TaiShan 2280 Server

User Guide

Issue 11

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About This Document

Purpose

This document describes the TaiShan 2280 server in terms of its appearance, functions, structure, installation and removal procedures, basic configuration, OS installation methods, parts replacement, and troubleshooting.

You can perform installation, removal, power-on, power-off, basic configuration, OS installation, parts replacement, and troubleshooting of the TaiShan 2280 server by referring to this document.

Intended Audience

This document is intended for:

- Enterprise administrators
- Enterprise end users

Symbol Convention

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

Symbol	Description
	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury.
	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Issue	Date	Description
11	2021-08-09	Modified **2.11 Product Specifications**.
10	2021-01-22	Modified **2.11 Product Specifications**.
09	2020-06-29	Added the "Powered by Kunpeng" label on the front panel.
08	2020-03-03	• Modified the power consumption description. • Added the description of the drive erasure function.
07	2020-01-17	Modified **3.3.3 Installing the Server on the Ball Bearing Rail Kit** and **3.5.3 Removing the Server and Ball Bearing Rail Kit**.
06	2019-12-04	Modified **8.2 Optimizing Onboard XGE NIC Performance**.
05	2019-06-15	Modified **2.2 Panels** and **5.7 Installing an OS**.
04	2019-01-25	Modified **6.30 Removing a Mainboard** and **6.31 Installing a Mainboard**.
03	2018-09-20	Added the description of server boot modes in **5.6 Configuring the BIOS**.
02	2018-06-19	Added **2.8.2 Internal Cabling for 25-Drive Configuration**.
01	2016-12-12	This issue is the first official release.

Contents

1 Safety Instructions

This section recommends the safety measures to follow when you install or replace a server or its parts.

General Instructions

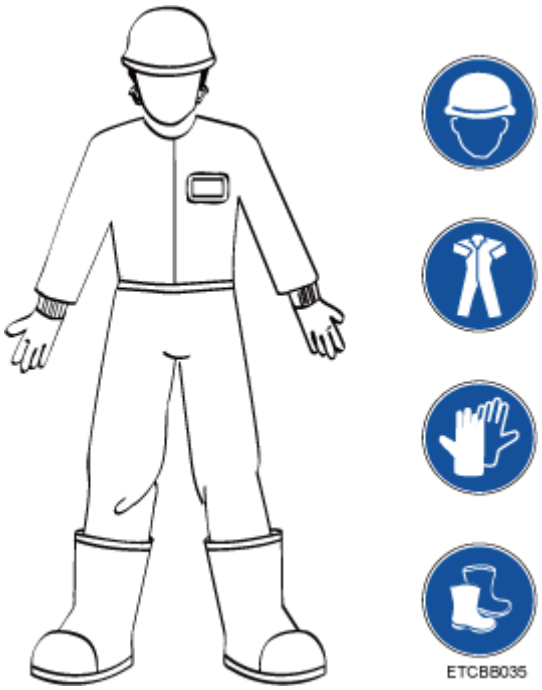
- Comply with all local laws and regulations when operating devices. These safety instructions are only a supplement.
- Observe the instructions that accompany all "DANGER", "WARNING", "CAUTION", and "NOTE" symbols in this document. Follow them in conjunction with these Safety Instructions.
- Observe all safety instructions provided on the device labels when installing hardware. Follow them in conjunction with these Safety Instructions.
- Only qualified personnel are allowed to perform special tasks, such as high-voltage operations and driving a pallet truck.
- This is a class A product, which may cause radio interference in a domestic environment. Take protective measures before operating this product in a residential environment.

Personal Safety

Observe the following precautions for personal safety:

- Only personnel certified or authorized by Huawei are allowed to install devices.
- Report the faults or errors that may cause safety problems to the person in charge immediately and take protective measures.
- Do not move devices or install cabinets and power cables in hazardous weather conditions.
- Wear clean protective gloves, electrostatic discharge (ESD) clothing, a protective hat, and protective shoes, as shown in **Figure 1-1**.

Figure 1-1 Safety work wear



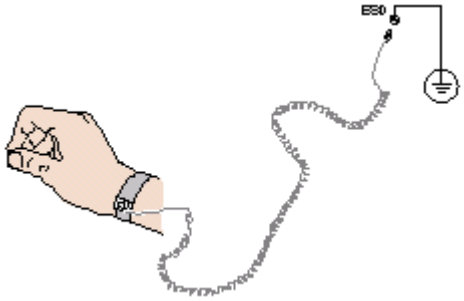
- Observe the following precautions when moving devices:
  - Do not carry the weight that is over the maximum load per person allowed by local laws or regulations.
  - Before moving or installing devices, check the maximum weight and arrange required personnel.
- Before touching a device, ensure that you are wearing ESD clothing and ESD gloves (or a wrist strap), and remove all conductive objects (such as watches and jewelry). **Figure 1-2** shows conductive objects that must be removed before you touch a device.

Figure 1-2 Conductive objects to be removed

Figure 1-3 shows how to wear an ESD wrist strap.

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

Figure 1-3 Putting on an ESD wrist strap



- Always follow the operating instructions when using tools.
- If the installation position of a device is higher than the shoulders of the installation personnel, use a vehicle such as a lift to facilitate installation. Prevent the device from falling down and causing personal injury or damage to the device.
- The device is powered by high-voltage power sources. Direct or indirect contact (especially through damp objects) with high-voltage power sources may result in serious injury or death.
- Properly ground a device before powering it on.
- Do not use the ladder unsupervised. Have someone else hold the ladder steady to prevent accidents.
- Do not look into optical ports without eye protection.

Capacity Expansion Precautions

Precautions for capacity expansion include but are not limited to the following:

- Only components listed in the **Computing Product Compatibility Checker** can be used, and the components must be genuine Huawei components.
- Only Huawei-certified maintenance engineers are allowed to expand capacity. Avoid physical damage caused by electrostatic discharge, collision, and scratches.
- Before expanding capacity, back up data and isolate the device from the network to prevent data loss, service interruption, and network loops.
- After expanding capacity, upgrade software to prevent software incompatibility with new components.

Device Security

Observe the following precautions:

- Use the recommended power cables at all times.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Before operating devices, wear ESD clothes and gloves to prevent electrostatic-sensitive devices from being damaged by ESD.
- When moving a device, hold the handles or bottom of the device. Do not hold the handle of the installed module, such as the power module, fan module, drive, or mainboard.

- Exercise caution to prevent damage to the devices when using tools during installation or maintenance.
- Connect the power cables to separate power distribution units (PDUs) for active/standby operation.
- Ground the device before powering it on.

Transportation Precautions

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

Transportation precautions include but are not limited to:

- The logistics company engaged to transport the devices must be reliable and comply with international standards for transporting electronics. Ensure that the devices being transported is always kept upright. Take necessary precautions to prevent collisions, corrosion, package damage, damp conditions and pollution.
- Transport the device in its original packaging.
- Package heavy, bulky items (such as chassis and blades) and fragile parts (such as PCIe GPUs and SSDs and optical modules) separately.

  NOTE

  For details about the components supported by the compute modules or servers, use the **Computing Product Compatibility Checker**.
- Power off all devices before transportation. Do not transport hazardous materials.

Limits for the Maximum Weight Carried Per Person

CAUTION

To reduce the risk of personal injury, comply with local regulations regarding the limits for the maximum weight carried per person.

Table 1-1 lists the limits for the maximum weight carried per person as stipulated by the following organizations.

Table 1-1 Limits for the maximum weight carried per person

Organization Name	Weight (kg/lb)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13

Organization Name	Weight (kg/lb)
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	• Male: 15/33.01 • Female: 10/22.05

2 Introduction to the TaiShan 2280 Server

2.1 Overview

The TaiShan 2280 server is a 2-socket rack server (marked as TaiShan 2280 on the nameplate) developed based on Huawei Kunpeng 916 processors. The server features high-performance computing, large-capacity storage, low power consumption, easy management, and easy deployment, and is ideal for Internet, distributed storage, and cloud computing scenarios.

The TaiShan 2280 server has the following configurations:

- Two Huawei-developed ARM64 CPUs. Each CPU supports up to 32 cores, 2.4 GHz frequency, and eight DDR4 DIMMs.
- Two types of front panels supporting 12 3.5-inch and 25 2.5-inch drives respectively. Each drive can be separately maintained.
- A maximum of four 2.5-inch or 3.5-inch HDDs at the rear when a front panel supporting 12 3.5-inch drives is used. Each drive can be separately maintained.

- A maximum of two 2.5-inch or 3.5-inch HDDs at the rear when a front panel supporting 25 2.5-inch drives is used. Each drive can be separately maintained.
- A maximum of five standard PCIe slots for expansion NICs and SSD cards.

NOTE

A 2.5-inch to 3.5-inch drive tray is required to support 3.5-inch drives.

Figure 2-1 shows the appearance of a TaiShan 2280 server with 12 drives.

Figure 2-1 TaiShan 2280 (with 12 drives)

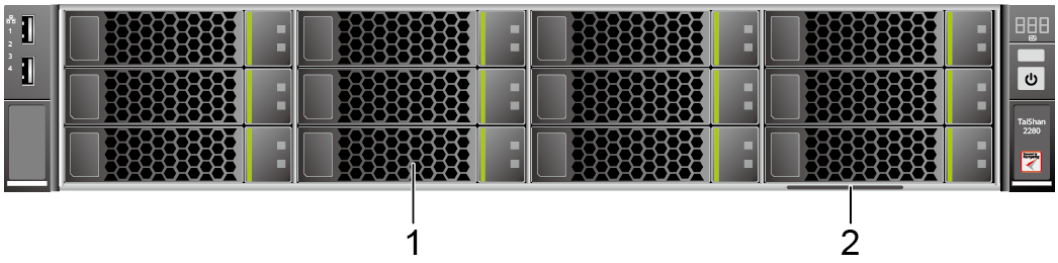
2.2 Panels

This section describes the TaiShan 2280 panels.

