



Exascale Server Rack Solution KRS8000V3

Technical White Paper

Version 3.1

Date August 29, 2025

Revision History

Refer to the table below for the updates made to this user manual.

Date	Version	Description of Change
June 27, 2025	0.8	First draft
July 11, 2025	1.0	Initial release
July 16, 2025	2.0	- Corrected BT-3 PCIe slot form factor from FHFL to FHHL - Added Sensor List in Table 13-3 - Simplified Chapter 13 for clarity; retained only tables as the primary reference - Delete Manifold section in Chapter 5.2 - Changed Compute Tray IO Port descriptions (from '4 x RJ45 port' to '3 x RJ45 port + 1 x RJ45 NIC port') in Table 2-4 and Chapter 6-1 - Updated terminology for consistency: changed 'RJ45 connector' to 'RJ45 port', 'RJ-45' to 'RJ45', and '1 GB NIC' to '1 GbE NIC'
August 15, 2025	2.1	Corrected E-W networking interface (removed incorrect HHHL PCIe NIC support) in Table 2-1 and Chapter 6.5
August 18, 2025	2.2	- Added note for FPC leakage detection sensor humidity level in Table 2-6 - Changed "Angle View" to "Front Angled View"
August 23, 2025	3.0	Updated KSManage Tool section in Chapter 11
August 29, 2025	3.1	- Revised power source to 50 VDC and 380/415 VAC in Tables 2-1 and 2-5 - Updated Deployed Device and CDU Options in Table 2-1 - Corrected storage drive type and form factor in Table 2-4 - Deleted power whip voltage rating value - Revised fan specification (not hot-swappable) - Revised E1.S SSD drive thickness (z-height) to 9.5 mm - Corrected Rack Front View Description in Chapter 5.1 - Specified that the Static Rail Kit applies only to Power Shelf installation in Table 2-7

About This Document

This document is intended specifically for **Pre-Sales Engineers** and serves as a technical white paper for the KRS8000V3 rack-scale server solution. It provides an overview of the system—including its physical design, key features, performance specifications, and software/hardware compatibility—along with the architectural insights and component-level details needed for technical evaluation, customer communication, and solution planning in the pre-sales phase.



WARNING indicates a potential risk of personal injury.



CAUTION indicates a risk of data loss or damage to equipment.



NOTE provides tips and additional information to help complete a task, choose an option, or finish a procedure.

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1 Product Overview

The KRS8000V3 is our first official L11 rack-scale design, integrating 36 Grace CPUs and 72 Blackwell GPUs in a liquid-cooled rack-scale architecture. It delivers breakthrough performance for real-time trillion-parameter large language model (LLM) inference and training.

The KRS8000V3 with GB200 NVL72 sets new performance benchmarks for AI and data analytics, making it a cornerstone of next-generation computing infrastructure.

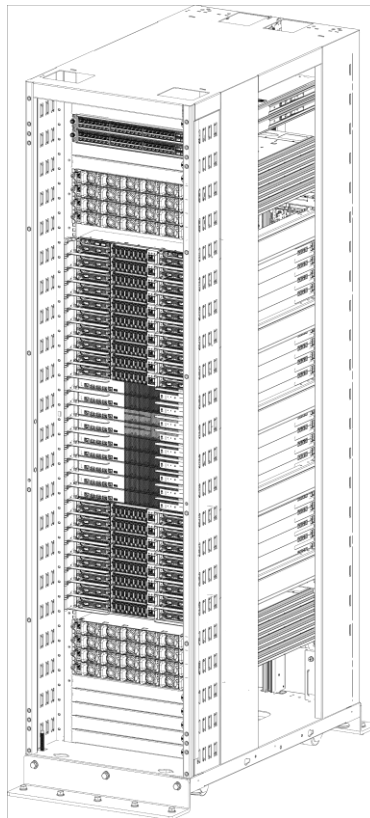


Figure 1-1 KRS8000V3 Rack View

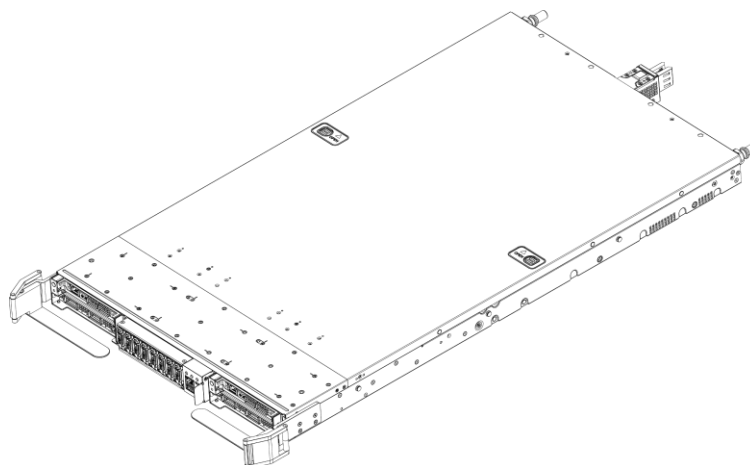


Figure 1-2 KR1288 Compute Tray View

2 Features

2.1 Rack Features

Table 2-1 Rack Specifications

Technical Feature	Description
Form Factor	48RU Rack
NVL Configuration	1x72 rack level (4 GPUs per compute tray)
Dimensions (W × H × D)	600 mm × 2,236 mm × 1,200 mm (23.62 × 88.03 × 47.24 in.)
Deployed Device	• 2 × 1RU Top-of-Rack, OOB Management Switch • 9 × 1RU NVLink Switch Tray • 18 × 1RU Compute Tray • 1 × 1,400 A Bus bar • 8 × 1RU 33 kW Power Shelf • 2 × 1RU Rack Stiffener • 1 × 1RU Leak Drip Pan • 9 × 1RU Blank Panel
N-S Networking	2 × FHHL PCIe 5.0 x16 BlueField-3
E-W Networking	2 × onboard CX-7 mezzanine card
Fan	Eight (8) high-speed 12 VDC 4056 fans with N+1 redundancy
Management Chipset	DC-SCM BMC management board
Power Supply and Distribution	• Input AC Outlet: 380/415 Vac • Output DC Outlet: 50 Vdc, via bus bar • Power Whip: – Type: 1-phase or 3-phase – Cable Length: 1.5 m or 3.5 m – Power Distribution Method: Bus bar connection • Power Shelf: 33 kW power shelf, houses 6 PSUs with 5+1 redundancy • Bus bar System: 50 Vdc, 1,400 A copper alloy with aluminum ground block and plastic insulator • Circuit Breaker: 63 A
Cooling System	• Cooling Method: Hybrid cooling

Technical Feature	Description
	• CDU Options: – L2L In-row CDU – L2A SideCar CDU – L2L In-rack CDU • Airflow: Front-to-rear (F2R) • Heat Dissipation Capacity: – Above 102 kW (Liquid cooling) – Above 18 kW (Air cooling) • Coolant Type: Water/Glycol mixture (PG25) • Coolant Flow Rate: 105 to 130 L/min (based on inlet temperature) • Inlet/Outlet Temperature: – Max. Inlet Temp.: 45°C (113°F) – Max. Outlet Temp.: 65°C (149°F) • Pressure Drop: Max. 13.3 psi • Manifold: Left/Right 44RU Bottom Feed (BF) and Top Feed (TF) Cooling Manifold Configuration • Leak Detection System • Emergency Shut-off Mechanism • Power Consumption: 125 kW
Rack Outer Packaging	• Dimensions (D × W × H): 1,719 × 1,150 × 2,547 mm (67.68 × 45.28 × 100.28 in.) • Weight: approx. 300 kg (661.39 lbs)

Table 2-2 Availability and Serviceability

Technical Feature	Description
Reliability	The rack is designed to withstand seismic activity of up to Magnitude 8 and can resist extreme natural disasters.
Availability	The rack supports front and rear I/O access.
O&M Efficiency	• Supports blind mate connection for liquid cooling (optional) • Supports blind mate connection for power supply  NOTE: Blind mate connection can improve O&M efficiency and reduce O&M complexity.

Table 2-3 Manageability and Security

Technical Feature	Description
Power and Environment Management	The PMC module integrated into the power shelf can monitor and manage the PSU temperature, and provides a RESTful interface.
U-level Position Management	Manages the U-level position sensors in the rack, and provides a RESTful interface.
CDU Management	Monitors the operating status and alarm information of the CDU, and supports liquid leak alarm and shutdown setting.
Power Shelf Management	The PMC module can manage the PSUs in the rack, count the total power, and monitor the health status of the PSUs.

2.2 Compute Tray Features

Table 2-4 Compute Tray Specifications

Technical Feature	Description
Form Factor	1U
Number of Trays	18
CPU	2 × NVIDIA Grace™ CPU Superchip: • Arm Neoverse V2 cores (up to 72 cores) • L1 cache of 64 KB i-cache + 64 KB d-cache per core, L2 cache of 1 MB per core, and L3 cache of 114 MB • 4 PCIe Gen 5.0 x16 with 400 Gb/s bandwidth options available • Supports NVLink4 up to 300 GB/s and NVLink-C2C up to 900 GB/s • TDP up to 300 W
GPU	4 × NVIDIA Blackwell GPU: • Memory size: 186 GB HBM3e on-die • TGP range: 200 W to 1,200 W • Thermal design target: 1,200 W per GPU
Memory	• 120 GB, 240 GB, and 480 GB on-module LPDDR5X memory options available • Up to 1.0 TB (128 GB per memory module) • Data transfer rate of up to 500 GB/s with low power consumption (16 W)

Technical Feature	Description
	- Memory bandwidth up to 384 GB/s for 480 GB, up to 512 GB/s for 120 and 240 GB - Memory protection including ECC, memory mirroring, and memory rank sparing (Disabling ECC is not supported.)
NIC Controller	- Mirror mezzanine connector for the CX-7 mezzanine network cards - NVLink5 (Blackwell GPU), 1.8 TB/s - NVLink4 (Grace CPU), 300 GB/s
Storage Drive	- Front Side (hot-swap): 8 × 9.5 mm E1.S SSD, 3.84 TB - Internal: 1 × onboard NVMe M.2, 1.92 TB (optional)
I/O Port and Connector	- Front: 4 × QSFP port (for BlueField-3) 2 × OSFP twin-port 3 × RJ45 OOB management port (one for BMC, two for BlueField-3) 1 × RJ45 1GbE NIC port 1 × Mini DisplayPort Connector 1 × Micro-USB port (for debugging only) 1 × USB Type-A 3.0 port - Rear: 2 × UQD LC connector 4 × NVLink5 connector 1 × bus bar clip connector
NVLink Interface	- Blackwell GPU: 18 NVLink5, each supporting two lanes connected to the cable cartridge - Grace CPU: 6 NVLink4, each supporting two lanes connected to the peer CPU - CPU-GPU: NVLink-C2C ports
Fan Module	Eight (8) high-speed 12 VDC 4056 fans with N+1 redundancy

Table 2-5 Power Supply and Distribution

Power	Description
Power Delivery Method	Supplied via bus bar connected to the power shelf in KRS8000V3 rack solution
Power Source	50 Vdc, delivered from the power shelf through the bus bar
Connector Type	Bus bar clip connector at the rear of the compute tray
Power Consumption	6.0 kW to 6.4 kW
Power Redundancy	Managed by power shelf in KRS8000V3 rack solution
Power Protection	Managed by power shelf in KRS8000V3 rack solution
 NOTE: - The compute tray does not contain a standalone power supply. It draws power through a direct connection to the rear bus bar, which is energized by the power shelf installed in the KRS8000V3. - KRS8000V3 rack solution deploys eight (8) 33 kW 1RU power shelves, each has six (6) 5.5 kW PSU with N+1 redundancy.	

