



Inspur Server NF5266M6 User Manual

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|----------------------------|--|
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Overview

This manual describes the server's specifications, features, hardware setup, warranty information and troubleshooting, which will help users to understand how best to utilize the server and all its functionalities.

Target Audience

This manual is intended for:

- Technical support engineers
- Product maintenance engineers

It is recommended that server installation, configuration, and maintenance is performed by experienced technicians only.






Safety Precautions

- If your purchases do not include Inspur on-site installation service, make sure that you inspect the shipping cartons before unpacking the equipment. If a shipping carton appears severely damaged, water immersed, or the seal or pressure-sensitive adhesive tape (PSA) is broken, report this based on your purchase channel. If you purchased from a third-party supplier, contact your supplier directly; if you purchased through Inspur direct sales stores, call Inspur service hotline 1-844-860-0011/1-760-769-1847 for technical support.
- For your safety, please do not disassemble the server's components, extend configuration or connect other peripherals arbitrarily. You can contact Inspur for our support and guidance.
- Before disassembling the server's components, please be sure to disconnect all the cables connected to the server.
- Please install the product-compatible operating system and use the driver that comes with the server or provided by Inspur. You can go to our official site, on the Top Navigator, click on **Support > Product Support > Drivers**, then find the correct driver of your product based on the prompt. An incompatible operating system or a non-Inspur driver may cause compatibility issues and affect the normal use of the product. Inspur will not assume any responsibility or liability for this.
- BIOS and BMC setup is a significant factor in correctly configuring your server. If

there are no special requirements, it is suggested to use the Default Values and not alter the parameter settings arbitrarily. After the first login, please change the BMC user password in time.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol | Description |
|--|--|
|  DANGER | A potential for serious injury, or even death if not properly handled |
|  WARNING | A potential for minor or moderate injury if not properly handled |
|  CAUTION | A potential loss of data or damage to equipment if not properly handled |
|  IMPORTANT | Operations or information that requires special attention to ensure successful installation or configuration |
|  NOTE | Supplementary description of manual information |

Revision History

| Version | Date | Description of Changes |
|---------|------------|--|
| V1.0 | 2021/04/23 | Initial release |
| V1.1 | 2021/07/23 | Corrected some descriptions and improved the figures |

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1 Safety Instructions

1.1 Warnings

Please be advised to follow the instructions below for safety. Failure to do so could result in potential dangers that may cause property loss, personal injury or death.

- The power supplies in the system may produce high voltages and energy hazards that may cause personal injury. For your safety, please do not attempt to remove the access panel to disassemble or replace any component on your own. Unless informed by Inspur, only service technicians trained by Inspur are authorized to do so.
- Please connect the equipment to an appropriate power supply. Use only the external power supplies indicated on the rated input label to power the system. To protect your equipment from damages caused by a momentary spike or plunge of the voltage, please use voltage stabilizing equipment or uninterruptible power supplies.
- If you must use an extension cable, please use a three-core cable with properly grounded plugs. Check ratings of the extension cable to ensure that the total rating of all equipment plugged into the extension cable does not exceed 80 percent of the rated current limit for the extension cable.
- Please be sure to use the power supply components that come with the server, such as power cords, power socket (if provided with the server) etc. For your safety and safety of the equipment, please do not replace power cords or plugs randomly.
- To prevent electric shocks caused by leakage in the system, please make sure that the power cables of the system and peripherals are correctly connected to the earthed/grounded outlet. Please connect the three-core power plug to the three-core AC power outlet that is well earthed and within reach. Be sure to use the earthing/grounding pin of power cord and do not use the patch plug or the earthing/grounding pin unplugged with cables. In the case that the earthing/grounding conductors are not installed and it is uncertain whether there is appropriate earthing/grounding protection, please do not use or attempt to operate the equipment. You can contact and consult an electrician.
- Please do not push any objects into the openings of the system. Doing so may cause short circuit of internal components and then lead to fire or electric shock.
- Please keep the system far away from the heatsink and heat sources, and be sure not to block the air vents.
- Please be sure not to scatter food or spill liquid into the system or onto other

components. Do not use the product in high humid or dusty environments.

- Using an incompatible battery may cause explosion. When battery replacement is required, please consult the manufacturer first, and choose batteries of the same or equivalent type suggested by them. Do not disassemble, crush, puncture the batteries or short circuit the external connection point, and do not expose them in the environment over 60°C (140°F). Never throw batteries into fire or water. Please do not attempt to open or repair the batteries. Dispose of used batteries properly. Do not put waste batteries, circuit boards or other components that may contain batteries with other wastes. For battery recycling, please contact the local recycling center.
- For independent cabinets, please install front and side stabilizers before installing the equipment into the cabinet. For cabinets connected with other cabinets, please install front stabilizers first. Failure to install the corresponding stabilizers before installing the equipment into the cabinet may cause the cabinet to tip over, possibly leading to personal injury. Hence, please do make sure to install stabilizers before installing the equipment into the cabinet. After installing the equipment and other components into the cabinet, only one component can be pulled out from the cabinet through its sliding part at one time. Pulling out several components at the same time may cause the cabinet to turn over, resulting in serious personal injury.
- Please do not move the cabinet on your own. Considering the height and weight of the cabinet, the moving of the cabinet should be completed by at least two people. Moving it without adequate, trained personnel could result in severe injury or death.
- It is prohibited to directly short-circuit the copper busbar. Please do not touch the copper busbar when the cabinet is powered on.
- This is a Class A product, and may cause radio interference. In such case, users may need to take necessary measures to mitigate the interference.

1.2 Precautions

The following considerations may help avoid problems that could damage the components or cause data loss, etc.

- In the event of the following, please unplug the power plug from the outlet and contact Inspur Customer Service:
 - The power cables, extension cables or power plugs are damaged.
 - The products get wet.
 - The products have fallen or have been damaged.
 - Other objects have fallen into the products.
 - The products do not or cannot function normally even when you operate

according to the instructions.

- If the system gets wet or damp, please follow steps below:
 - a. Power off the equipment, disconnect them with the outlet, wait for 10 to 20 seconds, and then open the access panel.
 - b. Move the equipment to a well-ventilated place to dry the system for at least 24 hours and make sure that the system is fully dried.
 - c. Close the access panel, reconnect the system to the power outlet, and then power on.
 - d. In case of operation failure or other abnormal situations, please contact Inspur for technical support.
- Avoid cabling system cables and power cords in high foot traffic locations. Please do not place objects on the cables.
- Before removing the access panel or accessing the internal components, please let the equipment cool first. To avoid damaging the motherboard, please power off the system and wait for 5 seconds, and then remove components from the motherboard or disconnect the peripherals from the system.
- If there are modem, telecom or LAN options installed in the equipment, please pay attention to the followings:
 - In case of lightning, please do not connect or use the modem.
 - Never connect or use the modem in a damp environment.
 - Never insert the modem or telephone cables into the socket of network interface controller (NIC).
 - Before unpacking the product package, accessing or installing internal components, or touching uninsulated cables or jacks of the modem, please disconnect the modem cables.
- In order to avoid damages of electronic components in the equipment caused by electrostatic discharge, please pay attention to the followings:
 - Please remove any static electricity on your body before dismounting or accessing any electronic component in the equipment, to prevent the static electricity from conducting itself to the sensitive components. You may remove the static electricity on your body by touching the metal earthing objects (such as the unpainted metal surface on the rack).
 - Please do not take static sensitive components that are not ready to be installed or used out of the anti-static packages.
 - During operation, please touch the earthing conductor or the unpainted metal surface on the cabinet regularly to remove any static electricity from your body

that may damage the internal components.

- When dismantling internal components upon receiving proper authorization from Inspur, please pay attention to the followings:
 - a. Power off the system and disconnect the cables, including all connections of the system. When disconnecting the cables, please hold the connector of the cables to slowly pull them out. Never pull the cables.
 - b. Only after the products completely cool down can you dismantle the access panel or access the internal components.
 - c. Please remove any static electricity on your body by touching metal earthing objects before dismantling or accessing any electronic component in the equipment.
 - d. When dismantling, avoid making large movement to prevent damage to the components or scratching arms.
 - e. Handle components and plug-in cards with care. Please do not touch the components or connectors on the plug-in cards. When handling the plug-in cards or components, firmly grab the edges of the plug-in cards or those of components, or their metal retaining brackets.
- During cabinet installation and application, please pay attention to the followings:
 - After the cabinet has been installed, please ensure that the stabilizer feet have been fixed into the rack and supported to ground, and the full weight of the cabinet is on the ground.
 - Always load from the bottom up, and load the heaviest items first.
 - When pulling out components from the rack, apply slight force to keep the rack balanced.
 - Please be careful when pressing down the release latch to slide components in or out as the rail may hurt your fingers.
 - Do not overload the AC power branch circuits in the cabinet. The total load of the cabinet should not exceed 80% of the ratings of the branch circuits.
 - Ensure that components in the cabinet are well vented.
 - When repairing components in the cabinet, never step on any other component.

2 Product Specifications

2.1 Introduction

The Inspur NF5266M6 server is a 2U rack server powered by Intel® Whitley Xeon Scalable processors. It can meet the high-density storage demands of customers with its superior storage performance, high I/O throughput and excellent PCIe expansion ability thanks to the 24 3.5-inch drives in three layers in a compact 2U space.

NF5266M6 delivers high quality and reliability for all kinds of application scenarios, as Inspur servers always do. It features exceptional configuration elasticity to cater to mainstream mid-range demands, adopting ultimate design philosophy in performance, scalability, availability and manageability.

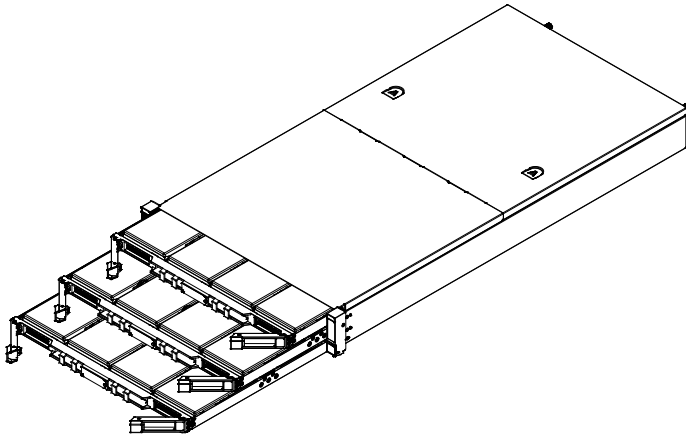
Key Features:

- NF5266M6 is built on the 3rd generation Intel® Xeon® Scalable processors. Each CPU communicates with each other via 3 UPI links at 11.2 GT/s. A single CPU supports up to 40 cores (1.5 MB L3 cache per core) and 80 threads with the max Turbo frequency at 4.3 GHz and TDP at up to 220 W, enabling powerful parallel processing capabilities.
- 16 DDR4 ECC memory modules (3200 MT/s, RDIMMs and LRDIMMs), offering a maximum capacity of 4 TB to deliver high speeds and superior availability.
- 3200 MHz Barlow Pass with a maximum capacity of 256 GB, ensuring memory data integrity in case of powering off without reducing memory capacity and bandwidth.
- Up to 8 NVDIMMs at a max speed of 3200 MT/s.
- Up to 26 hot-swap 3.5-inch HDDs.

2.1.1 24 × 3.5-inch Configuration (Full Configuration)

Three-layer drawers with eight 3.5-inch drives in each layer at the front of the chassis, as shown in the figure below.

Figure 2-1 24 × 3.5-inch Drive Configuration



2.2 Features and Specifications

Table 2-1 Features and Specifications

| Item | Description |
|-------------------------------|---|
| Time to Market | 2021/06 |
| Form Factor | 2U rack server |
| Processor | <p>One to two Intel® Xeon® Scalable 3300, 4300, 5300, 6300, 8300 Series processor(s):</p> <ul style="list-style-type: none"> • Up to 40 cores (3.1 GHz) • Max Turbo frequency up to 4.3 GHz (4 cores) • Three UPI links (Up to 11.2 GT/s) • L3 cache up to 1.5 MB (single core) • Thermal design power up to 220 W |
| Chipset | Intel C621A |
| Integrated Display Controller | Integrated in BMC (Aspeed 2600), up to 1280 × 1024 resolution |
| Memory | <ul style="list-style-type: none"> • Up to 16 memories • Each processor supports 8 memory channels • Each channel supports 1 memory slot • Speed up to 3200 MT/s • Supports RDIMMs and BPS/NVDIMMs |

| Item | Description |
|--------------------|---|
| | <ul style="list-style-type: none"> Memory protection: ECC, memory mirroring, memory rank sparing |
| Storage | <p>Front panel:</p> <ul style="list-style-type: none"> 24 × 3.5-inch hot-swap SATA/SAS drives <p>Rear storage:</p> <ul style="list-style-type: none"> Two-drive chassis supports 2 NVMe drives or 2 SAS/SATA drives Four-drive chassis supports 4 NVMe drives, 4 SAS/SATA drives, 2 NVMe drives + 2 SAS/SATA drives or 8 E1.S SSDs Eight-drive chassis supports 8 NVMe drives or 4 NVMe drives + 4 SAS/SATA drives Two optional SATA M.2 SSDs supporting hardware and software RAID Up to 2 TF cards (one for BIOS and the other for BMC) |
| Storage Controller | <ul style="list-style-type: none"> The RAID controller card controls all SAS/SATA drives NVMe drives can be directly connected to the CPU |
| Network | <ul style="list-style-type: none"> One onboard OCP 3.0 NIC module and one scalable OCP 3.0 NIC module (1 Gb/s, 10 Gb/s, 25 Gb/s, 100 Gb/s, 200 Gb/s) Standard 1 Gb/10 Gb/25 Gb/40 Gb/100 Gb NICs |
| I/O Expansion | <p>Two-drive chassis: Up to 6 standard PCIe expansion cards and up to 1 OCP 3.0 NIC</p> <ul style="list-style-type: none"> Two PCIe 4.0 x16 half-height half-length cards Four PCIe 3.0 x8 half-height half-length cards <p>Four-drive chassis: Up to 4 standard PCIe expansion cards and up to 2 OCP 3.0 NICs</p> <ul style="list-style-type: none"> One PCIe 4.0 x16 half-height half-length card Three PCIe 3.0 x8 half-height half-length cards <p>Eight-drive chassis: Up to 2 standard PCIe expansion cards and up to 1 OCP 3.0 NIC</p> <ul style="list-style-type: none"> Two PCIe 3.0 x8 half-height half-length cards |

| Item | Description |
|----------------------------|---|
| Port | <ul style="list-style-type: none"> • 2 rear USB 3.0 ports • 1 rear VGA port • 1 COM port |
| Fan | <p>6 hot-swap and N+1 redundant 6056 fans (High specification)/6038*(Low-speed).</p> <p>*6056 fans are equipped by default and 6038 fans can be selected for different configurations</p> |
| Power Supply | <p>1+1 redundant power supplies (1300 W/1600 W output power)</p> <ul style="list-style-type: none"> • 110 VAC - 230 VAC: 90 V - 264 V • 240 VDC: 180 V - 320 V • 336 VDC: 260 V - 400 V • -48 VDC: -40 V to -72 V |
| System Management | <p>Integrated with 1 independent 1000 Mbps network interface, dedicated for IPMI remote management</p> |
| Operating System | <ul style="list-style-type: none"> • Microsoft Windows Server 2016/2019; • Red Hat Enterprise Linux 7/8; • SUSE Linux Enterprise Server 12/15; • CentOS Enterprise Linux 7/8; |
| Chassis Dimensions | <ul style="list-style-type: none"> • With mounting ears: 482 × 87.5 × 891.2 mm (18.98 × 3.44 × 35.09 inch) (Width × Height × Depth) • Without mounting ears: 447 × 87.5 × 866 mm (17.60 × 3.44 × 34.09 inch) (Width × Height × Depth) |
| Outer Packaging Dimensions | <p>Length × Width × Height: 1168 × 721 × 279 mm (459.84 × 283.86 × 109.84 inch)</p> |
| Weight | <p>24 × 3.5" Configuration:</p> <ul style="list-style-type: none"> • Net weight: 45 kg (99.2 lb) • Gross weight: 58 kg (127.9 lb) (Packages + Rails + Accessory Box included) |

| Item | Description |
|-------------|---|
| Temperature | <ul style="list-style-type: none"> Operating: 5°C - 35°C (41°F - 95°F) Storage (packed): -40°C to +70°C (-40°F to +158°F) Storage (unpacked): -40°C to +70°C (-40°F to +158°F) |
| Humidity | <ul style="list-style-type: none"> Operating: 5% - 90% R.H. Storage (packed): 5% - 95% R.H. Storage (unpacked): 5% - 95% R.H. |
| Altitude | <ul style="list-style-type: none"> Operating temperature: 5°C - 35°C (41°F - 95°F) at 0 - 914 m (0 - 3000 ft) Operating temperature: 10°C - 32°C (50°F - 89.6°F) at 914 - 2133 m (3000 - 7000 ft) |
| Noise | <ul style="list-style-type: none"> Idle: 79 db Operating: 89 db |