Front Panels

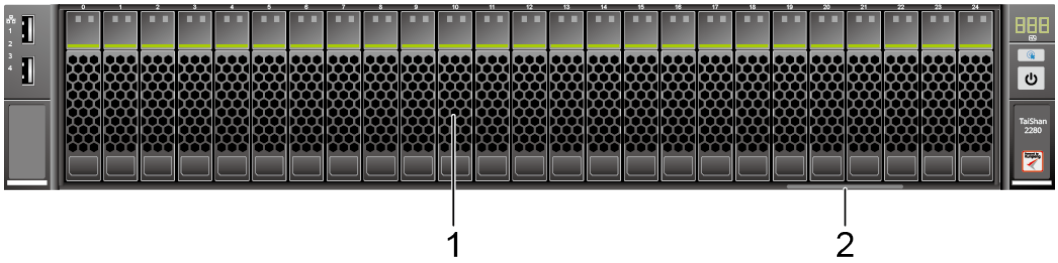
Figure 2-2 and Figure 2-3 show the front panels of the TaiShan 2280.

Figure 2-2 TaiShan 2280 front panel (with 12 drives)



1	Drive	2	Label (with the SN label)

Figure 2-3 TaiShan 2280 front panel (with 25 drives)



1	Drive	2	Label (with the SN label)

Product SN

The serial number (SN) on the label is a string that uniquely identifies a server. The SN is required when you contact Huawei technical support.

Figure 2-4 shows an SN example.

Figure 2-4 SN example

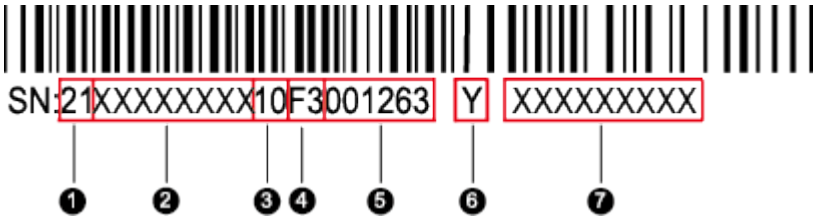


Table 2-1 SN description

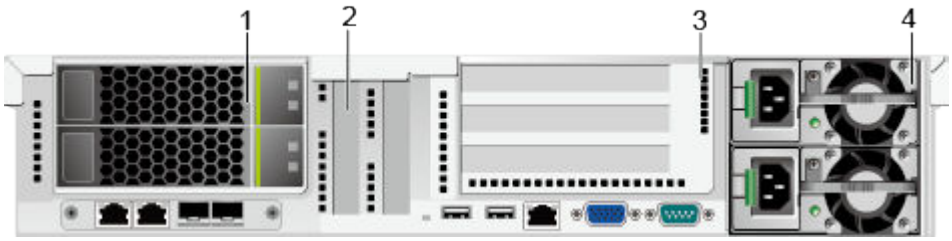
No.	Description
1	SN ID (two characters), which is 21 fixedly.
2	Material ID (eight characters), that is, the processing code.
3	Vendor code (two characters). **10** indicates Huawei, and other values indicate outsourcing vendors.

No.	Description
4	Year and month (two characters). • The first character indicates the year. Digits 1 to 9 indicate 2001 to 2009, letters A to H indicate 2010 to 2017, letters J to N indicate 2018 to 2022, and letters P to Y indicate 2023 to 2032. **NOTE** The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters look similar to digits 1, 0, and 2. • The second character indicates the month. Digits 1 to 9 indicate January to September, and letters A to C indicate October to December.
5	Serial number (six characters).
6	RoHS compliance (one character). **Y** indicates environment-friendly processing.
7	Internal model (product name) of the board.

Rear Panel

Figure 2-5 shows the rear panel of the TaiShan 2280.

Figure 2-5 Rear panel



1	I/O module 1	2	PCIe slot on the mainboard
3	I/O module 2	4	Power supply unit (PSU)

Two I/O modules of the following types can be installed on the rear panel:

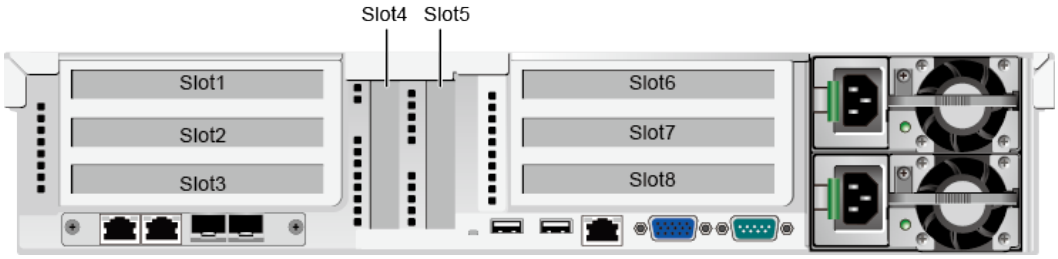
- Drive backplane for 2 x 2.5" drive configuration, applicable to both I/O modules
- Drive backplane for 2 x 3.5" drive configuration, applicable to both I/O modules
- Drive backplane for 2 x 2.5" drive configuration + 1 x PCIe x8 riser card, applicable only to I/O module 1
- 3 x PCIe x8 riser cards, applicable to both I/O modules

- 2 x PCIe x16 riser cards, applicable to both I/O modules

PCIe Slots

Figure 2-6 shows the PCIe slot layout of the TaiShan 2280.

Figure 2-6 PCIe slot layout



With appropriate I/O modules, the server supports a maximum of five standard PCIe slots:

- When I/O module 1 uses three PCIe x8 riser cards or two PCIe x16 riser cards, only slot 1 is available.
- When I/O module 1 uses a drive backplane for 2 x 2.5" drive configuration and a PCIe x8 riser card, only slot 3 is available.
- When I/O module 2 uses three PCIe x8 riser cards, slots 6, 7, and 8 are available.
- When I/O module 2 uses two PCIe x16 riser cards, only slots 6 and 7 are available.
- Slots 4 and 5 are provided by the mainboard. Slot 4 supports a PCIe card, while slot 5 is unavailable.

Table 2-2 describes the mapping between the CPUs and PCIe slots, and the compliant PCIe standards of the TaiShan 2280.

Table 2-2 PCIe slots

PCIe Slot	CPU	PCIe Standard	Connector Bandwidth	Bus Width	Slot Size
Slot 1	CPU 1	PCIe 3.0	x16	x8	Full-height full-length
Slot3	CPU 1	PCIe 3.0	x16	x8	Full-height half-length
Slot 4	CPU 1	PCIe 3.0	x8	x8	Half-height half-length
Slot 6	CPU 2	PCIe 3.0	x16	x8	Full-height full-length
Slot 7	CPU 2	PCIe 3.0	x8/x16	x8	Full-height full-length

PCIe Slot	CPU	PCIe Standard	Connector Bandwidth	Bus Width	Slot Size
Slot 8	CPU 2	PCIe 3.0	x8	x8	Full-height half-length
Note 1: The PCIe slots that support full-height full-length PCIe cards are backwards compatible with full-height half-length or half-height half-length PCIe cards. Note 2: The PCIe slots that support PCIe x16 cards are backwards compatible with PCIe x8, PCIe x4, and PCIe x1 cards. Note 3: When I/O module 2 uses a 2 x PCIe x16 riser card, the width of the slot 7 connector is x16. When I/O module 2 uses a 3 x PCIe x8 riser card, the width of the slot 7 connector is x8.					

2.3 External Ports

This section describes the ports on the TaiShan 2280 server.

Front Panels

Figure 2-7 and Figure 2-8 describe the ports on the TaiShan 2280 front panels.

Figure 2-7 Ports on the front panel (with 12 drives)

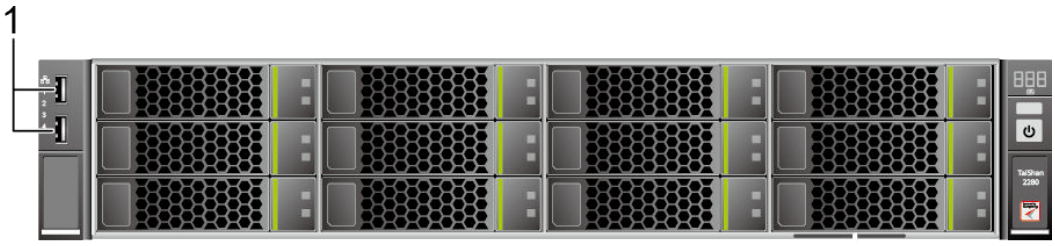


Figure 2-8 Ports on the front panel (with 25 drives)

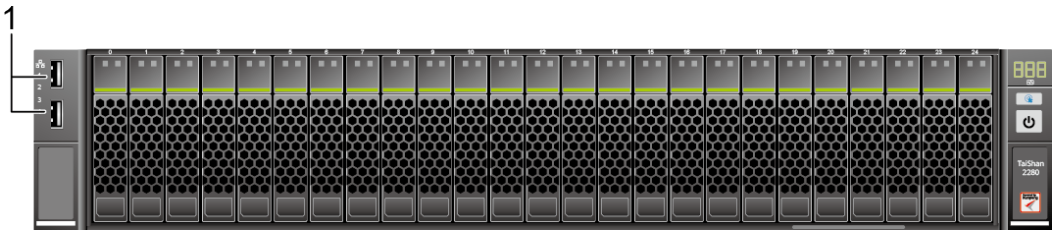


Table 2-3 Ports on the front panel

No.	Port	Type	Quantity	Description
1	USB port	USB 2.0	2	The USB ports allow USB devices to be connected to the server. **NOTE** • Before connecting an external USB device, check that the USB device functions properly. A server may operate improperly if an abnormal USB device is connected. • If an external USB device is used, the maximum length of the extension cable is 1 m. • If USB devices, including USB flash drives and portable drives, are not detected, contact Huawei technical support.

Rear Panel

Figure 2-9 describes the ports on the TaiShan 2280 rear panel.

Figure 2-9 Ports on the rear panel

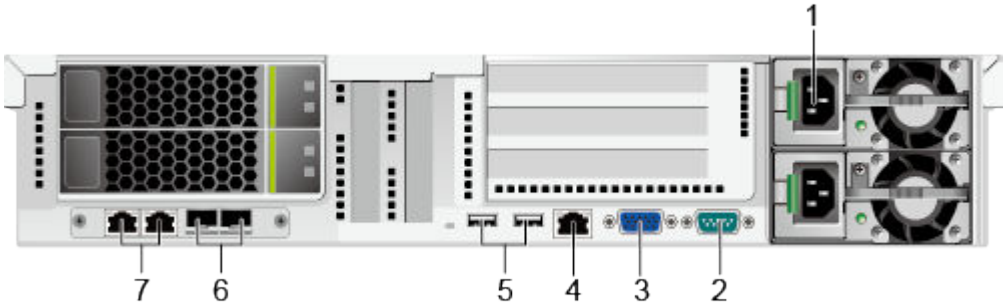


Table 2-4 Ports on the rear panel

No.	Port	Type	Quantity	Description
1	PSU socket	-	2	The port is used to connect to the power supply.
2	Serial port	DB9	1	The serial port is used as the system serial port by default. You can set it as the iBMC serial port using CLI commands. This port is used for debugging.
3	VGA port	DB15	1	The VGA port is used to connect to a terminal, such as a monitor.
4	Management network port	Ethernet port	1	The 1000 Mbit/s Ethernet port is used for server management.

