SUPERMICRO®

SuperServer®
9029GP-TNVRT
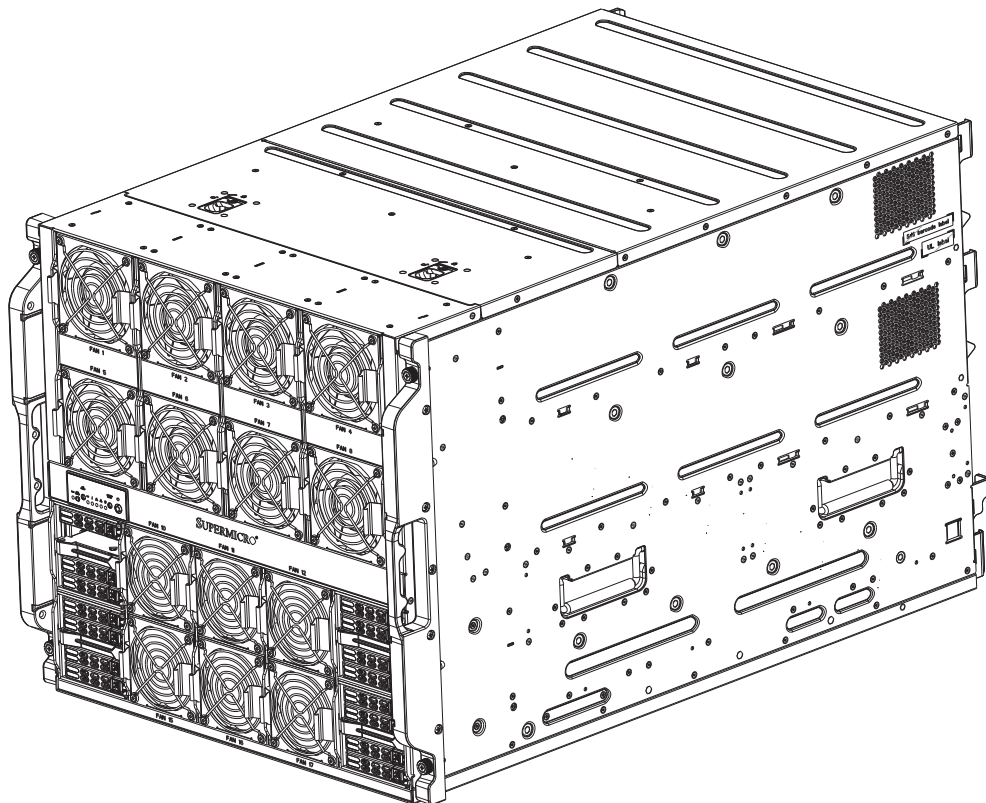
USER'S MANUAL

Revision 1.0a

Preface

About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the server. Installation and maintenance should be performed by experienced technicians only.

Please refer to the 9029GP-TNVRT server specifications page on our website for updates on supported memory, processors and operating systems (http://www.supermicro.com).

Notes

For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your server.

* Supermicro product manuals: http://www.supermicro.com/support/manuals/

* Product drivers and utilities: https://www.supermicro.com/wftp

* Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm

If you have any questions, please contact our support team at:
support@supermicro.com

This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.

Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wftp/utility/Lot9_Secure_Data_Deletion_Utility/

Warnings

Special attention should be given to the following symbols used in this manual.

Warning! Indicates important information given to prevent equipment/property damage or personal injury.

Warning! Indicates high voltage may be encountered when performing a procedure.

Contents

Chapter 4 Motherboard Connections

Chapter 5 Software

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Chapter 1

Introduction

1.1 Overview

This chapter provides a brief outline of the functions and features of the 9029GP-TNVRT SuperServer. The system is 10U, supporting 16 NVIDIA Tesla V100 GPUs. Sixteen GPUs are distributed evenly between two compute nodes (trays) and work as a single unified 2-petaFLOP system. It is useful in artificial intelligence, research, scientific laboratories and universities.

In addition to the motherboard, X11DPG-HGX2, and chassis, SC1018G-R12K, several major parts included with the system are listed below.

Main Parts List		
Description	**Part Number**	**Quantity**
Power supply modules	PWS-3K01G-1R	6
Switchboards	X11DPG-HGX2-SW	2
Midplane, including storage drive backplane	BPN-GPU-1018G	1
Storage drive bridge, head node	AOM-SBL-SAS3	1
NVLink bridges	AOM-HGX2-NVL-P	6 pairs
Riser cards, switches	RSC-G-66-HGX2	8
Riser card, PCIe expansion cards	RSC-G-A66	1
Fans	FAN-0196L4	8
	FAN-0197L4	6
Heatsinks	SNK-P0071VS or SNKP0067PS	2
Twenty amp power cords	CBL-0223L	6
Rack rail mounting kit	MCP-290-41803-0N	1

1.2 Unpacking the System

Inspect the box in which the server was shipped, and note if it was damaged. If any equipment appears damaged, file a claim with the carrier.

The server should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated. A grounded AC power outlet is required. Read the precautions and considerations noted in Appendix B.

Caution: The assembled system may weigh over 400 lbs. When moving it, remove the GPU trays to reduce weight, and use a lift and multiple people.

Note: The GPU trays are packaged separately.

1.3 System Features

The following table provides an overview of the main features of the system.

System Features
Motherboard
X11DPG-HGX2
Chassis
SC1018G-R12K
CPU
Two Intel Xeon Scalable processors, supporting Intel UltraPath Interconnect (UPI) of up to 10.4 GT/s; **Note**: The Intel Xeon Processor Scalable Family includes Platinum 8100 processors, Gold 6100/5100 processors, Silver 4100 processors, and Bronze 3100 processors. For the latest CPU/memory updates, refer to our website at http://www.supermicro.com/products/motherboard/Xeon/C620/X11DPG-HGX2.cfm.
Socket Type
Socket P0-LGA3647
Memory
Supports up to 3 TB of DDR4 3DS ECC RDIMM, LRDIMM, in 24 DIMM slots; up to 2666MHz
Chipset
Intel C621
Expansion Slots
Sixteen NVIDIA V100 GPUs, plus two PCIe x16 slots from CPU node, and sixteen PCIe x16 slots from the two switch nodes.
Storage Drives
Sixteen NVMe 2.5" hot-swap drive bays (front), and six SATA 2.5" hot-swap drive bays (rear) Two M.2 solid-state storage cards (internal)
Power
Six (5+1) 3000 W power supply modules, 80Plus Titanium level
Cooling
Eight 9-cm fans, six 8-cm fans, temperature-controlled by IPMI Two CPU heatsinks One air shroud to optimize air flow
Input/Output
LAN: Two 10 Gb network ports, one dedicated port for IPMI USB: Two USB 3.0 ports One VGA port
Dimensions
(WxHxD) 17.8 x 17.2 x 27.8 in (437 x 442 x 705 mm)

1.4   Server Chassis Features

Control Panel

Power switches and status indicators are located on the control panel.
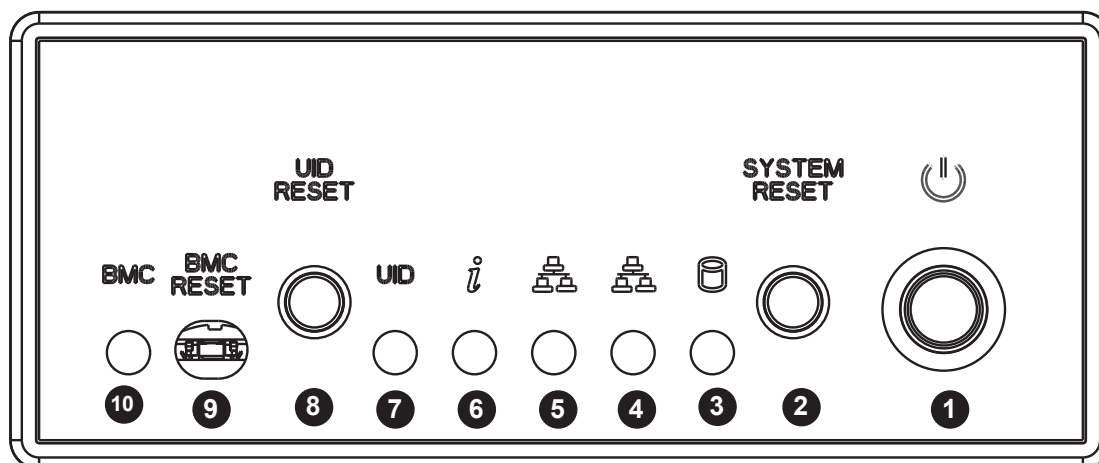
Figure 1-1. Control Panel View

Control Panel Features		
Item	**Feature**	**Description**
1	Power Button	Dual color LED power switch: yellow indicates standby, green shows the server has operational power
2	Reset Button	Reboots the system
3	HDD LED	Indicates activity on a storage drive when flashing
4	NIC2 LED	Indicates network activity on LAN port 2 when flashing
5	NIC1 LED	Indicates network activity on LAN port 1 when flashing
6	Information LED	See table below for details
7	Unit ID LED	Solid blue indicates UID has been activated locally. Blinking blue indicates UID has been activated using IPMI to locate the server in a rack environment.
8	UID Reset Button	Turns off the UID indicators
9	BMC Reset Button	Resets the BMC
10	BMC Heartbeat	Blinking at 1 Hz indicates BMC is on

Information LED	
Status	**Description**
Continuously on and red	An overheat condition has occurred. (This might be caused by cable congestion.)
Blinking red (1Hz)	Fan failure; check for an inoperative fan.
Blinking red (0.25Hz)	Power module failure

Front Features

The SC1018G-R12K is a 10U chassis.
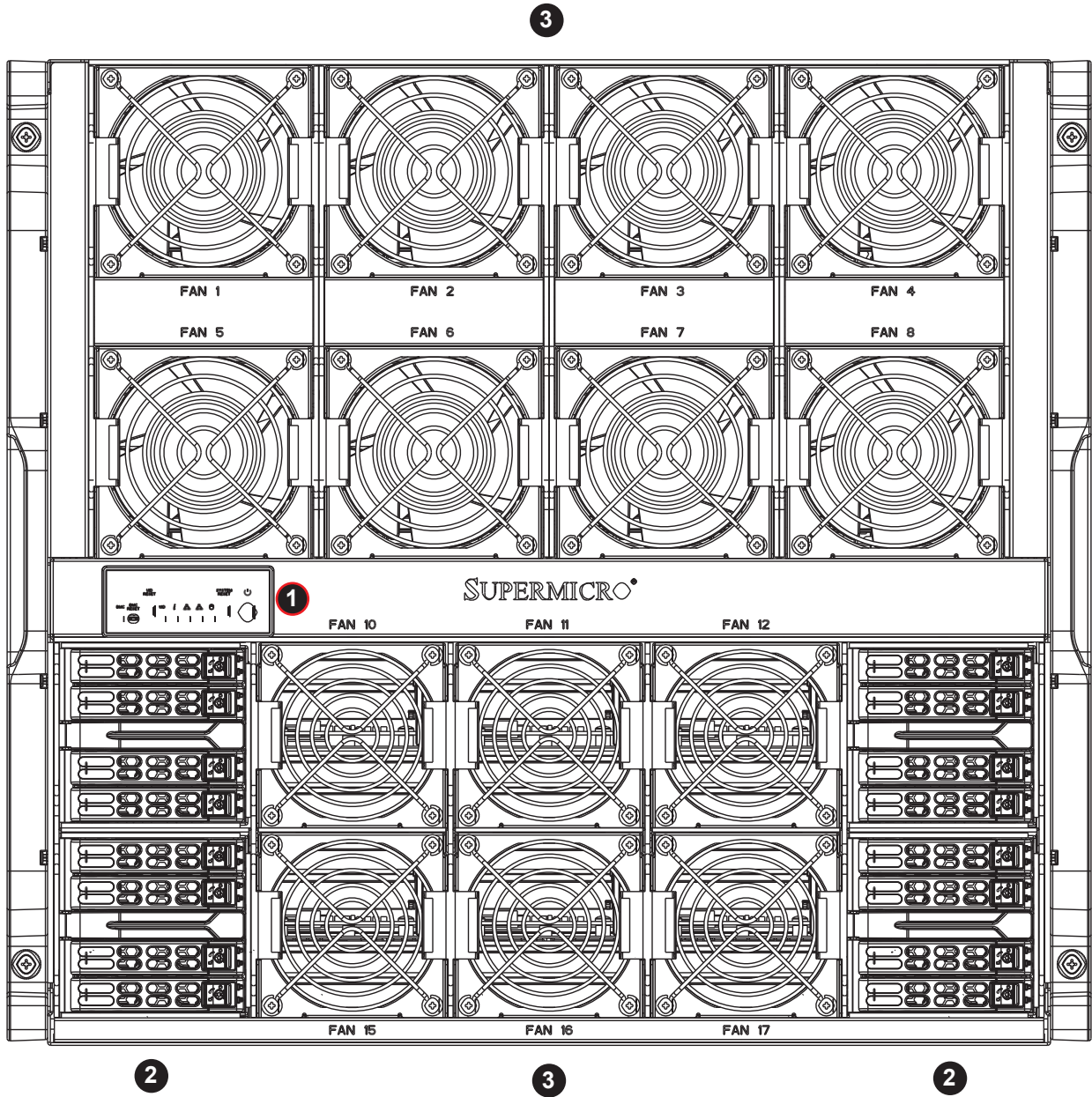
Figure 1-2. Chassis Front View

Front Chassis Features		
Item	**Feature**	**Description**
1	Control Panel	See previous page for details.
2	Drive Bays	Sixteen NVMe hot-swap 2.5" storage drive carriers; each has status indicators (see Section 3.4)
3	Fans	Eight 9-cm fans and six 8-cm fans

Rear Features
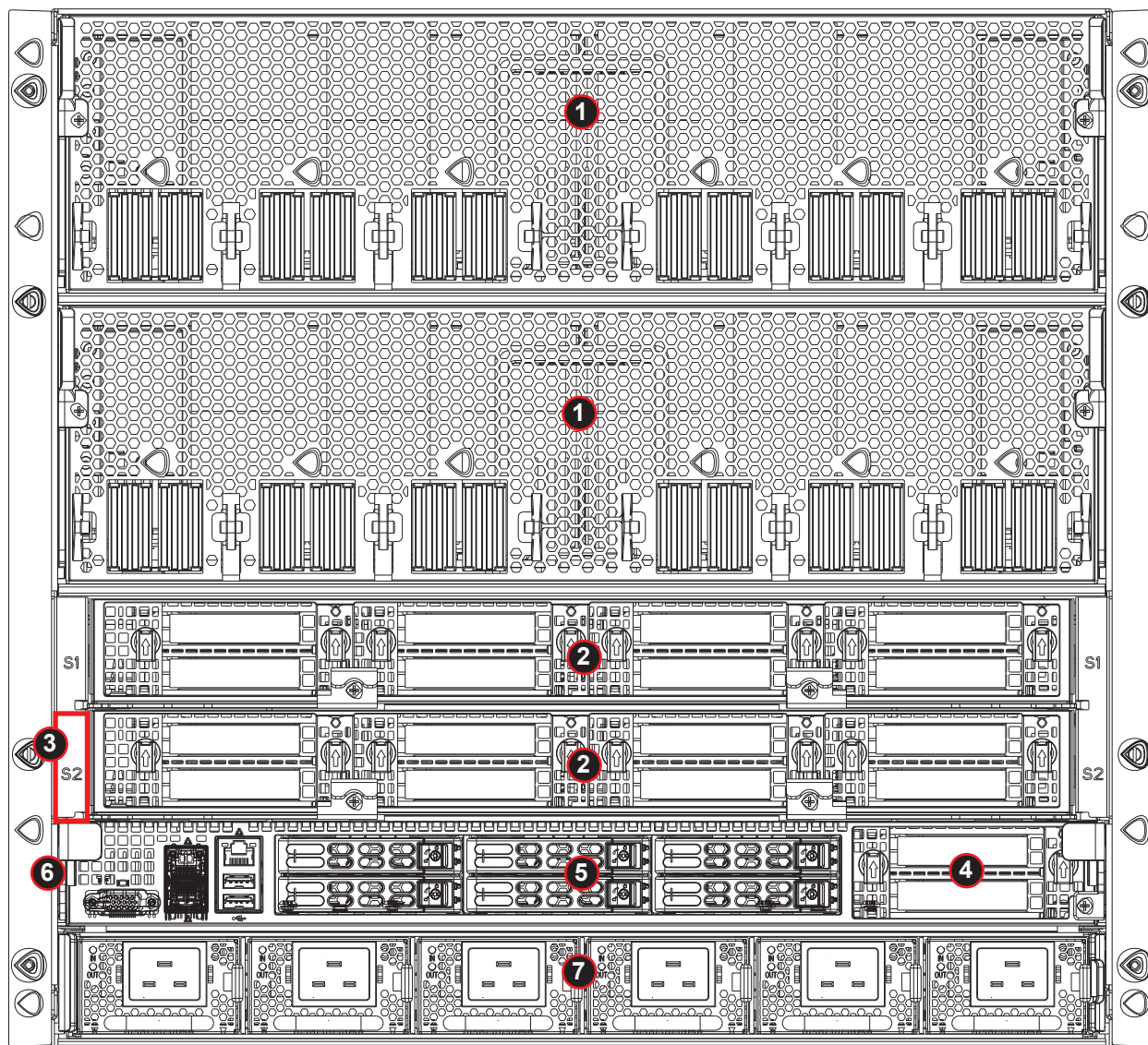
Figure 1-3. Chassis Rear View

Rear Chassis Features		
Item	**Feature**	**Description**
1	GPU Trays	Each tray holds up to eight GPUs
2	Switch Trays	Each tray hold up to eight Network Interface Cards
3	BMC Sticker	Sticker shows the BMC default password (see Section 5.4)
4	Expansion Slots	Two slots for external cards
5	Storage Drives	Six SATA hot-swap 2.5" drives
6	Input/Output Ports	Rear I/O ports (see below and Chapter 4 for details).
7	Power Tray	Six modules
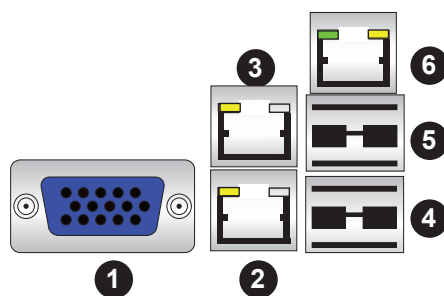
Figure 1-4. Rear I/O Ports

Input/Output Ports			
No.	**Description**	**No.**	**Description**
1.	VGA	4.	USB 1 (USB 3.0)
2.	LAN1	5.	USB 2 (USB 3.0)
3.	LAN2 (shared)	6.	IPMI LAN

Six NVLink Bridge
Assemblies
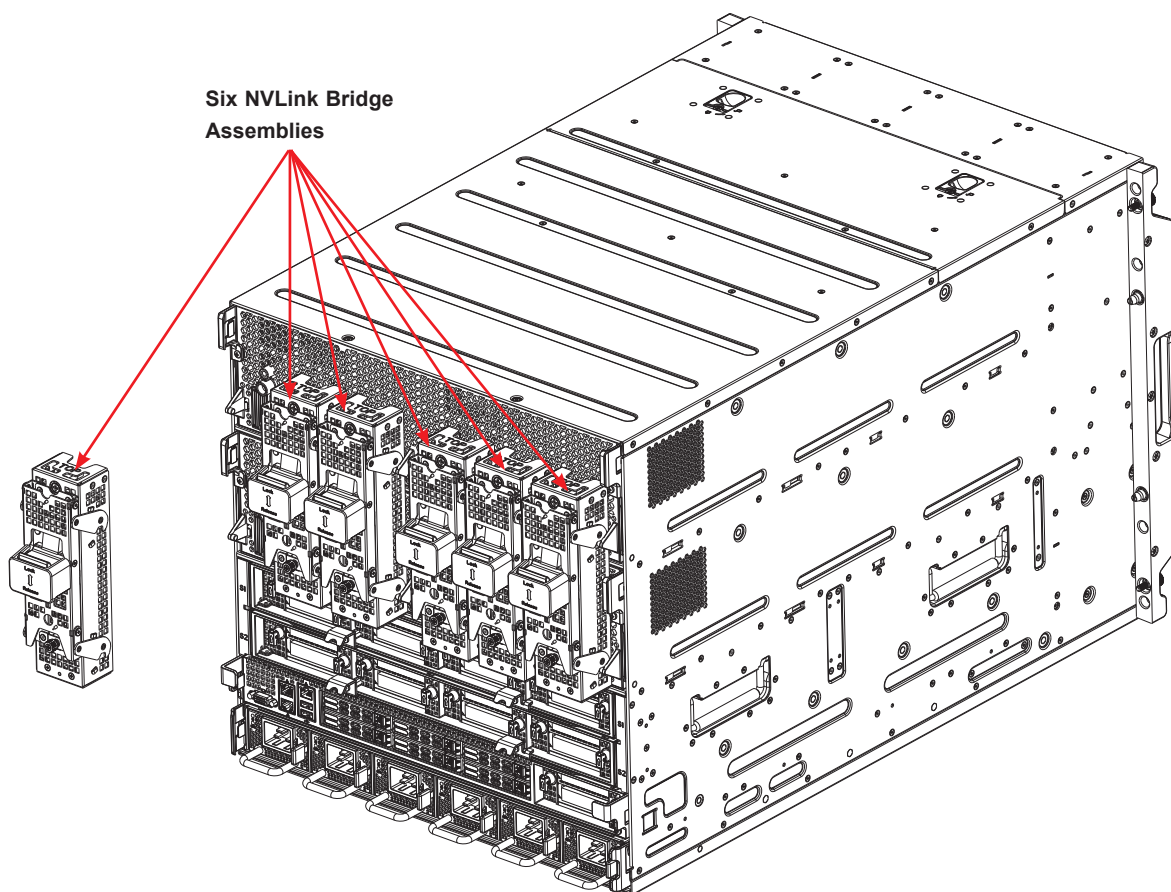
Figure 1-5. Chassis Rear View Showing NVLink Bridge Assemblies

NVLink bridge assemblies connect one GPU tray to the other. These must be installed to set up the system (see instructions in Chapter 3).

Chassis Trays
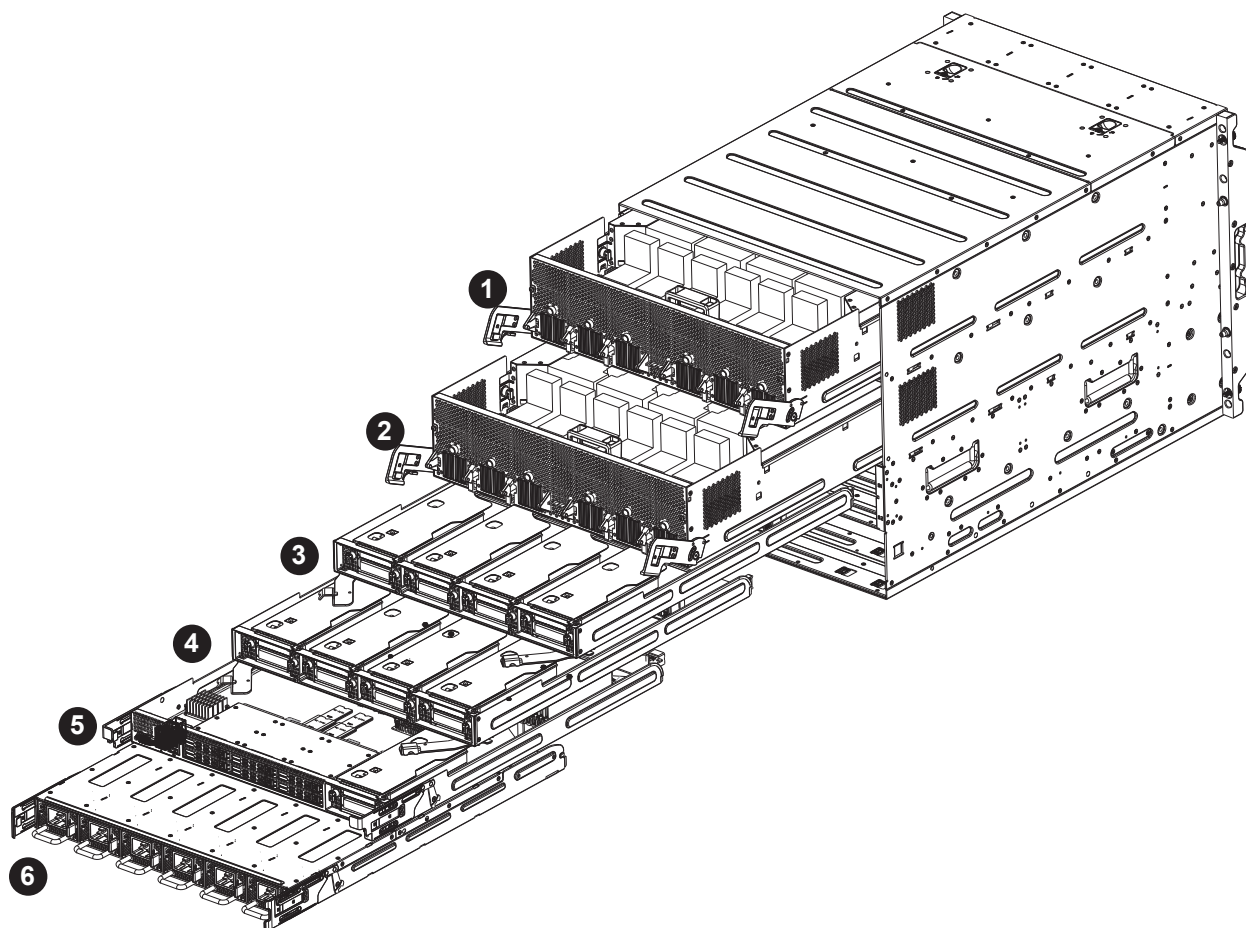
Figure 1-5. Chassis Trays

Rear Chassis Trays	
Item	**Feature**
1, 2	GPU Trays
3, 4	Switch Trays
5	Head Node Tray
6	Power Tray

1.5 Motherboard Layout

Below is a layout of the X11DPG-HGX2 with jumper, connector and LED locations shown. See the following page for descriptions. For detailed descriptions, pinout information and jumper settings, refer to Chapter 4.
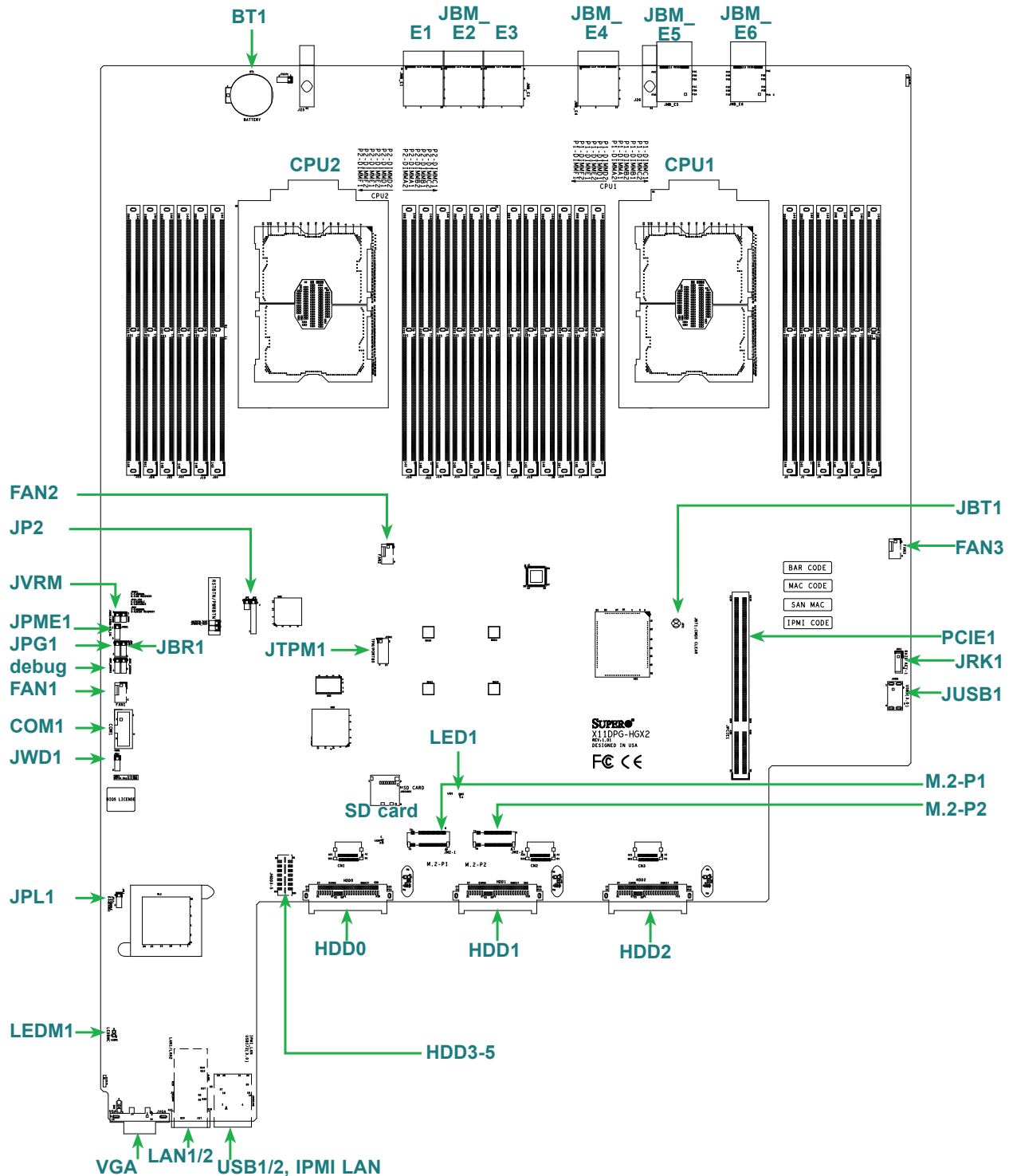
Figure 1-6. Motherboard Layout

Quick Reference Table

Jumper	Description	Default Setting
JBR1	Not supported (was BIOS Recovery)	n/a
JBT1	CMOS Clear	Open (Normal)
JPL1	LAN port enable	Pins 1-2 (Enabled)
JPME1	Manufacturing Mode Select	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JVRM1/2	VRM I²C (2-pins)	Closed
JWD1	Watch Dog Enable	Pins 1-2 (Reset)

Connector	Description
BT1	Onboard CMOS battery
COM1	COM port
debug	Debug connector, manufacturer use only, JBMC_DEBUG1/2
FAN1-FAN3	System/CPU fan headers (FAN 1 – FAN 3)
HDD0 – HDD2	Drive connectors; connectors for HDD3–5 are on a bridge card
HDD3–5	Header for backplane supporting HDD 3, 4, 5
IPMI_LAN	Dedicated IPMI LAN port
JMB_E1 – E4	PCIe connector
JMB_E5, E6	Power connector
JP2	CPLD programing, manufacturer use only
JRK1	Onboard RAID Key header
JTPM1	Trusted Platform Module/Port 80 connector
JUSB1	Header for USB 3.0
LAN1/2	Two network ports
M.2-P1, M.2-P2	Sockets for M.2 SSDs
PCIE1	PCIe x16 connector
USB1/2	Two USB ports
VGA	Video connector

LED	Description	Status
LED1	M.2 Activity	On shows activity
LEDM1	BMC Heartbeat LED	Blinking green: BMC normal

1.6 Other Boards and Bridges

The system also includes:

- Switch boards (X11DPG-HGX2-SW)—Provide direct communication between the GPUs and NICs without passing though the CPUs. **Note**: The two switch boards must always be present for the GPUs and NICs to be detected.

