



Mona 1U servers Range  
User Manual  
*Powered by AMD Processors*

## Applicable Model

Model	Maintenance	Cooling
BRB-MA1-112GG-R0XX	Rear access	Air cooling
BRB-MA1-144GG-R0XX	Rear access	Air cooling

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Global Service Hotline:	+33 (0) 3 68 41 10 60
Address:	32 Rue Jacobi-Netter, 67200 Strasbourg, France
Email:	support@2crsi.com



# Preface

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## Abstract

This white paper describes the Mona 1.12GG and Mona 1.44GG AMD-based servers' appearance, features, performance parameters, and software and hardware compatibility, providing in- depth information.






## Intended Audience

This white paper is intended for:

- 2CRSi pre-sales engineers
- Pre-sales engineers of channel partners
- Enterprise pre-sales engineers

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	A potential for serious injury, or even death if not properly handled
 WARNING	A potential for minor or moderate injury if not properly handled
 CAUTION	A potential loss of data or damage to equipment if not properly handled
 IMPORTANT	Operations or information that requires special attention to ensure successful installation or configuration
 NOTE	Supplementary description of document information

## Revision History

Version	Date	Description of Changes
V1	2023/09/14	Initial release
V2	2023/09/15	Technical Validation
V2.1	2024/03/08	Technical update

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# 1. Product Overview

The Mona 1.12GG and 1.44GG AMD-based systems are self-developed 1U 2-socket rack servers that features the 4th Gen AMD EPYC 9004 series processors. With high core counts, high memory bandwidth, ultra-high I/O throughput and other key features, it offers highly efficient compute resources and excellent performance to compute-intensive applications. It inherits high quality and reliability in various scenarios. Besides, it delivers exceptional performance, high expandability, broad ecosystem compatibility and ease of operation, management and maintenance.

Hence, it is ideal for cloud service, cloud computing, and high-performance computing scenarios.

## 12X 2.5-INCH DRIVE CONFIGURATION: MONA 1.12



## 4X 3.5-INCH + 4X 2.5-INCH DRIVE CONFIGURATION: MONA 1.44



## 2. Features

### 2.1 Expandability and Performance

- Features the 4th Gen AMD Genoa processors, with up to 96 cores per processor, TDP up to 400 W, a max boost frequency up to 4.40 GHz, an L3 cache of up to 384 MB, and 4 xGMI links at up to 32 GT/s, delivering unrivalled processing performance.
  - Up to 2 processors, 96 cores and 192 threads per processor, maximizing concurrent execution of multi-threaded applications.
  - Increased L2 cache. Each core has a private L2 cache of 1 MB.
  - Turbo Core technology brings you an intelligent self-adaption system. It allows the CPU cores to exceed the processor TDP at peak workload and run at the max frequency.
  - Hyper-threading technology allows every processor core to run multiple threads (up to 2 threads per core) concurrently, improving the performance of multi-threaded applications.
  - AMD Virtualization (AMD-V) technology integrates hardware-level virtualization features, allowing the operating system to better leverage hardware to handle virtualized workloads.
  - Advanced Vector Extensions 512 (AVX-512), an instruction set, can significantly improve the floating-point performance for compute-intensive workloads.
- Up to 24 DDR5 DIMMs.
  - Up to 24 DDR5 ECC RDIMMs (4,800 MT/s) for superior speed, high availability, and a memory capacity up to 3,072 GB, with a theoretical memory bandwidth of 900 GB/s.
- Supports a variety of drive configurations, providing elastic and expandable storage capacities to meet different capacity and upgrade requirements.
- Supports up to 12 hot-swap all-flash NVMe\* solid state drives (SSDs) with significantly higher I/O performance than mixing SSDs and HDDs or using only HDDs, as SSDs provide nearly 100X input/output operations per second (IOPS) over typical HDDs.

\*with a specific NVMe cable kit (sold separately)

- 12 Gbps serial attached SCSI (SAS) is double the internal storage data transfer rate of 6 Gbps SAS, maximizing the performance of storage I/O-intensive applications.

- Infinity Fabric technology, IOD and PCIe 5.0 controllers are integrated into processors, significantly shortening I/O latency and enhancing overall system performance.
- Up to 3 standard PCIe slots (up to 3 PCIe Gen5 x16 slots).
- Two OCP 3.0 slots for 10 Gb/s 25 Gb/s 200 Gb/s network connection, hot-swappable (RHEL 7.9 supports hot-swap; Windows Server 2019 supports hot-swap when it starts up with the OCP 3.0 card installed; RHEL 8.x does not support hot-swap).

## 2.2 Availability and Serviceability

- Supports hot-swap SAS/SATA/NVMe drives and RAID controller cards with RAID levels 0/1/1E/10/5/50/6/60 (with SAS/SATA drives), RAID cache and data protection enabled by the super-capacitor in case of power failures. Supported RAID levels vary with RAID controller cards.
- SSDs are much more reliable than traditional HDDs, increasing system uptime.
- The UID and status LEDs for fault diagnosis on the front panel, and the BMC Web GUI indicate the status of key components and quickly lead technicians to failed (or failing) components, simplifying maintenance, speeding up troubleshooting, and enhancing system availability.
- The IPMI management port on the rear panel enables you to directly access the IPMI and supports local O&M, improving O&M efficiency.
- Provides 2 hot-swap PSUs with 1+1 redundancy and 8 hot-swap fans with N+1 redundancy, improving system availability.
- The onboard BMC monitors system parameters in time and sends alerts in advance, so that technicians can take corresponding measures in time to ensure stable operation and minimize system downtime.
- Based on humanization design, the server allows tool-less maintenance. With enhanced and optimized structural parts, the system allows quick component installation and removal, greatly reducing the O&M time.
- 2CRSi's unique intelligent control technology combined with the cutting-edge air-cooling technology creates an optimum working environment for stable running of the server.

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For documentation of the system (such as product marketing materials, user manuals, product drivers, firmware, and product certifications), visit 2CRSi website: <https://2crsi.com>

## 2.3 Manageability and Security

- The BMC integrated in the server can monitor the server status and manage the server remotely.
- Network Controller Sideband Interface (NC-SI) feature allows a network port to serve as a management port and a service port. This feature can be enabled/disabled in the IPMI Web GUI or BIOS. It is disabled by default.
- Industry-standard Unified Extensible Firmware Interface (UEFI) improves the efficiency of setup, configuration, and update, and simplifies error handling.
- Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) provide advanced encryption.
- AMD Secure Processor (ASP), an integrated on-chip security processor, helps protect sensitive data and validate code before it is executed. It helps protect your system & data from unauthorized software and applications running on your device.
- AMD Secure Encrypted Virtualization (AMD SEV) protects Linux KVM virtual machines by transparently encrypting the memory of each VM with a unique key.
- Firmware update mechanism based on digital signatures prevents unauthorized firmware updates.
- UEFI Secure Boot protects the system from malicious boot loaders.
- Hierarchical password protection in BIOS ensures system boot and management security.
- BIOS Secure Flash and BIOS Lock Enable (BLE) reduces attacks from malicious software on the BIOS flash region.
- Dual-image mechanism for BMC and BIOS recovers firmware upon detection of firmware damage.
- BMC Secure Boot protects BMC from malicious tampering.
- Flexible BMC access control policies improves BMC management security.
- Chassis intrusion detection enhances physical security.



#### NOTE

The NC-SI port supports the following features:

- The NC-SI port can be bonded to any network port of the OCP card or of PCIe NIC that supports NC-SI.
  - Supports the enable/disable and configuration of Virtual Local Area Network ID (VLAN ID). VLAN is disabled by default and the default VLAN ID is 0.
  - Supports IPv6 and IPv4 addresses. IP address, subnet mask, default gateway, and prefix length of IPv6 address can be configured.
- 

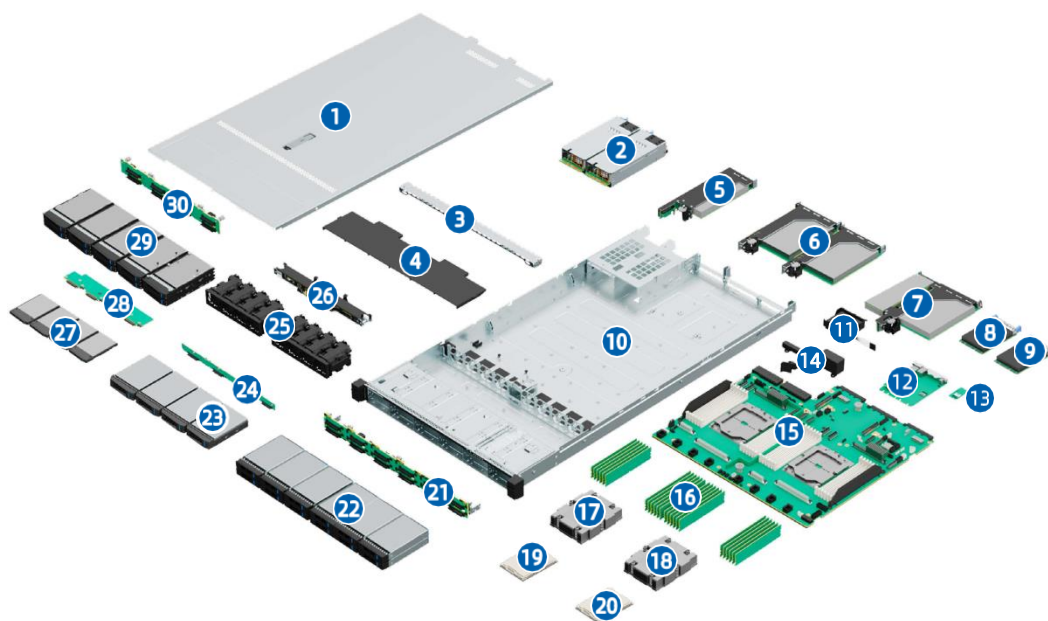
## 2.4 Energy Efficiency

- Equipped with 80 Plus Titanium power supply units (PSUs) (1,300 W), with the efficiency up to 96% at a load of 50%.
- Supports AC/DC power input for improved power conversion efficiency.
- Features high-efficiency single-board voltage regulator down (VRD) solutions, reducing DC-DC conversion loss.
- Delivers intelligent fan speed PID control and AMD Turbo Core technology, lowering energy consumption.
- Offers a fully-optimized system cooling design with energy-efficient cooling fans, lowering energy consumption from system cooling.
- Provides power capping and power control measures.
- Supports staggered spin-up of drives, reducing power consumption during server startup.
- The power consumption of an SSD is 80% lower than that of a traditional HDD.



### 3. System Parts Breakdown

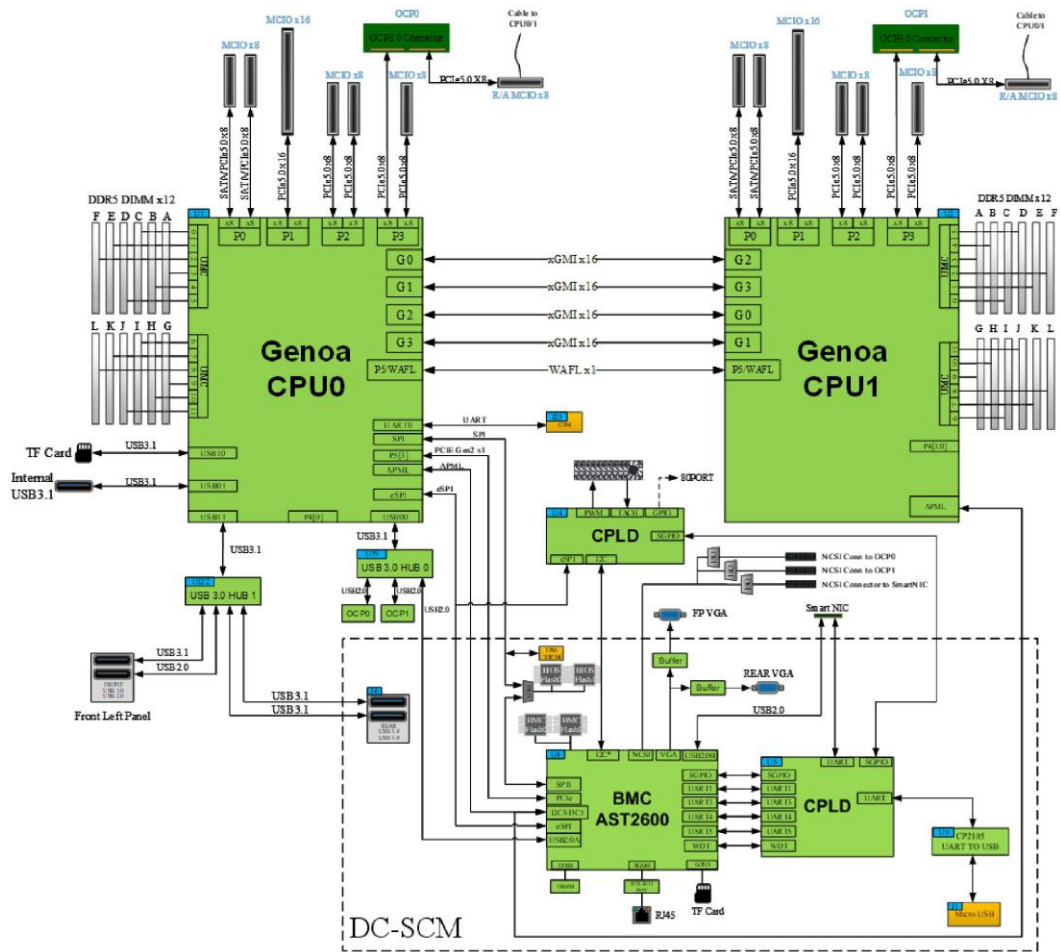
#### EXPLODED VIEW



Item	Feature	Item	Feature
1	Top Cover	2	PSUx 2
3	Reinforcement Crossbar	4	System Air Duct
5	PCIe Riser-Card Assembly	6	PCIe Riser-Card Assemblyx 2
7	PCIe Riser-Card Assembly	8	OCP 3.0 Card
9	OCP 3.0 Card	10	Chassis
11	Super-Capacitor Module	12	DC-SCM Board
13	TF Card Board	14	PSU Air Duct
15	Motherboard	16	DIMMs
17	Heatsink	18	Heatsink
19	CPU	20	CPU
21	12-Drive Backplane	22	2.5-inch Front Drive
23	3.5-inch Front Drivex 4	24	4-Drive Backplane
25	System Fans	26	Internal M.2 SSDx 2
27	2.5-inch Front Drivex 4	28	4-Drive Backplane
29	2.5-inch Front Drivex 10	30	8-Drive Backplane

## 4. System Logical Diagram

### SYSTEM LOGICAL DIAGRAM



- 1 or 2 AMD EPYC Genoa CPUs.
- Up to 24 DIMMs.
- xGMI links at up to 32 Gbps.
- Two OCP 3.0 slots and up to 3 PCIe 5.0 expansion slots.
- AST2600 BMC chip integrated on DC-SCM board with a VGA port, management network port, serial port, TF card slot and other ports.

# 5. Hardware Description

## 5.1 Front Panel

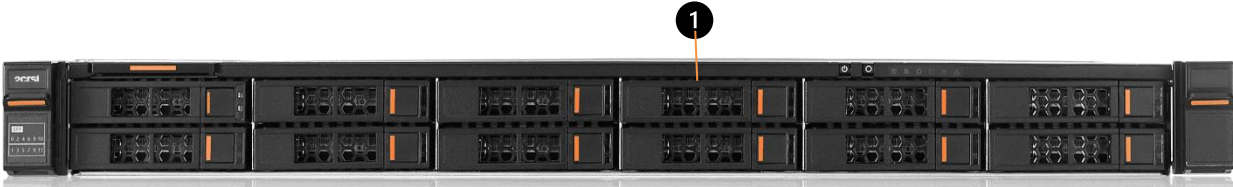
### 5.1.1 Front View

#### 4X 3.5-INCH + 4X 2.5-INCH DRIVE CONFIGURATION



Item	Feature	Item	Feature
1	Serial Label Pull Tag (with an SN label)	2	Drive Bay

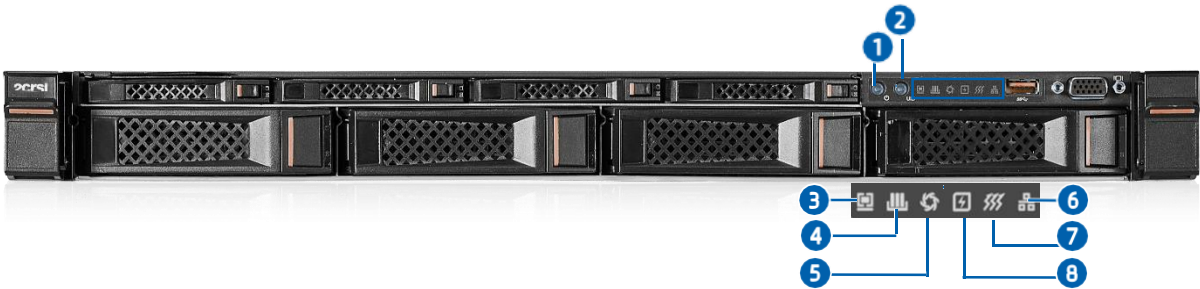
#### 12X 2.5-INCH DRIVE CONFIGURATION



Item	Feature	Item	Feature
1	Serial Label Pull Tag (with an SN label)	2	Drive Bay

### 5.1.2 LEDs & Buttons

#### 4X 3.5-INCH + 4X 2.5-INCH DRIVE CONFIGURATION



Item	Feature	Item	Feature
1	Power Button and LED	2	UID/BMC RST Button and LED

Item	Feature	Item	Feature
3	System Status LED	4	Memory Status LED
5	Fan Status LED	6	Network Status LED
7	System Overheat LED	8	Power Status LED






**12X 2.5-INCH DRIVE CONFIGURATION**






Item	Feature	Item	Feature
1	Power Button and LED	2	UID/BMC RST Button and LED
3	System Status LED	4	Memory Status LED
5	Fan Status LED	6	Network Status LED
7	System Overheat LED	8	Power Status LED

# LED and Button Description

## FRONT PANEL LED AND BUTTON DESCRIPTION

Icon	LED & Button	Description
	Power Button and LED	<ul style="list-style-type: none"> <li>• Solid green = Power on state</li> <li>• Solid orange = Standby state</li> <li>• Long press 4s to force a shutdown</li> </ul>
	UID/BMC RST Button and LED	<ul style="list-style-type: none"> <li>• Solid blue = UID LED is turned on manually or in the BMC</li> <li>• Flashing blue = KVM has been launched or firmware update in process</li> <li>• Long press 6s to force BMC to reset</li> </ul>
	System Status LED	<ul style="list-style-type: none"> <li>• Off = Normal</li> <li>• Solid red = A failure occurs</li> <li>• Flashing red = A warning occurs</li> </ul>
	Memory Status LED	<ul style="list-style-type: none"> <li>• Off = Normal</li> <li>• Solid red = A failure occurs</li> <li>• Flashing red = A warning occurs</li> </ul>
	Fan Status LED	<ul style="list-style-type: none"> <li>• Off = Normal</li> <li>• Solid red = Fan speed cannot be read</li> <li>• Flashing red = Speed read by BMC is abnormal</li> </ul>

	Power Status LED	<ul style="list-style-type: none"> <li>Off = Normal</li> <li>Solid red = A power failure occurs</li> <li>Flashing red = Power state is abnormal</li> </ul>
	System Overheat LED	<ul style="list-style-type: none"> <li>Off = Normal</li> <li>Solid red = CPU/Memory is overheating</li> </ul>
	Network Status LED	<ul style="list-style-type: none"> <li>Solid/Flashing green = Network connected</li> <li>Off = No network connection</li> </ul> <p>Note: It only indicates the working status of self-developed OCP card</p>

### 5.1.3 Ports

#### 4X 3.5-INCH + 4X 2.5-INCH DRIVE CONFIGURATION



Item	Feature	Item	Feature
1	USB 3.0 Port	2	VGA Port



No ports are available on the front panel of the 12x 2.5-inch drive configuration (Mona 1.12GG)

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## Port Description

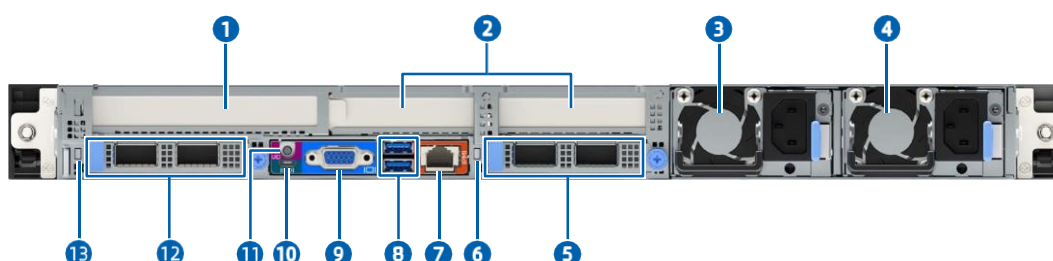
### FRONT PANEL PORT DESCRIPTION:

Feature	Type	Qty.	Description
VGA Port	DB15	1	Enables you to connect a display terminal to the system.
USB 3.0 Port	USB 3.0	1	Enables you to connect a USB 3.0/2.0 device to the system.  Note: Take sure the USB device is in good condition or it may cause the server to work abnormally.
USB 2.0 Port	USB 2.0	1	Enables you to connect a USB 2.0 device to the system.  Note: The maximum current supported by the USB port is 0.5 A.

