

FusionServer

2288H V6 Server

Technical White Paper

Issue 01

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About This Document

Overview






This document describes the FusionServer 2288H V6 rack server in terms of features, structure, specifications, and component hardware and software compatibility.

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 | Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury. |
|  WARNING | Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury. |
|  CAUTION | Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. |
|  NOTICE | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury. |
|  NOTE | Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

Change History

| Issue | Date | Description |
|-------|------------|-------------------------------------------|
| 01 | 2021-10-22 | This issue is the first official release. |

1 Product Introduction

FusionServer 2288H V6 (2288H V6) is a new-generation 2U 2-socket rack server designed for Internet, Internet Data Center (IDC), cloud computing, enterprise, and telecom applications.

The 2288H V6 is ideal for IT core services, cloud computing, virtualization, high-performance computing, distributed storage, big data processing, enterprise or telecom service applications, and other complex workloads.

The reliable 2288H V6 features low power consumption, high scalability, easy deployment, and simplified management.

Figure 1-1 2288H V6-32DIMM with 12 x 3.5" drives (example)



Figure 1-2 2288H V6-16DIMM with 12 x 3.5" drives (example)



2 Features

Performance and Scalability

- Powered by the third-generation Intel® Xeon® Scalable Ice Lake processors, the server provides up to 40 cores, 3.6 GHz frequency, a 60 MB L3 cache, and up to three 11.2 GT/s UPI links between the processors, which deliver supreme processing performance.
 - It supports up to two processors with 80 cores and 160 threads to maximize the concurrent execution of multithreaded applications.
 - The L2 cache capacity is increased. Each core exclusively occupies 1.25 MB L2 cache, and at least 1.5 MB L3 cache.
 - Intel Turbo Boost Technology 2.0 allows processor cores to run faster than the frequency specified in the Thermal Design Power (TDP) configuration if they are operating below power, current, and temperature specification limits.
 - Intel Hyper-Threading Technology enables each processor core to run up to two threads, improving parallel computation capability.
 - The hardware-assisted Intel® Virtualization Technology (Intel® VT) allows operating system (OS) to better use hardware to address virtualization workloads.
 - Intel® Advanced Vector Extensions 512 (Intel AVX-512) significantly accelerates floating-point performance for computing-intensive applications.
 - Intel DL Boost (VNNI) is supported to improve the performance of deep learning applications.
 - The Intel® SGX and Intel® TME security features provide fine-grained data protection through application isolation in the memory, and defend against physical attacks through full memory encryption.
- 2288H V6-32DIMM supports a maximum of 32 memory modules in the following memory forms:
 - The server supports a maximum of 32 DDR4 ECC 3200 MT/s DIMMs. The DDR4 ECC DIMMs support registered DIMMs (RDIMM) and load-reduced DIMMs (LRDIMMs), which provide high speed and availability. A server supports a maximum memory capacity of 8192 GB and a maximum memory bandwidth of 400 GB/s in theory.
 - The server supports a maximum of 16 Intel® Optane™ Persistent Memory Module 200 series (PMem modules for short), which must be used with the DDR4 memory modules. When the DDR4 memory modules are used together, the server supports a maximum of 12 TB memory capacity (calculated based on a maximum of 256 GB capacity per DDR4 memory module and a maximum of 512 GB capacity per PMem module).

- 2288H V6-16DIMM servers support a maximum of 16 DDR4 ECC 3200 MT/s DIMMs. The DDR4 ECC DIMMs support registered DIMMs (RDIMM) and load-reduced DIMMs (LRDIMMs), which provide high speed and availability. A server supports a maximum memory capacity of 2048 GB and a maximum memory bandwidth of 400 GB/s in theory.
- Flexible drive configurations meet a variety of business requirements and ensure high elasticity and scalability of storage resources.
- The use of all solid-state drives (SSDs) is supported. An SSD supports up to 100 times more I/O operations per second (IOPS) than a typical hard disk drive (HDD). The use of all SSDs provides higher I/O performance than the use of all HDDs or a combination of HDDs and SSDs.
- The use of 12 Gbit/s SCSI (SAS) serial connection for internal storage provides 2x data transmission rate than the use of 6 Gbit/s SAS connection, maximizing the performance of I/O-intensive applications.
- With Intel integrated I/O, the third-generation Intel® Xeon® Scalable processors integrate the PCIe 4.0 controller to shorten I/O latency and improve overall system performance.
- 2288H V6-32DIMM supports a maximum of eleven standard PCIe 4.0 expansion slots. 2288H V6-16DIMM supports a maximum of two standard PCIe 4.0 expansion slots and five standard PCIe 3.0 expansion slots.
- 2288H V6-32DIMM supports two FlexIO cards (adapting to the OCP 3.0 network adapter). 2288H V6-16DIMM supports one FlexIO card (adapting to the OCP 3.0 network adapter) with flexible configuration of GE/10GE/25GE/100GE network adapters which are hot swappable.

Availability and Serviceability

- Carrier-class components with process expertise ensure high system reliability and availability.
- The server supports hot-swappable SAS/SATA/NVMe drives. SAS/SATA drives support RAID 0, 1, 1E, 10, 5, 50, 6, and 60, depending on the RAID controller card used. It also uses a supercapacitor to protect the RAID cache data against power failures.
- SSDs offer better reliability than HDDs, prolonging system uptime.
- The server provides simplified O&M and efficient troubleshooting through the UID/HLY indicators on the front panel, fault diagnosis LED, touch LCD diagnosis panel, and iBMC web interface.
- The mounting ears of 2288H V6-32DIMM provide iBMC direct connect management ports to support local iBMC O&M, improving O&M efficiency.
- A server provides two hot-swappable PSUs in 1+1 redundancy mode and four hot-swappable fan modules in N+1 redundancy mode, improving system availability.
- The built-in iBMC monitors system parameters in real time, triggers alarms, and performs recovery actions to minimize the system downtime.
- For more information about the warranty in the Chinese market, consult the local sales representative.

Manageability and Security

- The built-in iBMC monitors server operating status and provides remote management.
- A password is required for accessing the BIOS, ensuring system boot and management security.

- The NC-SI feature allows a network port to serve as a management port and a service port. The NC-SI feature is disabled by default and can be enabled through the iBMC or BIOS.
- The integrated Unified Extensible Firmware Interface (UEFI) improves setup, configuration, and update efficiency and simplifies fault handling.
- The server chassis panel ensures security of local data.
- Chassis cover opening detection is supported to enhance security.
- Intel Execute Disable Bit (EDB) function prevents certain types of malicious buffer overflow attacks when working with a supported OS.
- The Intel Converged Boot Guard & Trusted Execution Technology (Intel CBnT) prevents malicious software attacks based on hardware, prevents the firmware from being maliciously modified, and prevents the execution of unauthorized boot blocks. It also allows applications to run in their own independent space without being affected by other software running in the system, thereby enhancing security.
- The secure boot based on the chip RoT implements level-by-level firmware verification starting from the hardware RoT and builds a complete secure boot chain.
- The trusted platform module (TPM) and trusted cryptography module (TCM) provide advanced encryption functions, such as digital signatures and remote authentication.
- The following requirements in NIST SP 800-147B are met:
 - The BIOS firmware digital signature update mechanism is supported. During the upgrade, the digital signature is verified to prevent unauthorized BIOS firmware upgrade.
 - The flash security protection mechanism is supported to prevent unauthorized modification of the flash memory in the OS.

NOTE

The service port with NC-SI enabled supports the following configuration:

- Configuring any network port on the FlexIO card or PCIe NIC (with NC-SI enabled).
- Enabling, disabling, and setting a virtual local area network (VLAN) ID for this port. The VLAN ID is 0 and disabled by default.
- Configuring IPv4 addresses (IPv4 address, subnet mask, and gateway) and IPv6 addresses (IPv6 address, prefix length, and gateway) for this port.

Energy Efficiency

- The server supports 80 Plus Platinum/Titanium PSUs of different energy efficiency levels. The PSU efficiency reaches 96% at 50% load.
- Active/standby power supply and HVDC power supply are supported, improving the efficiency of the power supply system.
- Efficient voltage regulator-down (VRD) power supplies for boards minimize the energy loss from DC/DC power conversion.
- Area-based, Proportional-Integral-Derivative (PID) intelligent fan speed adjustment and intelligent CPU frequency scaling optimize heat dissipation and reduce overall system power consumption.
- The improved thermal design with energy-efficient fans ensures optimal heat dissipation and reduces system power consumption.
- The server is protected with power capping and power control measures.
- Staggered spin-up of drives reduces the server boot power consumption.

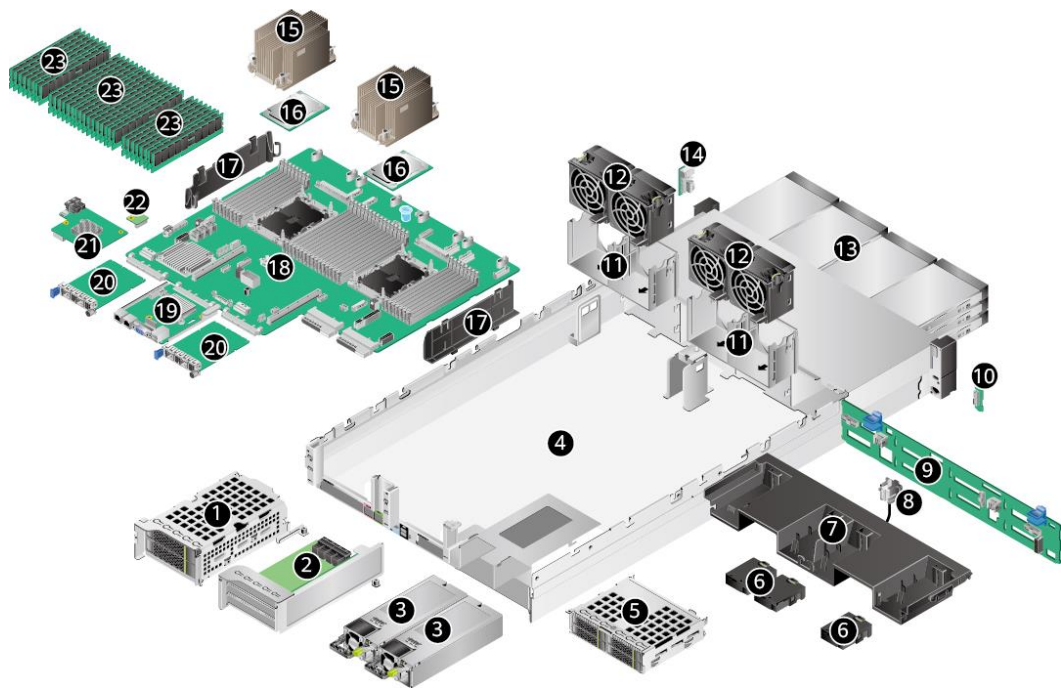
3 Physical Structure

3.1 2288H V6-32DIMM

3.2 2288H V6-16DIMM

3.1 2288H V6-32DIMM

Figure 3-1 Physical structure of a server with 12 x 3.5" drives (example)

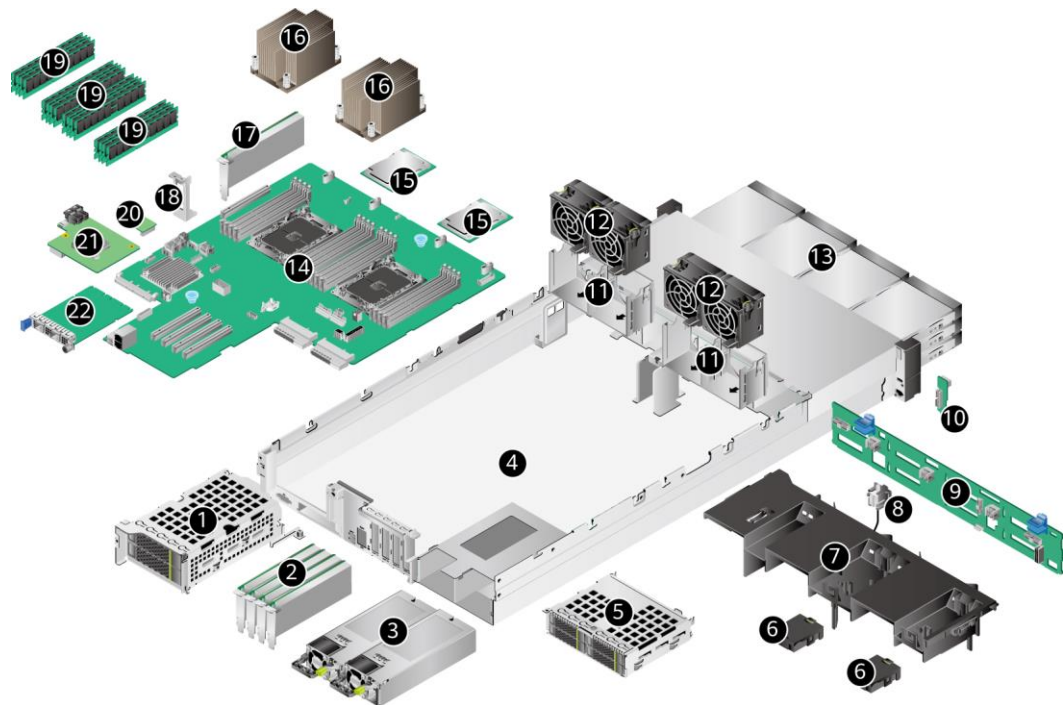


| | | | |
|---|--------------|---|-----------------------|
| 1 | I/O module 1 | 2 | I/O module 2 |
| 3 | PSU | 4 | Chassis |
| 5 | I/O module 3 | 6 | Supercapacitor holder |

| | | | |
|----|-----------------------------------------------------------------------------------------------|----|--------------------------|
| 7 | Air duct NOTE The air duct cannot be installed on a server with built-in drives. | 8 | Intrusion sensor |
| 9 | Front-drive backplane | 10 | Left mounting ear plate |
| 11 | Fan module brackets | 12 | Fan module |
| 13 | Front drive | 14 | Right mounting ear plate |
| 15 | Processor heat sink | 16 | Processor |
| 17 | Cable organizer | 18 | Mainboard |
| 19 | BMC card | 20 | OCP 3.0 network adapter |
| 21 | Screw-in RAID controller card | 22 | TPM/TCM |
| 23 | Memory | - | - |

3.2 2288H V6-16DIMM

Figure 3-2 Physical structure of a server with 12 x 3.5" drives (example)



| | | | |
|---|--------------|---|-----------|
| 1 | I/O module 1 | 2 | PCIe Card |
|---|--------------|---|-----------|

| | | | |
|----|-----------------------------------------------------------------------------------------------|----|---------------------------------------------------------|
| 3 | PSU | 4 | Chassis |
| 5 | I/O module 3 | 6 | Supercapacitor holder |
| 7 | Air duct NOTE The air duct cannot be installed on a server with built-in drives. | 8 | Intrusion sensor |
| 9 | Front-drive backplane | 10 | Left mounting ear plate |
| 11 | Fan module brackets | 12 | Fan module |
| 13 | Front drive | 14 | Mainboard |
| 15 | Processor | 16 | Processor heat sink |
| 17 | Built-in PCIe card | 18 | Install the guide trough for the built-in standard card |
| 19 | Memory | 20 | TPM/TCM |
| 21 | Screw-in RAID controller card | 22 | OCP 3.0 network adapter |

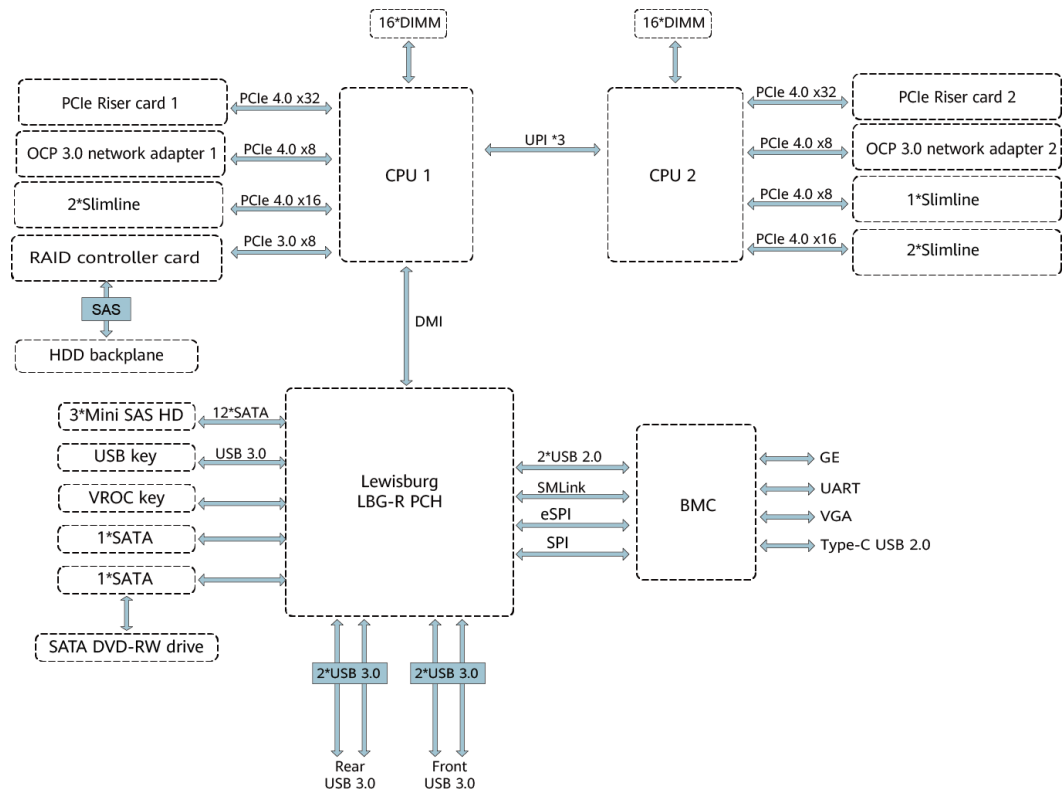
4 Logical Structure

4.1 2288H V6-32DIMM

4.2 2288H V6-16DIMM

4.1 2288H V6-32DIMM

Figure 4-1 Logical Structure

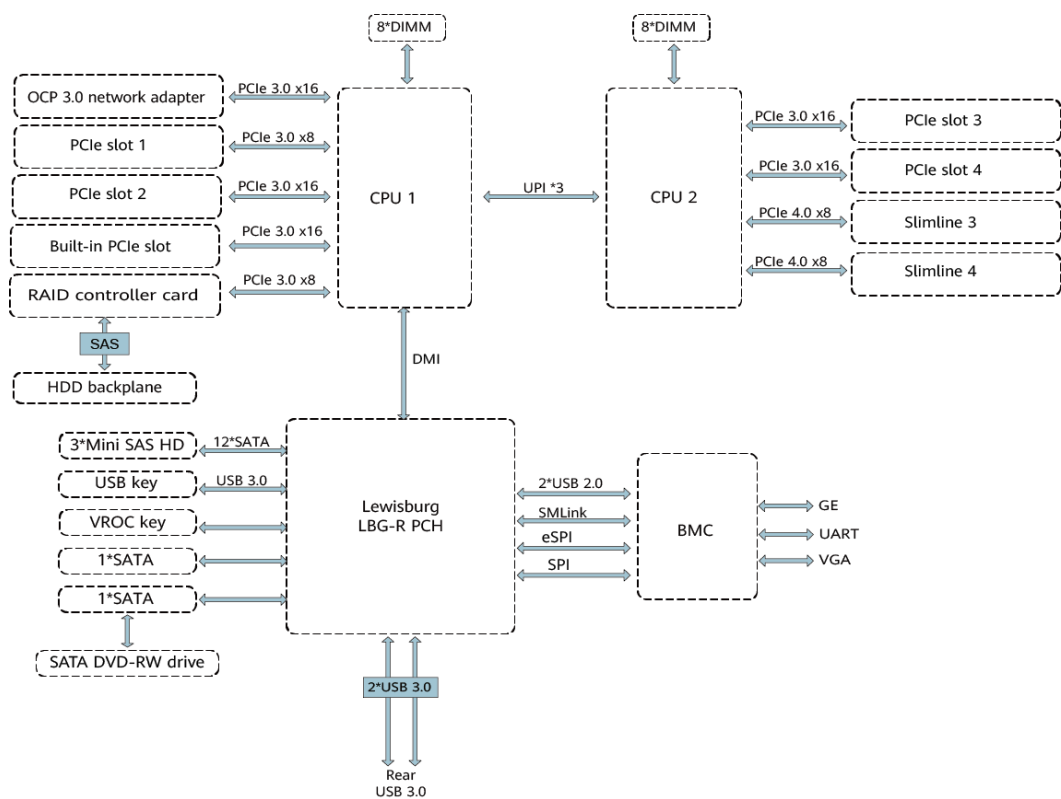


- The server supports one or two third-generation Intel® Xeon® Scalable Ice Lake processors.
- The server supports up to 32 memory modules.

- The CPUs (processors) interconnect with each other through three UPI links at a speed of up to 11.2 GT/s.
- The PCIe riser card connects to the processors through PCIe buses to provide ease of expandability and connection.
- CPU1 and CPU2 each support one OCP 3.0 network adapter.
- The screw-in RAID controller card on the mainboard connects to CPU 1 through PCIe buses, and connects to the drive backplane through SAS signal cables. A variety of drive backplanes are provided to support different local storage configurations.
- The LBG-R Platform Controller Hub (PCH) is integrated on the mainboard to support five USB 3.0 ports.
- The BMC management chip integrated on the mainboard supports a video graphic array (VGA) port, a management network port, and a serial port.

4.2 2288H V6-16DIMM

Figure 4-2 Logical Structure



- The server supports one or two third-generation Intel® Xeon® Scalable Ice Lake processors.
- The server supports up to 16 memory modules.
- The CPUs (processors) interconnect with each other through three UPI links at a speed of up to 11.2 GT/s.
- CPU1 supports one OCP 3.0 network adapter.

- The screw-in RAID controller card on the mainboard connects to CPU 1 through PCIe buses, and connects to the drive backplane through SAS signal cables. A variety of drive backplanes are provided to support different local storage configurations.
- The LBG-R Platform Controller Hub (PCH) is integrated on the mainboard to support three USB 3.0 ports.
- The BMC management chip integrated on the mainboard supports a video graphic array (VGA) port, a management network port, and a serial port.

5 Hardware Description

5.1 2288H V6-32DIMM

5.2 2288H V6-16DIMM

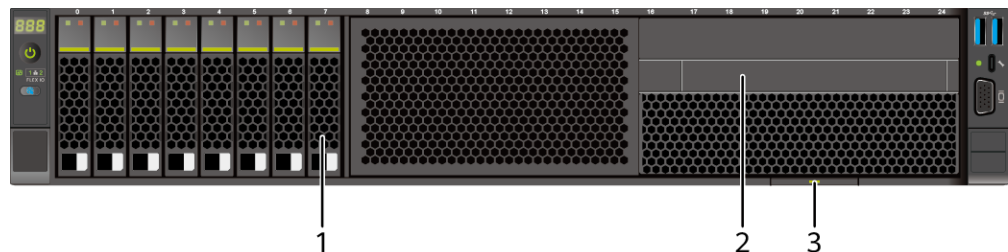
5.1 2288H V6-32DIMM

5.1.1 Front Panel

5.1.1.1 Appearance

- 8 x 2.5" Drive Configuration

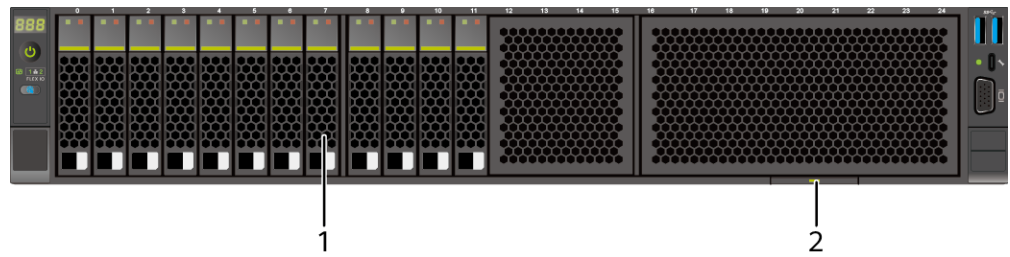
Figure 5-1 Front view



| | | | |
|---|------------------------------------------|---|-----------------------------------------------|
| 1 | Drive | 2 | (Optional) Built-in DVD drive (or LCD module) |
| 3 | Slide-out label plate (with an SN label) | - | - |

- 12 x 2.5" drive configuration (4 x SAS/SATA + 8 x NVMe)

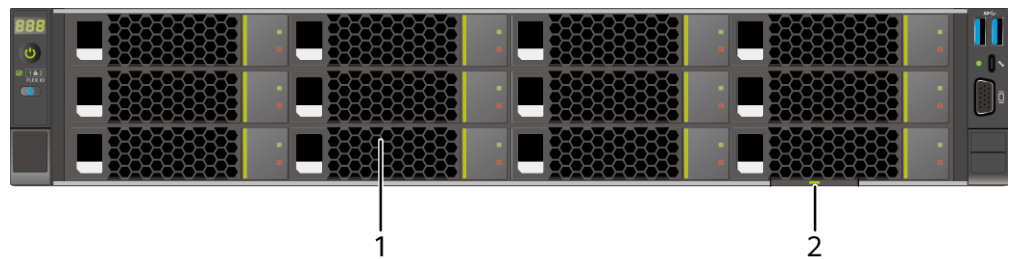
Figure 5-2 Front view



| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

- 12 x 3.5" drive configuration

Figure 5-3 Front view



| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

- 20 x 2.5" drive configuration (4 x SAS/SATA + 16 x NVMe)

Figure 5-4 Front view



| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

- 24 x 2.5" drive configuration

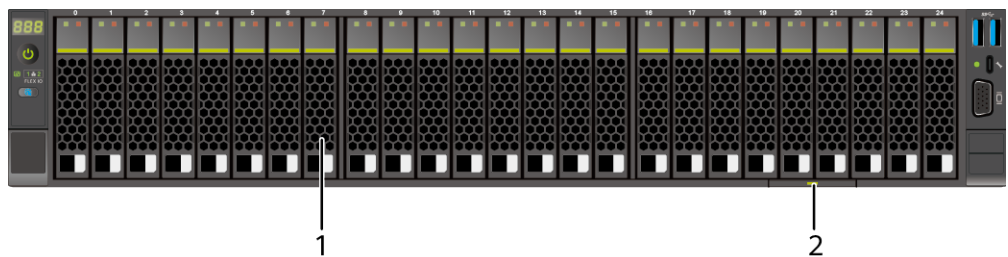
Figure 5-5 Front view



| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

- 25 x 2.5" drive configuration

Figure 5-6 Front view



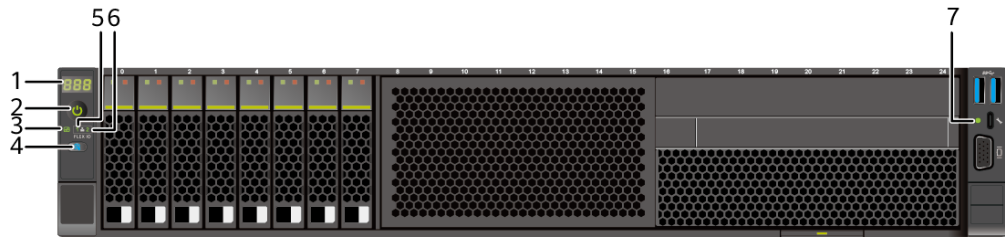
| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

5.1.1.2 Indicators and Buttons

Indicator and Button Positions

- 8 x 2.5" drive configuration

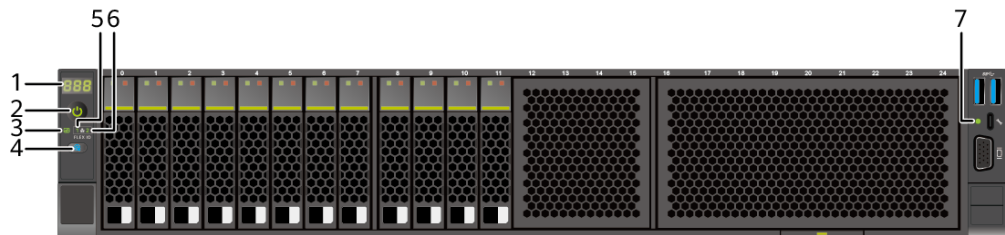
Figure 5-7 Indicators and buttons on the front panel



| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

- 12 x 2.5" drive configuration (4 x SAS/SATA + 8 x NVMe)

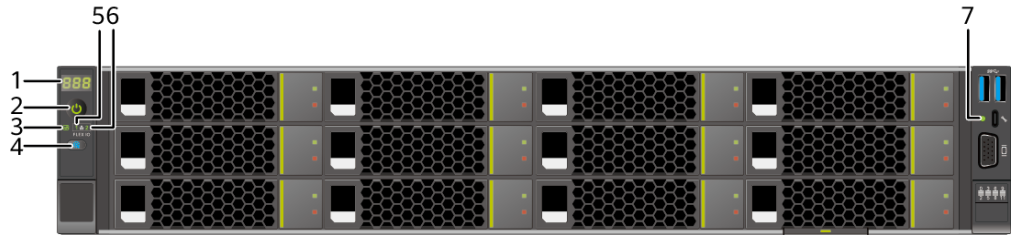
Figure 5-8 Indicators and buttons on the front panel



| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

- 12 x 3.5" drive configuration

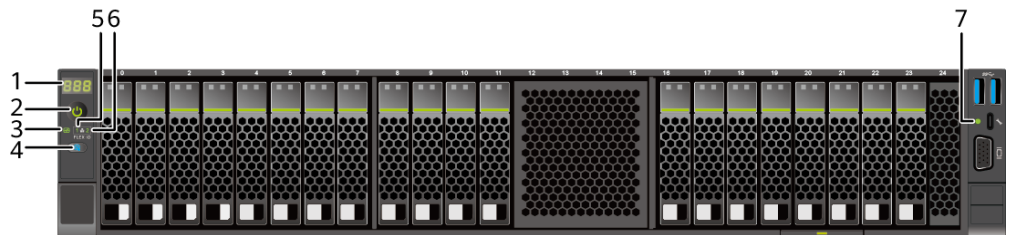
Figure 5-9 Indicators and buttons on the front panel



| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

- 20 x 2.5" drive configuration (4 x SAS/SATA + 16 x NVMe)

Figure 5-10 Indicators and buttons on the front panel



| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

- 24 x 2.5" drive configuration

Figure 5-11 Indicators and buttons on the front panel



| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

- 25 x 2.5" drive configuration

Figure 5-12 Indicators and buttons on the front panel









| | | | |
|---|-----------------------------------------------|---|----------------------------------|
| 1 | Fault diagnosis LED | 2 | Power button/indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card 1 presence indicator | 6 | FlexIO card 2 presence indicator |
| 7 | iBMC direct connect management port indicator | - | - |

Indicator and Button Descriptions

Table 5-1 Description of indicators and buttons on the front panel

| Silkscreen | Indicator and Button | Description |
|------------|----------------------|-------------|
|------------|----------------------|-------------|

| Silkscreen | Indicator and Button | Description |
|-------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Fault diagnosis LED | <ul style="list-style-type: none"> • ---: The device is operating properly. • Error code: A component is faulty. For details about error codes, see the <i>FusionServer Rack Server iBMC Alarm Handling</i> . |
|  | Power button/indicator | Power indicator: <ul style="list-style-type: none"> • Off: The device is not powered on. • Steady green: The device is powered on. • Blinking yellow: The iBMC is starting. The power button is locked and cannot be pressed. The iBMC is started in about 1 minute, and then the power indicator is steady yellow. • Steady yellow: The device is standby. Power button: <ul style="list-style-type: none"> • When the device is powered on, you can press this button to gracefully shut down the OS. <p>NOTE For different OSs, you may need to shut down the OS as prompted.</p> <ul style="list-style-type: none"> • When the device is powered on, you can hold down this button for 6 seconds to forcibly power off the device. • When the power indicator is steady yellow, you can press this button to power on the device. |
|  | Health status indicator | <ul style="list-style-type: none"> • Off: The device is powered off or is faulty. • Blinking red at 1 Hz: A major alarm has been generated on the system. • Blinking red at 5 Hz: A critical alarm has been generated on the system. • Steady green: The device is operating properly. |
|  | UID button/indicator | The UID button/indicator helps identify and locate a device. <p>UID indicator:</p> <ul style="list-style-type: none"> • Off: The device is not being located. • Blinking or steady blue: The device is being located. <p>UID button:</p> <ul style="list-style-type: none"> • You can control the UID indicator status by pressing the UID button or using the iBMC. • You can press this button to turn on or off the UID indicator. • You can press and hold down this button for 4 to 6 seconds to reset the iBMC. |

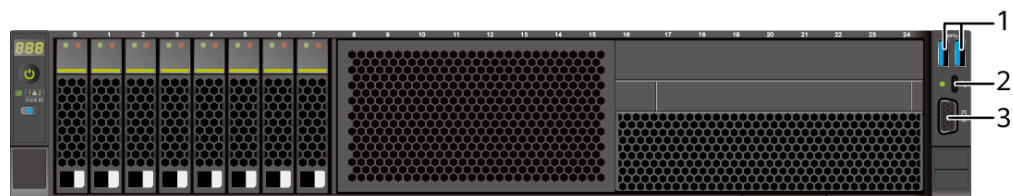
| Silkscreen | Indicator and Button | Description |
|-----------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | FlexIO card presence indicator | Indicates whether the FlexIO card is detected. <ul style="list-style-type: none"> • Off: The FlexIO card is not detected. • Blinking green at 0.5 Hz: The FlexIO card is detected but is not powered on. • Blinking green at 2 Hz: The FlexIO card is detected and has just been inserted. • Steady green: The FlexIO card is detected and the power supply is normal. |
|  | iBMC direct connect management port indicator | Indicates the status when the iBMC direct connect management port connects to a terminal (local PC or Android mobile phone): <ul style="list-style-type: none"> • Off: No terminal is connected. • Blinking green at short intervals for 3 seconds and then off: The port is disabled. • Steady green: The terminal is connected. Indicates the status when the iBMC direct connect management port connects to a USB device: <ul style="list-style-type: none"> • Blinking red at long intervals: The job fails or an error is reported when the job is complete. • Blinking green at short intervals: The job is being executed. • Blinking green at short intervals for 3 seconds and then off: The port is disabled. • Steady green: The server configuration file is being copied from the USB device or the job is successfully completed. |

5.1.1.3 Ports

Port Positions

- 8 x 2.5" drive configuration

Figure 5-13 Ports on the front panel

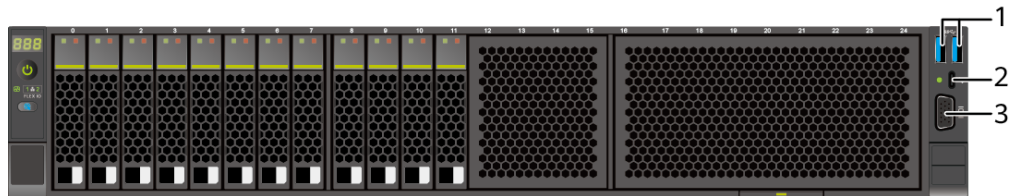


| | | | |
|---|--------------|---|---------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect |
|---|--------------|---|---------------------|

| | | | |
|---|----------|---|-----------------|
| | | | management port |
| 3 | VGA port | - | - |

- 12 x 2.5" drive configuration (4 x SAS/SATA + 8 x NVMe)

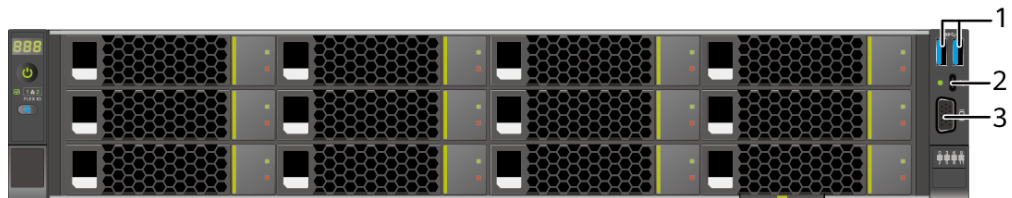
Figure 5-14 Ports on the front panel



| | | | |
|---|--------------|---|-------------------------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect management port |
| 3 | VGA port | - | - |

- 12 x 3.5" drive configuration

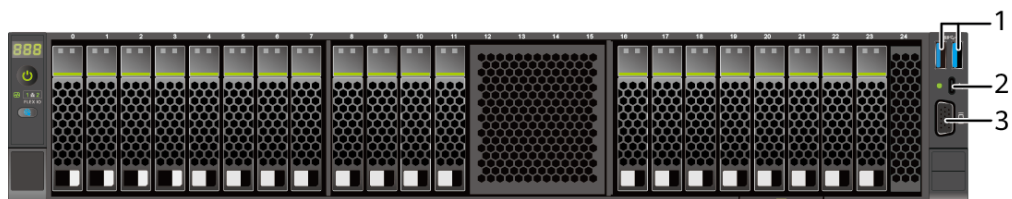
Figure 5-15 Ports on the front panel



| | | | |
|---|--------------|---|-------------------------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect management port |
| 3 | VGA port | - | - |

- 20 x 2.5" drive configuration (4 x SAS/SATA + 16 x NVMe)

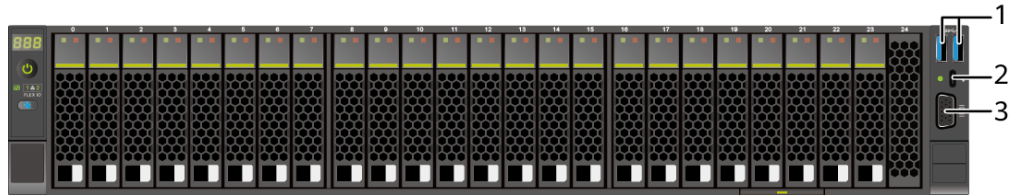
Figure 5-16 Ports on the front panel



| | | | |
|---|--------------|---|-------------------------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect management port |
| 3 | VGA port | - | - |

- 24 x 2.5" drive configuration

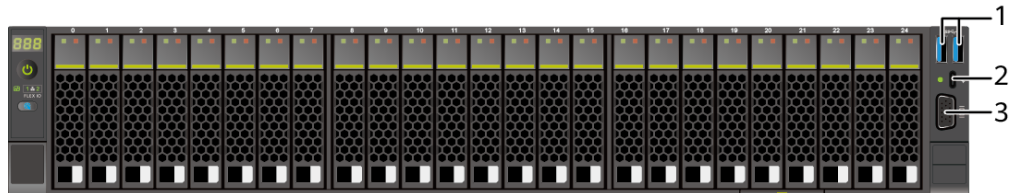
Figure 5-17 Ports on the front panel



| | | | |
|---|--------------|---|-------------------------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect management port |
| 3 | VGA port | - | - |

- 25 x 2.5" drive configuration

Figure 5-18 Ports on the front panel



| | | | |
|---|--------------|---|-------------------------------------|
| 1 | USB 3.0 port | 2 | iBMC direct connect management port |
| 3 | VGA port | - | - |

Port Description

Table 5-2 Ports on the front panel

| Port | Type | Quantity | Description |
|--------------------------|------|----------|---------------------------------------------------------------|
| VGA port ^{Note} | DB15 | 1 | Used to connect a display terminal, such as a monitor or KVM. |

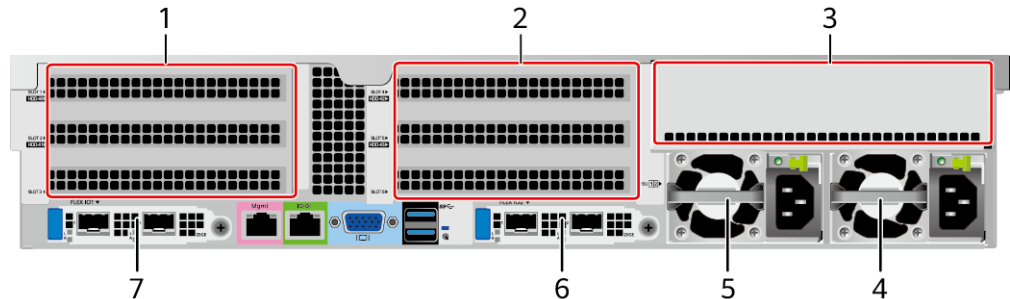
| Port | Type | Quantity | Description |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iBMC direct connect management port ^{Note} | USB Type-C NOTE The USB 2.0 protocol is supported. | 1 | Used to connect to a local PC or mobile phone through a USB Type-C cable to monitor and manage the system. NOTE Only local PCs running Windows 10 and mobile phones running Android are supported. <ul style="list-style-type: none"> To log in to the iBMC from the local PC, enter https://IP address of the iBMC management network port in the address box of the browser on the local PC. When accessing the iBMC through a mobile phone, you need to use the mobile application SmartServer to access the iBMC. For details, see the <i>FusionServer SmartServer User Guide</i> . Used to connect to a USB device. NOTICE <ul style="list-style-type: none"> Before connecting an external USB device, ensure that the USB device functions properly. Otherwise, it may adversely impact the server. For details about how to connect a USB device to the iBMC management port, see <i>FusionServer Rack Server iBMC User Guide</i>. |
| USB port | USB 3.0 | 2 | Used to connect to a USB 3.0 device. NOTICE <ul style="list-style-type: none"> Before connecting an external USB device, ensure that the USB device functions properly. Otherwise, it may adversely impact the server. The USB 3.0 port can be used to supply power to low-power peripherals. However, the USB 3.0 port must comply with the USB specifications. To run advanced peripherals, such as external CD/DVD drives, an external power supply is required. |
| Note: The VGA port and iBMC direct connect management port cannot be used at the same time. | | | |

5.1.2 Rear Panel

5.1.2.1 Appearance

- Server with a drive module or PCIe riser module on the rear panel

Figure 5-19 Rear view

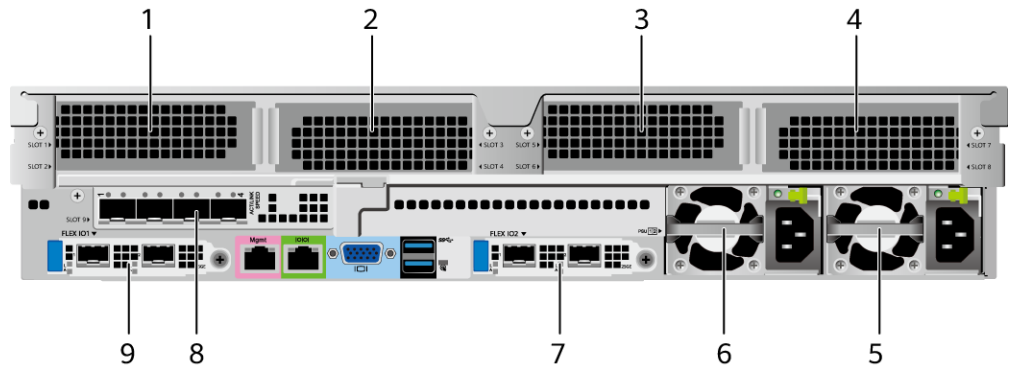


| | | | |
|---|---------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------|
| 1 | I/O module 1 | 2 | I/O module 2 |
| 3 | I/O module 3 | 4 | Power supply 2 |
| 5 | PSU 1 | 6 | (Optional) FlexIO card 2 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. |
| 7 | (Optional) FlexIO card 1 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. | - | - |

NOTE

- I/O module 1 and I/O module 2 each support a PCIe riser module, 2 x 3.5" rear-drive module, or module with 2 x 2.5" rear drives and one PCIe riser module.
- I/O module 3 supports a PCIe riser module or 4 x 2.5" rear-drive module.
- For details about the OCP 3.0 network adapter, see [5.1.6.1 OCP 3.0 Network Adapters](#) .
- The figure is for reference only. The actual configuration may vary.
- Server with four GPUs on the rear panel

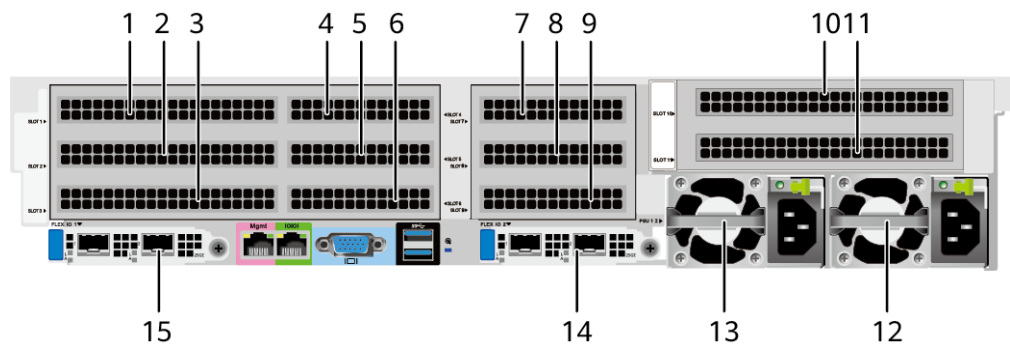
Figure 5-20 Rear view



| | | | |
|---|---------------------------------------------------------------------------------------------------------|---|---------------------------|
| 1 | Slot2 | 2 | Slot3 |
| 3 | Slot6 | 4 | Slot7 |
| 5 | PSU 2 | 6 | Power supply unit (PSU) 1 |
| 7 | (Optional) FlexIO card 2 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. | 8 | (Optional) Slot 9 |
| 9 | (Optional) FlexIO card 1 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. | - | - |

NOTE

- For details about the OCP 3.0 network adapter, see [5.1.6.1 OCP 3.0 Network Adapters](#) .
- The figure is for reference only. The actual configuration may vary.
- Server with 11 Standard PCIe Cards on the Rear Panel



| | | | |
|---|-------|---|-------|
| 1 | Slot1 | 2 | Slot2 |
| 3 | Slot3 | 4 | Slot4 |
| 5 | Slot5 | 6 | Slot6 |

| | | | |
|----|---------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------|
| 7 | Slot7 | 8 | Slot8 |
| 9 | Slot9 | 10 | Slot10 |
| 11 | Slot11 | 12 | Power supply 2 |
| 13 | Power supply unit (PSU) 1 | 14 | (Optional) FlexIO card 2 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. |
| 15 | (Optional) FlexIO card 1 NOTE The FlexIO card slot supports only OCP 3.0 network adapters. | - | - |

NOTE

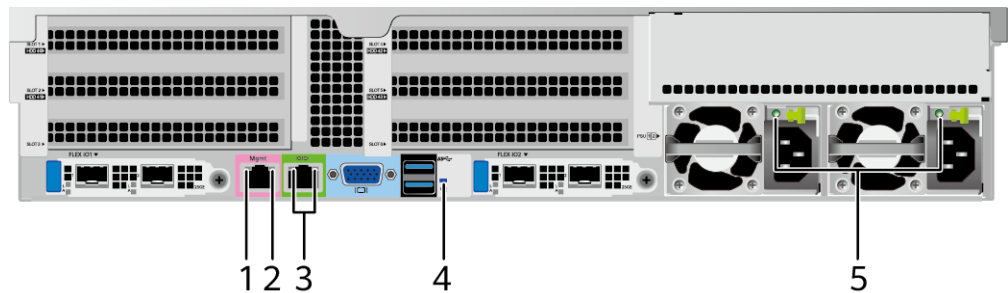
- For details about the OCP 3.0 network adapter, see [5.1.6.1 OCP 3.0 Network Adapters](#) .
- The figure is for reference only. The actual configuration may vary.