- Midplane—Provides connections between the system trays and for the NVMe drives.

- NVLink bridges—Provide direct communication between the two GPU trays.

- Storage drive bridge—Provides hot-swap capability for three SATA drives on the head node.
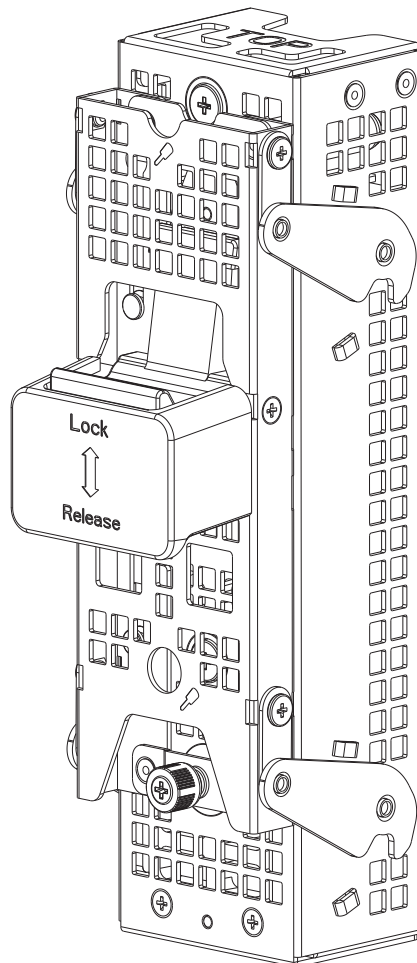
Figure 1-7. NVLink Bridge Assembly

1.7 System Block Diagram
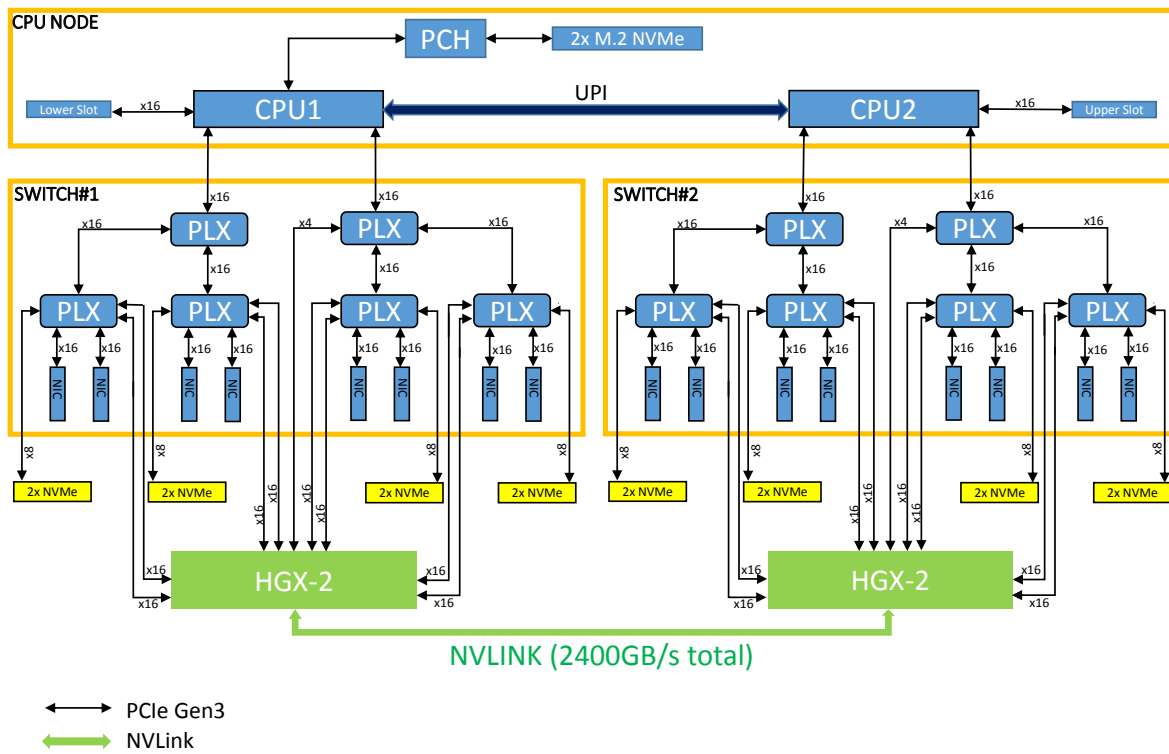
Figure 1-7. System Block Diagram

Chapter 2

Rack Installation

This chapter provides advice and instructions for mounting your system in a rack.

Caution: Equipment installalation should be conducted by service or trained person.

2.1 Preparing for Setup

The box in which the system was shipped should include the hardware needed to install it into the rack. Please note the precautions in this chapter and Appendix B

Choosing a Setup Location

- The system should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. It will also require a grounded AC power outlet nearby.

- Leave enough clearance in front of the rack so that you can open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow sufficient space for airflow and access when servicing.

- This product should be installed only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).

- This product is not suitable for use with visual display workplace devices according to §2 of the German Ordinance for Work with Visual Display Units.

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are extended to the floor so that the full weight of the rack rests on them.

- In single rack installations, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.

- Always make sure the rack is stable before extending a server or other component from the rack.

- Extend only one server or component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- **Caution**: The assembled system may weigh over 400 lbs. When moving it, remove the GPU trays to reduce weight, and use a lift and multiple people.

- Review the electrical and general safety precautions in Chapter 3.

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components at the bottom of the rack first and then work your way up.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges and voltage spikes and to keep your system operating in case of a power failure.

- Allow any drives and power supply modules to cool before touching them.

- When not servicing, always keep the front door of the rack and all covers/panels on the servers closed to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the room's ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

- Slide rail mounted equipment is not to be used as a shelf or a work space.

- Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

2.2 Installing the Rails

There are a variety of rack units on the market, which may require a slightly different assembly procedure. Also refer to the installation instructions that came with the rack.

This rail set fits a rack between 28" and 33.5" deep. Do not use a two post "telco" type rack.

1. Identify the left rail set and right rail set, as they are different.

2. Position the template at the front of the system to determine the locations of the screws for the rails.
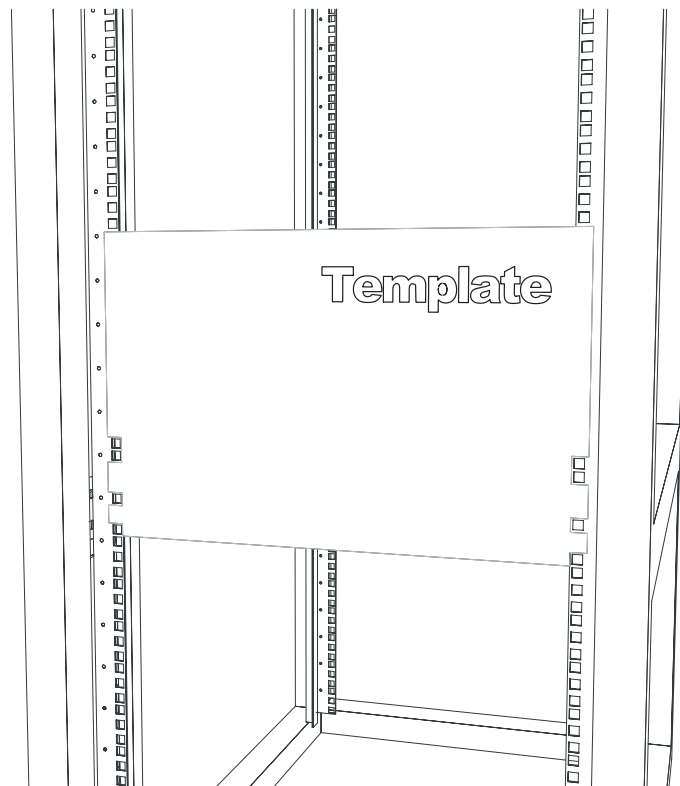
Figure 2-1. Placing the Template

3. In each rail set, the two sections are screwed together to keep them immobile during shipping. Release these screws just enough to allow the rail sections to slide apart. Note the arrow on the rail, which indicates the end that attaches to the front of the rack.

4. Slide the rails sections apart to match the depth of the rack. Position the rails with the template and secure the front of each to the front of the rack with two flathead screws, then secure the back of each rail to the rear of the rack with two flathead screws (see Figure 2-2).

5. Tighten the screws that keep the two rail sections from sliding.
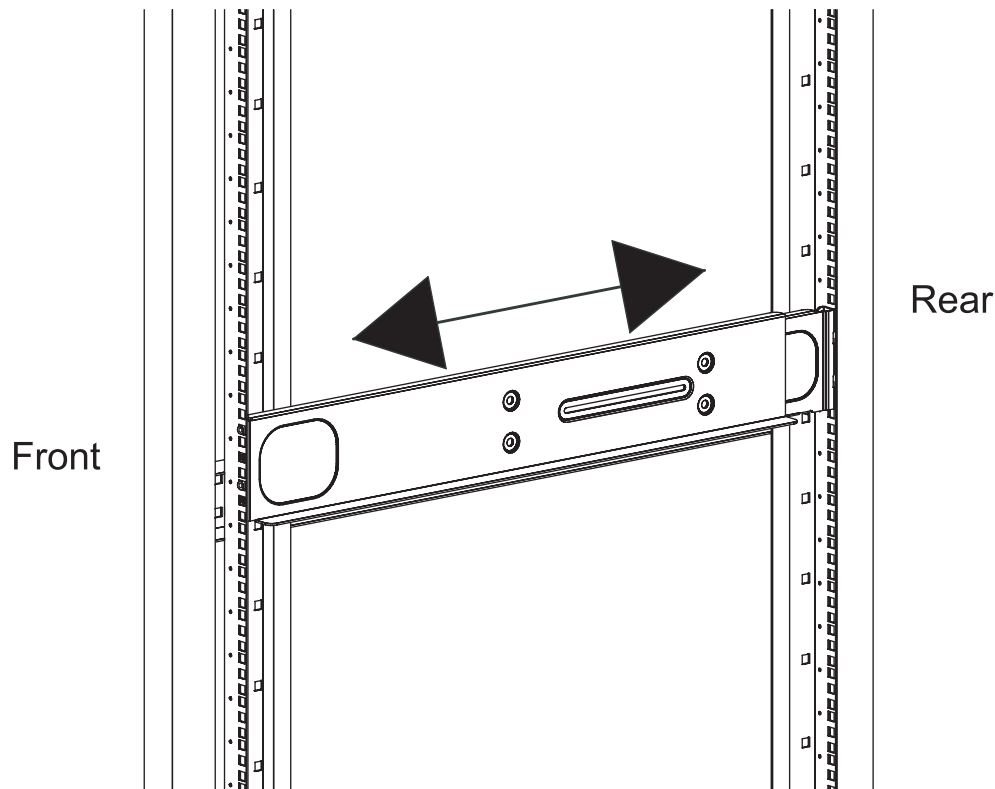
Figure 2-2. Installing the Left Rail

2.3 Installing the Server

Caution: The assembled system may weigh over 400 lbs. Use a lift and multiple people to move it.

1. If you want to install the optional chassis handles, use screws including a thumbscrew through the bottom hole of each handle. **Note:** These handles need only be installed when mounting the system into a short rack. When mounting into a deep rack, they are unnecessary and regular screws should be used instead of thumbscrews.

2. Using a lift and as many people as necessary, lift the system and slide it onto the installed rails.

3. After pushing the enclosure all the way into the rack, use the thumbscrew on each side of the server to lock it into place.
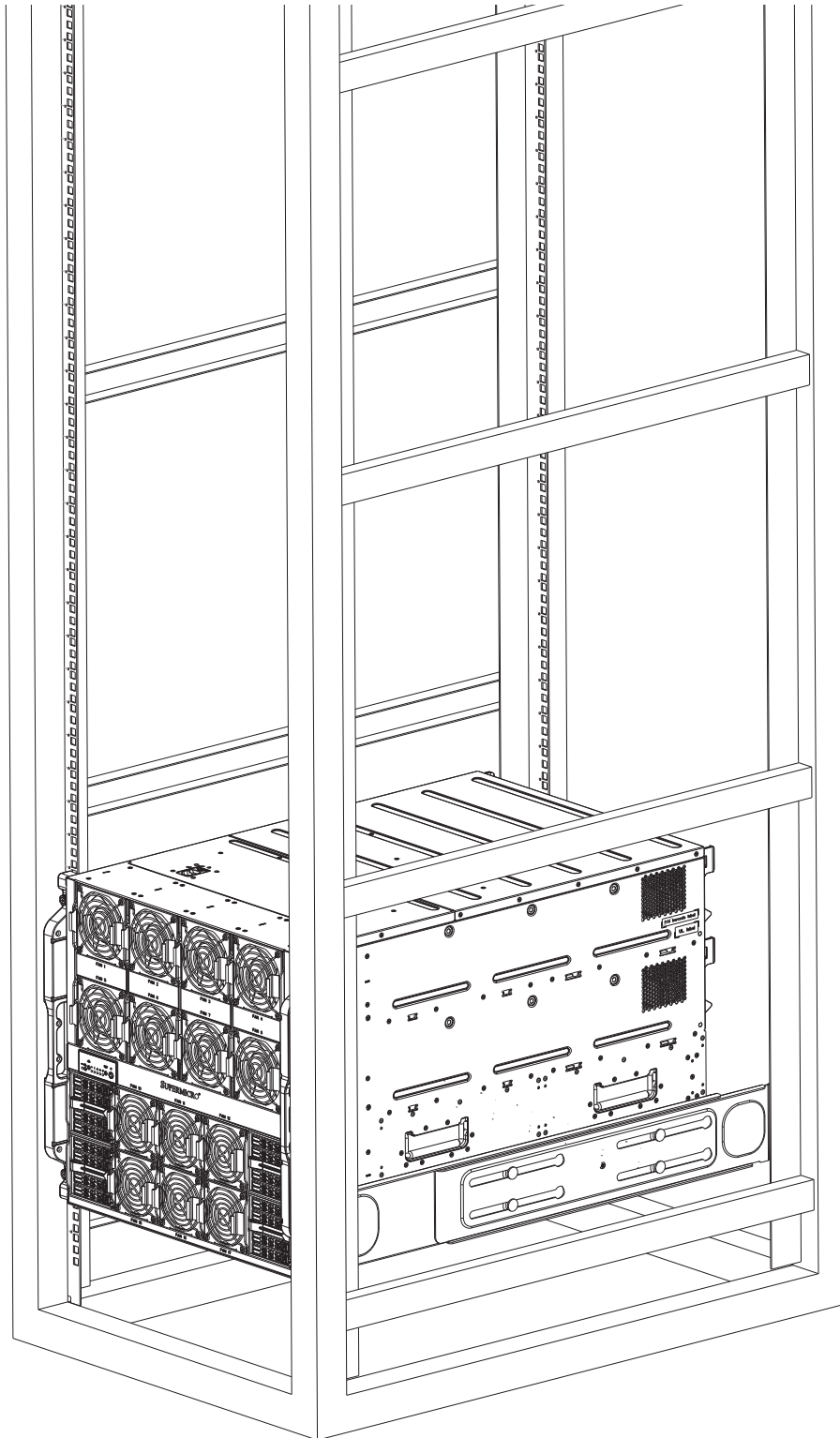
Figure 2-3. Installing the Server onto the Rails

Chapter 3

Component Installation and Maintenance

This chapter provides instructions on installing and replacing main system components. To prevent compatibility issues, only use components that match the specifications and part numbers given.

Remove power from the system before installing or replacing components.

3.1 Removing Power

Use the following procedure to verify that power has been removed from the system. This step is required when removing or installing non hot-swap components or when replacing a non-redundant power supply.

1. Use the operating system to power down the system.

2. After the system has fully shut down, disconnect the AC power cords from the power strip or outlet.

3. Disconnect the power cords from the power supply modules.

3.2 Accessing the System

The system is comprised of six trays. Each tray can be removed from the chassis using release levers. Before removing the trays, power down, as described in Section 3.1.
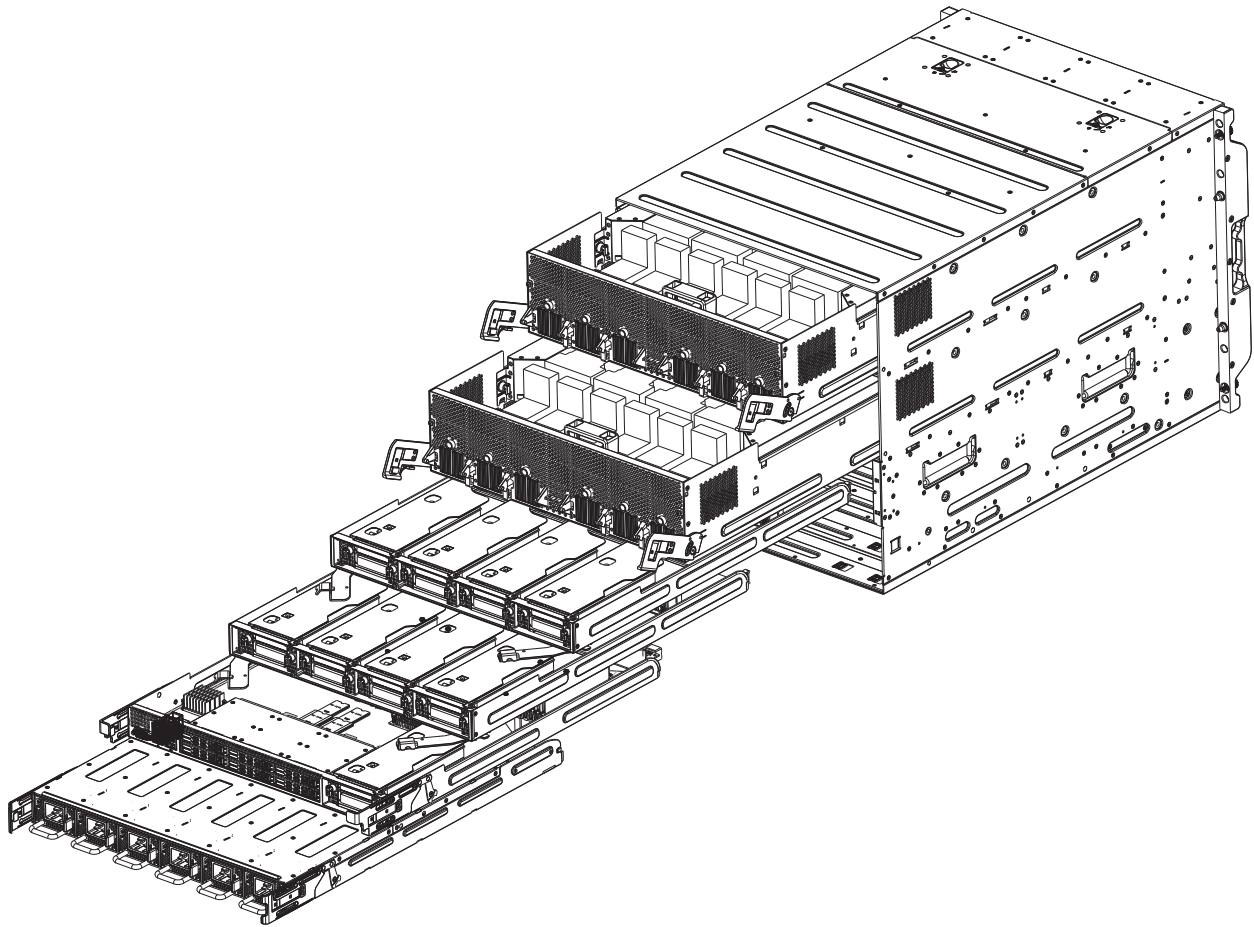
Figure 3-1. Chassis Rear with Trays Out
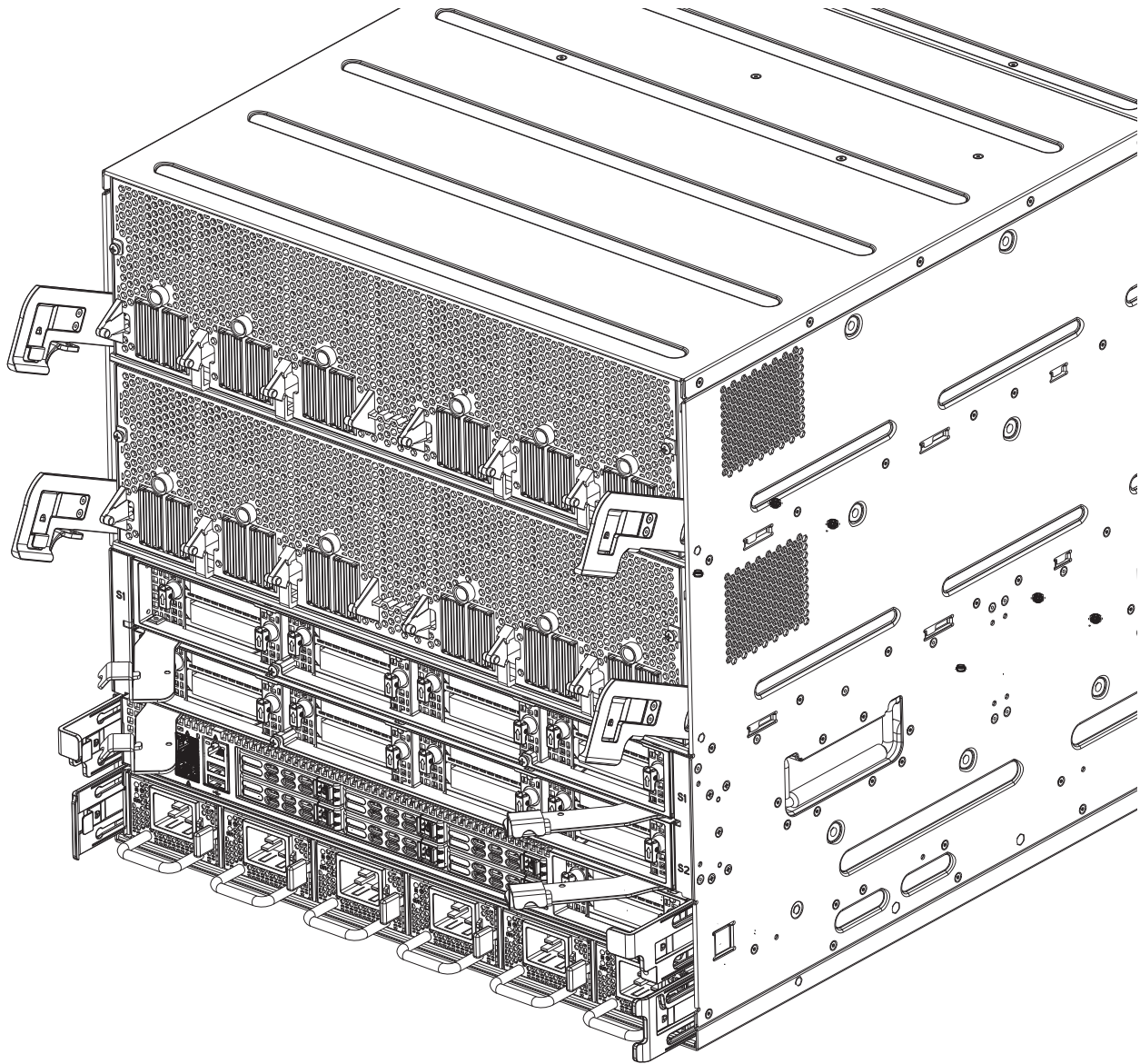
Figure 3-2. Tray Levers Released

Removing a GPU Tray

1. Remove the NVLink bridge assemblies, as described in this chapter, Section 3.4.

2. On the release levers, remove the locking screws, one each side

3. Press the release lever latches outward and pull the levers.

4. Use the levers to pull out the tray.

Note: When re-inserting the tray, be sure the levers are in the fully open positions.
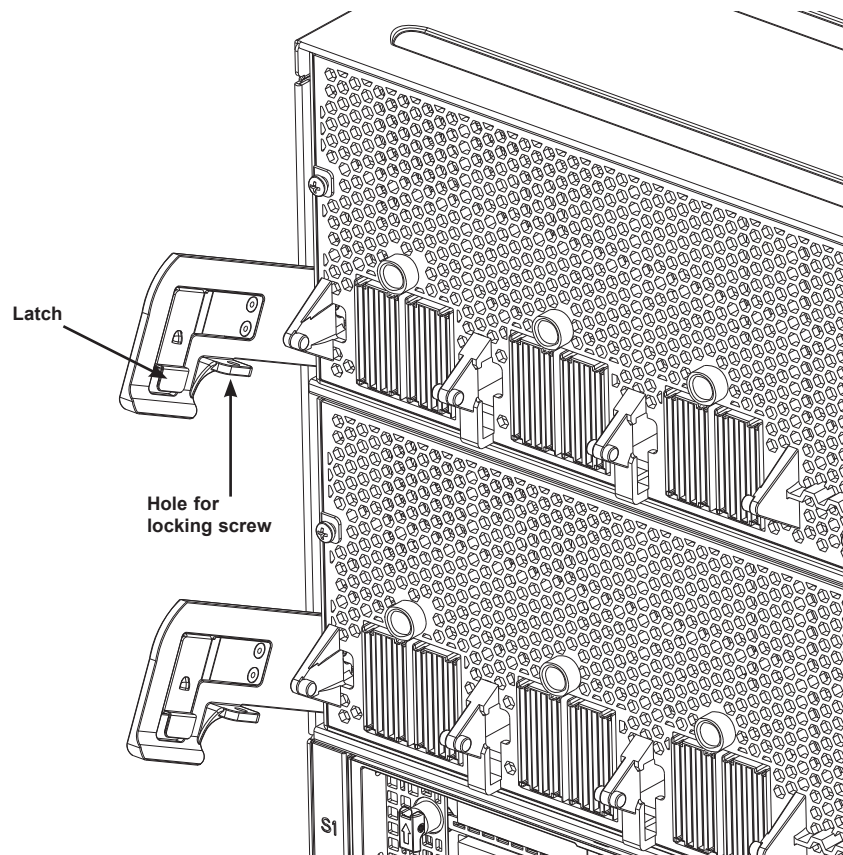
Figure 3-3. Releasing a GPU Tray

Removing a Switch Tray

1. On the release levers, remove the locking screws, one each side

2. Use the tab on the edge of the lever to rotate the lever out.

3. Use the levers to pull out the tray.

Note: When re-inserting the tray, be sure the levers are in the fully open positions.
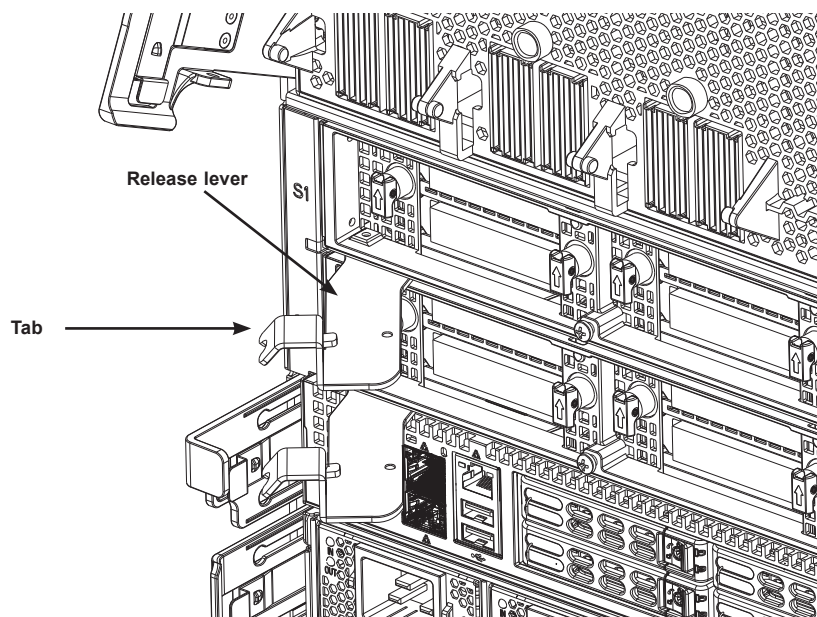
Figure 3-4. Releasing a Switch Tray

Removing the Head Node (motherboard) Tray

• On the release lever on the right side, press the outward and pull out the tray.