## 5.2 Rear Panel

### 5.2.1 Rear View

#### REAR VIEW:



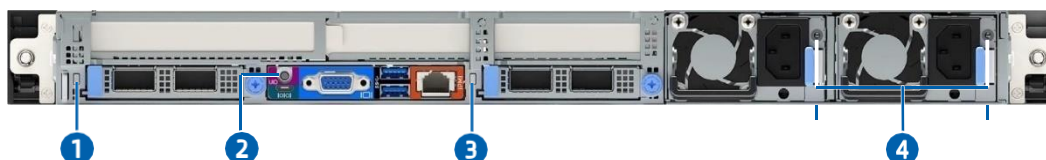
Item	Feature	Item	Feature
1	PCIe Slot	2	PCIe Slot HHL 2
3	PSU0	4	PSU1
5	OCP 3.0 Card 1	6	OCP 3.0 Card 1 Hot-Swap Button with LED
7	BMC Management Network Port	8	USB 3.0 Portx 2

Item	Feature	Item	Feature
9	VGA Port	10	System/BMC Serial Port
11	UID/BMC RST Button and LED	12	OCP 3.0 Card 0

13	OCP 3.0 Card 0 Hot-Swap Button with LED		
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## 5.2.2 LEDs and Buttons

### REAR PANEL LEDS AND BUTTONS



Item	Feature	Item	Feature
1	OCP 3.0 Card 0 Hot-Swap Button with LED	2	UID/BMC RST Button and LED
3	OCP 3.0 Card 1 Hot-Swap Button with LED	4	PSU LEDx 2

## LED and Button Description

### REAR PANEL LED AND BUTTON DESCRIPTION:

Icon	LED	Description
	UID/BMC RST Button and LED	<p>The UID LED is used to identify the device to be operated.</p> <ul style="list-style-type: none"> <li>Off = System unit not identified.</li> <li>Solid blue = System unit identified.</li> <li>Flashing blue = System unit being operated remotely.</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>The UID LED turns on when activated by the UID button or via BMC remotely.</li> <li>Long press the UID button for over 6 seconds to reset the BMC.</li> </ul>
	OCP 3.0 Card Hot-Swap Button with LED	Press the button to hot-swap the OCP 3.0 card.

Icon	LED	Description
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	PSU LED	<ul style="list-style-type: none"> <li>• Off = No AC power input.</li> <li>• Flashing green (1 Hz) = PSU operating in standby state with normal AC input.</li> <li>• Flashing green (2 Hz) = PSU firmware being updated.</li> <li>• Flashing green (off for 1s and green for 2s) = PSU in cold redundancy state.</li> <li>• Solid green = Normal input and output.</li> <li>• Flashing orange (1 Hz) = PSU warning event where the PSU continues to operate (possible causes: PSU overtemperature, PSU output overcurrent, excessively high or low fan speed).</li> <li>• Solid orange = Normal input but no output (possible causes of no output: PSU overtemperature protection, PSU output overcurrent or short circuit, output overvoltage, short circuit protection, device failure (not failures of all devices)).</li> </ul>
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### 5.2.3 Ports

#### Port Location

##### REAR PANEL PORTS:



Item	Feature	Item	Feature
1	System/BMC Serial Port	2	VGA Port
3	USB 3.0 Portx 2	4	BMC Management Network Port
5	PSU Socketx 2		

## Port Description

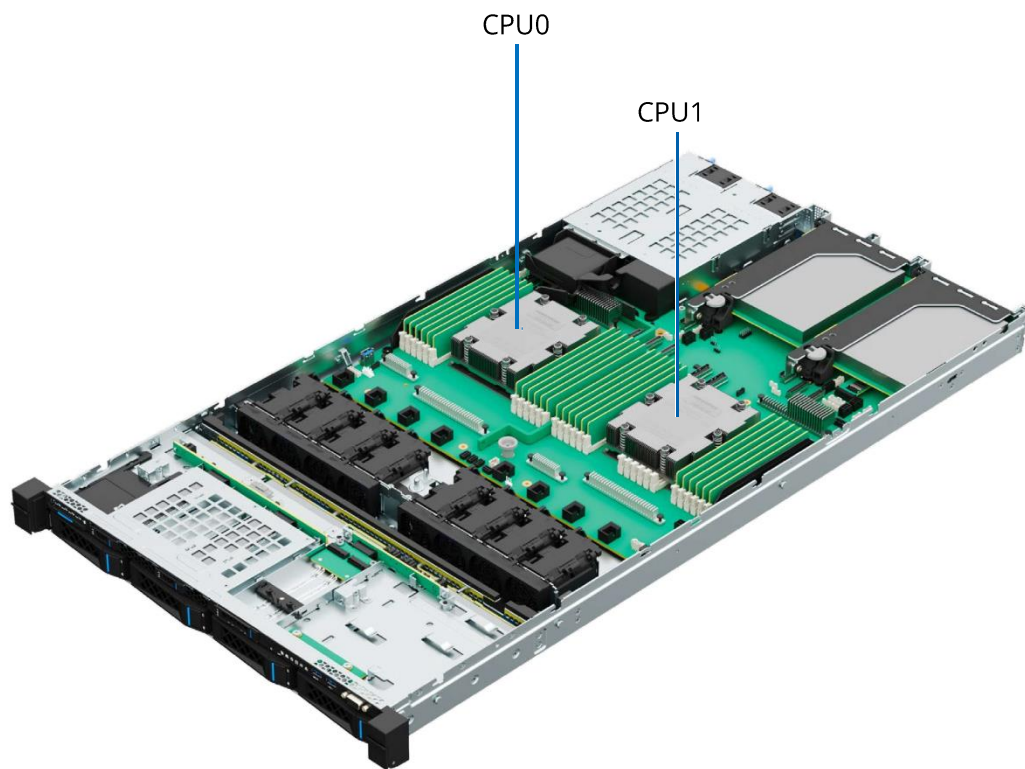
### REAR PANEL PORT DESCRIPTION:

Feature	Type	Qty.	Description
System/BMC Serial Port	Micro USB	1	Enables you to capture the system and BMC logs and debug the BMC.  Note: The Micro USB port is a TTL level port and the baud rate is 115,200 bit/s by default.
USB 3.0 Port	USB 3.0	2	Enables you to connect a USB 3.0 device to the system.  Note: Make sure the USB device is in good condition or it may cause the server to work abnormally.
BMC Management Network Port	RJ45 Port	1	Enables you to manage the server.  Note: The port is a Gigabit Ethernet port of 100/1000M supporting self-negotiation.
VGA Port	DB15	1	Enables you to connect a display terminal, for example, a monitor or KVM, to the system.
PSU Socket	-	2	Connected through a power cord. User can select PSUs as needed.  Note: Make sure the rated power of every PSU is greater than rated power of the server.

## 5.3 Processors

- Up to 2 processors.
- When configuring only 1 processor, CPU0 socket should be preferred.
- Two processors used in the server must be identical in the model.
- For specific system processor options, consult your local 2CRSi sales representative or refer to 7.2 Hardware Compatibility.

## PROCESSOR LAYOUT:



## 5.4 Memory

### 5.4.1 DDR5 DIMM



Item	Description	Example
1	Capacity	<ul style="list-style-type: none"> <li>• 16 GB</li> <li>• 32 GB</li> <li>• 64 GB</li> <li>• 128 GB</li> <li>• 256 GB</li> </ul>
2	Rank(s)	<ul style="list-style-type: none"> <li>• 1R = Single rank</li> <li>• 2R = Dual rank</li> <li>• 2S2R = Two ranks of two high stacked 3DS DRAM</li> <li>• 4DR = DDP (Dual Die Package) 4 rank</li> <li>• 4R = Quad rank</li> <li>• 8R = Octal rank</li> </ul>
3	Data width of DRAM	<ul style="list-style-type: none"> <li>• x4 = 4 bits</li> <li>• x8 = 8 bits</li> </ul>
4	DIMM slot type	PC5 = DDR5
5	Maximum memory speed	<ul style="list-style-type: none"> <li>• 4,800 MT/s</li> <li>• 5,600 MT/s</li> <li>• 6,400 MT/s</li> </ul>
6	CAS latency	B = 4800-39-39
7	DIMM Type	R = RDIMM

## Memory Subsystem Architecture

The server supports 24 DIMM slots and each processor supports 12 memory channels.

DIMM Slot List:

CPU	Channel ID	Silk Screen
CPU0	Channel A	CPU0_CAD0

CPU	Channel ID	Silk Screen
	Channel B	CPU0_CBD0
	Channel C	CPU0_CCD0
	Channel D	CPU0_CDD0
	Channel E	CPU0_CED0
	Channel F	CPU0_CFD0
	Channel G	CPU0_CGD0
	Channel H	CPU0_CHD0
	Channel I	CPU0_CID0
	Channel J	CPU0_CJD0
	Channel K	CPU0_CKD0
	Channel L	CPU0_CLD0
CPU1	Channel A	CPU1_CAD0
	Channel B	CPU1_CBD0
	Channel C	CPU1_CCD0
	Channel D	CPU1_CDD0
	Channel E	CPU1_CED0
	Channel F	CPU1_CFD0
	Channel G	CPU1_CGD0
	Channel H	CPU1_CHD0
	Channel I	CPU1_CID0
	Channel J	CPU1_CJD0
	Channel K	CPU1_CKD0
	Channel L	CPU1_CLD0

## Compatibility

Refer to the following rules to select the DDR5 DIMMs.



### IMPORTANT

- A server must use DDR5 DIMMs with the same part number (P/N code). All DDR5 DIMMs operate at the same speed, which is the lowest of:
    - Memory speed supported by a specific CPU.
    - Maximum operating speed of a specific memory configuration.
  - Mixing DDR5 DIMM specifications (capacity, bit width, rank, height, etc.) is not supported.
  - For specific system memory options, consult your local 2CRSi sales representative or refer to 7.2 Hardware Compatibility.
-

- DDR5 DIMMs can be used with AMD Genoa CPUs. The maximum memory capacity supported is identical for different CPU models.



#### IMPORTANT

The number of supported ranks per channel (up to 4 ranks for an RDIMM) has the following restrictions on the number of DIMMs supported per channel: Maximum number of DIMMs supported per channel  $\leq$  Maximum number of ranks supported per channel/Number of ranks per DIMM.

#### DDR5 DIMM SPECIFICATIONS:

Item		Value			
Capacity per DDR5 DIMM (GB)		16	32	64	128
Type		RDIMM	RDIMM	RDIMM	RDIMM
Rated speed (MT/s)		4,800	4,800	4,800	4,800
Operating voltage (V)		1.1	1.1	1.1	1.1
Maximum number of DDR5 DIMMs supported in a server <sup>a</sup>		24	24	24	24
Maximum capacity of DDR5 DIMMs supported in a server (GB) <sup>b</sup>		384	768	1,536	3,072
Actual speed (MT/s)	1DPC <sup>c</sup>	4,800	4,800	4,800	4,800
<sup>a</sup> : The maximum number of DDR5 DIMMs supported is based on the 2-processor configuration. If the server is 1-processor configuration, the number should be halved.  <sup>b</sup> : It indicates the maximum memory capacity supported when all the DIMM slots are populated with DDR5 DIMMs.  <sup>c</sup> : DPC (DIMM per channel) is the number of DIMMs per memory channel. The information above is for reference only, consult your local 2CRSi sales representative for details.					

## DIMM Population Rules

General population rules for DDR5 DIMMs:

- Install DIMMs only when the corresponding processor has been installed.
- Install dummies in empty DIMM slots.

DDR5 DIMM population rules in specific modes:

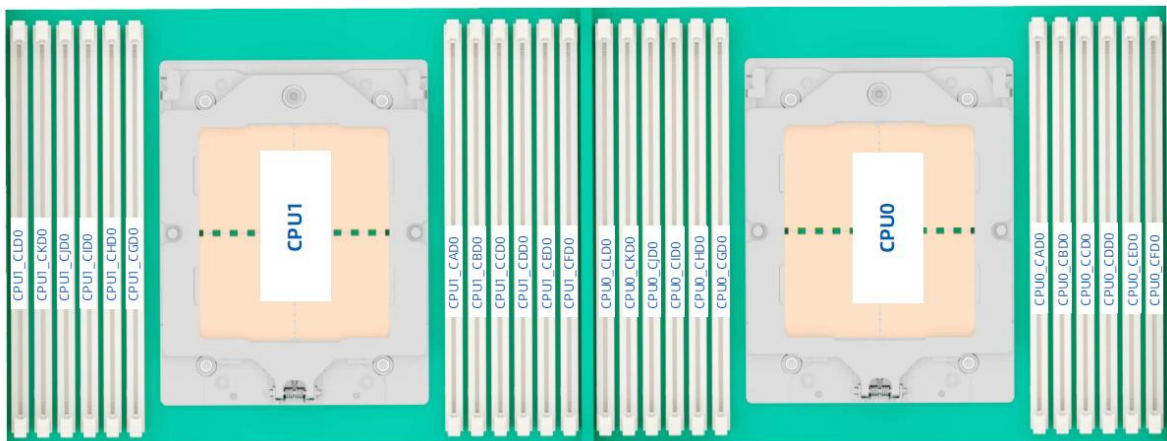
- Memory sparing
  - Follow the general population rules.
  - Each channel must have a valid online spare configuration.

- Each channel can have a different online spare configuration.
- Memory mirroring
  - Follow the general population rules.
  - Each processor supports 12 unified memory controllers (UMCs) and each UMC has one channel to be populated with DIMMs. Installed DIMMs must be of the same capacity and organization.
  - In a multi-processor configuration, each processor must have a valid memory mirroring configuration.
- Memory demand scrubbing/patrol scrubbing
  - Follow the general population rules.

## DIMM Slot Layout

Up to 24 DDR5 DIMMs can be installed in a server, and a balanced DIMM configuration is recommended for optimal memory performance. DIMM configuration must be compliant with the DIMM population rules.

### DIMM SLOT LAYOUT:



## DDR5 DIMM POPULATION RULES (1-PROCESSOR CONFIGURATION)

DDR5 QTY	CPU0											
	CL	CK	CJ	CI	CH	CG	CA	CB	CC	CD	CE	CF
	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0
1							V					
2						V	V					
4				V		V	V		V			
6				V	V	V	V	V	V			
8		V		V	V	V	V	V	V		V	
10		V	V	V	V	V	V	V	V	V	V	
12	V	V	V	V	V	V	V	V	V	V	V	V

## DDR5 DIMM POPULATION RULES (2-PROCESSOR CONFIGURATION)

DDR5 QTY	CPU0												CPU1											
	CL	CK	CJ	CI	CH	CG	CA	CB	CC	CD	CE	CF	CL	CK	CJ	CI	CH	CG	CA	CB	CC	CD	CE	CF
	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0
2							V											V						
4						V	V										V	V						
8				V		V	V		V							V		V	V		V			
12				V	V	V	V	V	V							V	V	V	V	V	V			
16		V		V	V	V	V	V	V		V			V		V	V	V	V	V	V		V	
20		V	V	V	V	V	V	V	V	V				V	V	V	V	V	V	V	V	V	V	
24	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V



## 5.5 Storage

### 5.5.1 Drive Configuration

#### DRIVE CONFIGURATION:

Configuration	Front Drive	Rear Drive	Internal Drive	Drive Management Mode
4x 3.5/2.5-inch SAS/SATA + 4x 2.5-inch SAS/SATA Drive Configuration	SAS/SATA drives in drive bays 0-7	/	/	SAS/SATA drives: SAS/RAID controller card or directly connected to CPU
4x 3.5/2.5-inch NVMe + 4x 2.5-inch NVMe Drive Configuration	NVMe drives in drive bays 0-7	/	/	NVMe drives: directly connected to CPU
12x 2.5-inch SAS/SATA Drive Configuration	SAS/SATA drives in drive bays 0-11	/	/	SAS/SATA drives: SAS/RAID controller card or directly connected to CPU
12x 2.5-inch NVMe Drive Configuration	NVMe drives in drive bays 0-11	/	/	NVMe drives: directly connected to CPU

### 5.5.2 Drive Numbering

#### 4X 3.5-INCH DRIVE + 4X 2.5-INCH DRIVE CONFIGURATION



Physical Drive No.	Drive No. Identified by BMC	Drive No. Identified by RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	0
5	5	1
6	6	2

7	7	3
---	---	---

## 12X 2.5-INCH DRIVE CONFIGURATION



Physical Drive No.	Drive No. Identified by BMC	Drive No. Identified by RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11

### 5.5.3 Drive LEDs

## SAS/SATA Drive LEDs

### SAS/SATA DRIVE LEDS:



### SAS/SATA DRIVE LED DESCRIPTION:

Activity LED (Green)	Error LED (Blue/Red)		Status Description
	Blue	Red	
Off	Off	RAID created	Drive absent
		RAID not created	
Solid on	Off	Solid on	Drive present but not in use
		Off	

Flashing	Off	Off	Drive present and in use
Flashing	Solid pink		Copyback/Rebuild in progress
Solid on	Solid on	Off	Drive selected but not in use
Flashing	Solid on	Off	Drive selected and in use
-	Off	Solid on	Drive failure

## NVMe Drive LEDs

### NVME DRIVE LEDS:



### NVME DRIVE LED DESCRIPTION:

Activity LED (Green)	Error LED (Blue/Red)		Status Description
	Blue	Red	
Off	Off	Off	Drive absent
Solid on	Off	Off	Drive present but not in use
Flashing	Off	Off	Drive present and in use
Flashing	Solid pink		Copyback/Rebuild/Initializing/Verifying in progress
Solid on	Solid on	Off	Drive selected but not in use
Flashing	Solid on	Off	Drive selected and in use
-	Off	Solid on	Drive failure

### 5.5.4 RAID Controller Cards

The RAID controller card supports RAID configuration, RAID level migration, drive roaming, and other functions.

