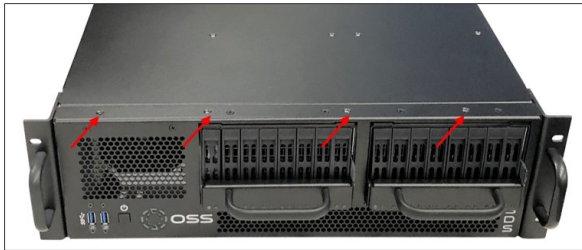
After removing all the screws, stand at the front of the unit, place each hand on the side, both hands grasping the side of lid, push the lid to dislodge.
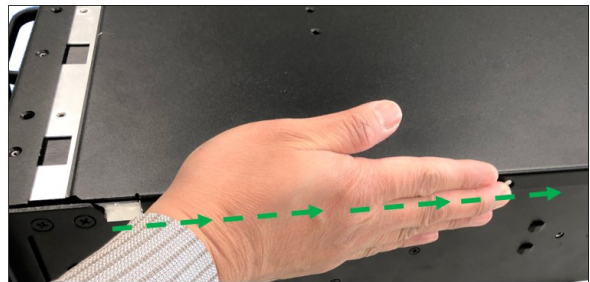
Gently pull the lid from the back and lift it up

12   How to Add / Remove PCIe Card

You must remove the "card hold-down" bracket prior to installing or pulling a PCIe card.

1. Power down the unit (if the unit is ON). Disconnect the power cord from the power supply.
2. Remove the two mounting screws and lift the card hold-down bracket.
3. Install your PCIe card in the card slot.
4. Place the card hold-down bracket on top of the card brackets and use two screws to secure it down.

Remove the screws, see photo below for the location of the screws.
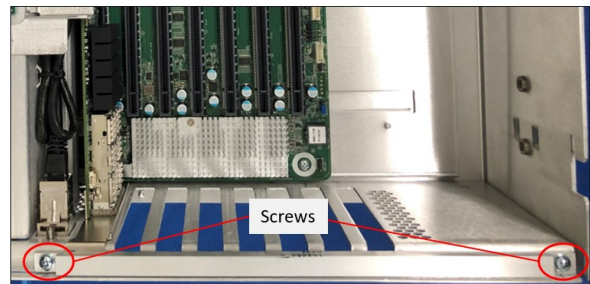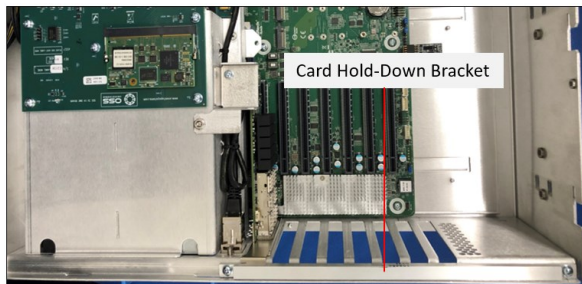
Detach the card-hold down bracket.

Install your PCIe card and secure it.
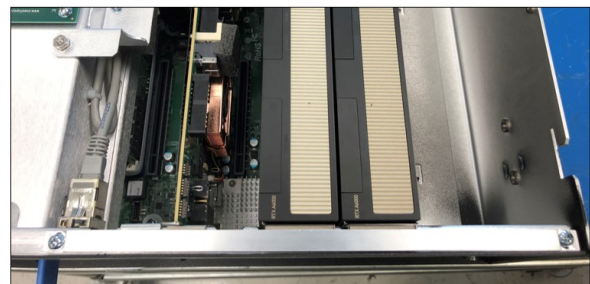
13   OSS Host Card Installation (Gen 4)

⚠ **Caution**   Power down the system first before installing any PCIe cards.

- Remove the power cord. 5VSB (5V Standby) is still available if the power cord is still installed.

The SDS unit support full height PCIe host card. Photos below show the difference between full height and half height brackets.
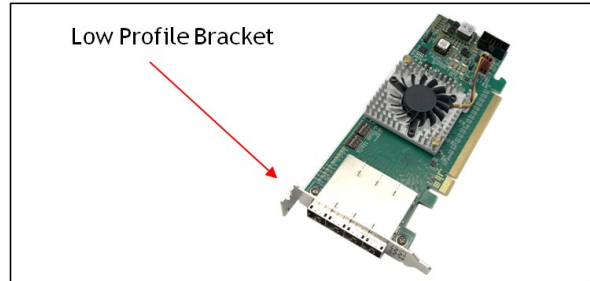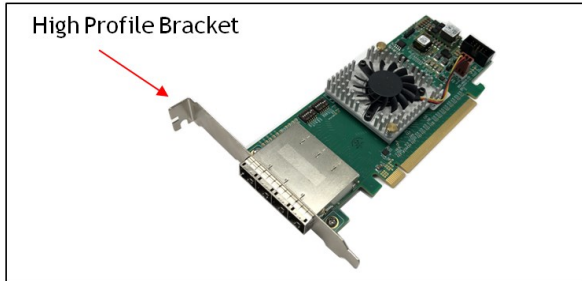
For low profile case applications, change the mounting bracket to the low-profile bracket. You can order a low-profile bracket by contacting our Sales Support.   Detach the standard bracket from the card and place the low-profile bracket and secure it.
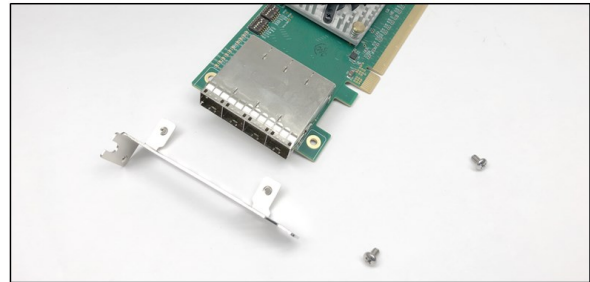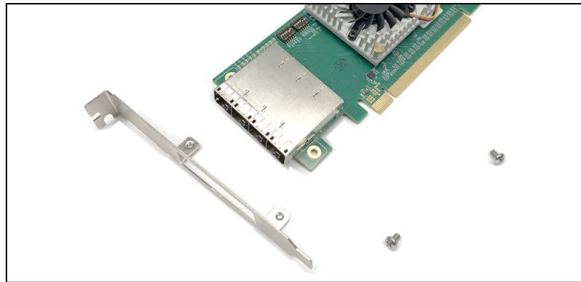
Once the correct bracket is mounted, configure the card dipswitches to host mode at x16. See settings below.
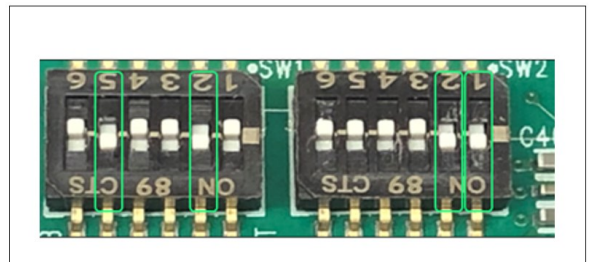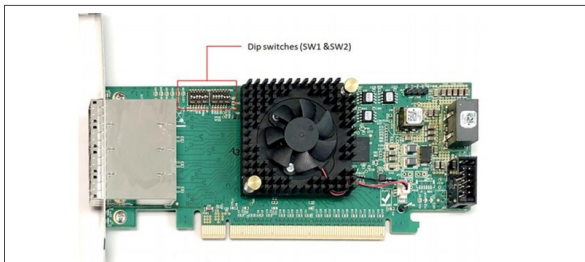
Insert the host card into a vacant x16 PCIe slot by gently pushing the card until it is firmly seated. Then secure the card to the slot with the card-hold-down bracket.

14   Attach OSS Expansion Unit

This section shows on how to connect an OSS Expansion unit to the SDS system.

Make sure you are using the same model of Target and Host adapter cards (i.e., OSS-OSS-PCIE-HIB616-X16).

14.1   Connect LINK Cables (Gen 4)

In this example we are connecting a Gen4 expansion unit.

Plug in the cables (i.e., SFF-8644) between host and target cards. Connect the four x4 SFF-8644 cables to the target card (installed in the expansion unit).

Connect the other end of the cables to the host card in the SDS appliance.

Cable diagram below shows how to connect all four SFF-8644 cables between Host and Target cards.
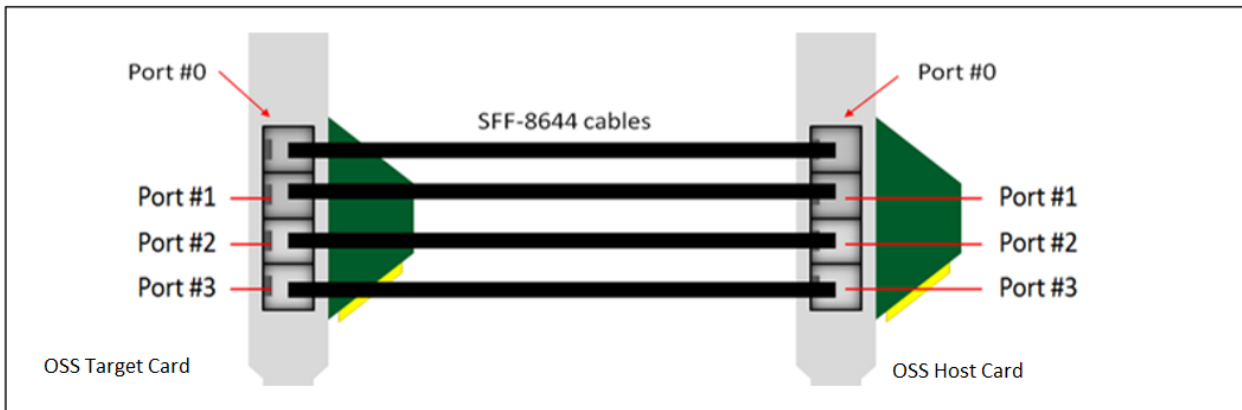
15   M.2 NVME Installation

Follow this step-by-step guide on how to install PCIe M.2 media in the SDS system.

- Remove the mounting screw located across from the M. 2 slot.
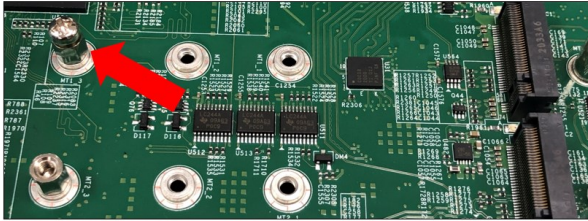
- Align the M.2 Key edge connector to the M.2 key edge socket on the board.
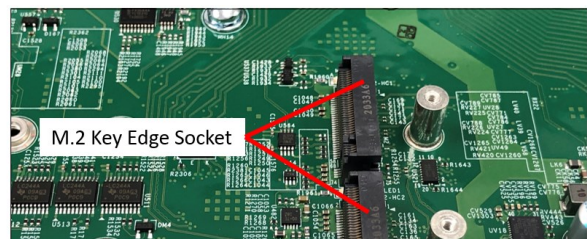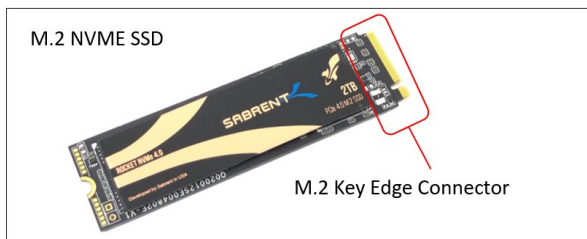
- Slowly insert the media at ~30-degree position into the socket until it is fully seated. The M.2 media will naturally stand at an angle when inserted, this is normal. See photos below.