5.1.2.2 Indicators and Buttons

Indicator Positions

- Server with a drive module or PRM on the rear panel

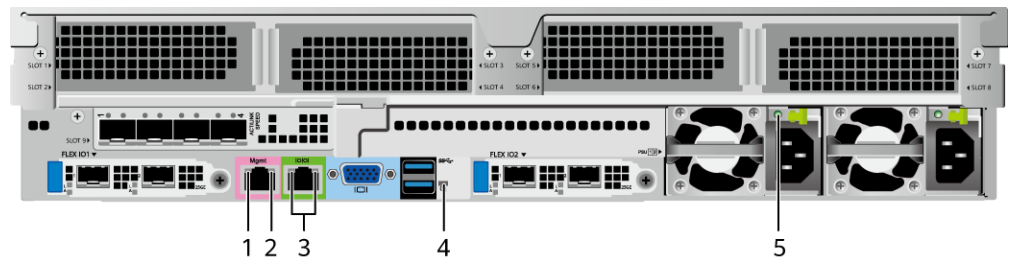
Figure 5-21 Indicators on the rear panel



| | | | |
|---|-----------------------------------------------------------------------------|---|------------------------------------------------------------|
| 1 | Data transmission status indicator of the management network port | 2 | Connection status indicator of the management network port |
| 3 | Serial port indicator NOTE Reserved and unavailable currently. | 4 | UID indicator |
| 5 | PSU indicator | - | - |

- Server with four GPUs on the rear panel

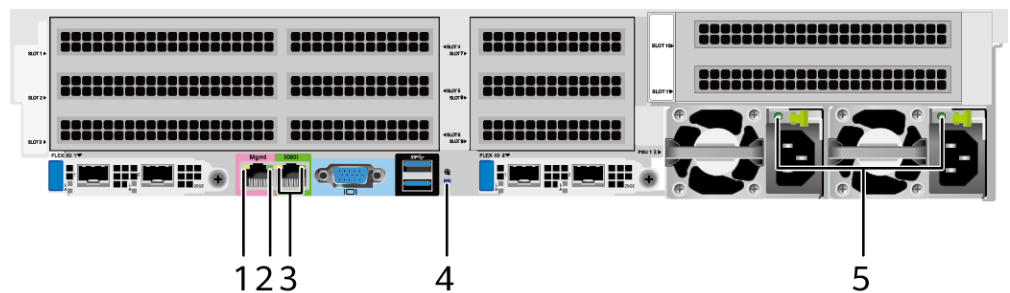
Figure 5-22 Indicators on the rear panel



| | | | |
|---|-----------------------------------------------------------------------------|---|------------------------------------------------------------|
| 1 | Data transmission status indicator of the management network port | 2 | Connection status indicator of the management network port |
| 3 | Serial port indicator NOTE Reserved and unavailable currently. | 4 | UID indicator |
| 5 | PSU indicator | - | - |

- Server with 11 standard PCIe cards on the rear panel


Figure 5-23 Indicators on the rear panel



| | | | |
|---|-----------------------------------------------------------------------------|---|------------------------------------------------------------|
| 1 | Data transmission status indicator of the management network port | 2 | Connection status indicator of the management network port |
| 3 | Serial port indicator NOTE Reserved and unavailable currently. | 4 | UID indicator |
| 5 | PSU indicator | - | - |

Indicator Description

Table 5-3 Indicators on the rear panel

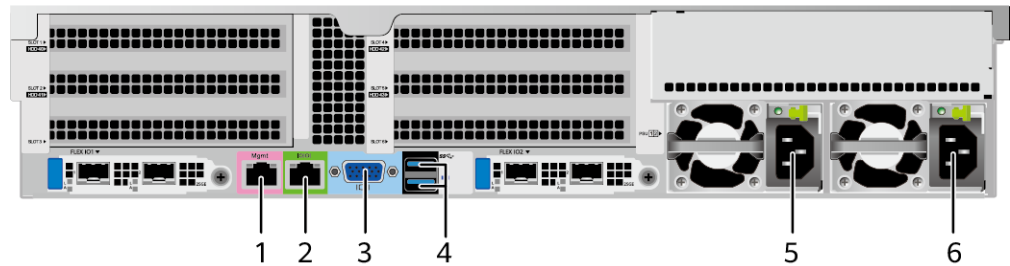
| Silkscreen | Indicator | Description |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - | Data transmission status indicator for the management network port | <ul style="list-style-type: none"> Off: No data is being transmitted. Blinking yellow: Data is being transmitted. |
| - | Connection status indicator for the management network port | <ul style="list-style-type: none"> Off: The network port is not connected. Steady green: The network port is connected properly. |
|  | UID indicator | <p>The UID indicator helps identify and locate a device.</p> <ul style="list-style-type: none"> Off: The device is not being located. Blinking or steady blue: The device is being located. <p>NOTE You can control the UID indicator status by pressing the UID button or using the iBMC.</p> |
| - | PSU indicator | <ul style="list-style-type: none"> Off: No power is supplied. Blinking green at 1 Hz: <ul style="list-style-type: none"> The input is normal, and the server is standby. The input is overvoltage or undervoltage. The PSU is in deep hibernation mode. Blinking green at 4 Hz: The firmware is being upgraded online. Steady green: The power input and output are normal. Steady orange: The input is normal but there is no output. <p>NOTE The possible causes of no power output are as follows:</p> <ul style="list-style-type: none"> Power supply overtemperature protection Power output overcurrent or short-circuit Output overvoltage Short-circuit protection Device failure (excluding failure of all devices) |

5.1.2.3 Interface

Port Positions

- Server with a drive module or PRM on the rear panel

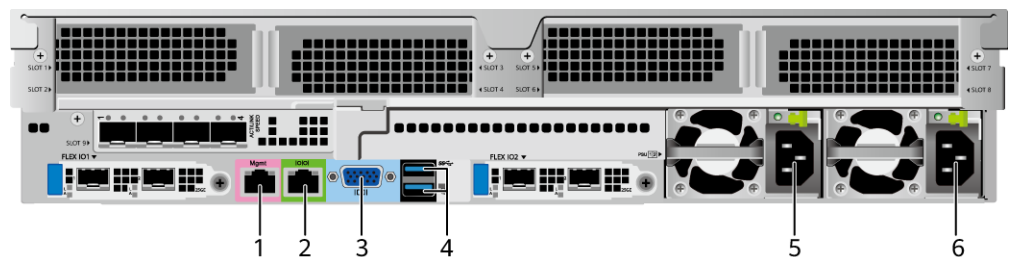
Figure 5-24 Ports on the rear panel



| | | | |
|---|-------------------------|---|------------------|
| 1 | Management network port | 2 | Serial port |
| 3 | VGA port | 4 | USB 3.0 port |
| 5 | Socket for PSU 1 | 6 | Socket for PSU 2 |

- Server with four GPUs on the rear panel

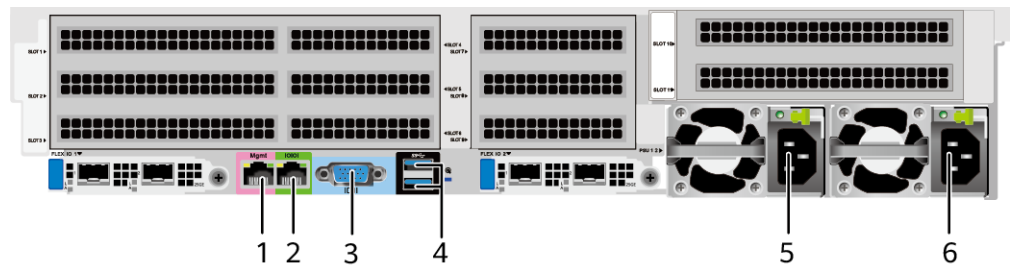
Figure 5-25 Ports on the rear panel



| | | | |
|---|-------------------------|---|------------------|
| 1 | Management network port | 2 | Serial port |
| 3 | VGA port | 4 | USB 3.0 port |
| 5 | Socket for PSU 1 | 6 | Socket for PSU 2 |

- Server with 11 standard PCIe cards on the rear panel

Figure 5-26 Ports on the rear panel



| | | | |
|---|-------------------------|---|------------------|
| 1 | Management network port | 2 | Serial port |
| 3 | VGA port | 4 | USB 3.0 port |
| 5 | Socket for PSU 1 | 6 | Socket for PSU 2 |

Port Description

Table 5-4 Ports on the rear panel

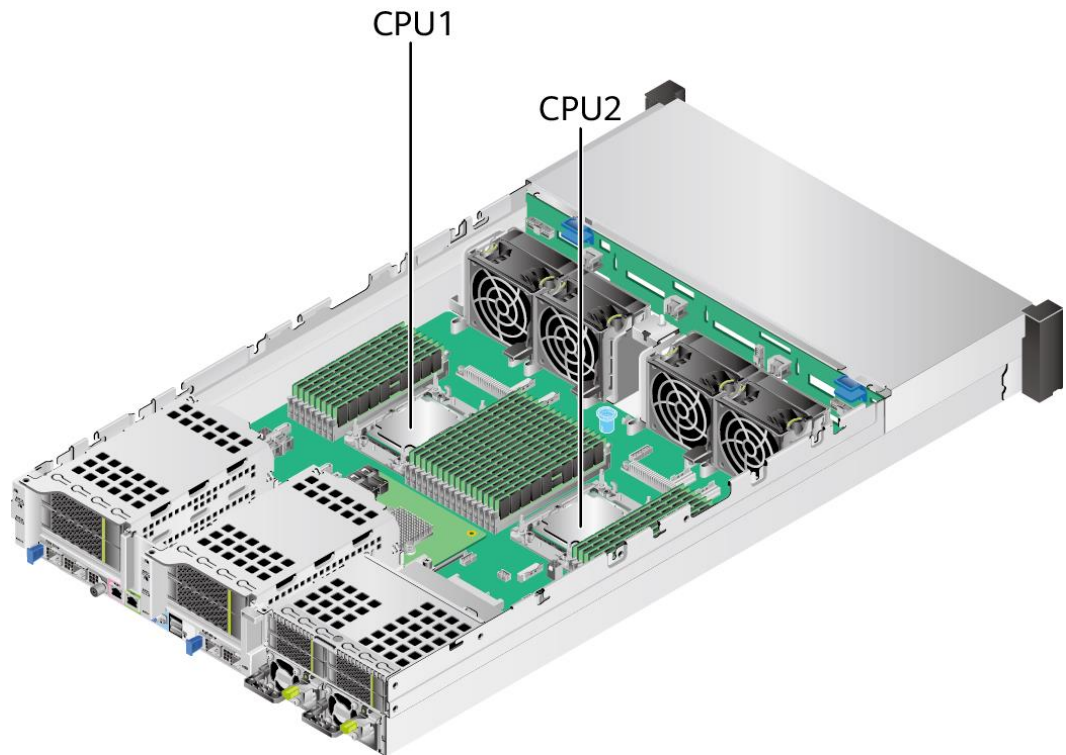
| Port | Type | Quantity | Description |
|-------------------------|---------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Management network port | RJ45 | 1 | iBMC management network port, which is used to manage the server. NOTE The management network port is a GE port that supports 100 Mbit/s and 1000 Mbit/s auto-negotiation. |
| Serial port | RJ45 | 1 | Default operating system serial port used for debugging. You can also set it as the iBMC serial port by using the iBMC command. NOTE The port uses 3-wire serial communication interface, and the default baud rate is 115,200 bit/s. |
| VGA port | DB15 | 1 | Used to connect a display terminal, such as a monitor or KVM. |
| USB port | USB 3.0 | 2 | Used to connect to a USB 3.0 device. NOTICE <ul style="list-style-type: none"> The maximum current is 1.3 A for an external USB device. Before connecting an external USB device, ensure that the USB device functions properly. |

| Port | Type | Quantity | Description |
|------------|------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <p>Otherwise, it may adversely impact the server.</p> <ul style="list-style-type: none"> The USB 3.0 port can be used to supply power to low-power peripherals. However, the USB 3.0 port must comply with the USB specifications. To run advanced peripherals, such as external CD/DVD drives, an external power supply is required. |
| PSU socket | - | 2 | <p>Used to connect to a power distribution unit (PDU) through a power cable. You can select the PSUs as required.</p> <p>NOTE</p> <p>When determining the PSUs, ensure that the rated power of the PSUs is greater than that of the server.</p> |

5.1.3 Processors

- The server supports one or two processors.
- If only one processor is required, install it in socket CPU1.
- Processors of the same model must be used in a server.
- For details about component options, consult the local sales representatives.

Figure 5-27 Processor positions



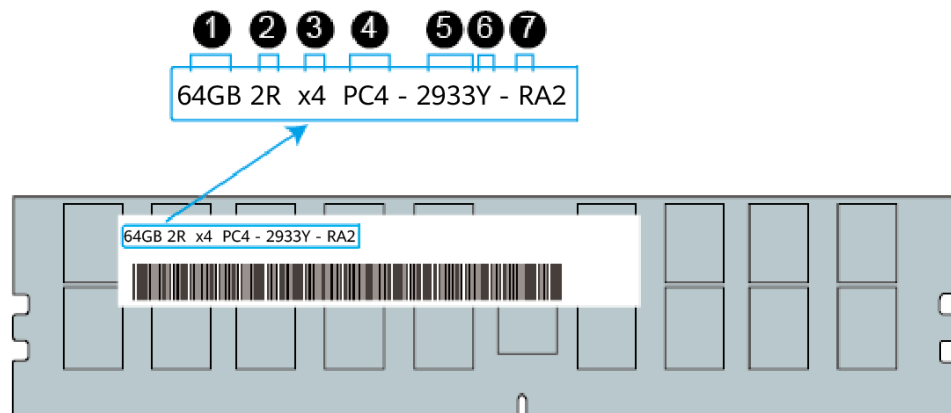
5.1.4 Memory

5.1.4.1 DDR4 Memory

5.1.4.1.1 Memory ID

You can determine the memory module properties based on the label attached to the memory module.

Figure 5-28 Memory identifier



| No. | Description | Example |
|-----|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Capacity | <ul style="list-style-type: none"> • 16 GB • 32 GB • 64 GB • 128 GB • 256 GB |
| 2 | Number of ranks | <ul style="list-style-type: none"> • 1R: single-rank • 2R: dual-rank • 4R: quad-rank • 8R: octal-rank |
| 3 | Data width on the DRAM | <ul style="list-style-type: none"> • x4: 4-bit • x8: 8-bit |
| 4 | Type of the memory interface | <ul style="list-style-type: none"> • PC4: DDR4 |
| 5 | Maximum memory speed | <ul style="list-style-type: none"> • 2933 MT/s • 3200 MT/s |
| 6 | Memory latency parameters (CL-tRCD-tRP) | <ul style="list-style-type: none"> • W = 20-20-20 • Y = 21-21-21 • AA = 22-22-22 |
| 7 | DIMM type | <ul style="list-style-type: none"> • R = RDIMM • L = LRDIMM |

5.1.4.1.2 Memory Subsystem Architecture

A server provides 32 memory slots. Each processor integrates eight memory channels.

Install the memory modules in the primary memory channels first. If the primary memory channel is not populated, the memory modules in secondary memory channels cannot be used.

Table 5-5 Memory channels

| CPU | Channel | Memory Slot |
|-------|-------------|-------------|
| CPU 1 | A (primary) | DIMM000(A) |
| | A | DIMM001(I) |
| | B (primary) | DIMM010(B) |
| | B | DIMM011(J) |
| | C (primary) | DIMM020(C) |
| | C | DIMM021(K) |
| | D (primary) | DIMM030(D) |

| CPU | Channel | Memory Slot |
|------|-------------|-------------|
| | D | DIMM031(L) |
| | E (primary) | DIMM040(E) |
| | E | DIMM041(M) |
| | F (primary) | DIMM050(F) |
| | F | DIMM051(N) |
| | G (primary) | DIMM060(G) |
| | G | DIMM061(O) |
| | H (primary) | DIMM070(H) |
| | H | DIMM071(P) |
| CPU2 | A (primary) | DIMM100(A) |
| | A | DIMM101(I) |
| | B (primary) | DIMM110(B) |
| | B | DIMM111(J) |
| | C (primary) | DIMM120(C) |
| | C | DIMM121(K) |
| | D (primary) | DIMM130(D) |
| | D | DIMM131(L) |
| | E (primary) | DIMM140(E) |
| | E | DIMM141(M) |
| | F (primary) | DIMM150(F) |
| | F | DIMM151(N) |
| | G (primary) | DIMM160(G) |
| | G | DIMM161(O) |
| | H (primary) | DIMM170(H) |
| H | DIMM171(P) | |

5.1.4.1.3 Memory Compatibility

Observe the following rules when configuring DDR4 memory modules:

NOTICE

- A server must use DDR4 memory modules of the same part number (P/N code), and the memory speed is the minimum value of the following items:
- Memory speed supported by a CPU
- Maximum operating speed of a memory module
- The DDR4 DIMMs of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together.
- For details about component options, consult the local sales representatives.

- The memory can be used with the third-generation Intel® Xeon® Scalable Ice Lake processors. The maximum memory capacity supported by all processor models is the same.
- For details about the capacity type of a single memory module, contact the local sales representatives.
- The maximum number of memory modules supported depends on the memory type and rank quantity.

 **NOTE**

Each memory channel supports a maximum of 8 ranks. The number of memory modules supported by each channel varies depending on the number of ranks supported by each channel:

Number of memory modules supported by each channel ≤ Number of ranks supported by each memory channel / Number of ranks supported by each memory module

- A memory channel supports more than eight ranks for LRDIMMs.

 **NOTE**

A quad-rank LRDIMM generates the same electrical load as a single-rank RDIMM on a memory bus.

Table 5-6 DDR4 memory specifications

| Parameter | | Specifications | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|-------|-------|--------|-------|
| Capacity per DDR4 memory module (GB) | | 16 | 32 | 64 | 128 | 256 |
| Type | | RDIMM | RDIMM | RDIMM | LRDIMM | RDIMM |
| Rated speed (MT/s) | | 3200 | 3200 | 3200 | 3200 | 2933 |
| Operating voltage (V) | | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Maximum number of DDR4 DIMMs in a server ^a | | 32 | 32 | 32 | 32 | 32 |
| Maximum DDR4 memory capacity of the server (GB) | | 512 | 1024 | 2048 | 4096 | 8192 |
| Actual rate (MT/s) | 1DPC ^b | 3200 | 3200 | 3200 | 3200 | 2933 |
| | 2DPC | 3200 | 3200 | 3200 | 3200 | 2933 |
| <ul style="list-style-type: none"> • a: The maximum number of DDR4 memory modules is based on dual-processor configuration. The value is halved for a server with only one processor. | | | | | | |

| Parameter | Specifications |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none">• b: DPC (DIMM per channel) indicates the number of memory modules per channel.• The information listed in this table is for reference only. For details, consult the local sales representative. |

5.1.4.1.4 DIMM Installation Rules

Observe the following when configuring DDR4 memory modules:

- Install memory modules only when corresponding processors are installed.
- Do not install LRDIMMs and RDIMMs in the same server.
- Install filler memory modules in vacant slots.

Observe the following when configuring DDR4 memory modules in specific operating mode:

- Rank sparing mode
 - Comply with the general installation guidelines.
 - At least two ranks must be configured for each channel.
 - A maximum of two standby ranks can be configured for each channel.
 - The capacity of a standby rank must be greater than or equal to that of other ranks in the same channel.
- Memory mirroring mode
 - Comply with the general installation guidelines.
 - Each processor supports four integrated memory controllers (IMCs), and each IMC has two channels for installing memory modules. The installed memory modules must be identical in size and organization.
 - For a multi-processor configuration, each processor must have a valid memory mirroring configuration.
- Memory scrubbing mode
 - Comply with the general installation guidelines.

5.1.4.1.5 Memory Installation Positions

A server supports a maximum of 32 DDR4 memory modules. To maximize performance, balance the total memory capacity between the installed processors and to load the channels similarly whenever possible.

Observe the memory module installation rules when configuring memory modules. For details, consult the local sales representatives.

NOTICE

At least one DDR4 memory module must be installed in the primary memory channels corresponding to CPU 1.

Figure 5-29 Memory slots

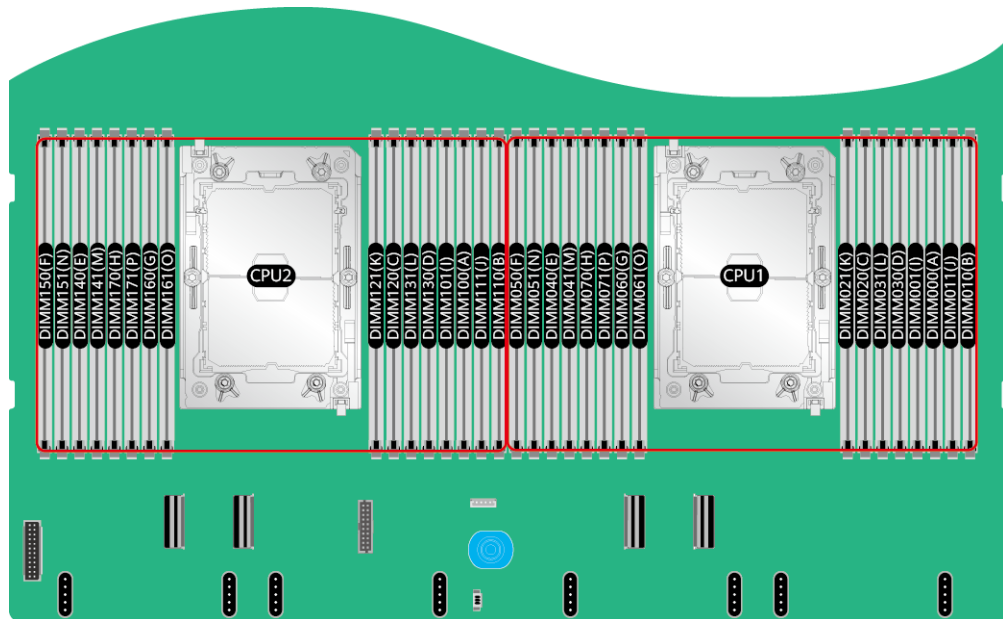


Figure 5-30 DDR4 memory module installation guidelines (1 processor)

| CPU | Channel | DIMM Slot | Number of DIMMs (✓: recommended ○: not recommended) | | | | | | | | |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------|---|---|---|---|----|----|----|---|
| | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ✓ | |
| | | | 1 | 2 | 4 | 6 | 8 | 12 | 12 | 16 | |
| CPU1 | A | DIMM000(A) | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM001(I) | | | | | | ● | ● | ● | |
| | B | DIMM010(B) | | | | ● | ● | ● | ● | ● | |
| | | DIMM011(J) | | | | | | ● | | ● | |
| | C | DIMM020(C) | | | ● | ● | ● | ● | ● | ● | |
| | | DIMM021(K) | | | | | | ● | ● | ● | |
| | D | DIMM030(D) | | | | | ● | | ● | ● | |
| | | DIMM031(L) | | | | | | | | ● | |
| | E | DIMM040(E) | | ● | ● | ● | ● | ● | ● | ● | |
| | | DIMM041(M) | | | | | | ● | ● | ● | |
| | F | DIMM050(F) | | | | ● | ● | ● | ● | ● | |
| | | DIMM051(N) | | | | | | ● | | ● | |
| | G | DIMM060(G) | | | ● | ● | ● | ● | ● | ● | |
| | | DIMM061(O) | | | | | | ● | ● | ● | |
| | H | DIMM070(H) | | | | | ● | | ● | ● | |
| | | DIMM071(P) | | | | | | | | ● | |
| Note | When 12 DIMMs are configured, the recommended installation (marked with ✓) achieves better performance than the installation that is not recommended (marked with ○). However, only the installation that is not recommended (marked with ○) supports SNC2, Hemi, SGX, and UMA X-skt. | | | | | | | | | | |

Figure 5-31 DDR4 memory module installation guidelines (2 processors)

| CPU | Channel | DIMM Slot | Number of DIMMs (√: recommended ○: not recommended) | | | | | | | | |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------|---|---|----|----|----|----|----|---|
| | | | √ | √ | √ | √ | √ | √ | ○ | √ | |
| | | | 2 | 4 | 8 | 12 | 16 | 24 | 24 | 32 | |
| CPU1 | A | DIMM000(A) | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM001(I) | | | | | | ● | ● | ● | |
| | B | DIMM010(B) | | | | ● | ● | ● | ● | ● | ● |
| | | DIMM011(J) | | | | | | ● | | | ● |
| | C | DIMM020(C) | | | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM021(K) | | | | | | ● | ● | ● | ● |
| | D | DIMM030(D) | | | | | ● | | ● | ● | ● |
| | | DIMM031(L) | | | | | | | | | ● |
| | E | DIMM040(E) | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM041(M) | | | | | | ● | ● | ● | ● |
| | F | DIMM050(F) | | | | ● | ● | ● | ● | ● | ● |
| | | DIMM051(N) | | | | | | ● | | | ● |
| | G | DIMM060(G) | | | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM061(O) | | | | | | ● | ● | ● | ● |
| | H | DIMM070(H) | | | | | ● | | ● | ● | ● |
| | | DIMM071(P) | | | | | | | | | ● |
| CPU2 | A | DIMM100(A) | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM101(I) | | | | | | ● | ● | ● | ● |
| | B | DIMM110(B) | | | | ● | ● | ● | ● | ● | ● |
| | | DIMM111(J) | | | | | | ● | | | ● |
| | C | DIMM120(C) | | | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM121(K) | | | | | | ● | ● | ● | ● |
| | D | DIMM130(D) | | | | | ● | | ● | ● | ● |
| | | DIMM131(L) | | | | | | | | | ● |
| | E | DIMM140(E) | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM141(M) | | | | | | ● | ● | ● | ● |
| | F | DIMM150(F) | | | | ● | ● | ● | ● | ● | ● |
| | | DIMM151(N) | | | | | | ● | | | ● |
| | G | DIMM160(G) | | | ● | ● | ● | ● | ● | ● | ● |
| | | DIMM161(O) | | | | | | ● | ● | ● | ● |
| | H | DIMM170(H) | | | | | ● | | ● | ● | ● |
| | | DIMM171(P) | | | | | | | | | ● |
| Note | When 24 DIMMs are configured, the recommended installation (marked with √) achieves better performance than the installation that is not recommended (marked with ○). However, only the installation that is not recommended (marked with ○) supports SNC2, Hemi, SGX, and UMA X-skt. | | | | | | | | | | |

5.1.4.1.6 Memory Protection Technologies

The following memory protection technologies are supported:

- ECC
- Memory Mirroring
- Memory Single Device Data Correction (SDDC, +1)
- Failed DIMM Isolation
- Memory Thermal Throttling
- Command/Address Parity Check and Retry
- Memory Demand/Patrol Scrubbing
- Memory Data Scrambling
- Memory Multi Rank Sparing
- Post Package Repair (PPR)
- Write Data CRC Protection
- Adaptive Data Correction - Single Region (ADC-SR)
- Adaptive Double Device Data Correction - Multiple Region (ADDDC-MR, +1)

5.1.5 Storage

5.1.5.1 Drive Configurations

5.1.5.1.1 8 x 2.5" drive pass-through configuration

Drive configuration

Table 5-7 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------|
| 8 x 2.5" drive pass-through configuration 1 | <ul style="list-style-type: none"> • Front drive: 8 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 8 x 2.5" drive pass-through configuration 2 | <ul style="list-style-type: none"> • Front drive: 8 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------|
| | | drives ^a . | | drive: CPU |
| 8 x 2.5" drive pass-through configuration 3 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SAS/SATA A drives. | <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller card NVMe drive: CPU |
| 8 x 2.5" drive pass-through + 11 x PCIe card configuration 1 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SATA drives. | - | - | <ul style="list-style-type: none"> PCH passthrough |
| 8 x 2.5" drive pass-through + 11 x PCIe card configuration 2 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SAS/SATA A drives. | - | - | <ul style="list-style-type: none"> 1 x screw-in RAID controller card |
| 8 x 2.5" drive pass-through + 11 x PCIe card configuration 3 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SAS/SATA A drives. | - | - | <ul style="list-style-type: none"> 1 x PCIe RAID controller card |
| 8 x 2.5" drive + 4 x GPU configuration 1 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SATA drives. | - | - | <ul style="list-style-type: none"> PCH passthrough |
| 8 x 2.5" drive + 4 x GPU configuration 2 | <ul style="list-style-type: none"> Front drive: 8 x 2.5" <ul style="list-style-type: none"> Slots 0 to 7 support only SAS/SATA A drives. | - | - | <ul style="list-style-type: none"> 1 x screw-in RAID controller card |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|----------------|-----------------------|
| <ul style="list-style-type: none"> a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 8 x 2.5" drive pass-through configuration 1 in [Table 5-7](#)

Figure 5-32 Slot numbers

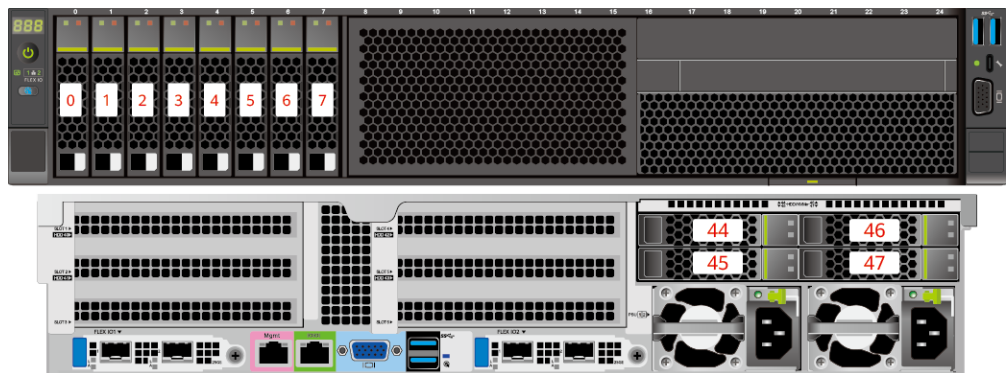


Table 5-8 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |

- Drive slot numbers of 8 x 2.5" drive pass-through configuration 2 and 8 x 2.5" drive pass-through configuration 3 in [Table 5-7](#)

Figure 5-33 Slot numbers

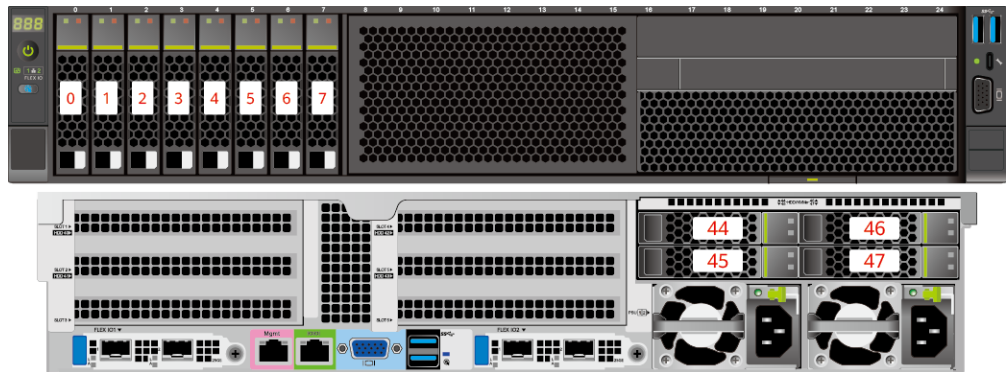


Table 5-9 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller Card |
|-----------|-------------------------------------|-----------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 8 x 2.5" drive pass-through + 11 x PCIe card configuration 1 and 8 x 2.5" drive + 4 x GPU configuration 1 in [Table 5-7](#)

Figure 5-34 Slot numbers

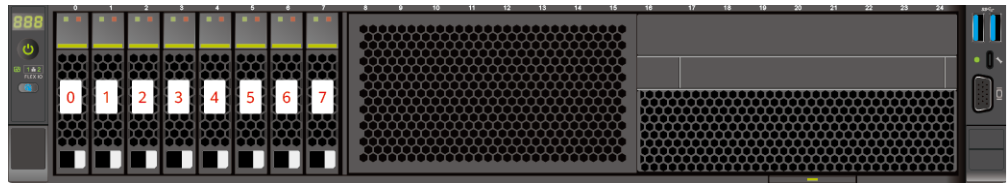


Table 5-10 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |

- Drive slot numbers of 8 x 2.5" drive pass-through + 11 x PCIe card configuration 2, 8 x 2.5" drive pass-through + 11 x PCIe card configuration 3, and 8 x 2.5" drive + 4 x GPU configuration 2 in [Table 5-7](#)

Figure 5-35 Slot numbers

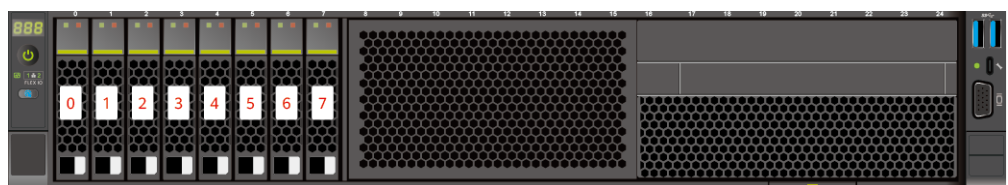


Table 5-11 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller Card |
|-----------|-------------------------------------|-----------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller Card |
|-----------|-------------------------------------|-----------------------------------------------------|
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |

5.1.5.1.2 12 x 2.5" Drive Pass-Through Configuration

Drive configuration

Table 5-12 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|------------------------------------------------------------------------------------------------------------------------------|
| 12 x 2.5" drive pass-through configuration 1 (4 x SATA + 8 x NVMe) | <ul style="list-style-type: none"> Front drive: 12 x 2.5" <ul style="list-style-type: none"> Slots 0 to 3 support only SATA drives. Slots 4 to 11 support only NVMe drives^a. | - | - | <ul style="list-style-type: none"> SATA drive: PCH NVMe drive: CPU |
| 12 x 2.5" drive pass-through configuration 2 (4 x SAS/SATA + 8 x NVMe) | <ul style="list-style-type: none"> Front drive: 12 x 2.5" <ul style="list-style-type: none"> Slots 0 to 3 support only SAS/SATA drives. Slots 4 to 11 support only NVMe drives^a. | - | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| 12 x 2.5" drive pass-through configuration 3 (4 x SAS/SATA + 8 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support only SAS/SATA drives. – Slots 4 to 11 support only NVMe drives^a. | - | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card • NVMe drive: CPU |
| 12 x 2.5" drive (4 x SATA + 8 x NVMe) + 4 x GPU configuration 1 | <ul style="list-style-type: none"> • Front drive: 12 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support only SATA drives. – Slots 4 to 11 support only NVMe drives^a. | - | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 12 x 2.5" drive (4 x SAS/SATA + 8 x NVMe) + 4 x GPU configuration 2 | <ul style="list-style-type: none"> • Front drive: 12 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support only SAS/SATA drives. – Slots 4 to 11 support only NVMe drives^a. | - | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 12 x 2.5" drive pass-through configuration 1 (4 x SATA + 8 x NVMe) and 12 x 2.5" drive (4 x SATA + 8 x NVMe) + 4 x GPU configuration 1 in [Table 5-12](#).

Figure 5-36 Slot numbers

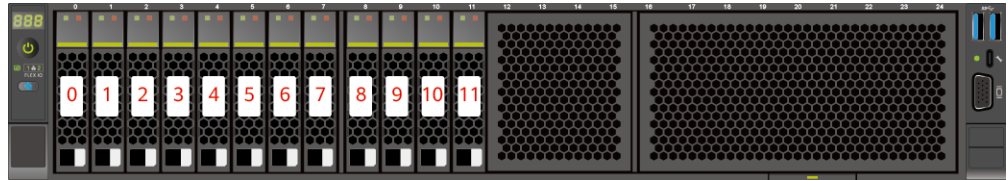


Table 5-13 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |

- Drive slot numbers of 12 x 2.5" drive pass-through configuration 2 (4 x SAS/SATA + 8 x NVMe), 12 x 2.5" drive pass-through configuration 3 (4 x SAS/SATA + 8 x NVMe), and 12 x 2.5" drive (4 x SAS/SATA + 8 x NVMe) + 4 x GPU configuration 2 in [Table 5-12](#).

Figure 5-37 Slot numbers

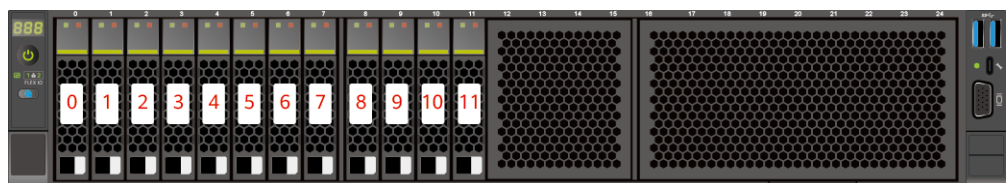


Table 5-14 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | - |
| 5 | 5 | - |
| 6 | 6 | - |
| 7 | 7 | - |
| 8 | 8 | - |
| 9 | 9 | - |
| 10 | 10 | - |
| 11 | 11 | - |

5.1.5.1.3 12 x 3.5" drive pass-through configuration

Drive configuration

Table 5-15 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------|
| 12 x 3.5" drive pass-through configuration 1 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SATA drives. | <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SATA drive: PCH NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 2 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SAT | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------|
| | A drives. | A drives. <ul style="list-style-type: none"> I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 42 and 43 support only SAS/SAT A drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | | drive: CPU |
| 12 x 3.5" drive pass-through configuration 3 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SAT A drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT A drives. I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 42 and 43 support only SAS/SAT A drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller card NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 1 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to | <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 | - | <ul style="list-style-type: none"> SATA drive: PCH NVMe |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| (4 x NVMe) | <p>7 support only SATA drives.</p> <ul style="list-style-type: none"> – Slots 8 to 11 support only SATA/NVMe drives. | <p>to 47 support only NVMe drives^a.</p> | | <p>drive: CPU</p> |
| 12 x 3.5" drive pass-through configuration 2 (4 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. – Slots 8 to 11 support SAS/SATA/NVMe drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> – Slots 42 and 43 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. – Slots 8 to 11 support | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 2: 2 x 2.5"/2 | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card • NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|
| | SAS/SATA/NVMe drives. | x 3.5" – Slots 42 and 43 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives ^a . | | |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 1 in [Table 5-15](#)

Figure 5-38 Slot numbers

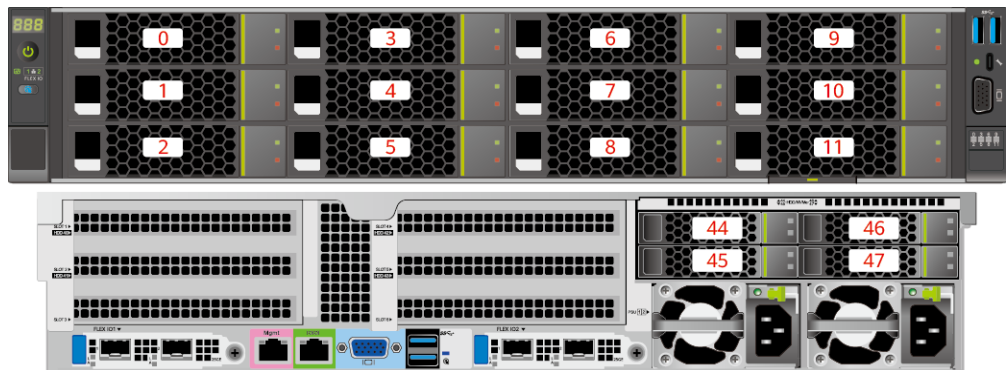


Table 5-16 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 2 and 12 x 3.5" drive pass-through configuration 3 in [Table 5-15](#)

Figure 5-39 Drive slot numbers (3.5" drives in I/O module 1 and I/O module 2)

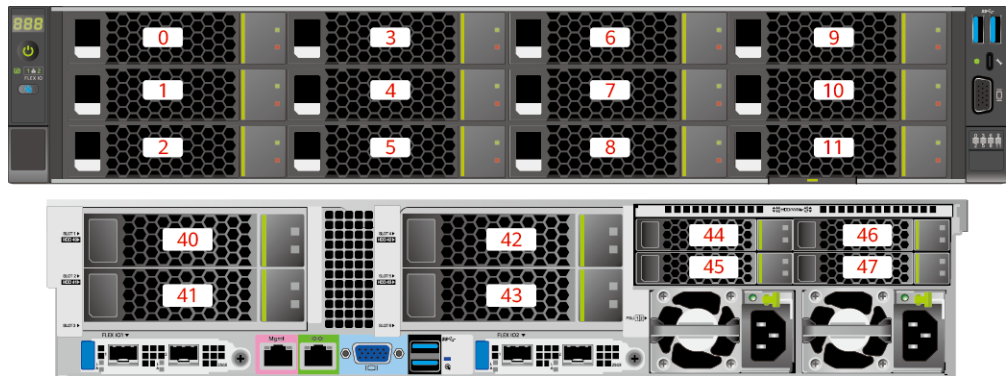


Figure 5-40 Drive slot numbers (2.5" drives in I/O module 1 and I/O module 2)

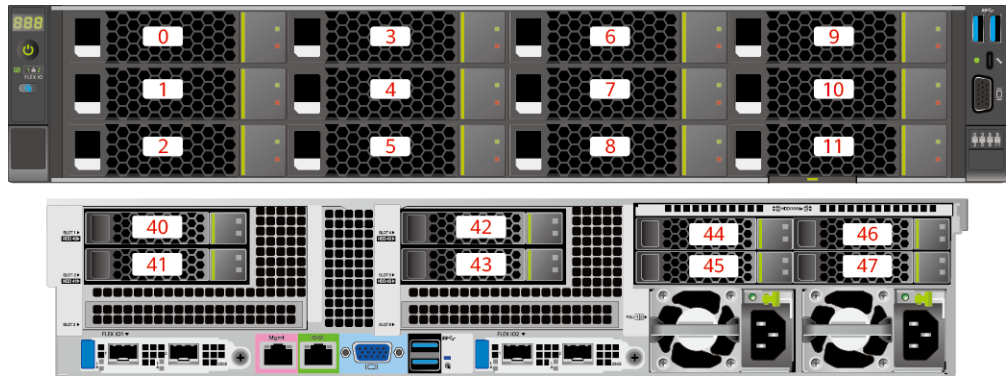


Table 5-17 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 42 | 42 | 14 |
| 43 | 43 | 15 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 1 (4 x NVMe) in [Table 5-15](#)

Figure 5-41 Slot numbers

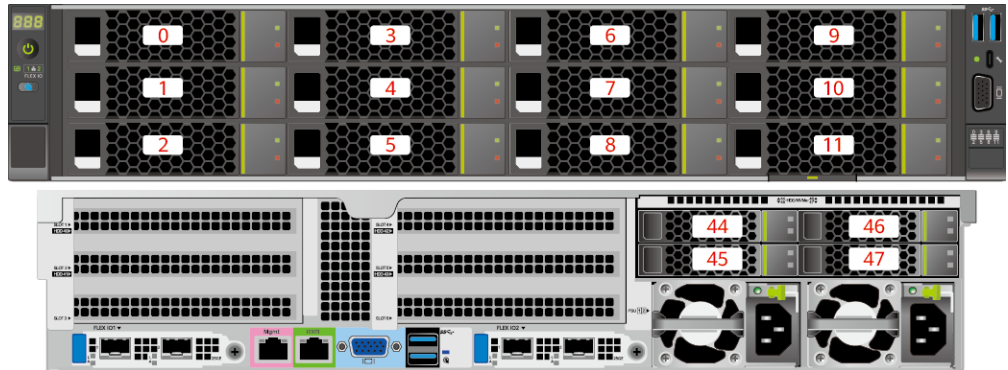


Table 5-18 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 2 (4 x NVMe) and 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) in [Table 5-15](#)

Figure 5-42 Drive slot numbers (3.5" drives in I/O module 1 and I/O module 2)

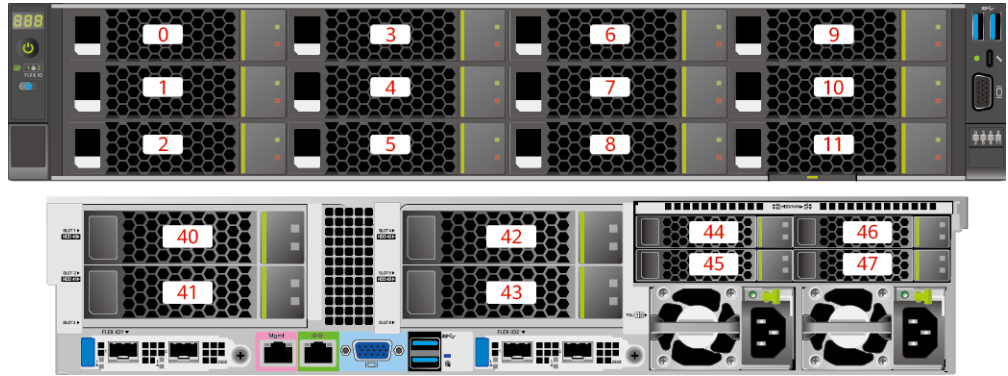


Figure 5-43 Drive slot numbers (2.5" drives in I/O module 1 and I/O module 2)

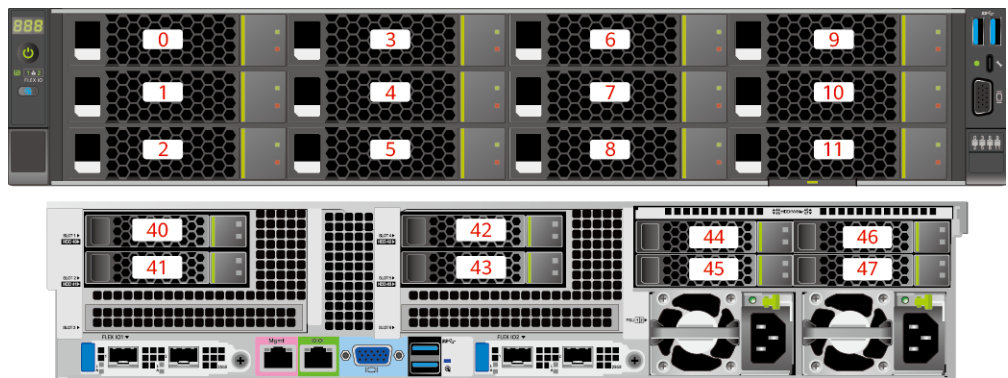


Table 5-19 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8Note |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 9 | 9 | 9 ^{Note} |
| 10 | 10 | 10 ^{Note} |
| 11 | 11 | 11 ^{Note} |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 42 | 42 | 14 |
| 43 | 43 | 15 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive.

5.1.5.1.4 12 x 3.5" drive EXP configuration

Drive configuration

Table 5-20 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 12 x 3.5" drive EXP configuration 1 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SATA drives. I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 42 and 43 support only | <ul style="list-style-type: none"> Built-in drive: 4 x 3.5" <ul style="list-style-type: none"> Slots 36 to 39 support only SAS/SATA drives. | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| | | SAS/SAT A drives. <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support SAS/SAT A/NVMe drives^a. | | |
| 12 x 3.5" drive EXP configuration 2 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SAT A drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT A drives. I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 42 and 43 support only SAS/SAT A drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support SAS/SAT A/NVMe drives^a. | <ul style="list-style-type: none"> Built-in drive: 4 x 3.5" <ul style="list-style-type: none"> Slots 36 to 39 support only SAS/SAT A drives. | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller card NVMe drive: CPU |
| 12 x 3.5" drive EXP configuration 3 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SAT A drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT A drives. I/O module 2: 2 x 2.5"/2 | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------|
| | | x 3.5" – Slots 42 and 43 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives ^a . | | |
| 12 x 3.5" drive EXP configuration 4 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 2: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> – Slots 42 and 43 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card • NVMe drive: CPU |
| 12 x 3.5" drive EXP configuration 5 (dual RAID controller cards) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card + 1 x PCIe RAID |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | A drives. | A drives. <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | | controller card <ul style="list-style-type: none"> – One screw-in RAID controller card manages the drives in slots 40 to 41. – One PCIe RAID controller card manages the drives in slots 0 to 11. <ul style="list-style-type: none"> • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 12 x 3.5" drive EXP configuration 1 and 12 x 3.5" drive EXP configuration 2 in [Table 5-20](#)

Figure 5-44 Drive slot numbers (3.5" drives in I/O module 1 and I/O module 2)



Figure 5-45 Drive slot numbers (2.5" drives in I/O module 1 and I/O module 2)



Table 5-21 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 36 | 36 | 8 |
| 37 | 37 | 9 |
| 38 | 38 | 10 |
| 39 | 39 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 42 | 42 | 14 |
| 43 | 43 | 15 |
| 44 | 44 | 12 ^{Note} |
| 45 | 45 | 13 ^{Note} |
| 46 | 46 | 14 ^{Note} |
| 47 | 47 | 15 ^{Note} |

- Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive.
- If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the EID.