No.	Port	Type	Quantity	Description
5	USB port	USB 2.0	2	The USB ports allow USB devices to be connected to the server. **NOTE** • Before connecting an external USB device, check that the USB device functions properly. A server may operate improperly if an abnormal USB device is connected. • If an external USB device is used, the maximum length of the extension cable is 1 m. • If USB devices, including USB flash drives and portable drives, are not detected, contact Huawei technical support.

No.	Port	Type	Quantity	Description
6	10GE optical port	-	2	The mainboard provides 10GE optical ports. **NOTE** • 10GE optical ports do not support GE autonegotiation. • When the maximum transmission unit (MTU) of the 10GE optical port on the server is less than 6000 bytes but the MTU of the peer end is greater than 6000 bytes, the server cannot receive large packets. As a result, the communication is abnormal.
7	GE electrical port	-	2	The mainboard provides GE electrical ports. **NOTE** When the MTU of the GE electrical port on the server is less than 6000 bytes but the MTU of the peer port is greater than 6000 bytes, the server cannot receive large packets. As a result, the communication is abnormal.

2.4 Indicators and Buttons

This section describes the indicators and buttons on the TaiShan 2280 server.

Front Panels

You can observe the indicators to determine the status of the TaiShan 2280.

Figure 2-10 and **Figure 2-11** describe the indicators and buttons on the TaiShan 2280 front panels.

Figure 2-10 Indicators and buttons on the front panel (with 12 drives)

Table 2-5 Indicators and buttons on the front panel

No.	Silkscreen	Indicator/ Button	Description
1	□□□	Fault diagnostic LED	• ---: The server is operating properly. • Error code: A server component is faulty. For details about error codes, see **TaiShan Rack Server iBMC Alarm Handling**.
2		Health indicator	• Steady green: The device is operating properly. • Blinking red at 1 Hz: A major alarm is generated. • Blinking red at 5 Hz: A critical alarm is generated.

No.	Silkscreen	Indicator/ Button	Description
3		UID button/ indicator	The UID button/indicator helps locate a device. UID indicator: ● Off: The server is not being located. ● Blinking blue (for 255 seconds): The server has been located and is differentiated from other servers that have also been located. ● Steady blue: The server is being located. **NOTE** ● After the iBMC is initialized, the UID indicator restores to the default Off state. You can press the UID button to relocate the server. ● The blinking continues for 255 seconds for each setting on the iBMC. After 255 seconds, the indicator is off. UID button: ● You can turn on, turn off, or blink the UID indicator by pressing the UID button on the panel or by using the iBMC CLI or WebUI. ● You can press this button to turn on or off the UID indicator. ● You can press and hold down this button for about 5 seconds to reset the iBMC.

No.	Silkscreen	Indicator/ Button	Description
4		Power button/ indicator	• Off: The device is not powered on. • Blinking yellow: The iBMC is starting. • Steady yellow: The device is ready to be powered on. • Steady green: The device has been powered on. **NOTE** • When the server is powered on, you can press this button once to shut down the OS. • When the server is powered on, you can hold down this button for 6 seconds to forcibly power off the server. • When the server is ready to be powered on, you can press this button once to start the server.
5	-	Drive fault indicator	• Off: The drive is operating properly. • Blinking yellow: The drive is being located or under RAID rebuild. • Steady yellow: The drive is faulty or member drives in the RAID array are abnormal. **NOTE** If the fault indicator is steady yellow, run a command to check the RAID status to determine whether the RAID array is abnormal or only a single drive is faulty. For details about the commands, see **Huawei Server RAID Controller Card User Guide (Arm)**.
6	-	Drive Activity indicator	• Off: The drive is not detected or is faulty. • Blinking green: Data is being read from or written to the drive, or synchronized between drives. • Steady green: The drive is inactive.

No.	Silkscreen	Indicator/ Button	Description
7		Network port link indicator	Each indicator shows the status of an Ethernet LAN on motherboard (LOM) port. • Steady green: The network port is properly connected. • Off: The port is faulty or not in use.

Figure 2-11 Indicators and buttons on the front panel (with 25 drives)

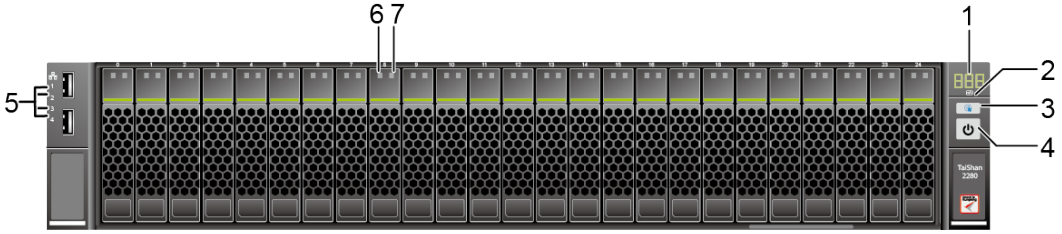


Table 2-6 Indicators and buttons on the front panel

No.	Silkscreen	Indicator/ Button	Description
1		Fault diagnostic LED	• ---: The server is operating properly. • Error code: A server component is faulty. For details about error codes, see **TaiShan Rack Server iBMC Alarm Handling**.
2		Health indicator	• Steady green: The device is operating properly. • Blinking red at 1 Hz: A major alarm is generated. • Blinking red at 5 Hz: A critical alarm is generated.

No.	Silkscreen	Indicator/ Button	Description
3		UID button/ indicator	The UID button/indicator helps locate a device. UID indicator: ● Off: The server is not being located. ● Blinking blue (for 255 seconds): The server has been located and is differentiated from other servers that have also been located. ● Steady blue: The server is being located. **NOTE** ● After the iBMC is initialized, the UID indicator restores to the default Off state. You can press the UID button to relocate the server. ● The blinking continues for 255 seconds for each setting on the iBMC. After 255 seconds, the indicator is off. UID button: ● You can turn on, turn off, or blink the UID indicator by pressing the UID button on the panel or by using the iBMC CLI or WebUI. ● You can press this button to turn on or off the UID indicator. ● You can press and hold down this button for about 5 seconds to reset the iBMC.

No.	Silkscreen	Indicator/ Button	Description
4		Power button/ indicator	• Off: The device is not powered on. • Blinking yellow: The iBMC is starting. • Steady yellow: The device is ready to be powered on. • Steady green: The device has been powered on. **NOTE** • When the server is powered on, you can press this button once to shut down the OS. • When the server is powered on, you can hold down this button for 6 seconds to forcibly power off the server. • When the server is ready to be powered on, you can press this button once to start the server.
5		Network port link indicator	Each indicator shows the status of an Ethernet LOM port. • Steady green: The network port is properly connected. • Off: The port is faulty or not in use.
6	-	Drive fault indicator	• Off: The drive is operating properly. • Blinking yellow: The drive is being located or under RAID rebuild. • Steady yellow: The drive is faulty or member drives in the RAID array are abnormal. **NOTE** If the fault indicator is steady yellow, run a command to check the RAID status to determine whether the RAID array is abnormal or only a single drive is faulty. For details about the commands, see **Huawei Server RAID Controller Card User Guide (Arm)**.

No.	Silkscreen	Indicator/ Button	Description
7	-	Drive Activity indicator	• Off: The drive is not detected or is faulty. • Blinking green: Data is being read from or written to the drive, or synchronized between drives. • Steady green: The drive is inactive.

Rear Panel

Figure 2-12 shows the indicators on the TaiShan 2280 rear panel.

Figure 2-12 Indicators on the rear panel

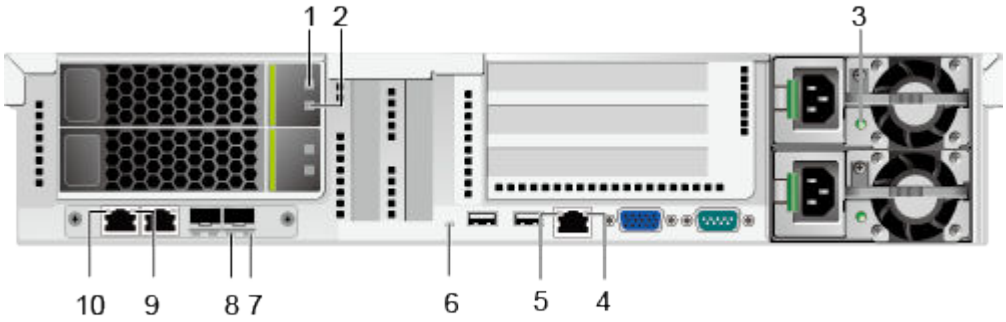


Table 2-7 Indicators on the rear panel

No.	Indicator	Description
1	Drive fault indicator	• Off: The drive is operating properly. • Blinking yellow: The drive is being located or under RAID rebuild. • Steady yellow: The drive is faulty or member drives in the RAID array are abnormal. **NOTE** If the fault indicator is steady yellow, run a command to check the RAID status to determine whether the RAID array is abnormal or only a single drive is faulty. For details about the commands, see **Huawei Server RAID Controller Card User Guide (Arm)**.
2	Drive Activity indicator	• Off: The drive is not detected or is faulty. • Blinking green: Data is being read from or written to the drive, or synchronized between drives. • Steady green: The drive is inactive.