- Secure the M.2 media using the mounting screw. Press down and hold the M.2 SSD while you replace the mounting screw that was removed in Step 1.
- This will secure the M.2 media in place. See photos below.

15.1   Verify M.2 Media

Make Sure the M.2 SSD is recognized by your computer. Other motherboards will automatically detect an M.2 SSD, but when that does not happen, you will need to manually go to the BIOS and set the settings that an M.2 device is connected.

1. Power UP the computer, during the boot-up process, press "Delete" to enter BIOS.
2. Go to Advanced Tab, select, and hit NVME Firmware Source, from the list select "AMI Native Support."
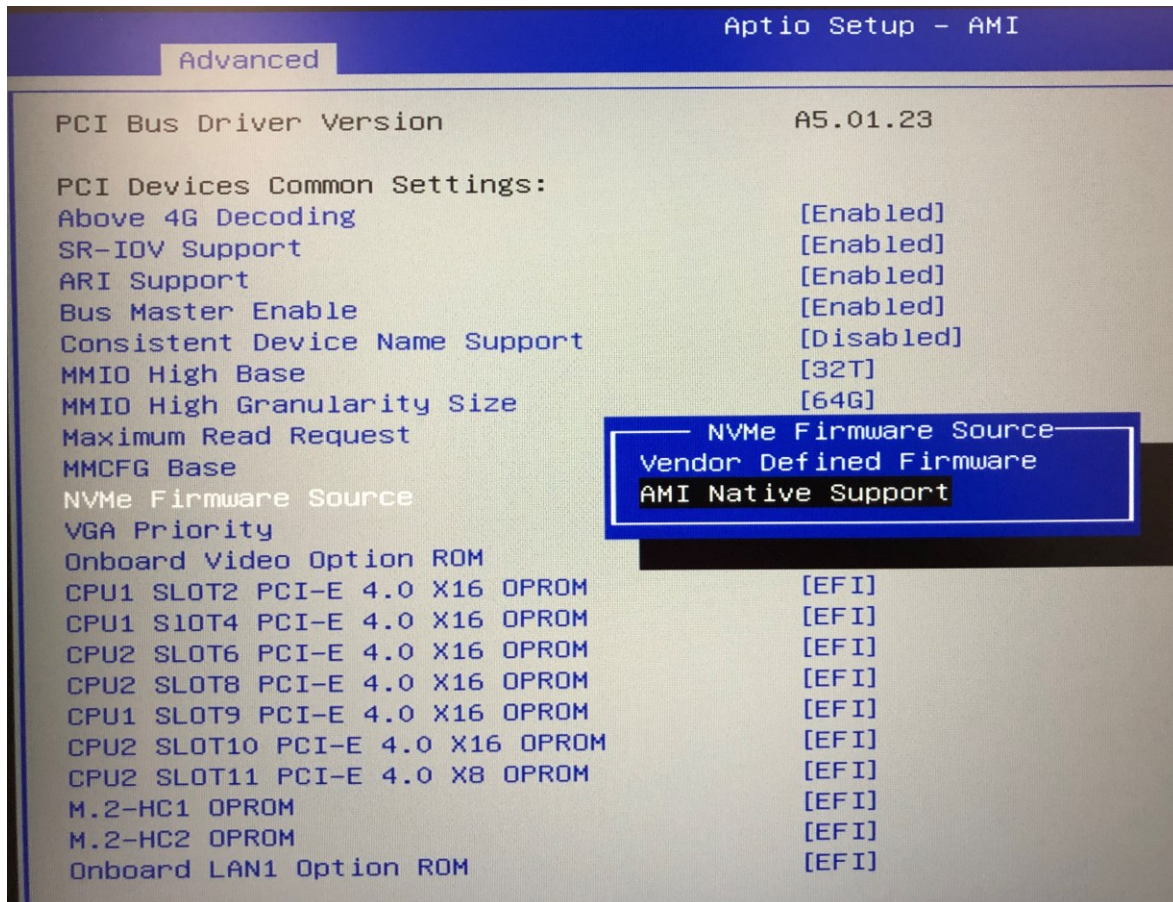
3. Go to "Boot" tab

    a. Click "Boot Mode Select", from the dropdown list select "Dual"

    b. Click "LEGACY to EFI Support", from the dropdown list select "Enabled"

    c. Click "Boot Option #1, find and select the "NAME of your Storage Device"

4. Go to "Save & Exit" tab, click "Save Changes and Reset"

```
                                          Aptio Setup — AMI
   Main   Advanced   Event Logs   IPMI   Security   Boot   Save & Exit

Boot Configuration

Boot Mode Select                              [Dual]
LEGACY to EFI Support                         [Enabled]

FIXED BOOT ORDER Priorities
Boot Option #1                                [Hard Disk:Sabrent
                                              Rocket 4.0 1TB]
Boot Option #2                                [UEFI Hard Disk]
Boot Option #3                                [UEFI USB CD/DVD]
Boot Option #4                                [USB CD/DVD]
Boot Option #5                                [USB Key]
Boot Option #6                                [USB Floppy]
Boot Option #7                                [USB Lan]
Boot Option #8                                [Network]
Boot Option #9                                [UEFI USB Key]
Boot Option #10                               [UEFI CD/DVD]
Boot Option #11                               [UEFI USB Hard Disk]
Boot Option #12                               [CD/DVD]
Boot Option #13                               [USB Hard Disk]
Boot Option #14                               [UEFI USB Floppy]
Boot Option #15                               [UEFI USB Lan]
```

16   IPMI

IPMI 2.0 based system monitoring on dedicated Ethernet.

IPMI monitors the status of the following hardware in the SDS unit and display it via Web interface.

- Fan status and speed
- Drive Backplane temperature
- Power supply voltage and temperature

16.1 Check IPMI Hardware

Check if the unit is equipped with IPMI. Remove the top cover of the appliance.
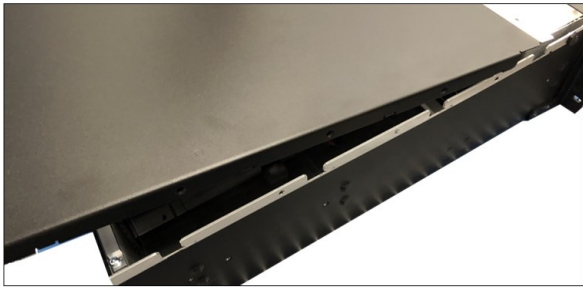
16.2   IPMI Module Location

See photos below for the location of the IPMI module.

IPMI Module
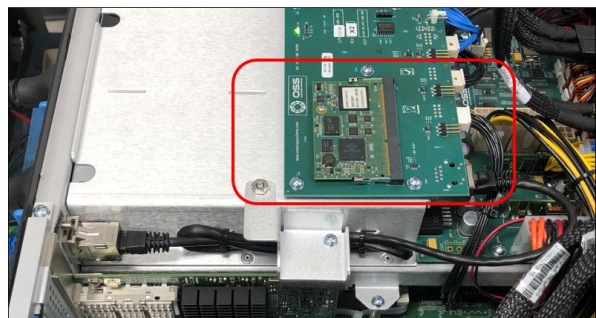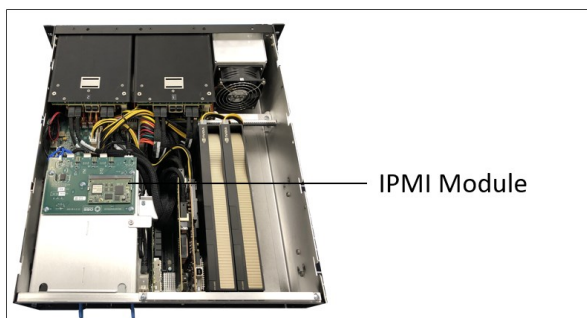
17   IPMI Set Up

17.1   Connect Ethernet Cable

Connect Ethernet cable to BMC port located on the back of the unit.

Plug in the other end of the Ethernet cable to your network (running DHCP).
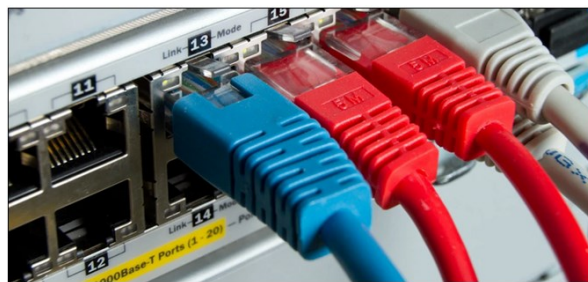
17.2   Connect Power Cables

Connect the power cords to the power supplies, located on the back of the unit.

Press the front power button to turn ON the SDS system.

Upon applying power, observe the IPMI LED located on top of the board, see photos below. It will illuminate from solid red to blinking green and to solid green. When the led status is solid green, the IPMI module is ready to use.
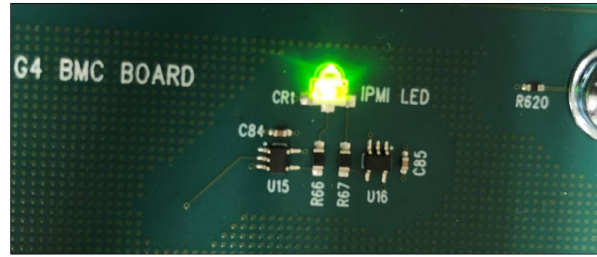
Verify the internal Ethernet cable is connected to the RJ45 port on the board and the LED is blinking green, see photos below.
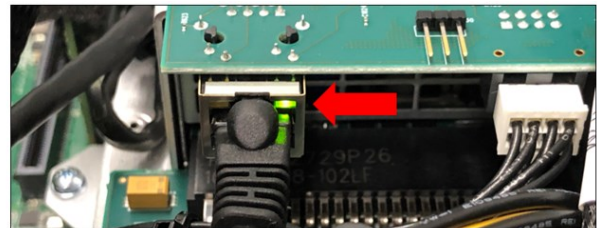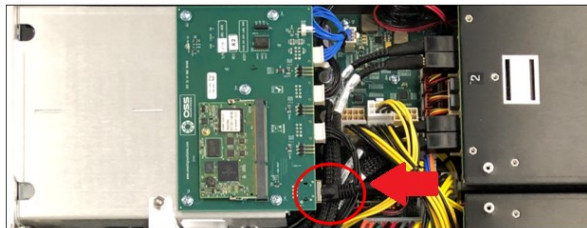
17.3   Locate Mac Address