- Drive slot numbers of 12 x 3.5" drive EXP configuration 3 and 12 x 3.5" drive EXP configuration 4 in [Table 5-20](#)

Figure 5-46 Drive slot numbers (3.5" drives in I/O module 1 and I/O module 2)

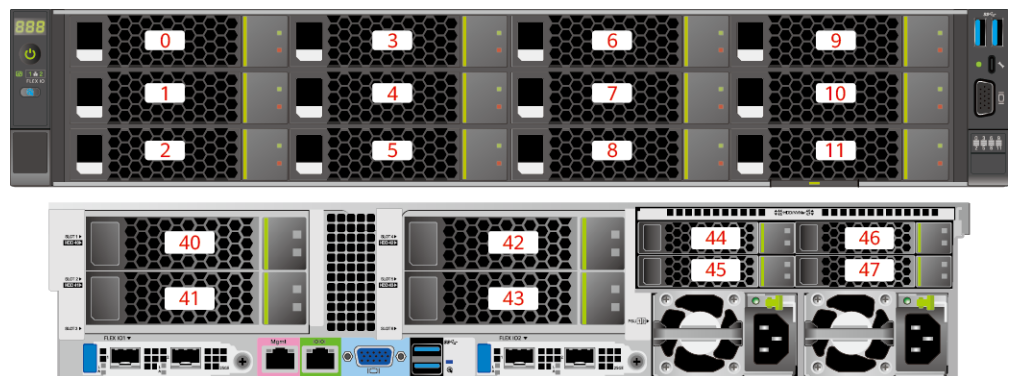


Figure 5-47 Drive slot numbers (2.5" drives in I/O module 1 and I/O module 2)

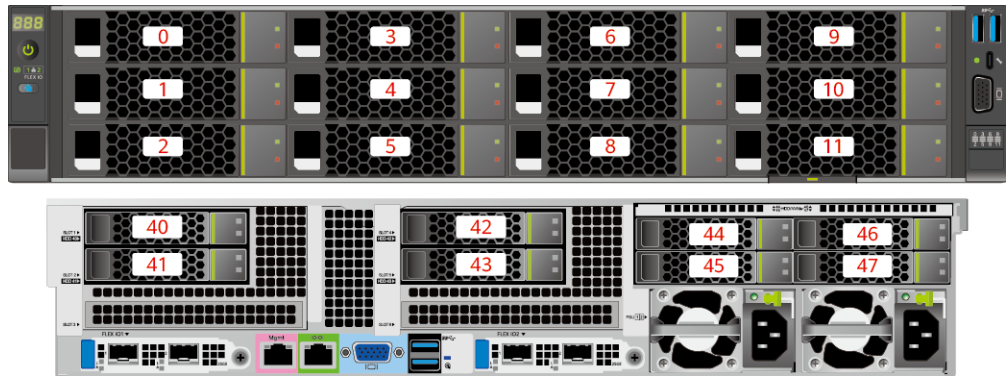


Table 5-22 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 42 | 42 | 14 |
| 43 | 43 | 15 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 12 x 3.5" drive EXP configuration 5 (dual RAID controller cards) in [Table 5-20](#)

Figure 5-48 Slot numbers

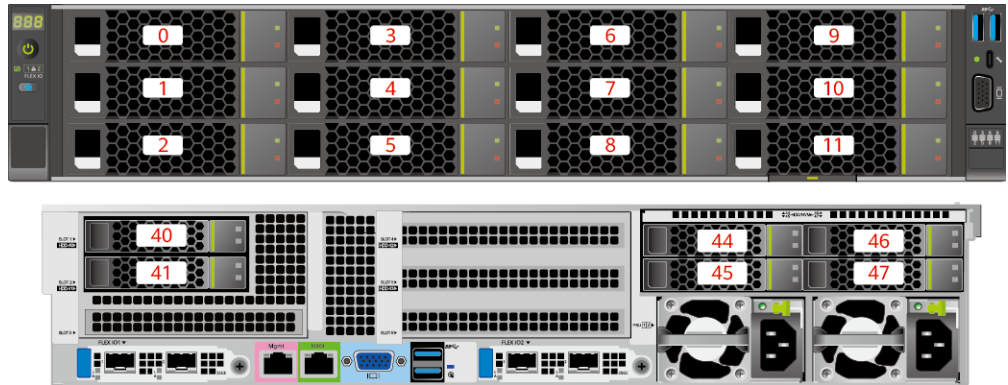


Table 5-23 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 0 |
| 41 | 41 | 1 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 47 | 47 | - |

5.1.5.1.5 20 x 2.5" Drive Pass-Through Configuration

Drive configuration

Table 5-24 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| 20 x 2.5" drive pass-through configuration 1 (4 x SATA + 16 x NVMe) | <ul style="list-style-type: none"> • Front drive: 20 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support only SATA drives. – Slots 4 to 11 and slots 16 to 23 support only NVMe drives. | - | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 20 x 2.5" drive pass-through configuration 2 (4 x SAS/SATA + 16 x NVMe) | <ul style="list-style-type: none"> • Front drive: 20 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support only SAS/SATA drives. – Slots 4 to 11 and slots 16 to 23 support only NVMe drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only SAS/SATA drives. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 20 x 2.5" drive pass-through configuration 3 (4 x SAS/SATA + | <ul style="list-style-type: none"> • Front drive: 20 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|---------------|---------------------------------------------------------------------------------------|-------------------------------|----------------|---------------------------|
| 16 x NVMe) | only SAS/SATA drives. – Slots 4 to 11 and slots 16 to 23 support only NVMe drives. | support only SAS/SATA drives. | | card • NVMe drive: CPU |

For details about component options, consult the local sales representatives.

Slot numbers

- Drive slot numbers of 20 x 2.5" drive pass-through configuration 1 (4 x SATA + 16 x NVMe) in [Table 5-24](#)

Figure 5-49 Slot numbers

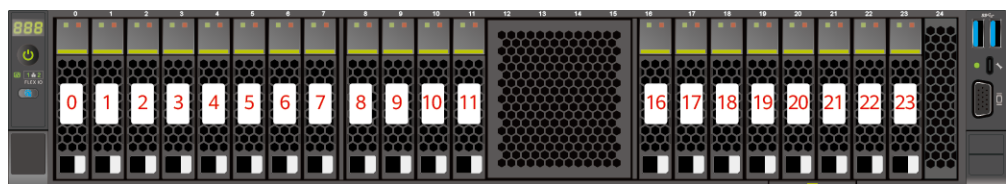


Table 5-25 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |

- Drive slot numbers of 20 x 2.5" drive pass-through configuration 2 (4 x SAS/SATA + 16 x NVMe) and 20 x 2.5" drive pass-through configuration 3 (4 x SAS/SATA + 16 x NVMe) in [Table 5-24](#).

Figure 5-50 Slot numbers

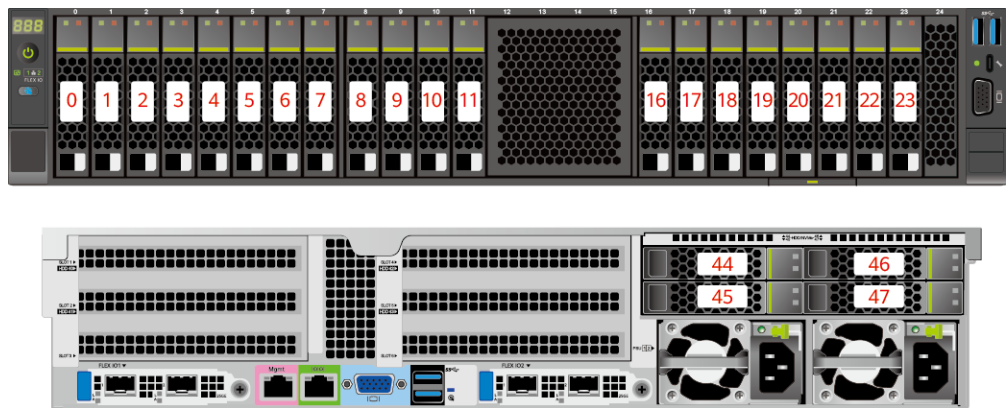


Table 5-26 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 3 | 3 | 3 |
| 4 | 4 | - |
| 5 | 5 | - |
| 6 | 6 | - |
| 7 | 7 | - |
| 8 | 8 | - |
| 9 | 9 | - |
| 10 | 10 | - |
| 11 | 11 | - |
| 16 | 16 | - |
| 17 | 17 | - |
| 18 | 18 | - |
| 19 | 19 | - |
| 20 | 20 | - |
| 21 | 21 | - |
| 22 | 22 | - |
| 23 | 23 | - |
| 44 | 44 | 4 |
| 45 | 45 | 5 |
| 46 | 46 | 6 |
| 47 | 47 | 7 |

5.1.5.1.6 24 x 2.5" drive pass-through configuration

Drive configuration

Table 5-27 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------|------------------------------------------------------------------------------------------------|------------|----------------|---------------------------------------------------------------------------------|
| 24 x 2.5" drive NVMe configuration 1 | <ul style="list-style-type: none"> Front drive: 24 x 2.5" – Slots 0 to | - | - | <ul style="list-style-type: none"> SATA drive: PCH NVMe |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>3 support only SATA/NVMe drives.</p> <ul style="list-style-type: none"> – Slots 4 to 23 support only NVMe drives. | | | drive: CPU |
| 24 x 2.5" drive NVMe configuration 2 | <ul style="list-style-type: none"> • Front drive: 24 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 3 support SAS/SATA/NVMe drives. – Slots 4 to 23 support only NVMe drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only SAS/SATA drives. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 24 x 2.5" drive pass-through configuration (three RAID controller cards) | <ul style="list-style-type: none"> • Front drive: 24 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 23 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card + 2 x PCIe RAID controller cards^a <ul style="list-style-type: none"> – One screw-in RAID controller card manages drives in slots 0 to 7. – One PCIe RAID controller card manages |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|----------------|--------------------------------------------------------------------------------------------------------------------|
| | | | | drives in slots 8 to 15. – One PCIe RAID controller card manages drives in slots 16 to 23. • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The model of the screw-in RAID controller card must be the same as that of the PCIe RAID controller card. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 24 x 2.5" NVMe configuration 1 in [Table 5-27](#)

Figure 5-51 Slot numbers

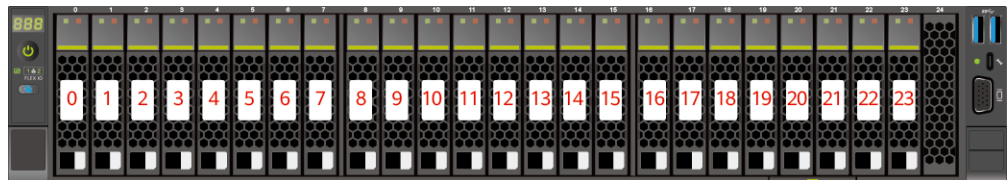


Table 5-28 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |

- Drive slot numbers of 24 x 2.5" NVMe configuration 2 in [Table 5-27](#)

Figure 5-52 Slot numbers

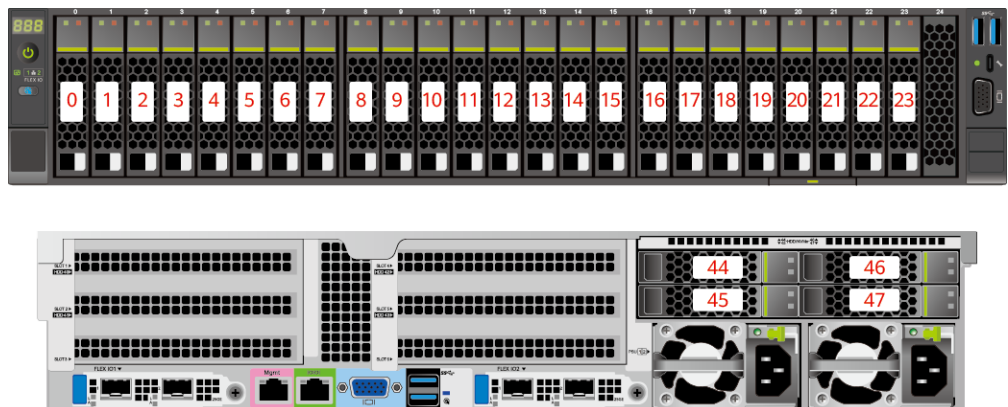


Table 5-29 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 ^{Note} |
| 1 | 1 | 1 ^{Note} |
| 2 | 2 | 2 ^{Note} |
| 3 | 3 | 3 ^{Note} |
| 4 | 4 | - |
| 5 | 5 | - |
| 6 | 6 | - |
| 7 | 7 | - |
| 8 | 8 | - |
| 9 | 9 | - |
| 10 | 10 | - |
| 11 | 11 | - |
| 12 | 12 | - |
| 13 | 13 | - |
| 14 | 14 | - |
| 15 | 15 | - |
| 16 | 16 | - |
| 17 | 17 | - |
| 18 | 18 | - |
| 19 | 19 | - |
| 20 | 20 | - |
| 21 | 21 | - |
| 22 | 22 | - |
| 23 | 23 | - |
| 44 | 44 | 4 |
| 45 | 45 | 5 |
| 46 | 46 | 6 |
| 47 | 47 | 7 |
| Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. | | |

- Drive slot numbers of 24 x 2.5" drive pass-through configuration (three RAID controller cards) in [Table 5-27](#)

Figure 5-53 Slot numbers

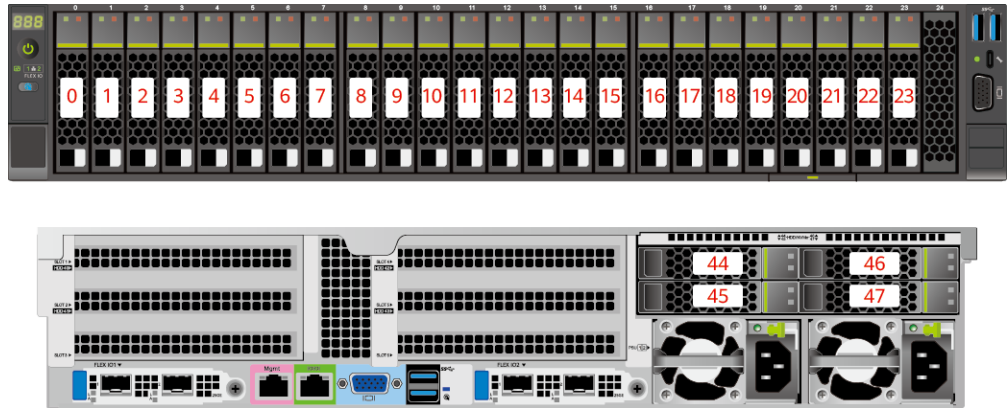


Table 5-30 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 0 |
| 9 | 9 | 1 |
| 10 | 10 | 2 |
| 11 | 11 | 3 |
| 12 | 12 | 4 |
| 13 | 13 | 5 |
| 14 | 14 | 6 |
| 15 | 15 | 7 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 16 | 16 | 0 |
| 17 | 17 | 1 |
| 18 | 18 | 2 |
| 19 | 19 | 3 |
| 20 | 20 | 4 |
| 21 | 21 | 5 |
| 22 | 22 | 6 |
| 23 | 23 | 7 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

5.1.5.1.7 25 x 2.5" drive EXP configuration

Drive configuration

Table 5-31 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------|
| 25 x 2.5" drive EXP configuration 1 | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SATA drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| 25 x 2.5" drive EXP configuration 2 | <ul style="list-style-type: none"> • Front drive: 25 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card • NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 3 | <ul style="list-style-type: none"> • Front drive: 25 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5"/2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support SAS/SATA/NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 4 | <ul style="list-style-type: none"> • Front drive: 25 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card • NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | SAS/SATA/NVMe drives ^a . | | |
| 25 x 2.5" drive EXP configuration 5 (dual RAID controller cards) | <ul style="list-style-type: none"> • Front drive: 25 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 2.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card + 1 x PCIe RAID controller card <ul style="list-style-type: none"> – One screw-in RAID controller card manages the drives in slots 40 to 41. – One PCIe RAID controller card manages the drives in slots 0 to 24. • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 25 x 2.5" drive EXP configuration 1 and 25 x 2.5" drive EXP configuration 2 in [Table 5-31](#)

Figure 5-54 Drive slot numbers (2.5" drives in I/O module 1)

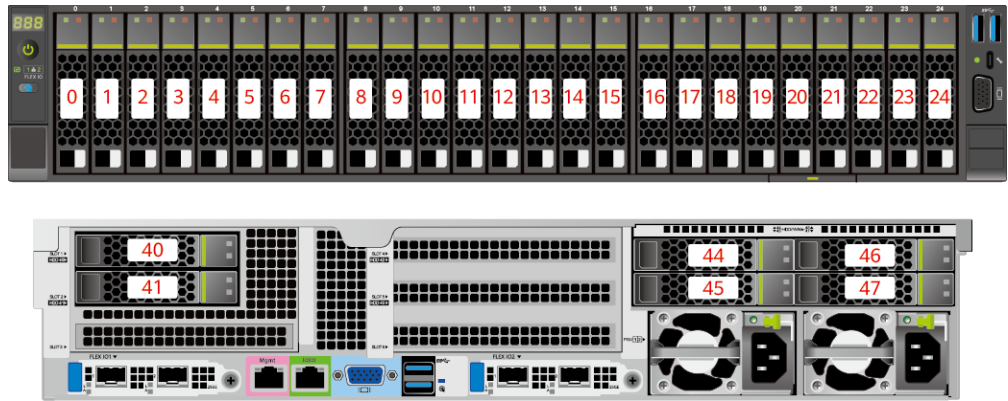


Figure 5-55 Drive slot numbers (3.5" drives in I/O module 1)

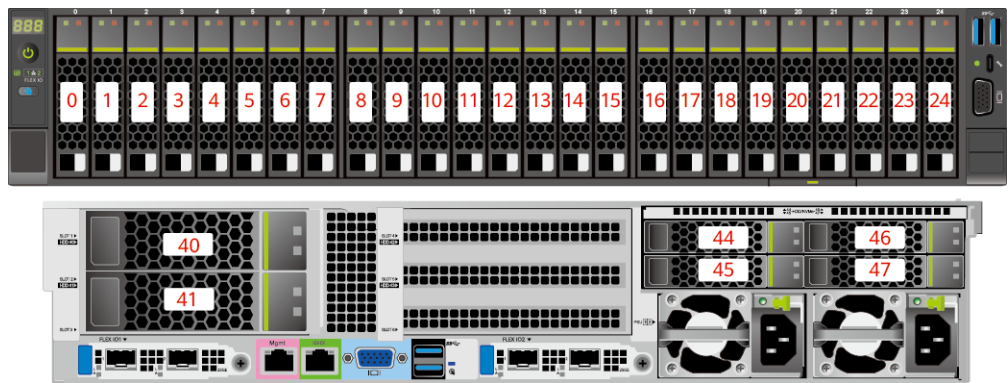


Table 5-32 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 25 |
| 41 | 41 | 26 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 25 x 2.5" drive EXP configuration 3 and 25 x 2.5" drive EXP configuration 4 in [Table 5-31](#)

Figure 5-56 Drive slot numbers (2.5" drives in I/O module 1)

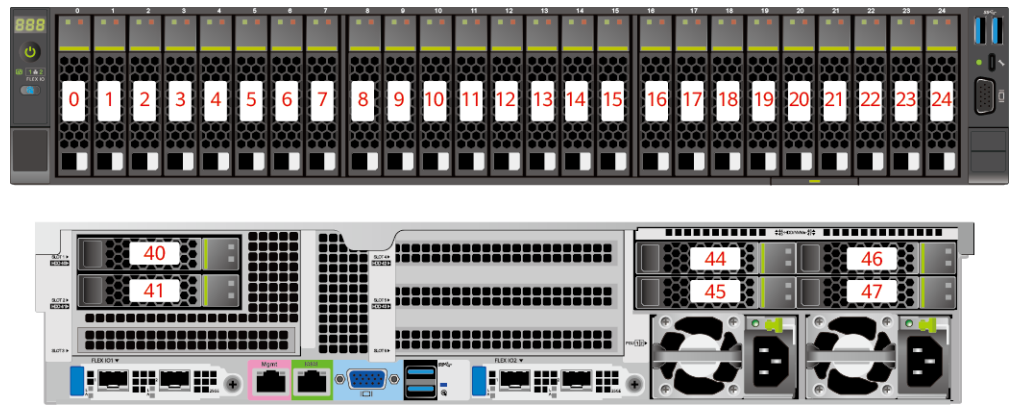


Figure 5-57 Drive slot numbers (3.5" drives in I/O module 1)

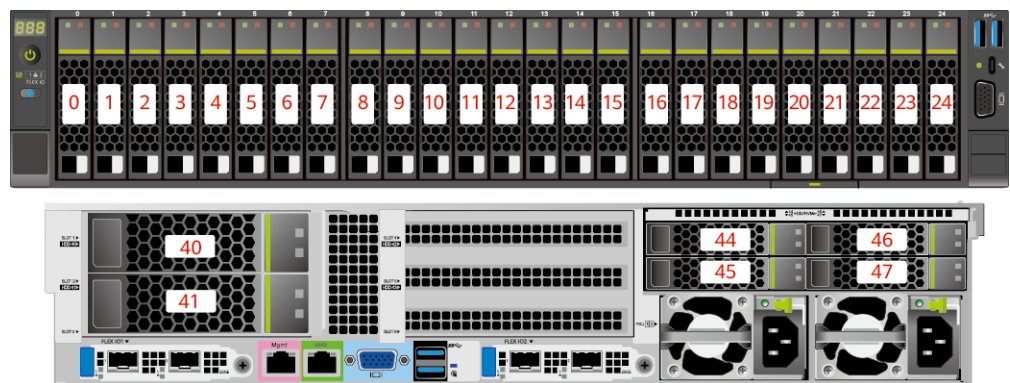


Table 5-33 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 25 |
| 41 | 41 | 26 |
| 44 | 44 | 8 ^{Note} |
| 45 | 45 | 9 ^{Note} |
| 46 | 46 | 10 ^{Note} |
| 47 | 47 | 11 ^{Note} |
| <ul style="list-style-type: none"> Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the EID. | | |

- Drive slot numbers of 25 x 2.5" drive EXP configuration 5 (dual RAID controller cards) in [Table 5-31](#)

Figure 5-58 Slot numbers

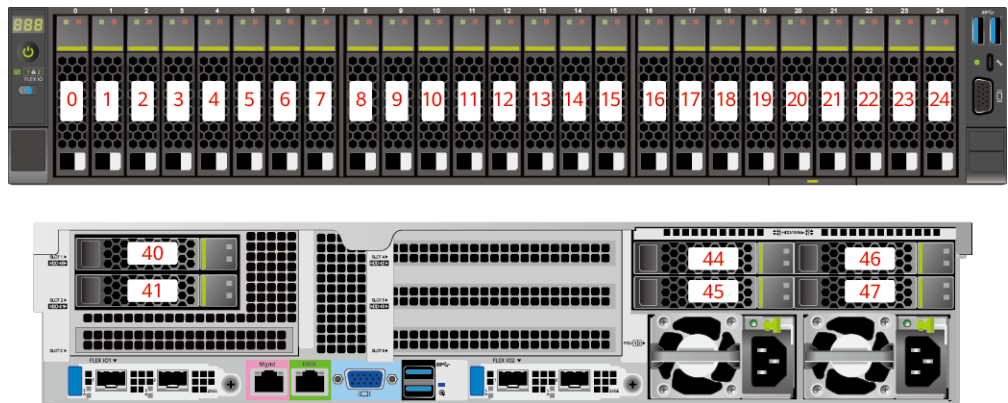


Table 5-34 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 0 |
| 41 | 41 | 1 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

5.1.5.2 Drive Indicators

SAS/SATA Drive Indicators

Figure 5-59 SAS/SATA drive indicators

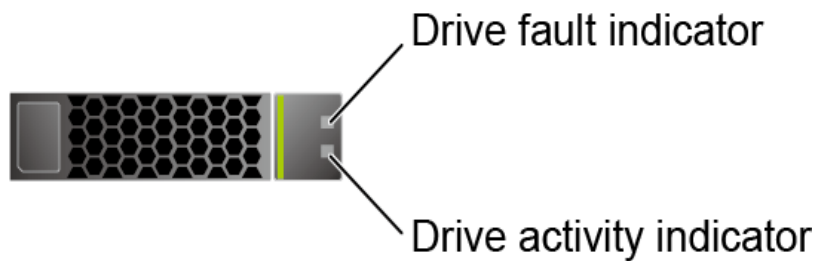


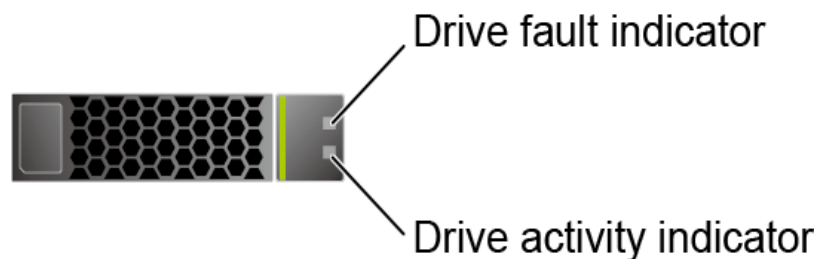
Table 5-35 SAS/SATA drive indicators

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|----------------------------------------------------------------------------------------|
| Off | Off | The drive is not in position. |
| Steady on | Off | The drive is detected. |
| Blinking at 4 Hz | Off | Data is being read or written properly, or data on the primary drive is being rebuilt. |

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|-----------------------------------------------|
| Steady on | Blinking at 1 Hz | The drive is being located. |
| Blinking at 1 Hz | Blinking at 1 Hz | Data on the secondary drive is being rebuilt. |
| Off | Steady on | A drive in a RAID array is removed. |
| Steady on | Steady on | The drive is faulty. |

NVMe Drive Indicators

Figure 5-60 NVMe drive indicators



- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.

Table 5-36 NVMe drive indicators (VMD enabled)

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|--------------------------------------------------------|
| Off | Off | The NVMe drive is not detected. |
| Steady on | Off | The NVMe drive is detected and operating properly. |
| Blinking at 2 Hz | Off | Data is being read from or written to the NVMe drive. |
| Off | Blinking at 2 Hz | The NVMe drive is being located. |
| Off | Blinking at 8 Hz | The data on the secondary NVMe drive is being rebuilt. |
| Steady on/Off | Steady on | The NVMe drive is faulty. |

- If the VMD function is disabled, NVMe drives support only orderly hot swap.

Table 5-37 NVMe drive indicators (VMD disabled)

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|---------------------------------------------------------------------|
| Off | Off | The NVMe drive is not detected. |
| Steady on | Off | The NVMe drive is detected and operating properly. |
| Blinking at 2 Hz | Off | Data is being read from or written to the NVMe drive. |
| Off | Blinking at 2 Hz | The NVMe drive is being located or hot-swapped. |
| Off | Blinking at 0.5 Hz | The NVMe drive has completed the hot swap process and is removable. |
| Steady on/Off | Steady on | The NVMe drive is faulty. |

M.2 FRU Indicators

The server supports the Avago SAS3004iMR RAID controller card, which supports two M.2 FRUs.

Figure 5-61 M.2 FRU indicators

M.2 FRU fault indicator M.2 FRU activity indicator



Table 5-38 M.2 FRU indicators

| M.2 FRU Active Indicator (Green) | M.2 FRU Fault Indicator (Yellow) | Description |
|----------------------------------|----------------------------------|------------------------------------------------------------|
| Off | Off | The M.2 FRU is not detected. |
| Steady on | Off | The M.2 FRU is inactive. |
| Blink | Off | The M.2 FRU is in the read/write or synchronization state. |
| Steady on | Blink | The M.2 FRU is being located. |
| Blink | Blink | The RAID array is being rebuilt. |
| Off | Steady on | The M.2 FRU cannot be detected or |

| M.2 FRU Active Indicator (Green) | M.2 FRU Fault Indicator (Yellow) | Description |
|----------------------------------|----------------------------------|--------------------------------------|
| | | is faulty. |
| Steady on | Steady on | The M.2 FRU RAID status is abnormal. |

5.1.5.3 RAID Controller Card

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

- For details about component options, consult the local sales representatives.
- For details about the RAID controller card, see *FusionServer V6 Server RAID Controller Card User Guide*.

5.1.6 Network

5.1.6.1 OCP 3.0 Network Adapters

OCP 3.0 network adapters provide network expansion capabilities.

- The FlexIO slot supports the OCP 3.0 network adapter, which can be configured as required.
- For details about component options, consult the local sales representatives.
- For details about the OCP 3.0 network adapter, see the documents of each OCP 3.0 network adapter.

5.1.7 I/O Expansion

5.1.7.1 PCIe Cards

PCIe cards provide ease of expandability and connection.

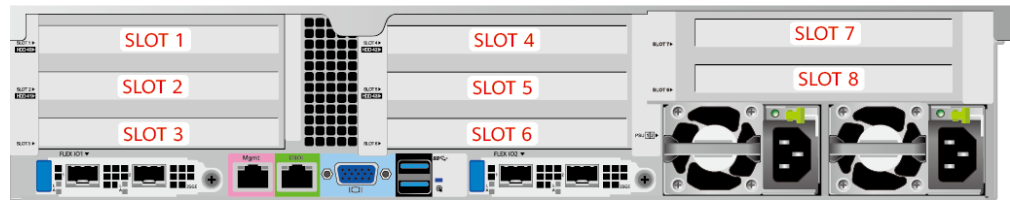
- The server with 11 standard PCIe cards on the rear panel supports up to 11 standard PCIe 4.0 expansion slots. Other server models support up to eight standard PCIe 4.0 expansion slots.
- The server with four GPU cards on the rear panel supports up to five standard PCIe 4.0 expansion slots (four FHFL dual-slot GPU cards and one FHHL standard PCIe 4.0 card).
- For details about component options, consult the local sales representatives.
- When IB cards are used to build an IB network, ensure that the IPoIB modes of the IB cards at both ends of the network are the same. For details, contact technical support.

5.1.7.2 PCIe Slots

PCIe Slots

- Server with a drive module or PRM on the rear panel

Figure 5-62 PCIe slots



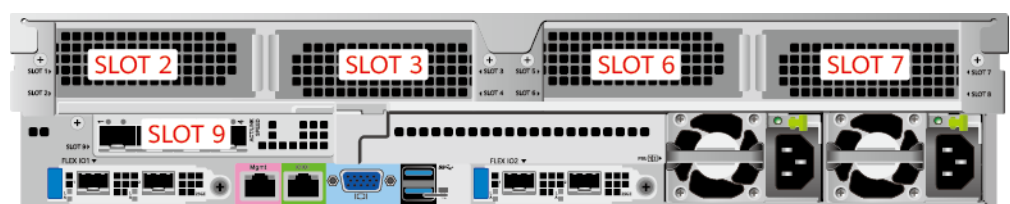
- I/O module 1 provides slots 1, 2, and 3. If a two-slot PCIe riser module is used, slot 1 is unavailable. If a module with 2 x 2.5" drives and one PCIe card is used, slots 1 and 2 are unavailable.
- I/O module 2 provides slots 4, 5, and 6. If a two-slot PCIe riser module is used, slot 4 is unavailable. If a module with 2 x 2.5" drives and one PCIe card is used, slots 4 and 5 are unavailable.
- I/O module 3 provides slots 7 and 8. If a one-slot PCIe riser module is used, slot 7 is unavailable.

NOTE

Observe the following rules when configuring GPU cards:

- When one to five x16 T4 GPU cards are configured:
 - I/O module 1 supports two HHHH PCIe x16 GPU cards.
 - I/O module 2 supports two HHHH PCIe x16 GPU cards.
 - I/O module 3 supports one HHHH PCIe x16 GPU card (in slot 8).
- When six to eight T4 GPU cards (six x8 + two x16) are configured:
 - I/O module 1 supports two HHHH PCIe x8 and one HHHH x16 GPU cards.
 - I/O module 2 supports two HHHH PCIe x8 and one HHHH x16 GPU cards.
 - I/O module 3 supports two HHHH PCIe x8 GPU cards.
- Server with four GPU cards on the rear panel

Figure 5-63 PCIe slots

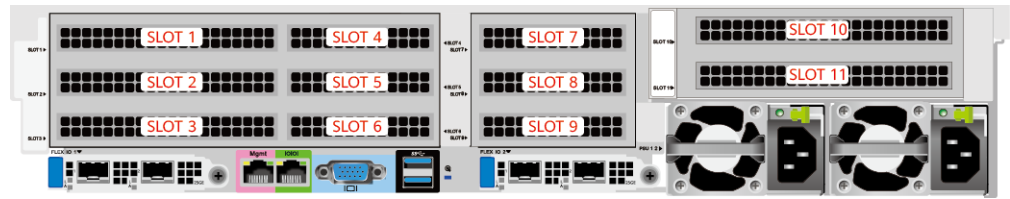


- PCIe riser module 1 provides slots 2 and 3.
- PCIe riser module 2 provides slots 6 and 7.
- PCIe riser module 3 provides slot 9.

NOTE

- Select this model when three or four FHFL dual-slot x16 GPU cards are required.
- GPU cards are installed in slots 2, 3, 6, and 7 in sequence.
- Server with 11 standard PCIe cards on the rear panel

Figure 5-64 PCIe slots

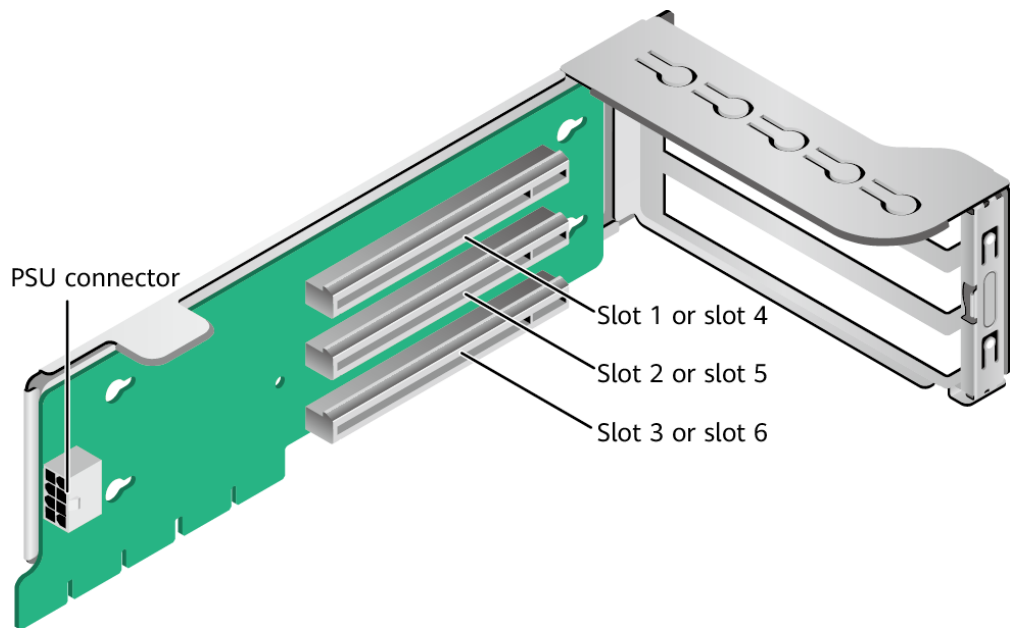


- PCIe riser module 1 provides slots 1, 2, 3, 4, 5 and 6.
- PCIe riser module 2 provides slots 7, 8, and 9.
- PCIe riser module 3 provides slots 10 and 11.

PCIe Riser Modules (Applicable to the Server with a Drive Module or PCIe Riser Module on the Rear Panel)

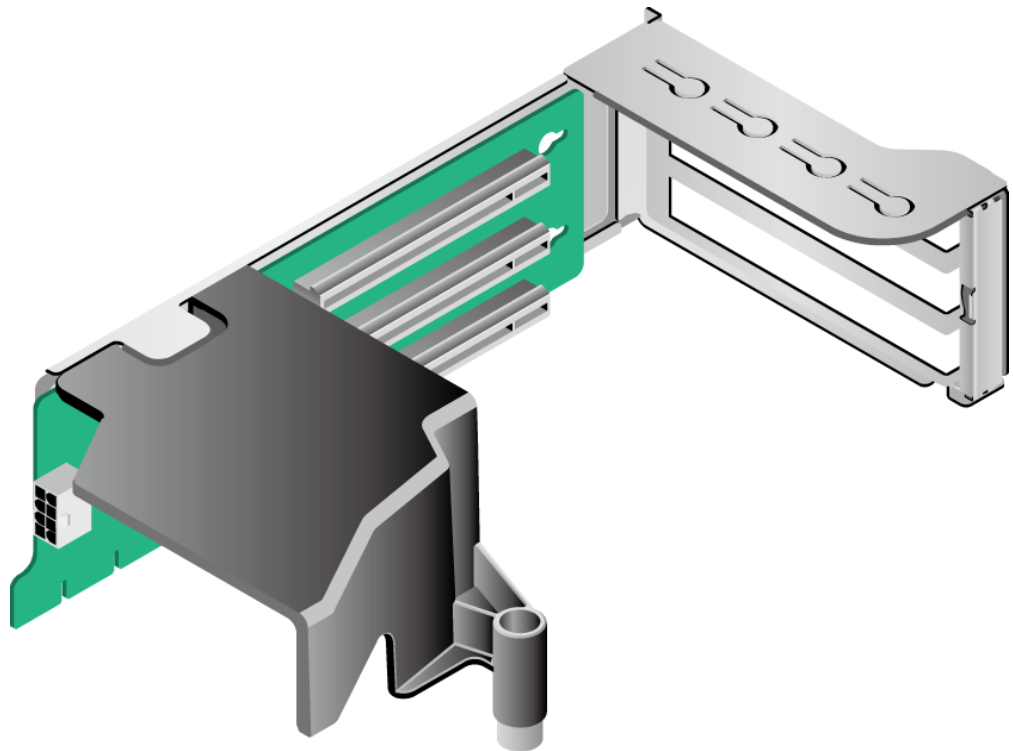
- PCIe riser module 1 (universal)
 - Provides PCIe slots 1, 2, and 3 when installed in I/O module 1.
 - Provides PCIe slots 4, 5, and 6 when installed in I/O module 2.

Figure 5-65 PCIe riser module 1



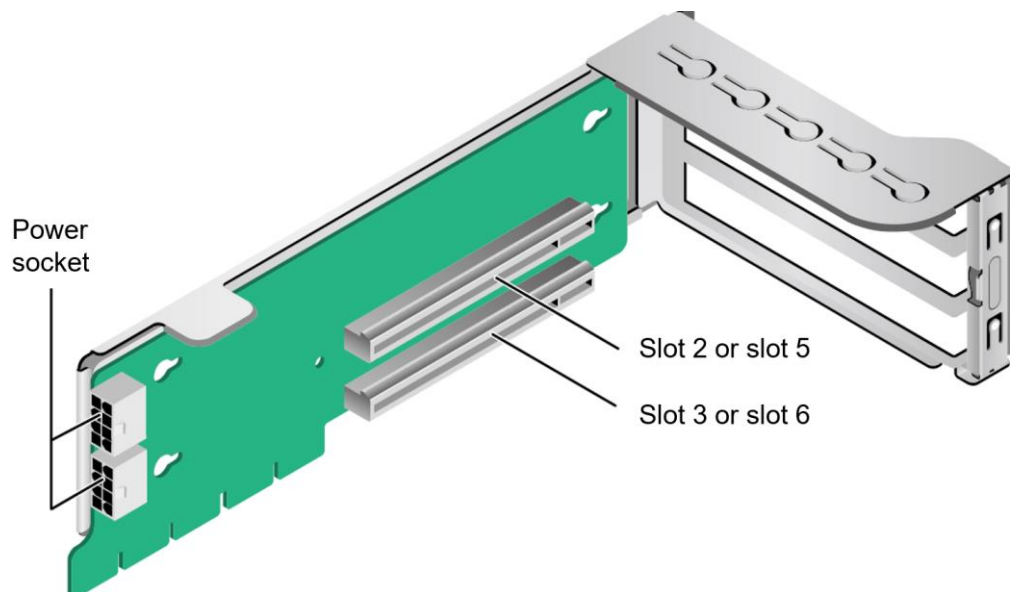
- PCIe riser module 2 (for T4 GPU cards only)
 - It provides PCIe slots 1, 2, and 3 when being installed in I/O module 1.
 - It provides PCIe slots 4, 5, and 6 when being installed in I/O module 2.

Figure 5-66 PCIe riser module 2



- PCIe riser module 3 (universal)
 - Provides PCIe slots 2 and 3 when installed in I/O module 1.
 - Provides PCIe slots 5 and 6 when installed in I/O module 2.

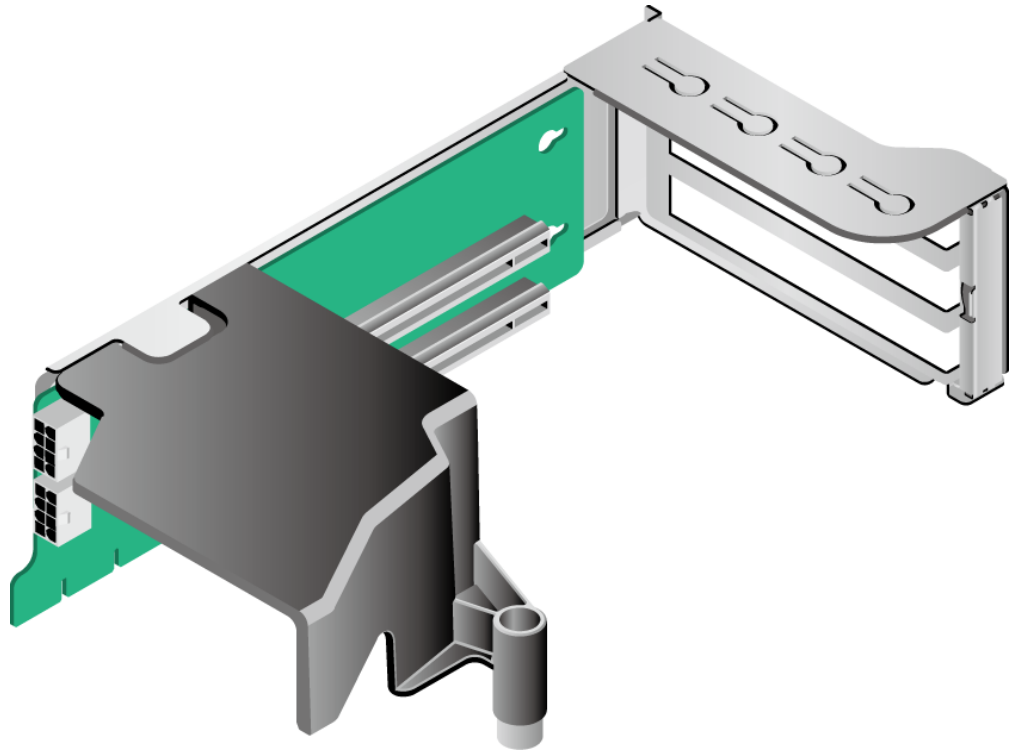
Figure 5-67 PCIe riser module 3



- PCIe riser module 4 (for T4 GPU cards only)

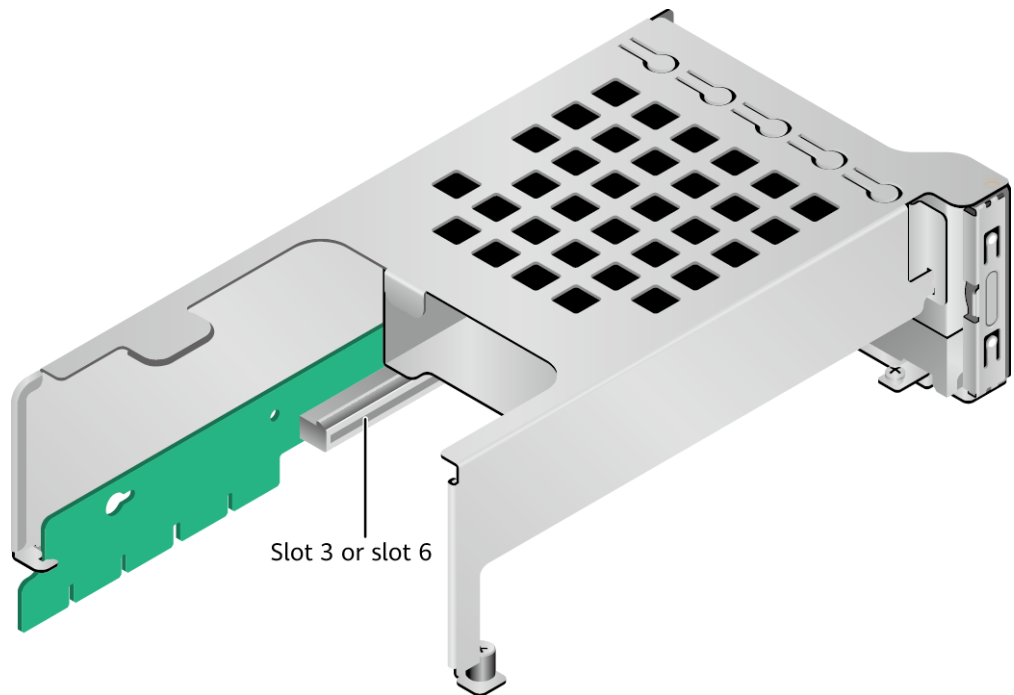
- Provides PCIe slots 2 and 3 when installed in I/O module 1.
- Provides PCIe slots 5 and 6 when installed in I/O module 2.

Figure 5-68 PCIe riser module 4



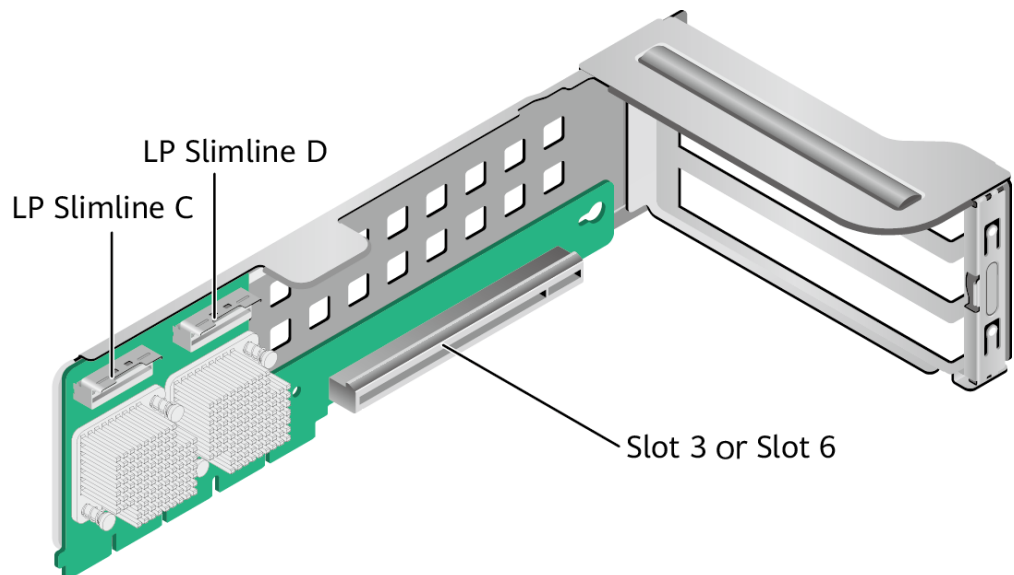
- 2 x 2.5" drives + PCIe riser module
 - Provides PCIe slot 3 when installed in I/O module 1.
 - Provides PCIe slot 6 when installed in I/O module 2.