Note: When re-inserting the tray, be sure the levers are in the fully open positions.
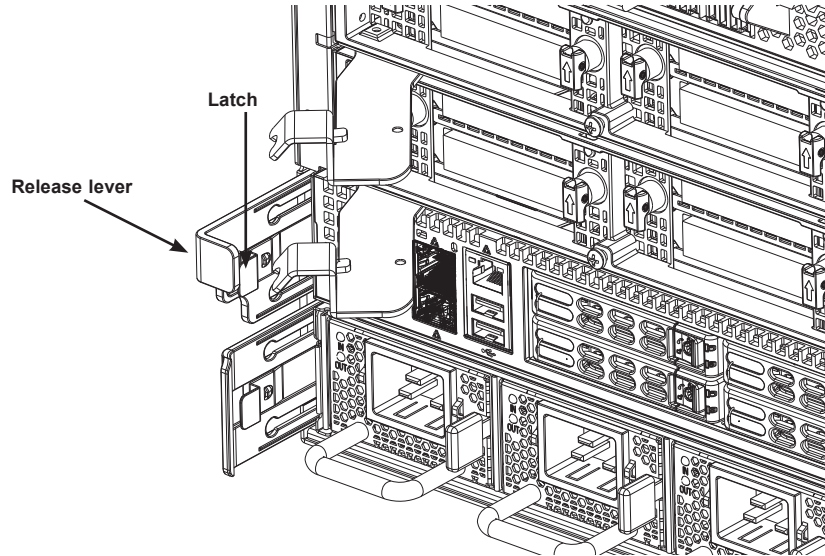
Figure 3-5. Releasing the Motherboard Tray

Removing the Power Supply Tray

1. On the each side of the chassis, remove the two locking screws.

2. Press the release lever latches outward and pull the levers.
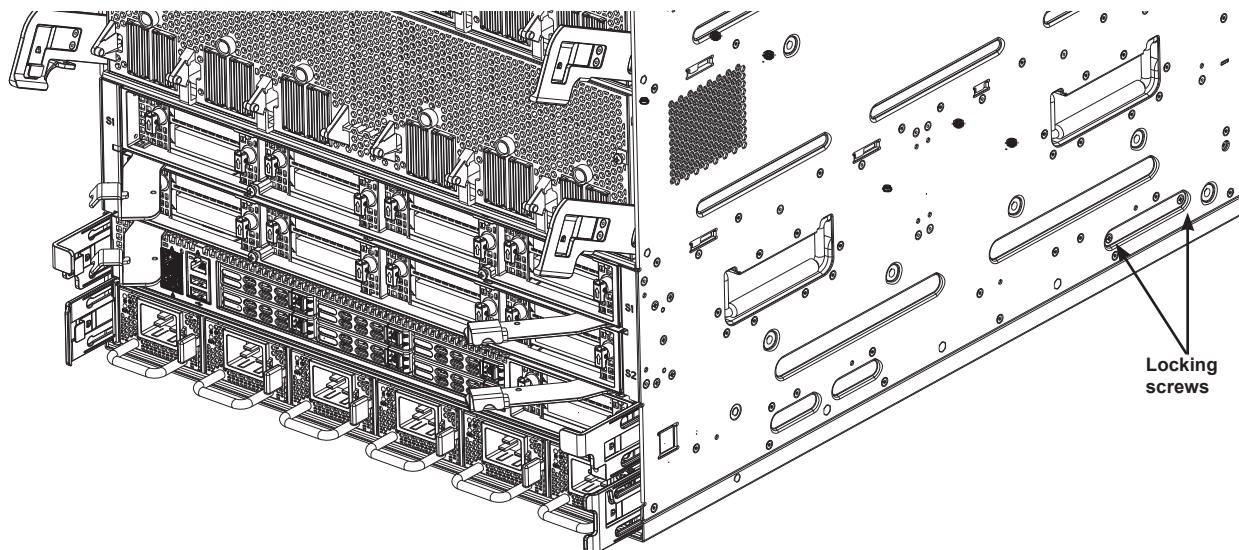
Locking screws

Figure 3-6. Locking Screws for the Power Supply Tray

3. Use the levers to pull out the tray.

Note: When re-inserting the tray, be sure the levers are in the fully open positions.

Release lever

Latch
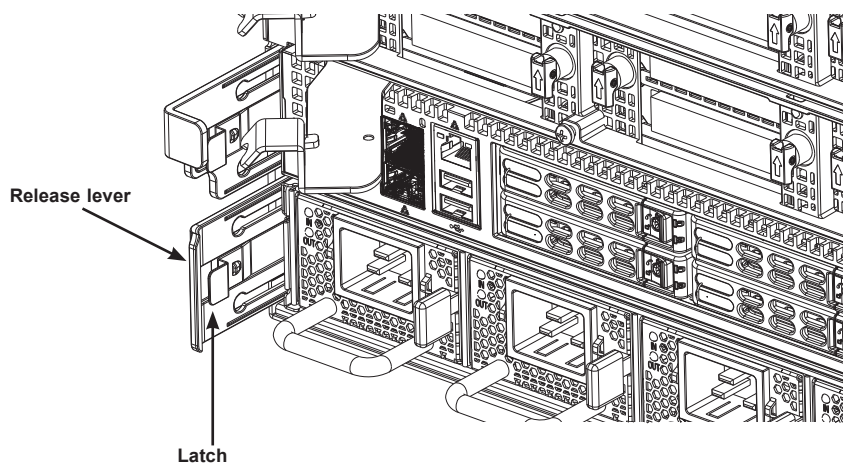
Figure 3-7. Releasing the Power Supply Tray

Removing the Chassis Top Section

One section of the chassis top can be removed. This is useful when removing the midplane.

1. On the each side of the chassis, remove the locking screws.

2. Pull up on the two release levers and lift off the top section.
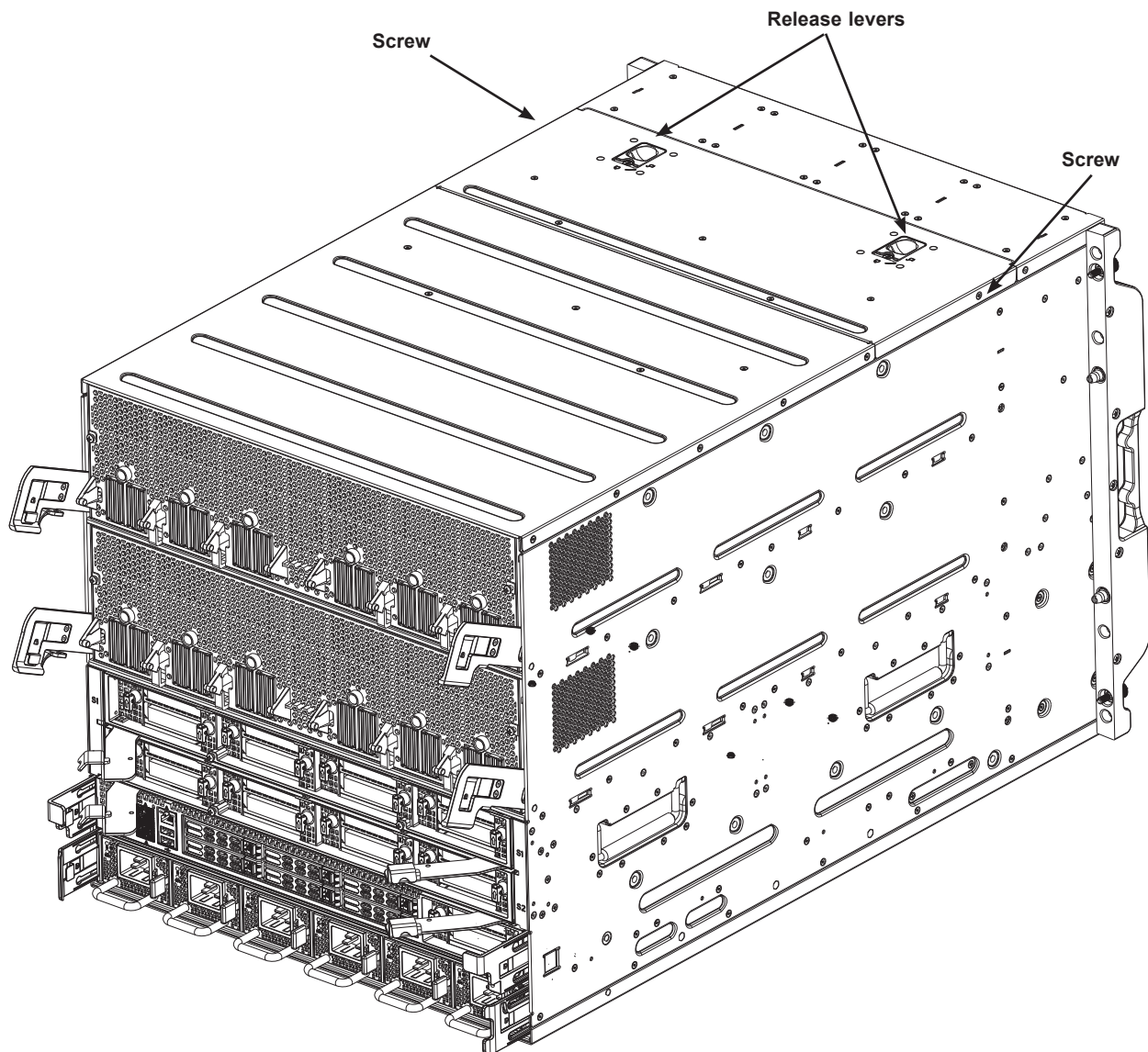
Figure 3-8. Removing the Chassis Top

3.3 Motherboard Components

Processor and Heatsink Installation

The processor (CPU) and processor carrier should be assembled together first to form the processor carrier assembly. This will be attached to the heatsink to form the processor heatsink module (PHM) before being installed onto the CPU socket.

Notes:

• Use ESD protection.

• Unplug the AC power cord from all power supplies after shutting down the system.

• Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.

• When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or CPU socket, which may require manufacturer repairs.

• Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.

• Refer to the Supermicro website for updates on processor support.

• All graphics in this manual are for illustration only. Your components may look different.

The Processor Carrier Assembly

The assembly is the processor and a plastic carrier.
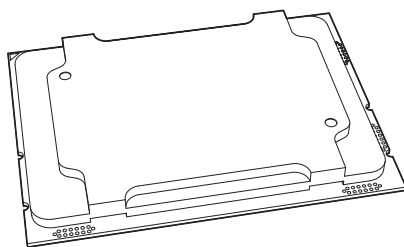
Processor
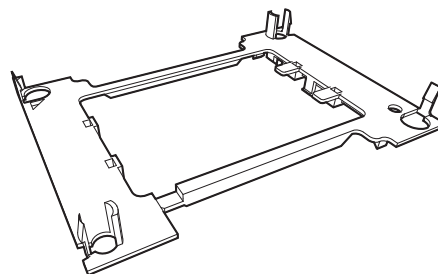
Processor Carrier

Overview of the Processor Heatsink Module

The Processor Heatsink Module (PHM) contains a heatsink, a processor carrier assembly.

Heatsink with Thermal Grease
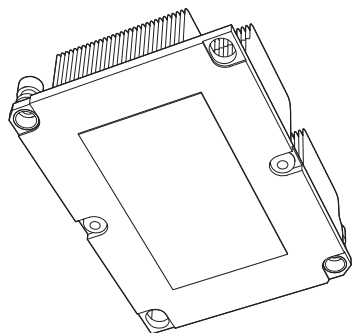
Processor Carrier
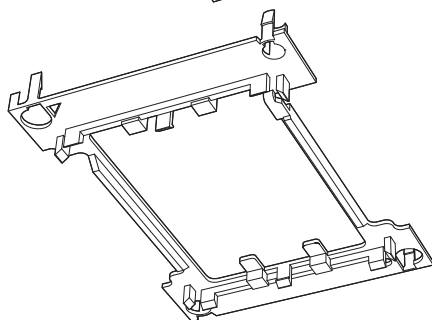
Processor
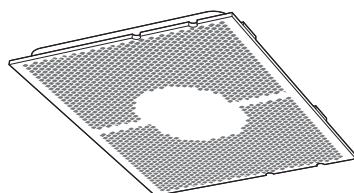
Processor Heatsink Module
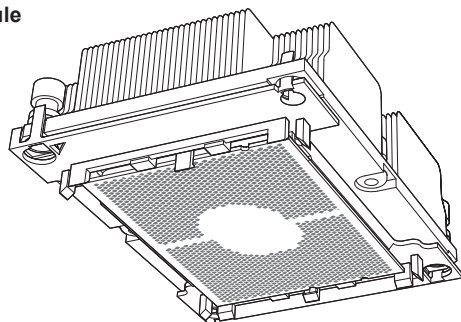
Bottom View

Creating the Processor Carrier Assembly

To install a processor into the processor carrier, follow the steps below:

1. Hold the processor with the LGA lands (gold contacts) facing up. Locate the small, gold triangle in the corner of the processor and the corresponding hollowed triangle on the processor carrier. These triangles indicate pin 1. See the images below.

2. Using the triangles as a guide, carefully align and place Point A of the processor into Point A of the carrier. Then gently flex the other side of the carrier for the processor to fit into Point B.

3. Examine all corners to ensure that the processor is firmly attached to the carrier.
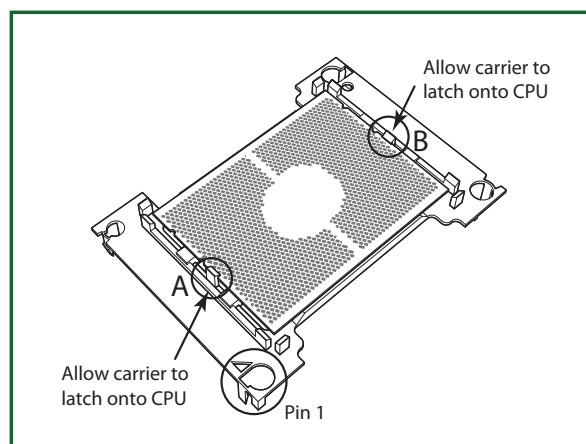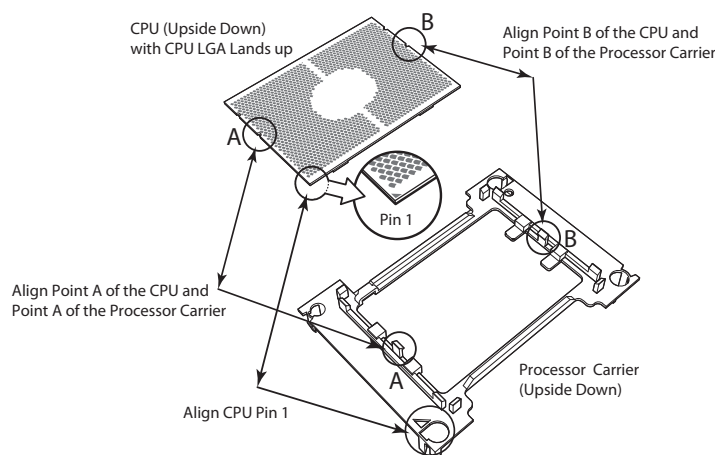
Processor Carrier Assembly

Assembling the Processor Heatsink Module

After creating the processor carrier assembly, mount it onto the heatsink to create the processor heatsink module (PHM):

1. Note the label on top of the heatsink, which marks the heatsink mounting holes as 1, 2, 3, and 4. If this is a new heatsink, the thermal grease has been pre-applied on the underside. Otherwise, apply the proper amount of thermal grease.

2. Turn the heatsink over with the thermal grease facing up. Hold the processor carrier assembly so the processor's gold contacts are facing up, then align the triangle on the assembly with hole 1 of the heatsink. Press the processor carrier assembly down. The plastic clips of the assembly will lock outside of holes 1 and 2, while the remaining clips will snap into their corresponding holes.

3. Examine all corners to ensure that the plastic clips on the processor carrier assembly are firmly attached to the heatsink.
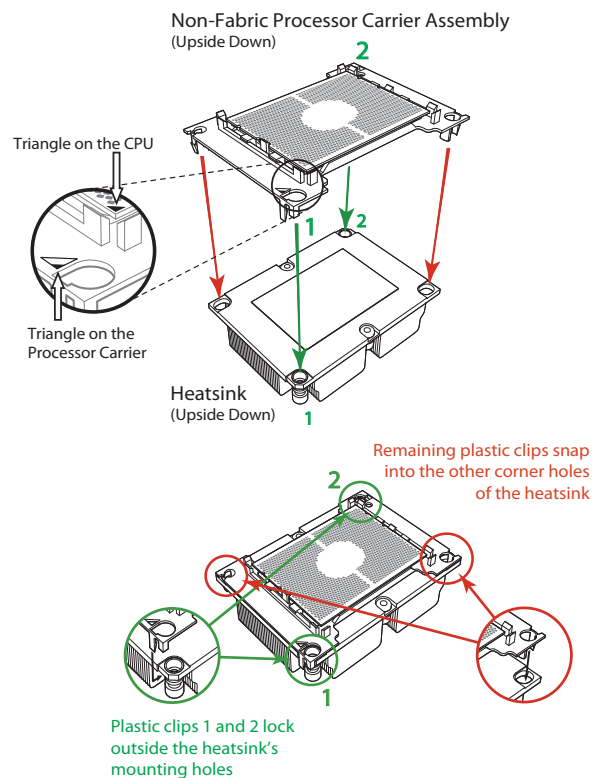
Preparing the CPU Socket for Installation

This motherboard comes with a plastic protective cover on the CPU socket. Remove it carefully to install the Processor Heatsink Module (PHM).
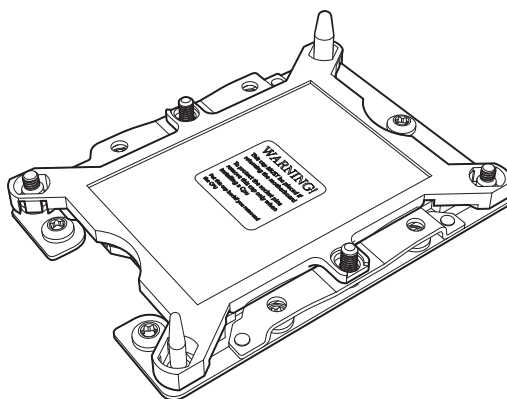
CPU Socket with Plastic Protective Cover

Remove the plastic protective cover from the CPU socket. Do not touch or bend the socket pins.

Socket Pins
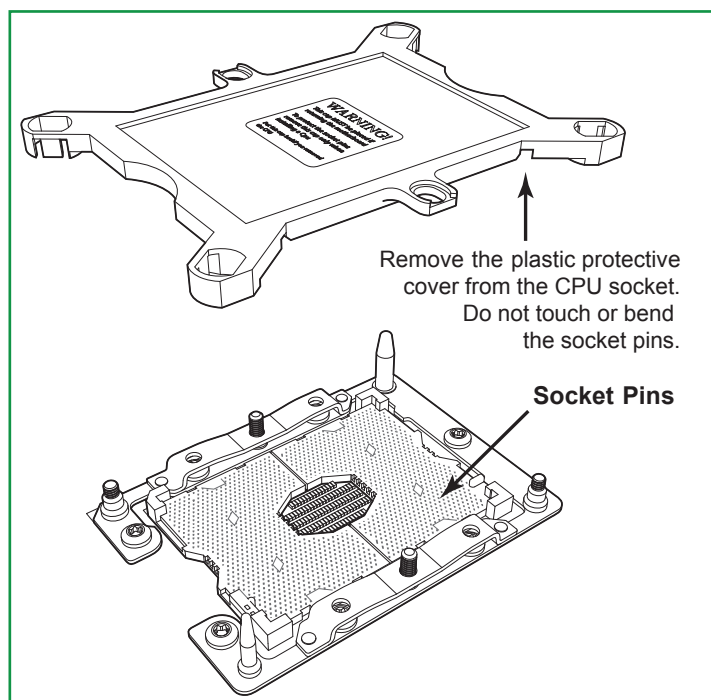
Installing the Processor Heatsink Module

After assembling the Processor Heatsink Module (PHM), install it onto the CPU socket:

1. Align hole 1 of the heatsink with the printed triangle on the CPU socket. See the left image below.

2. Make sure all four holes of the heatsink are aligned with the socket before gently placing the heatsink on top.

3. With a T30 Torx-bit screwdriver, gradually tighten screws #1 – #4 to assure even pressure. The order of the screws is shown on the label on top of the heatsink. To avoid damaging the processor or socket, do not use a force greater than 12 lbf-in when tightening the screws.

4. Examine all corners to ensure that the PHM is firmly attached to the socket.

Oval C

Oval D   **Large Guide Post**

Small Guide Post

Printed Triangle

Mounting the Processor Heatsink Module
onto the CPU socket (on the motherboard)

Use a torque of 12 lbf-in

T30 Torx Screwdriver

#4

#1   #2

#3

Tighten the screws in
the sequence of 1, 2, 3, 4
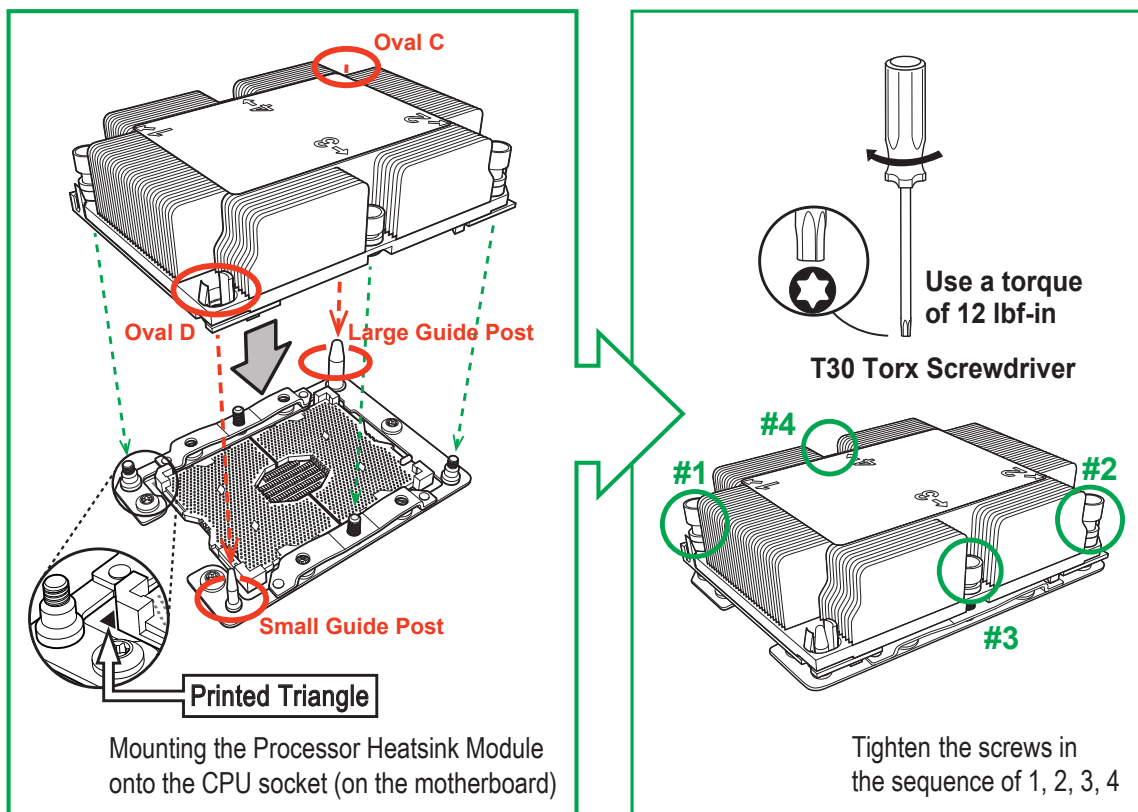
If at any time the PHM must be removed, power off, then loosen the screws in the sequence of #4, #3, #2, and #1.

Memory

Memory Support

The X11DPG-HGX2 motherboard offers 24 slots that support up to 3 TB of DDR4 3DS LRDIMM/LRDIMM/RDIMM ECC 2666 MHz modules. Check the Supermicro website for possible updates to memory support.

DDR4 Memory Support for the Intel Xeon Scalable processor						
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)		
				One Slot per Channel	Two Slots per Channel	
		DRAM Density		One DIMM per Channel	One DIMM per Channel	Two DIMMs per Channel
		4 Gb	8 Gb	1.2 Volts	1.2 Volts	1.2 Volts
RDIMM	DRx4	16 GB	32 GB	2666	2666	2666
RDIMM 3Ds	QRX4	N/A	2H-64GB			
	8RX4	N/A	4H-128GB			
LRDIMM	QRx4	32 GB	64 GB			
LRDIMM 3Ds	QRx4	N/A	2H-64GB			
	8Rx4	N/A	4H-128 GB			

Memory Population Guidelines

- All DIMMs must be DDR4.

- Balance memory. Using unbalanced memory topology, such as populating two DIMMs in one channel while populating one DIMM in another channel, reduces performance. It is not recommended for Supermicro systems.

- In dual-CPU configurations, memory must be installed in the slots associated with the installed CPUs.

Guidelines Regarding Mixing DIMMs

- Populating slots with a pair of DIMM modules of the same type and size results in interleaved memory, which improves memory performance.

- Use memory modules of the same type and speed, as mixing is not allowed.

- x4 and x8 DIMMs can be mixed in the same channel.

- Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets.

- Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.