To access the web interface of the IPMI you need the IP address. Check the IPMI module in the unit, find the label containing the Mac address. The photo below shows the location of the IPMI module label.
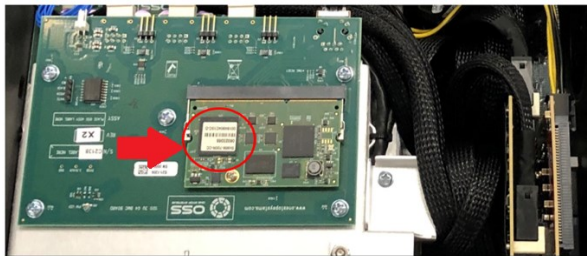
The OSS IPMI module Mac address contains thirteen characters / numbers. Use only the twelve numbers written on the label, this is the primary Mac address.
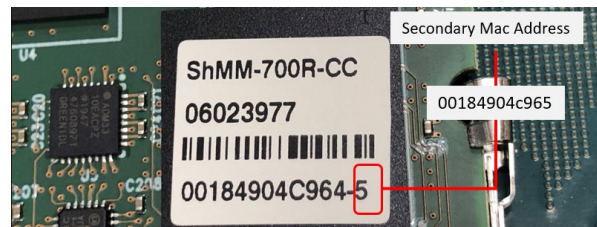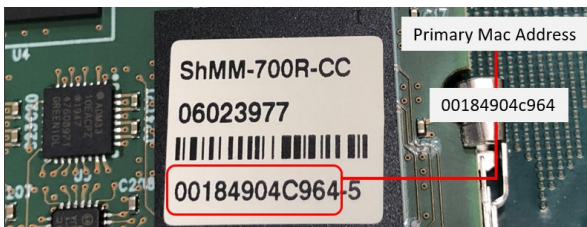
17.4   Discovering the Mac Address / IP Address

Use the known Mac address from the IPMI module to find or retrieve the IP address. The IPMI module eth0 is configured as DHCP.

- When the device is connected in a network, it will eventually get an IP from DHCP server, then you need to find out which IP address assigned to it.

There are multiple ways to do this as follows:

1. Look in your DHCP server logfiles for a lease that matches the MAC address of the device.
2. A network or IP scanner, which can scan, retrieve, and resolve MAC addresses.
3. Simple Command prompt or Windows Terminal.

17.4.1 Using The DHCP To Find IP Addresses

In case you have access to the DHCP Server, you can look at all IP, MAC, and interface relationships, as well as the names of the devices and LAN lease times.

- Log into your DHCP server, and here we will be using the home gateway.
- If you are not aware of the IP address of the DHCP Server, you can run an ipconfig command on Windows or an ifconfig command on macOS or Linux.
- Type in the IP address within your browser and insert your credentials.
- Go to "DHCP" then to "DHCP Clients List" here, and you will be able to see how the MAC and IP addresses are mapped on the network.
- Match the IP with the MAC address.

Navigate to Data management->DHCP->Leases->Current leases in the GUI and you can export it to check the list of clients involved.

17.4.2 Using A Network or IP scanner

Using a software tool such as an IP scanner to scan and retrieve all IP and Mac addresses on the network. Photo below displays the IP and Mac addresses after running the IP Scanner.

- Mac Address 00:18:49:04:F1:b8 and IP address of 10.2.5.2.

NOTE: The **"nVent,Schroff GmbH"** is the vendor / manufacture of the IPMI module.
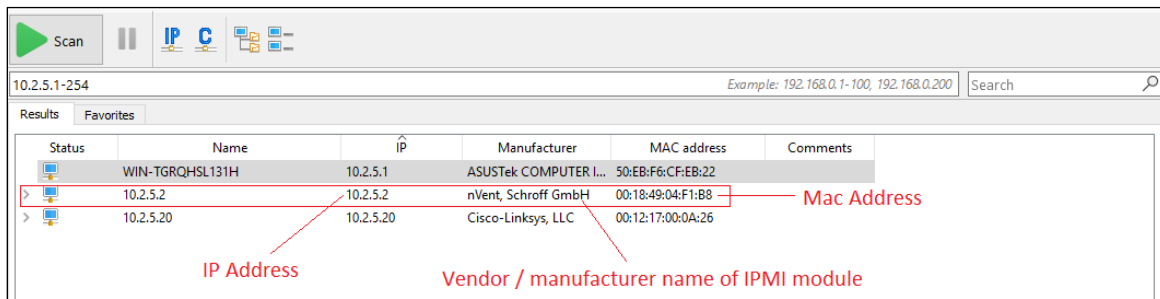
17.4.3 Using Command Prompt or Windows Terminal

Windows:

Using Command Prompt: "arp –a" command

For example, your network IP has an address of 10.2.5.20 then the broadcast address will be 10.2.5.255 if you have a /24 subnet (255.255.255.0)

- Open a command prompt and type: "ping 10.2.5.255."
- You will not get a response, wait until all the pings have timed out!
- Then type this: "arp -a"

You should be able to find your MAC of your device, with its IP address. In this example, the MAC Address on the IPMI module Eth0 is 00-18-49-F1-B8. Match that with the IP address on the "arp" table, it is 10.2.5.2, see example photo below.
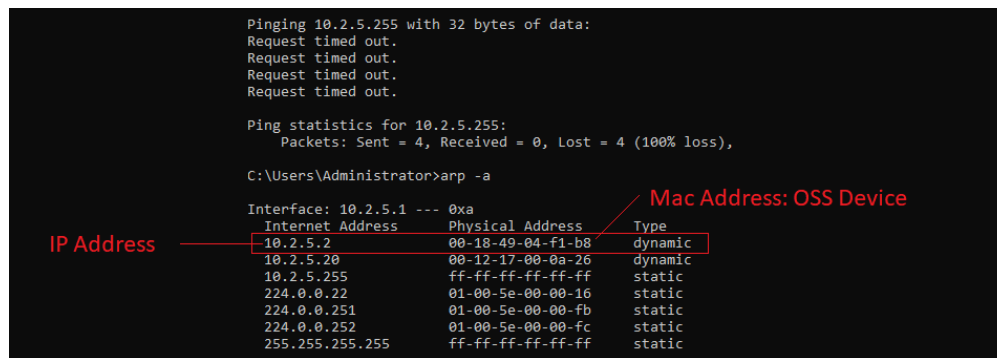
Using Windows PowerShell: "Get-NetNeighbor" command

Start Windows PowerShell as administrator and type:

"Get-NetNeighbor -LinkLayerAddress 00-18-49-04-c1-2c. Replace the number with the Mac address from the Storage Expansion unit sticker.

- Below photo is an example of Windows PowerShell cmdlet for querying the IP address using the Mac address.
- This is just one an example of PowerShell command that you can utilize. There are more commands available that you can use.

```
PS C:\WINDOWS\system32> Get-NetNeighbor -LinkLayerAddress 00-18-49-04-c1-2c

ifIndex IPAddress                           LinkLayerAddress    State      PolicyStore
------- ---------                           ----------------    -----      -----------
7       192.168.1.153                       00-18-49-04-C1-2C   Reachable  ActiveStore
```

Linux:

Photos below are an example of Linux commands to query the IP address and Mac address.

```
root@oss:/home/oss# arp -a
? (10.2.5.1) at 00:18:49:04:f1:b8 [ether] on enp4s0
? (10.2.5.20) at 00:12:17:00:0a:26 [ether] on enp4s0
root@oss:/home/oss# ip neigh
10.2.5.1 dev enp4s0 lladdr 00:18:49:04:f1:b8 REACHABLE
10.2.5.20 dev enp4s0 lladdr 00:12:17:00:0a:26 DELAY
root@oss:/home/oss# arp -n
Address              HWtype  HWaddress           Flags Mask        Iface
10.2.5.1             ether   00:18:49:04:f1:b8   C                 enp4s0
10.2.5.20            ether   00:12:17:00:0a:26   C                 enp4s0
```

```
root@oss:/home/oss# arp-scan 10.2.5.0/20
Interface: enp4s0, type: EN10MB, MAC: 50:eb:f6:cf:eb:22, IPv4: 10.2.5.1
WARNING: host part of 10.2.5.0/20 is non-zero
Starting arp-scan 1.9.7 with 4096 hosts (https://github.com/royhills/arp-scan)
10.2.5.2         00:18:49:04:f1:b8         nVent, Schroff GmbH
10.2.5.20        00:12:17:00:0a:26         Cisco-Linksys, LLC

2 packets received by filter, 0 packets dropped by kernel
Ending arp-scan 1.9.7: 4096 hosts scanned in 17.249 seconds (237.46 hosts/sec). 2 responde
root@oss:/home/oss# arp -a | grep 00:18:49:04:f1:b8
? (10.2.5.2) at 00:18:49:04:f1:b8 [ether] on enp4s0
root@oss:/home/oss#
```

17.5   Start Internet Browser

Once the IP address is identified, launch your internet browser, and type the IP address. Below photo is the Web interface of the IPMI displaying the status of the following hardware in the storage expansion unit.

- Fan status and speed
- Drive Backplane temperature
- Power supply voltage and temperature

SDS, dual drive pack, 2 power supplies

BMC Temperature	24C

Fan 1 Status	OK	Fan 4 Status	OK	Fan 8 Status	OK		
Fan 1 Speed	14915RPM	Fan 4 Speed	14915RPM	Fan 8 Speed	11875RPM	Fan 11 Status	OK
Fan 2 Status	OK	Fan 5 Status	OK	Fan 9 Status	OK	Fan 11 Speed	11590RPM
Fan 2 Speed	14915RPM	Fan 5 Speed	14915RPM	Fan 9 Speed	11685RPM	Fan 12 Status	OK
Fan 3 Status	OK	Fan 7 Status	OK	Fan 10 Status	OK	Fan 12 Speed	11780RPM
Fan 3 Speed	4905RPM	Fan 7 Speed	11780RPM	Fan 10 Speed	11685RPM		

PSU Backplane Temperature	25C
3V3 Switcher Temperature	32C
3V3 Switcher Output Voltage	3.3V
3V3 Switcher Output Current	0.1A
Aux 3V3 Voltage	3.42V
Main 3V3 Voltage	3.38V
Standby 5V Voltage	5.2V
Main 5V Voltage	5.13V
Main 12V Voltage	12.48V

PSU 1 Input Voltage	116V	PSU 2 Input Voltage	116V
PSU 1 Output Voltage	12.2V	PSU 2 Output Voltage	12.2V
PSU 1 Input Current	1A	PSU 2 Input Current	1A
PSU 1 Output Current	9A	PSU 2 Output Current	5A
PSU 1 Input Power	120W	PSU 2 Input Power	80W
PSU 1 Output Power	100W	PSU 2 Output Power	60W
PSU 1 Temperature 1	28C	PSU 2 Temperature 1	27C
PSU 1 Temperature 2	38C	PSU 2 Temperature 2	39C
PSU 1 Temperature 3	46C	PSU 2 Temperature 3	43C
PSU 1 Fan Speed	6300RPM	PSU 2 Fan Speed	6060RPM