2.3 Power Efficiency

Table 2-2 Power Efficiency of Platinum Power Supplies

| Rated Power | @10% Load | @20% Load | @50% Load | @100% Load | PF@50% Load |
|-------------|-----------|-----------|-----------|------------|-------------|
| 1300 W | - | 90% | 94% | 91% | 0.98 |
| 1600 W | - | 90% | 94% | 91% | 0.98 |

Table 2-3 Power Efficiency of Titanium Power Supplies

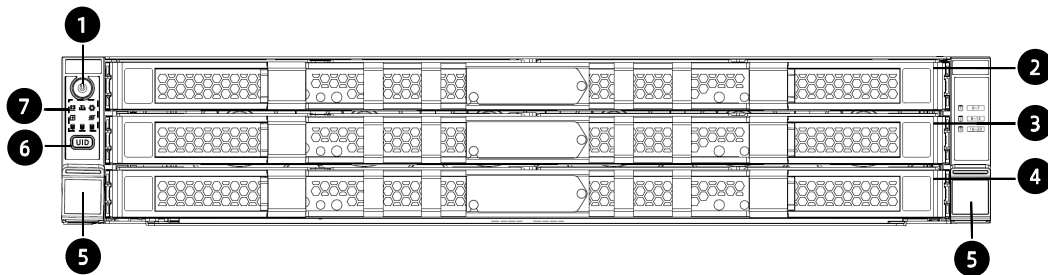
| Rated Power | @10% Load | @20% Load | @50% Load | @100% Load | PF@50% Load |
|-------------|-----------|-----------|-----------|------------|-------------|
| 1300 W | 90% | 94% | 96% | 91% | 0.98 |

3 Product Overview

3.1 Front Panel

3.1.1 24 × 3.5-inch Drive Configuration

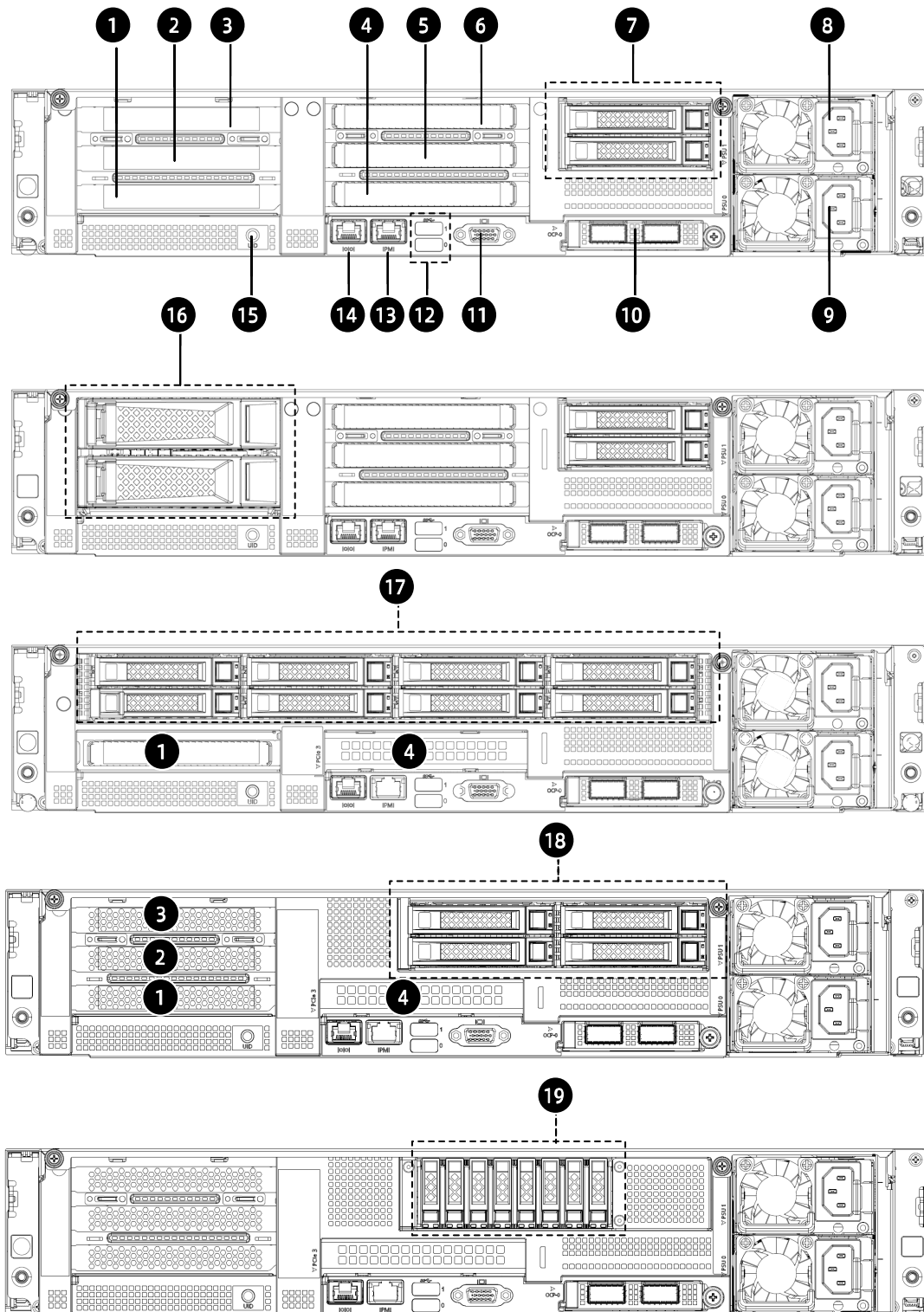
Figure 3-1 Front Panel of 24 × 3.5-inch Drive Configuration



| Item | Feature |
|------|---------------------------|
| 1 | Power Button |
| 2 | Top-layer Drive Drawer |
| 3 | Mid-layer Drive Drawer |
| 4 | Bottom-layer Drive Drawer |
| 5 | Quick Release Lever |
| 6 | UID/BMC RST button |
| 7 | LEDs |

3.2 Rear Panel

Figure 3-2 Rear Panel


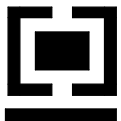










| Item | Feature | Item | Feature |
|------|--------------------|------|-----------------------------|
| 1 | PCIe0 Slot | 11 | VGA Port |
| 2 | PCIe1 Slot | 12 | USB 3.0 Port × 2 |
| 3 | PCIe2 Slot | 13 | BMC Management Network Port |
| 4 | PCIe3 Slot | 14 | Debug Serial Port |
| 5 | PCIe4 Slot | 15 | UID Button |
| 6 | PCIe5 Slot | 16 | 3.5-inch Drive × 2 |
| 7 | 2.5-inch Drive × 2 | 17 | 2.5-inch Drive × 8 |
| 8 | PSU1 | 18 | 2.5-inch Drive × 4 |
| 9 | PSU0 | 19 | E1.S SSD × 8 |
| 10 | OCP 3.0 NIC | | |

3.3 Buttons and LEDs

3.3.1 Front Panel Buttons and LEDs

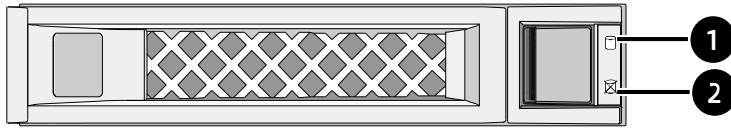
Table 3-1 Front Panel Buttons and LEDs

| Item | Icon | Feature | Description |
|------|---|-------------------|--|
| 1 |  | Power Button | <ul style="list-style-type: none"> • Solid green = Power on state • Solid orange = Standby state • Long press 4 seconds to force a shutdown |
| 2 |  | System Status LED | <ul style="list-style-type: none"> • Off = Normal • Solid red = A failure occurs • Flashing red = A warning occurs |
| 3 |  | Memory Status LED | <ul style="list-style-type: none"> • Off = Normal • Solid red = A failure occurs • Flashing red = A warning occurs |

| Item | Icon | Feature | Description |
|------|---|-------------------------------|---|
| 4 |  | Fan Status LED | <ul style="list-style-type: none"> Off = Normal Solid red = Fail to read the fan speed Flashing red = Speed reading is abnormal |
| 5 |  | Power Status LED | <ul style="list-style-type: none"> Off = Normal Solid red = A power failure occurs Flashing red = Power state is abnormal |
| 6 |  | System Overheat LED | <ul style="list-style-type: none"> Off = Normal Solid red = CPU/Memory overheats |
| 7 |  | Bottom-layer Drive Status LED | <ul style="list-style-type: none"> Solid green = Normal Solid red = Drive failure |
| 8 |  | Mid-layer Drive Status LED | <ul style="list-style-type: none"> Solid green = Normal Solid red = Drive failure |
| 9 |  | Top-layer Drive Status LED | <ul style="list-style-type: none"> Solid green = Normal Solid red = Drive failure |
| 8 |  | UID/BMC RST Button | <ul style="list-style-type: none"> Solid blue = UID is turned on manually or in the OS Flashing blue = KVM has been launched or firmware update in process Long press 6 seconds to force a shutdown of BMC |

3.3.2 Drive Tray LEDs

Figure 3-3 Drive Tray LEDs



| Item | Feature | Description |
|------|---------------------|--|
| 1 | Activity Status LED | <ul style="list-style-type: none"> Solid green = Normal Flashing green = Read/write activities |
| 2 | Drive Fault LED | <ul style="list-style-type: none"> Solid red = Drive error or failed Solid blue = Drive is being located Solid pink = RAID Rebuilding |

3.3.3 PSU LEDs

Table 3-2 PSU LEDs

| Item | PSU LED Status | Description |
|------|---|--|
| 1 | Solid green | Normal |
| 2 | Off | No AC power to PSU |
| 3 | Solid amber | A shutdown has occurred when the protection mechanism had been triggered |
| 4 | Flashing amber at 1 Hz | PSU continues operating after a warning event has occurred |
| 5 | Flashing green at 1 Hz | PSU operates in standby mode with AC input |
| 6 | Flashing green at 0.33 Hz (on for 2 seconds and off for 1 second) | PSU operates in cold redundant and sleep mode |
| 7 | Flashing green at 2 Hz | PSU operates in firmware update mode |

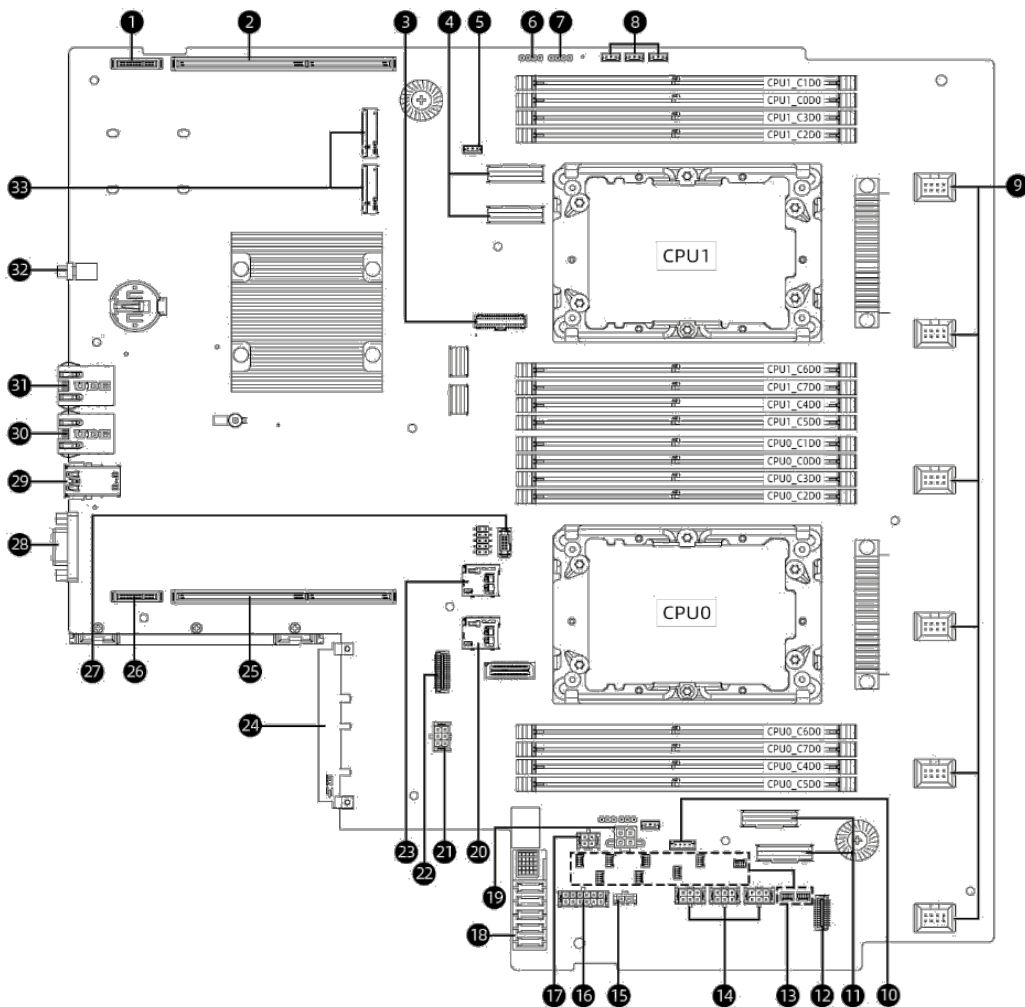
3.4 Interface Description

Table 3-3 Interface Description

| Feature | Description |
|-----------------------------|---|
| VGA Port | Enables you to connect a display terminal to the system, such as a monitor |
| USB 3.0 Port | Enables you to connect a USB device to the system Note: Make sure the USB device is in good condition as it may cause the server to work abnormally. |
| BMC Management Network Port | Enables you to manage the server Note: The port is a Gigabit Ethernet port of 100/1000M (self-adaption) |
| Debug Serial Port | Enables you to debug and monitor the system status |

3.5 Motherboard View

Figure 3-4 Motherboard Connectors



| Item | Feature | Item | Feature |
|------|---|------|--|
| 1 | CPU1 Riser Power Connector | 18 | PSU Power Connector |
| 2 | CPU1 Riser High-Speed Signal Connector | 19 | FPGA Card Power Connector |
| 3 | CPU1 OCP Riser Sideband Signal Connector or Smart Network Card NCSI Connector | 20 | BMC TF Card Connector |
| 4 | Slimline x8 Connector (SFF 8654 Connector) | 21 | CPU1 OCP Riser or MOC Power Connector |
| 5 | Intruder Connector | 22 | Rear M.2 Connector |
| 6 | BMC Serial Port Connector | 23 | PCH TF Card Connector |
| 7 | System Serial Port Connector | 24 | CPU0 OCP 3.0 NIC Connector |
| 8 | Drive Drawer Pull Sensing Connector | 25 | CPU0 Riser High-Speed Signal Connector |
| 9 | Fan Connectors | 26 | CPU0 Riser Power Connector |
| 10 | RAID Key Connector | 27 | VPP Bus Connector |
| 11 | Slimline x8 Connector (SFF 8654 Connector) | 28 | VGA Connector |
| 12 | Left Ear Connector | 29 | USB 3.0 Connector × 2 |
| 13 | I ² C Connector | 30 | 1000M Network Port |
| 14 | 3.5" Front Backplane Power Connector × 8 | 31 | Serial Port Connector |
| 15 | EXP Card Power Connector | 32 | UID Button |
| 16 | MISC Power Connector | 33 | Onboard SATA/PCIe M.2 Connector |
| 17 | 2.5" Rear Backplane Power Connector × 2 | | |

3.6 Motherboard Jumper Introduction



CAUTION

For your personal safety and protection of the equipment, it is necessary to shut down the system and disconnect the power cables.

