White Paper for KR4266V2 Series Servers

Powered by Intel Processors

For KR4266-X2-A0-R0-00 and KR4266-X2-C0-R0-00

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Applicable Models

Model	Maintenance	Cooling
KR4266-X2-A0-R0-00	Rear access	Air cooling
KR4266-X2-C0-R0-00	Rear access	Cold-plate liquid cooling

Technical Support

Global Service Hotline:	(+1) 844-912-0007
Address:	1501 McCarthy Blvd, Milpitas, CA 95035 AIVRES SYSTEMS INC.
Website:	https://aivres.com
Email:	serversupport@aivres.com

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- For server open source software statements, please contact us.
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Preface

Abstract

This document describes the KR4266V2 Intel-based server's appearance, features, performance parameters, and software and hardware compatibility, providing in-depth information of KR4266V2.

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	2025/04/24	Initial release

Table of Contents

1 Product Overview

The KR4266V2 Intel-based system is a general-purpose 4U storage server powered by the 4th/5th Gen Intel Xeon Scalable processors. With high storage capacities, superior computing performance, ultimate IO expansion, and high energy efficiency, it is suitable for various application scenarios such as warm/cold data storage, big data storage, and cloud storage pool creation. As the first storage server that adopts air cooling and liquid cooling (cold plate) solutions, it meets the low PUE requirements of high-density data centers, making it an ideal choice for warm/cold data storage.

Figure 1-1 KR4266V2 Intel-based System

2 Features

2.1 Scalability and Performance

Table 2-1 Scalability and Performance

Technical Feature	Description
Intel Processors	Features the 4th/5th Gen Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids), with up to 64 cores per processor, a TDP of up to 385 W, a max. Turbo frequency of 4.2 GHz, an L3 cache of up to 5 MB per core, and 4 UPI links per CPU at up to 20 GT/s. • With the processor cache hierarchy optimization, a larger L2 cache is provided. • 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. • Supports Intel Hyper-Threading Technology, allowing up to 2 threads to run on each core to improve the performance of multi-threaded applications. • Supports Intel Virtualization Technology that provides hardware assistance to the virtualization software, allowing the operating system to better use hardware to handle virtualized workloads. • Supports Intel Advanced Vector Extensions 512 (Intel AVX-512), significantly improving floating-point performance for compute-intensive applications. • Supports Intel Deep Learning Boost (Intel DL Boost) that uses Vector Neural Network Instructions (VNNI), improving the performance for deep learning applications.
DDR5 ECC DIMMs	Up to 32 DDR5 ECC DIMMs (5,600 MT/s, RDIMMs), delivering superior speed, high availability, and a memory capacity of up to 4 TB. Note: The server, if installed with forty-six 3.5-inch drives, supports up to 22 DIMMs. See 5.6.1.5 DIMM Slot Layout for the DIMM population rules.

Technical Feature	Description
Flexible Drive Configuration	Flexible drive configurations provide elastic and expandable storage solutions to meet different capacity and upgrade requirements. • Up to forty-six 3.5-inch SAS/SATA drives and 2 rear 2.5-inch SAS/SATA drives. • 2 rear M.2 or E1.S SSDs, satisfying diverse storage demands.
SSD Configuration	Up to 16 hot-swap all-flash NVMe SSDs, decupling the IOPS of high-end enterprise-level SATA SSDs and significantly boosting storage performance with ultimate storage I/O.
24 Gbps Serial Attached SCSI (SAS)	Offers 24 Gbps Serial Attached SCSI (SAS), quadrupling the data transfer rate of internal storage of 6 Gbps SAS solutions and maximizing the performance of storage I/O-intensive applications.
Intel Integrated I/O Technology	With the Intel integrated I/O technology, the processors integrate the PCIe 5.0 controller to significantly reduce I/O latency and enhance overall system performance.
PCIe 5.0 Expansion	Up to 13 PCIe 5.0 slots, namely, 10 standard PCIe slots, 1 dedicated slot for a RAID mezz card, and 2 dedicated slots for OCP 3.0 cards, further enhancing the I/O performance. Note: The server supports up to 2 dual-slot or 8 single-slot GPUs.
OCP 3.0 Card	Optional 1/10/25/40/100/200 Gb OCP 3.0 cards, delivering a more flexible network architecture.

2.2 Availability and Serviceability

Table 2-2 Availability and Serviceability

Technical Feature	Description
Hot-swap SAS/SATA/NVMe Drive	Supports hot-swap SAS/SATA/NVMe drives and RAID cards with RAID levels 0/1/1E/10/5/50/6/60, RAID cache and data protection enabled by the super-capacitor in case of power failures. Supported RAID levels vary by RAID cards.
Reliability	• The BMC monitors system parameters in real time and sends alerts in advance, enabling technicians to take appropriate measures in

Technical Feature	Description
	time to ensure stable operation and minimize system downtime. • SSDs are much more reliable than traditional HDDs, increasing system uptime. • Our intelligent fan control technology combined with the cutting-edge air-cooling technology creates an optimum working environment to ensure stable running of the server. Moreover, the cold-plate liquid cooling solution is introduced into the server.
Availability	• The LEDs on the front and rear panels, the LCD module, and the BMC Web GUI indicate the status of key components and quickly lead technicians to failed (or failing) components, simplifying maintenance and speeding up troubleshooting. • Provides 2 hot-swap PSUs with 1+1 redundancy. • Provides 9 hot-swap fan modules with N+1 redundancy, improving overall system availability.
Maintenance Efficiency	• The BMC management network port on the rear panel enables remote BMC O&M, improving O&M efficiency. • 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.

2.3 Manageability and Security

Table 2-3 Manageability and Security

Technical Feature	Description
Remote Management	The BMC monitors the system operating status and enables remote management.
Network Controller Sideband Interface (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 BMC. 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 enablement/disablement and configuration of Virtual Local Area Network (VLAN). VLAN is disabled by default. • Supports IPv6 and IPv4 addresses. IP address, subnet mask, default gateway, and prefix length of IPv6 address can be configured.
Unified Extensible Firmware Interface (UEFI)	The industry-standard UEFI improves the efficiency of setup, configuration and update, and simplifies the error handling process.
TPM & TCM	Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) provide advanced encryption and data security to enable secure boot of the server.
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	Protects the system from malicious bootloaders.
Hierarchical Password Protection in BIOS	Ensures system boot and management security.
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	Recovers firmware upon detection of corrupted firmware.
BMC Secure Boot	Protects BMC from malicious tampering.
BMC Access Control Policies	Flexible BMC access control policies improve BMC management security.

Technical Feature	Description
Hardware Design	• The motherboard and backplanes are designed with the overcurrent and overvoltage protection features. • The onboard connectors and cables are designed to be fool-proof, thus preventing potential circuit hazards.
Hardware Ports	• All physical I/O ports are clearly defined with no undefined ports reserved. • An access control mechanism is built for the ports used for maintenance to prevent malicious operations by unauthorized personnel.
Structural Security	The top cover features a lock to prevent unauthorized operations.
Firmware Security	Images are all signed with secure encryption algorithms before release, and the signature must be verified before firmware update, ensuring the integrity and legitimacy of the firmware.
Intelligent Management Software InManage	Allows centralized management of the server and full lifecycle management covering unified part-level asset management, intelligent monitoring and alerting, automatic inspection, fault diagnosis and reporting, energy consumption management, and firmware update/configuration.
InManage Boot	Enables rapid server initialization and supports batch RAID configuration and OS deployment.
Intelligent Management System BMC	Provides various security features such as identification and authentication, authorization and access control, Web GUI security configuration, and log audit, offering industry-leading security reinforcement capabilities.

2.4 Energy Efficiency

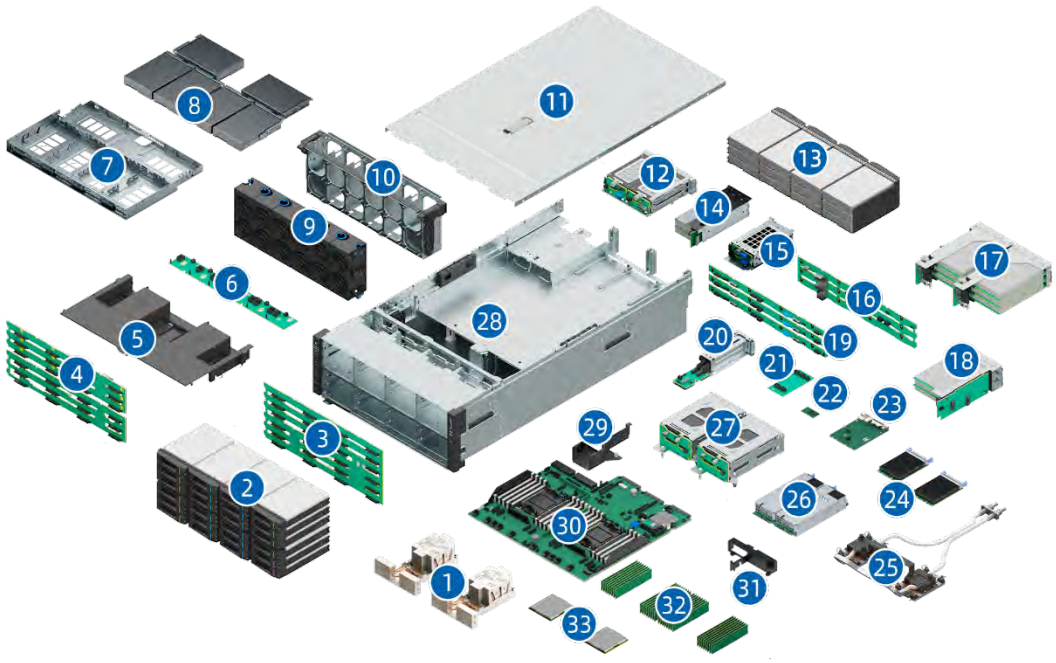
Table 2-4 Energy Efficiency

Technical Feature	Description
Power Supply	Equipped with power supplies of different power efficiency levels, with power efficiency of some PSUs up to 96% at a load of 50%.
1+1 Redundant PSUs	Supports AC/DC power input with improved power conversion efficiency.

Technical Feature	Description
VRD Power Supply	Features the high-efficiency single-board voltage regulator-down (VRD) solution, reducing DC-DC conversion loss.
Intelligent Fan Speed 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 and air cooling and cold-plate liquid cooling solutions, lowering energy consumption from system cooling.
Power Capping and Power Control	Provides power capping and power control measures.
Multiple Energy-Saving Technologies	Supports multiple energy-saving technologies, such as energy-saving technologies of drives (staggered spin-up of drives and independent power control of drives), and intelligent power capability. Meanwhile, our power consumption management suite allows users to precisely monitor and control system power consumption in real time, so as to conserve energy.
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.
Low Energy Consumption	Supports low-voltage Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids), consuming less energy and meeting the demands of data centers and telecommunications environments constrained by power and thermal limits.

3 System Parts Breakdown

Figure 3-1 Exploded View

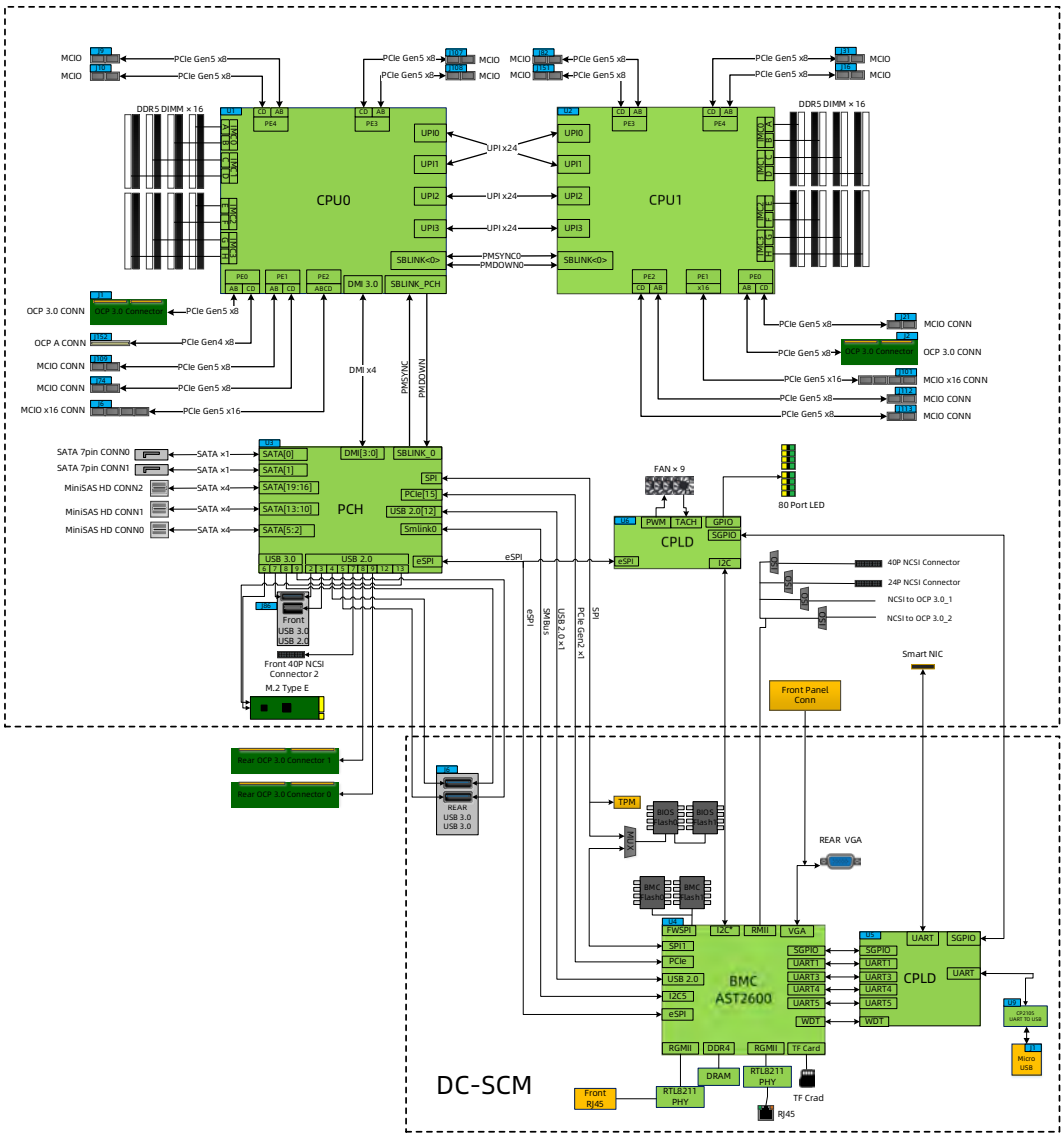


Item	Feature	Item	Feature
1	Heatsink × 2	18	PCIe Riser Module (with 2 FH PCIe Expansion Cards)
2	Front 3.5-Inch Drive × 24	19	Rear 4-Drive Backplane × 3
3	Front 24-Drive Backplane	20	E1.S/M.2 SSD Module (with 2 E1.S/M.2 SSDs)
4	Front 12-Drive Backplane × 2	21	Power Board
5	System Air Duct	22	TPM/TCM
6	Fan Backplane	23	DC-SCM Board
7	Middle Drive Holder	24	OCP 3.0 Card × 2
8	Middle 3.5-Inch Drive × 6	25	Cold Plate Module
9	Fan Module × 6 (with 9 Fans and 3 Dummies)	26	PSU × 2
10	Fan Cage	27	Rear 3.5-Inch Drive Module (with Two 3.5-Inch Drives) × 2
11	Top Cover	28	Chassis
12	Rear 2.5-Inch Drive Module (with Four 2.5-Inch Drives)	29	M.2 SSD Air Duct
13	Rear 3.5-Inch Drive × 12	30	Motherboard

Item	Feature	Item	Feature
14	PCIe Riser Module (with 2 HH PCIe Expansion Cards)	31	PSU Air Duct
15	Rear 2.5-Inch Drive Module (with Two 2.5-Inch Drives)	32	DIMM × 32
16	Rear 12-Drive Backplane	33	CPU × 2
17	PCIe Riser Module (with 3 FH PCIe Expansion Cards) × 2	-	-

4 System Logical Diagram

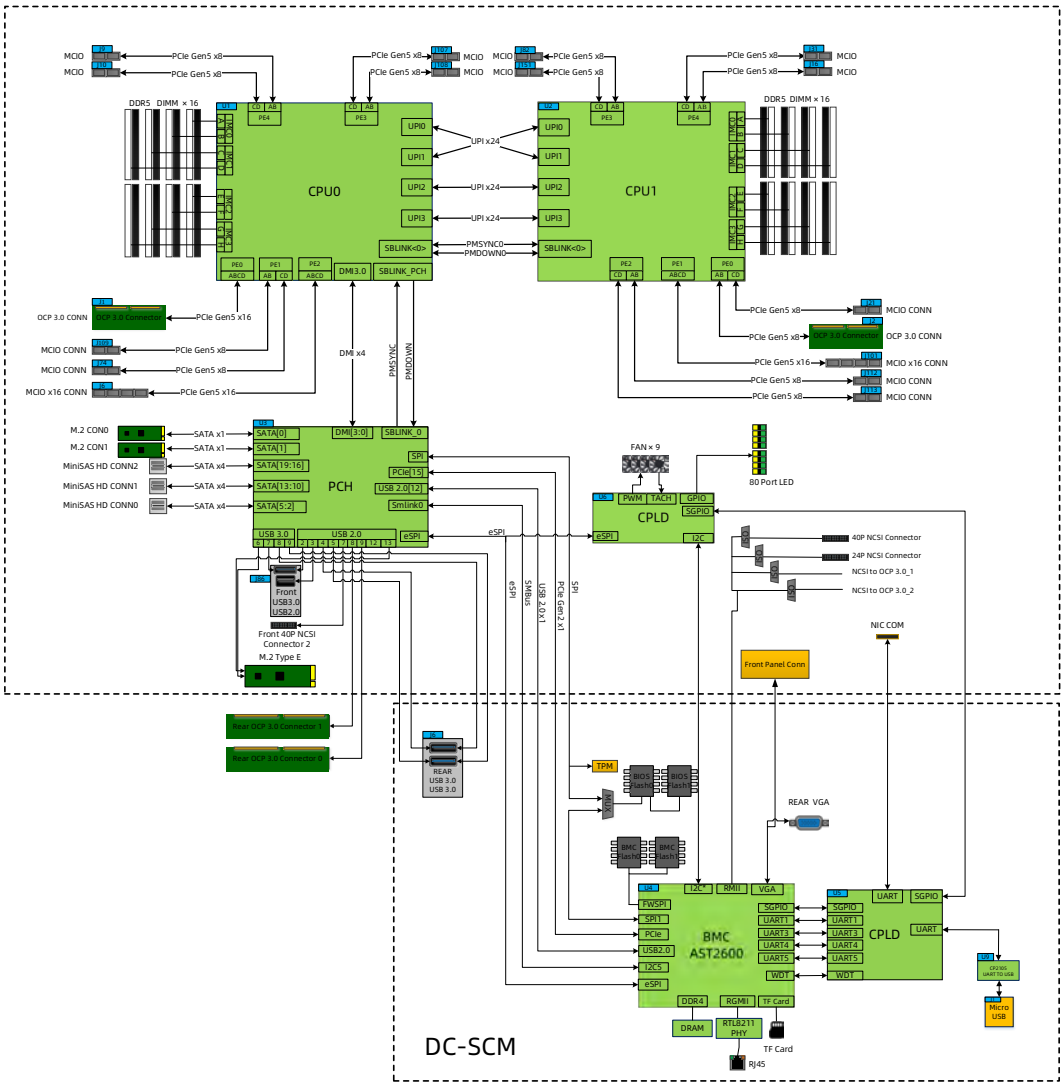
Figure 4-1 System Logical Diagram of Motherboard 1 (Air-Cooling Configuration)



- One or two 4th/5th Gen Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids).
- Up to 32 DIMMs.
- 4 UPI links per CPU at up to 20 GT/s.
- Up to 13 PCIe 5.0 slots, namely, 10 standard PCIe slots, 1 dedicated slot for a RAID mezz card, and 2 dedicated slots for OCP 3.0 cards. CPU0 and CPU1 each supports 1 OCP 3.0 card.

- The RAID mezz card is connected to CPU0 via the PCIe bus, and is connected to the drive backplanes via the SAS signal cables. Multiple local storage configurations are supported through different drive backplanes.
- The motherboard integrates the Emmitsburg (EBG) Platform Controller Hub (PCH) to support 3 USB 3.0 ports, 14 SATA drives, and 1 TF card adapter.
- The DC-SCM board integrates an AST2600 management chip and supports 1 VGA port, 1 BMC management network port, 1 system/BMC serial port, 1 TF card slot, and other connectors.

Figure 4-2 System Logical Diagram of Motherboard 2 (Liquid-Cooling Configuration)



- One or two 4th/5th Gen Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids).

- Up to 32 DIMMs.
- 4 UPI links per CPU at up to 20 GT/s.
- Up to 9 PCIe 5.0 slots, namely, 7 standard PCIe slots and 2 dedicated slots for OCP 3.0 cards. CPU0 and CPU1 each supports 1 OCP 3.0 card.
- The motherboard integrates the Emmitsburg (EBG) Platform Controller Hub (PCH) to support 3 USB 3.0 ports, 14 SATA drives, and 1 TF card adapter.
- The DC-SCM board integrates an AST2600 management chip and supports 1 VGA port, 1 BMC management network port, 1 system/BMC serial port, 1 TF card slot, and other connectors.

5 Hardware Description

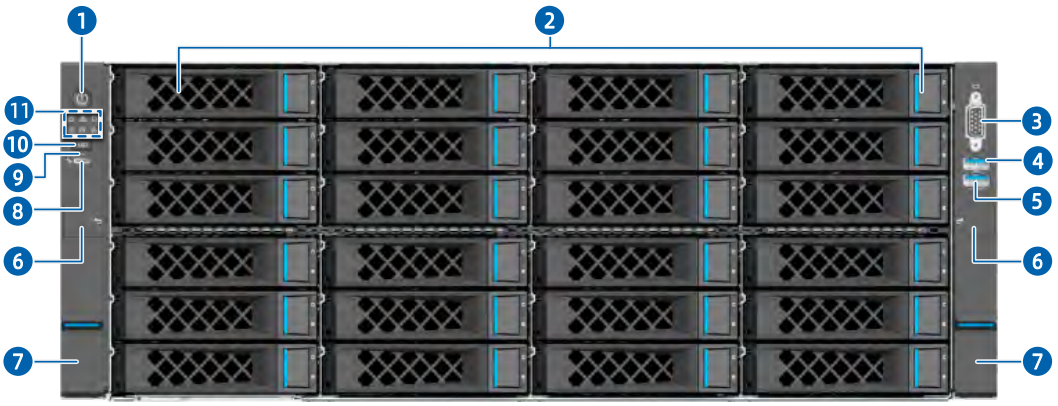
5.1 Front Panel

5.1.1 24 × 3.5-Inch Drive Configuration

NOTE

- Applicable model: KR4266-X2-A0-R0-00 and KR4266-X2-C0-R0-00.
- A 3.5-inch drive tray can accommodate a 2.5/3.5-inch drive.