Table 2-6 Environmental Specifications

Item	Description
Temperature	- Operating: 0°C to 35°C (32°F to 95°F) - Storage (unpacked): -40°C to 70°C (-40°F to 158°F)
Relative Humidity (RH, non-condensing)	- Operating: 5% RH to 85% RH - Storage (unpacked): 5% RH to 93% RH  NOTE: It is recommended to operate the compute tray's FPC leakage detection sensor at humidity levels under 70%.
Operating Altitude	- Operating: 0 to 3048 m (0 to 10,000 ft) - Shipping (storage): 0 to 12,912 m (0 to 42,362.2 ft)

Table 2-7 Physical Specifications

Item	Description
Outer Packaging Dimensions (L × W × H)	- Outer packaging (1 compute tray without pallet): 1,090 mm × 720 mm × 240 mm (42.91 × 28.35 × 9.45 in.) - Outer packaging (4 compute trays with 1 pallet): 1,200 mm × 750 mm × 1,080 mm (47.24 × 29.53 × 42.52 in.)
Compute Tray Dimensions (L × W × H)	438 × 43.6 × 766 mm (17.24 × 1.72 × 30.16 in.)
Installation Dimension Requirements	- Installation requirements for the rack are as follows: - General rack 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: - Static rail kit (for power shelf installation only): The distance between the front and rear mounting flanges ranges from 609 to 914 mm (23.98 to 35.98 in.). - Ball-bearing pull-out rail kit: The distance between the front and rear mounting flanges ranges from 735.1 to 784.6mm (28.94 to 30.89 in.).
Weight	26.76 kg (59.0 lbs)

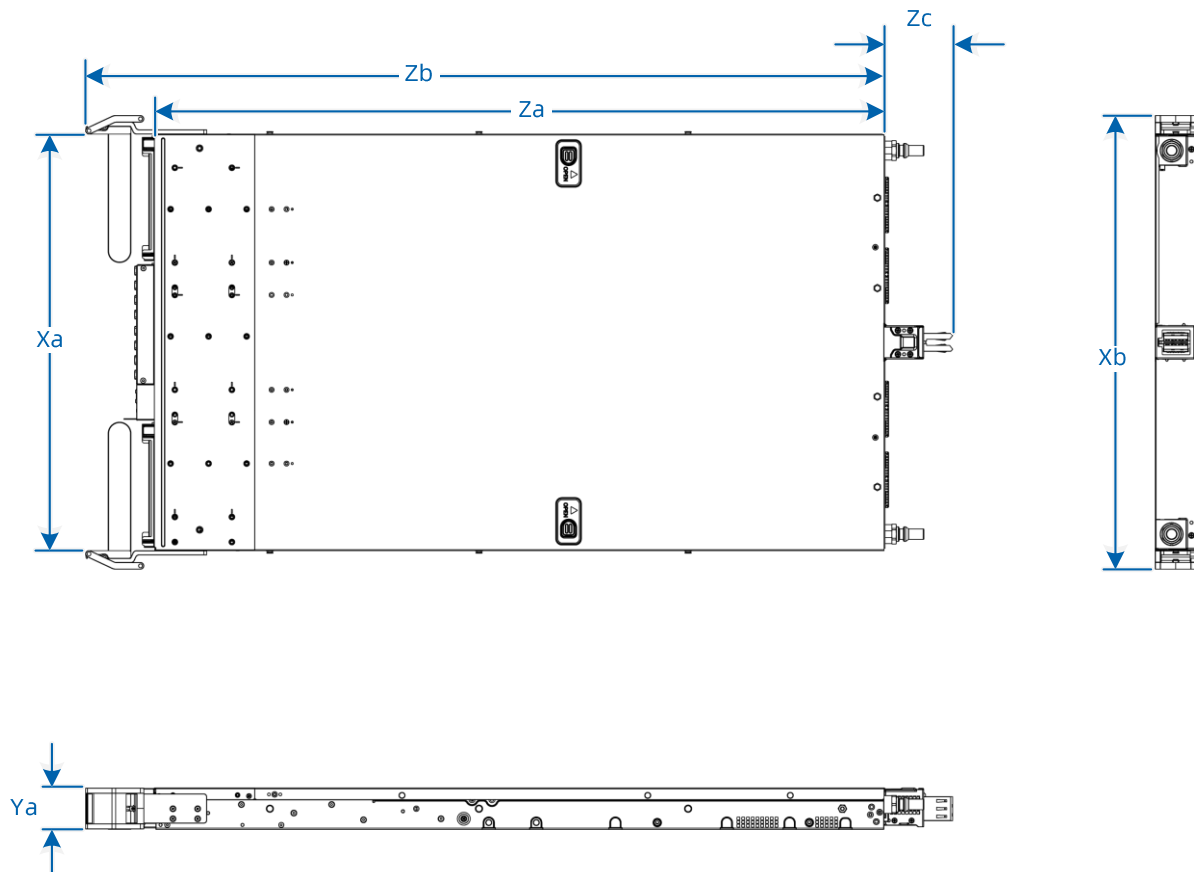


Figure 2-3 KR1288N3 Compute Tray Dimensions

Xa	Xb	Ya	Za	Zb	Zc
438 mm (17.24 in.)	476.8 mm (18.77 in.)	43.6 mm (1.72 in.)	766 mm (30.16 in.)	839.8 mm (33.06 in.)	72.3 mm (2.85 in.)

3 Compute Tray Component Overview

3.1 Left OSFP Module

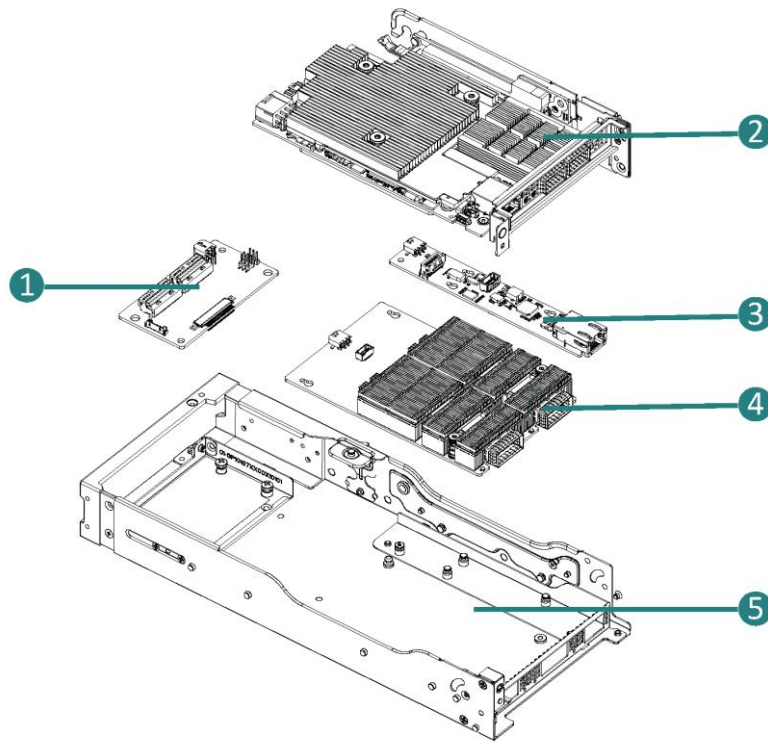


Figure 3-1 Left OSFP Module Exploded Diagram

Callout	Item
1	Left IPEX Bridge Board
2	BlueField-3 Card Assembly, including BlueField-3 Card, PCIe Riser Card (with Interposer Functionality), and PCIe Bracket
3	1 GbE NIC Card
4	Left Twin-port OSFP Board Assembly
5	Left OSFP Cage

3.2 Right OSFP Module

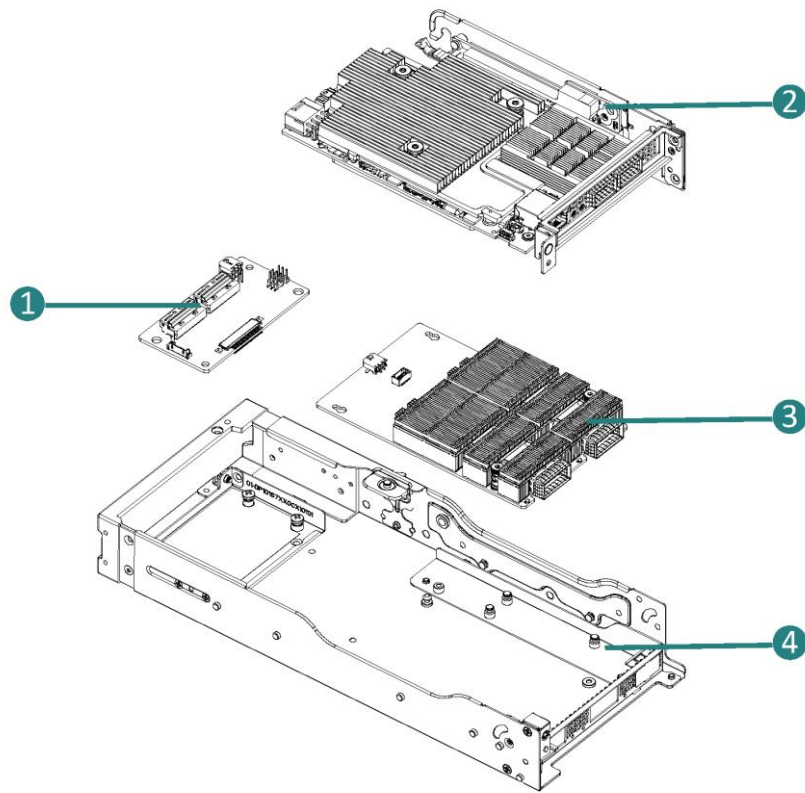


Figure 3-2* Right OSFP Module Exploded Diagram

This illustration is for reference only and will be updated and corrected in a future revision

Callout	Item
1	Right IPEX Bridge Board
2	BlueField-3 Card Assembly, including BlueField-3 Card, PCIe Riser Card (with Interposer Functionality), and PCIe Bracket
3	Right Twin-port OSFP Board Assembly
4	Right OSFP Cage

3.3 Middle Storage Module

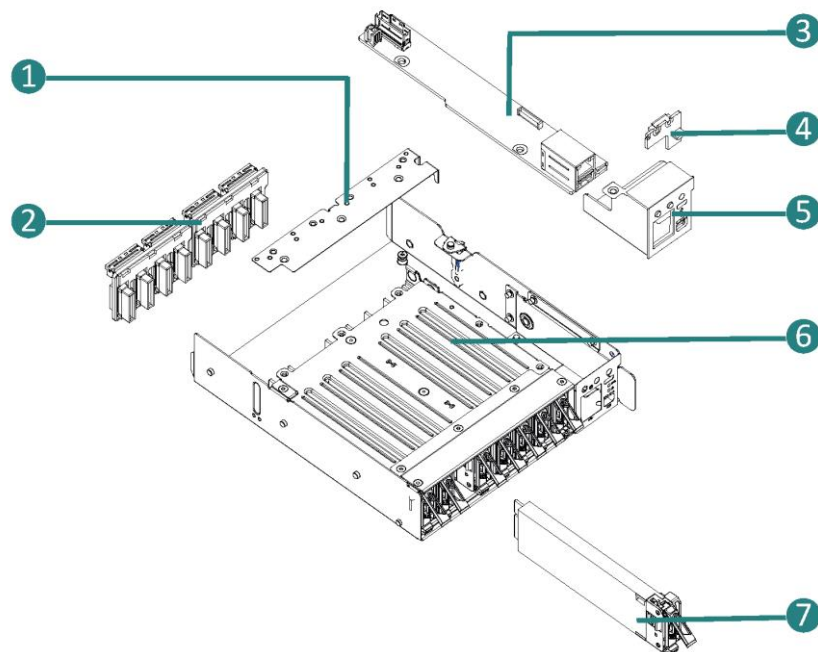


Figure 3-3 Middle Storage Module Exploded Diagram

Callout	Item
1	E1.S Backplane Bracket
2	E1.S Backplane (x2)
3	IO interposer board, part of the FIO Board Assembly
4	Panel board (FIO board), part of the FIO Board Assembly
5	FIO bracket, part of the FIO Board Assembly
6	Middle Storage Cage
7	E1.S SSD Module (x8)