192.168.1.125

Standby 5V Voltage	5.2V
Main 5V Voltage	5.13V
Main 12V Voltage	12.48V

PSU 1 Input Voltage	116V	PSU 2 Input Voltage	116V
PSU 1 Output Voltage	12.2V	PSU 2 Output Voltage	12.2V
PSU 1 Input Current	1A	PSU 2 Input Current	1A
PSU 1 Output Current	8A	PSU 2 Output Current	5A
PSU 1 Input Power	120W	PSU 2 Input Power	100W
PSU 1 Output Power	100W	PSU 2 Output Power	60W
PSU 1 Temperature 1	28C	PSU 2 Temperature 1	27C
PSU 1 Temperature 2	38C	PSU 2 Temperature 2	39C
PSU 1 Temperature 3	46C	PSU 2 Temperature 3	43C
PSU 1 Fan Speed	6300RPM	PSU 2 Fan Speed	6060RPM

Drive Pack Interface 1 Temperature	30C	Drive Pack Interface 2 Temperature	31C
5V Regulator 1 Output Voltage	5V	5V Regulator 1 Output Voltage	5V
5V Regulator 1 Output Current	0A	5V Regulator 1 Output Current	0A
5V Regulator 1 Temperature 2	38C	5V Regulator 1 Temperature 2	38C
5V Regulator 2 Output Voltage	5V	5V Regulator 2 Output Voltage	5V
5V Regulator 2 Output Current	0A	5V Regulator 2 Output Current	0A
5V Regulator 2 Temperature 2	37C	5V Regulator 2 Temperature 2	38C

Drive Pack 1 Temperature	23C	Drive Pack 2 Temperature	25C
SSD 1 Type	No Drive	SSD 1 Type	NVMe
SSD 2 Type	No Drive	SSD 2 Type	No Drive
SSD 3 Type	No Drive	SSD 3 Type	NVMe
SSD 4 Type	No Drive	SSD 4 Type	No Drive
SSD 5 Type	NVMe	SSD 5 Type	NVMe
SSD 6 Type	No Drive	SSD 6 Type	No Drive
SSD 7 Type	No Drive	SSD 7 Type	NVMe
SSD 8 Type	No Drive	SSD 8 Type	No Drive

BMC Temperature	23C

Fan 1 Status	OK
Fan 1 Speed	22040RPM
Fan 2 Status	OK
Fan 2 Speed	21755RPM
Fan 3 Status	OK
Fan 3 Speed	8235RPM

Fan 4 Status	OK
Fan 4 Speed	21850RPM
Fan 5 Status	OK
Fan 5 Speed	21850RPM
Fan 7 Status	OK
Fan 7 Speed	21660RPM

Fan 8 Status	OK
Fan 8 Speed	22040RPM
Fan 9 Status	OK
Fan 9 Speed	21660RPM
Fan 10 Status	OK
Fan 10 Speed	22040RPM

Fan 11 Status	OK
Fan 11 Speed	21850RPM
Fan 12 Status	OK
Fan 12 Speed	21850RPM

Large Front Fan

18 How To Login to IPMI Console

To login to the IPMI console you can use SSH and make necessary changes such as the following:

1. Changing the fan speed. Go to "IPMI Command Lines" for more information.
2. Setting the eth0 IP to either STATIC or DHCP. Go to "IPMI Command Lines" for more information.

18.1 Using SSH

18.1.1 On windows:

- Press the Windows Start button at the bottom left.
- Type in "Command Prompt".
- Right click on Command Prompt and click "Run as administrator".
- Click Yes if the Windows 10 User Account Control prompt is displayed.
- The Command Prompt should appear

18.1.2 On Linux:

- Pressing Ctrl+Alt+T will instantly launch a Terminal window

Once you have the Terminal Window or the Command Prompt started:

- Type "ssh root@XXX.XXX.X.XXX". Press the ENTER key
    - o NOTE: Replace the XXX.XXX.X.XXX with the address assigned to your OSS Storage Expansion unit.
- There is no password, press ENTER again.
- Once you have logged in, you can now change the fan speed and set the eth0 IP address to either static or DHCP.

19   IPMI Command Lines

". /ipmi_ctrl <duty cycle in %>": allows a manual speed selection.

- If the fan speed is chosen to be fixed during set up, then the specified fan speed will be used as power-up default.

- It can be changed with ". /ipmi_ctrl <duty cycle>", with <duty cycle> in the range 15-100.

While the IPMI module core operating system remains up and running the fans will remain at the last set speed (power-up default or the last value set using ipmi_ctrl).

- After a power-cycle the fans will default back to the configured speed (using setup or setfan), not the last one set using ipmi_ctrl.

- To change the power-up default fan-speed, run "setfan" and answer the questions. The new setting will be effective on the next reboot.

- To change the network settings, run setip. This will ask for the settings for both network interfaces again.

To change the fan control speed, go to /home/root directory and enter. /ipmi_ctrl

Note: This can only control the fan speed on the large front fan.

```
# cd
# pwd
/home/root
# ./ipmi_ctrl
Usage: ./ipmi_ctrl <pwm> [<lowtemp> <hightemp>]
  <pwm>      : 15-100, 15=0%, 100=100%

  only when <pwm> is 101:
  <lowtemp> : temperature at or below which the power determines the duty cycle
  <hightemp>: temperature at or above which the upper limit duty cycle (100) is enforced
```

To change IP address, go to /home/root directory and enter ./setip.sh

```
/home/root
# ./setip.sh

Use static IP address for eth0 (rear)? [y/n]: y

Enter IP address for eth0 (e.g.: 192.168.0.23): 192.168.1.24

IP address for eth0: 192.168.1.24
Is this correct? [y/n]: y

Specify netmask for eth0 (rear), optional? [y/n]: n

Use static IP address for eth1 (front)? [y/n]: n
```

20 Drive Packs

There are two Drive Packs in the SDS unit.

- Each Drive Pack contains 8 drives / 8 drive slots.

- The Drive Packs are linked to an OSS-536 PCIe storage controller card.

- Below are the slot assignments for each drive slot.
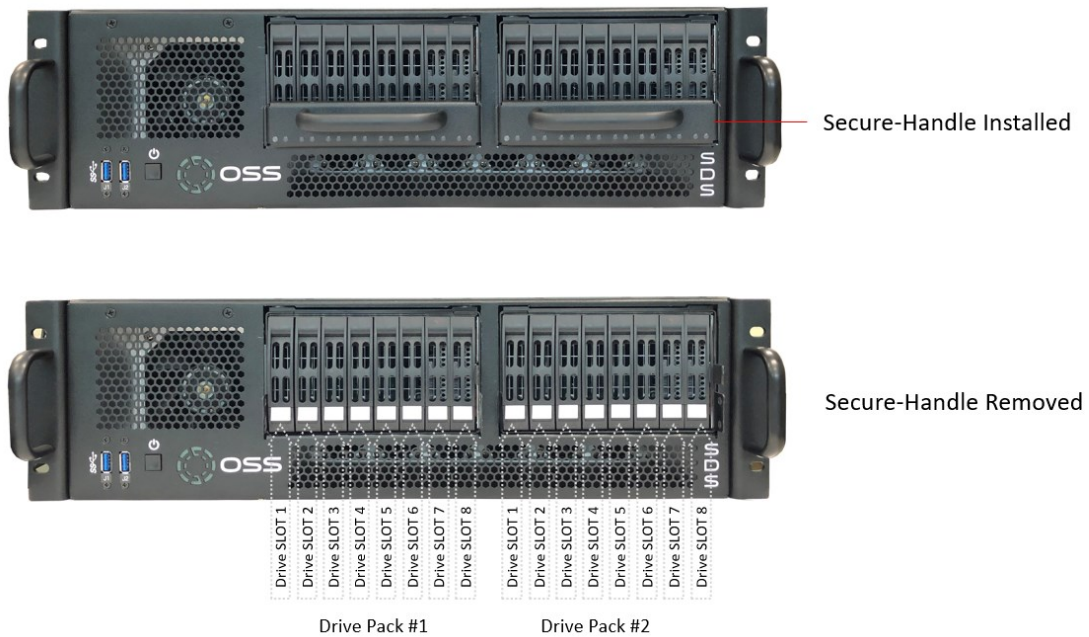
Figure 1: 8 Drive trays

Figure 2: 8 drive slots on the midplane. This is the slot where the U.2 drive is connected.
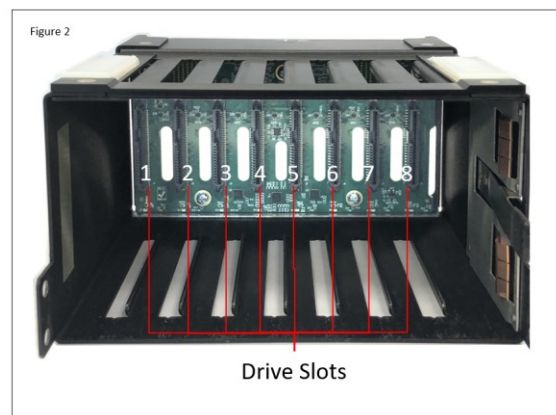
20.1   Slot / Port Mapping

FIG 3: The OSS-536 card (storage controller card) is connected to both drive packs (#1 and #2) via SFF-8643 cables.