Table 3-4 CMOS Jumper Cap

| Jumper Location | Description | Function |
|-----------------|-------------|----------|
|-----------------|-------------|----------|

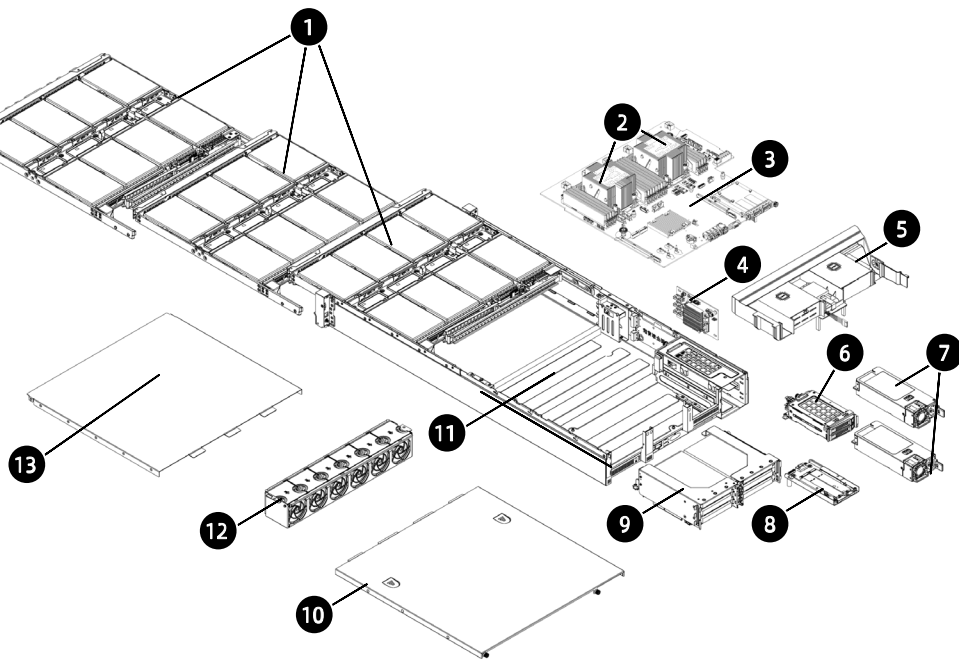
| Jumper Location | Description | Function |
|------------------------|--------------------|--|
| J122 (CLR_CMOS) | CMOS clear jumper | <ul style="list-style-type: none"> • Short-circuit pins 1-2 to restore to normal status. • Short-circuit pins 2-3 to clear CMOS. |

To clear the CMOS setting via a jumper:

1. Power down the server and unplug the power cable from the electrical outlet.
2. Wait for 5 seconds.
3. Locate the CLR_CMOS jumper cap on the motherboard.
4. Move the jumper cap from the default pins 1-2 to pins 2-3.
5. Plug in the power cable and power on the server, and then wait for 10 seconds for the CMOS to clear.
6. Power down the server, unplug the power cable, and then wait for 5 seconds again.
7. Move the jumper cap back to the default pins 1-2.
8. Reconnect the power cable and power on the server.

3.7 System Layout

Figure 3-5 Exploded Diagram



| Item | Feature | Item | Feature |
|------|------------------------|------|-------------------------------|
| 1 | Front Drive Drawer × 3 | 8 | OCP 3.0 NIC |
| 2 | PHMs | 9 | Rear PCIe Riser Card Assembly |
| 3 | Motherboard | 10 | Access Panel |
| 4 | Rear Drive Backplane | 11 | Chassis |
| 5 | Air Duct | 12 | Fan Modules |
| 6 | Rear Drive Modules | 13 | Access Panel |
| 7 | PSUs | | |

4 Getting Started

4.1 Installing Server into the Rack

For detailed information on installing the server into the rack with rails supplied by Inspur, see *Rack Server Installation Guide*.



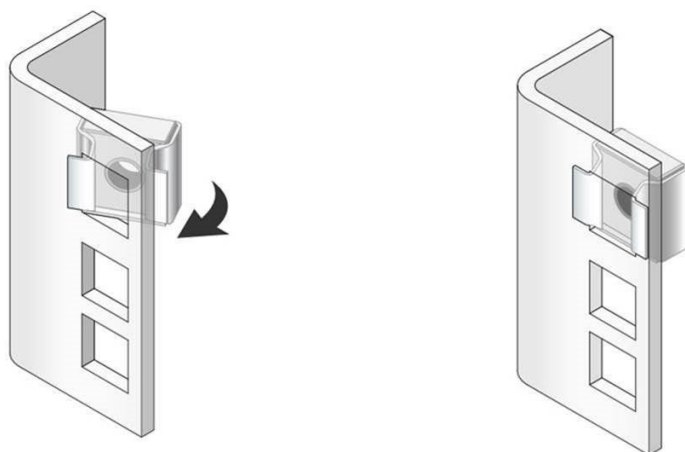
If you would like to use non-Inspur rails, please contact Inspur Customer Service first to ensure the server can be installed to the rack safely and properly. The loading-bearing capacity of non-Inspur rails must be higher than 100 kg. If not, you **MUST** use Inspur-supplied rails as using these non-Inspur rails may cause such risks as installation failure. Inspur will not assume any responsibility or liability for any damage or injury caused by this.



To reduce the risk of personal injury or damage to the equipment, **DO** secure the mounting ears to the posts firmly to prevent server from moving or sliding out from the cabinet.

4.1.1 Installing Cage Nuts

Figure 4-1 Installing a Cage Nut



1. Determine the post hole for the cage nut based on the position of the mounting ear.
2. Insert one side of the cage nut into the post hole.
3. Press the other side with a screwdriver until the cage nut is fully seated into the post hole.
4. Follow the preceding steps for the other cage nut on the other post. Make sure the two cage nuts are installed at the same height.

4.1.2 Securing Cage Nuts

Secure the mounting ears to the cage nuts with captive screws.

4.2 Power On/Off

To power on and off the server, press the power button.

To completely shut down the server, press the power button and disconnect the power cable from the server.



DANGER

To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to disconnect power from the server. The power button does not shut off the system power completely. Some power supplies and internal circuitry remain active until AC power is removed.

4.3 Pre-Disassembly Instructions

Read the installation instructions for all the hardware operations before disassembling or re-assembling the components. All prerequisites must be completed prior to starting installation or maintenance.



WARNING

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching.



CAUTION

To prevent damage to electrical components, properly ground the server before installation. Improper grounding can cause electrostatic discharge.

Do the following prior to starting installation or maintenance:

1. Power down the server.
2. Remove all cables from the server.
3. Remove the server out of the rack:

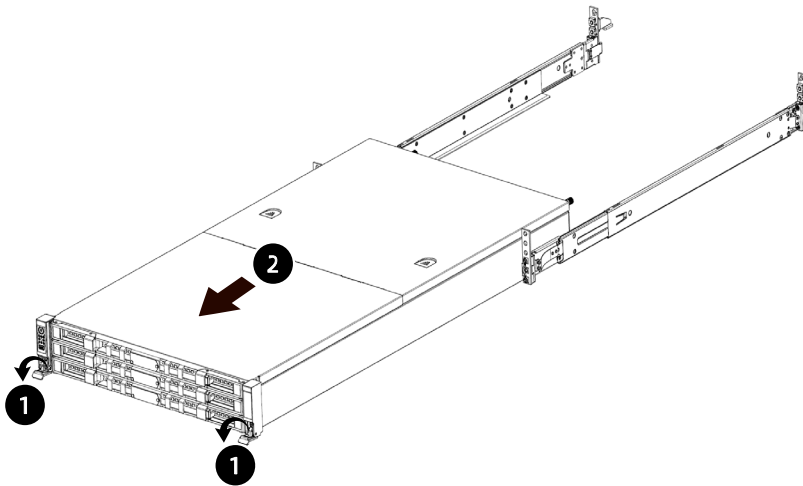


WARNING

1. To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before you extend a component from the rack.
 2. To reduce the risk of personal injury, be careful when sliding the server into the rack. The sliding rails could pinch your fingers.
-

- a. Open the quick release levers of the mounting ears on the front panel of the server, and then loosen the two captive screws in the levers securing the server in place.
- b. Gently slide and remove the server out of the rack.

Figure 4-2 Removing the Server out of the Rack



NOTE

- After performing installation or maintenance, slide the server all the way back into the rack to secure it in place.
 - For more information on how to install the server into the rack, refer to *Rack Server Installation Guide*.
-

4.4 Disassembly/Reassembly Process



NOTE

- During installation or removal of any hardware, always ensure all data is backed up properly.
 - Disconnect the server and all attached devices from their electrical outlets.
 - There is no need to remove power from the server when replacing hot-swap components.
 - If more than one option is to be installed, read the installation instructions for all the hardware options and identify similar steps to streamline the installation process.
-

Item appearance may be different on actual models.

4.4.1 Access Panel Replacement



WARNING

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching.



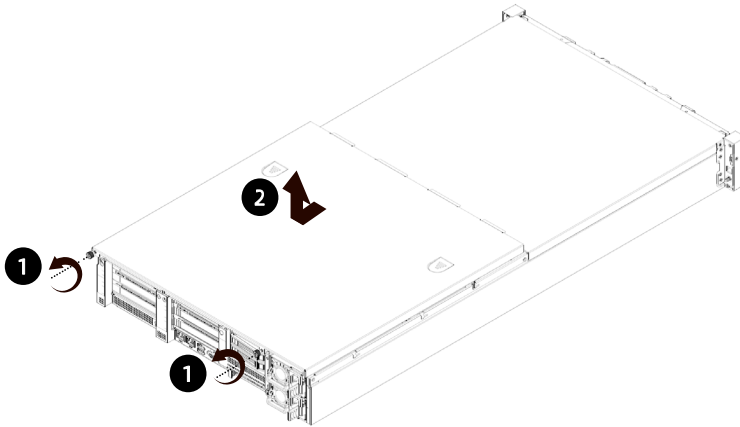
CAUTION

- For proper cooling, do not operate the server without the access panel, air duct, or fans installed.
 - If the server supports hot-swap components, minimize the amount of time the access panel is open.
-

To remove the access panel:

1. Loosen the two thumbscrews on the rear of the server securing the access panel to the server anticlockwise.
2. Pull the access panel toward the rear of the chassis. Lift up and remove the panel.

Figure 4-3 Removing the Access Panel



To install the access panel:

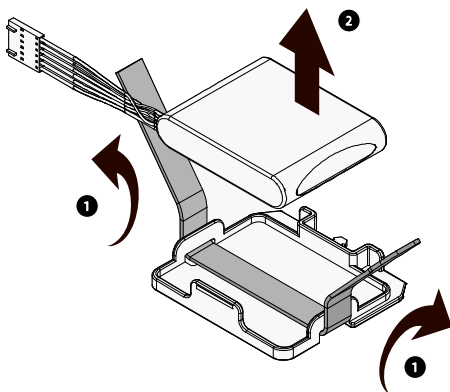
1. Align the standoffs of the access panel with the J-slots on the chassis. Lower the access panel down onto the chassis.
2. Push the access panel toward the front of the server until it closes.
3. Tighten the two captive screws on the rear of the server securing the access panel to the server clockwise.

4.4.2 Super-Capacitor Replacement

To remove the super-capacitor:

1. Remove the access panel.
2. Disconnect the cable of the super-capacitor.
3. Undo the velcro of the super-capacitor.
4. Remove and put the super-capacitor into an antistatic bag.

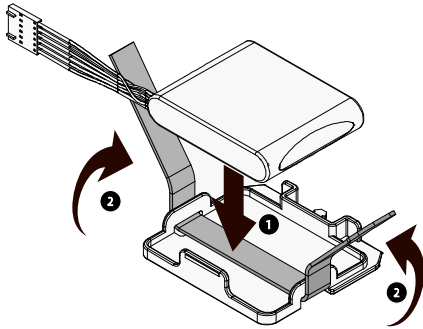
Figure 4-4 Removing the Super-Capacitor



To install the super-capacitor:

1. Take the new super-capacitor out from the antistatic bag and position it in place.
2. Secure the super-capacitor in place with velcro.

Figure 4-5 Installing the Super-Capacitor



3. Connect the cable of the super-capacitor.
4. Install the access panel.

4.4.3 Air Duct Replacement



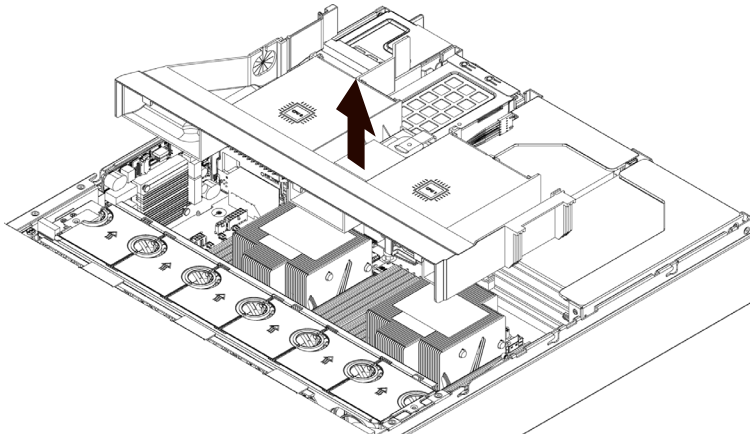
CAUTION

For proper cooling, do not operate the server without the access panel, air ducts, expansion slot covers, or blanks installed. If the server supports hot-swap components, minimize the amount of time the access panel is open.

To remove the air duct:

1. Remove the access panel.
2. Remove the super-capacitor on the air duct.
3. Lift up the air duct as indicated by the arrow to remove it from the server.

Figure 4-6 Removing the Air Duct



To install the air duct:

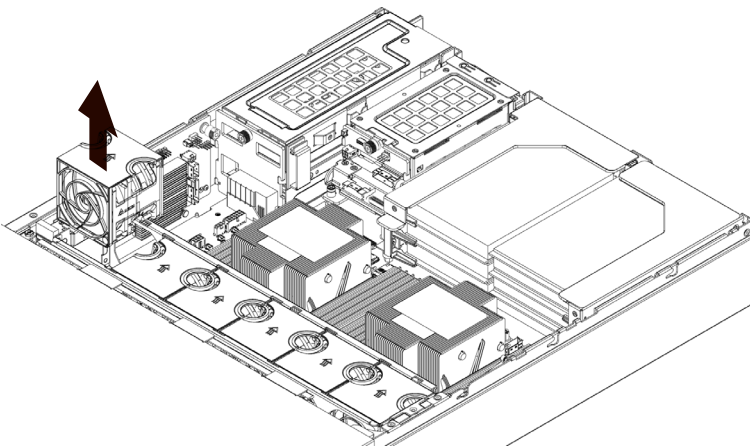
1. Lower down the air duct vertically into the chassis.
2. Install the super-capacitor.
3. Install the access panel.

4.4.4 Hot-Swap Fan Module Replacement

To remove the fan module:

1. Remove the access panel.
2. Remove the fan module:
 - a. Squeeze the circular release tabs towards each other, and then lift up the fan module out of the fan bay.
 - b. Put the fan module in an antistatic bag.

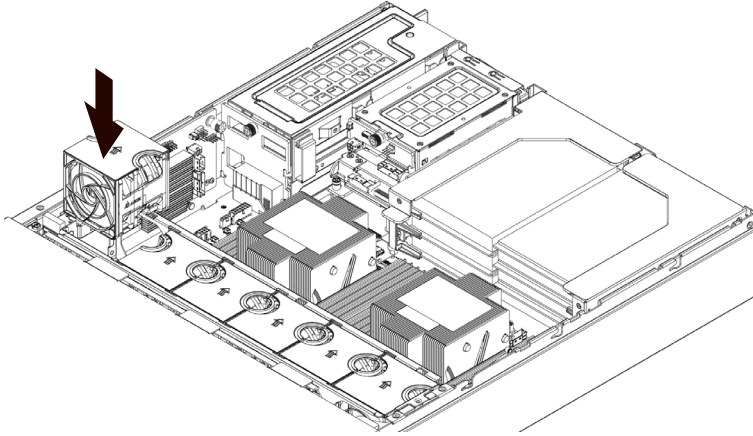
Figure 4-7 Removing the Fan Module



To install the fan module:

1. Take the new fan module out from the antistatic bag.
2. Align the fan power connector with the power connector on the motherboard and install the fan module vertically into the fan cage.

Figure 4-8 Installing the Fan Module



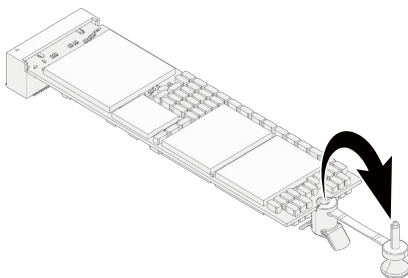
3. Install the access panel.
4. Verify that the fan status LED is off.

4.4.5 Onboard M.2 SSD Replacement

To remove the M.2 SSD:

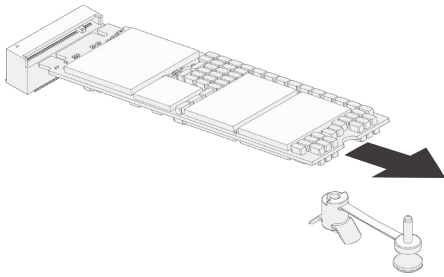
1. Remove the access panel.
2. Disconnect the cable of the super-capacitor.
3. Remove the air duct.
4. Open the latch securing M.2 SSD in place, and one side of the SSD pops up.

Figure 4-9 Opening the Latch of the M.2 SSD



5. Tilt and pull out the M.2 SSD. Put it into an antistatic bag.

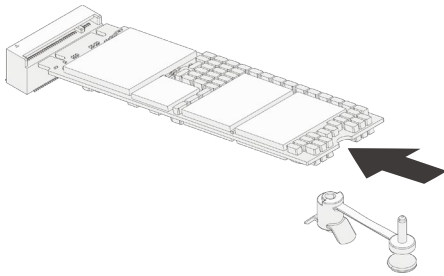
Figure 4-10 Removing the M.2 SSD



To install the M.2 SSD:

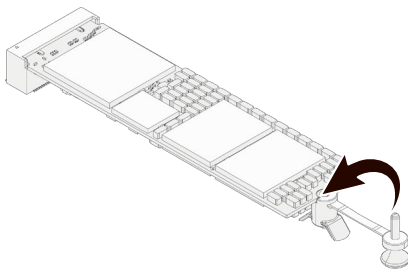
1. Take the new M.2 SSD out from the antistatic bag.
2. Tilt the M.2 SSD a little and insert it into the slot.