No.	Indicator	Description
3	PSU indicator	• Steady green: The power input is normal. • Off: There is no AC power input or the system is in standby state.
4	Management network port data transmission status indicator	• Blinking yellow: Data is being transmitted. • Off: No data is being transmitted.
5	Management network port link status indicator	• Steady green: The network is properly connected. • Off: The network is disconnected.
6	UID indicator	The UID indicator helps locate a device. • Off: The server is not being located. • Blinking blue (for 255 seconds): The server has been located and is differentiated from other servers that have also been located. • Steady blue: The server is being located. **NOTE** • After the iBMC is initialized, the UID indicator restores to the default Off state. You can press the UID button to relocate the server. • The blinking continues for 255 seconds for each setting on the iBMC. After 255 seconds, the indicator is off.
7	Optical port data transmission status indicator	• Blinking orange: Data is being transmitted. • Off: No data is being transmitted.
8	Optical port link status indicator	• Steady green: The network is properly connected. • Off: The network is disconnected.
9	Electrical port data transmission status indicator	• Blinking yellow: Data is being transmitted. • Off: No data is being transmitted.
10	Electrical port link status indicator	• Steady green: The network is properly connected. • Off: The network is disconnected.

2.5 Drive Numbers

Figure 2-13 Front panel with 12 3.5-inch drives

Figure 2-14 Front panel with 25 2.5-inch drives

NOTE

Drive slots are numbered 0 to 24 from left to right.

Figure 2-15 Rear panel with four 3.5-inch drives

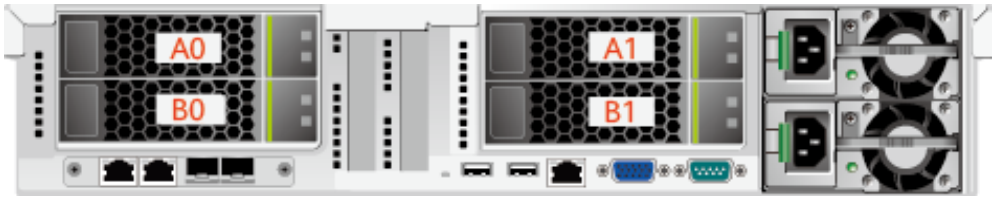


Table 2-8 Drive numbering

Drive Position	Physical Drive Number	Drive Number Identified by the iBMC
Front drives	0 to 11 (12 x 3.5" drive configuration)	Disk0~Disk11
	0 to 24 (25 x 2.5" drive configuration)	Disk0~Disk24
Rear drives	A0, B0, A1, B1	DiskA, DiskB, DiskC, DiskD

2.6 Physical Structure

This section describes the components of the TaiShan 2280.

Figure 2-16 shows the components of a TaiShan 2280 server with 12 drives.

Figure 2-16 TaiShan 2280 components (with 12 drives)

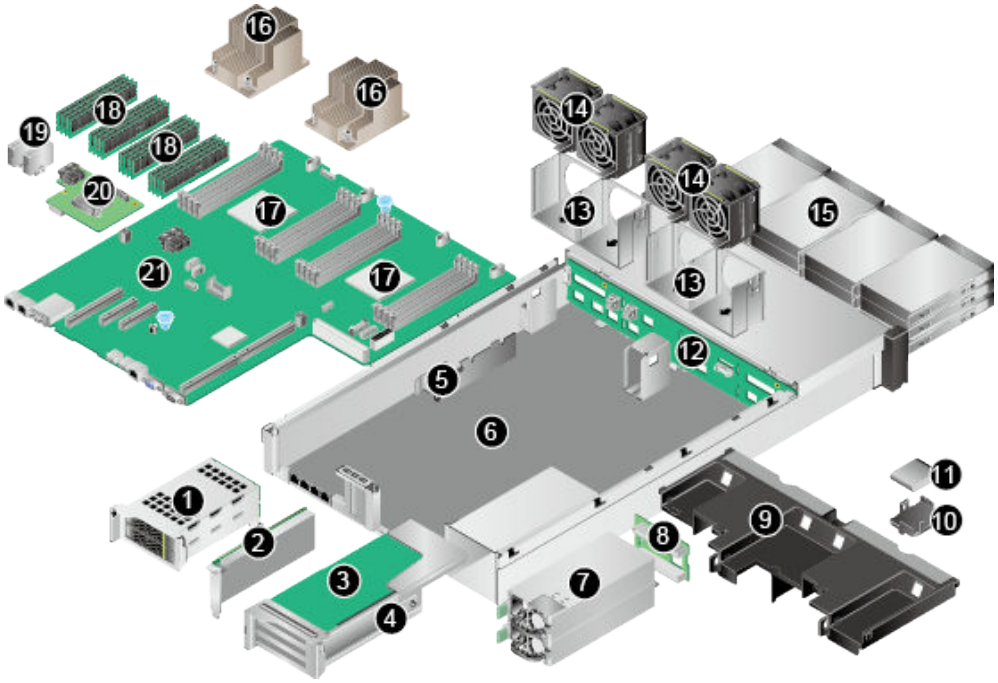


Table 2-9 describes the TaiShan 2280 components.

Table 2-9 Components

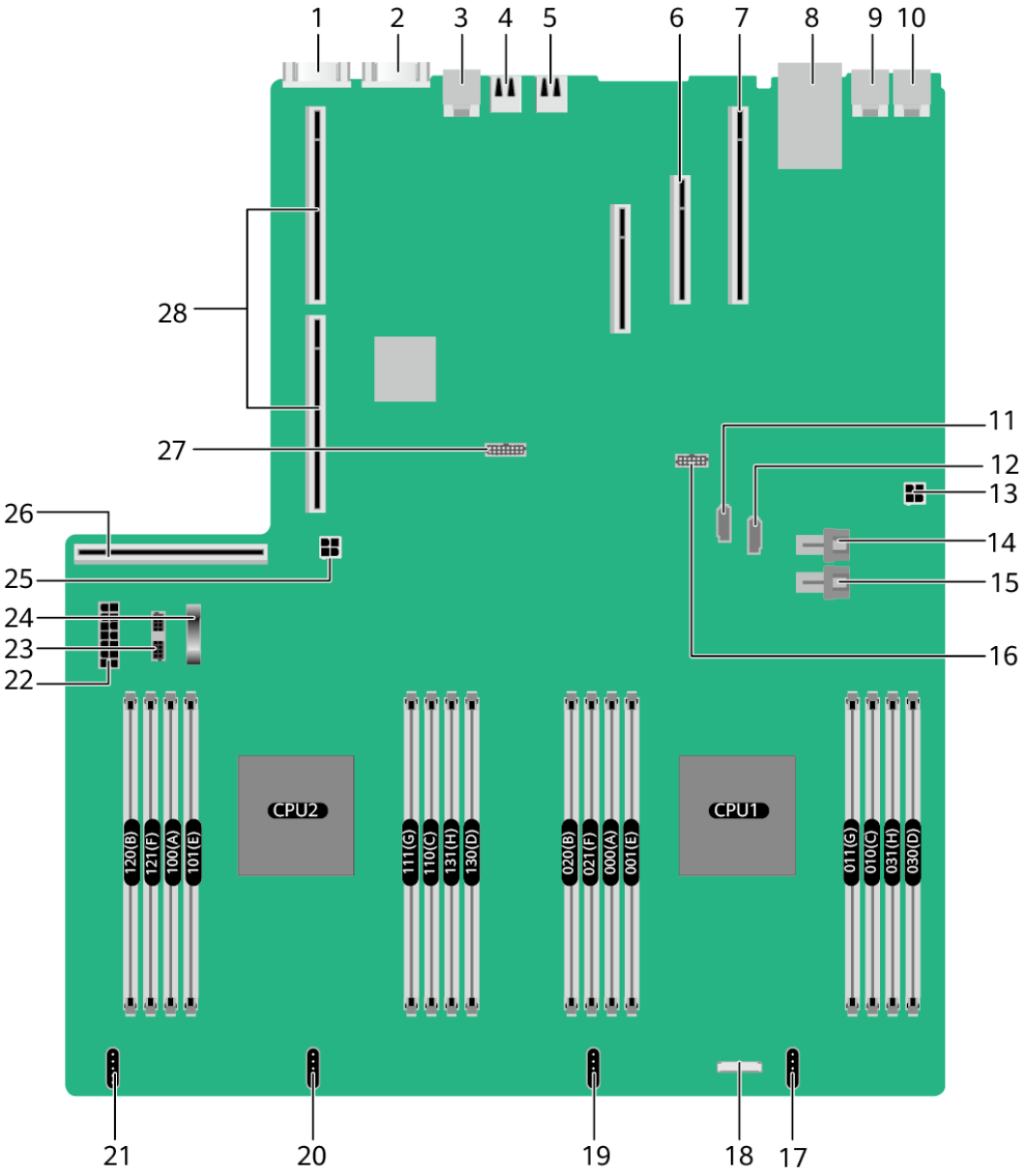
No.	Item	Description
1	I/O module 1	I/O module for a CPU
2	PCIe plug-in controller on the mainboard	A PCIe device
3	PCIe plug-in controller on a riser card	A PCIe device
4	I/O module 2	I/O module for a CPU
5	Cable organizer	Enables neat cabling.
6	Chassis	Houses all components.
7	PSU	Supplies power to the server.
8	PSU backplane	Connects PSUs to the mainboard.
9	Air duct	Provides ventilation channels.
10	Supercapacitor holder	Provides fixed support for the supercapacitor on the screw-in RAID controller card.

No.	Item	Description
11	Supercapacitor	Provides power failure protection for storage controller cards.
12	Front drive backplane	Supplies power to front drives and provides data transmission channels.
13	Fan module bracket	Provides fixed support for fan modules.
14	Fan module	Dissipates heat from the device. Fan modules are hot-swappable. A faulty fan will trigger speed adjustment of other fans by area, maintaining optimal heat dissipation.
15	Front drive	Stores data.
16	Heat sink	Cools a CPU. Each CPU is configured with one heat sink.
17	CPU	Compute and control unit of a server
18	Memory	Stores programs and data and supports direct addressing by CPUs.
19	SATADOM	The SATA disk on module (SATA DOM) is a SATA SSD or SATA DOM electrical drive. It is a quick memory storage media unit that features high energy efficiency and stability. **NOTE** The SATA DOM port is a reserved port and is not supported yet.
20	Screw-in RAID controller card	Connects to drives to expand the storage capacity.
21	Mainboard	As the most important component of a server, the mainboard integrates basic components such as CPUs, DIMM slots, the BIOS chip, and PCIe slots.

2.7 Mainboard Layout

Figure 2-17 shows the connectors on the mainboard.