Figure 5-1 Front View



Item	Feature	Item	Feature
1	Power Button and LED	7	Ear Latch × 2
2	3.5-Inch Drive Bay × 24	8	USB Type-C Port
3	VGA Port	9	USB Type-C Status LED
4	USB 3.0 Port	10	UID/BMC RST Button and LED
5	USB 2.0/LCD Port	11	LEDs
6	Shipping Screw Cover × 2	-	-

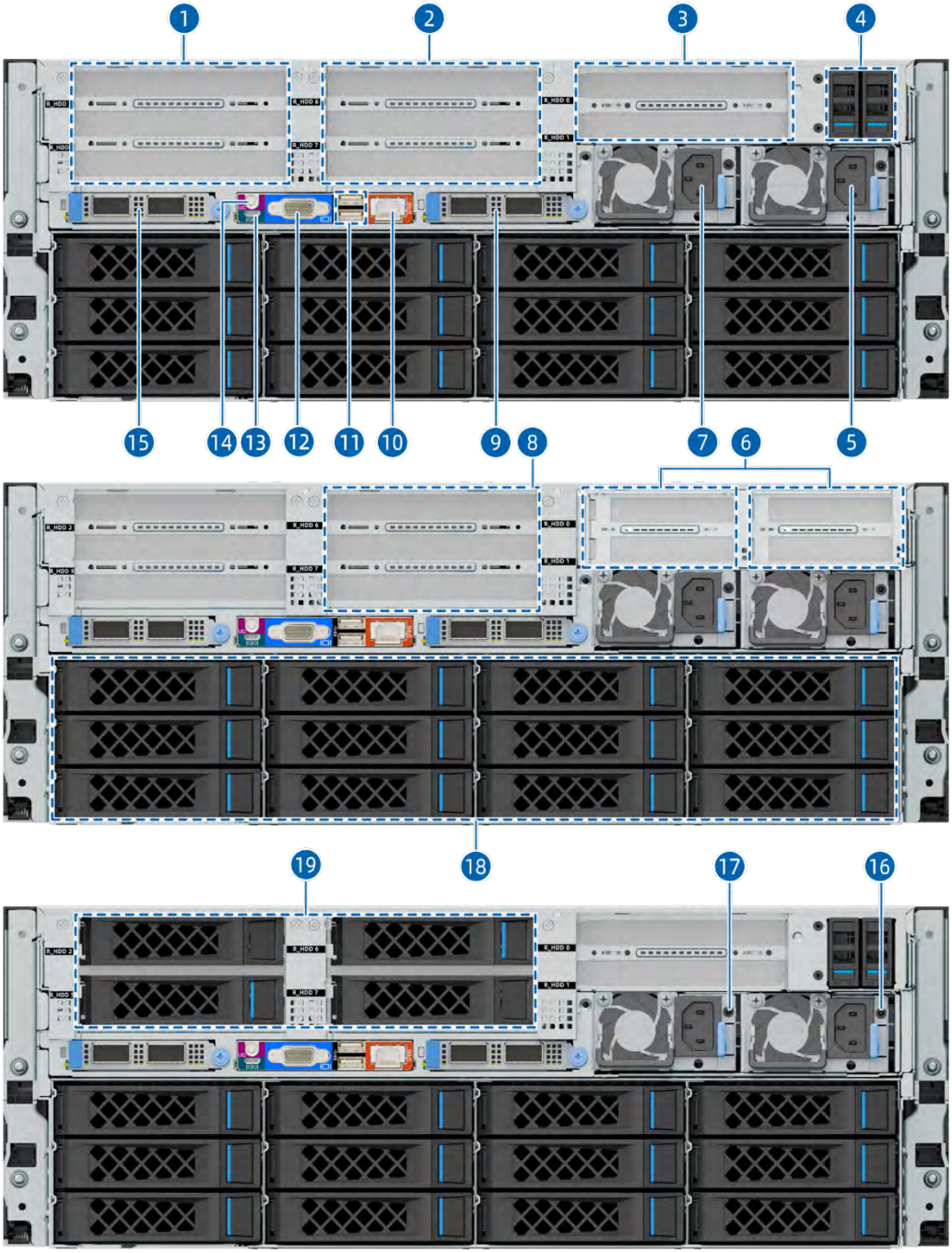
5.2 Rear Panel

5.2.1 KR4266-X2-A0-R0-00

NOTE

A 3.5-inch drive tray can accommodate a 2.5/3.5-inch drive.

Figure 5-2 Rear View



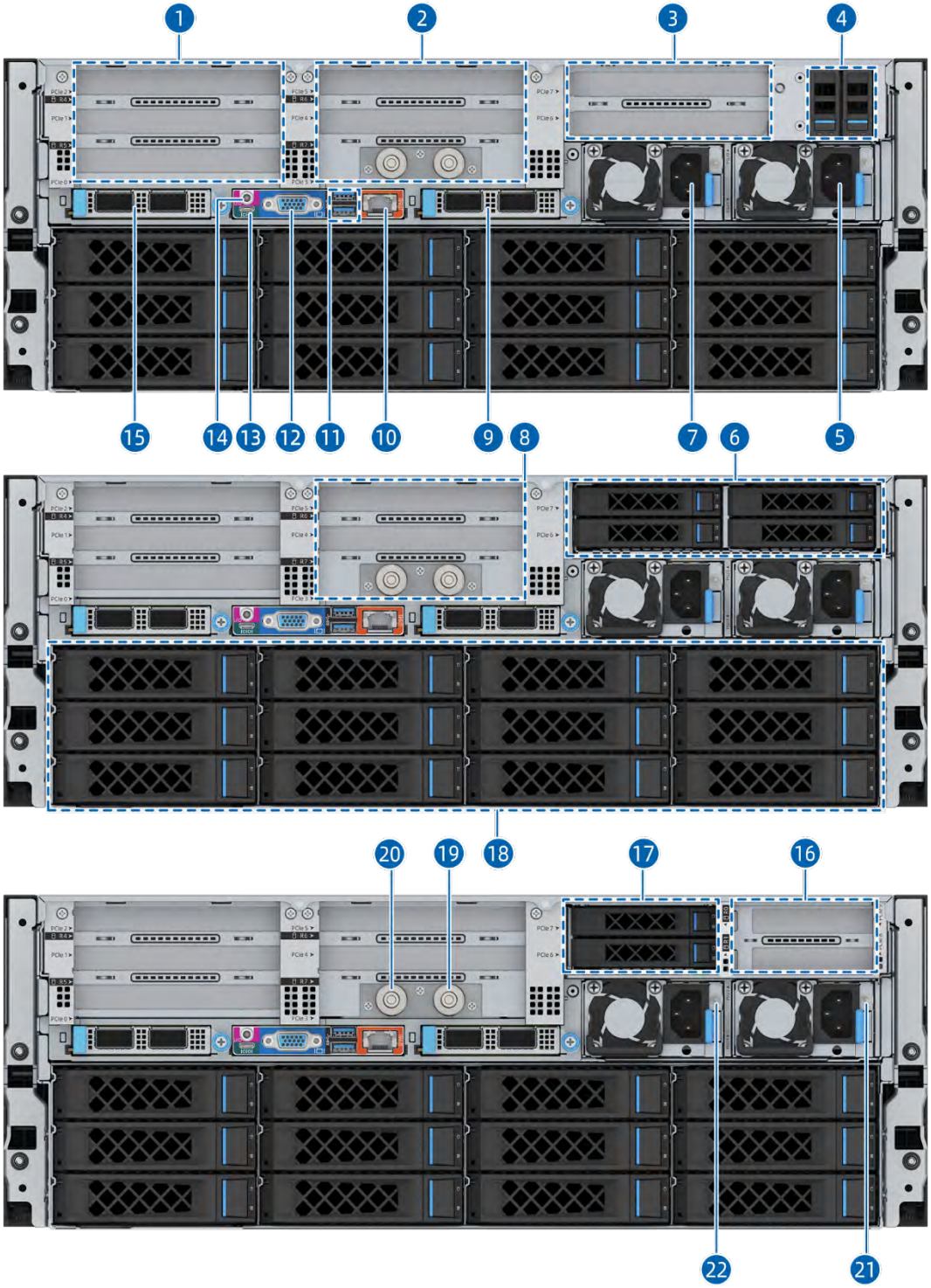
Item	Feature	Item	Feature
1	PCIe Riser Module 1	11	USB 3.0 Port × 2
2	PCIe Riser Module 2	12	VGA Port
3	PCIe Riser Module 5	13	System/BMC Serial Port
4	M.2/E1.S SSD Bays (with 2 M.2/E1.S SSDs)	14	UID/BMC RST Button and LED
5	PSU1	15	OCP 3.0 Card (CPU0)
6	PCIe Riser Module 3 × 2	16	PSU1 LED
7	PSU0	17	PSU0 LED
8	PCIe Riser Module 4	18	3.5-Inch Drive Bay × 12
9	OCP 3.0 Card (CPU1)	19	3.5-Inch Drive Bay × 4
10	BMC Management Network Port	-	-

5.2.2 KR4266-X2-C0-R0-00

NOTE

A 3.5-inch drive tray can accommodate a 3.5-/2.5-inch drive.

Figure 5-3 Rear View



Item	Feature	Item	Feature
1	PCIe Riser Module 1	12	VGA Port
2	PCIe Riser Module 2	13	System/BMC Serial Port
3	PCIe Riser Module 5	14	UID/BMC RST Button and LED

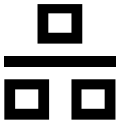
Item	Feature	Item	Feature
4	M.2/E1.S SSD Bays (with 2 M.2/E1.S SSDs)	15	OCP 3.0 Card (CPU0)
5	PSU1	16	PCIe Riser Module 3
6	2.5-Inch Drive Bay × 4	17	2.5-Inch Drive Bay × 2
7	PSU0	18	3.5-Inch Drive Bay × 12
8	PCIe Riser Module 4	19	Quick Disconnect (liquid outlet)
9	OCP 3.0 Card (CPU1)	20	Quick Disconnect (liquid inlet)
10	BMC Management Network Port	21	PSU1 LED
11	USB 3.0 Port × 2	22	PSU0 LED

5.3 LEDs and Buttons

Table 5-1 LED and Button Description

Icon	Feature	Description
	Power Button and LED	• Power LED: - Off = No power - Solid green = Power-on state - Solid orange = Standby state • Power button: - Press and release the button to power on the system from the standby state - Press and hold the button for 6 seconds to force a shutdown from the power-on state
	UID/BMC RST Button and LED	• UID/BMC RST LED: - Solid blue = The UID LED is activated by the UID button or via the BMC. - Gradually turning blue within 2 seconds and then gradually turning off within 2 seconds = PFR authentication in progress is booting normally. (Note: The server can be powered on only after this LED turns off.)

Icon	Feature	Description
		- Blinking blue (4 Hz) = PFR authentication fails and the firmware images cannot be recovered - Solid blue = The UID LED is activated by the UID button or via the BMC • UID/BMC RST Button: - Press and release the button to activate the UID LED. - Press and hold the button for 6 seconds to force a BMC reset.
	System Status LED	• Off = Normal • Blinking red (1 Hz) = A warning error is detected on CPU, memory, power supply, drive, fan, etc. • Solid red = A critical error is detected on CPU, memory, power supply, drive, fan, etc.
	Memory Status LED	• Off = Normal • Blinking red (1 Hz) = A warning error occurs • Solid red = A critical error occurs
	Fan Status LED	• Off = Normal • Blinking red (1 Hz) = A warning error occurs • Solid red = A critical error occurs, including fan failure and fan absence
	Power Status LED	• Off = Normal • Blinking red (1 Hz) = A warning error occurs • Solid red = A critical error occurs
	System Overheat LED	• Off = Normal • Blinking red (1 Hz) = A warning error occurs, including Proc Hot, resulting in CPU throttling • Solid red = A critical error occurs, including CPU Thermal Trip/PCH Hot/MEM Hot

Icon	Feature	Description
	Network Status LED	• Off = No network connection • Blinking green = Network connected with data being transmitted • Solid green = Network connected without data being transmitted Note: It only indicates the status of the self-developed OCP card.
	USB Type-C Status LED	Connected to a terminal: • Off = Not connected to a terminal • Blinking green (2 Hz) for 3 seconds and then off = Port function is disabled • Solid green = Connected to a terminal Connected to a USB storage device: • Off = Not connected to a USB storage device • Blinking red (1 Hz) = Job fails or is completed with an error reported • Blinking green (2 Hz) = Job in progress • Blinking green (2 Hz) 5 times and then off = Port function is disabled • Solid green = Job is completed successfully
-	PSU LED	• Off = No AC/DC input to the PSU • Solid green = Normal • Solid amber = PSU critical event causing a shutdown (possible causes: PSU overtemperature protection, PSU overcurrent protection, overvoltage protection, and short circuit protection) • Blinking amber (1 Hz) = PSU warning event where the PSU continues to operate (possible causes: PSU overtemperature alarm, PSU output overcurrent alarm, excessively low fan speed alarm)

Icon	Feature	Description
		• Blinking green (1 Hz) = PSU operating in standby mode with normal input • Blinking green (on for 2 seconds and off for 1 second) = PSU in cold redundant state • Blinking green (2 Hz) = PSU firmware updating

NOTE

- Warning error: Errors that result in redundancy degradation or loss, and other errors that have a minor impact on the system running and that require attention.
- Critical error: Errors that result in system crash/restart or part failure, and other errors that have a major impact on the system running and that require immediate action.

5.4 Port Description

Table 5-2 Port Description

Item	Port	Description
1	USB Type-C port	Enables you to connect a USB storage device to the system for automatic log copying to the USB device and automatic configuration importing to the BMC. Note: BMC provides a USB management interface, for searching and configuring functions of the BMC management network port. It provides the function to enable/disable the USB management (enabled by default), displaying the USB device access status of being connected or disconnected. Also, BMC records operations on the USB device in the audit log after the device is connected to the system.
2	VGA Port	Enables you to connect a display terminal, for example, a monitor or KVM, to the system.
3	USB 3.0 Port	Enables you to connect a USB device to the system. Note: Make sure that the USB device is in good condition or it may cause the server to work abnormally.

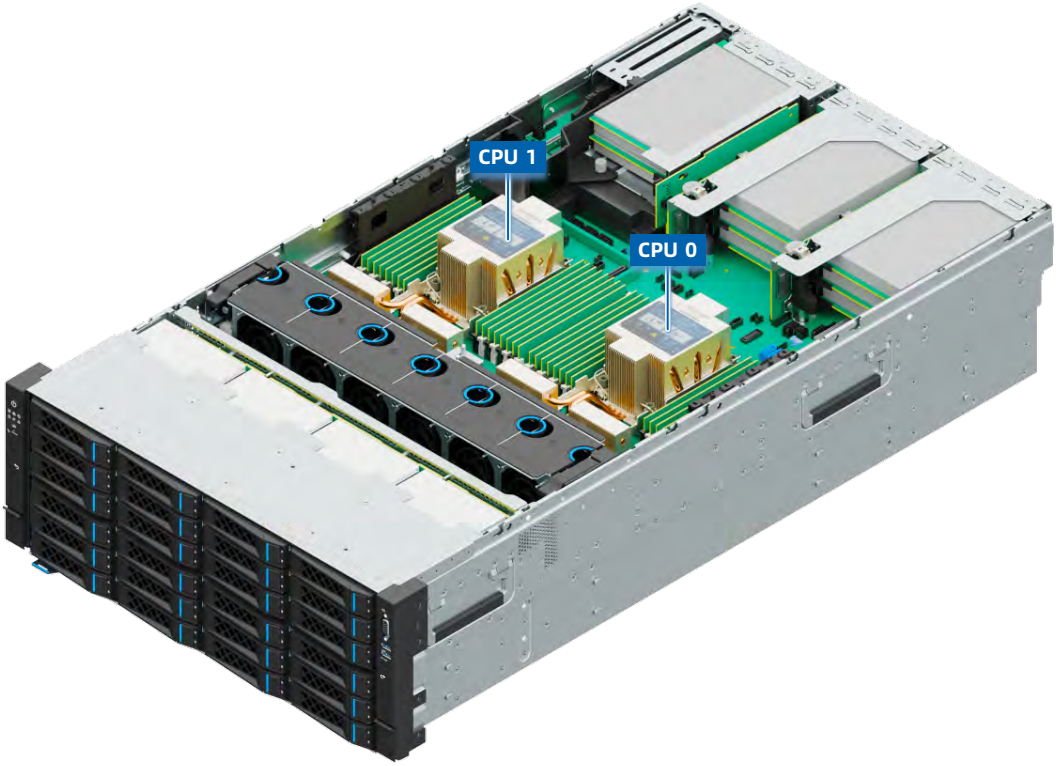
Item	Port	Description
4	USB 2.0 Port/LCD Port	• USB 2.0 port: Enables you to connect a USB 2.0 device to the system. Note: Make sure that the USB device is in good condition or it may cause the server to work abnormally. • LCD port: Enables you to connect our exclusive LCD module to the system.
5	System/BMC Serial Port	• Enables you to capture system logs. • Enables you to capture BMC logs and debug the BMC. Note: It is a micro USB serial port with a default baud rate of 115,200 bit/s.
6	BMC Management Network Port	Enables you to manage the server via the BMC management network port. Note: It is a Gigabit Ethernet port that supports 100 Mbps and 1,000 Mbps auto-negotiation.
7	PSU Socket	Connected through a power cord. Users can select the PSUs as needed. Note: Make sure that the rated power of every PSU is greater than that of the server.

5.5 Processors

- One or two Intel Xeon Scalable processors.
- If only 1 processor is configured, install it in the CPU0 socket.
- The processors used in a server must bear the same model.

For specific system processor options, consult your local sales representative or refer to 7.2 Hardware Compatibility.

Figure 5-4 Processor Locations



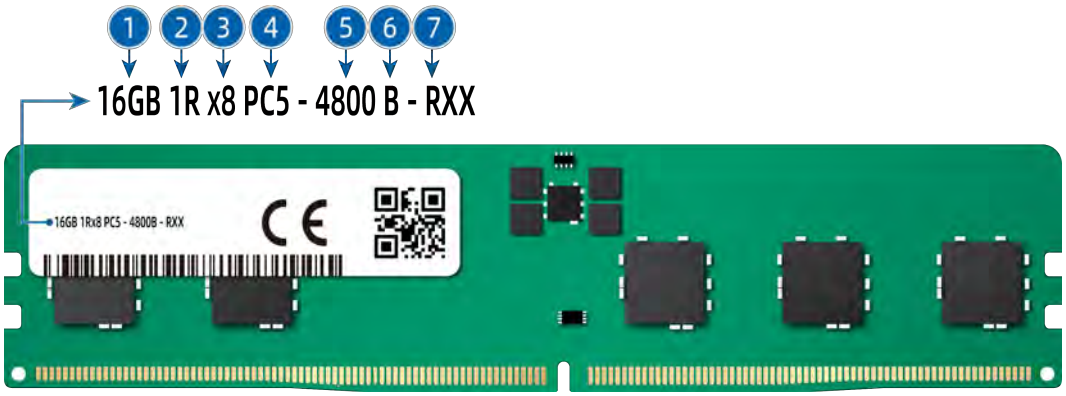
5.6 Memory

5.6.1 DDR5 DIMMs

1. Identification

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

Figure 5-5 DIMM Identification



Item	Description	Example
1	Capacity	• 16 GB • 32 GB • 64 GB • 128 GB
2	Rank(s)	• 1R = Single rank • 2R = Dual rank • 2S2R = Two ranks of two high stacked 3DS DRAM • 2S4R = Four ranks of two high stacked 3DS DRAM • 4R = Quad rank
3	Data width of DRAM	• x4 = 4 bits • x8 = 8 bits
4	DIMM slot type	PC5 = DDR5
5	Maximum memory speed	• 4,800 MT/s • 5,600 MT/s
6	CAS latency	• SDP 4800B = 40-39-39 • 3DS 4800B = 46-39-39 • SDP 5600B = 46-45-45 • 3DS 5600B = 52-45-45
7	DIMM type	R = RDIMM

2. Memory Subsystem Architecture

The server supports 32 DIMM slots and 8 memory channels per CPU.

Table 5-3 DIMM Slot List

CPU	Channel ID	Silk Screen
CPU0	Channel 0	CPU0_C0D0
		CPU0_C0D1

CPU	Channel ID	Silk Screen
	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
	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 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 DIMMs of different 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 Compatiblity.

- DDR5 DIMMs can be used with the Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids). The maximum memory capacity supported is identical for different CPU models.
- The total memory capacity supported is the sum of the capacities of all DDR5 DIMMs.

Table 5-4 DDR5 DIMM (4,800 MT/s) 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[a]		32	32	32	32
Maximum capacity of DDR5 DIMMs supported in a server (GB)[b]		512	1,024	2,048	4,096
Actual speed (MT/s)	1DPC[c]	4,800	4,800	4,800	4,800
	2DPC	4,400	4,400	4,400	4,400
a: The maximum number of DDR5 DIMMs supported is based on the dual-CPU configuration. The number is halved for the single-CPU configuration (The server, if installed with forty-six 3.5-inch drives, supports up to 22 DIMMs. See 5.6.1.5 DIMM Slot Layout for the DIMM population rules.). b: It indicates the maximum memory capacity supported when all the DIMM slots are populated with DDR5 DIMMs. c: DIMM Per Channel (DPC) is the number of DIMMs per memory channel. The information above is for reference only. Consult your local sales representative for details.					

Table 5-5 DDR5 DIMM (5,600 MT/s) Specifications

Item	Value			
Capacity per DDR5 DIMM (GB)	16	32	64	128
Type	RDIMM	RDIMM	RDIMM	RDIMM

Item		Value			
Rated speed (MT/s)		5,600	5,600	5,600	5,600
Operating voltage (V)		1.1	1.1	1.1	1.1
Maximum number of DDR5 DIMMs supported in a server[a]		32	32	32	32
Maximum capacity of DDR5 DIMMs supported in a server (GB)[b]		512	1,024	2,048	4,096
Actual speed (MT/s)	1DPC[c]	5,600	5,600	5,600	5,600
	2DPC	4,400	4,400	4,400	4,400
a: The maximum number of DDR5 DIMMs supported is based on the dual-CPU configuration. The number is halved for the single-CPU configuration (The server, if installed with forty-six 3.5-inch drives, supports up to 22 DIMMs. See 5.6.1.5 DIMM Slot Layout for the DIMM population rules.). b: It indicates the maximum memory capacity supported when all the DIMM slots are populated with DDR5 DIMMs. c: DIMM Per Channel (DPC) is the number of DIMMs per memory channel. With SPR CPUs configured, the actual speed of DDR5 DIMMs is 4800 MT/s@1DPC. The information above is for reference only. Consult your local sales representative for details.					

4. DIMM Population Rules

General population rules for DDR5 DIMMs:

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

Population rules for DDR5 DIMMs in specific modes:

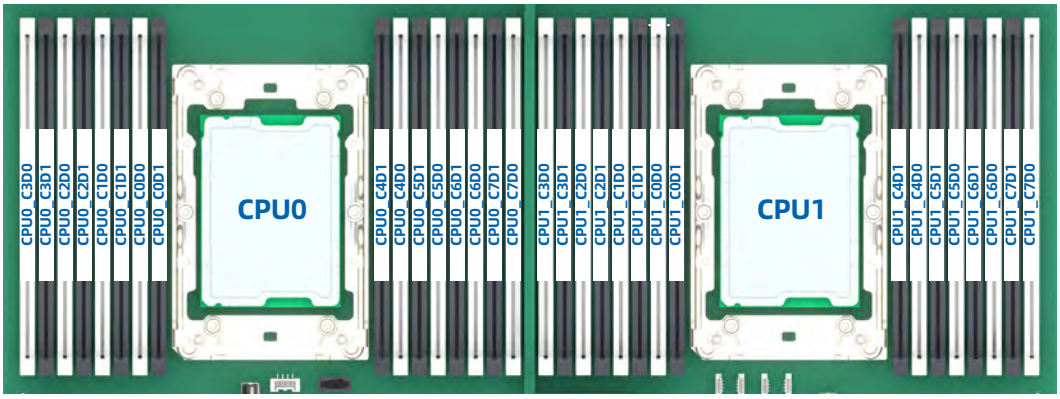
- Memory sparing mode
  - Follow the general population rules.
  - Each channel must have a valid online spare configuration.
  - Each channel can have a different online spare configuration.
  - Each channel with a DIMM installed must have a spare rank.
- Memory mirroring mode
  - Follow the general population rules.
  - Each processor supports 4 integrated memory controllers (iMCs). Each iMC has 2 channels to be populated with DIMMs.
  - In a multi-CPU configuration, each CPU must have a valid memory

mirroring configuration.