Figure 5-69 2 x 2.5" drives + PCIe riser module



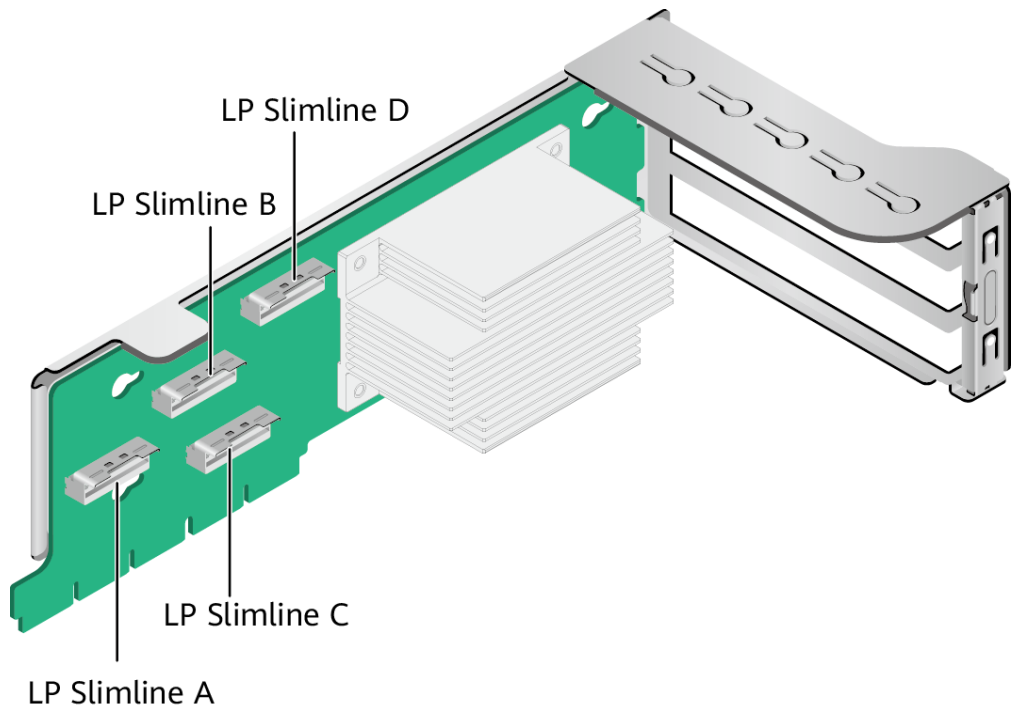
- PCIe riser module 6 (applicable to the 20 x 2.5" drive pass-through configuration)
 - Provides PCIe slot 3 when installed in I/O module 1.
 - Provides PCIe slot 6 when installed in I/O module 2.

Figure 5-70 PCIe riser module 6



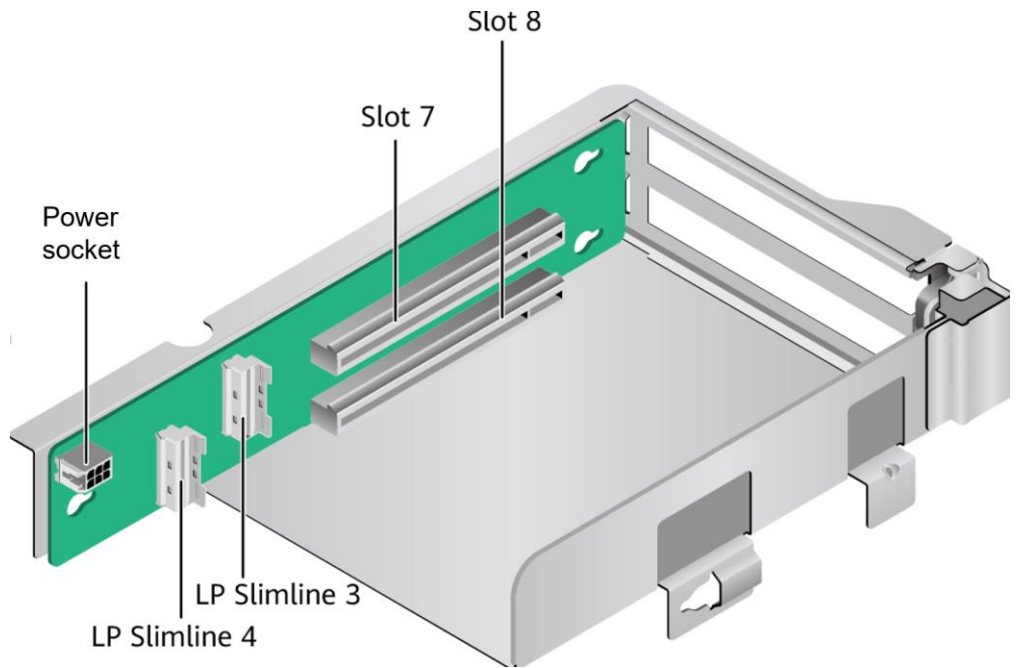
- PCIe riser module 7 (applicable to the 24 x 2.5" drive pass-through model 1/2)
Installed in I/O module 1 or 2.

Figure 5-71 PCIe riser module 7



- PCIe riser module 8
It provides PCIe slots 7 and 8 when being installed in I/O module 3.

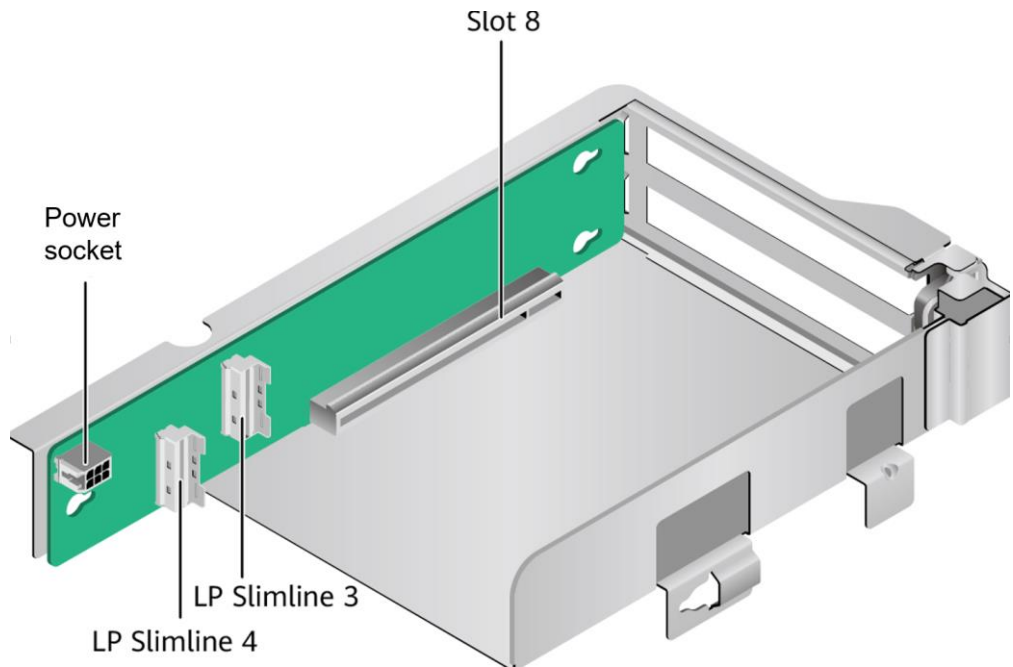
Figure 5-72 PCIe riser module 8



- PCIe riser module 9

Provides PCIe slot 8 when installed in I/O module 3.

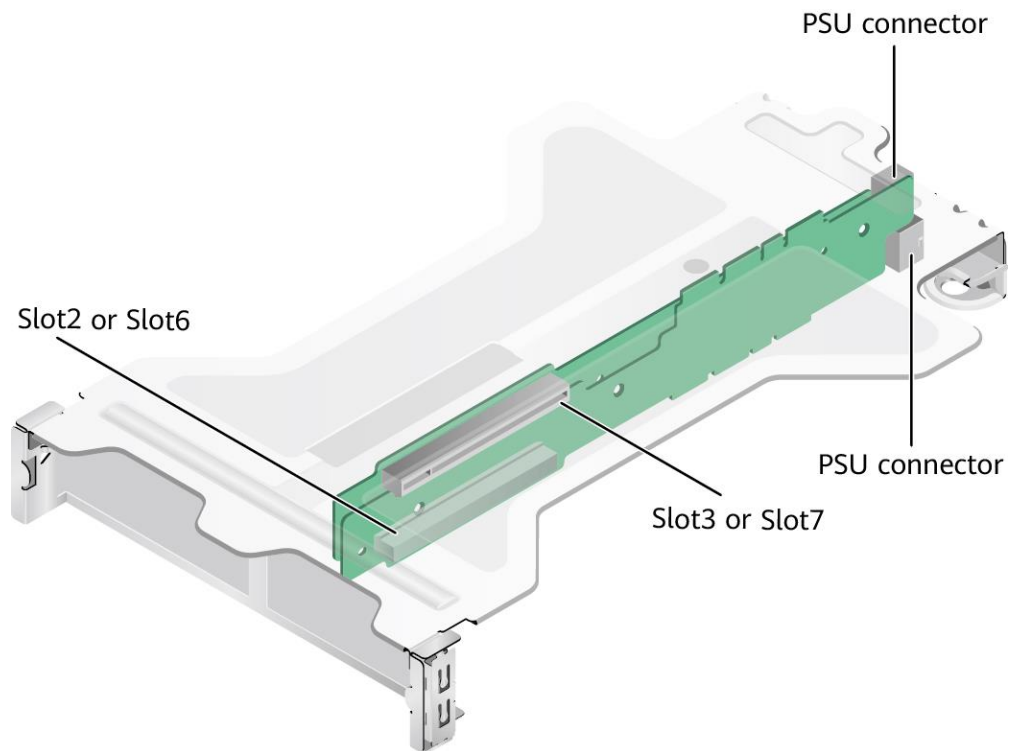
Figure 5-73 PCIe riser module 9



PCIe Riser Modules (Applicable to the Server with Four GPU Cards on the Rear Panel)

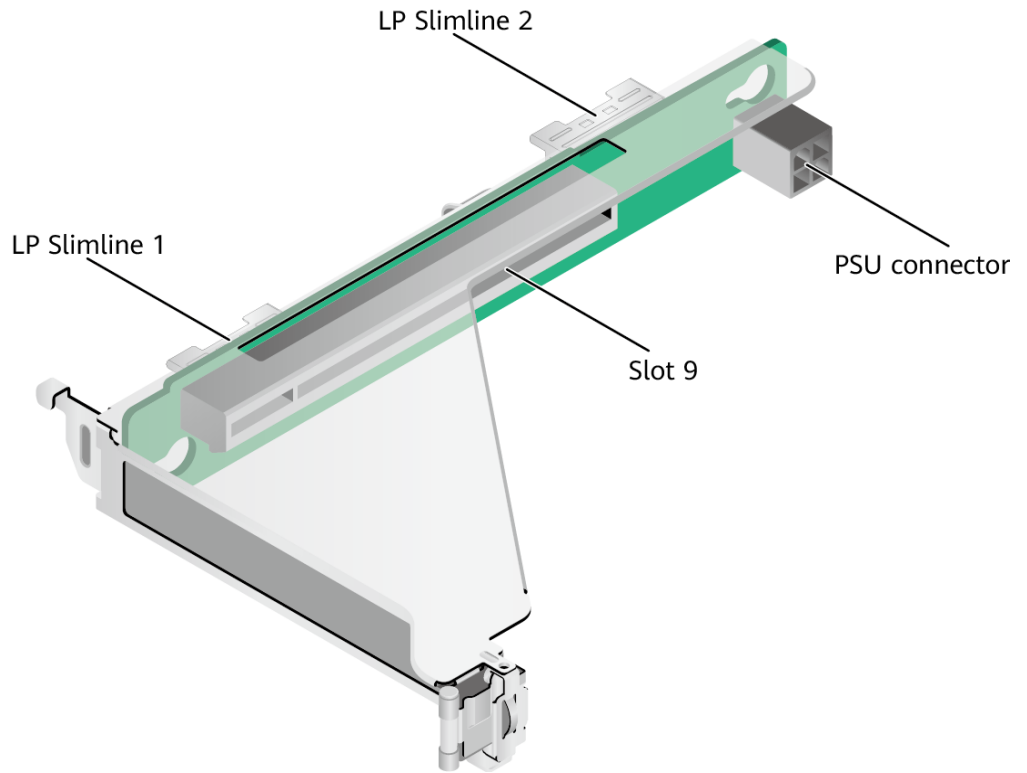
- PCIe riser module 1 or PCIe riser module 2
 - PCIe riser module 1 provides slots 2 and 3.
 - PCIe riser module 2 provides slots 6 and 7.

Figure 5-74 PCIe riser module of the GPU card



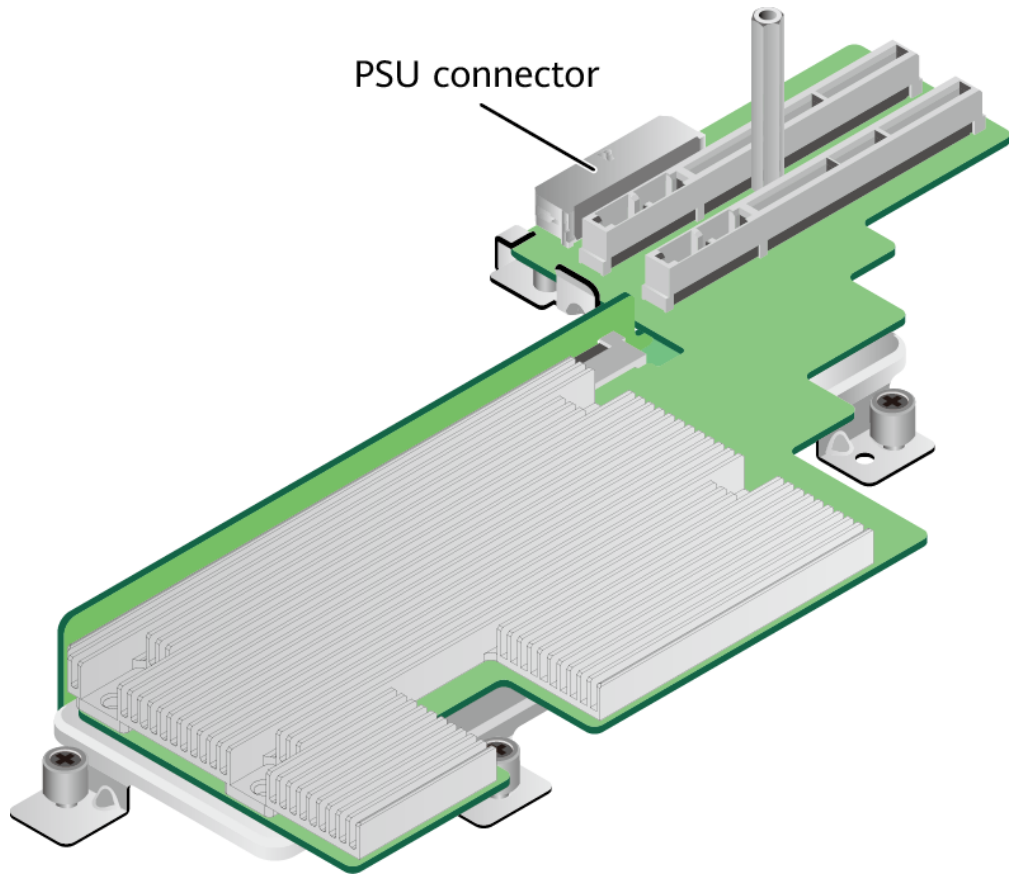
- PCIe riser module 3
PCIe riser module 3 provides slot 9.

Figure 5-75 PCIe riser module



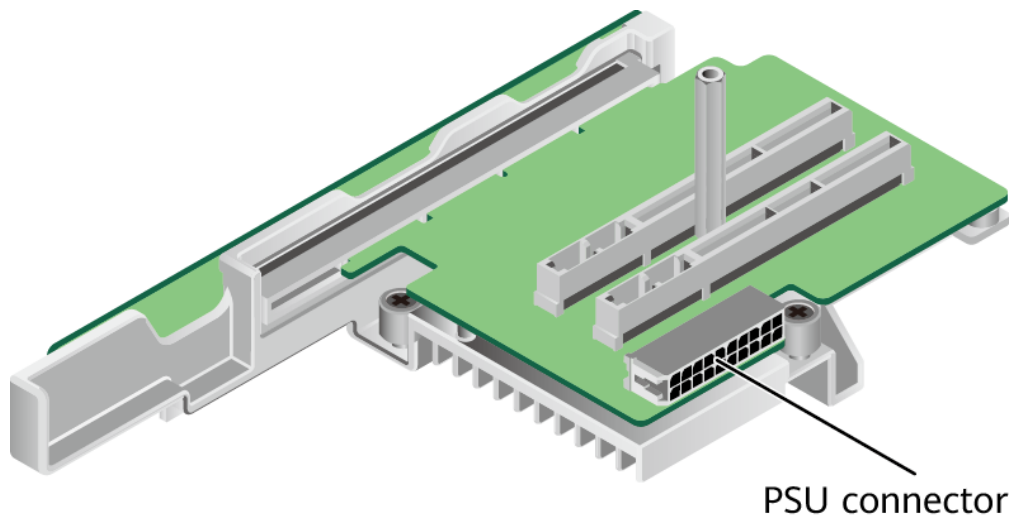
- Adapter board 1 between layer 1 and layer 2
Installed next to CPU 1 to provide slots for PCIe riser module 1 at the upper layer.

Figure 5-76 Adapter board 1 between layer 1 and layer 2



- Adapter board 2 between layer 1 and layer 2
Installed next to CPU 2 to provide slots for PCIe riser module 2 at the upper layer.

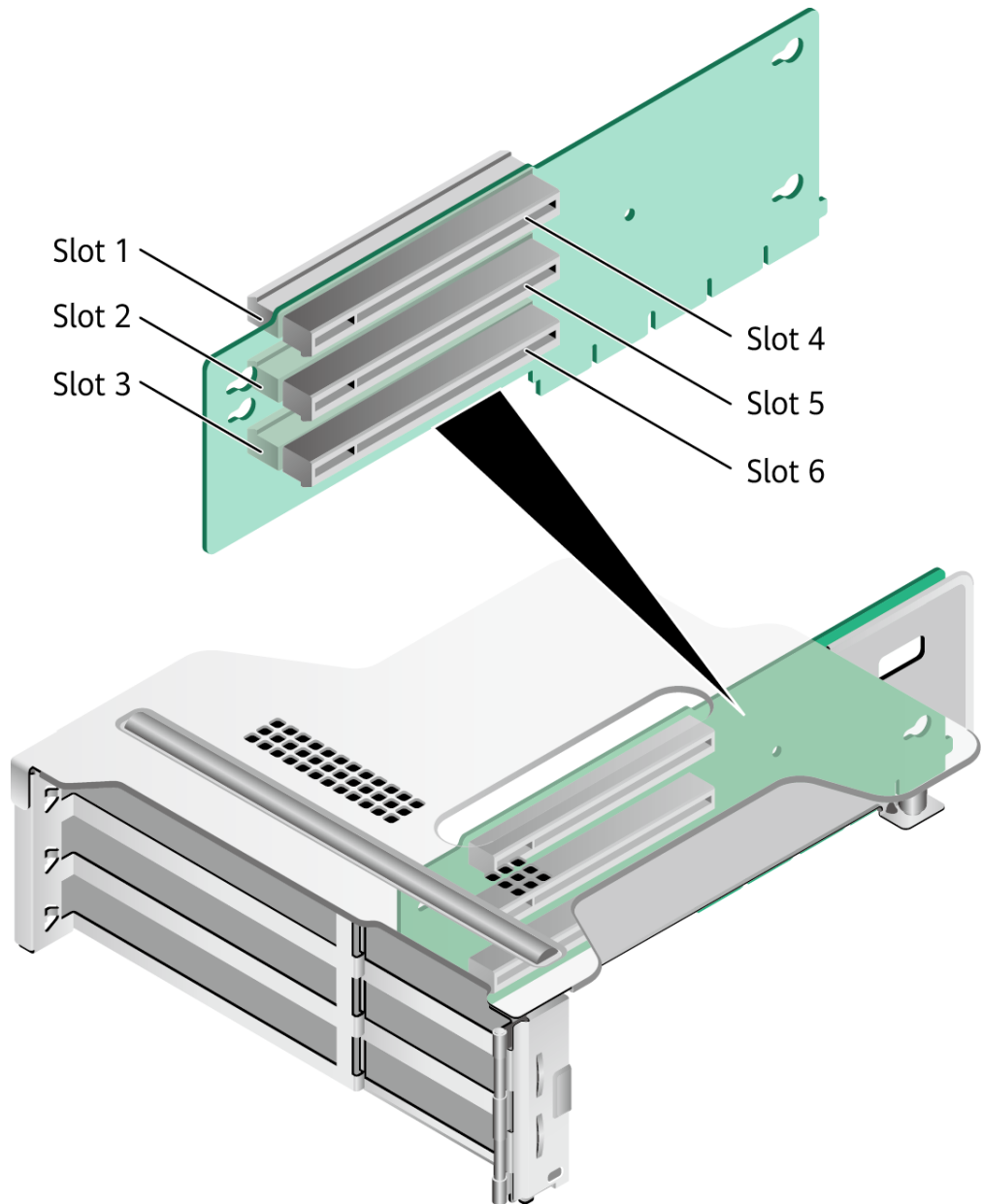
Figure 5-77 Adapter board 2 between layer 1 and layer 2



PCIe Riser Modules (Applicable to the Server with 11 Standard PCIe cards on the Rear Panel)

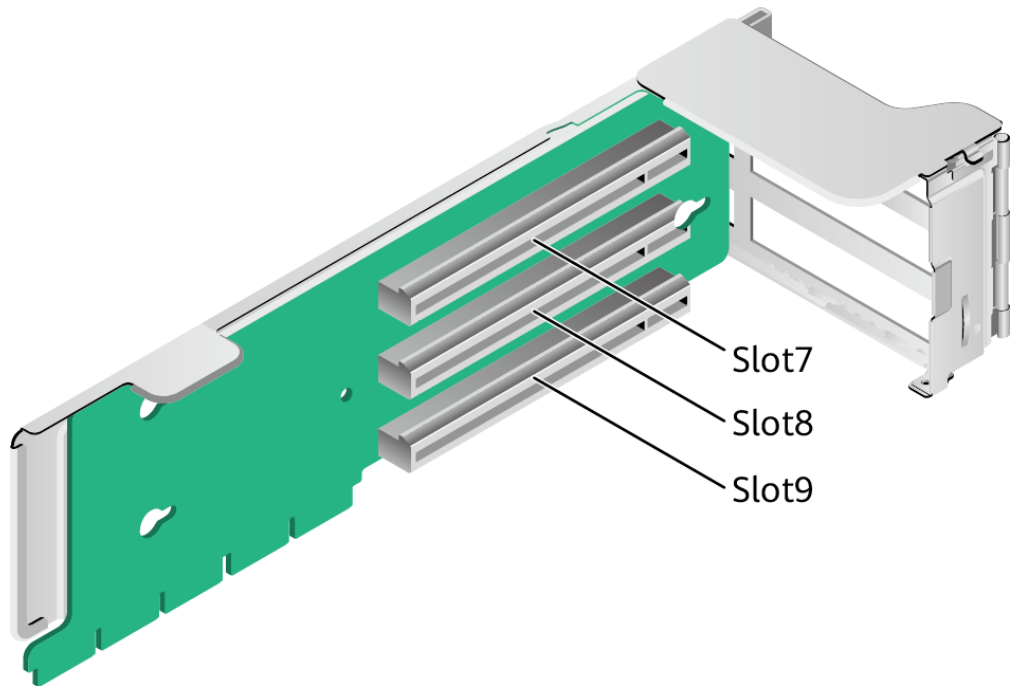
- PCIe riser module 1
Provides PCIe slots 1, 2, 3, 4, 5, and 6 when installed in PCIe riser module 1.

Figure 5-78 PCIe riser module 1



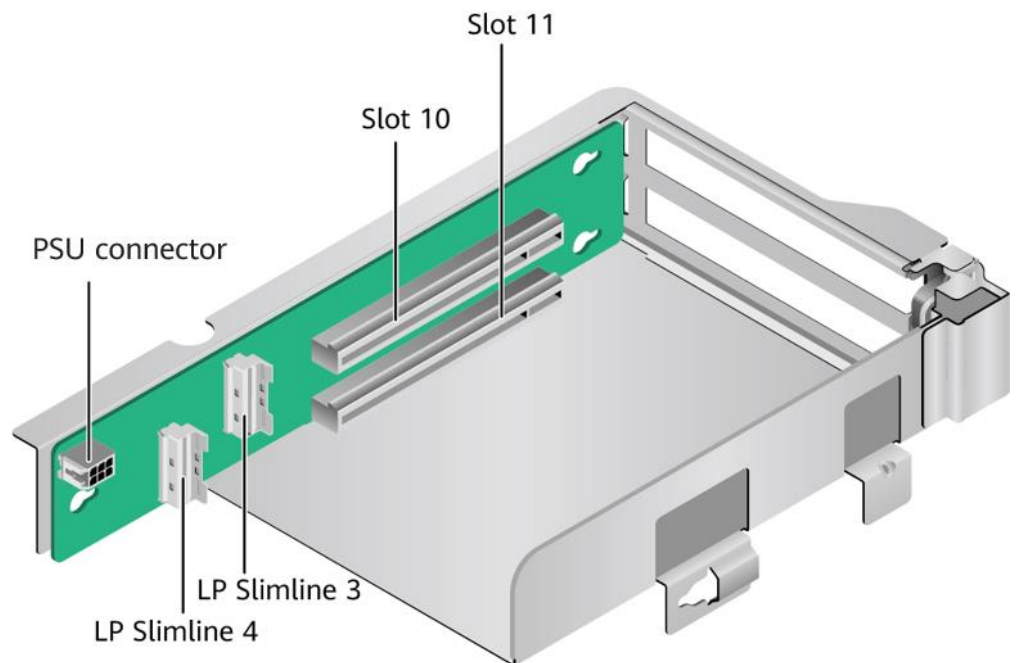
- PCIe riser module 2
Provides PCIe slots 7, 8, and 9 when installed in PCIe riser module 2.

Figure 5-79 PCIe riser module 2



- PCIe riser module 3
Provides PCIe slots 10, and 11 when installed in PCIe riser module 3.

Figure 5-80 PCIe riser module 3



5.1.7.3 PCIe Slot Description

 **NOTE**

The PCIe slots mapping to a vacant CPU socket are unavailable.

Server with Drive Modules or PCIe Riser Modules on the Rear Panel

Table 5-39 PCIe slot description

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-------------------------------|------|----------------|-----------------|-----------------------------------------------------------------------------------------------------------------|----------|-------------------|----------------|------------------------|
| Screw-in RAID controller card | CPU1 | PCIe 3.0 | x8 | x8 | Port0A | 16/02/0 | 17/00/0 | - |
| FlexIO card 1 | CPU1 | PCIe 4.0 | x16 | x8 Expansion cables used by the mainboard: x8 + x8 ^a | Port0C | 16/04/0 | 18/00/0 | OCP 3.0 specifications |
| FlexIO card 2 | CPU2 | PCIe 4.0 | x16 | x8 Expansion cable used by the mainboard: x16 | Port2A | C9/02/0 | CA/00/0 | OCP 3.0 specifications |
| Slot 1 | CPU1 | PCIe 4.0 | x16 | <ul style="list-style-type: none"> • 3-slot PCI e riser module (PRM): x16 • 2-slot PRM: | Port1A | 30/02/0 | 31/00/0 | FHFL |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------|------|----------------|-----------------|------------------------------------------------------------------------------------------------|----------|-------------------|----------------|-----------|
| | | | | N/A • Module with 2 x 2.5" drives and one PCIe card : N/A | | | | |
| Slot 2 | CPU1 | PCIe 4.0 | x16 | • 3-slot PRM: x8 • 2-slot PRM: x16 • Module with 2 x 2.5" drives and one PCIe card : N/A | Port2A | 4A/02/0 | 4B/00/0 | FHFL |
| Slot 3 | CPU1 | PCIe 4.0 | x16 | • 3-slot PRM: x8 • 2-slot PRM: x8 | Port2C | 4A/04/0 | 4C/00/0 | FHHL |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------|------|----------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|----------------|-----------|
| | | | | M: x16 • Module with 2 x 2.5" drives and one PCIe card : x16 | | | | |
| Slot4 | CPU2 | PCIe 4.0 | x16 | <ul style="list-style-type: none"> • 3-slot PCI e riser module (PR M): x16 • 2-slot PR M: N/A • Module with 2 x 2.5" drives and one PCIe card : N/A | Port0A | 97/02/0 | 98/00/0 | FHFL |
| Slot 5 | CPU2 | PCIe 4.0 | x16 | <ul style="list-style-type: none"> • 3-slot PR | Port1A | B0/02/0 | B1/00/0 | FHFL |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------|------|----------------|-----------------|------------------------------------------------------------------------------------------------|----------|-------------------|----------------|-----------|
| | | | | M: x8 • 2-slot PRM: x16 • Module with 2 x 2.5" drives and one PCIe card : N/A | | | | |
| Slot 6 | CPU2 | PCIe 4.0 | x16 | • 3-slot PRM: x8 • 2-slot PRM: x16 • Module with 2 x 2.5" drives and one PCIe card : x16 | Port1C | B0/04/0 | B2/00/0 | FHHL |
| Slot 7 | CPU2 | PCIe 4.0 | x16 | • 2-slot | Port3A | E2/02/0 | E3/00/0 | FHHL |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|-----------------|-------------------------------------------------------------------------------------------|----------|-------------------|----------------|-----------|
| | | | | PRM: x8 <ul style="list-style-type: none"> 1-slot PRM: N/A | | | | |
| Slot 8 | CPU2 | PCIe 4.0 | x16 | <ul style="list-style-type: none"> 2-slot PRM: x8 1-slot PRM: x16 | Port3C | E2/04/0 | E4/00/0 | FHHL |
| <ul style="list-style-type: none"> a: When CPU1 and CPU2 use x8 signals, the socket-direct function is supported. The B/D/F (Bus/Device/Function Number) is the default value when the server is fully configured with PCIe cards. The value may differ if the server is not fully configured with PCIe cards or if a PCIe card with a PCI bridge is configured. Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor. Device (B/D/F) indicates the B/D/F (bus address displayed on the OS) of an onboard or extended PCIe device. The PCIe x16 slots are compatible with PCIe x16, PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width. The full-height full-length (FHFL) PCIe slots are compatible with FHFL PCIe cards, full-height half-length (FHHL) PCIe cards, and half-height half-length (HHHL) PCIe cards. The full-height half-length (FHHL) PCIe slots are compatible with FHHL PCIe cards and half-height half-length (HHHL) PCIe cards. The maximum power supply of each PCIe slot is 75 W. | | | | | | | | |

Server with Four GPU Cards on the Rear Panel

Table 5-40 PCIe slot description

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------|-----|----------------|-----------------|-----------|----------|-------------------|----------------|-----------|
| | | | | | | | | |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|-----------------|-------------------------------------------------------|----------|-------------------|----------------|------------------------|
| Screw-in RAID controller card | CPU1 | PCIe 3.0 | x8 | x8 | Port0A | 16/02/0 | 17/00/0 | - |
| FlexIO card 1 | CPU1 | PCIe 4.0 | x16 | x8 Expansion cables used by the mainboard: x8 + x8 | Port0C | 16/04/0 | 18/00/0 | OCP 3.0 specifications |
| FlexIO card 2 | CPU2 | PCIe 4.0 | x16 | x8 Expansion cable used by the mainboard: x16 | Port2A | C9/02/0 | CA/00/0 | OCP 3.0 specifications |
| Slot2 | CPU1 | PCIe 4.0 | x16 | x16 | Port1A | 30/02/0 | 31/00/0 | FHFL |
| Slot 3 | CPU1 | PCIe 4.0 | x16 | x16 | Port2A | 4A/02/0 | 4B/00/0 | FHFL |
| Slot 6 | CPU2 | PCIe 4.0 | x16 | x16 | Port0A | 97/02/0 | 98/00/0 | FHFL |
| Slot7 | CPU2 | PCIe 4.0 | x16 | x16 | Port1A | B0/02/0 | B1/00/0 | FHFL |
| Slot9 | CPU1 | PCIe 4.0 | x16 | x16 | Port3A | 64/02/0 | 65/00/0 | HHHL |
| <ul style="list-style-type: none"> • The B/D/F (Bus/Device/Function Number) is the default value when the server is fully configured with PCIe cards. The value may differ if the server is not fully configured with PCIe cards or if a PCIe card with a PCI bridge is configured. • Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor. • Device (B/D/F) indicates the B/D/F (bus address displayed on the OS) of an onboard or extended PCIe device. • The PCIe x16 slots are compatible with PCIe x16, PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width. | | | | | | | | |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------|-----------------|-----------|----------|-------------------|----------------|-----------|
| <ul style="list-style-type: none"> The full-height full-length (FHFL) PCIe slots are compatible with FHFL PCIe cards, full-height half-length (FHHL) PCIe cards, and half-height half-length (HHHL) PCIe cards. | | | | | | | | |

Server with Eleven Standard PCIe Cards on the Rear Panel

Table 5-41 PCIe slot description

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-------------------------------|------|----------------|-----------------|-------------------------------------------------------|----------|-------------------|----------------|------------------------|
| Screw-in RAID controller card | CPU1 | PCIe 3.0 | x8 | x8 | Port0A | 16/02/0 | 17/00/0 | - |
| FlexIO card 1 | CPU1 | PCIe 4.0 | x16 | x8 Expansion cables used by the mainboard: x8 + x8 | Port0C | 16/04/0 | 18/00/0 | OCP 3.0 specifications |
| FlexIO card 2 | CPU2 | PCIe 4.0 | x16 | x8 Expansion cable used by the mainboard: x16 | Port2A | C9/02/0 | CA/00/0 | OCP 3.0 specifications |
| Slot 1 | CPU1 | PCIe 4.0 | x16 | x8 | Port1A | 30/02/0 | 31/00/0 | FHHL |
| Slot2 | CPU1 | PCIe 4.0 | x16 | x8 | Port1C | 30/04/0 | 32/00/0 | FHHL |
| Slot3 | CPU1 | PCIe 4.0 | x16 | x8 | Port2A | 4A/02/0 | 4B/00/0 | FHHL |

| PCIe Slot | CPU | PCIe Standards | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------|------|----------------|-----------------|-----------|----------|-------------------|----------------|-----------|
| Slot4 | CPU1 | PCIe 4.0 | x16 | x8 | Port2C | 4A/04/0 | 4C/00/0 | HHHL |
| Slot5 | CPU1 | PCIe 4.0 | x16 | x8 | Port3A | 64/02/0 | 65/00/0 | HHHL |
| Slot6 | CPU1 | PCIe 4.0 | x16 | x8 | Port3C | 64/04/0 | 66/00/0 | HHHL |
| Slot7 | CPU2 | PCIe 4.0 | x16 | x16 | Port0A | 97/02/0 | 98/00/0 | HHHL |
| Slot8 | CPU2 | PCIe 4.0 | x16 | x8 | Port1A | B0/02/0 | B1/00/0 | HHHL |
| Slot9 | CPU2 | PCIe 4.0 | x16 | x8 | Port1C | B0/04/0 | B2/00/0 | HHHL |
| Slot10 | CPU2 | PCIe 4.0 | x16 | x8 | Port3A | E2/02/0 | E3/00/0 | FHHL |
| Slot11 | CPU2 | PCIe 4.0 | x16 | x8 | Port3C | E2/04/0 | E4/00/0 | FHHL |

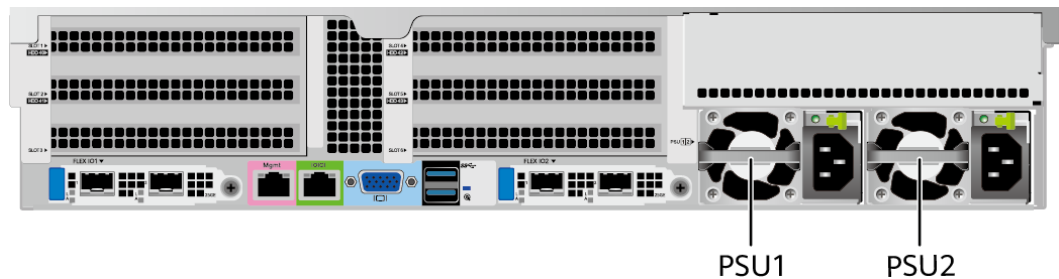
- The B/D/F (Bus/Device/Function Number) is the default value when the server is fully configured with PCIe cards. The value may differ if the server is not fully configured with PCIe cards or if a PCIe card with a PCI bridge is configured.
- Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor.
- Device (B/D/F) indicates the B/D/F (bus address displayed on the OS) of an onboard or extended PCIe device.
- The PCIe x16 slots are compatible with PCIe x16, PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width.
- The full-height half-length (FHHL) PCIe slots are compatible with FHHL PCIe cards and half-height half-length (HHHL) PCIe cards.
- The maximum power supply of each PCIe slot is 75 W.

5.1.8 PSUs

- The server supports one or two PSUs.
- The server supports AC or DC PSUs.
- The PSUs are hot-swappable.
- The server supports two PSUs in 1+1 redundancy.
- PSUs of the same part number (P/N code) must be used in a server.
- The PSUs are protected against short circuit. Double-pole fuse is provided for the PSUs with dual input live wires.

- If the DC power supply is used, purchase the DC power supply that meets the requirements of the safety standards or the DC power supply that has passed the CCC certification.
- For details about component options, consult the local sales representatives.

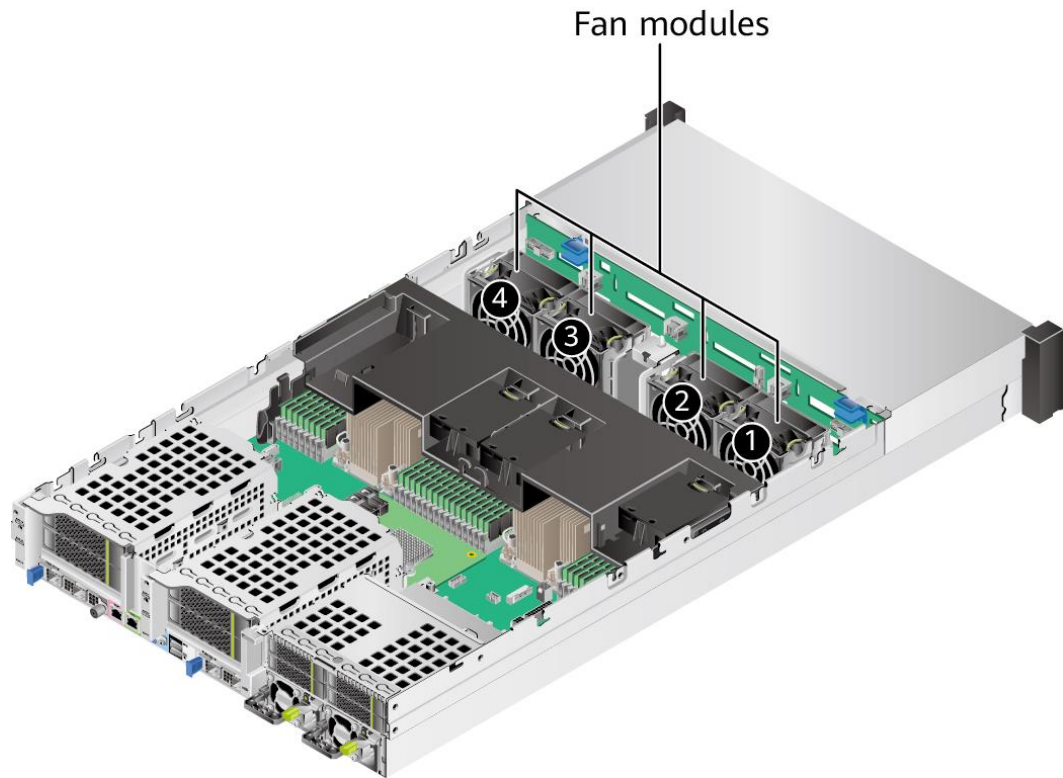
Figure 5-81 PSU positions



5.1.9 Fan Modules

- The server supports four fan modules.
- The fan modules are hot-swappable.
- N+1 redundancy is supported. That is, the server can work properly when a single fan fails.
- The fan speed can be adjusted.
- Fan modules of the same part number (P/N code) must be used in a server.

Figure 5-82 Positions of fan modules



5.1.10 LCD

NOTE

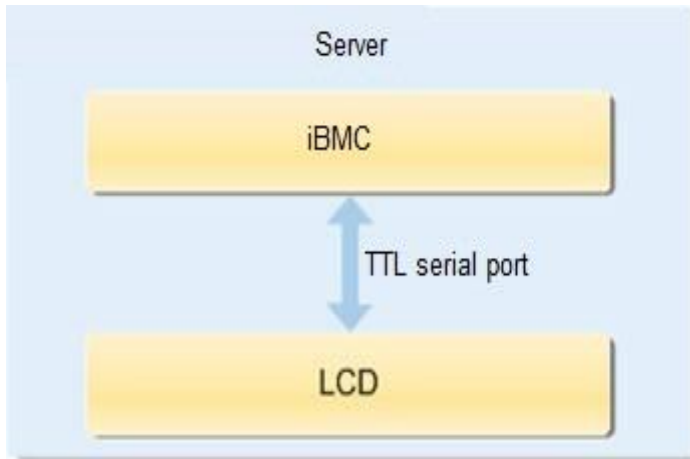
Only the 8 x 2.5" drive pass-through configuration supports the LCD.

Function

The LCD displays the installation status and running status of server components and enables users to set the IP address of the iBMC management network port on the server.

The LCD and the server iBMC form an LCD subsystem. The LCD directly obtains device information from the iBMC. The LCD subsystem does not store device data.

Figure 5-83 LCD subsystem working principle



UI

Figure 5-84 LCD main interface

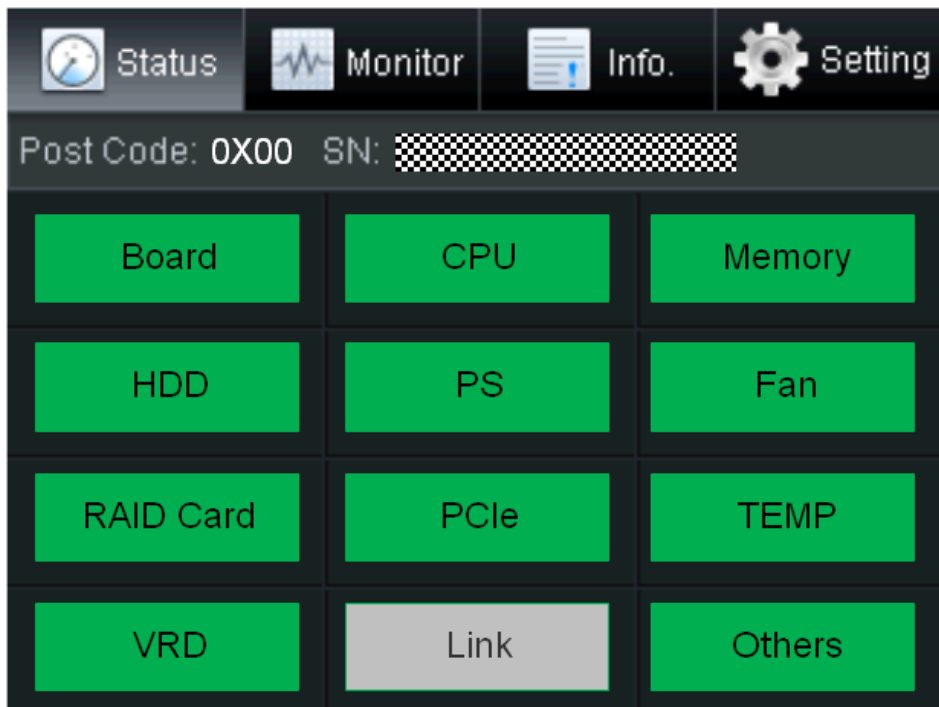


Table 5-42 Parameters on the LCD home screen

| Tab | Function |
|---------|---------------------------------------------------------------------------------------------------|
| Status | Displays the port 80 status, serial number, component status, and component alarms of the server. |
| Monitor | Displays the current power, CPU temperature, and inlet |

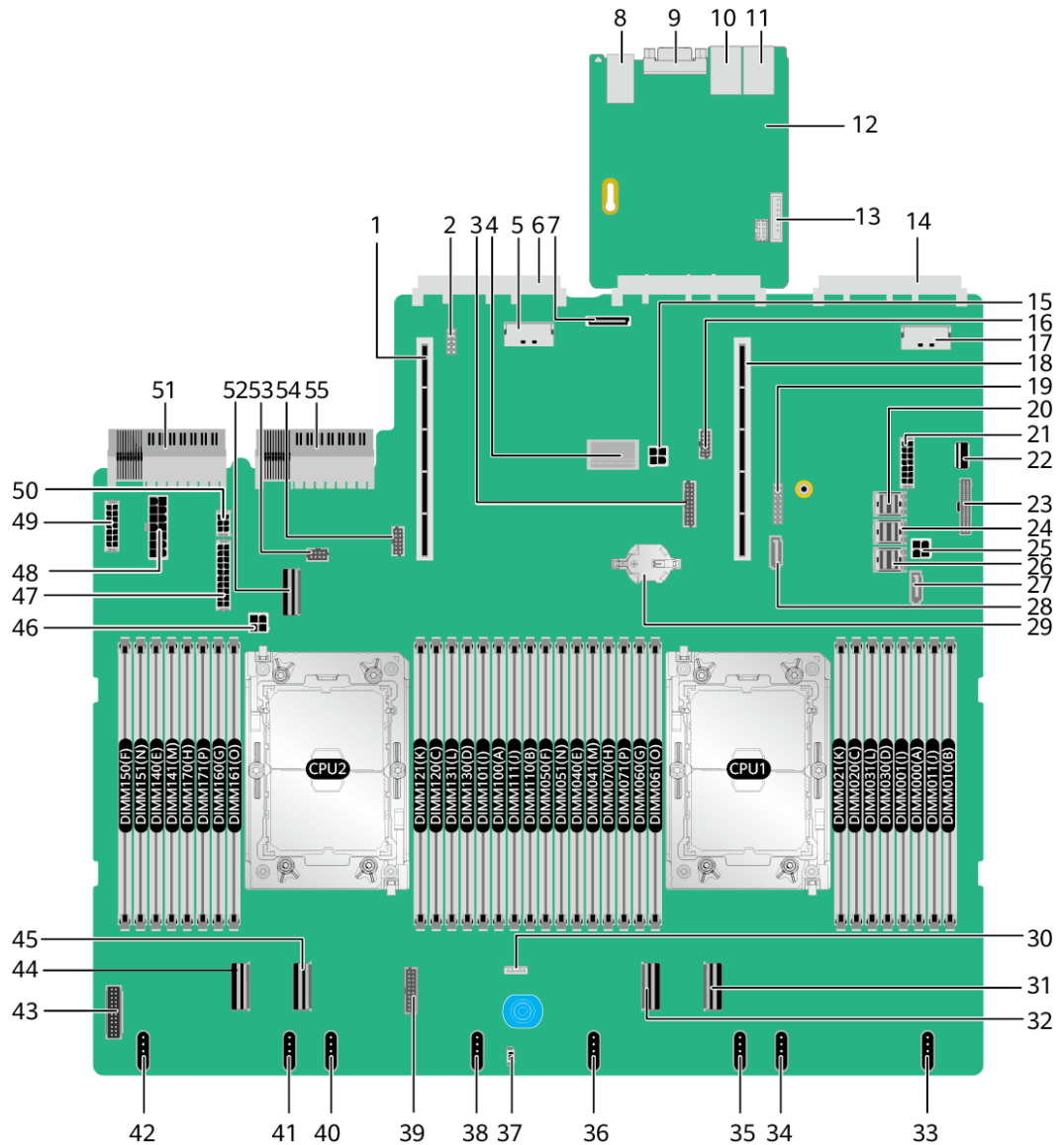
| Tab | Function |
|---------|-----------------------------------------------------------------------------------------------------------------------------------|
| | temperature of the server. |
| Info. | Displays the IP address and MAC address of the iBMC management network port, device SNs, asset information, and firmware version. |
| Setting | Sets the IP address of the iBMC management network port. |

For details about how to use the LCD module, see *FusionServer Rack Server LCD User Guide (x86 V6)*.