Figure 4-11 Installing the M.2 SSD



3. Secure the M.2 SSD onto the board with the latch.

Figure 4-12 Installing the M.2 SSD Latch



4. Install the air duct.
5. Connect the cable of the super-capacitor.
6. Install the access panel.

4.4.6 DIMM Replacement

i IMPORTANT

- Mixing use of RDIMMs and LRDIMMs is not allowed.
 - Mixing use of BPS is not allowed.
 - Mixing use of BPS with RDIMMs or LRDIMMs is allowed.
-

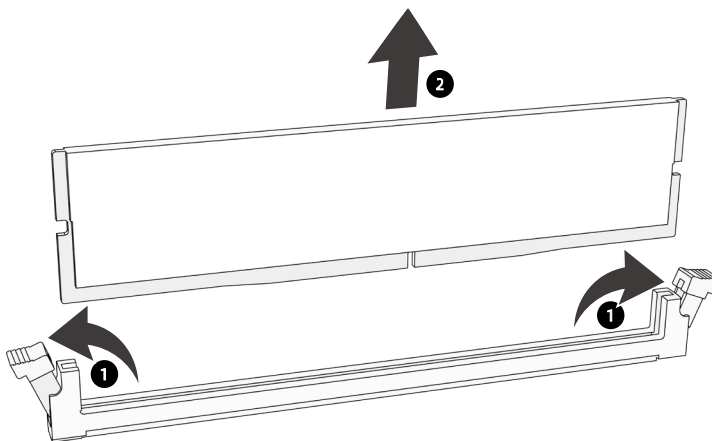
To remove the DIMM:

1. Remove the access panel.
2. Disconnect the cable of the super-capacitor.
3. Remove the air duct.
4. Locate the DIMM you want to replace.
5. Remove the DIMM:
 - a. Push the release tabs on both ends of the DIMM slot outward to unlock it. Gently lift and remove the DIMM from the slot.

☰ NOTE

Make sure the release tabs on both ends of the DIMM slot are fully opened.

Figure 4-13 Removing the DIMM



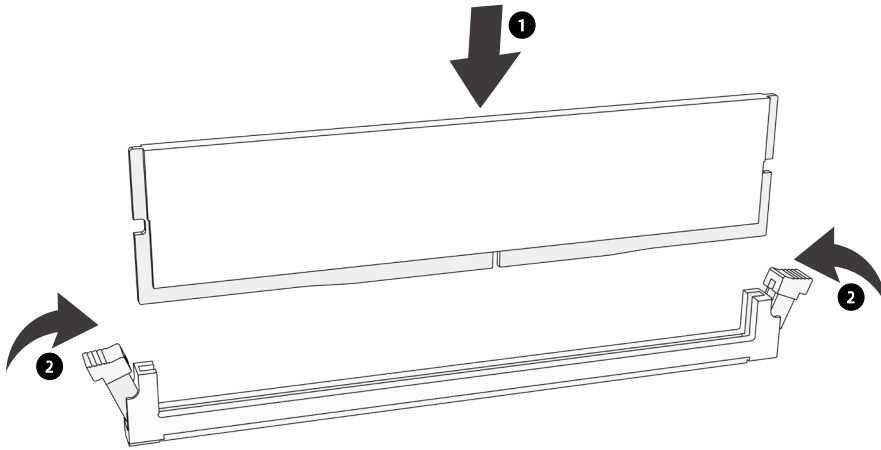
- b. Put it into the memory box.

To install the DIMM:

1. Take the new DIMM out from the memory box.

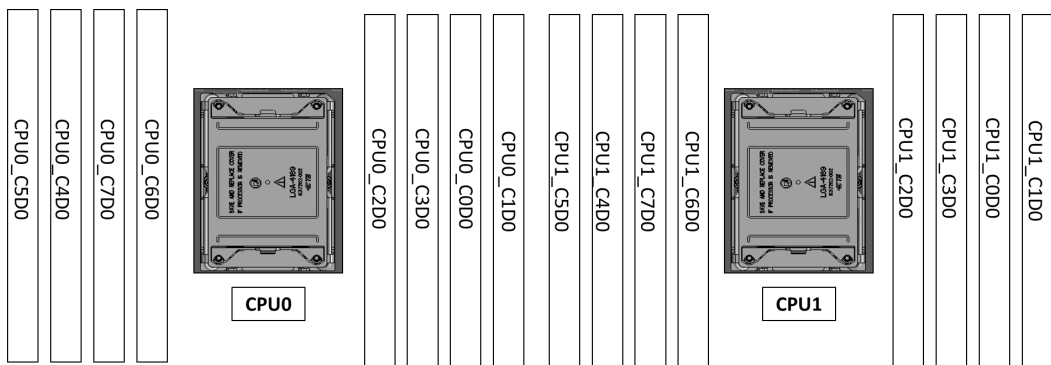
- Align the bottom notch with the receptive point on the slot. Use two thumbs together to press both ends of the module straight down into the slot until the module snaps into place.

Figure 4-14 Installing the DIMM



- Install the air duct.
- Connect the cable of the super-capacitor.
- Install the access panel.

Figure 4-15 DIMM Slot Layout



Detailed DIMM population and combination principles are as follows:

 NOTE

BPS need to be used with DDR4 DIMMs. In the following figure, "D" stands for DDR4 DIMMs, B for BPS and iMC for Integrated Memory Controller.

Only DIMMs of the same type could be used in the same machine. Detailed DIMM population and combination principles are as follows:

- DIMMs of CPU1 should be populated symmetrically with those of CPU0.

- For one-CPU configuration, install only the DIMMs of CPU0. Populate DIMMs in the sequence of the silk-screen: CPU0_C0D0, CPU0_C1D0, CPU0_C2D0, CPU0_C3D0...CPU0_C7D0
- For dual-CPU configuration, DIMMs of CPU0 should be populated in the sequence of the silk-screen: CPU0_C0D0, CPU0_C1D0, CPU0_C2D0, CPU0_C3D0...CPU0_C7D0; DIMMs of CPU1 should be installed symmetrically with those of CPU0: CPU1_C0D0, CPU1_C1D0, CPU1_C2D0, CPU1_C3D0...CPU1_C7D0.

Table 4-1 Population Principles of DDR4 DIMMs

| DDR4 Qty | CPU0 | | | | | | | | CPU1 | | | | | | | |
|----------|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|
| | iMC0 | | iMC1 | | iMC2 | | iMC3 | | iMC0 | | iMC1 | | iMC2 | | iMC3 | |
| | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
| | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 |
| 1 | v | | | | | | | | | | | | | | | |
| 2 | v | | | | | | | | v | | | | | | | |
| 3 | v | | | | v | | | | v | | | | | | | |
| 4 | v | | | | v | | | | v | | | | v | | | |
| 8 | v | | v | | v | | v | | v | | v | | v | | v | |
| 12 | v | v | v | | v | v | v | | v | v | v | | v | v | v | |
| 16 | v | v | v | v | v | v | v | v | v | v | v | v | v | v | v | v |

Detailed DIMM population and combination principles of DDR4 with BPS under dual-CPU configuration are as follows:

Table 4-2 Population Principles of DDR4 DIMMs with BPS

| DDR4 Qty | BPS Qty | CPU0 | | | | | | | | CPU1 | | | | | | | |
|----------|---------|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|
| | | iMC0 | | iMC1 | | iMC2 | | iMC3 | | iMC0 | | iMC1 | | iMC2 | | iMC3 | |
| | | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
| | | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 | D0 |
| 8 | 8 | D | B | D | B | D | B | D | B | D | B | D | B | D | B | D | B |

4.4.7 Processor Heatsink Module (PHM) Replacement

The server supports single- or dual-processor configuration depending on the model you purchased.



CAUTION

- To help avoid damage to the processor and motherboard, do not install the processor without using the processor installation tool.
- To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

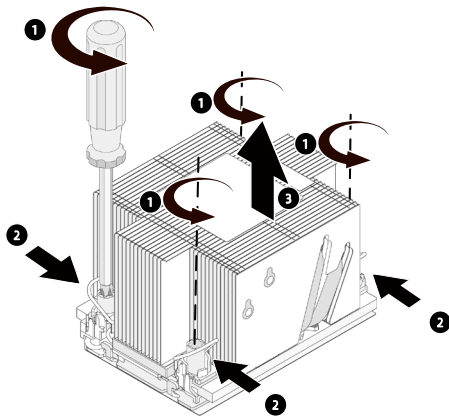
To remove the PHM:



The heatsink may be hot after the system has been powered down. Allow the heatsink to cool down for a few minutes before removing it.

1. Remove the access panel.
2. Disconnect the cable of the super-capacitor.
3. Remove the air duct.
4. Remove the PHM:
 - a. Loosen the four screws securing the PHM to the CPU socket anticlockwise in the sequence as shown on the heatsink label with a T30 Torx screwdriver.
 - b. Push the four lock-in wires inward to unlocked position with both hands simultaneously.
 - c. Gently lift the PHM off the CPU socket.

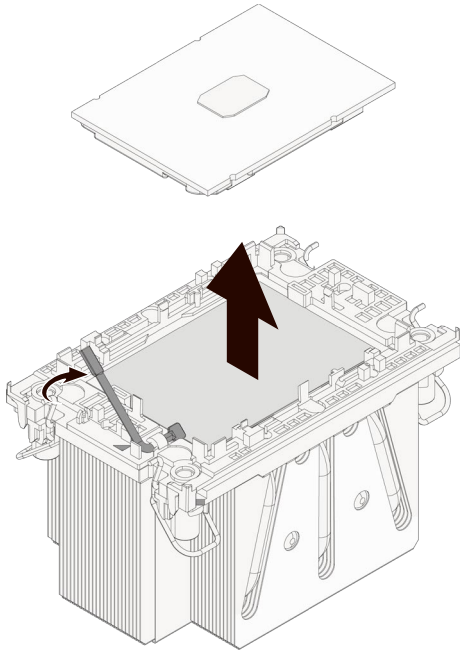
Figure 4-16 Removing the PHM



- Use a protective cover to protect the CPU socket to avoid damaging socket pins after the PHM has been removed.
 - The gold pins on the CPU are fragile and can be easily damaged if touched. During removal and installation, always keep the gold pins side up and DO NOT touch the pins when processor dedicated insertion/removal tool (CPU tray) is unavailable.
-

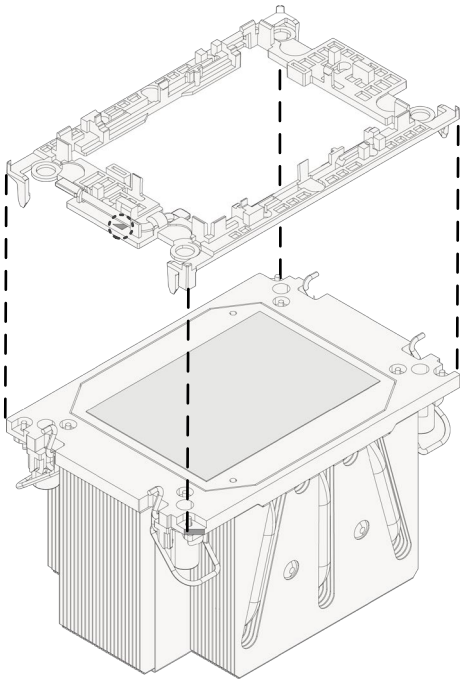
5. Lift up the lever to release one side of the CPU off the Carrier Clip.
6. Pry the retaining tabs securing the CPU to the Carrier Clip. Gently remove the CPU and put it into an antistatic bag.

Figure 4-17 Removing the CPU



7. Remove the CPU Carrier Clip:
 - a. Close the CPU lever.
 - b. Push to release the retaining tab near the printed triangle.
 - c. Release the rest three tabs.
 - d. Gently lift the CPU Carrier Clip off the heatsink.

Figure 4-18 Removing the CPU Carrier Clip



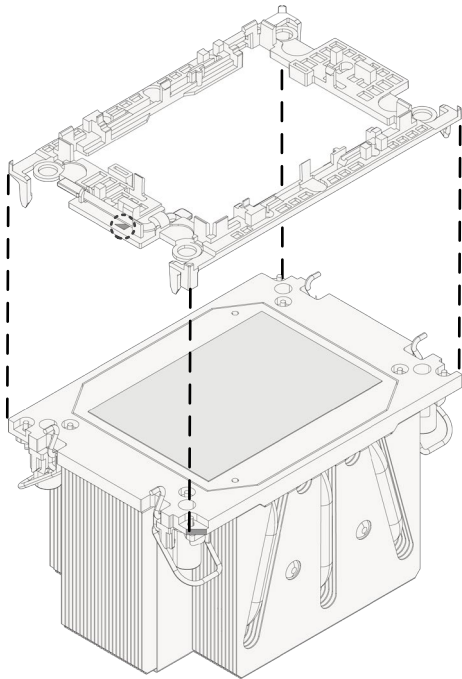
 CAUTION

- Use a clean and lint-free cloth to wipe off the old thermal grease first if the heatsink is to be reused.
 - Coat thermal grease evenly onto the heatsink before reusing the heatsink.
-

To install the PHM:

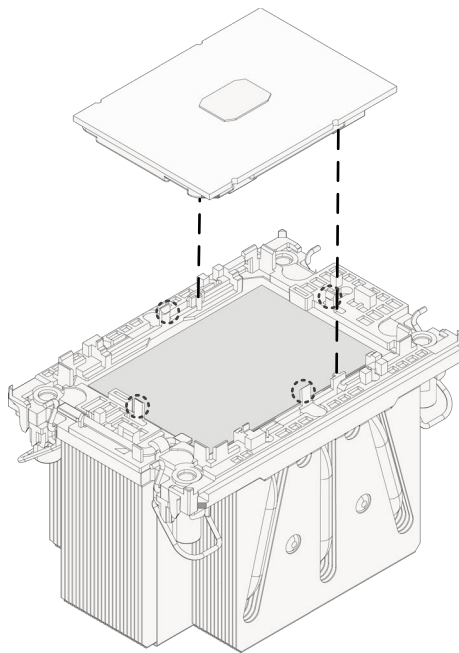
1. Install the CPU Carrier Clip:
 - a. With the heatsink thermal grease side up, align the triangle mark on the Carrier Clip with that on the heatsink label.
 - b. Install the Carrier Clip onto the heatsink until the four retaining tabs of the Carrier Clip snap into place.

Figure 4-19 Installing the CPU Carrier Clip



2. Apply the thermal grease evenly across the heatsink in the size of the CPU.
3. Install the CPU:
 - a. With the gold pins up, align the triangle mark on the CPU with that on the Carrier Clip.
 - b. Grasp CPU by its two edges, and install it into the Carrier Clip. Make sure the notches of the CPU are aligned with the retaining tabs of the Carrier Clip and the CPU is secured in place by the tabs on the four sides of the Carrier Clip.

Figure 4-20 Installing the CPU



4. Grasp the protective cover (if available) by its short edges to remove it from the CPU socket.
5. With the gold pins down, align the triangle mark on the CPU with that on the heatsink to attach the PHM onto the CPU socket.
6. Push the four lock-in wires outward to locked position with both hands simultaneously.
7. Tighten the four screws securing the PHM to the CPU socket clockwise in the sequence as shown on the heatsink label with a T30 Torx screwdriver.
8. Install the air duct.
9. Connect the cable of the super-capacitor.
10. Install the access panel.

4.4.8 PCIe Expansion Card Replacement



CAUTION

- To prevent damage to the server or expansion cards, power down the server and remove all power cables before removing or installing the PCIe card.
 - To prevent damage to the PCIe slot pins, be sure to apply even force and pull and insert the PCIe card vertically.
-

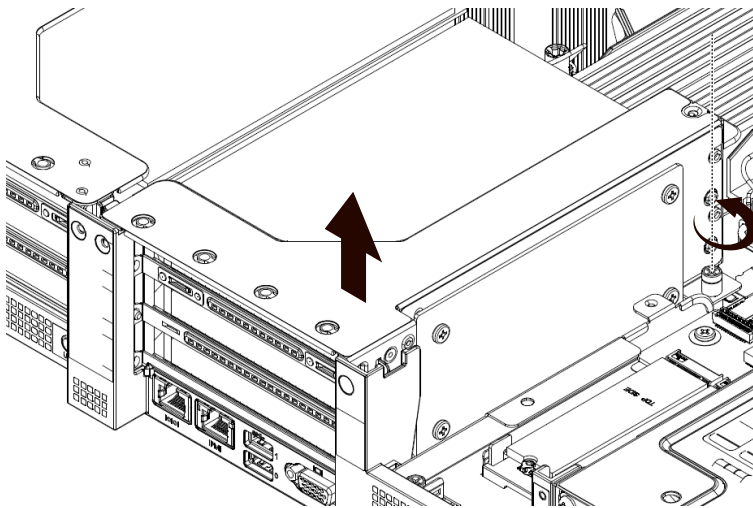
 NOTE

The installation and removal of PCIe Riser card assembly may vary with the server model. Please install and remove based on the the server model you purchased.