DIMM Construction

- RDIMM (*non-3DS*) Raw Cards: A/B (2Rx4), C (1Rx4), D (1Rx8), E (2Rx8)

- 3DS RDIMM Raw Cards: A/B (4Rx4)

- LRDIMM (*non-3DS*) Raw Cards: D/E (4Rx4)

- 3DS LRDIMM Raw Cards: A/B (8Rx4)

Memory Population Sequence

Blue slots versus black slots: Install the first DIMM in the blue memory slot, which is the first of a memory channel. Then, if using two DIMMs per channel, install the second DIMM in the black slot.

The following memory population sequence table was created based on guidelines provided by Intel to support Supermicro motherboards. The diagram is for illustrative purposes; your motherboard may look different.

Memory Population for the X11 DP Motherboard, 24 DIMM Slots	
CPUs/DIMMs	**Memory Population Sequence**
1 CPU & 1 DIMM	CPU1: P1-DIMMA1
1 CPU & 2 DIMMs	CPU1: P1-DIMMA1/P1-DIMMD1
1 CPU & 3 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1
1 CPU & 4 DIMMs	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
1 CPU & 5 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
1 CPU & 6 DIMM	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1
1 CPU & 7 DIMMs*	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD1/P1-DIMME1/ P1-DIMMF1
1 CPU & 8 DIMMs	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME2/P1-DIMME1
1 CPU & 9 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD1/P1-DIMME1/P1-DIMMF1
1 CPU & 10 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1
1 CPU & 11 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1
1 CPU & 12 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1
2 CPUs & 2 DIMMs	CPU1: P1-DIMMA1 CPU2: P2-DIMMA1
2 CPUs & 4 DIMMs	CPU1: P1-DIMMA1/P1-DIMMD1 CPU2: P2-DIMMA1/P2-DIMMD1
2 CPUs & 6 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1
2 CPUs & 8 DIMMs	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
2 CPUs & 10 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
2 CPUs & 12 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1
2 CPUs & 14 DIMMs	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME2/P1-DIMME1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1
2 CPUs & 16 DIMMs	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1 /P1-DIMME2/P1-DIMME1 CPU2: P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/P2-DIMMD2/P2-DIMMD1 /P2-DIMME2/P2-DIMME1
2 CPUs & 18 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1
2 CPUs & 20 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1 CPU2: P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/P2-DIMMD2/P2-DIMMD1/ P2-DIMME2/P2-DIMME1
2 CPUs & 22 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMC2/P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/ P2-DIMMD2/P2-DIMMD1/P2-DIMME2/P2-DIMME1/P2-DIMMF1
2 CPUs & 24 DIMMs	CPU1: all slots CPU2: all slots

*Unbalanced, not recommended.

Note: The diagram below shows DIMM module population for each CPU installed on the motherboard. Install the processors starting with CPU Socket 1.
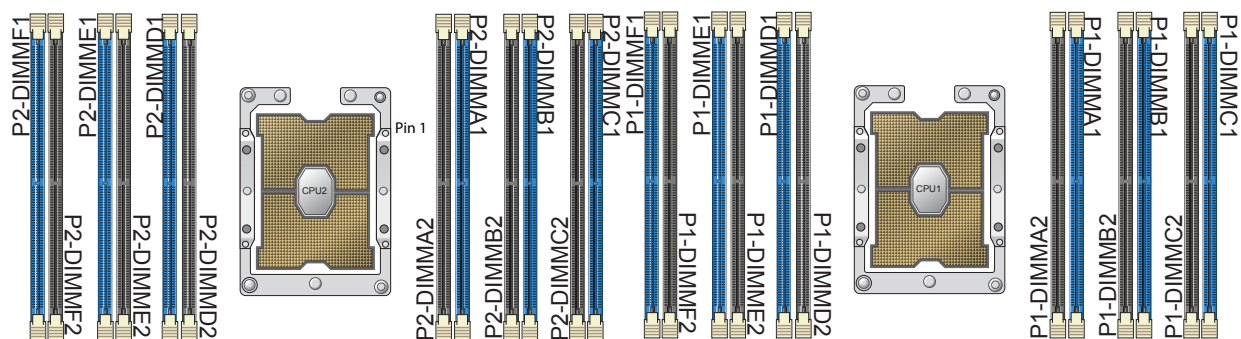
Figure 3-9. DIMM Slots

Installing Memory

ESD Precautions

Electrostatic Discharge (ESD) can damage electronic components including memory modules. To avoid damaging DIMM modules, it is important to handle them carefully. The following measures are generally sufficient.

• Use a grounded wrist strap designed to prevent static discharge.

• Handle the memory module by its edges only.

• Put the memory modules into the antistatic bags when not in use.

Installing Memory

Begin by removing power from the system as described in Section 3.1. Follow the memory population sequence in the preceding table.

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
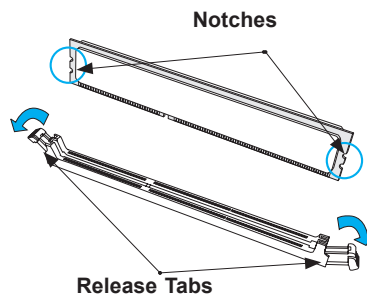
2. Align the key of the DIMM with the receptive point on the memory slot and with your thumbs on both ends of the module, press it straight down into the slot until the module snaps into place.
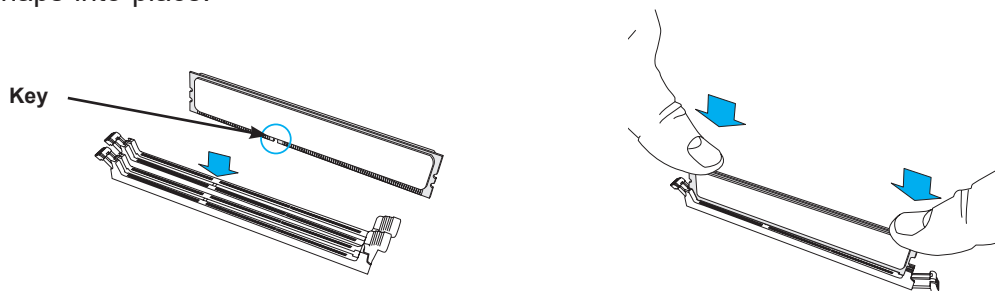
3. Press the release tabs to the locked position to secure the DIMM module into the slot.

Caution: Exercise extreme caution when installing or removing memory modules to prevent damage to the DIMMs or slots.

Removing Memory

To remove a DIMM, unlock the release tabs then pull the DIMM from the memory slot.

Motherboard Battery

The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

Replacing the Battery

Begin by removing power from the system as described in Section 3.1 and remove the cover as described in Section 3.2..

1. Push aside the small clamp that covers the edge of the battery. When the battery is released, lift it out of the holder.

2. To insert a new battery, slide one edge under the lip of the holder with the positive (+) side facing up. Then push the other side down until the clamp snaps over it.

LITHIUM BATTERY

BATTERY HOLDER
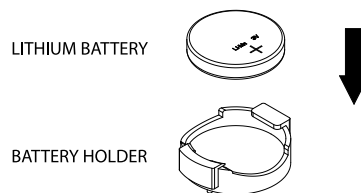
Figure 3-10. Installing the Onboard Battery

Warning: There is a danger of explosion if the onboard battery is installed upside down (which reverses its polarities). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032).

Note: Handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

3.4 Chassis Components

Installing the GPU Trays

The GPUs are installed into the trays by the vendor and shipped separately. You must install the trays.

**Fully Open
Release Lever**
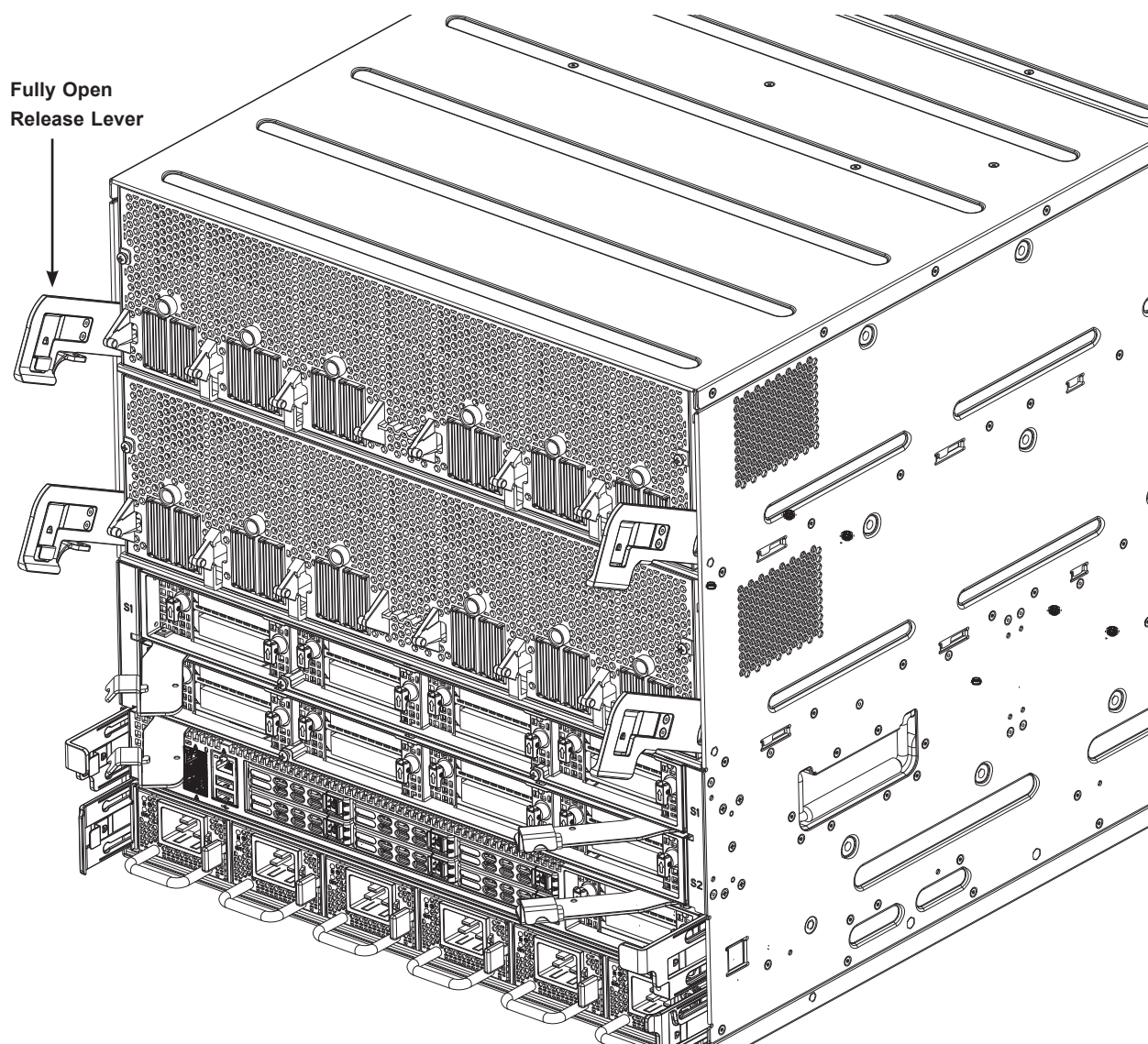
Figure 3-11. Installing the GPU Trays

Installing GPU Trays

1. Note that the release levers on each side must be in the fully open position.

2. Slide each tray into the chassis.

3. Lift the two levers simultaneously until they snap into place.

4. Secure each lever with a screw.

Installing the NVLink Bridges

After both GPU trays are installed, they must be connected by the NVLink bridge assemblies.
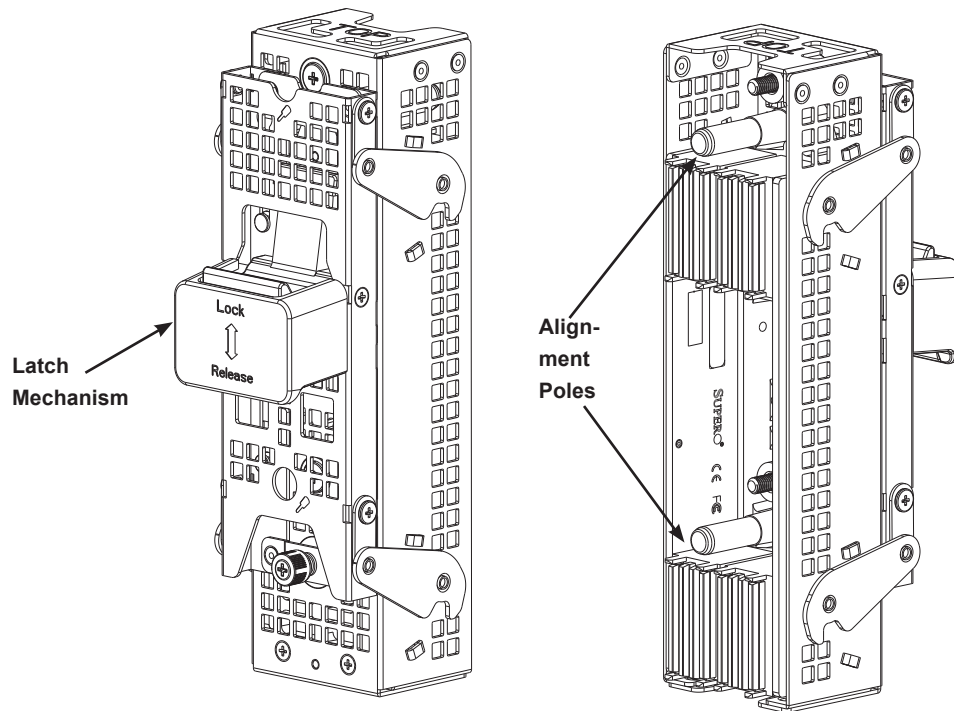
Figure 3-12. NVLink Bridge Assembly (front and back)

Installing a Bridge Assembly

1. Orient the bridge assembly, noting the word "TOP" printed on the top.

2. With the latch mechanism in the Release position, hold the bridge assembly with both hands, fingers under the latch mechanism and thumbs on top of the assembly.

3. Align the two poles on the contact side of the bridge assembly with the two holes in the rear of the GPU trays. Keeping the assembly strictly perpendicular, push it into the GPU trays until the latch mechanism snaps into place. (Figure on next page)

Caution: Do not tilt the assembly as you install or remove it to protect delicate parts.
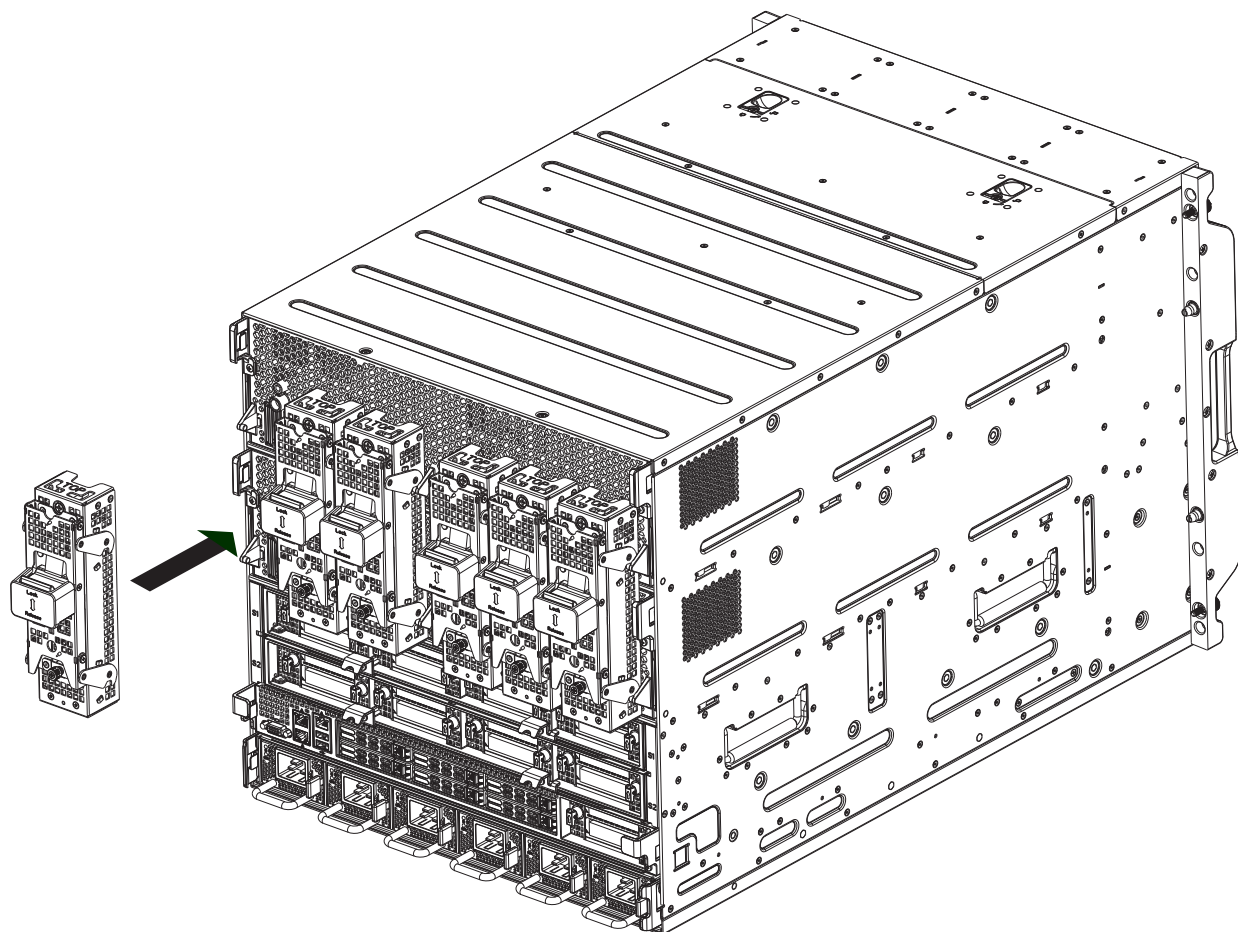
Figure 3-13. Installing an NVLink Bridge Assembly

Removing a Bridge Assembly

1. Hold the bridge assembly with both hands, fingers under the assembly and thumbs on top of the latch.

2. Keeping the assembly strictly perpendicular, squeeze to pull the latch down while pulling the assembly straight out from the GPU trays.

Switch Trays

Installing Switch Trays

1. Note that the release levers on each side must be in the fully open position. (Fig 3-11)

2. Slide each tray into the chassis.

3. Push the two levers simultaneously into the chassis until they snap into place.

4. Secure each lever with a screw.

Storage Drives

The system supports sixteen NVMe 2.5" storage drives in the front and eight SATA 2.5" storage drives in the rear. If RAID is configured, these drives can be removed or replaced without powering down the system.

In addition the system features two internal M.2 SSDs.

Note: Enterprise level drives are recommended for use in Supermicro servers. For information on recommended HDDs, visit the Supermicro website at http://www.supermicro.com/products/nfo/files/storage/SBB-HDDCompList.pdf.

Drive Carriers

The drives are mounted in drive carriers that simplify their removal from the chassis. These carriers also help promote proper airflow. Even carriers without drives must remain in the chassis for proper airflow.

Each drive carrier has two LED indicators: an activity indicator and a status indicator. In RAID configurations, the status indicator lights to indicate the status of the drive. In non-RAID configurations, the status indicator remains off. See the table below for details.

Drive Carrier LED Indicators			
	Color	**Blinking Pattern**	**Behavior for Device**
Activity LED	Blue	Solid On	SAS/NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for drive with RSTe support *(not supported in VMD mode)*
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Green	Solid On	Safe to remove NVMe device *(not supported in VMD mode)*
	Amber	Blinking at 1 Hz	Attention state—do not remove NVMe device *(not supported in VMD mode)*

Removing Drive Carrier

1. Press the release button on the drive carrier to extend the drive carrier handle.

2. Use the handle to pull the drive out of the chassis.
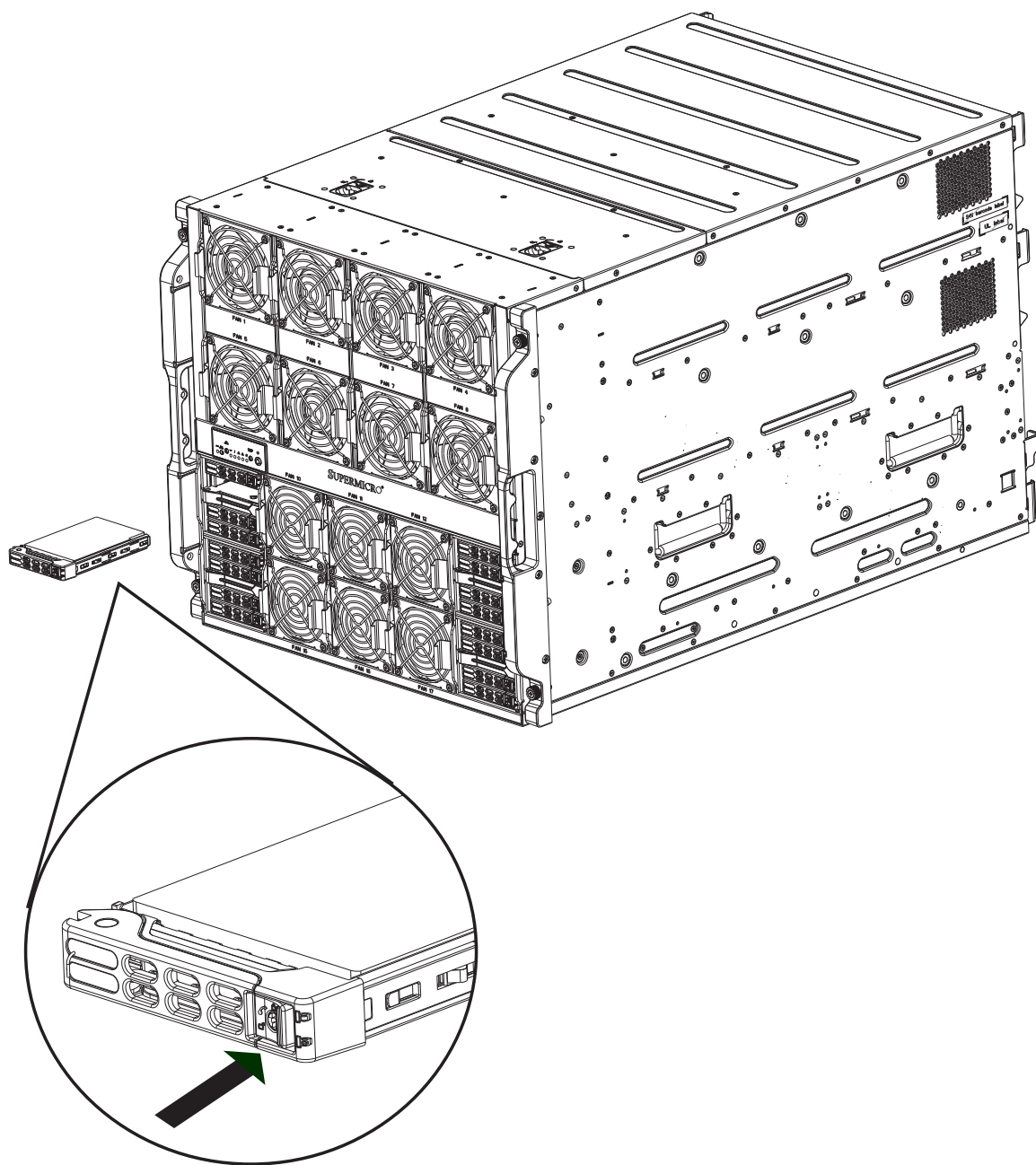
Figure 3-14. Removing a Hard Drive Carrier

Installing a Drive

1. Remove the screws securing the dummy drive into the drive carrier, and remove the dummy drive.

2. Install a drive into the carrier with the printed circuit board side facing down so that the mounting holes in the drive align with those in the carrier.

3. Secure the drive into the carrier with screws.

4. Use the open handle to replace the drive carrier into the chassis.

5. Gently close the drive carrier handle to secure the drive and carrier into the chassis drive bay.
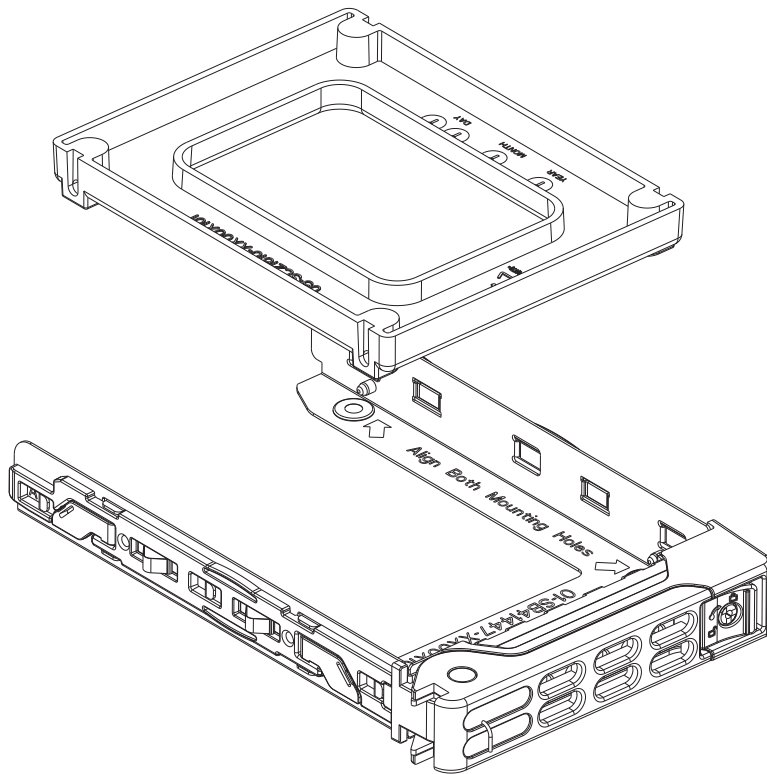
Figure 3-15. Removing Dummy from a Drive Carrier

Caution: Except for short periods of time while swapping drives, do not operate the server without the carriers in the drive bays.

Hot-Swap for NVMe Drives

Supermicro Ultra servers support NVMe surprise hot-swap. For even better data security, NVMe *orderly* hot-swap is recommended. NVMe drives can be ejected and replaced remotely using IPMI.

Note: If you are using VROC, see the VROC appendix in this manual instead.

Ejecting a Drive

1. **IPMI > Server Health > NVMe SSD**

2. Select Device, Group and Slot, and click **Eject**. After ejecting, the drive Status LED indicator turns green.

3. Remove the drive.

Note that *Device* and *Group* are categorized by the CPLD design architecture. The 9029GP-TNVRT server has one Device and one Group, except the 2029U-TN24 server which has one Device and two Groups.

Slot is the slot number on which the NVMe drives are mounted.
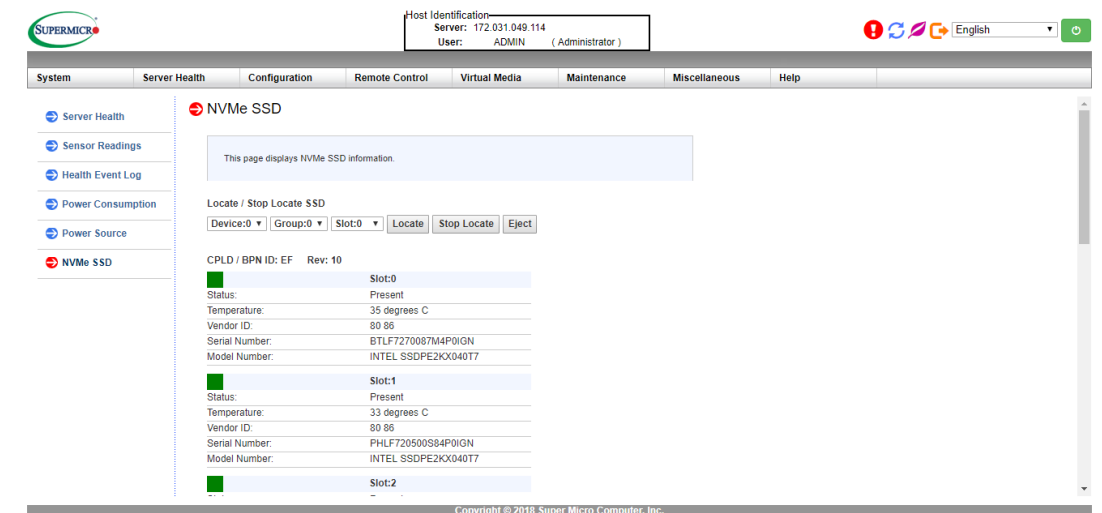
Figure 3-16. IPMI Screenshot

Replacing the Drive

1. Insert the replacement drive.

2. **IPMI > Server Health > NVMe SSD**

3. Select Device, Group and slot and click **Insert**. The drive Status LED indicator flashes red, then turns off. The Activity LED turns blue.