Figure 2-17 Mainboard layout



1	Serial port (J55)	2	VGA port (J54)
3	Management network port (J33)	4	USB 2.0 port (J156)
5	USB 2.0 port (J155)	6	PCIe x8 slot (J50 x8 PCIe SLOT HH/HL)
7	Riser card slot (J47 PCIe RISER1 x8 SIGNAL)	8	10GE optical port (J143-J142)
9	GE electrical port (J145)	10	GE electrical port (J144)

11	SATA DOM 2 (J37) **NOTE** The SATA DOM port is a reserved port and is not supported yet.	12	SATA DOM 1 (J37) **NOTE** The SATA DOM port is a reserved port and is not supported yet.
13	Rear drive backplane power connector (J166 POWER CONN2)	14	CPU mini-SAS HD connector A (J154)
15	CPU mini-SAS HD connector B (J53)	16	NC-SI connector (J136)
17	Connector for fan module 4 (J130)	18	Right mounting ear connector (J43)
19	Connector for fan module 3 (J131)	20	Connector for fan module 2 (J132)
21	Connector for fan module 1 (J133)	22	Front drive backplane power connector (J30 POWER CONN1)
23	Front drive backplane signal connector (J159)	24	Left mounting ear connector (J162)
25	Rear drive backplane power connector 2 (J29 POWER CONN3)	26	PSU backplane connector (J31 PSBP CONN)
27	Jumper (J44) **NOTE** COM_SW(ON) is used for changing the connection direction of the physical serial port. CLR_BMC_PW(ON) is used for restoring iBMC settings to default ones.	28	Riser card slot 2 (corresponding to CPU 2/ J1001)

2.8 Internal Cabling

This section describes the internal cabling for the TaiShan 2280 server.

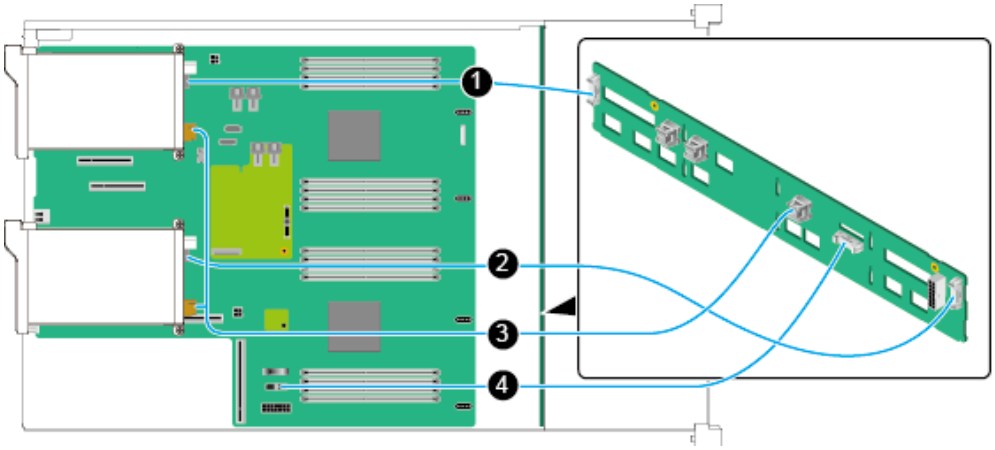
2.8.1 Internal Cabling for 12-Drive Configuration

Storage Signal Cabling

The ports on a screw-in RAID controller card may look different from the picture in this section, depending on the card model.

Signal cables to the front drive backplane

Figure 2-18 Signal cables to the front drive backplane



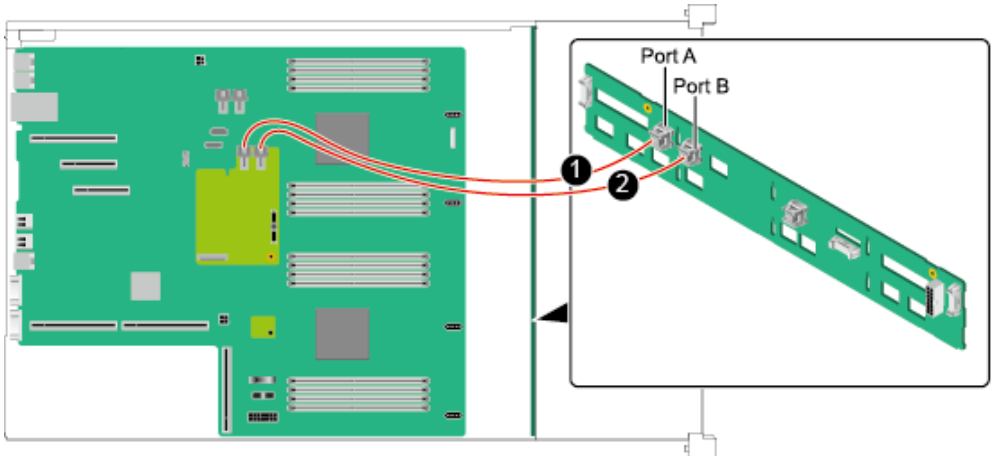
No.	Description	BOM Code
1	Indicator signal cable for connecting the front drive backplane (J32) to the rear drive backplane (J24)	04051053
2	Indicator signal cable for connecting the front drive backplane (J35) to the rear drive backplane (J24)	04051053
3	SAS cable for connecting the front drive backplane (J31) to the rear drive backplane (J3)	04051060
4	Indicator signal cable for connecting the front drive backplane (J1) to the mainboard (J159)	04051052

Storage Controller Cabling

The TaiShan 2280 server supports two drive connection modes: A screw-in RAID controller card or a SAS controller integrated in the CPU can be combined with the drive backplane. You can select either mode.

- Using a screw-in RAID controller card

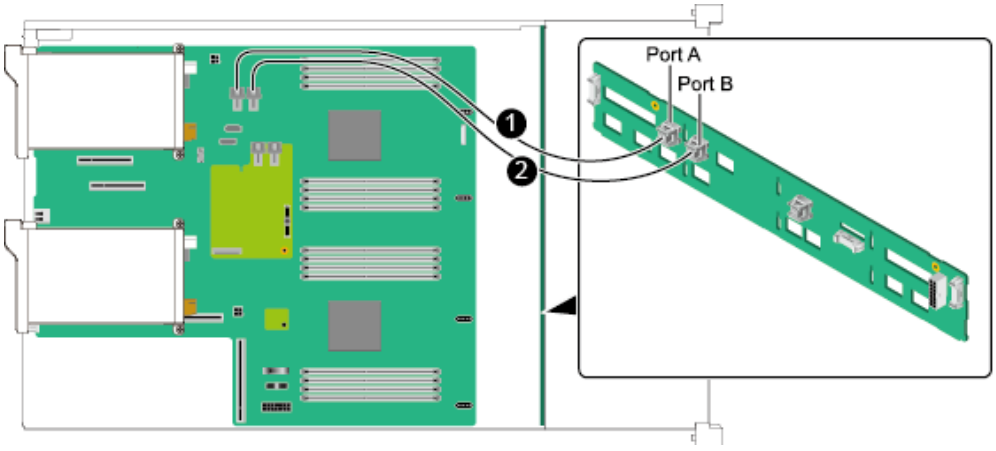
Figure 2-19 Internal cabling with a screw-in RAID controller card



No.	Description	BOM Code
1	SAS cable for connecting port A (J28) of the front drive backplane to port A of the screw-in RAID controller card on the mainboard	04051018 (LSI SAS3008/3108)
2	SAS cable for connecting port B (J29) of the front drive backplane to port B of the screw-in RAID controller card on the mainboard	04051018 (LSI SAS3008/3108)

- Using a SAS controller integrated in the CPU

Figure 2-20 Internal cabling with a SAS controller integrated in the CPU

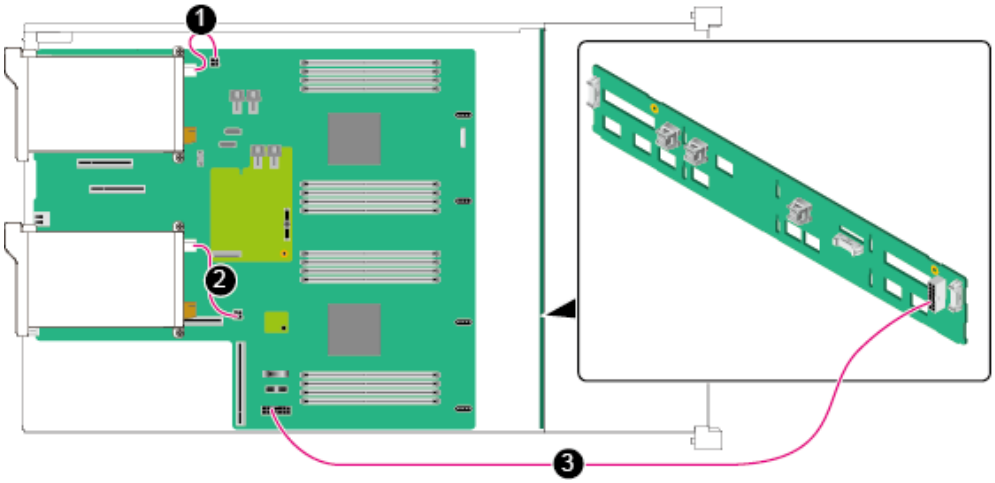


No.	Description	BOM Code
1	Signal cable for connecting port A (J28) of the front drive backplane to port A (J154) of the drive controller card integrated into the chip	04051018
2	Signal cable for connecting port B (J29) of the front drive backplane to port B (J153) of the drive controller card integrated into the chip	04051018

Storage Power Cabling

Power cables to the front drive backplane and the two-bay rear drive backplane

Figure 2-21 Power cables to the front drive backplane and the two-bay rear drive backplane