To remove the PCIe expansion card:

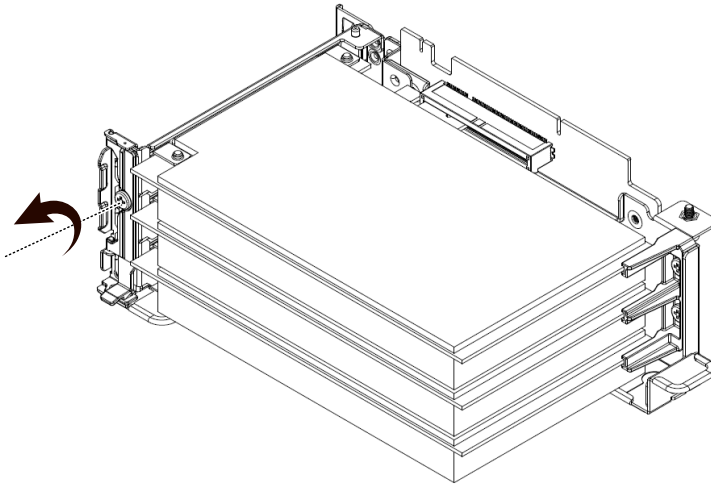
1. Remove the access panel.
2. Loosen the captive screw anticlockwise with a Phillips screwdriver. Gently lift and remove the PCIe Riser card assembly with both hands. Be sure to apply even force.

Figure 4-21 Removing the PCIe Riser Card Assembly



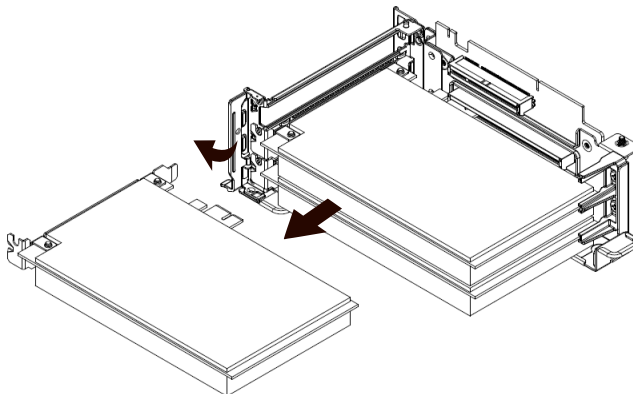
3. Loosen the screw on the cover plate to remove it.

Figure 4-22 Removing the Screw



4. Open the cover plate. Remove the PCIe card from the assembly.

Figure 4-23 Removing the PCIe Card



To install the PCIe expansion card:

1. Take the new PCIe card out from the antistatic bag.
2. Align and insert the PCIe card to the Riser card slot.
3. Close the cover plate. Install and tighten the screw to secure it in place.
4. Align and insert the Riser card to the slot on the motherboard.
5. Tighten the captive screw clockwise with a Phillips screwdriver. Insert the PCIe Riser card assembly onto the motherboard. Be sure to apply even force.
6. Install the access panel.

4.4.9 Hot-swap 2.5/3.5-inch Drive Replacement



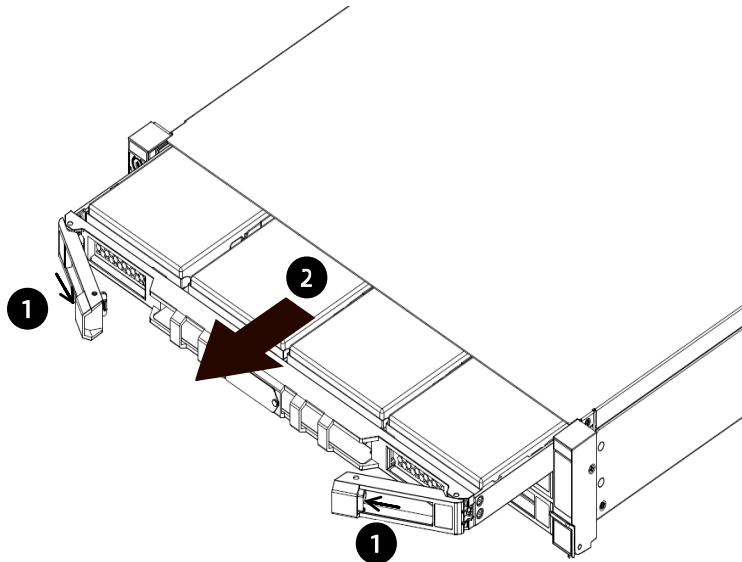
For proper cooling, do not operate the server without the access panel, air ducts, expansion slot covers, or blanks installed. If the server supports hot-swap components, minimize the amount of time the access panel is open.

1. Front Panel (24 × 3.5-inch Drive)

To remove the drive:

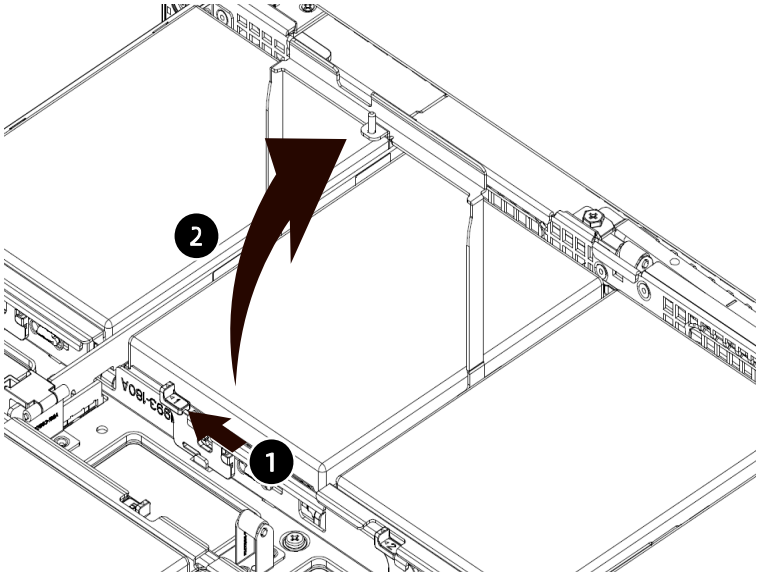
1. Press the blue latches on both sides of the drawer inward. The drawer handles pop up. Hold the handles with both hands to slide the drawer out.

Figure 4-24 Pulling out the Drive Drawer



2. Push the latch as indicated by the silkscreen arrow. The drive tray handle pops up. Hold the handle to remove the drive module from the drawer.

Figure 4-25 Removing the Drive Module



3. Remove the drive tray as indicated by the figure to remove the drive.

Figure 4-26 Releasing the Drive Tray

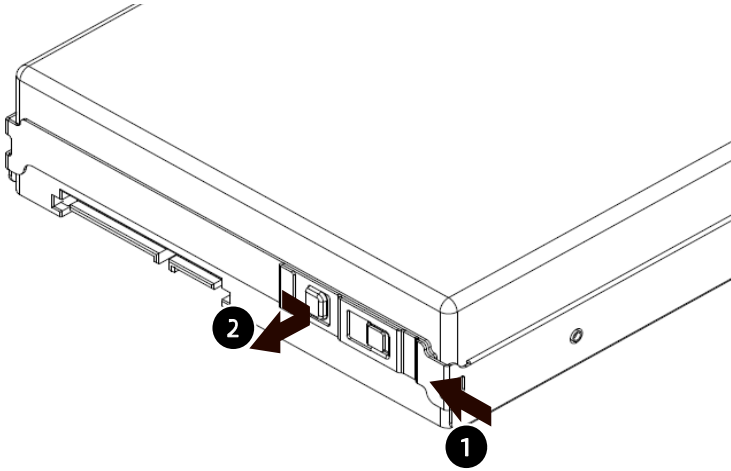
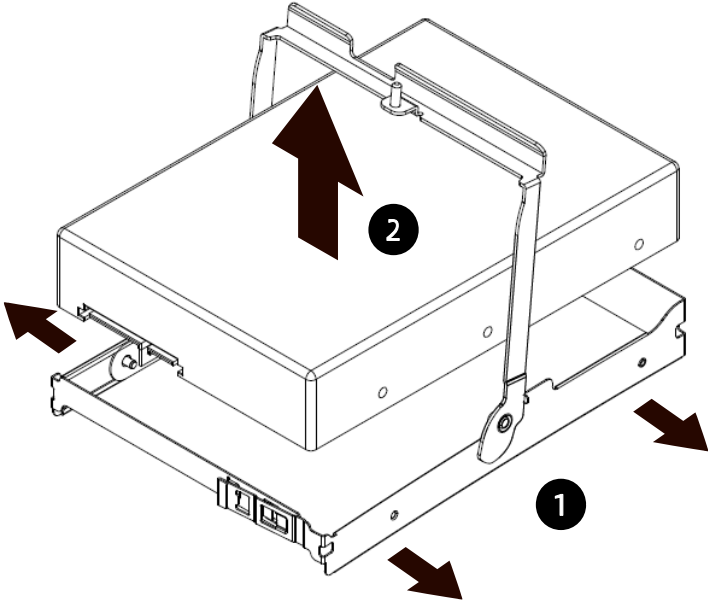


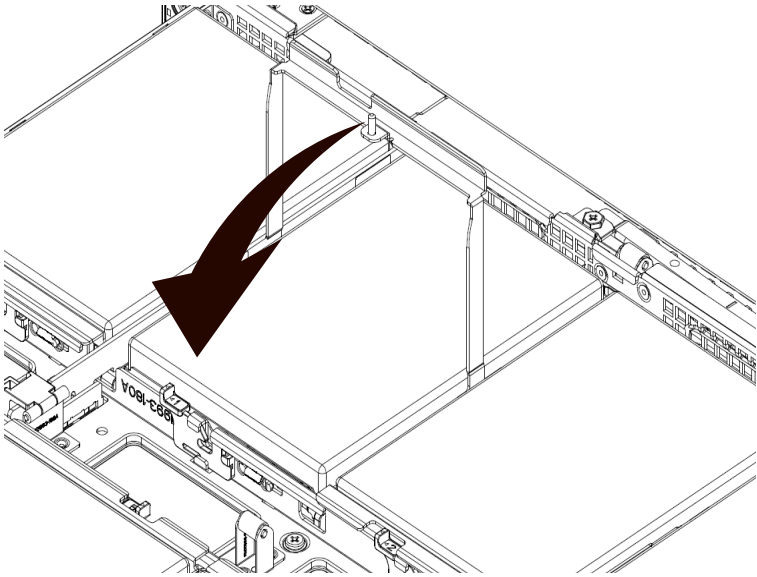
Figure 4-27 Removing the Drive



To install the drive:

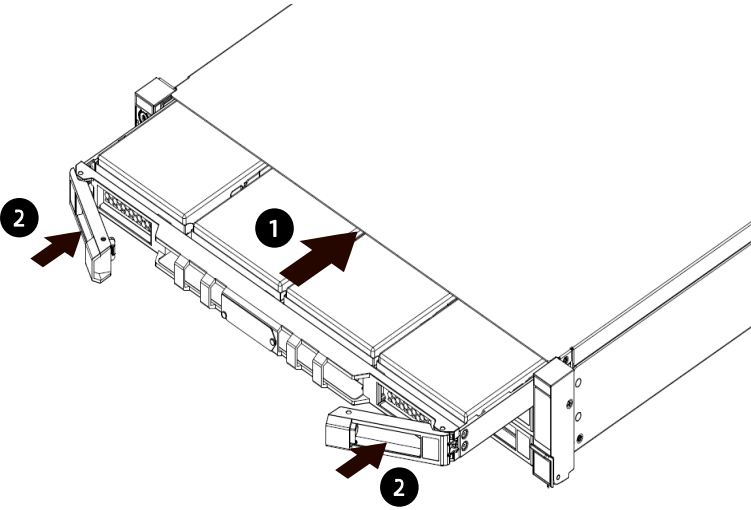
1. Install the drive to the drive tray.
2. Install the drive module into the drive drawer. Rotate the handle downward until it clicks into place.

Figure 4-28 Closing the Tray Handle



3. Slide the drawer in. Press the handles to close it.

Figure 4-29 Sliding the Drive Drawer in

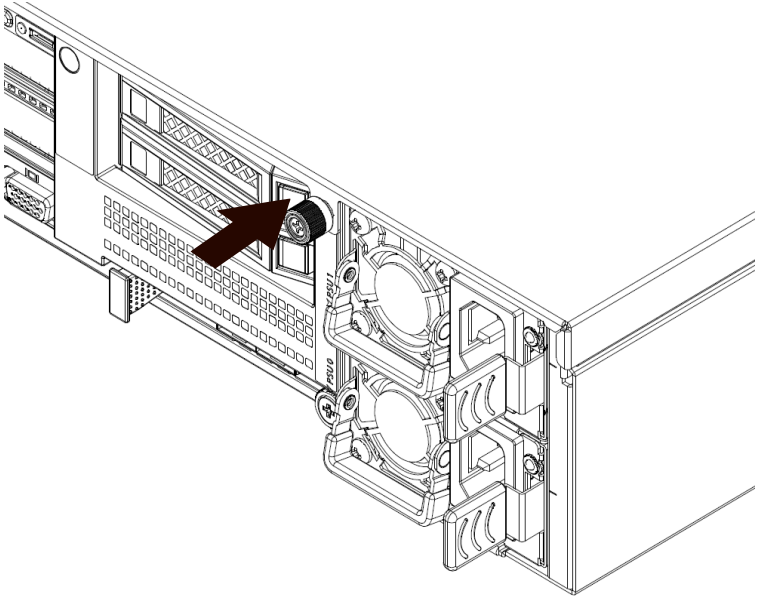


2. Rear Panel (2.5/3.5-inch Drive)

To remove the drive:

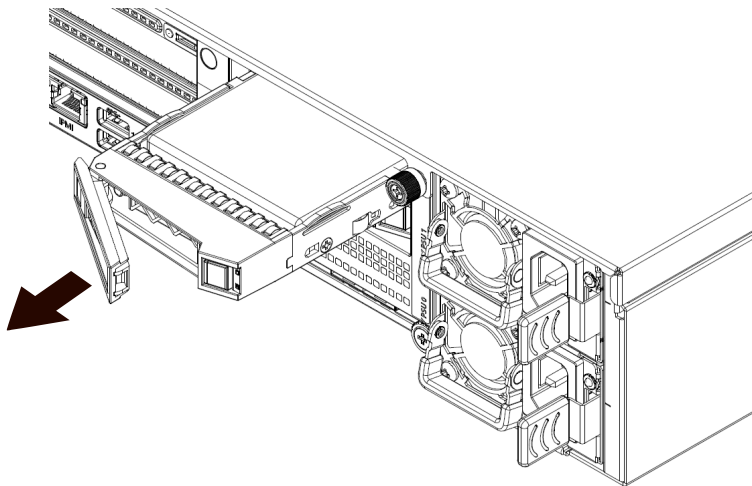
1. Remove the hot-swap drive.
 - a. Press the release latch to release the lever. The lever will pop up automatically.

Figure 4-30 Pressing the Release Latch



- b. Hold the lever and pull the drive module out of the drive bay.

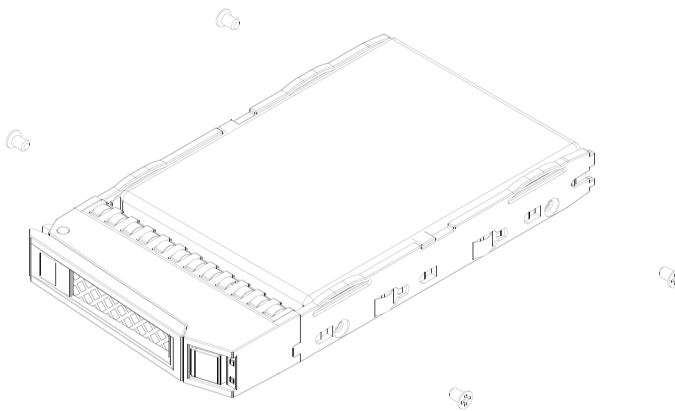
Figure 4-31 Pulling out the Drive Module



c. Separate the drive tray and the drive:

Remove the four screws securing the drive to the drive tray anticlockwise with a Phillips screwdriver.

Figure 4-32 Removing Screws Securing the Drive to the Drive Tray



To install the drive:

1. Install the drive to the drive tray.
 - a. Orient the drive to the drive tray with the drive connector facing the rear end of the tray.
 - b. Tighten the four screws securing the drive to the drive tray clockwise with a Phillips screwdriver.
2. Insert the drive module into the drive bay with the lever in the open position.

3. Close the release lever to lock the drive module in place.
4. Power on the server and verify that the drive activity status LED is green.

4.4.10 Hot-Swap PSU Replacement



To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching.