Checking the Temperature of an NVMe Drive

There are two ways to check using IPMI.

Checking a Drive

- **IPMI > Server Health > NVMe SSD –** Shows the temperatures of all NVMe drives, as in Figure 3-4.

- **IPMI > Server Health > Sensor Reading > NVME_SSD –** Shows the single highest temperature among all the NVMe drives.

Installing M.2 SSDs

The system supports two M.2 solid state storage drives of form factor 2280 or 22110.

1. Power down the system as described in Section 3.1, and remove the head node (motherboard) tray.

M.2
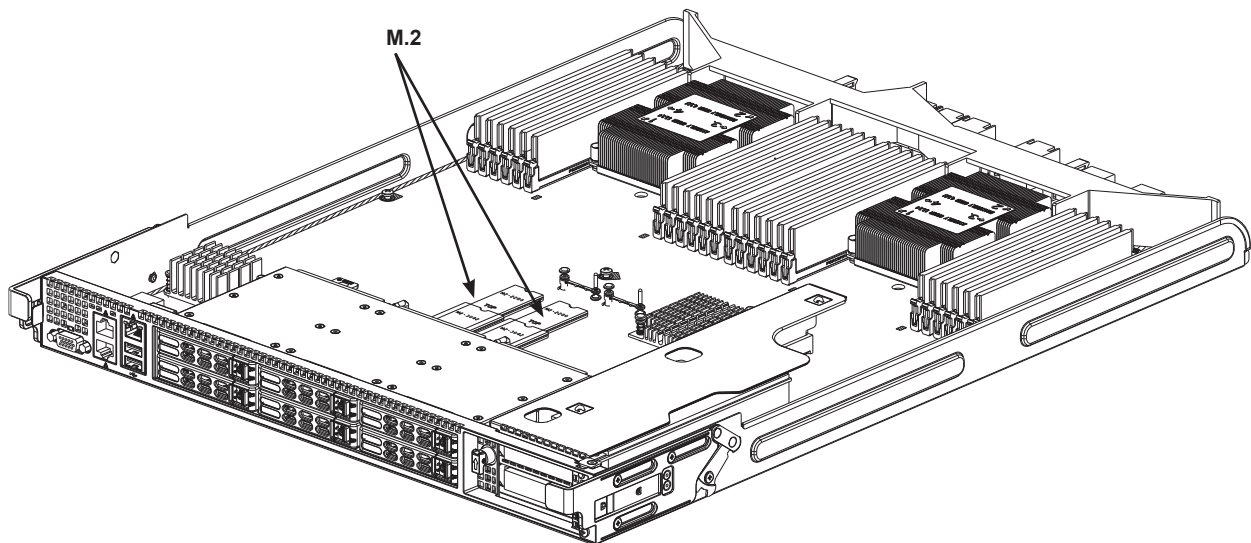
Figure 3-17. Locating M.2 Positions

2. Locate the M.2 slots (M.2-P1, M.2-P2) on the motherboard.

3. The M.2 card will be held in place by a plastic standoff/holder already installed on the motherboard. Depending on the form factor of your card, you may need to move it. If necessary, move it so that your card just fits between the slot on the motherboard and the standoff.

4. In the plastic standoff, pull out the top plug.

5. Slip the M.2 card into the slot on the motherboard, then trap the other end of the card with the standoff plug by reinserting it.

System Cooling

The chassis contains fourteen fans, a heatsink for each CPU, and an air shroud to direct air flow.

Fans

The chassis contains eight 9-cm and six 8-cm high-performance fans. Fan speed is controlled by IPMI depending on the system temperature. If a fan fails, the remaining fans will ramp up to full speed. The system will continue to run with a failed fan, although it may shut down if the heat gets too great. Replace any failed fan at your earliest convenience with the same model. Failed fans can be identified through the IPMI.

Changing a System Fan

1. Determine which fan has failed using IPMI, or check by observation.

2. Push the release tab and pull the failed fan from the chassis. Fans can be replaced while the system is running.

3. Replace the failed fan with an identical fan, available from Supermicro. Push the new fan into the housing. Note that the fan module top is labelled.

4. Check that the fan is working properly and that the LED on the control panel is off.
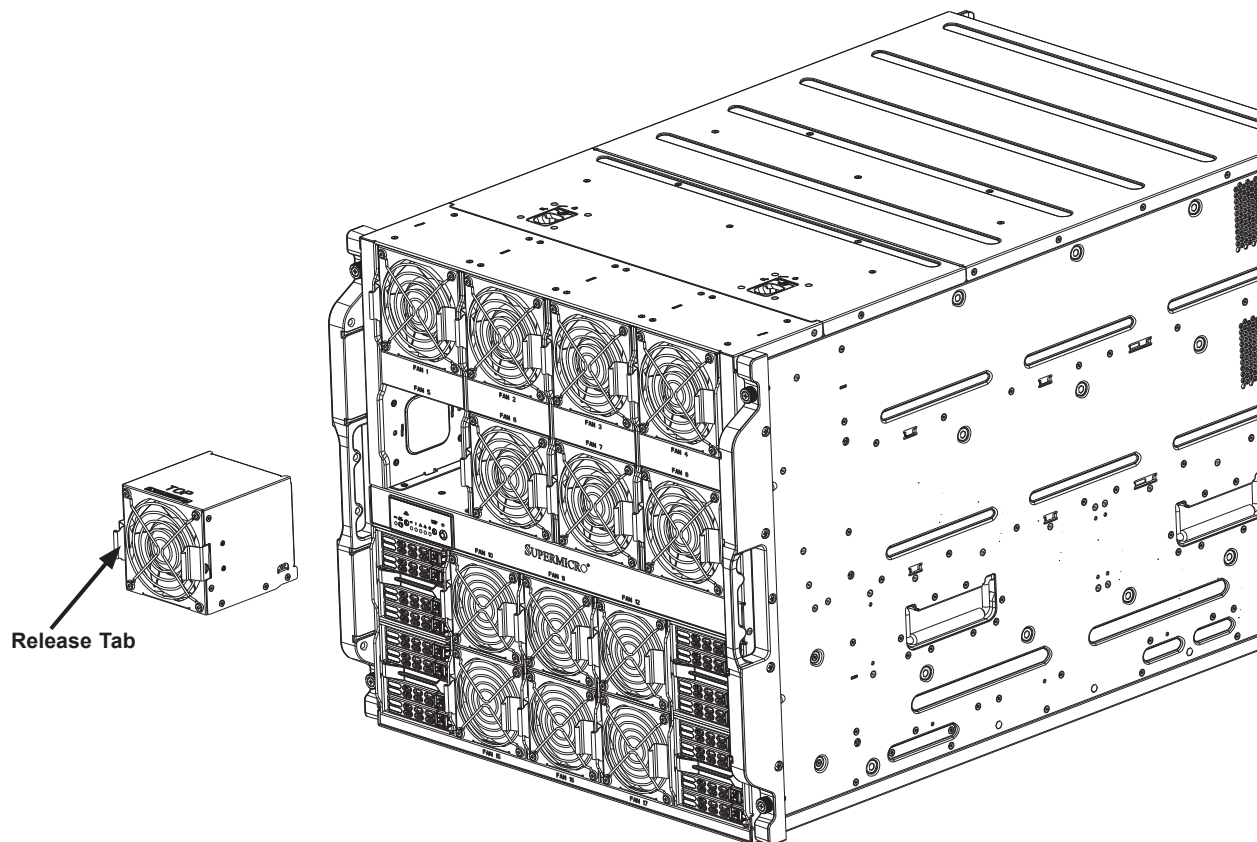
Figure 3-18. Replacing a Rear System Fan

Air Shroud

Generally you do not need to remove the air shroud to perform any service on the system. However, if you need to temporarily remove it (the air shroud should always be in place when the system is operating), follow this procedure.

Air shrouds concentrate airflow to maximize fan efficiency. The SC1018G chassis air shroud does not require screws to set up.

Installing the Air Shroud

Begin by removing power from the system as described in Section 3.1 and removing the chassis cover as described in Section 3.2.

1. Place the air shroud in the chassis so that it fits between the middle bracket and the rear window.

2. Insert the front hooks of the air shroud into the gaps on the back of the middle fan bracket.

3. Replace the chassis cover and system power.
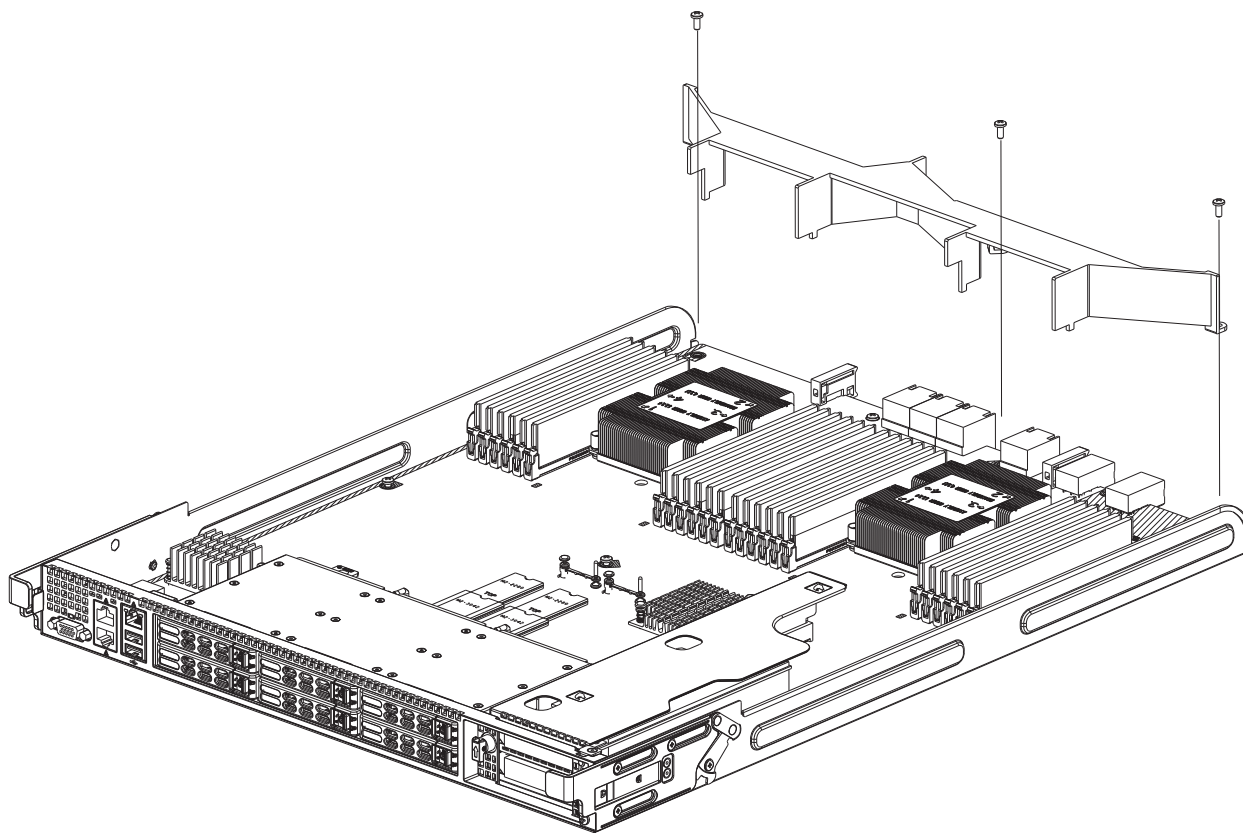
Figure 3-19. Installing the Air Shroud

Power Supply

The system includes six hot-plug power supplies in modules. Five are required to power the system allowing one spare. The rack or power supply system must provide at least 80 A.

Caution: Twenty amp power cords are required, and are supplied with this server.

The power supplies automatically sense the input voltage between 200v to 240v, and operate at that voltage. Note that different input voltages will result in different maximum power output levels.

In the event of a power supply failure, the remaining power module will automatically take over. The failed power module can be replaced without powering-down the system. Replace with the same model. Replacement modules can be ordered directly from Supermicro.

An amber light on the power supply is illuminated when the power is switched off. An green light indicates that the power supply is operating normally.

Replacing the Power Supply

1. Unplug the AC power cord from the failed power supply module.

2. Press the release tab on the power supply module as illustrated, and use the handle to pull the module straight out of the chassis.

3. Push the new power supply module into the bay until it clicks into the locked position.

4. Plug the AC power cord back into the module.
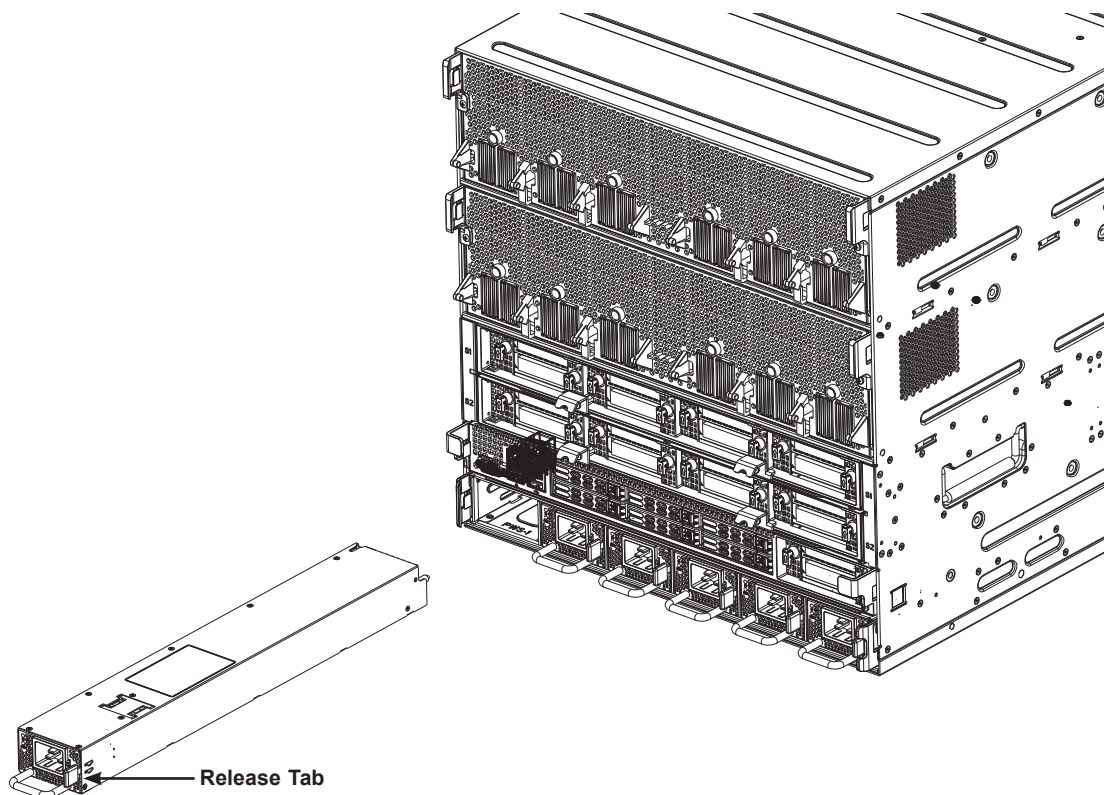
Figure 3-20. Removing/Replacing a Power Supply

Expansion Card Installation

The system includes support for two PCIe expansion cards using pre-installed riser cards.

Installing External PCI Expansion Cards

1. Power down the system as described in Section 3.1 and remove the motherboard tray.

2. Remove the riser card bracket. On the rear of the chassis, the bracket is secured by a small black plastic flip-switch with an arrow on it. Flip open the switch to release the bracket, then pull the bracket out of the chassis.

3. Insert the expansion card(s) into the riser card slot(s) while aligning the rear PCI shield.

4. Replace the riser card into the motherboard expansion slot while aligning the bracket into the chassis. Flip the black plastic switch back in place, making sure it snaps closed with a click.

5. Replace the motherboard tray
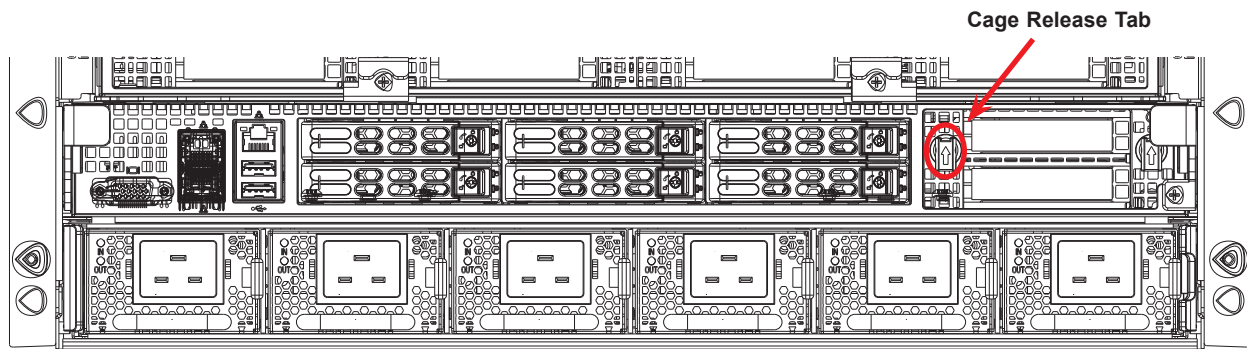
Figure 3-21. Expansion Card Cage Release Tab

Removing the Mid-Plane

In unusual case that the mid-plane must be removed:

1. Power down as described in Section 3.1 and remove the chassis top cover.

2. Remove all trays from the rear of the chassis as described in Section 3.2.

3. Remove all fans and storage drives from the front of the chassis as described in this section.

4. Remove the Control Panel assembly from the front of the chassis by loosening the two screws.

5. Lift out the mid-plane.

Chapter 4

Motherboard Connections

This section describes the connections on the motherboard and provides pinout definitions. Note that depending on how the system is configured, not all connections are required. The LEDs on the motherboard are also described here. A motherboard layout indicating component locations may be found in Chapter 1.

Please review the Safety Precautions in the manual appendix before installing or removing components.

4.1 Power Connections

Two proprietary power connectors (JMB_E5, JMB_E6), provide power for the system from the midplane.

4.2 Headers and Connectors

Onboard Fan Header

Headers FAN1, FAN2, and FAN3, are not used in this system. System fans are powered from the midplane.

TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM). A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system.

Please go to the following link for more information on TPM: http://www.supermicro.com/manuals/other/TPM.pdf.

Trusted Platform Module Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+3.3V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	GND
7	SPI_MOSI	8	
9	+3.3V Stby	10	SPI_IRQ#

RAID Key Header

A RAID Key header is located at JRK1 on the motherboard. It supports VMD used in creating optional advanced NVMe RAID configurations. (See NVMe/VROC appendix.)

Intel RAID Key Pin Definitions	
Pin#	Definition
1	Ground
2	3.3V Standby
3	Ground
4	PCH RAID Key

Serial Port

A serial port (COM1) is located next to the FAN1 connector on the motherboard.

M.2 Slots

Two PCIe M.2 slots (M.2-P1/M.2-P2) are provided on the motherboard. It supports PCIe 3.0 x4 (32 Gb/s) SSD cards in the 2280 and 22110 form factors.

PCIe Slot

One PCIe x32 expansion slot (PCIE1) is provided. It is used with a riser card.

4.3 Ports
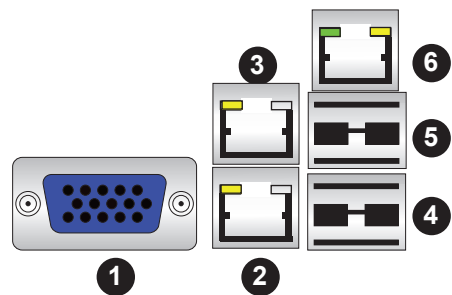
Figure 4-2. Rear I/O Ports

Input/Output Ports			
No.	Description	No.	Description
1.	VGA	4.	USB 1 (USB 3.0)
2.	LAN1	5.	USB 2 (USB 3.0)
3.	LAN2	6.	IPMI LAN

Network Ports

Two 10 Gb LAN ports (LAN1,LAN2) provide contact with a network.

IPMI LAN Port

A dedicated IPMI LAN GbE port is located on the I/O back panel. IPMI LAN is supported by the Aspeed AST2500 BMC (Baseboard Management Controller). This port accept a RJ45 type cable. Refer to the LED Indicator Section for IPMI LAN LED information.

4.4 Jumpers

Explanation of Jumpers

To modify the operation of the motherboard, jumpers are used to choose between optional settings. Jumpers create shorts between two pins to change the function associated with it. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" indicates the jumper is either on only one pin or has been completely removed.
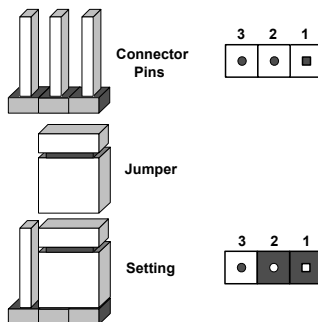
CMOS Clear

JBT1 is used to clear CMOS, which also clears any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To Clear CMOS

1. Power down the system and unplug the power cord(s).

2. Remove the cover of the chassis to access the motherboard.

3. Remove the onboard battery from the motherboard.

4. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.

5. Remove the screwdriver (or shorting device).

6. Replace the cover, reconnect the power cord(s) and power on the system.

Notes: Clearing CMOS will also clear all passwords.

Do not use the PW_ON connector to clear CMOS.

JBT1 contact pads

LAN Port Enable/Disable

Change the setting of jumpers JPL1 to enable or disable the LAN chip. The default setting is Enabled.

LAN Port Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Management Engine (ME) Recovery

Use jumper JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, online upgrade will be available via Recovery mode.

Manufacturer Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	ME Recovery

Watch Dog

JWD1 controls the Watch Dog function. Watch Dog is a monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause Watch Dog to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. Watch Dog must also be enabled in BIOS. The default setting is Reset.

Note: When Watch Dog is enabled, the user must write their own application software to disable it.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

VGA Enable/Disable

Use jumper JPG1 to enable or disable the VGA port using the onboard graphics controller. The default setting is Enabled.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

BIOS Recovery

Close pins 2-3 of jumper JBR1 for BIOS recovery. The default setting is on pins 1 and 2 for normal operation.

BIOS Recovery Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	BIOS Recovery

4.5 LED Indicators

LAN LEDs

The Ethernet ports each have two LEDs. One LED indicates activity when flashing, while the other LED may be green, amber or off to indicate the speed of the connection.

LAN LED (Connection Speed Indicator)	
LED Color	Definition
Off	10 Mb/s
Amber	1 Gb/s
Green	10 Gb/s

Dedicated IPMI LAN LEDs

A dedicated IPMI LAN port is on the I/O back panel. The amber LED on the right of the IPMI LAN port indicates activity, while the LED on the left indicates the link speed of the connection.

IPMI LAN LED (Connection Speed Indicator)	
Color/State	Definition
Green: Blinking	100 Mbps
Amber: Blinking	1G

BMC Heartbeat LED

LEDM1 (LEDBMC) is the BMC heartbeat LED. When the LED is blinking green, BMC is functioning normally.

M.2 Activity LED

LED1 indicates when one M.2 storage is active.

Chapter 5

Software

After the hardware has been installed, you can install the Operating System (OS), configure RAID settings and install the drivers.

5.1 Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver. Refer to the RAID Configuration User Guides posted on our website at www.supermicro.com/support/manuals.

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That might be a DVD, perhaps using an external USB/SATA DVD drive, or a USB flash drive, or the IPMI KVM console.

2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.

3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.
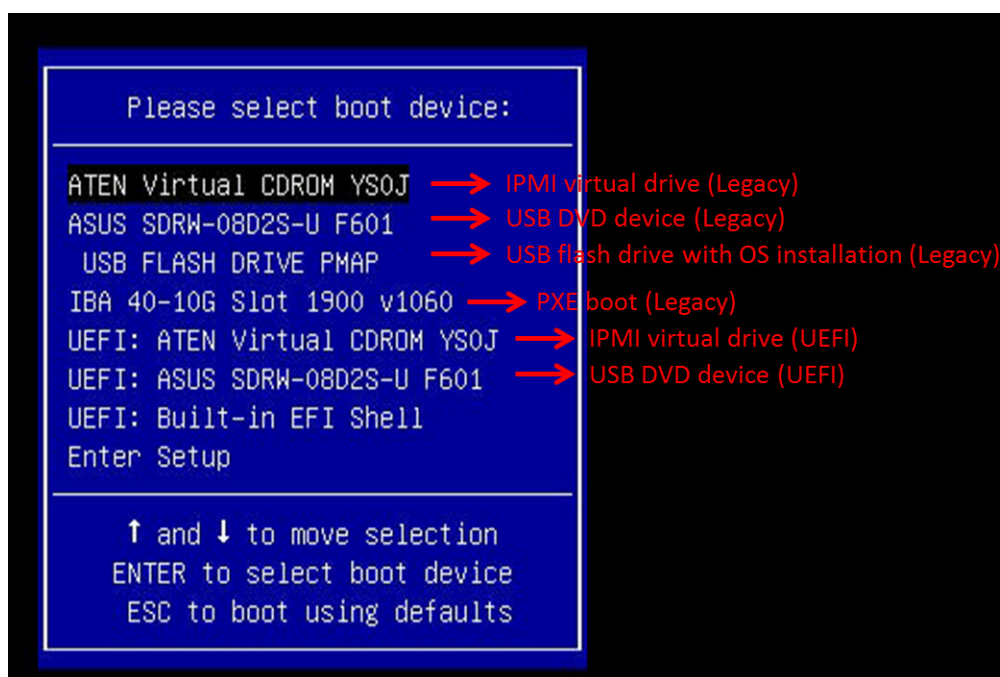
Figure 5-1. Select Boot Device

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on "Load driver" link at the bottom left corner.
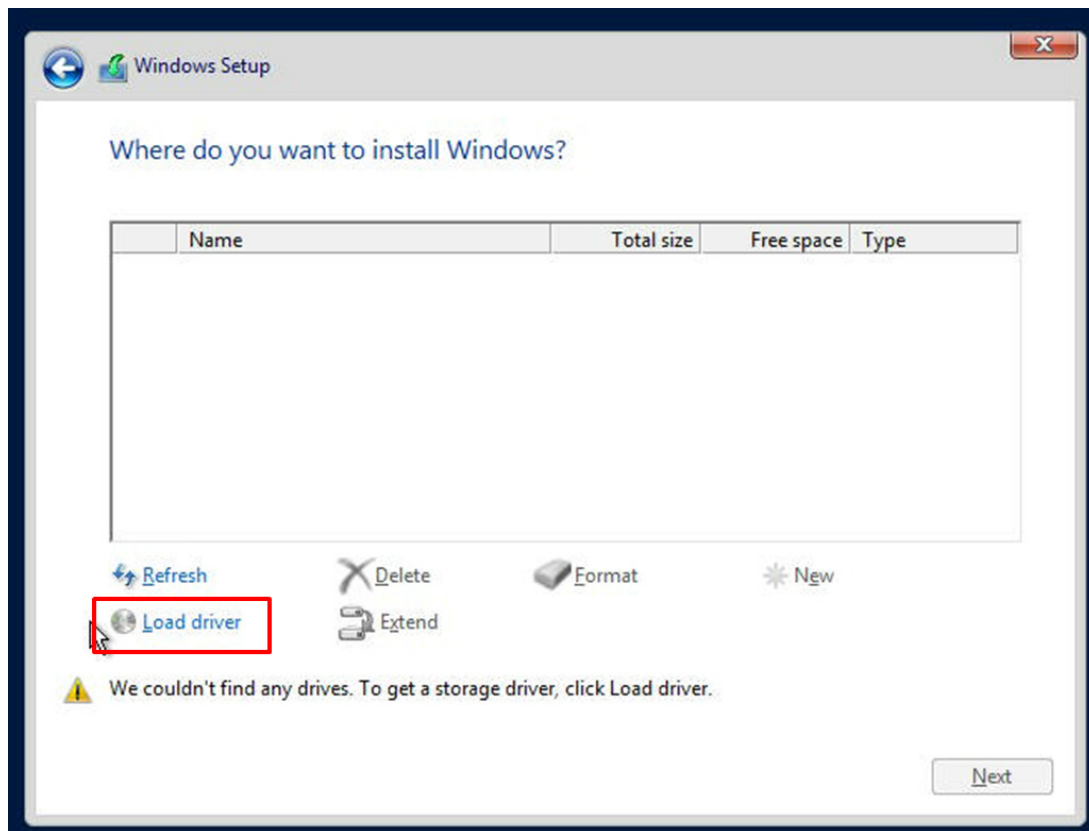
Figure 5-2. Load Driver Link

To load the driver, browse the USB flash drive for the proper driver files.

