White Paper for
KR2180V2 Series Servers

Powered by AMD Processors

For KR2180-E2-A0-R0-00

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Applicable Model

Model	Maintenance	Cooling
KR2180-E2-A0-R0-00	Rear access	Air cooling

Technical Support

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Preface

Abstract

This document describes the KR2180V2 AMD-based server's appearance, features, performance parameters, and software and hardware compatibility, providing in-depth information of KR2180V2.

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	2025/04/28	Initial release

Table of Contents

1 Product Overview

The KR2180V2 AMD-based system is a cost-effective, scalable 2U single-socket rack server powered by the AMD EPYC 9004 series processor. Featuring multiple cores, high base frequency, large cache, and high scalability, it maximizes the performance of the single processor. In a 2U space, it maximizes the storage and expansion capabilities, making it particularly suitable for scenarios such as big data, distributed storage, video transcode, and HPC.

Figure 1-1 24 × 2.5-Inch Drive Configuration

Figure 1-2 25 × 2.5-Inch Drive Configuration

Figure 1-3 12 × 3.5-Inch Drive Configuration

Figure 1-4 24 × E3.S Drive Configuration

2 Features

2.1 Scalability and Performance

Table 2-1 Scalability and Performance

Technical Feature	Description
4th Gen AMD EPYC Processor (Genoa)	• Supports up to 128 cores, a TDP up to 400 W, a max boost frequency up to 4.40 GHz, and an L3 cache up to 384 MB per core, delivering unrivalled processing performance. - Supports 1 processor with up to 128 cores and 256 threads, maximizing the concurrent execution of multi-threaded applications. - Increases the capacity of L2 cache. Each core has its own 1 MB L2 cache. - AMD Turbo Core technology brings you an intelligent self-adaption system. It allows the CPU cores to exceed the processor TDP at peak workload and run at the max boost frequency. - Hyper-threading technology allows every processor core to run multiple threads (up to 2 threads per core) concurrently, improving the performance of multi-threaded applications. - AMD Virtualization (AMD-V) technology integrates hardware-level virtualization features, allowing the operating system to better utilize the hardware for virtualization workloads. - Advanced Vector Extensions 512 (AVX-512), an instruction set, can significantly improve the floating-point performance for compute-intensive applications.
DDR5 ECC DIMMs	Up to 24 DDR5 ECC DIMMs (4,800 MT/s at 1 DPC, RDIMMs), delivering superior speed, high availability, and a memory capacity up to 3,072 GB.
Flexible Drive Configuration	Provides elastic and scalable storage solutions to meet different capacity and update requirements.

Technical Feature	Description
All-SSD Configuration	Brings higher I/O performance over all-HDD configuration or HDD-SSD mixing configuration.
12 Gbps Serial Attached SCSI (SAS)	Doubles the internal storage data transfer rate of 6 Gbps SAS, maximizing the performance of storage I/O-intensive applications.
Infinity Fabric Technology	IOD and PCIe 5.0 controllers are integrated into processors, significantly shortening I/O latency and enhancing overall system performance.
PCIe Expansion	Supports up to 8 PCIe 5.0 expansion slots.
OCP Expansion	Two OCP 3.0 slots that can flexibly support 1/10/25/40/100/200 Gb hot-plug OCP 3.0 cards.

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.
Reliability	• SSDs are much more reliable than traditional HDDs, increasing system uptime. • The BMC monitors system parameters in real time and sends alerts in advance, enabling technicians to take corresponding measures in time to minimize system downtime.
Availability	• The LEDs on front and rear panels 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 6 hot-swap fan modules with N+1 redundancy.
Maintenance Efficiency	The BMC management network port on the rear panel supports remote BMC O&M, improving O&M efficiency.

2.3 Manageability and Security

Table 2-3 Manageability and Security

Technical Feature	Description
Remote Management	The BMC monitors 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. Notes: The NC-SI port supports the following features: • The NC-SI port can be bonded to any network port of the OCP 3.0 card or of PCIe NIC that supports NC-SI. • Supports the enablement/disablement and configuration of Virtual Local Area Network ID (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.
AMD Secure Processor	AMD Secure Processor (ASP), a microcontroller within the AMD processor that provides enhanced security through hardware-based resistance to malicious software attacks.
AMD SEV	AMD Secure Encrypted Virtualization (SEV) allows applications to run in isolated space, helping prevent malicious theft and modification of critical codes and data.
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)	Reduces attacks from malicious software on the BIOS flash region.

Technical Feature	Description
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.
Chassis Intrusion Detection	Enhances physical security.

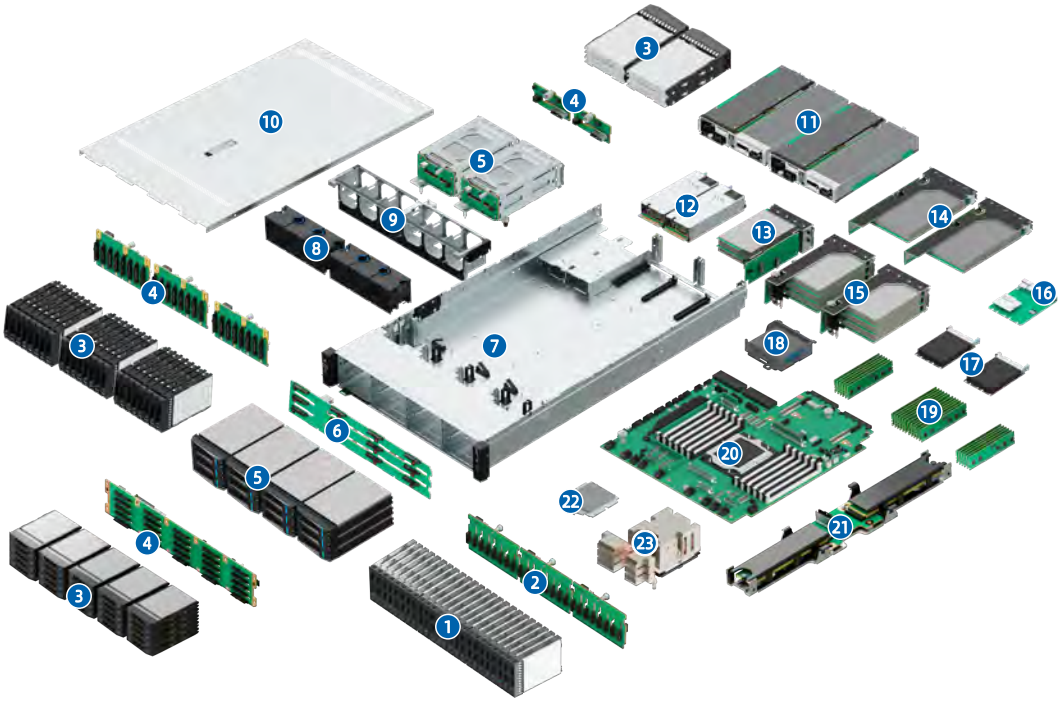
2.4 Energy Efficiency

Table 2-4 Energy Efficiency

Technical Feature	Description
80 Plus Platinum/Titanium PSUs	Equipped with 80 Plus Platinum/Titanium power supply units (PSUs) (550 W to 2,000 W), with power efficiency up to 94% at a load of 50%.
1+1 Redundant Power Supplies	Supports AC/DC power input for improved power conversion efficiency.
VRD Power Supply	Features the high-efficiency single-board voltage regulator down (VRD) solution, reducing DC-DC conversion loss.
Intelligent Fan Speed PID Control and CPU Frequency Scaling	Supports Proportional-Integral-Derivative (PID) intelligent fan speed control and intelligent CPU frequency scaling, conserving energy.
System Cooling Design	Offers a fully-optimized system cooling design with energy-efficient cooling fans, lowering energy consumption from system cooling.
Power Capping and Power Control	Provides power capping and power control measures.
Staggered Spin-up of Drives	Supports staggered spin-up of drives, reducing power consumption during startup.
Low Energy Consumption	The power consumption of an SSD is 80% lower than that of a traditional HDD.

3 System Parts Breakdown

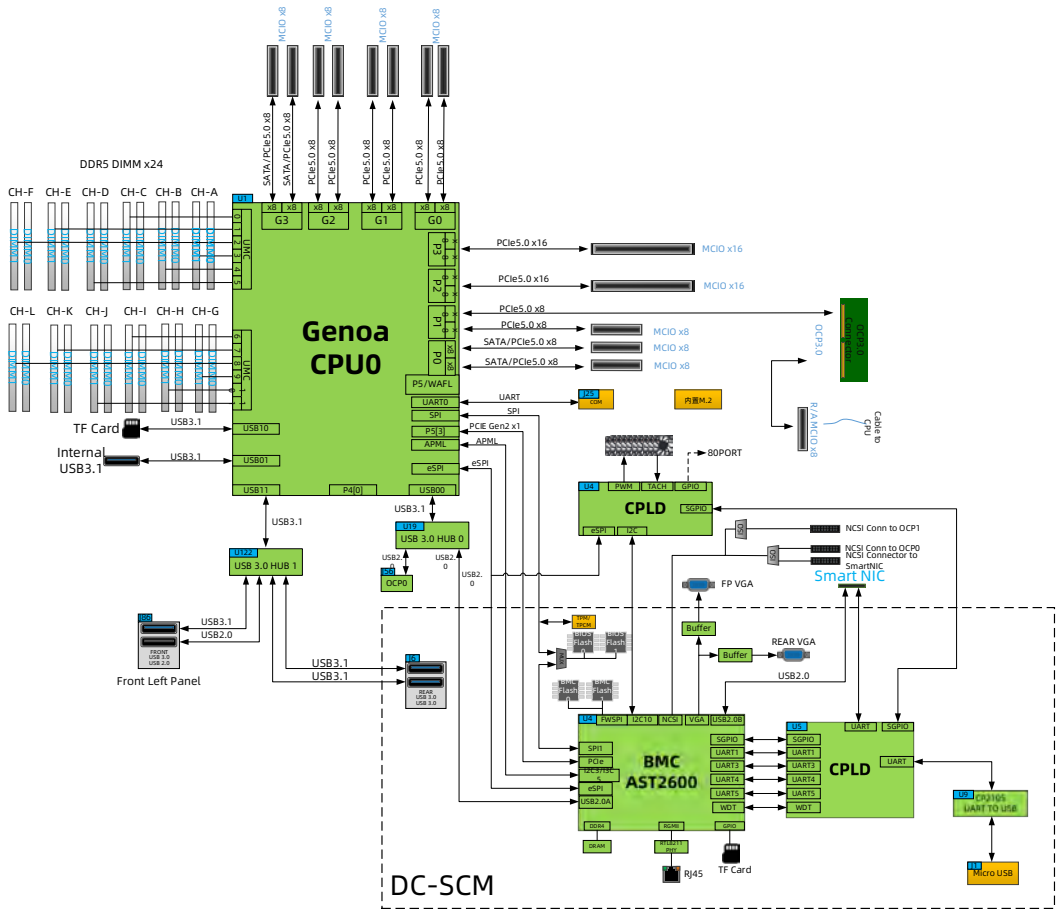
Figure 3-1 Exploded View



Item	Feature	Item	Feature
1	E3.S SSD Module	13	PCIe Riser Module
2	E3.S Drive Backplane	14	PCIe Riser Module (with an FH card)
3	2.5-Inch Drive Module	15	PCIe Riser Module
4	2.5-Inch Drive Backplane	16	DC-SCM Board
5	3.5-Inch Drive Module	17	OCP 3.0 Card
6	3.5-Inch Drive Backplane	18	Super-Capacitor
7	Chassis	19	DIMMs
8	Fan Module	20	Motherboard
9	Fan Cage	21	M.2 SSD Module
10	Top Cover	22	CPU
11	GPU	23	Heatsink
12	PSU	-	-

4 System Logical Diagram

Figure 4-1 System Logical Diagram



- The 4th Gen AMD EPYC processor (Genoa), with a TDP up to 400 W.
- Up to 24 DDR5 DIMMs.
- Supports 2 PCIe 5.0 MCIO x16 connectors, 11 PCIe 5.0 MCIO x8 connectors, and 2 OCP 3.0 slots (one of which is onboard).
- Onboard SATA can be directly connected to CPU PCIe P0/G3; the motherboard supports up to 32 SATA connectors, with a maximum speed of 6 Gbps (SATA 3.0).
- The motherboard has the ability to expand add-in high-performance graphics cards; the DC-SCM board integrates a 2D graphics controller with 16 MB of video memory, and the maximum resolution of the display controller on the DC-SCM board is 1,920 × 1,200 32 bpp at 60 Hz.

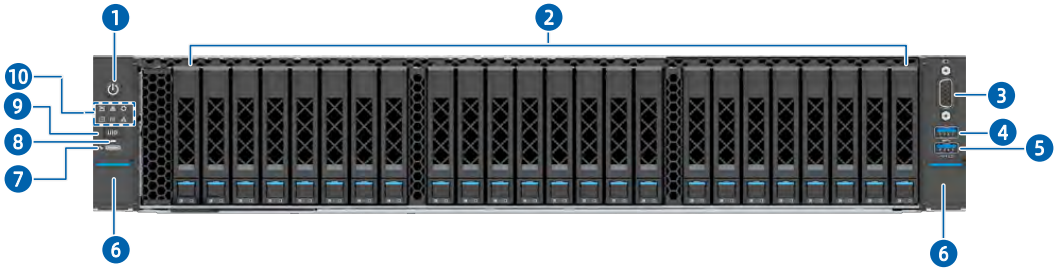
- The PCIe RAID card is connected to CPU0 via the PCIe bus, and is connected to the drive backplane via the SAS signal cable. Multiple local storage configurations are supported through different drive backplanes.