5.1.11 Boards

5.1.11.1 Mainboard

Figure 5-85 2288H V6-32DIMM mainboard



| | | | |
|---|------------------------------------------------------------------------------------|---|---------------------------------------------------------|
| 1 | PCIe riser 2 slot (PCIE RISER2/J51) | 2 | Debugging pin (J103) |
| 3 | Rear-drive backplane & BBU low-speed signal connector (BACK HDD BP&BBU SIGNAL/J90) | 4 | Screw-in RAID controller card connector (RAID CARD/J86) |
| 5 | LP slimline 7 connector for OCP 3.0 network adapter 2 | 6 | OCP 3.0 network adapter 2 connector (OCP2) |

| | | | |
|----|-----------------------------------------------------------------------------|----|------------------------------------------------------|
| | (SLIMLINE7/J31) | | CONN/J109) |
| 7 | Built-in storage expansion port (SD CARD/J87) | 8 | 2 x USB 3.0 ports (USB3.0 CONN/J88) |
| 9 | Rear VGA port (VGA CONN/J60) | 10 | Serial port (COM/J6020) |
| 11 | BMC management network port (BMC_GE /J6019) | 12 | BMC management board |
| 13 | LCD connector (LCD CONN/J6025) | 14 | OCP 3.0 network adapter 1 connector (OCP1 CONN/J108) |
| 15 | Rear-drive backplane power connector 2 (REAR BP PWR2/J21) | 16 | NC-SI connector (NCSI CONN/J114) |
| 17 | LP slimline 6 connector for OCP 3.0 network adapter 1 (SLIMLINE6/J13) | 18 | PCIe riser 1 slot (PCIE RISER1/J50) |
| 19 | TPM/TCM connector (J10) | 20 | mini-SAS HD connector C (MINIHD PORTC/J4) |
| 21 | Drive backplane power connector 3 (HDD BP PWR3/J89) | 22 | Built-in USB 3.0 connector (INNER USB3.0/J110) |
| 23 | Right mounting ear connector (RCIA BOARD/J113) | 24 | mini-SAS HD connector B (MINIHD PORTB/J5) |
| 25 | Rear-drive backplane power connector 1 (REAR BP PWR1/J64) | 26 | mini-SAS HD connector A (MINIHD PORTA/J6) |
| 27 | SATA connector 1 (SATA1/J1) | 28 | SATA connector 2 (SATA2/J2) |
| 29 | Cell battery holder (U9) | 30 | VROC key connector (Soft RAID KEY/J3) |
| 31 | LP slimline 1 connector (SLIMLINE1/J11) | 32 | LP slimline 2 connector (SLIMLINE2/J84) |
| 33 | Fan module 4 connector (J100) | 34 | Fan module 4 connector (2U FAN4/J98) |
| 35 | Fan module 3 connector (J97) | 36 | Fan module 3 connector (2U FAN3/J95) |
| 37 | Intrusion sensor connector (INTRUDER CONN/S1) | 38 | Fan module 2 connector (J93) |
| 39 | Low-speed signal connector for the front-drive backplane (FRONT HDD BP/J75) | 40 | Fan module 2 connector (2U FAN2/J91) |
| 41 | Fan module 1 connector | 42 | Fan module 1 connector (2U |

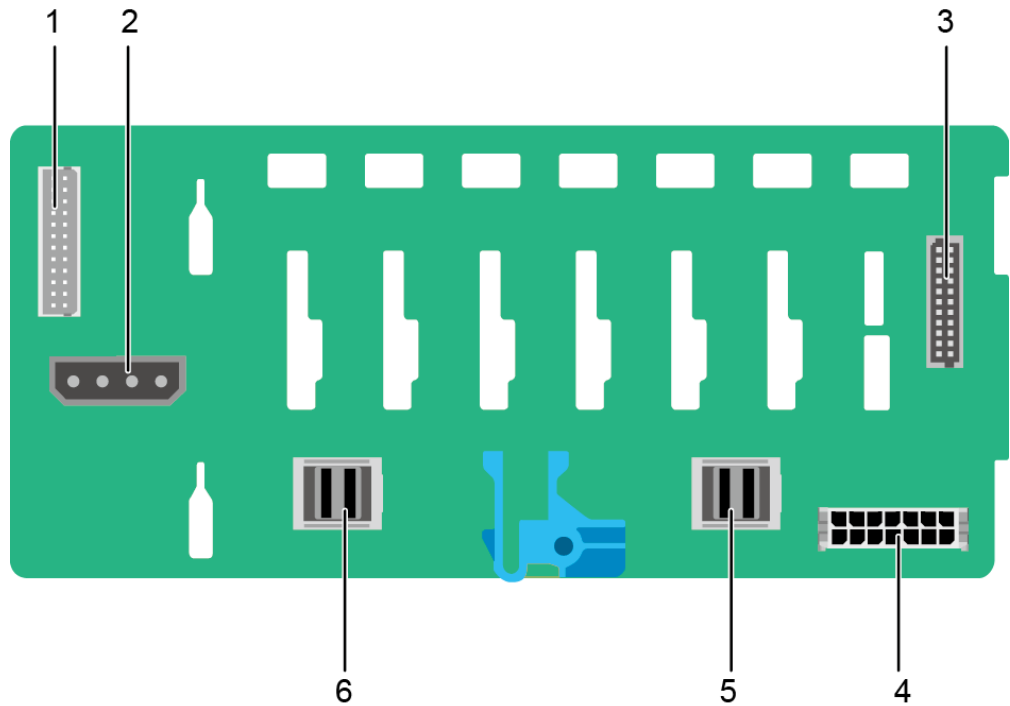
| | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------|
| | (J102) | | FAN1/J67) |
| 43 | Left mounting ear connector (LCIA BOARD/J106) | 44 | LP slimline 4 connector (SLIMLINE4/J12) |
| 45 | LP slimline 3 connector (SLIMLINE3/J85) | 46 | Power connector for the built-in-drive backplane (INNER HDD PWR/J22) |
| 47 | Drive backplane power connector 2 (HDD BP PWR2/J88) | 48 | BBU power connector (BBU POWER/J13001) |
| 49 | Drive backplane power connector 1 (HDD BP PWR1/J26) | 50 | Rear-drive backplane power connector 3 (REAR BP PWR3/J20) |
| 51 | PSU 2 connector (PSU2/J56) | 52 | LP slimline 5 connector (SLIMLINE5/J30) |
| 53 | Low-speed signal connector for the built-in-drive backplane (INNER HDD BP/J27) | 54 | Low-speed signal connector for the rear 4 x 2.5" drive backplane (REAR 4x2.5 HDD BP/J57) |
| 55 | PSU 1 connector (PSU1/J28) | - | - |
| <ul style="list-style-type: none"> • Use connectors 34, 36, 40, and 42 when the 8038+ fan modules are configured. • Use connectors 33, 34, 35, 36, 38, 40, 41, and 42 when the 8080 fan modules are configured. | | | |

5.1.11.2 Drive Backplane

Front Drive Backplane

- 8 x 2.5" drive pass-through backplane
 All drive configurations in [5.1.5.1.1 8 x 2.5" drive pass-through configuration](#) support this backplane.

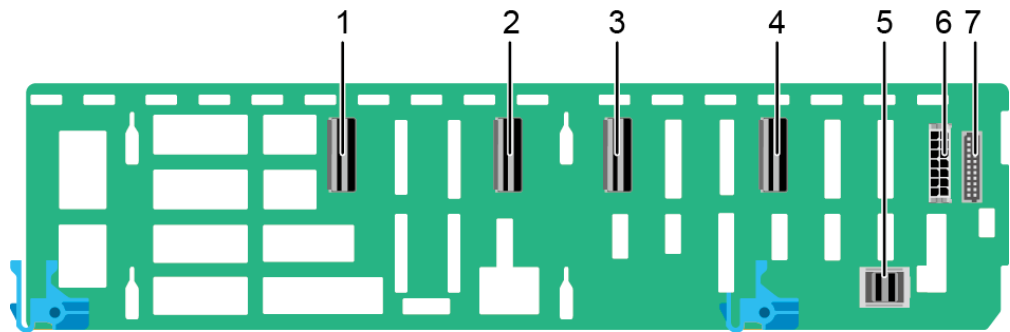
Figure 5-86 8 x 2.5" drive pass-through backplane



| | | | |
|---|------------------------------------------------------------------------------------------------------|---|-------------------------------------|
| 1 | Indicator signal cable connector (REAR BP1/J3) NOTE Reserved and unavailable currently. | 2 | DVD drive power connector (DVD/J11) |
| 3 | Backplane signal cable connector (HDD BP/J1) | 4 | Power connector (POWER/J2) |
| 5 | Mini-SAS HD connector (PORT A/J28) | 6 | Mini-SAS HD connector (PORT B/J29) |

- 12 x 2.5" drive pass-through configuration (4 x SAS/SATA + 8 x NVMe) backplane
 All drive configurations in [5.1.5.1.2 12 x 2.5" Drive Pass-Through Configuration](#) support this backplane.

Figure 5-87 12 x 2.5" drive pass-through configuration (4 x SAS/SATA + 8 x NVMe) backplane

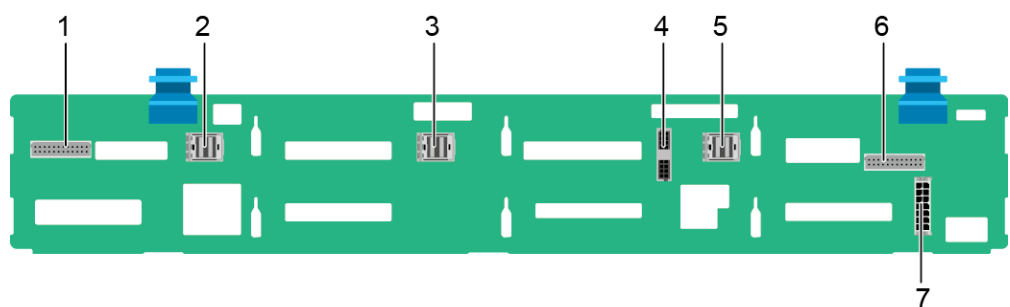


| | | | |
|---|-------------------------------------------------|---|---------------------------------------------|
| 1 | LP slimline 2 connector (SLIM_2/J1001) | 2 | LP slimline 1 connector (SLIM_1/J901) |
| 3 | LP slimline 4 connector (SLIM_4/J1201) | 4 | LP slimline 3 connector (SLIM_3/J1101) |
| 5 | Mini-SAS HD connector (PORT A/J801) | 6 | Backplane power connector (HDD POWER/J4003) |
| 7 | Backplane signal cable connector (HDD_BP/J3702) | - | - |

- 12 x 3.5" drive pass-through backplane

This backplane is supported by 12 x 3.5" drive pass-through configuration 1, 12 x 3.5" drive pass-through configuration 2, and 12 x 3.5" drive pass-through configuration 3 in [5.1.5.1.3 12 x 3.5" drive pass-through configuration](#).

Figure 5-88 12 x 3.5" drive pass-through backplane

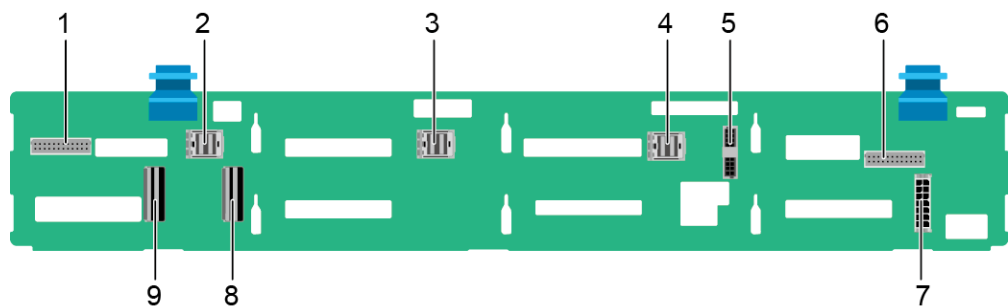


| | | | |
|---|------------------------------------------------|---|----------------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J7) | 2 | Mini-SAS HD connector (PORT C/J5) |
| 3 | Mini-SAS HD connector (PORT B/J4) | 4 | Backplane signal cable connector (HDD BP/J6) |
| 5 | Mini-SAS HD connector | 6 | Indicator signal cable |

| | | | |
|---|----------------------------|---|-------------------------|
| | (PORT A/J3) | | connector (REAR BP1/J8) |
| 7 | Power connector (POWER/J1) | - | - |

- 12 x 3.5" drive NVMe backplane (4 x NVMe)
 This backplane is supported by 12 x 3.5" drive pass-through configuration 1 (4 x NVMe), 12 x 3.5" drive pass-through configuration 2 (4 x NVMe), and 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) in [5.1.5.1.3 12 x 3.5" drive pass-through configuration](#).

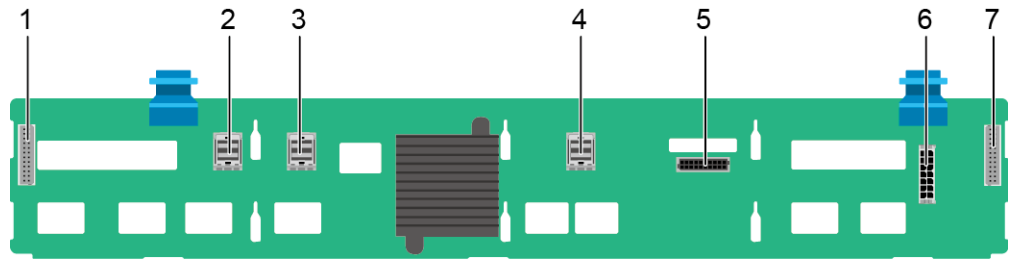
Figure 5-89 12 x 3.5" drive NVMe backplane (4 x NVMe)



| | | | |
|---|-------------------------------------------------|---|-------------------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J30) | 2 | Mini-SAS HD connector (PORT C/J36) |
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | Mini-SAS HD connector (PORT A/J28) |
| 5 | Backplane signal cable connector (HDD_BP/J1) | 6 | Indicator signal cable connector (REAR BP1/J31) |
| 7 | Backplane power connector (HDD_BP/J24) | 8 | LP slimline 1 connector (SLIMLINE 1/J4) |
| 9 | LP slimline 2 connector (SLIMLINE 2/J37) | - | - |

- 12 x 3.5" drive EXP backplane
 All drive configurations in [5.1.5.1.4 12 x 3.5" drive EXP configuration](#) support this backplane.

Figure 5-90 12 x 3.5" drive EXP backplane

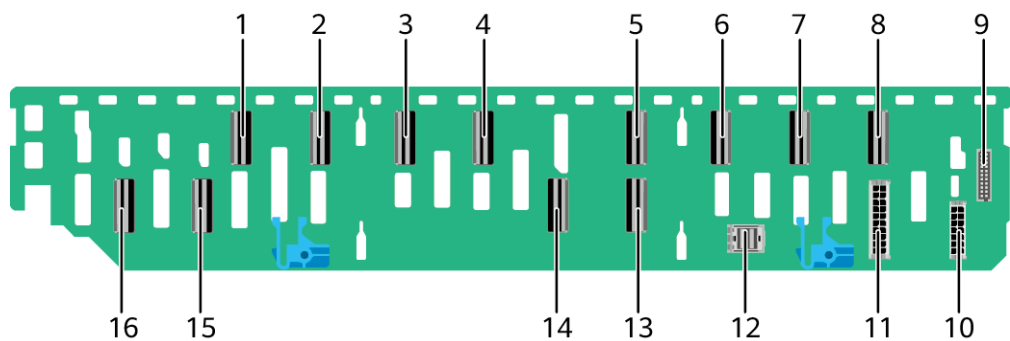


| | | | |
|---|-------------------------------------------------|---|---------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J31) | 2 | Mini-SAS HD connector (PORT A/J28) |
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | Mini-SAS HD connector (REAR PORT/J34) |
| 5 | Backplane signal cable connector (HDD BP/J35) | 6 | Power connector (POWER/J24) |
| 7 | Indicator signal cable connector (REAR BP1/J32) | - | - |

- 24 x 2.5" NVMe backplane

This backplane is supported by all drive configurations in [5.1.5.1.5 20 x 2.5" Drive Pass-Through Configuration](#) and 24 x 2.5" drive NVMe configuration 1 and 24 x 2.5" drive NVMe configuration 2 in [5.1.5.1.6 24 x 2.5" drive pass-through configuration](#).

Figure 5-91 24 x 2.5" NVMe backplane

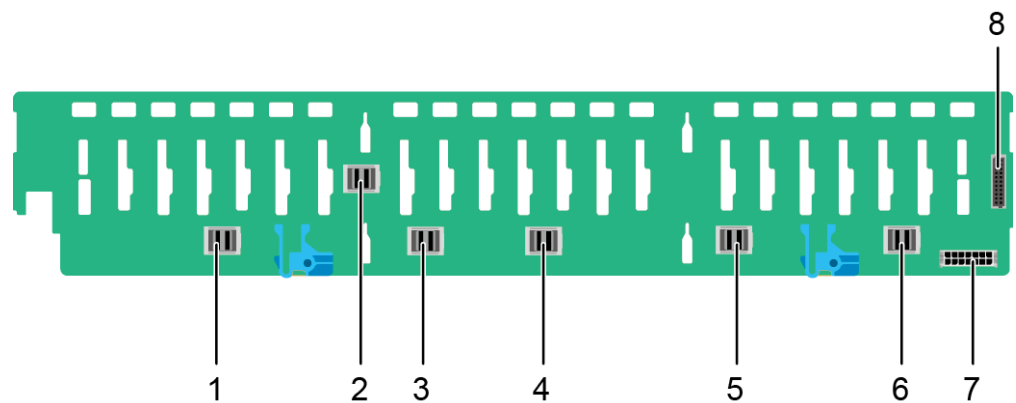


| | | | |
|---|----------------------------------------------|---|----------------------------------------------|
| 1 | LP slimline 1D connector (SLIMLINE 1D/J1801) | 2 | LP slimline 1C connector (SLIMLINE 1C/J1701) |
| 3 | LP slimline 1A connector (SLIMLINE 1A/J1601) | 4 | LP slimline 1B connector (SLIMLINE 1B/J1501) |
| 5 | LP slimline 2D connector (SLIMLINE 2D/J2201) | 6 | LP slimline 2C connector (SLIMLINE 2C/J2101) |
| 7 | LP slimline 2B connector | 8 | LP slimline 2A connector |

| | | | |
|----|-------------------------------------------------|----|--------------------------------------------|
| | (SLIMLINE 2B/J2001) | | (SLIMLINE 2A/J1901) |
| 9 | Backplane signal cable connector (HDD BP/J7102) | 10 | Power connector 1 (HDD POWER1/J30) |
| 11 | Power connector 2 (HDD POWER2/J7303) | 12 | Mini-SAS HD connector (PORT A/J1001) |
| 13 | LP slimline 3 connector (SLIMLINE 3/J1301) | 14 | LP slimline 4 connector (SLIMLINE 4/J1401) |
| 15 | LP slimline 1 connector (SLIMLINE 1/J1101) | 16 | LP slimline 2 connector (SLIMLINE 2/J1201) |

- 24 x 2.5" drive pass-through backplane
 This backplane is supported by 24 x 2.5" drive pass-through configuration (3 x RAID controller card) in [5.1.5.1.6 24 x 2.5" drive pass-through configuration](#).

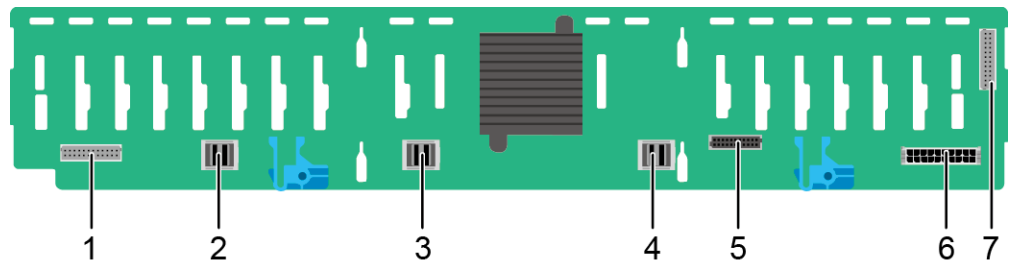
Figure 5-92 24 x 2.5" drive pass-through backplane



| | | | |
|---|-------------------------------------|---|----------------------------------------------|
| 1 | Mini-SAS HD connector (PORT 3B/J33) | 2 | Mini-SAS HD connector (PORT 3A/J39) |
| 3 | Mini-SAS HD connector (PORT 2B/J31) | 4 | Mini-SAS HD connector (PORT 2A/J30) |
| 5 | Mini-SAS HD connector (PORT 1B/J29) | 6 | Mini-SAS HD connector (PORT 1A/J28) |
| 7 | Power connector (POWER/J24) | 8 | Backplane signal cable connector (HDD_BP/J1) |

- 25 x 2.5" drive EXP backplane
 All drive configurations in [5.1.5.1.7 25 x 2.5" drive EXP configuration](#) support this backplane.

Figure 5-93 25 x 2.5" drive EXP backplane



| | | | |
|---|-------------------------------------------------|---|---------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J32) | 2 | Mini-SAS HD connector (PORT A/J28) |
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | Mini-SAS HD connector (REAR PORT/J31) |
| 5 | Backplane signal cable connector (HDD_BP/J1) | 6 | Power connector (POWER/J24) |
| 7 | Indicator signal cable connector (REAR BP1/J35) | - | - |

Built-in-Drive Backplane

- 4 x 3.5" drive backplane

Figure 5-94 4 x 3.5" drive backplane

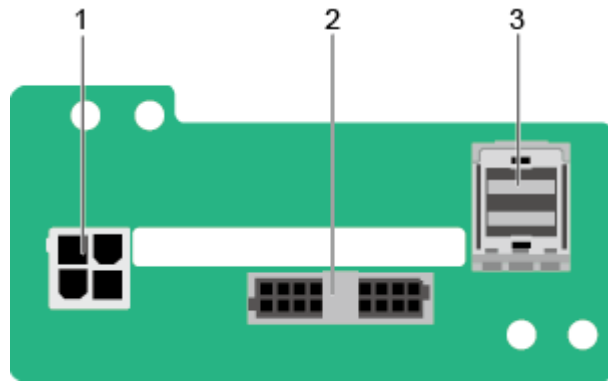


| | | | |
|---|----------------------------------------------|---|----------------------------------------------------|
| 1 | Mini-SAS HD connector (PORT A/J3) | 2 | Backplane signal cable connector (INNER HDD BP/J1) |
| 3 | Backplane power connector (INNER HDD PWR/J2) | - | - |

Rear-drive backplane

- 2 x 2.5" drive backplane

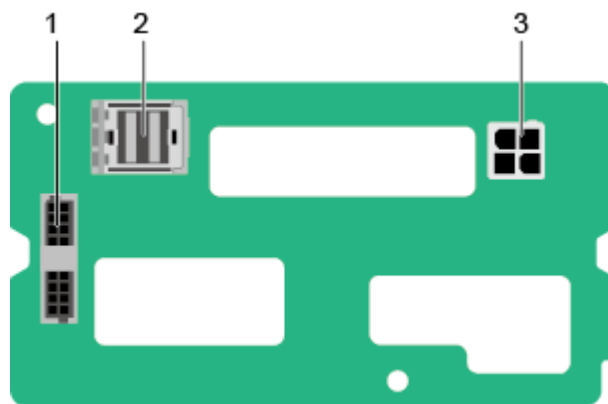
Figure 5-95 2 x 2.5" drive backplane



| | | | |
|---|--------------------------------------|---|-----------------------------------------------|
| 1 | Power connector (BP PWR/J1) | 2 | Indicator signal cable connector (REAR BP/J5) |
| 3 | Mini-SAS HD connector (REAR PORT/J2) | - | - |

- 2 x 3.5" drive backplane

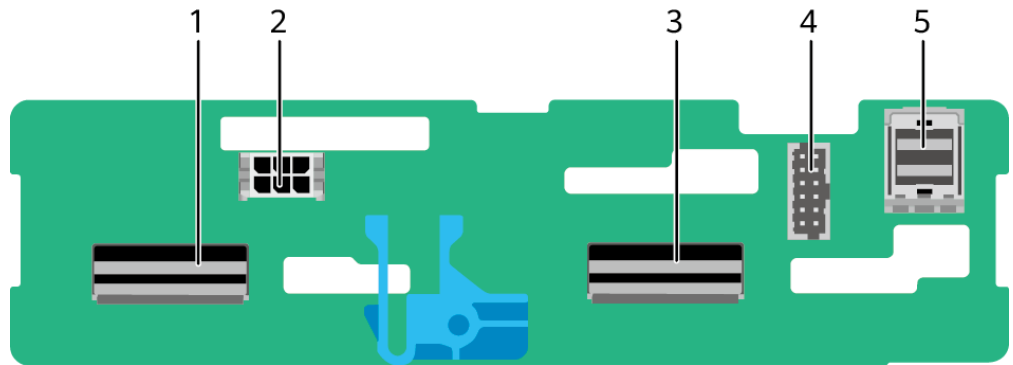
Figure 5-96 2 x 3.5" drive backplane



| | | | |
|---|-----------------------------------------------|---|--------------------------------------|
| 1 | Indicator signal cable connector (REAR BP/J5) | 2 | Mini-SAS HD connector (REAR PORT/J2) |
| 3 | Power connector (BP PWR/J1) | - | - |

- 4 x 2.5" drive backplane

Figure 5-97 4 x 2.5" drive backplane



| | | | |
|---|----------------------------------------|---|-------------------------------------------------|
| 1 | LP slimline 4 connector (SLIM_4/J1001) | 2 | Power connector (POWR/J2502) |
| 3 | LP slimline 3 connector (SLIM_3/J901) | 4 | Backplane signal cable connector (HDD BP/J2302) |
| 5 | Mini-SAS HD connector (Port A/J801) | - | - |

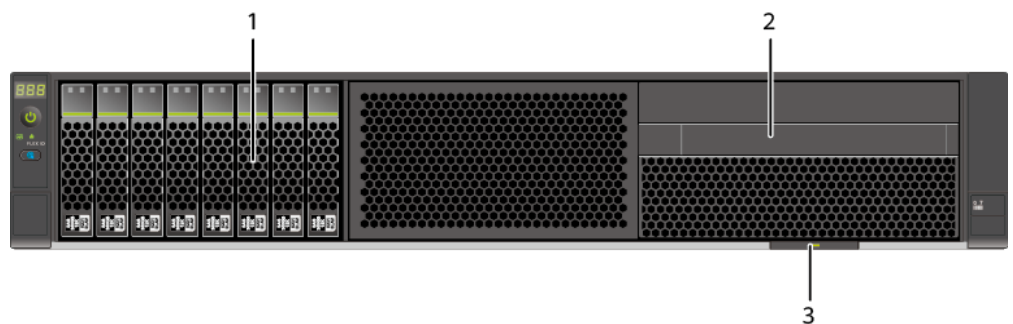
5.2 2288H V6-16DIMM

5.2.1 Front Panel

5.2.1.1 Appearance

- 8 x 2.5" drive configuration

Figure 5-98 Front view

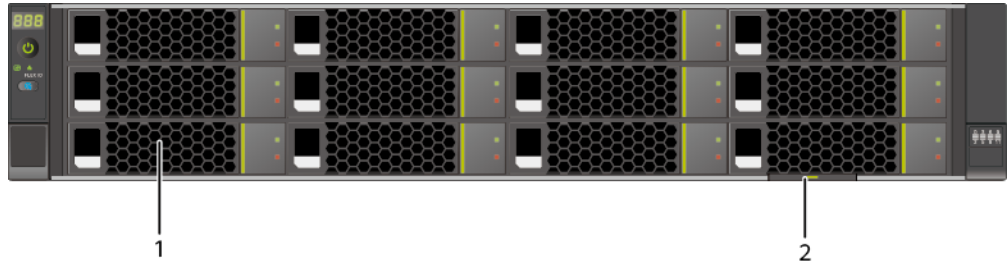


| | | | |
|---|--------------------------------|---|-----------------------------------------------|
| 1 | Drive | 2 | (Optional) Built-in DVD drive (or LCD module) |
| 3 | Slide-out label plate (with an | - | - |

| | | | |
|--|-----------|--|--|
| | SN label) | | |
|--|-----------|--|--|

- 12 x 3.5" drive configuration

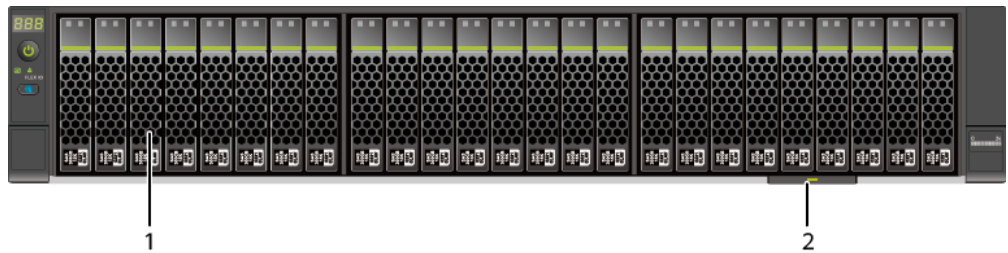
Figure 5-99 Front view



| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

- 25 x 2.5" drive configuration

Figure 5-100 Front view



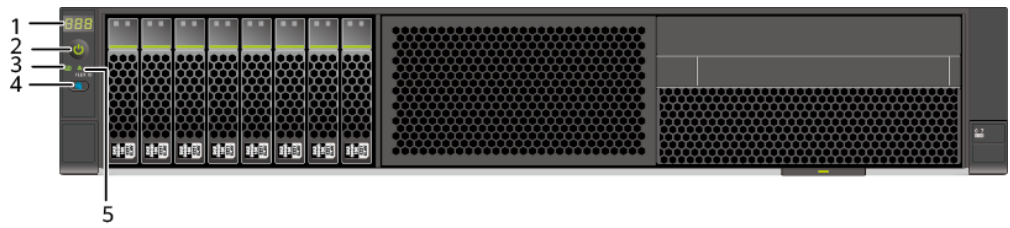
| | | | |
|---|-------|---|------------------------------------------|
| 1 | Drive | 2 | Slide-out label plate (with an SN label) |
|---|-------|---|------------------------------------------|

5.2.1.2 Indicators and Buttons

Indicator and Button Positions

- 8 x 2.5" drive configuration

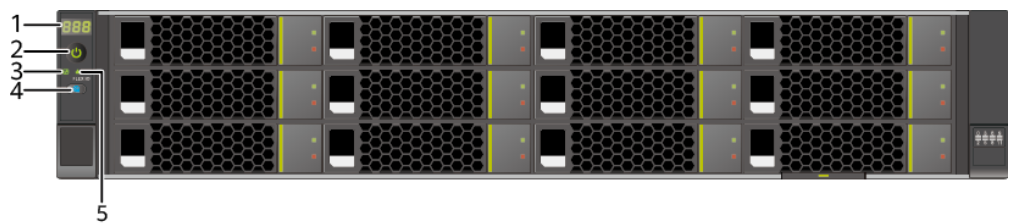
Figure 5-101 Indicators and buttons on the front panel



| | | | |
|---|--------------------------------|---|------------------------|
| 1 | Fault Diagnosis LED | 2 | Power Button/Indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card presence indicator | - | - |

- 12 x 3.5" drive configuration

Figure 5-102 Indicators and buttons on the front panel



| | | | |
|---|--------------------------------|---|------------------------|
| 1 | Fault Diagnosis LED | 2 | Power Button/Indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card presence indicator | - | - |

- 25 x 2.5" drive configuration





Figure 5-103 Indicators and buttons on the front panel




| | | | |
|---|--------------------------------|---|------------------------|
| 1 | Fault Diagnosis LED | 2 | Power Button/Indicator |
| 3 | Health status indicator | 4 | UID button/indicator |
| 5 | FlexIO card presence indicator | - | - |

Indicator and Button Descriptions

Table 5-43 Description of indicators and buttons on the front panel

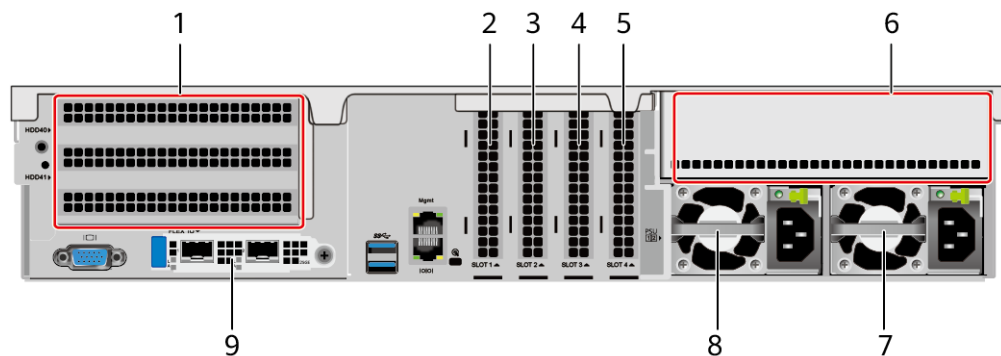
| [Azure] Available | Indicator/Button | Description |
|-------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Fault Diagnosis LED | <ul style="list-style-type: none"> ---: The device is operating properly. Error code: A component is faulty. For details about error codes, see the <i>FusionServer Rack Server iBMC Alarm Handling</i> . |
|  | Power Button/Indicator | Power indicator: <ul style="list-style-type: none"> Off: The device is not powered on. Steady green: The device is powered on. Blinking yellow: The iBMC is starting. The power button is locked and cannot be pressed. The iBMC is started in about 1 minute, and then the power indicator is steady yellow. Steady yellow: The device is standby. Power button: <ul style="list-style-type: none"> When the device is powered on, you can press this button to gracefully shut down the OS. NOTE For different OSs, you may need to shut down the OS as prompted. <ul style="list-style-type: none"> When the device is powered on, you can hold down this button for 6 seconds to forcibly power off the device. When the power indicator is steady yellow, you can press this button to power on the device. |
|  | Health status indicator | <ul style="list-style-type: none"> Off: The device is powered off or is faulty. Blinking red at 1 Hz: A major alarm has been generated on the system. Blinking red at 5 Hz: A critical alarm has been generated on the system. Steady green: The device is operating properly. |
|  | UID Button/Indicator | The UID button/indicator helps identify and locate a device. |

| [Azure] Available | Indicator/Button | Description |
|-----------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | UID indicator: <ul style="list-style-type: none"> • Off: The device is not being located. • Blinking or steady blue: The device is being located. UID button: <ul style="list-style-type: none"> • You can control the UID indicator status by pressing the UID button or using the iBMC. • You can press this button to turn on or off the UID indicator. • You can press and hold down this button for 4 to 6 seconds to reset the iBMC. |
|  | FlexIO card presence indicator | <ul style="list-style-type: none"> • Off: The FlexIO card is not detected. • Blinking green at 0.5 Hz: The FlexIO card is detected but is not powered on. • Blinking green at 2 Hz: The FlexIO card is detected and has just been inserted. • Steady green: The FlexIO card is detected and the power supply is normal. |

5.2.2 Rear Panel

5.2.2.1 Appearance

Figure 5-104 Rear view



| | | | |
|---|--------------|---|--------------|
| 1 | I/O module 1 | 2 | PCIe Slot1 |
| 3 | PCIe Slot2 | 4 | PCIe Slot3 |
| 5 | PCIe Slot4 | 6 | I/O module 3 |
| 7 | PSU 2 | 8 | PSU 1 |

| | | | |
|---|-------------------------------------------------------------------------------------------|---|---|
| 9 | FlexIO card NOTE The FlexIO card slot supports OCP 3.0 network adapters. | - | - |
|---|-------------------------------------------------------------------------------------------|---|---|

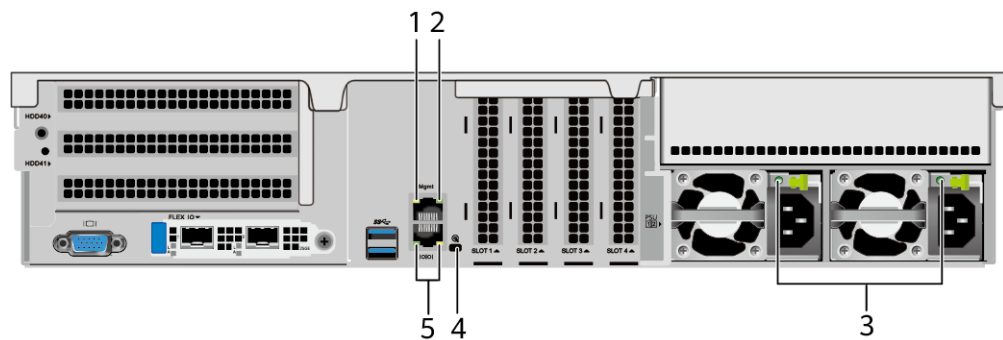
NOTE

- I/O module 1 supports only the 2 x 3.5" rear-drive module.
- I/O module 3 supports a PCIe riser module or 4 x 2.5" rear-drive module.
- For details about the OCP 3.0 network adapter, see [5.2.6.1 OCP 3.0 Network Adapters](#).
- The figure is for reference only. The actual configuration may vary.

5.2.2.2 Indicators and Buttons

Indicator Positions

Figure 5-105 Indicators on the rear panel




| | | | |
|---|---------------------------------------------------------------------------------|---|------------------------------------------------------------|
| 1 | Data transmission status indicator of the management network port | 2 | Connection status indicator of the management network port |
| 3 | PSU indicator | 4 | UID indicator |
| 5 | Serial port indicator NOTE Reserved and unavailable currently. | - | - |

Indicator Description

Table 5-44 Description of indicators on the rear panel

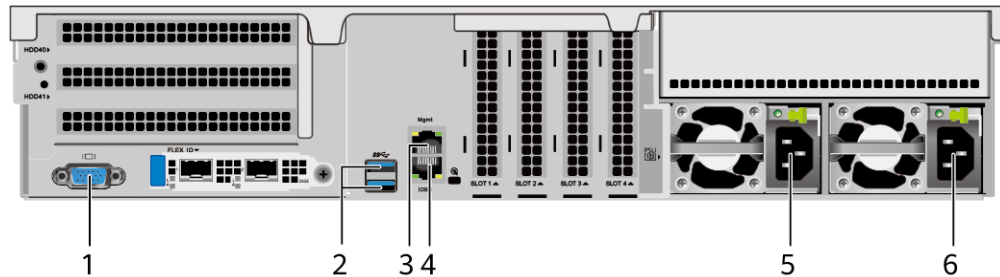
| Identifier | Indicator | State Description |
|------------|---------------------------------------|----------------------------------------------------------------------------------------|
| - | Data transmission status indicator of | <ul style="list-style-type: none"> • Off: No data is being transmitted. |

| Identifier | Indicator | State Description |
|-----------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | the management network port | <ul style="list-style-type: none"> Blinking yellow: Data is being transmitted. |
| - | Connection status indicator of the management network port | <ul style="list-style-type: none"> Off: The network port is not connected. Steady green: The network port is connected properly. |
|  | UID indicator | <p>The UID indicator helps identify and locate a device.</p> <ul style="list-style-type: none"> Off: The device is not being located. Blinking or steady blue: The device is being located. <p>NOTE You can control the UID indicator status by pressing the UID button or using the iBMC.</p> |
| - | PSU indicator | <ul style="list-style-type: none"> Off: No power is supplied. Blinking green at 1 Hz: <ul style="list-style-type: none"> The input is normal, and the server is standby. The input is overvoltage or undervoltage. The PSU is in deep hibernation mode. Blinking green at 4 Hz: The firmware is being upgraded online. Steady green: The power input and output are normal. Steady orange: The input is normal but there is no output. <p>NOTE The possible causes of no power output are as follows:</p> <ul style="list-style-type: none"> Power supply overtemperature protection Power output overcurrent or short-circuit Output overvoltage Short-circuit protection Device failure (excluding failure of all devices) |

5.2.2.3 Interface

Port Positions

Figure 5-106 Ports on the rear panel



| | | | |
|---|-------------------------|---|------------------|
| 1 | VGA port | 2 | USB 3.0 port |
| 3 | Management network port | 4 | Serial port |
| 5 | Socket for PSU 1 | 6 | Socket for PSU 2 |

Port Description

Table 5-45 Ports on the rear panel

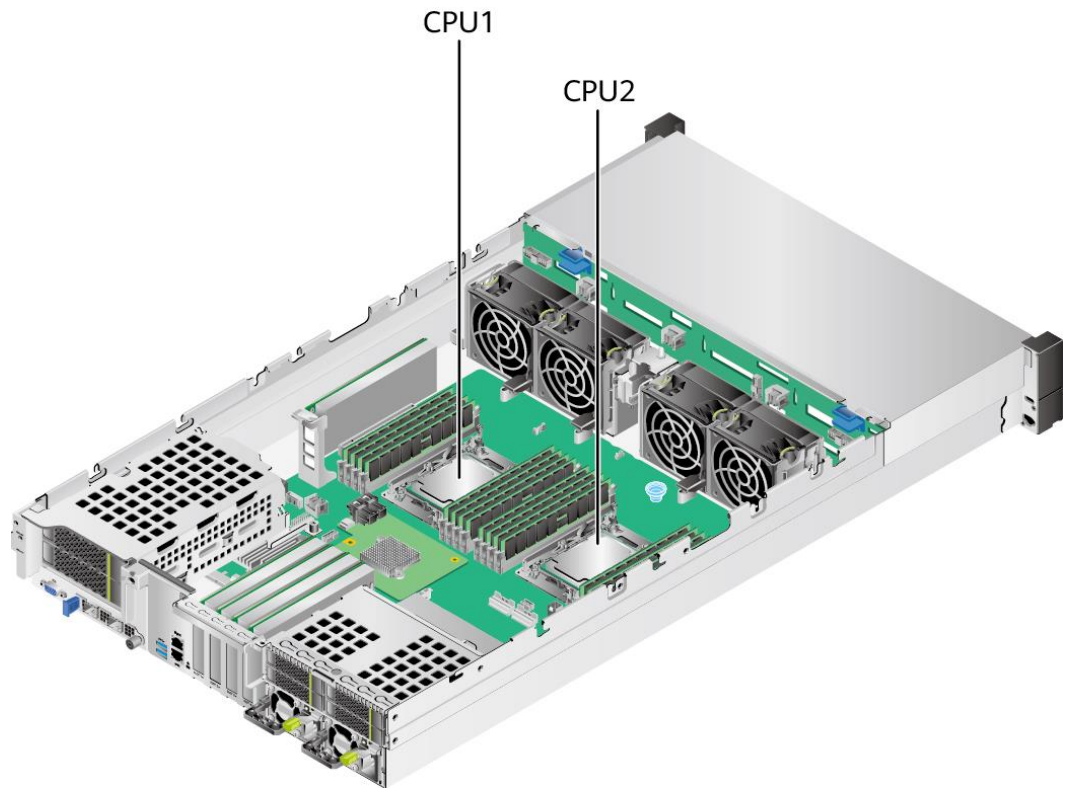
| Port | Type | Quantity | Description |
|------------|---------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VGA port | DB15 | 1 | Used to connect a display terminal, such as a monitor or KVM. |
| USB port | USB 3.0 | 2 | Used to connect to a USB 3.0 device. NOTICE <ul style="list-style-type: none"> The maximum current is 1.3 A for an external USB device. Before connecting an external USB device, ensure that the USB device functions properly. Otherwise, it may adversely impact the server. The USB 3.0 port can be used to supply power to low-power peripherals. However, the USB 3.0 port must comply with the USB specifications. To run advanced peripherals, such as external CD/DVD drives, an external power supply is required. |
| Management | RJ45 | 1 | iBMC management network port, which is used to manage the |

| Port | Type | Quantity | Description |
|--------------|------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| network port | | | server. NOTE The management network port is a GE port that supports 100 Mbit/s and 1000 Mbit/s auto-negotiation. |
| Serial port | RJ45 | 1 | Default operating system serial port used for debugging. You can also set it as the iBMC serial port by using the iBMC command. NOTE The port uses 3-wire serial communication interface, and the default baud rate is 115,200 bit/s. |
| PSU socket | - | 2 | Used to connect to a power distribution unit (PDU) through a power cable. You can select the PSUs as required. NOTE When determining the PSUs, ensure that the rated power of the PSUs is greater than that of the server. |

5.2.3 Processor

- The server supports one or two processors.
- If only one processor is required, install it in socket CPU1.
- Processors of the same model must be used in a server.
- For details about component options, consult the local sales representatives.

Figure 5-107 Positions of processors



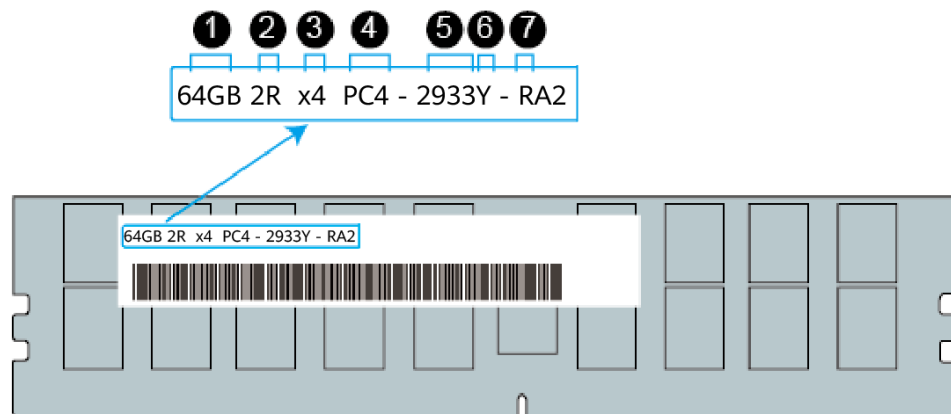
5.2.4 Memory

5.2.4.1 DDR4 Memory

5.2.4.1.1 Memory ID

You can determine the memory module properties based on the label attached to the memory module.

Figure 5-108 Memory identifier



| No. | Description | Example |
|-----|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Capacity | <ul style="list-style-type: none"> • 16 GB • 32 GB • 64 GB • 128 GB |
| 2 | rank(s) | <ul style="list-style-type: none"> • 1R = Single rank • 2R = Dual rank • 4R = Quad rank • 8R = Octal rank |
| 3 | Data width on the DRAM | <ul style="list-style-type: none"> • x4: 4-bit • x8: 8-bit |
| 4 | Type of the memory interface | <ul style="list-style-type: none"> • PC4 = DDR4 |
| 5 | Maximum memory speed | <ul style="list-style-type: none"> • 2933 MT/S • 3200 MT/S |
| 6 | Column Access Strobe (CAS) latency | <ul style="list-style-type: none"> • W=CAS 20-20-20 • Y=CAS 21-21-21 • AA=CAS 22-22-22 |
| 7 | DIMM type | <ul style="list-style-type: none"> • R = RDIMM • L = LRDIMM |

5.2.4.1.2 Memory Subsystem Architecture

A server provides 16 memory slots. Each processor integrates eight memory channels.