- For RAID, choose the SATA/sSATA RAID driver indicated then choose the storage drive on which you want to install it.

- For non-RAID, choose the SATA/sSATA AHCI driver indicated then choose the storage drive on which you want to install it.

5. Once all devices are specified, continue with the installation.

6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

5.2 Driver Installation

The Supermicro website contains drivers and utilities for your system at https://www.supermicro.com/wftp/driver. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash drive or a DVD. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Supermicro website at http://www.supermicro.com/products/. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

Insert the flash drive or disk and the screenshot shown below should appear.
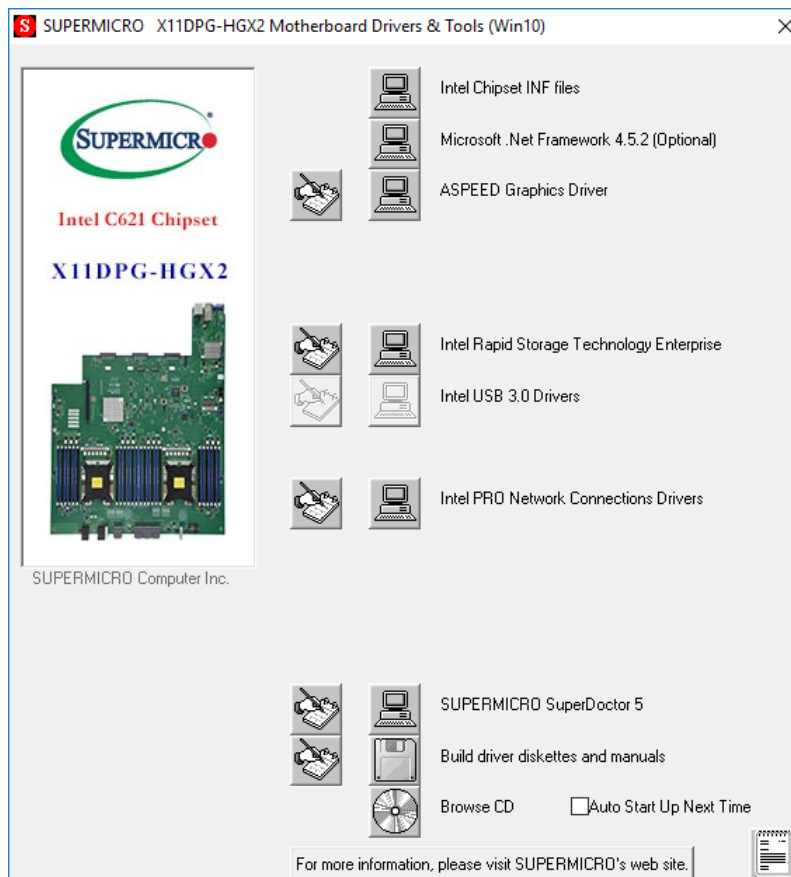
Figure 5-3. Driver & Tool Installation Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents.

5.3 SuperDoctor® 5

The Supermicro SuperDoctor 5 is a program that functions in a command-line or web-based interface for Windows and Linux operating systems. The program monitors such system health information as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

Note: The default User Name and Password for SuperDoctor 5 is ADMIN / ADMIN.
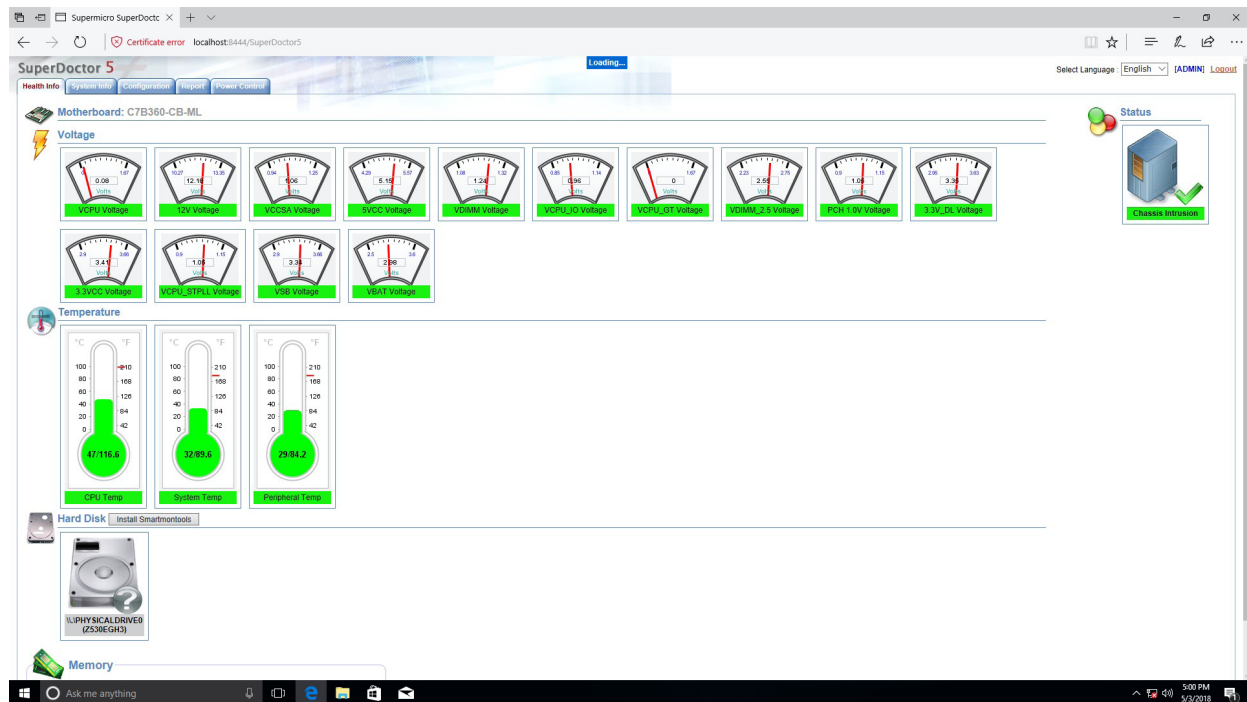
Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

5.4 IPMI

The X11DPG-HGX2 supports the Intelligent Platform Management Interface (IPMI). IPMI provides remote access, monitoring and management through the baseboard management controller (BMC) and other management controllers distributed among different system modules. There are several BIOS settings that are related to IPMI. For general documentation and information on IPMI, visit our website at: http://www.supermicro.com/products/nfo/IPMI.cfm.

BMC ADMIN User Password

For security, each system is assigned a unique default BMC password for the ADMIN user. This can be found on a sticker on the chassis and a sticker on the motherboard. The sticker also displays the BMC MAC address.

Figure 5-5. BMC Password Label

See Chapter 1, Section 1.4 for the location of the label.

Chapter 6

UEFI BIOS

6.1 Introduction

This chapter describes the UEFI BIOS setup utility and provides the instructions on navigating the setup screens. The BIOS is stored in a Flash EEPROM and can be updated.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted since this manual was published.

Starting BIOS Setup Utility

To enter the AMI BIOS setup utility screens, press the <Delete> key while the system is booting up. (There are a few cases when other keys are used, such as <F1>, <F2>, etc.)

The BIOS screens have three main frames. The large left frame displays options can be configured by the user. These are blue. When an option is selected, it is highlighted in white. Settings printed in **Bold** are the default values.

In the left frame, a " ▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key opens the list of settings in that submenu.

The upper right frame displays helpful information for the user. The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The lower right frame lists navigational methods. The AMI BIOS setup utility uses a key-based navigation system called *hot keys*. Most of these hot keys can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

Some system parameters may be changed.

6.2 Main Setup

When running the AMI BIOS setup utility, it starts with the Main screen. You can always return to it by selecting the Main tab on the top of the screen.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
       Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                                                   Set the Date. Use Tab to
                                                                   switch between Date elements.
       System Date                         [Tue 05/07/2019]
       System Time                         [17:22:10]

       Supermicro X11DPG-HGX2
       BIOS Version                        2.2
       Build Date                          01/16/2019
       CPLD Version                        02.bD.05

       Memory Information
       Total Memory                        8192 MB
       Memory Speed                        2132 MT/s
                                                                   ↔: Select Screen
                                                                   ↑↓: Select Item
                                                                   Enter: Select
                                                                   +/-: Change Opt.
                                                                   F1: General Help
                                                                   F2: Previous Values
                                                                   F3: Optimized Defaults
                                                                   F4: Save & Exit
                                                                   ESC: Exit



              Version 2.19.1268. Copyright (C) 2019 American Megatrends, Inc.
```

The Main tab page allows you to set the date and time, and it displays system information.

System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format.

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is 01/01/2016 after RTC reset.

Supermicro X11DPG-HGX2 (Motherboard model)

BIOS Version

Build Date (of the BIOS)

CPLD (Complex Programmable Logic Device) **Version**

Memory Information

Total Memory (for the system)

Memory Speed

6.3 Advanced Setup Configurations

Use the arrow keys to select the Advanced tab and press <Enter> to access the submenu items.
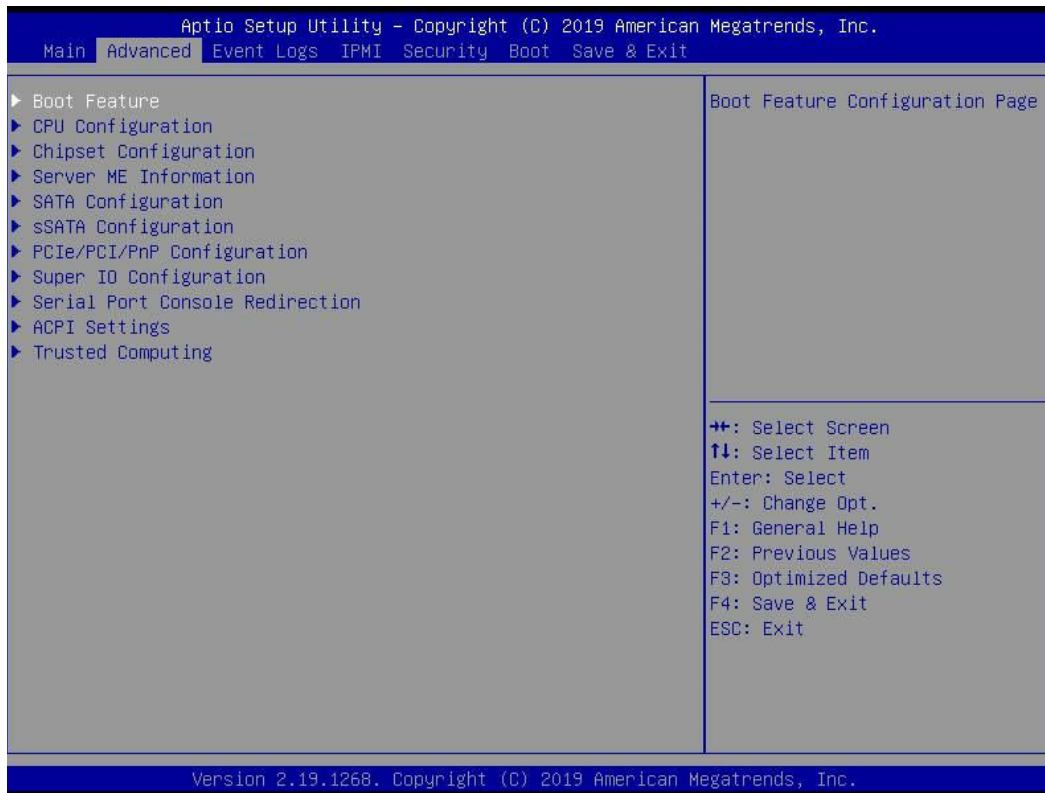
Caution: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing setting may make the system unstable. If this occurs, revert to the manufacture default settings.

▶Boot Feature

Boot Configuration

Quiet Boot

Use this feature to select the screen between displaying POST messages or the OEM logo at bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

Note: POST message is always displayed regardless of the item setting.

Option ROM Messages

Use this feature to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM display setting. Select Force BIOS to use the display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup NumLock State

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup immediately and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the ROM BIOS of the host adaptors will not capture Interrupt 19 immediately and allow the drives attached to these adaptors to function as bootable devices at bootup. The options are **Immediate** and Postponed.

Re-try Boot

When EFI (Expansible Firmware Interface) Boot is selected, the system BIOS will automatically reboot the system from an EFI boot device after an initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after an initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the user to power off the system after pressing and holding the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and **Instant Off**.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The options are Stay-Off, Power-On, and **Last State**.

Throttle on Power Fail

Decreases the system power by throttling the CPU frequency when on power supply module fails. The options are **Disabled** and Enabled.

►CPU Configuration

Warning: Setting the wrong values in the following sections may cause the system to malfunction.

Processor Configuration

The following CPU information will be displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version

Hyper-Threading (ALL)

Select Enable to use Intel Hyper-Threading Technology to enhance CPU performance. The options are **Enable** and Disable.

Cores Enabled

Use this feature to limit the CPU cores. Type the number of cores desired. Enter 0 to enable all cores. Enter bit0 to disable CPU Core 0. Enter bit1 to disable CPU Core 1. Note that the maximum of 24 cores are currently available in each CPU package. The default setting is **0**.

Execute Disable Bit (Available if supported by the OS & the CPU)

Select Enable to keep mixed power-on frequency of each CPU socket. The options are **Enable** and Disable.

Intel Virtualization Technology

Select Enable to use Intel Virtualization Technology which will allow the I/O device assignments to be directly reported to the VMM (Virtual Memory Management) through the DMAR ACPI tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security, and availability in networking and data-sharing. The settings are **Enable** and Disable.

PPIN Control

Select Unlock/Enable to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **Unlock/Enable** and Unlock/Disable.

Hardware Prefetcher (Available when supported by the CPU)

If this feature is set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the Level 2 (L2) cache to improve CPU performance. The options are Disable and **Enable**.

Adjacent Cache Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.

Note: Power off and reboot the system for your changes to take effect. Please refer to the Intel website for detailed information.

DCU (Data Cache Unit) **Streamer Prefetcher** (Available when supported by the CPU)

If this feature is set to Enable, the DCU (Data Cache Unit) streamer prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing for CPU performance enhancement. The options are Disable and **Enable**.

DCU (Data Cache Unit) **IP Prefetcher**

If this feature is set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

LLC Prefetch

If this feature is set to Enable, LLC (hardware cache) prefetching on all threads will be supported. The options are **Disable** and Enable.

Extended APIC (Extended Advanced Programmable Interrupt Controller)

Based on the Intel Hyper-Threading technology, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will be expanded from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enable** and Disable.

►Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disable, **Energy Efficient**, and Custom.

The following items are configurable if Custom *is selected above.*

Power Performance Tuning

Select BIOS to allow the system BIOS to configure the Power-Performance Tuning BIAS setting below. The options are BIOS Controls EPB and **OS Controls EPB**.

Energy Performance BIAS Setting

(Available when "Power Performance Tuning" *is set to* BIOS Controls EPB*)*

Use this feature to set the processor power use policy to achieve the desired operation settings for your machine by prioritizing system performance or energy savings. Select Maximum Performance to maximize system performance (to its highest potential); however, this may result in maximum power consumption as energy is needed to fuel the processor frequency. The higher the performance is, the higher the power consumption will be. Select Max Power Efficient to maximize power saving; however, system performance may be substantially impacted because limited power use decreases the processor frequency. The options are Maximum Performance, Performance, **Balanced Performance**, Balanced Power, Power, and Max Power Efficient.

►CPU P State Control

SpeedStep (PStates)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Refer to the Intel website for detailed information. The options are Disable and **Enable**.

The following two items are configurable if SpeedStep *is enabled above.*

EIST PSD Function

Use this item to configure the processor's P-State coordination settings. During a P-State, the voltage and frequency of the processor will be reduced when it is in operation. This makes the processor more energy efficient, resulting in further energy gains. The options are **HW_ALL**, SW_ALL and SW-ANY.

Turbo Mode

Select Enable for processor cores to run faster than the frequency specified by the manufacturer. The options are Disable and **Enable**.

▶**Hardware PM (Power Management) State Control**

Hardware P-States

If this feature is set to Disable, the hardware power management will choose a P-state setting for the system based on an OS request. If this feature is set to Native Mode, the hardware power management will choose a P-state setting based on OS guidance. If this feature is set to Native Mode with No Legacy Support, the hardware power management will choose a P-state setting independently without OS guidance. The options are **Disable**, Native Mode, Out of Band Mode, and Native Mode with No Legacy Support.

▶**CPU C State Control**

Autonomous Core C-State

Select Enable to support Autonomous Core C-State control which will allow the processor core to control its C-State setting automatically and independently. The options are Enable and **Disable**.

CPU C6 Report

Select Enable to allow the BIOS to report the CPU C6 state (ACPI C3) to the operating system. During the CPU C6 state, power supply to all caches is turned off. The options are **Auto**, Enable, and Disable.

Enhanced Halt State (C1E)

Select Enable to enable "Enhanced Halt State" support, which will significantly reduce the CPU's power consumption by minimizing CPU's clock cycles and reduce voltage during a "Halt State." The options are Disable and **Enable**.

▶**Package C State Control**

Package C State

Use this feature to set the limit on the C-State package register. The options are C0/1 state, C2 state, C6 (non-Retention) state, C6 (Retention) state, No Limit, and **Auto**.

▶CPU T State Control

Software Controlled T-States

If this feature is set to Enable, CPU throttling settings will be supported by the software of the system. The options are **Enable** and Disable.

▶Chipset Configuration

▶North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

▶UPI (Ultra Path Interconnect) General Configuration

This section displays the following UPI General Configuration information:

- Number of CPU
- Number of Active UPI Link
- Current UPI Link Speed
- Current UPI Link Frequency
- UPI Global MMIO Low Base/Limit
- UPI Global MMIO High Base/Limit
- UPI PCI-E Configuration Base/Size

Degrade Precedence

Use this feature to select the degrading precedence option for Ultra Path Interconnect connections. Select Topology Precedent to degrade UPI features if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

Link L0p Enable

Select Enable to enable Link L0p. The options are Disable, Enable, and **Auto**.

Link L1 Enable

Select Enable to enable Link L1 (Level 1 link). The options are Disable, Enable, and **Auto**.

IO Directory Cache (IODC)

Select Enable for the IODC (I/O Directory Cache) to generate snoops instead of generating memory lockups for remote IIO (InvIToM) and/or WCiLF (Cores). Select Auto for the IODC to generate snoops (instead of memory lockups) for WCiLF (Cores). The options are Disable, **Auto**, Enable for Remote InvItoM Hybrid Push, InvItoM AllocFlow, Enable for Remote InvItoM Hybrid AllocNonAlloc, and Enable for Remote InvItoM and Remote WViLF.

Isoc Mode

Select Enable to enable Isochronous support to meet QoS (Quality of Service) require-
ments. This feature is especially important for Virtualization Technology. The options are
Disable, Enable, and **Auto**.

SNC (Sub NUMA Cluster)

Select Enable for Sub-NUMA (Non-uniform memory access) Cluster support. Select Auto
for 1-cluster or 2-cluster support depending on the status of IMC (Integrated Memory
Controller) Interleaving. The options are **Disable**, Enable, and Auto.

XPT Prefetch

Select Enable to support to enhance system performance. The options are Enable and
Disable.

KTI Prefetech

Select Enable to support to enhance system performance. The options are **Enable** and
Disable.

Local/Remote Threshold

This feature allows the user to set the threshold for the Interrupt Request (IRQ) signal,
which handles hardware interruptions. The options are Disable, **Auto**, Low, Medium,
and High.

Stale AtoS (A to S)

Select Enable to remove the contents and the structures of the files that are no longer
needed in the remote host server but are still in use by the local client machine from
Directory A to Directory S in the NFS (Network File System) to optimize system perfor-
mance. The options are **Disable**, Enable, and Auto.

LLC Dead Line Alloc

Select Enable to opportunistically fill the deadlines in LLC (Last Level Cache). The op-
tions are **Enable**, Disable, and Auto.

▶**Memory Configuration**

Enforce POR

Select the Plan of Record (POR) to enforce POR restrictions for DDR4 memory frequency
and voltage programming. The options are **POR** and Disable.

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules.
The options are **Auto**, 1866, 2000, 2133, 2400, and 2666.

IMC Interleaving

Use this feature to configure interleaving settings for the Integrated Memory Controller (IMC), which can improve memory performance. The options are **Auto**, 1-way Interleave, or 2-way Interleave.

Data Scrambling for DDR4

Select Enable to enable data scrambling for DDR4 memory to enhance system performance and security. The options are **Auto**, Disable, and Enable.

tCCD_L Relaxation

If this feature is enabled, SPD (Serial Presence Detect) will override tCCD_L ("Column to Column Delay-Long", or "Command to Command Delay-Long" on the column side.) If this feature is set to Disable, tCCD_L will be enforced based on the memory frequency. The options are Disable, Enable, and **Auto**.

tRWSR Relaxation

Select Enable to use the same tRWSR (Read to Write turnaround time for Same Rank) DDR timing setting among all memory channels, and in which case, the worst case value among all channels will be used. Select Disable to use different values for the tRWSR DDR timing settings for different channels as trained. If enabled, the tRWST timing is overridden by optimized value. If Auto, the override only applies to Samsung's DIMM. The options are Auto, Disable, and **Enable**.

Enable ADR

Select Enable for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enable and **Disable**.

2X REFRESH

Select 2X refresh mode. **Auto** means CLTT Low 1X refresh, CLTT Mid 2X refresh; Enable means CLTT Low/Mid 2X refresh; Disable means CLTT Low/Mid 1X refresh.

Page Policy

Use this feature to set the page policy for onboard memory support. The options are **Auto**, Closed, and Adaptive.

▶**Memory Topology**

This item displays the information about memory modules as detected by the BIOS, listed by the motherboard memory slot labels.

▶Memory RAS Configuration

Use this submenu to configure Memory RAS (Reliability, Availability, Serviceability) settings:

Static Virtual Lockstep Mode

Select Enable to support Static Virtual Lockstep mode to enhance memory performance. The options are **Disable** and Enable.

Mirror Mode

Use this feature to configure the mirror mode settings for all 1LM/2LM memory modules installed in the system, which will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity into half. The options are **Disable**, Mirror Mode 1LM, and Mirror Mode 2LM.

UEFI ARM Mirror

If this feature is set to Enable, mirror mode configuration settings for UEFI-based Address Range memory will be enabled upon system boot. This will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity to half. The options are **Disable** and Enable.

Memory Rank Sparing

(Only available when memory mirror mode is disabled.)

Select Enable to support memory-rank sparing to optimize memory performance. The options are Enable and **Disable**.

Multi Rank Sparing

Only available when Memory Rank Sparing is enabled. Use this setting to Multi Rank Sparing number. The options are One Rank and **Two Rank.**

Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors (1 – 32767) used for sparing, tagging and leaky bucket.. Type your choice. The default setting is **100**.

Intel Run Sure

Enable Intel Run Sure technology. The default is **Disable**. If Enable is selected. the following two choice are available.

SDDC Plus One

(Available when this feature is supported by the CPU and Intel Run Sure is set to Enable)

SDDC (Single Device Data Correction) checks and corrects single-bit or multiple-bit (4-bit max.) memory faults that affect an entire single x4 DRAM device. SDDC Plus One is the enhanced feature to SDDC. SDDC+1 will spare the faulty DRAM device

out after an SDDC event has occurred. After the event, the SDDC+1 ECC mode is activated to protect against any additional memory failure caused by a 'single-bit' error in the same memory rank. The options are Disable and Enable*. (The option "Enable" can be set as default when it is supported by the motherboard.)

ADDDC (Adaptive Double Device Data Correction) **Sparing**

(Available when this feature is supported by the CPU and Intel Run Sure is set to Enable)

Select Enable for Adaptive Double Device Data Correction (ADDDC) support, which will not only provide memory error checking and correction but will also prevent the system from issuing a performance penalty before a device fails. Please note that virtual lockstep mode will only start to work for ADDDC after a faulty DRAM module is spared. The options are Enable* and Disable. (The option "Enable" can be set as default when it is supported by the motherboard.)

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected in a memory module and send the corrections to the requestor (the original source). When this item is set to Enable, the IO hub will read and write back one cache line every 16K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are **Enable** and Disable.

Patrol Scrub Interval

If Patrol Scrub is set to Enable, use this item to specify the number of hours (between 0 to 24) required for the system to complete a full patrol scrubbing. Enter 0 for patrol scrubbing to be performed automatically. Type your choice. The default setting is **24**.

▶IIO Configuration

EV DFX (Device Function On-Hide) Features

When this feature is set to Enable, the EV_DFX Lock Bits that are located in a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

▶CPU1 Configuration/CPU2 Configuration

IOU0 (IIO PCIe Br1)

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIe Br2)

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU2 (IIO PCIe Br3)

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

MCP0 (IIO PCIe Br4)

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

MCP1 (IIO PCIe Br5)

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

▶**Socket 0 PcieBr0D00F0 – Port 0/DMI**

(Available for CPU 1 Configuration only)

Link Speed

This feature configures the link speed of a PCI-E this port. The options are

Auto,
Gen 1 (Generation 1) (2.5 GT/s),
Gen 2 (Generation 2) (5 GT/s), and
Gen 3 (Generation 3) (8 GT/s)

The following information will also be displayed:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port Max (Maximum) Payload Size

(Available for CPU 1 Configuration only)

Select Auto for the BIOS to automatically set the maximum payload value for a PCI-E device specified by to user to enhance system performance. The options are **Auto**, 128B, and 256B.

▶**Socket 0 PcieBr1D00F0 – Port 1A**
▶**Socket 0 PcieBr2D00F0 – Port 2A**
▶**Socket 0 PcieBr3D00F0 – Port 3A**
▶**Socket 0 PcieBr4D00F0 – MCP 0**
▶**Socket 0 PcieBr5D00F0 – MCP 1**

(Above available for CPU 1 Configuration only)

▶**Socket 1 PCI-E Br0D00F0 – Port 0**

▶**Socket 1 PcieBr1D00F0 – Port 1A**

▶**Socket 1 PcieBr2D00F0 – Port 2A**

▶**Socket 1 PcieBr3D00F0 – Port 3A**

▶**Socket 1 PcieBr4D00F0 – MCP 0**

▶**Socket 1 PcieBr5D00F0 – MCP 1**

(Above available for CPU 2 Configuration only)

PCI-E Port

The Auto mode (default) removes the EXP port if there is no device, or errors on that device, and the device is not HP capable.

Disable is use to disable the port and hid its CFG space.

The options are **Auto**, Disable, Enable.

Link Speed

This feature configures the link speed of a PCI-E this port. The options are:

Auto
Gen 1 (Generation 1) (2.5 GT/s)
Gen 2 (Generation 2) (5 GT/s)
Gen 3 (Generation 3) (8 GT/s)

The following information will also be displayed:

• PCI-E Port Link Status

• PCI-E Port Link Max

• PCI-E Port Link Speed

PCI-E Port Max (Maximum) **Payload Size**

Select Auto for the BIOS to automatically set the maximum payload value for a PCI-E device specified by to user to enhance system performance. The options are **Auto**, 128B, and 256B.

▶**IOAT Configuration**

Disable TPH

TPH (TLP Processing Hint) is used for data-tagging with a destination ID and a few important attributes. It can send critical data to a particular cache without writing through to memory. Select No in this item for TLP Processing Hint support, which will allow a "TPL request" to provide "hints" to help optimize the processing of each transaction occurred in the target memory space. The options are Yes and **No**.

Prioritize TPH

If TPH is not disabled, select Enable to prioritize the TPL requests. The options are Enable and **Disable**.

Relaxed Ordering

Select Enable to allow certain transactions to be processed and completed before other transactions that have already been enqueued. The options are **Disable** and Enable.

▶Intel® VT for Directed I/O (VT-d)

Intel® VT for Directed I/O (VT-d)

Select Enable to use Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

ACS Control

Select Enable to program Access Control Services (ACS) to Chipset PCI-E Root Port Bridges. Select Disable to program Access Control Services to all PCI-E Root Port Bridges. The options are Enable and **Disable**.

*If **Intel VT for Directed I/O** is enabled, the following settings are available.*

Interrupt Remapping

Select Enable for Interrupt Remapping support to enhance system performance. The options are **Enable** and Disable.

Pass Through DMA

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

ATS

Select Enable to enable ATS (Address Translation Services) support for the Non-Iscoh VT-d engine to enhance system performance. The options are **Enable** and Disable.

Posted Interrupt

Select Enable to support VT_D Posted Interrupt which will allow external interrupts to be sent directly from a direct-assigned device to a client machine in non-root mode to improve virtualization efficiency by simplifying interrupt migration and lessening the need of physical interrupts. The options are **Enable** and Disable.

Coherency Support (Non-Isoch)

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

II0-PCIE Express Global Options

PCIe Hot Plug

Select Enable to support Hot-plugging for the selected PCI-E slots which will allow the user to replace the devices installed in the slots without shutting down the system. The options are **Enable**, Disable, Auto, and Manual.

PCI-E Completion Timeout (Global)

Use this feature to enable PCI-E Completion Timeout support for electric tuning. The options are Yes, **No**, and Per-Port.

▶South Bridge

The following South Bridge information is displayed: USB Module Version, USB Devices

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable to have all USB devices available for EFI applications only. The options are **Enabled,** Disabled and Auto.

XHCI Hand-Off

This is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The options are Enabled and **Disabled**.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support, which in turn, will provide complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are **Enabled** and Disabled.

PCIe PLL SSC

Select Enabled for PCH PCI-E Spread Spectrum Clocking (SSC) support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are Enabled and **Disabled**.

Port 61h Bit-4 Emulation

Select Enabled for I/O Port 61h-Bit 4 emulation support to enhance system performance. The options are Enabled and **Disabled**.

Install Windows 7 USB Support

Select Enabled to install Windows 7 and the XHCI drivers for USB keyboard/mouse support. After you've installed the Windows 7 and XHCI drivers, be sure to set this feature to "Disabled" (default). The options are **Disabled** and Enabled.

▶Server ME (Management Engine) Configuration

This feature displays the following system ME configuration settings.

- Operational Firmware Version

- Backup Firmware Version

- Recovery Firmware Version

- ME Firmware Status #1/ME Firmware Status #2

  - Current State

  - Error Code

▶SATA Configuration

When this submenu is selected, the BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following items:

SATA Controller

This feature enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enable** and Disable.

Configure SATA as (Available when SATA Controller is enabled)

Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are **AHCI** and RAID. If this is set as RAID, the following two options appears.

SATA/sSATA RAID Boot Select

Select the boot capability for SATA and sSATA RAID controllers. The options are None, SATA Controller, **sSATA Controller**, and Both.

SATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are **Legacy**, EFI, and Disable.

SATA HDD Unlock (Available when SATA Controller is enabled)

Select Enable to unlock SATA HDD password in the OS. The options are **Enable** and Disable.

Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are Enable and **Disable**.

SATA Port 0 – SATA Port 7

Hot Plug

Select Enable to support Hot-plugging for the device installed on a selected SATA port which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Enable** and Disable.

Spin Up Device

On an edge detect from 0 to 1, set this item to allow the SATA device installed on the SATA port specified by the user to start a COMRESET initialization. The options are Enable and **Disable**.

SATA Device Type

Use this item to specify if the device installed on the SATA port selected by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶sSATA Configuration

When this submenu is selected, the BIOS automatically detects the presence of the sSATA devices that are supported by the Intel PCH chip and displays the following items:

sSATA Controller

This feature enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enable** and Disable.

Configure sSATA as (Available when SATA Controller is enabled)

Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are **AHCI** and RAID. If this is set as RAID, the following two options appears.

SATA/sSATA RAID Boot Select

Select the boot capability for SATA and sSATA RAID controllers. The options are None, SATA Controller, **sSATA Controller**, and Both.

sSATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are **Legacy**, EFI, and Disable.

SATA HDD Unlock (Available when SATA Controller is enabled)

Select Enable to unlock SATA HDD password in the OS. The options are **Enable** and Disable.

Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of

I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are Enable and **Disable**.

sSATA Port 0 – sSATA Port 7

Hot Plug

Select Enable to support Hot-plugging for the device installed on a selected SATA port which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Enable** and Disable.

Spin Up Device

On an edge detect from 0 to 1, set this item to allow the SATA device installed on the SATA port specified by the user to start a COMRESET initialization. The options are Enable and **Disable**.

SATA Device Type

Use this item to specify if the device installed on the SATA port selected by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶PCIe/PCI/PnP Configuration

The PCI Bus Driver Version is displayed:

PCI Devices Common Settings

Above 4G Decoding

(Available if the system supports 64-bit PCI decoding) Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are **Enabled** and Disabled.

SR-IOV Support

(Available if the system supports Single-Root Virtualization) Select Enabled for Single-Root IO Virtualization support. The options are Enabled and **Disabled.**

MMIO High Base

Use this feature to select the base memory size according to memory-address mapping for the IO hub. The base memory size must be between 4032G to 4078G. The options are **56T**, 48T, 24T, 16T, 4T, and 1T.

MMIO High Granularity Size

Use this feature to select the high memory size according to memory-address mapping for the IO hub. The options are 1G, 4G, 16G, 64G, 256G, and **1024G**.

PCI PERR/SERR Support

Select Enabled to log the runtime error event when a PERR (PCI/PCI-E Parity Error) error or an SERR (System Error) error has occurred to a PCI-E device. The options are Enabled and **Disabled**.

Maximum Read Request

Select Auto for the system BIOS to automatically set the maximum size for a read request for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

MMCFG Base

This feature determines the lowest MMCFG (Memory-Mapped Configuration) base assigned to PCI devices. The options are 1G, 1.5G, 1.75G. **2G**, 2.25G, and 3G.

VGA Priority

This feature selects the graphics device to be used as the primary video display for system boot. The options are Auto, **Onboard** and Offboard.

PCI Devices Option ROM Setting

RSC-G-A66 Upper PCI-E 3.0 X16 (for upper slot) and

RSC-G-A66 Lower PCI-E 3.0 X16 (for lower slot)

Select EFI to allow the user to boot the computer using an EFI (Expansible Firmware Interface) device installed on the PCI-E slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the PCI-E slot specified by the user. The options are Disabled, **Legacy** and EFI.

Onboard Video Option ROM

Use this feature to select the Onboard Video Option ROM type. The options are Disabled, **Legacy** and EFI.

Onboard LAN Device

To enable onboard LAN devices. The options are **Auto**, Disabled, and Enabled.

Onboard LAN Option ROM Type

Select the onboard LAN option ROM type. The options are **Legacy** and EFI.

Onboard LAN1 OPROM

Use this feature to select the type of device to be installed in LAN Port1 used for system boot. The options are **PXE**, iSCSI, and Disabled.

Onboard LAN2 OPROM

Use this feature to select the type of device to be installed in LAN Port2 used for system boot. The options are PXE and **Disabled**.

▶**Network Stack Configuration**

Network Stack

Select Enabled to enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are **Enabled** and Disabled.

If "Network Stack" is set to Enabled, the following items will display:

Ipv4 PXE Support

Select Enabled to enable Ipv4 PXE boot support. If this feature is disabled, it will not create the Ipv4 PXE boot option. The options are Disabled and **Enabled**.

Ipv4 HTTP Support

Select Enabled to enable Ipv4 HTTP boot support. If this feature is disabled, it will not create the Ipv4 HTTP boot option. The options are Enabled and **Disabled**.

Ipv6 PXE Support

Select Enabled to enable Ipv6 PXE boot support. If this feature is disabled, it will not create the Ipv6 PXE boot option. The options are Disabled and **Enabled**.

Ipv6 HTTP Support

Select Enabled to enable Ipv6 HTTP boot support. If this feature is disabled, it will not create the Ipv6 HTTP boot option. The options are Enabled and **Disabled**.

PXE Boot Wait Time

Use this feature to select the wait time to press the <ESC> key to abort the PXE boot. The default is **0**.

Media Detect Count

Use this feature to select the wait time in seconds for the BIOS ROM to detect the LAN media (Internet connection or LAN port). The default is **1**.

▶**Super IO Configuration**

Displays the Super IO Chip model and the following settings.

▶**Serial Port 1 Configuration**
▶**Serial Port 2 Configuration**

Serial Port (1 and 2)

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This feature displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. The options for Serial Port 1 are:

Auto
IO=3F8h; IRQ=4;
IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Serial Port

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled.

Serial Port 2 Attribute (Only for Serial Port 2)

Select SOL to use COM Port 2 as a Serial_Over_LAN (SOL) port for console redirection. The options are COM and **SOL**.

▶Serial Port Console Redirection

COM 1 Console Redirection

Select Enabled to enable COM Port 1 for Console Redirection, which will allow a client machine to be connected to a host machine at a remote site for networking. The options are Enabled and **Disabled**.

If the item above is set to Enabled, the following items become available for configuration:

▶Console Redirection Settings (for COM1)

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 (Bits) and **8 (Bits)**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled**.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When the option - Bootloader is selected, legacy Console Redirection is disabled before booting the OS. When the option-Always Enable is selected, legacy Console Redirection remains enabled upon OS bootup. The options are **Always Enable** and Bootloader.

COM2/SOL Console Redirection (

Select Enabled to use the SOL port for Console Redirection. The options are **Enabled** and Disabled.

If the item above is set to Enabled, the following items become available for configuration:

▶**Console Redirection Settings** (for COM2/SOL)

Use this feature to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 (Bits) and **8 (Bits)**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a

mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled**.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When this feature is set to Bootloader, legacy Console Redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy Console Redirection remains enabled upon OS boot. The options are **Always Enable** and Bootloader.

▶Legacy Console Redirection Settings

Legacy Serial Redirection Port

Select the COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are COM1 and **COM2/SOL**.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

Select Enabled to use a COM port selected by the user for EMS Console Redirection. The options are **Disabled** and Enabled.

If the item above is set to Enabled, the following items become available for configuration:

▶Console Redirection Settings (EMS)

Out-of-Band Management Port

The feature selects a serial port in a client server to be used by the Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and COM2/SOL.

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

Bits Per Second

This feature sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in both host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop data-sending when the receiving buffer is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

Data Bits, Parity, Stop Bits — The setting for each is displayed.

▶ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

NUMA Support (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are **Enabled** and Disabled.

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are **Enabled** and Disabled.

High Precision Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

▶Trusted Computing

(Available when a TPM device is detected and PTT Support under "Server ME Config" is not Enabled)

When a TPM (Trusted-Platform Module) device is detected in your machine, the following information will display.

- TPM2.0 Device Found
- Vendor
- Firmware Version

Security Device Support

If this feature and the TPM jumper (JPT1) are both enabled, the onboard security (TPM) device will be enabled in the BIOS to enhance data integrity and system security. Please note that the OS will not show the security device. Neither TCG EFI protocol nor INT1A interaction will be available for use. If you have made changes on the setting on this item, be sure to reboot the system for the change to take effect. The options are Disable and **Enable**. If this option is set to Enable, the following screen and items will display:

```
              Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
     Trusted Computing

                                                                    Enables or Disables BIOS
                                                                    support for security device.
        TPM20 Device Found                                          O.S. will not show Security
        Vendor: IFX                                                 Device. TCG EFI protocol and
        Firmware Version: 7.61                                      INT1A interface will not be
                                                                    available.
        Security Device Support         [Enable]
        Active PCR banks                SHA-1,SHA256
        Available PCR banks             SHA-1,SHA256


        Pending operation               [None]
        Platform Hierarchy              [Enabled]
        Storage Hierarchy               [Enabled]
        Endorsement Hierarchy           [Enabled]           →←: Select Screen
        PH Randomization                [Disabled]          ↑↓: Select Item
                                                            Enter: Select
     TXT Support                        [Disabled]          +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit



              Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

- Active PCR Banks
- Available PCR Banks

Pending Operation

Use this feature to schedule a TPM-related operation to be performed by a security (TPM) device at the next system boot to enhance system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **None** and TPM Clear.

Note: Your system will reboot to carry out a pending TPM operation.

Platform Hierarchy (for TPM Version 2.0 and above)

Select Enabled for TPM Platform Hierarchy support which will allow the manufacturer to utilize the cryptographic algorithm to define a constant key or a fixed set of keys to be used for initial system boot. This early boot code is shipped with the platform and is included in the list of "public keys". During system boot, the platform firmware uses this trusted public key to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via a TPM device. The options are **Enabled** and Disabled.

Storage Hierarchy

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by the platform owner such as an IT professional or the end user. Storage Hierarchy has an owner policy and an authorization value, both of which can be set and are held constant (-rarely changed) through reboots. This hierarchy can be cleared or changed independently of the other hierarchies. The options are **Enabled** and Disabled.

Endorsement Hierarchy

Select Enabled for Endorsement Hierarchy support, which provides separate controls to address the user's privacy concerns because the primary keys in this hierarchy are certified by the TPM or a manufacturer to be used only in an authentic TPM device that is attached to an authentic platform. A primary key can be an encrypted, and a certificate can be created using TPM2_ ActivateCredential. It allows the user to independently enable "flag, policy, and authorization value" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications and permitting the platform software to use the TPM. The options are **Enabled** and Disabled.

PH (Platform Hierarchy) Randomization (for TPM Version 2.0 and above)

Select Enabled for Platform Hierarchy Randomization support, which is used only during the platform developmental stage. This feature cannot be enabled in the production platforms. The options are **Disabled** and Enabled.

TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system security and data integrity. The options are **Disabled** and Enabled.

Note 1: If the option for this item (TXT Support) is set to Enabled, be sure to disable EV DFX (Device Function On-Hide) support for the system to work properly. (EV DFX is under "IIO Configuration" in the "Chipset/North Bridge" submenu).

Note 2: For more information on TPM, please refer to the TPM manual at http://www.supermicro.com/manuals/other.

▶Intel® Virtual RAID on CPU

When this submenu is selected and the RAID devices are detected, the BIOS screen displays the following items:

Intel® VROC with VMD Technology 5.3.0.1052

6.4 Event Logs

Use this tab page to configure Event Log settings.

```
                 Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main   Advanced   Event Logs   IPMI   Security   Boot   Save & Exit

 ▶ Change Smbios Event Log Settings                       Press <Enter> to change the
 ▶ View Smbios Event Log                                  Smbios Event Log configuration.




                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



                 Version 2.19.1268. Copyright (C) 2019 American Megatrends, Inc.
```

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

Erasing Settings (can be changed when Smbios Event Log is enabled)

Erase Event Log

Select Enabled to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are **No**, Yes, Next Reset, and Yes, Next Reset.

When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings (can be changed when Smbios Event Log is enabled)

Log System Boot Event

Select Enabled to log system boot events. The options are Enabled and **Disabled**.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

Specify how long the multiple event counter should wait before generating a new event log. Enter a number between 0 to 99 (minutes). The default setting is **60**.

Note: Reboot the system for the changes to take effect.

▶View SMBIOS Event Log

This item allows the user to view the event in the system event log. Select this feature and press <Enter> to view the status of an event in the log. The following categories are displayed Date/Time/Error Code/Severity

6.5 IPMI

Use this tab page to configure Intelligent Platform Management Interface (IPMI) settings.

```
                  Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

     IPMI Firmware Revision          1.04            Configure BMC network
     Status Of BMC                   Working         parameters

   ▶ System Event Log
   ▶ BMC Network Configuration



                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit


                  Version 2.19.1268. Copyright (C) 2019 American Megatrends, Inc.
```

The following items will be displayed:

- IPMI Firmware Revision: This feature indicates the firmware revision of the BMC (Baseboard Management Controller) used in your system.

- BMC Status: This feature indicates IPMI status of your system.

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at bootup. The options are **Enabled** and Disabled.

Erasing Settings (can be changed when SEL Components is enabled)

Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot. Select Yes, On every reset to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No,** Yes, On next reset, and Yes, On every reset.

When SEL is Full

This feature allows the user to specify what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

Note: Reboot the system for the changes to take effect.

▶BMC Network Configuration

The current configuration is displayed.

- IPMI LAN Selection
- IPMI Network Link Status
- Current Configuration Address Source
- Station IP Address
- Subnet Mask
- Station MAC Address
- Gateway IP Address:
- VLAN

Update IPMI LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes at the next system boot. The options are **No** and Yes.

If the item above is set to Yes, the following items become available for configuration:

IPMI LAN Selection

Use this feature to select the type of the IPMI LAN. The options are Dedicated, Shared, and **Failover**.

VLAN

Select Enabled for IPMI VLAN support. The options are **Disabled** and Enabled.

If the item above is set to Enabled, the following item become available for configuration:

VLAN

Select a VLAN ID (0–4093). If set to 0, VLAN is disabled.

Configuration Address Source

Use this feature to select the IP address source for this computer. The options are **DHCP** and Static.

If DHCP is selected, BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server attached to the network and request the next available IP address for this computer.

When **Static** is selected, the user must manually enter the following values.

- Station IP Address

- Subnet Mask

- Gateway IP Address

6.6 Security

Use this tab page to configure Security settings.

```
             Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Event Logs  IPMI   Security   Boot  Save & Exit

  Password Description                                    Customizable Secure Boot
                                                          settings
  If ONLY the Administrator's password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length                    3
  Maximum length                    20
                                                       →←: Select Screen
                                                       ↑↓: Select Item
  Administrator Password                               Enter: Select
  User Password                                        +/-: Change Opt.
  Password Check                   [Setup]             F1: General Help
                                                       F2: Previous Values
▶ Secure Boot                                          F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

Administrator Password

Use this feature to set the administrator password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this feature to set the user password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup or upon entering the BIOS Setup utility. The options are **Setup** and Always.

▶Secure Boot

The following items are displayed:

- System Mode
- Secure Boot
- Vendor Keys

Attempt Secure Boot

If this feature is set to Enabled, Secure Boot will be activated when a Platform Key (PK) is entered. A Platform Key is a security key used to manage the security settings of the platform firmware used in your system. The options are Enabled and **Disabled.**

Secure Boot Mode

Use this feature to select the desired secure boot mode for the system. The options are Standard and **Custom**.

CSM Support

Select Enabled to enable Compatibility Service Module (CMS) which will support Legacy BIOS through UEFI to enhance system performance. The options are **Enabled** and Disabled

▶**Key Management**

Provision Factory Default Keys

Select Enabled to install all manufacturer default keys to configure the following system security settings. The options are Enabled and **Disabled**.

▶**Install Factor Default keys**

Select Yes to install all manufacturer defaults to configure the following system security settings. The options are **Yes** and No.

▶**Enroll Efi Image**

Select this item and press <Enter> to select an EFI (Extensible Firmware Interface) image for the system to operate in Secure Boot mode.

▶**Save All Secure Boot Variables**

This feature allows the user to set and save the secure boot key variables specified by the user with the following items.

Set Boot variables

▶**Platform Key (PK)**

This feature allows the user to enter and configure a set of values to be used as a platform firmware key for the system. This set of values also indicate the size, the keys numbers, and the key source of the Platform Key. The options are **Save to File**, Set New, and Erase.

▶Key Exchange Keys

This feature allows the user to enter and configure a set of values to be used as a Key-Exchange-Keys for the system. This set of values also indicate the size, the keys numbers, and the key source of the Key-Exchange-Keys. The options are **Save to File**, Set New, and Erase.

▶Authorized Signatures

This feature allows the user to enter and configure a set of values to be used as Authorized Signatures for the system. These values also indicate the size, the keys numbers, and the key source of the Authorized Signatures. The options are **Set New** and Append.

Secure Boot Variable/Size/Key#/Key Sources The options are **Save to File**, Set New, and Erase.

▶Forbidden Signatures

This feature allows the user to enter and configure a set of values to be used as Forbidden Signatures for the system. These values also indicate the size, the keys numbers, and the key source of the Forbidden Signatures. The options are **Save to File**, Set New, and Erase.

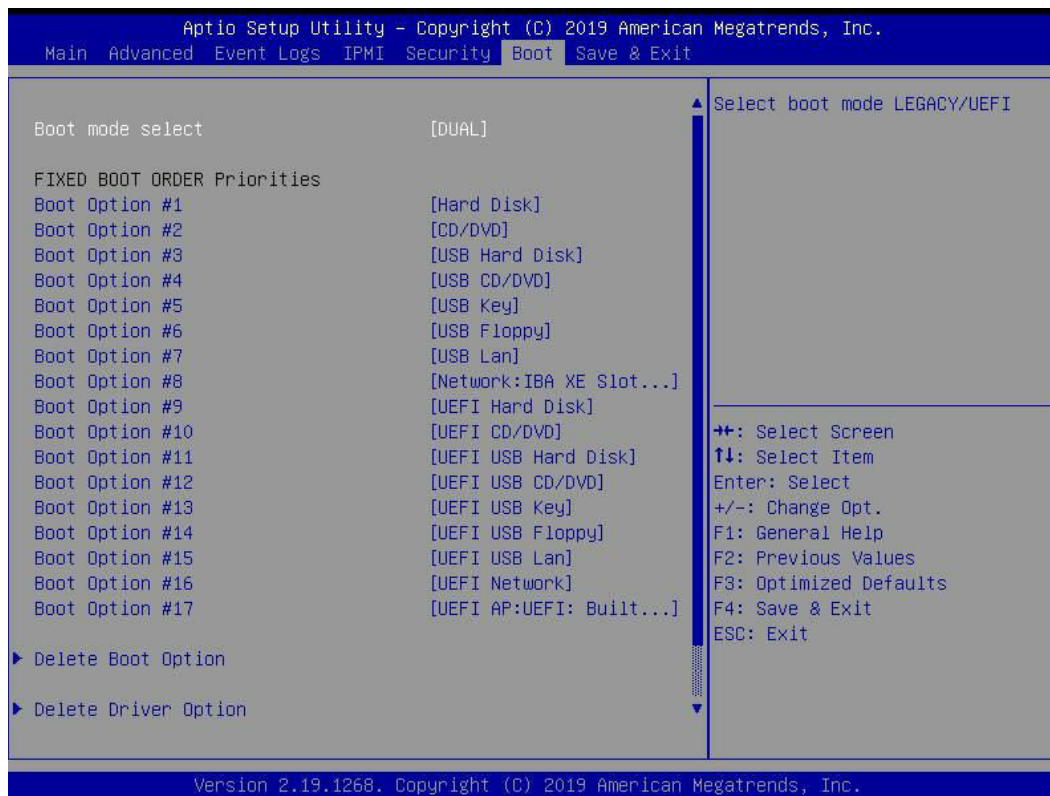### ▶Authorized TimeStamps

This feature allows the user to set and save the timestamps for Authorized Signatures to indicate when these signatures were entered into the system. The options are **Save to File**, Set New, and Erase.

▶OsRecovery Signatures

This feature allows the user to set and save the Authorized Signatures used for OS recovery. The options are **Save to File**, Set New, and Erase.

6.7 Boot

Use this tab page to configure Boot Settings.

```
         Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                              ▲  Select boot mode LEGACY/UEFI
  Boot mode select                 [DUAL]

  FIXED BOOT ORDER Priorities
  Boot Option #1                   [Hard Disk]
  Boot Option #2                   [CD/DVD]
  Boot Option #3                   [USB Hard Disk]
  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:IBA XE Slot...]
  Boot Option #9                   [UEFI Hard Disk]
  Boot Option #10                  [UEFI CD/DVD]             ↔: Select Screen
  Boot Option #11                  [UEFI USB Hard Disk]      ↑↓: Select Item
  Boot Option #12                  [UEFI USB CD/DVD]         Enter: Select
  Boot Option #13                  [UEFI USB Key]            +/-: Change Opt.
  Boot Option #14                  [UEFI USB Floppy]         F1: General Help
  Boot Option #15                  [UEFI USB Lan]            F2: Previous Values
  Boot Option #16                  [UEFI Network]            F3: Optimized Defaults
  Boot Option #17                  [UEFI AP:UEFI: Built...]  F4: Save & Exit
                                                             ESC: Exit
 ▶ Delete Boot Option

 ▶ Delete Driver Option                              ▼

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```

Boot Mode Select

Use this feature to select the type of devices to be used for system boot. The options are Legacy, UEFI (Unified Extensible Firmware Interface), and **Dual.**

Fixed Boot Order Priorities

This feature prioritizes the order of a bootable device from which the system will boot from the top of the list to the bottom. Select each entry choose a boot device. When Boot Mode Select is set to Legacy or UEFI, only those items are displayed.

▶Delete Boot Option

Use this feature to select a boot device to delete from the boot priority list.

Delete Boot Option

Use this feature to remove an EFI boot option from the boot priority list or choose UEFI: Built-in EFI Shell.

▶Delete Driver Option

Use this item to select a boot driver to delete from the boot priority list.

Delete Drive Option

Select the target boot driver to delete from the boot priority list.

▶UEFI Application Boot Priorities

Boot Option #1

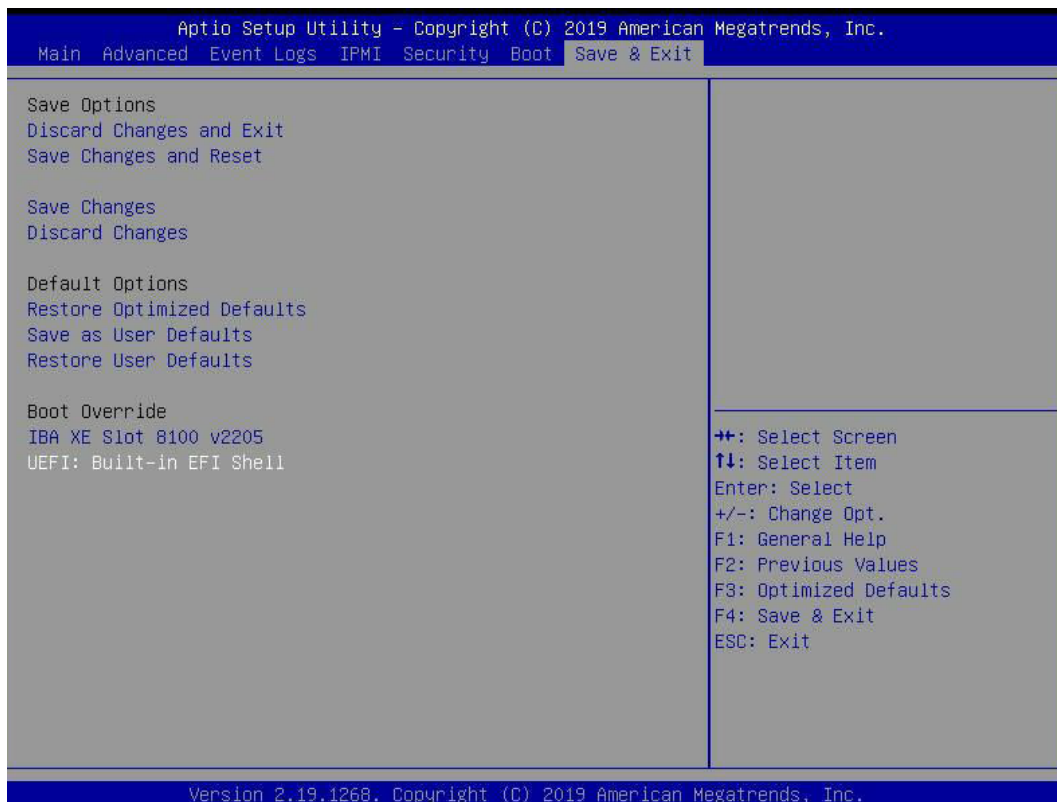Choose **UEFI: Built-in EFI Shell** or Disabled.

▶Network Drive BBS Priorities

Boot Option #1

Choose **IBA XE Slot 8100 v2205** or Disabled.