5 Hardware Description

5.1 Front Panel

5.1.1 24 × 2.5-Inch Drive Configuration

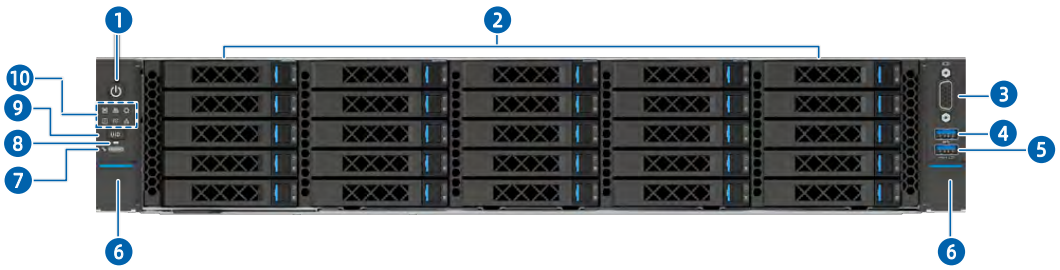
Figure 5-1 Front View



Item	Feature	Item	Feature
1	Power Button and LED	6	Ear Latch
2	2.5-Inch Drive Bay	7	USB Type-C Port
3	VGA Port	8	USB Type-C Port Status LED
4	USB 3.0 Port	9	UID/BMC RST Button and LED
5	USB 2.0/LCD Port	10	LEDs

5.1.2 25 × 2.5-Inch Drive Configuration

Figure 5-2 Front View



Item	Feature	Item	Feature
1	Power Button and LED	6	Ear Latch
2	2.5-Inch Drive Bay	7	USB Type-C Port
3	VGA Port	8	USB Type-C Port Status LED

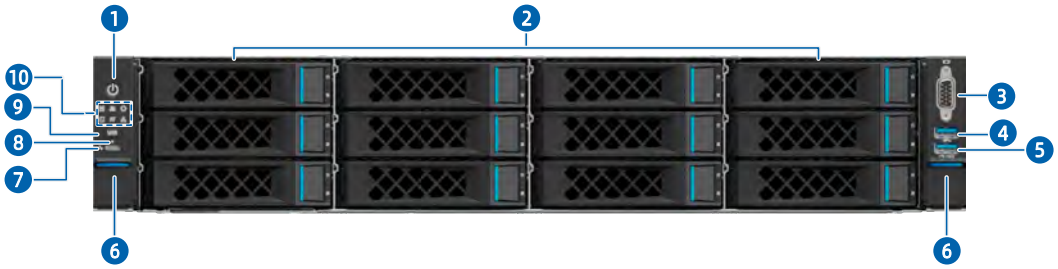
4	USB 3.0 Port	9	UID/BMC RST Button and LED
5	USB 2.0/LCD Port	10	LEDs

5.1.3 12 × 3.5-Inch Drive Configuration

IMPORTANT

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

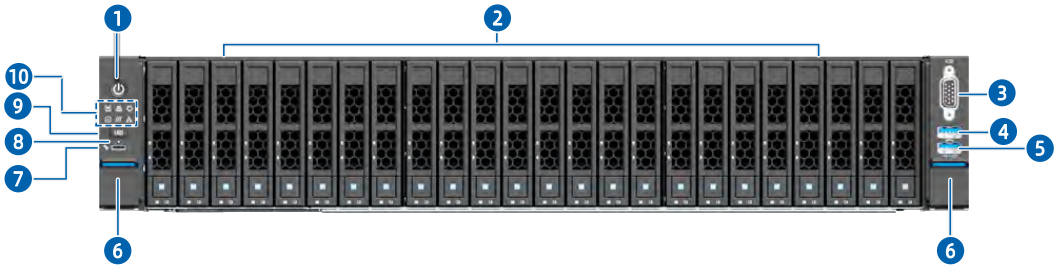
Figure 5-3 Front View



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

5.1.4 24 × E3.S Drive Configuration

Figure 5-4 Front View



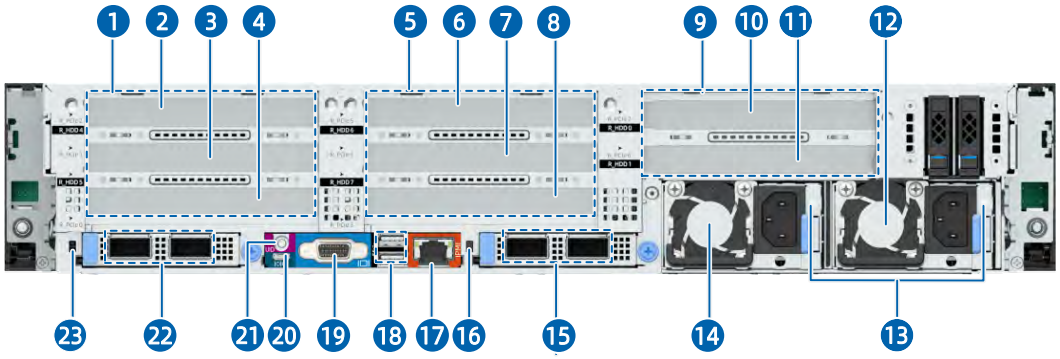
Item	Feature	Item	Feature

1	Power Button and LED	6	Ear Latch
2	E3.S Drive Bay	7	USB Type-C Port
3	VGA Port	8	USB Type-C Port Status LED
4	USB 3.0 Port	9	UID/BMC RST Button and LED
5	USB 2.0/LCD Port	10	LEDs

5.2 Rear Panel

5.2.1 8 × PCIe Card Configuration

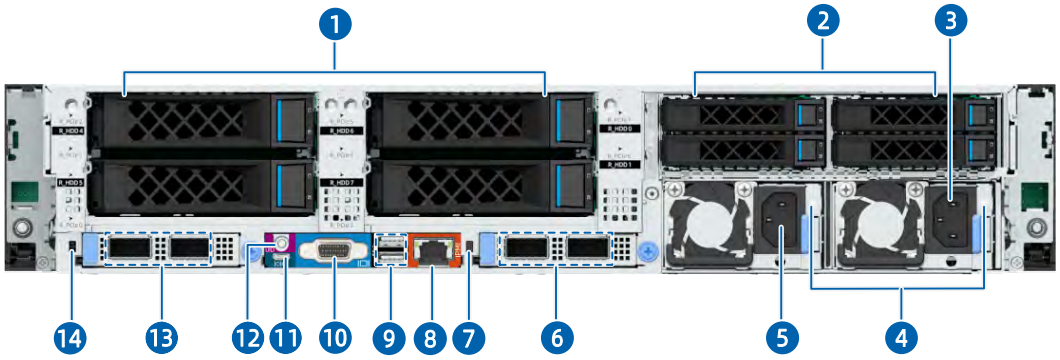
Figure 5-5 Rear View



Item	Feature	Item	Feature
1	PCIe Riser Module 0	13	PSU LED
2	PCIe Slot 2	14	PSU0
3	PCIe Slot 1	15	OCP 3.0 Card 1
4	PCIe Slot 0	16	OCP 3.0 Card 1 Hot-Plug Button and LED
5	PCIe Riser Module 1	17	BMC Management Network Port
6	PCIe Slot 5	18	USB 3.0 Port
7	PCIe Slot 4	19	VGA Port
8	PCIe Slot 3	20	System/BMC Serial Port (Micro USB)
9	PCIe Riser Module 2	21	UID/BMC RST Button and LED
10	PCIe Slot 7	22	OCP 3.0 Card 0
11	PCIe Slot 6	23	OCP 3.0 Card 0 Hot-Plug Button and LED
12	PSU1	-	-

5.2.2 4 × 3.5-Inch Drive + 4 × 2.5-Inch Drive Configuration

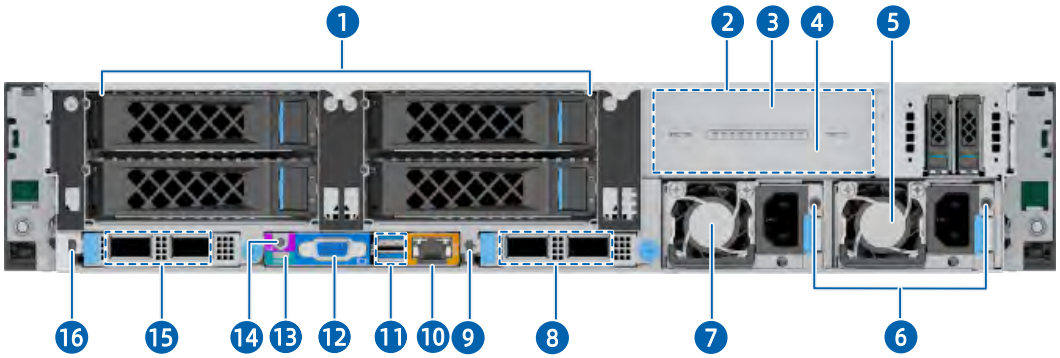
Figure 5-6 Rear View



Item	Feature	Item	Feature
1	3.5-Inch Drive Bay	8	BMC Management Network Port
2	2.5-Inch Drive Bay	9	USB 3.0 Port
3	PSU1	10	VGA Port
4	PSU LED	11	System/BMC Serial Port (Micro USB)
5	PSU0	12	UID/BMC RST Button and LED
6	OCP 3.0 Card 1	13	OCP 3.0 Card 0
7	OCP 3.0 Card 1 Hot-Plug Button and LED	14	OCP 3.0 Card 0 Hot-Plug Button and LED

5.2.3 4 × 3.5-Inch Drive + 2 × PCIe Card Configuration

Figure 5-7 Rear View

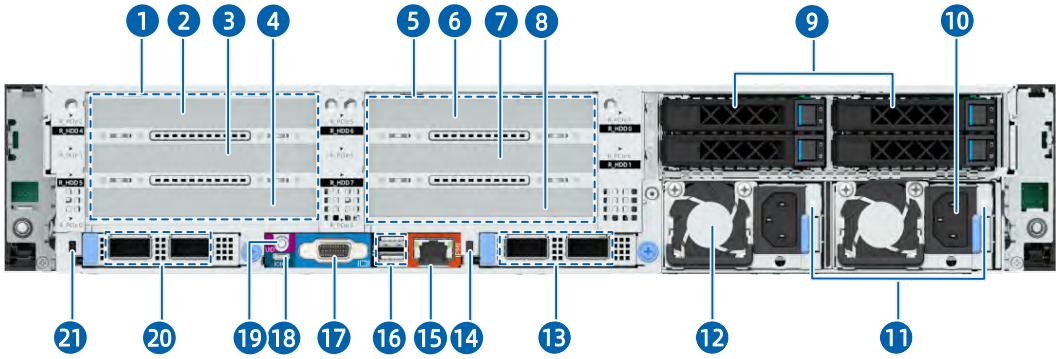


Item	Feature	Item	Feature
1	3.5-Inch Drive Bay	9	OCP 3.0 Card 1 Hot-Plug Button and LED
2	PCIe Riser Module 0	10	BMC Management Network Port

Item	Feature	Item	Feature
3	PCIe Slot 0	11	USB 3.0 Port
4	PCIe Slot 1	12	VGA Port
5	PSU1	13	System/BMC Serial Port (Micro USB)
6	PSU LED	14	UID/BMC RST Button and LED
7	PSU0	15	OCP 3.0 Card 0
8	OCP 3.0 Card 1	16	OCP 3.0 Card 0 Hot-Plug Button and LED

5.2.4 4 × 2.5-Inch Drive + 6 × PCIe Card Configuration

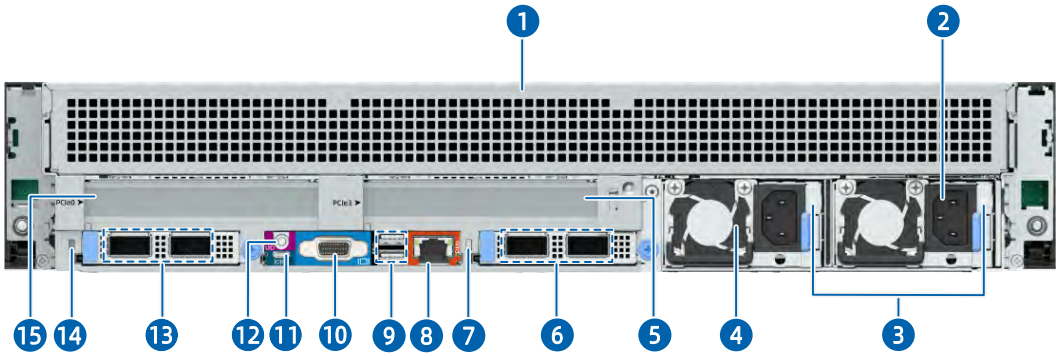
Figure 5-8 Rear View



Item	Feature	Item	Feature
1	PCIe Riser Module 0	12	PSU0
2	PCIe Slot 2	13	OCP 3.0 Card 1
3	PCIe Slot 1	14	OCP 3.0 Card 1 Hot-Plug Button and LED
4	PCIe Slot 0	15	BMC Management Network Port
5	PCIe Riser Module 1	16	USB 3.0 Port
6	PCIe Slot 5	17	VGA Port
7	PCIe Slot 4	18	System/BMC Serial Port (Micro USB)
8	PCIe Slot 3	19	UID/BMC RST Button and LED
9	2.5-Inch Drive Bay	20	OCP 3.0 Card 0
10	PSU1	21	OCP 3.0 Card 0 Hot-Plug Button and LED
11	PSU LED	-	-

5.2.5 2 × PCIe Card + 4 × GPU Configuration

Figure 5-9 Rear View

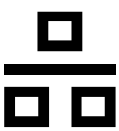


Item	Feature	Item	Feature
1	GPU	9	USB 3.0 Port
2	PSU1	10	VGA Port
3	PSU LED	11	System/BMC Serial Port (Micro USB)
4	PSU0	12	UID/BMC RST Button and LED
5	PCIe Slot 3	13	OCP 3.0 Card 0
6	OCP 3.0 Card 1	14	OCP 3.0 Card 0 Hot-Plug Button and LED
7	OCP 3.0 Card 1 Hot-Plug Button and LED	15	PCIe Slot 0
8	BMC Management Network Port	-	-

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

Icon	Feature	Description
		- Press and hold the button for 6 seconds to force a shutdown from the power-on state
	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, etc.
	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.