For specific RAID controller card options, consult your local 2CRSi sales representative or refer to 7.2 Hardware Compatibility.

## 5.6 Network

NICs provide network expansion capabilities.

- The OCP slots support OCP 3.0 cards. Users can select the optional OCP 3.0 cards as needed.
- The PCIe slots support PCIe NICs. Users can select the cards as needed.
- For specific NIC options, consult your local 2CRSi sales representative or refer to 7.2 Hardware Compatibility.

## 5.7 I/O Expansion

### 5.7.1 PCIe Expansion Card

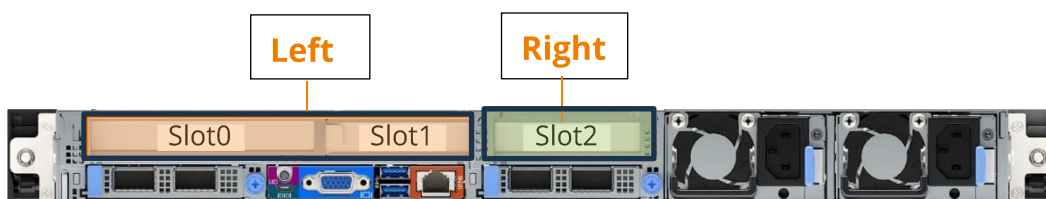
The PCIe cards provide system expansion capabilities.

- The server supports 2 dedicated OCP 3.0 slots and up to 3 PCIe 5.0 expansion slots.
- For specific PCIe expansion card options, consult your local 2CRSi sales representative or refer to 7.2 Hardware Compatibility.

### 5.7.2 PCIe Slots

#### PCIe Slot Layout

##### 3X PCIE SLOT CONFIGURATION:



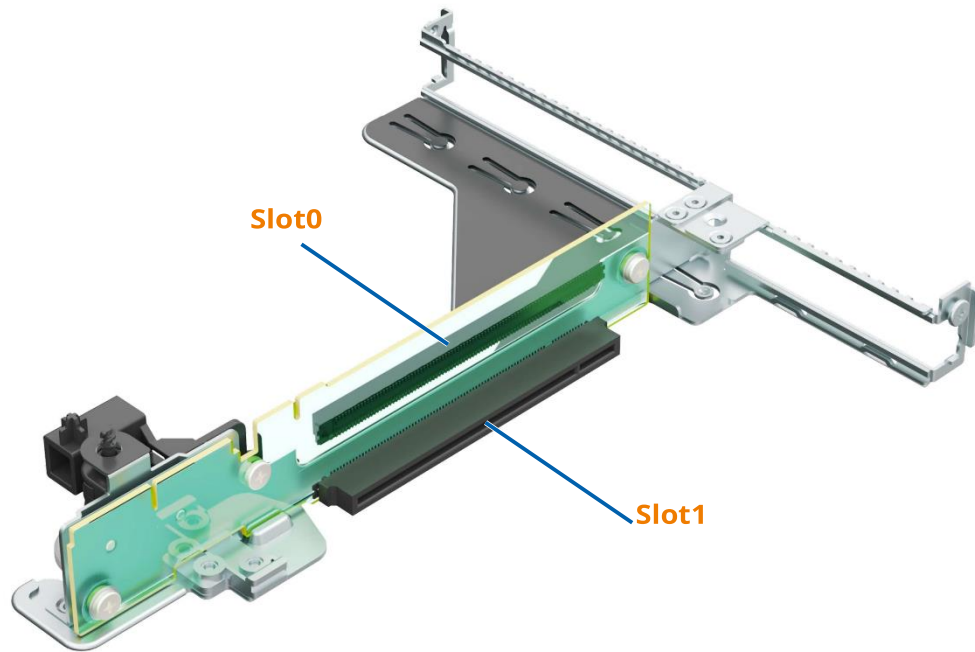
- Slot 0 and slot 1 reside in the left PCIe riser module.
- Slot 2 resides in the right PCIe riser module.



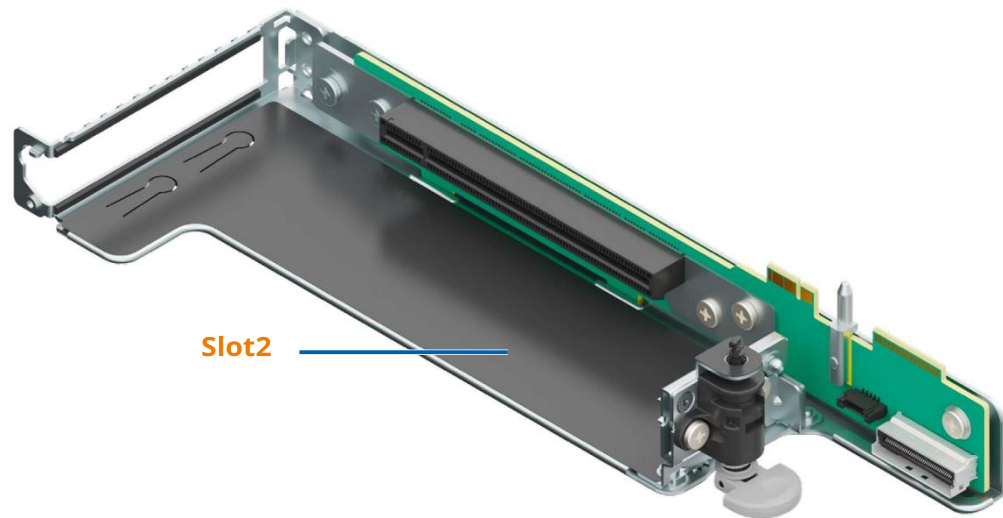
## PCIe riser module

- The PCIe riser module 1, as shown in the figure below, is the left one in the previous figure.
  - PCIe slots 0 and 1 reside in this module.

### PCIE RISER MODULE 1

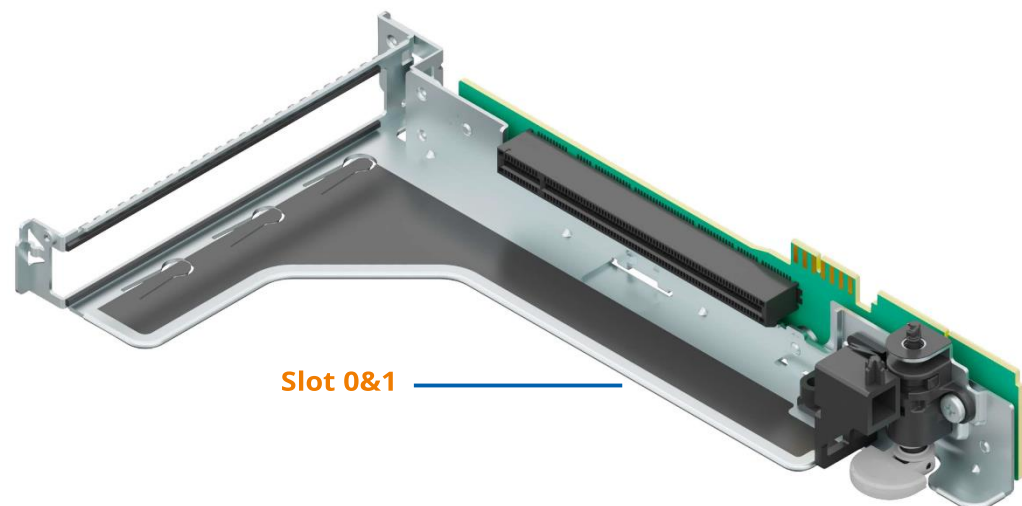


## PCIE RISER-CARD MODULE 2



- PCIe slot 0/1 resides in this module.

## PCIE RISER MODULE 3



### 5.7.3 PCIe Slot Description



When CPU1 is not present, the corresponding PCIe slots do not work.

---

## Servers Configured with Rear PCIe Riser Modules

### PCIe SLOT DESCRIPTION (3 PCIe SLOTS):

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port Number	Root Port (B/D/F)	Form Factor
Slot 0	CPU1	PCIe 4.0/ PCIe 5.0	x16	x16	PE1/PE2	C0:01.0 1	FHHL
Slot 1	CPU1	PCIe 4.0/ PCIe 5.0	x16	x16	PE2/PE0	80:01.0 1	HHHL
Slot 2	CPU0	PCIe 4.0/ PCIe 5.0	x16	x16	PE2	40:01.0 1	HHHL
OCP 3.0 slot	CPU0	PCIe 5.0	x16	x8/x 16	PE3AB/PE3A BCD	20:01.0 1/ 20:01.0 2	Standard OCP 3.0 slot
OCP 3.0 slot	CPU1	PCIe 5.0	x16	x8/x 16	PE3AB/PE3A BCD	A0:01.0 1/ A0:01.0 2	Standard OCP 3.0 slot

- The B/D/F (Bus/Device/Function) numbers are the default values when all PCIe slots are fully populated with PCIe cards. The default values may vary if PCIe slots are partially populated or when PCIe cards with PCIe bridges are installed.
- Root Port (B/D/F): the B/D/F of an internal PCIe root node of the processor.
- A PCIe x16 slot is compatible with a PCIe x16, x8, x4, and x1 card. It is not upward compatible, that is, the PCIe slot width cannot be lower than that of the inserted PCIe card.
- A FHFL PCIe slot is compatible with an FHFL, FHHL, or HHHL PCIe card.
- A FHHL PCIe slot is compatible with an FHHL or HHHL PCIe card.
- Each PCIe slot provides a maximum 75 W of power.

## 5.8 PSUs

- Supports 1 or 2 PSUs.
- Supports AC or DC power input.
- The PSUs are hot-swappable.
- The server supports 2 PSUs with 1+1 redundancy.
- The server must use PSUs of the same part number (P/N code).
- The server provides short-circuit protection and provides PSUs supporting dual-live-wire input.

### PSU LAYOUT



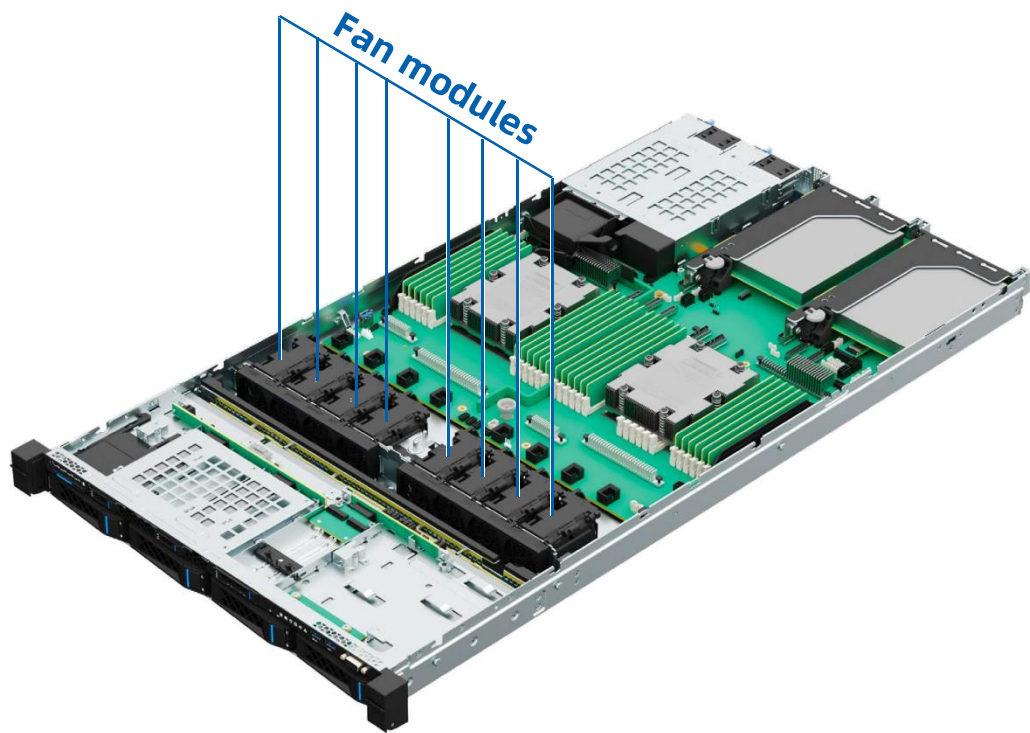
Item	Feature	Item	Feature
1	PSU0	2	PSU1

## 5.9 Fans

- Supports 8 fans. High-performance 4056 fans and standard 4056 fans can be selected based on actual configuration.
- The fans are hot-swappable.
- Some configurations support N+1 redundancy, allowing the server to continue working properly when one fan fails.
- Supports intelligent fan speed control.
- The server must use fans of the same part number (P/N code).

### FAN LAYOUT

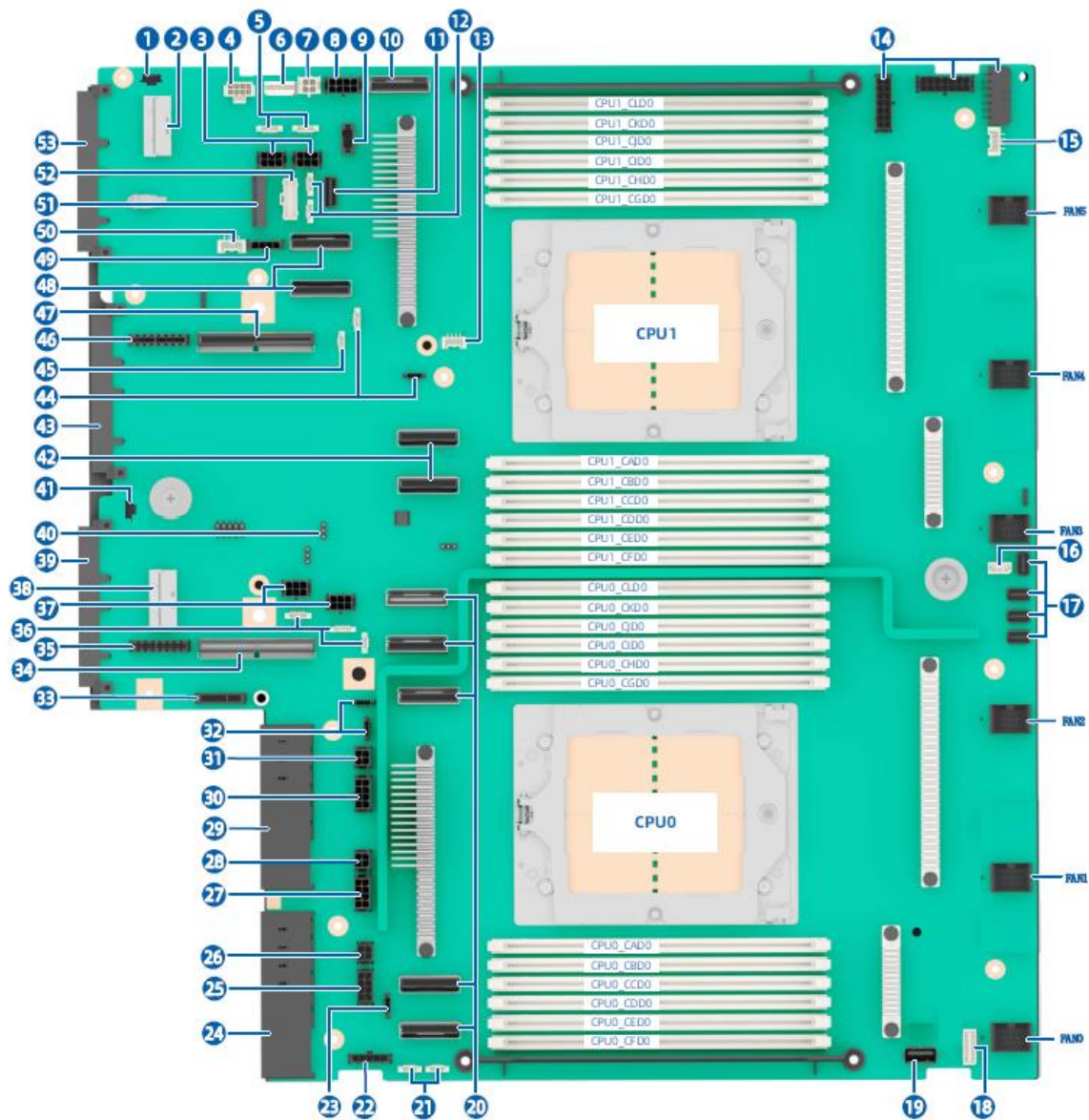




## 5.10 Boards

### 5.10.1 Motherboard

#### MOTHERBOARD LAYOUT



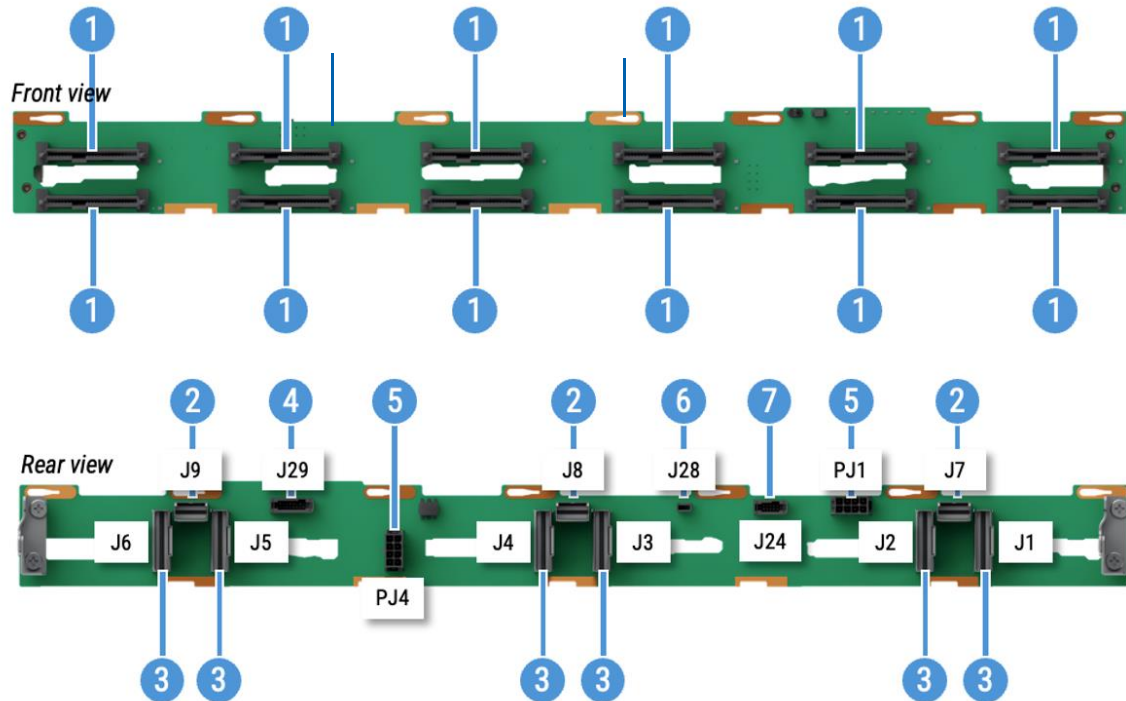
Item	Feature	Item	Feature
1	OCP 3.0_1 Button Connector	28	GPU2 Power Connector
2	OCP 3.0 MCIO Connector	29	PSU0 Connector
3	GPU Riser & Rear Backplane Power Connectorx 2	30	GPU1 Power Connector
4	Mid-backplane Power Connector	31	GPU1 Power Connector
5	I2C Connector x 2	32	I2C Connectorx 2
6	Right Control Panel Connector	33	Riser Card Power Connector
7	GPU0 Connector	34	MCIO x16 Slot (CPU0)