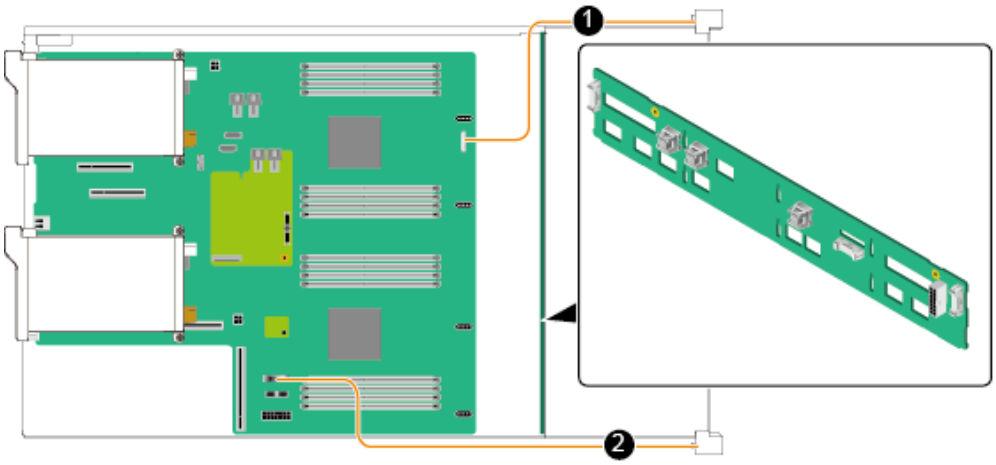


No.	Description	BOM Code
1	Power cable for connecting the rear drive backplane (J1) to the mainboard (J166)	04150448-001
2	Power cable for connecting the rear drive backplane (J1) to the mainboard (J29)	04150448-001
3	Power cable for connecting the front drive backplane (J24) to the mainboard (J30)	04150997

Mounting Ear Cabling

Cables for connecting the left and right mounting ears on the TaiShan 2280 server to the mainboard

Figure 2-22 Cables to the mounting ears



No.	Description	BOM Code
1	Signal cable (FFC cable) for connecting the indicator plate of the right mounting ear to the mainboard (J43)	04051026
2	Signal cable for connecting the USB plate of the left mounting ear to the mainboard (J162)	04051006

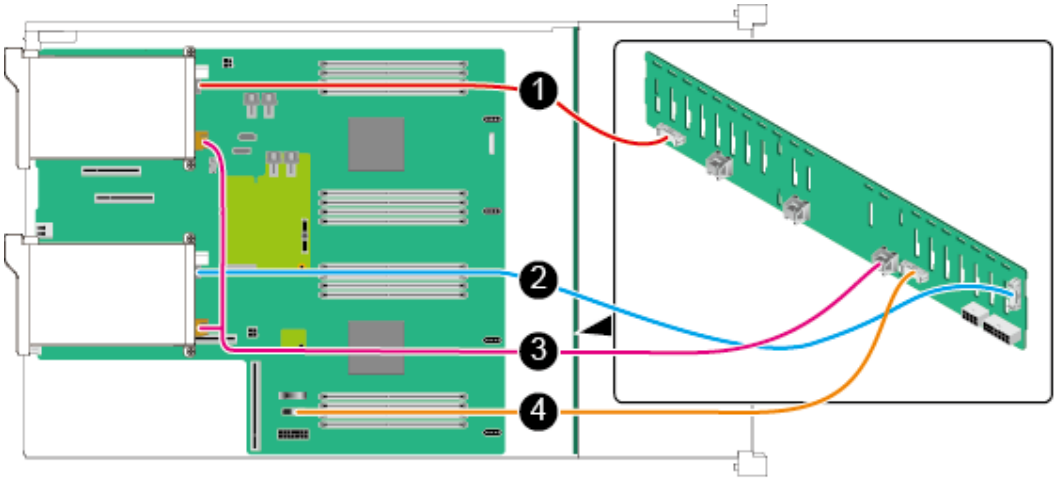
2.8.2 Internal Cabling for 25-Drive Configuration

Storage Signal Cabling

The ports on a screw-in RAID controller card may look different from the picture in this section, depending on the card model.

Signal cables to the front drive backplane

Figure 2-23 Signal cables to the front drive backplane



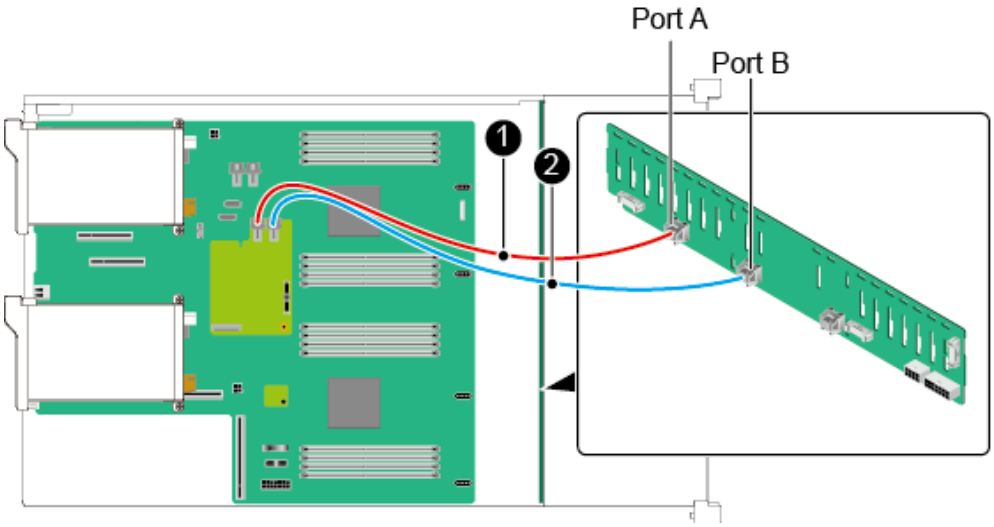
No.	Description	BOM Code
1	Indicator signal cable for connecting the front drive backplane (J32) to the rear drive backplane (J24)	04051053
2	Indicator signal cable for connecting the front drive backplane (J35) to the rear drive backplane (J24)	04051053
3	SAS cable for connecting the front drive backplane (J31) to the rear drive backplane (J3)	04051060
4	Indicator signal cable for connecting the front drive backplane (J1) to the mainboard (J159)	04051052

Storage Controller Cabling

The TaiShan 2280 server supports two drive connection modes: A screw-in RAID controller card or a SAS controller integrated in the CPU can be combined with the drive backplane. You can select either mode.

- Using a RAID controller card and two rear drives (optional):

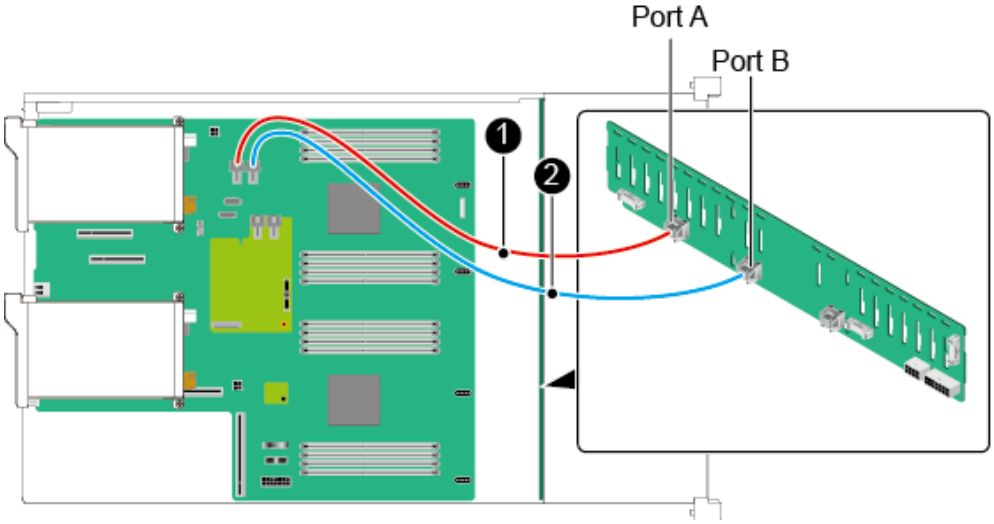
Figure 2-24 Internal cabling with a screw-in RAID controller card



No.	Description	BOM Code
1	SAS cable for connecting port A (J28) of the front drive backplane to port A of the screw-in RAID controller card on the mainboard	04051018 (LSI SAS3008/3108)
2	SAS cable for connecting port B (J29) of the front drive backplane to port B of the screw-in RAID controller card on the mainboard	04051018 (LSI SAS3008/3108)

- Using a SAS controller integrated in the CPU

Figure 2-25 Internal cabling with a SAS controller integrated in the CPU

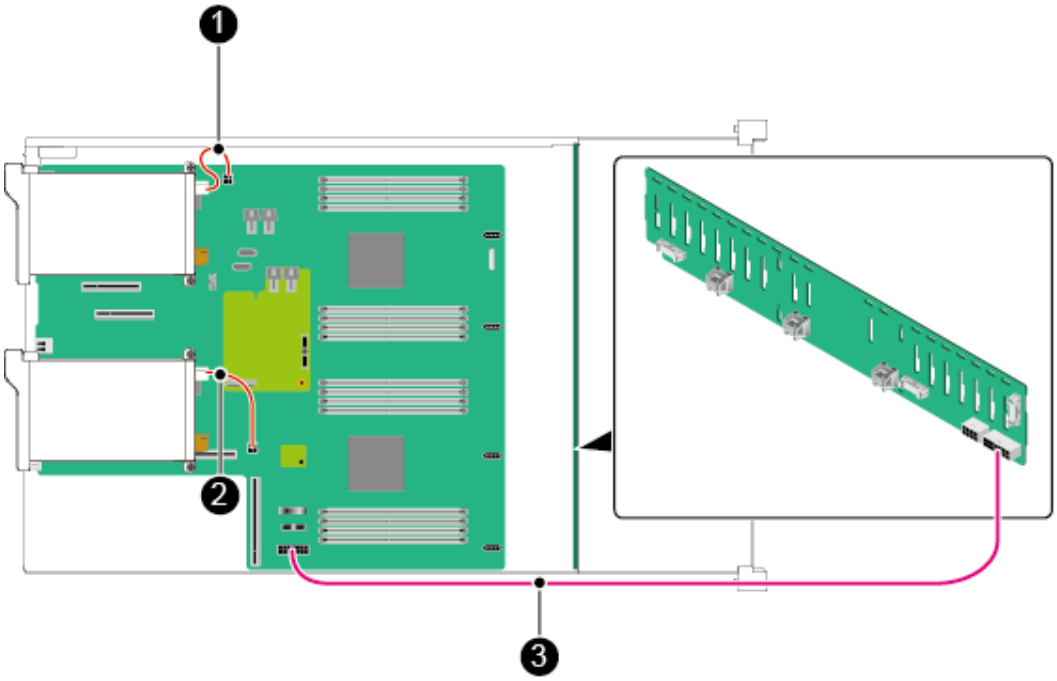


No.	Description	BOM Code
1	Signal cable for connecting port A (J28) of the front drive backplane to port A (J154) of the drive controller card integrated into the chip	04051018
2	Signal cable for connecting port B (J29) of the front drive backplane to port B (J153) of the drive controller card integrated into the chip	04051018