Icon	Feature	Description
	UID/BMC RST Button and LED	• Solid blue = The UID LED is activated by the UID button or via the BMC • Press and hold the button for 6 seconds to force the BMC to reset
-	USB Type-C Port Status LED	• Connects to a terminal (PC or phone): - Off = Port not connected to a terminal (PC or phone) - Blinking green (2 Hz) for 3 seconds and then off = Port function has been disabled - Solid green = Port connected to a terminal (PC or phone) • Connects to a USB storage device: - Off = Port not connected to a USB storage device - Blinking red (1 Hz) = Job has failed or has been completed with an error reported - Blinking green (2 Hz) = Job in progress - Blinking green (2 Hz) 5 times and then off = Port function has been disabled - Solid green = Job has been completed
-	OCP 3.0 Card Hot-Plug Button and LED	• OCP 3.0 card hot-plug LED: - Off = OCP card is powered off - Blinking green = OCP card is getting ready for hot-plugging or OCP card is being identified after being inserted - Solid green = OCP card is powered on • OCP 3.0 card hot-plug button:

Icon	Feature	Description
		- With the LED solid on, press and release the button to power off the OCP card. - With the LED off and the OCP 3.0 card installed, press and release the button to power on the OCP card.

5.4 Port Description

Table 5-2 Port Description

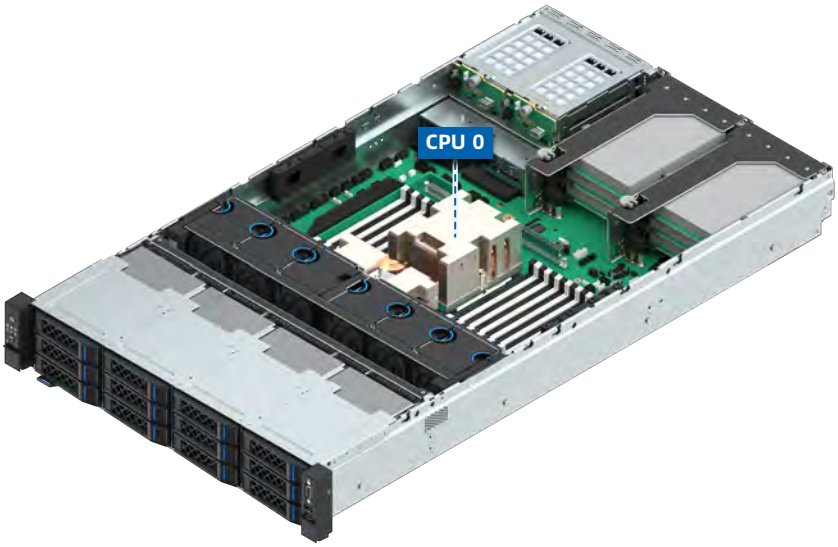
Feature	Description
VGA Port	Enables you to connect a display terminal
USB 3.0 Port	Enables you to connect a USB 3.0/2.0 device
USB 2.0/LCD Port	Enables you to connect a USB 2.0 device or LCD device to the system
BMC/System Serial Port	• Enables you to debug and monitor the BMC • Enables you to debug and monitor the system
BMC Management Network Port	Enables you to manage the server Note: It is a Gigabit Ethernet port that supports 100/1,000 Mbps auto-negotiation.
OCP 3.0 Network Port	Enables you to connect the system to the network

5.5 Processor

- The server supports 1 processor.

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

Figure 5-10 Processor Location



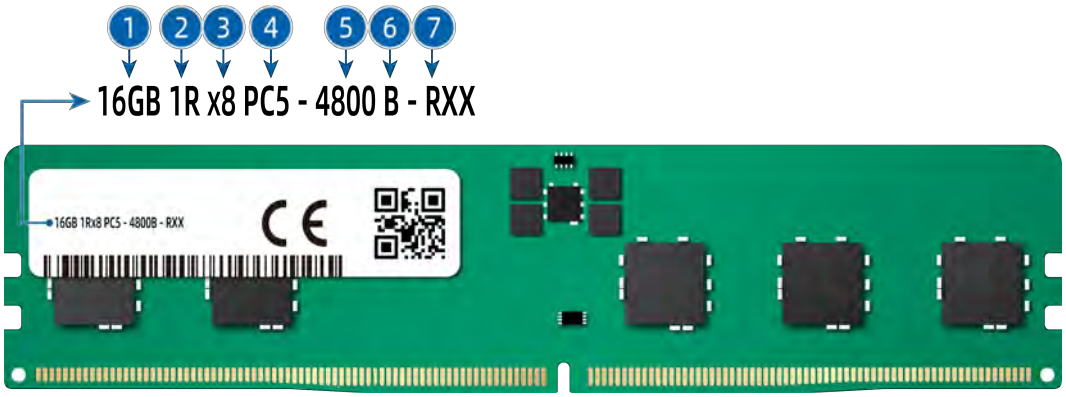
5.6 Memory

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 5-11 DIMM Identification



Item	Description	Example
1	Capacity	• 16 GB • 32 GB • 64 GB • 128 GB

Item	Description	Example
		• 256 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 24 DIMM slots.

Within a channel, populate the DIMM slot with its silk screen ending with D1 first. For instance, within CPU0 Channel A, populate CPU0_CAD1 first. To install DIMMs, refer to the recommended DIMM population rules.

Table 5-3 DIMM Slot List

CPU	Channel ID	Silk Screen
CPU0	Channel A	CPU0_CAD0
		CPU0_CAD1
	Channel B	CPU0_CBD0
		CPU0_CBD1
	Channel C	CPU0_CCD0
		CPU0_CCD1
	Channel D	CPU0_CDD0
		CPU0_CDD1
	Channel E	CPU0_CED0

CPU	Channel ID	Silk Screen
		CPU0_CED1
	Channel F	CPU0_CFD0
		CPU0_CFD1
	Channel G	CPU0_CGD0
		CPU0_CGD1
	Channel H	CPU0_CHD0
		CPU0_CHD1
	Channel I	CPU0_CID0
		CPU0_CID1
	Channel J	CPU0_CJD0
		CPU0_CJD1
	Channel K	CPU0_CKD0
		CPU0_CKD1
	Channel L	CPU0_CLD0
		CPU0_CLD1

3. Compatibility

Refer to the following rules to select the DDR5 DIMMs.

IMPORTANT

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

- DDR5 DIMMs can be used with AMD EPYC processors (Genoa). The maximum memory capacity supported is identical for different CPU models.
- The total memory capacity is the sum of the capacities of all DDR5 DIMMs.

NOTE

Maximum number of DIMMs supported per channel ≤ Maximum number of ranks supported per channel ÷ Number of ranks per DIMM.

Table 5-4 DDR5 DIMM Specifications

Item		Value			
Capacity per DDR5 DIMM (GB)		16	32	64	128
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[1]		24	24	24	24
Maximum capacity of DDR5 DIMMs supported in a server (GB)[2]		384	768	1,536	3,072
Actual speed (MT/s)	1DPC[3]	4,800	4,800	4,800	4,800
	2DPC	3,600	3,600	3,600	3,600

Notes:

1. The maximum number of DDR5 DIMMs supported is based on 2DPC. The number is halved for 1 DPC.
2. It indicates the maximum memory capacity supported when all the DIMM slots are populated with DDR5 DIMMs.
3. DIMM Per Channel (DPC) is the number of DIMMs per memory channel.

The above information 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 patrol scrubbing mode
  - Follow the general population rules.

5. DIMM Slot Layout

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

Figure 5-12 DIMM Slot Layout

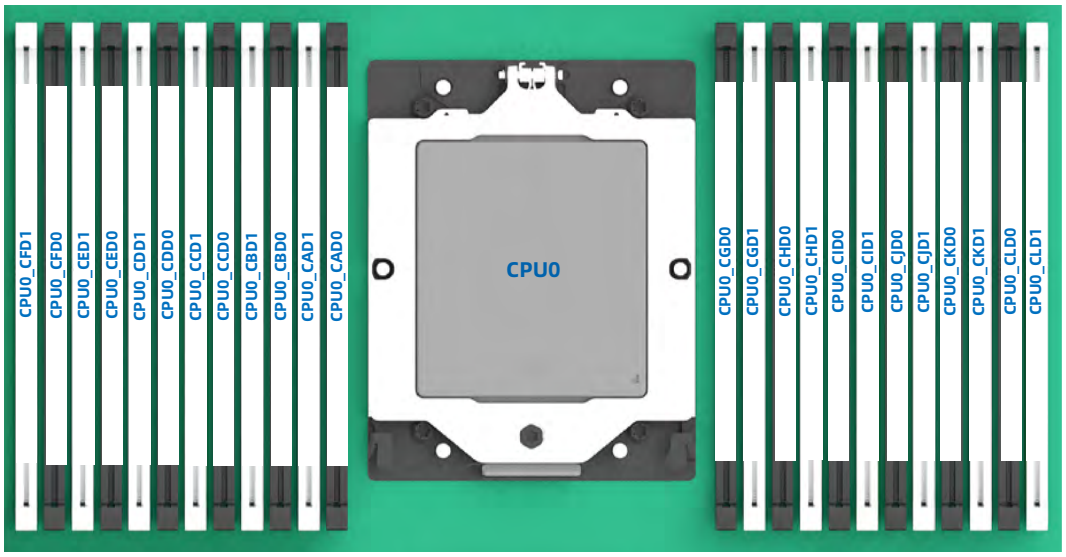


Table 5-5 DDR5 DIMM Population Rules (Single-CPU Configuration)

DDR QTY	CPU0																							
	CAD0	CAD1	CBD0	CBD1	CCD0	CCD1	CDD0	CDD1	CED0	CED1	CFD0	CFD1	CGD0	CGD1	CHD0	CHD1	CID0	CID1	CJD0	CJD1	CKD0	CKD1	CLD0	CLD1
1		•																						
2		•												•										
4		•				•								•				•						
6		•		•		•								•		•		•						
8		•		•		•				•				•		•		•				•		
10		•		•		•		•		•				•		•		•		•		•		
12		•		•		•		•		•		•		•		•		•		•		•		•
16	•	•	•	•	•	•			•	•			•	•	•	•	•	•			•	•		
20	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•		
24	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

5.7 Storage

5.7.1 Drive Configurations

NOTE

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

Table 5-6 Drive Configurations

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
24 × 2.5-Inch Drive Config.	24 × 2.5-inch drive: Drive bays with physical drive No. 0 to 23 support SAS/SATA/NVMe drives	4 × 2.5-inch SAS/SATA/NVMe drive	M.2 SSD: Configured through the internal M.2 adapter that supports two SATA/PCIe M.2 SSDs	• SAS/SATA drive: SAS/RAID card • NVMe drive or internal M.2 SSD: directly connected to the CPU
25 × 2.5-Inch Drive Config.	25 × 2.5-inch drive: Drive bays with physical drive No. 0 to 20 support SAS/SATA drives only and those with physical drive No. 21 to 24 support SAS/SATA/NVMe drives only	4 × 2.5-inch SAS/SATA drive	M.2 SSD: Configured through the internal M.2 adapter that supports two SATA/PCIe M.2 SSDs	• SAS/SATA drive: SAS/RAID card • NVMe drive or internal M.2 SSD: directly connected to the CPU
12 × 3.5-Inch Drive Config. (A 3.5-inch drive tray can accommodate a 2.5-inch drive.)	12 × 3.5-inch drive: Drive bays with physical drive No. 0 to 11 support SAS/SATA drives only (12 × 2.5-inch drive: Drive bays with physical drive No. 0 to 11 support SAS/SATA/NVMe drives)	4 × 3.5-inch SAS/SATA drive or 4 × 2.5-inch SAS/SATA/NVMe drive	M.2 SSD: Configured through the internal M.2 adapter that supports two SATA/PCIe M.2 SSDs	• SAS/SATA drive: SAS/RAID card or directly connected to the CPU • Internal M.2 SSD: directly connected to the CPU

Configuration	Front Drives	Rear Drives	Internal Drives	Drive Management Mode
24 × E3.S Drive Config.	24 × E3.S SSD: Drive bays with physical drive No. 0 to 23 support E3.S SSDs only	4 × 2.5-inch SAS/SATA drive	M.2 SSD: Configured through the internal M.2 adapter that supports two SATA/PCIe M.2 SSDs	• E3.S SSD: directly connected to the CPU • Internal M.2 SSD: directly connected to the CPU

5.7.2 Drive Numbering

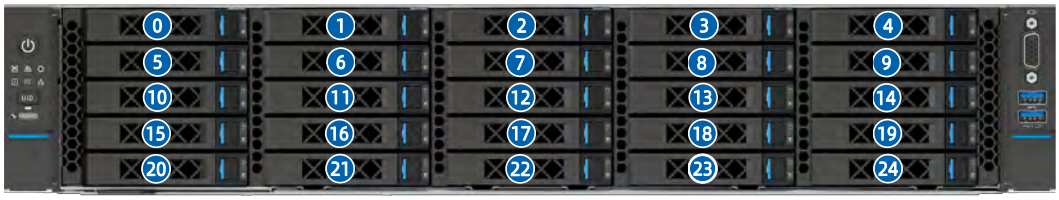
1. 24 × 2.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-13 Drive Numbering

Configuration	Physical Drive No.	Drive No. Identified by the BMC	Front/Rear	Drive No. Identified by the 8i RAID Card
24 × SAS/SATA	0 to 7	0 to 7	Front	0 to 7
	8 to 15	8 to 15	Front	8 to 15
	16 to 23	16 to 23	Front	16 to 23
24 × NVMe	0 to 23	0 to 23	Front	-

2. 25 × 2.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-14 Drive Numbering



Configuration	Physical Drive No.	Drive No. Identified by the BMC	Front/Rear	Drive No. Identified by the 8i RAID Card
25 × SAS/SATA	0 to 7	0 to 7	Front	0 to 7
	8 to 15	8 to 15	Front	8 to 15
	16 to 23	16 to 23	Front	16 to 23
	24	24	Front	24
25 × NVMe	0 to 24	0 to 24	Front	-

3. 12 × 3.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-15 Drive Numbering

Configuration	Physical Drive No.	Drive No. Identified by the BMC	Front/Rear	Drive No. Identified by the 8i RAID Card
12 × SAS/SATA	0 to 7	0 to 7	Front	0 to 7
	8 to 11	8 to 11	Front	8 to 11
12 × NVMe	0 to 11	0 to 11	Front	-

4. 24 × E3.S Drive Configuration

Figure 5-16 Drive Numbering

Configuration	Physical Drive No.	Drive No. Identified by the BMC	Front/Rear	Drive No. Identified by the RAID Card
24 × E3.S	0 to 23	0 to 23	Front	-

5.7.3 Drive LEDs

1. SAS/SATA Drive LEDs

Figure 5-17 SAS/SATA Drive LEDs

Activity LED (①)	Locator/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	Off	Off		Drive present and in use
Blinking	Solid pink			Copyback/Rebuild in progress
Solid on	Solid on	Off		Drive selected but not in use
Blinking	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 5-18 NVMe Drive LEDs

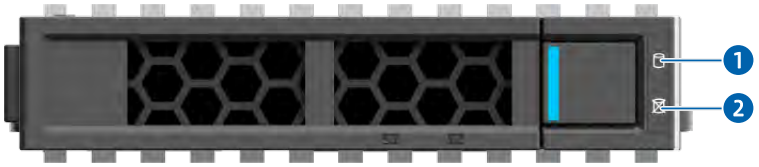
The NVMe drive LED can be lit up.

