



# **White Paper for KAYTUS KR6880V2 Series Servers**

**Powered by Intel Processors**

For KR6880-X2-A0-R0-00

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## Applicable Model

Model	Maintenance	Cooling
KR6880-X2-A0-R0-00	Rear access	Air cooling

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## Abstract





This document describes the KR6880V2 Intel-based server's appearance, features, performance parameters, and software and hardware compatibility, providing in-depth information of KR6880V2.

## Intended Audience

This document is intended for 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
V1.0	2023/08/16	Initial release

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# 1 Product Overview

The KR6880V2 Intel-based system is designed for customers' key business applications. Featuring excellent computing performance and comprehensive reliability design, it is ideal for application scenarios such as large core transaction databases, SAP HANA, enterprise ERP, and virtual integration of critical applications.

The KR6880V2 is a high-end 8-socket server developed by us based on the 4<sup>th</sup> Gen Intel Xeon Scalable processors built on the Eagle Stream platform. With up to 8 Intel Xeon Scalable processors in a 6U space, it reaches the highest computing density in the industry. Additionally, the server supportDDR5 DIMM slots (for DDR5 RDIMMs/3DS-RDIMMs, up to 4,800 MT/s), providing powerful physical resources for critical applications.

Figure 1-1 Appearance (24 × 2.5-inch Drive Configuration)



# 2 Features

## 2.1 Scalability and Performance

Technical Feature	Description
4 <sup>th</sup> Gen Intel Xeon Scalable Processors (Sapphire Rapids)	<ul style="list-style-type: none"><li>• Features up to 60 cores per processor, a max base frequency of 3.7 GHz, a max Turbo frequency of 4.2 GHz, an L3 cache up to 112.5 MB, and 4 UPI 2.0 links per CPU at up to 16 GT/s, delivering unrivaled processing performance.<ul style="list-style-type: none"><li>- Supports up to 8 processors with up to 480 cores and 960 threads, maximizing the concurrent execution of multi-threaded applications.</li><li>- With the processor cache hierarchy optimization, a larger L2 cache of private 1 MB per core is provided, so that memory data can be put and processed directly in L2 cache, improving the memory access performance and reducing the demand for L3 cache capacity, and a single processor can share up to 112.5 MB of L3 cache.</li><li>- Supports Intel Turbo Boost Technology 2.0 and automatically scales CPU speeds up to the max Turbo frequency at peak workloads, allowing processor cores to exceed the thermal design power (TDP) for a limited time.</li><li>- Supports Intel Hyper-Threading Technology, allowing up to 2 threads to run on each core to improve the performance of multi-threaded applications.</li><li>- Supports Intel Virtualization Technology that provides hardware assist to the virtualization software, allowing the operating system to better use hardware to handle virtualized workloads.</li><li>- Supports Intel Advanced Vector Extensions 512 (Intel AVX-512), significantly accelerating the workloads that are strongly floating point compute intensive.</li><li>- Supports Intel DL Boost (VNNI/INT8) instructions, improving the performance for deep learning applications.</li></ul></li></ul>


Multiple DIMM Types	Supports up to 128 DDR5 ECC DIMMs (4,800 MT/s, RDIMMs and 3DS-DIMMs), delivering superior speed, high availability, and a memory capacity up to 32 TB.
Flexible Drive Configuration	Provides elastic and expandable storage solutions to meet different capacity and upgrade requirements.
All-SSD Configuration	Brings higher I/O performance over all HDD configuration or HDD-SSD mixing configuration.
24 Gbps Serial Attached SCSI (SAS 4.0)	Doubles the data transfer rate of internal storage of 12 Gbps SAS (SAS 3.0) solution, maximizing the performance of storage I/O-intensive applications.
Intel Integrated I/O Technology	The processors integrate the PCIe 5.0 controller to reduce I/O latency and enhance overall system performance.
Brand New CXL Technology	Built on PCIe 5.0, this technology enables resource sharing among different PCIe devices.
PCIe 5.0 Expansion	Supports up to 16 PCIe 5.0 expansion slots (8 FHFL PCIe x16 + 8 FHHH PCIe x16).
OCP I/O Expansion	Supports 4 OCP 3.0 slots that can flexibly support 1/10/25/100/200 Gb OCP 3.0 cards. (Only single-host OCP 3.0 cards are hot-swappable.)

## 2.2 Availability and Serviceability

Technical Feature	Description
Hot-swap SAS/SATA/NVMe Drive	SAS/SATA drives can be configured to RAID level 0/1/1E/10/5/50/6/60 depending on the RAID card in use, with RAID cache and data protection enabled by the super-capacitor in case of power failures.
Reliability	SSDs are much more reliable than traditional HDDs, increasing system uptime.
Availability	<ul style="list-style-type: none"> <li>The LEDs for fault diagnosis on the front and rear panels, the LCD module, and the ISBMC 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.</li> <li>The BMC management network port on the rear panel enables you to directly access the ISBMC and supports local O&amp;M, thus improving O&amp;M efficiency.</li> </ul>

	<ul style="list-style-type: none"> <li>Provides 4 hot-swap PSUs with 2+2/3+1 redundancy and 8 hot-swap fan modules with N+1 redundancy, improving system availability.</li> </ul>
Maintenance Efficiency	<ul style="list-style-type: none"> <li>The onboard ISBMC monitors system parameters in real time and sends alerts in advance, enabling technicians to take appropriate measures to ensure stable system operation and minimize system downtime.</li> <li>Offline memory optical path diagnosis helps service technicians quickly locate the failed DIMMs, improving maintenance efficiency.</li> <li>The system load LED displays the system load state and startup process, enabling customers to know the real-time system status. (Amber green = CPU load ranges from 0% to 30%; Blue = CPU load ranges from 31% to 80%; Yellow = CPU load ranges from 81% to 100%)</li> </ul>

## 2.3 Manageability and Security

Technical Feature	Description
Remote Management	The ISBMC monitors system operating status and enables remote management.
Network Controller Sideband Interface (NC-SI) Feature	<ul style="list-style-type: none"> <li>The NC-SI feature allows a network port to serve as a management port and a service port. The NC-SI feature is disabled by default and can be enabled/disabled through the BIOS or ISBMC.</li> </ul> <p> <b>NOTE</b></p> <p>The NC-SI port supports the following features:</p> <ul style="list-style-type: none"> <li>The NC-SI port can be bonded to any network port of server node 0 or of NIC that supports NC-SI.</li> <li>Supports the enablement/disablement and configuration of Virtual Local Area Network (VLAN). VLAN is disabled by default.</li> <li>Supports IPv6 and IPv4 addresses. IP address, subnet mask, default gateway, and prefix length of IPv6 address can be configured.</li> </ul>
Intel PFR	Intel Platform Firmware Resilience (PFR) protects firmware from malicious tampering and restores detected corrupted firmware automatically.

UEFI	Industry-standard Unified Extensible Firmware Interface (UEFI) improves the efficiency of setup, configuration, and update, and simplifies error handling.
TPM & TCM	Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) provide advanced encryption.
Intel Trusted Execution Technology	Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks.
Firmware Update Mechanism	The firmware update mechanism based on digital signatures prevents unauthorized firmware updates.
UEFI Secure Boot	UEFI Secure Boot protects the system from malicious bootloaders.
Hierarchical Password Protection in BIOS	Hierarchical password protection in BIOS ensures system boot and management security.
BIOS Secure Flash and BIOS Lock Enable (BLE)	BIOS Secure Flash and BIOS Lock Enable (BLE) reduce attacks from malicious software on the BIOS flash region.
Dual-image mechanism for BMC and BIOS	Dual-image mechanism for BMC and BIOS recovers firmware upon detection of corrupted firmware.
BMC Secure Boot	Hardware-based BMC Secure Boot protects BMC from malicious tampering.
BIOS Secure Boot	BIOS Secure Boot based on Trusted Platform Module (TPM) protects BIOS from malicious tampering.
BMC Access Control Policies	Flexible BMC access control policies, double factor authentication and single sign-on improve BMC management security.
Intel SGX Technology	Intel Software Guard Extensions (SGX) technology allows applications to run in its own isolated space, helping prevent malicious theft and modification of critical codes and data.
Secure System Wiping	Optional secure system wiping functionality to wipe data on the storage device with one click.

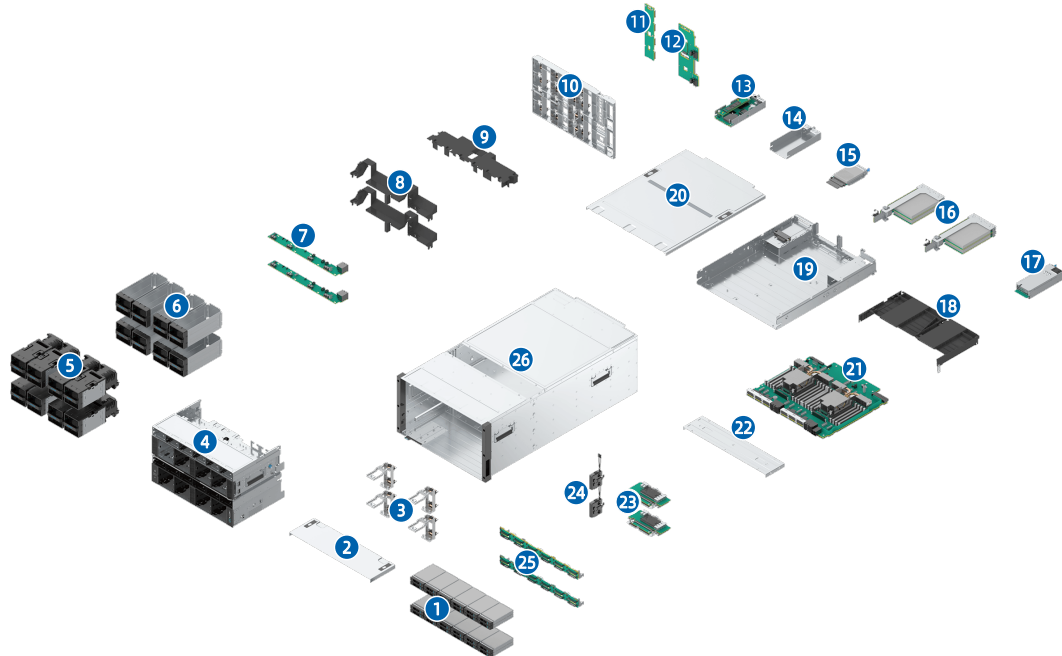
## 2.4 Energy Efficiency

Technical Feature	Description
80 Plus Platinum/Titanium Power Supplies	Equipped with 80 Plus Platinum/Titanium power supplies of different power efficiency levels, with power efficiency up to 96% at a load of 50%.

2+2/3+1 Redundant Power Supplies	Offers 2+2/3+1 redundant and integrated AC/DC power supplies for optimized power conversion efficiency.
VRD Power Supply	Features the high-efficiency single-board voltage regulator down (VRD) solution, reducing DC-DC conversion loss.
Intelligent Fan Speed PID Control and CPU Frequency Scaling	Supports Proportional-Integral-Derivative (PID) intelligent fan speed control and intelligent CPU frequency scaling, conserving energy.
System Cooling Design	Offers a fully-optimized system cooling design with energy-efficient cooling fans, lowering energy consumption from system cooling.
Power Capping and Power Control	Provides power capping and power control measures.
Staggered Spin-up of Drives	Supports staggered spin-up of drives, reducing power consumption during startup.
Intel Intelligent Power Capability	Supports Intel Intelligent Power Capability (IIPC) to optimize energy usage in the processor cores by turning computing functions on only when needed.
Less Energy Consumption per Core	Supports the 4 <sup>th</sup> Gen Intel Xeon Scalable processors (Sapphire Rapids), consuming less energy per core, improving energy efficiency, and reducing operation cost per unit.

# 3 System Parts Breakdown

Figure 3-1 Exploded View (24 × 2.5-inch Drive Configuration)



Item	Feature	Item	Feature
1	Drive	14	ICM Tray
2	Front Module Rear Top Cover	15	OCP 3.0 Card
3	Drive Blind-Mate Connector Bracket	16	PCIe Riser Module
4	Front Module	17	CRPS PSU
5	Fan	18	Node Air Duct
6	Fan Holder	19	Node Chassis Base
7	Fan Board	20	Node Top Cover
8	Split Node Air Duct	21	Node Motherboard
9	Anti-backflow Air Duct	22	Server Chassis Middle Top Cover
10	Midplane Board Retention Bracket	23	Storage Controller Card
11	Left Midplane Board	24	Super-Capacitor
12	Right Midplane Board	25	Drive Backplane
13	ICM	26	Server Chassis

# 4 System Logical Diagram

Figure 4-1 System Logical Diagram

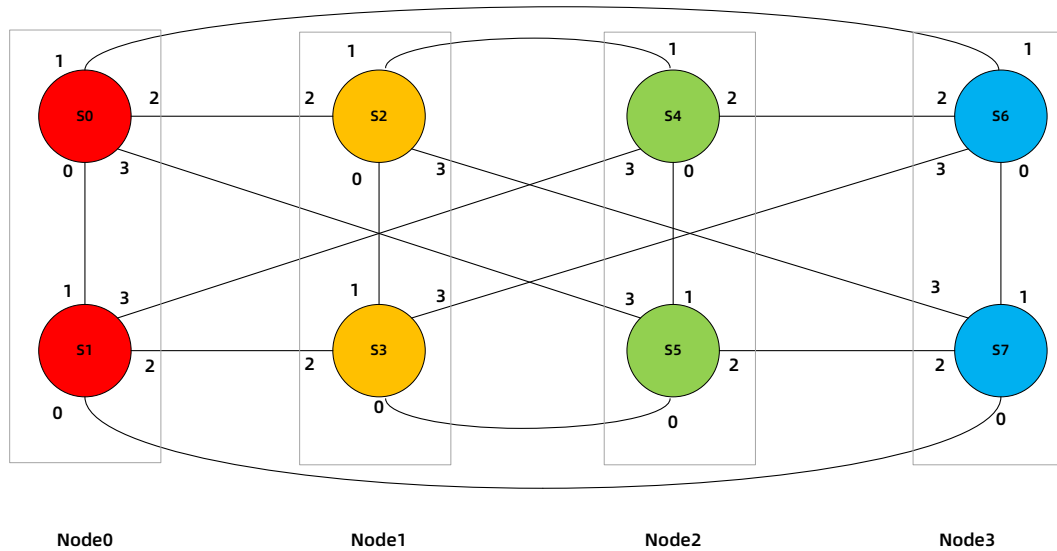
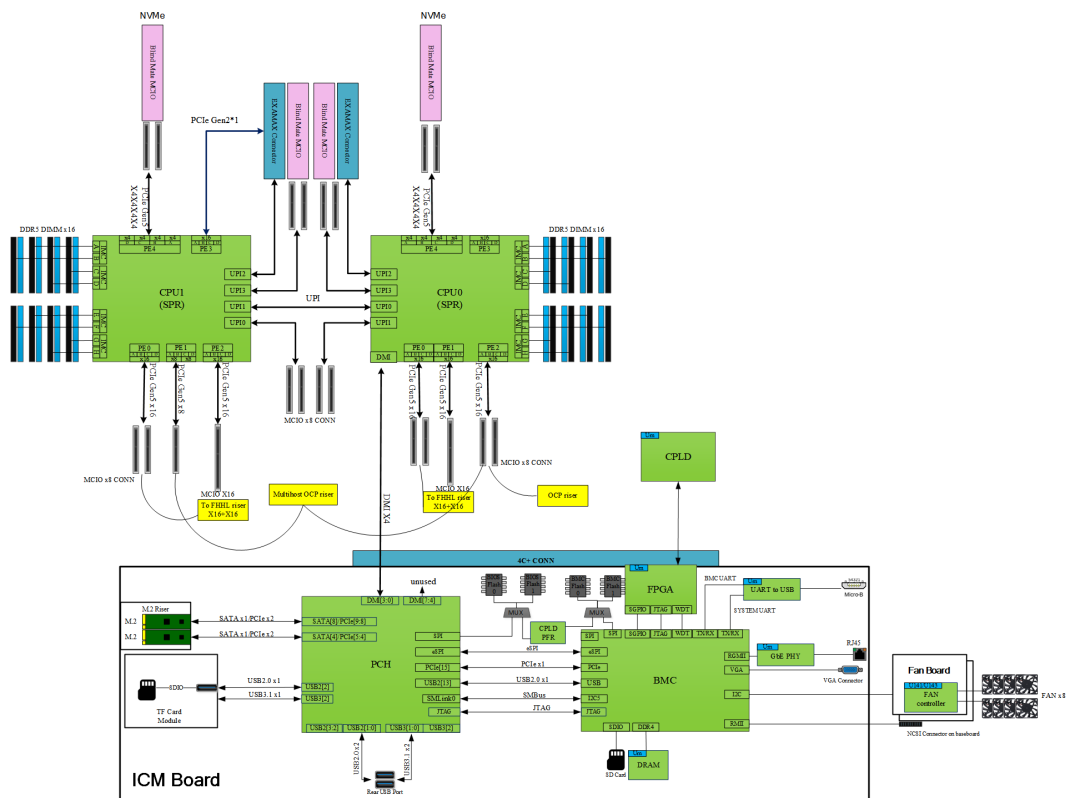


Figure 4-2 8-Socket System Topology (for Node 0)





- Four or eight 4<sup>th</sup> Gen Intel Xeon Scalable processors (Sapphire Rapids).
- Up to 128 DIMMs.
- 4 UPI links per CPU at up to 16 GT/s.
- Up to 16 PCIe 5.0 expansion slots and 4 OCP slots (for OCP 3.0 cards). The motherboard of each node supports 1 single-host or multi-host OCP 3.0 card.
- The RAID card is connected to CPU via the PCIe bus, and is connected to the drive backplane via the SAS signal cable. 1 to 2 drive backplanes, up to 24 SAS/SATA drives and up to 8 NVMe drives are supported.
- Up to 24 front NVMe drives directly connected to the CPU.
- Each of the upper and lower layers has a 12-drive backplane, which supports the mixing of SAS/SATA/NVMe drives.
- The ICM board integrates the Emmitsburg (EBG) Platform Controller Hub (PCH) to support 2 USB 3.0 ports, 2 SATA/PCIe M.2 SSDs, and up to 3 TF cards (up to 2 PCH TF cards and 1 BMC TF card).
- The ICM board integrates a BMC management chip and supports a VGA port, a BMC management network port, a serial port, TF card slots, and other connectors.