FIG 3
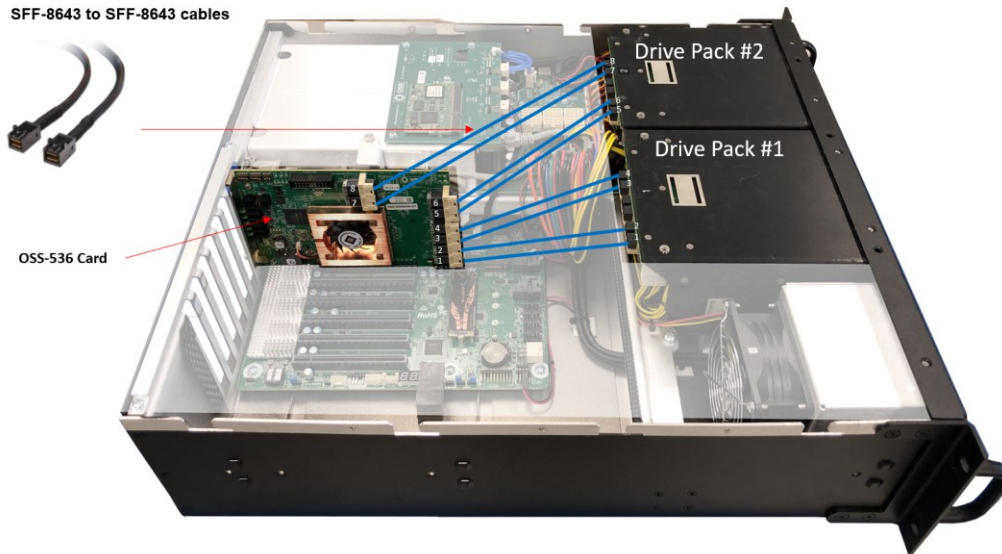
Drawing below shows the connection between the OSS-536 board and the Drive Packs.
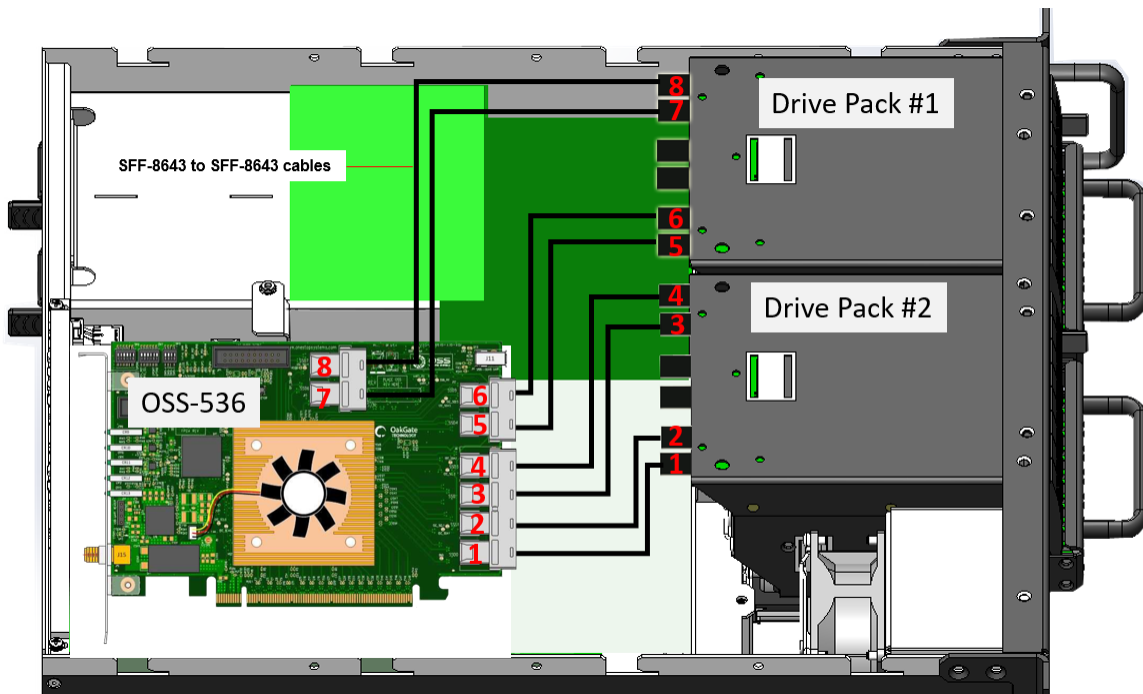
20.1.1 OSS-536 Port Mapping

Table below shows the corresponding hardware port for each drive slot.

PEX88048 / Port	Link / Partner
0	Drive Pack 2, Slot 8
2	Drive Pack 2, Slot 7
4	Drive Pack 2, Slot 6
6	Drive Pack 2, Slot 5
8	Drive Pack 2, Slot 4
10	Drive Pack 2, Slot 3
12	Drive Pack 2, Slot 2
14	Drive Pack 2, Slot 1
16	Drive Pack 1, Slot 8
18	Drive Pack 1, Slot 7
20	Drive Pack 1, Slot 6
22	Drive Pack 1, Slot 5
24	Drive Pack 1, Slot 4
26	Drive Pack 1, Slot 3
28	Drive Pack 1, Slot 2
30	Drive Pack 1, Slot 1
32	PCIe Card Edge

20.2   OSS-536 LEDs / Board LEDs:

CR7: Fatal Error
CR8: PEX Switch Heartbeat, 1Hz
CR14: PCIe Reset Asserted

D9: AUX Power Good
CR3: Link Status DP 2, Slot 7
CR4: Link Status DP 2, Slot 5
CR5: Link Status DP 2, Slot 3
CR6: Link Status DP 2, Slot 1

CR15: PEX 1.8V Power Good
CR16: PEX Core Power Good

20.4   Bracket LINK STATUS LEDs

0: Link Status DP 1, Slot 2
1: Link Status DP 1, Slot 4
2: Link Status DP 1, Slot 6
3: Link Status DP 1, Slot 8
4: Link Status DP 2, Slot 2
5: Link Status DP 2, Slot 4
6: Link Status DP 2, Slot 6
7: Link Status DP 2, Slot 8
CE: Link Status of Card Edge PCIe x16
PWR: Board power status

FIG 4: Shows the associated drive slots (2,4,6 and 8) from drive pack#1 and their corresponding link status LEDs (0,1,2 and 3) from the OSS-536.

FIG 4
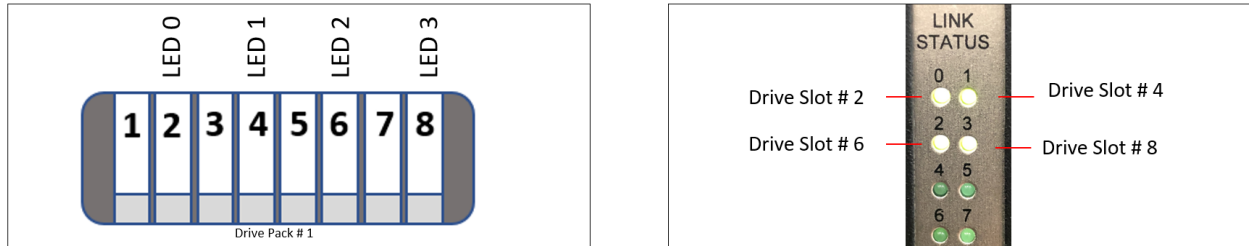
FIG 5: Shows the associated drive slots (2,4,6 and 8) from drive pack#2 and their corresponding link status LEDs (5,6,7 and 8) from the OSS-536.

FIG 5
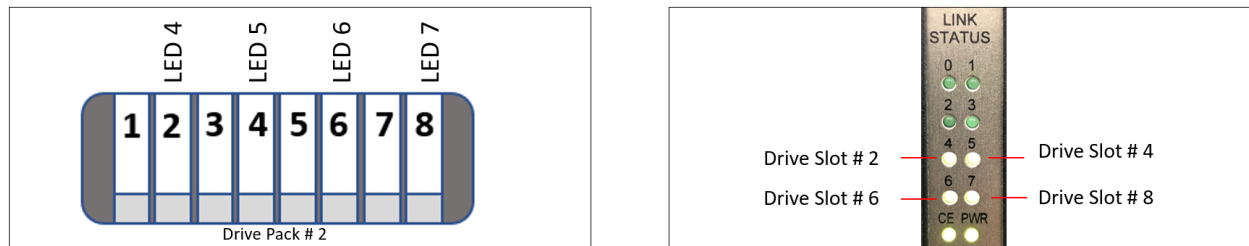
The photos below show the CE & PWR LED indicators.
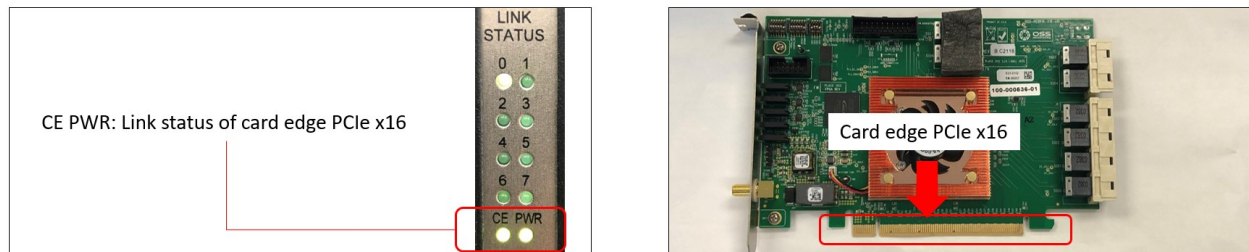
21   Hierarchy of NVME Drives – Windows OS

Hierarchy of 16 NVME drives in Windows Device Manager, viewing it "Devices by Connection".