Table 5-7 NVMe Drive LED Description

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

3. E3.S SSD LEDs

Figure 5-19 E3.S SSD LEDs



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

Activity LED (①)	Locator/Error LED (②)		Description
Green	Blue	Red	
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 NICs as needed.
- For specific NIC options, consult your local sales representative or refer to 7.2 Hardware Compatibility.

5.9 I/O Expansion

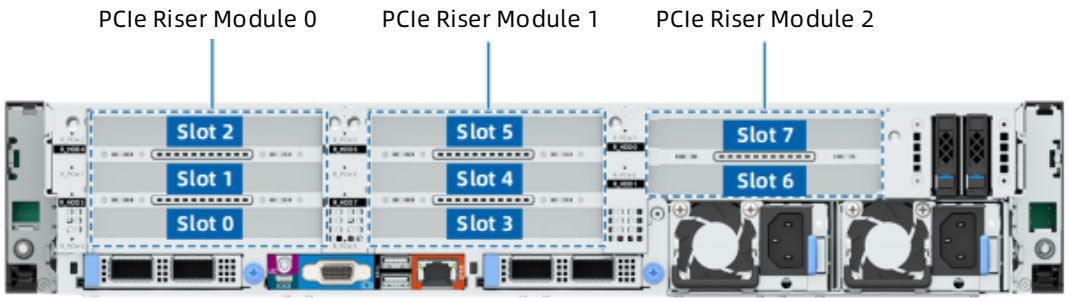
5.9.1 PCIe Expansion Cards

The PCIe expansion cards provide system expansion capabilities.

- The server supports up to 8 PCIe 5.0 expansion slots 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.

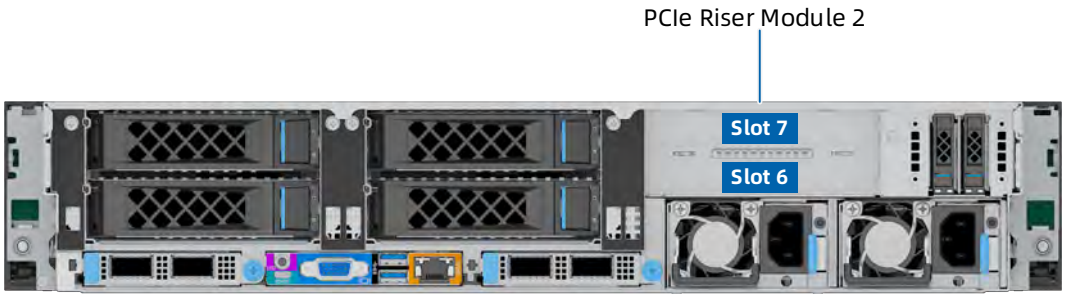
5.9.2 PCIe Slot Locations

Figure 5-20 PCIe Slot Locations - 8 × PCIe Slot Configuration



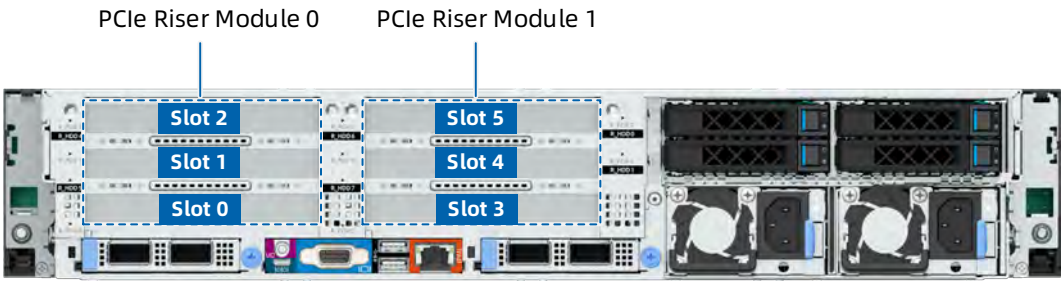
- Slot 0, slot 1 and slot 2 reside in PCIe riser module 0.
- Slot 3, slot 4 and slot 5 reside in PCIe riser module 1.
- Slot 6 and slot 7 reside in PCIe riser module 2.

Figure 5-21 PCIe Slot Locations - 2 × PCIe Slot + 4 × 3.5-Inch Drive Configuration



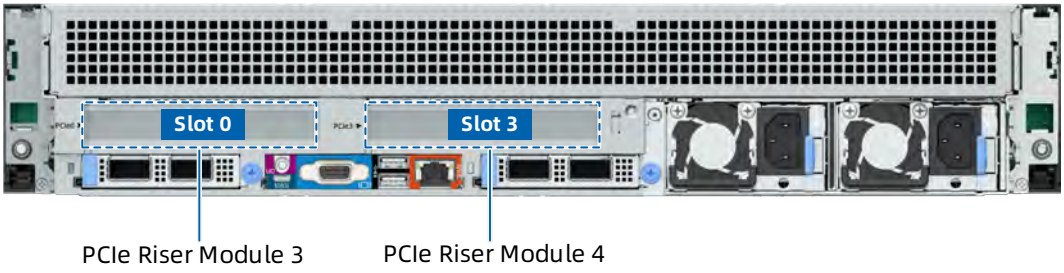
- Slot 6 and slot 7 reside in PCIe riser module 2.

Figure 5-22 PCIe Slot Locations - 6 × PCIe Slot + 4 × 2.5-Inch Drive Configuration



- Slot 0, slot 1 and slot 2 reside in PCIe riser module 0.
- Slot 3, slot 4 and slot 5 reside in PCIe riser module 1.

Figure 5-23 PCIe Slot Locations - 2 × PCIe Slot + 4 × GPU Configuration



- 4 dual-slot GPUs are installed in the upper 1U space.
- Slot 0 resides in PCIe riser module 3 in the lower-left 1U space. It can be populated with an FHHL PCIe expansion card.
- Slot 3 resides in PCIe riser module 4 in the lower-left 1U space. It can be populated with an FHHL PCIe expansion card.

5.9.3 PCIe Riser Modules

Figure 5-24 PCIe Riser Module 0/1 (Three PCIe x16 Slots)

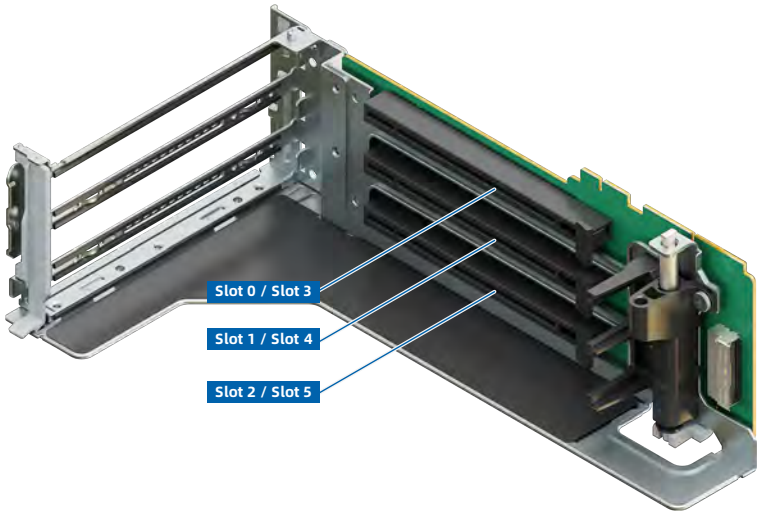


Figure 5-25 PCIe Riser Module 2 (Two PCIe x16 Slots)

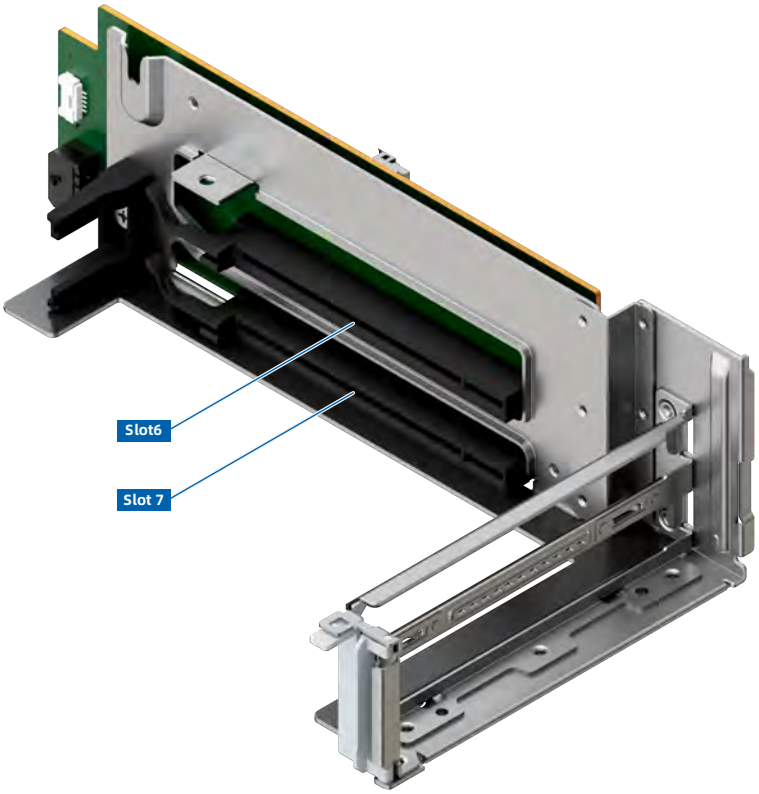
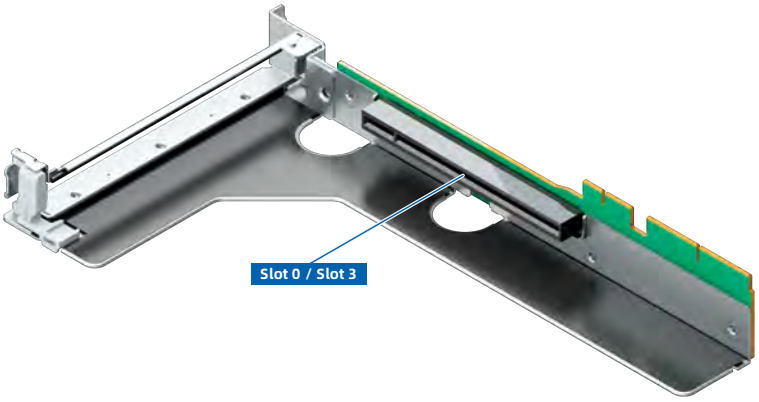


Figure 5-26 PCIe Riser Module 3/4 (One PCIe x16 Slot)



5.9.4 PCIe Slot Description

Models with the rear PCIe riser module.

Table 5-8 PCIe Slot Description - Standard 8-Slot Configuration

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 0	CPU0	PCIe 4.0/5.0	x16	x8	P3AB	FHHL
Slot 1	CPU0	PCIe 4.0/5.0	x16	x8	P3CD	Full-height 3/4-length
Slot 2	CPU0	PCIe 4.0/5.0	x16	x16	G3	Full-height 3/4-length
Slot 3	CPU0	PCIe 4.0/5.0	x16	x8	P2AB	FHHL
Slot 4	CPU0	PCIe 4.0/5.0	x16	x8	P2CD	Full-height 3/4-length
Slot 5	CPU0	PCIe 4.0/5.0	x16	x16	G0	Full-height 3/4-length
Slot 6	CPU0	PCIe 4.0/5.0	x16	x16	P0	Full-height 3/4-length
Slot 7	CPU0	PCIe 4.0/5.0	x16	x16	G1	Full-height 3/4-length
OCP 3.0 Slot	CPU0	PCIe 4.0/5.0	x16	x16	G2	SFF OCP 3.0
OCP 3.0 Slot	CPU0	PCIe 4.0/5.0	x16	x8/x16	P1AB/P1ABCD	SFF OCP 3.0

Table 5-9 PCIe Slot Description - GPU Configuration

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 0	CPU0	PCIe 4.0/5.0	x16	x8	P3	FHHL

PCIe Slot	Owner	PCIe Standard	Connector Width	Bus Width	Port No.	Form Factor
Slot 3	CPU0	PCIe 4.0/5.0	x16	x8	P2	FHHL
OCP 3.0 Slot	CPU0	PCIe 4.0/5.0	x16	x8/x16	P1AB/P1ABCD	SFF OCP 3.0

5.10 PSUs

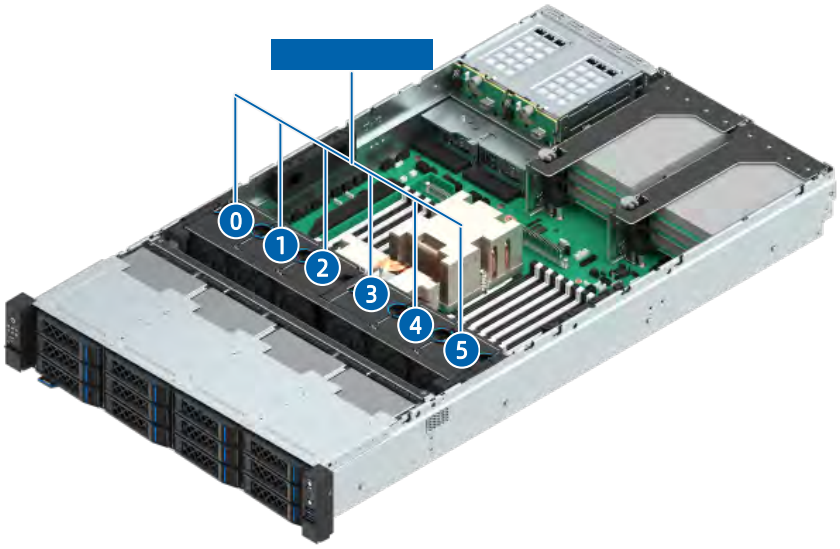
- The server supports 1 or 2 PSUs.
- The server supports AC or DC power input.
- The PSUs are hot-swappable.
- When 2 PSUs are configured, the PSUs are 1+1 redundant.
- The server must use PSUs bearing the same part number (P/N code).
- The PSUs feature short-circuit protection.