# 5 Hardware Description

## 5.1 Front Panel

### 5.1.1 24 × 2.5-inch Drive Configuration



#### NOTE

Applicable model: KR6880-X2-A0-R0-00.

Figure 5-1 Front View



Item	Feature
1	Captive Screw (securing the server to the cabinet)
2	UID/BMC RST Button and LED
3	LED
4	Power Button and LED
5	System Load LED
6	Fan Module
7	Drive Bay
8	VGA Port
9	USB 3.0 Port
10	USB 2.0/LCD Port
11	Serial Label Pull Tag (with an SN label and drive numbers)

# 5.2Rear Panel

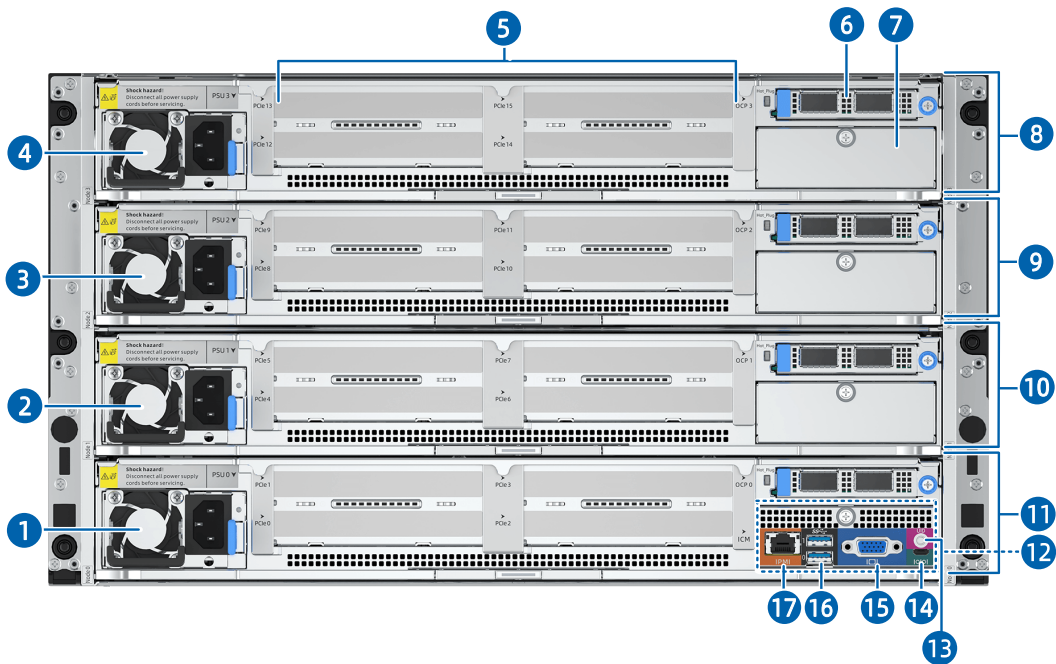


## NOTE

- Applicable model: KR6880-X2-A0-R0-00.
- The figures are for reference only. The actual configuration may differ.

## 5.2.1 16 × PCIe Configuration

Figure 5-2 Rear View

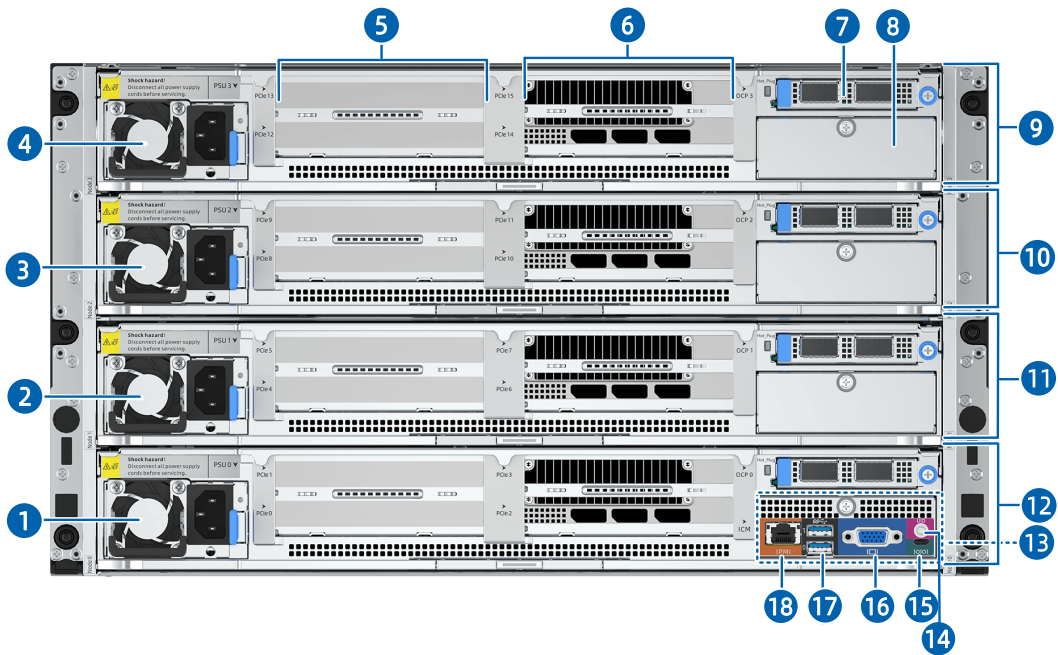


Item	Feature	Item	Feature
1	PSU0	10	Node 1
2	PSU1	11	Node 0
3	PSU2	12	ICM
4	PSU3	13	UID/BMC RST Button and LED
5	PCIe Slot (PCIe 0 to PCIe 15)	14	System/BMC Serial Port
6	OCP 3.0 Connector <div><div><div></div></div><div>NOTE</div></div> <div>The OCP 3.0 slots support single-host or multi-host OCP 3.0 cards. Only single-host OCP 3.0 cards are hot-swappable.</div>	15	VGA Port
7	ICM Slot Blank	16	USB 3.0 Port

Item	Feature	Item	Feature
8	Node 3	17	BMC Management Network Port
9	Node 2	-	-

## 5.2.2 8 × PCIe + 4 × GPU Configuration

Figure 5-3 Rear View












Item	Feature	Item	Feature
1	PSU0	10	Node 2
2	PSU1	11	Node 1
3	PSU2	12	Node 0
4	PSU3	13	ICM
5	PCIe Slot (PCIe 0/1/4/5/8/9/12/13)	14	UID/BMC RST Button and LED
6	GPU Slot (PCIe 3/7/11/15)	15	System/BMC Serial Port
7	OCP 3.0 Connector  NOTE The OCP 3.0 slots support single-host or multi-host OCP 3.0 cards. Only single-host OCP 3.0 cards are hot-swappable.	16	VGA Port
8	ICM Slot Blank	17	USB 3.0 Port

Item	Feature	Item	Feature
9	Node 3	18	BMC Management Network Port

## 5.3 LED and Button Description


Table 5-1 LED and Button Description





Symbol	Feature	Description
	System Load LED	<ul style="list-style-type: none"> <li>Off = Standby state</li> <li>Amber green = CPU load ranges from 0% to 30%</li> <li>Blue = CPU load ranges from 31% to 80%</li> <li>Yellow = CPU load ranges from 81% to 100%</li> </ul>
	Power Button and LED	<ul style="list-style-type: none"> <li>Solid green = Power-on state</li> <li>Solid orange = Standby state</li> <li>Press and hold the button for 6s to force a shutdown</li> </ul>
<b>UID</b>	UID/BMC RST Button and LED	<ul style="list-style-type: none"> <li>Solid blue = The UID LED turns on when activated by the UID button or via BMC</li> <li>Press and hold the button for 6s to force BMC to reset</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>
	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>
	Power Status LED	<ul style="list-style-type: none"> <li>Off = Normal</li> <li>Solid red = A power failure occurs</li> </ul>

Symbol	Feature	Description
		<ul style="list-style-type: none"> <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>
	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>
	Network Status LED	<ul style="list-style-type: none"> <li>Solid/Flashing green = Network connected</li> <li>Off = No network connection</li> </ul> <p> <b>CAUTION</b> The LED only indicates the status of the self-developed OCP card.</p>

## 5.4 Port Description

Table 5-2 Port Description

Feature	Type	Quantity	Description
VGA Port	DB15	1	Enables you to connect a display terminal, for example, a monitor or KVM, to the system.
USB 3.0 Port	USB 3.0	1	<p>Enables you to connect a USB 3.0/2.0 device to the system.</p> <p> <b>IMPORTANT</b></p> <ul style="list-style-type: none"> <li>The maximum current supported by the USB port is 0.9 A.</li> <li>Make sure that the USB device is in good condition or it may cause the server to work abnormally.</li> </ul>
USB 2.0/LCD Port	USB 2.0	1	<ul style="list-style-type: none"> <li>Enables you to connect a USB 2.0 device to the system.</li> <li>Enables you to connect a self-developed LCD module to the system.</li> </ul>

Feature	Type	Quantity	Description
			 <b>IMPORTANT</b> Make sure that the USB device is in good condition or it may cause the server to work abnormally.
PSU Socket	-	4	Connected through a power cord. Users can select the PSUs as needed.   <b>NOTE</b> Make sure that the total rated power of every PSU is greater than that of the server.
System/BMC Serial Port	Micro USB	1	<ul style="list-style-type: none"> <li>Enables you to capture BMC logs and debug the BMC.</li> <li>Enables you to print system logs.</li> </ul>  <b>NOTE</b> The default baud rate is 115,200 bit/s.
BMC Management Network Port	RJ45	1	Enables you to manage the server.   <b>NOTE</b> It is a GbE port of 100/1,000 Mbps auto-negotiation.

## 5.5 Processors

- Supports four or eight 4<sup>th</sup> Gen Intel Xeon Scalable processors. The 4-layer motherboards accommodate CPU0/1, CPU2/3, CPU4/5, and CPU6/7, from the bottom layer to the upper layer.
- If 4 processors are configured, install them in CPU0, CPU1, CPU2, and CPU3.
- The processors used in a server must be of the same model.

For specific processor options, consult your local sales representative or refer to [7.2 Hardware Compatibility](#).

Figure 5-4 Processor Locations (for Node 0)

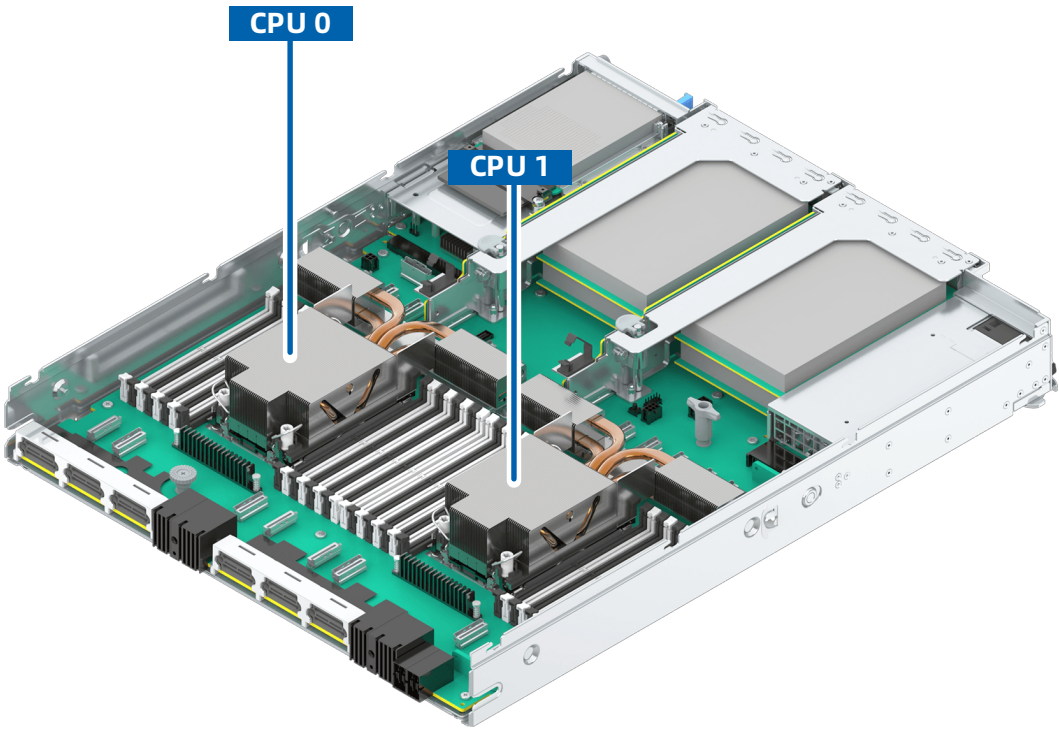


Figure 5-5 Location Relationship Between Nodes and CPUs (Octa-CPU Configuration)

Node	Left CPU (Facing the Rear Panel)	Right CPU (Facing the Rear Panel)
Node 0	CPU1	CPU0
Node 1	CPU3	CPU2
Node 2	CPU5	CPU4
Node 3	CPU7	CPU6

Figure 5-6 Location Relationship Between Nodes and CPUs (Quad-CPU Configuration)

Node	Left CPU (Facing the Rear Panel)	Right CPU (Facing the Rear Panel)
Node 0	CPU1	CPU0
Node 1	CPU3	CPU2
Node 2	-	-
Node 3	-	-



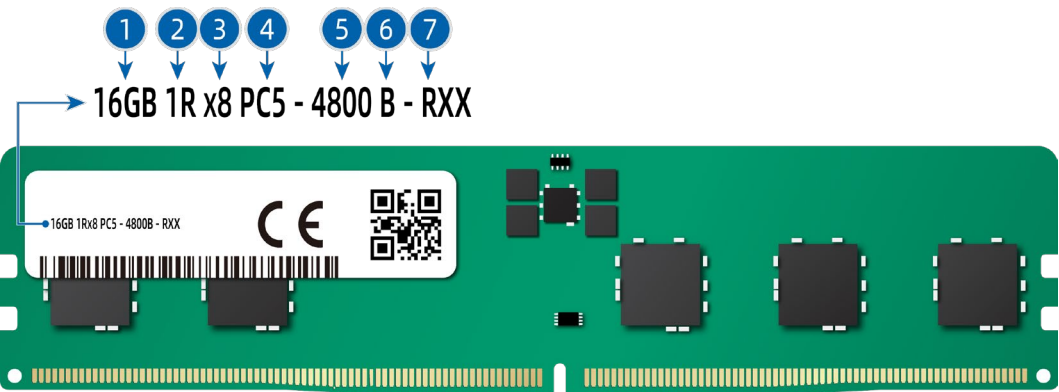
# 5.6Memory

## 5.6.1 DDR5 DIMMs

### 1. Identification (DDR5)

To determine DIMM characteristics, refer to the label attached to the DIMM and the following figure and table.