FIG 6
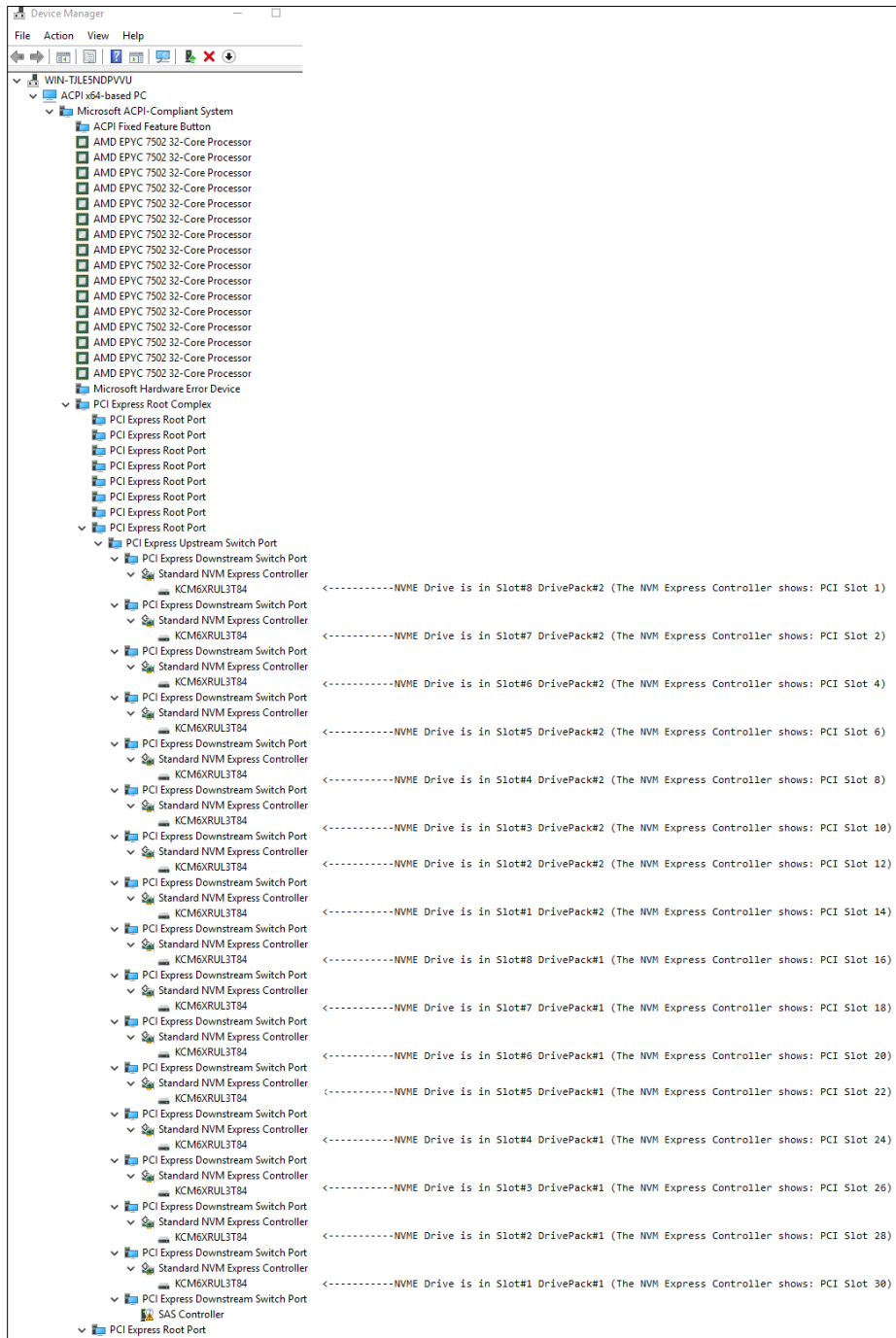
FIG 7
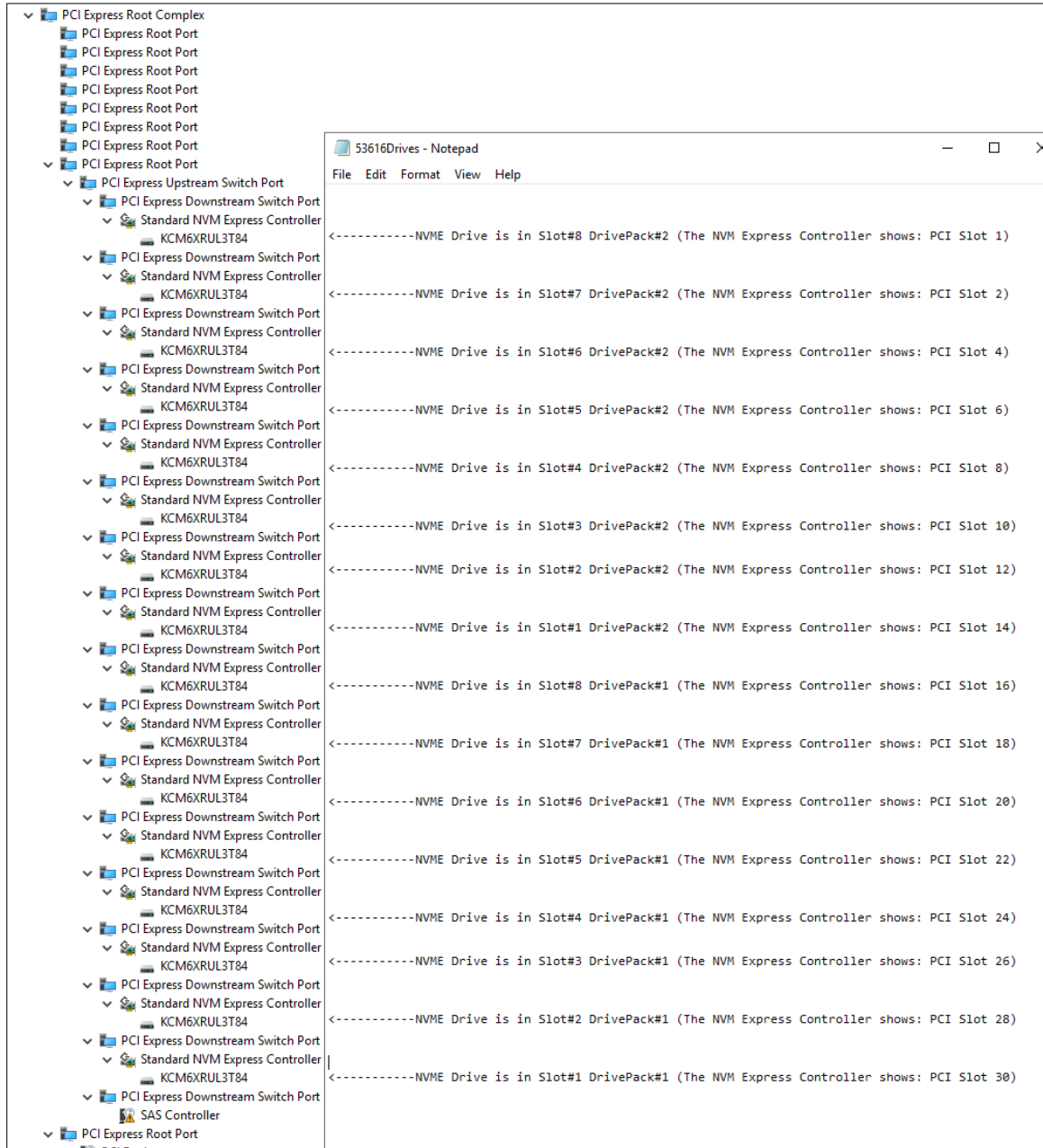
FIG 8: Viewing the 16 storage devices using the "Disk Management" tool.

The screenshot below shows 8 detected NVME drives in Windows Device Manager from Drive Pack #2.

FIG 9
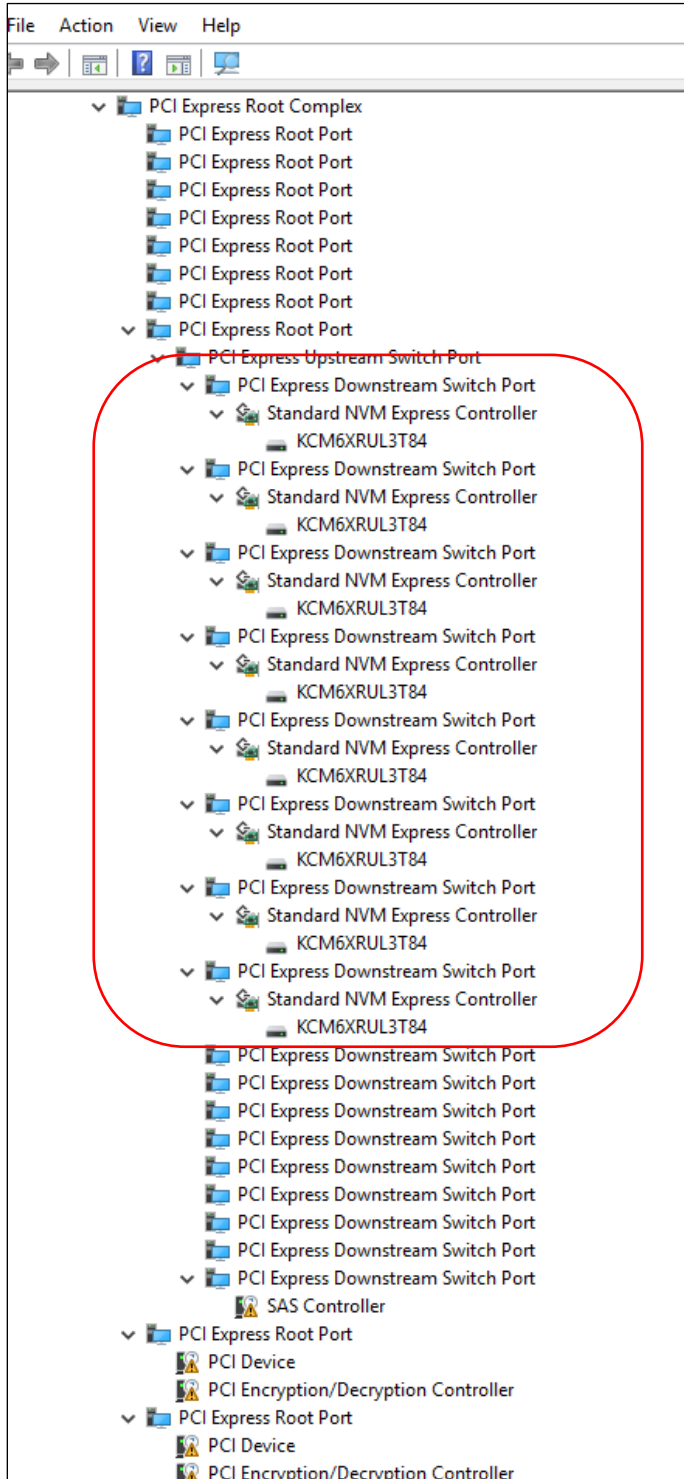
The screenshot below shows 8 detected NVME drives in Windows Device Manager from Drive Pack #1.

FIG 10
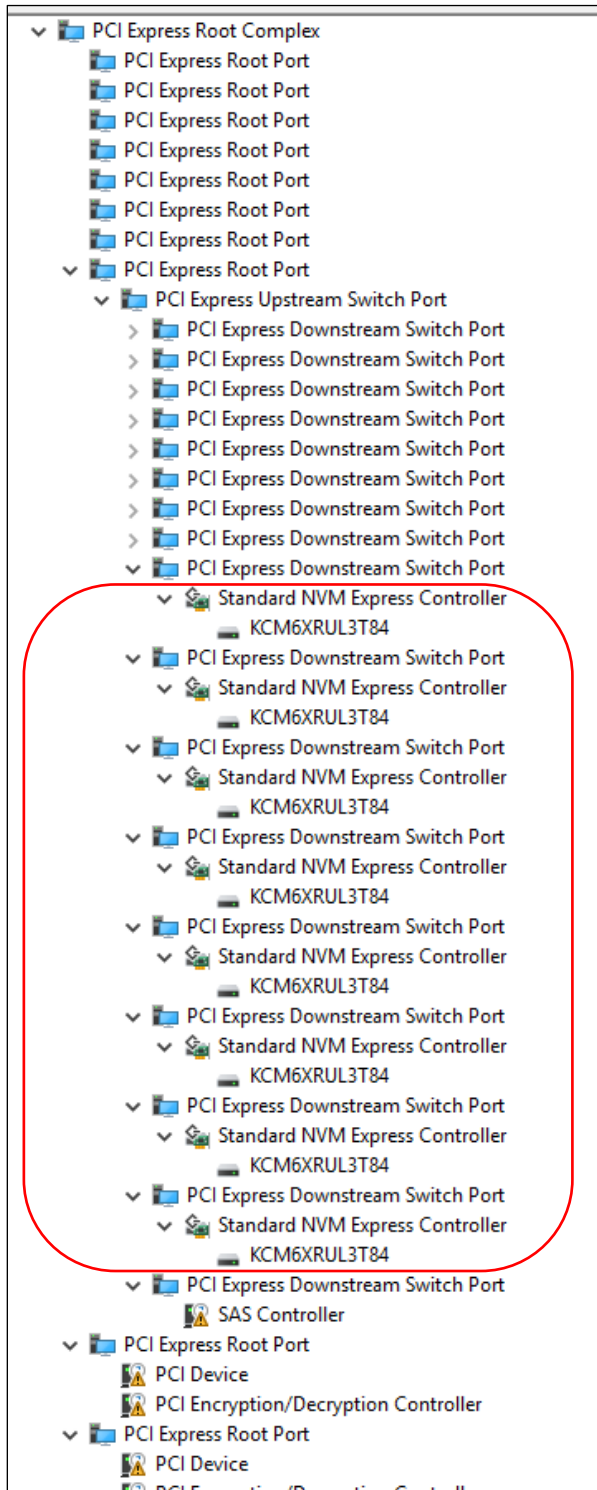
Screenshot below shows 16 PCI Express Downstream Switch Ports
- It represents the drive slot in the drive packs (#1 and #2).
- The 17th PCI Express Downstream Switch Port is the SAS Controller (OSS-563).