Figure 5-27 PSU Locations

5.11 Fan Modules

- The server supports 6 fan modules. Users can select 6038 or 6056 fans based on the configuration.
- The fan modules are hot-swappable.
- The server supports fans in N+1 redundancy, which means that the server can continue working properly when a single fan fails.
- The server supports intelligent fan speed control.
- The server must use fan modules bearing the same part number (P/N code).

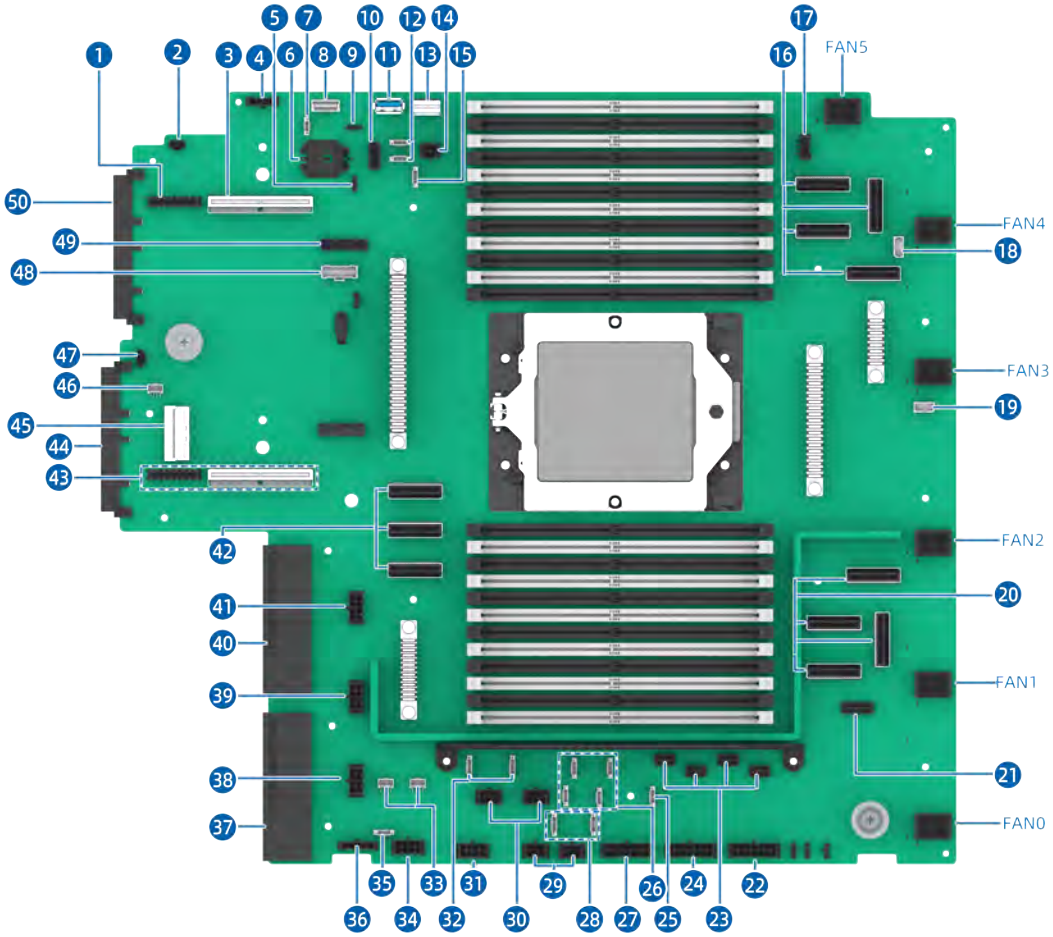
Figure 5-28 Fan Module Locations



5.12 Boards

5.12.1 Motherboard

Figure 5-29 Motherboard Layout



Item	Feature	Item	Feature
1	Riser Power Connector	26	Drive BP I²C Connector
2	OCP 3.0 Card 0 Hot-Plug Button and LED Connector	27	GPU Riser Power Connector
3	MCIO x16 Connector	28	Drive Riser I²C Connector
4	Smart NIC Power Connector	29	GPU Riser Power Connector
5	NMI Connector	30	GPU Riser Power Connector
6	Button Cell Battery Socket	31	GPU Power Connector

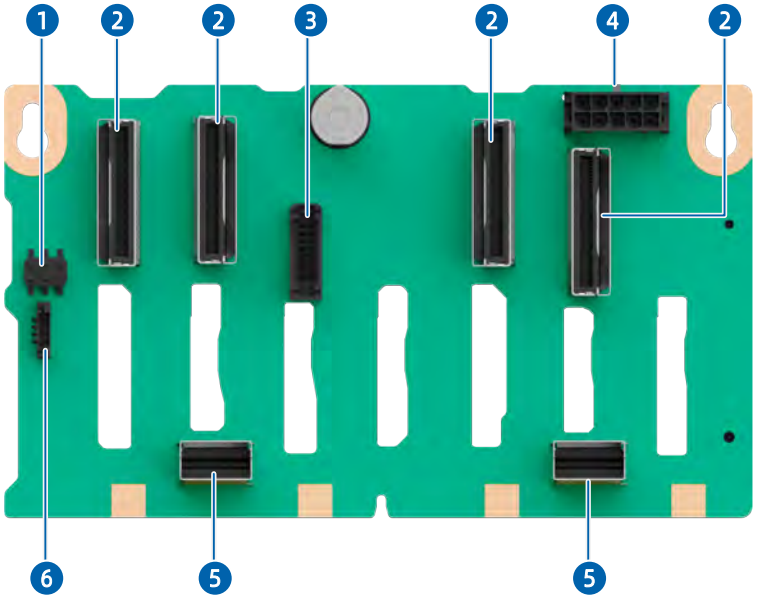
Item	Feature	Item	Feature
7	Smart NIC UART Connector	32	Riser I²C Connector
8	M.2 Riser Sideband Connector	33	Leak Detection Connector
9	CMOS Jumper	34	Mid-Drive Power Connector
10	VPP Connector	35	Drive BP I²C Connector
11	USB 3.0 Port	36	Capacitor Board Power Connector
12	Drive BP I²C Connector	37	PSU1 Connector
13	Right Control Panel Connector	38	GPU Power Connector
14	OCP 3.0 Card 0 Power Connector	39	GPU Power Connector
15	Drive BP I²C Connector 4	40	PSU0 Connector
16	MCIO x8 Connector	41	GPU Power Connector
17	Inlet Temperature Sensor Connector	42	MCIO x8 Connector
18	Intrusion Detection Connector	43	Riser Power Connector
19	Intrusion Detection Connector	44	OCP 3.0 Card 1 Expansion Connector
20	MCIO x8 Connector	45	OCP 3.0 Card 1 Connector
21	Left Control Panel Connector	46	IPMB Connector
22	Front Drive BP Power Connector	47	OCP 3.0 Card 1 Hot-Plug Button and LED Connector
23	Drive BP SGPIO Connector	48	NC-SI Connector
24	Front Drive BP Power Connector	49	OCP 3.0 Card 0 NC-SI Connector
25	Drive BP I²C Connector 0	50	DC-SCM Connector

5.12.2 Drive Backplanes

1. Front Drive Backplanes

- 24 × 2.5-Inch SAS/SATA/NVMe Drive Configuration

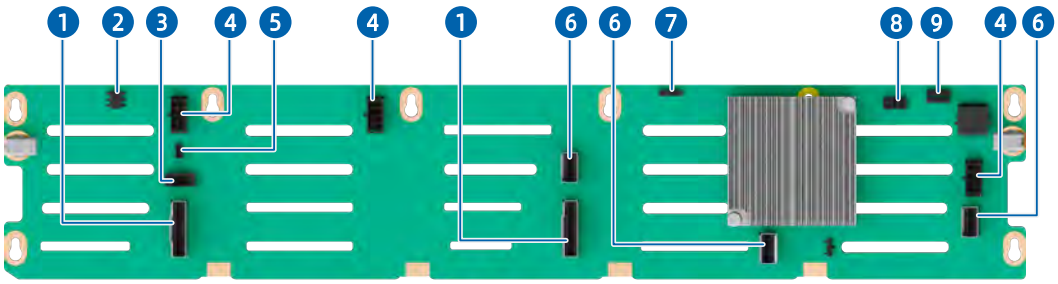
Figure 5-30 8 × 2.5-Inch SAS/SATA/NVMe Drive Backplane



Item	Feature	Item	Feature
1	CPLD JTAG Connector	4	Drive BP Power Connector
2	MCIO x8 Connector	5	Slimline x4 Connector
3	VPP Connector	6	BMC_I²C Connector

- 25 × 2.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-31 25 × 2.5-Inch SAS/SATA/NVMe Drive Backplane

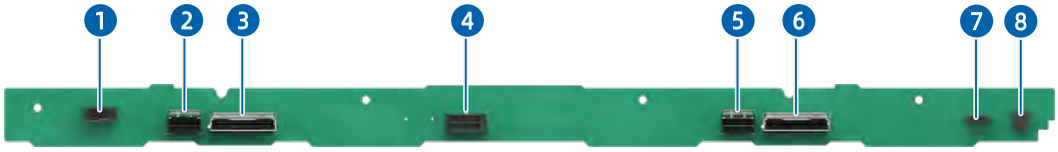


Item	Feature	Item	Feature
1	Slimline x8 Connector	6	Slimline x4 Connector
2	CPLD JTAG Connector	7	Expander Chip Debug Connector 1

Item	Feature	Item	Feature
3	VPP Connector	8	Expander Chip Debug Connector 2
4	Drive BP Power Connector	9	Expander Chip Debug Connector 3
5	BMC_I²C Connector	-	-

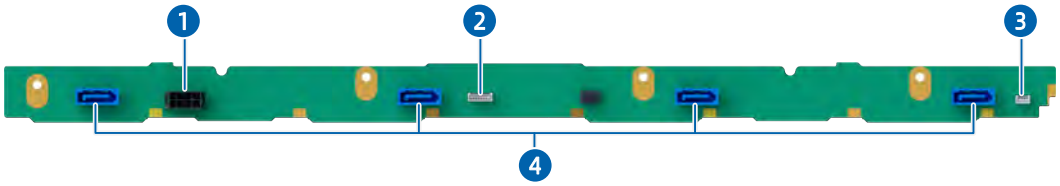
- 12 × 3.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-32 4 × 3.5-Inch SAS/SATA/NVMe Drive Backplane



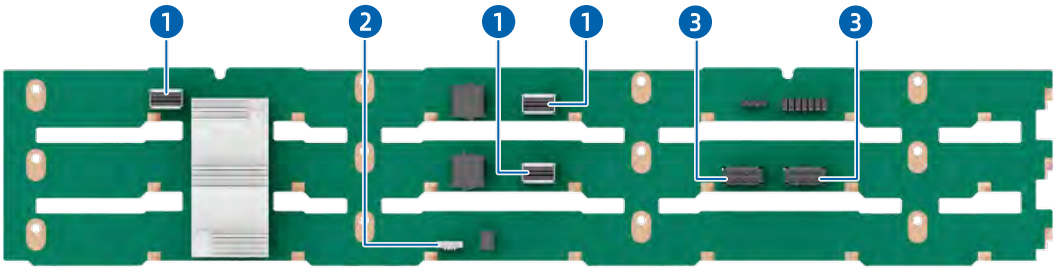
Item	Feature	Item	Feature
1	VPP Connector	5	Slimline x4 Connector
2	Slimline x4 Connector	6	Slimline x8 Connector
3	Slimline x8 Connector	7	BMC I²C Connector
4	Power Connector	8	CPLD JTAG Connector

Figure 5-33 4 × 3.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	Drive BP Power Connector	3	BMC I²C Connector
2	SGPIO Connector	4	SATA 7-Pin Connector

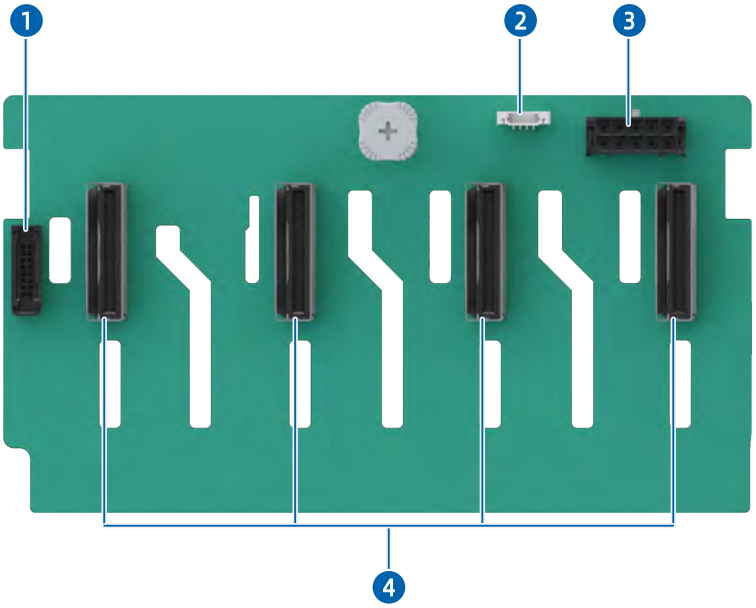
Figure 5-34 12 × 3.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	Slimline x4 Connector	3	Drive BP Power Connector
2	I²C_BMC Connector	-	-