Figure 5-7 DIMM Identification



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></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

Item	Description	Example
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 40-39-39
7	DIMM type	<ul style="list-style-type: none"> <li>R = RDIMM</li> <li>RDIMM-3DS = 3DS-DIMM</li> </ul>

## 2. Memory Subsystem Architecture

The server supports 128 DIMM slots, and a single motherboard supports 8 memory channels per CPU.

Table 5-3 DIMM Slot List (for Node 0)

CPU	Channel ID	Silk Screen
CPU0	Channel 0	CPU0_C0D0
		CPU0_C0D1
	Channel 1	CPU0_C1D0
		CPU0_C1D1
	Channel 2	CPU0_C2D0
		CPU0_C2D1
	Channel 3	CPU0_C3D0
		CPU0_C3D1
	Channel 4	CPU0_C4D0
		CPU0_C4D1
	Channel 5	CPU0_C5D0
		CPU0_C5D1
	Channel 6	CPU0_C6D0
		CPU0_C6D1
	Channel 7	CPU0_C7D0
		CPU0_C7D1
CPU1	Channel 0	CPU1_C0D0
		CPU1_C0D1
	Channel 1	CPU1_C1D0
		CPU1_C1D1
	Channel 2	CPU1_C2D0
		CPU1_C2D1
	Channel 3	CPU1_C3D0
		CPU1_C3D1

CPU	Channel ID	Silk Screen
	Channel 4	CPU1_C4D0
		CPU1_C4D1
	Channel 5	CPU1_C5D0
		CPU1_C5D1
	Channel 6	CPU1_C6D0
		CPU1_C6D1
	Channel 7	CPU1_C7D0
		CPU1_C7D1

### 3. Compatibility

Refer to the following rules to configure 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 types (RDIMM, 3DS-RDIMM) or mixing DDR5 DIMM specifications (capacity, bit width, rank, height, etc.) is not supported.
- For specific memory options, consult your local sales representative or refer to [7.2 Hardware Compatibility](#).

- DDR5 DIMMs can be used with the 4<sup>th</sup> Gen Intel Xeon Scalable processors (Sapphire Rapids). A single CPU supports a memory capacity of up to 4 TB and 8 CPUs support a total memory capacity of up to 32 TB.
- The maximum number of DIMMs supported varies with the CPU type, DIMM type and the rank quantity.



#### NOTE

The number of supported ranks per channel has the following restrictions on the number of DIMMs supported per channel: Maximum number of DIMMs supported per channel ≤ Maximum number of ranks supported per channel/Number of ranks per DIMM.

Table 5-4 DDR5 DIMM Specifications

Item	Value				
Capacity per DDR5 DIMM (GB)	16	32	64	128	256
Type	RDIMM	RDIMM	RDIMM	3DS-	3DS-

Item		Value				
					DIMM	DIMM
Rated speed (MT/s)		4,800	4,800	4,800	4,800	4,800
Operating voltage (V)		1.1	1.1	1.1	1.1	1.1
Maximum number of DDR5 DIMMs supported in a server <sup>a</sup>		128	128	128	128	128
Maximum capacity of DDR5 DIMMs supported in a server (GB) <sup>b</sup>		2,048	4,096	8,192	16384	32768
Actual speed (MT/s)	1DPC <sup>c,d</sup>	4,800	4,800	4,800	4,800	4,800
	2DPC <sup>c,d</sup>	4,400	4,400	4,400	4,400	4,400
<p>a. The maximum number of DDR5 DIMMs supported is based on the octa-CPU configuration. The number is halved for the quad-CPU configuration.</p> <p>b. It indicates the maximum memory capacity supported when all the DIMM slots are populated with DDR5 DIMMs. The maximum DDR5 capacity varies with the CPU type.</p> <p>c. DPC (DIMM per channel) is the number of DIMMs per memory channel.</p> <p>d. When configured with Sapphire Rapids processors, the speed of DDR5 DIMMs is 4,800 MT/s (1 DPC) and 4,400 MT/s (2 DPC).</p> <p>The above information is for reference only. Consult your local sales representative for details.</p>						

## 4. DIMM Population Rules

General population rules for DDR5 DIMMs:

- Install DIMMs only when the corresponding processor has been installed.
- Mixing RDIMMs and 3DS-RDIMMs is not allowed.
- Install dummies in the empty DIMM slots.

Population rules for DDR5 DIMMs 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.
  - Each channel with a DIMM installed must have a spare rank.

- Memory mirroring
  - Follow the general population rules.
  - Each processor supports 2 integrated memory controllers (iMCs). Each iMC has 2 channels to be populated with DIMMs. Installed DIMMs must be of the same capacity and organization.
  - In a multi-CPU configuration, each CPU must have a valid memory mirroring configuration.

## 5. DIMM Slot Layout

Up to 128 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.



### IMPORTANT

At least 1 DDR5 DIMM must be installed for each CPU.

Figure5-8 DIMM Slot Layout

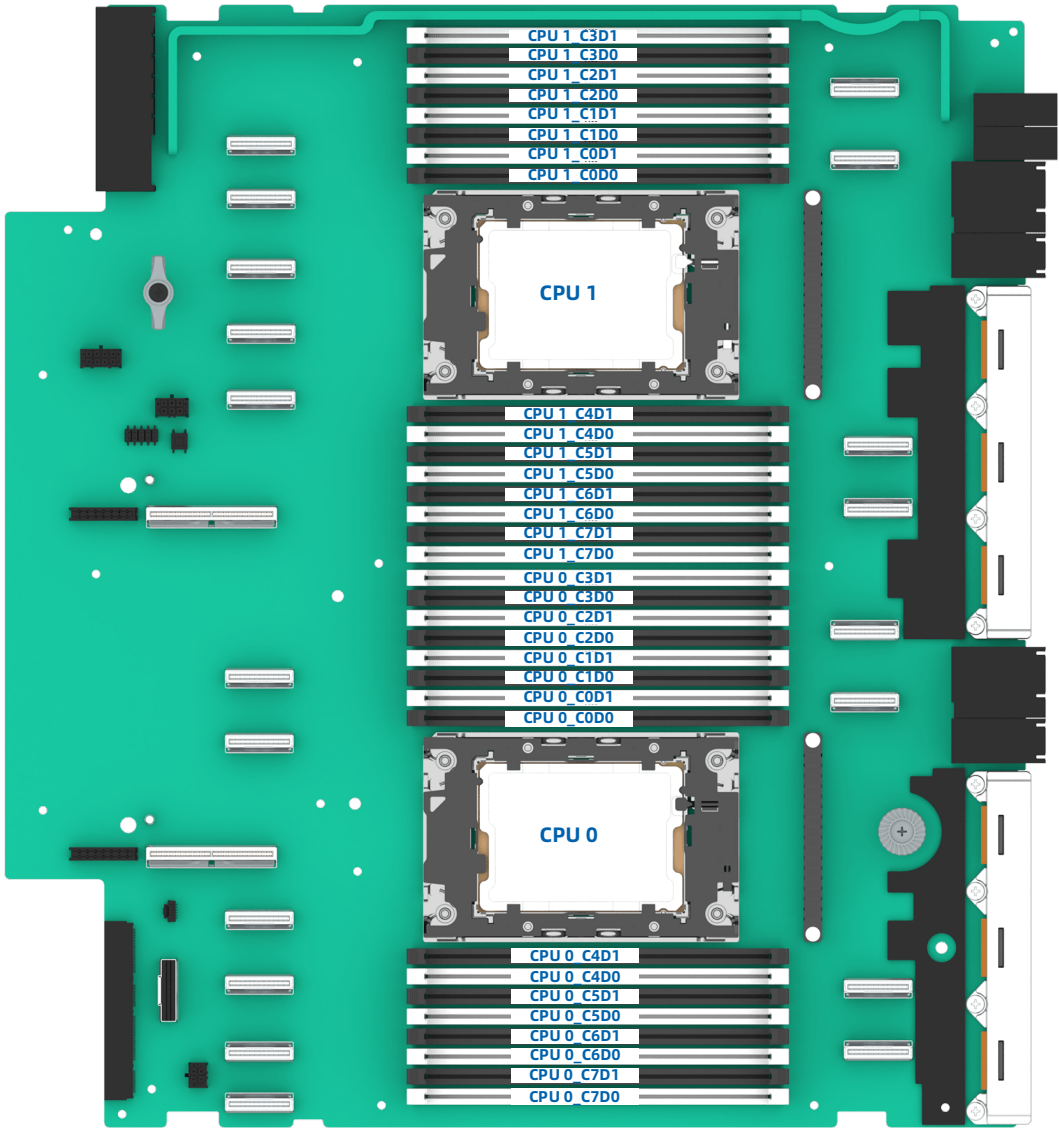


Figure 5-9 DDR5 DIMM Population Rules (Single-Node)

DIMM Slot 2DPC		CPU0																CPU1															
		C0D0	C0D1	C1D0	C1D1	C2D0	C2D1	C3D0	C3D1	C4D0	C4D1	C5D0	C5D1	C6D0	C6D1	C7D0	C7D1	C0D0	C0D1	C1D0	C1D1	C2D0	C2D1	C3D0	C3D1	C4D0	C4D1	C5D0	C5D1	C6D0	C6D1	C7D0	C7D1
DIMM Qty	2	●																●															
	4	●												●				●												●			
	8	●				●				●				●				●				●				●				●			
	12	●				●		●		●		●		●				●				●		●		●		●		●			
	16	●		●		●		●		●		●		●		●		●		●		●		●		●		●		●		●	
	24	●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●	
	32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

## 5.7 Storage

### 5.7.1 Drive Configurations



#### NOTE

For the physical drive No. of each configuration, refer to [5.7.2 Drive Numbering](#).

Table 5-5 Drive Configurations

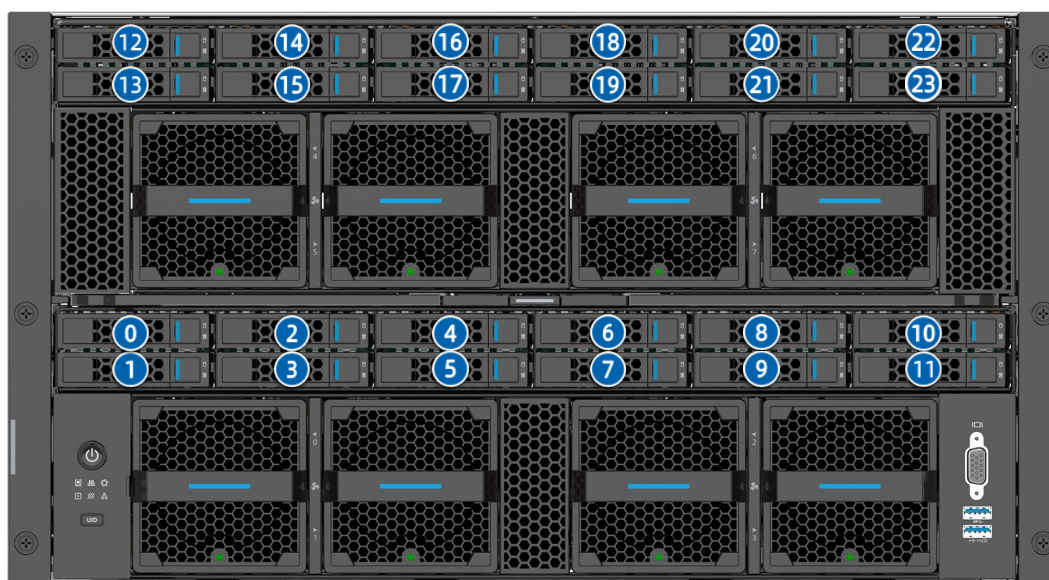
Configuration	Front Drives	Internal Drives	Drive Management Mode
12 × 2.5-inch Drive Configuration (12 × SAS/SATA Drive)	12 × 2.5-inch front drive: Drive bays 0 to 11 support SAS/SATA drives, and the supported number of drives varies with the storage controller cards configured	2 × SATA/NVMe M.2 SSD: Configured on the M.2 adapter (installed on ICM)	SAS/SATA drives: 1 × PCIe RAID card
24 × 2.5-inch Drive Configuration (24 × SAS/SATA Drive)	24 × 2.5-inch front drive: Drive bays 0 to 23 support SAS/SATA drives, and the supported number of drives varies with the storage controller cards configured	2 × SATA/NVMe M.2 SSD: Configured on the M.2 adapter (installed on ICM)	SAS/SATA drives: 2 × PCIe RAID card
24 × 2.5-inch Drive Configuration (24 × NVMe Drive)	24 × 2.5-inch front drive: Drive bays 0 to 23 support NVMe drives	2 × SATA/NVMe M.2 SSD: Configured on the M.2 adapter (installed on ICM)	NVMe drives: Directly connected to CPUs
8 × 2.5-inch Drive Configuration (8 × NVMe Drive)	8 × 2.5-inch front drive: Drive bays 0 to 3 and drive bays 12 to 15 support NVMe drives	2 × SATA/NVMe M.2 SSD: Configured on the M.2 adapter (installed on ICM)	NVMe drives: 2 × standard tri-mode controller card

Note: A standard Marvell 88SE9230 HHHL PCIe M.2 storage card can be selected.

## 5.7.2 Drive Numbering

### 1. 24 × 2.5-inch Drive Configuration (24 × SAS/SATA/NVMe Drive)

Figure 5-10 Drive Numbering



Physical Drive No.	Drive No. Identified by the ISBMC	Drive No. Identified by Two 8i RAID Cards
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	0
9	9	1
10	10	2
11	11	3
12	12	4
13	13	5
14	14	6
15	15	7



Physical Drive No.	Drive No. Identified by the ISBMC	Drive No. Identified by Two 8i RAID Cards
16	16	0
17	17	1
18	18	2
19	19	3
20	20	4
21	21	5
22	22	6
23	23	7

## 5.7.3 Drive LEDs

### 1. SAS/SATA Drive LEDs

Figure5-11 SAS/SATA Drive LEDs

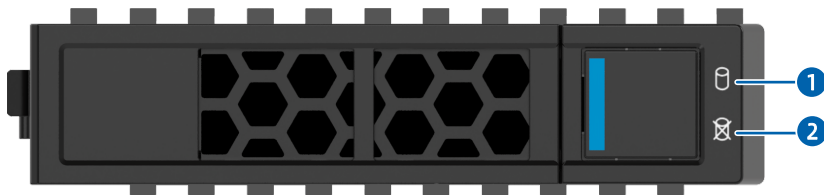


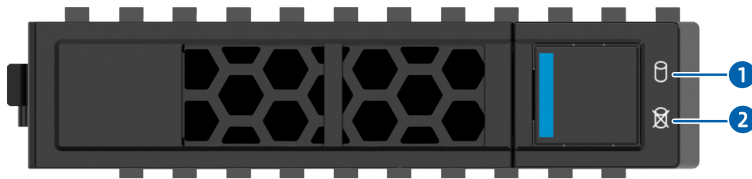
Table 5-6 SAS/SATA Drive LED Description

Activity LED (①)	Locator/Error LED (②)		Description
	Blue	Red	
Off	Off	RAID created Solid on	Drive absent
		RAID not created Off	
Solid on	Off	Off	Drive present but not in use
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

Activity LED (①)	Locator/Error LED (②)		Description
Green	Blue	Red	
Off	Solid on	Off	Drive selected but failed
Any status	Off	Solid on	Drive failed

## 2. NVMe Drive LEDs

Figure 5-12 NVMe Drive LEDs



When the VMD function is enabled with the latest VMD driver installed, the NVMe drives support RAID.

Table 5-7 NVMe Drive LED Description

Activity LED (①)	Locator/Error LED (②)		Description
Green	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	Off	Drive selected but failed
Any status	Off	Solid on	Drive failed

### 5.7.4 RAID Cards



#### CAUTION

Please avoid mixing storage controllers, as doing so may cause drive sequence drift.

The RAID card provides functions such as RAID configuration, RAID level migration, and drive roaming. For specific RAID card options, consult your local sales representative or refer to [7.2 Hardware Compatibility](#).

## 5.8 Network

NICs provide network expansion capabilities.

- The OCP slots support single-host or multi-host OCP 3.0 cards. Users can select the OCP 3.0 cards as needed.
- The PCIe expansion slots support PCIe NICs. Users can select the PCIe expansion cards as needed.
- For specific NIC options, consult your local sales representative or refer to [7.2 Hardware Compatibility](#).