FIG 11
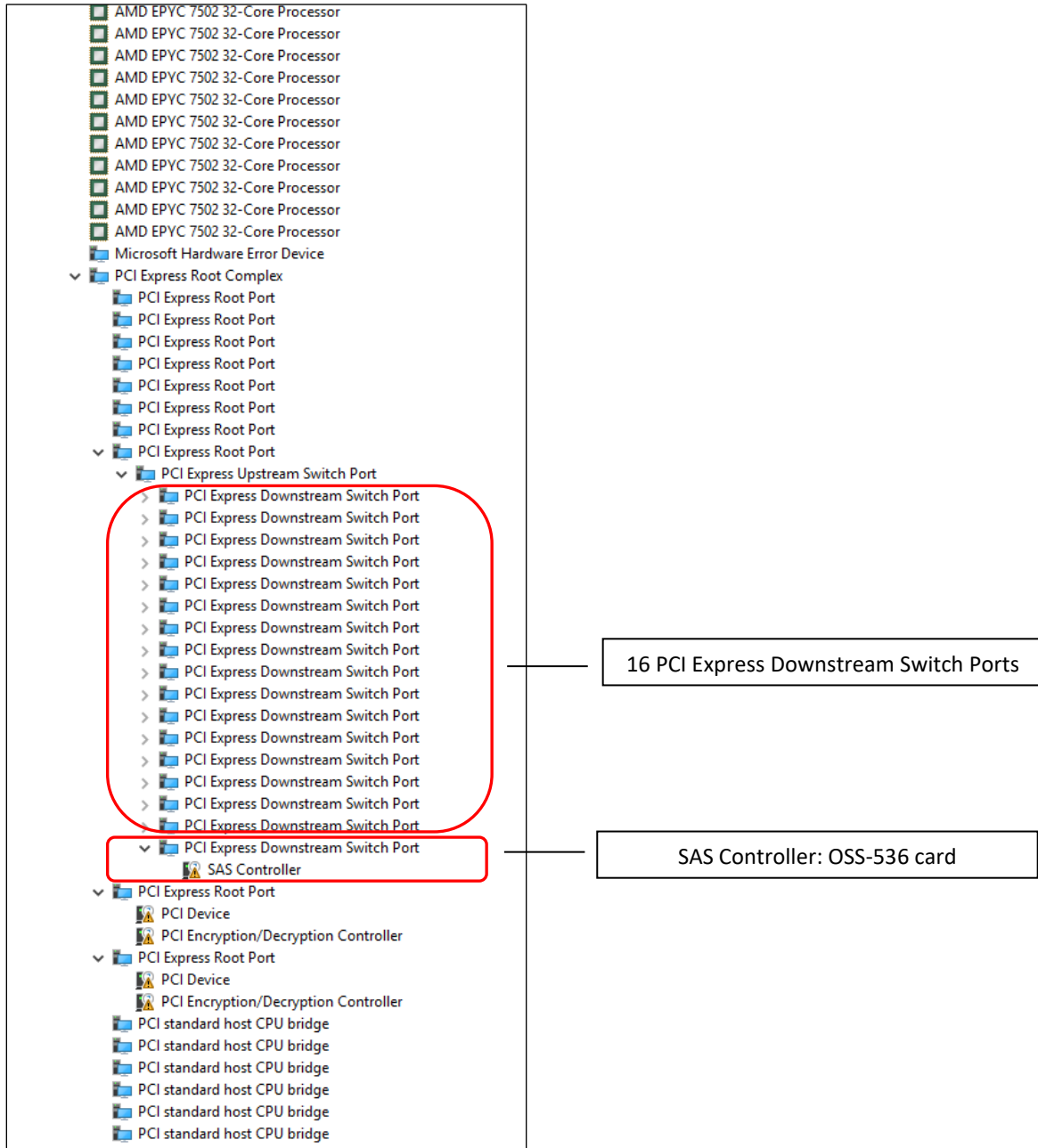
NVME Drives are hot-pluggable
- You can remove and reinsert the NVME drive while the Operating System is running.
- The Operating System will automatically reinitialize the NVME drives when reinserted and will automatically dismount when removed or ejected.
- When the Operating System detects the NVME drive, an instance of "Standard NVME Controller" will appear below the "PCI Express Downstream Switch Port".
  - o Under the "Standard NVME Express Controller", the NVME storage device will appear.

FIG 12
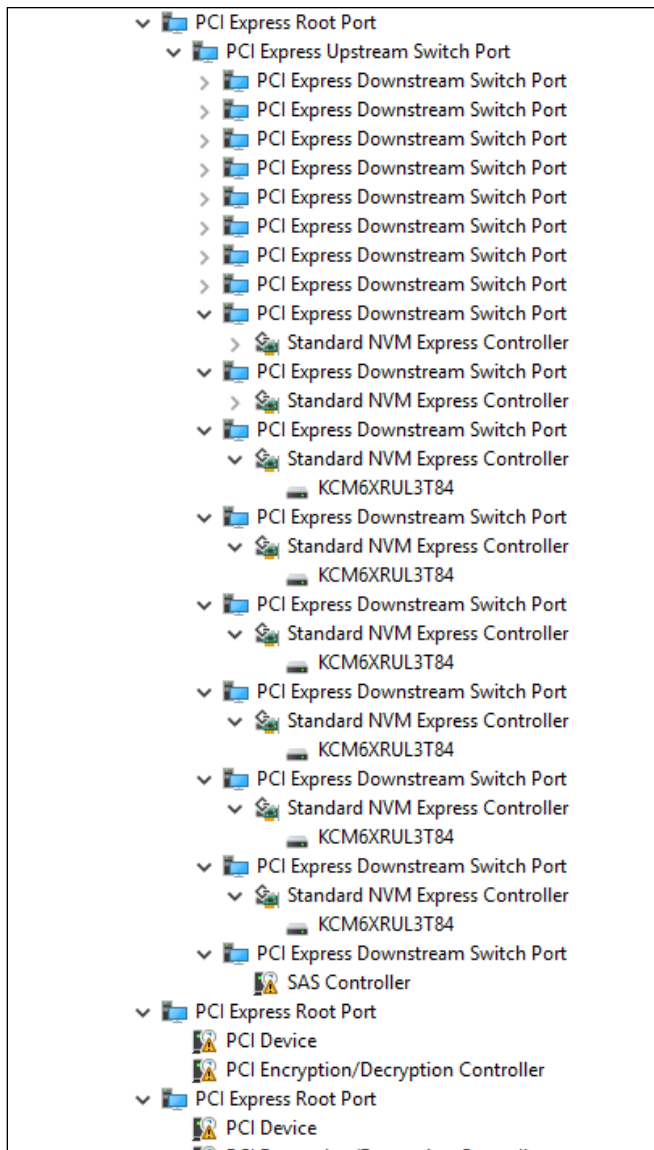
FIG 13: Showing 16 NMVE drives enumerated, viewing "devices by type" in Windows Device Manager.

FIG 13
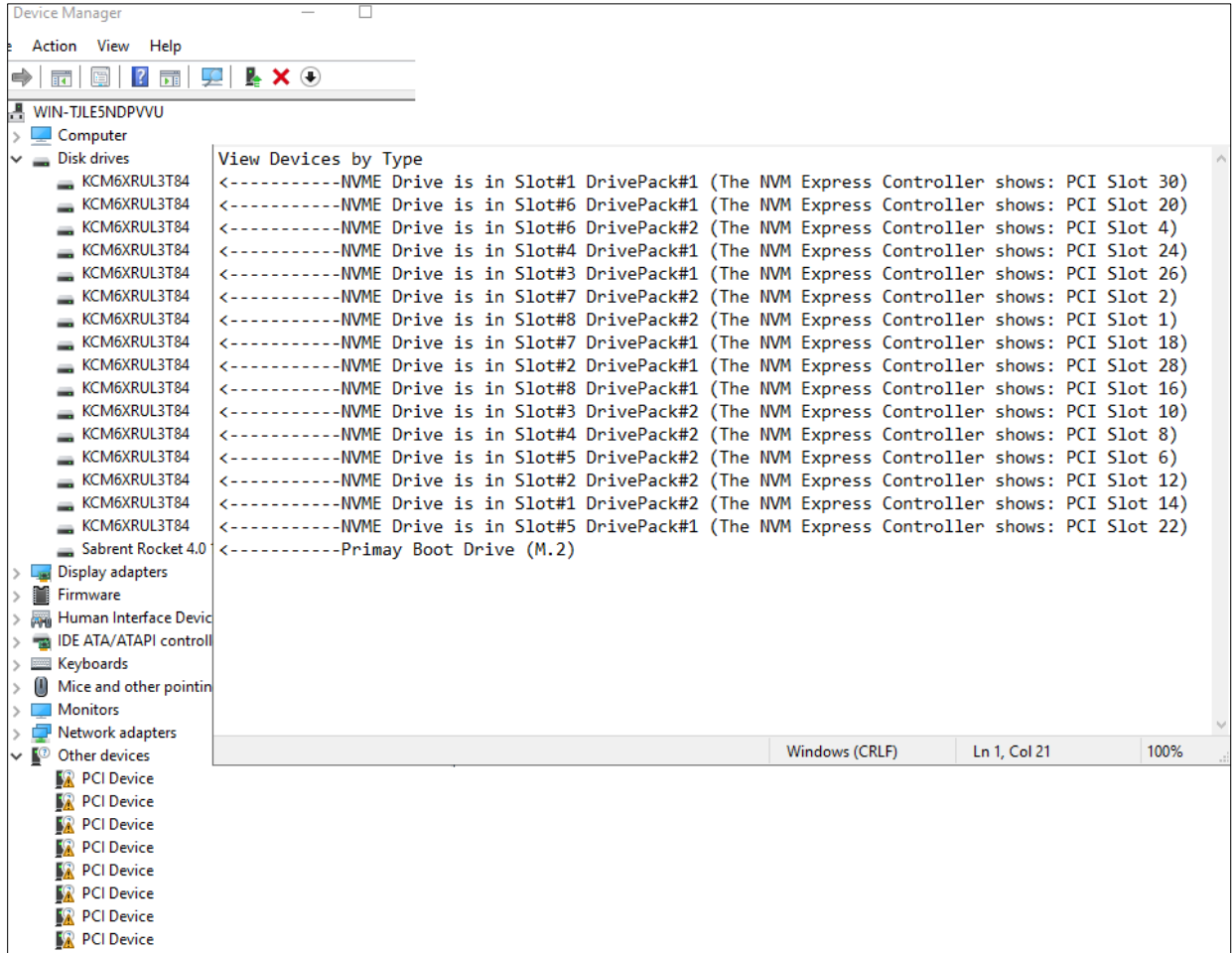
22   Hierarchy of NVME Drives - Linux OS