- 24 × E3.S Drive Configuration

Figure 5-35 8 × E3.S Drive Backplane

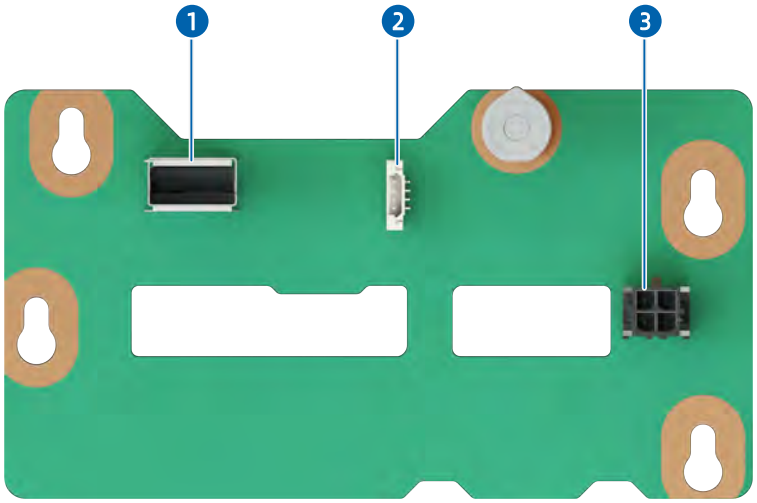


Item	Feature	Item	Feature
1	VPP Connector	3	Drive BP Power Connector
2	I²C_BMC Connector	4	MCIO x8 Connector

2. Rear Drive Backplanes

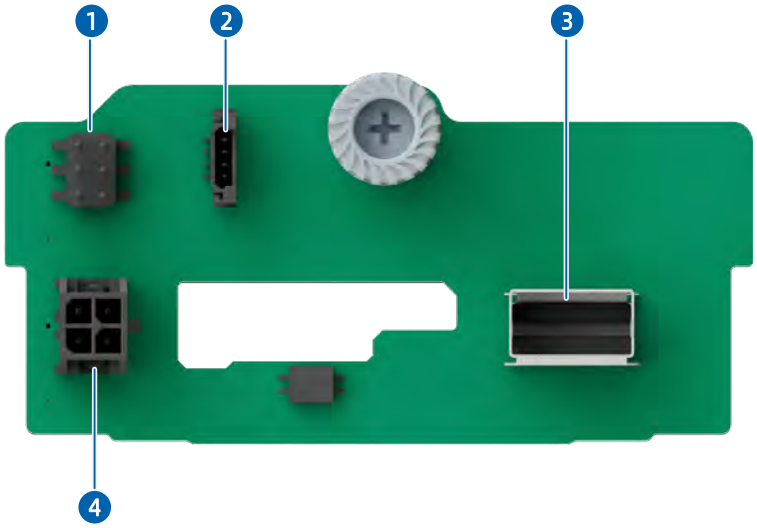
- 4 × 3.5-Inch SAS/SATA + 4 × 2.5-Inch SAS/SATA/NVMe Drive Configuration

Figure 5-36 2 × 3.5-Inch SAS/SATA Drive Backplane



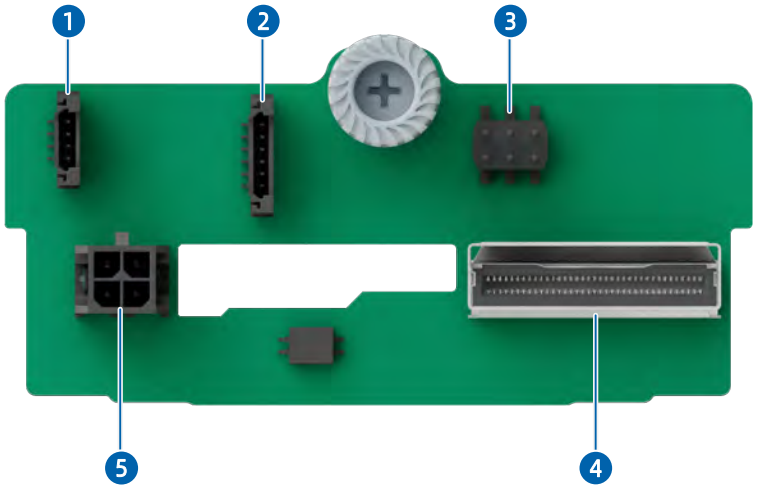
Item	Feature	Item	Feature
1	Slimline x4 Connector	3	Drive BP Power Connector
2	I²C_BMC Connector	-	-

Figure 5-37 2 × 2.5-Inch SAS/SATA Drive Backplane



Item	Feature	Item	Feature
1	CPLD JTAG Connector	3	Slimline x4 Connector
2	BMC_I²C Connector	4	Drive BP Power Connector

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



Item	Feature	Item	Feature
1	BMC_I²C Connector	4	MCIO x8 Connector
2	SGPIO Connector	5	Drive BP Power Connector
3	CPLD JTAG Connector	-	-

6 Product Specifications

6.1 Technical Specifications

Table 6-1 Technical Specifications

Item	Description
Form Factor	2U rack server
Processor	Supports one 4th Gen AMD EPYC processor (Genoa) • Integrated memory controllers and 12 memory channels per processor • Integrated PCIe 5.0 controllers and 128 PCIe lanes per processor • Up to 128 cores • Max boost frequency of 4.40 GHz • L3 cache up to 384 MB • TDP up to 400 W Note: The information above is for reference only. See 7.2 Hardware Compatibility for details.
Memory	Supports up to 24 DDR5 DIMMs. • RDIMMs supported • Up to 4,800 MT/s at 1 DPC and 3,600 MT/s at 2 DPC • Mixing DDR5 DIMM types or mixing DDR5 DIMM specifications (capacity, bit width, rank, height, etc.) is not supported. • A server must use DDR5 DIMMs bearing the same part number (P/N code). Note: The information above is for reference only. See 7.2 Hardware Compatibility for details.
Storage	Supports multiple drive configurations. For detailed information, refer to 5.7.1 Drive Configurations. • Front: - Up to 24 × 2.5-inch hot-swap SAS/SATA/NVMe drive or - Up to 21 × 2.5-inch hot-swap SAS/SATA drive + 4 × 2.5-inch hot-swap SAS/SATA/NVMe drive or - Up to 12 × 3.5-inch hot-swap SAS/SATA/NVMe drive or - Up to 24 × hot-swap E3.S SSD

Item	Description

	• Rear:
	  - Up to 4 × 2.5-inch hot-swap SAS/SATA/NVMe drive + 4 × 3.5-inch hot-swap SAS/SATA drive
	• Internal:
	  - 2 × SATA/PCIe M.2 SSD

Network	• Up to two 1/10/25/40/100/200 Gb hot-plug OCP 3.0 cards • Standard 1/10/25/40/100/200 Gb PCIe NICs • 1 BMC management network port of 100/1,000 Mbps auto-negotiation
I/O Expansion	• Up to 8 PCIe expansion cards • 4 dual-slot GPUs or 8 single-slot GPUs/graphics cards • 2 OCP 3.0 cards For details, see 5.9.2 PCIe Slot Locations and 5.9.4 PCIe Slot Description.

Port	Supports multiple ports.
	• Front:
	  - 1 × USB 3.0 port
	  - 1 × USB 2.0/LCD Port
	  - 1 × VGA port
	  - 1 × USB type-C port
	• Rear:
	  - 2 × USB 3.0 port
	  - 1 × VGA port
	  - 1 × BMC management network port
	  - 1 × system/BMC serial port (micro USB)
	Note: OS installation on the USB storage media is not recommended.

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 Notes: • 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. • When both the front and rear VGA ports are connected to monitors, only the monitor connected to the front VGA port works.
System Management	• UEFI • BMC • NC-SI

Item	Description
	• KSManage
Security	• Trusted Platform Module (TPM) 2.0 and Trusted Cryptography Module (TCM) • ASP • AMD SEV • 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 Environmental Specifications

Table 6-2 Environmental Specifications

Parameter	Description
Temperature[1,2]	• Operating: 10°C to 35°C (50°F to 95°F) (For some configurations, the operating temperature is 5°C to 45°C (41°F to 113°F)) • Storage (packed): -40°C to +70°C (-40°F to +158°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
Altitude	Operating: 0 to 3,050 m (0 to 10,007 ft) Shipping (storage): 0 to 12,000 m (0 to 39,370 ft)
Corrosive Gaseous Contaminants	Maximum growth rate of corrosion film thickness: • Copper coupon: 300 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013) • Silver coupon: 200 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013)
Acoustic Noise[3,4,5,6]	Noise emissions are measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). Listed are the declared A-weighted

Parameter	Description
	sound power levels (LWAd) and the declared average bystander position A-weighted sound pressure levels (LpAm) at a server operating temperature of 23°C (73°F): • Idle: LWAd: 6.7 Bels for standard configuration LpAm: 49.9 dBA for standard configuration • Operating: LWAd: 7.2 Bels for standard configuration LpAm: 56.6 dBA for standard configuration

Notes:

1. The GPU configuration supports an operating temperature range of 10°C to 30°C (50°F to 86°F) and some configurations with high CPU TDP support an operating temperature range of 10°C to 35°C (50°F to 95°F).

2. Standard operating temperature

- 10°C to 35°C (50°F to 95°F) is the standard operating temperature range at sea level. From sea level to an altitude of 3,050 m (10,007 ft), derate the maximum allowable operating temperature by 1°C per 305 m (1°F per 556 ft). No direct sustained sunlight is permitted. The maximum temperature gradient is 20°C/h (36°F/h) and the maximum operating altitude is 3,050 m (10,007 ft), both varying with server configuration.
- Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.

3. This document lists the LWAd and LpAm 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). The listed sound levels apply to the standard configuration. Additional options may result in increased sound levels. Contact your sales representative for more information.

4. The sound levels shown here were measured based on specific configurations of a server. Sound levels vary by server configuration. These values are for reference only and subject to change without notice.

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

6. The listed sound levels apply to the standard configuration. Additional options may result in increased noise.

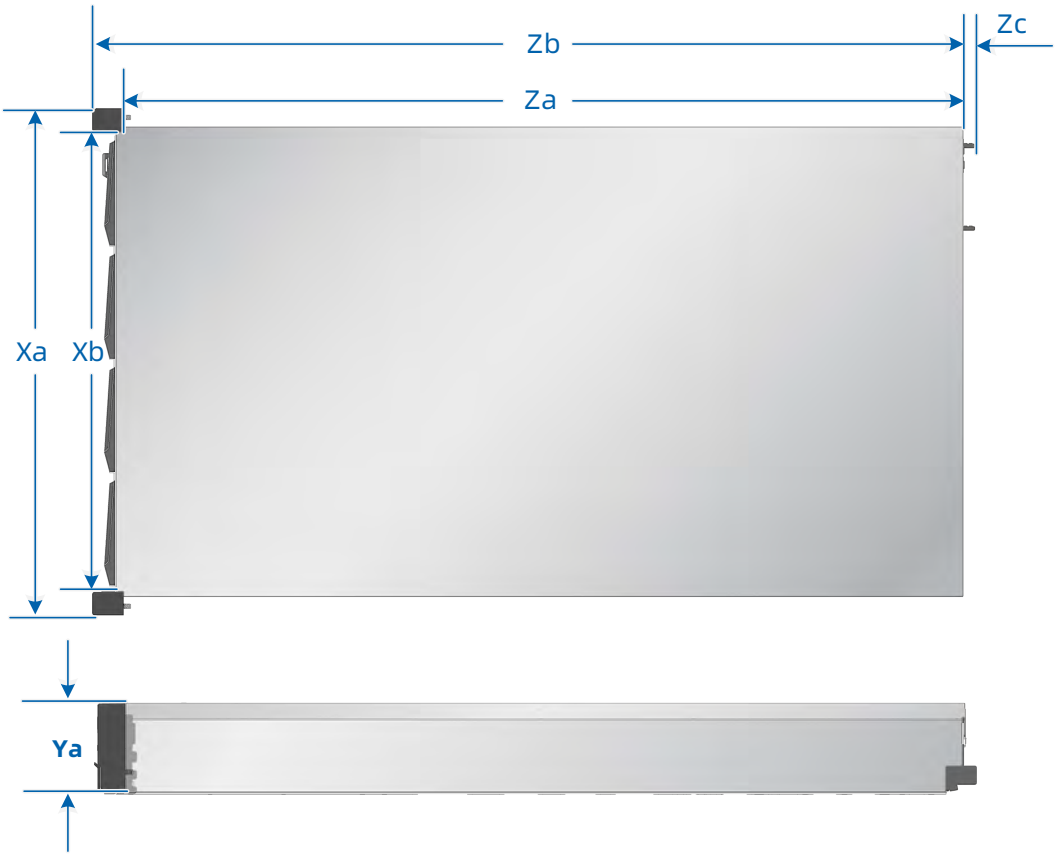
6.3 Physical Specifications

Table 6-3 Physical Specifications

Item	Description
Outer Packaging Dimensions (L × W × H)	1,090 × 600 × 295 mm (42.91 × 23.62 × 11.61 in.)
Installation Dimension Requirements	• Installation requirements for the cabinet are as follows:

Item	Description
	- General cabinet compliant with the International Electrotechnical Commission 297 (IEC 297) standard - Width: 482.6 mm (19 in.) - Depth: Above 1,000 mm (39.37 in.) • Installation requirements for the server rails are as follows: - L-bracket rails: applicable to our cabinets only - Static rail kit: Distance between the front and rear mounting flanges ranges from 609 to 914 mm (23.98 to 35.98 in.) - Ball-bearing rail kit: Distance between the front and rear mounting flanges ranges from 609 to 914 mm (23.98 to 35.98 in.) - When selecting a slide rail CMA, the cabinet depth should be ≥1,200 mm (47.24 in.)
Weight	• 25 × 2.5-inch drive configuration - Net weight: 25.5 kg (56.22 lbs) - Gross weight: 35 kg (77.16 lbs) (including server, packaging box, rails and accessory box) • 24 × 2.5-inch drive configuration - Net weight: 25.2 kg (55.56 lbs) - Gross weight: 35 kg (77.16 lbs) (including server, packaging box, rails and accessory box) • 12 × 3.5-inch drive configuration (with 2 GPUs) - Net weight: 31.2 kg (68.78 lbs) - Gross weight: 41 kg (90.39 lbs) (including server, packaging box, rails and accessory box) • 24 × E3.S drive configuration - Net weight: 22.8 kg (50.27 lbs) - Gross weight: 32.6 kg (71.87 lbs) (including server, packaging box, rails and accessory box) Note: The weight of a server varies by server configuration.