Item	Feature	Item	Feature
8	GPU0 Power Connector	35	Riser Card Power Connector
9	VPP Connector	36	I2C Connectorx 3
10	MCIO x8 Connector (CPU1)	37	GPU Riser & Rear Backplane Power Connectorx 2
11	M.2_SB Connector	38	OCP 3.0 MCIO Connector
12	I2C Connectorx 2	39	OCP 3.0 Connector
13	Leak Detection Connector	40	CLR_CMOS Jumper
14	Front Backplane Power Connector x 3	41	OCP 3.0_0 Button Connector
15	Sensor Connector	42	MCIO x8 Connector (CPU1)x 2
16	Intrusion Switch Connector	43	DC-SCM Connector
17	SGPIO Connector x 4	44	I2C Connectorx 2
18	Left Control Panel Connector	45	NIC_COM Connector
19	USB 3.0 Port	46	PCIE_CPU1 Power Connector
20	MCIO x8 Connector (CPU0)x 5	47	MCIO x16 Connector (CPU1)
21	I2C Connectorx 2	48	MCIO x8 Connector (CPU1)x 2
22	Capacitor Board Power Connector	49	Smart_LAN Power Connector
23	I2C Connector	50	Leak Detection Connector
24	PSU1 Connector	51	SYS_TF Connector
25	GPU3 Power Connector	52	GPU_Riser Power Connector
26	GPU3 Power Connector	53	OCP 3.0 Connector
27	GPU2 Power Connector		

## 5.10.2 Backplanes

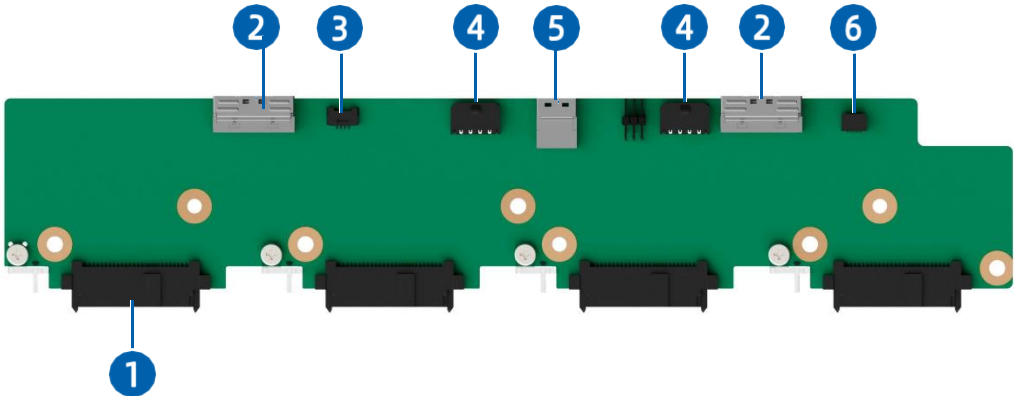
### Front Drive Backplane

#### 12X 2.5-INCH SAS/SATA/NVME DRIVE BACKPLANE



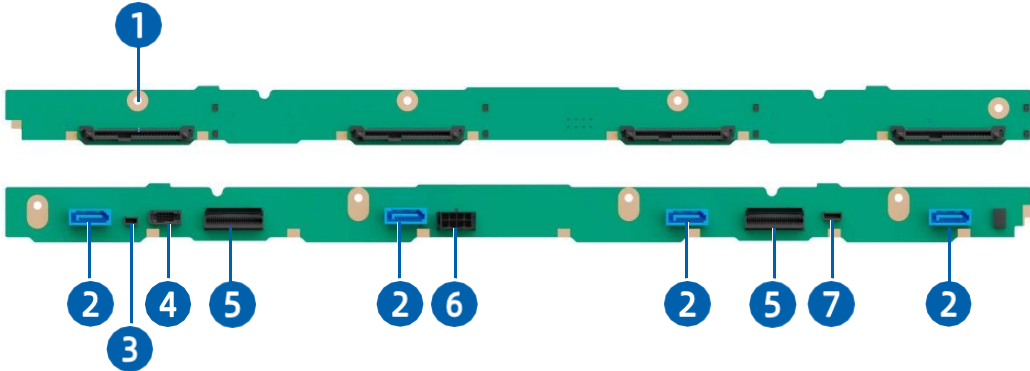
Item	Location	Description	Item	Location	Description
1	N/A	Hard drive connector × 12	4	J29	Front control panel connector
2	J9, J8, J7	Slimline x4 SATA/SAS connector × 3	5	PJ4, PJ1	Backplane power connector
3	J6, J5, J4, J3, J2, J1	MCIO x8 NVMe connector × 6	6	J28	BMC I2C connector
			7	J24	VPP connector

**4X 2.5-INCH SAS/SATA/NVME DRIVE BACKPLANE**



Item	Feature	Item	Feature
1	Drive Connector	2	MCIO_NVMe Connector x 2
3	BMC I2C Connector	4	Backplane Power Connector x 2
5	Slimline_SAS Connector	6	VPP Connector

**4X 3.5-INCH SAS/SATA/NVME DRIVE BACKPLANE**



Item	Feature	Item	Feature
1	Drive Connector	2	SATA 7-Pin Connector x 4
3	BMC I2C Connector	4	VPP Connector
5	MCIO x8 Connector x 2	6	Backplane Power Connector
7	SGPIO Connector		

## 6. Maintenance and Component Replacement

### 6.1 Installing the Server into the Rack

For detailed information on installing the server into the rack with rails supplied by us, see the rack server installation guide.

#### CAUTION

If you would like to use rails not provided by us, please contact us first to ensure the server can be installed into the rack safely and properly. The load-bearing capacity of rails must be higher than 100 kg (220.46 lbs). If not, you **MUST** use our rails as using rails not provided by us may cause such risks as installation failure. We will not assume any responsibility or liability for any damage or injury caused by this.

#### WARNING

To reduce the risk of personal injury or equipment damage, **DO** secure the mounting ears to the mounting flanges firmly to prevent the server from moving or sliding out from the rack.

### 6.2 Powering On/Off the Server

To power on or off the server, press the power button.

To completely shut down the server, press the power button and disconnect the power cords from the server.

### **DANGER**

To reduce the risk of personal injury, electric shock, or equipment damage, disconnect the power cords to remove power from the server. Pressing the power button on the front panel does not shut off the system power completely.

Portions of the power supply and some internal circuitry remain active until the power is removed.

## 6.3 Preparing for Component Replacement

Read the installation instructions for all the hardware operations before removing or installing the components. All prerequisites must be completed prior to installation or maintenance.

### WARNING

To reduce the risk of personal injury from hot surfaces, allow the drives and internal system components to cool before touching them.

### CAUTION

To prevent damage to electrical components, properly ground the server before installation. Improper grounding may cause electrostatic discharge.

Do the following prior to installation or maintenance:

1. Power off the server.
2. Remove all cords from the server.

### WARNING

- To reduce the risk of personal injury or equipment damage, make sure that the rack is adequately stabilized before you pull the server or a component out of the rack.
- To reduce the risk of personal injury, be careful when sliding the server into the rack. The sliding rails could pinch your fingers.

3. Open the left and right ear latches, and then loosen the 2 captive screws under the ear latches.

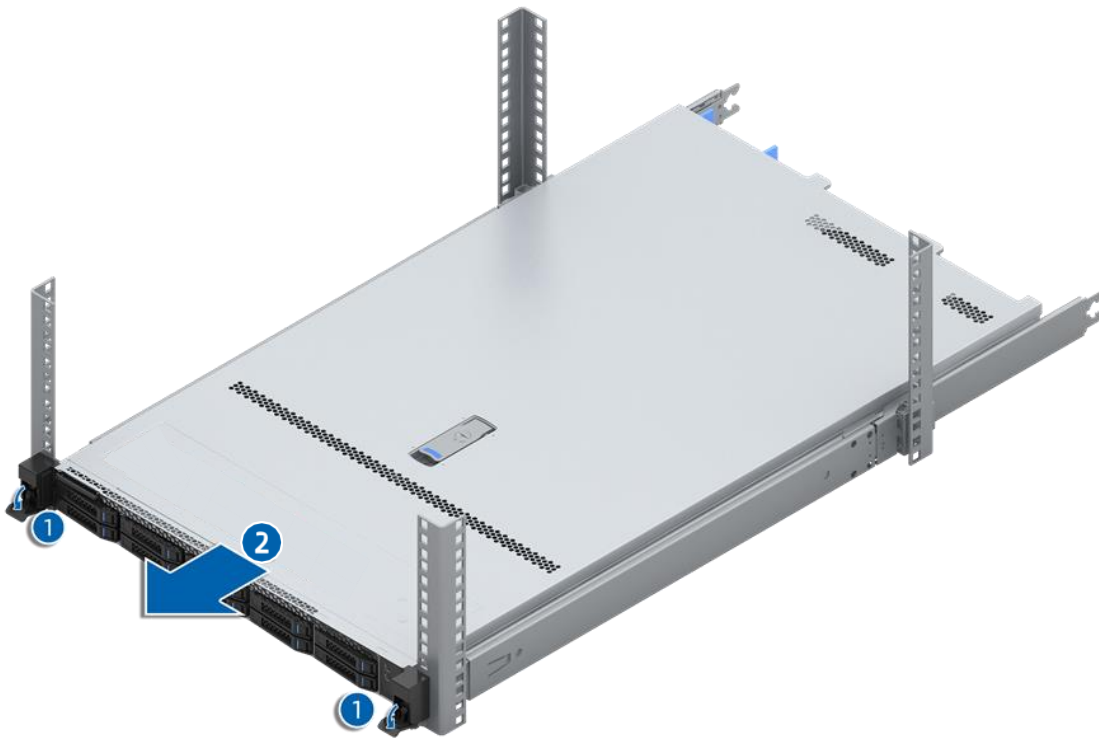


Figure 4-1 Loosening the Captive Screw



4. Gently slide and remove the server out of the rack.

Figure 4-2 Removing the Server from the Rack



5. After installation or maintenance, slide the server all the way back into the rack to secure it in place.

## 6.4 Replacing System Components

### NOTE

- When installing or removing system components, always wear anti-static gloves or an anti-static wrist strap.
- Before the installation or removal of any hardware, always ensure all data is backed up properly.
- Disconnect the server and all attached devices from the electrical outlets.
- Hot-swap components can be replaced with the server powered on.
- If more than one option is to be installed, read the installation instructions for all the hardware options and identify similar steps to streamline the installation process.

Component appearance may differ depending on actual configurations.

### 6.4.1 Replacing the Top Cover

#### WARNING

To reduce the risk of personal injury from hot surfaces, allow the drives and internal system components to cool before touching them.

#### CAUTION

- For proper cooling, do not operate the server without the top cover, air ducts, fans, dummies, or blanks installed.
- If the server supports hot-swap components, minimize the amount of time the top cover is open.

To remove the top cover:

1. Loosen the security screw on the latch counterclockwise to the unlocked position with a Phillips screwdriver.

2. Lift the latch handle until the top cover slides toward the rear of the server and the tabs on the top cover disengage from the guide slots on the chassis. Hold the top cover on both sides and remove the top cover away from the chassis.

Figure 4–3 Removing the Top Cover



To install the top cover:

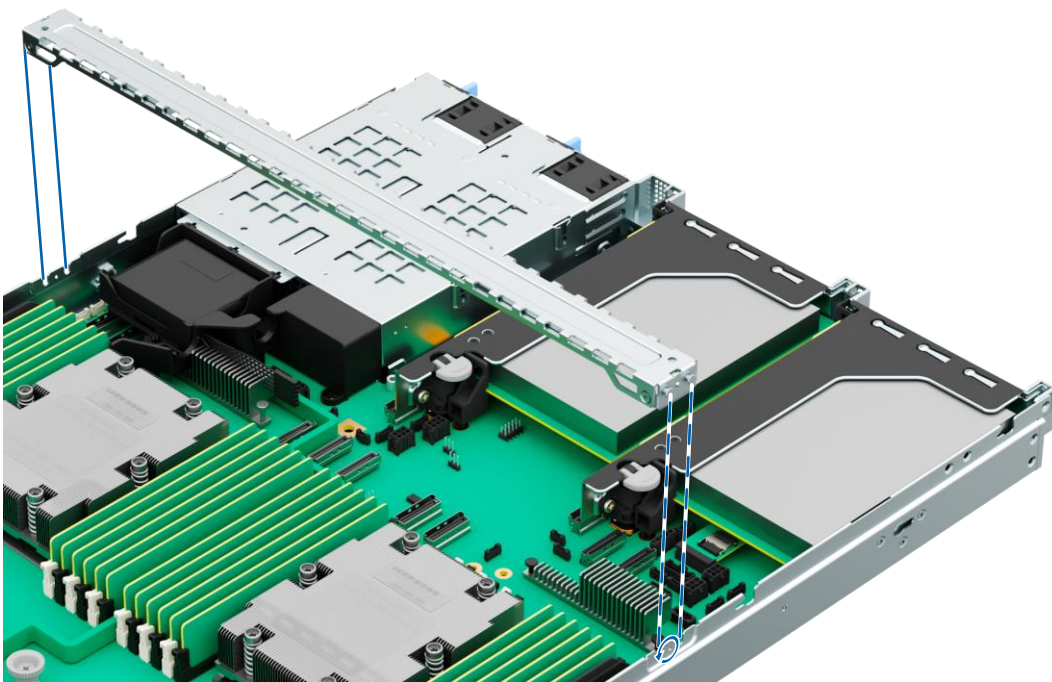
1. Lift the latch handle, align the standoffs of the top cover with the J-slots on the chassis, and lower the top cover down onto the chassis.
2. Press down the latch handle until the top cover slides toward the front of the server to the closed position.
3. Tighten the security screw on the latch clockwise to the locked position with a Phillips screwdriver.

## 6.4.2 Replacing the Reinforcement Crossbar

To remove the reinforcement crossbar:

1. Remove the top cover.
2. Loosen and remove the 2 screws securing the reinforcement crossbar to the chassis counterclockwise with a Phillips screwdriver.
3. Lift up and remove the reinforcement crossbar.

Figure 4-3 Removing the Reinforcement Crossbar



To install the reinforcement crossbar:

1. Align the standoffs on the ends of the reinforcement crossbar with the holes on the chassis.
2. Lower down and install the reinforcement crossbar to the chassis in place.

Insert and tighten the 2 screws clockwise securing the reinforcement crossbar to the chassis.

### 6.4.3 Replacing a Super-Capacitor

To remove the super-capacitor:

1. Remove the top cover.
2. Disconnect the cable of the super-capacitor.
3. Open the Velcro used to secure the super-capacitor.
4. Remove and put the super-capacitor into an anti-static bag.

Figure 4-4 Removing the Super-Capacitor



To install the super-capacitor:

1. Take a new super-capacitor out from the anti-static bag and put it into the super-capacitor holder.
2. Secure the super-capacitor firmly with the Velcro.
3. Connect the cable of the super-capacitor.
4. Install the top cover.

## 6.4.4 Replacing the Air Duct

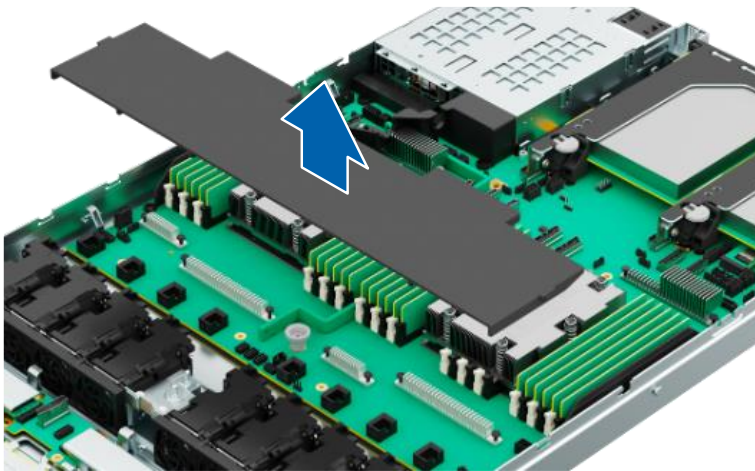
### CAUTION

- For proper cooling, do not operate the server without the top cover, air ducts, fans, dummies, or blanks installed.
- If the server supports hot-swap components, minimize the amount of time the top cover is open.