Storage Power Cabling

Power cables to the front drive backplane and the two-bay rear drive backplane

Figure 2-26 Power cables to the front drive backplane and the two-bay rear drive backplane

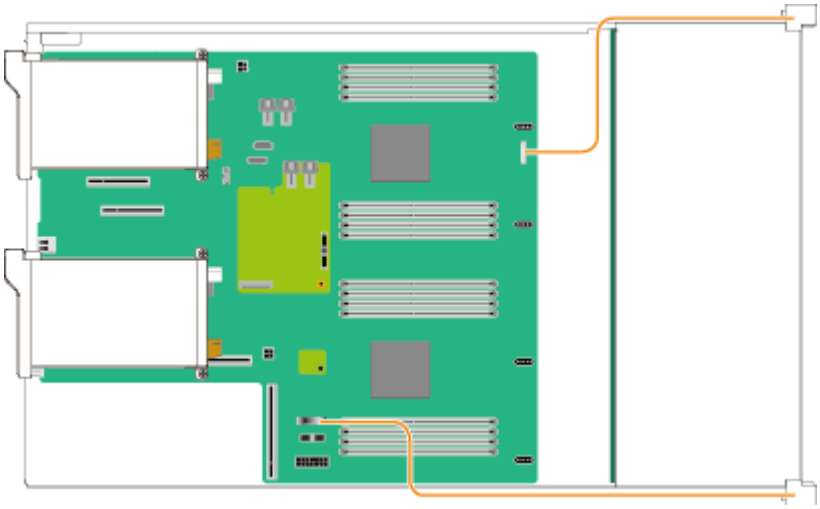


No.	Description	BOM Code
1	Power cable for connecting the rear drive backplane (J1) to the mainboard (J166)	04150448-001
2	Power cable for connecting the rear drive backplane (J1) to the mainboard (J29)	04150448-001
3	Power cable for connecting the front drive backplane (J24) to the mainboard (J30)	04150997

Mounting Ear Cabling

Cables for connecting the left and right mounting ears on the TaiShan 2280 server to the mainboard

Figure 2-27 Cables to the mounting ears



No.	Description	BOM Code
1	Signal cable (FFC cable) for connecting the indicator plate of the right mounting ear to the mainboard (J43)	04051026
2	Signal cable for connecting the USB plate of the left mounting ear to the mainboard (J162)	04051006

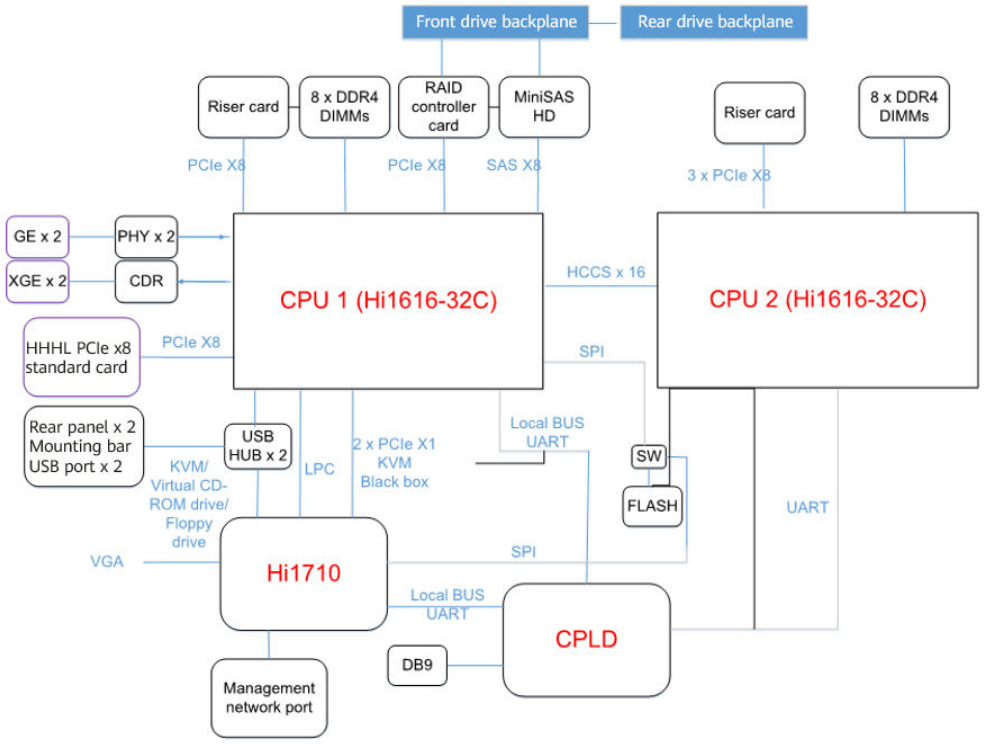
2.9 Logical Structure

This section describes the logical structure of the TaiShan 2280.

Figure 2-28 shows the logical structure of the TaiShan 2280.

- The TaiShan 2280 supports two Huawei-developed ARM64 processors, each processor supporting eight DDR4 DIMMs.
- The mainboard provides two 10GE optical ports and two GE electrical ports.
- The TaiShan 2280 supports two drive connection modes: (1) A RAID controller card is combined with a drive backplane to work as a drive interface module, which connects to a CPU over PCIe connectors. The RAID controller card manages the drives. (2) No RAID controller card is configured, and the CPU manages the drives.

Figure 2-28 TaiShan 2280 logical structure



2.10 Software and Hardware Compatibility

Use the **Computing Product Compatibility Checker** to obtain information about the supported OSs and hardware types.

NOTICE

Do not use incompatible components. Otherwise, the server may fail to work properly. The technical support and warranty do not cover faults caused by incompatible components.

2.11 Product Specifications

This section describes the specifications of the TaiShan 2280.

Table 2-10 lists specifications of the TaiShan 2280.

Table 2-10 Specifications

Item	Specifications
Type	2U rack server
Processor	Two 32-core Kunpeng 916 processors with a dominant frequency of 2.4 GHz

Item	Specifications
Memory	• Up to 16 DDR4 RDIMMs • Memory speed up to 2400 MT/s • Support for error checking and correcting (ECC) for memory data protection • 16 GB or 32 GB capacity per DIMM **NOTE** • All the DIMMs on a server must have the same specifications (such as the capacity, bit width, rank, and height). That is, all DIMMs on one server must have the same BOM code. • DIMMs in same memory channel (for example, 000 and 001) must be provided by the same vendor and have the same specifications. DIMMs of different vendors cannot be used together.
Storage	• TaiShan 2280 with a front panel for the 12 x 3.5" drive configuration: supports 12 3.5-inch front SAS/SATA drives + (optional) four 2.5-inch or 3.5-inch rear SAS/SATA drives or SSDs. SAS cables or SAS RAID controller cards are required. • TaiShan 2280 with a front panel for the 25 x 2.5" drive configuration: supports 25 2.5-inch front SAS/SATA drives + (optional) two 2.5-inch or 3.5-inch rear SAS/SATA drives or SSDs. SAS cables or SAS RAID controller cards are required. • Drives are hot-swappable. • SR130 (LSI SAS3008) or SR430C (LSI SAS3108) RAID controller card
RAID support	The TaiShan 2280 supports LSI SAS3008 and LSI SAS3108 RAID controller cards. • The SR130 (LSI SAS3008) supports RAID 0, 1, 10, and 1E. • The SR430C (LSI SAS3108) supports RAID 0, 1, 10, 5, 50, 6, and 60 and provides a supercapacitor to protect data in the case of power failures.
Network port	The board supports four LOM ports (provided by the CPUs), including two 10GE SFP+ optical ports and two GE electrical ports. PXE is supported, but NC-SI is not supported.

Item	Specifications
PCIe slot	The TaiShan 2280 supports a maximum of six PCIe 3.0 x8 slots, including one PCIe slot for installing a RAID controller card and five standard PCIe slots. The specifications of the five standard PCIe slots are as follows: • I/O module 1: supports one standard full-height full-length PCIe 3.0 x16 slot (bandwidth: PCIe 3.0 x8). • I/O module 2: supports one standard full-height full-length PCIe 3.0 x16 slot (bandwidth: PCIe 3.0 x8), one standard full-height full-length PCIe 3.0 x8 slot, and one standard full-height half-length PCIe 3.0 x8 slot. • Mainboard: integrates one standard half-height half-length PCIe 3.0 x8 slot.
Port	• The front panel provides two USB 2.0 ports. • The rear panel provides two USB 2.0 ports, one DB15 VGA port, one DB9 serial port, one RJ45 system management port, two 10GE SFP+ optical ports, and two GE electrical ports.
Fan module	Four hot-swappable fan modules, providing protection against single-fan failure
PSU	Hot-swappable PSUs in 1+1 redundancy. Specific power supply: • 460 W AC Platinum PSU, supporting 240 V HVDC • 750 W AC Platinum PSU, supporting 240 V HVDC **NOTE** The PSUs are protected against short circuit. Double-pole fuses are provided for the PSUs with dual input live wires.
System management	The Huawei iBMC supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media, and provides one 10/100/1000 Mbit/s RJ45 management network port.
Security	Administrator password
Video card	An SM750 video chip with 32 MB display memory is integrated on the mainboard. The maximum display resolution is 1920 x 1200 at 60 Hz with 16 M colors. **NOTE** • The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the operating system version is installed. Otherwise, only the default resolution supported by the operating system is provided. • If both the front and rear VGA ports of a device are connected to a monitor, the front VGA port is used by default.
OS	OSs built based on Huawei-provided kernel 4.1

2.12 Physical and Environmental Specifications

This section describes the physical, environmental, and power supply specifications of the TaiShan 2280.

Table 2-11 lists the physical and environmental specifications of the TaiShan 2280.