4 System Architecture Overview

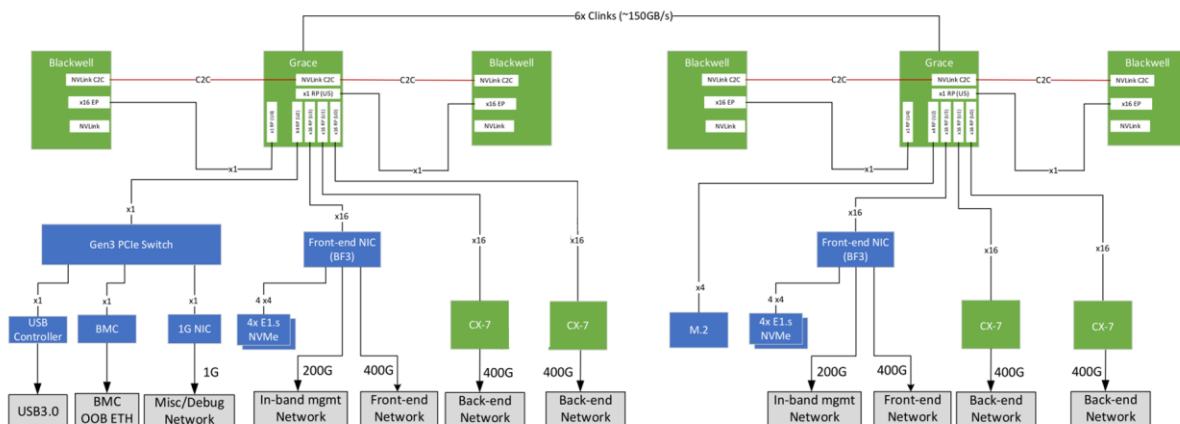


Figure 4-1 KRS8000V3 Logical Diagram

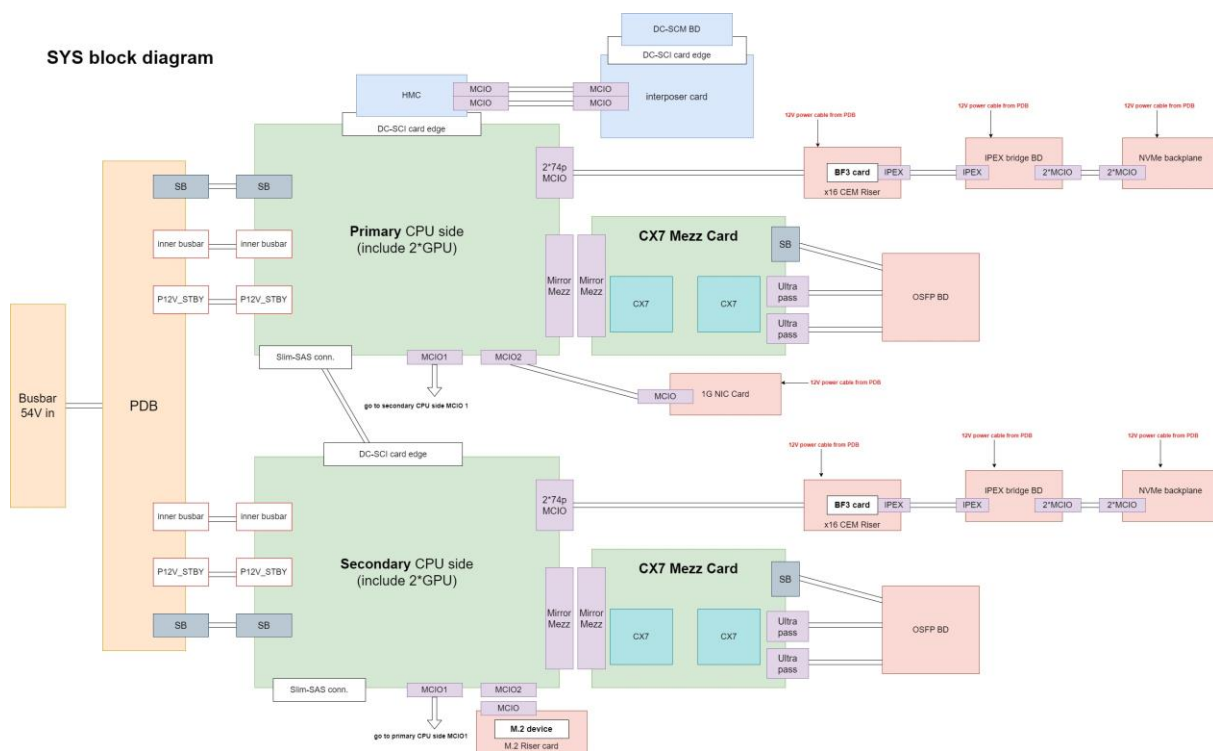


Figure 4-2 KR1288N3 Logical Diagram

- 4-GPU compute tray
- Coherent interconnect between Grace CPUs
- Single OS per tray
- Back-end NIC & SSDs scale with GPU count

- 4 × CX7 NIC with 400 Gb/s bandwidth to each GPU
- Up to 8 × SSD
- 2 × BlueField-3 card for front-end networking
- SSDs attached to the BlueField-3 card

5 Rack Hardware Overview

This chapter describes the physical layout of the rack system and provides an overview of key hardware components, including the compute tray, power shelf, NVLink switch tray, and management switch.

5.1 Rack View

NOTE

The drawings shown below are for illustration only.

Actual configuration may vary depending on the model you purchased.

5.1.1 Front View

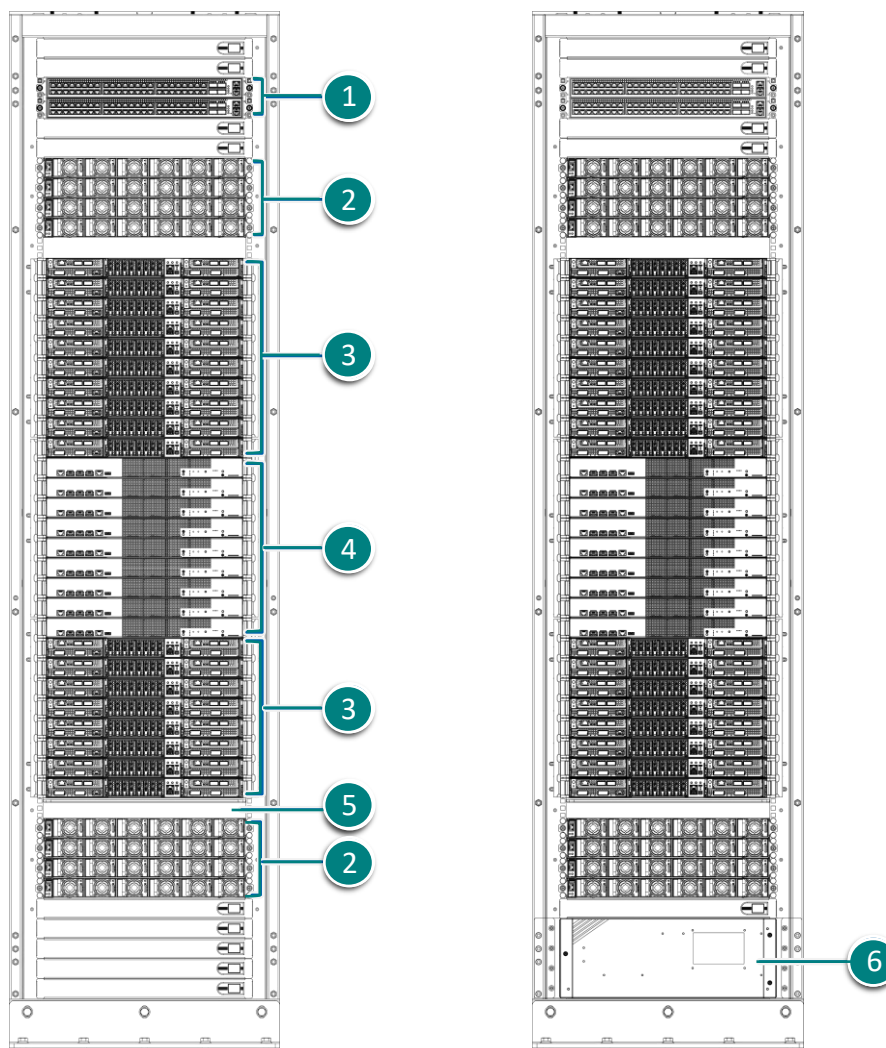


Figure 5-1 Front View

Callout	Item	Description
1	OOB Management Switch	Provides a separate, dedicated network access for remote management and monitoring.
2	Power Shelf	Distributes power to the rack system.
3	Compute Tray	Rack computing node featuring two Bianca Compute Boards for high-density computing.
4	NVLink Switch Tray	Rack tray switch delivering 57.6 Tbps of full duplex bandwidth for NVLink-5.
5	Leak Drip Pan	Collects accidental leaks or spills to prevent damage to surrounding components.  CAUTION: The leak drip pan is above the bottom power shelf and funnels liquid down the drain hose, preventing liquid from entering the high-voltage section of the rack. Liquid in contact with the power shelf or AC power infrastructure can present personal hazard.
6	CDU (Coolant Distribution Unit)	Distributes cooling water to the rack's cooling system to maintain optimal temperature levels.

5.1.2 Rear View

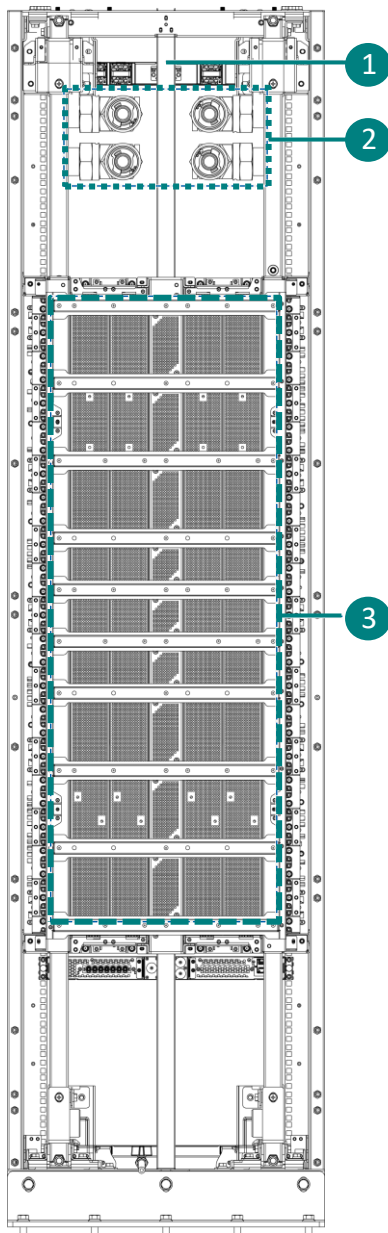


Figure 5-2 Rear View (Top Feed)

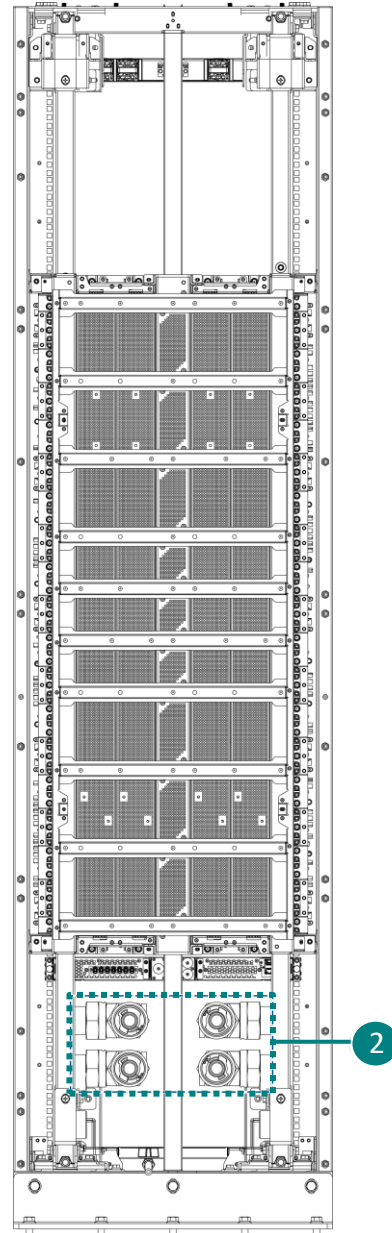


Figure 5-3 Rear View (Bottom Feed)

Callout	Item	Description
1	Bus Bar Assembly	Connects and distributes power across the rack.
2	Cooling Manifold	Distributes coolant to the cooling system to dissipate the heat. Two configuration available: Bottom Feed (BF) and Top Feed (TF)

Callout	Item	Description
3	NV Cable Cartridge	Connects the high-speed interfaces (NVLink L1 domain) between the switch trays and the compute trays.