To remove the air duct:

1. Remove the top cover.
2. Remove the super-capacitors on the air duct.
3. Lift the air duct to remove it.

Figure 4–5 Removing the Air Duct



To install the air duct:

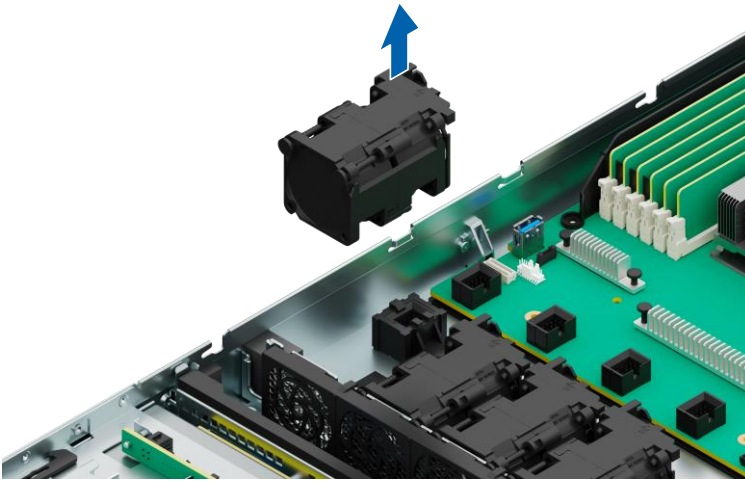
1. Lower down the air duct vertically into the chassis.
2. Install the super-capacitors.
3. Install the top cover.

## 6.4.5 Replacing a Hot-Swap Fan Module

To remove the fan module:

1. Remove the top cover.
2. Remove the fan module:
  - a. Press and hold the release tab of the fan module, and then lift the fan module out of the fan bay.
  - b. Put the fan module into an anti-static bag.

Figure 4-6 Removing the Fan Module



To install the fan module:

1. Take a new fan module from the anti-static bag.
2. Determine the bay of the fan module (The server supports up to 8 fan modules).
3. Align the fan module connector with the slot on the motherboard, and lower the fan module vertically to install it in place.
4. Install the air duct.
5. Install the top cover.
6. Check that the fan status LED is off.

## 6.4.6 Replacing a DIMM

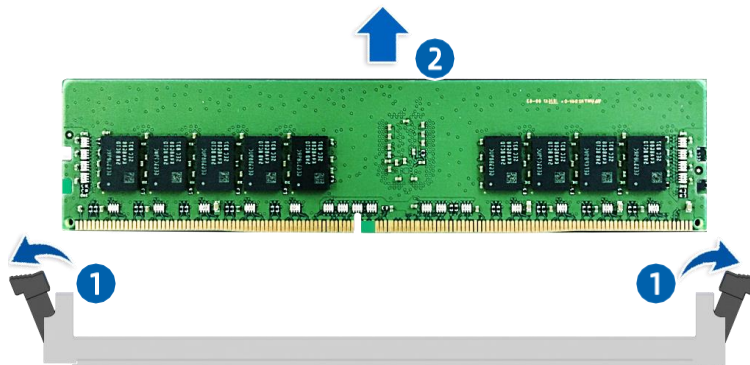
To remove the DIMM:

1. Remove the top cover.
2. Disconnect the cables of the super-capacitors (if any).
3. Remove the air duct.
4. Locate the DIMM to be replaced.
5. Remove the DIMM:
  - a. Press the ejectors on both ends of the DIMM slot outward to unlock it. Gently lift and remove the DIMM from the slot.

### NOTE

Make sure that the ejectors on both ends of the DIMM slot are fully opened.

Figure 4-12 Removing the DIMM



- b. Put the DIMM into a memory tray.

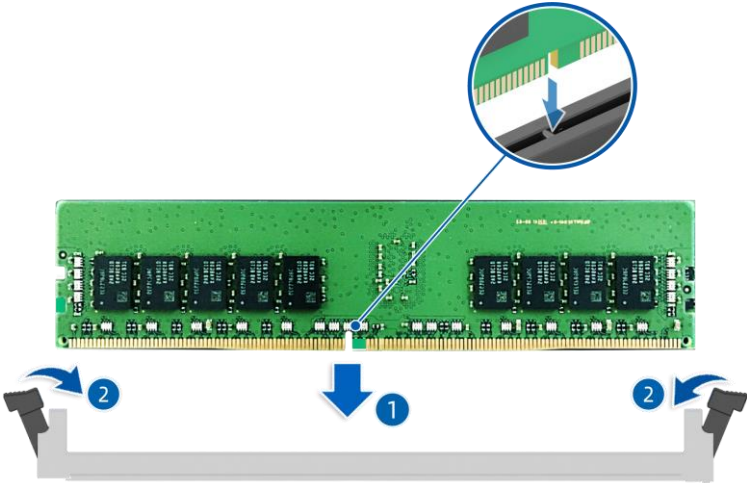
To install the DIMM:

1. Take a new DIMM out from the memory tray.



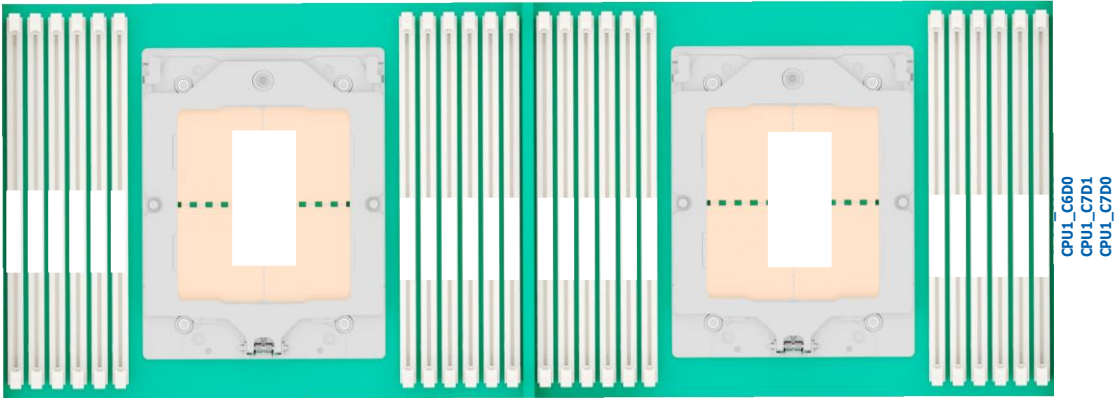
- Align the alignment keys on the DIMM and DIMM slot. Insert the DIMM into the slot. Press both ends of the DIMM at the same time with your thumbs until the DIMM snaps into place.

Figure 4-13 Installing the DIMM



- Install the air duct.
- Connect the cables of the super-capacitors (if any).
- Install the top cover.

Figure 4-14 DIMM Slot Layout



Detailed DIMM population rules are as follows:

Table 4-1 DDR5 DIMM Population Rules (Single-CPU Configuration)

DDR5 QTY	CPU0											
	CL	CK	CJ	CI	CH	CG	CA	CB	CC	CD	CE	CF
	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0	D0
1								V				
2						V	V					
4				V	V	V	V		V			
6				V	V	V	V	V	V			
8		V		V	V	V	V	V	V		V	
10		V	V	V	V	V	V	V	V	V	V	
12	V	V	V	V	V	V	V	V	V	V	V	V

Table 4–2 DDR5 DIMM Population Rules (Dual–CPU Configuration)

DDR5 QTY	CPU0												CPU1											
	CL	CK	CJ	CI	CH	C G	CA	CB	CC	C D	CE	C F	CL	C K	CJ	CI	C H	C G	C A	C B	C C	CD	C E	CF
	D0	D0	D0	D0	D0	D0	D0	D0	D 0	D 0	D 0	D0	D0	D 0	D0	D 0	D 0	D 0	D 0	D 0	D 0	D 0	D 0	D0
2							V											V						
4						V	V											V	V					
8				V		V	V		V							V		V	V		V			
12				V	V	V	V	V	V							V	V	V	V	V	V			
16		V		V	V	V	V	V	V		V			V		V	V	V	V	V	V		V	
20		V	V	V	V	V	V	V	V	V	V			V	V	V	V	V	V	V	V	V	V	
24	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

### 6.4.7 Replacing the Processor and Heatsink

The server supports single- or dual-processor configuration depending on the model you purchased.

#### CAUTION

- To avoid damage to the processor and motherboard, do not install the processor without using the processor installation tool.
- To prevent possible server malfunction and equipment damage, processors in a multiprocessor configuration must bear the same part number.

To remove the heatsink and CPU :

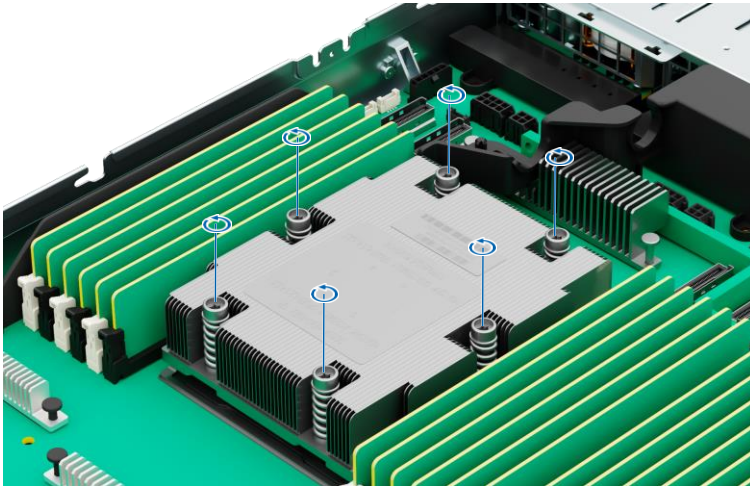
#### DANGER

The heatsink may be hot after the system has been powered off. Allow the heatsink to cool for a few minutes before removing it.

1. Remove the top cover.
2. Remove the air duct.
3. Loosen the 6 captive screws securing the heatsink to the CPU stiffener frame counterclockwise in the sequence shown on the heatsink label with a T20

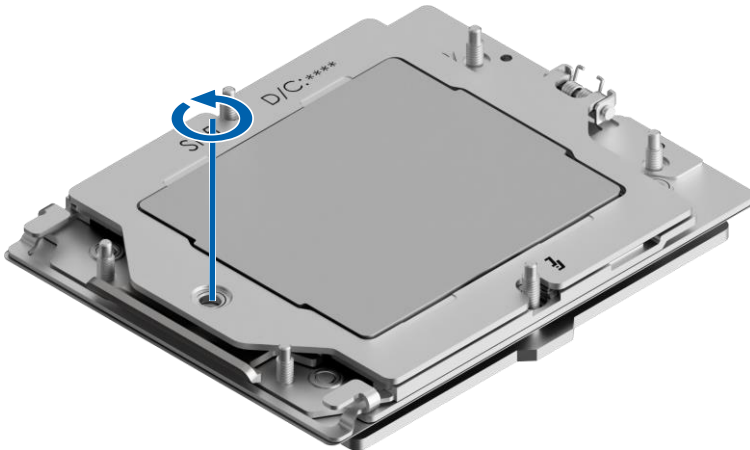
Torx screwdriver.

Figure 4–9 Removing the Heatsink



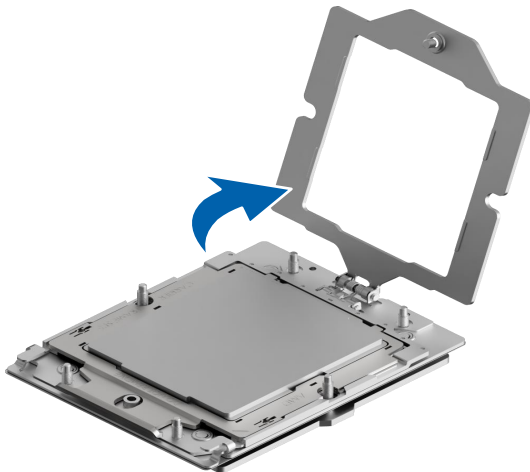
4. Gently remove the heatsink from the CPU stiffener frame.
5. Remove the CPU:
  - a. Loosen the captive screw securing the retention frame to the stiffener frame counterclockwise with a T20 Torx screwdriver.

Figure 4–10 Loosening the Captive Screw



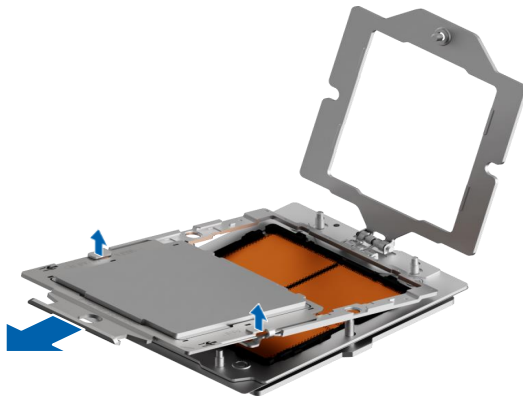
- b. The retention frame ejects automatically.

Figure 4-11 Opening the Retention Frame



- c. Lift up the 2 lift tabs of the rail frame to release the CPU carrier from the stiffener frame. Hold the CPU handle to pull out the CPU and put it into an anti-static bag.

Figure 4-12 Removing the CPU



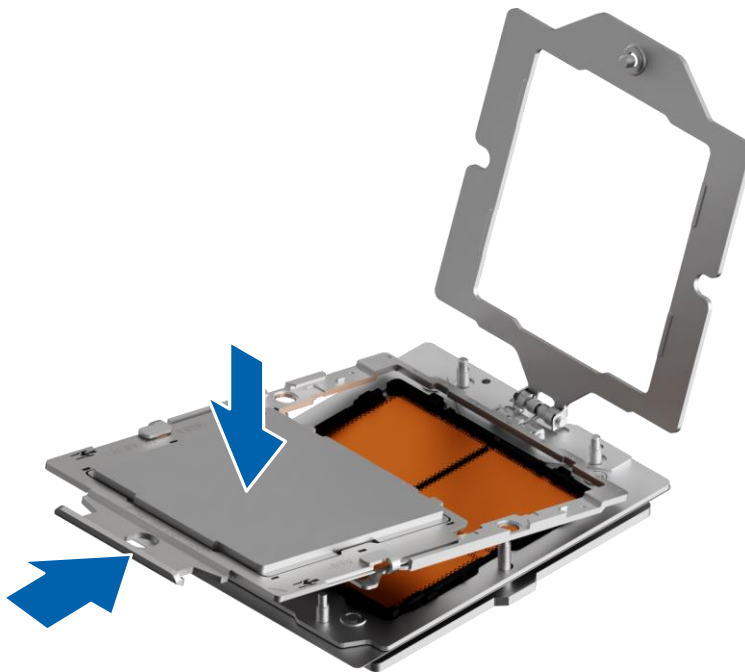
**CAUTION**

- Use a protective cover to protect the CPU socket to avoid damaging socket pins after removing the PHM.
- The CPU contacts are fragile and easily damaged. During removal and installation, always keep the CPU contacts side up when the dedicated processor installation/removal tool (CPU tray) is unavailable.
- DO NOT touch the CPU contacts.

To install the CPU and heatsink:

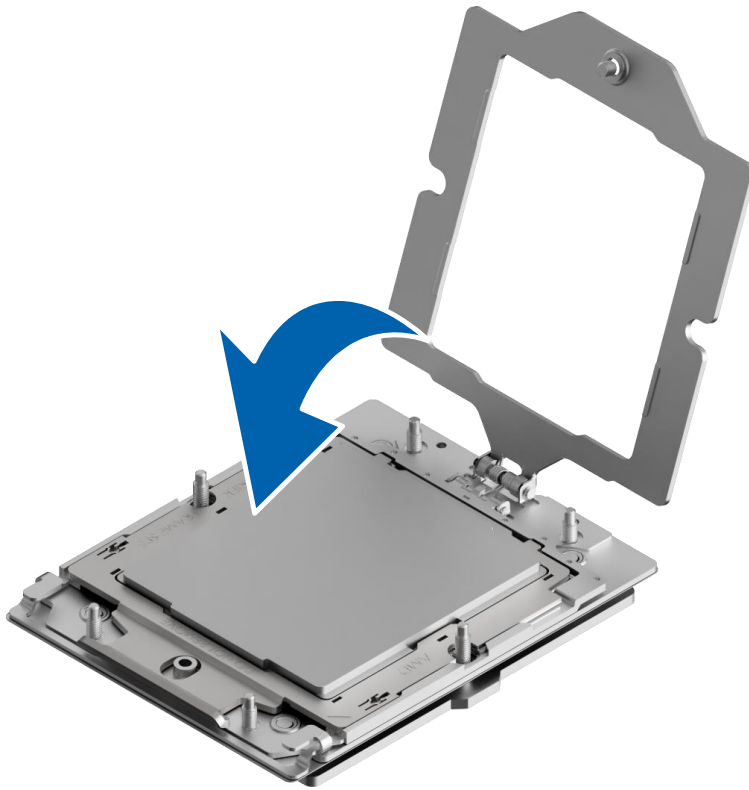
1. Install the CPU:
  - a. Open the retention frame and CPU carrier.
  - b. Hold the CPU handle, insert the CPU into the CPU carrier, and then press down the lift tabs to secure the CPU carrier in place.

Figure 4-13 Installing the CPU



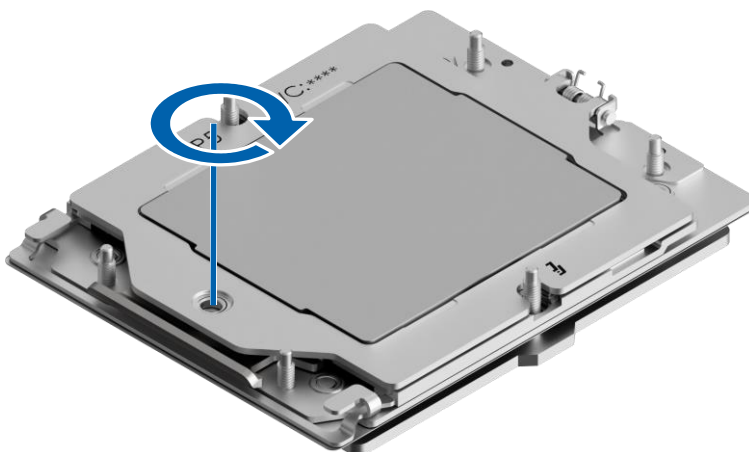
- c. Close the retention frame.

Figure 4–14 Closing the Retention Frame



- d. Tighten the captive screw securing the retention frame to the stiffener frame clockwise with a T20 Torx screwdriver.

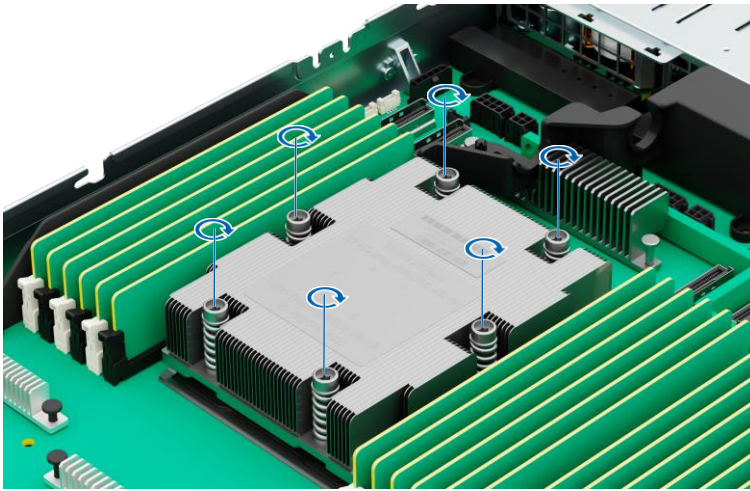
Figure 4–15 Tightening the Captive Screw



2. Install the heatsink.

- a. Align the nuts on the heatsink with the threaded fasteners on the CPU stiffener frame, and lower the heatsink onto the CPU stiffener frame.
- b. Tighten the 6 screws securing the heatsink to the CPU stiffener frame clockwise in the sequence shown on the heatsink label with a T20 Torx screwdriver.