5. DIMM Slot Layout

Up to 32 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.

Figure 5-6 DIMM Slot Layout



Detailed DIMM population rules are as follows:

- DIMM Population Rules (Under 1 × EMR/SPR CPU and Non-46 × 3.5-Inch Drive Configuration)

NOTE
When a SPR CPU and DIMMs with 24 Gb DRAM chips are configured, see Table 5-10 DDR5 DIMM Population Rules.

Table 5-6 DDR5 DIMM Population Rules

DDR5 QTY	CPU0															
	C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	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
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

- DDR5 DIMM Population Rules (Under 2 × EMR/SPR CPU and Non-46 × 3.5-Inch Drive Configuration)

NOTE

When 2 SPR CPUs and DIMMs with 24 Gb DRAM chips are configured, see Table 5-11 DDR5 DIMM Population Rules.

Table 5-7 DDR5 DIMM Population Rules

DDR5 QTY	CPU0																CPU1													
	C3		C2		C1		C0		C4		C5		C6		C7		C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	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
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
32	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

- DIMM Population Rules (Under 1 × HBM CPU and Non-46 × 3.5-Inch Drive Configuration)

Table 5-8 DDR5 DIMM Population Rules

DDR5 QTY	CPU0															
	C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0
0																
1							V									
2							V							V		
4			V				V			V				V		
8	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

- DDR5 DIMM Population Rules (Under 2 × HBM CPU and Non-46 × 3.5-Inch Drive Configuration)

Table 5-9 DDR5 DIMM Population Rules

DDR5 QTY	CPU0																CPU1													
	C3		C2		C1		C0		C4		C5		C6		C7		C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0
0																														
2							V																V							
4							V							V									V							V		
8			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
32	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

- 24 Gb DRAM chip-based DIMM Population Rules (Under 1 × SPR CPU and Non-46 × 3.5-Inch Drive Configuration)

Table 5-10 DDR5 DIMM Population Rules

DDR5 QTY	CPU0															
	C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0
8	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

- 24 Gb DRAM chip-based DIMM Population Rules (Under 2 × SPR CPU and Non-46 × 3.5-Inch Drive Configuration)

Table 5-11 DDR5 DIMM Population Rules

DDR5 QTY	CPU0																CPU1													
	C3		C2		C1		C0		C4		C5		C6		C7		C3		C2		C1		C0		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0
16	V		V		V		V			V		V		V		V	V		V		V		V			V		V		V
32	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

NOTE

Only 24/48/96 GB DIMMs support 24 Gb DRAM chips, and these are the exclusive chips supported by 24/48/96 GB DIMMs.

- DIMM Population Rules (Under 2 × CPU and 46 × 3.5-Inch Drive Configuration)

Table 5-12 DDR5 DIMM Population Rules

DDR5 Qty	CPU0																CPU1													
	C0		C1		C2		C3		C4		C5		C6		C7		C0		C1		C2		C3		C4		C5		C6		C7	
	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1
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			
18	v	v	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			
22	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v				v		v		v		v		v			

NOTE

- When HBM CPUs are configured in the server, the quantity of DDR5 DIMMs can not be 12/18/20/22.
- When DIMMs with 24 Gb DRAM chips are configured in the server, the quantity of DDR5 DIMMs can only be 16.

5.7 Storage

5.7.1 Drive Configurations

NOTE

For the physical drive No. of each configuration, refer to 5.7.2 Drive Numbering.

1. KR4266-X2-A0-R0-00

Table 5-13 Drive Configurations

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
24 × 3.5-Inch Drive Configuration	24 × 3.5-inch drive: Drive bays with physical drive No. 0 to 23 support SAS/SATA drives only	12 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch SAS/SATA drive	N/A	SAS/SATA drive: RAID mezz card or PCIe RAID card
		16 × 3.5-inch SAS/SATA drive + 2 × 2.5-inch SAS/SATA drive	6 × 3.5-inch SAS/SATA drive	SAS/SATA drive: RAID mezz card or PCIe RAID card
		16 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch NVMe drive	N/A	• SAS/SATA drive: RAID mezz card • NVMe drive: CPU
		16 × 3.5-inch SAS/SATA drive + 2 × M.2 SSD	N/A	SAS/SATA drive: RAID mezz card
		14 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch NVMe drive	N/A	• SAS/SATA drive: PCIe RAID card

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
				• NVMe drive: CPU
		14 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch SAS/SATA drive	N/A	SAS/SATA drive: RAID mezz card or PCIe RAID card
		16 × 3.5-inch SAS/SATA drive + 2 × 2.5-inch SAS/SATA drive	N/A	SAS/SATA drive: RAID mezz card or PCIe RAID card
		12 × 2.5-inch NVMe drive (lower 2U) + 4 × 2.5-inch NVMe drive (upper 2U)	N/A	• SAS/SATA drive: PCIe RAID card • NVMe drive: CPU

2. KR4266-X2-C0-R0-00

Table 5-14 Drive Configurations

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
24 × 3.5-Inch Drive Configuration	24 × 3.5-inch drive: Drive bays with physical drive No. 0 to 23 support SAS/SATA drives only	12 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch SAS/SATA drive	2 × SATA M.2 SSD	SAS/SATA drive: PCIe RAID card
		12 × 3.5-inch SAS/SATA drive + 2 × 2.5-inch	2 × SATA M.2 SSD	SAS/SATA drive: PCIe RAID card

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
		SAS/SATA drive		
		12 × 3.5-inch SAS/SATA drive + 4 × 2.5-inch NVMe drive	2 × SATA M.2 SSD	• SAS/SATA drive: PCIe RAID card • NVMe drive: CPU
		12 × 3.5-inch SAS/SATA drive + 2 × M.2 SSD	2 × SATA M.2 SSD	SAS/SATA drive: PCIe RAID card
		12 × 2.5-inch NVMe drive (lower 2U) + 4 × 2.5-inch NVMe drive (upper 2U)	2 × SATA M.2 SSD	• SAS/SATA drive: PCIe RAID card • NVMe drive: CPU

5.7.2 Drive Numbering

NOTE

- The RAID card and drive backplanes are connected in cascade. In this fashion, the RAID card is connected to the front drive backplane via SAS cables, and the front drive backplane is connected to the rear drive backplane via SAS cables.
- The "drive sequence set on the backplane" mentioned below is a + b + c, where b (with a value of 12 or 24) represents the number of drives that can be connected to a backplane, and a and c (both with a value of 0, 2, or 4) represent the number of drives that can be cascaded. On the RAID management interface, a is displayed before b which is followed by c. Table 5-17 Drive Numbering (1 Front 24-Drive Backplane Is Used) is an example.

NOTE

- Either 1 front 24-drive backplane or 2 front 12-drive backplanes can be used

for KR4266-X2-A0-R0-00.

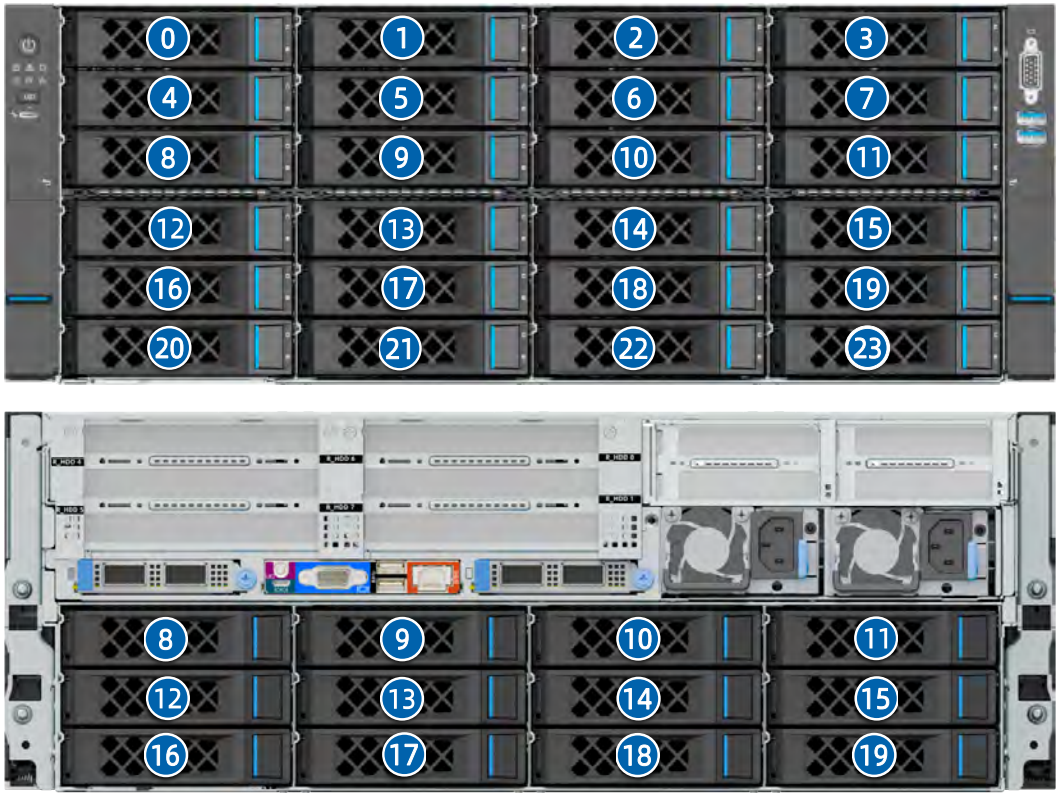
- Only 1 front 24-drive backplane can be used for KR4266-X2-C0-R0-00.

1. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 12 × 3.5-inch drive)

NOTE

Applicable model: KR4266-X2-A0-R0-00.

Figure 5-7 Drive Numbering



- When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 24 + 4; the drive sequence on the rear backplane is set to 12 + 4.):

Table 5-15 Drive Numbering (1 Front 24-Drive Backplane Is Used)

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
36 × 3.5-Inch SAS/SATA Drive Configuration	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	0 to 23
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	24 to 35

- When 2 front 12-drive backplanes are used (The drive sequence on the two front backplanes is set to 12 + 4; the drive sequence on the rear backplane is set to 12 + 4.)

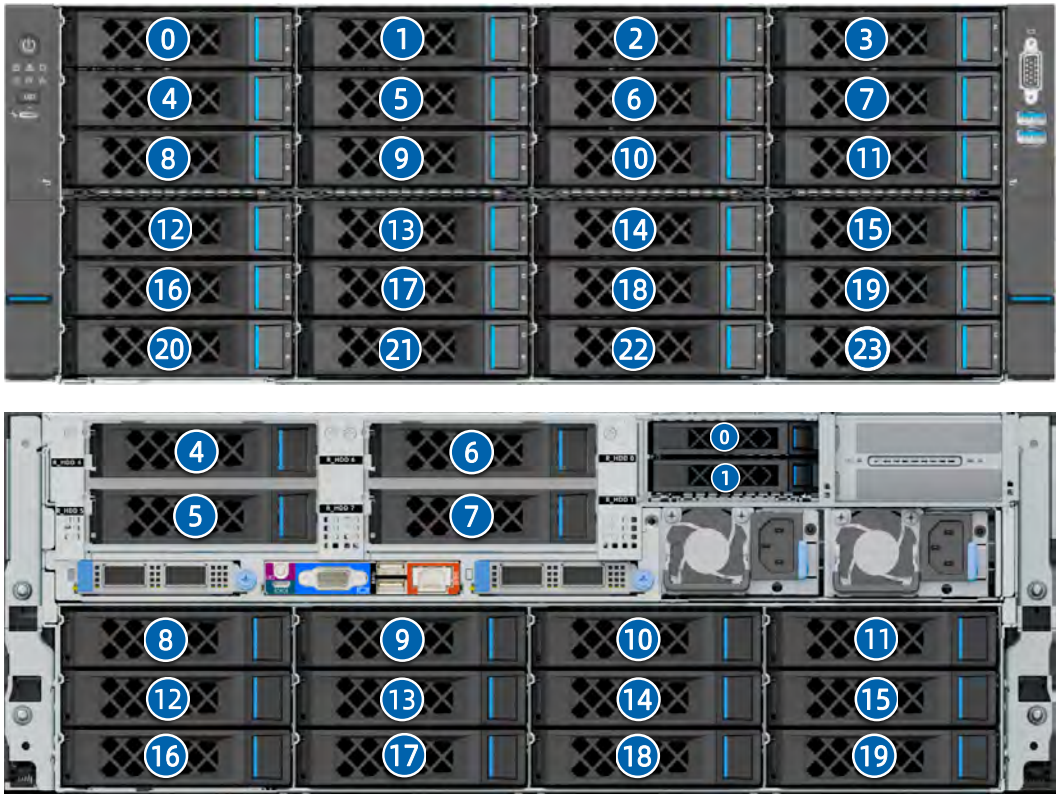
Table 5-16 Drive Numbering (2 Front 12-Drive Backplanes Are Used)

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/Rear	Drive No. Identified by Two 8i RAID Cards
36 × 3.5-Inch SAS/SATA Drive Configuration	12 × front 3.5-inch SAS/SATA drive (upper 2U)	0 to 11	0 to 11	Front	0 to 11
	12 × front 3.5-inch SAS/SATA drive (lower 2U)	12 to 23	12 to 23	Front	0 to 11
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	12 to 23

2. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 16 × 3.5-inch drive + 2 × 2.5-inch drive)

NOTE
Applicable model: KR4266-X2-A0-R0-00.

Figure 5-8 Drive Numbering



- When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 2 + 24 + 2; the drive sequence on the rear backplane in the lower 2U space is set to 4 + 12.):

Table 5-17 Drive Numbering (1 Front 24-Drive Backplane Is Used)

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
40 × 3.5-Inch SAS/SATA Drive + 2 × 2.5-Inch SAS/SATA Drive Configuration	2 × rear 2.5-inch SAS/SATA drive	0 to 1	0 to 1	Rear	0 to 1
	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	2 to 25
	4 × rear 3.5-inch SAS/SATA drive	4 to 7	4 to 7	Rear	26 to 29
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	30 to 41

- When 2 front 12-drive backplanes are used (The drive sequence on the front backplane in the upper 2U space is set to 2 + 12 + 2; the drive sequence on the front backplane in the lower 2U space is set to 12 + 4; the drive sequence on the rear backplane in the lower 2U space is set to 4 + 12.):

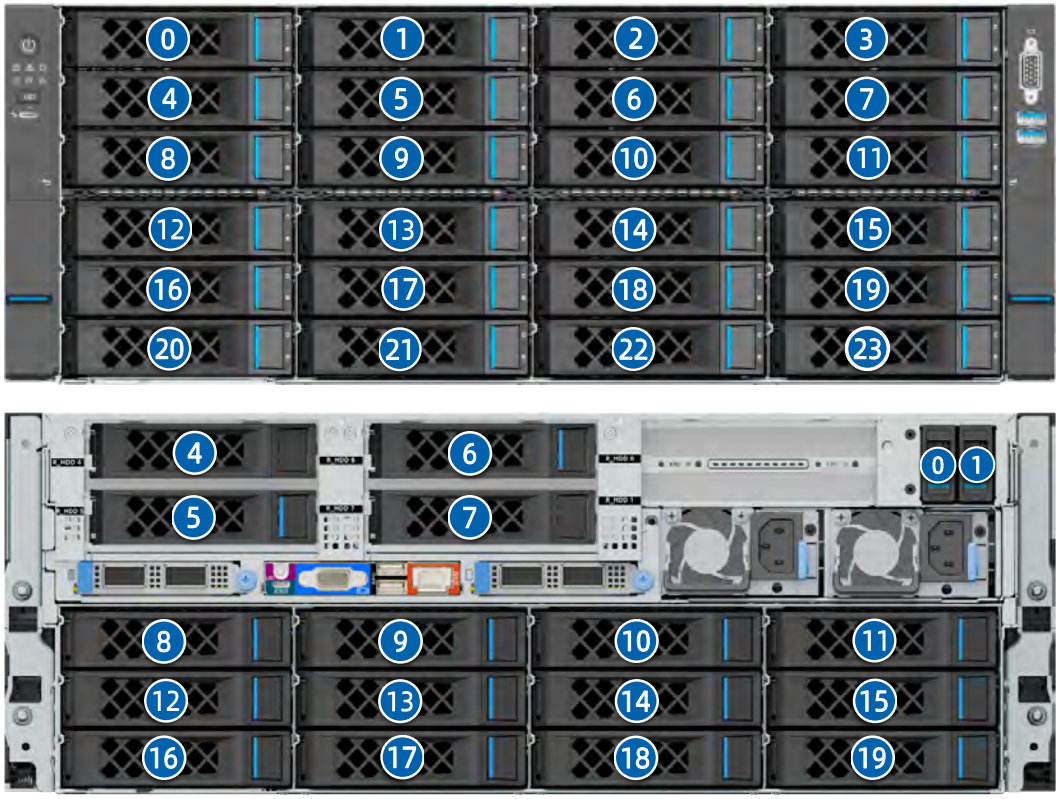
Table 5-18 Drive Numbering (2 Front 12-Drive Backplanes Are Used)

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by Two 8i RAID Cards
40 × 3.5-Inch SAS/SATA Drive + 2 × 2.5-Inch SAS/SATA Drive Configuration	2 × rear 2.5-inch SAS/SATA drive	0 to 1	0 to 1	Rear	0 to 1
	12 × front 3.5-inch SAS/SATA drive (upper 2U)	0 to 11	0 to 11	Front	2 to 13
	12 × front 3.5-inch SAS/SATA drive (lower 2U)	12 to 23	12 to 23	Front	0 to 11
	4 × rear 3.5-inch SAS/SATA drive	4 to 7	4 to 7	Rear	12 to 15
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	16 to 27

3. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 16 × 3.5-inch drive + 2 × M.2 SSD)

NOTE
Applicable model: KR4266-X2-A0-R0-00.

Figure 5-9 Drive Numbering



- When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 2 + 24 + 2; the drive sequence on the rear backplane in the lower 2U space is set to 4 + 12.):

Table 5-19 Drive Numbering (1 Front 24-Drive Backplane Is Used)

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
40 × 3.5-Inch SAS/SATA Drive + 2 × M.2 SSD Configuration	2 × rear M.2 SSD	0 to 1	0 to 1	Rear	0 to 1
	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	2 to 25
	4 × rear 3.5-inch SAS/SATA drive	4 to 7	4 to 7	Rear	26 to 29
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	30 to 41

- When 2 front 12-drive backplanes are used (The drive sequence on the front backplane in the upper 2U space is set to 2 + 12 + 2; the drive sequence on the front backplane in the lower 2U space is set to 12 + 4; the drive sequence on the rear backplane in the lower 2U space is set to 4 + 12.):

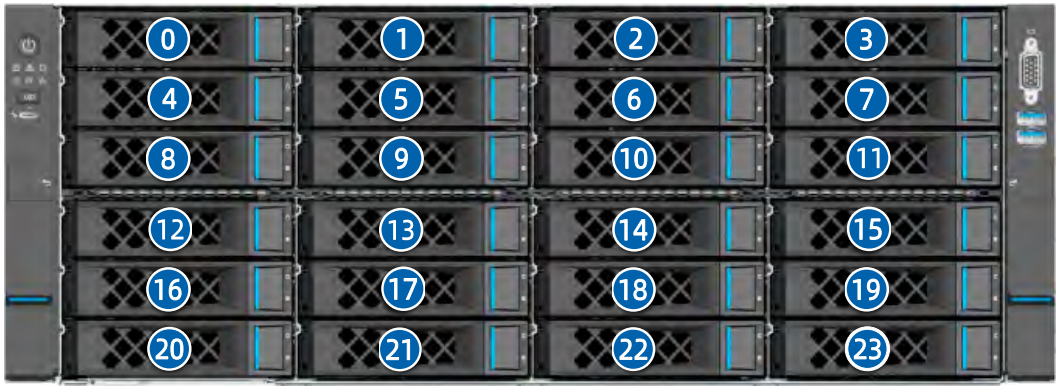
Table 5-20 Drive Numbering (2 Front 12-Drive Backplanes Are Used)

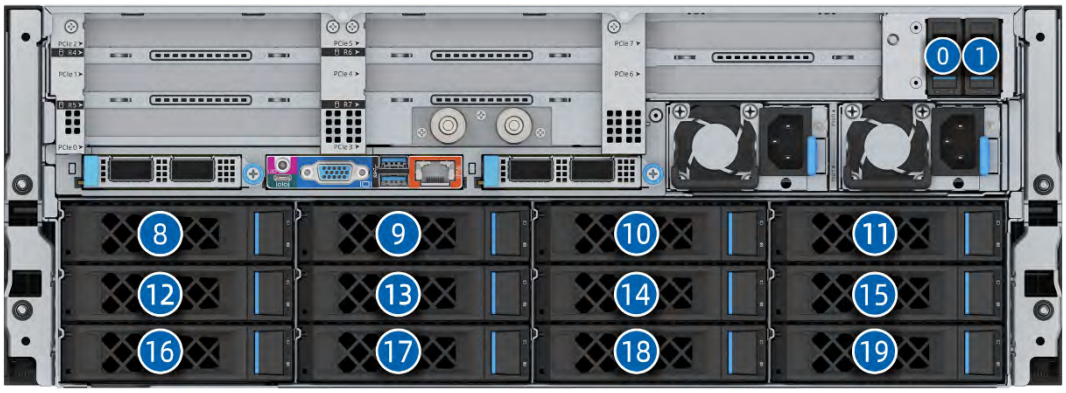
Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by Two 8i RAID Cards
40 × 3.5-Inch SAS/SATA Drive + 2 × M.2 SSD Configuration	2 × rear M.2 SSD	0 to 1	0 to 1	Rear	0 to 1
	12 × front 3.5-inch SAS/SATA drive (upper 2U)	0 to 11	0 to 11	Front	2 to 13
	12 × front 3.5-inch SAS/SATA drive (lower 2U)	12 to 23	12 to 23	Front	0 to 11
	4 × rear 3.5-inch SAS/SATA drive	4 to 7	4 to 7	Rear	12 to 15
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	16 to 27

4. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 12 × 3.5-inch drive + 2 × M.2 SSD)

NOTE
Applicable model: KR4266-X2-C0-R0-00.