Figure 6-1 Chassis Dimensions



Model	Za	Zb	Zc	Xa	Xb	Ya
KR2180-E2-A0-R0-00	800 mm (31.50 in.)	830 mm (32.68 in.)	11 mm (0.43 in.)	482 mm (18.98 in.)	431 mm (16.97 in.)	87 mm (3.43 in.)

7 Operating System and Hardware Compatibility

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

IMPORTANT

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

7.1 Supported Operating System

Table 7-1 Supported Operating Systems

OS Version
Red Hat Enterprise Linux 9.1
CentOS 8.5
Windows Server 2022
Windows Server 2019
SUSE Linux Enterprise Server 15.4
Ubuntu 20.04.5
OpenEuler 22.03

OS Version
Debian 11.2

NOTE

After installing Linux OS, add **iommu=pt** in the OS. See the OS installation guide on our website for details.

7.2 Hardware Compatibility

7.2.1 CPU Specifications

The server supports 1 AMD EPYC processor (Genoa).

Table 7-2 CPU Specifications

Model	Cores	Threads	Base Frequency (GHz)	Max Boost Frequency (GHz)	Cache (MB)	Default TDP (W)
9654P	96	192	2.4	3.7	384	360
9654	96	192	2.4	3.7	384	360
9354	32	64	3.25	3.8	256	280
9124	16	32	3.00	3.7	64	200
9554P	64	128	3.1	3.75	256	360
9754	128	256	2.4	2.5	256	360
9554	64	128	3.1	3.75	256	360
9634	84	168	2.25	3.7	384	290
9454	48	96	2.75	3.8	256	290
9454P	48	96	2.75	3.8	256	290
9534	64	128	2.45	3.7	256	280

7.2.2 DIMM Specifications

The server supports up to 24 DDR5 DIMMs. The server supports 12 memory channels and 2 DIMM per channel. The server supports RDIMMs.

Table 7-3 DIMM Specifications

Type	Capacity (GB)	Rate (MT/s)	Data Width	Organization
RDIMM	16	4,800	x72	1R x8
RDIMM	32	4,800	x72	2R x8
RDIMM	64	4,800	x72	2R x4

7.2.3 Drive Specifications

Table 7-4 SAS/SATA HDD Specifications

Type	Capacity	Max. Qty.
SATA HDD	20 TB	20
SATA HDD	18 TB	20
SATA HDD	16 TB	20
SATA HDD	14 TB	20
SATA HDD	12 TB	20
SATA HDD	10 TB	20
SATA HDD	8 TB	20
SATA HDD	6 TB	20
SATA HDD	4 TB	20
SATA HDD	2 TB	20

Table 7-5 SAS/SATA SSD Specifications

Type	Capacity	Max. Qty.
SATA SSD	1.92 TB	24
SATA SSD	7.68 TB	24
SATA SSD	3.84 TB	24
SATA SSD	960 GB	24
SATA SSD	480 GB	24
SATA SSD	240 GB	24

Table 7-6 U.2 NVMe SSD Specifications

Type	Capacity	Max. Qty.
U.2 NVMe SSD	3.84 TB	24
U.2 NVMe SSD	7.68 TB	24
U.2 NVMe SSD	1.92 TB	24

Table 7-7 M.2 SSD Specifications

Type	Capacity	Max. Qty.
M.2 SATA SSD	240 GB	2
M.2 SATA SSD	480 GB	2
M.2 PCIe SSD	3.84 TB	2
M.2 PCIe SSD	1.92 TB	2
M.2 PCIe SSD	960 GB	2

7.2.4 SAS/RAID Card Specifications

Table 7-8 SAS/RAID Card Specifications

Type	Description
SAS Card	SAS Card_BRCM_8R0_9500-8i_SMSAS3_PCIE4
	SAS Card_PM8222_PM8222_8_SAS3_PCIE
	SAS Card_PM8222_SmartHBA_8_SAS3_PCIE3
RAID Card	RAID Card_PM8204_RA_8_4GB_SAS3_PCIE3
	RAID Card_L_8R0_9560-8i_4G_HDM12G_PCIE4
	RAID Card_ PM8204_RA_8_2GB_SAS3_PCIE3

7.2.5 NIC Specifications

Table 7-9 OCP Card Specifications

Type	Description	Speed (Gbps)	Port Qty.
OCP 3.0 Card	NIC_Andes-6_X710_10G_LC_OCP3x8_2	10	2
	NIC_SND_1G_I350_RJ_OCP3x4_2_XR	1	2
	NIC_Andes-M6_E810_25G_LC_OCP3x8_2	25	2
	NIC_I_100G_E810CQDA2_LC_OCP3x16_2_XR	100	2
	NIC_M_100G_MCX623436AN_LC_OCP3x16_2_XR	100	2
	NIC_M_25G_MCX623432AN_LC_OCP3x16_2_XR	25	2
	NIC_I_25G_E810XXVDA2_LC_OCP3x8_2_XR	25	2
	NIC_Andes-M6_E810_25G_LC_OCP3x8_2	25	2

Table 7-10 PCIe NIC Specifications

Type	Description	Speed (Gbps)	Port Qty.
PCIe NIC	NIC_I_10G_EX710DA2_LC_PCIEx8_2_XR	10	2
	MCX631102AN-ADAT_25G	25	2
	NIC_Andes-M6_E810_25G_LC_PCIEx8_2	25	2
	NIC_I_100G_E810-CQDA2_LC_PCIEx16_2_XR	100	2
	NIC_M_25G_MCX623432AN_LC_OCP3x16_2_XR	25	2
	NIC_ Vostok_I350_1G_RJ_PCIEx4_4	1	4

7.2.6 HBA/HCA Card Specifications

Table 7-11 HBA Card Specifications

Type	Description
HBA Card	HBA Card_E_0R1_LPE31000-AP_FC16G_PCIE 16G_Single_EMULEX

Table 7-12 HCA Card Specifications

Type	Description	Speed (Gbps)	Port Qty.
HCA Card	HCA Card_M_2-HDR200_MCX653106A-HDAT_PCIE	200	2
	HCA Card_M_1-HDR100_MCX653105A-ECAT_PCIE	100	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-swapping 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:
  - 2,700 W Platinum PSU: 1,000 W (110 Vac), 2,700 W (230 Vac)
  - 2,000 W Platinum PSU: 1,000 W (110 Vac), 2,000 W (230 Vac)
  - 1,600 W Platinum PSU: 1,000 W (110 Vac), 1,600 W (230 Vac)
  - 1,300 W Platinum PSU: 1,000 W (110 Vac), 1,300 W (230 Vac)

- 800 W Platinum PSU: 800 W (110 Vac), 800 W (230 Vac)
- 550 W Platinum PSU: 550 W (110 Vac), 550 W (230 Vac)
- 2,000 W Titanium PSU: 1,000W (110 Vac), 2,000W (230 Vac)
- 1,600 W Titanium PSU: 1,000W (110 Vac), 1,600W (230 Vac)
- 1,300 W Titanium PSU: 1,000W (110 Vac), 1,300W (230 Vac)
- 800 W Titanium PSU: 800W (110 Vac), 800W (230 Vac)

Note: 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.

Operating voltage range:

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

- The following rated -48 Vdc PSUs in 1+1 redundancy are supported:
  - 800 W -48 Vdc PSU: 800 W (-48 Vdc)
  - 1,300 W -48 Vdc PSU: 1,300 W (-48 Vdc)

  Operating voltage range:

  -48 Vdc: -40 Vdc to -72 Vdc

8 Regulatory Information

8.1 Safety

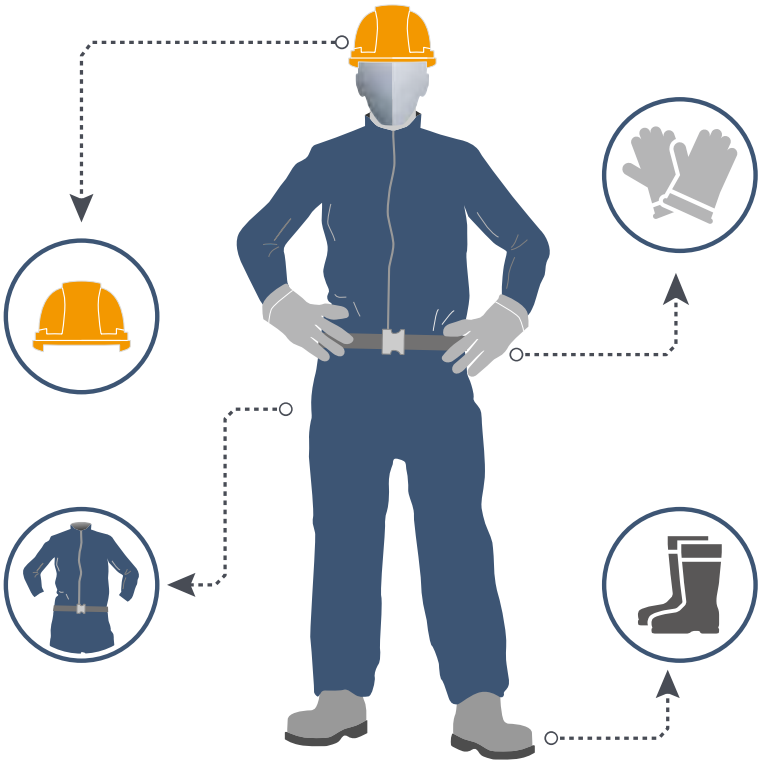
8.1.1 General

- 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

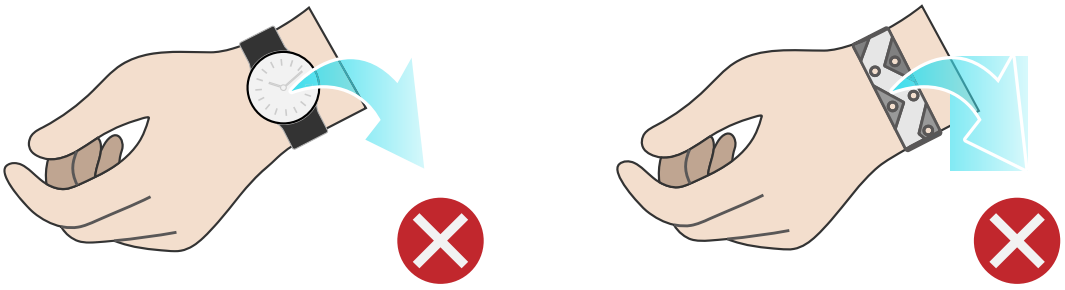
- Only personnel certified or authorized by us are allowed to perform the installation procedures.
- Stop any operation that could cause personal injury or equipment damage. Report to the project manager and take effective protective measures.
- Working during thunderstorms, including but not limited 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



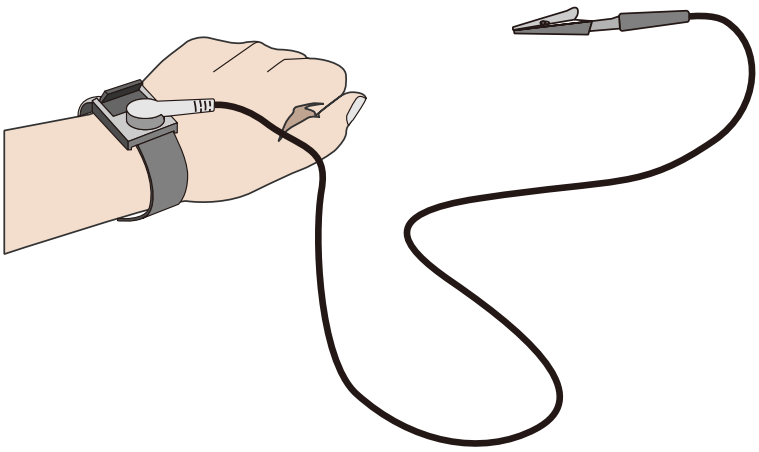
How to put on an ESD strap (Figure 8-3).

a. Put your hand through an ESD wrist strap.

b. Tighten the strap buckle to ensure a snug fit.

c. Plug the alligator clip of the ESD wrist strap into the corresponding jack on the grounded cabinet or grounded chassis.

Figure 8-3 Wearing an ESD Wrist Strap



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

8.1.3 Equipment Safety

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

- To ensure equipment safety, always ground the equipment before powering it on.

8.1.4 Transportation Precautions

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

- Hire a trusted logistics company to move all equipment. The transportation process must comply with international transportation standards for electronic equipment. Always keep the equipment being transported right-side up. Avoid collision, moisture, corrosion, packaging damage or contamination.
- Transport the equipment in its original packaging.
- If the original packaging is unavailable, separately package heavy and bulky components (such as chassis, blade servers and blade switches), and fragile components (such as optical modules and PCIe cards).
- Power off all equipment before shipping.

8.1.5 Manual Handling Weight Limits

CAUTION

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

Table 8-1 lists the manual handling weight limits per person specified by some organizations.

Table 8-1 Manual Handling Weight Limits per Person

Organization	Weight Limit (kg/lbs)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13
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 • SMASH CLP • SNMP • HTTPS • Web GUI • Redfish • RESTful • DCMI • Syslog
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.