5.1.3 Top View

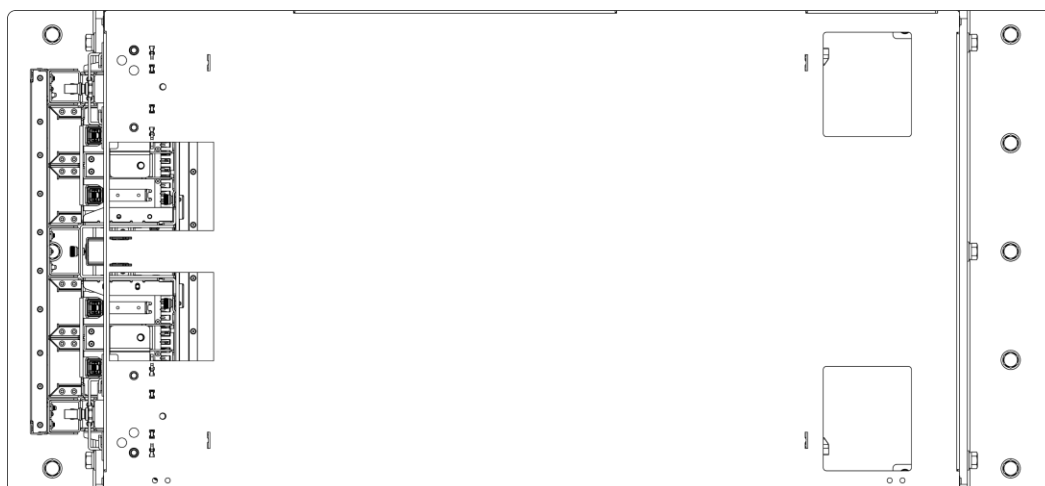


Figure 5-4 Top View

5.1.4 Bottom View

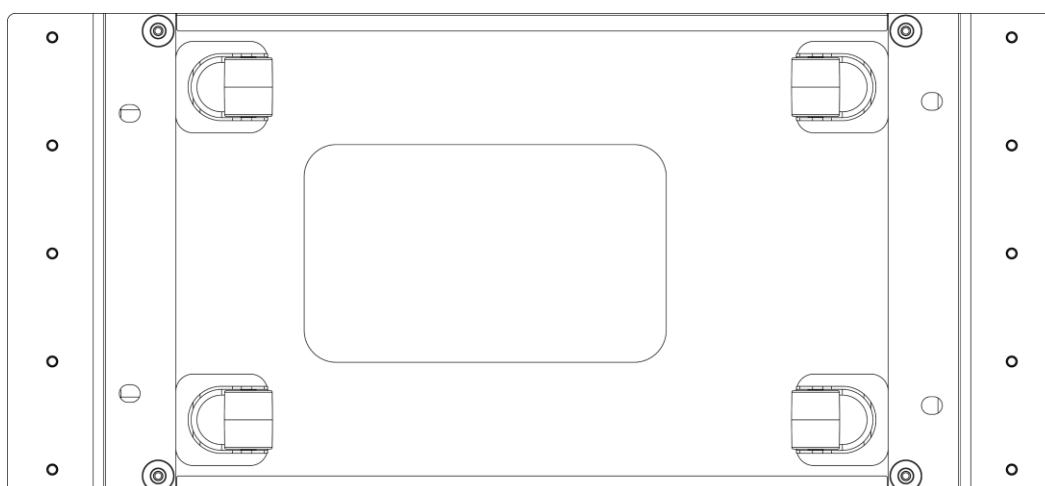


Figure 5-5 Bottom View

5.1.5 Front Angled View

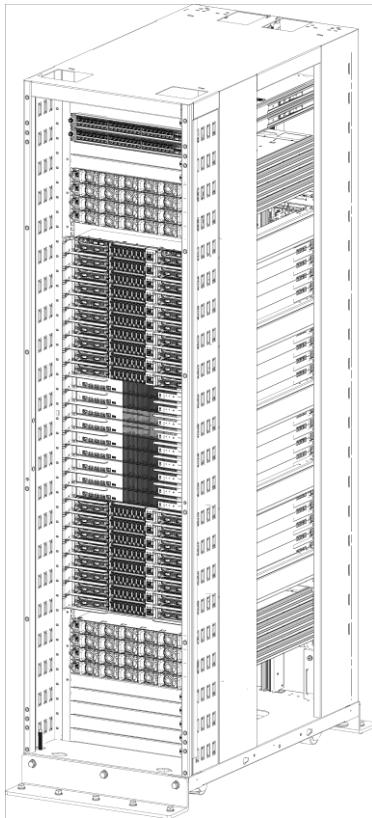


Figure 5-6 Angled View (SKU 1)

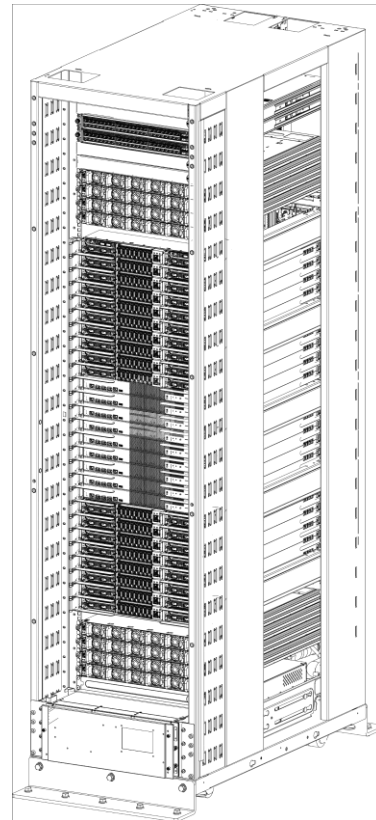


Figure 5-7 Angled View (SKU 2)

5.2 Key Hardware Component

5.2.1 Management Switch

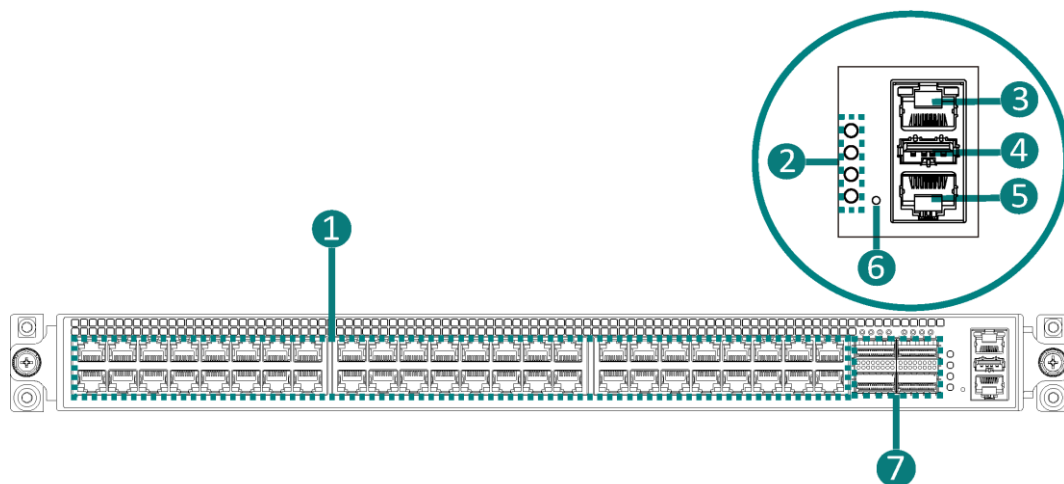


Figure 5-8 Management Switch Front View

Callout	Item	Description
1	RJ45 OOB ports (x48)	RJ45 OOB 1G Base-T ports (ports 1-16, 17-32, and 33-48), a dedicated management network for remote access and device management.
2	System Status LEDs	Four Indicators (system health status, fan status, power status, and UID status) showing the operational status of the device.  NOTE: For more information on OOB switch system status LEDs, see 7.3 Management Switch LEDs.
3	RJ45 Ethernet MGT Port	1 GbE port for Ethernet management
4	USB Type A Port	Connects USB devices for software upgrade, file management or diagnostics. This port is USB 2.0-compliant.
5	Serial RS232 Console Port	Provides serial access to the CPU UART or BMC for initial configuration and debugging  NOTE: Certain configurations are equipped with an RJ45 console port for debugging.
6	Reset Button	Press and hold the reset button with a flat object for at least 15 seconds to reset the system.  CAUTION: DO NOT use a sharp pointed object such as a needle or a push pin.
7	QSFP28 Port (x4)	QSFP28 (Quad Small Form-factor Pluggable 28) 100 GbE ports, each capable of transmitting data at 25 Gbps.

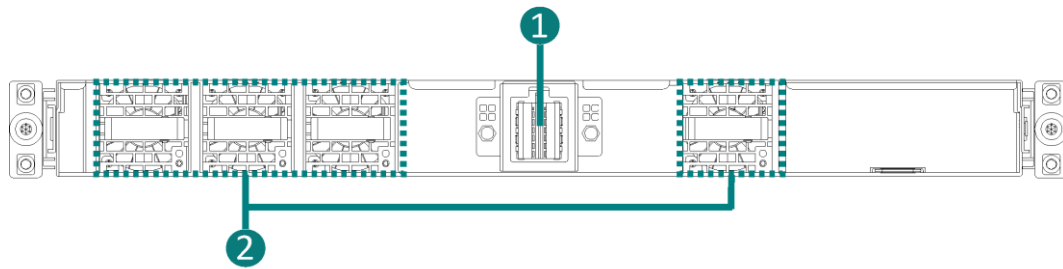


Figure 5-9 Management Switch Rear View

Callout	Item	Description
1	Fan Module (x4)	Four (4) hot-swapped N+1 redundant fans for cooling the switch temperature
2	Bus Bar Clip Connector	Connects and secures the connection between the NVLink switch and the bus bar for power delivery.

5.2.2 Compute Tray

Refer to [Chapter 6 Compute Tray Hardware Overview](#).

5.2.3 Power Shelf

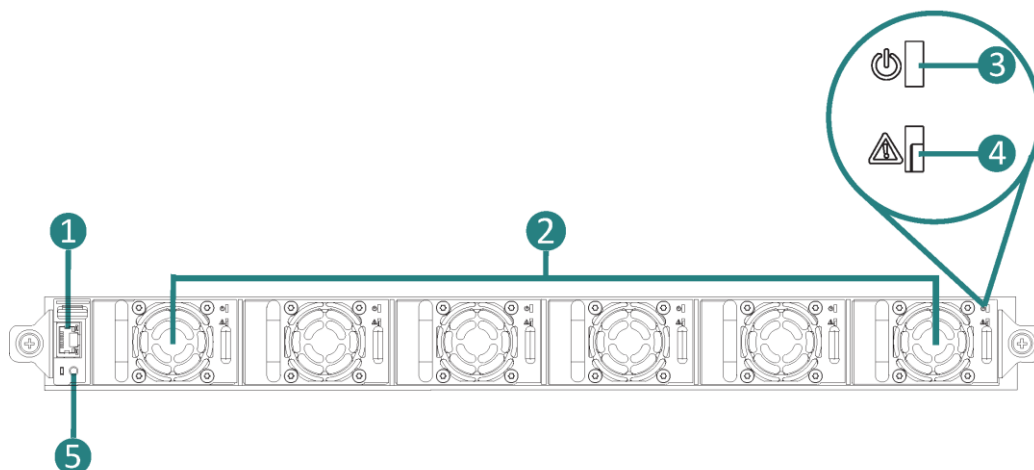


Figure 5-10 Power Shelf Front View

Callout	Item	Description
1	RJ45 Port	Telemetry and monitoring of the power shelf NOTE: It provides network access and PoE input to power the PMC for remote monitoring and management.
2	PSU (1-6)	Each PSU provides 5.5 kW power to the system.
3	PSU Power Status LED	Indicates whether the PSU is receiving AC input and supplying DC output. NOTE: For more information on PSU power status LED, see 7.2 Power Shelf LEDs .
4	PSU Fault Status LED	Indicates whether a PSU fault or warning has occurred. NOTE: For more information on PSU fault status LED, see 7.2 Power Shelf LEDs .
5	PMC Status LED	Indicates the operational status of the power shelf NOTE: For more information on PMC status LED, see 7.2 Power Shelf LEDs .

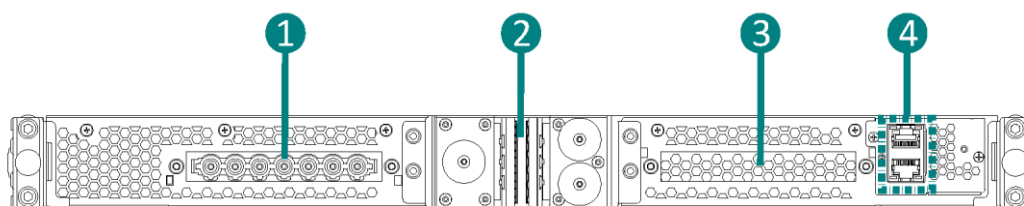


Figure 5-11 Power Shelf Rear View

Callout	Item	Description
1	Power Whip 1 Connector	Connects the power whip cable to the power distribution system (1 x 60 A)
2	Bus Bar Clip Connector	Connects and secures the connection between the power shelf and the bus bar

Callout	Item	Description
3	Power Whip 2 Connector (if applicable)	Connects the power whip cable to the power distribution system (2 x 30 A)
4	RJ45-1 & RJ45-2 Shelf-to-Shelf Connector	Connects CAT6 cables in a daisy-chain configuration to enable current sharing and synchronize power shelf startup

5.2.4 NVLink Switch Tray

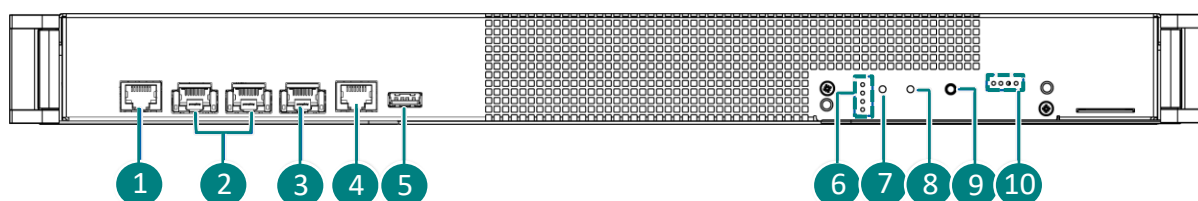


Figure 5-12 NVLink Switch Tray Front View

Callout	Item	Description
1	RJ45 Leakage Detection	Connects to a leak detection system for monitoring liquid exposure.
2	RJ45 Ethernet MGT Port (x2)	1 GbE port for eth0 and eth1 management
3	RJ45 BMC MGT Port	1 GbE port for BMC management
4	RJ45 Serial Console Port	Provides serial access to the CPU UART or BMC over an RJ45 connection.
5	USB Type A Port	Connects USB devices for maintenance or diagnostics. This port is USB 2.0-compliant.
6	System Status LEDs	Four indicators (system fault status, system power status, system fan status, and UID status) showing the operating status of the device. NOTE: For more information on NVLink switch system status LEDs, see 7.4 NVLink Switch Tray LEDs.
7	Reset Button	Press and hold the reset button with a flat object for at least 15 seconds to reset the system.