Figure 5-10 Drive Numbering





When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 2 + 24 + 2; the drive sequence on the rear backplane in the lower 2U space is set to 12 + 4.):

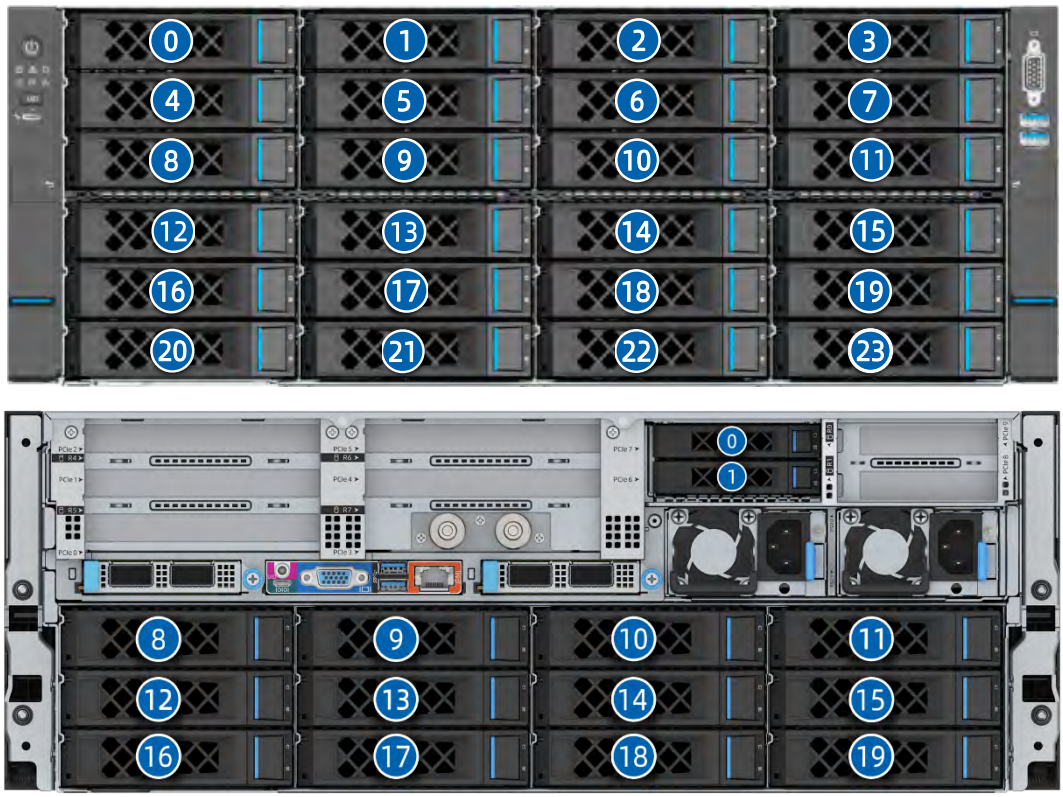
Table 5-21 Drive Numbering

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
36 × 3.5-Inch SAS/SATA Drive + 2 × M.2 SSD Configuration	2 × rear M.2 SSD	0 to 1	0 to 1	Rear	0 to 1
	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	2 to 25
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	26 to 37

5. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 12 × 3.5-inch drive + 2 × 2.5-inch drive)

NOTE
Applicable model: KR4266-X2-C0-R0-00.

Figure 5-11 Drive Numbering



When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 2 + 24 + 2; the drive sequence on the rear backplane in the lower 2U space is set to 12 + 4.):

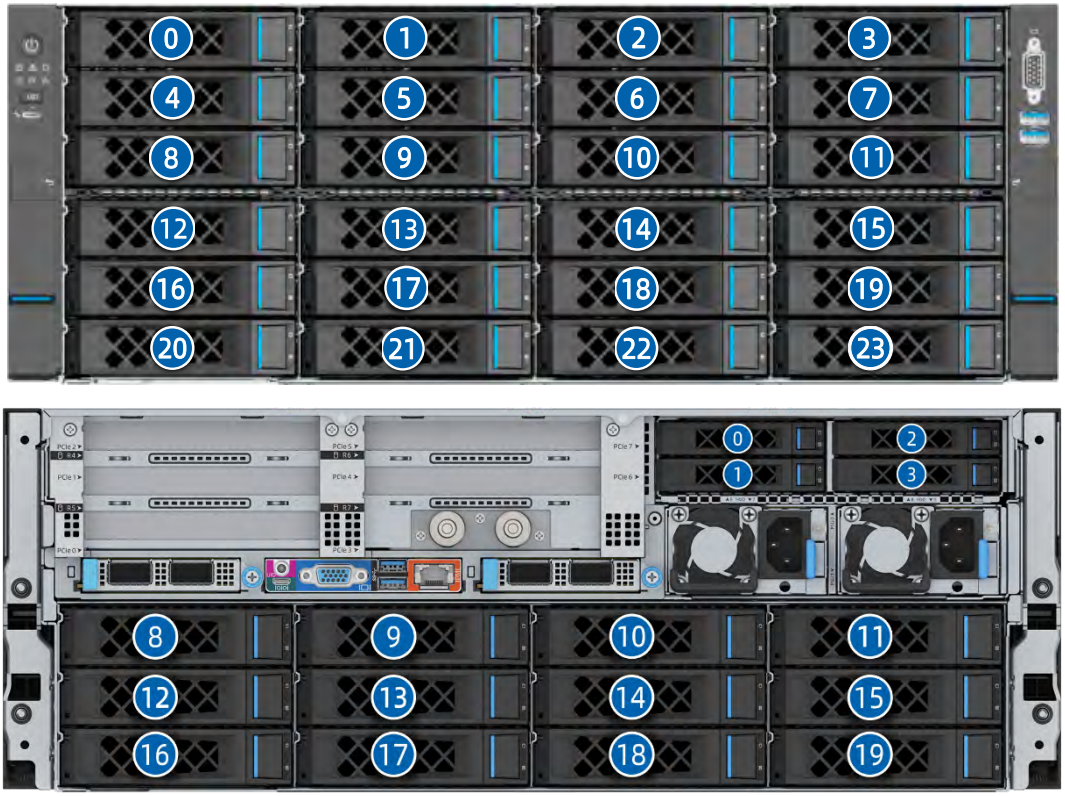
Table 5-22 Drive Numbering

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
36 × 3.5-Inch SAS/SATA Drive + 2 × 2.5-Inch SAS/SATA Drive Configuration	2 × rear 2.5-inch SAS/SATA drive	0 to 1	0 to 1	Rear	0 to 1
	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	2 to 25
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	26 to 37

6. The front drive backplane (with 24 × 3.5-inch drive) is cascaded with the rear drive backplane (with 12 × 3.5-inch drive + 4 × 2.5-inch drive)

NOTE
Applicable model: KR4266-X2-C0-R0-00.

Figure 5-12 Drive Numbering



When 1 front 24-drive backplane is used (The drive sequence on the front backplane is set to 4 + 24; the drive sequence on the rear backplane in the lower 2U space is set to 12 + 4.):

Table 5-23 Drive Numbering

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
36 × 3.5-Inch SAS/SATA Drive	4 × rear 2.5-inch SAS/SATA drive	0 to 3	0 to 3	Rear	0 to 3

Configuration		Physical Drive No.	Drive No. Identified by the BMC	Front/ Rear	Drive No. Identified by an 8i RAID Card
+ 4 × 2.5-Inch SAS/SATA Drive Configuration	24 × front 3.5-inch SAS/SATA drive	0 to 23	0 to 23	Front	4 to 27
	12 × rear 3.5-inch SAS/SATA drive	8 to 19	8 to 19	Rear	28 to 39

5.7.3 Drive LEDs

1. SAS/SATA Drive LEDs

Figure 5-13 SAS/SATA Drive LEDs

Table 5-24 SAS/SATA Drive LED Description

Activity LED (①)	Error LED (②)			Description
Green	Blue	Red		
Off	Off	RAID created	RAID not created	Drive absent
		Solid on	Off	
Solid on	Off	Off		Drive present but not in use
Blinking at 4 Hz	Off	Off		Drive present and in use
Blinking at 4 Hz	Solid pink			Copyback/Rebuild in progress
Solid on	Solid on	Off		Drive selected but not in use
Blinking at 4 Hz	Solid on	Off		Drive selected and in use
Off	Solid on	Off		Drive is selected but fails
Any status	Off	Solid on		Drive fails

2. NVMe Drive LEDs

Figure 5-14 NVMe Drive LEDs

When the VROC and VMD functions are enabled, and the latest VMD driver is installed, the NVMe drives support the light-up function.

Table 5-25 NVMe Drive LED Description

Activity LED (①)	Error LED (②)		Description
Green	Blue	Red	
Off	Off	Off	Drive absent
Solid on	Off	Off	Drive present but not in use
Blinking at 4 Hz	Off	Off	Drive present and in use
Blinking at 4 Hz	Solid pink		Copyback/Rebuild/Initializing/Verifying in progress
Solid on	Solid on	Off	Drive selected but not in use
Blinking at 4 Hz	Solid on	Off	Drive selected and in use
Off	Solid on	Off	Drive is selected but fails
-	Off	Solid on	Drive fails

5.7.4 RAID Cards

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 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 cards as needed.
- For specific NIC options, consult your local sales representative or refer to 7.2 Hardware Compatibility.

5.9 I/O Expansion

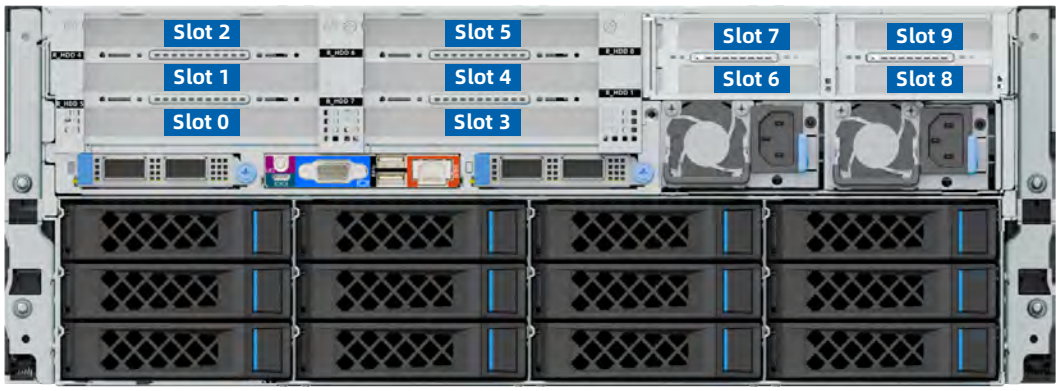
5.9.1 PCIe Expansion Cards

The PCIe expansion cards provide system expansion capabilities.

- Up to 13 PCIe 5.0 slots, including 10 standard PCIe slots, 1 dedicated slot for a RAID mezz card, and 2 dedicated slots for OCP 3.0 cards.
- For specific PCIe expansion card options, consult your local sales representative or refer to 7.2 Hardware Compatibility.

5.9.2 PCIe Slot Locations

Figure 5-15 PCIe Slot Locations - 10 × PCIe Expansion Slot

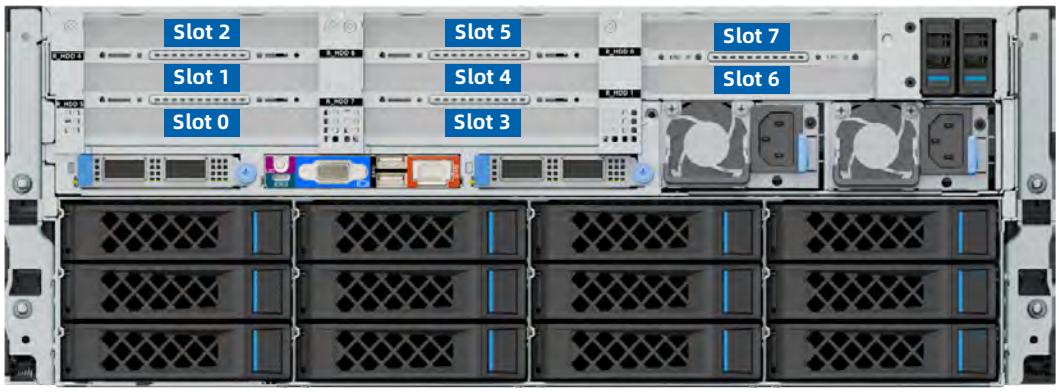


NOTE

Applicable model: KR4266-X2-A0-R0-00.

- Slot 2, slot 1, and slot 0 reside in the left PCIe riser module 1.
- Slot 5, slot 4, and slot 3 reside in the middle PCIe riser module 2.
- Slots 7 & 6 and slots 9 & 8 reside in the 2 right PCIe riser modules (PCIe riser module 3).

Figure 5-16 PCIe Slot Locations - 8 × PCIe Expansion Slot

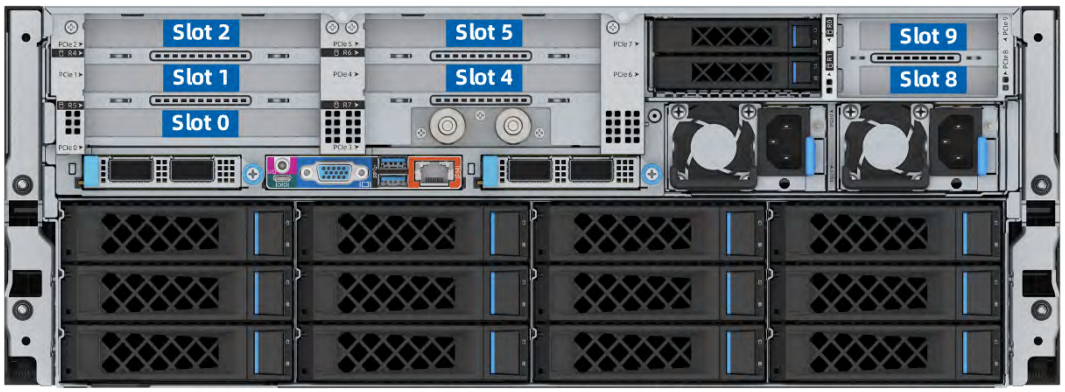


NOTE

Applicable model: KR4266-X2-A0-R0-00.

- Slot 2, slot 1, and slot 0 reside in the left PCIe riser module 1.
- Slot 5, slot 4, and slot 3 reside in the middle PCIe riser module 4.
- Slot 7 and slot 6 reside in the right PCIe riser module 5.

Figure 5-17 PCIe Slot Locations - 7 × PCIe Expansion Slot (1)

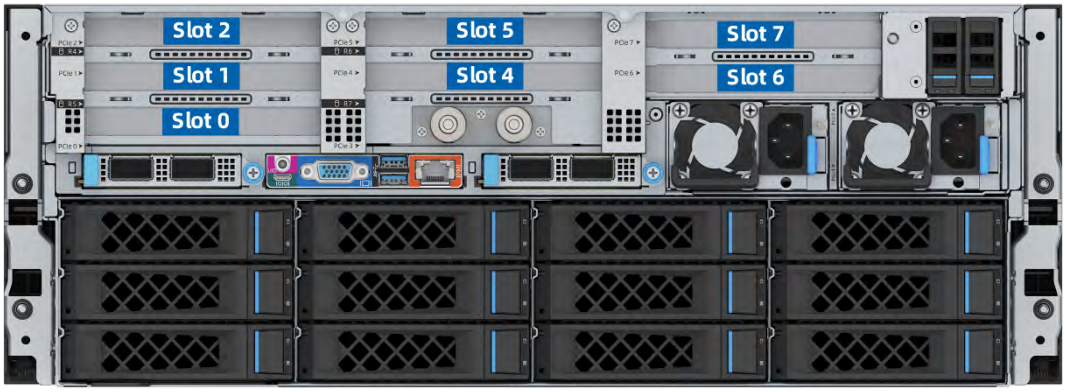


NOTE

Applicable model: KR4266-X2-C0-R0-00.

- Slot 2, slot 1, and slot 0 reside in the left PCIe riser module 1.
- Slot 5 and slot 4 reside in the middle PCIe riser module 2.
- Slot 9 and slot 8 reside in the right PCIe riser module 3.

Figure 5-18 PCIe Slot Locations - 7 × PCIe Expansion Slot (2)



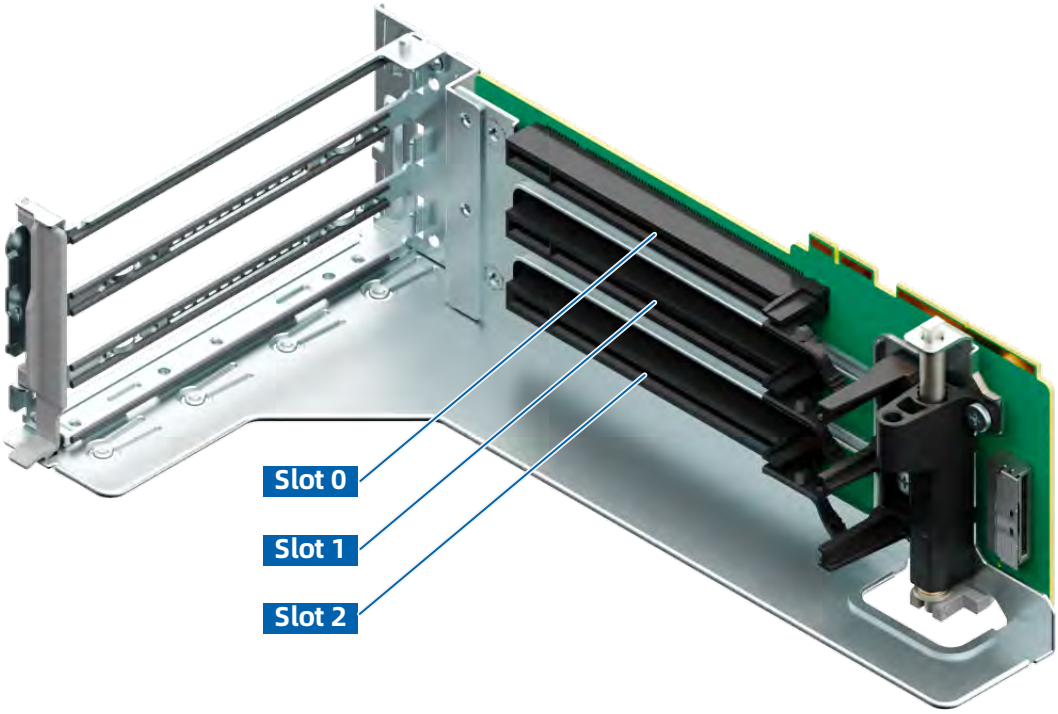
NOTE
Applicable model: KR4266-X2-C0-R0-00.

- Slot 2, slot 1, and slot 0 reside in the left PCIe riser module 1.
- Slot 5 and slot 4 reside in the middle PCIe riser module 4.
- Slot 7 and slot 6 reside in the right PCIe riser module 5.

5.9.3 PCIe Riser Modules

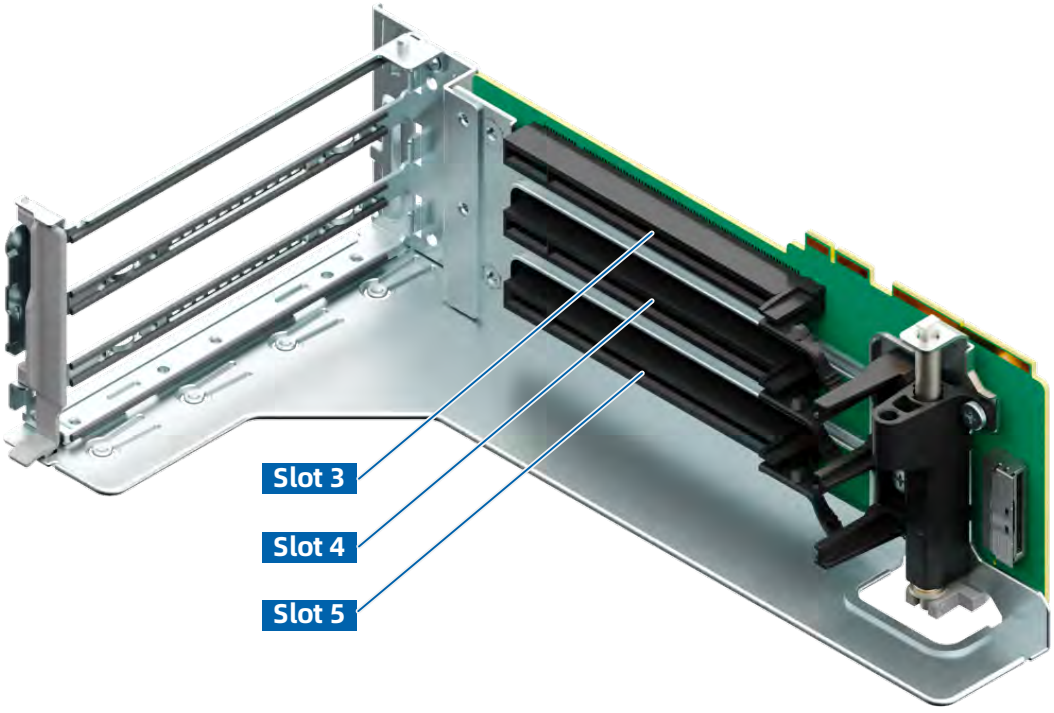
- The left PCIe riser module 1 houses 3 slots.
  - This module houses slot 2, slot 1 and slot 0.

Figure 5-19 Left PCIe Riser Module 1



- The middle PCIe riser module 2 houses 3 slots.
  - This module houses slot 5, slot 4, and slot 3.

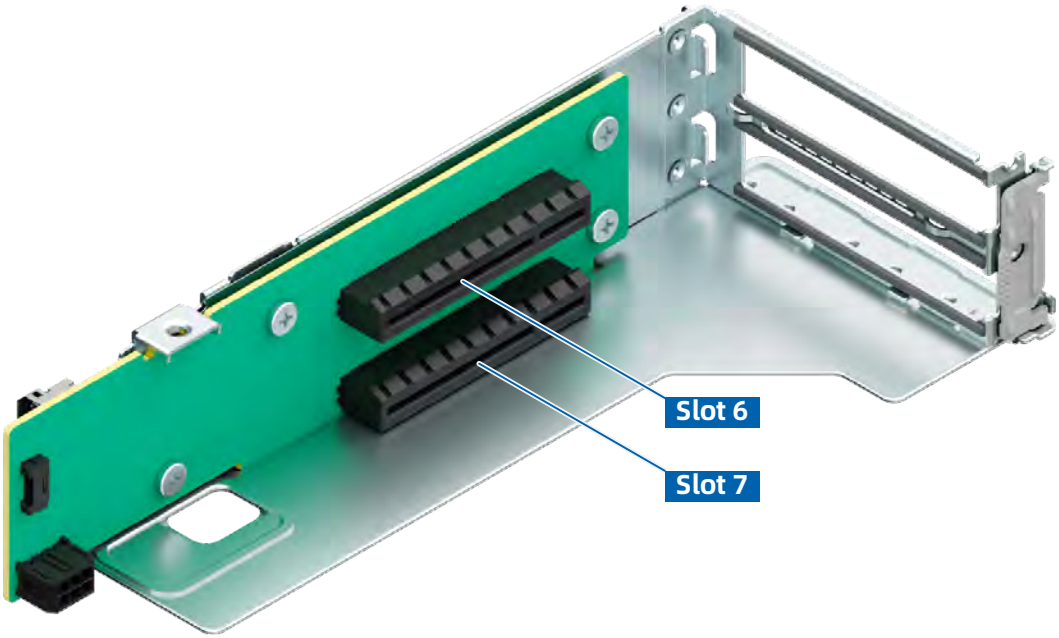
Figure 5-20 Middle PCIe Riser Module 2



NOTE
Slot 3 is unavailable for KR4266-X2-C0-R0-00.