Figure 4-16 Installing the Heatsink



## 6.4.8 Replacing a PCIe Expansion Card

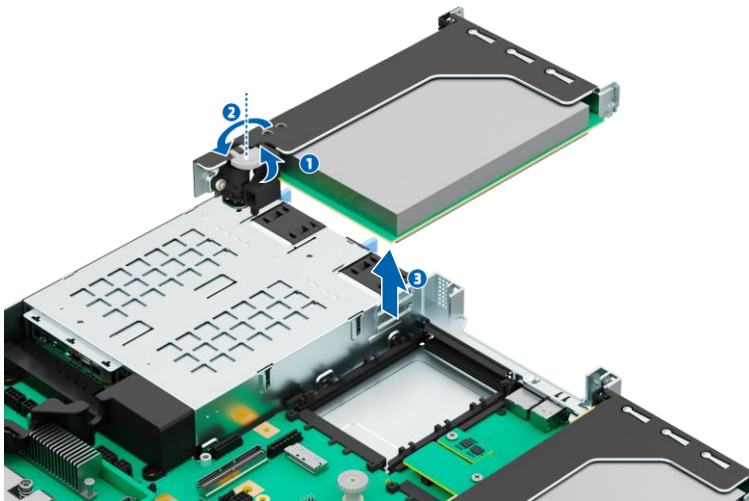
### CAUTION

- To prevent damage to the server or expansion cards, power off the server and remove all power cords before removing or installing the PCIe expansion card.
- To prevent damage to the PCIe slot pins, be sure to apply even force and remove or install the PCIe expansion card vertically to the riser card.

To remove the PCIe expansion card:

1. Remove the top cover.
2. Disconnect the cables from the riser card and PCIe expansion card.
3. Lift up the grey latch (if any) on the PCIe riser-card assembly. Rotate the latch 180° counterclockwise to unlock it.
4. Gently lift and remove the PCIe riser-card assembly with both hands.

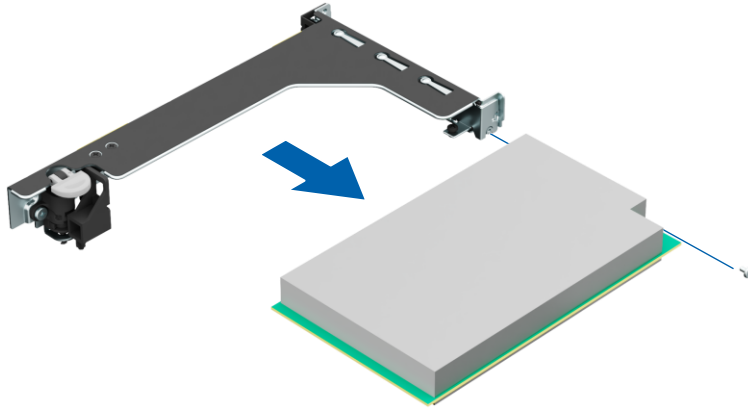
Figure 4-17 Removing the PCIe Riser-Card Assembly



5. Loosen and remove the screw securing the PCIe expansion card to the PCIe cage counterclockwise with a Phillips screwdriver. Remove the PCIe expansion card horizontally as indicated by the arrow and put it into an anti-static bag.

Figure 4-18 Removing the PCIe Expansion Card





To install the PCIe expansion card:

1. Take a new PCIe expansion card from the anti-static bag.
2. Align the PCIe expansion card with the riser card slot and insert the card into the slot.
3. Insert and tighten the screw securing the PCIe expansion card to the PCIe cage clockwise with a Phillips screwdriver.
4. Connect the cables of the riser card and PCIe expansion card.
5. Install the top cover.

## 6.4.9 Replacing a Hot-Swap Drive

### CAUTION

- For proper cooling, do not operate the server without the top cover, air duct, dummies, or blanks installed. If the server supports hot-swap components, minimize the amount of time the top cover is open.
- The front 2.5-inch drives and 3.5-inch drives are hot-swappable

To remove the drive:

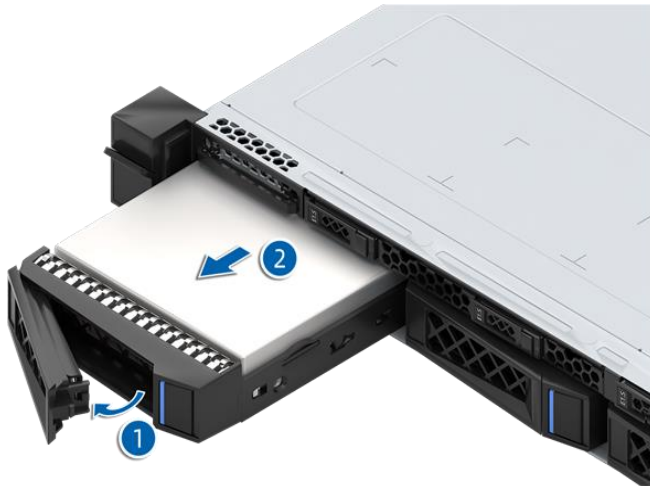
1. Check the status of the drive by the LEDs on the drive tray.
2. Back up all the data on the drive.
3. Press the release button to release the 2.5-/3.5-inch drive tray handle.  
The handle ejects automatically.

Figure 4–19 Pressing the Drive Tray Release Button



4. Hold the drive tray handle and pull the drive module out of the drive bay.

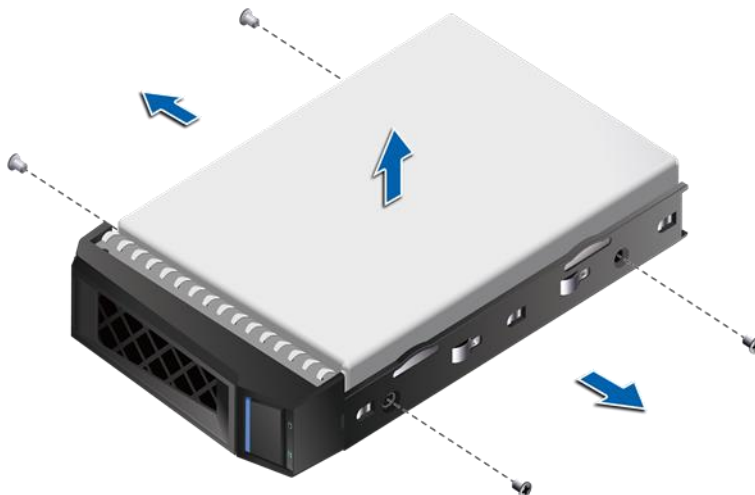
Figure 4–20 Pulling out the Drive Module



5. Remove the drive from the drive tray:

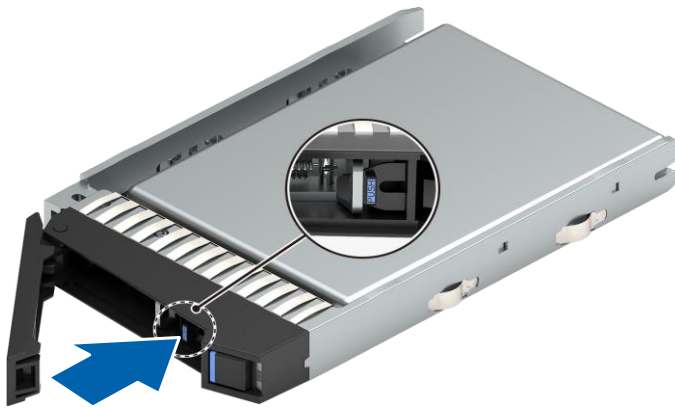
- Drive tray with screws
  - a. Loosen and remove the 4 screws securing the drive to the drive tray counterclockwise with a Phillips screwdriver. Remove the drive from the drive tray and put it into an anti-static bag.

Figure 4–21 Removing the Drive



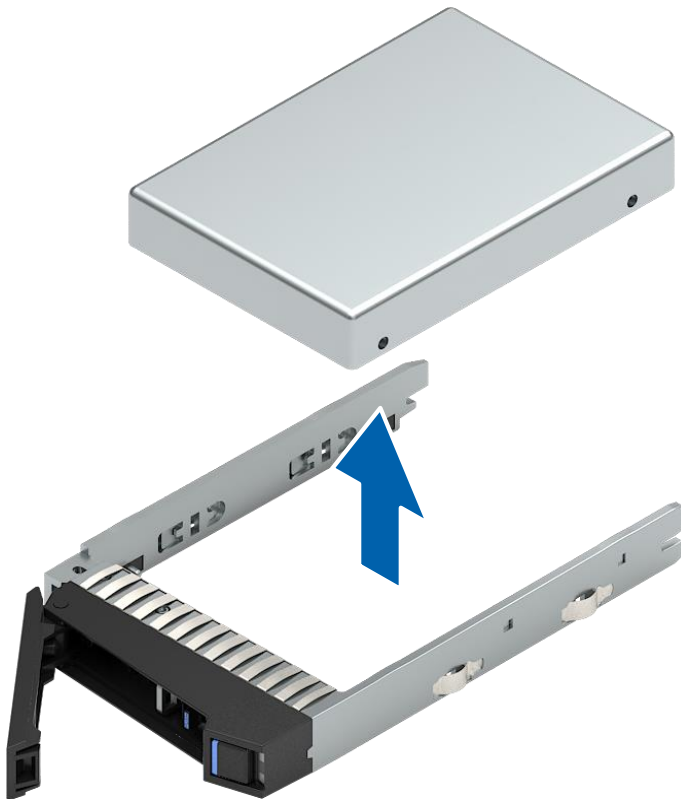
- Tool-less drive tray
  - a. Press the PUSH button on the drive tray. The drive caddy bracket ejects automatically.

Figure 4–22 Releasing the Drive Caddy Bracket



- b. Remove the drive from the drive tray and put it into an anti-static bag.

Figure 4–23 Removing the Drive

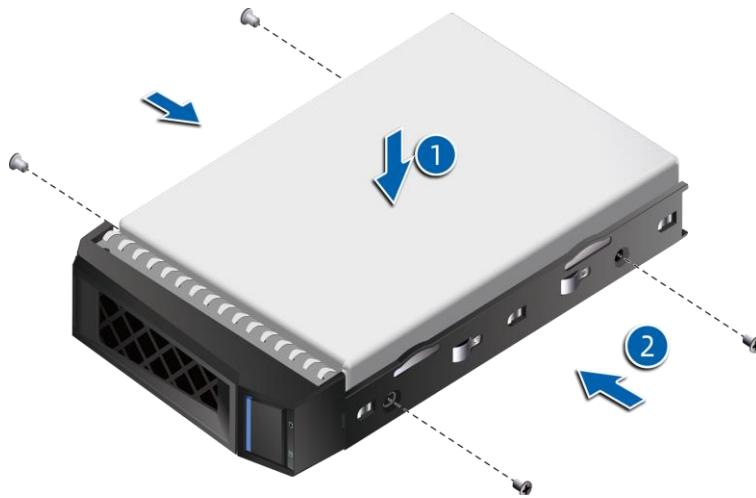


To install the drive:

1. Install the drive into the drive tray:
  - Drive tray with screws
    - a. Orient the drive into the drive tray with the drive connector towards the rear end of the tray.

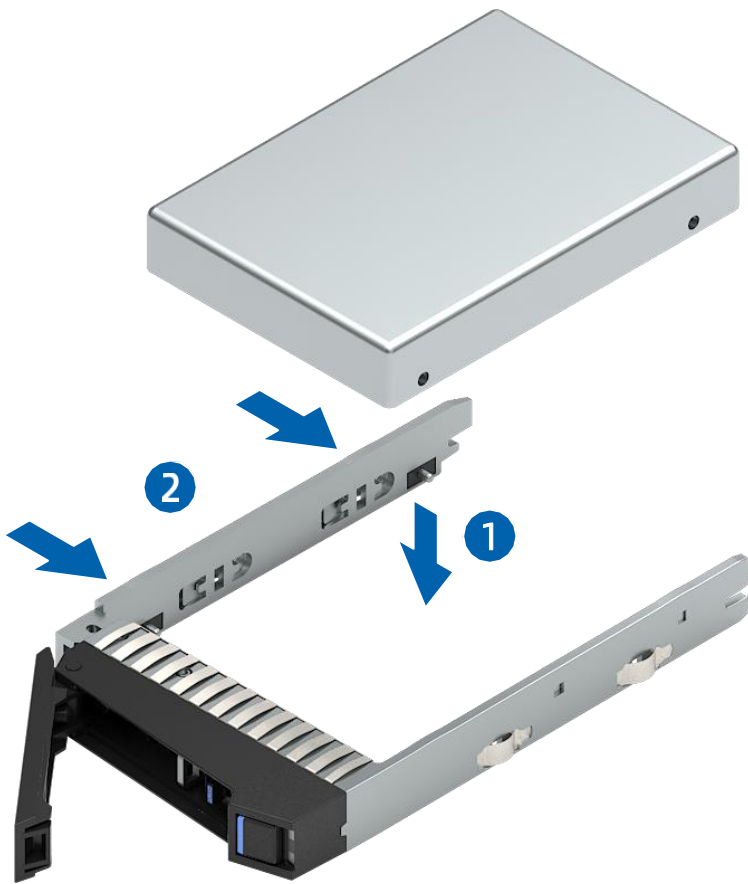
- b. Insert and tighten the 4 screws securing the drive to the drive tray clockwise with a Phillips screwdriver.

Figure 4-24 Installing the Drive (Drive Tray with Screws)



- Tool-less drive tray
  - a. Orient the drive into the drive tray with the drive connector towards the rear end of the tray.
  - b. Press the drive caddy bracket inwards to secure the drive in place.

Figure 4–25 Installing the Drive (Tool-Less Drive Tray)



2. Open the drive tray handle and push the drive module into the drive bay.
3. Close the drive tray handle to lock the drive module in place.

Check that the drive activity LED on the drive tray is green

## 6.4.10 Replacing a Hot-Swap PSU

### WARNING

To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.



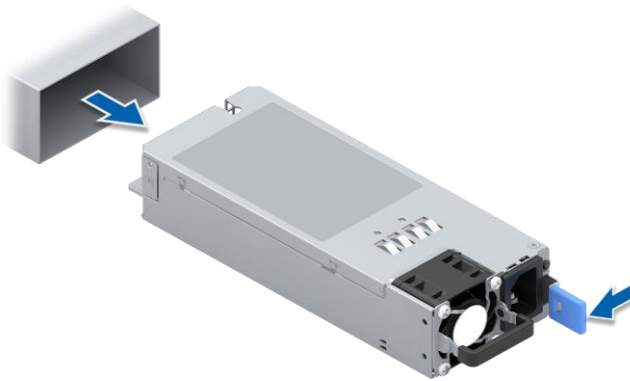
### CAUTION

To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the PSU:

1. Disconnect the power cord.
2. Hold the handle and press the blue release tab to pull the PSU out of the power bay.

Figure 4-42 Removing the PSU



3. Put the PSU into an anti-static bag.

To install the PSU:

1. Take a new PSU out from the anti-static bag.
2. Make sure that the blue release tab is on the right of the PSU. Hold the handle and push the PSU into the power bay until it snaps into place.

3. Connect the power cord.
4. Check that the PSU LED is solid green when the server is powered on.

### 6.4.11 Replacing an OCP Card

#### CAUTION

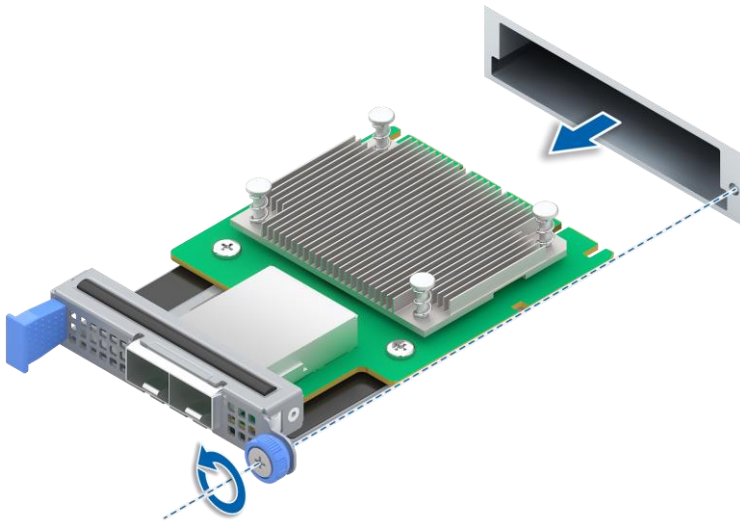
The OCP card supports hot-plug operations:

- To remove the OCP card with the server powered on, press the OCP hot-plug button, the LED turns off, and then remove the OCP card.
- To install the OCP card with the server powered on, after installing the OCP card, press the OCP hot-plug button, and the LED turns green.

To remove the OCP card:

1. Loosen the thumbscrew securing the OCP card to the chassis counterclockwise.
2. Pull out the OCP card from the chassis horizontally.

Figure 4-43 Removing the OCP Card



3. Put the OCP card into an anti-static bag.



To install the OCP card:

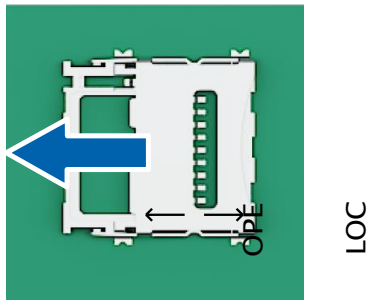
1. Take a new OCP card out from the anti-static bag.
2. Insert the OCP card horizontally into the slot until it snaps into place.
3. Tighten the thumbscrew securing the OCP card to the chassis clockwise.

## 6.4.12 Replacing a TF Card

To remove the TF card:

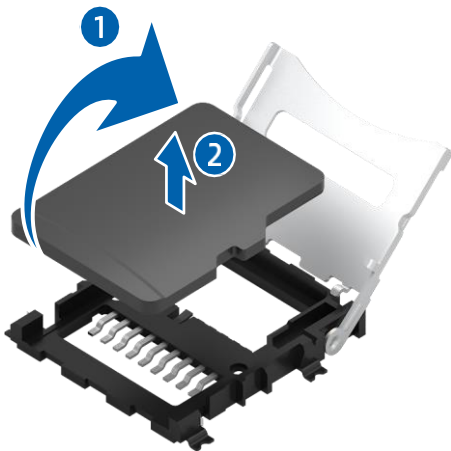
1. Remove the top cover.
2. Remove the air duct.
3. Remove the PCIe riser-card assembly.
4. Push the TF card cover in the direction of the OPEN arrow to unlock it.