Callout	Item	Description
		CAUTION: DO NOT use a sharp pointed object such as a needle or a push pin.
8	Power Button	Press to turn on or off the system. Press and hold to force a shutdown. CAUTION: DO NOT use a sharp pointed object such as a needle or a push pin.
9	UID Button	Press to turn on or off the UID LED. NOTE: When the UID LED is flashing blue, it means the system is being identified/located.
10	NVLink Health LEDs	Four indicators (1, 2, 3 and 4) showing the NVLink connection status. NOTE: For more information on NVLink Health LEDs, see 7.4 NVLink Switch Tray LEDs .

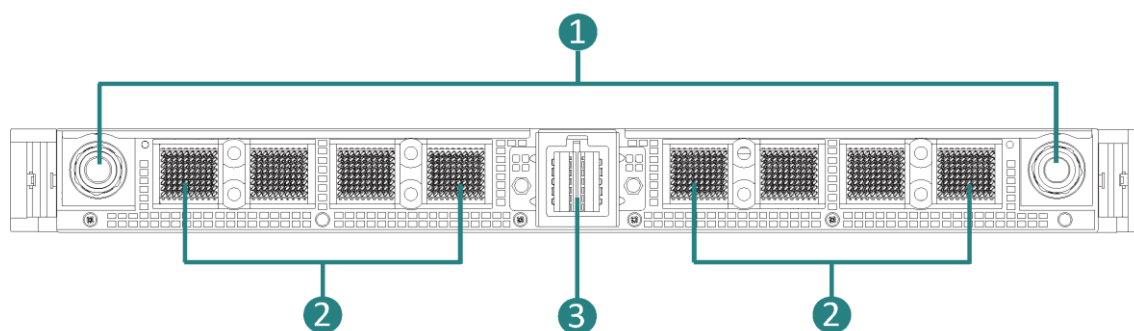


Figure 5-13 NVLink Switch Tray Rear View

Callout	Item	Description
1	UQD LC Connector (x2)	Universal Quick Disconnect (UQD) Liquid-Cooling (LC) connector, provides quick and reliable disconnection and reconnection for liquid-cooling systems.

Callout	Item	Description
2	NVLink5 Connector (x4)	Connects the NVLink switch tray to the cable cartridges.
3	Bus Bar Clip Connector	Connects and secures the connection between the NVLink switch and the bus bar for power delivery.

6 Compute Tray Hardware Overview

6.1 Front View

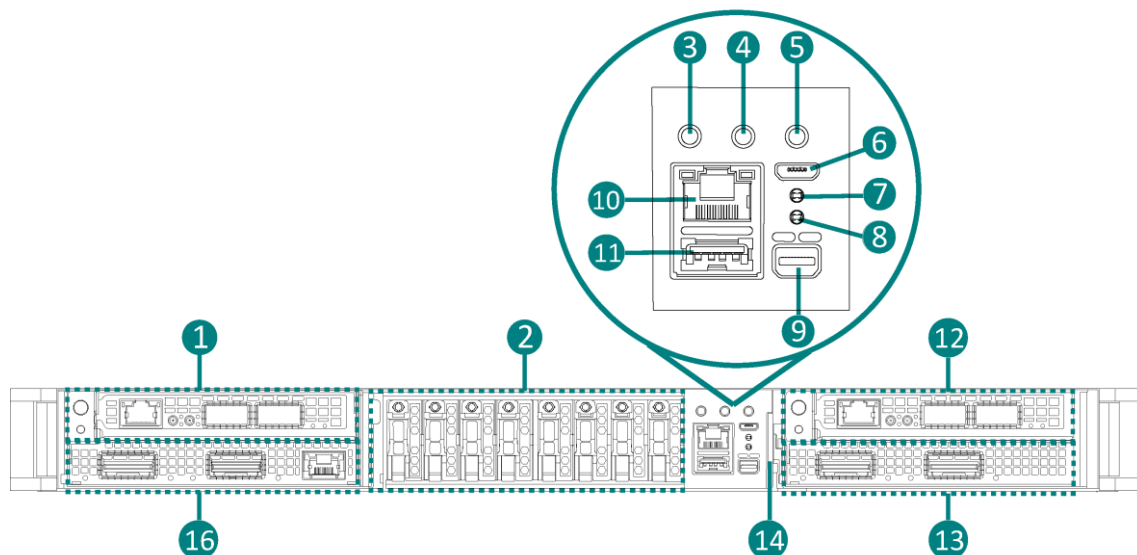


Figure 6-1 Compute Tray Front View

Callout	Item	Description
1	Left BlueField-3 Card Assembly	The BlueField®-3 card equipped with 1 OOB RJ45 management port and 2 QSFP ports with up to 400 Gb/s Ethernet or NDR InfiniBand connectivity. NOTE: The RJ45 port on the BlueField-3 Networking Platform must be connected to an Ethernet network that supports DHCP capabilities and has Internet access.
2	E1.S Hot-swap Drive Bay (0-7)	Install E1.S 9.5 mm hot-swap drives to these bays.
3	Power Button with LED	Press to turn on or off the system. Press and hold to force a shutdown. NOTE: The Power Button LED indicates the system power status. For more information, see 7.1 Compute Tray LEDs.

Callout	Item	Description
4	UID Button with LED	Press to turn on or off the UID LED.  NOTE: When the UID LED is flashing blue, it means the system is being identified/located.
5	Reset Button	Press and hold the reset button with a flat object for at least 15 seconds to reset the system.
6	Micro-USB Management Port	Functions as a CPU UART debug port for debugging and diagnostics. This port is USB 2.0-compliant.
7	NVLink Health LED	Indicates the NVLink connection status.  NOTE: For more information on NVLink connection status, see 7.1 Compute Tray LEDs .
8	System Fault LED	Indicates whether a system fault is occurred.  NOTE: For more information on system fault status, see 7.1 Compute Tray LEDs .
9	Mini DisplayPort Connector	Connects a VGA display to the system.
10	RJ45 BMC Management Port	Provides remote management (via IPMI, Redfish, or web GUI) for monitoring, power control, and firmware, and also allows access to the BMC.
11	USB Type A Port	Connects USB devices to the system. This port is USB 3.0-compliant.
12	Right BlueField-3 Card Assembly	The BlueField®-3 card equipped with 1 OOB RJ45 management port and 2 QSFP ports with up to 400 Gb/s Ethernet or NDR InfiniBand connectivity.  NOTE: The RJ45 port on the BlueField-3 Networking Platform must be connected to an Ethernet network that supports DHCP capabilities and has Internet access.

Callout	Item	Description
13	Right OSFP Cage	Houses 1 OSFP twin-port supporting Ethernet connection. NOTE: Actual configuration may vary depending on the model you purchased.
14	Pull Tab	A label and Service Tag sticker for easy identification and service management.
16	Left OSFP Cage	Houses 1 RJ45 1GbE NIC port and 1 OSFP twin-port supporting Ethernet connections. NOTE: Actual configuration may vary depending on the model you purchased.

6.2 Rear View

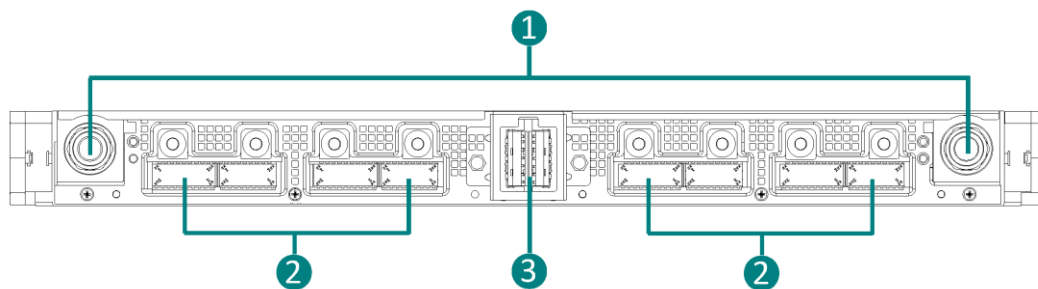


Figure 6-2 Compute Tray Rear View

Callout	Item	Description
1	UQD LC Connector (x2)	Universal Quick Disconnect (UQD) Liquid-Cooling (LC) connector, provides quick and reliable disconnection and reconnection for liquid-cooling systems.
2	NVLink5 Connector (x4)	Connects the compute tray to the cable cartridges.
3	Bus bar Clip Connector	Connects and secures the connection between the compute tray and the bus bar for power delivery.

6.3 Processors

- **Architecture:** The Grace CPU supports up to 144 Arm Neoverse V2 cores with support for the SVE2 instruction set.
- **Memory:** Features high bandwidth and low power consumption, with ECC support and a uniform shared memory architecture. Supports up to 960 GB of LPDDR5X memory capacity and delivers a memory bandwidth of up to 1 TB/s.
- **Interconnect technology:** Uses NVLink-C2C technology to deliver up to 900 GB/s of bandwidth for high-efficiency data transfer between CPUs and GPUs.

6.4 Storage

6.4.1 Drive Configuration

Table 6-1 Drive Configuration

Configuration	Front Drives	Internal Drives	Drive Management Mode
8 x E1.S Drive Configuration	8 x E1.S SSD: Drive bays with physical drive No. 0 to 7 support E1.S SSDs only	1 x NVMe M.2 SSD	NVMe SSD: BlueField-3 card

6.4.2 Drive Numbering

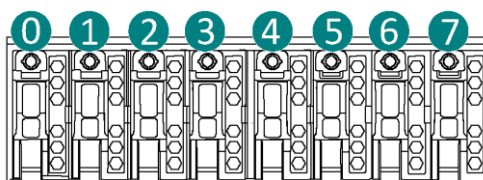


Figure 6-3 Drive Numbering

Configuration	Physical Drive No.	Drive No. Identified by the BMC	Front/Rear
8 x E1.S SSD	0 to 7	0 to 7	Front

6.5 Network

NICs provide network expansion capabilities.

- N-S Networking: Supports 2 × FHHL PCIe 5.0 x16 BlueField-3 card
- E-W Networking: Supports 2 × onboard CX-7 mezzanine card

6.6 Boards

6.6.1 Bianca Compute Board

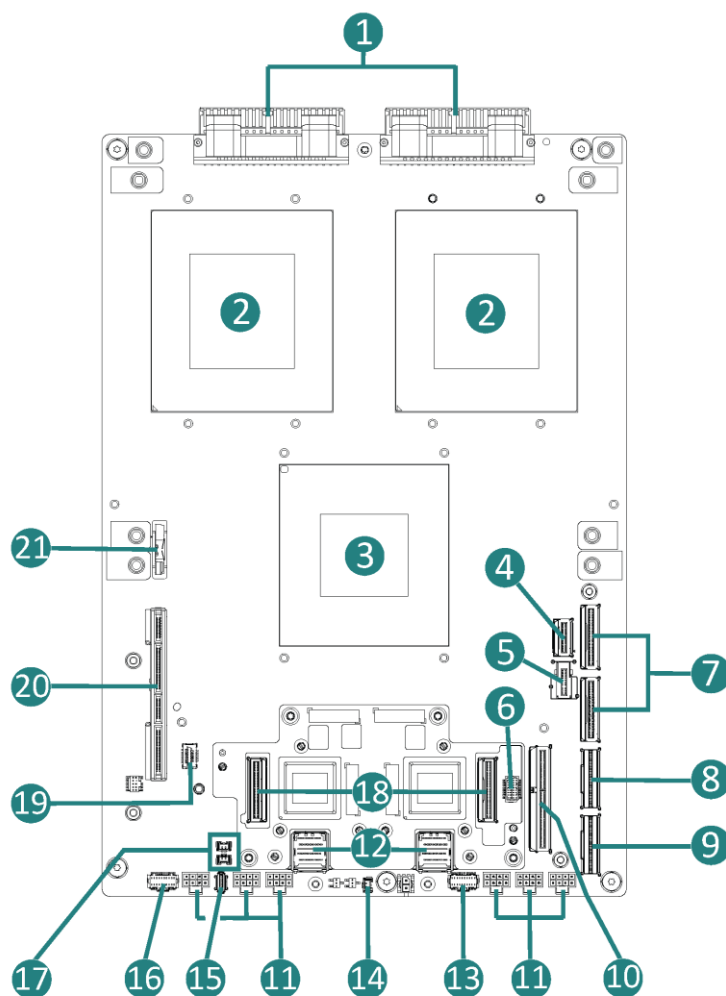


Figure 6-4 Bianca Compute Board View

#	Description	#	Description
1	NVLink5 connector (x2)	12	Ultra pass connector

#	Description	#	Description
2	Blackwell GPU (x2)	13	PDB sideband connector
3	Grace CPU	14	Intrusion header
4	M.2 Riser connector	15	USB debug connector
5	M.2 side-mount connector	16	NCSI sideband connector
6	CX7-OSFP sideband connector	17	Leak detect circuit connector
7	BlueField-3 MCIO connector (x2)	18	CX-7 card MCIO connector (x2)
8	Front IO connector	19	TPM module connector
9	B2B connector	20	DC-SCI HMC module connector
10	C-Link connector	21	RTC battery holder
11	Fan connector (x6)		