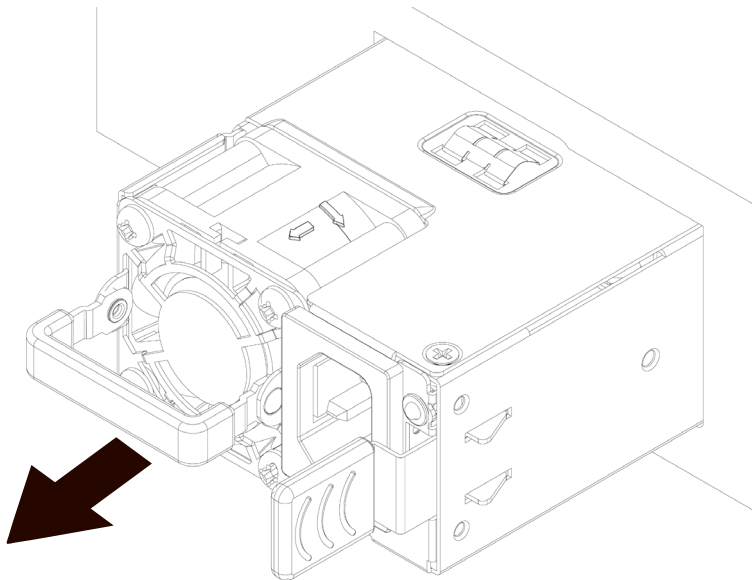


To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the PSU:

1. Grasp the handle and press on the blue lever to release the PSU. Pull the PSU out of the power supply bay.

Figure 4-33 Removing the PSU



2. Put it into an antistatic bag.

To install the PSU:

1. Take the new PSU out from the antistatic bag.

2. Insert the PSU into the power supply bay until it clicks into a locked position.
3. Power on the server and verify that the PSU LED is green.

4.4.11 OCP NIC Replacement

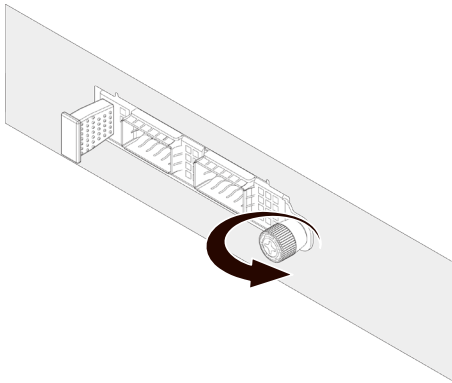


To prevent damage to the server or expansion boards, power down the server and remove all power cables before removing or installing the OCP NIC.

To remove the OCP NIC:

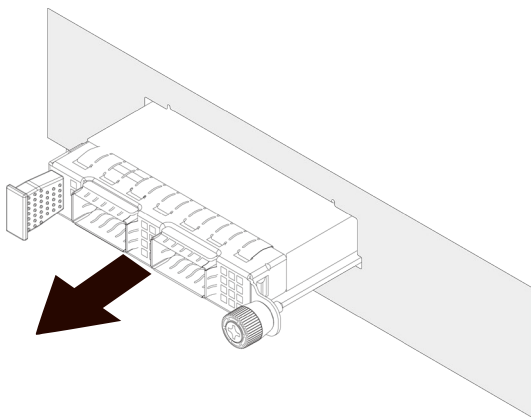
1. Loosen the thumbscrew securing the OCP NIC to the chassis anticlockwise.

Figure 4-34 Loosening the Thumbscrew



2. Pull the OCP NIC horizontally out of the chassis.

Figure 4-35 Removing the OCP NIC



3. Put it into an antistatic bag

To install the OCP NIC:

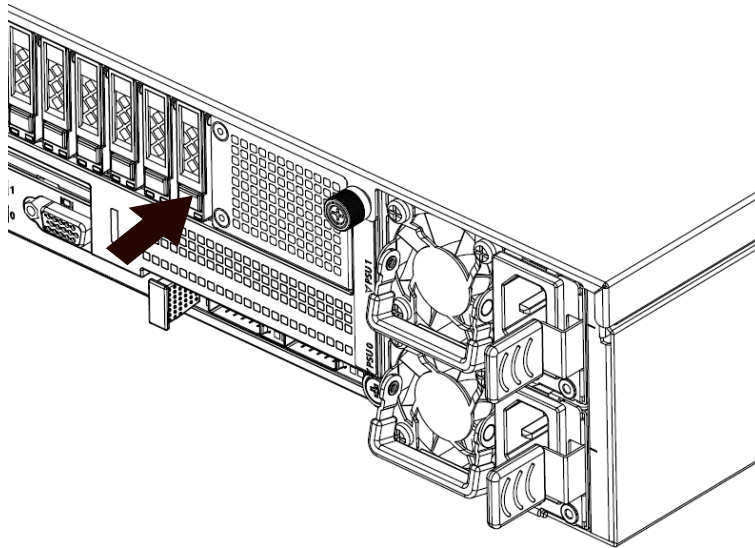
1. Take the new OCP NIC out from the antistatic bag.
2. Insert the OCP NIC into the card slot until it snaps into place.
3. Tighten the thumbscrew securing the card to the chassis clockwise.

4.4.12 E1.S SSD Replacement

To remove the E1.S SSD:

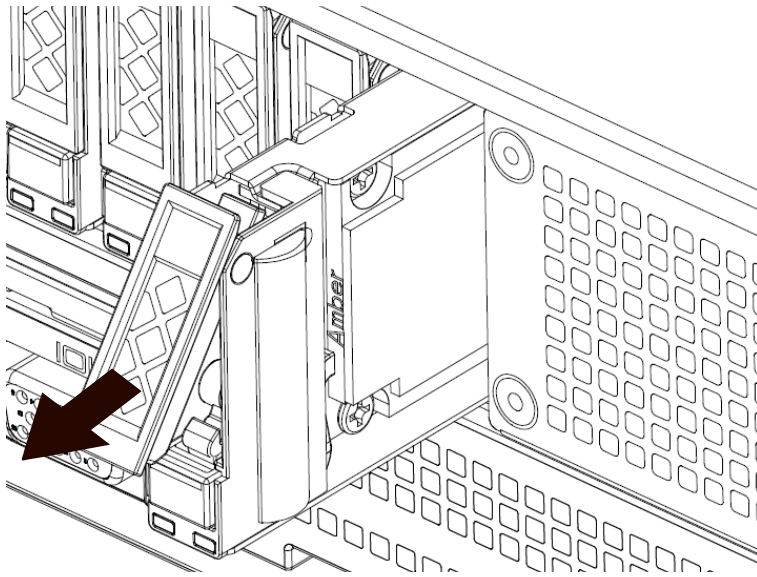
1. Press the release latch to release the lever. The lever will pop up automatically.

Figure 4-36 Pressing the Release Latch



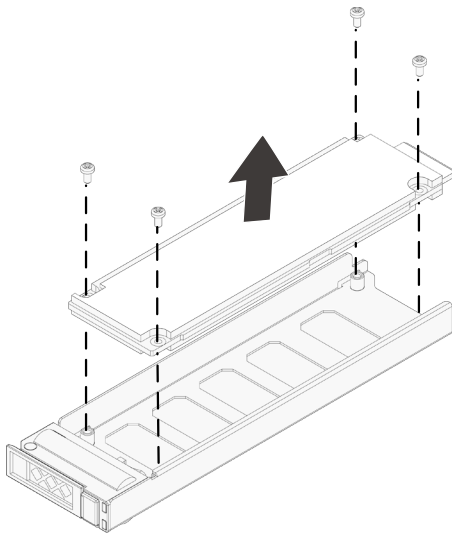
2. Hold the lever and pull the E1.S SSD module out of the drive bay.

Figure 4-37 Pulling out the E1.S SSD Module



3. Remove the four screws securing the E1.S SSD to the drive tray.
4. Lift up and remove the E1.S SSD from the tray.

Figure 4-38 Remove the E1.S SSD



To install the E1.S SSD:

1. Align the four screws with the screw holes, insert the four screws into the holes.
2. Tighten the four screws.
3. Fully open the lever. Install the E1.S SSD module into the chassis, and close the lever to secure the module in place.

4.5 Firmware Update and Configuration

For update and configuration of firmware, refer to:

- BIOS User Manual
- BIOS Update Manual
- BMC User Manual
- BMC Configuration Manual
- BMC Log Collection and Analysis Guide
- BMC Update Manual

4.6 Cable Routing

Blue indicates the data cable routing between the backplane and SAS/RAID card;

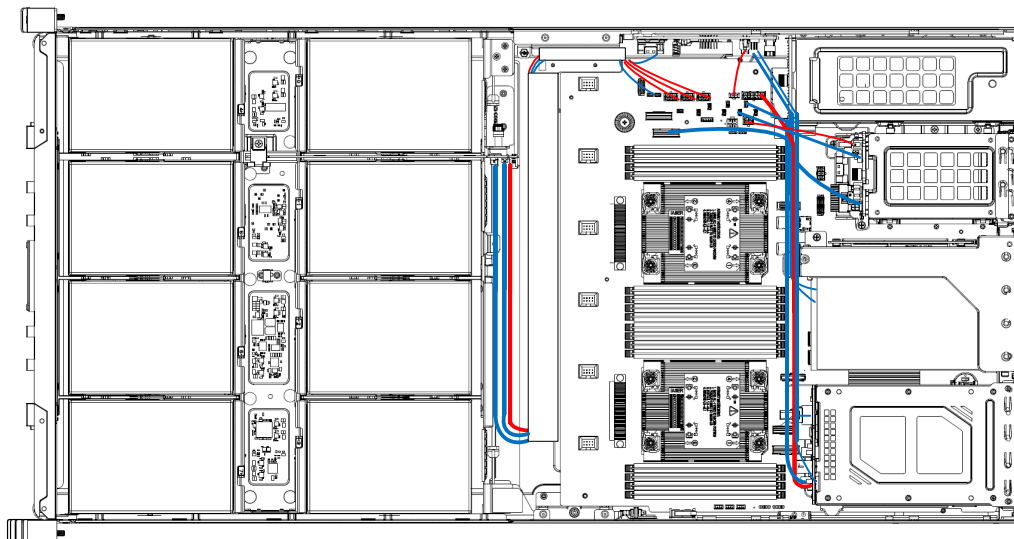
Red indicates the cable routing between the backplane power connector and the motherboard power connector for powering the drives.



CAUTION

Please route cables based on the purchased machine configuration.

Figure 4-39 Front 24 LFF + Rear 2 LFF + 2 NVMe



5 Battery Replacement



DANGER

The server CMOS contains an internal lithium cell. A risk of fire and burns exists if the cell is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
 - Do not expose the battery to temperatures higher than 60°C (140°F).
 - Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
 - Replace only with the spare designated for this product.
 - Take proper electrostatics discharge (ESD) precautions such as using appropriate anti-static straps, conductive foam pad or anti-static gloves.
-

To replace the battery:

1. Power off the server and disconnect all the power cables to remove power completely.
2. Gently slide and remove the server out of the rack.
3. Remove the access panel.
4. Remove the air duct.
5. Remove the OCP 3.0 NIC.
6. Remove any full-length expansion card if the card is in the way.
7. Locate the CMOS battery.
8. Gently press the clip on the battery socket until the battery pops up from the socket.
9. Remove the battery from the socket.



NOTE

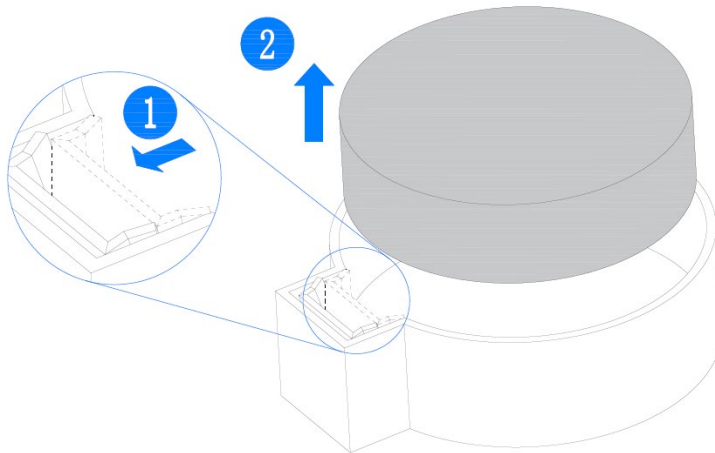
- DO NOT push the battery using excessive force.
 - Failing to remove the battery properly might damage the socket on the motherboard. Any damage to the socket might require replacing the entire base with the motherboard.
-

10. Dispose of the battery as required by local ordinances or regulations.

 NOTE

The drawings shown below are for illustration only. The location and orientation of the battery may differ depending on the models you purchased.

Figure 5-1 Removing the CMOS Battery



11. Take the new battery out from the anti-static package.
12. Place the new battery into the socket, being careful to observe the correct polarity.
13. Snap the battery into place. Make sure the battery is secured within the socket.

 NOTE

After replacing the battery, you must reconfigure the server and reset the system date and time.

6 Electrostatic Discharge

6.1 Preventing Electrostatic Discharge

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers before they arrive at static-free workstations.
- Place parts on a grounded surface before taking them out from their packages.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

6.2 Grounding Methods to Prevent Electrostatic Discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact Inspur Customer Service.

7 Troubleshooting

This chapter describes the common server faults, basic fault diagnosis and troubleshooting suggestions.

7.1 Hardware Problems

7.1.1 Power-On Failure

Symptoms:

After pressing the power button, the power LED on the power button is orange and the drive activity status LED is off. Meanwhile, there is no output on the monitor, and server fans do not rotate.

Solutions:

Check the status of the PSU LEDs on the rear panel.

1. PSU LED Off or Illuminates Amber
 - a. If the PSU LEDs are off or amber, it indicates abnormal power supply. Check if the outlet can function, if the power cords are plugged properly and if the power cables of the faulty PSU can work;
 - b. If all yes: the PSU LEDs are still off or amber, maybe the PSUs are faulty. Please replace the faulty PSUs with PSUs of the same server model and of the same specifications to test whether the PSUs have failed; the PSU LEDs turn green, but the power LED on the power button is still orange, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.
2. All the PSU LEDs are green
 - a. If all the PSU LEDs are green, disconnect the power cables, remove and re-insert all the PSUs. Connect the power cables and power on again to test if the problem can be solved;
 - b. If re-inserting the PSUs won't work, please replace the PSUs with PSUs of the same server model and of the same specifications to test whether the PSUs have failed;
 - c. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.1.2 No Display

Symptoms:

After pressing the power button, the power LED on the power button changes from orange to green, the system fans work normally, but there's no output on the monitor.

Solutions:

1. Check whether the monitor is powered up normally;
2. If yes, but there is still no output on the monitor, check whether the monitor is connected properly to the server's VGA port;
3. If yes, but there is still no output on the monitor, please replace with another monitor;
4. If the problem still persists, maybe the VGA port is abnormal. Please log into the BMC Web interface. Launch the BMC remote KVM (For detailed reference document, see [Firmware Update and Configuration](#)) to see if KVM can be displayed normally: If yes, maybe the VGA port on the motherboard is abnormal, please contact Inspur Customer Service; if no, please record the detailed warning information;
5. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com, and inform us of the detailed warning information and failure.

7.1.3 Abnormal LED on the Front Panel

Symptoms:

The status LED on the front panel illuminates red.

Solutions:

Identify the abnormal LED based on "[Front Panel Buttons and LEDs](#)"

1. If the system status LED illuminates red, check whether the server is under normal operation: If yes, log into the BMC Web interface to view the BMC logs (For detailed reference document, see [Firmware Update and Configuration](#)) to check whether there are warnings. If yes, please record the detailed warning information;
 - a. If the power status LED is abnormal, please check if the PSU LEDs on the rear panel are abnormal (amber or off): If the PSU LEDs are normal, please log into the BMC Web interface to check the BMC logs (For detailed reference document, see [Firmware Update and Configuration](#)) to see if there are warnings. If yes, please record the detailed warning information;

if all the PSU LEDs are abnormal, please refer to All the PSU LEDs are green;
if one PSU LED is abnormal, please refer to PSU LED Off or Illuminates Amber;

- b. If other status LEDs are abnormal, log into the BMC Web interface to check the BMC logs to see if there are warnings; if yes, please record the detailed warning information;
- c. If the instructions above do not locate or resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com, and inform us of the detailed warning information and failure.

7.1.4 Stuck in POST Interface or Other Interface

Symptoms:

After pressing the power button, the server gets stuck in the POST interface or other interface and cannot enter the OS.

Solutions:

1. If the server gets stuck in the media test failure interface, please confirm if OS is installed successfully and OS boot order is set to first;
2. If the stuck interface includes directional error information of hardware, such as self-test errors of memory and RAID, record the detailed errors;
3. If the stuck interface is the POST interface and there are errors reported in the interface, please record the detailed errors;
4. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com, and inform us of the detailed errors.

7.1.5 PSU LED Off or Illuminates Amber

Symptoms:

A certain PSU LED on the rear panel is off or illuminates amber when the server is under normal operation.

Solutions:

1. Check if there is normal external power supply. Inspect the server for any abnormal appearance such as burning or vulcanization;
2. Check whether the power cables are connected properly. Re-connect the power cables again.
3. If the fault still exists, remove the power and insert the PSU again.