Table 5-46 Channels

| CPU | Channel | Memory Slot |
|-------|---------|-------------|
| CPU 1 | A | DIMM000(A) |
| | B | DIMM010(B) |
| | C | DIMM020(C) |
| | D | DIMM030(D) |
| | E | DIMM040(E) |
| | F | DIMM050(F) |
| | G | DIMM060(G) |
| | H | DIMM070(H) |
| CPU 2 | A | DIMM100(A) |
| | B | DIMM110(B) |

| CPU | Channel | Memory Slot |
|-----|---------|-------------|
| | C | DIMM120(C) |
| | D | DIMM130(D) |
| | E | DIMM140(E) |
| | F | DIMM150(F) |
| | G | DIMM160(G) |
| | H | DIMM170(H) |

5.2.4.1.3 Memory Compatibility

Observe the following rules when configuring DDR4 memory modules:

NOTICE

- A server must use DDR4 memory modules of the same part number (P/N code), and the memory speed is the minimum value of the following items:
 - Memory speed supported by a CPU
 - Maximum operating speed of a memory module
 - The DDR4 DIMMs of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together.
 - For details about component options, consult the local sales representatives.
-
- The memory can be used with the third-generation Intel® Xeon® Scalable Ice Lake processors. The maximum memory capacity supported by all processor models is the same.
 - The total memory capacity is the sum of the capacity of all DDR4 memory modules.
 - For details about the capacity type of a single memory module, contact the local sales representatives.
 - The maximum number of memory modules supported depends on the memory type and rank quantity.

NOTE

Each memory channel supports a maximum of 8 ranks. The number of memory modules supported by each channel varies depending on the number of ranks supported by each channel:

Number of memory modules supported by each channel ≤ Number of ranks supported by each memory channel / Number of ranks supported by each memory module

Table 5-47 DDR4 memory specifications

| Parameter | Specifications | | | |
|--------------------------------------|----------------|-------|-------|--------|
| Capacity per DDR4 memory module (GB) | 16 | 32 | 64 | 128 |
| Type | RDIMM | RDIMM | RDIMM | LRDIMM |

| Parameter | | Specifications | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|------|------|------|
| Rated speed (MT/s) | | 3200 | 3200 | 3200 | 3200 |
| Operating voltage (V) | | 1.2 | 1.2 | 1.2 | 1.2 |
| Maximum number of DDR4 DIMMs in a server ^a | | 16 | 16 | 16 | 16 |
| Maximum DDR4 memory capacity of the server (GB) | | 256 | 512 | 1024 | 2048 |
| Actual rate (MT/s) | 1DPC ^b | 3200 | 3200 | 3200 | 3200 |
| <ul style="list-style-type: none"> • a: The maximum number of DDR4 memory modules is based on dual-processor configuration. The value is halved for a server with only one processor. • b: DPC (DIMM per channel) indicates the number of memory modules per channel. • The information listed in this table is for reference only. For details, consult the local sales representative. | | | | | |

5.2.4.1.4 DIMM Installation Rules

Observe the following when configuring DDR4 memory modules:

- Install memory modules only when corresponding processors are installed.
- Do not install LRDIMMs and RDIMMs in the same server.
- Install filler memory modules in vacant slots.

Observe the following when configuring DDR4 memory modules in specific operating mode:

- Memory sparing mode
 - Comply with the general installation guidelines.
 - Each memory channel must have a valid online spare configuration.
 - The channels can have different online spare configurations.
 - Each populated channel must have a spare rank.
- Memory mirroring mode
 - Comply with the general installation guidelines.
 - Each processor supports four integrated memory controllers (IMCs), and each IMC has two channels for installing memory modules. The installed memory modules must be identical in size and organization.
 - For a multi-processor configuration, each processor must have a valid memory mirroring configuration.
- Memory scrubbing mode
 - Comply with the general installation guidelines.

5.2.4.1.5 Memory Installation Positions

A server supports a maximum of 16 DDR4 memory modules. To maximize performance, balance the total memory capacity between the installed processors and to load the channels similarly whenever possible.

Observe the memory module installation rules when configuring memory modules. For details, consult the local sales representatives.

NOTICE

At least one DDR4 memory module must be installed in the primary memory channels corresponding to CPU 1.

Figure 5-109 Memory slots

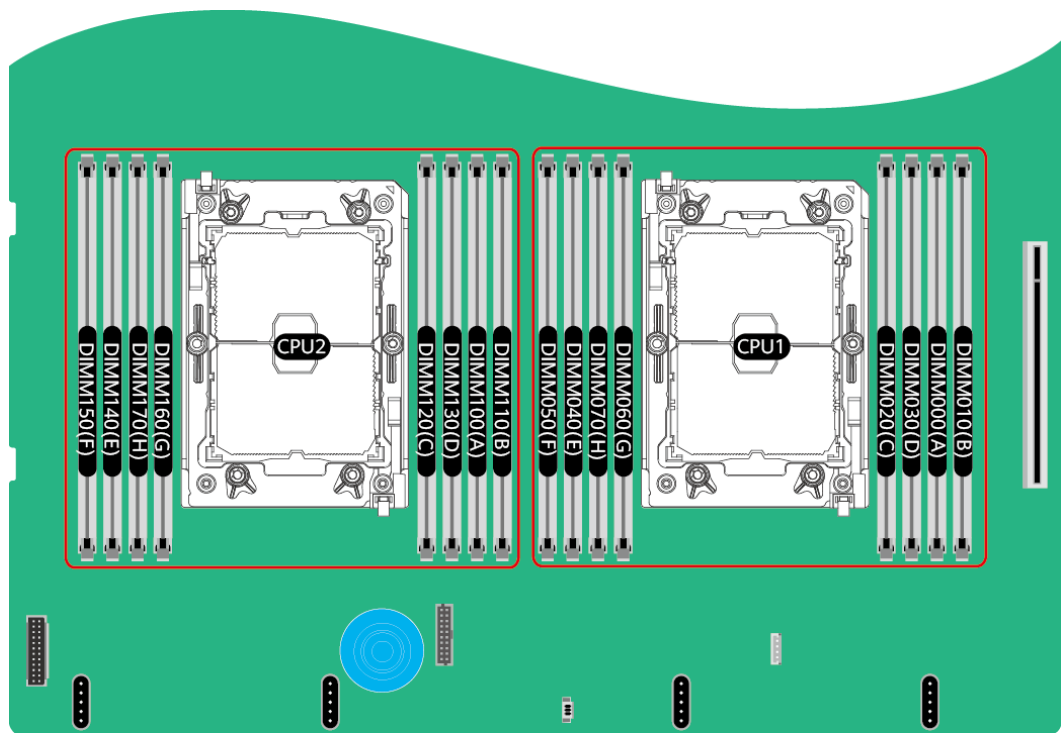


Figure 5-110 DDR4 memory module installation guidelines (1 processor)

| CPU | Channel | DIMM Slot | Number of DIMMs | | | | |
|------|---------|------------|-----------------|--------|--------|--------|--------|
| | | | ✓ 1 | ✓ 2 | ✓ 4 | ✓ 6 | ✓ 8 |
| CPU1 | A | DIMM00(A) | ● | ● | ● | ● | ● |
| | B | DIMM010(B) | | | | ● | ● |
| | C | DIMM020(C) | | | ● | ● | ● |
| | D | DIMM030(D) | | | | | ● |
| | E | DIMM040(E) | | ● | ● | ● | ● |
| | F | DIMM050(F) | | | | ● | ● |
| | G | DIMM060(G) | | | ● | ● | ● |
| | H | DIMM070(H) | | | | | ● |

Figure 5-111 DDR4 memory module installation guidelines (2 processors)

| CPU | Channel | DIMM Slot | Number of DIMMs | | | | |
|------|---------|------------|-----------------|---|---|----|----|
| | | | 2 | 4 | 8 | 12 | 16 |
| CPU1 | A | DIMM000(A) | ● | ● | ● | ● | ● |
| | B | DIMM010(B) | | | | ● | ● |
| | C | DIMM020(C) | | | ● | ● | ● |
| | D | DIMM030(D) | | | | | ● |
| | E | DIMM040(E) | | ● | ● | ● | ● |
| | F | DIMM050(F) | | | | ● | ● |
| | G | DIMM060(G) | | | ● | ● | ● |
| | H | DIMM070(H) | | | | | ● |
| CPU2 | A | DIMM100(A) | ● | ● | ● | ● | ● |
| | B | DIMM110(B) | | | | ● | ● |
| | C | DIMM120(C) | | | ● | ● | ● |
| | D | DIMM130(D) | | | | | ● |
| | E | DIMM140(E) | | ● | ● | ● | ● |
| | F | DIMM150(F) | | | | ● | ● |
| | G | DIMM160(G) | | | ● | ● | ● |
| | H | DIMM170(H) | | | | | ● |

5.2.4.1.6 Memory Protection Technologies

The following memory protection technologies are supported:

- ECC
- Memory Mirroring
- Memory Single Device Data Correction (SDDC, +1)
- Failed DIMM Isolation
- Memory Thermal Throttling
- Command/Address Parity Check and Retry
- Memory Demand/Patrol Scrubbing
- Memory Data Scrambling
- Memory Multi Rank Sparing
- Post Package Repair (PPR)
- Write Data CRC Protection
- Adaptive Data Correction - Single Region (ADC-SR)
- Adaptive Double Device Data Correction - Multiple Region (ADDDC-MR, +1)

5.2.5 Storage

5.2.5.1 Drive Configurations

5.2.5.1.1 8 x 2.5" drive pass-through configuration

Drive configuration

Table 5-48 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 x 2.5" drive pass-through configuration 1 | <ul style="list-style-type: none"> • Front drive: 8 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 8 x 2.5" drive pass-through configuration 2 | <ul style="list-style-type: none"> • Front drive: 8 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 8 x 2.5" drive pass-through configuration 3 | <ul style="list-style-type: none"> • Front drive: 8 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 8 x 2.5" drive pass-through configuration 1 in [Table 5-48](#)

Figure 5-112 Slot numbers

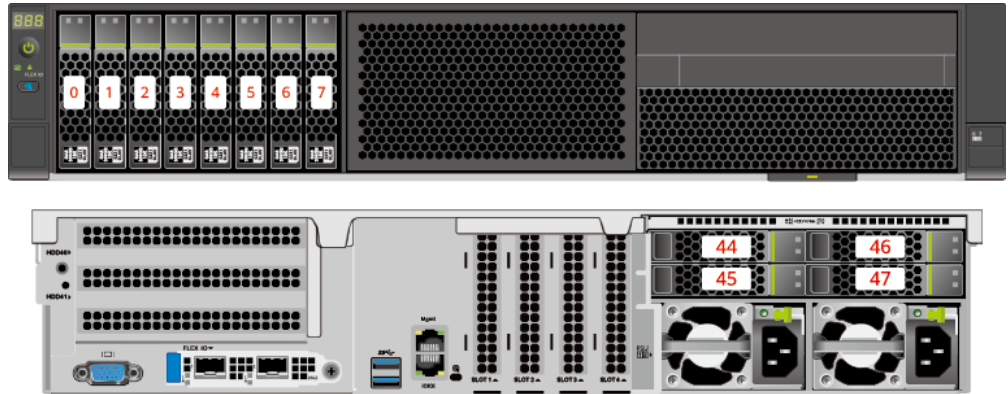


Table 5-49 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |

- Drive slot numbers of 8 x 2.5" drive pass-through configuration 2 and 8 x 2.5" drive pass-through configuration 3 in [Table 5-48](#)

Figure 5-113 Slot numbers

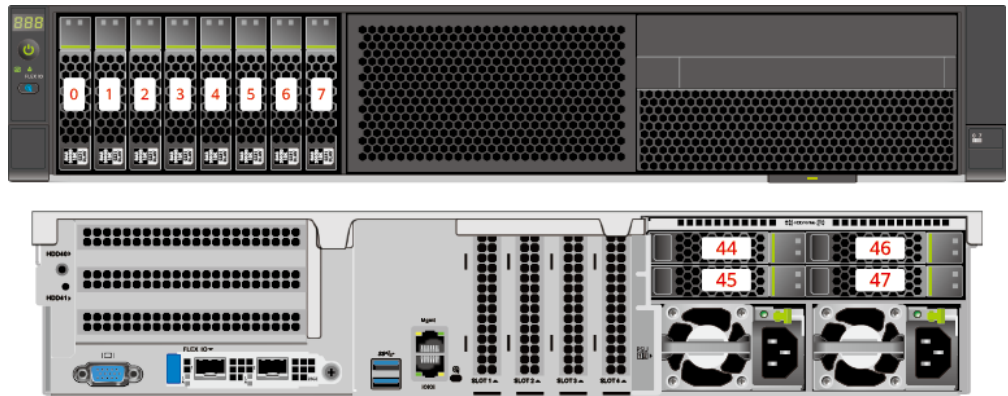


Table 5-50 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

5.2.5.1.2 12 x 3.5" drive pass-through configuration

Drive configuration

Table 5-51 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|---------------|-------------|------------|----------------|-----------------------|
| | | | | |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 x 3.5" drive pass-through configuration 1 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 2 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 3 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. • NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | NVMe drives ^a . | | |
| 12 x 3.5" drive pass-through configuration 1 (4 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SATA drives. – Slots 8 to 11 support only SATA/NVMe drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SATA drives. | - | <ul style="list-style-type: none"> • SATA drive: PCH • NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 2 (4 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. – Slots 8 to 11 support SAS/SATA/NVMe drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 7 support only SAS/SATA drives. – Slots 8 to 11 support SAS/SATA/NVMe drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 1 in [Table 5-51](#)

Figure 5-114 Slot numbers

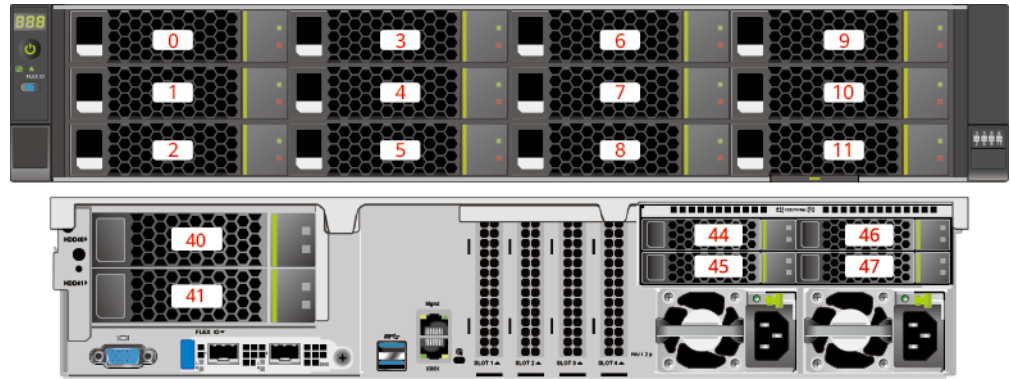


Table 5-52 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 40 | 40 |
| 41 | 41 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 47 | 47 |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 2 and 12 x 3.5" drive pass-through configuration 3 in [Table 5-51](#)

Figure 5-115 Slot numbers

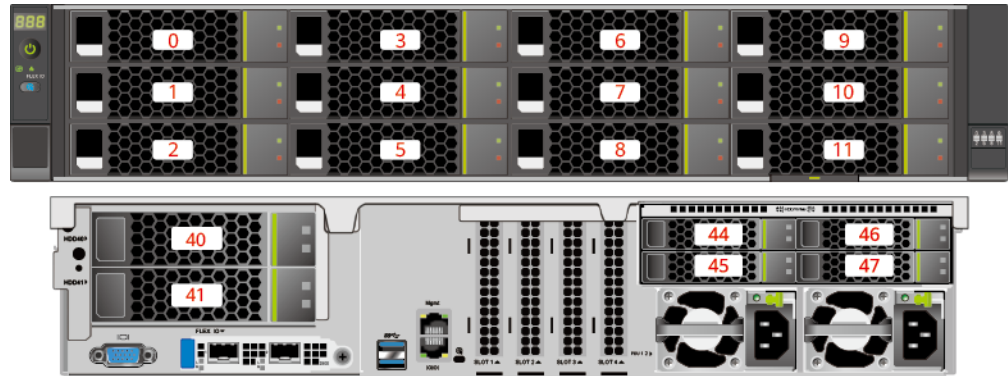


Table 5-53 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 44 | 44 | - |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 1 (4 x NVMe) in [Table 5-51](#)

Figure 5-116 Slot numbers

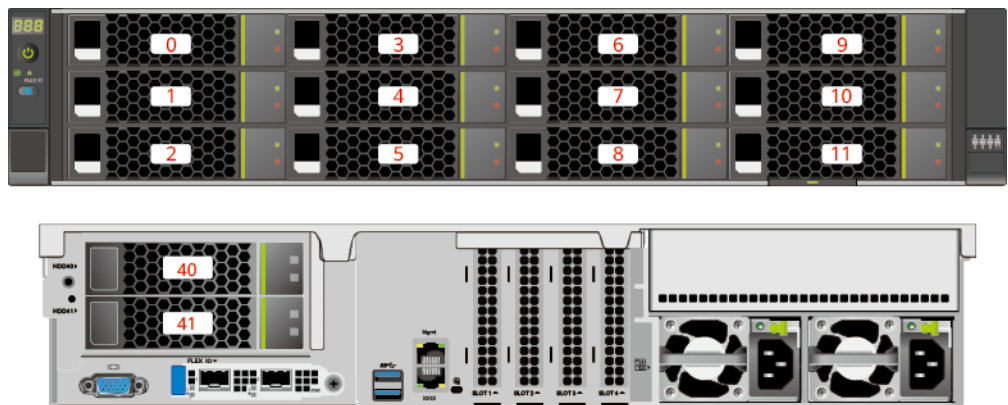


Table 5-54 Slot numbers

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |

| Drive No. | Drive Number Identified by the iBMC |
|-----------|-------------------------------------|
| 40 | 40 |
| 41 | 41 |

- Drive slot numbers of 12 x 3.5" drive pass-through configuration 2 (4 x NVMe) and 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) in [Table 5-51](#)

Figure 5-117 Slot numbers

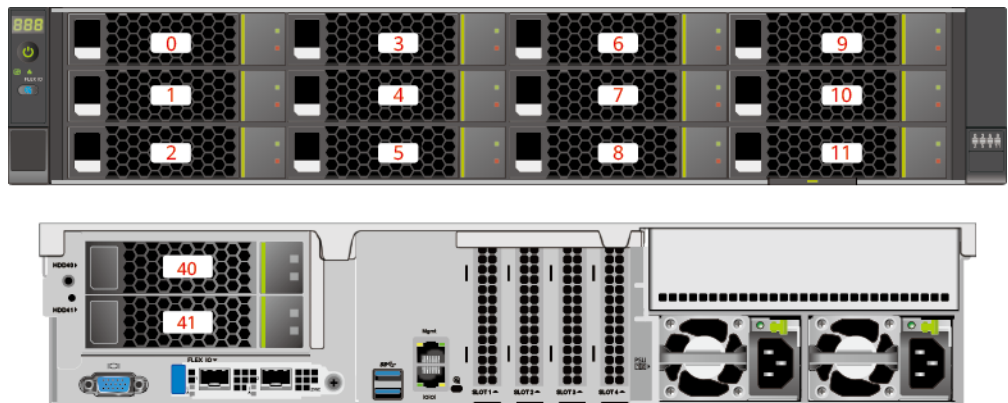


Table 5-55 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 ^{Note} |
| 9 | 9 | 9 ^{Note} |
| 10 | 10 | 10 ^{Note} |
| 11 | 11 | 11 ^{Note} |
| 40 | 40 | 12 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|
| 41 | 41 | 13 |
| Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. | | |

5.2.5.1.3 12 x 3.5" drive EXP configuration

Drive configuration

Table 5-56 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 x 3.5" drive EXP configuration 1 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SATA drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |
| 12 x 3.5" drive EXP configuration 2 | <ul style="list-style-type: none"> Front drive: 12 x 3.5" <ul style="list-style-type: none"> Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SATA drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. NVMe drive: CPU |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 x 3.5" drive EXP configuration 3 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support SAS/SATA/NVMe drives^a. | <ul style="list-style-type: none"> • Built-in drive: 4 x 3.5" <ul style="list-style-type: none"> – Slots 36 to 39 support only SAS/SATA drives. | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card • NVMe drive: CPU |
| 12 x 3.5" drive EXP configuration 4 | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support SAS/SATA/NVMe drives^a. | <ul style="list-style-type: none"> • Built-in drive: 4 x 3.5" <ul style="list-style-type: none"> – Slots 36 to 39 support only SAS/SATA drives. | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. • NVMe drive: CPU |
| 12 x 3.5" drive EXP configuration 5 (dual RAID controller cards) | <ul style="list-style-type: none"> • Front drive: 12 x 3.5" <ul style="list-style-type: none"> – Slots 0 to 11 support only SAS/SATA drives. | <ul style="list-style-type: none"> • I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only SAS/SATA drives. • I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> – Slots 44 to 47 support only | - | <ul style="list-style-type: none"> • SAS/SATA drive: 1 x screw-in RAID controller card + 1 x PCIe RAID controller card. The PCIe RAID controller card must be configured in the |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | NVMe drives ^a . | | built-in PCIe slot. <ul style="list-style-type: none"> - The screw-in RAID controller card manages the SAS/SATA drives in slots 40 to 41. - The PCIe RAID controller card manages SAS/SATA drives in slots 0 to 11. <ul style="list-style-type: none"> • NVMe drive: CPU |
| <ul style="list-style-type: none"> • a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. • For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 12 x 3.5" drive EXP configuration 1 and 12 x 3.5" drive EXP configuration 2 in [Table 5-56](#)

Figure 5-118 Slot numbers

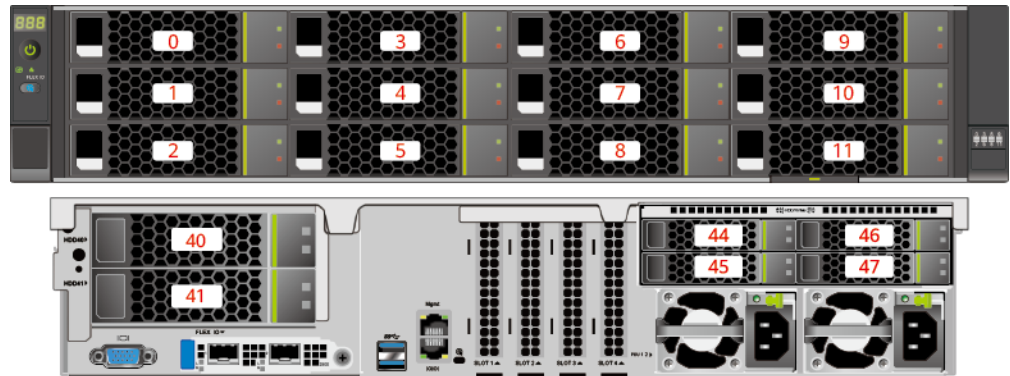


Table 5-57 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 12 x 3.5" drive EXP configuration 3 and 12 x 3.5" drive EXP configuration 4 in [Table 5-56](#)

Figure 5-119 Slot numbers



Table 5-58 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 36 | 36 | 8 |
| 37 | 37 | 9 |
| 38 | 38 | 10 |
| 39 | 39 | 11 |
| 40 | 40 | 12 |
| 41 | 41 | 13 |
| 44 | 44 | 12 ^{Note} |
| 45 | 45 | 13 ^{Note} |
| 46 | 46 | 14 ^{Note} |
| 47 | 47 | 15 ^{Note} |

- Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive.
- If duplicate RAID controller card numbers are displayed, identify the RAID controller cards based on the EID.

- Drive slot numbers of 12 x 3.5" drive EXP configuration 5 (dual RAID controller cards) in [Table 5-56](#)

Figure 5-120 Slot numbers

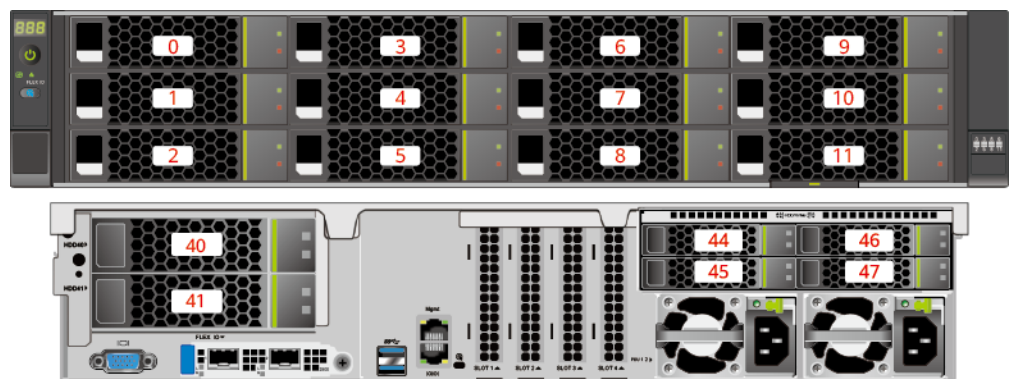


Table 5-59 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 40 | 40 | 0 |
| 41 | 41 | 1 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

5.2.5.1.4 25 x 2.5" drive EXP configuration

Drive configuration

Table 5-60 Drive configuration

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------|
| 25 x 2.5" drive EXP configuration 1 | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> – Slots 0 to 24 support only | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> – Slots 40 and 41 support only | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | SAS/SAT A drives. | SAS/SAT A drives. <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | | <ul style="list-style-type: none"> NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 2 | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> Slots 0 to 24 support only SAS/SAT A drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT A drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller card The PCIe RAID controller card must be installed in slot 1. NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 3 | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> Slots 0 to 24 support only SAS/SAT A drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SAT A drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support SAS/SAT A/NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 4 | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> Slots 0 to 24 | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x PCIe RAID controller |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | support only SAS/SATA drives. | support only SAS/SATA drives. <ul style="list-style-type: none"> I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support SAS/SATA/NVMe drives^a. | | card The PCIe RAID controller card must be installed in slot 1. <ul style="list-style-type: none"> NVMe drive: CPU |
| 25 x 2.5" drive EXP configuration 5 (dual RAID controller cards) | <ul style="list-style-type: none"> Front drive: 25 x 2.5" <ul style="list-style-type: none"> Slots 0 to 24 support only SAS/SATA drives. | <ul style="list-style-type: none"> I/O module 1: 2 x 3.5" <ul style="list-style-type: none"> Slots 40 and 41 support only SAS/SATA drives. I/O module 3: 4 x 2.5" <ul style="list-style-type: none"> Slots 44 to 47 support only NVMe drives^a. | - | <ul style="list-style-type: none"> SAS/SATA drive: 1 x screw-in RAID controller card + 1 x PCIe RAID controller card. The PCIe RAID controller card must be configured in the built-in PCIe slot. <ul style="list-style-type: none"> The screw-in RAID controller card manages the SAS/SATA drives in slots 40 to 41. The PCIe RAID controller card manages SAS/SATA drives in slots 0 |

| Configuration | Front Drive | Rear Drive | Built-in Drive | Drive Management Mode |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|----------------|-----------------------------------------------------------------------------|
| | | | | to 24. <ul style="list-style-type: none"> NVMe drive: CPU |
| <ul style="list-style-type: none"> a: The server with CPU 2 supports NVMe drives, but the server with a single CPU does not support NVMe drives. For details about component options, consult the local sales representatives. | | | | |

Slot numbers

- Drive slot numbers of 25 x 2.5" drive EXP configuration 1 and 25 x 2.5" drive EXP configuration 2 in [Table 5-60](#)

Figure 5-121 Slot numbers

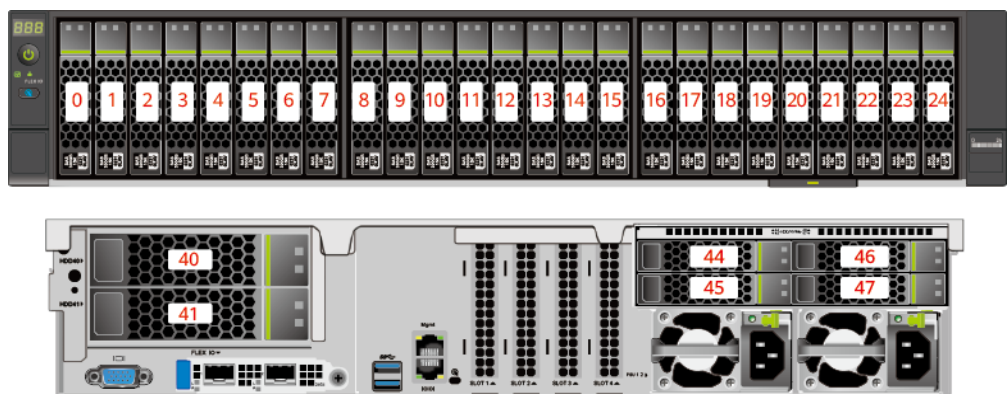


Table 5-61 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 25 |
| 41 | 41 | 26 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

- Drive slot numbers of 25 x 2.5" drive EXP configuration 3 and 25 x 2.5" drive EXP configuration 4 in [Table 5-60](#)

Figure 5-122 Slot numbers

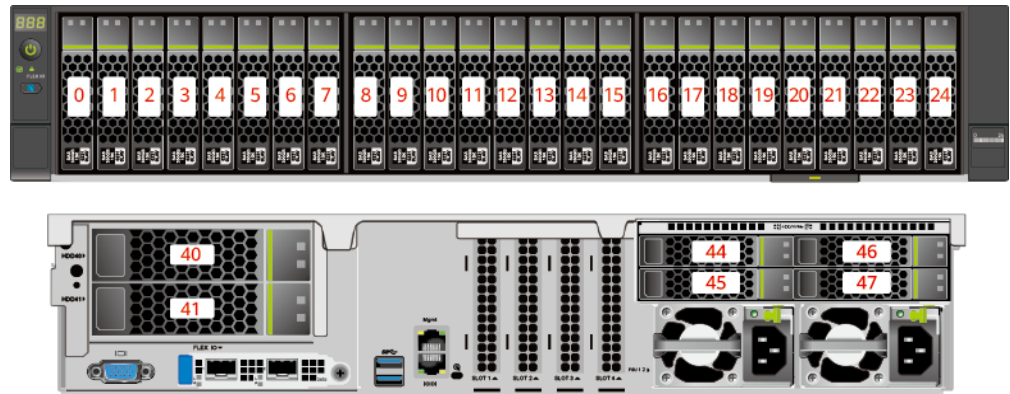


Table 5-62 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 25 |
| 41 | 41 | 26 |
| 44 | 44 | 8 ^{Note} |
| 45 | 45 | 9 ^{Note} |
| 46 | 46 | 10 ^{Note} |
| 47 | 47 | 11 ^{Note} |

- Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive.
- If duplicate RAID controller card numbers are displayed, identify the RAID controller cards based on the EID.

- Drive slot numbers of 25 x 2.5" drive EXP configuration 5 (dual RAID controller cards) in [Table 5-60](#)

Figure 5-123 Slot numbers

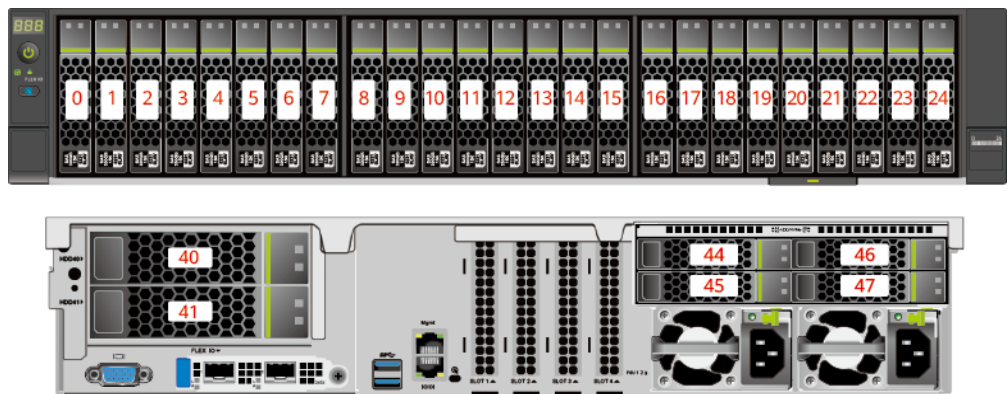


Table 5-63 Slot numbers

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 0 | 0 | 0 |

| Drive No. | Drive Number Identified by the iBMC | Drive Number Identified by the RAID Controller |
|-----------|-------------------------------------|------------------------------------------------|
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |
| 10 | 10 | 10 |
| 11 | 11 | 11 |
| 12 | 12 | 12 |
| 13 | 13 | 13 |
| 14 | 14 | 14 |
| 15 | 15 | 15 |
| 16 | 16 | 16 |
| 17 | 17 | 17 |
| 18 | 18 | 18 |
| 19 | 19 | 19 |
| 20 | 20 | 20 |
| 21 | 21 | 21 |
| 22 | 22 | 22 |
| 23 | 23 | 23 |
| 24 | 24 | 24 |
| 40 | 40 | 0 |
| 41 | 41 | 1 |
| 44 | 44 | - |
| 45 | 45 | - |
| 46 | 46 | - |
| 47 | 47 | - |

5.2.5.2 Drive Indicators

SAS/SATA Drive Indicators

Figure 5-124 SAS/SATA drive indicators

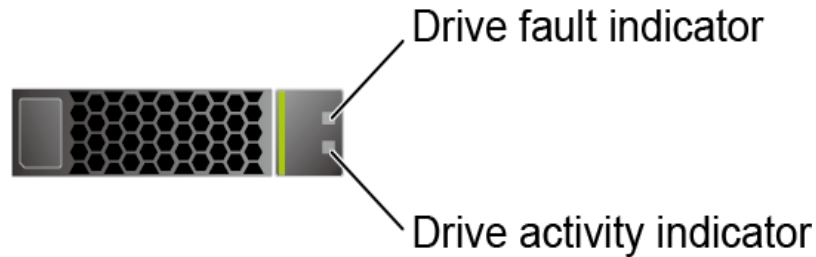
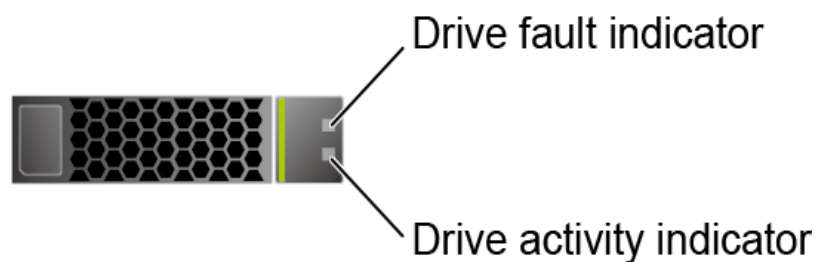


Table 5-64 SAS/SATA drive indicators

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|----------------------------------------------------------------------------------------|
| Off | Off | The drive is not in position. |
| Steady on | Off | The drive is detected. |
| Blinking at 4 Hz | Off | Data is being read or written properly, or data on the primary drive is being rebuilt. |
| Steady on | Blinking at 1 Hz | The drive is being located. |
| Blinking at 1 Hz | Blinking at 1 Hz | Data on the secondary drive is being rebuilt. |
| Off | Steady on | A drive in a RAID array is removed. |
| Steady on | Steady on | The drive is faulty. |

NVMe Drive Indicators

Figure 5-125 NVMe drive indicators



- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.

Table 5-65 NVMe drive indicators (VMD enabled)

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|--------------------------------------------------------|
| Off | Off | The NVMe drive is not detected. |
| Steady on | Off | The NVMe drive is detected and operating properly. |
| Blinking at 2 Hz | Off | Data is being read from or written to the NVMe drive. |
| Off | Blinking at 2 Hz | The NVMe drive is being located. |
| Off | Blinking at 8 Hz | The data on the secondary NVMe drive is being rebuilt. |
| Steady on/Off | Steady on | The NVMe drive is faulty. |

- If the VMD function is disabled, NVMe drives support only orderly hot swap.

Table 5-66 NVMe drive indicators (VMD disabled)

| Activity Indicator (Green) | Fault Indicator (Yellow) | Description |
|----------------------------|--------------------------|---------------------------------------------------------------------|
| Off | Off | The NVMe drive is not detected. |
| Steady on | Off | The NVMe drive is detected and operating properly. |
| Blinking at 2 Hz | Off | Data is being read from or written to the NVMe drive. |
| Off | Blinking at 2 Hz | The NVMe drive is being located or hot-swapped. |
| Off | Blinking at 0.5 Hz | The NVMe drive has completed the hot swap process and is removable. |
| Steady on/Off | Steady on | The NVMe drive is faulty. |

M.2 FRU Indicators

The server supports the Avago SAS3004iMR RAID controller card, which supports two M.2 FRUs.

Figure 5-126 M.2 FRU indicators

M.2 FRU fault indicator M.2 FRU activity indicator



Table 5-67 M.2 FRU indicators

| M.2 FRU Active Indicator (Green) | M.2 FRU Fault Indicator (Yellow) | Description |
|----------------------------------|----------------------------------|------------------------------------------------------------|
| Off | Off | The M.2 FRU is not detected. |
| Steady on | Off | The M.2 FRU is inactive. |
| Blink | Off | The M.2 FRU is in the read/write or synchronization state. |
| Steady on | Blink | The M.2 FRU is being located. |
| Blink | Blink | The RAID array is being rebuilt. |
| Off | Steady on | The M.2 FRU cannot be detected or is faulty. |
| Steady on | Steady on | The M.2 FRU RAID status is abnormal. |

5.2.5.3 RAID Controller Card

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

- For details about component options, consult the local sales representatives.
- For details about the RAID controller card, see *FusionServer V6 Server RAID Controller Card User Guide*.

5.2.6 Network

5.2.6.1 OCP 3.0 Network Adapters

OCP 3.0 network adapters provide network expansion capabilities.

- The FlexIO slot supports the OCP 3.0 network adapter, which can be configured as required.
- For details about component options, consult the local sales representatives.
- For details about the OCP 3.0 network adapter, see the documents of each OCP 3.0 network adapter.

5.2.7 I/O Expansion

5.2.7.1 PCIe Card

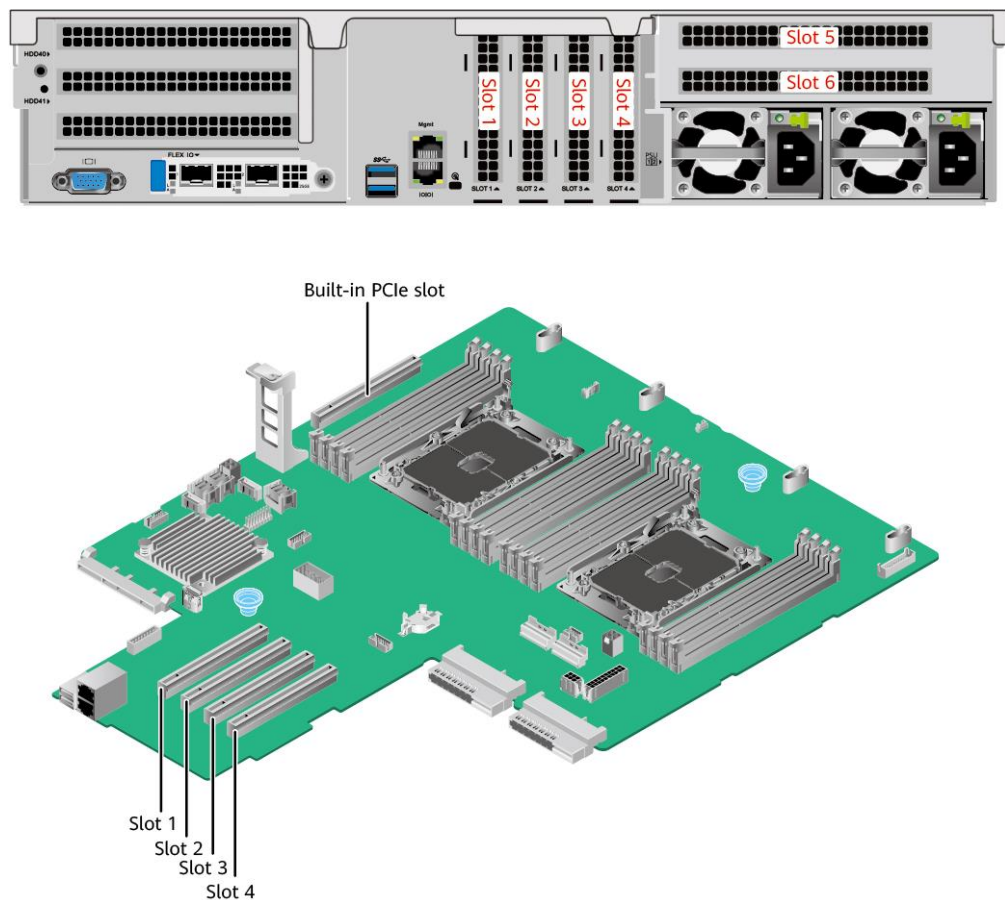
PCIe cards provide ease of expandability and connection.

- A maximum of five PCIe 3.0 and two PCIe 4.0 slots are supported.
- For details about component options, consult the local sales representatives.

5.2.7.2 PCIe Slots

PCIe Slots

Figure 5-127 PCIe slots

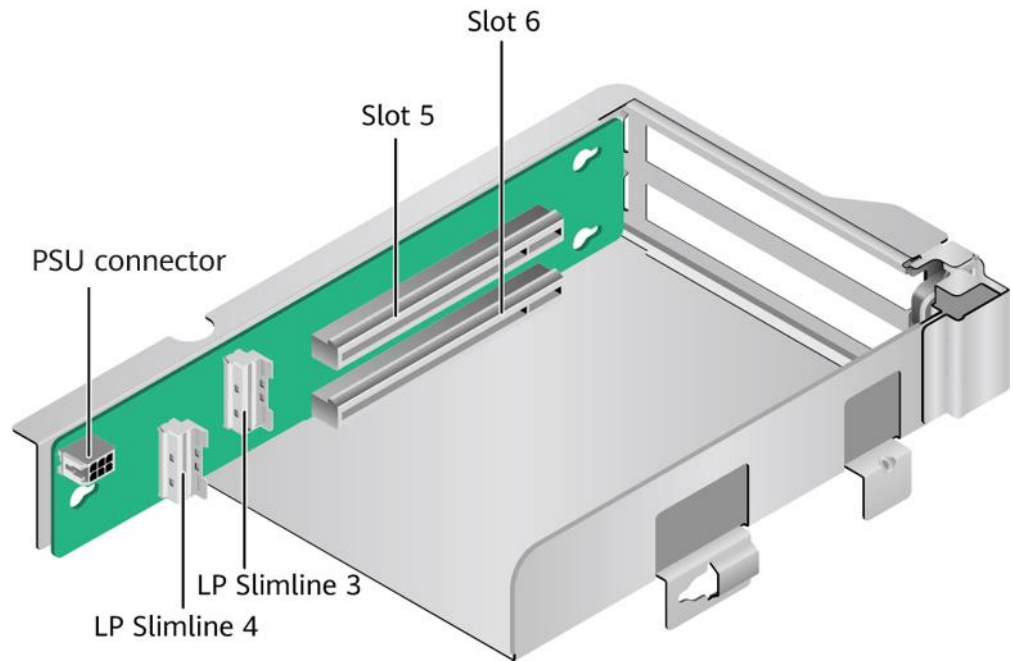


- I/O module 3 provides slots 5 and 6. If a one-slot PCIe riser module is used, slot 5 is unavailable.
- The mainboard provides PCIe slots 1, 2, 3, and 4, and a built-in PCIe slot.

PCIe Riser Module

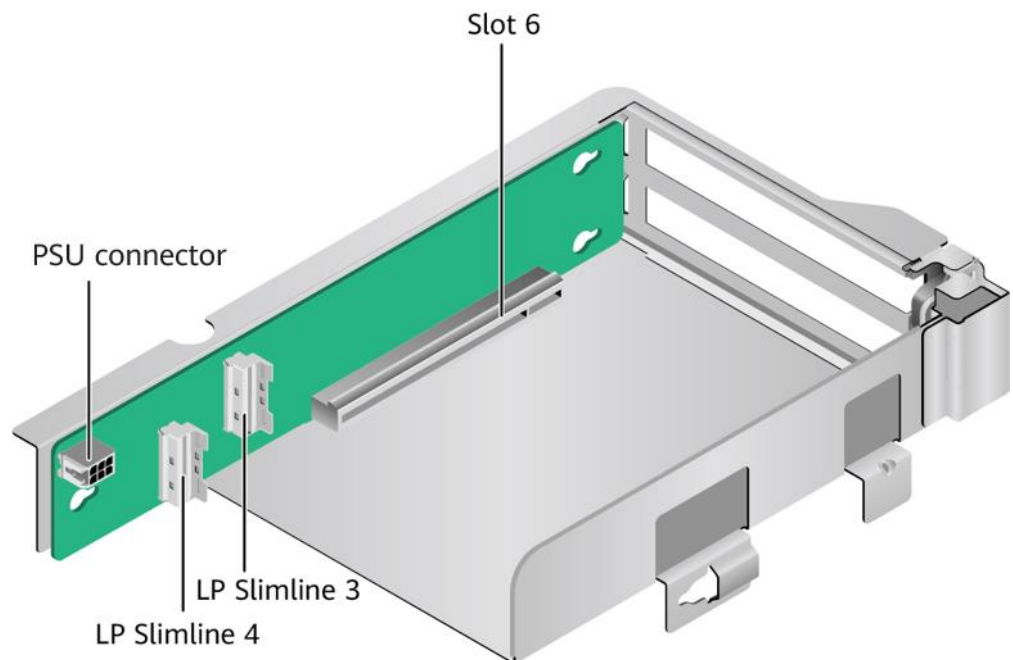
- PCIe riser module
Provides PCIe slots 5 and 6 when installed in I/O module 3.

Figure 5-128 PCIe riser module



- PCIe riser module
Provides PCIe slot 6 when installed in I/O module 3.

Figure 5-129 PCIe riser module



5.2.7.3 PCIe Slot Description

 **NOTE**

The PCIe slots mapping to a vacant CPU socket are unavailable.

Table 5-68 PCIe slot description

| PCIe Slot | CPU | PCIe Standard | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-------------------------------|------|---------------|-----------------|---------------------------------------------------------------|----------|-------------------|----------------|-----------------------------|
| Screw-in RAID controller card | CPU1 | PCIe 3.0 | x8 | x8 | Port1C | 30/4/0 | 33/0/0 | - |
| FlexIO card | CPU1 | PCIe 3.0 | x16 | x16 | Port0A | 16/2/0 | 17/0/0 | OCP 3.0 specifications |
| Built-in PCIe slot | CPU1 | PCIe 3.0 | x16 | x16 | Port3A | 64/2/0 | 65/0/0 | Half-height and half-length |
| Slot 1 | CPU1 | PCIe 3.0 | x8 | x8 | Port1A | 30/2/0 | 31/0/0 | Half-height and half-length |
| Slot 2 | CPU1 | PCIe 3.0 | x16 | x16 | Port2A | 4A/2/0 | 4B/0/0 | Half-height and half-length |
| Slot 3 | CPU2 | PCIe 3.0 | x16 | x16 | Port0A | 97/2/0 | 98/0/0 | Half-height and half-length |
| Slot 4 | CPU2 | PCIe 3.0 | x16 | x16 | Port1A | B0/2/0 | B1/0/0 | Half-height and half-length |
| Slot5 | CPU2 | PCIe 4.0 | x16 | <ul style="list-style-type: none"> • 2-slot PR | Port2A | C9/2/0 | CA/0/0 | Full-height and half-length |

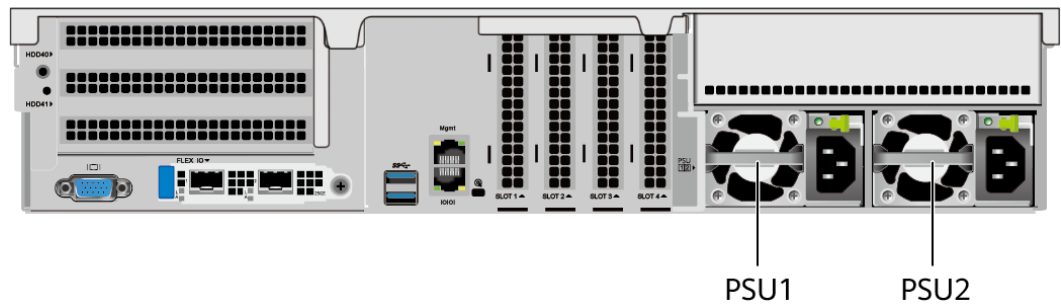
| PCIe Slot | CPU | PCIe Standard | Connector Width | Bus Width | Port No. | Root Port (B/D/F) | Device (B/D/F) | Slot Size |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|-----------------|---------------------------------------------------|----------|-------------------|----------------|-----------------------------|
| | | | | M: x8 • 1-slot PRM: N/A | | | | gth |
| Slot6 | CPU2 | PCIe 4.0 | x16 | • 2-slot PRM: x8 • 1-slot PRM: x16 | Port2C | C9/4/0 | CC/0/0 | Full-height and half-length |
| <ul style="list-style-type: none"> • The B/D/F (Bus/Device/Function Number) is the default value when the server is fully configured with PCIe cards. The value may differ if the server is not fully configured with PCIe cards or if a PCIe card with a PCI bridge is configured. • Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor. • Device (B/D/F) indicates the B/D/F (bus address displayed on the OS) of an onboard or extended PCIe device. • The PCIe x16 slots are compatible with PCIe x16, PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width. • The full-height half-length (FHHL) PCIe slots are compatible with FHHL PCIe cards and half-height half-length (HHHL) PCIe cards. • The maximum power supply of each PCIe slot is 75 W. | | | | | | | | |

5.2.8 PSUs

- The server supports one or two PSUs.
- The server supports AC or DC PSUs.
- The PSUs are hot-swappable.
- The server supports two PSUs in 1+1 redundancy.
- PSUs of the same part number (P/N code) must be used in a server.
- The PSUs are protected against short circuit. Double-pole fuse is provided for the PSUs with dual input live wires.
- If the DC power supply is used, purchase the DC power supply that meets the requirements of the safety standards or the DC power supply that has passed the CCC certification.