## 5.9 I/O Expansion

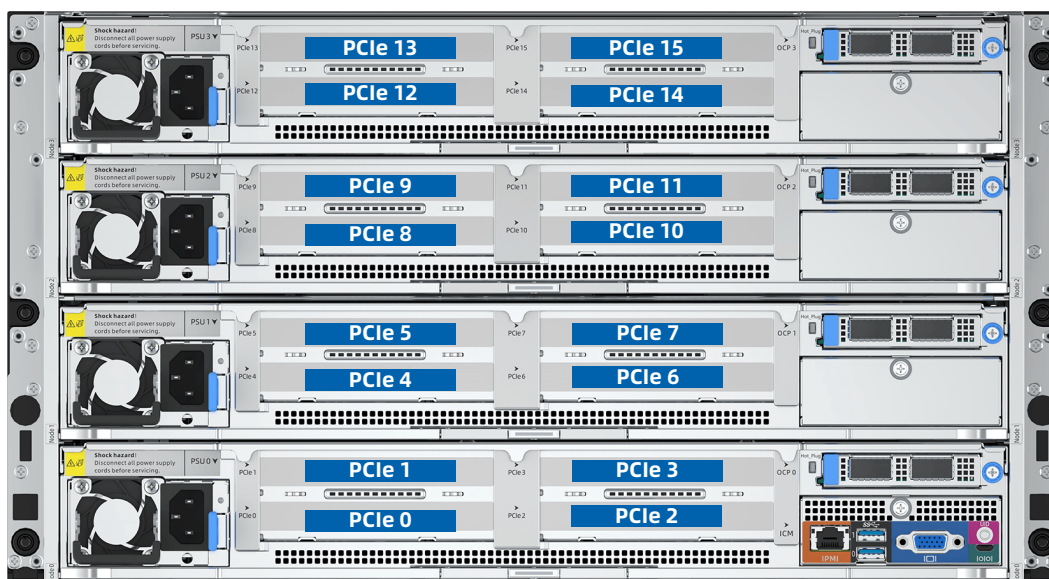
### 5.9.1 PCIe Expansion Cards

The PCIe expansion cards provide system expansion capabilities.

- The server supports up to 16 PCIe 5.0 expansion slots and 4 dedicated slots for OCP 3.0 cards (single-host or multi-host OCP 3.0 cards).
- For specific PCIe expansion card options, consult your local sales representative or refer to [7.2 Hardware Compatibility](#).
- Limited by the Intel Eagle Stream platform, the specific installation position of a PCIe expansion card varies with its type. Consult your local sales representative.

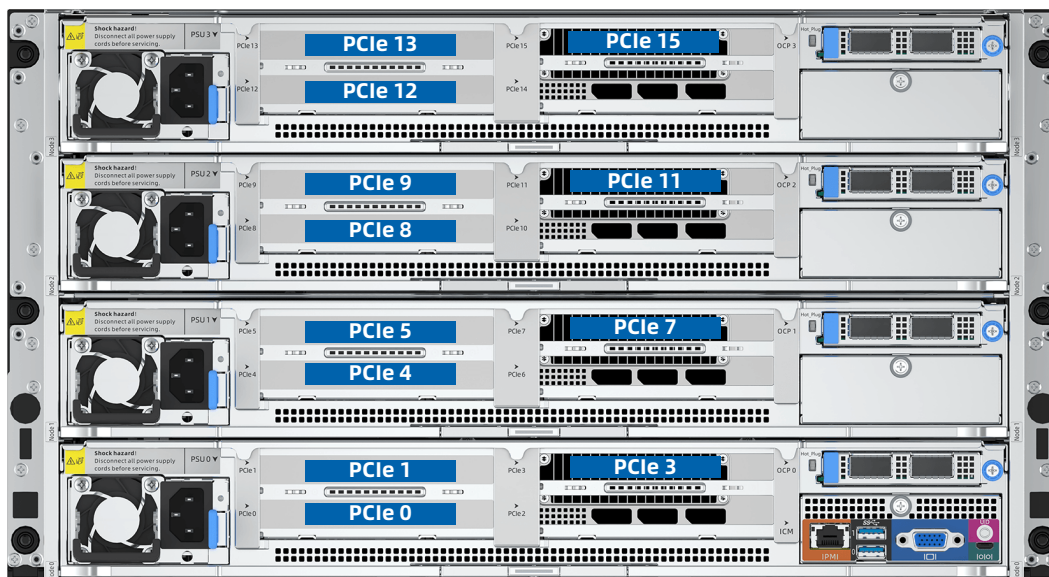
## 5.9.2 PCIe Slot Locations

Figure 5-13 16 × PCIe Configuration



2 x8/2 x16 PCIe riser modules can be installed in either set of PCIe slots.

Figure 5-14 8 × PCIe + 4 × GPU Configuration



PCIe 0/1/4/5/8/9/12/13 reside in 2 x8/2 x16 PCIe riser modules, and 1 x16 GPU riser modules are installed in PCIe 3/7/11/15, which are dedicated slots for GPUs.

## 5.9.3 PCIe Riser Modules

- PCIe riser module - 2 x8/2 x16

- A standard PCIe x8 card is used with a 2 x8 PCIe riser module.
- A standard PCIe x16 card must be used with a 2 x16 PCIe riser module.

Figure 5-15 Slot Identification (2 × PCIe x8 Slot)

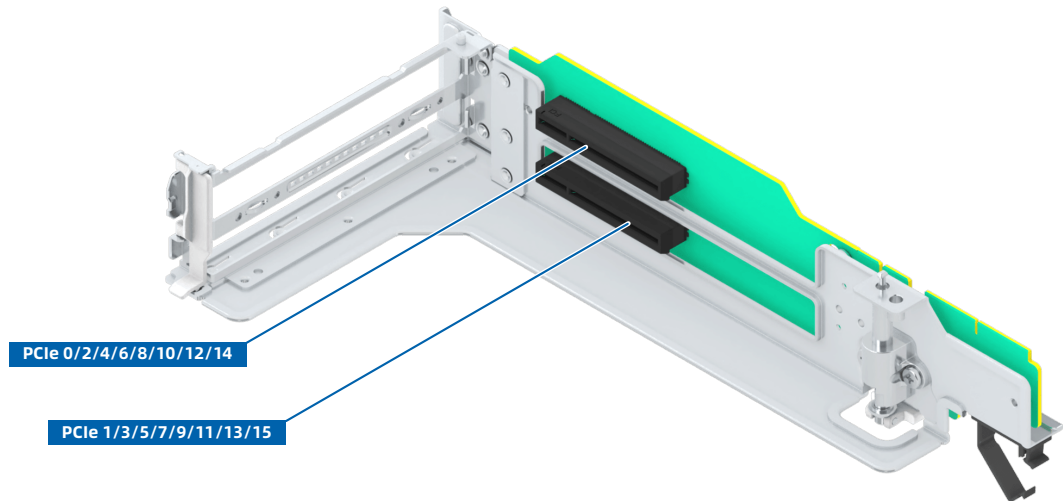
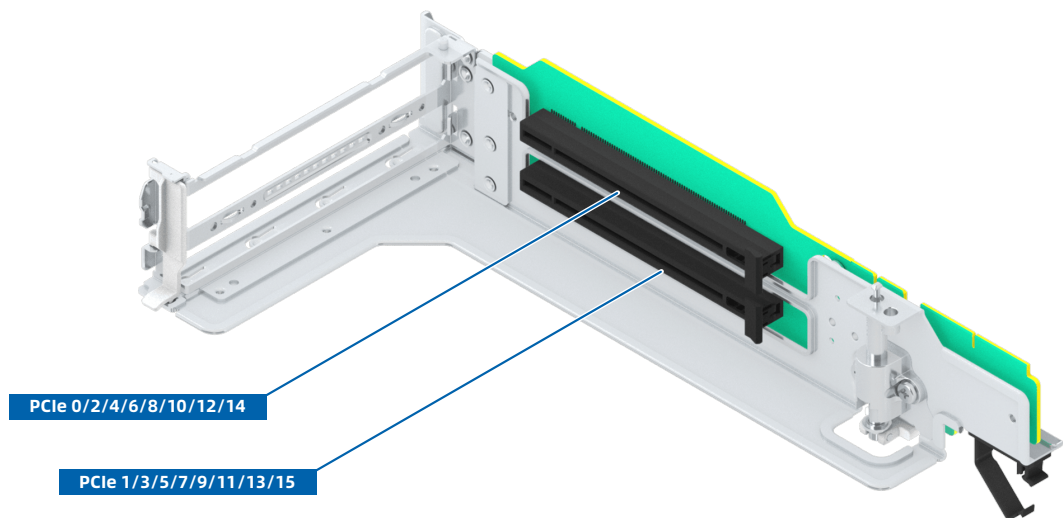
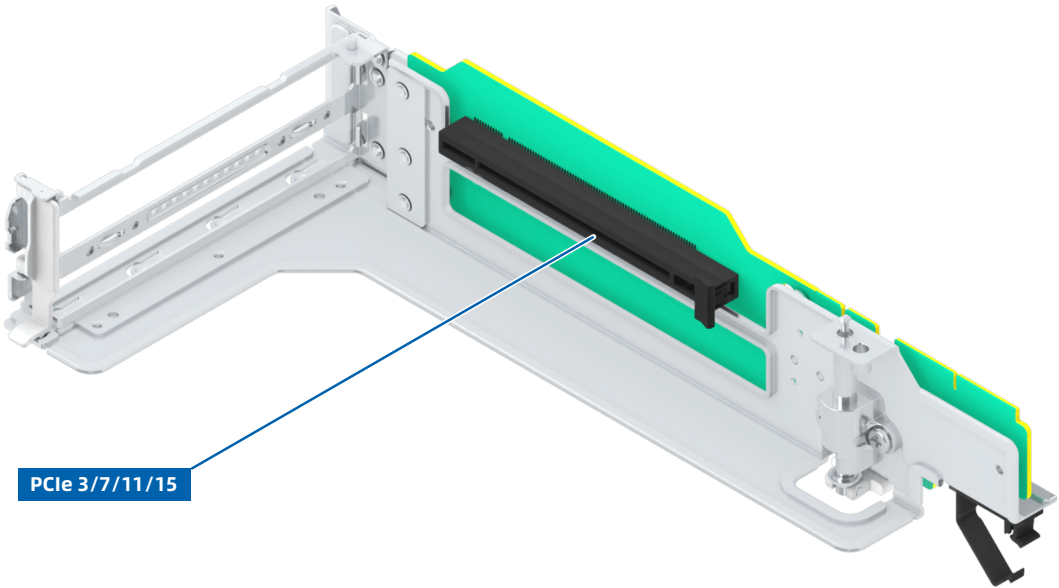


Figure 5-16 Slot Identification (2 × PCIe x16 Slot)



- PCIe riser module - GPU
  - It must be installed in the dedicated slots (PCIe 3/7/11/15) for GPUs.

Figure 5-17 Slot Identification (GPU)



### 5.9.4 PCIe Slot Description



NOTE

When a CPU is absent, its corresponding PCIe slots cannot be used.

Table 5-8 PCIe Slot Description

PCIe Slot	Owner	PCIe Standard	Connect or Width	Bus Width	Port No.	Form Factor
PCIe 0	CPU1	PCIe 5.0	x16	x16	0	FHFL
PCIe 1	CPU1	PCIe 5.0	x16	x16	1	FHFL
PCIe 2	CPU0	PCIe 5.0	x16	x16	2	FHHL
PCIe 3	CPU0	PCIe 5.0	x16	x16	3	FHHL
OCP 3.0 Slot (for Node 0)	CPU0	PCIe 5.0	x16	x16	100	SFF OCP 3.0
PCIe 4	CPU3	PCIe 5.0	x16	x16	4	FHFL
PCIe 5	CPU3	PCIe 5.0	x16	x16	5	FHFL
PCIe 6	CPU2	PCIe 5.0	x16	x16	6	FHHL
PCIe 7	CPU2	PCIe 5.0	x16	x16	7	FHHL
OCP 3.0 Slot (for Node 1)	CPU2	PCIe 5.0	x16	x16	101	SFF OCP 3.0
PCIe 8	CPU5	PCIe 5.0	x16	x16	8	FHFL

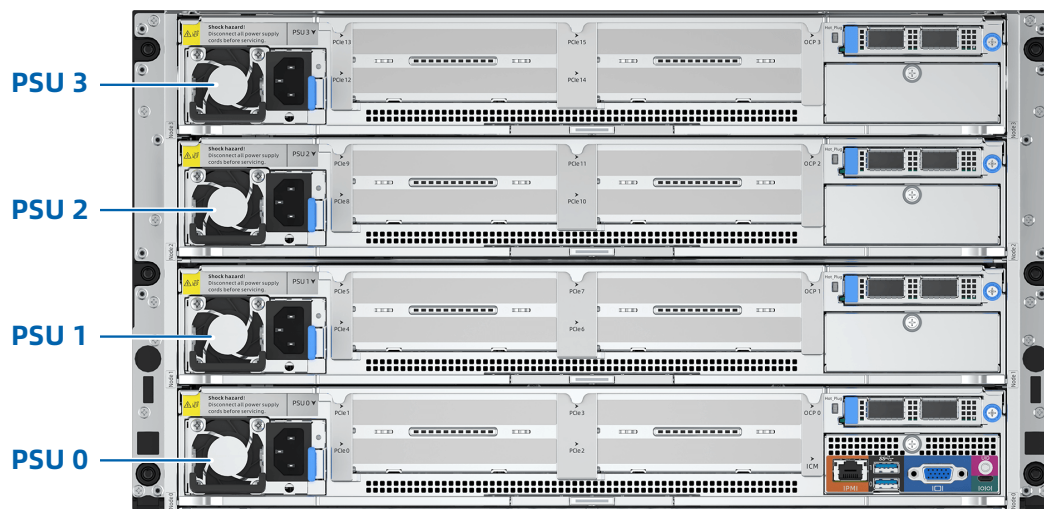
PCIe Slot	Owner	PCIe Standard	Connect or Width	Bus Width	Port No.	Form Factor
PCIe 9	CPU5	PCIe 5.0	x16	x16	9	FHFL
PCIe 10	CPU4	PCIe 5.0	x16	x16	10	FHHL
PCIe 11	CPU4	PCIe 5.0	x16	x16	11	FHHL
OCP 3.0 Slot (for Node 2)	CPU4	PCIe 5.0	x16	x16	102	SFF OCP 3.0
PCIe 12	CPU7	PCIe 5.0	x16	x16	12	FHFL
PCIe 13	CPU7	PCIe 5.0	x16	x16	13	FHFL
PCIe 14	CPU6	PCIe 5.0	x16	x16	14	FHHL
PCIe15	CPU6	PCIe 5.0	x16	x16	15	FHHL
OCP 3.0 Slot (for Node 3)	CPU6	PCIe 5.0	x16	x16	103	SFF OCP 3.0

## 5.10 PSUs

- The server supports 2 or 4 PSUs.
- The server supports AC or DC power input.
- The PSUs are hot-swappable.
- When the server is configured with 4 PSUs, the PSUs support 2+2/3+1 redundancy.
- The server must use PSUs bearing the same part number (P/N code).
- The server provides short-circuit protection, and provides PSUs supporting dual-live-wire input.



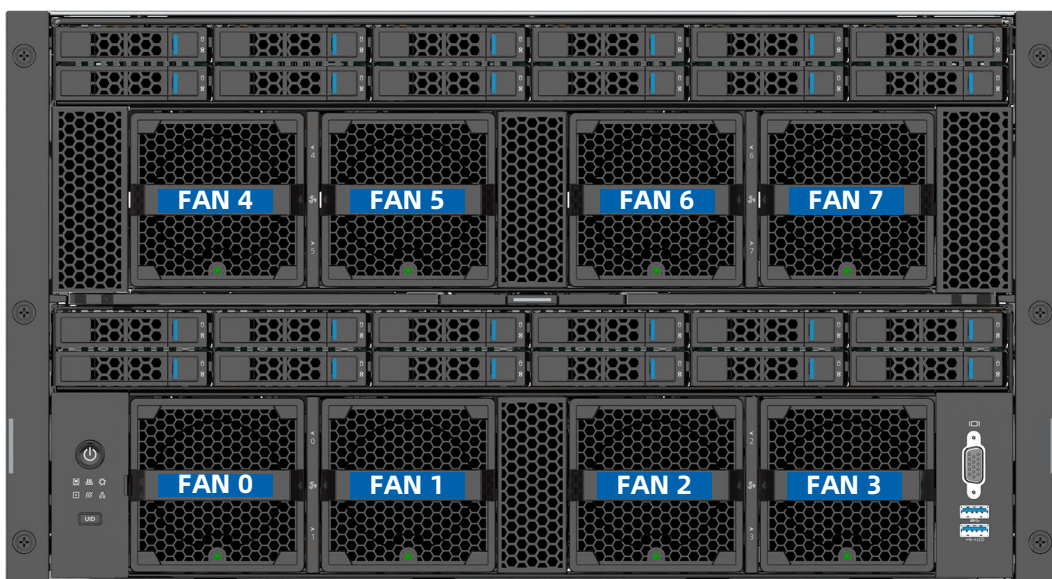
Figure 5-18 PSU Locations



## 5.11 Fan Modules

- The server supports 8 fan modules (8056).
- The fan modules are hot-swappable.
- The fan modules support N+1 redundancy.
- The server supports intelligent fan speed control.
- The server must use fan modules bearing the same part number (P/N code).