4. Shut down the server (if shutdown is allowed), switch the positions of the PSUs and cross-check whether the PSU is faulty.
5. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.1.6 Abnormal Drive Status LED

Symptoms:

The drive activity status LED is off or the drive fault LED illuminates red when the server is under normal operation.

Solutions:

1. Check if the drives are installed properly;
2. Check whether the drivers are removed and inserted or if there are other manual operations. If yes, restore the array through RAID configuration to ensure the drives are configured properly;
3. If no, run command under the OS to see if all the drives are identified. If the server is configured with an RAID card, you can also choose to log into the RAID management interface to check whether there is a drive failure;
4. If there is a drive failure or the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.



NOTE

- Hot-swap storage drive allows users to remove or replace the drive without shutting down or powering off the system, which improves the system disaster recovery capability, scalability and flexibility. It only means the hot-swap drive can be plugged in and out online without damage.
 - Depending on the RAID level, hot-plugging a storage drive in the RAID may cause RAID degradation or failure. When installing a new drive, different RAID cards have different policies. You may need to log into the RAID management interface for recovery.
 - Remove the drive until the drive motor stops completely in order to prevent damage to the motor.
-

7.1.7 Loud System Fan Noise

Symptoms:

System fans make excessive noise when the server is under normal operation.

Solutions:

1. Check the fan status LED or other status LEDs on the front panel for any warnings. Meanwhile, ensure that the access panel is closed properly and the air duct has not been moved;
2. Check the server temperature by hand or the sensor temperature in the BMC Web interface for over-temperature;
3. If the temperature of the chassis is too high, check the temperature of the server room. If it is too high, adjust the air conditioner to cool the room;
4. If the temperature of the server room isn't high, check whether the front bezel or chassis interior is jammed with dust. If yes, clean with a soft and dry cloth, or a specialized brush. The environment of the server room needs to be improved to avoid over-temperature running of the server caused by too much dust;
5. Check if the server is operating under heavy load. Log into the BMC Web interface to see if all the fans are identified and if the fan mode is automatic;
6. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.1.8 Alarm Sound from the Server

Symptoms:

There is an alarm sound during server startup or operation.

Solutions:

Find the source of the alarm sound:

1. If the alarm sound comes from the PSUs, check the status of the PSU LEDs on the rear panel. If the PSU LEDs are abnormal, refer to PSU LED Off or Illuminates Amber to handle it.
2. If the alarm sound comes from the chassis interior, remove the access panel to find the specific source;
3. If the alarm sound comes from the RAID card, check the drive fault LED for any warning or log into the RAID management interface for any drive warning and record the detailed warning information if any.
4. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com, and inform us of the alarm source and detailed warning information.

7.1.9 Keyboard and Mouse Failure

Symptoms:

Neither keyboard nor mouse can function.

Solutions:

1. Make sure the keyboard and mouse have been connected properly and firmly.
2. Connect the keyboard and mouse to a laptop or a server to test if they can function or not;
3. Power cycle the server and retest;
4. Restart the server and enter BIOS or RAID management interface to test if the keyboard and mouse can function: If the keyboard and mouse can function in non-OS environment, maybe there is something wrong with the USB driver of the OS; if the keyboard and mouse cannot function in non-OS environment, then maybe the connector on the motherboard is faulty. Please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.1.10 USB Port Problem

Symptoms:

Unable to use devices with a USB port.

Solutions:

1. Make sure the OS of the server supports USB devices;
2. Make sure the server has been installed with the correct USB driver, and try installing the USB driver again;
3. Connect the USB device to another server to test if the device can function;
4. If the USB device cannot function, please replace with a known working USB device;
5. Power cycle the server and retest;
6. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.2 Software Problems

7.2.1 OS Installation Problems

Symptoms:

Unable to load the RAID driver or create partitions larger than 2 T during OS installation; C disk usage is too high after OS installation, etc.

Solutions:

1. If it fails to load the driver during OS installation, check the RAID driver version. Go to Inspur website <https://en.inspur.com> to download the correct RAID driver. Some RAID drivers need to be loaded several times.
2. If it fails to create partitions larger than 2 T during OS installation, select **Advanced>CSM Configuration>Boot option filter>UEFI only** (For detailed reference document, see [Firmware Update and Configuration](#)) in BIOS, save and exit BIOS interface. Choose UEFI to boot the OS. The server will restart automatically. It needs to enter the CMD command line to change the drive format to GPT, and then partitions larger than 2 T can be created;
3. If the C disk usage is too high after installing the Windows OS, turn down the virtual memory or allocate the virtual memory to other partitions;
4. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.2.2 PXE Boot Failure

Symptoms:

Unable to install OS via PXE.

Solutions:

1. Check if the PXE server can be used to install OS for another server;
2. Check whether there is network link via the network port LED to check if there is a fault in external network;
3. Check whether the NIC can be identified under BMC Web, BIOS or Shell;
4. Check if PXE Function is enabled and if the boot sequence is set to first in BIOS;
5. Check if the target drive for the OS or RAID array can be identified and if there is enough space;
6. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.2.3 Abnormal Memory Capacity

Symptoms:

The memory capacity displayed in the OS and the physical memory capacity are

inconsistent.

Solutions:

1. Check the OS version. The supported memory capacity varies with the version of Windows OS. Enter BIOS Setup to view the memory capacity. If the memory is identified completely, the OS may be unable to access all the installed memories. For example, Windows server 2008 x86 supports up to 4 G memory;
2. If the memory is not identified completely in BIOS Setup, confirm that the corresponding slots have been populated with memories of correct type;
3. If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com.

7.2.4 Abnormal Network

Symptoms:

The network is disconnected, or the rate is lower than the actual rate of the network port under the server OS.

Solutions:

1. Check whether the network cable is connected properly and whether the network port LED flashes normally to ensure that the network is configured correctly;
2. Unplug and plug the network cable back to see if the problem can be solved. If not, connect the server with a laptop via a known working network cable: If the network is normal, check the network cable or the switch port; if the network is faulty, go to Inspur Website <https://en.inspur.com> <https://en.inspur.com> to download the latest NIC driver;
3. Check whether the NIC can be identified under BMC Web, BIOS or Shell and whether the MAC address is correct;

If the instructions above do not resolve the problem, please call Inspur Customer Service Hotline (1-844-860-0011/1-760-769-1847) or email to serversupport@inspur.com, and inform us of the detailed warning information and failure.

8 Environmental Requirements

8.1 Ambient Temperature

Table 8-1 Ambient Temperature

| Parameter | Condition | Requirement |
|-------------|--|--|
| Temperature | Operating continuously | 5°C - 35°C (41°F - 95°F) |
| | Transportation (Storage) | -40°C to 70°C (-40°F to 158°F) |
| | Maximum temperature gradient (Operation and storage) | 20°C/h (68°F/h) |
| Humidity | Operating | Relative humidity is 5% to 90% with the maximum dew point at 32°C (89.6°F) |
| | Transportation (Storage) | When the maximum dew point is 39°C (102.2°F), relative humidity is 5% to 95%, and the atmosphere must be non-condensing all the time |

8.2 Vibration and Shock Resistance

Table 8-2 Vibration and Shock Resistance

| Parameter | Condition | Requirement |
|-----------|--------------------------|--|
| Vibration | Operating | 5 - 500 Hz: 0.21 Grms (X, Y and Z axis and every direction for 15 minutes) |
| | Transportation (Storage) | 5 - 500Hz: 2.2 Grms (X, Y and Z axis and every direction for 10 minutes) |
| Shock | Operating | On negative and positive X, Y and Z axis direction, each axis can stand 100 shock pulses of 2 G in a row and the period can last for 11 ms at most |
| | Transportation (Storage) | On X, Y and Z axis direction, each axis can stand 1000 shock pulses of 40 G in a row and the period can last for 6 ms at most |

8.3 Altitude and Air Pressure

Table 8-3 Altitude and Air Pressure

| Parameter | Condition | Requirement |
|-----------|-----------------------------|----------------------------------|
| Altitude | Operating | 0 to 3,048 m (0 to 10,000 feet) |
| | Transportation (Storage) | 0 to 12,192 m (0 to 40,000 feet) |

8.4 Alternating Temperature and Humidity

Table 8-4 Alternating Temperature and Humidity

| Parameter | Condition | Requirement |
|-----------|-----------------------------|--|
| Humidity | Operating | Relative humidity is 5% to 90% with the maximum dew point at 38°C (100.4°F) |
| | Transportation (Storage) | When the maximum dew point is 39°C (102.2°F), relative humidity is 5% to 95%, and the atmosphere must be non-condensing all the time |

8.5 Extended Operation Temperature

Table 8-5 Extended Operation Temperature

| Temperature Specification (Numbers are for instance only) | Description |
|---|--------------------------------|
| 5°C - 35°C (41°F - 95°F) (5% - 85%RH) ^{Note1} | Continuous running is possible |
| 5°C - 35°C (41°F - 95°F) (5% - 90%RH) ^{Note2} | Running time ≤1% per year |

Note 1: The system performance will be impacted when the temperature is not within the specification range;

Note 2: Ignore alarm sound of ambient temperature when the temperature is not within the specification range.

8.6 Extended Operation Temperature Limits

- Powering on under 5°C (41°F) is not allowed;

- The altitude cannot be higher than 3,000 m (9,843 feet);
- Only specified PCIe cards are supported;
- Only specified NVMe drives are supported;
- NVDIMMs are not supported;
- Internal drives are not supported;
- FPGA configuration is not supported;
- GPU configurations are not supported;
- 6038 fans are not supported

8.7 Thermal Restrictions

Table 8-6 Thermal Restrictions

| Configuration | Front Drive | CPU | Heatsink | Fan | Max Temperature |
|---------------------------|-------------|----------------------|----------|------|---|
| 8-Drive configuration | 24 × 3.5" | No higher than 220 W | 1U & 2U | 6056 | SAS drives ≤ 35°C (95° F)/NVDIMM drives ≤ 30°C (86°F) |
| 4-Drive configuration | 24 × 3.5" | No higher than 220 W | 1U & 2U | 6038 | SAS drives ≤ 35°C (95° F)/NVDIMM drives ≤ 30°C (86°F) |
| 2-Drive configuration | 24 × 3.5" | No higher than 220 W | 1U & 2U | 6056 | SAS drives ≤ 35°C (95° F)/NVDIMM drives ≤ 30°C (86°F) |
| 2 LFF drive configuration | 24 × 3.5" | No higher than 165 W | 1U | 6056 | SAS drives ≤ 35°C (95° F)/NVDIMM drives ≤ 30°C (86°F) |
| 8 E1.S SSD configuration | 24 × 3.5" | No higher than 185 W | 1U | 6056 | SAS drives ≤ 35°C (95° F)/NVDIMM drives ≤ 30°C (86°F) |

8.8 Operational Requirement

This section specifies the requirements of temperature, humidity, organisms, chemical materials and mechanically active materials in the server room when the server is operating.

1. Temperature and humidity

The temperature, dew point and relative humidity in the server room should meet the requirements for operating the server. For specified requirements, see the detailed description in the product documentations.

2. Organisms

Plants and animals are not allowed in the server room. Take strict precautions against damage by rats and ants.

To meet these requirements, take the following measures in the server room:

- Ensure safety if there are humidification devices in the server room.
- All the structures and construction gaps of doors, windows, walls, ground (floors) must be sealed.
- If there are water supply and drainage pipes in the server room, anti-leakage and anti-condensation measures should be taken.
- If there is water equipment in the main server room, measures to prevent water overflow and leakage should be taken.
- Block cable holes and antenna holes.
- Clean and sterilize the server room periodically.

3. Corrosive Airborne Contaminants

Generally, a small amount of common corrosive gas pollutants exist in indoor and outdoor atmospheric environments. Chemical reactions may occur due to long-term contact between these mixed corrosive gas pollutants or pollutants of one single corrosive gas and other environmental factors (such as temperature or relative humidity), which may pose a risk of IT equipment failure from corrosion and damage circuit boards of IT equipment and system component units with weak oxidation resistance. This article specifies the limitation on corrosive airborne contaminants with an aim to avoid such risks.

The concentration level of corrosive airborne contaminants in a data center shall meet the requirements listed in the white paper entitled Gaseous and Particulate Contamination Guidelines for Data Centers published in 2011 by American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE) Technical Committee (TC) 9.9. According to the Guidelines, corrosive airborne contaminants in a data center shall meet the following requirements:

- Copper coupon corrosion rate less than 300 Å/month per ANSI/ISA-71.04-2013 severity level G1
- Silver corrosion rate less than 200 Å/month per ANSI/ISA-71.04-2013 severity level G1
- According to ANSI/ISA-71.04-2013 Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants, the gaseous

corrosivity levels are G1 (mild), G2 (moderate), G3 (harsh), and GX (severe), as described in the table below.

Table 8-7 Gaseous Corrosivity Levels per ANSI/ISA-71.04-2013

| Severity Level | Copper Reactivity Level | Silver Reactivity Level | Description |
|----------------|-------------------------|-------------------------|---|
| G1 (mild) | < 300 Å/month | < 200 Å/month | An environment sufficiently well-controlled such that corrosion is not a factor in determining equipment reliability. |
| G2 (moderate) | < 1000 Å/month | < 1000 Å/month | An environment in which the effects of corrosion are measurable and may be a factor in determining equipment reliability. |
| G3 (harsh) | < 2000 Å/month | < 2000 Å/month | An environment in which there is high probability that corrosive attack will occur. |
| GX (severe) | ≥ 2000 Å/month | ≥ 2000 Å/month | An environment in which only specially designed and packaged equipment would be expected to survive. |

See the table below for the requirements on the copper and silver corrosion rates.

Table 8-8 Concentration Limitation on Corrosive Airborne Contaminants in a Data Center

| Group | Gas | Unit | Concentration |
|---------|------------------|------------------|---------------|
| Group A | H ₂ S | ppb ^a | <3 |
| | SO ₂ | ppb | <10 |
| | Cl ₂ | ppb | <1 |
| | NO ₂ | ppb | <50 |
| Group B | HF | ppb | <1 |
| | NH ₃ | ppb | <500 |
| | O ₃ | ppb | <2 |

a: Part per billion (ppb) is the number of units of mass of a contaminant per 1000 million units of total mass.

Group A and group B are common gas groups in a data center. Group A's or group B's concentration limitation values correspond to copper and silver reactivity level G1.

Corrosion is not determined by a single factor, but by comprehensive environmental factors such as temperature, relative humidity and corrosive airborne contaminants. Any change of the environmental factors may affect the gaseous corrosivity level. Therefore, the concentration limitation values specified in the previous table are for reference only. If the actual mixed gas concentration is not listed in the table, refer to chemically active substance level in IEC-60721-3-3 or GB/T 4798.3-2007 to choose the concentration range.

4. Mechanically Active Materials

The server room should be free from explosive, conductive, magnetism-permeable, and corrosive dust. The table below lists the requirements for concentration of the mechanically active materials in the server room

Table 8-9 Requirements for Concentration of Mechanically Active Materials

| Mechanically Active Materials | Unit | Concentration |
|--------------------------------------|-----------------------|----------------------|
| Sand | mg/m ³ | ≤30 |
| Suspending dust | mg/m ³ | ≤0.2 |
| Dust deposit | mg/(m ² h) | ≤1.5 |

To meet these requirements, take the following measures in the server room:

- Use dustproof materials on the ground, wall, and ceiling of the server room.
- Adopt few or no windows design in the server room, and use dustproof materials for outer windows.
- Clean the server room, especially the air filters periodically.
- Wear shoe covers and ESD clothing before entering the server room.

8.9 EMC Requirements

As per GB/T 17626.3(IEC 61000-4-3) & GB/T 17626.6(IEC 61000-4-6) & GB/T 17626.8(IEC 61000-4-8), the recommended electromagnetic environment is as follows:

Table 8-10 Electromagnetic Environment

| Electromagnetic Phenomenon | | Specifications |
|-----------------------------------|----------------|-----------------------|
| Power frequency magnetic field | Frequency (Hz) | 50 |
| | A/m (rms) | ≤ 1 |

| Electromagnetic Phenomenon | | Specifications |
|---|------------------------|----------------|
| RF electromagnetic field amplitude modulation | Frequency (MHz) | 80 - 1000 |
| | V/m (rms, unmodulated) | ≤ 3 |
| | %AM (1kHz) | 80 |
| RF continuous wave conduction | Frequency (MHz) | 0.15 - 80 |
| | V (rms, unmodulated) | ≤ 3 |
| | %AM (1kHz) | 80 |

Meanwhile, we recommend you to take the following measures to suppress interfering signals:

- Take effective measures against power grid interference to the power supply system.
- Keep away from electrical equipment such as medical magnetic resonance device, helium arc welder, radio frequency electric heater, etc.
- Try to avoid the impact of nearby areas with high power emissions (broadcast, radar, mobile communication transmitters), electrified railways, industrial radiation, substations, and high-voltage transmission lines.
- The interference effect of other equipment in the server room must comply with relevant standards and regulations.
- Take measures to shield and isolate natural noise such as atmospheric noise and solar radio noise when necessary.

To avoid damage to the system, take ESD protection measures (Refer to Electrostatic Discharge for electrostatic protection methods).