- For details about component options, consult the local sales representatives.

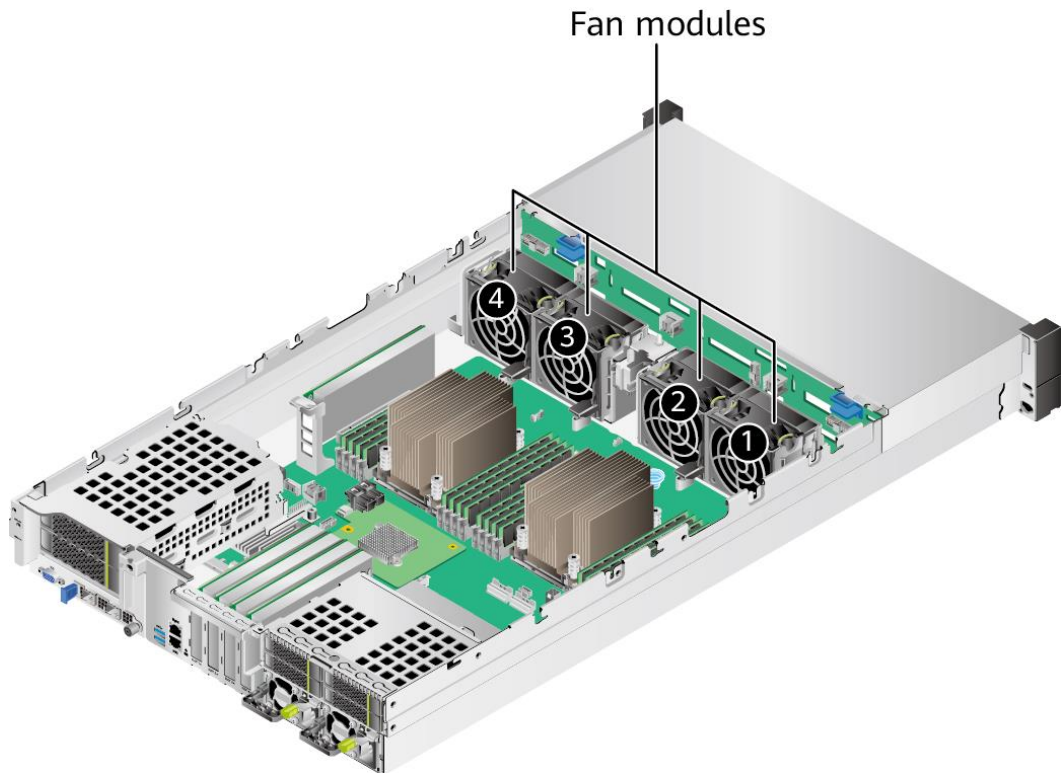
Figure 5-130 PSU positions



5.2.9 Fan Modules

- The server supports four fan modules.
- The fan modules are hot-swappable.
- N+1 redundancy is supported. That is, the server can work properly when a single fan fails.
- The fan speed can be adjusted.
- Fan modules of the same part number (P/N code) must be used in a server.

Figure 5-131 Positions of fan modules



5.2.10 LCD

 **NOTE**

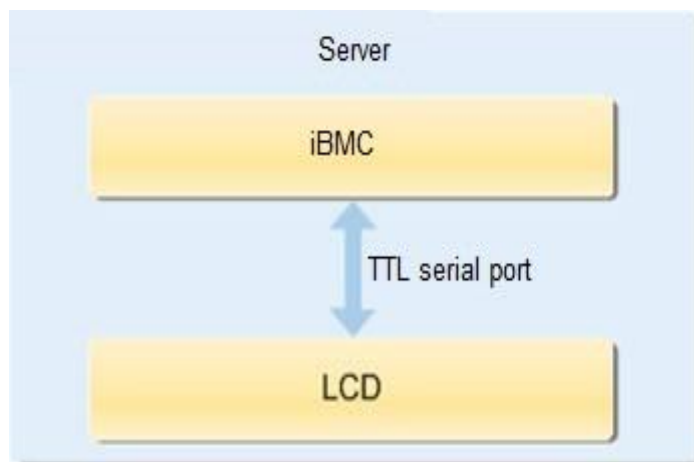
Only the 8 x 2.5" drive pass-through configuration supports the LCD.

Function

The LCD displays the installation status and running status of server components and enables users to set the IP address of the iBMC management network port on the server.

The LCD and the server iBMC form an LCD subsystem. The LCD directly obtains device information from the iBMC. The LCD subsystem does not store device data.

Figure 5-132 LCD subsystem working principle



UI

Figure 5-133 LCD main interface

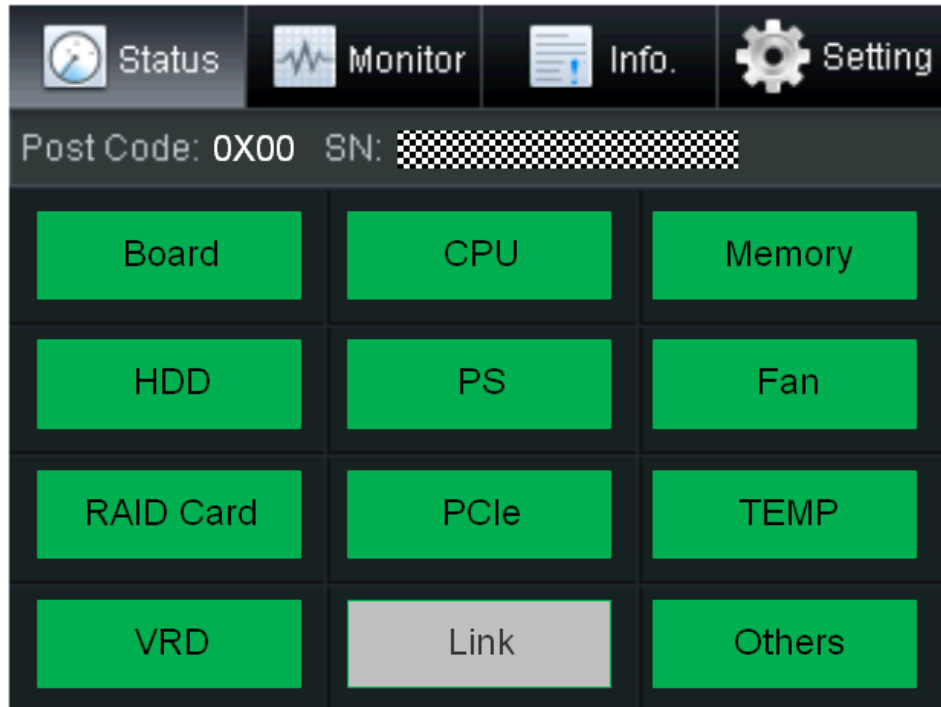


Table 5-69 Parameters on the LCD home screen

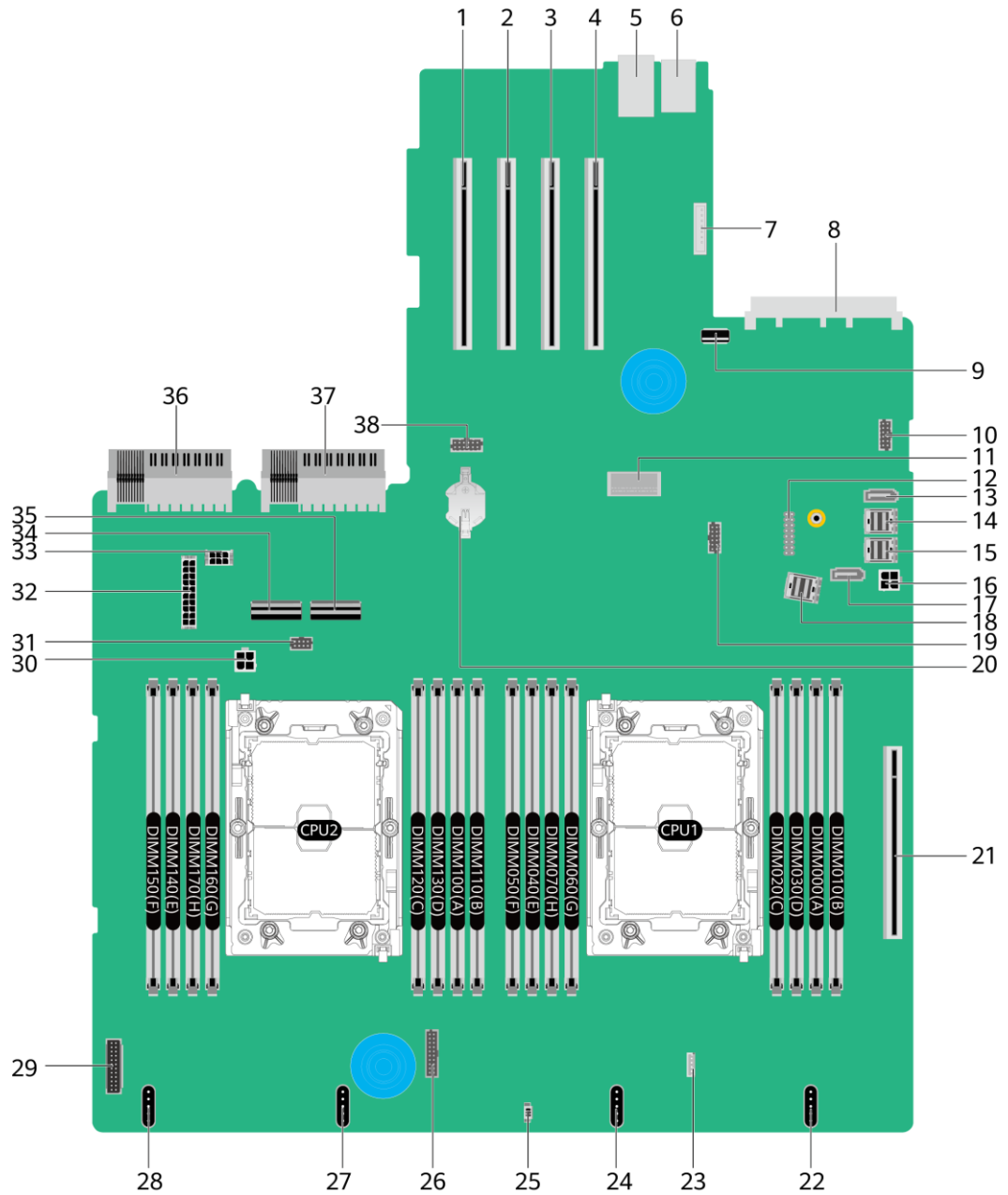
| Tab | Function |
|---------|-----------------------------------------------------------------------------------------------------------------------------------|
| Status | Displays the port 80 status, serial number, component status, and component alarms of the server. |
| Monitor | Displays the current power, CPU temperature, and inlet temperature of the server. |
| Info. | Displays the IP address and MAC address of the iBMC management network port, device SNs, asset information, and firmware version. |
| Setting | Sets the IP address of the iBMC management network port. |

For details about how to use the LCD module, see *FusionServer Rack Server LCD User Guide (x86 V6)*.

5.2.11 Board

5.2.11.1 Mainboard

Figure 5-134 2288H V6-16DIMM mainboard



| | | | |
|---|--------------------------------|---|--------------------------------|
| 1 | PCIe slot 4 (PCIE SLOT4/J2034) | 2 | PCIe slot 3 (PCIE SLOT3/J2035) |
| 3 | PCIe slot 2 (PCIE SLOT2/J2033) | 4 | PCIe slot 1 (PCIE SLOT1/J2032) |

| | | | |
|----|--------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------|
| 5 | BMC management network port and management serial port (BMC_GE/COM/J2038) | 6 | USB 3.0 port (USB 3.0 CONN/J17) |
| 7 | LCD connector (LCD CONN/J9) | 8 | OCP 3.0 network adapter connector (OCP1 CONN/J108) |
| 9 | Built-in USB 3.0 connector (INNER USB 3.0/J110) | 10 | VGA port (VGA CONN/J2037) |
| 11 | Screw-in RAID controller card connector (RAID CARD/J86) | 12 | TPM/TCM connector (J10) |
| 13 | SATA connector 2 (SATA2/J2) | 14 | mini-SAS HD connector C (MINIHD PORTC/J4) |
| 15 | mini-SAS HD connector B (MINIHD PORTB/J5) | 16 | Rear-drive backplane power connector 1 (REAR BP PWR1/J64) |
| 17 | SATA connector 1 (SATA1/J1) | 18 | mini-SAS HD connector A (MINIHD PORTA/J6) |
| 19 | NC-SI connector (NCSI CONN/J114) | 20 | Cell battery holder (U9) |
| 21 | Built-in PCIe slot (PCIe SLOT7/J2036) | 22 | Fan module 4 connector (FAN4/J98) |
| 23 | VROC key connector (Soft RAID KEY/J3) ^a | 24 | Fan module 3 connector (FAN3/J95) |
| 25 | Intrusion sensor connector (INTRUDER CONN/S1) | 26 | Low-speed signal connector for the front-drive backplane (FRONT HDD BP/J75) |
| 27 | Fan module 2 connector (FAN2/J91) | 28 | Fan module 1 connector (FAN1/J67) |
| 29 | Left mounting ear connector (LCID BOARD/J106) | 30 | Power connector for the built-in-drive backplane (INNER HDD PWR/J22) |
| 31 | Low-speed signal connector for the built-in-drive backplane (INNER HDD BP/J27) | 32 | Power connector for the front-drive backplane (HDD BP PWR1/J88) |
| 33 | Rear-drive backplane power connector 2 (REAR BP PWR2/J20) | 34 | CPU2 LP Slimline 4 connector (SLIMLINE4/J12) |
| 35 | CPU2 LP Slimline 3 connector (SLIMLINE3/J85) | 36 | PSU 2 connector (PSU2/J56) |
| 37 | PSU 1 connector (PSU1/J28) | 38 | Rear 4 x 2.5" drive backplane low-speed signal connector |

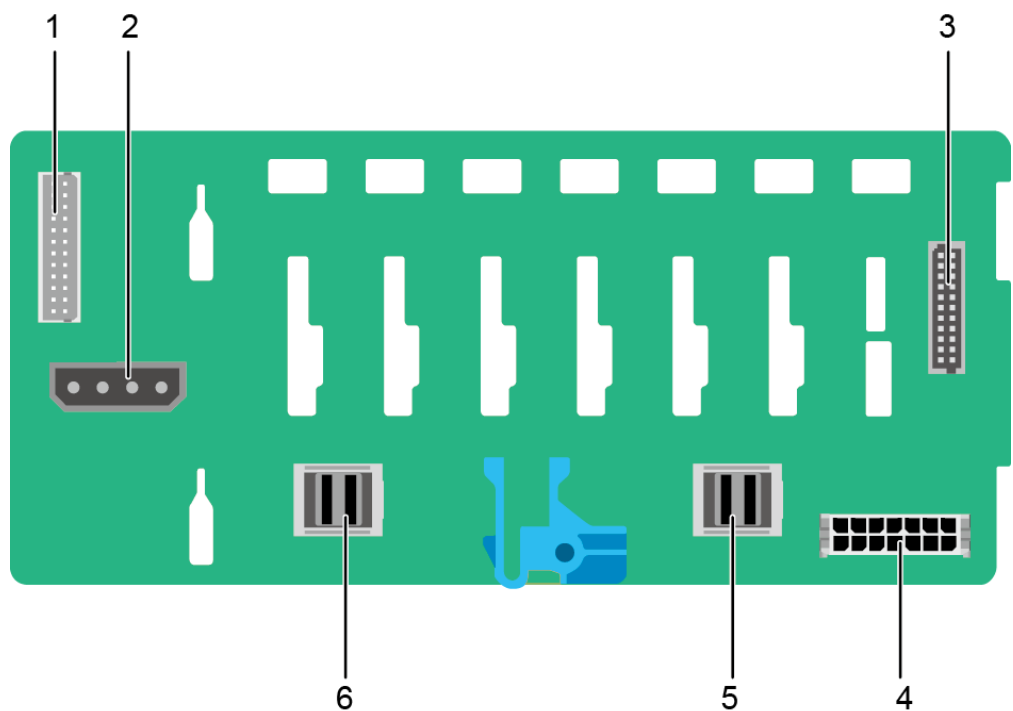
| | | | |
|----------------------------------------|--|--|-------------------------|
| | | | (REAR 4*2.5 HDD BP/J57) |
| a: Reserved and unavailable currently. | | | |

5.2.11.2 Drive Backplane

Front hard disk backplane

- 8 x 2.5" drive pass-through backplane
 All drive configurations in [5.2.5.1.1 8 x 2.5" drive pass-through configuration](#) support this backplane.

Figure 5-135 8 x 2.5" drive pass-through backplane

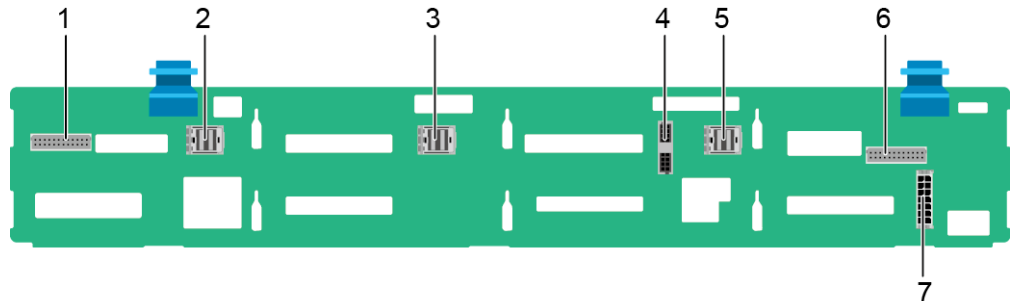


| | | | |
|---|------------------------------------------------------------------------------------------------------|---|-------------------------------------|
| 1 | Indicator signal cable connector (REAR BP1/J3) NOTE Reserved and unavailable currently. | 2 | DVD drive power connector (DVD/J11) |
| 3 | Backplane signal cable connector (HDD BP/J1) | 4 | Power connector (POWER/J2) |
| 5 | Mini-SAS HD connector (PORT A/J28) | 6 | Mini-SAS HD connector (PORT B/J29) |

- 12 x 3.5" drive pass-through backplane

This backplane is supported by 12 x 3.5" drive pass-through configuration 1, 12 x 3.5" drive pass-through configuration 2, and 12 x 3.5" drive pass-through configuration 3 in [5.2.5.1.2 12 x 3.5" drive pass-through configuration](#).

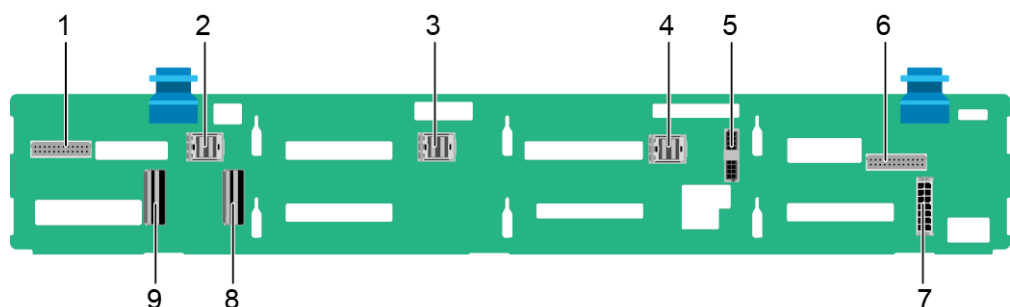
Figure 5-136 12 x 3.5" drive pass-through backplane



| | | | |
|---|------------------------------------------------|---|------------------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J7) | 2 | Mini-SAS HD connector (PORT C/J5) |
| 3 | Mini-SAS HD connector (PORT B/J4) | 4 | Backplane signal cable connector (HDD BP/J6) |
| 5 | Mini-SAS HD connector (PORT A/J3) | 6 | Indicator signal cable connector (REAR BP1/J8) |
| 7 | Power connector (POWER/J1) | - | - |

- 12 x 3.5" drive NVMe backplane (4 x NVMe)
 This backplane is supported by 12 x 3.5" drive pass-through configuration 1 (4 x NVMe), 12 x 3.5" drive pass-through configuration 2 (4 x NVMe), and 12 x 3.5" drive pass-through configuration 3 (4 x NVMe) in [5.2.5.1.2 12 x 3.5" drive pass-through configuration](#).

Figure 5-137 12 x 3.5" drive NVMe backplane (4 x NVMe)

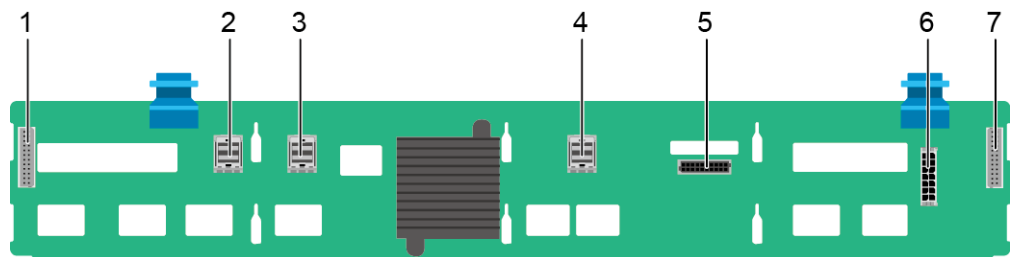


| | | | |
|---|-------------------------------------------------|---|------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J30) | 2 | Mini-SAS HD connector (PORT C/J36) |
|---|-------------------------------------------------|---|------------------------------------|

| | | | |
|---|----------------------------------------------|---|-------------------------------------------------|
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | Mini-SAS HD connector (PORT A/J28) |
| 5 | Backplane signal cable connector (HDD_BP/J1) | 6 | Indicator signal cable connector (REAR BP1/J31) |
| 7 | Backplane power connector (HDD_BP/J24) | 8 | LP slimline 1 connector (SLIMLINE 1/J4) |
| 9 | LP slimline 2 connector (SLIMLINE 2/J37) | - | - |

- 12 x 3.5" drive EXP backplane
 All drive configurations in [5.2.5.1.3 12 x 3.5" drive EXP configuration](#) support this backplane.

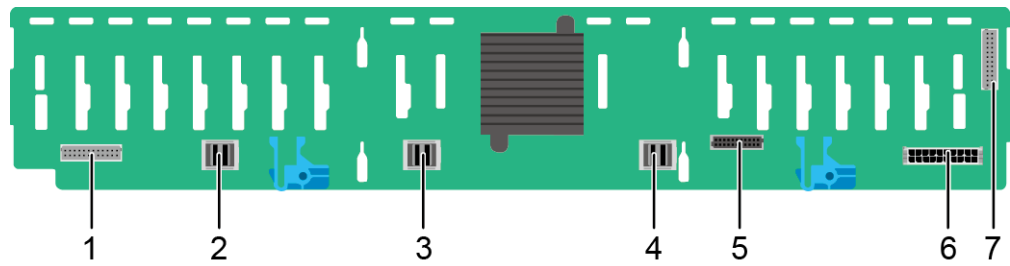
Figure 5-138 12 x 3.5" drive EXP backplane



| | | | |
|---|-------------------------------------------------|---|---------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J31) | 2 | Mini-SAS HD connector (PORT A/J28) |
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | mini-SAS HD connector (REAR PORT/J34) |
| 5 | Backplane signal cable connector (HDD BP/J35) | 6 | Power connector (POWER/J24) |
| 7 | Indicator signal cable connector (REAR BP1/J32) | - | - |

- 25 x 2.5" drive backplane
 All drive configurations in [5.2.5.1.4 25 x 2.5" drive EXP configuration](#) support this backplane.

Figure 5-139 25 x 2.5" drive backplane



| | | | |
|---|-------------------------------------------------|---|---------------------------------------|
| 1 | Indicator signal cable connector (REAR BP0/J32) | 2 | Mini-SAS HD connector (PORT A/J28) |
| 3 | Mini-SAS HD connector (PORT B/J29) | 4 | Mini-SAS HD connector (REAR PORT/J31) |
| 5 | Backplane signal cable connector (HDD_BP/J1) | 6 | Power connector (POWER/J24) |
| 7 | Indicator signal cable connector (REAR BP1/J35) | - | - |

Built-in-Drive Backplane

- 4 x 3.5" drive backplane

Figure 5-140 4 x 3.5" drive backplane

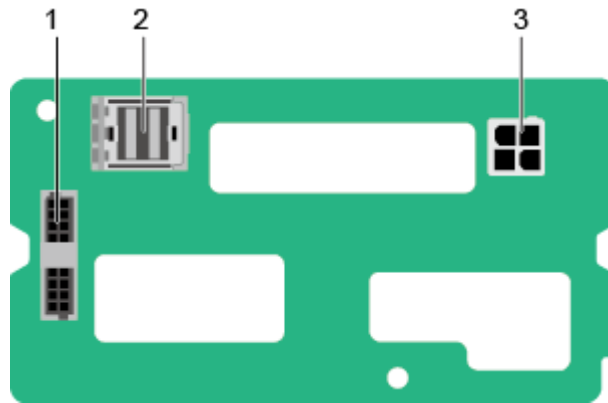


| | | | |
|---|----------------------------------------------|---|----------------------------------------------------|
| 1 | Mini-SAS HD connector (PORT A/J3) | 2 | Backplane signal cable connector (INNER HDD BP/J1) |
| 3 | Backplane power connector (INNER HDD PWR/J2) | - | - |

Rear-drive backplane

- 2 x 3.5" drive backplane

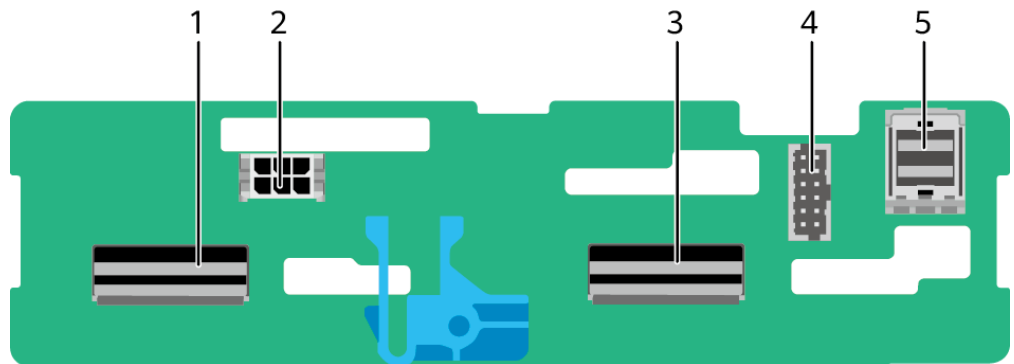
Figure 5-141 2 x 3.5" drive backplane



| | | | |
|---|-----------------------------------------------|---|--------------------------------------|
| 1 | Indicator signal cable connector (REAR BP/J5) | 2 | mini-SAS HD connector (REAR PORT/J2) |
| 3 | Power connector (BP PWR/J1) | - | - |

- 4 x 2.5" drive backplane

Figure 5-142 4 x 2.5" drive backplane



| | | | |
|---|----------------------------------------|---|-------------------------------------------------|
| 1 | LP slimline 4 connector (SLIM_4/J1001) | 2 | Power connector (POWR/J2502) |
| 3 | LP slimline 3 connector (SLIM_3/J901) | 4 | Backplane signal cable connector (HDD BP/J2302) |
| 5 | mini-SAS HD connector (Port A/J801) | - | - |

6 Product Specifications

[6.1 2288H V6-32DIMM](#)

[6.2 2288H V6-16DIMM](#)

6.1 2288H V6-32DIMM

6.1.1 Technical Specifications

Table 6-1 Technical specifications

| Component | Specifications |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form factor | 2U rack server |
| Chipset | Intel® C621A |
| Processor | <p>Supports one or two processors.</p> <ul style="list-style-type: none"> • Third-generation Intel® Xeon® Scalable Ice Lake processors • Built-in memory controller and eight memory channels per processor • Built-in PCIe controller, supporting PCIe 4.0 and 64 lanes per processor • Three UPI buses between processors, providing up to 11.2 GT/s transmission per channel • Up to 40 cores • Max. 3.6 GHz • Min. 1.5 MB L3 cache per core • Max. 270 W TDP <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| DIMM | <p>Supports 32 memory module slots.</p> <ul style="list-style-type: none"> • Up to 32 DDR4 memory modules |

| Component | Specifications |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> - RDIMM and LRDIMM support - Max. 3200 MT/s memory speed - The DDR4 memory modules of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together. - A server must use DDR4 memory modules of the same part number (P/N code). <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| Storage | <p>Supports a variety of drive configurations. For details, see 5.1.5.1 Drive Configurations .</p> <ul style="list-style-type: none"> • Supports two M.2 SSDs. <ul style="list-style-type: none"> - M.2 SSDs are supported for RAID configuration when the server is configured with an Avago SAS3004iMR RAID controller card. - M.2 SSDs are supported for VROC (SATA RAID) configuration when the server is configured with an M.2 SSD adapter card. <p>NOTE</p> <ul style="list-style-type: none"> • The M.2 SSD is used only as a boot device for installing the OS. Small-capacity (32 GB or 64 GB) M.2 SSDs do not support logging due to poor endurance. If a small-capacity M.2 SSD is used as the boot device, a dedicated log drive or log server is required for logging. For example, you can dump VMware logs in either of the following ways: <ul style="list-style-type: none"> • Redirect /scratch. For details, see https://kb.vmware.com/s/article/1033696. • Configure syslog. For details, see https://kb.vmware.com/s/article/2003322. • The M.2 SSD cannot be used to store data due to poor endurance. In write-intensive applications, the M.2 SSD will wear out in a short time. If you want to use SSDs or HDDs as data storage devices, use enterprise-level SSDs or HDDs with high DDPD. • The M.2 SSD is not recommended for write-intensive service software due to poor endurance. • Do not use M.2 SSDs for cache. <ul style="list-style-type: none"> • Supports hot swap of SAS/SATA/NVMe drives. <p>NOTE The NVMe drives support:</p> <ul style="list-style-type: none"> • Before using the VMD function, contact technical support engineers of the OS vendor to check whether the OS supports the VMD function. If yes, check whether the VMD driver needs to be manually installed and check the installation method. • Surprise hot swap if the VMD function is enabled and the latest Intel VMD driver is installed. • Orderly hot swap if the VMD function is disabled. <ul style="list-style-type: none"> • Supports a variety of RAID controller cards. For details, |

| Component | Specifications |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>consult the local sales representative.</p> <ul style="list-style-type: none"> - The RAID controller card supports RAID configuration, RAID level migration, and drive roaming. - The RAID controller card supports a supercapacitor for power-off protection to ensure user data security. - The PCIe RAID controller card occupies one PCIe slot. <p>For details about the RAID controller card, see <i>FusionServer V6 Server RAID Controller Card User Guide</i>.</p> <p>NOTE If the BIOS is in legacy mode, the 4K drive cannot be used as the boot drive.</p> |
| Network | <p>Supports expansion capability of multiple types of networks.</p> <ul style="list-style-type: none"> • OCP 3.0 network adapter <ul style="list-style-type: none"> - The two FlexIO card slots support two OCP 3.0 network adapter respectively, which can be configured as required. - Supports orderly hot swap. <p>NOTE The OCP 3.0 network adapter supports orderly hot swap only when the VMD function is disabled.</p> <ul style="list-style-type: none"> - Supports a variety of OCP 3.0 network adapters. For details, consult the local sales representatives. |
| I/O expansion | <p>Supports PCIe slots.</p> <ul style="list-style-type: none"> • Server model with drive module or PCIe riser module (PRM) on the rear panel: one PCIe slot dedicated for a screw-in RAID controller card, two FlexIO slots dedicated for OCP 3.0 network adapters, and eight slots for standard PCIe cards. • Server model with four GPU cards installed on the rear panel: one PCIe slot dedicated for a screw-in RAID controller card, two FlexIO slots dedicated for OCP 3.0 network adapters, and five slots for PCIe cards. • Server model with 11 standard PCIe cards installed on the rear panel: one PCIe slot dedicated for a screw-in RAID controller card, two FlexIO slots dedicated for OCP 3.0 network adapters, and 11 slots for standard PCIe cards. <p>For details, see 5.1.7.2 PCIe Slots and 5.1.7.3 PCIe Slot Description.</p> <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| Port | <p>Supports a variety of ports.</p> <ul style="list-style-type: none"> • Ports on the front panel: <ul style="list-style-type: none"> - One USB Type-C iBMC direct connect management port |

| Component | Specifications |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> - Two USB 3.0 ports - One DB15 VGA port • Ports on the rear panel: <ul style="list-style-type: none"> - Two USB 3.0 ports - One DB15 VGA port - One RJ45 serial port - One RJ45 management network port • Built-in ports: <ul style="list-style-type: none"> - One USB 3.0 port - Two SATA ports <p>NOTE You are not advised to install the operating system on the USB storage media.</p> |
| Video card | <p>An SM750 video chip with 32 MB display memory is integrated on the mainboard. The maximum display resolution is 1920 x 1200 at 60 Hz with 16 M colors.</p> <p>NOTE</p> <ul style="list-style-type: none"> • The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the operating system version is installed. Otherwise, only the default resolution supported by the operating system is provided. • If both the front and rear VGA ports are connected to monitors, only the monitor connected to the front VGA port displays information. |
| System management | <ul style="list-style-type: none"> • UEFI • iBMC • NC-SI • Integration with third-party management systems |
| Security feature | <ul style="list-style-type: none"> • Power-on password • Administrator password • TCM (only in China)/TPM • Secure boot • Front bezel (optional) • Chassis cover opening detection |

6.1.2 Environmental Specifications

Table 6-2 Environmental specifications

| Category | Specifications |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature | <ul style="list-style-type: none"> • Operating temperature: 5°C to 45°C (41°F to 113°F) (ASHRAE Classes A1 to A4 compliant) |

| Category | Specifications |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Storage temperature (within three months): –30°C to +60°C (–22°F to 140°F) • Storage temperature (within six months): –15°C to +45°C (5°F to 113°F) • Storage temperature (within one year): –10°C to +35°C (14°F to 95°F) • Maximum rate of temperature change: 20°C (36°F) per hour, 5°C (9°F) per 15 minutes <p>NOTE The highest operating temperature varies depending on the server configuration. For details, see A.2.1 2288H V6-32DIMM.</p> |
| Relative humidity (RH, non-condensing) | <ul style="list-style-type: none"> • Operating humidity: 8% to 90% • Storage humidity (within three months): 8% to 85% • Storage humidity (within six months): 8% to 80% • Storage humidity (within one year): 20% to 75% • Maximum humidity change rate: 20%/h |
| Air volume | ≥ 204 cubic feet per minute (CFM) |
| Operating altitude | <p>≤ 3050 m (10006.44 ft)</p> <ul style="list-style-type: none"> • When the server configuration complies with ASHRAE Classes A1 and A2 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.24 ft). • When the server configuration complies with ASHRAE Class A3 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 175 m (574.14 ft). • When the server configuration complies with ASHRAE Class A4 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.1 ft). • HDDs cannot be used at an altitude of over 3050 m (10006.44 ft). |
| Corrosive gaseous contaminant | <p>Maximum corrosion product thickness growth rate:</p> <ul style="list-style-type: none"> • Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion) • Silver corrosion rate test: 200 Å/month |
| Particle contaminant | <ul style="list-style-type: none"> • The equipment room environment meets the requirements of ISO 14664-1 Class 8. • There is no explosive, conductive, magnetic, or corrosive dust in the equipment room. <p>NOTE It is recommended that the particulate pollutants in the equipment room be monitored by a professional organization.</p> |

| Category | Specifications |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acoustic noise | <p>The declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) listed are measured at 23°C (73.4°F) in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).</p> <ul style="list-style-type: none"> • Idle: <ul style="list-style-type: none"> – LWAd: 5.73 Bels – LpAm: 40.2 dBA • Operating: <ul style="list-style-type: none"> – LWAd: 6.62 Bels – LpAm: 49.1 dBA <p>NOTE Actual sound levels generated during server operation vary depending on server configuration, load, and ambient temperature.</p> |

 **NOTE**

SSDs and HDDs (including NL-SAS, SAS, and SATA) cannot be preserved for a long time in the power-off state. Data may be lost or faults may occur if the preservation duration exceeds the specified maximum duration. When drives are preserved under the storage temperature and humidity specified in the preceding table, the following preservation time is recommended:

- Maximum preservation duration of SSDs:
 - 12 months in power-off state without data stored
 - 3 months in power-off state with data stored
- Maximum preservation duration of HDDs:
 - 6 months in unpacked/packed and powered-off state
- The maximum preservation duration is determined according to the preservation specifications provided by drive vendors. For details, see the manuals provided by drive vendors.

6.1.3 Physical Specifications

Table 6-3 Physical specifications

| Category | Description |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> • Chassis with 3.5" drives: 86.1 mm x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.) • Chassis with 2.5" drives: 86.1 mm x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.) |
| Installation space | <ul style="list-style-type: none"> • Requirements for cabinet installation: <p>Cabinet compliant with the International Electrotechnical Commission (IEC) 297 standard</p> <ul style="list-style-type: none"> – Cabinet width: 482.6 mm (19.00 in.) – Cabinet depth ≥ 1000 mm (39.37 in.) • Requirements for guide rail installation: <ul style="list-style-type: none"> – L-shaped guide rails: For details about the installation |

| Category | Description |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>requirements, contact technical support.</p> <ul style="list-style-type: none"> - Static rail kit: applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars. - Ball bearing rail kit: applies to cabinets with a distance of 609 mm to 950 mm (23.98 in. to 37.40 in.) between the front and rear mounting bars. |
| Weight in full configuration | <ul style="list-style-type: none"> • Maximum net weight: <ul style="list-style-type: none"> - Server with 8 x 2.5" front drives: 22.5 kg (49.60 lb) - Server with 12 x 2.5" front drives: 23.5 kg (51.81 lb) - Server with 12 x 3.5" front drives: 35.5 kg (78.26 lb) - Server with 20 x 2.5" front drives: 25.5 kg (56.22 lb) - Server with 24 x 2.5" front drives: 25.5 kg (56.22 lb) - Server with 25 x 2.5" front drives: 25.5 kg (56.22 lb) • Packaging materials: 5 kg (11.03 lb) |
| Power consumption | The power consumption parameters vary with server configurations, including the configurations complying with energy-related products (ErP) requirements. For details, consult the local sales representative. |

6.2 2288H V6-16DIMM

6.2.1 Technical Specifications

Table 6-4 Technical specifications

| Component | Specifications |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form factor | 2U rack server |
| Chipset | Intel® C621A |
| Processor | <p>Supports one or two processors.</p> <ul style="list-style-type: none"> • Third-generation Intel® Xeon® Scalable Ice Lake processors • Built-in memory controller and eight memory channels per processor • Built-in PCIe controller, supporting PCIe 4.0 and 64 lanes per processor • Three UPI buses between processors, providing up to 11.2 GT/s transmission per channel • Up to 40 cores |

| Component | Specifications |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Max. 3.6 GHz • Min. 1.5 MB L3 cache per core • Max. 270 W TDP <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| DIMM | <ul style="list-style-type: none"> • Up to 16 DDR4 memory modules <ul style="list-style-type: none"> – RDIMM and LRDIMM support – Max. 3200 MT/s memory speed – The DDR4 memory modules of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together. – A server must use DDR4 memory modules of the same part number (P/N code). <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| Storage | <p>Supports a variety of drive configurations. For details, see 5.2.5.1 Drive Configurations .</p> <ul style="list-style-type: none"> • Supports two M.2 SSDs. <ul style="list-style-type: none"> – M.2 SSDs are supported for RAID configuration when the server is configured with an Avago SAS3004iMR RAID controller card. – M.2 SSDs are supported for VROC (SATA RAID) configuration when the server is configured with an M.2 SSD adapter card. <p>NOTE</p> <ul style="list-style-type: none"> • The M.2 SSD is used only as a boot device for installing the OS. Small-capacity (32 GB or 64 GB) M.2 SSDs do not support logging due to poor endurance. If a small-capacity M.2 SSD is used as the boot device, a dedicated log drive or log server is required for logging. For example, you can dump VMware logs in either of the following ways: <ul style="list-style-type: none"> • Redirect <code>/scratch</code>. For details, see https://kb.vmware.com/s/article/1033696. • Configure syslog. For details, see https://kb.vmware.com/s/article/2003322. • The M.2 SSD cannot be used to store data due to poor endurance. In write-intensive applications, the M.2 SSD will wear out in a short time. If you want to use SSDs or HDDs as data storage devices, use enterprise-level SSDs or HDDs with high DDPD. • The M.2 SSD is not recommended for write-intensive service software due to poor endurance. • Do not use M.2 SSDs for cache. <ul style="list-style-type: none"> • Supports hot swap of SAS/SATA/NVMe drives. <p>NOTE</p> |

| Component | Specifications |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>The NVMe drives support:</p> <ul style="list-style-type: none"> • Before using the VMD function, contact technical support engineers of the OS vendor to check whether the OS supports the VMD function. If yes, check whether the VMD driver needs to be manually installed and check the installation method. • Surprise hot swap if the VMD function is enabled and the latest Intel VMD driver is installed. • Orderly hot swap if the VMD function is disabled. <ul style="list-style-type: none"> • Supports a variety of RAID controller cards. For details, consult the local sales representative. <ul style="list-style-type: none"> – The RAID controller card supports RAID configuration, RAID level migration, and drive roaming. – The RAID controller card supports a supercapacitor for power-off protection to ensure user data security. – The PCIe RAID controller card occupies one PCIe slot. <p>For details about the RAID controller card, see <i>FusionServer V6 Server RAID Controller Card User Guide</i>.</p> <p>NOTE If the BIOS is in legacy mode, the 4K drive cannot be used as the boot drive.</p> |
| Network | <p>Supports expansion capability of multiple types of networks.</p> <ul style="list-style-type: none"> • OCP 3.0 network adapter <ul style="list-style-type: none"> – The FlexIO card slot supports OCP 3.0 network adapters, which can be configured as required. – Supports orderly hot swap. <p>NOTE The OCP 3.0 network adapter supports orderly hot swap only when the VMD function is disabled.</p> <ul style="list-style-type: none"> – Supports a variety of OCP 3.0 network adapters. For details, consult the local sales representatives. |
| I/O expansion | <p>Supports 9 PCIe slots.</p> <ul style="list-style-type: none"> • One PCIe slot dedicated for a screw-in RAID controller card, one FlexIO slot dedicated for an OCP 3.0 network adapter, and seven PCIe slots for standard PCIe cards. <p>For details, see 5.2.7.2 PCIe Slots and 5.2.7.3 PCIe Slot Description.</p> <ul style="list-style-type: none"> • Support GPU cards. <p>NOTE The information listed in this table is for reference only. For details, consult the local sales representative.</p> |
| Port | <p>Supports a variety of ports.</p> <ul style="list-style-type: none"> • Ports on the rear panel: <ul style="list-style-type: none"> – Two USB 3.0 ports – One DB15 VGA port – One RJ45 serial port |

| Component | Specifications |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> - One RJ45 management network port • Built-in ports: <ul style="list-style-type: none"> - One USB 3.0 port - Two SATA ports <p>NOTE You are not advised to install the operating system on the USB storage media.</p> |
| Video card | <p>An SM750 video chip with 32 MB display memory is integrated on the mainboard. The maximum display resolution is 1920 x 1200 at 60 Hz with 16 M colors.</p> <p>NOTE The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the operating system version is installed. Otherwise, only the default resolution supported by the operating system is provided.</p> |
| System management | <ul style="list-style-type: none"> • UEFI • iBMC • NC-SI • Integration with third-party management systems |
| Security feature | <ul style="list-style-type: none"> • Power-on password • Administrator password • TCM (only in China)/TPM • Secure boot • Front bezel (optional) • Chassis cover opening detection |

6.2.2 Environmental Specifications

Table 6-5 Environmental specifications

| Category | Specifications |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature | <ul style="list-style-type: none"> • Operating temperature: 5°C to 45°C (41°F to 113°F) (ASHRAE Classes A1 to A4 compliant) • Storage temperature (within three months): -30°C to +60°C (-22°F to 140°F) • Storage temperature (within six months): -15°C to +45°C (5°F to 113°F) • Storage temperature (within one year): -10°C to +35°C (14°F to 95°F) • Maximum rate of temperature change: 20°C (36°F) per hour, 5°C (9°F) per 15 minutes <p>NOTE</p> |

| Category | Specifications |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | The highest operating temperature varies depending on the server configuration. For details, see A.2.2 2288H V6-16DIMM . |
| Relative Humidity (RH, non-condensing) | <ul style="list-style-type: none"> • Operating humidity: 8% to 90% • Storage humidity (within three months): 8% to 85% • Storage humidity (within six months): 8% to 80% • Storage humidity (within one year): 20% to 75% • Maximum humidity change rate: 20%/h |
| Air volume | ≥ 204 CFM |
| Operating altitude | ≤ 3050 m (10006.44 ft) <ul style="list-style-type: none"> • When the server configuration complies with ASHRAE Classes A1 and A2 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.24 ft). • When the server configuration complies with ASHRAE Class A3 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 175 m (574.14 ft). • When the server configuration complies with ASHRAE Class A4 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.1 ft). • HDDs cannot be used at an altitude of over 3050 m (10006.44 ft). |
| Corrosive gaseous contaminant | Maximum corrosion product thickness growth rate: <ul style="list-style-type: none"> • Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion) • Silver corrosion rate test: 200 Å/month |
| Particle contaminant | <ul style="list-style-type: none"> • The equipment room environment meets the requirements of ISO 14664-1 Class 8. • There is no explosive, conductive, magnetic, or corrosive dust in the equipment room. <p>NOTE It is recommended that the particulate pollutants in the equipment room be monitored by a professional organization.</p> |
| Acoustic noise | The declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) listed are measured at 23°C (73.4°F) in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). <ul style="list-style-type: none"> • Idle: <ul style="list-style-type: none"> – LWAd: 5.98 Bels – LpAm: 42.6 dBA • Running: |

| Category | Specifications |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> - LWAd: 6.68 Bels - LpAm: 49.5 dBA <p>NOTE Actual sound levels generated during server operation vary depending on server configuration, load, and ambient temperature.</p> |

 **NOTE**

SSDs and HDDs (including NL-SAS, SAS, and SATA) cannot be preserved for a long time in the power-off state. Data may be lost or faults may occur if the preservation duration exceeds the specified maximum duration. When drives are preserved under the storage temperature and humidity specified in the preceding table, the following preservation time is recommended:

- Maximum preservation duration of SSDs:
 - 12 months in power-off state without data stored
 - 3 months in power-off state with data stored
- Maximum preservation duration of HDDs:
 - 6 months in unpacked/packed and powered-off state
- The maximum preservation duration is determined according to the preservation specifications provided by drive vendors. For details, see the manuals provided by drive vendors.