Photo below, showing the list of 16 NVME drives on LINUX operating system using the command "#nvme list".

```
[root@OSS118 oss]# nvme list
Node              SN                  Model                    Namespace Usage                    Format            FW Rev
----------------  ------------------  -----------------------  --------- -----------------------  ----------------  --------
/dev/nvme0n1      90C0A006TTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#8 Drivepack #2
/dev/nvme10n1     90D0A00ETTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#6 Drivepack #1
/dev/nvme11n1     90D0A00WTTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#5 Drivepack #1
/dev/nvme12n1     90D0A00DTTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#4 Drivepack #1
/dev/nvme13n1     90D0A009TTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#3 Drivepack #1
/dev/nvme14n1     90D0A00PTTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#2 Drivepack #1
/dev/nvme15n1     90D0A00STTVR        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0102    ---------> Slot#1 Drivepack #1
/dev/nvme16n1     112103300040092     T-CREATE TM8FPE001T      1          1.02   TB /   1.02  TB   512   B +  0 B    S1218A3 ---------->>Primary boot drive
/dev/nvme1n1      3130A03GT3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#7 Drivepack #2
/dev/nvme2n1      3130A037T3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#6 Drivepack #2
/dev/nvme3n1      3130A03ST3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#5 Drivepack #2
/dev/nvme4n1      3130A03WT3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#4 Drivepack #2
/dev/nvme5n1      3130A03PT3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#3 Drivepack #2
/dev/nvme6n1      3130A03RT3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#2 Drivepack #2
/dev/nvme7n1      3130A036T3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#1 Drivepack #2
/dev/nvme8n1      3130A03YT3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#8 Drivepack #1
/dev/nvme9n1      3130A034T3A8        KCM6XRUL3T84             1          0.00   B /   3.84  TB    512   B +  0 B    0105    ---------> Slot#7 Drivepack #1
[root@OSS118 oss]#
```

Photo below, showing the list of 8 NVME drives on LINUX operating system using the command "#nvme list".

```
root@OSS118 sbin]# nvme list
Node              SN                  Model                    Namespace Usage                    Format            FW Rev
----------------  ------------------  -----------------------  --------- -----------------------  ----------------  --------
/dev/nvme0n1      90C0A006TTVR        KCM6XRUL3T84             1          61.86  GB /   3.84  TB     4 KiB +  0 B    0102    ------>>>Slot#8 Drivepack #1
/dev/nvme1n1      3130A03GT3A8        KCM6XRUL3T84             1          63.00  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#7 Drivepack #1
/dev/nvme2n1      3130A037T3A8        KCM6XRUL3T84             1          61.92  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#6 Drivepack #1
/dev/nvme3n1      3130A03ST3A8        KCM6XRUL3T84             1          61.92  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#5 Drivepack #1
/dev/nvme4n1      3130A03WT3A8        KCM6XRUL3T84             1          61.92  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#4 Drivepack #1
/dev/nvme5n1      3130A03PT3A8        KCM6XRUL3T84             1          61.92  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#3 Drivepack #1
/dev/nvme6n1      3130A03RT3A8        KCM6XRUL3T84             1          61.92  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#2 Drivepack #1
/dev/nvme7n1      3130A036T3A8        KCM6XRUL3T84             1         489.06  GB /   3.84  TB    512   B +  0 B    0105    ------>>>Slot#1 Drivepack #1
/dev/nvme8n1      112103300040092     T-CREATE TM8FPE001T      1          1.02   TB /   1.02  TB   512   B +  0 B    S1218A3
```

To check the hierarchy of 16 NVME drives (in Drive Pack#1 and #2), use the command #lspci -vvvt | grep 'KIOXIA,'

- Replace the "KIOXIA" with your storage NVME drive vendor name.

- FIG 15: 16 NVME drives enumerated; 8 drives in Drive Pack #1 and 8 drives in Drive Pack #2.

FIG 15

Drives in Drive Pack #2

```
[root@OSS118 oss]# lspci -vvvt | grep 'KIOXIA'
        +-03.4-[c8-da]----00.0-[c9-da]-+-00.0-[ca]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#8 Drivepack #2
        |                              +-01.0-[cb]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#7 Drivepack #2
        |               |              +-02.0-[cc]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#6 Drivepack #2
        |               |              +-03.0-[cd]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#5 Drivepack #2
        |               |              +-04.0-[ce]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#4 Drivepack #2
        |               |              +-05.0-[cf]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#3 Drivepack #2
        |               |              +-06.0-[d0]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#2 Drivepack #2
        |               |              +-07.0-[d1]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#1 Drivepack #2
        |               |              +-08.0-[d2]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#8 Drivepack #1
        |               |              +-09.0-[d3]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#7 Drivepack #1
        |               |              +-0a.0-[d4]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#6 Drivepack #1
        |               |              +-0b.0-[d5]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#5 Drivepack #1
        |               |              +-0c.0-[d6]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#4 Drivepack #1
        |               |              +-0d.0-[d7]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#3 Drivepack #1
        |               |              +-0e.0-[d8]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#2 Drivepack #1
        |               |              +-0f.0-[d9]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------> Slot#1 Drivepack #1
```

Drives in Drive Pack #1

To check the hierarchy of the 8 NVME drives (Drive Pack#1), use the command below.

#lspci -vvvt | grep 'KIOXIA\|Broadcom'.

- Replace the "KIOXIA" with your storage NVME drive vendor name.
- FIG 16: 8 NVME drives enumerated; 8 drives in Drive Pack #1. No drives installed in Drive Pack #2.

FIG 16

```
root@OSS118 sbin]# lspci -vvvt | grep 'KIOXIA\|Broadcom'
        +-03.4-[c8-da]----00.0-[c9-da]--+-00.0-[ca]----00.0  Broadcom / LSI Device 02b2
        |               |               +-01.0-[cb]----00.0  Broadcom / LSI Device 02b2
        |               |               +-02.0-[cc]----00.0  Broadcom / LSI Device 02b2
        |               |               +-03.0-[cd]----00.0  Broadcom / LSI Device 02b2
        |               |               +-04.0-[ce]----00.0  Broadcom / LSI Device 02b2
        |               |               +-05.0-[cf]----00.0  Broadcom / LSI Device 02b2
        |               |               +-06.0-[d0]----00.0  Broadcom / LSI Device 02b2
        |               |               +-07.0-[d1]----00.0  Broadcom / LSI Device 02b2
        |               |               +-08.0-[d2]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#8 Drivepack #1
        |               |               +-09.0-[d3]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#7 Drivepack #1
        |               |               +-0a.0-[d4]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#6 Drivepack #1
        |               |               +-0b.0-[d5]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#5 Drivepack #1
        |               |               +-0c.0-[d6]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#4 Drivepack #1
        |               |               +-0d.0-[d7]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#3 Drivepack #1
        |               |               +-0e.0-[d8]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#2 Drivepack #1
        |               |               +-0f.0-[d9]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6---------->Slot#2 Drivepack #1
        |               |               \-1f.0-[da]----00.0  Broadcom / LSI Device 00b2
[root@OSS118 sbin]#
```

To check the hierarchy of the 8 NVME drives (Drive Pack#2).

#lspci -vvvt | grep 'KIOXIA\|Broadcom'.

- Replace the "KIOXIA" with your storage NVME drive vendor name.
- FIG 17: 8 NVME drives enumerated; 8 drives in Drive Pack #2. No drives installed in Drive Pack #1.

FIG 17

```
The 8 NVME drives are installed in DrivePack #2 of the SDS

root@OSS118 sbin]# lspci -vvvt | grep 'KIOXIA\|Broadcom'
    |              +-03.4-[c8-da]----00.0-[c9-da]--+-00.0-[ca]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6-\-------->>>Slot#8 Drivepack #2
    |              |                               +-01.0-[cb]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#7 Drivepack #2
    |              |                               +-02.0-[cc]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#6 Drivepack #2
    |              |                               +-03.0-[cd]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#5 Drivepack #2
    |              |                               +-04.0-[ce]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#4 Drivepack #2
    |              |                               +-05.0-[cf]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#3 Drivepack #2
    |              |                               +-06.0-[d0]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6--------->>>Slot#2 Drivepack #2
    |              |                               +-07.0-[d1]----00.0  KIOXIA Corporation NVMe SSD Controller Cx6/-------->>>Slot#2 Drivepack #2
    |              |                               +-08.0-[d2]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-09.0-[d3]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0a.0-[d4]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0b.0-[d5]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0c.0-[d6]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0d.0-[d7]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0e.0-[d8]----00.0  Broadcom / LSI Device 02b2
    |              |                               +-0f.0-[d9]----00.0  Broadcom / LSI Device 02b2
    |              |                               \-1f.0-[da]----00.0  Broadcom / LSI Device 00b2
[root@OSS118 sbin]#
```

To check on NVME drives and their assigned BUS numbers, use command below.

#lspci | grep KIOXIA

FIG 18: The characters shown on the left are the assigned bus numbers.

```
[root@OSS118 oss]# lspci | grep KIOXIA
 ca:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#8 Drivepack #2
 cb:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#7 Drivepack #2
 cc:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#6 Drivepack #2
 cd:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#5 Drivepack #2
 ce:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#4 Drivepack #2
 cf:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#3 Drivepack #2
 d0:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#2 Drivepack #2
 d1:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#1 Drivepack #2
 d2:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#8 Drivepack #1
 d3:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#7 Drivepack #1
 d4:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#6 Drivepack #1
 d5:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#5 Drivepack #1
 d6:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#4 Drivepack #1
 d7:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#3 Drivepack #1
 d8:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#2 Drivepack #1
 d9:00.0 Non-Volatile memory controller: KIOXIA Corporation NVMe SSD Controller Cx6 (rev 01)----------> Slot#1 Drivepack #1
```

Bus Number assignment (will vary from OS to OS, or when using different computers)

23   Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting One Stop Systems Technical Support, please be sure to include the following information:

1) Name	7) Serial Number
2) Company Name	8) Computer Make
3) Phone Number	9) Computer Model
4) Fax Number	10) Operating System and Version
5) Email Address	11) Make/Model of PCI cards in expansion chassis
6) Model Number	12) Detailed description of the problem

You can also visit our web site at: https://www.onestopsystems.com/support-0

To submit a support ticket or case, use our OSS Online Support portal: https://onestopsystems.desk.com/customer/portal/emails/new

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem. For example: Do not say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

24   Returning Merchandise to One Stop Systems

If factory service is required, you must contact OSS Service Representative to obtain a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. **One Stop Systems will return any product that is not accompanied by an RMA number**. Please note that One Stop Systems WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

RMA # _____
One Stop Systems
2235 Enterprise Street, Suite#110
Escondido, CA 92029
USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your One Stop Systems product. However, if you return a product to One Stop Systems for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. One Stop Systems cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for the PCIe expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to ensuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

2241   Shipping / transporting the card

Use appropriate packaging materials

IMPORTANT

PCIe cards should be removed (or not to be installed) prior to shipping to avoid or prevent possible damage, failure to do so, will void the warranty of the unit.

25   APPENDIX A   Compliance

FCC

NOTE: This equipment has been evaluated 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 not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the service personnel will be required to correct the interference at his own expense.

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, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the service personnel's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to evaluate the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numériqué de la classe A est conformé

à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. One Stop

Systems will not retest or recertify systems or components that have been reconfigured by customers

2235 Enterprise Street, Suite#110, Escondido CA 92029

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