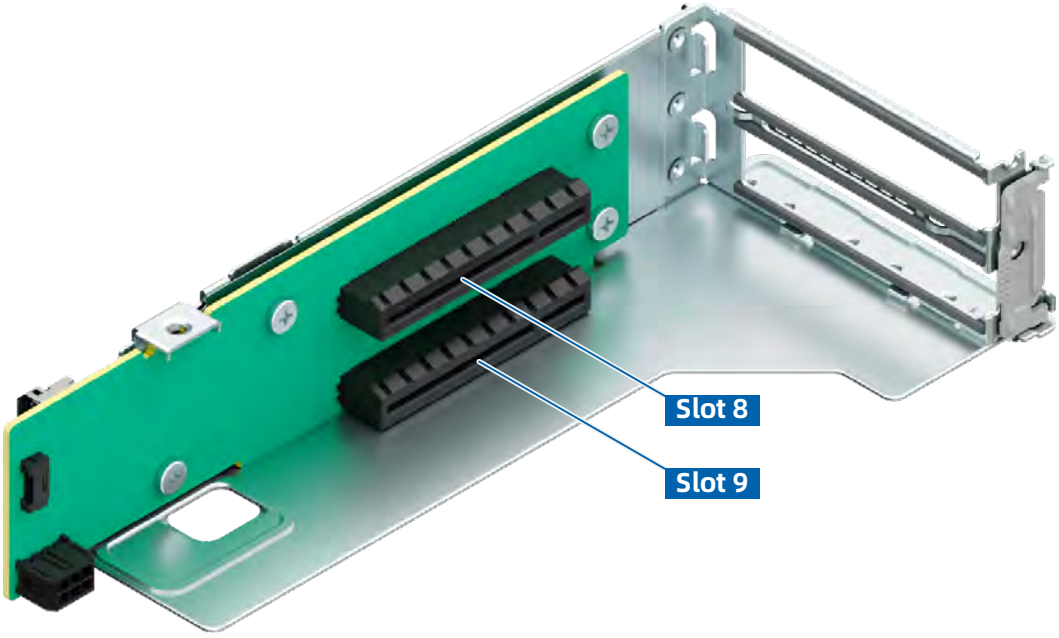
- The right PCIe riser module 3 houses 2 slots.
  - This module houses slot 7 and slot 6 (or slot 9 and slot 8).

Figure 5-21 Right PCIe Riser Module 3 (with Slot 7 and Slot 6)



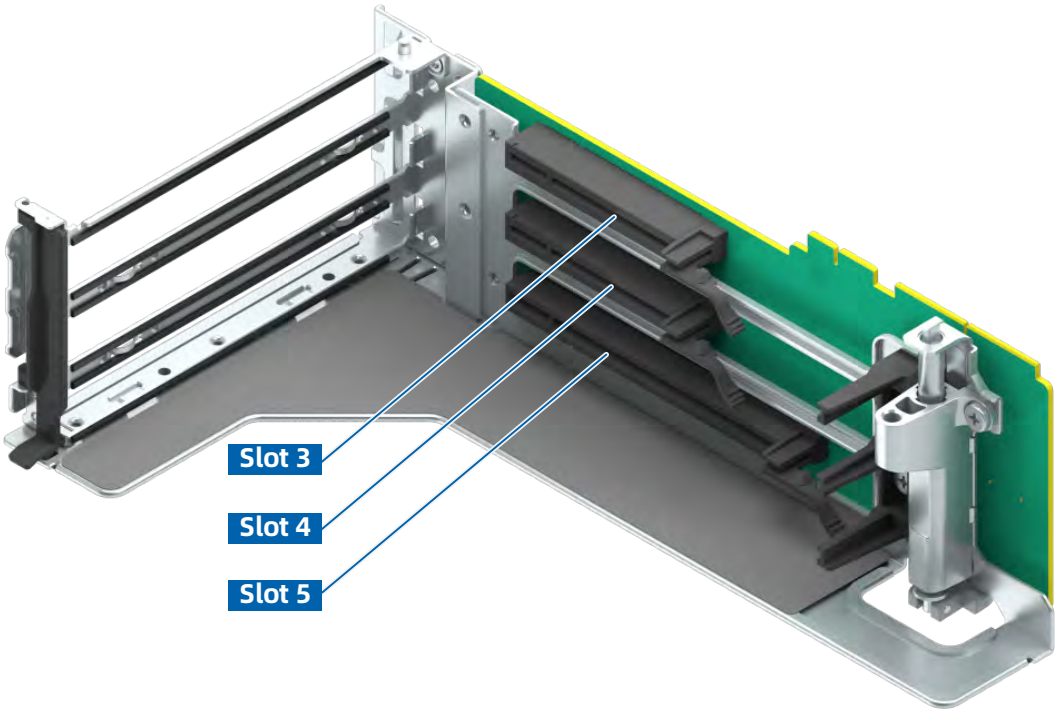
NOTE
Slot 6 and slot 7 are unavailable for KR4266-X2-C0-R0-00.

Figure 5-22 Right PCIe Riser Module 3 (with Slot 9 and Slot 8)



- The middle PCIe riser module 4 houses 3 slots.
  - This module houses slot 5, slot 4, and slot 3.

Figure 5-23 Middle PCIe Riser Module 4

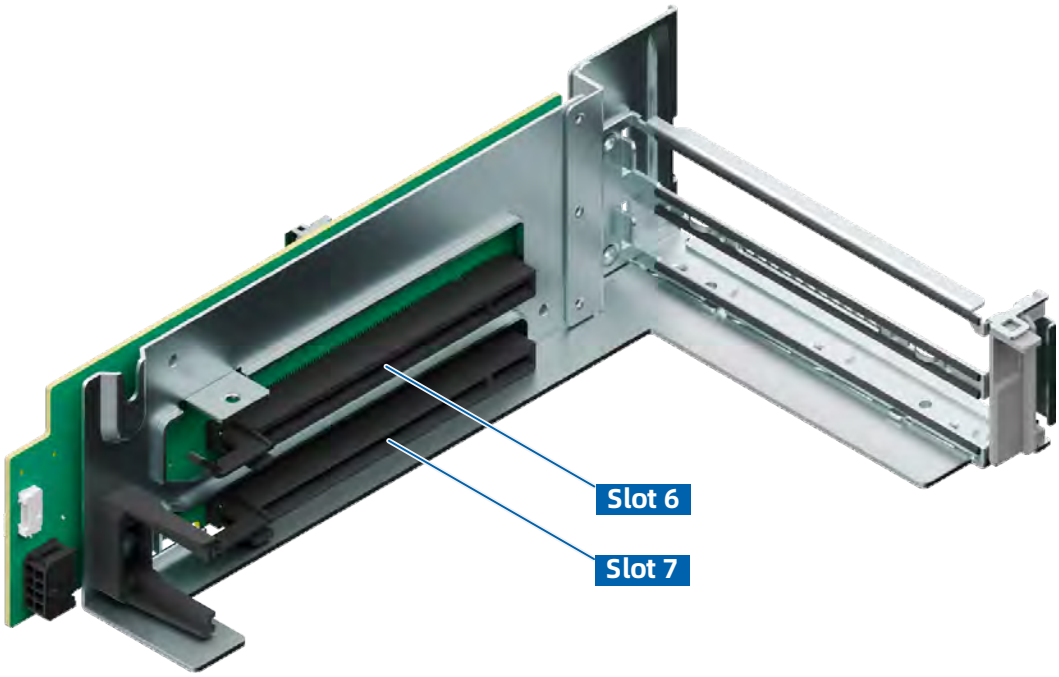


NOTE

Slot 3 is unavailable for KR4266-X2-C0-R0-00.

- The right PCIe riser module 5 houses 2 slots.
  - This module houses slot 7 and slot 6.

Figure 5-24 Right PCIe Riser Module 5



5.9.4 PCIe Slot Description

NOTE

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

Table 5-26 PCIe Slot Description - 8 × PCIe Expansion Slot

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 0	CPU0	PCIe 5.0	x16	x16	PE2	FHHL
Slot 1	CPU0	PCIe 5.0	x16	x16	PE1	FHHL
Slot 2	CPU0	PCIe 5.0	x16	x16	PE3	FHHL
Slot 3[Note 1]	CPU1	PCIe 5.0	x16	x16	PE1	FHHL
Slot 4	CPU1	PCIe 5.0	x16	x16	PE2	FHHL
Slot 5	CPU0	PCIe 5.0	x16	x16	PE4	FHHL

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 6[Note 1]	CPU1	PCIe 5.0	x16	x16	PE3	FHHL
Slot 7[Note 1]	CPU1	PCIe 5.0	x16	x16	PE4	FHHL
OCP 3.0 Slot	CPU1	PCIe 5.0	x8	x8/x16[Note 2]	PE0	Standard OCP 3.0
OCP 3.0 Slot	CPU0	PCIe 5.0	x8	x8	PE0	Standard OCP 3.0

Table 5-27 PCIe Slot Description - 10 × PCIe Expansion Slot

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 0	CPU0	PCIe 5.0	x16	x16	PE2	FHHL
Slot 1	CPU0	PCIe 5.0	x16	x16	PE3	FHHL
Slot 2	CPU0	PCIe 5.0	x16	x16	PE4	FHHL
Slot 3[Note 1]	CPU1	PCIe 5.0	x8	x8	PE1	FHHL
Slot 4	CPU1	PCIe 5.0	x8	x8	PE1	FHHL
Slot 5	CPU1	PCIe 5.0	x16	x16	PE2	FHHL
Slot 6[Note 1]	CPU1	PCIe 5.0	x8	x8	PE3	HHHL
Slot 7[Note 1]	CPU1	PCIe 5.0	x8	x8	PE3	HHHL
Slot 8	CPU1	PCIe 5.0	x8	x8	PE4	HHHL
Slot 9	CPU1	PCIe 5.0	x8	x8	PE4	HHHL
OCP 3.0 Slot	CPU1	PCIe 5.0	x8	x8/x16[Note 2]	PE0	Standard OCP 3.0
OCP 3.0 Slot	CPU0	PCIe 5.0	x8	x8	PE0	Standard OCP 3.0

Note 1: This slot is unavailable for the liquid-cooled KR4266-X2-C0-R0-00.

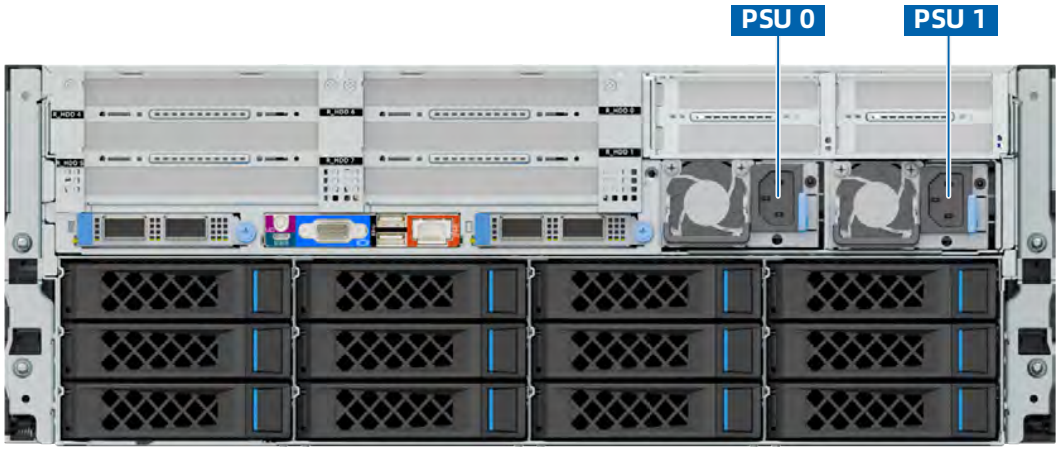
Note 2:

- Air-cooled KR4266-X2-A0-R0-00: The OCP 3.0 slot supports a bus width of x8 and can be expanded to a bus width of x16 via the combination of the OCP 3.0 slot and an MCIO x8 connector.
- Liquid-cooled KR4266-X2-C0-R0-00: The OCP 3.0 slot supports a bus width of x8.

5.10 Power Supply

- Up to 2 PSUs.
- Supports AC or DC power input.
- The server supports 2 hot-swap PSUs with 1+1 redundancy.
- The server must use PSUs with the same part number (P/N code).
- The PSUs feature short-circuit protection.

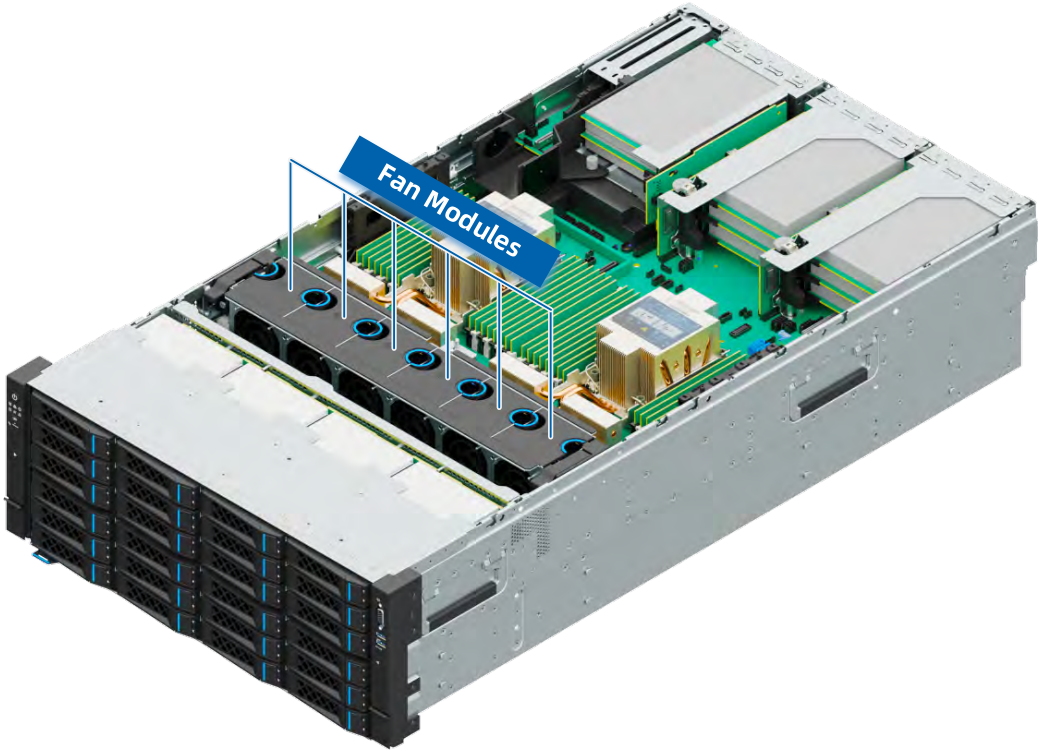
Figure 5-25 PSU Locations



5.11 Fan Modules

- The server supports nine 6056/6038 fans.
  - The 6056 fans support N+1 redundancy, which means that the server can continue working properly when a single fan fails.
  - The 6038 fans do not support redundancy.
- The fan modules are hot-swappable.
- Supports intelligent fan speed control.
- The server must use fans with the same part number (P/N code).

Figure 5-26 Fan Module Locations



Front Panel						
Left						Right
Upper	Fan 0	Fan 1	Fan 2	Fan 4	Fan 6	Fan 8
Lower	Dummy	Dummy	Fan 3	Fan 5	Fan 7	Dummy

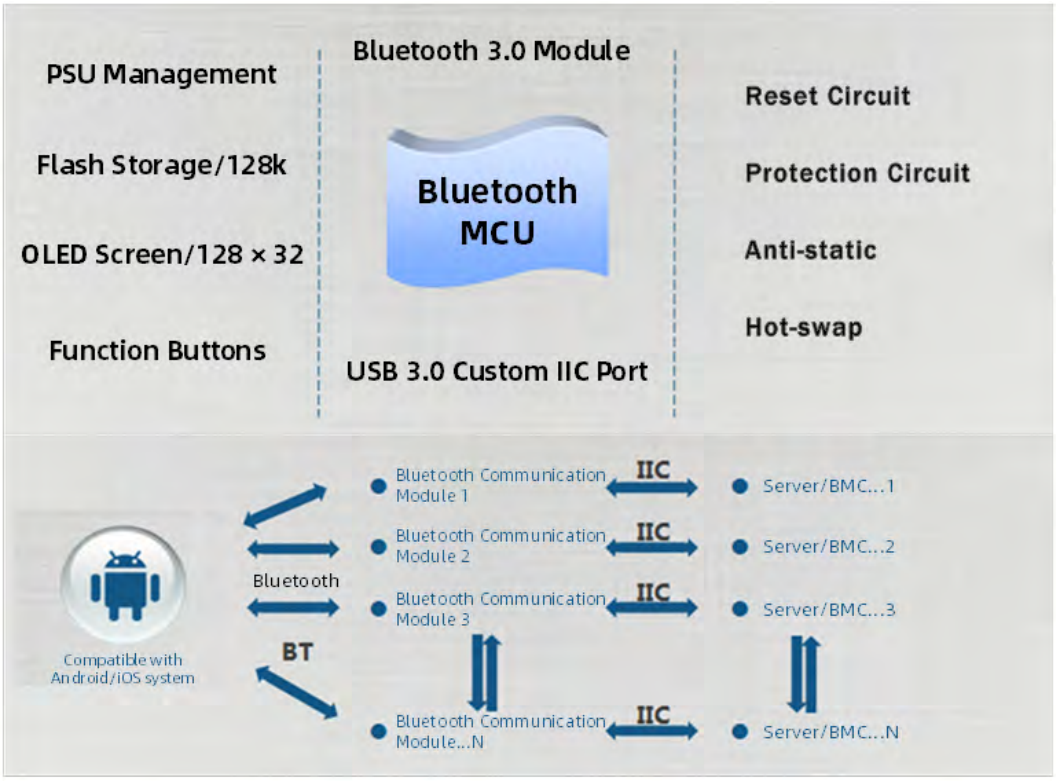
5.12 LCD Module

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 BMC through I^2C 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 5-27 How LCD Subsystem Works



5.12.2 Mobile Management Software ISMM

As mobile management software, ISMM reads server-related information from the BMC via the LCD module, including the operating status of processors and memories, network status, logs, and alerts, and transmits the information to client mobile terminals via Bluetooth. ISMM facilitates the O&M personnel to inspect and maintain the server and delivers more comprehensive server management capabilities.

Table 5-28 Basic Features of ISMM

Feature	Item
Basic Information	Host name
	IP address
	Asset label
	Product serial number
	Product model
	All CPU models
	Total memory capacity (GB)
	Firmware version

Feature	Item	
	Note: BMC/BIOS/ME/CPLD version	
	Status (Power-on/power-off/processor/memory/hard disk/fan/power/network)	
Hardware Device	Processor	
	Memory	
	Device list	
	Power	
Health	Processor	
	Memory	
	Hard disk	
	Network	
	Power consumption	
	Power	
	Fan	
	Temperature	
	Voltage	
	GPU	
Warning	No.	
	Item	
	Status	
	Time	
Network Conditions	LAN interface type	
	MAC address	
	IPv4 configuration	IPv4 address
		Subnet mask
		IPv4 default gateway
	IPv6 configuration	IPv6 address
		Subnet mask
		IPv6 default gateway
Log	Logs	
Service Support	Service support (hotline and official website)	

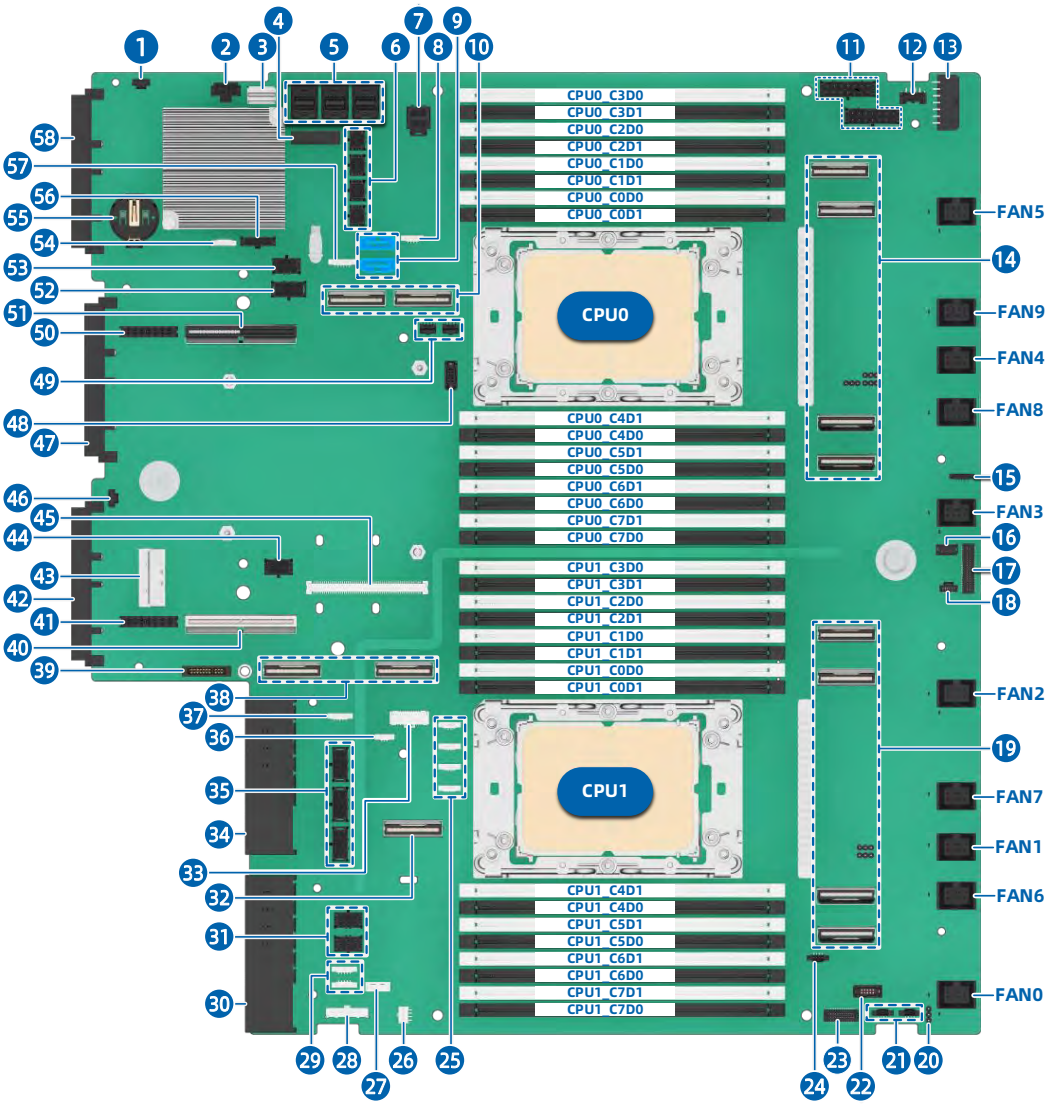
5.13 Boards

5.13.1 Motherboard

NOTE

- Motherboard 1, with 1 OCPA connector (RAID mezz card connector), is applicable for the air-cooling configuration.
- Motherboard 2, with 2 M.2 SSD connectors, is applicable for the cold-plate liquid cooling configuration.