6.2.3 Physical Specifications

Table 6-6 Physical specifications

| Category | Description |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> • Chassis with 3.5" drives: 86.1 mm x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.) • Chassis with 2.5" drives: 86.1 mm x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.) |
| Installation space | <ul style="list-style-type: none"> • Requirements for cabinet installation: <p>Cabinet compliant with the International Electrotechnical Commission (IEC) 297 standard</p> <ul style="list-style-type: none"> - Cabinet width: 482.6 mm (19.00 in.) - Cabinet depth \geq 1000 mm (39.37 in.) • Requirements for guide rail installation: <ul style="list-style-type: none"> - L-shaped guide rails: For details about the installation requirements, contact technical support. - Static rail kit: applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars. - Ball bearing rail kit: applies to cabinets with a distance of 609 mm to 950 mm (23.98 in. to 37.40 in.) between the front and rear mounting bars. |
| Weight in full configuration | <ul style="list-style-type: none"> • Maximum net weight: <ul style="list-style-type: none"> - Server with 8 x 2.5" front drives: 22.5 kg (55.13 lb) |

| Category | Description |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none">- Server with 12 x 3.5" front drives: 35.5 kg (66.15 lb)- Server with 25 x 2.5" front drives: 25.5 kg (66.15 lb)• Packaging materials: 5 kg (11.03 lb) |
| Power consumption | The power consumption parameters vary with server configurations, including the configurations complying with energy-related products (ErP) requirements. For details, consult the local sales representative. |

7 Software and Hardware Compatibility

For details about the OS and hardware, contact technical support.

NOTICE

- If incompatible components are used, the device may be abnormal. This fault is beyond the scope of technical support and warranty.
 - The performance of servers is closely related to application software, basic middleware software, and hardware. The slight differences of the application software, middleware basic software, and hardware may cause performance inconsistency between the application layer and test software layer.
 - If the customer has requirements on the performance of specific application software, contact technical support to apply for POC tests in the pre-sales phase to determine detailed software and hardware configurations.
 - If the customer has requirements on hardware performance consistency, specify the specific configuration requirements (for example, specific drive models, RAID controller cards, or firmware versions) in the pre-sales phase.
-

8 Safety Instructions

8.1 Security

8.2 Maintenance and Warranty

8.1 Security

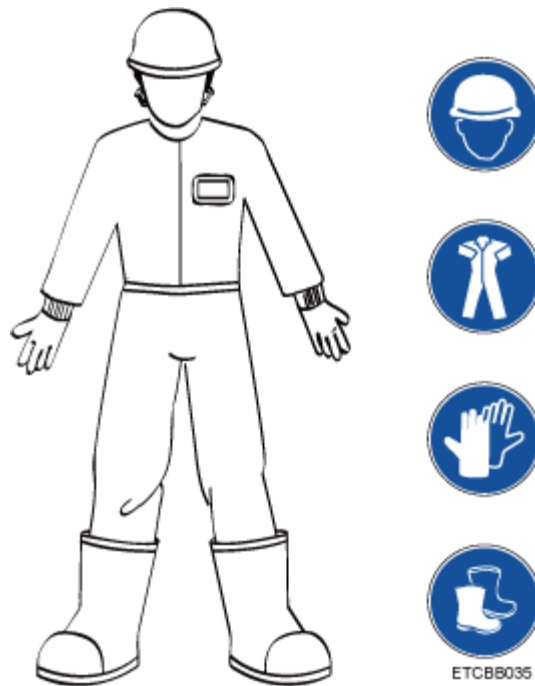
General Statement

- Comply with local laws and regulations when installing devices. These Safety Instructions are only a supplement.
- The "DANGER", "WARNING", and "CAUTION" information in this document does not represent all the safety instructions, but supplements to the safety instructions.
- Observe all safety instructions provided on the device labels when installing hardware. Follow them in conjunction with these Safety Instructions.
- Only qualified personnel are allowed to perform special tasks, such as performing high-voltage operations and driving a forklift.
- This is a class A product, which may cause radio interference in a domestic environment. Take protective measures before operating this product in a residential environment.

Personal Safety

- Only personnel certified or authorized are allowed to install equipment.
- Discontinue any dangerous operations and take protective measures. Report anything that could cause personal injury or device damage to a project supervisor.
- Do not move devices or install racks and power cables in hazardous weather conditions.
- Do not carry the weight that is over the maximum load per person allowed by local laws or regulations. Before moving or installing equipment, check the maximum equipment weight and arrange required personnel.
- Wear clean protective gloves, ESD clothing, a protective hat, and protective shoes, as shown in [Figure 8-1](#).

Figure 8-1 Safety work wear



- Before touching a device, wear ESD clothing and gloves (or wrist strap), and remove any conductive objects (such as watches and jewelry). [Figure 8-2](#) shows conductive objects that must be removed before you touch a device.

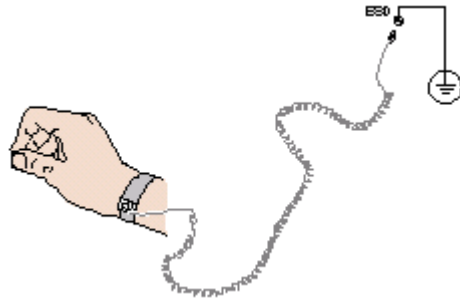
Figure 8-2 Removing conductive objects



[Figure 8-3](#) shows how to wear an ESD wrist strap.

- Put your hands into the ESD wrist strap.
- Tighten the strap buckle and ensure that the ESD wrist strap is in contact with your skin.
- Insert the ground terminal attached to the ESD wrist strap into the jack on the grounded rack or chassis.

Figure 8-3 Wearing an ESD wrist strap



- Exercise caution when using tools.
- If the installation position of a device is higher than the shoulders of the installation personnel, use a vehicle such as a lift to facilitate installation. Prevent the device from falling down and causing personal injury or damage to the device.
- The equipment is powered by high-voltage power sources. Direct or indirect contact (especially through damp objects) with high-voltage power sources may result in serious injury or death.
- Ground the equipment before powering it on. Otherwise, personal injury may be caused by high electricity leakage.
- When a ladder is used, ensure that another person holds the ladder steady to prevent accidents.
- Do not look into optical ports without eye protection.

Device Security

- Use the recommended power cables at all times.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Before operating equipment, wear ESD clothes and gloves to prevent electrostatic-sensitive devices from being damaged by ESD.
- When moving a device, hold the bottom of the device. Do not hold the handles of the installed modules, such as the PSUs, fan modules, drives, and the mainboard. Handle the equipment with care.
- Exercise caution when using tools.
- Connect the primary and secondary power cables to different power distribution units (PDUs) to ensure reliable system operation.
- Ground a device before powering it on. Otherwise, high leakage current may cause device damage.

Transportation Precautions

Improper transportation may damage equipment. Contact the manufacturer for precautions before attempting transportation.

Transportation precautions include but are not limited to:

- The logistics company engaged to transport the device must be reliable and comply with international standards for transporting electronics. Ensure that the equipment being transported is always kept upright. Take necessary precautions to prevent collisions, corrosion, package damage, damp conditions and pollution.

- Transport each device in its original packaging.
- If the original packaging is unavailable, package heavy, bulky parts (such as chassis and blades) and fragile parts (such as PCIe cards and optical modules) separately.

 **NOTE**

For details about the components supported by the server, contact the local sales representatives.

- Power off all devices before transportation.

Maximum Weight Carried by a Person

 **CAUTION**

Comply with local regulations for the maximum load per person.

Table 8-1 lists the maximum weight one person is permitted to carry as stipulated by a number of organizations.

Table 8-1 Maximum weight carried per person

| Organization | Weight (kg/lb) |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 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) | <ul style="list-style-type: none">• Male: 15/33.08• Female: 10/22.05 |

For more information about safety instructions, see *Server Safety Information*.

8.2 Maintenance and Warranty

For details about the maintenance policy, contact technical support.

For details about the warranty policy, contact technical support.

9 System Management

This product integrates the new-generation Intelligent Baseboard Management Controller (iBMC), which complies with Intelligent Platform Management Interface 2.0 (IPMI 2.0) specifications and provides reliable hardware monitoring and management.

The iBMC provides the following features:

- Various management interfaces
The iBMC provides the following standard interfaces to meet various system integration requirements:
 - DCMI 1.5 interface
 - IPMI 1.5/IPMI 2.0 interface
 - CLI
 - Redfish interface
 - HTTPS
 - SNMP
- Fault detection and alarm management
Faults can be detected and rectified in advance to ensure 24/7 stable running of the device.
 - The iBMC allows screenshots and videos to be created when the system breaks down, facilitating cause analysis of the system breakdown.
 - The iBMC offers screen snapshots and videos, simplifying routine preventive maintenance, recording, and auditing.
 - The FDM function supports component-based precise fault diagnosis, facilitating component fault locating and replacement.
 - The iBMC supports the reporting of alarms through syslog packets, trap packets, and emails, helping the upper-layer NMS to collect the fault information about the server.
- Security management
 - Software image backup improves system security. Even if the running software breaks down, the system can be started from the backup image.
 - Diversified user security control interfaces are provided to ensure user login security.
 - Multiple types of certificates can be imported and replaced to ensure data transmission security.

- System maintenance interface
 - The virtual KVM and virtual media functions facilitate remote maintenance.
 - The iBMC supports out-of-band RAID monitoring and configuration to improve RAID configuration efficiency and management capabilities.
 - Smart Provisioning provides a convenient operation interface for installing the OS, configuring RAID, and performing the upgrade without a CD-ROM.
- Various network protocols
 - The NTP synchronizes network time to optimize time configuration.
 - The iBMC supports domain name system (DNS) and Lightweight Directory Application Protocol (LDAP) to implement domain management and directory service.
- Intelligent power management
 - The power capping technology helps you easily improve deployment density.
 - The iBMC uses dynamic power saving to reduce operational expenditure (OPEX).
- License management

By managing licenses, you can use the features of the iBMC advanced edition in authorization mode.

Compared with the standard edition, the iBMC advanced edition provides more advanced features, such as:

 - Implements the OS deployment using Redfish.
 - Collect the original data of intelligent diagnosis using Redfish.

A Appendix

A.1 Product SN

The serial number (SN) on the slide-out label plate uniquely identifies a device. The SN is required when you contact technical support.

Figure A-1 SN example



Table A-1 SN description

| No. | Description |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | ESN ID (two characters), which can only be 21 . |
| 2 | Material ID (eight characters), that is, the processing code. |
| 3 | Vendor code (two characters). XF indicates xFusion Digital Technologies Co., Limited, and other values indicate outsourcing vendors. |
| 4 | Year and month (two characters). <ul style="list-style-type: none"> The first character indicates the year. <ul style="list-style-type: none"> Digits 1 to 9 indicate years 2001 to 2009, respectively. Letters A to H indicate years 2010 to 2017, respectively. Letters J to N indicate years 2018 to 2022, respectively. Letters P to Y indicate years 2023 to 2032, respectively. <p>NOTE The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters are similar to the digits 1, 0, and 2.</p> |

| No. | Description |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> The second character indicates the month. <ul style="list-style-type: none"> Digits 1 to 9 indicate January to September, respectively. Letters A to C indicate October to December, respectively. |
| 5 | Serial number (six digits). |
| 6 | RoHS compliance (one character). Y indicates RoHS compliant. |
| 7 | Internal model, that is, product name. |

A.2 Operating Temperature Limitations

A.2.1 2288H V6-32DIMM

Table A-2 Operating temperature limitations

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|-------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 x 2.5" drive pass-through configuration | All options supported | Options not supported: <ul style="list-style-type: none"> 2 x Tesla V100 GPU cards | Options not supported: <ul style="list-style-type: none"> Rear drives (including HDD/SSD/NVMe SSD/M.2) GPU cards PMem | Options supported: <ul style="list-style-type: none"> 4309Y/4310/4310T/4314/4316/5315Y/5317/5318N/5318S/5318Y/5320T/6338T processors RDIMMs of less than 64 GB per module Options not supported: <ul style="list-style-type: none"> Rear drives (including HDD/SSD/NVMe SSD/M.2) GPU cards IB cards NICs of greater than 25 GB CX5/CX6 NICs |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|-----------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | <ul style="list-style-type: none"> • OCP 3.0 network adapters with ports of 25GE or higher rate • 9460-16i RAID controller cards • PMem |
| 8 x 2.5" drive + 11 x PCIe card configuration | <ul style="list-style-type: none"> • All options supported | <ul style="list-style-type: none"> • Options not supported: 2 x Tesla V100 GPU cards | <ul style="list-style-type: none"> • Options not supported: Rear drives (including HDD/SSD/NVMe SSD/M.2) • GPU cards • PMem | <ul style="list-style-type: none"> • Options supported: 4309Y/4310/4310T/4314/4316/5315Y/5317/5318N/5318S/5318Y/5320T/6338T processors • DIMMs of less than 64 GB • Options not supported: Rear drives (including HDD/SSD/NVMe SSD/M.2) • GPU cards • IB cards • NICs of greater than 25 GB • CX5/CX6 NICs • OCP 3.0 network adapters with ports of 25GE or higher • 9460-16i RAID controller cards |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|----------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | <ul style="list-style-type: none"> • PMem |
| 8 x 2.5" drive + 4 GPUs configuration | <ul style="list-style-type: none"> • All options supported | <ul style="list-style-type: none"> • Supports all options. | <ul style="list-style-type: none"> • All options not supported | <ul style="list-style-type: none"> • All options not supported |
| 12 x 2.5" drive pass-through configuration (4 x SAS/SATA + 8 x NVMe) | All options supported | Options not supported: <ul style="list-style-type: none"> • 2 x Tesla V100 GPU cards | Options not supported: <ul style="list-style-type: none"> • Rear drives (including HDD/SSD/Pcie SSD/NVMe SSD/M.2) • GPU cards • PMem | Options supported: <ul style="list-style-type: none"> • 4309Y/4310/4310T/4314/4316/5315Y/5317/5318N/5318S/5318Y/5320T/6338T processors • RDIMMs of less than 64 GB per module Options not supported: <ul style="list-style-type: none"> • Rear drives (including HDD/SSD/NVMe SSD/M.2) • GPU cards • IB cards • NICs of greater than 25 GB • CX5/CX6 NICs • OCP 3.0 network adapters with ports of 25GE or higher rate • 9460-16i RAID controller cards • PMem |
| 12 x 2.5" (4 x SAS/SATA + 8 x NVMe) + 4 x | <ul style="list-style-type: none"> • All options supported | <ul style="list-style-type: none"> • Supports all options. | <ul style="list-style-type: none"> • All options not supported | <ul style="list-style-type: none"> • All options not supported |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| GPU configuration | | | | |
| 12 x 3.5" drive pass-through configuration | <ul style="list-style-type: none"> Options not supported: Tesla V100/Tesla A100 GPU cards DDR4 DIMM or PMem of 256 GB per module or larger | <ul style="list-style-type: none"> Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 Built-in drives when the 6314U/6330/6338 processors and other processors of 205 W or higher power are configured 2.5" rear drives when built-in drives are configured OCP 3.0 network adapters with 2 x 100GE ports DDR4 DIMM or PMem of 128 GB per module or larger | <ul style="list-style-type: none"> Options not supported: 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors GPU cards Built-in drives Rear drives (including HDD/SSD/NVMe SSD/M.2) OCP 3.0 network adapters with ports of 100GE or higher rate DDR4 DIMM or PMem of 128 GB per module or larger | All options not supported |
| 12 x 3.5" drive EXP configuration | <ul style="list-style-type: none"> Options not supported: Tesla V100/Tesla A100 GPU cards DDR4 DIMM or PMem of 256 GB per module or larger | <ul style="list-style-type: none"> Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 Built-in drives when | <ul style="list-style-type: none"> Options not supported: 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors GPU cards | All options not supported |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| | larger | the 6314U/6330/6338 processors and other processors of 205 W or higher power are configured <ul style="list-style-type: none"> • 2.5" rear drives when built-in drives are configured • OCP 3.0 network adapters with 2 x 100GE ports • DDR4 DIMM or PMem of 128 GB per module or larger | <ul style="list-style-type: none"> • Built-in drives • Rear drives (including HDD/SSD/NVMe SSD/M.2) • OCP 3.0 network adapters with ports of 100GE or higher rate • DDR4 DIMM or PMem of 128 GB per module or larger | |
| 20 x 2.5" drive pass-through configuration (4 x SAS/SATA + 16 x NVMe) | <ul style="list-style-type: none"> • Options not supported: Tesla V100/Tesla A100 GPU cards | <ul style="list-style-type: none"> • Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 • OCP 3.0 network adapters with 2 x 100GE ports • DDR4 DIMM or PMem of 256 GB per module or larger | Options not supported: <ul style="list-style-type: none"> • 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors • GPU cards • Rear drives (including HDD/SSD/NVMe SSD/M.2) • OCP 3.0 network adapters with ports of 100GE or higher rate • DDR4 DIMM or | <ul style="list-style-type: none"> • All options not supported |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| | | | PMem of 128 GB per module or larger | |
| 24 x 2.5" drive pass-through configuration | Options not supported: <ul style="list-style-type: none"> • Tesla V100/Tesla A100 GPU cards | <ul style="list-style-type: none"> • Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 • OCP 3.0 network adapters with 2 x 100GE ports • DDR4 DIMM or PMem of 256 GB per module or larger | Options not supported: <ul style="list-style-type: none"> • 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors • GPU cards • Rear drives (including HDD/SSD/NVMe SSD/M.2) • OCP 3.0 network adapters with ports of 100GE or higher rate • DDR4 DIMM or PMem of 128 GB per module or larger | All options not supported |
| 24 x 2.5" NVMe drive configuration | <ul style="list-style-type: none"> • Options not supported: Tesla V100/Tesla A100 GPU cards | <ul style="list-style-type: none"> • Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 • OCP 3.0 network adapters with 2 x 100GE ports • DDR4 DIMM or PMem of 256 GB per | Options not supported: <ul style="list-style-type: none"> • 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors • GPU cards • Rear drives (including HDD/SSD/NVMe SSD/M.2) • OCP 3.0 network | <ul style="list-style-type: none"> • All options not supported |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Max. 45°C (113°F) |
|-----------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| | | module or larger | adapters with ports of 100GE or higher rate <ul style="list-style-type: none"> • DDR4 DIMM or PMem of 128 GB per module or larger | |
| 25 x 2.5" drive EXP configuration | Options not supported: <ul style="list-style-type: none"> • Tesla V100/Tesla A100 GPU cards | <ul style="list-style-type: none"> • Options not supported: Passively-cooled GPU cards, such as Tesla V100/Tesla T4 • OCP 3.0 network adapters with 2 x 100GE ports • DDR4 DIMM or PMem of 256 GB per module or larger | Options not supported: <ul style="list-style-type: none"> • 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors • GPU cards • Rear drives (including HDD/SSD/NVMe SSD/M.2) • OCP 3.0 network adapters with ports of 100GE or higher rate • DDR4 DIMM or PMem of 128 GB per module or larger | All options not supported |

 **NOTE**

- When a single fan is faulty, the highest operating temperature is 5°C (9°F) lower than the rated value.
- When a single fan is faulty, the system performance may be affected.
- When the 6342/6348/8351N/8358/8358P/8360Y/8368/8380 processors are configured, I/O modules 1, 2, and 3 do not support Tesla T4 GPU cards, and I/O module 3 does not support HDDs.
- It is recommended that servers be deployed at an interval of 1U to reduce server noise and improve server energy efficiency.
- The server does not support 8368Q 38c 270 W 2.6 GHz liquid-cooled processors.

A.2.2 2288H V6-16DIMM

Table A-3 Operating temperature limitations

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Maximum Operating Temperature: 45°C (113°F) |
|-------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 x 2.5" drive pass-through configuration | <ul style="list-style-type: none"> Supports all options. | <ul style="list-style-type: none"> Supports all options. | Options not supported: <ul style="list-style-type: none"> Rear drives (including HDD/SSD/P CIE SSD/NVMe SSD/M.2) Tesla T4 GPU cards | Options supported: <ul style="list-style-type: none"> 4309Y/4310/4310T/4314/4316/5315Y/5317/5318N/5318S/5318Y/5320T/6338T processors DIMMs of less than 64 GB per module Options not supported: <ul style="list-style-type: none"> Rear drives (including HDD/SSD/P CIE SSD/NVMe SSD/M.2) Tesla T4 GPU cards IB cards NICs greater than 25 GB CX5/CX6 NICs OCF 3.0 network adapters with ports of 25 GE or higher rate 9460-16i RAID controller cards |
| 12 x 3.5" drive pass-through | <ul style="list-style-type: none"> Supports all options. | <ul style="list-style-type: none"> Tesla T4 GPU cards | Options not supported: | <ul style="list-style-type: none"> No |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Maximum Operating Temperature: 45°C (113°F) |
|-----------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| configuration | | are not supported. | <ul style="list-style-type: none"> 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors Tesla T4 GPU cards Rear drives (including HDD/SSD/P CLe SSD/NVMe SSD/M.2) OCP 3.0 network adapters with ports of 100GE or higher rate | |
| 12 x 3.5" drive EXP configuration | <ul style="list-style-type: none"> Supports all options. | <ul style="list-style-type: none"> Tesla T4 GPU cards are not supported. Built-in drives when the 6314U/6330/6338 processors and other processors of 205 W or higher power are configured 2.5" rear drives when built-in drives are configured | Options not supported: <ul style="list-style-type: none"> 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors Tesla T4 GPU cards Built-in drives Rear drives (including HDD/SSD/P CLe SSD/NVMe SSD/M.2) OCP 3.0 network adapters with ports of 100GE or higher rate | <ul style="list-style-type: none"> All options not supported |

| Configuration | Max. 30°C (86°F) | Max. 35°C (95°F) | Max. 40°C (104°F) | Maximum Operating Temperature: 45°C (113°F) |
|-----------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 25 x 2.5" drive EXP configuration | <ul style="list-style-type: none"> Supports all options. | <ul style="list-style-type: none"> Tesla T4 GPU cards are not supported. | Options not supported: <ul style="list-style-type: none"> 6334/6342/6346/6348/8351N/6354/8358/8358P/8360Y/8368/8380 processors Tesla T4 GPU cards Rear drives (including HDD/SSD/Pcie SSD/NVMe SSD/M.2) OCP 3.0 network adapters with ports of 100GE or higher rate | <ul style="list-style-type: none"> All options not supported |

 **NOTE**

- When a single fan is faulty, the highest operating temperature is 5°C (9°F) lower than the rated value.
- When a single fan is faulty, the system performance may be affected.
- The server configured with 6342/6348/8351N/8358/8358P/8360Y/8368/8380 processors does not support Tesla T4 GPUs, and I/O module 3 does not support rear HDDs.
- It is recommended that servers be deployed at an interval of 1U to reduce server noise and improve server energy efficiency.
- The server does not support 8368Q 38c 270 W 2.6 GHz liquid-cooled processors.

A.3 RAS Features

The server supports a variety of Reliability, Availability, and Serviceability (RAS) features. You can configure these features for better performance.

For details about the RAS features, see *FusionServer Ice Lake Platform RAS Technical White Paper*.

A.4 Sensor List

A.4.1 2288H V6-32DIMM

| Sensor | Description | Component |
|----------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Inlet Temp | Air inlet temperature | Right mounting ear |
| Outlet Temp | Air outlet temperature | BMC card |
| PCH Temp | PCH bridge temperature | Mainboard |
| CPUN Core Rem | CPU core temperature | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN DTS | CPU DTS value | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN Margin | CPU Margin | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VDDQ Temp | CPU VDDQ temperature | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VRD Temp | CPU VRD temperature | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN MEM Temp | CPU memory module temperature | Memory module corresponding to CPU <i>N</i> <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN 12V | 12 V voltage supplied by the mainboard to the CPU | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| Riser 12V | 12 V voltage supplied by the mainboard to the riser card | Mainboard |
| Disk BP 12V | 12 V voltage supplied by the mainboard to the drive backplane | Mainboard |
| CPUN DDR VDDQ | 1.2 V memory module voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN DDR VDDQ2 | 1.2 V memory module voltage | Mainboard <i>N</i> indicates the CPU |

| Sensor | Description | Component |
|----------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------|
| | | number. The value is 1 or 2 . |
| CPUN VCCIN | CPU VCCIN voltage | Mainboard N indicates the CPU number. The value is 1 or 2 . |
| CPUN VSA | CPU VSA voltage | Mainboard N indicates the CPU number. The value is 1 or 2 . |
| CPUN P1V8 | CPU P1V8 voltage | Mainboard N indicates the CPU number. The value is 1 or 2 . |
| CPUN VCCIO | CPU VCCIO voltage | Mainboard N indicates the CPU number. The value is 1 or 2 . |
| CPUN VCCANA | CPU VCCANA voltage | Mainboard N indicates the CPU number. The value is 1 or 2 . |
| FAN <i>N</i> Speed | Fan speed | Fan module <i>N</i> N indicates the fan module number. The value ranges from 1 to 4 . |
| FAN <i>N</i> F Speed | | |
| FAN <i>N</i> R Speed | | |
| Power | Server input power | Power supply unit (PSU) |
| PSN VIN | PSU <i>N</i> input voltage | PSU <i>N</i> N indicates the PSU number. The value is 1 or 2 . |
| Disks Temp | Maximum drive temperature | Drive |
| Power <i>N</i> | PSU input power | PSU <i>N</i> N indicates the PSU number. The value is 1 or 2 . |
| PCH Status | PCH chip fault diagnosis health status | Mainboard |
| CPUN UPI Link | CPU UPI link fault diagnosis health status | Mainboard or CPU <i>N</i> N indicates the CPU number. The value is 1 or 2 . |
| CPUN Prochot | CPU Prochot | CPUN N indicates the CPU number. The value is 1 or 2 . |
| CPUN Status | CPU status | CPUN N indicates the CPU number. The value is 1 or 2 . |

| Sensor | Description | Component |
|-------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| CPUN Memory | Status of the memory corresponding to the CPU | Memory module corresponding to CPU <i>N</i> <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| FAN <i>N</i> Status | Fan fault status | Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from 1 to 4 . |
| FAN <i>N</i> F Status | | |
| FAN <i>N</i> R Status | | |
| DIMM <i>N</i> | DIMM status | DIMM <i>N</i> <i>N</i> indicates the DIMM slot number. |
| RTC Battery | RTC battery status. An alarm is generated when the voltage is lower than 1 V. | RTC battery on the mainboard |
| PCIE Status | PCIE status error | PCIE card |
| Power Button | Power button pressed | Mainboard and power button |
| Watchdog2 | Watchdog | Mainboard |
| Mngmnt Health | Management subsystem health status | Management modules |
| UID Button | UID button status | Mainboard |
| PwrOk Sig. Drop | Voltage dip status | Mainboard |
| PwrOn TimeOut | Power-on timeout | Mainboard |
| PwrCap Status | Power capping status | Mainboard |
| HDD Backplane | Hardware presence | Drive backplane |
| HDD BP Status | Drive backplane health status | Drive backplane |
| Riser <i>N</i> Card | Hardware presence | Riser card <i>N</i> <i>N</i> indicates the riser card slot number. The value ranges from 1 to 3 . |
| SAS Cable | Hardware presence | SAS cable on the mainboard |
| FAN <i>N</i> Presence | Fan presence | Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from 1 to 4 . |
| FAN <i>N</i> F Presence | | |
| FAN <i>N</i> R Presence | | |
| RAID Presence | RAID presence | RAID controller card |
| LCD Status | LCD health status | LCD |

| Sensor | Description | Component |
|------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| LCD Presence | LCD presence | LCD |
| PS Redundancy | Redundancy failure due to PSU removal | Power supply unit (PSU) |
| PSN Status | PSU status | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| PSN Fan Status | PSU fan fault status | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| PSN Temp Status | PSU presence | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| DISK\$ | Disk status | Drive |
| PCIe RAID\$ Temp | Temperature of the PCIe RAID controller card | PCIe RAID controller card |
| M2 Temp(PCIe\$) | Maximum temperature of all M.2 drives of the RAID controller card | PCIe RAID controller card |
| RAID Temp | Temperature of the RAID controller card | RAID controller card |
| RAID Status | RAID controller card health status | RAID controller card |
| RAID PCIE ERR | Health status of the RAID controller card in fault diagnosis | RAID controller card |
| IB\$ Temp | IB NIC temperature | IB card |
| PCIe\$ OP Temp | PCIe card optical module temperature | PCIe card |
| PCIe NIC\$ Temp | PCIe card chip temperature | PCIe card |
| PCIe FC\$ Temp | PCIe card chip temperature | PCIe card |
| RAID Card BBU | RAID controller card BBU | BBU supercapacitor of RAID controller card |
| FPGA\$ Temp | FPGA card temperature | PCIe card |
| FPGA\$ DDR Temp | FPGA card memory temperature | PCIe card |
| FPGA\$ Power | FPGA card power | PCIe card |
| FPGA\$ OP Temp | FPGA card optical module temperature | PCIe card |

| Sensor | Description | Component |
|------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| PCIe\$ Inlet Temp | PCIe smart card air inlet temperature | PCIe smart cards |
| PCIe\$ Cpu Temp | PCIe smart card CPU temperature | PCIe smart cards |
| 1711 Core Temp | Core temperature of the BMC management chip | BMC card |
| PS\$ IIn | PSU input current | Power supply unit (PSU) |
| PS\$ IOut | PSU output current | Power supply unit (PSU) |
| PS\$ Pout | PSU output power | Power supply unit (PSU) |
| PS\$ Temp | Maximum internal temperature of the PSU | Power supply unit (PSU) |
| PS\$ Inlet Temp | PSU air inlet temperature | Power supply unit (PSU) |
| AreaIntrusion | Listening to the unpacking action | Mainboard |
| OCP\$ OP Temp | OCP card optical module temperature | OCP 3.0 Network Adapters |
| OCP\$ Temp | OCP card chip temperature | OCP 3.0 Network Adapters |
| CPU <i>N</i> PMem Temp | CPU PMem module temperature | PMem module corresponding to CPU <i>N</i> . <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| Riser\$ Temp | Riser card temperature | Riser cards |
| Disk BP\$ Temp | Drive backplane temperature | Drive backplane |
| SSD Max Temp | Maximum SSD temperature | SSD |
| RAID BBU Temp | RAID controller card capacitor temperature | Supercapacitor of the RAID controller card |
| PCIe\$ Temp | PCIe card chip temperature | PCIe card |
| PCIe\$ Card BBU | BBU status of the PCIe RAID controller card | PCIe RAID controller card |
| GPU\$ Power | GPU card power | GPU cards |
| GPU\$ Temp | GPU temperature | GPU cards |
| GPU\$ MINI Temp | Mini chip temperature of the GPU card | GPU cards |
| GPU\$ DDR Temp | DDR chip temperature of the GPU card | GPU cards |

| Sensor | Description | Component |
|------------------|-------------------------------------------------------------------------|-----------|
| GPU\$ HBM Temp | HBM chip temperature of the GPU card | GPU cards |
| System Notice | Hot restart reminder and fault diagnosis program information collection | N/A |
| System Error | System suspension or restart. Check the background logs. | |
| ACPI State | ACPI status | |
| SysFWProgress | Software process and system startup errors | |
| SysRestart | Cause of system restart | |
| Boot Error | Boot error | |
| CPU Usage | CPU usage. | |
| Memory Usage | Memory usage. | |
| BMC Boot Up | BMC startup events | |
| BMC Time Hopping | Time hopping | |
| NTP Sync Failed | NTP synchronization failure and recovery events | |
| SEL Status | SEL full or clearing events | |
| Op. Log Full | Operation log full or clearing events | |
| Sec. Log Full | Security log full or clearing events | |
| Host Loss | System monitoring software (BMA) link loss detection | |
| ProductID Status | Product identification status | |
| OAMPort1_\$ Link | Network port OAM link status | |
| OAMPort2_\$ Link | Network port OAM link status | |

A.4.2 2288H V6-16DIMM

| Sensor | Description | Component |
|------------|-----------------------|-----------|
| Inlet Temp | Air inlet temperature | Mainboard |

| Sensor | Description | Component |
|----------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Outlet Temp | Air outlet temperature | BMC card |
| PCH Temp | PCH bridge temperature | Mainboard |
| CPUN Core Rem | CPU core temperature | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN DTS | CPU DTS value | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN Margin | CPU Margin | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VDDQ Temp | CPU VDDQ temperature | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VRD Temp | CPU VRD temperature | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN MEM Temp | CPU memory module temperature | Memory module corresponding to CPU <i>N</i> <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN 12V | 12 V voltage supplied by the mainboard to the CPU | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| Riser 12V | 12 V voltage supplied by the mainboard to the riser card | Mainboard |
| CPUN DDR VDDQ | 1.2 V memory module voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN DDR VDDQ2 | 1.2 V memory module voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VCCIN | CPU VCCIN voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VSA | CPU VSA voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN P1V8 | CPU P1V8 voltage | Mainboard |

| Sensor | Description | Component |
|---------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| | | <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VCCIO | CPU VCCIO voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN VCCANA | CPU VCCANA voltage | Mainboard <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| FAN <i>N</i> Speed | Fan speed | Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from 1 to 4 . |
| Power | Server input power | Power supply unit (PSU) |
| PS <i>N</i> VIN | PSU <i>N</i> input voltage | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| Disks Temp | Maximum drive temperature | Drive |
| Power <i>N</i> | PSU input power | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| PCH Status | PCH chip fault diagnosis health status | Mainboard |
| CPUN UPI Link | CPU UPI link fault diagnosis health status | Mainboard or CPU <i>N</i> <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN Prochot | CPU Prochot | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN Status | CPU status | CPUN <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| CPUN Memory | Status of the memory corresponding to the CPU | Memory module corresponding to CPU <i>N</i> <i>N</i> indicates the CPU number. The value is 1 or 2 . |
| FAN <i>N</i> Status | Fan fault status | Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from 1 to 4 . |

| Sensor | Description | Component |
|------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| DIMM <i>N</i> | DIMM status | DIMM <i>N</i> <i>N</i> indicates the DIMM slot number. |
| RTC Battery | RTC battery status. An alarm is generated when the voltage is lower than 1 V. | RTC battery on the mainboard |
| PCIE Status | PCIE status error | PCIE card |
| Power Button | Power button pressed | Mainboard and power button |
| Watchdog2 | Watchdog | Mainboard |
| Mngmnt Health | Management subsystem health status | Management modules |
| UID Button | UID button status | Mainboard |
| PwrOk Sig. Drop | Voltage dip status | Mainboard |
| PwrOn TimeOut | Power-on timeout | Mainboard |
| PwrCap Status | Power capping status | Mainboard |
| HDD Backplane | Hardware presence | Drive backplane |
| HDD BP Status | Drive backplane health status | Drive backplane |
| Riser3 Card | Hardware presence | Riser cards |
| SAS Cable | Hardware presence | SAS cable on the mainboard |
| FAN <i>N</i> Presence | Fan presence | Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from 1 to 4 . |
| RAID Presence | RAID presence | RAID controller card |
| LCD Status | LCD health status | LCD |
| LCD Presence | LCD presence | LCD |
| PS Redundancy | Redundancy failure due to PSU removal | Power supply unit (PSU) |
| PS <i>N</i> Status | PSU status | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| PS <i>N</i> Fan Status | PSU fan fault status | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |

| Sensor | Description | Component |
|-------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| PSN Temp Status | PSU presence | PSU <i>N</i> <i>N</i> indicates the PSU number. The value is 1 or 2 . |
| DISK\$ | Disk status | Drive |
| PCIe RAID\$ Temp | Temperature of the PCIe RAID controller card | PCIe RAID controller card |
| M2 Temp(PCIe\$) | Maximum temperature of all M.2 drives of the RAID controller card | PCIe RAID controller card |
| RAID Temp | Temperature of the RAID controller card | RAID controller card |
| RAID Status | RAID controller card health status | RAID controller card |
| RAID PCIE ERR | Health status of the RAID controller card in fault diagnosis | RAID controller card |
| IB\$ Temp | IB NIC temperature | IB card |
| PCIe\$ OP Temp | PCIe card optical module temperature | PCIe card |
| PCIe NIC\$ Temp | PCIe card chip temperature | PCIe card |
| PCIe FC\$ Temp | PCIe card chip temperature | PCIe card |
| RAID Card BBU | RAID controller card BBU | BBU supercapacitor of RAID controller card |
| FPGA\$ Temp | FPGA card temperature | PCIe card |
| FPGA\$ DDR Temp | FPGA card memory temperature | PCIe card |
| FPGA\$ Power | FPGA card power | PCIe card |
| FPGA\$ OP Temp | FPGA card optical module temperature | PCIe card |
| PCIe\$ Inlet Temp | PCIe smart card air inlet temperature | PCIe smart cards |
| PCIe\$ Cpu Temp | PCIe smart card CPU temperature | PCIe smart cards |
| 1711 Core Temp | Core temperature of the BMC management chip | BMC card |
| PS\$ IIn | PSU input current | Power supply unit (PSU) |
| PS\$ IOut | PSU output current | Power supply unit (PSU) |

| Sensor | Description | Component |
|-----------------|-------------------------------------------------------------------------|--------------------------------------------|
| PS\$ Pout | PSU output power | Power supply unit (PSU) |
| PS\$ Temp | Maximum internal temperature of the PSU | Power supply unit (PSU) |
| PS\$ Inlet Temp | PSU air inlet temperature | Power supply unit (PSU) |
| AreaIntrusion | Listening to the unpacking action | Mainboard |
| OCP\$ OP Temp | OCP card optical module temperature | OCP 3.0 Network Adapters |
| OCP\$ Temp | OCP card chip temperature | OCP 3.0 Network Adapters |
| Riser\$ Temp | Riser card temperature | Riser cards |
| Disk BP\$ Temp | Drive backplane temperature | Drive backplane |
| SSD Max Temp | Maximum SSD temperature | SSD |
| RAID BBU Temp | RAID controller card capacitor temperature | Supercapacitor of the RAID controller card |
| PCIe\$ Temp | PCIe card chip temperature | PCIe card |
| PCIe\$ Card BBU | BBU status of the PCIe RAID controller card | PCIe RAID controller card |
| NIC1 Presence | Hardware presence | Mainboard |
| SYS 3.3V | Mainboard 3.3 V voltage | Mainboard |
| SYS 5V | Mainboard 5.0 V voltage | Mainboard |
| V_STBY_1V8 | Southbridge standby 1.8 V voltage of the mainboard | Mainboard |
| V_STBY_5V0 | Mainboard standby 5.0 V voltage | Mainboard |
| Stby 3V3 | Mainboard standby 3.3 V voltage | Mainboard |
| PCH VPVNN | PCH VPVNN voltage | Mainboard |
| PCH VOLT | PCH 1.05 V voltage | Mainboard |
| PCIe Slot 3V3 | Riser card 3.3 V voltage | Mainboard |
| SYS 5V HDD | 5 V voltage of the rear backplane | Mainboard |
| System Notice | Hot restart reminder and fault diagnosis program information collection | N/A |
| System Error | System suspension or | |

| Sensor | Description | Component |
|------------------|------------------------------------------------------|-----------|
| | restart. Check the background logs. | |
| ACPI State | ACPI status | |
| SysFWProgress | Software process and system startup errors | |
| SysRestart | Cause of system restart | |
| Boot Error | Boot error | |
| CPU Usage | CPU usage. | |
| Memory Usage | Memory usage. | |
| BMC Boot Up | BMC startup events | |
| BMC Time Hopping | Time hopping | |
| NTP Sync Failed | NTP synchronization failure and recovery events | |
| SEL Status | SEL full or clearing events | |
| Op. Log Full | Operation log full or clearing events | |
| Sec. Log Full | Security log full or clearing events | |
| Host Loss | System monitoring software (BMA) link loss detection | |
| ProductID Status | Product identification status | |

B Glossary

B.1 A-E

B

| | |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BMC | The baseboard management controller (BMC) complies with the Intelligent Platform Management Interface (IPMI). It collects, processes, and stores sensor signals, and monitors the operating status of components. The BMC provides the hardware status and alarm information about the managed objects to the upper-level management system, so that the management system can manage the objects. |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

E

| | |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ejector lever | A part on the panel of a device used to facilitate installation or removal of the device. |
| Ethernet | A baseband local area network (LAN) architecture developed by Xerox Corporation by partnering with Intel and DEC. Ethernet uses the Carrier Sense Multiple Access/Collision Detection (CSMA/CD) access method and allows data transfer over various cables at 10 Mbit/s. The Ethernet specification is the basis for the IEEE 802.3 standard. |

B.2 F-J

G

| | |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gigabit Ethernet (GE) | An extension and enhancement of traditional shared media Ethernet standards. It is compatible with 10 Mbit/s and 100 Mbit/s Ethernet and complies with IEEE 802.3z standards. |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

H

| | |
|-----------------|------------------------------------------------------------------------------|
| hot swap | Replacing or adding components without stopping or shutting down the system. |
|-----------------|------------------------------------------------------------------------------|

B.3 K-O

K

| | |
|------------|-------------------------------------------------------------------------|
| KVM | A hardware device that provides public video, keyboard and mouse (KVM). |
|------------|-------------------------------------------------------------------------|

B.4 P-T

P

| | |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| panel | An external component (including but not limited to ejector levers, indicators, and ports) on the front or rear of the server. It seals the front and rear of the chassis to ensure optimal ventilation and electromagnetic compatibility (EMC). |
| Peripheral Component Interconnect Express (PCIe) | A computer bus PCI, which uses the existing PCI programming concepts and communication standards, but builds a faster serial communication system. Intel is the main sponsor for PCIe. PCIe is used only for internal interconnection. A PCI system can be transformed to a PCIe system by modifying the physical layer instead of software. PCIe delivers a faster speed and can replace almost all AGP and PCI buses. |

R

| | |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| redundancy | A mechanism that allows a backup device to automatically take over services from a faulty device to ensure uninterrupted running of the system. |
| redundant array of independent disks (RAID) | A storage technology that combines multiple physical drives into a logical unit for the purposes of data redundancy and performance improvement. |

S

| | |
|---------------|-----------------------------------------------------------------------|
| server | A special computer that provides services for clients over a network. |
|---------------|-----------------------------------------------------------------------|

| | |
|-------------------------------|---------------------------------------------------------------------------------------------|
| system event log (SEL) | Event records stored in the system used for subsequent fault diagnosis and system recovery. |
|-------------------------------|---------------------------------------------------------------------------------------------|

B.5 U-Z

U

| | |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| U | A unit defined in International Electrotechnical Commission (IEC) 60297-1 to measure the height of a cabinet, chassis, or subrack. 1 U = 44.45 mm |
| UltraPath Interconnect (UPI) | A point-to-point processor interconnect developed by Intel. |

C Acronyms and Abbreviations

C.1 A-E

A

| | |
|------------|--------------------------------------------------|
| AC | alternating current |
| AES | Advanced Encryption Standard New Instruction Set |
| ARP | Address Resolution Protocol |
| AVX | Advanced Vector Extensions |

B

| | |
|-------------|---------------------------------|
| BBU | backup battery unit |
| BIOS | Basic Input/Output System |
| BMC | baseboard management controller |

C

| | |
|------------|--------------------------------|
| CCC | China Compulsory Certification |
| CD | calendar day |
| CE | Conformite Europeenne |
| CIM | Common Information Model |
| CLI | command-line interface |

D

| | |
|-------------|--------------------------------------|
| DC | direct current |
| DDR4 | Double Data Rate 4 |
| DDDC | double device data correction |
| DEMT | Dynamic Energy Management Technology |
| DIMM | dual in-line memory module |
| DRAM | dynamic random-access memory |
| DVD | digital video disc |

E

| | |
|-------------|--------------------------------------------|
| ECC | error checking and correcting |
| ECMA | European Computer Manufacturer Association |
| EDB | Execute Disable Bit |
| EN | European Efficiency |
| ERP | enterprise resource planning |
| ETS | European Telecommunication Standards |

C.2 F-J

F

| | |
|----------------|-----------------------------------|
| FB-DIMM | Fully Buffered DIMM |
| FC | Fiber Channel |
| FCC | Federal Communications Commission |
| FCoE | Fibre Channel over Ethernet |
| FTP | File Transfer Protocol |

G

| | |
|-------------|------------------------------|
| GE | Gigabit Ethernet |
| GPIO | General Purpose Input/Output |
| GPU | graphics processing unit |

H

| | |
|--------------|------------------------------------|
| HA | high availability |
| HDD | hard disk drive |
| HPC | high-performance computing |
| HTTP | Hypertext Transfer Protocol |
| HTTPS | Hypertext Transfer Protocol Secure |

I

| | |
|-------------|---------------------------------------------------|
| iBMC | intelligent baseboard management controller |
| IC | Industry Canada |
| ICMP | Internet Control Message Protocol |
| IDC | Internet Data Center |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IGMP | Internet Group Message Protocol |
| IOPS | input/output operations per second |
| IP | Internet Protocol |
| IPC | Intelligent Power Capability |
| IPMB | Intelligent Platform Management Bus |
| IPMI | Intelligent Platform Management Interface |

C.3 K-O

K

| | |
|------------|----------------------------|
| KVM | keyboard, video, and mouse |
|------------|----------------------------|

L

| | |
|-----------|------------------|
| LC | Lucent Connector |
|-----------|------------------|

| | |
|---------------|-----------------------------------------|
| LRDIMM | load-reduced dual in-line memory module |
| LED | light emitting diode |
| LOM | LAN on motherboard |

M

| | |
|------------|------------------------------|
| MAC | media access control |
| MMC | module management controller |

N

| | |
|--------------|---------------------------------------|
| NBD | next business day |
| NC-SI | Network Controller Sideband Interface |

O

| | |
|------------|----------------------|
| OCP | Open Compute Project |
|------------|----------------------|

C.4 P-T

P

| | |
|--------------|-------------------------------------------|
| PCIe | Peripheral Component Interconnect Express |
| PDU | power distribution unit |
| PHY | physical layer |
| PMBUS | power management bus |
| POK | Power OK |
| PWM | pulse-width modulation |
| PXE | Preboot Execution Environment |

R

| | |
|-------------|--------------------------------------|
| RAID | redundant array of independent disks |
|-------------|--------------------------------------|

| | |
|--------------|-----------------------------------------------------------------------------------------------|
| RAS | reliability, availability and serviceability |
| RDIMM | registered dual in-line memory module |
| REACH | Registration Evaluation and Authorization of Chemicals |
| RJ45 | registered jack 45 |
| RoHS | Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment |

S

| | |
|---------------|-----------------------------------------------------------------|
| SAS | Serial Attached Small Computer System Interface |
| SATA | Serial Advanced Technology Attachment |
| SCM | supply chain management |
| SDDC | single device data correction |
| SERDES | serializer/deserializer |
| SGMII | serial gigabit media independent interface |
| SMI | serial management interface |
| SMTP | Simple Mail Transfer Protocol |
| SNMP | Simple Network Management Protocol |
| SOL | serial over LAN |
| SONCAP | Standards Organization of Nigeria-Conformity Assessment Program |
| SSD | solid-state drive |
| SSE | Streaming SIMD Extension |

T

| | |
|---------------|------------------------------------|
| TACH | tachometer signal |
| TBT | Turbo Boost Technology |
| TCG | Trusted Computing Group |
| TCM | trusted cryptography module |
| TCO | total cost of ownership |
| TDP | thermal design power |
| TELNET | Telecommunication Network Protocol |

| | |
|-------------|--------------------------------|
| TET | Trusted Execution Technology |
| TFM | TransFlash module |
| TFTP | Trivial File Transfer Protocol |
| TOE | TCP offload engine |
| TPM | trusted platform module |

C.5 U-Z

U

| | |
|--------------|---------------------------------------|
| UDIMM | unbuffered dual in-line memory module |
| UEFI | Unified Extensible Firmware Interface |
| UID | unit identification light |
| UL | Underwriter Laboratories Inc. |
| UPI | UltraPath Interconnect |
| USB | Universal Serial Bus |

V

| | |
|-------------|--------------------------------------------------------------------------------|
| VCCI | Voluntary Control Council for Interference by Information Technology Equipment |
| VGA | Video Graphics Array |
| VLAN | virtual local area network |
| VRD | voltage regulator-down |

W

| | |
|--------------|-------------------------------------------|
| WEEE | waste electrical and electronic equipment |
| WSMAN | Web Service Management |