Figure 5-19 Fan Module Locations





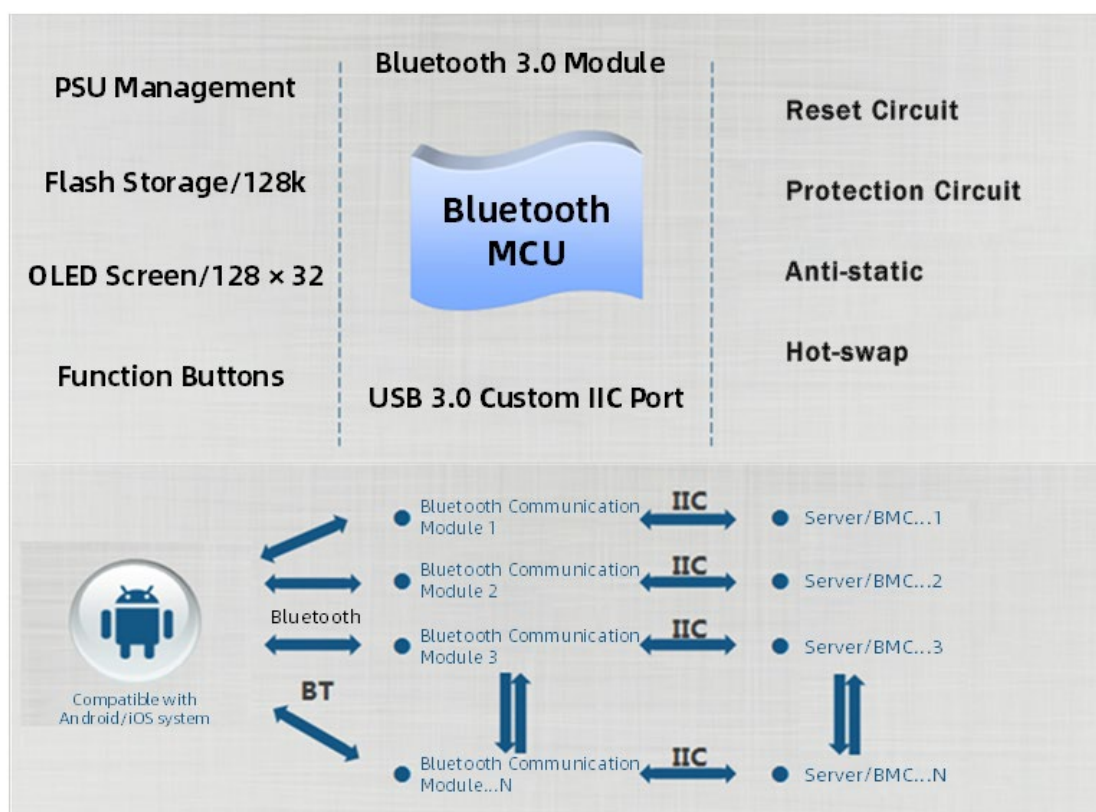
## 5.12 LCD Module

### 5.12.1 Function

The LCD module reads server-related information from the BMC, such as the operating status of processors and memories, network status, logs, and alerts, and transmits the information to client mobile terminals via Bluetooth.

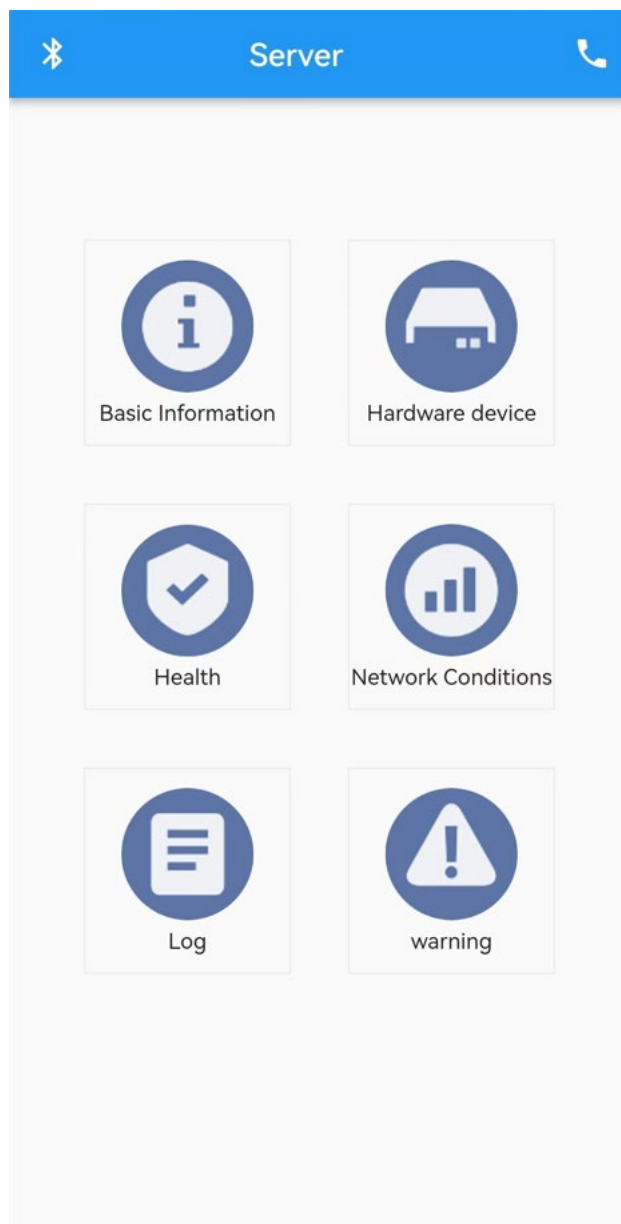
The LCD module synchronizes information with the ISBMC through I<sup>2</sup>C and can display information on an LCD screen or in the app. The server's basic information, system status and alert diagnosis can be displayed in the app via Bluetooth, facilitating the operation and maintenance.

Figure 5-1 How LCD Subsystem Works



## 5.12.2 Interface

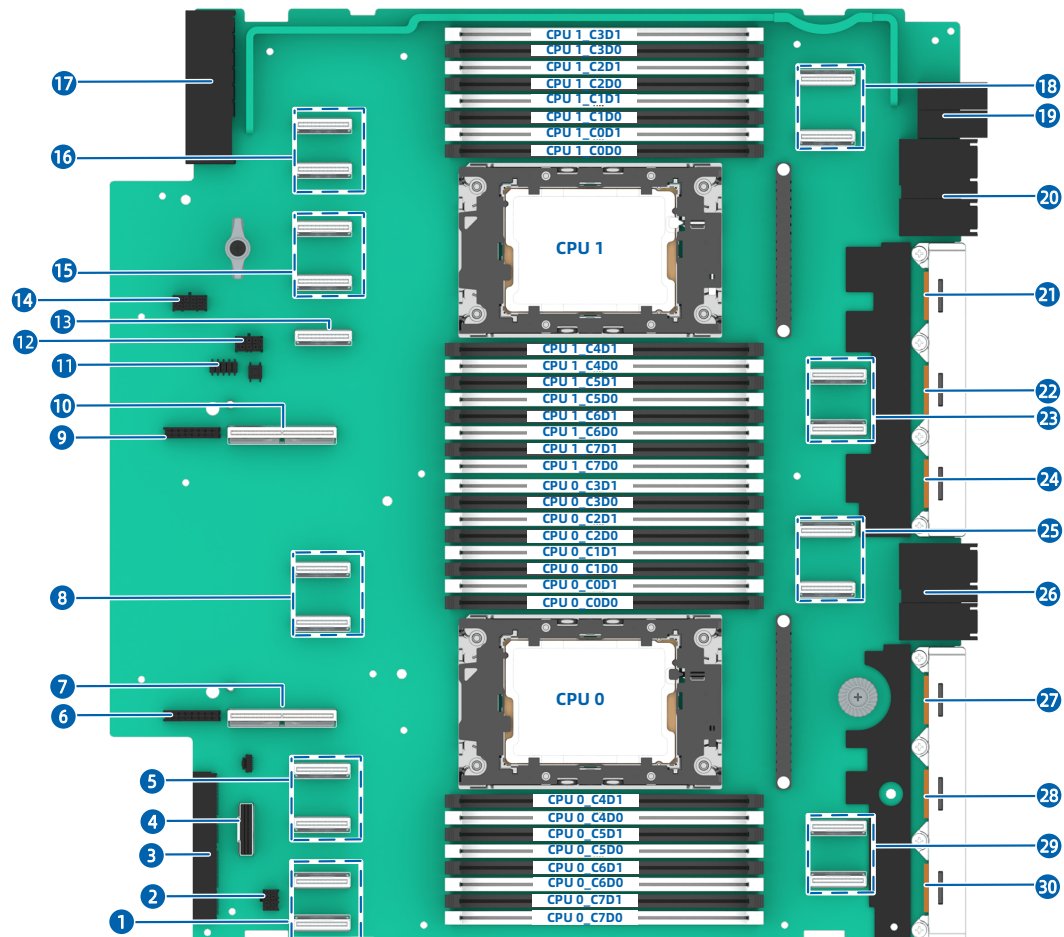
Figure 5-2 App Home Screen



## 5.13 Boards

### 5.13.1 Motherboard

Figure 5-20 Motherboard Layout

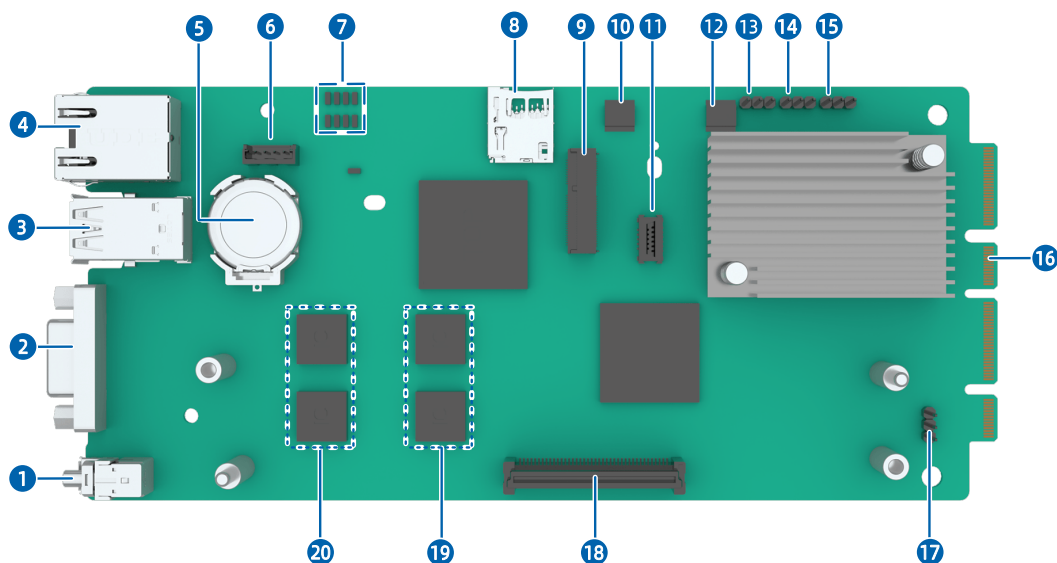


Item	Feature	Item	Feature
1	OCP Cable Connector	16	MCIO Connector for CPU1 x16 Riser Cable
2	OCP Power Cable Connector	17	PSU Connector
3	ICM Board Connector	18	CPU1 NVMe MCIO Connector
4	NC-SI Cable Connector	19	Fan Board Power Connector
5	CPU0_UPI1 Cable MCIO Connector	20	Right Midplane Board Connector
6	CPU0 Riser Power Connector	21	CPU1 NVMe Blind-Mate Connector
7	CPU0 Riser Connector	22	CPU1_UPI3 Cable Blind-Mate Connector
8	CPU0 x16 Riser Cable MCIO Connector	23	CPU1_UPI3 Cable MCIO Connector

Item	Feature	Item	Feature
9	CPU1 Riser Power Connector	24	CPU0_UPI3 Cable Blind-Mate Connector
10	CPU1 Riser Connector	25	CPU0 NVMe/RAID Riser MCIO Connector
11	CPLD JTAG Cable Connector	26	Left Midplane Board Connector
12	Smart NIC Power Cable Connector	27	CPU1_UPI0 Cable Blind-Mate Connector
13	MHCOP Cable Connector	28	CPU0 NVMe/RAID Riser Blind-Mate Connector
14	GPU Power Cable Connector	29	CPU0_UPI3 Cable MCIO Connector
15	CPU1_UPI0 Cable MCIO Connector	30	CPU0_UPI1 Cable Blind-Mate Connector

## 5.13.2 ICM Board

Figure 5-21 ICM Board Layout



Item	Feature	Item	Feature
1	UID/BMC RST Button and LED	11	TPM/TCM Connector
2	VGA Port	12	DIP Switch 2
3	USB Port	13	CLR_CMOS Jumper Cap
4	BMC Management Network Port	14	SMLink Debug Connector
5	Battery Socket	15	Password Clear Jumper Cap
6	RAID Key Connector	16	Gold Finger
7	Port 80 LED	17	BIOS Recovery Jumper Cap
8	BMC TF Card Slot	18	M.2 Adapter Connector

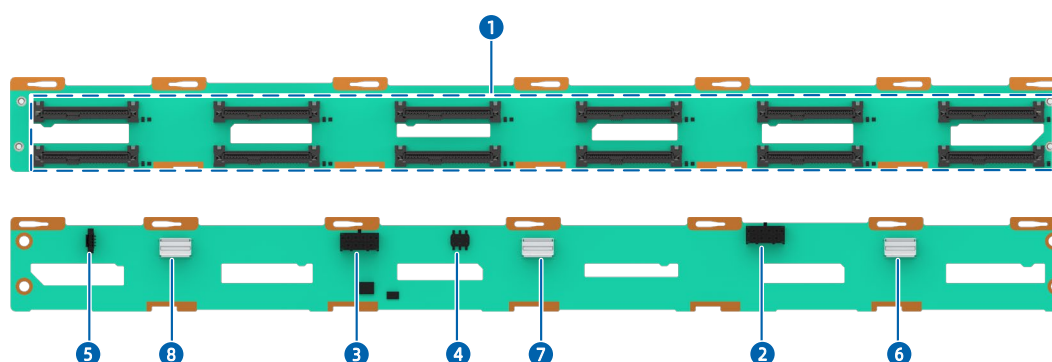
Item	Feature	Item	Feature
9	PCH TF Card Module Connector	19	BIOS Flash
10	DIP Switch 1	20	BMC Flash

## 5.13.3 Drive Backplanes

### 1. Front Drive Backplanes

- Backplane for 12 × 2.5-inch Drive Configuration (12 × SAS/SATA Drive)

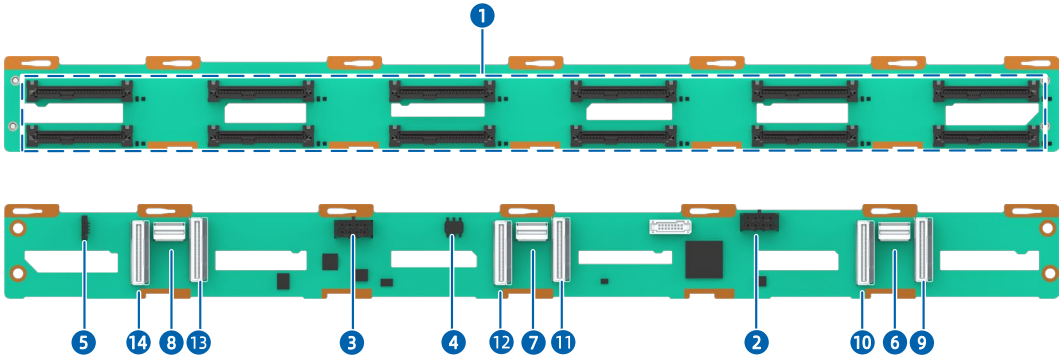
Figure 5-22 Backplane for 12 × 2.5-inch Drive Configuration (12 × SAS/SATA Drive)



Item	Feature	Item	Feature
1	Drive Connector × 12	5	I <sup>2</sup> C Connector
2	Power Connector (for drives 0 to 5)	6	SAS Signal Connector 1 (for drives 0 to 3)
3	Power Connector (for drives 6 to 11)	7	SAS Signal Connector 2 (for drives 4 to 7)
4	CPLD JTAG Connector	8	SAS Signal Connector 3 (for drives 8 to 11)