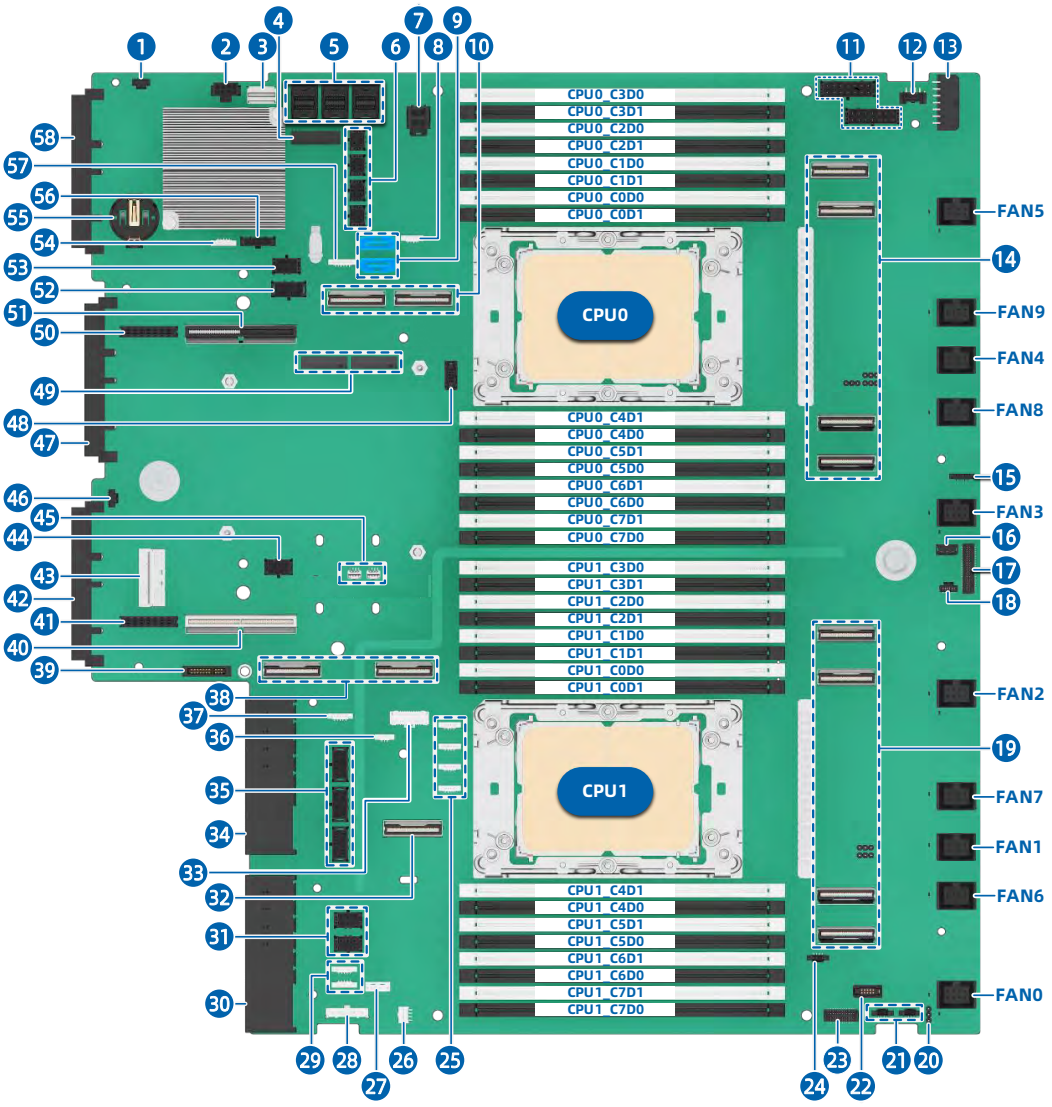
Figure 5-28 Motherboard 1



Item	Feature	Item	Feature
1	OCP 3.0 Card Hot-Plug Button and LED Connector	2	Mid-Drive Power Connector

Item	Feature	Item	Feature
3	Right Control Panel Connector	4	System TF Connector
5	Mini SAS Connector × 3	6	Rear Drive BP Power Connector × 4
7	Front OCP Power Connector	8	Drive BP I^2C Connector
9	SATA Connector × 2	10	MCIO x8 Connector (CPU0) × 2
11	Front Drive BP Power Connector × 2	12	Inlet Temperature Sensor Connector
13	Front Drive BP Power Connector	14	MCIO x8 Connector (CPU0) × 4
15	Fan Backplane Connector	16	Intrusion Detection Connector
17	OCP 2 Sideband Signal Connector	18	OCP 3.0 Card Hot-Plug Button and LED Connector
19	MCIO x8 Connector (CPU1) × 4	20	CMOS Jumper
21	Drive BP I^2C Connector × 2	22	VPP Connector
23	Left Control Panel Connector	24	Drive BP I^2C Connector
25	Drive BP I^2C Connector × 4	26	IPMB Connector
27	RAID Key Connector	28	Capacitor Board Power Connector
29	Riser I^2C Connector × 2	30	PSU1 Connector
31	GPU Riser Power Connector × 2	32	MCIO x8 Connector (CPU1)
33	NC-SI Connector	34	PSU0 Connector
35	GPU Power Connector × 3	36	Smart NIC UART Connector
37	Riser I^2C Connector	38	MCIO x8 Connector (CPU1) × 2
39	Riser Power Connector	40	MCIO x16 Connector (CPU1)
41	Riser Power Connector	42	OCP 3.0 Card Connector
43	OCP 3.0 Card MCIO Connector (CPU1)	44	GPU Riser Power Connector
45	OCPA Connector (CPU0)	46	OCP 3.0 Card Hot-Plug Button and LED Connector
47	DC-SCM Connector	48	VPP Connector
49	Leak Detection Connector × 2	50	Riser Power Connector
51	MCIO x16 Connector (CPU0)	52	GPU0 Power Connector
53	GPU Riser Power Connector	54	Riser I^2C Connector
55	Button Cell Battery Socket	56	Smart NIC Power Connector
57	SGPIO Connector	58	OCP 3.0 Card Connector

Figure 5-29 Motherboard 2

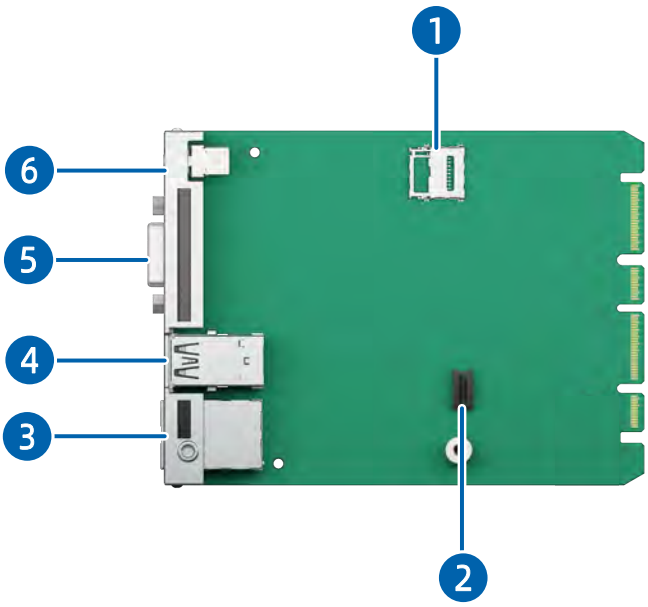


Item	Feature	Item	Feature
1	OCP 3.0 Card Hot-Plug Button and LED Connector	2	Mid-Drive Power Connector
3	Right Control Panel Connector	4	System TF Card Connector
5	Mini SAS Connector × 3	6	Rear Drive BP Power Connector × 4
7	Front OCP Power Connector	8	Drive BP I^2C Connector
9	SATA Connector × 2	10	MCIO x8 Connector (CPU0) × 2
11	Front Drive BP Power Connector × 2	12	Inlet Temperature Sensor Connector
13	Front Drive BP Power Connector	14	MCIO x8 Connector (CPU0) × 4
15	Fan Backplane Connector	16	Intrusion Detection Connector

Item	Feature	Item	Feature
17	OCP2 Sideband Signal Connector	18	OCP 3.0 Card Hot-Plug Button and LED Connector
19	MCIO x8 Connector (CPU1) × 4	20	CMOS Jumper
21	Drive BP I^2C Connector × 2	22	VPP Connector
23	Left Control Panel Connector	24	Drive BP I^2C Connector
25	Drive BP I^2C Connector × 4	26	IPMB Connector
27	RAID Key Connector	28	Capacitor Board Power Connector
29	Riser I^2C Connector × 2	30	PSU1 Connector
31	GPU Riser Power Connector × 2	32	MCIO x8 Connector (CPU1)
33	NC-SI Connector	34	PSU0 Connector
35	GPU Power Connector × 3	36	Smart NIC UART Connector
37	Riser I^2C Connector	38	MCIO x8 Connector (CPU1) × 2
39	Riser Power Connector	40	MCIO x16 Connector (CPU1)
41	Riser Power Connector	42	OCP 3.0 Card Connector
43	OCP 3.0 Card MCIO Connector (CPU1)	44	GPU Riser Power Connector
45	Leak Detection Connector × 2	46	OCP 3.0 Card Hot-Plug Button and LED Connector
47	DC-SCM Connector	48	VPP Connector
49	M.2 SSD Connector × 2	50	Riser Power Connector
51	MCIO x16 Connector (CPU0)	52	GPU0 Power Connector
53	GPU Riser Power Connector	54	Riser I^2C Connector
55	Button Cell Battery Socket	56	Smart NIC Power Connector
57	SGPIO Connector	58	OCP 3.0 Card Connector

5.13.2 DC-SCM Board

Figure 5-30 DC-SCM Board



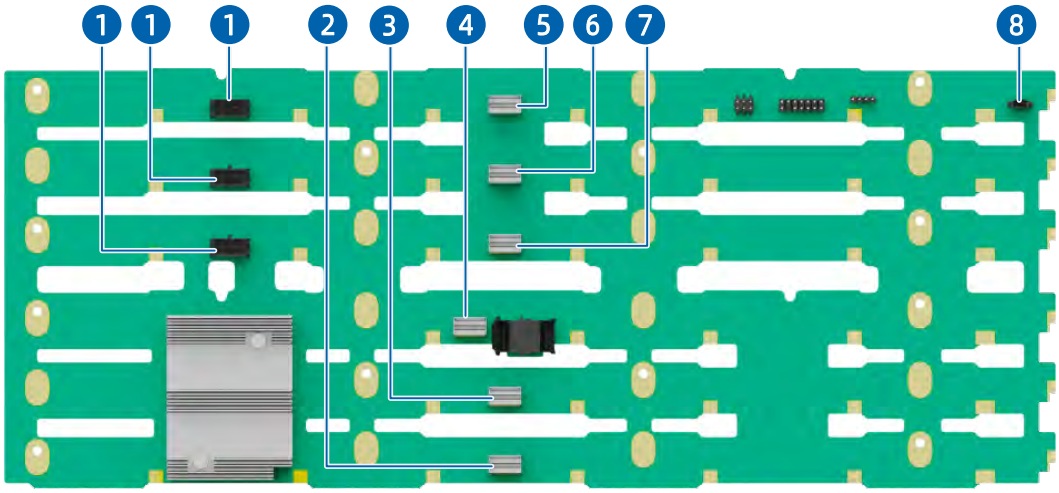
Item	Feature	Item	Feature
1	BMC TF Card Slot	2	TCM/TPM Connector
3	BMC Management Network Port	4	USB 3.0 Port × 2
5	VGA Port	6	System/BMC Serial Port

5.13.3 Drive Backplanes

1. Front Drive Backplanes

- 24 × 3.5-Inch SAS/SATA Drive Expander Backplane

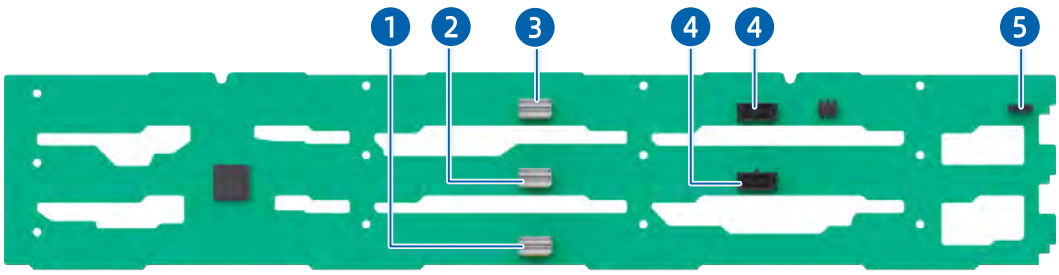
Figure 5-31 24 × 3.5-Inch SAS/SATA Drive Expander Backplane



Item	Feature	Item	Feature
1	Backplane Power Connector × 3	5	Slimline_SAS_UP_0 Connector
2	Slimline_SAS_DOWN_2 Connector	6	Slimline_SAS_UP_1 Connector
3	Slimline_SAS_DOWN_1 Connector	7	Slimline_SAS_DOWN_3 Connector
4	Slimline_SAS_DOWN_0 Connector	8	BMC I^2C Connector

- 12 × 3.5-Inch SAS/SATA Drive Backplane

Figure 5-32 12 × 3.5-Inch SAS/SATA Drive Backplane

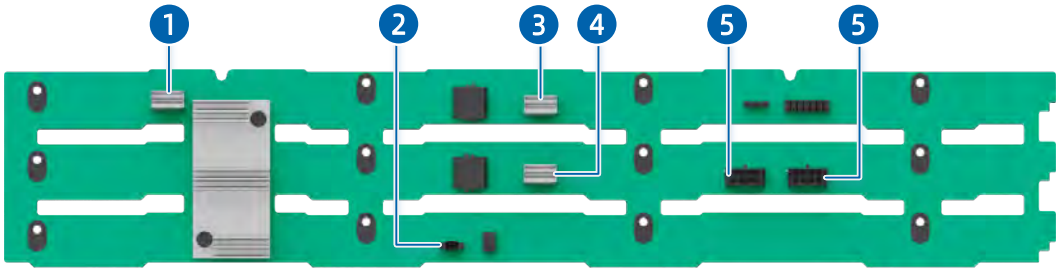


Item	Feature	Item	Feature
1	Slimline_SAS_UP_0 Connector	4	Backplane Power Connector × 2

Item	Feature	Item	Feature
2	Slimline_SAS_UP_1 Connector	5	BMC I²C Connector
3	Slimline_SAS_UP_2 Connector	-	-

- 12 × 3.5-Inch SAS/SATA Drive Expander Backplane

Figure 5-33 12 × 3.5-Inch SAS/SATA Drive Expander Backplane

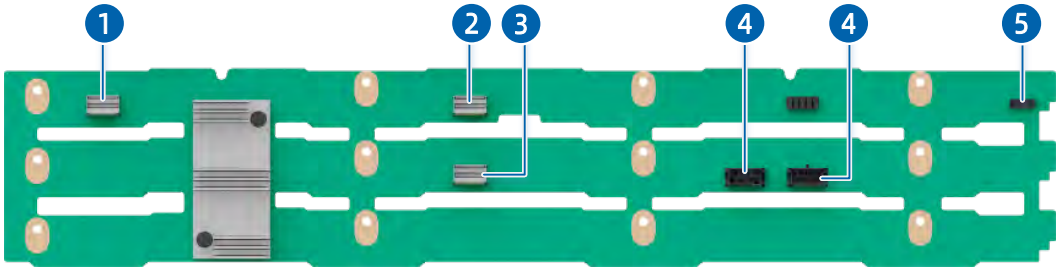


Item	Feature	Item	Feature
1	Slimline_SAS_DOWN Connector	4	Slimline_SAS_UP_1 Connector
2	BMC I²C Connector	5	Backplane Power Connector × 2
3	Slimline_SAS_UP_0 Connector	-	-

2. Rear Drive Backplanes

- 12 × 3.5-Inch SAS/SATA Expander Backplane

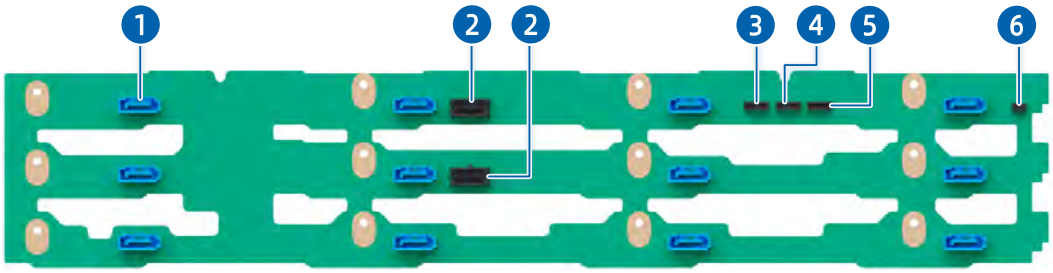
Figure 5-34 12 × 3.5-Inch Drive Expander Backplane



Item	Feature	Item	Feature
1	Slimline_SAS_DOWN Connector	4	Backplane Power Connector × 2
2	Slimline_SAS_UP_0 Connector	5	BMC I²C Connector
3	Slimline_SAS_UP_1 Connector	-	-

- 12 × 3.5-Inch SAS/SATA Drive Backplane

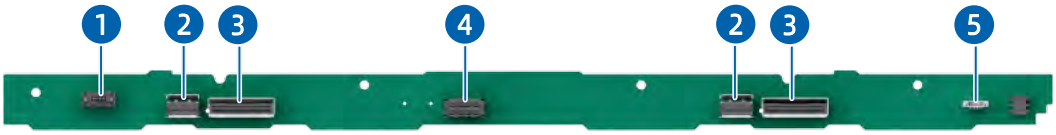
Figure 5-35 12 × 3.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	SATA Connector	4	SGPIO_01 Connector
2	Backplane Power Connector × 2	5	SGPIO_00 Connector
3	SGPIO_02 Connector	6	BMC I^2C Connector

- 4 × 3.5-Inch SAS/SATA/NVMe Drive Backplane

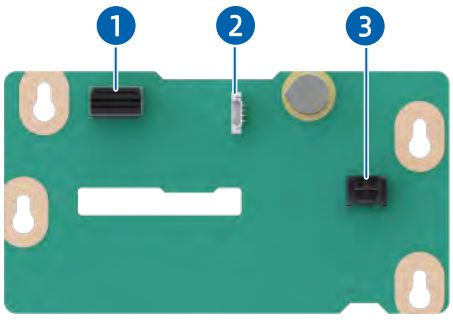
Figure 5-36 4 × 3.5-Inch SAS/SATA/NVMe Drive Backplane



Item	Feature	Item	Feature
1	VPP Connector	4	Backplane Power Connector
2	Slimline x4 Connector × 2	5	BMC I^2C Connector
3	MCIO x8 Connector × 2	-	-

- 2 × 3.5-Inch SAS/SATA Drive Backplane

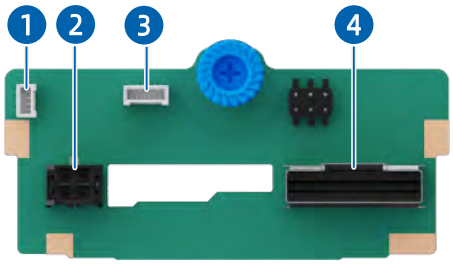
Figure 5-37 2 × 3.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	Slimline x4 Connector	3	Backplane Power Connector
2	BMC I²C Connector	-	-

- 2 × 2.5-Inch NVMe Drive Backplane

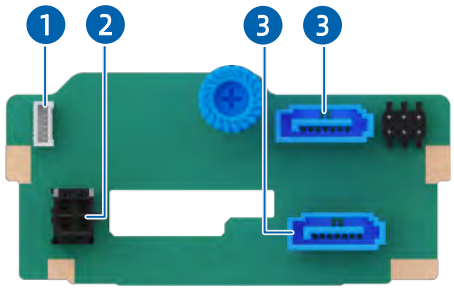
Figure 5-38 2 × 2.5-Inch NVMe Drive Backplane



Item	Feature	Item	Feature
1	BMC I²C Connector	3	SGPIO Connector
2	Backplane Power Connector	4	Slimline x8 Connector

- 2 × 2.5-Inch SAS/SATA Drive Backplane

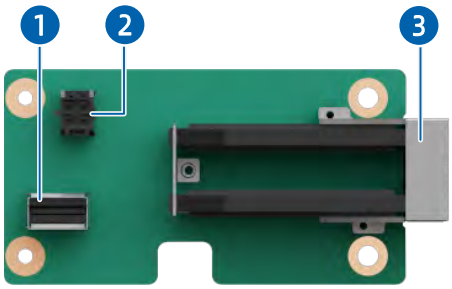
Figure 5-39 2 × 2.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	BMC I²C Connector	3	SATA Connector × 2
2	Backplane Power Connector	-	-

- 2 × M.2 Drive Backplane

Figure 5-40 2 × M.2 Drive Backplane



Item	Feature	Item	Feature
1	Slimline x4 Connector	3	M.2 SSD Connector
2	Backplane Power Connector	-	-

6 Product Specifications

6.1 KR4266-X2-A0-R0-00

6.1.1 Technical Specifications

Table 6-1 Technical Specifications

Item	Description
Form Factor	4U rack server
Chipset	Intel C741 chipset
Processor	Supports 1 or 2 processors • Intel Xeon Scalable processors (Sapphire Rapids/ Emerald Rapids) • Integrated memory controllers and 8 memory channels per processor • Integrated PCIe 5.0 controllers and 80 PCIe lanes per processor • 4 UPI links per CPU at up to 20 GT/s per link • Up to 64 cores per processor • Max. Turbo frequency of 4.2 GHz • L3 cache up to 5 MB per core • TDP up to 385 W Note: The information above is for reference only. See 7.2 Hardware Compatibility for details.
Display	Integrated VGA on the DC-SCM board with a video memory of 64 MB and a maximum 16M color resolution of 1,920 × 1,200 at 60 Hz Note: 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.
Memory	• 32 DIMM slots • 8 memory channels per processor and up to 2 DIMMs per channel

Item	Description
	• Up to 5,600 MT/s at 1DPC and 4,400 MT/s at 2DPC • Supports RDIMMs • Memory protection: ECC and memory mirroring Note: The server, if installed with forty-six 3.5-inch drives, supports up to 22 DIMMs. See 5.6.1.5 DIMM Slot Layout for the DIMM population rules.
Storage	Front: • Up to 24 × 3.5-inch SAS/SATA drive (hot-swap) Rear: • Up to 16 × 3.5-inch SAS/SATA drive (hot-swap) • Up to 4 × 2.5-inch SAS/SATA/NVMe drive (hot-swap) • Optional: 2 × M.2 SSD or 2 × E1.S SSD (E1.S SSDs are hot-swappable) • Up to 16 × 2.5-inch NVMe drive (hot-swap) Internal: • Up to 6 × 3.5-inch SAS/SATA drive • Up to 2 TF cards • Up to 2 PCIe M.2 SSDs or 2 SATA M.2 SSDs
Network	• Up to 2 optional 1/10/25/40/100/200 Gb OCP 3.0 cards • 1/10/25/40/100/200 Gb PCIe NICs
I/O Expansion	Up to 13 PCIe 5.0 slots, namely, 10 standard PCIe slots, 1 dedicated slot for a RAID mezz card, and 2 dedicated slots for OCP 3.0 cards. • Up to 9 PCIe x16 slots, namely, 8 standard PCIe slots and 1 dedicated slot for an OCP 3.0 card • Up to 13 PCIe slots, namely, 4 standard PCIe x16 slots, 6 standard PCIe x8 slots, 1 dedicated PCIe x8 slot for a RAID mezz card, 1 dedicated PCIe x16 slot for an OCP 3.0 card, and 1 dedicated PCIe x8 slot for an OCP 3.0 card
Port	• Front: - 1 × USB 3.0 port

Item	Description
	- 1 × USB 2.0 port - 1 × VGA port - 1 × USB Type-C port • Rear: - 2 × USB 3.0 port - 1 × VGA port - 1 × system/BMC serial port (Micro USB) - 1 × BMC management network port
Fan	9 × 6056/6038 fan module • 6056 fans are N+1 redundant • 6038 fans are not redundant
Power Supply	CRPS PSUs with the output power of 1,300 W/1,600 W/2,000 W/ 2,700 W (1+1 redundancy) • 110 Vac: 90 Vac to 132 Vac • 230 Vac: 180 Vac to 264 Vac • -48 Vdc: -40 Vdc to -72 Vdc
System Management	• UEFI/Legacy • BMC • NC-SI • InManage
Security	• Intel Platform Firmware Resilience (PFR) • Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) • Intel Trusted Execution Technology • Firmware update mechanism based on digital signatures • UEFI Secure Boot • Hierarchical BIOS password protection • BIOS Secure Flash and BIOS Lock Enable (BLE)

Item	Description
	• BMC and BIOS dual-image mechanism • Chassis intrusion detection

6.1.2 Environmental Specifications

Table 6-2 Environmental Specifications

Item	Description
Temperature	• Operating: 5°C to 45°C (41°F to 113°F)[1,2,3] • Storage (packed): -40°C to +65°C (-40°F to +149°F) • Storage (unpacked): -40°C to +70°C (-40°F to +158°F)
Relative Humidity (RH, non-condensing)	• Operating: 5% to 90% RH • Storage (packed): 5% to 95% RH • Storage (unpacked): 5% to 95% RH
Acoustic Noise (Bels)[4,5,6]	• Idle - LWAd: 6.0 Bels - LpAm: 44 dBA • Operating - LWAd: 6.6 Bels - LpAm: 50 dBA
Altitude	• Operating altitude: ≤3,050 m (10,007 ft) - For configurations compliant with ASHRAE class A2, derate the maximum allowable temperature by 1°C per 300 m (1°F per 547 ft) above 900 m (2,953 ft) - For configurations compliant with ASHRAE class A3, derate the maximum allowable temperature by 1°C per 175 m (1°F per 319 ft) above 900 m (2,953 ft) - For configurations compliant with ASHRAE class A4, derate the maximum allowable temperature by 1°C per 125 m (1°F per 228 ft) above 900 m (2,953 ft) • Shipping (storage) altitude: 0 to 12,000 m (0 to 39,370 ft)

Notes:

1. Not all configurations support an operating temperature range of 5°C to 45°C (41°F to 113°F). The GPU configuration supports an operating temperature range of 10°C to 30°C (50°F to 86°F).
2. Standard operating temperature:
   - 10°C to 35°C (50°F to 95°F) is the standard operating temperature range at sea level. Derate the maximum allowable temperature by 1°C per 300 m (1°F per 547 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 by system configurations.
   - Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.
3. Expanded operating temperature:
   - For certain approved configurations (as shown in Table 12-1 Operating Temperature Specification Limits), the supported minimum ambient temperature at the inlet of the system can be expanded to 5°C to 10°C (41°F to 50°F) at sea level, with an altitude derating of 1.0°C per 175 m (1°F per 319 ft) above 900 m (2,953 ft) to a maximum of 3,050 m (10,000 ft).
   - For certain approved configurations (as shown in Table 12-1 Operating Temperature Specification Limits), the supported maximum ambient temperature at the inlet of the system can be expanded to 35°C to 45°C (95°F to 113°F) at sea level, with an altitude derating of 1°C per 125 m (1°F per 228 ft) above 900 m (2,953 ft) to a maximum of 3,050 m (10,000 ft).
   - Any fan failure or operations under the expanded operating temperature may lead to system performance degradation.
4. This document lists the LWAd of the product at a 23°C (73.4°F) ambient environment. All measurements are conducted in conformance with ISO 7779 (ECMA 74) and declared in conformance with ISO 9296 (ECMA 109). Contact your sales representative for more information.
5. The sound levels shown here were measured based on the specific configurations of a server. Sound levels vary by the server configuration, workload, ambient temperature, and other factors. These values are for reference only and subject to change without further notice.
6. 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.