6.6.2 E1.S Backplane

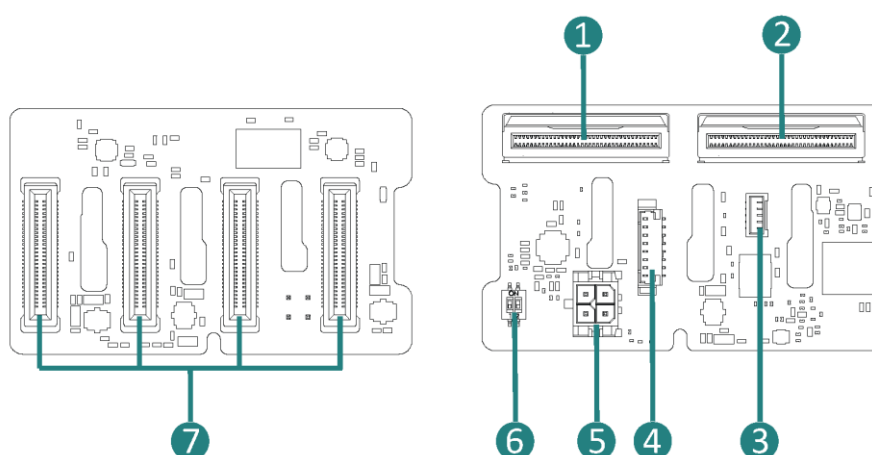


Figure 6-5 E1.S SSD Backplane View

#	Description	Reference Designator
1	BP to IPEX board connector	J11
2	BP to IPEX board connector	J12
3	Signal connector	J6
4	JTAG program connector	J113
5	Power connector	J15
6	Vpp sku switch	SW1
7	E1.S SSD drive connector (x4)	J1, J2, J3, J4

6.6.3 HMC Board

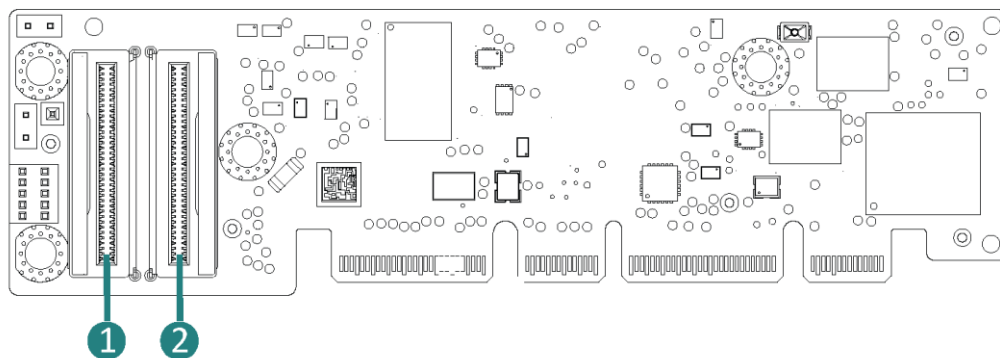


Figure 6-6 HMC Board View

#	Description	Reference Designator
1	HMC-to-BMC connector	J21
2	HMC-to-BMC connector	J22

6.6.4 BMC Board

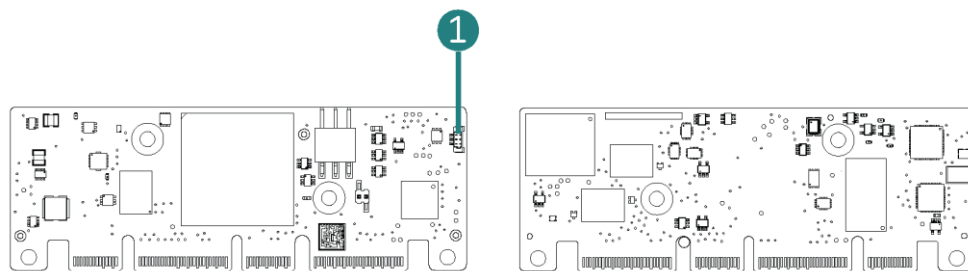


Figure 6-7 BMC Board View

#	Description	Reference Designator
1	I2C debug header	J9

6.6.5 BMC Interposer Board

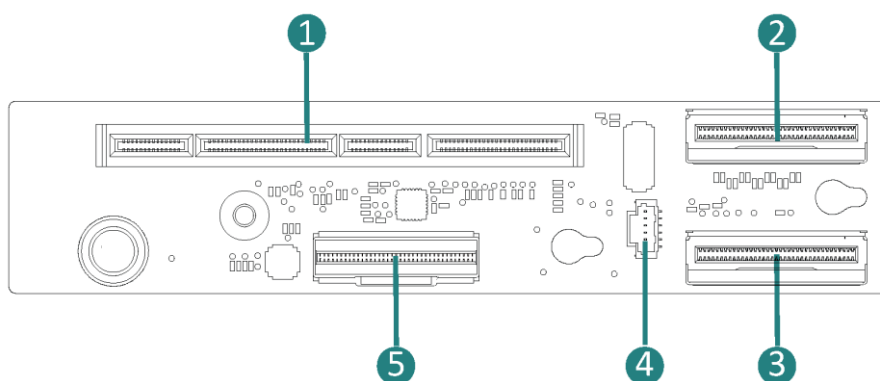


Figure 6-8 BMC Interposer Board View

#	Description	Reference Designator
1	BMC Connector	J1
2	BMC-to HMC connector	J4
3	BMC-to HMC connector	J3
4	Signal connector	J6
5	IO Board SlimSAS connector	J2

7 System Status LEDs

7.1 Compute Tray LEDs

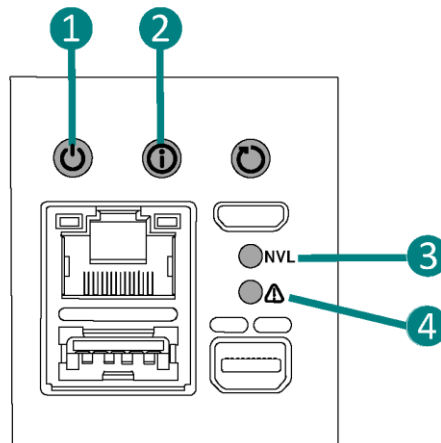


Figure 7-1 Compute Tray Front Panel LEDs

Callout	Item	Description
1	Power Button LED	System Power Status: - Off: system off - Flashing Blue (1 Hz): stand-by mode - Flashing Blue (4 Hz): system running POST - Solid Blue: system power on
2	UID Button LED	UID Status: - Off: ID status off, UID is not active - Flashing Blue (1 Hz): identify location
3	NVLink Health LED	NVLink Connection Status: - Off: No link on any NVLink - Flashing Amber (1 Hz): Beacon/locate on any NVLink - Solid Amber: an NVLink error or a degraded state - Flashing Green (0.5 Hz): Link is active - Solid Green: link connected, but no traffic

Callout	Item	Description
4	System Fault LED	System Fault Status: • Off: system normal, no fault detected • Flashing Amber (4 Hz): Leak detected • Solid Amber: system fault present

7.2 Power Shelf LEDs

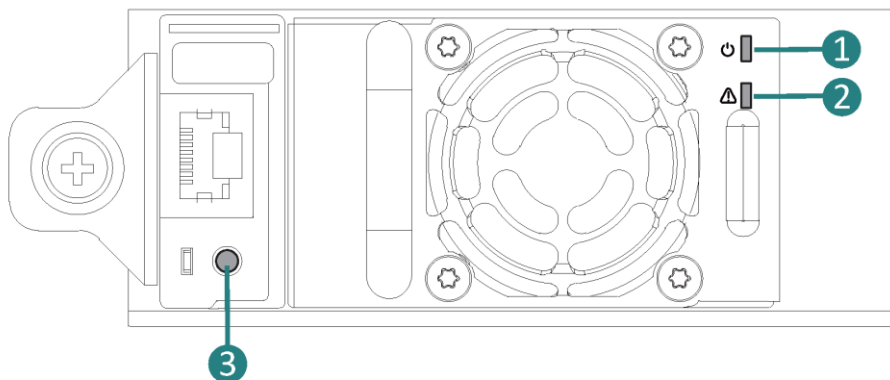


Figure 7-2 Power Shelf LEDs

Callout	Item	Description
1	PSU Power Status LED	PSU Power Status: • Off: NO AC input • Solid Green: PSU normal, that is, PSU is receiving AC input and supplying DC output • Blinking Green: PSU in standby mode, or only AC input present (no load)
2	PSU Fault Status LED	PSU Fault Status: • Off: No fault detected • Solid Amber: AC Loss or PSU failure has occurred • Blinking Amber: warning events
3	PMC Status LED	Power Shelf Status:

Callout	Item	Description
		- Off: No PoE power or the port is not enabled for PoE - Solid Green: PoE power is active and supplying power

7.3 Management Switch LEDs

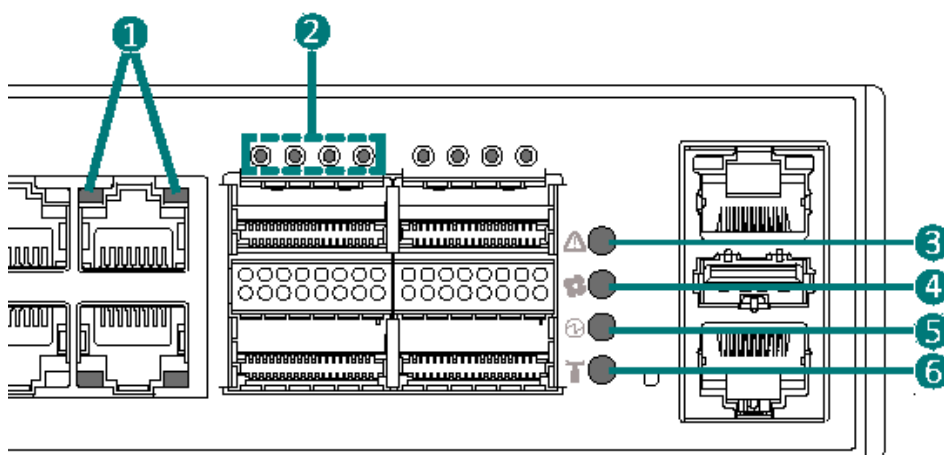


Figure 7-1 OOB Management Switch LEDs

Callout	Item	Description
1	Port Status for RJ45 Port	- Off: system normal - Solid Green: Link is active - Flashing Amber: port fault detected, replace the port cable on the corresponding port
2	Port Status for QSFP28 Port	The QSFP28 port includes four lane LEDs (Lane 1-4), only Lane 1 is active; Lanes 2-4 are not supported currently. - Off: system normal - Solid Green: Link is active - Flashing Amber: port fault detected, replace the port cable on the corresponding port
3	System Health Status	Off: system off

Callout	Item	Description
		• Solid Green: System is powered on and functioning normally • Flashing Green: during the boot process  NOTE: If the system health status LED remains red after five minutes, unplug the system and contact your Aivres representative.
4	System Fan Status	• Off: system off • Solid Green: fan normal, status available only after the network OS has booted. • Solid Red: one or more fans have failed
5	System Power Status	• Off: system off • Solid Green: bus bar input power is normal • Solid Red: bus bar connection error or PDB malfunction
6	UID Status	• Off: ID status off, UID is not active • Solid Blue: UID is active, indicating the switch is being located

7.4 NVLink Switch Tray LEDs

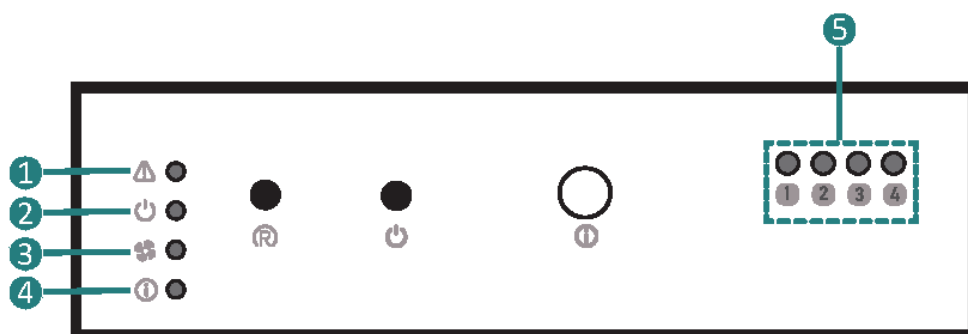


Figure 7-3 NVLink Switch Tray Front Panel LEDs

Callout	Item	Description
1	System Fault Status	• Solid Green: system normal • Solid Amber: system fault present