- Backplane for 12 × 2.5-inch Drive Configuration (12 × SAS/SATA/NVMe Drive)

Figure 5-23 12 × 2.5-inch Drive Configuration (12 × SAS/SATA/NVMe Drive)







Item	Feature	Item	Feature
1	Drive Connector × 12	8	SAS Signal Connector 3 (for drives 8 to 11)
2	Power Connector (for drives 0 to 5)	9	NVMe Signal Connector 1 (for drives 0 to 1)
3	Power Connector (for drives 6 to 11)	10	NVMe Signal Connector 2 (for drives 2 to 3)
4	CPLD JTAG Connector	11	NVMe Signal Connector 3 (for drives 4 to 5)
5	I <sup>2</sup> C Connector	12	NVMe Signal Connector 4 (for drives 6 to 7)
6	SAS Signal Connector 1 (for drives 0 to 3)	13	NVMe Signal Connector 5 (for drives 8 to 9)
7	SAS Signal Connector 2 (for drives 4 to 7)	14	NVMe Signal Connector 6 (for drives 10 to 11)

# 6 Product Specifications




## 6.1 Technical Specifications

Table 6-1 Technical Specifications

Item	Description
Form Factor	6U8S rack server
Chipset	Intel C741 Emmitsburg
Processor	<p>Supports 4 or 8 processors:</p> <ul style="list-style-type: none"><li>• 4<sup>th</sup> Gen Intel Xeon Scalable processors (Sapphire Rapids)</li><li>• Integrated memory controllers and 8 memory channels per processor</li><li>• Integrated PCIe controllers and 80 PCIe 5.0 lanes per processor</li><li>• 4 UPI links per CPU at up to 16 GT/s</li><li>• Up to 60 cores</li><li>• Max Turbo frequency at 4.2 GHz (18 cores)</li><li>• Minimum L3 cache per core of 1.875 MB</li><li>• TDP up to 350 W</li></ul> <p> <b>NOTE</b></p> <p>The information above is for reference only. See <a href="#">7.2 Hardware Compatibility</a> for details.</p>
Memory	<ul style="list-style-type: none"><li>• Supports 128 DIMM slots</li><li>• Up to 128 DDR5 DIMMs<ul style="list-style-type: none"><li>- Supports RDIMMs or 3DS-RDIMMs</li><li>- Up to 4,800 MT/s</li><li>- Mixing DDR5 DIMM types (RDIMM, 3DS-RDIMM) or mixing DDR5 DIMM specifications (capacity, bit width, rank, height, etc.) is not supported.</li><li>- A server must use DDR5 DIMMs bearing the same part number (P/N code).</li></ul></li></ul>

Item	Description
	 <b>NOTE</b> The information above is for reference only. See <a href="#">7.2 Hardware Compatibility</a> for details.
Storage	<p>Supports multiple drive configurations. For detailed information, refer to <a href="#">5.7.1 Drive Configurations</a>.</p> <ul style="list-style-type: none"> <li>Up to 2 SATA/NVMe M.2 SSDs <ul style="list-style-type: none"> <li>When the server is configured with an SND 9230 RAID card, the M.2 SSDs support RAID configuration.</li> <li>When the server is configured with an M.2 adapter, the SATA/PCIe M.2 SSDs support VROC.</li> </ul> </li> </ul>  <b>NOTE</b> <ul style="list-style-type: none"> <li>It is recommended that the M.2 SSD be only used as a boot device for installing the OS.</li> <li>The M.2 SSD has low endurance and cannot be used as a data storage device, especially in scenarios with frequent data erasing and re-writing. The reason is that write limits can be reached within a short period of time, which will result in damage and unavailability.</li> <li>For data storage, use enterprise-class SSDs with higher DWPD or HDDs.</li> <li>Write-intensive business software will cause the M.2 SSD to reach write endurance and wear out; therefore, the M.2 SSD is not recommended for such business scenarios.</li> <li>Do not use the M.2 SSD as caching.</li> <li>Supports hot-swap SAS/SATA/NVMe drives.</li> </ul>  <b>NOTE</b> <p>When the server is configured with NVMe drives:</p> <ul style="list-style-type: none"> <li>When the VMD function is enabled and the latest VMD driver is installed, the NVMe drive supports RAID.</li> <li>Supports multiple models of RAID cards. See <a href="#">7.2 Hardware Compatibility</a> 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 PCIe RAID card occupies 1 PCIe slot.</li> </ul> </li> </ul>
Network	<ul style="list-style-type: none"> <li>4 optional single-host/multi-host OCP 3.0 cards (1/10/25/40/100/200/400 Gb). Only single-host OCP 3.0 cards are hot-swappable</li> </ul>



Item	Description
	<ul style="list-style-type: none"> <li>Standard NICs (1/10/25/40/100/200/400 Gb)</li> </ul>
I/O Expansion	<ul style="list-style-type: none"> <li>Up to 16 standard PCIe x16 expansion slots               <ul style="list-style-type: none"> <li>8 FHHL PCIe 5.0 x16 slots and 8 FHFL PCIe 5.0 x16 slots</li> </ul> </li> <li>Up to 4 smart NICs</li> <li>Up to 4 dual-slot GPUs</li> </ul> <p> <b>NOTE</b> For details, see <a href="#">5.9.2 PCIe Slot Locations</a> and <a href="#">5.9.4 PCIe Slot Description</a>.</p>
Port	<ul style="list-style-type: none"> <li>Front:               <ul style="list-style-type: none"> <li>1 × USB 2.0/LCD port</li> <li>1 × USB 3.0 port</li> <li>1 × DB15 VGA port</li> </ul> </li> <li>Rear:               <ul style="list-style-type: none"> <li>2 × USB 3.0 port</li> <li>1 × DB15 VGA port</li> <li>1 × Micro USB serial port</li> <li>1 × RJ45 management network port</li> </ul> </li> <li>Internal:               <ul style="list-style-type: none"> <li>1 × USB 3.0 port (optional)</li> </ul> </li> </ul> <p> <b>NOTE</b> OS installation on the USB storage media is not recommended.</p>
Display	<p>Integrated VGA on the motherboard with a video memory of 1 GB (shared with the BMC) and a maximum 16M color resolution of 1,920 × 1,200 at 60 Hz.</p> <p> <b>NOTE</b></p> <ul style="list-style-type: none"> <li>The integrated VGA can support a maximum resolution of 1,920 × 1,200 only when the video driver matching the OS version is installed; otherwise, only the default resolution of the OS is supported.</li> <li>When the front and rear VGA ports are both connected to monitors, only the monitor connected to the front VGA port works.</li> </ul>

Item	Description
System Management	<ul style="list-style-type: none"> <li>• UEFI</li> <li>• ISBMC</li> <li>• NC-SI</li> <li>• InManage</li> </ul>
Security	<ul style="list-style-type: none"> <li>• Intel Platform Firmware Resilience (PFR)</li> <li>• Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM)</li> <li>• Intel Trusted Execution Technology</li> <li>• Firmware update mechanism based on digital signatures</li> <li>• UEFI Secure Boot</li> <li>• Hierarchical BIOS password protection</li> <li>• BIOS Secure Flash and BIOS Lock Enable (BLE)</li> <li>• BMC and BIOS dual-image mechanism</li> <li>• Double factor authentication</li> <li>• BIOS Secure Boot based on TPM</li> <li>• BMC Secure Boot</li> </ul>

## 6.2 Environmental Specifications

Table 6-2 Environmental Specifications

Parameter	Description
Temperature <sup>1,2,3</sup>	<ul style="list-style-type: none"> <li>• Operating: 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: 5% to 90% RH</li> <li>• Storage (packed): 5% to 93% RH</li> <li>• Storage (unpacked): 5% to 93% RH</li> </ul>

Parameter	Description
Operating Altitude	≤3,050 m (10,007 ft)
Corrosive Gaseous Contaminants	<p>Maximum growth rate of corrosion film thickness:</p> <ul style="list-style-type: none"> <li>Copper coupon: 300 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013)</li> <li>Silver coupon: 200 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013)</li> </ul>
Acoustic Noise <sup>4,5,6</sup>	<p>Noise emissions are measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). Listed are the declared A-weighted sound power levels (LWAd) and the declared average bystander position A-weighted sound pressure levels (LpAm) at a server operating temperature of 25°C (77°F):</p> <ul style="list-style-type: none"> <li>Idle: <ul style="list-style-type: none"> <li>LWAd: 7.4 B for standard configuration</li> <li>LpAm: 59.2 dBA for standard configuration</li> </ul> </li> <li>Operating: <ul style="list-style-type: none"> <li>LWAd: 7.4 B for standard configuration</li> <li>LpAm: 59.2 dBA for standard configuration</li> </ul> </li> </ul>

Notes:

- Not all configurations support an operating temperature range of 5°C to 45°C (41°F to 113°F). For GPU configurations, the supported temperature ranges from 10°C to 25°C (50°F to 77°F).
- 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. No direct sustained sunlight is permitted. The maximum operating altitude is 3,050 m (10,007 ft) and the maximum temperature gradient is 20°C/h (36°F/h), both varying with server configuration.
  - Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.
- Expanded operating temperature:

- 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 10,007 ft), derate the maximum allowable temperature by 1°C per 125 m (1°F per 228 ft).
  - Any fan failure or operations under the expanded operating temperature may lead to system performance degradation.
4. The sound levels shown here were measured based on the specific configurations of a server. Sound levels vary with server configuration. These values are for reference only and subject to change without notice.
  5. 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.
  6. The listed sound levels apply to the standard configuration. Additional options may result in increased sound levels.

## 6.3 Physical Specifications

Table 6-3 Physical Specifications

Item	Description
Dimensions	<ul style="list-style-type: none"> <li>• With mounting ears: 482 × 263.2 × 870 mm (18.98 × 10.36 × 34.25 in.) (W × H × D)</li> <li>• Without mounting ears: 448 × 263.2 × 820 mm (17.64 × 10.36 × 32.28 in.) (W × H × D)</li> <li>• Outer Packaging (with pallet): 1,200 × 800 × 574 mm (47.24 × 31.50 × 22.60 in.) (L × W × H)</li> </ul>
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: Above 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: Intended for 9.5 mm (0.37 in.) square hole cabinets and <math>\phi</math>7.1 mm (0.28 in.) round hole cabinets</li> </ul> </li> </ul>


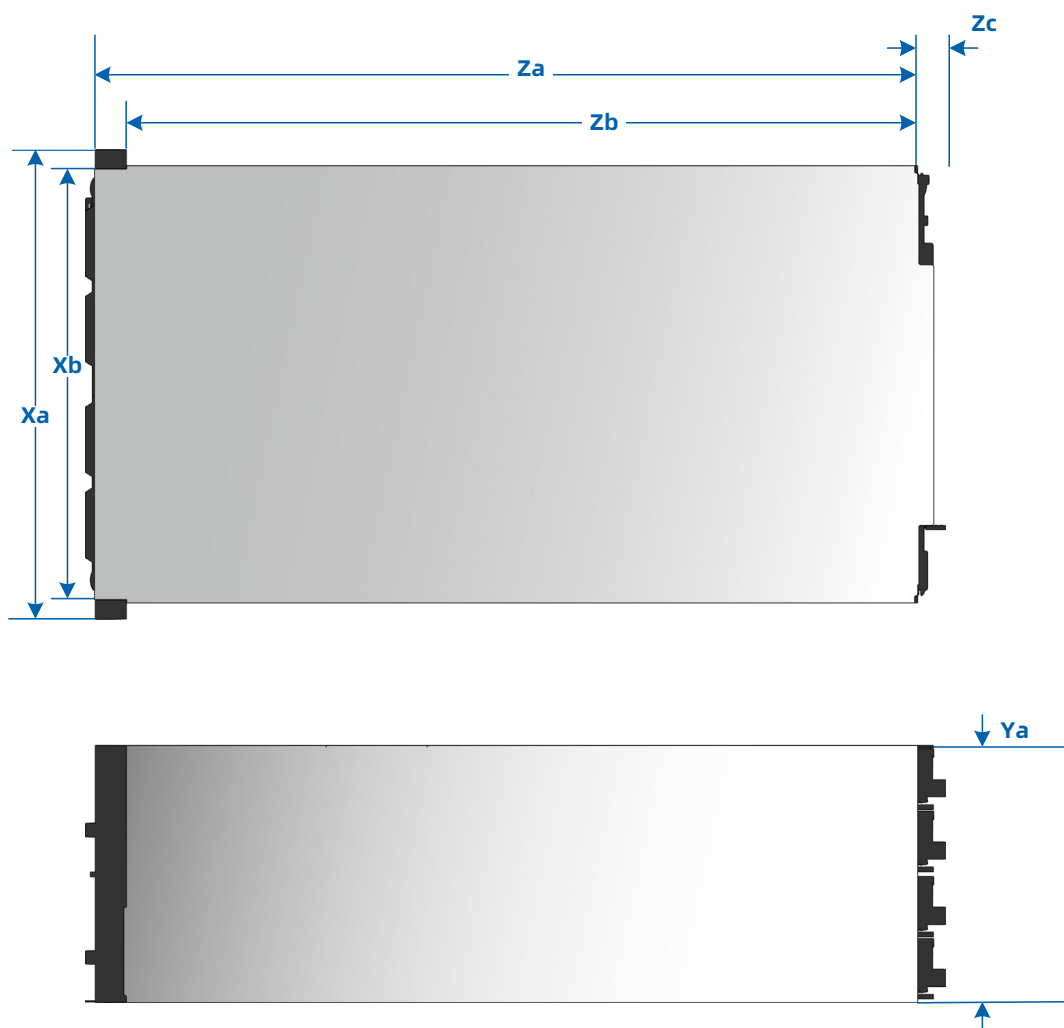
Item	Description
	<ul style="list-style-type: none"> <li>- Static rail kit: The distance between the front and rear mounting flanges ranges from 645 to 917 mm (25.39 to 36.10 in.)</li> <li>- With a stopper: The distance between the front and rear mounting flanges ranges from 772 to 815 mm (30.39 to 32.09 in.)</li> </ul>
Weight	<p>24 × 2.5-inch drive configuration (24 × drive + 4 × GPU)</p> <ul style="list-style-type: none"> <li>• Net weight: 96.8 kg (213.41 lbs)</li> <li>• Gross weight: 126 kg (277.78 lbs, including server, packaging box, pallet, rails and accessory box)</li> </ul> <p> <b>NOTE</b> The weight of a server varies with the server configurations.</p>

Figure 6-1 Chassis Dimensions



<b>Model</b>	<b>Za</b>	<b>Zb</b>	<b>Zc</b>	<b>Xa</b>	<b>Xb</b>	<b>Ya</b>
KR6880- X2-A0- R0-00	843 mm (33.19 in.)	811 mm (31.93 in.)	16.33 mm (0.64 in.)	482 mm (18.98 in.)	448 mm (17.64 in.)	263.2 mm (10.36 in.)

# 7 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 sales representative.



## IMPORTANT

- Using incompatible components may cause the server to work abnormally, and such failures are not covered by technical support or warranty.
- The hardware compatibility of different models may vary slightly. Contact your sales representatives to confirm the detailed hardware configurations during the pre-sales phase.
- 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 our sales representatives to 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 cards, or firmware versions) during the pre-sales phase.

## 7.1 Supported Operating Systems

Table 7-1 Supported Operating Systems

OS Version
Windows Server 2022
Red Hat Enterprise Linux 8.6

## 7.2 Hardware Compatibility

### 7.2.1 Component Installation Location Requirements

Feature	Installation Position Requirements (Node #)
Display	No limit
GPU	No limit
HBA Card	Must be installed on node 0/1
HCA Card	Must be installed on node 0/1
FPGA Card	No limit
Marvell 88SE9230 PCIe Expansion Card (With M.2 Storage Cards Installed)	No limit
SAS Card	No limit ※If it is installed above the upper or lower front module, the functionality of the front module will be affected.
RAID Card	No limit ※If it is installed above the upper or lower front module, the functionality of the front module will be affected.
Intel X710 Dual-Port Standard NIC	Must be installed on node 0/1
NIC (≤10 Gb)	No limit
NIC (≥25 Gb)	Must be installed on node 0/1
Mellanox BlueField-2 (Smart NIC)	Must be installed on node 0/1
U.2 SSD	No limit

### 7.2.2 CPU Specifications

The server supports 8 Intel Xeon Scalable processors. 84XX series supports both 8 sockets and 4 sockets, and 64XX series only supports 4 sockets.