Feature	Description
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. • 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

Feature	Description
	the workload to restore to normal when the device usage rate is too high.
Power Control	Supports virtual power buttons for power on/off, power cycle and reset.
UID LED	Supports remote lighting of the UID LED for locating the server in the server room.
Secure Firmware Update	Supports firmware update based on secure digital signatures, and mismatch prevention mechanism for firmware from different manufacturers and firmware for different server models; supports firmware update of BMC/BIOS/CPLD/ PSU.
Serial Port Redirection	Supports remote redirection of the system serial port, BMC serial port and other serial ports, and directs the server-side serial port output to the local administrator via the network for server debugging.
Storage Information Display	Displays RAID logical array information and drive information, and supports remote RAID creation for improved deployment efficiency.
User Role Management	Supports user detail management based on user roles and flexible creation of user roles with different privileges, and provides more user roles to allow administrators to grant different privileges to O&M personnel.
Security Feature	Adopts the industry-leading server security baseline standard V3.0. SSH, HTTPS, SNMP and IPMI use secure and reliable algorithms. 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	Imports and exports the existing system configurations.
System Information Display	Displays the server basic information such as the information and health status of key 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.

Feature	Description
Power Policy	Sets how the server operating system reacts under the BMC's control when AC power is reconnected to the server.
One-Click Erasing	Performs non-recoverable erasing on all storage devices of the server, preventing data leakage when the server is to be retired.
System Lockdown	After this feature is enabled, some parameters of the server cannot be set and some operations cannot be performed on the server.

10.2 KSManage

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

Built on cutting-edge O&M concepts, KSManage 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. KSManage offers:

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

Table 10-1 KSManage 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 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

Feature	Description
	• 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 • 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
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 KSManage parameters
Security	Security control of KSManage via a set of security policies such as user management, role management, authentication management (local authentication and LDAP authentication) and certificate management.

10.3 KSManage Tools

Table 10-2 Features of KSManage Tools

Feature	Description
KSManage Kits	A lightweight automatic batch O&M tool for servers, mainly used for server deployment, routine maintenance, firmware update, fault handling, etc.
KSManage 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
KSManage Server CLI	Fast integration with third-party management platforms, delivering a new O&M mode of Infrastructure as Code (IaC)
KSManage 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
KSManage 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

Table 11-1 Certifications

Country/Region	Certification	Mandatory/Voluntary
International	CB	Voluntary
EU	CE	Mandatory
US	FCC	Mandatory
	UL	Voluntary
	Energy Star	Voluntary
Canada	IC	Mandatory
EAEU	EAC	Mandatory
	EAC-RoHS	Mandatory
	FSS	Mandatory
South Korea	KC	Mandatory
	E-Standby	Mandatory
India	BIS	Mandatory
Australia	RCM	Mandatory

12 Appendix A

12.1 Thermal Restrictions

Table 12-1 Thermal Restrictions

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temperature: 35°C (95°F)
12 × 3.5-Inch SAS/SATA Drive Config.	• DIMMs ≤24 pcs • CPU TDP ≤360 W • Unperforated chassis supported • Only NICs <40 Gb supported in some slots • 100 Gb NIC not supported in OCP1 slot • GPUs not supported	• DIMMs ≤24 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • Only NICs <40 Gb supported in some slots • 100 Gb NIC not supported in OCP1 slot • GPUs not supported
24 × 2.5-Inch NVMe/SAS/SATA Config.	• DIMMs ≤24 pcs • CPU TDP ≤360 W • Unperforated chassis supported • Only NICs <40 Gb supported in some slots • 100 Gb NIC not supported in OCP1 slot • GPUs not supported	• DIMMs ≤24 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • Only NICs <40 Gb supported in some slots • 100 Gb NIC not supported in OCP1 slot • GPUs not supported
GPU Configuration 1 - 8 × 2.5-Inch NVMe/SAS/SATA Drive	• DIMMs ≤12 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • 100 Gb NIC supported in OCP1 slot • 6 single-slot A2/L4 GPUs supported	• DIMMs ≤12 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • 100 Gb NIC not supported in OCP1 slot • 6 single-slot A2/L4 GPUs supported

Configuration	Max. Operating Temp. 30°C (86°F)	Max. Operating Temperature: 35°C (95°F)
GPU Configuration 2 – 4 × 3.5-Inch SAS/SATA Drive	• DIMMs ≤12 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • 100 Gb NIC supported in OCP1 slot • 6 single-slot A2/L4 GPUs supported	• DIMMs ≤12 pcs • CPU TDP ≤360 W • Unperforated chassis not supported • 100 Gb NIC not supported in OCP1 slot • 6 single-slot A2/L4 GPUs supported

NOTE

- The maximum operating temperature will drop by 5°C (9°F) if a single fan fails.
- Single fan failure may affect system performance.
- When the front bezel is used with any of the following, the maximum operating temperature will drop by 3°C (5.4°F): 100 Gb OCP 3.0 cards, 400 W TDP CPUs, 24 × 2.5-inch drive configuration, 12 × 3.5-inch drive configuration, or GPUs.
- Consult your sales representative for detailed restrictions on component combination with rear NICs.

12.2 Model

Table 12-2 Model

Certified Model	Description
KR2180-E2-A0-R0-00	Global

12.3 RAS Features

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

12.4 Sensor List

Table 12-3 Sensor List

Sensor	Description	Sensor Location	Note
Inlet_Temp	Chassis air inlet temperature	Right mounting ear	
Outlet_Temp	Chassis air outlet temperature	Motherboard	
CPU0_Temp	CPU core temperature	CPU	
CPU0_VR_Temp	CPU VR temperature	VR chip on the motherboard	
CPU0_DIMMGx_T	The maximum temperature of the DIMMs of CPU0	DIMM	x indicates the DIMM number with a value of 0 to 1
HDD_MAX_Temp	Maximum temperature among all drives connected to the RAID card	Drives attached to the drive backplane	
NVMe_Temp	Maximum temperature among all NVMe drives	Drives attached to the drive backplane	
PSU_Inlet_Temp	PSU inlet temperature	PSU	
OCP_0_NIC_Temp	OCP card temperature	Motherboard OCP card	
OCP_0_SFP_Temp	The temperature of the SFP optical module on the OCP card	SFP optical module on the OCP card	
PCIe_NIC_Temp	Maximum temperature among all PCIe NICs	Motherboard PCIe NIC	
PCIe_SFP_Temp	The temperature of the SFP optical module on the PCIe NIC	SFP optical module on the PCIe NIC	

Sensor	Description	Sensor Location	Note
RAID_Temp	Maximum temperature among all RAID cards	Motherboard RAID cards	
GPUx_Temp	GPUx temperature	GPU	x indicates the GPU number with a value of 0 to 3
HBA_Temp	HBA card temperature	HBA card	
PCIe_HCA_Temp	HCA card temperature	HCA card	
PCIe_HCA_SFP_T	The temperature of the SFP optical module on the HCA card	SFP optical module on the HCA card	
OCP_RAID_Temp	RAID mezz card temperature	RAID mezz card	
SYS_12V	12 V voltage supplied by motherboard to BMC	Motherboard	
SYS_5V	5 V voltage supplied by motherboard to BMC	Motherboard	
SYS_3V3	3.3 V voltage supplied by motherboard to BMC	Motherboard	
P5V_STBY	5 V voltage of standard power connectors on the motherboard	Motherboard	
P3V3_STBY	3.3 V voltage of standard power connectors on the motherboard	Motherboard	
P1V8_STBY	1.8 V voltage of standard power connectors on the motherboard	Motherboard	

Sensor	Description	Sensor Location	Note
P1V05_USB	1.05 V voltage supplied to USB module	Motherboard	
PVDD33_S5	The voltage supplied by VR chip to CPU	Motherboard	
PVDDCR_CPU0_P0	The voltage supplied by VR chip to CPU	Motherboard	
PVDDCR_CPU1_P0	The voltage supplied by VR chip to CPU	Motherboard	
PVDD18_S5_P0	The voltage supplied by VR chip to CPU	Motherboard	
PVDDCR_SOC_P0	The voltage supplied by VR chip to CPU	Motherboard	
PVDD11_S3_P0	The voltage supplied by VR chip to CPU	Motherboard	
PVDDIO_P0	The voltage supplied by VR chip to CPU	Motherboard	
P12V_CPU0_DIMM1	12 V voltage supplied by motherboard to DIMMs	Motherboard	
PSUx_VIN	PSUx input voltage	PSU	x indicates the PSU number with a value of 0 to 1
PSUx_VOUT	PSUx output voltage	PSU	x indicates the PSU number with a value of 0 to 1
RTC_Battery	RTC battery voltage	RTC battery on the motherboard	
FANx_Status	FANx status	FANx	x indicates the fan module number with a value of 0 to 5

Sensor	Description	Sensor Location	Note
FAN_Redundant	Fan redundancy status	Fan module	
FANx_F_Speed	FANx speed in rpm	FANx	x indicates the fan module number with a value of 0 to 5
FANx_R_Speed	FANx speed in rpm	FANx	x indicates the fan module number with a value of 0 to 5
Total_Power	Total power	PSU	
PSUx_PIN	PSUx input power	PSUx	x indicates the PSU number with a value of 0 to 1
PSUx_POUT	PSUx output power	PSUx	x indicates the PSU number with a value of 0 to 1
FAN_Power	Total fan power	Fan Modules	
CPU_Power	Total CPU power	Motherboard	
Memory_Power	Total memory power	Motherboard	
CPU0_Status	CPU status	CPU	
CPU_Config	CPU configuration status (mixing of CPUs, or primary CPU not installed)	CPU	
CPU0_CxDy	CPU DIMM status	CPU DIMM	x indicates the memory channel number under the CPU with a value of A to L; y indicates the DIMM number with a value of 0 to 1
PCIe_Status	PCIe status error	PCIe bus	

Sensor	Description	Sensor Location	Note
Power_Button	Power button pressed	Power button on the front panel	
Watchdog2	Watchdog	Motherboard	
Sys_Health	BMC health status	BMC	
UID_Button	UID button status	Motherboard	
PWR_CAP_Fail	Power capping status	Motherboard	
PSU_Redundant	PSU redundancy status	PSU	
PSU_Mismatch	PSU model mismatch	PSUs	
PSUx_Status	PSUx failure status	PSUx	x indicates the PSU number with a value of 0 to 1
Intrusion	Monitors chassis-opening activity (chassis intrusion detection)	Top cover	
SysShutdown	Reason for system shutdown	-	
ACPI_PWR	ACPI status		
ME_FW_Status	System software process, system startup error		
SysRestart	Reason for system restart		
BIOS_Boot_Up	BIOS boot up complete		
System_Error	Emergency system failure		
POST_Status	POST status		
CPU_Config	System hang	-	
BMC_Boot_Up	Record the BMC boot event	-	
SEL_Status	Record the event that system event logs are almost full/cleared		

Sensor	Description	Sensor Location	Note
BMC_Status	BMC status	-	
LeakageSensor	Leak detection (reserved)	-	

13 Appendix B Acronyms and Abbreviations

13.1 A - E

A

AC	Alternating Current
ACPI	Advanced Configuration and Power Interface
AI	Artificial Intelligence
AMD	Advanced Micro Devices, Inc.
AMD-V	AMD Virtualization
ANSI	American National Standards Institute
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
ARMA	Advanced Return Material Authorization
ASP	AMD Secure Processor
AVX	Advanced Vector Extensions

B

BIOS	Basic Input Output System
BLE	BIOS Lock Enable
BMC	Baseboard Management Controller
BOM	Bill of Materials
BP	Backplane

C

CAS	Column Address Strobe
CB	Certification Body
CCC	China Compulsory Certificate
CE	Conformite Europeenne
CEN	European Committee for Standardization
CLI	Command-Line Interface
CMA	Cable Management Arm
CMOS	Complementary Metal-Oxide-Semiconductor
COM	Communication
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
CRPS	Common Redundant Power Supply

D

DC	Direct Current
DCMI	Data Center Manageability Interface
DC-SCM	Datacenter-ready Secure Control Module
DDR5	Double Data Rate 5
DIMM	Dual In-Line Memory Module
DOA	Dead on Arrival
DPC	DIMM Per Channel
DRAM	Dynamic Random-Access Memory

E

EAC	Eurasian Conformity

ECC	Error-Correcting Code
ECMA	European Computer Manufacturer Association
ESD	Electro-static Discharge
EU	European Union

13.2 F - J

F

FCC	Federal Communications Commission
FHHL	Full-Height Half-Length
FW	Firmware

G

GPU	Graphics Processing Unit
GUI	Graphical User Interface

H

HBA	Host Bus Adapter
HCA	Host Channel Adapter
HDD	Hard Disk Drive
HDT	Hardware Debug Tool
HSE	Health and Safety Executive
HTTPS	HyperText Transfer Protocol Secure

I

I/O	Input/Output

IC	Industry Canada
ID	Identity
IEC	International Electrotechnical Commission
IOD	I/O Die
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface
ISA	International Society of Automation
ISO	International Organization for Standardization

J

JTAG	Joint Test Action Group

13.3 K - O

K

KC	Korean Certification
KVM	Keyboard Video Mouse

L

LC	Lucent Connector
LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode

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
O&M	Operations and Maintenance
OS	Operating System

13.4 P - T

P

PC	Personal Computer
PCH	Platform Controller Hub
PCIe	Peripheral Component Interconnect Express
PFR	Platform Firmware Resilience
PID	Proportional, Integral, Derivative
POST	Power-On Self-Test
PSU	Power Supply Unit
PWR	Power

R

RAID	Redundant Arrays of Independent Disks
RAS	Reliability, Availability, Serviceability
RDIMM	Registered Dual In-line Memory Module
RH	Relative Humidity
RHEL	Red Hat Enterprise Linux
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
SDP	System Demonstration Platform
SEL	System Event Log
SEV	Secure Encrypted Virtualization
SFF	Small Form Factor
SFP	Small Form-factor Pluggable
SGPIO	Serial General Purpose Input/Output
SLA	Service Level Agreements
SNMP	Simple Network Management Protocol
SSD	Solid State Drive
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	Unit Identification
UL	Underwriters Laboratories
UMC	Unified Memory Controller
USB	Universal Serial Bus

V

VGA	Video Graphics Array
VLAN	Virtual Local Area Network
VM	Virtual Machine
VMD	Volume Management Device
VNC	Virtual Network Console
VPP	Virtual Pin Point
VR	Voltage Regulator
VRD	Voltage Regulator Down
VROC	Virtual RAID on CPU