6.1.3 Physical Specifications

Table 6-3 Physical Specifications

Item	Description
Dimensions	• With mounting ears: 482 × 174.5 × 841.5 mm (18.98 × 6.87 × 33.13 in.) (W × H × D) • Without mounting ears: 447 × 174.5 × 799.2 mm (17.60 × 6.87 × 31.46 in.) (W × H × D) • Outer packaging: 1,200 × 800 × 473 mm (47.24 × 31.50 × 18.62 in.) (L × W × H)

Item	Description
Weight	36 × 3.5-inch drive configuration (2 rear 2.5-inch drives included): • Net weight: 62.7 kg (138.23 lbs) • Gross weight: 92.4 kg (203.71 lbs) (including server, packaging box, rails and accessory box) 46 × 3.5-inch drive configuration (2 rear 2.5-inch drives included): • Net weight: 68.7 kg (151.46 lbs) • Gross weight: 98.8 kg (217.82 lbs) (including server, packaging box, rails and accessory box)

6.2 KR4266-X2-C0-R0-00

6.2.1 Technical Specifications

Table 6-4 Technical Specifications

Item	Description
Form Factor	4U rack server
Chipset	Intel C741 chipset
Processor	Supports 1 or 2 processors • Intel Xeon Scalable processors (Sapphire Rapids/Emerald Rapids) • Integrated memory controllers and 8 memory channels per processor • Integrated PCIe 5.0 controllers and 80 PCIe lanes per processor • 4 UPI links per CPU at up to 20 GT/s per link • Up to 64 cores per CPU • Max. Turbo frequency of 4.2 GHz • L3 cache up to 5 MB per core • TDP up to 385 W Note: The information above is for reference only. See 7.2 Hardware Compatibility for details.

Item	Description
Display	Integrated VGA on the DC-SCM board with a video memory of 64 MB and a maximum 16M color resolution of 1,920 × 1,200 at 60 Hz Note: 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.
Memory	• 32 DIMM slots • 8 memory channels per processor and up to 2 DIMMs per channel • Up to 5,600 MT/s at 1DPC and 4,400 MT/s at 2DPC • Supports RDIMMs • Memory protection: ECC and memory mirroring
Storage	Front: • Up to 24 × 3.5-inch SAS/SATA drive (hot-swap) Rear: • Up to 12 × 3.5-inch SAS/SATA drive (hot-swap) • Up to 4 × 2.5-inch SAS/SATA/NVMe drive (hot-swap) • Optional: 2 × M.2 SSD or 2 × E1.S SSD (E1.S SSDs are hot-swappable) • Up to 16 × 2.5-inch NVMe drive (hot-swap) Internal: • Up to 2 TF cards • Up to 2 × SATA M.2 SSD
Network	• Up to 2 optional 1/10/25/40/100/200 Gb OCP 3.0 cards • 1/10/25/40/100/200 Gb PCIe NICs
I/O Expansion	Up to 9 PCIe 5.0 slots, namely, 7 standard PCIe slots and 2 dedicated slots for OCP 3.0 cards.
Cold Plate	• Material: copper • Coolant: deionized water, PG25, etc. • Filtered particle size (diameter): ≤50 μm • Flow rate: 1 to 1.4 L/min per node, depending on the actual condition

Item	Description
	• Inlet liquid temperature: < 50℃ (122℉) • Outlet liquid temperature: varying by configuration • Operating pressure: < 50 psi • Maximum transient pressure: 100 psi • Quick disconnects: TSC/D-4Z02BSSJE
Port	• Front: - 1 × USB 3.0 port - 1 × USB 2.0 port - 1 × VGA port - 1 × USB Type-C port • Rear: - 2 × USB 3.0 port - 1 × VGA port - 1 × system/BMC serial port (Micro USB) - 1 × BMC management network port - 2 × quick disconnect
Fan	9 × 6056/6038 fan module • 6056 fans are N+1 redundant • 6038 fans are not redundant
Power Supply	CRPS PSUs with the output power of 1,300 W/1,600 W/2,000 W/ 2,700 W (1+1 redundancy) • 110 Vac: 90 Vac to 132 Vac • 230 Vac: 180 Vac to 264 Vac • -48 Vdc: -40 Vdc to -72 Vdc
System Management	• UEFI/Legacy • BMC • NC-SI • InManage

Item	Description
Security	• Intel Platform Firmware Resilience (PFR) • Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) • Intel Trusted Execution Technology • Firmware update mechanism based on digital signatures • UEFI Secure Boot • Hierarchical BIOS password protection • BIOS Secure Flash and BIOS Lock Enable (BLE) • BMC and BIOS dual-image mechanism • Chassis intrusion detection

6.2.2 Environmental Specifications

Table 6-5 Environmental Specifications

Item	Description
Temperature[1,2,3]	• Operating: 5°C to 45°C (41°F to 113°F) • Storage (packed): -40°C to +65°C (-40°F to +149°F) • Storage (unpacked): -40°C to +70°C (-40°F to +158°F)
Relative Humidity (RH, non-condensing)	• Operating: 5% to 90% RH • Storage (packed): 5% to 95% RH • Storage (unpacked): 5% to 95% RH
Acoustic Noise (Bels)[4,5,6]	• Idle - LWAd: 6.0 Bels - LpAm: 44 dBA • Operating - LWAd: 6.6 Bels - LpAm: 50 dBA
Altitude	• Operating altitude: ≤3,050 m (10,007 ft)

Item	Description
	- For configurations compliant with ASHRAE class A2, derate the maximum allowable temperature by 1°C per 300 m (1°F per 547 ft) above 900 m (2,953 ft) - For configurations compliant with ASHRAE class A3, derate the maximum allowable temperature by 1°C per 175 m (1°F per 319 ft) above 900 m (2,953 ft) - For configurations compliant with ASHRAE class A4, derate the maximum allowable temperature by 1°C per 125 m (1°F per 228 ft) above 900 m (2,953 ft) • Shipping (storage) altitude：0 to 12,000 m (0 to 39,370 ft)

Notes:

1. Not all configurations support an operating temperature range of 5°C to 45°C (41°F to 113°F). The GPU configuration supports an operating temperature range of 10°C to 30°C (50°F to 86°F).
2. Standard operating temperature:
   - 10°C to 35°C (50°F to 95°F) is the standard operating temperature range at sea level. Derate the maximum allowable temperature by 1°C per 300 m (1°F per 547 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 by system configurations.
   - Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.
3. Expanded operating temperature:
   - For certain approved configurations (as shown in Table 12-2 Operating Temperature Specification Limits), the supported minimum ambient temperature at the inlet of the system can be expanded to 5°C to 10°C (41°F to 50°F) at sea level, with an altitude derating of 1.0°C per 175 m (1°F per 319 ft) above 900 m (2,953 ft) to a maximum of 3,050 m (10,000 ft).
   - For certain approved configurations (as shown in Table 12-2 Operating Temperature Specification Limits), the supported maximum ambient temperature at the inlet of the system can be expanded to 35°C to 45°C (95°F to 113°F) at sea level, with an altitude derating of 1°C per 125 m (1°F per 228 ft) above 900 m (2,953 ft) to a maximum of 3,050 m (10,000 ft).
   - Any fan failure or operations under the expanded operating temperature may lead to system performance degradation.
4. This document lists the LWAd of the product at a 23°C (73.4°F) ambient environment. All measurements are conducted in conformance with ISO 7779 (ECMA 74) and declared in conformance with ISO 9296 (ECMA 109). Contact your sales representative for more information.
5. The sound levels shown here were measured based on the specific configurations of a server. Sound levels vary by the server configuration, workload, ambient temperature, and other factors. These values are for reference only and subject to change without further notice.
6. 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.

6.2.3 Physical Specifications

Table 6-6 Physical Specifications

Item	Description
Dimensions	• With mounting ears: 482 × 174.5 × 841.5 mm (18.98 × 6.87 × 33.13 in.) (W × H × D) • Without mounting ears: 447 × 174.5 × 799.2 mm (17.60 × 6.87 × 31.46 in.) (W × H × D) • Outer packaging: 1,200 × 800 × 473 mm (47.24 × 31.50 × 18.62 in.) (L × W × H)
Weight	36 × 3.5-inch drive configuration (2 rear 2.5-inch drives included): • Net weight: 62.7 kg (138.23 lbs) • Gross weight: 92.4 kg (203.71 lbs) (including server, packaging box, rails and accessory box) 46 × 3.5-inch drive configuration (2 rear 2.5-inch drives included): • Net weight: 68.7 kg (151.46 lbs) • Gross weight: 98.8 kg (217.82 lbs) (including server, packaging box, rails and accessory box)

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 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 your 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
Windows Server 2019

7.2 Hardware Compatibility

7.2.1 CPU Specifications

The server supports one or two Intel Xeon Scalable processors.

Table 7-2 CPU Specifications

Model	Cores	Threads	Base Frequency (GHz)	Max. Turbo Frequency (GHz)	Cache (MB)	TDP (W)
8470	52	104	2.00	3.80	105	350
6454S	32	64	2.20	3.40	60	270
6430	32	64	2.10	3.40	60	270
8468V	48	96	2.40	3.80	97.5	330
8480+	56	112	2.00	3.80	105	350
8452Y	36	72	2.00	3.20	67.5	300
4410Y	12	24	2.00	3.90	30	150
5418Y	24	48	2.00	3.80	45	185
5420+	28	56	2.00	4.10	52.5	205
8462Y+	32	64	2.80	4.10	60	300
6442Y	24	48	2.60	4.00	60	225
6426Y	16	32	2.50	4.10	37.5	185
8468	48	96	2.10	3.80	105	350
8470Q	52	104	2.10	3.80	105	350
6438M	32	64	2.20	3.90	60	205
8592+	64	128	1.90	3.90	320	350
8580	60	120	2.00	4.00	300	350
8593Q	64	128	2.20	3.90	320	385
8570	56	112	2.10	4.00	300	350
8558	48	96	2.10	4.00	260	330
6530	32	64	2.10	4.00	160	270
8558U	48	96	2.00	4.00	260	300
8581V	60	120	2.00	3.90	300	270
8558P	48	96	2.70	4.00	260	350
6554S	36	72	2.20	4.00	180	270
8571N	52	104	2.40	4.00	300	300
8562Y+	32	64	2.80	4.10	60	300
6548Y+	32	64	2.50	4.10	60	250
6544Y	16	32	3.60	4.10	45	270
6542Y	24	48	2.90	4.10	60	250
6534	8	16	3.90	4.20	22.5	195
6538Y+	32	64	2.20	4.00	60	225
6526Y	16	32	2.80	3.90	37.5	195
5520+	28	56	2.20	4.00	52.5	205
5515+	8	16	3.20	4.10	22.5	165
4516Y+	24	48	2.20	3.70	45	185
4514Y	16	32	2.00	3.40	30	150
6558Q	32	64	3.20	4.10	60	350

Model	Cores	Threads	Base Frequency (GHz)	Max. Turbo Frequency (GHz)	Cache (MB)	TDP (W)
5512U	28	56	2.10	3.70	52.5	185
6548N	32	64	2.80	4.10	60	250
6538N	32	64	2.10	4.10	60	205

7.2.2 DIMM Specifications

Each processor supports up to 16 DDR5 RDIMMs, and the motherboard supports up to 32 DDR5 RDIMMs.

Table 7-3 DIMM Specifications

Type	Capacity (GB)	Frequency (MT/s)	Data Width	Organization
RDIMM	16	4,800	-	1R x8
RDIMM	32	4,800	-	2R x8
RDIMM	64	4,800	-	2R x4
RDIMM	16	5,600	-	1R x8
RDIMM	32	5,600	-	2R x8
RDIMM	64	5,600	-	2R x4

7.2.3 Drive Specifications

Table 7-4 Rear SSD Specifications

Type	Capacity	Max. Qty.
SATA SSD	240 GB	4
SATA SSD	480 GB	4
SATA SSD	960 GB	4
SATA SSD	1.92 TB	4
SATA SSD	3.84 TB	4

Table 7-5 Internal SATA M.2 SSD Specifications

Type	Capacity (GB)	Max. Qty.
SATA M.2 SSD	240	2
SATA M.2 SSD	480	2

Table 7-6 Rear SATA M.2 SSD Specifications

Type	Capacity (GB)	Max. Qty.
SATA M.2 SSD	240	2
SATA M.2 SSD	480	2

Table 7-7 Rear NVMe M.2 SSD Specifications

Type	Capacity	Max. Qty.
NVMe M.2 SSD	960 GB	2
NVMe M.2 SSD	1.92 TB	2

Table 7-8 U.2 NVMe SSD Specifications

Type	Capacity	Max. Qty.
U.2 NVMe SSD	960 GB	16
U.2 NVMe SSD	1.92 TB	16
U.2 NVMe SSD	3.84 TB	16

Table 7-9 HDD Specifications

Type	Speed in rpm	Capacity (TB)	Max. Qty.
3.5-Inch SAS HDD	7.2k	10	40
3.5-Inch SAS HDD	7.2k	12	40
3.5-Inch SAS HDD	7.2k	14	40
3.5-Inch SAS HDD	7.2k	16	40
3.5-Inch SATA HDD	7.2k	4	40
3.5-Inch SATA HDD	7.2k	6	40
3.5-Inch SATA HDD	7.2k	8	40
3.5-Inch SATA HDD	7.2k	10	40
3.5-Inch SATA HDD	7.2k	12	40
3.5-Inch SATA HDD	7.2k	14	40
3.5-Inch SATA HDD	7.2k	16	40
3.5-Inch SATA HDD	7.2k	18	40

7.2.4 SAS/RAID Card Specifications

Table 7-10 SAS/RAID Card Specifications

Type	Description
SAS Card	SAS_PM8222_SmartHBA_8_SAS3_PCIE3_MCTP
	SAS_PM8222_HBA_8_SAS3_PCIE3_MCTP
RAID Card	RAID_PM8204_RA_8_2GB_SAS3_PCIE3_MCTP
	RAID_PM8204_RA_8_4GB_SAS3_PCIE3_MCTP
	RAID_PM8254_RA_8_4GB_SAS4_PCIE4
	RAID_PM8254_RA_8_8GB_SAS4_PCIE4

7.2.5 NIC Specifications

Table 7-11 PCIe NIC Specifications

Type	Description	Speed (Gbps)	Port Qty.
PCIe NIC	NIC_Vostok_I350_1G_RJ_PCIEx4_4	1	4
	NIC_I_1G_I350-T4V2_RJ_PCIEx4_4_XR	1	4
	NIC_Vostok_X710_10G_LC_PCIEx8_2_M7	10	2
	NIC_Vostok_82599_10G_LC_PCIEx8_2	10	2
	NIC_Pyxis_X550_10G_RJ_PCIEx8_2_XR	10	2
	NIC_BROADCM_25G_57414_LC_PCIEx8_2_XR_42C	25	2
	NIC_M_25G_MCX631102AN_LC_PCIEx8_2_XR	25	2
	NIC_M_100G_MCX623106AN_LC_PCIEx16_2_XR	100	2

Table 7-12 OCP 3.0 Card Specifications

Type	Description	Speed (Gbps)	Port Qty.
OCP 3.0 Card	NIC_M_100G_MCX623436AN_LC_OCP3x16_2_XR	100	2

7.2.6 HBA/HCA Card Specifications

Table 7-13 HBA Card Specifications

Type	Description
HBA Card	HBA_E_0R1_LPE31000-AP_FC16G_PCIE
	HBA_E_8R2_LPE31002_FC16G_PCIE
	HBA_E_0R2_LPE35002_FC32G_PCIE
	HBA_QL_4R2_QLE2692-ISR-BK_FC16G_PCIE
	HBA_QL_8R2_QLE2740-ISR-BK_FC32G_PCIE
	HBA_QL_8R2_QLE2742-ISR-BK_FC32G_PCIE
	HBA_Marvell_0R2_QLE2772_FC32G_PCIE_4.0

Table 7-14 HCA Card Specifications

Type	Description	Speed (Gbps)	Port Qty.
HCA Card	HCA_M_1-HDR100_MCX653105A-ECAT_PCIE	100	1
	HCA_M_2-HDR100_MCX653106A-ECAT_PCIE	100	2
	HCA_M_2-QSFP_MCX653106A-HDAT_PCIE	200	2

7.2.7 PSU Specifications

The server supports up to 2 PSUs in 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 Platinum or Titanium rated with various output powers, allowing customers to choose as needed.

- The following rated 110 Vac to 230 Vac PSUs in 1+1 redundancy are supported:
  - 1,300 W Platinum PSU: 1,000 W (110 Vac), 1,300 W (230 Vac)
  - 1,600 W Platinum PSU: 1,000 W (110 Vac), 1,600 W (230 Vac)
  - 2,000 W Platinum PSU: 1,000 W (110 Vac), 2,000 W (230 Vac)
  - 2,700 W Platinum PSU: 1,200 W (110 Vac), 2,000 W (230 Vac)
  - 1,300 W Titanium PSU: 1,000 W (110 Vac), 1,300 W (230 Vac)
  - 1,600 W Titanium PSU: 1,000 W (110 Vac), 1,600 W (230 Vac)

- 2,000 W Titanium PSU: 1,000 W (110 Vac), 2,000 W (230 Vac)
- 2,700 W Titanium PSU: 1,200 W (110 Vac), 2,000 W (230 Vac)

CAUTION

- At a rated input voltage of 110 Vac, the output power of a 1,300/1,600/ 2,000 W PSU will be derated to 1,000 W.
- At a rated input voltage of 110 Vac, the output power of a 2,700 W PSU will be derated to 1,200 W.

Operating voltage range:

- 110 Vac: 90 Vac to 132 Vac
- 230 Vac: 180 Vac to 264 Vac

- The following rated -48 Vdc PSUs in 1+1 redundancy are supported:
  - 1,300 W PSU: 1,300 W (-48 Vdc)

  Operating voltage range:
  - -48 Vdc: -40 Vdc to -72 Vdc

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.

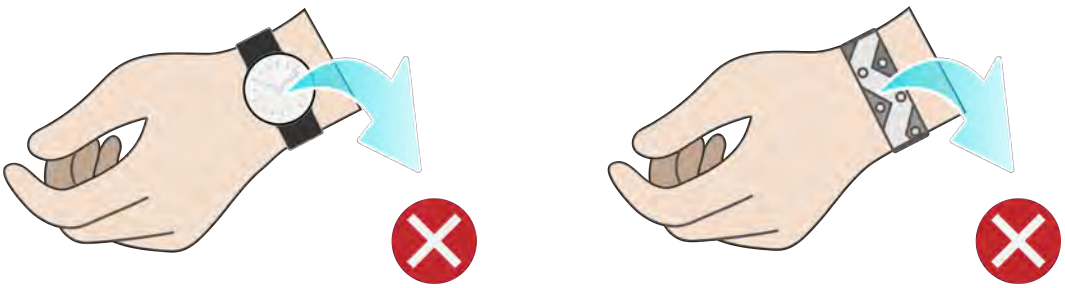
8.1.2 Personal Safety

- 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.

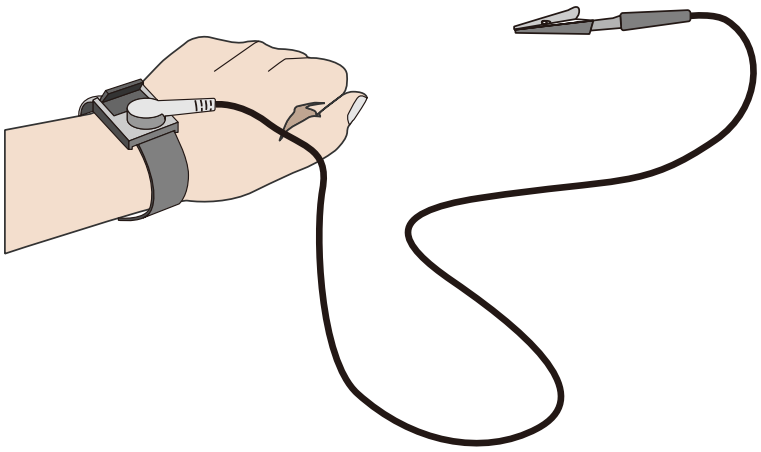
Figure 8-2 Removing Conductive Objects



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

1. Put your hand through an ESD wrist strap.
2. Tighten the strap buckle to ensure a snug fit.
3. 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 expansion 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
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	• Male: 15/33.08 • Female: 10/22.05

9 Limited Warranty

This limited warranty applies only to the original purchasers of our products who are direct customers or distributors of us (“Customer”).

We warrant all our hardware products, if properly used and installed, to be free from defects in material and workmanship within the warranty period. The term “Hardware Product” is limited to the hardware components and required firmware. The term “Hardware Product” DOES NOT include software applications or programs, and DOES NOT include products or peripherals that are not supplied by us. We may, at our discretion, repair or replace the defective parts. Repair or replacement parts may be new, used, or equivalent to new in performance and reliability. Repair or replacement parts are warranted to be free of defects in material or workmanship for ninety (90) calendar days or for the remainder of the warranty period of the product, whichever is longer.

Service offerings may vary by geographic region. Please contact your representative to identify service levels and needs for your region.