Table 7-2 CPU Specifications

Model	Cores	Threads	Base Frequency (GHz)	Max Turbo Frequency (GHz)	Cache (MB)	TDP (W)
8450H	28	56	2.0	2.6	75	250
8444H	16	32	2.9	3.2	45	270
8454H	32	64	2.1	2.7	82.5	270
8460H	40	80	2.2	3.1	105	330
8468H	48	96	2.1	3.0	105	330
8490H	60	120	1.9	2.9	112.5	350
6448H	32	64	2.4	3.2	60	250
6418H	24	48	2.1	2.9	60	185
6434H	8	16	3.7	4.1	22.5	195
6416H	18	36	2.2	2.9	45	165

## 7.2.3 DIMM Specifications

The server supports up to 128 DDR5 DIMMs. Each processor supports 8 memory channels with 2 DIMMs per channel. RDIMMs are supported.

Table 7-3 DIMM Specifications

Type	Capacity (GB)	Speed (MHz)	Data Width	Organization
RDIMM	16	4,800	x64	1R x8
RDIMM	32	4,800	x64	1R x4/2R x8
RDIMM	64	4,800	x64	2R x4/2R x8

## 7.2.4 Drive Specifications

Table 7-4 HDD Specifications

Model	RPM	Capacity	Max. Qty.
2.5-inch SAS HDD	10k	600 GB/1.2 TB/1.8 TB/2.4 TB	24
2.5-inch SAS HDD	15k	300 GB/600 GB/900 GB	24

Table 7-5 SATA SSD Specifications

Model	Capacity	Max. Qty.
SATA SSD	240 GB/480 GB/960 GB/1.92 TB/3.84 TB	24

Table 7-6 U.2 NVMe SSD Specifications

Model	Capacity	Max. Qty.
U.2 NVMe SSD	960 GB/1.92 TB/3.84 TB	24

Table 7-7 M.2 SSD Specifications

Model	Capacity	Max. Qty.
M.2 SATA SSD	240 GB/480 GB	2

## 7.2.5 SAS/RAID Card Specifications

Table 7-8 SAS/RAID Card Specifications

Type	Description
SAS Card	SAS Card_PM8222_PM8222_8_SAS3_PCIE
	SAS Card_PM8222_SmarthBA_8_SAS3_PCIE3
RAID Card	RAID Card_PM8204_RA_8_2GB_SAS3_PCIE3
	RAID Card_PM8204_RA_8_4GB_SAS3_PCIE3
	RAID Card_L_8R0_9560-8i_4G_HDM12G_PCIE4

## 7.2.6 NIC Specifications

Table 7-9 OCP Card Specifications

Type	Description	Speed (Gb)	Port Qty.
OCP 3.0 Card	NIC_SND_10G_X550_RJ_OCP3x4_2_XR	10	2
	NIC_M_25G_MCX631432AN_LC_OCP3x8_2_XR	25	2
	NIC_Andes-M6_E810_25G_LC_OCP3x8_2	25	2

Table 7-10 PCIe NIC Specifications

Type	Description	Speed (Gb)	Port Qty.
PCIe NIC	NIC_Vostok_I350_1G_RJ_PCIEx4-G3_2	1	2
	NIC_Vostok_I350_1G_RJ_PCIEx4_4	1	4
	NIC_I_10G_X710DA2_LC_PCIEx8_2_XR_M7	10	2
	NIC_Vostok_X710_10G_LC_PCIEx8_2_M7	10	2
	NIC_Pyxis_X550_10G_RJ_PCIEx8_2_XR	10	2
	NIC_M_25G_MCX512A-ACAT_LC_PCIEx8_2_XR	25	2
	NIC_Andes-M6_E810_25G_LC_PCIEx8_2	25	2

## 7.2.7 HBA/HCA Card Specifications

Table 7-11 HBA Card Specifications

Type	Description
HBA Card	HBA Card_E_8R0_LPE31000-M6_FC16G_PCIE
	HBA Card_E_8R2_LPE31002-M6_FC16G_PCIE

Table 7-12 HCA Card Specifications

Type	Description	Speed (Gb)	Port Qty.
HCA Card	HCA Card_M_1-HDR100_MCX653105A-ECAT_PCIE	100	1

## 7.2.8 GPU/Graphics Card Specifications

Table 7-13 GPU/Graphics Card Specifications

Type	Description	Max. Qty.
GPU		
Display		

## 7.2.9 PSU Specifications

The server supports up to 4 hot-swap PSUs in 2+2 or 3+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 Platinum or Titanium rated with various output powers, allowing customers to choose as needed.

- The following rated 110 Vac to 230 Vac and 240 Vdc PSUs are supported:
  - 2,000 W Platinum PSU: 1,000 W (110 Vac), 2,000 W (230 Vac), 2,000 W (240 Vdc for China)

Note:

- At a rated voltage of 110 Vac, the 2,000 W power supply will be derated to 1,000 W.

Operating voltage range:

- 110 Vac to 230 Vac: 90 V to 264 V
- 240 Vdc: 180 V to 320 V

# 8 Regulatory Information

## 8.1 Safety

### 8.1.1 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.

### 8.1.2 Personal Safety

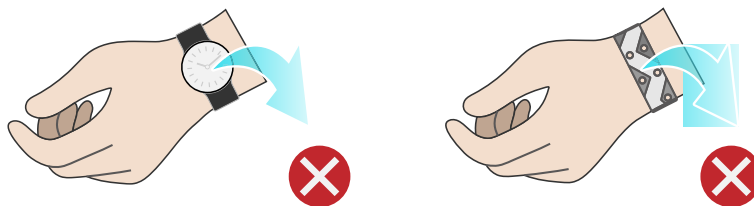
- Only personnel certified or authorized by us are allowed to perform the installation procedures.
- Stop any operation that could cause personal injury or equipment damage. Report to the project manager and take effective protective measures.
- Working during thunderstorms, including but not limited 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, as shown in [Figure 8-1](#).

Figure 8-1 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, as shown in [Figure 8-2](#), in order to avoid electric shock or burns.

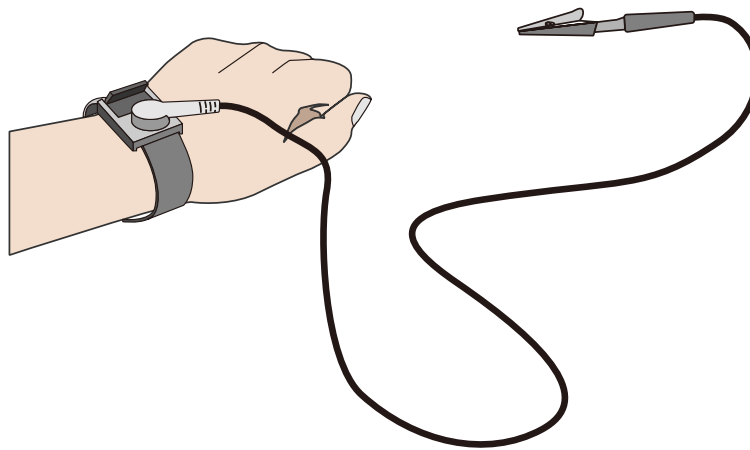
Figure 8-2 Removing Conductive Objects



How to put on an ESD strap ([Figure 8-3](#)).

- 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.

Figure 8-3 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.

### 8.1.3 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.

## 8.1.4 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 (such as chassis, blade servers and blade switches), and fragile components (such as optical modules and PCIe cards).
- Power off all equipment before shipping.

## 8.1.5 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.

[Table 8-1](#) lists the manual handling weight limits per person specified by some organizations.

Table 8-1 Manual Handling Weight Limits 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



Organization	Weight Limit (kg/lbs)
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	<ul style="list-style-type: none"> <li>• Male: 15/33.08</li> <li>• Female: 10/22.05</li> </ul>

## 9 Limited Warranty

Contact your sales representative or customer service representative for information about product warranty policy, including service offering, warranty period, service type, response time and disclaimer.

# 10 System Management

## 10.1 Intelligent Management System ISBMC

ISBMC, a remote server management system, supports mainstream management specifications in the industry such as IPMI 2.0 and Redfish 1.13. ISBMC features high operational reliability, easy serviceability for different business scenarios, accurate and comprehensive fault diagnosis capabilities, and industry-leading security reinforcement capabilities.

ISBMC supports:

- IPMI 2.0
- Redfish 1.13
- SNMP v1/v2c/v3
- HTML5/Java remote consoles (Keyboard, Video, Mouse)
- Remote virtual media
- Login via web browsers
- Intelligent fault diagnosis

Table 10-1 ISBMC Features

Feature	Description
Management Interface	<p>Supports extensive remote management interfaces for various server O&amp;M scenarios. The supported interfaces include:</p> <ul style="list-style-type: none"><li>• IPMI</li><li>• SSH CLI</li><li>• SNMP</li><li>• HTTPS</li><li>• Web GUI</li><li>• Redfish</li><li>• RESTful</li><li>• Syslog</li></ul>

Feature	Description
Accurate and Intelligent Fault Location	IDL, a fault diagnosis system, offers accurate and comprehensive hardware fault location capabilities, and outputs detailed fault causes and handling suggestions.
Alert Management	Supports rich automatic remote alert capabilities, including proactive alerting mechanisms such as SNMP Trap (v1/v2c/v3), email alerts and syslog remote alerts to ensure 24 × 7 reliability.
Remote Console KVM	Supports HTML5- and Java-based remote console to remotely control and operate the monitor/mouse/keyboard of the server, providing highly available remote management capabilities without on-site operation.
Virtual Network Console (VNC)	Supports mainstream third-party VNC clients without relying on Java, improving management flexibility.
Remote Virtual Media	Supports virtualizing images, USB devices, folders and local media devices as media devices of remote servers, simplifying OS installation, file sharing, and other O&M tasks.
Web GUI	Supports the visual management interface developed by us, displaying abundant information of the server and components, and offers easy-to-use Web GUIs.
Crash Screenshot and Crash Video Recording	<ul style="list-style-type: none"> <li>Supports automatic crash screenshot and crash video recording (video needs to be enabled manually) to capture the last screen and video before crash.</li> <li>Provides manual screenshot, which can quickly capture the screen for easy inspection at scheduled time.</li> </ul>
Dual Flash and Dual Image	Supports dual flash and dual image, enabling automatic flash failover in case of software or flash corruption, improving operational reliability.
Power Capping	Supports power capping, increasing deployment density and reducing energy consumption.
IPv4/IPv6	Supports both IPv4 and IPv6, enhancing network deployment flexibility.
Auto-Switching of Management Network Port	Supports auto-switching between the dedicated management network port and shared management network port, providing customers with flexible network deployment solutions for different management network deployment scenarios.
ISBMC Self-Diagnosis and Self-Recovery System	<p>Supports the reliable dual watchdog mechanism for hardware and software, enabling automatic restoration of BMC in case of BMC abnormality.</p> <p>Provides a thermal protection mechanism, which is automatically triggered when the BMC is abnormal to ensure</p>

Feature	Description
	that the fan operates at safe speeds to avoid system overheating. Supports self-diagnosis of processors, memory modules, and storage devices of ISBMC, and automatically cleans the workload to restore to normal when the device usage rate is too high.
Power Control	Supports virtual power buttons for power on/off, power cycle and reset.
UID LED	Supports remote lighting of the UID LED for locating the server in the server room.
Secure Firmware Update	Supports firmware update based on secure digital signatures, and mismatch prevention mechanism for firmware from different manufacturers and firmware for different server models; supports firmware update of BMC/BIOS/CPLD/PSU.
Serial Port Redirection	Supports remote redirection of the system serial port, BMC serial port and other serial ports, and directs the server-side serial port output to the local administrator via the network for server debugging.
Storage Information Display	Displays RAID logical array information and drive information, and supports remote RAID creation for improved deployment efficiency.
User Role Management	Supports user detail management based on user roles and flexible creation of user roles with different privileges, and provides more user roles to allow administrators to grant different privileges to O&M personnel.
Security Feature	Adopts the industry-leading server security baseline standard V3.0. SSH, HTTPS, SNMP and IPMI use secure and reliable algorithms. ISBMC offers capabilities including secure update and boot and security reinforcement mechanisms such as anti-replay, anti-injection, and anti-brute force.
Double Factor Authentication	Supports double factor authentication for local BMC users. Users need to log in to the BMC with both password and certificate, thus to prevent attacks caused by password leakage.
Configuration Exporting and Importing	Imports and exports the existing system configurations.
System Information Display	Displays the server basic information such as the information and health status of major server components, including CPU, memory, power supply, device inventory, hard drive, network adapter, and security chip.

Feature	Description
Fan Management	Displays the status, current speed, duty ratio, and other information of a fan module. You can select the fan control mode and preset the speed for each fan module in the Manual Fan Control mode.
Power Policy	Sets how the server operating system reacts under the BMC's control when AC power is reconnected to the server.
One-Key Erasing	Performs non-recoverable erasing on all storage devices of the server, preventing data leakage when the server is to be retired.
System Lockdown	After this feature is enabled, some parameters of the server cannot be set and some operations cannot be performed on the server.

## 10.2 InManage

The server is compatible with the latest version of InManage, a new-generation infrastructure O&M management platform for data centers.

Built on cutting-edge O&M concepts, InManage provides users with leading and efficient overall management solutions for data centers to ensure advanced infrastructure management. This platform provides a rich set of functions such as centralized asset management, in-depth fault diagnosis, component fault early warning, intelligent energy consumption management, 3D automatic topologies, and stateless automatic deployment. With these functions, users can implement centralized O&M of servers, storage devices, network devices, security devices, and edge devices, effectively improving O&M efficiency, reducing O&M costs, and ensuring the secure, reliable, and stable operation of data centers. InManage offers:

- lightweight deployment in multiple scenarios and full lifecycle management of devices
- high reliability and on-demand scalability enabled by 1 to N data collectors
- intelligent asset management and real-time tracking of asset changes
- comprehensive monitoring for overall business control
- intelligent fault diagnosis for reduced maintenance time
- second-level performance monitoring for real-time status of devices
- batch configuration, deployment and update, shortening the time needed to bring the production environment online
- improved firmware version management efficiency

- standardized northbound interfaces for easy integration and interfacing

Table 10-1 InManage Features

Feature	Description
Home	<ul style="list-style-type: none"> <li>• Display of basic information (data centers, server rooms, cabinets, assets and alerts), quick addition of devices and custom home page</li> </ul>
Assets	<ul style="list-style-type: none"> <li>• Batch asset import, automatic asset discovery, and full lifecycle management of assets</li> <li>• Management of the full range of our server family, including general-purpose rack servers, AI servers, multi-node servers, edge servers and all-in-one servers)</li> <li>• Management of our general-purpose disk arrays and distributed storage devices</li> <li>• Management of network devices (switches, routers, etc.), security devices (firewalls, load balancers, etc.), cabinets and clouds</li> <li>• Management of data centers</li> <li>• Asset warranty information management, asset inventory reports for server acceptance, asset attribute expansion, etc.</li> </ul>
Monitor	<ul style="list-style-type: none"> <li>• Display of real-time alerts, history alerts, blocked alerts and events</li> <li>• Fault prediction of drives and memories</li> <li>• Custom inspection plan and inspection result management</li> <li>• Notification record viewing</li> <li>• Intelligent fault diagnosis and analysis, automatic fault reporting and repair ticket viewing</li> <li>• Trap management and Redfish management</li> <li>• Management of monitoring rules, such as alert rules, notification rules, blocking rules, alert noise reduction rules, compression rules and fault reporting rules, and redefinition of the above rules</li> </ul>

Feature	Description
Control	<ul style="list-style-type: none"> <li>• Quick start of firmware update, OS installation, power management, drive data erasing and stress test</li> <li>• Batch firmware update (BMC/BIOS/RAID Card/NIC/Drive/HBA Card/MB CPLD/BP CPLD/PSU)</li> <li>• Batch firmware configuration (BMC/BIOS)</li> <li>• Batch RAID configuration and OS deployment for servers</li> <li>• Secure and quick drive data erasing</li> <li>• CPU and memory stress test</li> <li>• Automatic firmware baseline management</li> <li>• BMC and BIOS snapshot management</li> <li>• Repositories for update files</li> </ul>
Energy Efficiency	<ul style="list-style-type: none"> <li>• Overview of data center power consumption trend chart and carbon emission trend chart</li> <li>• Setting of server dynamic power consumption policies and minimum power consumption policies</li> <li>• Server temperature optimization, utilization optimization, power consumption characteristics analysis, power consumption prediction, load distribution, etc.</li> <li>• Carbon asset and carbon emission management</li> </ul>
Log	<ul style="list-style-type: none"> <li>• Fault log record management</li> <li>• Diagnosis record and diagnosis rule management</li> </ul>
Topologies	<ul style="list-style-type: none"> <li>• Centralized management of multiple data centers and panoramic 3D views, including dynamic display of power consumption, temperature, alerts and cabinet capacity of the data center</li> <li>• Network topologies</li> </ul>
Reports	<ul style="list-style-type: none"> <li>• Management of warranty information reports, alert reports, asset reports, hardware reports and performance reports</li> </ul>










Feature	Description
	<ul style="list-style-type: none"> <li>Export of reports in .xlsx format</li> </ul>
System	<ul style="list-style-type: none"> <li>Password management, alert forwarding and data dump</li> <li>Customized InManage parameters</li> </ul>
Security	Security control of InManage via a set of security policies such as user management, role management, authentication management (local authentication and LDAP authentication) and certificate management.