As per the requirements of Appendix F.5 of IEC6268, the server is pasted with a safety protection logo. The logo and interpretation are as follows:

- Fan blade safety protection:

Figure 8-1 Fan Blade Safety Protection



Caution: Keep body parts away from fan blades.

- Multi-power safety protection:

- Figure 8-2 Multi-power Safety Protection



Caution: Shock Hazard! Disconnect all power supply cords before servicing.

8.10 Power Supply Requirements

8.10.1 AC Power Supply Requirement

An AC power supply that consists of mains supply, uninterruptible power supply (UPS), and self-supplied electric generator set can be used as an integrated power supply. The AC power supply must feature simple connection line, safe operation, flexible scheduling, and easy maintenance in addition to meeting the requirements of site load. Low voltage power supply should adopt three-phase five-wire mode or monophase three-wire mode.

AC power supply system should work under nominal voltage and rated frequency.

Table 8-11 Nominal Voltage and Rated Frequency

| Nominal Voltage | Rated Frequency |
|-----------------|-----------------|
| 110 V, 208 V | 60 Hz |
| 220 V, 380 V | 50 Hz |

A UPS is typically used as an AC potential power of network products. A UPS should be in the same phase as the mains supply. The time used for switching between the UPS and the mains supply should be less than 8 ms. Otherwise, the server will reboot or reset.

8.10.2 DC Power Supply Requirement

DC power supply system should work under nominal voltage of -48 V, 270 V and 380 V.

8.10.3 Recommendations on the AC Power Supply

Recommendations on the AC power supply are as follows:

- Use a voltage stabilizer or voltage-regulator to respond to unstable voltages.
Use a voltage-regulator in the following situations:

- The server is directly powered by the mains supply, and the power supply voltage exceeds the rated voltage by -10% to +10% or the voltage range allowed for the server.
- The server is not directly powered by the mains supply, and the mains voltage exceeds the rated voltage by -10% to +10% or the AC input voltage range allowed for the DC power equipment.
- To prevent interruption or surge of AC power supply, use the UPS or inverter.
- The data center should be equipped with self-supplied generator set in case of mains failure to ensure proper function of important load and important power load. All electrical equipment such as IT equipment and refrigeration equipment shall be considered. Check the start-up shock to ensure that the generator can start reliably. The generator performance should meet the requirements of Code for Design of Data Centers (GB50174).
- Connect two storage battery strings in parallel. A second UPS is needed as redundant backup.

8.10.4 HVDC Power Supply

The high-voltage direct current (HVDC) system can eliminate the problems existing in conventional AC and low-voltage DC power supplies. At present, 240 V HVDC standards and 336 V HVDC standards are the mainstream HVDC standards used in China.

8.10.5 HVDC Power Supply Requirements

- The requirements for HVDC power supply are as follows:
 - Operating range: -5°C to 45°C (23°F to 113°F)
 - Storage and transportation range: -40°C to 45°C (-40°F to 113°F)
- Relative Humidity:
 - Operating range: ≤ 90% RH (40±2°C)
 - Storage and transportation range: ≤95% RH (40±2°C)
- Vibration performance: ability to withstand sinusoidal frequencies between 10 Hz to 55 Hz and amplitude of 0.35 mm.
- Battery capacity configuration: Ensure continuous operation of servers at full loads when the power supplies are unavailable. The battery backup time should be 15 minutes when a diesel generator is available as backup power source.

- Determination of cell voltage and pack number: Depending on the system capacity and backup time, the cell voltage can be selected from 2 V, 6 V or 12 V.
- The insulation monitoring device acts properly if a ground fault occurs or the insulation resistance is 28 kΩ lower than the set value. The HVDC system is protected against overcurrent and short circuits and can be manually or automatically restored after overcurrent or short circuits are rectified.
- Over- and under-voltage protection for AC power supplies: The power supply system can monitor the input voltage changes. When detecting that the AC input voltage is higher or lower than the specified threshold, which may pose safety risk on the operation of the power supply system, the system automatically shuts down. The system automatically restores when the input voltage is normal.
- The site is free from explosive materials, conductive media and hazardous gases that erode metals and affect insulation, and mold.
- Protection against high temperature: When the temperature in the power supply system reaches the specified threshold, the power supply system automatically reduces the power or shuts down the power amplifier. When the temperature falls below the threshold, the power supply system restores the normal power output.
- The system provides alarm records and query, and the alarm display can be updated on a real-time basis. The alarm information is protected against loss when the system is out of power.

8.10.6 HVDC Power Supply Suggestions

- Terminal equipment can be connected to power sockets or wiring terminals. Wiring terminals are recommended.
- Do not use a shunt circuit breaker to connect to or control multiple PSUs through a multi-purpose power socket.
- Choose DC circuit breakers based on the rated current of the equipment. The 10 A or 16 A DC breakers are recommended.
- Recommended standards for equipment power wiring: Connect the DC output positive pole to terminal N of the equipment power cord. Connect the DC output negative pole to terminal L of the equipment power cord. DC system is strictly forbidden to be grounded.
- The upstream input terminal of the power supply system is equipped with a surge protection device to protect the system against a minimal voltage surge of 10/700 us, 5 kV and a minimal current surge of 8/20 us, 20 kA.

- All cables in the power distribution frame (PDF) comply with YD/T 1173 specifications, and the diameters of all power cords meet the requirements for wire ampacity.

8.10.7 DC Power Supply

The DC power supply should be stable and reliable. The power equipment should be deployed near the server. The standard DC voltage is -48 VDC with a fluctuation range of server power between -40 V to -72 V.

9 Warranty

Inspur warrants that all Inspur-branded hardware products shall be free from material malfunctioning and material defects under conditions of normal use for a period of three (3) years from the Date of Invoice.

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

9.1 Warranty Service

Remote Technical Support

Inspur warranty service includes 24/7 remote technical support and 3 years parts replacement throughout the warranty period. Warranty Service are Advance Replacement Service in the first year and Standard Replacement Service in the second and third years.

Table 9-1 Warranty Service Type and Duration

| Type | Duration |
|--------------------------|----------|
| Remote Technical Support | 3 years |
| RMA Services | 3 years |

The 24/7 remote technical support can be obtained through hotline, e-mail, and Service Portal*¹. Through hotline and e-mail support, Inspur engineers help customers diagnose the cause of malfunction and provide solution. Service Portal*¹ provides access to firmware, customized update files, and related manuals for Inspur products. Customer may also access the Service Portal*¹ to submit Return Material Authorization (RMA) for parts replacement or repair.

Information needed when requesting for support:

- Contact name, phone number, e-mail address
- System Serial Number, Part Number, Model and location (address) of the product needing service
- Detailed description of problem, logs (sel and blackbox, and any other related logs from OS), screenshot of issue, pictures of damaged/questions parts, etc.

Table 9-2 Support Contact Information

| Type | Description | Support Window |
|------------------------------|--|---|
| Global Hotline | Global: 1-844-860-0011/1-760-769-1847 (English) China: 800-860-0011/400-860-0011 (Chinese) | 24 × 7 × 365 |
| Email | Global: serversupport@inspur.com China: lckf@inspur.com | 24 × 7 × 365 |
| | US**: serversupportusa@inspur.com Korea: serversupport_kr@inspur.com Japan: serversupport_jp@inspur.com | Local business hours 9AM to 6PM Monday to Friday **US: PST (GMT -8) |
| Service Portal* ¹ | US**: http://service.inspursystems.com/login.htm EU: http://eurportal.inspur.com/ | Local business hours 9 AM to 6 PM Monday to Friday **US: PST (GMT -8) |

RMA Services

Inspur may, at its discretion, repair or replace the defective parts. Repair or Replacement parts may be new, used, or equivalent to new in performance and reliability. Repaired or replaced parts are warranted to be free of defects in material or workmanship for ninety (90) calendar days or for the remainder of the warranty period of the product, whichever is longer.

Advance Replacement: Under the terms of Advance Replacement Service, if a problem with customer product cannot be resolved via hotline and e-mail support and a replacement part is required, Inspur will ship out replacement part(s) in advance within one (1) business day. Customer should return defective part(s) within five (5) business days after receiving the replacement(s). Inspur will cover one-way shipment via ground.

Standard Replacement: When a hardware failure happens, customer may submit RMA request to Inspur via e-mail or Service Portal*¹. Inspur will review and approve RMA submission, and provide an RMA number and return information that customer may use to return for RMA service. Inspur will ship out replacement part(s) within one (1) business day after receiving the defective part(s) and cover one-way shipment via ground.

9.2 Inspur Service SLA

Inspur offers a variety of Service Level Agreements (SLA)*² to meet customer requirements with different service components and service level targets.

- Base Warranty Services
- Advance Replacement
- 9x5 NBD Onsite Service
- 24 x 7 x 4 Onsite Service
- Onsite Deployment Service
- Data Media Retention
- Global Service
- Customized Service

9.3 Warranty Exclusions

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

The Warranty Terms & Conditions do not apply to consumable parts, as well as any products that the serial number missed, damaged or obscured for the following reasons:

- Accident, misuse, abuse, defiling, improper maintenance or calibration or other external causes
- Operating beyond the parameters as stipulated in the user documentation
- Use of the software, interface, parts or supplies not provided by Inspur
- Improper staging, usage, or maintenance
- Virus infection
- Loss or damage in transit which is not arranged by Inspur
- The product has been modified or serviced by non-authorized personnel
- Any damage to or loss of any personal data, programs, or removable storage media
- The restoration or reinstallation of any data or programs except the software installed by Inspur when the product is manufactured

- Any consumable parts, such as, but not limited to, battery or protective coating that is diminished over time, unless the failure has occurred during DOA period, such failure caused by Inspur's material or workmanship
- Any cosmetic damage, such as, but not limited to, scratches, dents, broken plastics, metal corrosion, or mechanical damage, unless the failure has occurred during DOA period due to defect in Inspur's material or workmanship
- Any engineering sample, evaluation unit, or non-mass production product is not covered under warranty service
- Any solid-state drive (SSD) with the usages of which has reached its write endurance limit

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

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

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

Appendix

A.1 Drive Neodymium Content Reference Table

Table A.1-1 Seagate Drive Neodymium Content Reference Range

| Product Series Name | Neodymium Content Range | | |
|------------------------|-------------------------|------------|--------|
| | < 5 g | 5 g - 25 g | > 25 g |
| Cimarron (2T/4T) | √ | | |
| Cimarron (6T/8T) | | √ | |
| Evans | | √ | |
| Kestrel | √ | | |
| MakaraBP | | √ | |
| MakaraPLUS | | √ | |
| Mobula | | √ | |
| MobulaBP | | √ | |
| Skybolt | √ | | |
| Tatsu | | √ | |

Table A.1-2 WD Drive Neodymium Content Reference Range

| Product Series Name | Neodymium Content Range | | |
|------------------------|-------------------------|------------|--------|
| | < 5 g | 5 g - 25 g | > 25 g |
| Rainier | √ | | |
| Libra He10 | | √ | |
| Leo A | | √ | |
| Vela-A | | √ | |
| Vela-AP | | √ | |
| Hs14 | | √ | |
| Leo-B | | √ | |
| Paris C | | √ | |
| Vela-AX | | √ | |

Table A.1-3 Toshiba Drive Neodymium Content Reference Range

| Product Series Name | Neodymium Content Range | | |
|---------------------|-------------------------|------------|--------|
| | < 5 g | 5 g - 25 g | > 25 g |
| AL14SE-Lite | √ | | |
| AL15SE | √ | | |
| AL14SX | √ | | |
| MG04 Tomcat-R SAS | | √ | |
| MG04 Tomcat-R SATA | | √ | |
| MG04 Tomcat SATA | | √ | |
| MG06 SAS | | √ | |
| MG06 SATA | | √ | |
| MG07 SAS | | √ | |
| MG07 SATA | | √ | |
| MG08 16T | | √ | |

A.2 Acronyms and Abbreviations

A

| | |
|------|---|
| AC | Alternating Current |
| ACPI | Advanced Configuration and Power Management Interface |
| AES | Advanced Encryption Standard New Instruction Set |
| AI | Artificial Intelligence |
| AOC | Active Optical Cables |
| API | Application Program Interface |
| ARP | Address Resolution Protocol |

B

| | |
|------|---------------------------------|
| BIOS | Basic Input Output System |
| BMC | Baseboard Management Controller |

C

| | |
|------|--|
| CE | Conformite Europeenne |
| CLI | Command-Line Interface |
| CMOS | Complementary Metal-Oxide-Semiconductor Transistor |
| CPLD | Complex Programming Logic Device |
| CPU | Central Processing Unit |
| CRPS | Common Redundant Power Supplies |
| CRU | Customer-Replaceable Unit |
| CSA | Canadian Standards Association |
| CSM | Compatibility Support Module |

D

| | |
|------|-------------------------------------|
| DC | Direct Current |
| DDR4 | Double Date Rate 4 |
| DHCP | Dynamic Host Configuration Protocol |
| DIMM | Dual-Inline-Memory-Modules |
| DNS | Domain Name System |
| DVD | Digital Video Disc |

F

| | |
|-----|------------------------|
| FMA | Failure Mode Analysis |
| FRU | Field-Replaceable Unit |

| | |
|-----|------------------------|
| FTP | File Transfer Protocol |
| FW | Firmware |

G

| | |
|-----|--------------------------|
| GPU | Graphics Processing Unit |
| GUI | Graphical User Interface |

H

| | |
|--------|---|
| HBA | Host Bus Adapter |
| HCA | Host Channel Adapter |
| HDD | Hard Disk Drive |
| HTML | Hyper Text Markup Language |
| HWRAID | Hardware Redundant Arrays of Independent Drives |

I

| | |
|-------|---|
| I/O | Input/Output |
| IEC | International Electrotechnical Commission |
| IOPS | Input/Output Operations Per Second |
| IP | Internet Protocol |
| IPMB | Intelligent Platform Management Bus |
| IPMI | Intelligent Platform Management Interface |
| iSCSI | Internet Small Computer System Interface |

J

| | |
|------|-------------------------|
| JTAG | Joint Test Action Group |
|------|-------------------------|

K

| | |
|-----|----------------------|
| KVM | Keyboard Video Mouse |
|-----|----------------------|

L

| | |
|--------|---|
| LAN | Local Area Network |
| LCD | Liquid Crystal Display |
| LED | Light Emitting Diode |
| LRDIMM | Load Reduced Dual In-Lane Memory Module |

M

| | |
|------|--------------------------|
| MLAN | Music Local Area Network |
|------|--------------------------|

N

| | |
|------|---|
| NCSI | National Communication System Instructions |
| NEMA | National Electrical Manufacturers Association |
| NFPA | National Fire Protection Association |
| NIC | Network Interface Controller |
| NM | Node Manager |
| NPU | Network Processing Unit |

| | |
|--------|---|
| NTP | Network Time Protocol |
| NVDIMM | Non-Volatile Dual In-Line Memory Module |
| NVMe | Non-Volatile Memory Express |

O

| | |
|-----|----------------------|
| OCP | Open Compute Project |
| OS | Operating System |

P

| | |
|-------|---|
| PCH | Platform Controller Hub |
| PCI | Peripheral Component Interconnect |
| PCIe | Peripheral Component Interconnect express |
| PDU | Power Distribution Unit |
| PFR | Platform Firmware Resilience |
| PHM | Processor Heatsink Module |
| PHY | Physical |
| PMBus | Power Management Bus |
| POST | Power On Self Test |
| PSU | Power Supply Unit |
| PXE | Pre-boot Execution Environment |

R

| | |
|-------|--|
| RAM | Random-Access Memory |
| RAID | Redundant Arrays of Independent Drives |
| RDIMM | Registered Dual In-line Memory Module |
| RH | Relative Humidity |
| ROM | Read-Only Memory |
| RTA | Real Time Clock |

S

| | |
|--------|---|
| SAS | Serial Attached Small Computer System Interface |
| SATA | Serial Advanced Technology Attachment |
| SFP | Small Form-factor Pluggable |
| SIC | Smart Interface Card |
| SKU | Stock Keeping Unit |
| SMTP | Simple Mail Transfer Protocol |
| SNMP | Simple Network Management Protocol |
| SOL | Serial Over LAN |
| SSD | Solid State Disk |
| SSH | Secure Shell |
| SWRAID | Software Redundant Arrays of Independent Drives |

T

| | |
|------|---------------------------------|
| TCG | Trusted Computing Group |
| TCM | Trusted Cryptography Module |
| TCO | Total Cost of Ownership |
| TDP | Thermal Design Power |
| TPCM | Trusted Platform Control Module |
| TPM | Trusted Platform Module |

U

| | |
|------|---------------------------------------|
| UEFI | Unified Extensible Firmware Interface |
| UID | User Identification |
| UPI | Ultra Path Interconnect |
| UPS | Uninterruptible Power Supply |
| USB | Universal Serial Bus |

V

| | |
|------|----------------------------|
| VGA | Video Graphics Array |
| VLAN | Virtual Local Area Network |

X

| | |
|-----|-------------------|
| XDP | eXtend Debug Port |
|-----|-------------------|