Callout	Item	Description
		Flashing Green: system booting  NOTE: When pressing and holding the Reset Button, the system fault status LED flashes green.
2	System Power Status	- Off: during the boot process - Solid Amber: power error - Solid Green: power normal
3	System Fan Status	- Off: during the boot process - Solid Amber: fan error - Solid Green: fan normal
4	UID Status	- Off: during the boot process - Solid Blue: system normal - Flashing Blue (1 Hz): identify location  NOTE: Press the UID button to turn on/off this LED.
5	NVLink Health LED	Four indicators (1, 2, 3, 4) showing the NVLink switch connection status for cartridges #1 through #4: - Off: no NVLink - Solid Amber: physical link on any NVLink connection - Flashing Amber (1 Hz): identify link - Flashing Amber (2 Hz): link error - Solid Green: NVLink connected, but no traffic - Flashing Green: NVLink is active

8 PSU Specifications

The power shelves in the KRSV8300 rack are designed to support high-power GPU configurations, using a bus bar–based power distribution architecture. They convert three-phase high-voltage AC power into high-current DC power to supply the compute trays, network modules, and other components in the rack. The rack supports a single power shelf, or multiple cascaded power shelves to accommodate different power requirements and redundancy strategies, and it supports cascading up to 8 power shelves (4 + 4). The PSUs are hot-swappable, and a single power shelf can support up to 6 PSUs, which support tool-less installation and automatic locking after being inserted into the power shelf. The PSUs are 80 Plus Platinum rated with a maximum output power of 5,500 W. Users can choose the number of PSUs based on the specific configuration.

Operating voltage range:

- AC input: 180 Vac to 264 Vac
- DC input: 180 Vdc to 320 Vdc

Table 8-1 PSU Efficiency and PF Specifications

Rated Power	@10% Load	@50% Load	@100% Load	@20% to 50% Load	@50% to 100% Load
5,500 W PSU	≥94%	≥96.5%	≥95.5%	PF ≥0.96	PF ≥0.98

9 Regulatory Information

9.1 Safety

9.1.1 General

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

9.1.2 Personal Safety

- Only personnel certified or authorized by 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 9-1.



Figure 9-1 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 9-2, in order to avoid electric shock or burns.

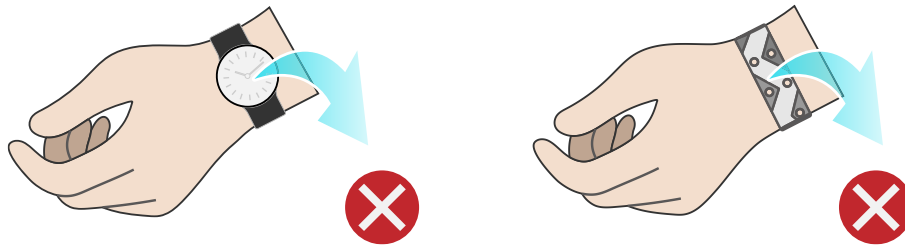


Figure 9-2 Removing Conductive Objects

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

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

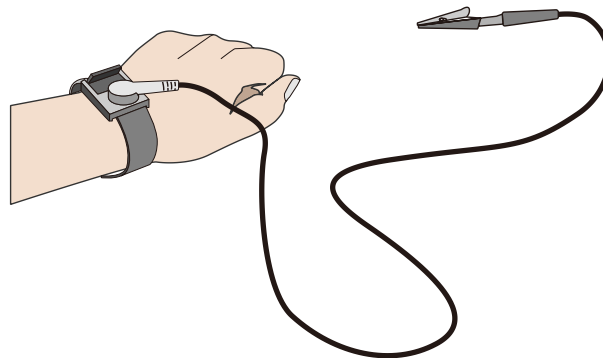


Figure 9-3 Wearing an ESD Wrist Strap

- 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 fiber optic cables, avoid looking into the optical port without eye protection in order to prevent eye damage from laser light.

9.1.3 Equipment Safety

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

9.1.4 Transportation Precautions

Contact the manufacturer for precautions before transportation as improper transportation may damage the equipment. The precautions include but are 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.

9.1.5 Manual Handling Weight Limits



CAUTION

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

Table 9-1 lists the manual handling weight limits per person specified by some organizations.

Table 9-1 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

10 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.

10.1 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.

10.1.1 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.

10.1.2 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.

10.1.3 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.

10.1.4 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.

10.1.5 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.

10.2 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

10.3 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.

11 System Management

This chapter introduces the system management functions available on the compute tray as part of the KRS8000V3 Exascale Server Rack.

11.1 Intelligent Management System BMC

The Baseboard Management Controller (BMC) provides out-of-band management capabilities such as remote power control, sensor monitoring, and firmware upgrades.

Detailed specifications and supported features will be provided in a future revision.

11.2 KSManage Tool



NOTE

The compute tray has been tested for compatibility with the latest version of KSManage.

KSManage is a new-generation infrastructure Operations and Maintenance (O&M) management platform for data centers. Based on advanced O&M concepts, KSManage provides users with leading, efficient, and comprehensive solutions for data centers, ensuring the advanced infrastructure management.

KSManage supports numerous functions such as unified asset management, device monitoring, in-depth fault diagnosis, component fault prediction, intelligent energy consumption management, 3D automatic topology, and stateless automatic deployment. These functions provide unified O&M management of super nodes, servers, storage devices, network devices, and edge devices. KSManage can improve the enterprise O&M efficiency, reduce O&M costs, and ensure the safe, stable, and reliable operation of data centers.

Main features:

- Multi-scenario lightweight deployment and full lifecycle device management

KSManage supports deployment on virtual machines (KVM/VMware) and bare-metal systems, meeting the full-lifecycle management needs of all devices (especially servers) for enterprises of all sizes.

- High reliability and 1-to-N on-demand scalability of data collection and analysis nodes

KSManage meets the needs of multiple business scenarios and provides high reliability. The data collection and analysis nodes can scale seamlessly from 1 to N, enabling multi-data center management and expansion with no impact on the existing monitoring services.

- Intelligent asset management and real-time tracking of asset changes

KSManage provides fully automated, end-to-end asset management capabilities, including: RFID tag-based outbound/inbound management, inventory checking of asset contracts, RFID scanning of offline assets, equipment rack mounting, change sensing of equipment U-position, configuration verification, component change sensing, equipment rack dismounting, asset workflow approval management, thus realizing full lifecycle management of assets.

- Comprehensive monitoring and fault prediction for overall business control

KSManage provides comprehensive alarm monitoring and fault prediction services. By integrating advanced AI technology, it enables fault prediction of server drives and memories to ensure the efficient and stable operation of enterprise infrastructure.

- Intelligent power consumption management, comprehensively improving energy efficiency of data centers

KSManage provides power consumption monitoring, energy consumption analysis, power consumption policies, and power distribution optimization, supporting refined energy management for data centers.

- Performance monitoring and intelligent prediction, keeping track of device health status

KSManage supports in-band and out-of-band performance monitoring. Through seamless integration with the Driver, it enables large-scale real-time performance data collection. By multi-channel information gathering and comprehensive monitoring and analyzing of key indicators, it provides administrators with effective operational decision support for efficient data center management.

- Dual-channel batch configuration, shortening the go-live cycle

KSManage provides batch firmware upgrade, hardware configuration, system deployment, and software deployment. It significantly improves the server go-live and O&M efficiency, and supports dual-channel (BMC + PXE) automated initial deployment and delivery for servers.

- Version management, improving the management efficiency

KSManage provides local management of firmware and OS images as well as automatic synchronization with remote official websites, improving the efficiency of version management for hardware and software of data center devices.

- Integrated power and environment management, providing comprehensive insight into the overall operation status of data centers

With an integrated power and environmental system, KSManage enables comprehensive management of both IT and non-IT devices. It supports unified management of non-IT infrastructure (e.g., access control, air conditioner, power distribution cabinets, temperature and humidity sensors), and integrates IT and non-IT data across data centers to deliver a more complete view of data center operation to users.

- Standardized northbound interfaces, facilitating user integration and interconnection

KSManage provides standard interfaces such as REST and SNMP, with extensibility for additional functions on this basis to facilitate user integration and interconnection.

Capabilities and Supported Features:

- **Asset Management**

- Supports automatic discovery and batch import of the devices in the rack.
- Supports asset management for compute trays, NVLink switch trays, OOB switches, IB switches, and power shelves.
- Supports automatic acquisition of compute tray asset information, including basic information and components such as CPUs, GPUs, memories, NICs, network ports, PCIe devices, RAID cards, and drives.
- Supports automatic acquisition of NVLink switch tray asset information, including basic information and components such as ports, fans, and PSUs.
- Supports automatic acquisition of OOB and IB switch asset information, including basic information and components such as ports, fans, PSUs, and transceivers.
- Supports automatic acquisition of power shelf asset information, including basic information, BMC, and PSUs.
- Supports rack management in data centers and server rooms, including location maintenance and 2D/3D visualization.
- Supports rack asset property expansion with custom fields (time, text, etc.), featuring advanced search, sorting, and batch assignment.
- Supports rack space capacity analysis and report export.
- Supports device change management, including addition, movement, deletion, and status/configuration changes of rack internal devices (compute trays, NVLink switch trays, OOB/IB switches, power shelves, etc.).
- Supports maintenance management for key devices (compute trays, NVLink switch trays, OOB/IB switches, power shelves, etc.) in the rack, with auto-acquisition, manual maintenance, batch import of maintenance information, and expiration reminders.
- Supports password escrow for compute tray in the rack, featuring password complexity identification, batch management/removal, update policy settings, and forced deletion.

- **Monitoring Management**

- Supports overall health monitoring of the rack, including internal devices such as power shelves, compute trays, OOB switches, and NVLink switches.
- Supports power shelf health monitoring, with items covering performance overview, BMC, power shelves, PSUs, power consumption, network, fans, temperature, voltage, and current.

- Supports compute tray health monitoring, with items covering FRU, CPUs, GPUs, memories, BMC network, liquid cooling devices, NICs, network ports, PCIe devices, RAID cards, and physical disks.
- Supports OOB switch health monitoring, with items covering fans, PSUs, ports, voltage, CPUs, memories, and temperature.
- Supports NVLink switch health monitoring, with items covering CPUs, memories, fans, ports, liquid cooling devices, voltage, and temperature.
- Supports unified GPU monitoring with second-level tracking of metrics like utilization, memory usage, bandwidth, temperature, and power consumption.
- Supports custom inspection tasks with automated report generation and distribution.
- Supports alarm subscription settings for power shelves, compute trays, OOB switches, and NVLink switches.
- Supports message record tracing, custom message parsing, and alarm simulation testing for all devices.
- Supports unified management of real-time alarms, historical alarms, events, and masked alarms across devices.
- Supports fault prediction for drives and memories.
- Supports custom alarm notification rules and templates, with notifications via email, SMS, Slack, PagerDuty, WeChat, etc., and supports notification record viewing.
- Supports intelligent fault diagnosis and analysis, automatic fault reporting, and repair ticket viewing.
- Supports alarm rule configuration for all metrics with custom thresholds for alarm triggering.
- Supports management of monitoring rules, including alarm masking, noise reduction, auto-confirmation, compression, reporting, and redefinition.
- Supports settings for historical alarm/event dump and querying of dumped content.
- Supports alarm correlation rule settings and correlation analysis display.
- Supports custom log collection and retrieval via KQL, SQL, and regular expressions.
- Supports log index management, including index viewing, custom index templates, and lifecycle management.

● Configuration Management

- Provides batch firmware upgrade for core components including BMC, BIOS, GPU, NVLink, and NVMe drives.
- Supports batch configuration of BMC and BIOS, including alarm policy setting, log management, virtual media mounting, and BIOS boot order setting.
- Enables rapid OS deployment, with cloning of a single compute unit's deployment to others for consistent cluster configuration.
- Supports batch injection of NVIDIA GPU drivers, NVLink drivers, and InfiniBand drivers for rapid GPU and network topology identification.

- Supports automated deployment of HPC job systems (e.g., Slurm, Kubernetes) and batch deployment of compute unit clients, improving server racking efficiency.
- Enables batch configuration of high-performance networks, including cluster network topology management and NIC MAC address control.
- Offers secure and quick data erasure for NVMe drives to prevent data leakage during server decommissioning.
- Supports repository-based management of firmware upgrade files and driver packages for unified version control.
- Enables remote access to various devices (via SSH and Telnet).
- Supports multiple methods for remote KVM access to servers, with operation video recording and auditing capabilities.