Figure 4–49 Pushing the TF Card Cover



5. Open the TF card cover.
6. Remove the TF card and put it into an anti-static bag.

Figure 4–50 Removing the TF Card



To install the TF card:

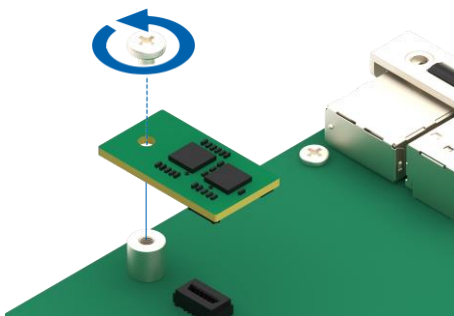
1. Take a new TF card out from the anti-static bag.
2. Put the TF card into the TF card slot.
3. Close the TF card cover and push it in the direction of the LOCK arrow to lock it.
4. Install the PCIe riser-card assembly.
5. Install the air duct.
6. Install the top cover.

### 6.4.13 Replacing the TPM/TCM

To remove the TPM/TCM:

1. Remove the top cover.
2. Remove the air duct.
3. Loosen the screw counterclockwise with a Phillips screwdriver to remove it.
4. Vertically remove the TPM/TCM and put it into an anti-static bag.

Figure 4–51 Removing the TPM/TCM



To install the TPM/TCM:

1. Take a new TPM/TCM out from the anti-static bag.
2. Align the connector and screw hole on the TPM/TCM with the connector and locating post on the motherboard respectively, and install the TPM/TCM vertically onto the motherboard.
3. Insert and tighten the screw clockwise with a Phillips screwdriver.
4. Install the air duct.
5. Install the top cover.

## 6.5 Cable Routing

Blue lines indicate the SAS cable routing between the backplane connectors and the SAS/RAID controller card connectors or the motherboard MCIO connectors.

Red lines indicate the power cable routing between the backplane connectors and the motherboard power connectors.

Figure 4–37 Cable Routing (4 × 3.5-inch Drive Configuration)

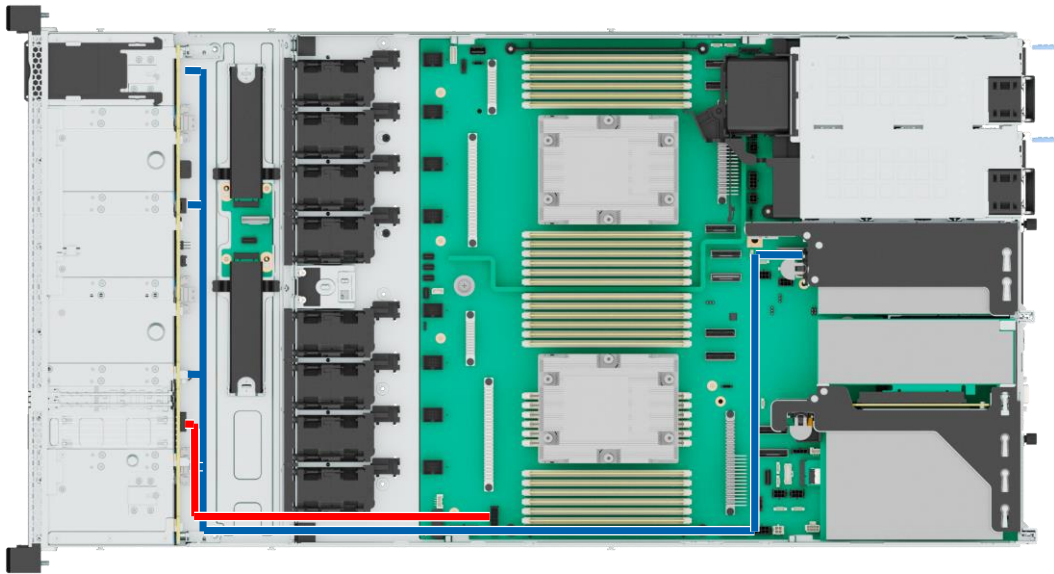
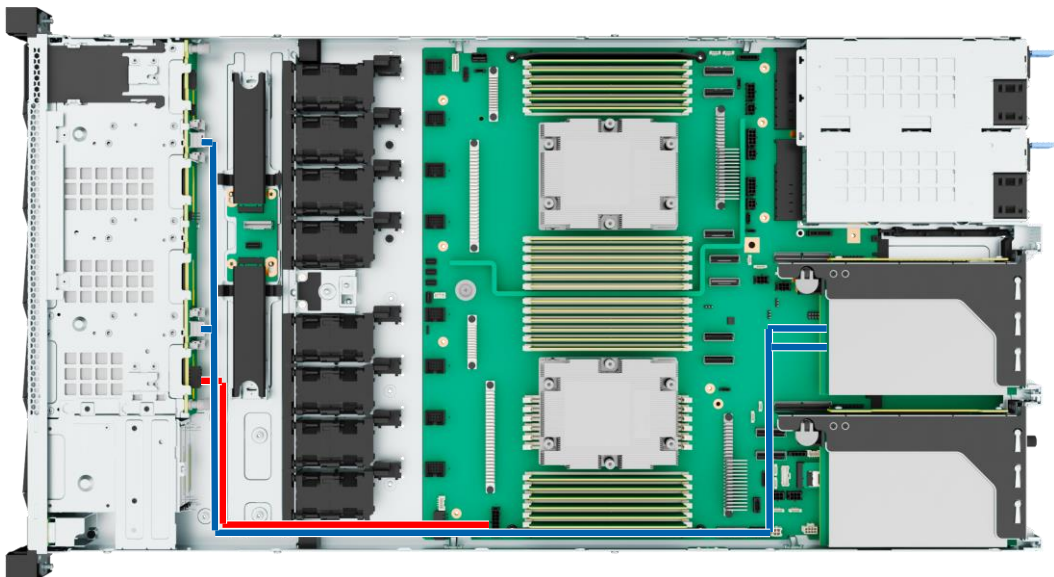


Figure 4–38 Cable Routing (8 × 2.5-inch Drive Configuration)



## 7. System Specifications

### 7.1 Technical Specifications

#### SYSTEM SPECIFICATIONS:

Item	Specification
Form Factor	1U rack server
Processor	<p>Supports 1 or 2 processors.</p> <ul style="list-style-type: none"><li>• 4th Gen AMD Genoa processors.</li><li>• Integrated with memory controllers, with 12 memory channels per processor.</li><li>• Integrated with PCIe controllers with 128 PCIe 5.0 lanes per processor.</li><li>• 4 xGMI links at up to 32 GT/s.</li><li>• Up to 96 cores per processor.</li><li>• Max boost frequency is 4.40 GHz.</li><li>• L3 cache up to 384 MB.</li><li>• TDP up to 225 W with standard heatsink and up to 400 W with optional EVAC heatsink (ask you pre-sales or sales contact for more information).</li></ul> <p>Note: The information above is for reference only, consult 2CRSi Customer Service for details about component compatibility.</p>

Memory	<p>24 DIMM slots.</p> <ul style="list-style-type: none"> <li>• Up to 24 DDR5 DIMMs.</li> <li>• Each processor supports 12 memory channels and each channel supports 1 DIMM slot.</li> <li>• Up to 4,800 MT/s.</li> <li>• RDIMMs supported.</li> <li>• Mixing DDR5 DIMMs of different specifications (such as capacity, bit width, rank, and height) is not supported.</li> <li>• A server must use DDR5 DIMMs with the same part number (P/N code).</li> <li>• ECC, memory mirroring, and memory rank sparing supported.</li> </ul>
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Item	Specification
	<p>Note: The information above is for reference only, consult 2CRSi Customer Service for details about component compatibility.</p>
Storage	<p>Supports multiple drive configurations. For detailed information, refer to 5.5.1 Drive Configuration.</p> <ul style="list-style-type: none"> <li>• Supports multiple models of RAID controller cards. Consult 2CRSi Customer Service for details. <ul style="list-style-type: none"> <li>○ Supports functions such as RAID configuration, RAID level migration, and disk roaming.</li> <li>○ Supports power failure protection enabled by the super-capacitor to protect user data.</li> <li>○ A standard RAID controller card occupies 1 PCIe slot.</li> </ul> </li> <li>• 32 onboard SATA connectors (4 MCIO x8 connectors, each with 8 SATA connectors).</li> </ul>

Network	<p>Multiple types of network expansion:</p> <ul style="list-style-type: none"> <li>• optional OCP 3.0 cards (1 Gb/s ; 10 Gb/s ; 25 Gb/s ; 40 Gb/s ; 100 Gb/s ; 200 Gb/s).</li> <li>• 1x (10 Gb/s ; 25 Gb/s ; 40 Gb/s ; 100 Gb/s) PCIe NICs.</li> </ul>
I/O Expansion	<p>PCIe slots:</p> <ul style="list-style-type: none"> <li>• Up to 3 PCIe x16 slots.</li> <li>• OCP 3.0 x16 cards.</li> </ul> <p>Note: The information above is for reference only. For detailed information, see PCIe Slot and PCIe Slot Description.</p>
Port, Button and LED	<p>Supports multiple ports.</p> <ul style="list-style-type: none"> <li>• Front panel ports, buttons and LEDs (12x 2.5-inch drive configuration): <ul style="list-style-type: none"> <li>○ 1 UID/BMC RST button and LED</li> <li>○ 1 power button and LED</li> </ul> </li> <li>• Rear panel ports, buttons and LEDs: <ul style="list-style-type: none"> <li>○ USB 3.0 ports</li> <li>○ 1 DB15 VGA port</li> <li>○ 1 BMC management network port</li> <li>○ 1 system serial port/BMC serial port (micro USB port)</li> <li>○ 1 UID/BMC RST button and LED</li> </ul> </li> <li>• Internal connectors: <ul style="list-style-type: none"> <li>○ 32 SATA connectors (4 MCIO x8 connectors, each with 8 SATA connectors)</li> </ul> </li> </ul> <p>Note: The installation of OS on USB storage media is not recommended.</p>
Fan	8 hot-swap redundant 4056 fans with N+1 redundancy

PSU	<p>Supports 550 W/800 W/1300 W CRPS standard PSUs with 1+1 redundancy.</p> <ul style="list-style-type: none"> <li>• 110 VAC – 230 VAC: 90 V -264 V</li> <li>• 240 VDC: 180 V – 320 V</li> <li>• 336 VDC: 260 V – 400 V</li> <li>• -48 VDC: -40 V to -72 V</li> </ul>
System Management	<ul style="list-style-type: none"> <li>• BMC</li> <li>• NC-SI</li> <li>• Physical Infrastructure Manager (IPMI)</li> </ul>
OS	For supported operating systems, see 7.1 Operating System.

## 7.2 Environmental Specifications

### ENVIRONMENTAL SPECIFICATIONS:

Item	Parameter
Temperature <sup>1, 2, 3</sup>	<ul style="list-style-type: none"> <li>• Operating: 10°C to 35°C (50°F to 95°F) (For some configurations, the operating temperature is 5°C to 45°C (41°F to 113°F))</li> <li>• Storage (packed): -40°C to +70°C (-40°F to +158°F)</li> <li>• Storage (unpacked): -40°C to +55°C (-40°F to +131°F)</li> </ul>
Relative Humidity (RH, non-condensing)	<ul style="list-style-type: none"> <li>• Operating: 8% to 90% RH</li> <li>• Storage (packed): 5% to 95% RH</li> <li>• Storage (unpacked): 5% to 95% RH</li> </ul>
Operating Altitude	<p>≤ 3,050 m (10,007 ft)</p> <ul style="list-style-type: none"> <li>• For configurations that satisfy the requirement of ASHRAE A2 level, derate the maximum allowable temperature by 1°C per 300 m (1°F per 547 ft) above 900 m (2,953 ft).</li> <li>• For configurations that satisfy the requirement of ASHRAE A3 level, derate the maximum allowable temperature by 1°C per 175 m (1°F per 318 ft) above 900 m (2,953 ft).</li> <li>• For configurations that satisfy the requirement of ASHRAE A4 level, derate the operating temperature by 1°C per 125 m (1°F per 228 ft) above 900 m (2,953 ft).</li> </ul>



Notes:

<sup>1</sup> Some configurations with high CPU TDP support an operating temperature range of 10°C to 35°C (50°F to 95°F).

<sup>2</sup> Standard operating temperature:

- 10°C to 35°C (50°F to 95°F) is the standard operating temperature range at sea level. For temperatures between 10°C and 35°C (50°F and 95°F), derate the maximum allowable temperature by 1°C per 305 m (1°F per 556 ft) above sea level. The maximum temperature gradient is 20°C/h (36°F/h) and the maximum operating altitude is 3,050 m (10,007 ft), both varying with server configuration.
- Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.

<sup>3</sup> Expanded operating temperature:

- For certain approved configurations, the temperature range at the server inlet can be expanded to 5°C to 10°C (41°F to 50°F) and 35°C to 45°C (95°F to 113°F) at sea level. At an altitude of 900 to 3,050 m (2,953 to 10,000 ft), de-rate the maximum allowable temperature by 1°C per 175 m (1°F per 319 ft).
- For certain approved configurations, the temperature range at the server inlet can be expanded to 35°C to 45°C (95°F to 113°F) at sea level. At an altitude of 900 to 3,050 m (2,953 to 10,000 ft), de-rate the maximum allowable temperature by 1°C per 125 m (1°F per 228 ft).
- Any fan failure or operations under expanded environments may lead to system performance degradation.

<sup>4</sup> Product conformance to cited normative standards is based on sample testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

## 7.3 Physical Specifications

### PHYSICAL SPECIFICATIONS:

Item	Description
Dimensions (W x H x D)	850 chassis: <ul style="list-style-type: none"><li>• Chassis: 437x 43.05x 850 mm (17.20x 1.70x 33.46 in.)</li></ul>
	Outer packaging: 600x 240x 1,090 mm (23.62x 9.44x 42.91 in.)

Installation Dimension Requirements	<ul style="list-style-type: none"> <li>• Installation requirements for the cabinet are as follows: <ul style="list-style-type: none"> <li>○ General cabinet compliant with the International Electrotechnical Commission 297 (IEC 297) standard</li> <li>○ Width: 482.6 mm (19 in.)</li> <li>○ Depth: Over 1,000 mm (39.37 in.)</li> </ul> </li> <li>• Installation requirements for the server rails are as follows: <ul style="list-style-type: none"> <li>○ L-bracket rails: L-bracket rails should be installed at intervals.</li> <li>○ Ball-bearing rail kit: The distance between the mounting flanges at the front and rear of the cabinet is 610 to 900 mm (24.02 to 35.43 in.).</li> </ul> </li> </ul>
Weight	<ul style="list-style-type: none"> <li>• Net weight: <ul style="list-style-type: none"> <li>○ 4x 3.5-inch + 4x 2.5-inch drive configuration: 27.5 kg (60.63 lbs)</li> <li>○ 12x 2.5-inch drive configuration: 28 kg (61.73 lbs)</li> </ul> </li> <li>• Packaging material weight: 9.5 kg (20.94 lbs)</li> </ul>
Power Consumption	Power consumption varies with configuration. Consult 2CRSi Customer Service for details.

## 8. Operating System and Hardware Compatibility

This section describes the OS and hardware compatibility of the server. For the latest compatibility configuration and the component models not listed in this document, contact your local 2CRSi sales representative.



- Using incompatible components may cause the server to work abnormally, and such failures are not covered by technical support or warranty.
  - The server performance is strongly influenced by application software, middleware and hardware. The subtle differences in them may lead to performance variation in the application and test software.
    - For requirements on the performance of specific application software, contact 2CRSi sales representatives to request for a proof of concept (POC) and confirm the detailed hardware and software configurations during the pre-sales phase.
    - For requirements on hardware performance consistency, define specific configuration requirements (for example, specific drive models, RAID controller cards, or firmware versions) during the pre-sales phase.
- 

### 8.1 Supported Operating Systems

#### **SUPPORTED OPERATING SYSTEMS:**

OS	OS Version
Windows	Windows Server 2019
Red Hat	Red Hat Enterprise Linux 8.6
	Red Hat Enterprise Linux 9.0
VMware	VMware ESXi 7.0 P06

## 8.2 Hardware Compatibility

### 8.2.1 CPU Specifications

#### CPU SPECIFICATIONS:

MODEL	CORES	THREADS	BASE FREQ. (GHZ)	UP TO MAX BOOST FREQ. (GHZ) <sup>a</sup>	ALL-CORE BOOST (GHZ) <sup>b</sup>	DEFAULT TDP (W)	L3 CACHE (MB)	2P/1P
9754	128	256	2.25	3.10	3.10	360	256	2P/1P
9754S		128						2P/1P
9734	112	224	2.20	3.00	3.00	340	256	2P/1P
9654	96	192	2.40	3.70	3.55	360	384	2P/1P
9654P								1P
9634	84	168	2.25	3.70	3.10	290	384	2P/1P
9554	64	128	3.10	3.75	3.75	360	256	2P/1P
9554P								1P
9534	64	128	2.45	3.70	3.55	280	256	2P/1P
9454	48	64	2.75	3.80	3.65	290	256	2P/1P
9454P								1P
9354	32	64	3.25	3.80	3.75	280	256	2P/1P
9354P								1P
9334	32	56	2.70	3.90	3.85	210	128	2P/1P
9254	24	48	2.90	4.15	3.90	200	128	2P/1P
9224	24	48	2.50	3.70	3.65	200	64	2P/1P
9124	16	32	3.00	3.70	3.60	200	64	2P/1P
AMD EPYC 9004 SERIES PROCESSORS WITH AMD 3D V-CACHE								
9684X	96	192	2.55	3.70	3.42	400	1152	2P/1P
9384X	32	64	3.10	3.90	3.50	320	768	2P/1P
9184X	16	32	3.55	4.20	3.85	320	768	2P/1P
HIGH-FREQUENCY AMD EPYC 9004 SERIES PROCESSORS								
9474F	48	96	3.60	4.10	3.95	360	256	2P/1P
9374F	32	64	3.85	4.30	4.10	320	256	2P/1P
9274F	24	48	4.05	4.30	4.10	320	256	2P/1P
9174F	16	32	4.10	4.40	4.15	320	256	2P/1P



#### IMPORTANT

CPU with TDP upper than 225W required optional EVAC Heatsink.

### 8.2.2 DIMM Specifications

The server supports up to 32 DDR5 DIMMs. Each processor supports 12 memory channels with up to 2 DIMMs per channel. The supported DIMMs includes RDIMMs and CPS.