## 10.3 InManage Tools

Table 10-2 Features of InManage Tools

Feature	Description
InManage Kits	<ul style="list-style-type: none"> <li>A lightweight automatic batch O&amp;M tool for servers, mainly used for server deployment, routine maintenance, firmware update, fault handling, etc.</li> </ul>
InManage Boot	A unified batch management platform for bare metals, with features including firmware management, hardware configuration, system deployment and migration, stress test and in-band management
InManage Server CLI	Fast integration with third-party management platforms, delivering a new O&M mode of Infrastructure as Code (IaC)
InManage Driver	<ul style="list-style-type: none"> <li>Operates under the OS and gets system asset and performance information via the in-band mode, providing users with more comprehensive server management capabilities</li> </ul>
InManage Server Provisioning	<ul style="list-style-type: none"> <li>Offers users with RAID configuration, intelligent OS installation, firmware update, hardware diagnosis, secure erasing and software upgrade, using the TF card as the carrier</li> </ul>

# 11 Certifications

Country/Region	Certification	Logo	Mandatory/Voluntary
China	CCC		Mandatory
	China Environmental Labelling		Voluntary
International Mutual Recognition	CB		Voluntary
EU	CE		Mandatory
US	FCC		Mandatory
	UL		Voluntary
Eurasian Customs Union	EAC		Mandatory

# 12 Appendix A

## 12.1 Operating Temperature Specification

Table 12-1 Operating Temperature Specification Limits

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temperature: 35°C (95°F)	Max. Operating Temperature: 40°C (104°F)	Max. Operating Temperature: 45°C (113°F)
Mainstream Configuration (8 × 250 W CPU)	<ul style="list-style-type: none"> <li>CPU TDP ≤250 W</li> <li>64 × RDIMM</li> <li>8 × HHHL PCIe expansion card</li> <li>24 × SATA/SAS/NVMe drive</li> <li>4 × SFF OCP card</li> <li>2 × M.2 SSD</li> <li>GPUs not supported</li> </ul>	<ul style="list-style-type: none"> <li>CPU TDP ≤250 W</li> <li>64 × RDIMM</li> <li>8 × HHHL PCIe expansion card</li> <li>24 × SATA/SAS/NVMe drive</li> <li>4 × SFF OCP card</li> <li>2 × M.2 SSD</li> <li>GPUs not supported</li> </ul>	<ul style="list-style-type: none"> <li>CPU TDP ≤250 W</li> <li>64 × RDIMM</li> <li>4 × HHHL PCIe expansion card (AOC not supported for PCIe expansion cards ≤25 Gb)</li> <li>24 × SATA/SAS/NVMe drive (≤480 GB)</li> <li>NVMe drives not supported</li> <li>4 × SFF OCP card (AOC not supported for SFF OCP ≤25 Gb)</li> <li>2 × M.2 SSD (≤960 GB)</li> <li>GPUs not supported</li> </ul>	<ul style="list-style-type: none"> <li>CPU TDP ≤250 W</li> <li>64 × RDIMM</li> <li>4 × HHHL PCIe expansion card (AOC not supported for PCIe expansion cards ≤25 Gb)</li> <li>24 × SATA/SAS/NVMe drive (≤480 GB)</li> <li>NVMe drives not supported</li> <li>4 × SFF OCP card (AOC not supported for SFF OCP ≤25 Gb)</li> <li>2 × M.2 SSD (≤960 GB)</li> <li>GPUs not supported</li> </ul>

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temperature: 35°C (95°F)	Max. Operating Temperature: 40°C (104°F)	Max. Operating Temperature: 45°C (113°F)
Single 8-Socket Configuration (8 × 350 W CPU)	<ul style="list-style-type: none"> <li>• CPU TDP ≤350 W</li> <li>• 128 × RDIMM</li> <li>• 8 × HHHL PCIe expansion card</li> <li>• 24 × SATA/SAS/NVMe drive</li> <li>• 4 × SFF OCP card</li> <li>• 2 × M.2 SSD</li> <li>• GPUs not supported</li> </ul>	<ul style="list-style-type: none"> <li>• CPU TDP ≤350 W</li> <li>• 128 × RDIMM</li> <li>• 4 × HHHL PCIe expansion card</li> <li>• 24 × SATA/SAS/NVMe drive</li> <li>• 4 × SFF OCP card</li> <li>• 2 × M.2 SSD</li> <li>• GPUs not supported</li> </ul>	Not supported	Not supported
Single 4-Socket Configuration (4 × 350 W CPU)	<ul style="list-style-type: none"> <li>• CPU TDP ≤350 W</li> <li>• 128 × RDIMM</li> <li>• 4 × HHHL PCIe expansion card</li> <li>• 24 × SATA/SAS/NVMe drive</li> <li>• 2 × SFF OCP card</li> <li>• 2 × M.2 SSD</li> <li>• GPUs not supported</li> </ul>	<ul style="list-style-type: none"> <li>• CPU TDP ≤350 W</li> <li>• 128 × RDIMM</li> <li>• 2 × HHHL PCIe expansion card</li> <li>• 24 × SATA/SAS/NVMe drive</li> <li>• 2 × SFF OCP card</li> <li>• 2 × M.2 SSD</li> <li>• GPUs not supported</li> </ul>	Not supported	Not supported
GPU configuration (8 × 250 W CPU + 4 × 300 W GPU)	<ul style="list-style-type: none"> <li>• CPU TDP ≤250 W</li> <li>• 128 × RDIMM</li> <li>• 24 × 2.5-inch NVMe drive</li> <li>• 4 × HHHL PCIe expansion</li> </ul>	Not supported	Not supported	Not supported

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temperature: 35°C (95°F)	Max. Operating Temperature: 40°C (104°F)	Max. Operating Temperature: 45°C (113°F)
	card (A100/A800) <ul style="list-style-type: none"> <li>8 × HHHL PCIe expansion card</li> <li>4 × SFF OCP card</li> <li>2 × M.2 SSD</li> </ul>			



#### NOTE

- The maximum operating temperature is 5°C (9°F) lower than the rated value if a single fan fails.
- Single fan failure may affect system performance.

## 12.2 Model

Certified Model	Description
KR6880-X2-A0-R0-00	Global

## 12.3 RAS Features

The server supports a variety of RAS (Reliability, Availability, and Serviceability) features. By configuring these features, the server can provide greater reliability, availability, and serviceability.

## 12.4 Sensor List

Sensor	Description	Sensor Location
Inlet_Temp	Air inlet temperature	Motherboard
CPUx_VR_Temp	CPUx VR temperature	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>

Sensor	Description	Sensor Location
PSUx_VIN	PSUx input voltage	PSUx <ul style="list-style-type: none"> <li>x indicates the PSU number with a value of 0 - 3</li> </ul>
PSUx_VOUT	PSUx output voltage	PSUx <ul style="list-style-type: none"> <li>x indicates the PSU number with a value of 0 - 3</li> </ul>
SYS_3V3	System 3.3 V voltage	Motherboard
RTC_Battery	Motherboard RTC battery voltage	Motherboard
PVNN_MAIN_CPUx	CPUx voltage	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>
P12V_CPUx_DIMM	CPUx DIMM voltage	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>
PVNN_PCH_STBY	PCH core voltage	Motherboard
P1V05_PCH_STBY	PCH logic voltage	Motherboard
CPUx_Temp	CPUx core temperature	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>
CPUx_DTS	CPU_DTS temperature CPU margin temperature before it reaches the throttling frequency	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>
CPUx_DIMM_Temp	The maximum temperature among DDR5 DIMMs of CPUx	CPUx <ul style="list-style-type: none"> <li>x indicates the CPU number with a value of 0 - 7</li> </ul>
PCH_Temp	PCH temperature	Motherboard
PSU_Inlet_Temp	PSU temperature	-
Total_Power	Total power	-

Sensor	Description	Sensor Location
FAN_Power	Total fan power	-
PSUx_PIN	PSUx input power	PSUx <ul style="list-style-type: none"> <li>x indicates the PSU number with a value of 0 - 3</li> </ul>
PSUx_POUT	PSUx output power	PSUx <ul style="list-style-type: none"> <li>x indicates the PSU number with a value of 0 - 3</li> </ul>
CPU_Power	Total CPU power (obtained through ME)	-
Memory_Power	Total memory power (obtained through ME)	-
FANx_F_Speed, FANx_R_Speed	FANx speed	FANx <ul style="list-style-type: none"> <li>x indicates the fan number with a value of 0 - 7</li> </ul>
RAID_Temp	PCIe RAID card temperature (Max temp. will be taken in case of multiple RAID cards, including SAS, RAID, and HBA)	-
HDD_MAX_Temp	Maximum temperature among all drives	-
NVMe_Temp	Maximum temperature among all NVMe drives	-
OCP_NIC_Temp	OCP card temperature (Max temp. will be taken in case of multiple OCP cards)	-
PCIE_NIC_Temp	PCIe NIC temperature (Max temp. will be taken in case of multiple PCIe NICs)	-
MEM_ResourceRate	Memory utilization rate	-
CPU_ResourceRate	CPU utilization rate	-
GPUx_Temp	GPUx core temperature	GPUx

Sensor	Description	Sensor Location
		<ul style="list-style-type: none"> <li>x indicates the GPU number with a value of 0 - 3</li> </ul>
MB_Inlet_Temp_x	MBx air inlet temperature	-
MB_Outlet_Temp_x	MBx air outlet temperature	-
P3V3_BMC_RGM	BMC RGM 3.3 V voltage	Motherboard
P1V2_BMC_STBY	BMC 1.2 V standby voltage	Motherboard
P1V8_PCH_STBY	PCH 1.8 V standby voltage	Motherboard
P12V_STBY	Motherboard 12 V standby voltage	Motherboard
P2V5_STBY	Motherboard 2.5 V standby voltage	Motherboard
P3V3_STBY	Motherboard 3.3 V standby voltage	Motherboard
P5V_STBY	Motherboard 5 V standby voltage	Motherboard
P1V_STBY	Motherboard 1 V standby voltage	Motherboard
M.2 Inlet	M.2 SSD air inlet temperature	Motherboard
Disk_Power	Drive power	-
CPUN_Status	CPU n status (n: 0 - n)	CPU n <ul style="list-style-type: none"> <li>n indicates the CPU number with a value of 0 - 7</li> </ul>
SEL_Status	SEL status	-
PSU_Mismatch	Monitored PSU model mismatch Alarm logs of abnormal power failure upgrade in the test	-
PSU_Redundant	PSU redundancy status	-
FANn_Status	FAN n status Front/Rear fan status of fan module n	FAN n <ul style="list-style-type: none"> <li>n indicates the fan number with a value of 0 - 7</li> </ul>
FAN_Redundant	Fan redundancy status	-



Sensor	Description	Sensor Location
PCle_Status	The status of PCIe device (including PCIe bus, slots and cards)	-
POST_Status	System firmware and POST status	-
PWR_CAP_Fail	Power capping failure	-
CPUN1_CN2DN3	DIMM silk screen	Motherboard <ul style="list-style-type: none"> <li>N1 indicates the CPU number with a value of 0 - 3</li> <li>N2 indicates the channel number with a value of 0 - 7</li> <li>N3 indicates the DIMM slot number with a value of 0 - 1</li> </ul>
CPU_Config	CPU configuration status (mixing of CPUs, or primary CPU not installed)	-
PSUn_Status	PSUn status (n: 0 - n)	PSUn <ul style="list-style-type: none"> <li>n indicates the PSU number with a value of 0 - 3</li> </ul>
K_HDDx	Drive	Drive <ul style="list-style-type: none"> <li>K denotes front, internal and rear, with a value of F/I/R respectively</li> <li>x indicates the HDD number</li> </ul>
ACPI_PWR	ACPI status	-
Sys_Health	System health status	-
BMC_Boot_Up	BMC boot up complete	-
BIOS_Boot_Up	BIOS boot up complete	-
ME_FW_Status	ME health status	-
TPM_Verify	TPM verification status	-

# 13 Appendix B Acronyms and Abbreviations

## 13.1A - E

### A

AC	Alternating Current
ACPI	Advanced Configuration and Power Management Interface
AI	Artificial Intelligence
AOC	Active Optical Cable
AQSIQ	Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
AVX	Advanced Vector Extensions

### B

BIOS	Basic Input Output System
BLE	BIOS Lock Enable
BMC	Baseboard Management Controller

### C

CAS	Column Address Strobe
CB	Certification Body
CCC	China Compulsory Certificate
CE	Conformite Europeenne
CEN	European Committee for Standardization
CLI	Command-Line Interface
CLR	Clear
CMOS	Complementary Metal-Oxide-Semiconductor Transistor

CPLD	Complex Programming Logic Device
CPU	Central Processing Unit
CRPS	Common Redundant Power Supplies
CXL	Compute Express Link

## D

DC	Direct Current
DDP	Dual Die Package
DDR5	Double Data Rate 5
DIMM	Dual-Inline-Memory-Modules
DIP	Dual In-line Package
DL	Deep Learning
DPC	DIMM per Channel
DRAM	Dynamic Random Access Memory
DTS	Distributed Temperature Sensing
DWPD	Drive Writes Per Day

## E

EAC	Eurasian Conformity
EBG	Emmitsburg
ECC	Error Correcting Code
ECMA	European Computer Manufacturers Association
ERP	Enterprise Resource Planning
ESD	Electrostatic Discharge
EU	European Union

## 13.2F - J

### F

FCC	Federal Communications Commission
FHFL	Full-Hight Full-Length
FHHL	Full-Height Half-Length
FPGA	Field Programmable Gate Array

### G

GPU	Graphics Processing Unit
GUI	Graphical User Interface

### H

HANA	High-performance ANalytic Appliance
HBA	Host Bus Adapter
HCA	Host Channel Adapter
HDD	Hard Disk Drive
HHHL	Half-Height Half-Length
HSE	Health and Safety Executive
HTML	Hyper Text Markup Language
HTTPS	Hypertext Transfer Protocol Secure

### I

I/O	Input/Output
ICM	Ignition Control Module

ID	Identification
IEC	International Electrotechnical Commission
IIPC	Intel Intelligent Power Capability
IP	Internet Protocol
IPMI	Intelligent Platform Management Interface
ISA	International Society of Automation
ISO	International Organization for Standardization

## J

JTAG	Joint Test Action Group
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## 13.3K - O

## K

KVM	Keyboard Video Mouse
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## L

LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LWAd	Declared A-weighted Sound Power Levels

**M**

MCIO	Mini Cool Edge IO
ME	Management Engine

**N**

NC-SI	Network Controller Sideband Interface
NIC	Network Interface Controller
NIOSH	National Institute for Occupational Safety and Health
NVMe	Non-Volatile Memory Express

**O**

OCP	Open Compute Project
OS	Operating System

**13.4P - T****P**

PCH	Platform Controller Hub
PCIe	Peripheral Component Interconnect express
PDU	Power Distribution Unit
PFR	Platform Firmware Resilience
PID	Proportional, Integral, Derivative
POST	Power On Self Test

PSU	Power Supply Unit
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## R

RAID	Redundant Arrays of Independent Drives
RAS	Reliability, Availability, and Serviceability
RDIMM	Registered Dual In-line Memory Module
RH	Relative Humidity
RST	Reset
RTC	Real Time Clock

## S

SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SCSI	Small Computer System Interface
SEL	System Event Log
SFF	Small Form Factor
SGX	Software Guard Extensions
SN	Serial Number
SNMP	Simple Network Management Protocol
SSD	Solid State Disk
SSH	Secure Shell

**T**

TCM	Trusted Cryptography Module
TDP	Thermal Design Power
TF	TransFlash
TPM	Trusted Platform Module

## 13.5U - Z

**U**

UEFI	Unified Extensible Firmware Interface
UID	User Identification
UL	Underwriter Laboratories
UPI	Ultra Path Interconnect
USB	Universal Serial Bus

**V**

VGA	Video Graphics Array
VLAN	Virtual Local Area Network
VMD	Volume Management Device
VNC	Virtual Network Console
VNNI	Vector Neural Network Instructions
VR	Voltage Regulator
VRD	Voltage Regulator Down



VROC	Virtual RAID on CPU
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