● Energy Efficiency Management

- Supports energy consumption statistics and trend charts for the rack, covering devices such as compute trays, switches, NVLink switches, and power shelves.
- Provides energy consumption and usage trend charts at data center, room, rack, and device levels for physical and business views.
- Supports power strategy management, offering dynamic and minimum power consumption strategies for devices and groups.
- Enables rack temperature analysis, with ASHRAE standard evaluation and repair recommendations for the rack.
- Supports device usage analysis, generating lists of high-utilization and low-utilization devices.
- Supports power distribution analysis, displaying the distribution of racks with high/low power supply loads, as well as rack power loads and space usage.
- Offers tools for power consumption characteristic analysis, power consumption forecasting, and load distribution analysis.
- Supports power and environmental system integration, with monitoring of non-IT devices such as liquid cooling devices, air conditioners, temperature and humidity sensors, power distribution cabinets, access control, and cameras.

● Topology Management

- Supports unified management of multiple data centers with a panoramic 3D view, dynamically displaying the power consumption, temperature, alarms, and rack capacity of the data center.
- Supports dynamic generation of data center network topology, showing interconnection links between computing, storage, and network devices.
- Supports visual management of NVLink interconnections between GPUs, with NVLink performance trend analysis (including status, bandwidth utilization, and error counts).

- Supports visual management of IB network interconnections between the racks, with IB link performance trend analysis (including status, bandwidth utilization, error counts, and latency).
- **Statistical Management**
 - Supports management of maintenance reports, asset reports, hardware reports, and performance reports.
 - Supports space capacity analysis and statistical report export for the rack.
 - Supports statistics and detail viewing of alarms, events, and recovery trends, with statistics on alarm occurrence frequency and flash alarms.
 - Supports custom timing reports that can be exported in Excel, Word, and PDF formats.
 - Supports custom homepages with multi-dimensional information statistics (data centers, rooms, racks, assets, health statistics and power consumption).
 - Supports statistics on rack quantity, utilization rate, internal device classification, and space capacity.
- **System Management:** Supports system parameter settings, operation logs, job management, license management, system integration, and data collector management.
- **Security Management:** Through user management, authentication management (supporting local and LDAP authentication), role management, scope management, certificate management, firewall policies and other security features, it achieves multi-level, fine-grained security control for the platform, comprehensively ensuring system security and compliance.

12 Certification

12.1 KR1288-N3-C0-F0-00

Table 12-1 Certification

Country/Region	Certification	Mandatory/Voluntary
International	CB	Voluntary
EU	CE	Mandatory
US	FCC	Mandatory
	UL	Voluntary

13 Appendix A

Table 13-1 Compute Tray Model

Certified Model	Description
KR1288-N3-C0-F0-00	Global

Table 13-2 Compute Tray Thermal Restrictions

Configuration	Max. Operating Temp.: 40°C (104°F)
8 × E1.S SSD + 8 × 4056 Fan	CPU TDP ≤300 W GPU TDP ≤1,200 W

NOTE: Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.

Table 13-3 Sensor List

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
BMC0DCSC MTemp0	35.000	degrees C	ok	NA	NA	5.000	90.000	93.000	NA
Chas0FronIO Temp0	30.000	degrees C	ok	NA	NA	NA	42.000	45.000	NA
PDB0InletTemp0	35.000	degrees C	ok	NA	NA	NA	80.000	NA	NA
CPU0_Temp	45.498	degrees C	ok	NA	NA	NA	90.498	NA	NA
M0_CPUTempLim0	44.498	degrees C	ok	NA	NA	5.498	NA	NA	NA
CPU1_Temp	44.498	degrees C	ok	NA	NA	NA	90.498	NA	NA
M1_CPUTempLim0	45.498	degrees C	ok	NA	NA	5.498	NA	NA	NA
M0_Inlet_Temp0	36.000	degrees C	ok	NA	NA	NA	65.000	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
M0_Inlet_Temp1	41.000	degrees C	ok	NA	NA	NA	65.000	NA	NA
M0_Exhaust Temp0	44.000	degrees C	ok	NA	NA	NA	70.000	NA	NA
M1_Inlet_Temp1	42.000	degrees C	ok	NA	NA	NA	65.000	NA	NA
M1_Inlet_Temp0	39.000	degrees C	ok	NA	NA	NA	65.000	NA	NA
M1_Exhaust Temp0	44.000	degrees C	ok	NA	NA	NA	70.000	NA	NA
M0_CPU_Energy0	96040.000	Joules	ok	NA	NA	NA	NA	NA	NA
M0_CPU_Power0	98.000	Watts	ok	NA	NA	NA	NA	NA	NA
M1_CPU_Energy0	87808.000	Joules	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
M1_CPU_Power0	98.000	Watts	ok	NA	NA	NA	NA	NA	NA
M0_VregCpuPower0	46.648	Watts	ok	NA	NA	NA	NA	NA	NA
M0_VregSocPower0	6.478	Watts	ok	NA	NA	NA	NA	NA	NA
M0_VregCpuVol0	1.176	Volts	ok	NA	NA	NA	NA	NA	NA
M0_VregSocVol0	0.784	Volts	ok	NA	NA	NA	NA	NA	NA
M1_VregCpuPower0	45.472	Watts	ok	NA	NA	NA	NA	NA	NA
M1_VregSocPower0	6.517	Watts	ok	NA	NA	NA	NA	NA	NA
M1_VregCpuVol0	1.176	Volts	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
M1_VregSoc Vol0	1.176	Volts	ok	NA	NA	NA	NA	NA	NA
HGX_HMC_0_Temp_0	40.000	degrees C	ok	NA	NA	5.000	90.000	NA	NA
HGX_GPU_0_Temp_1	45.000	degrees C	ok	NA	NA	0.000	NA	NA	NA
HGX_GPU_1_Temp_1	45.000	degrees C	ok	NA	NA	0.000	NA	NA	NA
HGX_GPU_2_Temp_1	46.000	degrees C	ok	NA	NA	0.000	NA	NA	NA
HGX_GPU_3_Temp_1	46.000	degrees C	ok	NA	NA	0.000	NA	NA	NA
HGX_GPU_0_Temp_0	42.000	degrees C	ok	NA	NA	NA	87.000	95.000	NA
HGX_GPU_1_Temp_0	42.000	degrees C	ok	NA	NA	NA	87.000	95.000	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
HGX_GPU_2_Temp_0	41.000	degrees C	ok	NA	NA	NA	87.000	95.000	NA
HGX_GPU_3_Temp_0	41.000	degrees C	ok	NA	NA	NA	87.000	95.000	NA
HGXGPU0DR A0Temp0	45.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
HGXGPU1DR A0Temp0	44.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
HGXGPU2DR A0Temp0	44.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
HGXGPU3DR A0Temp0	43.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
HGXGPU0Power0	148.370	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU1Power0	172.430	Watts	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
HGXGPU2Power0	176.440	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU3Power0	152.380	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU0DR A0Powe0	32.080	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU1DR A0Powe0	24.060	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU2DR A0Powe0	28.070	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU3DR A0Powe0	28.070	Watts	ok	NA	NA	NA	NA	NA	NA
HGXGPU0Energy0	2368800000.000	Joules	ok	NA	NA	NA	NA	NA	NA
HGXGPU1Energy0	2788800000.000	Joules	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
HGXGPU2Energy0	2822400000.000	Joules	ok	NA	NA	NA	NA	NA	NA
HGXGPU3Energy0	2503200000.000	Joules	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN1PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN2PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN3PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN4PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN5PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN6PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
Chassis0FAN 7PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
Chassis0FAN 8PWM	45.000	percent	ok	NA	NA	NA	NA	NA	NA
FAN0_F_RPM	14790.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN0_R_RPM	13920.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN1_F_RPM	14790.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN1_R_RPM	13775.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN2_F_RPM	14790.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN2_R_RPM	13775.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
FAN3_F_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN3_R_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN4_F_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN4_R_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN5_F_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN5_R_RPM	NA	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN6_F_RPM	15080.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN6_R_RPM	13920.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
FAN7_F_RPM	15080.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
FAN7_R_RPM	13920.000	RPM	Ok	NA	2900.000	NA	NA	NA	NA
IOBoar0CX70Temp0	44.000	degrees C	ok	NA	NA	NA	100.000	NA	NA
IOBoar0CX71Temp0	49.000	degrees C	ok	NA	NA	NA	105.000	108.000	NA
IOBoar1CX70Temp0	46.000	degrees C	ok	NA	NA	NA	105.000	108.000	NA
IOBoar1CX71Temp0	47.000	degrees C	ok	NA	NA	NA	105.000	108.000	NA
BF3Slot1NIC Temp0	65.000	degrees C	ok	NA	NA	NA	100.000	105.000	NA
BF3Slot2NIC Temp0	83.000	degrees C	ok	NA	NA	NA	100.000	105.000	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
PDB0HSCOCur0	2.000	Amps	ok	NA	NA	NA	NA	NA	NA
PDB0HSCOPwr0	106.200	Watts	ok	NA	NA	NA	NA	NA	NA
PDB0HSCOTemp0	32.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
PDB0HSCOVoltIn0	49.000	Volts	ok	NA	NA	NA	NA	NA	NA
PDB0HSCOVoltOut0	49.000	Volts	ok	NA	NA	NA	NA	NA	NA
PDB0HSC1Temp0	34.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
PDB0HSC1Pwr0	94.400	Watts	ok	NA	NA	NA	NA	NA	NA
PDB0HSC1Cur0	2.000	Amps	ok	NA	NA	NA	NA	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
PDB0HSC1V oltIn0	49.000	Volts	ok	NA	NA	NA	NA	NA	NA
PDB0HSC1V oltOut0	50.000	Volts	ok	NA	NA	NA	NA	NA	NA
Ch0LeaDet0 ColPla	1.725	Volts	ok	NA	1.647	NA	NA	NA	NA
Cha0LeaDet e0Mani	1.725	Volts	ok	NA	1.647	NA	NA	NA	NA
Ch0LeaDet1 ColPla	1.732	Volts	ok	NA	1.647	NA	NA	NA	NA
Cha0LeaDet e1Mani	1.725	Volts	ok	NA	1.647	NA	NA	NA	NA
PDB0Vreg0T emp0	36.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
PDB0Vreg0T emp1	33.000	degrees C	ok	NA	NA	NA	105.000	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
PDB0Vreg1Temp0	36.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
PDB0Vreg1Temp1	32.000	degrees C	ok	NA	NA	NA	105.000	NA	NA
System Event	0x0	Discrete	0x0080	NA	NA	NA	NA	NA	NA
System Event Log	0x0	Discrete	0x0080	NA	NA	NA	NA	NA	NA
Total_power	212.400	Watts	ok	NA	NA	NA	NA	NA	NA
SYS0_12V	12100	Volts	ok	NA	NA	NA	NA	NA	NA
SYS1_12V	12.100	Volts	ok	NA	NA	NA	NA	NA	NA
BMC_Reset	0x0	Discrete	0x0080	NA	NA	NA	NA	NA	NA
BF3_Slot_1_Temp	65.000	degrees C	ok	NA	NA	NA	100.000	105.000	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
BF3_Slot_2_Temp	83.000	degrees C	ok	NA	NA	NA	100.000	105.000	NA
BF3Slo1Port 0Temp	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
BF3Slo2Port 0Temp	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
BF3Slo2Port 1Temp	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
BF3Slo1Port 1Temp	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
IOBoard0CX 70Temp	0.000	degrees C	ok	NA	NA	NA	100.000	NA	NA
IOBoard0CX 71Temp	0.000	degrees C	ok	NA	NA	NA	100.000	NA	NA
IOBoard1CX 70Temp	0.000	degrees C	ok	NA	NA	NA	100.000	NA	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
IOBoard1CX71Temp	0.000	degrees C	ok	NA	NA	NA	100.000	NA	NA
IOBo1CX70P or0Tem	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
IOBo0CX71P or0Tem	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
IOBo1CX71P or0Tem	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
IOBo0CX70P or0Tem	0.000	degrees C	ok	NA	NA	NA	70.000	80.000	NA
StoBac1SSD1Temp0	37.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
StoBac1SSD0Temp0	35.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
StoBac1SSD3Temp0	35.000	degrees C	ok	NA	NA	NA	NA	77.000	NA

Sensor Name	Reading/ Value	Units	Status	Lower Non-Recoverable	Lower Critical	Lower Non-Critical	Upper Non-Critical	Upper Critical	Upper Non-Recoverable
StoBac0SSD 2Temp0	34.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
NVMe_M.2_Temp	44.000	degrees C	ok	NA	NA	NA	NA	70.000	NA
StoBac0SSD 3Temp0	34.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
StoBac0SSD 0Temp0	30.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
StoBac1SSD 2Temp0	36.000	degrees C	ok	NA	NA	NA	NA	77.000	NA
StoBac0SSD 1Temp0	33.000	degrees C	ok	NA	NA	NA	NA	77.000	NA