6.8 Save & Exit

Use this tab page to configure Save & Exit settings.

```
             Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

    Save Options
    Discard Changes and Exit
    Save Changes and Reset

    Save Changes
    Discard Changes

    Default Options
    Restore Optimized Defaults
    Save as User Defaults
    Restore User Defaults

    Boot Override
    IBA XE Slot 8100 v2205                          →←: Select Screen
    UEFI: Built-in EFI Shell                        ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


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```

Save Options

Discard Changes and Exit

Select this option to quit the BIOS setup without making any permanent changes to the system configuration and reboot the computer. Select and press <Enter>.

Save Changes and Reset

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect. Select and press <Enter>.

Save Changes

When you have completed the system configuration changes, select this option to save all changes made. This will not reboot the system.

Discard Changes

To discard all changes and stay in the BIOS setup utility, select and press <Enter> .

Default Options

Restore Optimized Defaults

To load manufacturer default settings which are intended for maximum system performance but not for maximum stability, select and press <Enter>.

Save As User Defaults

To enable the user to save any changes to the BIOS setup for future use, select and press <Enter>.

Restore User Defaults

To retrieve user-defined settings that were saved previously, select and press <Enter>.

Boot Override

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified by the user instead of the one specified in the boot list. This is a one-time override.

IBA XE Slot 8100 v2205

UEFI: Built-in EFI Shell

Appendix A

BIOS Error Codes

A.1BIOS Error Beep (POST) Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The table below lists some common errors and their corresponding beep codes encountered by users.

BIOS Error Beep (POST) Codes		
Beep Code	**Error Message**	**Description**
1 short	Refresh	Circuits have been reset (Ready to power up)
5 short, 1 long	Memory error	No memory detected in system
5 long, 2 short	Display memory read/write error	Video adapter missing or with faulty memory
1 long continuous	System OH	System overheat condition

A.2Additional BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at http://www.supermicro.com/support/manuals/ ("AMI BIOS POST Codes User's Guide").

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, a diagnostic card can be attached to the computer to read I/O port 0080h (Supermicro p/n AOC-LPC80-20).

For information on AMI updates, please refer to http://www.ami.com/products/.

Appendix B

Standardized Warning Statements for AC Systems

About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our website at http://www.supermicro.com/about/policies/safety_information.cfm.

Warning Definition

Warning! This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、

電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

Warnung

WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

הצהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

ا كَ ف حالة وُكي أى تتسبب ف اصابة جسذ ةُ هذا الزهز عٌ خطز !تحذ زٌ .

قبل أى تعول على أي هعذات،كي على علن بالوخاطز ال اُجوة عي الذوائز
الكهزبائٔ ةٍ

وكي على درا ةُ بالووارسات النقائٔ ةٍ لو عٌ وقع أي حادث

استخذم رقن الب إى الو صُص ف هًا ةُ كل تحذ زٌ للعشر تزجوتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는
상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된
위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기
바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel
kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn
van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de
standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van
elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

Installation Instructions

Warning! Read the installation instructions before connecting the system to the power
source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告
将此系统连接电源前,请先阅读安装说明。

警告
將系統與電源連接前，請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

Circuit Breaker

Warning! This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡（過電流）保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

警告

此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250VDC, 20A

هذا المنتج يعتمد على معداث الحمايت مه الدوائرالقصيرة التي تم تثبيتها في المبنى
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

경고!
이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw electrische installatie. Controleer of het beveiligde aparaat niet groter gedimensioneerd is dan 250V, 20A.

Power Disconnection Warning

Warning! The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.

電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシー内部にアクセスするには、システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de systéme.

אזהרה מפני ניתוק חשמלי

אזהרה!

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק

לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل اننظاو من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد
انطاقت قبم
انصل إنى امناطق انداخهيت نههيكم نتثبيج أو إزانت مكناث الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 섀시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

Equipment Installation

Warning! Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

警告
只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告
只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاس يجب أن يسمح فقط للمظفيه المؤهليه

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

Restricted Area

 Warning! This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

警告
此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

警告
此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת

כלי אבטחה בלבד)מפתח, מנעול וכד.('

تخصيص هذه انحذة نترك بُها ف مناطق محظورة تم .

،مَكن اننصبل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت

أو أ وس هُت أخري نلالأمما قفم ومفتاح

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

Battery Handling

Warning! There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل

اسحبذال البطارية

فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Redundant Power Supplies

Warning! This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告
此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告
此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein trom zugeführt wird, müssen alle Verbindungen entfernt werden.

¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה!

ליחדה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة .

يجب إزالة كافة الاتصالات لعسل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

Backplane Voltage

Warning! Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際には注意ください。

警告
当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告
當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי
אזהרה!
קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך
העבודה.

هناك خطز مه التيار الكهزبائي أوالطاقة المجددة على اللحة
عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاس

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다. 서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

Comply with Local and National Electrical Codes

 Warning! Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقاويه المحلية والطية المتعلقة بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

Product Disposal

Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية عند

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Hot Swap Fan Warning

WARNING
Hazardous moving parts.
Keep away from moving fan blades.

Warning! Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

ファン・ホットスワップの警告

警告!回転部品に注意。運転中は回転部(羽根)に触れないでください。シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告!
警告！危险的可移动性零件。请务必与转动的风扇叶片保持距离。 当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

警告
危险的可移动性零件。請務必與轉動的風扇葉片保持距離。 當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

Warnung

Gefährlich Bewegende Teile. Von den bewegenden Lüfterblätter fern halten. Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

¡Advertencia!

Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Pieces mobiles dangereuses. Se tenir a l'ecart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

אזהרה!

חלקים נעים מסוכנים. התרחק מלהבי המאוורר בפעולהכאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء متحركة خطرة. ابتعد عن شفرات المروحة المتحركة.من الممكن أن المراوح لا تزال تدورعند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة.

경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 섀시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

Waarschuwing

Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

Power Cable and AC Adapter

Warning! When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the cord) for any other electrical devices than products designated by Supermicro only.

電源コードとACアダプター

製品を設置する場合、提供または指定および購入された接続ケーブル、電源コードとACアダプターを 該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。

電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)を Supermicro が指定する製品以外に使用することを禁止しています。

警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器，包含遵照当地法规和安全要求的合规的电源线尺寸和插头.使用其它线材或适配器可能会引起故障或火灾。
除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止
使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安裝此產品時,請使用本身提供的或指定的或採購的連接線,電源線和電源適配器，包含遵照當地法規和安全要求的合規的電源線尺寸和插頭.使用其它線材或適配器可能會引起故障或火災。
除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止
使用未經UL或CSA認證的線材。 (線材上會顯示UL/CSA符號)。

Warnung

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/oder Adapater, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adapter können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.

¡Advertencia!

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) para cualquier otros dispositivos eléctricos que los productos designados únicamente por Supermicro.

Attention

Lors de l'installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de securite y compris les tailles de cables et les prises electriques appropries. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifies- UL ou CSA (qui ont UL ou CSA indiqué sur le code) pour tous les autres appareils électriques sauf les produits désignés par Supermicro seulement.

כבלים חשמליים ומתאמי AC

אזהרה!

כאשר מתקינה את המוצר, שי להשתמש בכבלים, ספקים ומתאמים AC אשר נרכשו או שהותאמו לצורך
שימוש בכך . עקתהו לבכה לש הנוכנ הדימ ללוכ, תוימוקמה תוחיטבה תושירדל ומאתוה רשאו ,הנקתהה
לש לבכ וא םאתמ גוסמ רחא ,לולו לורגל הלקתל רצק וא .ןלמשח םאתהב לחוקי השימושה ירישכמב הומחשמל
וחוקי הביטחות, קייק איסור להשתמש בכבלים מוסמכים ב- UL או ב-CSA (כאשר רשא עיפומ הליעה דוק לש
(UL/CSA רובל ךל רצומ ילמשח רחא, אלא קר רצומב רשא הותאמ ע"י Supermicro בלבד.

عند تركيب المنتج، قم باستخدام التوصيلات الموفرة أو المتوفرة أو المحددة قم أو بشراء الكابلات
الكهربائية ومحولات التيار المتردد مع متطلبات الالتزام بقوانين ومتطلبات السلامة المحلية بما في ذلك
حجم الموصل والقابس السليم. استخدام أي كابلات أخرى ومحولات قد يتسبب في عطل أو حريق.
يحظر قانون السلامة للأجهزة الكهربائية واستخدام المعدات استخدام الكابلات المعتمدة من قبل UL وأ CSA
والتي تحمل علامة (UL/CSA) مع أي معدات أخرى غير المنتجات المعينة والمحددة من قبل .Supermicro

전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굵기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블)을 Supermicro 가 지정한 제품 이외의 전기 장치에 사용하는 것을 금지합니다.

Stroomkabel en AC-Adapter

Waarschuwing! Bij het aansluiten van het Product uitsluitend gebruik maken van de geleverde Kabels of een andere geschikte aan te schaffen Aansluitmethode, deze moet altijd voldoen aan de lokale voorschriften en veiligheidsnormen, inclusief de juiste kabeldikte en stekker. Het gebruik van niet geschikte Kabels en/of Adapters kan een storing of brand veroorzaken. Wetgeving voor Elektrische apparatuur en Materiaalveiligheid verbied het gebruik van UL of CSA -gecertificeerde Kabels (met UL/CSA in de code) voor elke andere toepassing dan de door Supermicro hiervoor beoogde Producten.

Appendix C

System Specifications

Processors

Dual Intel Xeon Scalable processors (non-Fabric model only) in a Socket P0-LGA3647

Chipset

Intel C621

BIOS

64 MB SPI AMI BIOS SM Flash UEFI BIOS

Memory

Supports up to 3 TB of DDR4 3DS ECC RDIMM, LRDIMM, in 24 DIMM slots; up to 2666MHz

SATA Controller

On-chip (Intel C621) controller

Storage Drives

Sixteen NVMe 2.5" hot-swap drive bays (front), and six SATA 2.5" hot-swap drive bays (rear)
Two M.2 solid-state storage cards, 2280 and 22110 form factors

Expansion Slots

Sixteen GPU, sixteen x16 slots from switch nodes and two x16 from CPU node

Motherboard

X11DPG-HGX2;

Chassis

SC1018G-R12K; 10U Rackmount, (WxHxD) 17.2 x 17.5 x 27.6 in (437 x 445 x 701 mm)

System Cooling

Eight 9-cm fans, six 8-cm fans, temperature-controlled by IPMI
Two CPU heatsinks
One air shroud to optimize air flow

Input/Output

LAN: Two 10 Gb network ports, one dedicated port for IPMI
USB: Two USB 3.0 ports
One VGA port

Power Supply

Model: PWS-3K01G-1R, six (5+1) 80Plus Titanium level; the rack or power supply system must provide at least 80 A
Total Output Power:
   2883 W with input 200-207 Vac
   3000 W with input 208-240 Vac
Rated Input Frequency: 50-60 Hz
Output:
   +12 Max 53.4 A and Min 0.3 A (200-207 Vac); Max 535.6 A and min 0.3 A (208-240 Vac);
   12Vsb Max 3 A and Min 0 A

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 60º C (-40º to 140º F)
Operating Relative Humidity: 10% to 85% (non-condensing)
Non-operating Relative Humidity: 10% to 90% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Part 15 Subpart B, Class A, EN 55032 Class A, EN 61000-3-2/3-3, CISPR 32 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Other: VCCI-CISPR 32 and AS/NZS CISPR 32

Environmental: Directive 2011/65/EU and Delegated Directive (EU) 2015/863 and Directive 2012/19/EU

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

Perchlorate Warning

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

Appendix D

UEFI BIOS Recovery

Warning: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you do update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

D.1 Overview

The Unified Extensible Firmware Interface (UEFI) provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism that will allow the UEFI OS loader stored in an add-on card to boot the system. The UEFI offers clean, hands-off management to a computer during system boot.

D.2 Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is turned on, the recovery block codes execute first. Once this process is complete, the main BIOS code will continue with system initialization and the remaining POST (Power-On Self-Test) routines.

Note 1: Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS block crashes.

Note 2: When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (For a RMA request, please see section 3.5 for more information). Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (OOB) (https://www.supermicro.com.tw/products/nfo/SMS_SUM.cfm) to reflash the BIOS.

D.3 Recovering the Main BIOS Block with a USB Device

This feature allows the user to recover the main BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by the recovery block is FAT (including FAT12, FAT16, and FAT32) which is installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the Root "\" directory of a USB device or a writable CD/DVD.

   Note 1: If you cannot locate the "Super.ROM" file in your drive disk, visit our website at www.supermicro.com to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

   Note 2: Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.
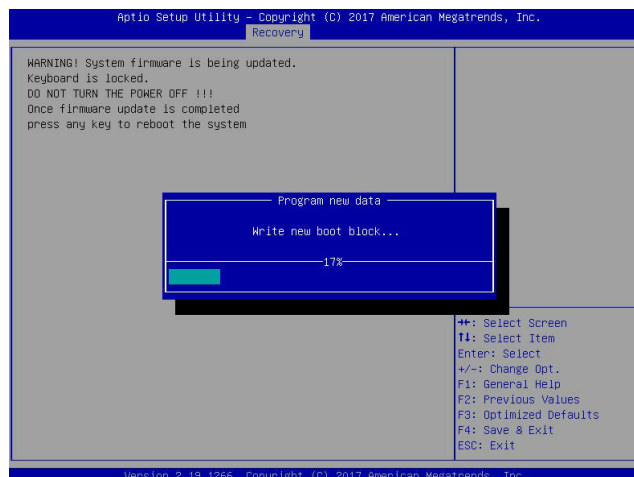
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

```
                 Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
      Main  Advanced  Event Logs  IPMI  Recovery  Security  Boot  Save & Exit

      Please select blocks you want to update        Set this option to reset
      Reset NVRAM                       [Enabled]     NVRAM to default values
      Boot Block Update                 [Enabled]

    ▶ Proceed with flash update




                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

                 Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

Note: At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.

Note: *Do not interrupt the BIOS flashing process until it has completed*.

```
                 Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                                         Recovery

      WARNING! System firmware is being updated.
      Keyboard is locked.
      DO NOT TURN THE POWER OFF !!!
      Once firmware update is completed
      press any key to reboot the system


                   ┌──────────── Program new data ────────────┐
                   │                                          │
                   │         Write new boot block...          │
                   │                                          │
                   │──────────────17%──────────────          │
                   │ ████                                     │
                   └──────────────────────────────────────────┘
                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

                 Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

5. After the BIOS recovery process is complete, press any key to reboot the system.
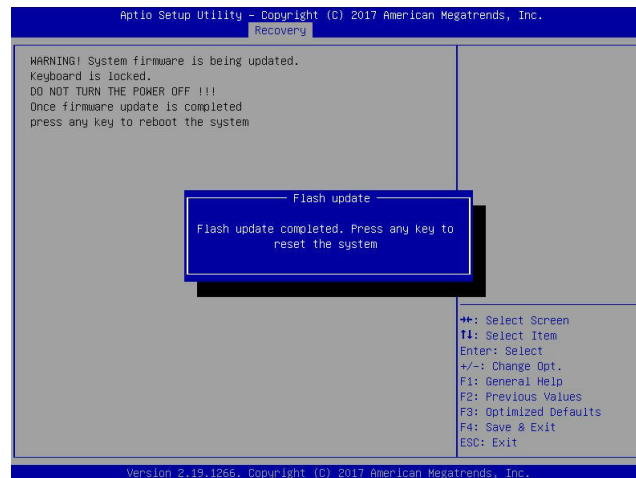
6. Using a different system, extract the BIOS package into a USB flash drive.

7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.
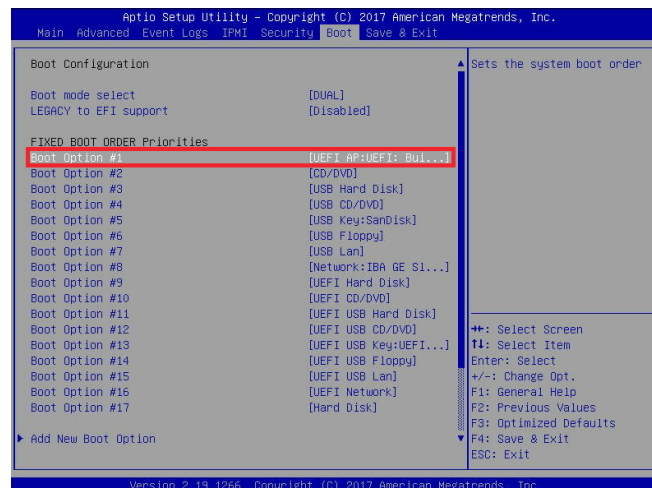
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.

Note: *Do not interrupt this process* until the BIOS flashing is complete.

9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.

10. Press <Del> continuously to enter the BIOS Setup utility.

11. Press <F3> to load the default settings.

12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.
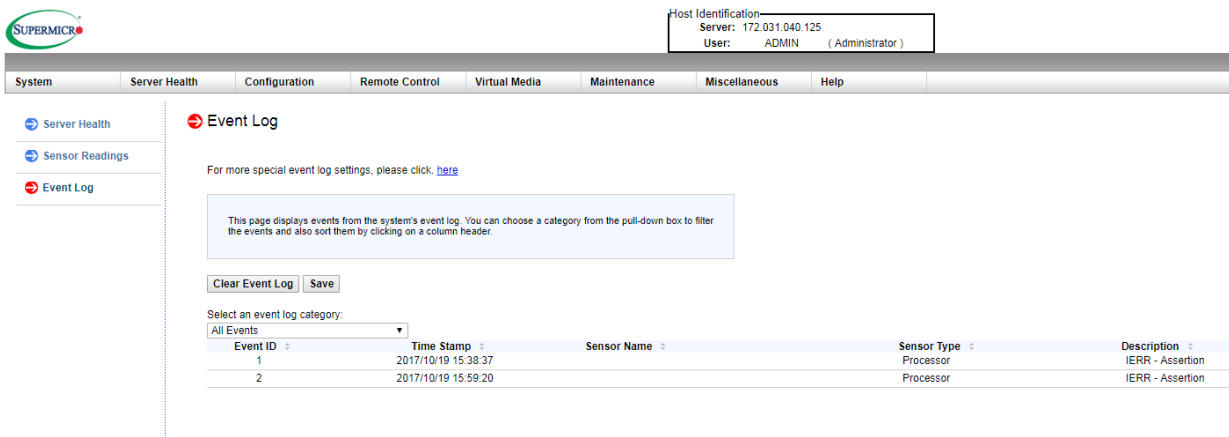
Appendix E

Crash Dump Using IPMI

In the event of a processor internal error (IERR) that crashes your system, you may want to provide information to support staff. For this purpose you can download a crash dump of status information using IPMI. The IPMI manual is available at https://www.supermicro.com/solutions/IPMI.cfm.

Check IPMI Error Log

1. Access the IPMI web interface.

2. Click the **Server Health** tab, then **Event Log** to verify an IERR error has occurred.

Figure E-1. IPMI Event Log

In the event of an IERR, the BMC executes a crash dump. You must download the crash dump and save it.

Downloading the Crash Dump File

1. In the IPMI interface, click the **Miscellanous** tab, then the **Trouble Shooting** option.

2. Click the **Dump** button and wait five minutes for the file to be created. (No confirmation message will appear.)

3. Click the **Download** button and a Save As dialog appears.

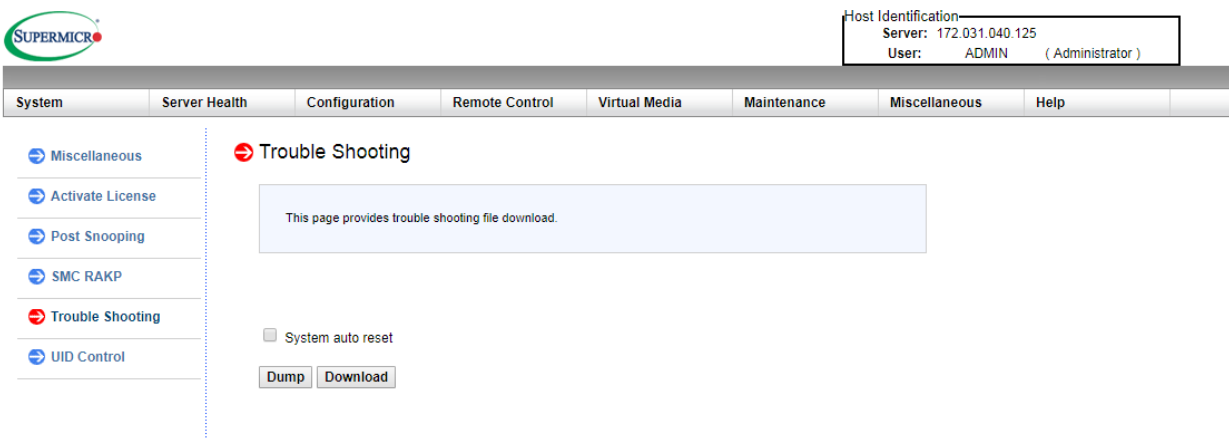4. Save the zipped dump file, noting the name and location.

Figure E-2. IPMI Crash Dump Download

Note: The **System auto reset** check box dictates behavior after an IERR. If checked, the system will restart automatically, and the dump file will be erased. If not, the system remains in a failed state. Do not check this box until after the dump file has been sent to Support.

Appendix F

CPU-Based RAID for NVMe

Intel® Virtual RAID on CPU (Intel VROC) is an enterprise RAID solution for NVMe SSDs directly attached to Intel Xeon Scalable processors. Intel Volume Management Device (VMD) is an integrated controller inside the CPU PCIe root complex.

* A single processor supports up to 12 NVMe SSDs and up to 6 RAID arrays.

* A dual processor system supports up to 24 NVMe SSDs and 12 RAID arrays.

Strip sizes are 4K, 8K, 16K, 32K, 64K, 128K.

Requirements and Restrictions

* **Intel VROC is only available when the system is configured for UEFI boot mode.**

* To enable the **mdadm** command and support for RSTe, install the patch from

    * Linux: https://downloadcenter.intel.com/download/28158/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Linux-

    * Windows: https://downloadcenter.intel.com/download/28108/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Windows-

* To enable Intel VROC, a hardware key must be inserted on the motherboard, and the appropriate processor's Virtual Management Devices must be enabled in the BIOS setup.

* It is possible to enable Intel VROC without a hardware key installed, but only RAID0 will be enabled.

* Intel VROC is not compatible with secure boot. This feature must be disabled.

* When creating bootable OS RAID1 devices, you must have both devices on the same CPU, and a VMD on that CPU.

* Spanning drives when creating RAID devices is not recommended to due to performance issues, even though it is supported.

Supported SSDs and Operating Sytems

To see the latest support information: https://www.intel.com/content/www/us/en/support/articles/000030310/memory-and-storage/ssd-software.html

Additional Information

Additional information is available on the product page for the Supermicro add-on card and the linked manuals.

www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm

F.1 Hardware Key

The Intel VROC hardware key is a license key that detects the Intel VROC SKU and activates the function accordingly. The key must be plugged into the Supermicro motherboard (connector JRK1). The key options are:

Intel® VROC Keys			
VROC Package	Description	Part Number	Intel MM Number
Standard	RAID 0, 1, 10 Supports 3rd party SSDs	AOC-VROCSTNMOD	951605
Premium	RAID 0, 1, 5, 10 Supports 3rd party SSDs	AOC-VROCPREMOD	951606
Intel SSD only	RAID 0, 1, 5, 10 Supports Intel SSDs only	AOC-VROCINTMOD	956822

Figure F-1. Intel® VROC RAID Key and Motherboard Connector JRK1

F.2 Enabling NVMe RAID

RAID for NVMe SSDs must be enabled through the UEFI BIOS.

1. Install the patch as described in the Restrictions and Requirements section on a previous page.

2. Reboot the server.

3. Press [DEL] key to enter BIOS.

4. Switch to **Advanced > Chipset Configuration > North Bridge > IIO Configuration > Intel® VMD Technology > CPU1 & CPU2**.

5. **Enable** the VMD according to the following rules.

   - For M.2 NVMe or NVMe AIC, enable the VMD according to which AOC card/slot it used.
   - For U.2 NVMe, enable all the sub-items under each PStack, based on the your model server:

VMD BIOS Setting for 9029GP-TNVRT	
CPU1	**CPU2**
VMD Config for PStack0	VMD Config for PStack1

An example U.2 configuration follows.

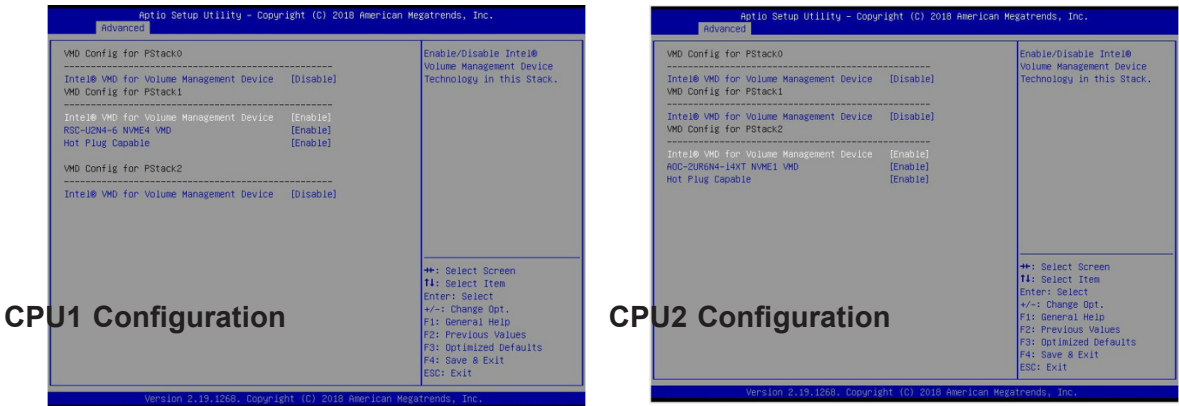**CPU1 Configuration**   **CPU2 Configuration**

Figure F-2. BIOS VMD Setting Example for 24 Drives

6. Press [F4] to save the configuration and reboot the system.

7. Press [DEL] to enter BIOS.

8. Switch to **Advanced > Intel® Virtual RAID on CPU > All Intel VMD Controllers > Create RAID Volume**.

9. Set **Name**.

10. Set **RAID Level**.

11. If cross-controller RAID is required, select **Enable RAID spanned over VMD Controller** as shown in Figure F-4.
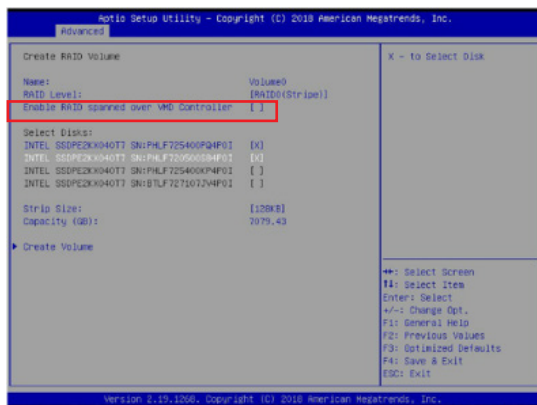

Figure F-3. Created Volume *without* enabling RAID spanned over VMD controller
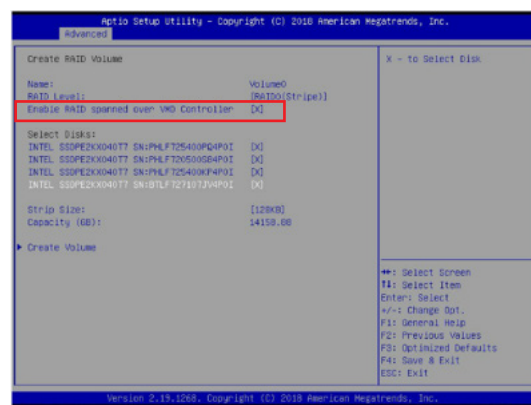

Figure F-4. Created Volume *with* enabling RAID spanned over VMD controller

12. Select specific disks for RAID with an [X].

- RAID0: Select at least two [2 - 24] disks
- RAID1: Select only two disks
- RAID5: Select at least three [3 - 24] disks
- RAID10: Select only four disks

13. Select **Strip Size** (Default 64KB).

14. Select **Create Volume**.

15. If another RAID is needed, start again at step 6.

16. Press [F4] to save and reboot.

F.3 Status Indications

An LED indicator on the drive carrier shows the RAID status of the drive.

Drive Carrier Status LED Indicator	
Status	**State (red)**
Normal function	Off
Locating	4 Hz blink
Fault	Solid on
Rebuilding	1 Hz Blink

IBPI SFF 8489 Defined Status LED States

F.4 Hot Swap Drives

Intel VMD enables hot-plug and hot-unplug for NVMe SSDs, whether from Intel or other manufacturers. Under vSphere ESXi, several steps are necessary to avoid potential stability issues. See the information at link [1] below.

Hot-unplug

1. Prevent devices from being re-detected during rescan:

```
esxcli storage core claiming autoclaim --enabled=false
```

2. Unmount the VMFS volumes on the device. Check [2] for details.

3. Detach the device. Check [3] for details.

4. Physically remove the device.

Hot-plug

• Physically install the device.

ESXi will automatically discover NVMe SSDs, but a manual scan may be required in some cases.

Related Information Links

[1] https://kb.vmware.com/s/article/2151404

[2] https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-1B56EF97-F60E-4F21-82A7-8F2A7294604D.html

[3] https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-F2E75F67-740B-4406-9F0C-A2D99A698F2A.html