9.1 Warranty Service

Our warranty service includes 24 × 7 remote technical support, RMA (Return Material Authorization) Service, ARMA (Advanced Return Material Authorization) Service, 9 × 5 × NBD (Next Business Day) Onsite Service and 24 × 7 × 4 Onsite Service.

9.1.1 Remote Technical Support

The 24 × 7 remote technical support can be obtained through hotline, e-mail, and Service Portal*[1]. Through hotline and e-mail support, our engineers help customers diagnose the causes of malfunctions and provide solutions. Service Portal*[1] provides access to firmware, customized update files, and related manuals for Hardware Products. Customer may also access the Service Portal*[1] to submit an RMA request or an ARMA request for parts replacement or repair.

Information needed when requesting support:

- Contact name, phone number, e-mail address
- System serial number, part number, model and location (address) of the product needing service
- Detailed description of problem, logs (SELs and blackbox logs, and any other related logs from OS), screenshot of issue, pictures of damaged/faulty parts, etc.

9.1.2 RMA Service

Standard Replacement: When a hardware failure occurs, Customer may submit an RMA request to us via e-mail or Service Portal*[1]. We will review and approve the RMA submission at our own discretion, and provide an RMA number and return information that Customer may use to return the defective part(s) for the RMA service. We will ship out replacement part(s) within one (1) business day after receiving the defective part(s) and cover one-way shipment.

 NOTE

- Customer should return the defective parts in original packaging to our designated service center at their own expense.
- After our further diagnosing and testing, if the defective parts conform to our repair policy, we will ship out the repair or replacement parts at our own expense; otherwise, we will return the defective parts at Customer's expense.
- If Customer needs to designate a logistics company, allocation of the shipping cost to us/Customer will be redefined.

9.1.3 ARMA Service

Advanced Replacement: If a problem with our hardware products cannot be resolved via hotline or e-mail support and replacement part(s) are required, we will ship out replacement part(s) in advance within one (1) business day. Customer should return defective part(s) within five (5) business days after receiving the replacement(s). The shipping cost coverage varies by region. Contact your sales representative for details.

 NOTE

- Customer should return the defective parts in original packaging to our designated service center.
- We will ship out the replacement parts at our own expense after completing remote diagnosis.
- If Customer needs to designate a logistics company, allocation of the shipping cost to us/Customer will be redefined.

9.1.4 9 × 5 × NBD Onsite Service

When we ultimately determine that an onsite service call is required to repair or replace a defect, the call will be scheduled in accordance with the Response Time

Commitment. The response time is measured from the time when the remote troubleshooting is completed and logged to the arrival of a service engineer and parts to Customer location for repair.

NOTE

9 × 5 × NBD: Our service engineer typically arrives at the customer's data center on the next business day. Service engineers are available on local business day from 9:00 am to 6:00 pm local time. Calls received/dispatches after 5:00 pm local time will require an additional day for the service engineer to arrive.

9.1.5 24 × 7 × 4 Onsite Service

When we ultimately determine that an onsite service call is required to repair or replace a defect, the call will be scheduled in accordance with the Response Time Commitment. The response time is measured from the time when the remote troubleshooting is completed and logged to the arrival of a service engineer and parts to Customer location for repair.

NOTE

24 × 7 × 4: Our service engineer typically arrives at the customer site within 4 hours. Service engineers are available at any time, including weekends and local national holidays.

9.2 Our Service SLA

We offer a variety of Service Level Agreements (SLA)*[2] to meet customer requirements.

- RMA Service
- ARMA Service
- 9 × 5 × NBD Onsite Service
- 24 × 7 × 4 Onsite Service

9.3 Warranty Exclusions

We do not guarantee that there will be no interruptions or mistakes during the use of the products. We will not undertake any responsibility for the losses arising from any operation not conducted according to instructions intended for Hardware Products.

The Limited Warranty does not apply to

- expendable or consumable parts, such as, but not limited to, batteries or protective coatings that are designed to diminish over time, unless failure has occurred during DOA period due to a defect in material or workmanship;
- any cosmetic damage, such as, but not limited to, scratches, dents, broken plastics, metal corrosion, or mechanical damage, unless failure has occurred during DOA period due to a defect in material or workmanship;
- damage or defects caused by accident, misuse, abuse, contamination, improper or inadequate maintenance or calibration or other external causes;
- damage or defects caused by operation beyond the parameters as stipulated in the user documentation;
- damage or defects by software, interfacing, parts or supplies not provided by us;
- damage or defects by improper storage, usage, or maintenance;
- damage or defects by virus infection;
- loss or damage in transit which is not arranged by us;
- Hardware Products that have been modified or serviced by non-authorized personnel;
- any damage to or loss of any personal data, programs, or removable storage media;
- the restoration or reinstallation of any data or programs except the software installed by us when the product is manufactured;
- any engineering sample, evaluation unit, or non-mass production product that is not covered under warranty service;
- any solid-state drive (SSD) which has reached its write endurance limit.

In no event will we be liable for any direct loss of use, interruption of business, lost profits, lost data, or indirect, special, incidental or consequential damages of any kind regardless of the form of action, whether in contract, tort (including negligence), strict liability or otherwise, even if we have been advised of the possibility of such damage, and whether or not any remedy provided should fail of its essential purpose.

*1 Service Portal availability is subject to customer type and customer location. Please contact your representative to learn more.

*2 Not all SLA offerings are available at all customer locations. Some SLA offerings may be limited to geolocation and/or customer type. Please contact your representative to learn more.

10 System Management

10.1 Intelligent Management System BMC

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

BMC 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 BMC Features

Feature	Description
Management Interface	Supports extensive remote management interfaces for various server O&M scenarios. The supported interfaces include: • IPMI • SSH CLI • SNMP • HTTPS • Web GUI • Redfish • RESTful • Syslog

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	• Supports automatic crash screenshot and crash video recording (video needs to be enabled manually) to capture the last screen and video before crash. • Provides manual screenshot, which can quickly capture the screen for easy inspection at scheduled time.
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.
BMC Self-Diagnosis and Self-Recovery System	• Supports the reliable dual watchdog mechanism for hardware and software, enabling automatic restoration of BMC in case of BMC abnormality.

Feature	Description
	• Provides a thermal protection mechanism, which is automatically triggered when the BMC is abnormal to ensure that the fan operates at safe speeds to avoid system overheating. • Supports self-diagnosis of processors, memory modules, and storage devices of BMC, 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 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, provides more user roles to allow administrators to grant different privileges to O&M personnel.
Security Features	Adopts the industry-leading server security baseline standard V3.0. SSH, HTTPS, SNMP and IPMI use secure and reliable algorithms. BMC 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	To import and export the existing system configurations.

Feature	Description
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.
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	To set how the server operating system reacts under the BMC's control when AC power is reconnected to the server.
One-Key Erasing	To perform 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 10-2 InManage Features

Feature	Description
Home	Display of basic information (data centers, server rooms, cabinets, assets and alerts), quick addition of devices and custom home page
Assets	• Batch asset import, automatic asset discovery, and full lifecycle management of assets • 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 • Management of our general-purpose disk arrays and distributed storage devices • Management of network devices (switches, routers, etc.), security devices (firewalls, load balancers, etc.), cabinets and clouds • Management of data centers • Asset warranty information management, asset inventory reports for server acceptance, asset attribute expansion, etc.
Monitor	• Display of real-time alerts, history alerts, blocked alerts and events • Fault prediction of drives and memories • Custom inspection plan and inspection result management • Notification record viewing • Intelligent fault diagnosis and analysis, automatic fault reporting and repair ticket viewing • Trap management and Redfish management • Management of monitoring rules, such as alert rules, notification rules, blocking rules, alert noise reduction

Feature	Description
	rules, compression rules and fault reporting rules, and redefinition of the above rules.
Control	• Quick start of firmware update, OS installation, power management, drive data erasing and stress test • Batch firmware update (BMC/BIOS/RAID Card/NIC/Drive/HBA Card/MB CPLD/BP CPLD/PSU) • Batch firmware configuration (BMC/BIOS) • Batch RAID configuration and OS deployment for servers • Secure and quick drive data erasing • CPU and memory stress test • Automatic firmware baseline management • BMC and BIOS snapshot management • Repositories for update files
Energy Efficiency	• Overview of data center power consumption trend chart and carbon emission trend chart • Setting of server dynamic power consumption policies and minimum power consumption policies • Server temperature optimization, utilization optimization, power consumption characteristics analysis, power consumption prediction, load distribution, etc. • Carbon asset and carbon emission management
Log	• Fault log record management • Diagnosis record and diagnosis rule management
Topologies	• 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 • Network topologies

Feature	Description
Reports	• Management of warranty information reports, alert reports, asset reports, hardware reports and performance reports • Export of reports in .xlsx format
System	• Password management, alert forwarding and data dump • Customized InManage parameters
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 10-3 Features of InManage Tools

Feature	Description
InManage Kits	A lightweight automatic batch O&M tool for servers, mainly used for server deployment, routine maintenance, firmware update, fault handling, etc.
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	Operates under the OS and gets system asset and performance information via the in-band mode, providing users with more comprehensive server management capabilities
InManage Server Provisioning	Offers users with RAID configuration, intelligent OS installation, firmware update, hardware diagnosis, secure erasing and software upgrade, using the TF card as the carrier

11 Certifications

11.1 KR4266-X2-A0-R0-00

Table 11-1 Certifications

Country/Region	Certification	Mandatory/Voluntary
International	CB	Voluntary
EU	CE	Mandatory
US	FCC	Mandatory
	UL	Voluntary
	Energy Star	Voluntary
South Korea	E-Standby	Mandatory
	KC	Mandatory
EAEU	EAC/EAC RoHS	Mandatory

11.2 KR4266-X2-C0-R0-00

Table 11-2 Certifications

Country/Region	Certification	Mandatory/Voluntary
International	CB	Voluntary
EU	CE	Mandatory
US	FCC	Mandatory
	UL	Voluntary
	Energy Star	Voluntary
South Korea	E-Standby	Mandatory
	KC	Mandatory
EAEU	EAC/EAC RoHS	Mandatory

12 Appendix A

12.1 Operating Temperature Specification Limits

12.1.1 KR4266-X2-A0-R0-00

Table 12-1 Operating Temperature Specification Limits

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temp. 35°C (95°F)	Max. Operating Temp. 40°C (104°F)	Max. Operating Temp. 45°C (113°F)
24 × Front 3.5-Inch Drive + No Mid-Drive + 4 × Rear NVMe Drive (Upper 2U) + 12 × Rear 3.5-Inch Drive (Lower 2U) Configuration	All options supported (CPU TDP ≤165 W when configured with GPUs)	• All options supported (CPU TDP ≤165 W when configured with GPUs • L20/A100/H100 GPUs not supported	• GPUs not supported • Rear NVMe drives not supported • CPU TDP ≤165 W • DDR5 DIMM ≥128 GB not supported • Non-perforated chassis not supported	• GPUs not supported • CPU TDP ≤165 W • Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported Note: A perforated chassis indicates a chassis with air vents on the top cover and side walls.

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temp. 35°C (95°F)	Max. Operating Temp. 40°C (104°F)	Max. Operating Temp. 45°C (113°F)
24 × Front 3.5-Inch Drive + No Mid-Drive + 4 × Rear NVMe Drive (Upper 2U) + 12 × Rear NVMe Drive (Lower 2U) Configuration	• CPU TDP ≤205 W • Non-perforated chassis not supported	• CPU TDP ≤165 W • Non-perforated chassis not supported	• Passively-cooled GPUs not supported • CPU TDP ≤150 W • DDR5 DIMM ≥128 GB not supported • Non-perforated chassis not supported	• GPUs not supported • CPU TDP ≤165 W • Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported
24 × Front 3.5-Inch Drive + 6 × Middle 3.5-Inch Drive + 4 × Rear 3.5-Inch Drive (Upper 2U) + 12 × Rear 3.5-Inch Drive (Lower 2U) Configuration	• CPU TDP ≤165 W • DIMM quantity ≤24		• CPU TDP ≤150 W • DIMM quantity ≤24 • DDR5 DIMM ≥128 GB not supported	• GPUs not supported • CPU TDP ≤165 W • Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temp. 35°C (95°F)	Max. Operating Temp. 40°C (104°F)	Max. Operating Temp. 45°C (113°F)
				• Mid-drives not supported

12.1.2 KR4266-X2-C0-R0-00

Table 12-2 Operating Temperature Specification Limits

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temp. 35°C (95°F)	Max. Operating Temp. 40°C (104°F)	Max. Operating Temp. 45°C (113°F)
24 × Front 3.5-Inch Drive + No Mid-Drive + 4 × Rear NVMe Drive (Upper 2U) + 12 × Rear 3.5-Inch Drive (Lower 2U) + 5 × PCIe Expansion Card Configuration	All options supported	• L20/A100/H100 GPUs not supported	• Passively-cooled GPUs not supported • DDR5 DIMM ≥128 GB not supported • Non-perforated chassis not supported	• GPUs not supported • Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported Note: A perforated chassis indicates a chassis with air vents on the top cover and side walls.
24 × Front 3.5-Inch Drive + No Mid-Drive + 4 × Rear	Non-perforated chassis not supported	• Non-perforated	• Passively-cooled	• GPUs not supported

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temp. 35°C (95°F)	Max. Operating Temp. 40°C (104°F)	Max. Operating Temp. 45°C (113°F)
NVMe Drive (Upper 2U) + 12 × Rear NVMe Drive (Lower 2U) + 5 × PCIe Expansion Card Configuration		chassis not supported • L20/A100/ H100 GPUs not supported	GPUs not supported • DDR5 DIMM ≥128 GB not supported • Non-perforated chassis not supported	• Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported
24 × Front 3.5-Inch Drive + 6 × Middle 3.5-Inch Drive + 2 × Rear 3.5-Inch Drive (Upper 2U) + 12 × Rear 3.5-Inch Drive (Lower 2U) Configuration	DIMM quantity ≤24		• DIMM quantity ≤24 • DDR5 DIMM ≥128 GB not supported	• GPUs not supported • Up to 8 DIMMs with a capacity no higher than 32 GB per DIMM • Rear drives not supported • Non-perforated chassis not supported • Mid-drives not supported

12.2 Model

Table 12-3 Models

Certified Model	Description
KR4266-X2-A0-R0-00	Global
KR4266-X2-C0-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

Table 12-4 Sensor List

Sensor	Description	Sensor Location
Inlet_Temp	Chassis air inlet temperature	Left mounting ear
Outlet_Temp	Chassis air outlet temperature	Motherboard
PVCCIN_CPUx	CPUx core temperature	CPUx x indicates the CPU number with a value of 0 - 1
PVCCFA_FIVR_CPUx	UPI I/O voltage	CPUx x indicates the CPU number with a value of 0 - 1
PVCCINFAON_CPUx	CPUx boot voltage	CPUx x indicates the CPU number with a value of 0 - 1
PVCCFA_EHV_CPUx	Controller voltage	CPUx x indicates the CPU number with a value of 0 - 1
PVCCD_HV_CPUx	Memory controller voltage	CPUx x indicates the CPU number with a value of 0 - 1
CPUx_VR_Temp	CPUx VR temperature	CPUx x indicates the CPU number with a value of 0 - 1
PSUx_VIN	PSUx input voltage	PSUx

Sensor	Description	Sensor Location
		x indicates the PSU number with a value of 0 - 1
PSUx_VOUT	PSUx output voltage	PSUx x indicates the PSU number with a value of 0 - 1
SYS_12V	System 12 V voltage	Motherboard
SYS_5V	System 5 V voltage	Motherboard
SYS_3V3	System 3.3 V voltage	Motherboard
RTC_Battery	Motherboard RTC battery voltage	Motherboard
PVNN_MAIN_CPUx	CPUx voltage	Motherboard x indicates the CPU number with a value of 0 - 1
P12V_CPUx_DIMM	CPUx DIMM voltage	Motherboard x indicates the CPU number with a value of 0 - 1
PVNN_PCH_STBY	PCH core voltage	Motherboard
P1V05_PCH_STBY	PCH logic voltage	Motherboard
CPUx_Temp	CPUx temperature	CPUx x indicates the CPU number with a value of 0 - 1
CPUx_DTS	CPUx margin temperature[1] before it reaches the throttling frequency	CPUx x indicates the CPU number with a value of 0 - 1
CPUx_DIMM_T	The maximum temperature among DDR5 DIMMs of CPUx	CPUx x indicates the CPU number with a value of 0 - 1
PCH_Temp	PCH temperature	Motherboard
PSU_Inlet_Temp	PSU temperature (Max. temp. will be taken)	PSUs
Total_Power	Total power	Motherboard
FAN_Power	Total fan power	Fan modules
PSUx_PIN	PSUx input power	PSUx x indicates the PSU number with a value of 0 - 1
PSUx_POUT	PSUx output power	PSUx x indicates the PSU number with a value of 0 - 1
CPU_Power	Total CPU power	Motherboard

Sensor	Description	Sensor Location
Memory_Power	Total memory power	Motherboard
FANx_Speed	6038 FANx speed	FANx x indicates the fan number with a value of 0 - 8
FANx_F_Speed	6056 FANx speed	FANx x indicates the fan number with a value of 0 - 8
FANx_R_Speed		
RAID_Temp	PCIe RAID card temperature (Max. temp. will be taken in case of multiple PCIe RAID cards)	PCIe RAID card
HDD_MAX_Temp	Maximum temperature among all HDDs	HDD
OCP_RAID_Temp	RAID mezz card temperature	RAID mezz card
NVME_Temp	Maximum temperature among all NVMe drives	NVMe drive
OCP_NIC_SFP_Temp	OCP card SFP module temperature	Optical module
PCIe_NIC_SFP_T	PCIe NIC SFP module temperature	Optical module
OCP_NIC_Temp	OCP card temperature (Max. temp. will be taken in case of multiple OCP cards)	OCP 3.0 card
PCIE_NIC_Temp	PCIe NIC temperature (Max. temp. will be taken in case of multiple PCIe NICs)	PCIe NIC
MEM_ResourceRate	Memory utilization rate	-
CPU_ResourceRate	CPU utilization rate	-
GPUx_Temp	GPUx core temperature	GPUx x indicates the GPU number with a value of 0 - 7
CPUx_Status	CPUx status	CPUx x indicates the CPU number with a value of 0 - 1
SEL_Status	SEL status	-
PSU_Mismatch	PSU model mismatch	-
PSU_Redundant	PSU redundancy status	-

Sensor	Description	Sensor Location
FANx_Status	FANx status	FANx x indicates the fan number with a value of 0 - 8
FAN_Redundant	Fan redundancy status	-
PCIe_Status	The status of PCIe device (including PCIe buses, slots and expansion cards)	-
POST_Status	System firmware and POST status	-
PWR_CAP_Fail	Power capping failure	-
CPUx_CnDm	Status of the DIMM with the same silkscreen on the motherboard	CPUx DIMM • x indicates the CPU number with a value of 0 - 1 • n indicates the memory channel number under CPUx with a value of 0 - 7 • m indicates the DIMM number with a value of 0 - 1
CPU_Config	CPU configuration status (mixing of CPUs, or CPU0 not installed)	-
PSUx_Status	PSUx status	PSUx x indicates the PSU number with a value of 0 - 1
k_HDDx	Drive	Drive • k denotes front, internal and rear, with a value of F/I/R respectively • x indicates the drive number
ACPI_PWR	ACPI power status	-
Sys_Health	System health status	-

Sensor	Description	Sensor Location
BMC_Boot_Up	BMC boot up complete	-
BIOS_Boot_Up	BIOS boot up complete	-
Intrusion	Detects chassis-opening activity	Top cover
LeakageStatus	Leak detection	Leak detection cable
ME_FW_Status	ME health status	-
TPM_Verify	TPM status verification	-
Air_Press	Air pressure	Left mounting ear
PWR_On_TMOUT	Motherboard power failure	Motherboard
System_Error	System error	Motherboard
CPUx_PMEM_DIMM_T	NVDIMM temperature	CPUx x indicates the CPU number with a value of 0 - 1
BMC_Status	BMC status	-
FPGA_Card_Temp	PCIe FPGA temperature (Max. temp. will be taken in case of multiple PCIe FPGA cards)	FPGA card
HBA_Temp	PCIe HBA temperature (Max. temp. will be taken in case of multiple PCIe HBA cards)	HBA card
PSUx_IOUT	PSUx output current	PSUx x indicates the PSU number with a value of 0 - 1
PSUx_Fan_Status	PSUx fan status	PSUx x indicates the PSU number with a value of 0 - 1
FANx_Present	FANx presence	FANx x indicates the fan number with a value of 0 - 8
PCIe_HCA_SFP_T	HCA card optical module temperature (Max. temp. will be taken in case of multiple HCA cards)	Optical module
PCIe_HCA_Temp	PCIe HCA card temperature (Max. temp. will be taken in case of multiple PCIe HCA cards)	HCA card

Note:

1: Indicates the difference between the current temperature and the maximum temperature.

13 Appendix B Acronyms and Abbreviations

13.1 A - E

A

AC	Alternating Current
ACPI	Advanced Configuration and Power Interface
AI	Artificial Intelligence
AQSIQ	Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
ARMA	Advanced Return Material Authorization
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
CECP	China Energy Conservation Program
CEN	European Committee for Standardization
CLI	Command-Line Interface
CMOS	Complementary Metal-Oxide-Semiconductor Transistor
CPLD	Complex Programming Logic Device
CPU	Central Processing Unit

CRPS	Common Redundant Power Supplies

D

DC	Direct Current
DC-SCM	Datacenter-ready Secure Control Module
DDR5	Double Date Rate 5
DIMM	Dual In-Line Memory Module
DL	Deep Learning
DOA	Dead on Arrival
DPC	DIMM per Channel
DRAM	Dynamic Random Access Memory

E

EBG	Emmitsburg
ECC	Error-Correcting Code
ECMA	European Computer Manufacturer Association
ESD	Electrostatic Discharge
E1.S	Enterprise & Data Center SSD Form Factor 1 Unit Short

13.2 F - J

F

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

FW	Firmware

G

GPU	Graphics Processing Unit
GUI	Graphical User Interface

H

HBA	Host Bus Adapter
HBM	High-Bandwidth Memory
HCA	Host Channel Adapter
HDD	Hard Disk Drive
HH	Half-Height
HHHL	Half-Height Half-Length
HSE	Health and Safety Executive
HTML	Hyper Text Markup Language
HTTPS	Hyper Text Transfer Protocol Secure

I

I/O	Input/Output
ID	Identification
IIPC	Intel Intelligent Power Capability
IOPS	Input/Output Operations Per Second
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface
ISO	International Organization for Standardization

13.3 K - O

K

KC	Korea Certification
KVM	Keyboard Video Mouse

L

LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LP	Low Profile

M

MCIO	Mini Cool Edge IO
ME	Management Engine

N

NBD	Next Business Day
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

13.4 P - T

P

PCH	Platform Controller Hub
PCIe	Peripheral Component Interconnect express
PDB	Power Distribution Board
PDU	Power Distribution Unit
PFR	Platform Firmware Resilience
PID	Proportional, Integral, Derivative
POST	Power-on Self-test
PSU	Power Supply Unit
PUE	Power Usage Effectiveness
PXE	Pre-boot Execution Environment

R

RAID	Redundant Arrays of Independent Drives
RAS	Reliability, Availability, and Serviceability
RDIMM	Registered Dual In-line Memory Module
RH	Relative Humidity
RMA	Return Material Authorization
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
SFP	Small Form-factor Pluggable
SGPIO	Serial General Purpose Input/Output
SLA	Service Level Agreement
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

13.5 U - Z

U

UART	Universal Asynchronous Receiver Transmitter
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
VPP	Virtual Pin Port
VRD	Voltage Regulator Down
VROC	Virtual RAID on CPU