## DIMM SPECIFICATIONS

Type	Capacity (GB)	Frequency (MHz)	Data Width	Organization
RDIMM	16	4,800	x80	1R x8
RDIMM	32	4,800	x80	1R x4/2R x8
RDIMM	64	4,800	x80	2R x4
CPS	128	4,800		

## 8.2.3 Drive Specifications

### SAS/SATA DRIVE SPECIFICATIONS

Type	Speed in rpm	Capacity
2.5-inch SAS	10K	600 GB/1.2 TB/1.8 TB/2.4 TB
	15K	600 GB/900 GB

### SSD SPECIFICATIONS

Type	Vendor	Model
2.5" SATA SSD		
2.5" SATA SSD	SAMSUNG	SSD SATA3 PM893 3.84TB_MZ7L33T8HBLT-00A07
2.5" SATA SSD	SAMSUNG	SSD SATA3 PM893 1.92TB_MZ7L31T9HBLT-00A07
2.5" SATA SSD	SAMSUNG	SSD SATA3 PM893 960GB_MZ7L3960HCJR-00A07
2.5" SATA SSD	SAMSUNG	SSD SATA3 PM893 480GB_MZ7L3480HCHQ-00A07
2.5" SATA SSD	SAMSUNG	SSD SATA3 PM893 240GB_MZ7L3240HCHQ-00A07
2.5" SATA SSD	INTEL	SSD SATA3 S4620 3.84TB_SSDSC2KG038TZ01 99A0DC
2.5" SATA SSD	INTEL	SSD SATA3 S4620 1.92TB_SSDSC2KG019TZ01 99A0DA
2.5" SATA SSD	INTEL	SSD SATA3 S4620 960GB_SSDSC2KG960GZ01 99A0D9
2.5" SATA SSD	INTEL	SSD SATA3 S4620 480GB_SSDSC2KG480GZ01 99A0D8
2.5" SATA SSD	INTEL	SSD SATA3 S4520 7.68TB_SSDSC2KB076TZ01 99A0D7
2.5" SATA SSD	INTEL	SSD SATA3 S4520 3.84TB_SSDSC2KB038TZ01 99A0D6
2.5" SATA SSD	INTEL	SSD SATA3 S4520 1.92TB_SSDSC2KB019TZ01 99A0CP
2.5" SATA SSD	INTEL	SSD SATA3 S4520 960GB_SSDSC2KB960GZ01 99A0AF
2.5" SATA SSD	INTEL	SSD SATA3 S4520 480GB_SSDSC2KB480GZ01 99A0AD
2.5" SATA SSD	INTEL	SSD SATA3 S4520 480GB_SSDSC2KB240GZ01 99A0AA

**U.2/U.3 NVME SSD SPECIFICATIONS (WARNING : 2.5" DRIVES ARE LIMITED TO 7MM ON THE MONA 1.44GG)**

Type	Vendor	Model
2.5" NVMe SSD		
2.5" NVMe SSD	WESTERN DIGITAL	ULTRASTAR DC SN655 TLC NVMe U.3 SFF-15mm RI-1 3.84TB – WUS5EA138ESP7E1
2.5" NVMe SSD	WESTERN DIGITAL	ULTRASTAR DC SN655 TLC NVMe U.3 SFF-15mm RI-1 7.68TB – WUS5EA176ESP7E1
2.5" NVMe SSD	WESTERN DIGITAL	ULTRASTAR DC SN655 TLC NVMe U.3 SFF-15mm RI-1 15.36TB – WUS5EA1A1ESP7E1
2.5" NVMe SSD	SAMSUNG	SSD PCIE5 PM1743 15.36TB_MZWLO15THBLA-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE5 PM1743 7.68TB_MZWLO7T6HBLA-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE5 PM1743 3.84TB_MZWLO3T8HCLS-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE5 PM1743 1.92TB_MZWLO1T9HCJR-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE4 PM9A3 7.68TB U.2_MZQL27T6HBLA-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE4 PM9A3 3.84TB U.2_MZQL23T8HCLS-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE4 PM9A3 1.92TB U.2_MZQL21T9HCJR-00A07
2.5" NVMe SSD	SAMSUNG	SSD PCIE4 PM9A3 960GB U.2_MZQL2960HCJR-00A07
2.5" NVMe SSD	INTEL	SSD PCIE4 D7-P5510 7.68TB_SSDPF2KX076TZ01 99A5DR
2.5" NVMe SSD	INTEL	SSD PCIE4 D7-P5510 3.84TB_SSDPF2KX038TZ01 99A5DP
2.5" NVMe SSD	INTEL	SSD PCIE P5620 6.4TB_SSDPF2KE064T1 99AH31

**3.5" HDD SPECIFICATIONS**

Type	Vendor	Model
3.5" SATA HDD		
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTAR DC HC580 24TB SATA Helium_WUH722424ALE6L1
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTAR DC HC570 22TB SATA Helium_WUH722222ALE6L4
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTAR DC HC570 22TB SAS Helium_WUH722222AL5204
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTARDCHC320 8TB SATA AIR_HUS728T8TALE6L4
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTARDCHC330 10TB SATA AIR_WUS721010ALE6L4
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTARDCHC520 12TB SATA Helium_HUH721212ALE600
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTAR DC HC550 16TB SATA Helium_WUH721816AL5204
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTAR DC HC550 18TB SATA Helium_WUH721818ALE6L4
3.5" SATA HDD	WESTERN DIGITAL	ULTRASTAR DC HC560 20TB SATA Helium_WUH722020ALE6L4

3.5" SAS HDD	WESTERN DIGITAL	ULTRASTARDCHC320 8TB SAS AIR_HUS728T8TAL5204
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTARDCHC330 10TB SAS AIR_WUS721010AL5204
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTARDCHC520 12TB SAS Helium_HUH721212AL5200
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTARDCHC530 14TB SAS Helium_WUH721414AL5204
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTAR DC HC550 16TB SAS Helium_WUH721816AL5204
3.5" SAS HDD	WESTERN DIGITAL	ULTRASTAR DC HC550 18TB SAS Helium_WUH721818AL5204
3.5" SATA HDD	TOSHIBA	18TB 7200RPM_MG09ACA18TE/0104
3.5" SATA HDD	TOSHIBA	16TB 7200RPM_MG08ACA16TE/0102
3.5" SATA HDD	TOSHIBA	14TB 7200RPM_MG07ACA14TE/0104
3.5" SATA HDD	TOSHIBA	12TB 7200RPM_MG07ACA12TE/0104
3.5" SATA HDD	TOSHIBA	10TB 7200RPM_MG06ACA10TE/FW:0109
3.5" SATA HDD	TOSHIBA	8TB 7200RPM_MG08ADA800E/FW:0101
3.5" SATA HDD	TOSHIBA	6TB 7200RPM_MG08ADA600E/FW:0101
3.5" SATA HDD	TOSHIBA	4TB 7200RPM_MG08ADA400E/FW0101
3.5" SATA HDD	TOSHIBA	2TB 7200RPM_MG04ACA200E/FW:FP4B
3.5" SATA HDD	TOSHIBA	1TB 7200RPM_MG04ACA100N/FW:FJ5A
3.5" SATA HDD	SEAGATE	18TB 7200RPM_SEAGATE/ST18000NM000J/SN02
3.5" SATA HDD	SEAGATE	10TB 7200RPM_SEAGATE/ST10000NM017B/SN01
3.5" SATA HDD	SEAGATE	8TB 7200RPM_SEAGATE/ST8000NM017B/SN01
3.5" SATA HDD	SEAGATE	6TB 7200RPM_SEAGATE/ST6000NM019B/SN01
3.5" SATA HDD	SEAGATE	4TB 7200RPM_SEAGATE/ST4000NM024B/SN01

## 8.2.4 SAS/RAID Controller Card Specifications

### SAS/RAID CONTROLLER CARD SPECIFICATIONS

Type	Vendor	Model
RAID Card	BROADCOM	RAID CARD 9560-16I 8G_BROADCOM/05-50077-00
RAID Card	BROADCOM	RAID CARD 9540-8I_BROADCOM/05-50134-03
RAID Card	BROADCOM	RAID CARD 9560-8I 8G_BROADCOM/05-50077-01
RAID Card	BROADCOM	RAID CARD 9500-16E 8G_BROADCOM/05-50075-00
RAID Card	BROADCOM	RAID CARD 9500-8E 8G_BROADCOM/05-50075-01
CACHE VAULT	BROADCOM	CACHE VAULT FOR 9460-16i, 9480-8i8e, 9560-16i, 9560-8i, 9580-8i8e, SAS 9365-28i, SAS 9460-8i_BCM/05-50039-00/CVPM05

## 8.2.5 NIC Specifications

### NIC SPECIFICATIONS

Type	Vendor	Model
OCP3.0 NIC Cards		
OCP3.0 Card	BROADCOM	LAN CARD PCIE 2T 10G N210TP_BROADCOM/BCM957416A4160C
OCP3.0 Card	BROADCOM	LAN CARD PCIE 2S 10G N210P_BROADCOM/BCM957412N4120C
OCP3.0 Card	BROADCOM	LAN CARD PCIE 2P 25G N225P_BROADCOM/BCM957414N4140C
OCP3.0 Card	BROADCOM	LAN CARD PCIE 4P 25G N425G_BROADCOM/BCM957504-N425G
OCP3.0 Card	BROADCOM	LAN CARD PCIE 2P 100G N2100G_BROADCOM/BCM957508-N2100G
OCP3.0 Card	NVIDIA	LAN CARD OCP3 G5 2P NDR200 MCX7_NVIDIA/MCX753436MS-HEAB
OCP3.0 Card	NVIDIA	LAN CARD OCP3 G4 2P 100G MCX6DX_NVIDIA/MCX623436AN-CDAB
OCP3.0 Card	INTEL	LAN CARD OCP3 2P 100G E810_INTEL/E810CQDA20CPV3G 983094
OCP3.0 Card	INTEL	LAN CARD OCP3 2P 25G E810_INTEL/E810XXVDA20CP3G 983263
Network Card	NVIDIA	LAN CARD PCIE G5 1P NDR MCX7V_NVIDIA/MCX75310AAS-NEAT
Network Card	NVIDIA	LAN CARD PCIE G5 2P NDR200 MCX7_NVIDIA/MCX755106AS-HEAT
Network Card	MELLANOX	LAN CARD PCIE G4 1P 200G MCX6DX_MELLANOX/MCX623105AC-VDAT
Network Card	MELLANOX	LAN CARD PCIE 2PORT 100G_MELLANOX/MBF2H536C-CECOT
Network Card	MELLANOX	LAN CARD PCIE G4 2P 100G MCX6DX_MELLANOX/MCX623106AN-CDAT
Network Card	MELLANOX	LAN CARD PCIE G4 2P 25G MCX6LX_MELLANOX/MCX631102AN-ADAT
Network Card	MELLANOX	LAN CARD PCIE 2PORT 25G_MELLANOX/MBF2H532C-AECOT
Network Card	MELLANOX	LAN CARD PCIE 2PORT 25G MCX4_MELLANOX/MCX4121A-ACAT
Network Card	BROADCOM	LAN CARD PCIE 2T 10G P210TP_BROADCOM/BCM957416A4160C
Network Card	BROADCOM	LAN CARD PCIE 2S 10G P210P_BROADCOM/BCM957412A4120AC
Network Card	BROADCOM	LAN CARD PCIE 2P 25G P225P_BROADCOM/BCM957414A4142CC
Network Card	BROADCOM	LAN CARD PCIE 4P 25G P425G_BROADCOM/BCM957504-P425G
Network Card	BROADCOM	LAN CARD PCIE 2P 100G P2100G_BROADCOM/BCM957508-P2100G



## 8.2.6 PSU Specifications

The server supports up to 2 PSUs in 1+1 redundancy (some 3-GPU or 4-GPU configurations do not support 1+1 redundancy) that follow the Intel Common Redundant Power Supply (CRPS) specification. The PSUs share a common electrical and structural design that allows for hot-swap and tool-less installation into the server with the PSUs locking automatically after being inserted into the power bay. The CRPS PSUs are 80 Plus Titanium rated with various output powers, allowing customers to choose as needed.

- The following rated 110 VAC to 230 VAC and 240 VDC PSUs in 1+1 redundancy are supported:
    - 1,300 W Titanium PSU: 1,000W (110 VAC), 1,300 W (230 VAC)
- 

At a rated input voltage of 110 VAC, the output power of a 1,300W PSU will be derated to 1,000 W.

---

Operating voltage range:

- 110 to 230 VAC: 90 to 264 VAC
- 240 VDC: 180 to 320 VDC

The following rated 336 VDC PSUs in 1+1 redundancy are supported:

- 1,300 W PSU: 1,300 W (230 VAC) (330 VDC)
- 2,700 W PSU: 2,700 W (230 VAC) (330 VDC)

Operating voltage range:

- 336 VDC: 260 to 400 VDC

The following rated -48 VDC PSUs in 1+1 redundancy are supported:

- 800 W PSU: 800 W (-48 VDC)
- 1,300 W PSU: 1,300 W (-48 VDC)
- 2,700 W PSU: 2,700 W (-48 VDC)

Operating voltage range:

- -48 VDC: -40 to -72 VDC

## 9. Regulatory Information

### 9.1 Safety

#### 9.1.1 General

- Strictly comply with local laws and regulations while installing the equipment. The safety instructions in this section are only a supplement to local safety regulations.
- To ensure personal safety and to prevent damage to the equipment, all personnel must strictly observe the safety instructions in this section and on the device labels.
- People performing specialized activities, such as electricians and electric forklift operators, must possess qualifications recognized by the local government or authorities.

#### 9.1.2 Personal Safety

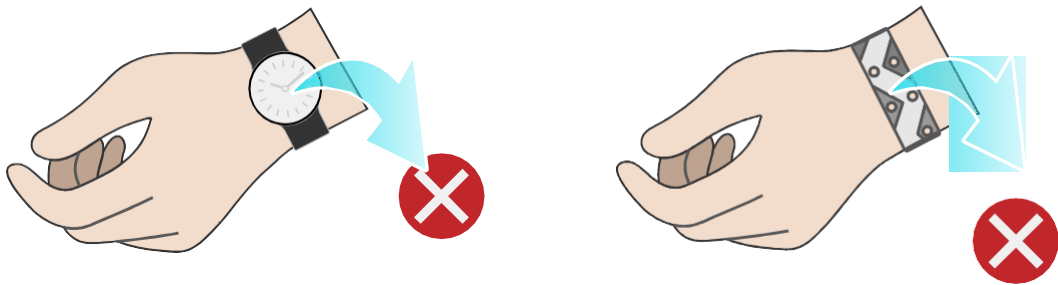
- Only personnel certified or authorized by 2CRSi are allowed to perform the installation procedures.
- Stop any operation that could cause personal injury or equipment damage. Report to the project manager and take effective protective measures.
- Working during thunderstorms, including but not limited to handling equipment, installing cabinets and installing power cords, is forbidden.
- Do not carry the weight over the maximum load per person allowed by local laws or regulations. Arrange appropriate installation personnel and do not overburden them.
- Installation personnel must wear clean work clothes, work gloves, safety helmets and safety shoes.

## PROTECTIVE CLOTHING



- Before touching the equipment, put on ESD clothes and ESD gloves or an ESD wrist strap, and remove any conductive objects such as wrist watches or metal jewelry, in order to avoid electric shock or burns.

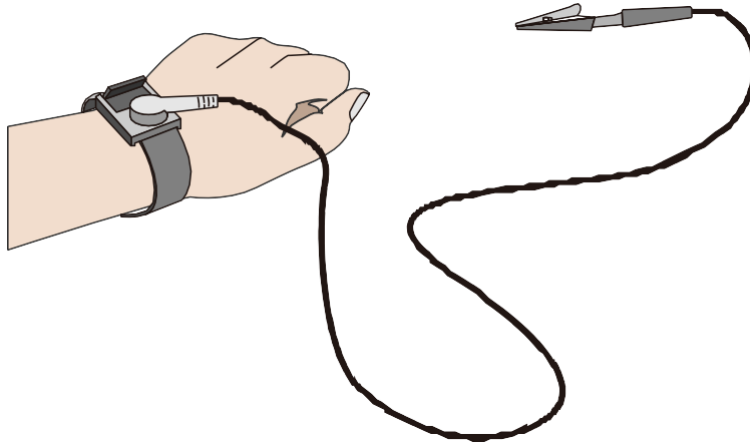
## REMOVING CONDUCTIVE OBJECTS



How to put on an ESD strap.

- a. Put your hand through an ESD wrist strap.
- b. Tighten the strap buckle to ensure a snug fit.
- c. Plug the alligator clip of the ESD wrist strap into the corresponding jack on the grounded cabinet or grounded chassis.

## WEARING AN ESD WRIST STRAP



- Use tools correctly to avoid personal injury.
- When moving or lifting equipment above shoulder height, use lifting devices and other tools as necessary to avoid personal injury or equipment damage due to equipment slippage.
- The power sources of the server carry a high voltage. Direct contact or indirect contact through damp objects with the high-voltage power source is fatal.
- To ensure personal safety, ground the server before connecting power.
- When using ladders, always have someone hold and guard the bottom of the ladders. In order to prevent injury, never use a ladder alone.
- When connecting, testing or replacing optical fiber cable, avoid looking into the optical port without eye protection in order to prevent eye damage from laser light.

### 9.1.3 Equipment Safety

- To ensure personal safety and prevent equipment damage, use only the power cords and cables that come with the server. Do not use them with any other equipment.
- Before touching the equipment, put on ESD clothing and ESD gloves to prevent static electricity from damaging the equipment.
- When moving the server, hold the bottom of the server. Do not hold the handles of any module installed in the server, such as PSUs, fan modules, drive modules, or motherboard. Handle the equipment with care at all times.
- Use tools correctly to avoid damage to the equipment.
- Connect the power cords of active and standby PSUs to different PDUs to ensure high system reliability.
- To ensure equipment safety, always ground the equipment before powering it on.

### 9.1.4 Transportation Precautions

Contact the manufacturer for precautions before transportation as improper transportation may damage the equipment. The precautions include but not limited to:

- Hire a trusted logistics company to move all equipment. The transportation process must comply with international transportation standards for electronic equipment. Always keep the equipment being transported upright. Avoid collision, moisture, corrosion, packaging damage or contamination.
- Transport the equipment in its original packaging.
- If the original packaging is unavailable, separately package heavy and bulky components,

- and fragile components (such as optical modules and PCIe cards).
- Power off all equipment before shipping.

### 9.1.5 Manual Handling Weight Limits



#### CAUTION

Observe local laws or regulations regarding the manual handling weight limits per person. The limits shown on the equipment and in the document are recommendations only.

The following table lists the manual handling weight limits per person specified by some organizations.

Manual Handling Weight Limit per Person:

Organization	Weight Limit (kg/lbs)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	Male: 15/33.08 Female: 10/22.05

## 10. Certifications

Certifications:

Country/Region	Certification	Mandatory/Voluntary
International Mutual Recognition	CB	Voluntary
EU	CE	Mandatory
US	FCC	Mandatory
	UL	Voluntary
	Energy Star	Voluntary
India	BIS	Mandatory
Australia	RCM	Mandatory
Israel	SII	Mandatory
Mexico	NOM	Mandatory
UK	UKCA	Mandatory