Table 2-11 Physical and environmental specifications

Item	Specifications
Dimensions (H x W x D)	Chassis with 3.5-inch drives: 86.1 mm (2U) x 447 mm x 748 mm (3.39 in. x 17.60 in. x 29.45 in.) Chassis with 2.5-inch drives: 86.1 mm (2U) x 447 mm x 727.7 mm (3.39 in. x 17.60 in. x 28.65 in.)
Installation space	Requirements for cabinet installation (cabinet compliant with the IEC 297 standard): • Cabinet width: 482.6 mm (19 in.) • Cabinet depth: > 1000 mm (39.37 in.) Requirements for guide rail installation: • L-shaped guide rails: apply only to Huawei cabinets. • Adjustable guide rails: apply to a cabinet with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars. • Holding rails: apply to a cabinet with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.
Weight in full configuration	• With twelve 3.5-inch drives: 30 kg (66.14 lb) • With twenty-five 2.5-inch drives: 30 kg (66.14 lb) Packaging materials: 5 kg (11.02 lb)
Power consumption	The power consumption parameters vary according to configurations (including the ErP standard configuration of the European Union). Use the **Computing Product Power Calculator** to obtain specific information.
PSU power rating	The PSUs support the following power ratings: • 460 W AC Platinum PSU (input voltage: 100 to 240 V AC or 192 to 288 V DC) • 750 W AC Platinum PSU (input voltage: 100 to 240 V AC or 192 to 288 V DC)
Rated input voltage	460/750 W Platinum PSU: • AC input range: 100 to 240 V • High-voltage DC input range: 192 to 288 V

Item	Specifications
Temperature	• Operating temperature: 5°C to 40°C (41°F to 104°F) • Storage temperature (within 3 months): –30°C to +60°C (–22°F to +140°F) • Storage temperature (within 6 months): –15°C to +45°C (5°F to 113°F) • Storage temperature (within 1 year): –10°C to +35°C (14°F to 95°F) • Maximum temperature change rate: 20°C (36°F) per hour, 5°C (9°F) per 15 minutes
Relative humidity (RH, non-condensing)	• Operating humidity: 8% to 90% • Storage humidity (within 3 months): 8% to 85% • Storage humidity (within 6 months): 8% to 80% • Storage humidity (within 1 year): 20% to 75% • Maximum humidity change rate: 20% per hour
Altitude	≤ 3000 m (9842.52 ft). When the altitude is higher than 900 m (2952.76 ft), the operating temperature decreases by 1°C (1.8°F) per 300 m (984.25 ft).
Acoustic noise	The following data is the declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) when the server is operating at 23°C (73.4°F). Noise emissions are measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). Noise during server operation: • LWAd: 46.625 dBA • LpAm: 69.6 dBA **NOTE** Actual sound levels generated during operation vary depending on server configuration, load, and ambient temperature.

3 Installing and Removing the TaiShan 2280

3.1 Overview

This section describes the check procedure before the installation and the rules for installing the TaiShan 2280 server.

NOTE

For details about the safety precautions to be observed when you install or replace servers and their parts, see **1 Safety Instructions**.

Checking the Installation Environment

To ensure proper operating of the device, check the installation environment before beginning. The installation environment includes the space, cabinet, temperature, and humidity.

Space Requirements

- Install the TaiShan 2280 in an access-restricted area.
- Keep the area in which the device is located clean and tidy.
- To facilitate heat dissipation and maintenance, keep a clearance of 800 mm (31.50 in.) between walls and the front and rear doors of the cabinet.

NOTE

The server draws in cool air from the front of the cabinet and exhausts hot air from the rear. Therefore, the front and rear of the cabinet must be well ventilated for optimal heat dissipation.

Cabinet Requirements

- A general 19-inch cabinet with a depth of more than 1000 mm (39.37 in.) which complies with the International Electrotechnical Commission 297 (IEC 297) standard
- Air filters installed on cabinet doors
- AC power supply from the rear of the cabinet

Temperature and Humidity Requirements

- Use temperature control devices all year long in any climates.
- In dry areas, use humidifiers to ensure ambient humidity.
- In damp areas, use dehumidifiers to lower the humidity.

Table 3-1 Temperature and humidity requirements in the equipment room

Item	Description
Temperature	5°C to 40°C (41°F to 104°F)
Humidity	8% RH to 90% RH (non-condensing)

Installation Rules

The TaiShan 2280 is 2U high and can be installed in a standard 19-inch cabinet. The TaiShan 2280 is stackable. If space is sufficient, leave a distance of 1U between two adjacent servers.

3.2 Unpacking the Chassis

This topic describes how to unpack the server chassis.

Scenarios

Unpack the server chassis. Before the operation, you must be familiar with the hardware devices.

Impact on the System

This operation has no adverse impact on the system.

Prerequisites

Conditions

No special conditions are required for this operation.

Data

No data preparation is required for this operation.

Tools

The following tools must be available before the operation:

- Protective gloves
- ESD gloves or ESD wrist strap
- Box cutter

Procedure

Step 1 Check whether the package and seals are in good condition.

NOTE

If the package is damaged (for example, the package is soaked or deformed, or the seals or pressure sensitive adhesive tape is unsealed), fill in the *Cargo Problems Feedback Form*.

Step 2

CAUTION

Exercise caution when using a box cutter to avoid personal injury or equipment damage.

Use a box cutter to cut the pressure-sensitive adhesive tape on the package, and open the package.

Step 3 Based on **Table 3-2**, check that the components are intact and free from oxidation, corrosion, or damage. Ensure that no parts are missing.

Table 3-2 Packing items

No.	Description
1	Accessory box, containing the product documentation DVD, one ServiceCD, Quick Start Guide, and warranty card
2	A pair of guide rails
3	One rack server

----End

3.3 Installing the TaiShan 2280

This section describes how to install the TaiShan 2280 server.

3.3.1 Installing the TaiShan 2280 on L-Shaped Guide Rails

This section describes how to install the server on L-shaped guide rails.

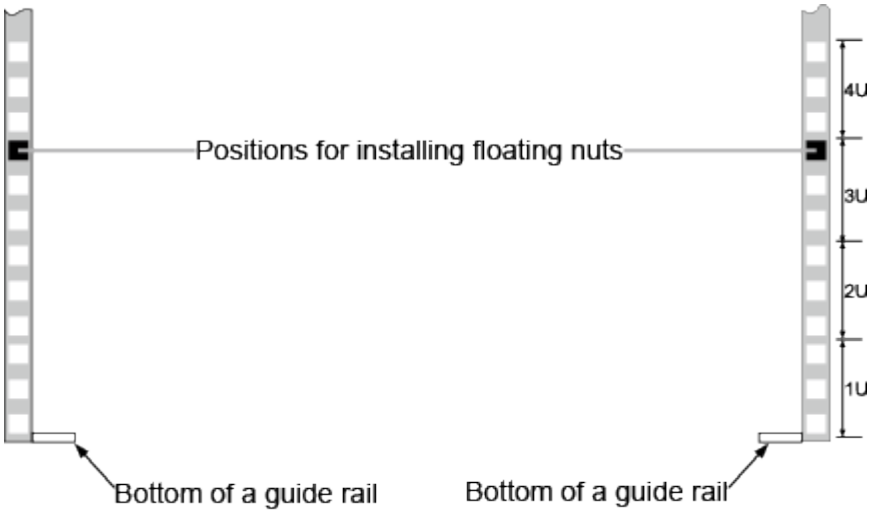
Context

L-shaped guide rails apply only to a Huawei cabinet.

Procedure

Step 1 Determine the positions for installing floating nuts. See **Figure 3-1**.

Figure 3-1 Positions for installing floating nuts



Step 2 Install floating nuts.

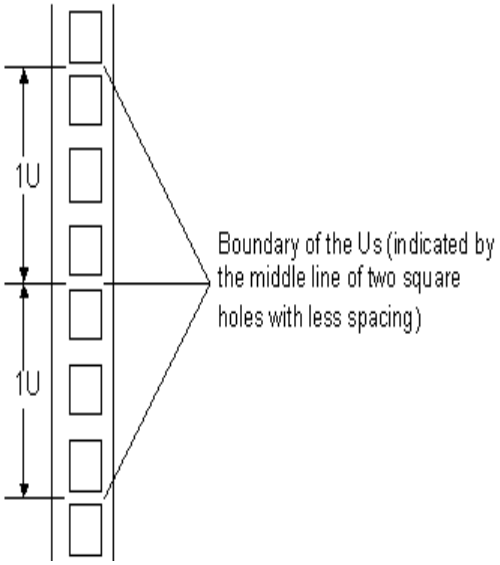
1. Determine the installation locations of the floating nuts according to the installation plan of devices in the cabinet.

   NOTE

   Floating nuts are used to secure screws.

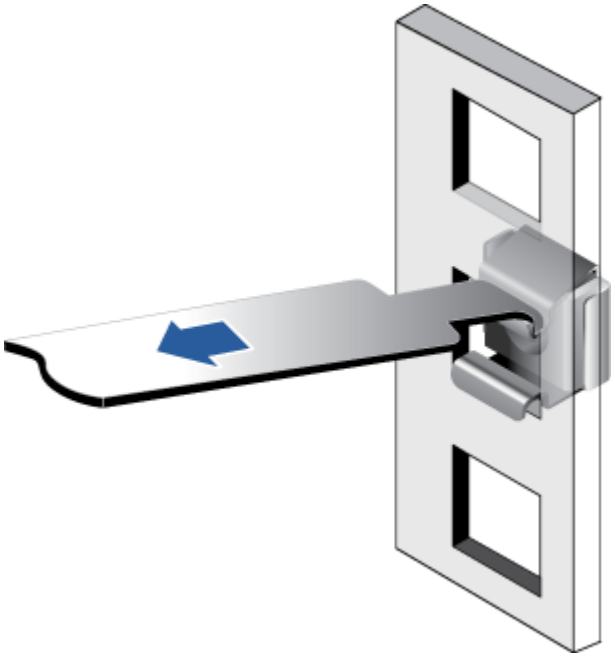
   The boundary of two Us is indicated by the smaller spacing between two adjacent square holes, as shown in **Figure 3-2**. The boundary between Us is used as the reference for calculating device installation space.

Figure 3-2 Boundary between Us



2. Fasten one end of a floating nut to the target square hole in a mounting bar at the front of the cabinet.
3. Use a floating nut hook to pull the upper end of the floating nut, and fasten it to the upper edge of the square hole, as shown in **Figure 3-3**.

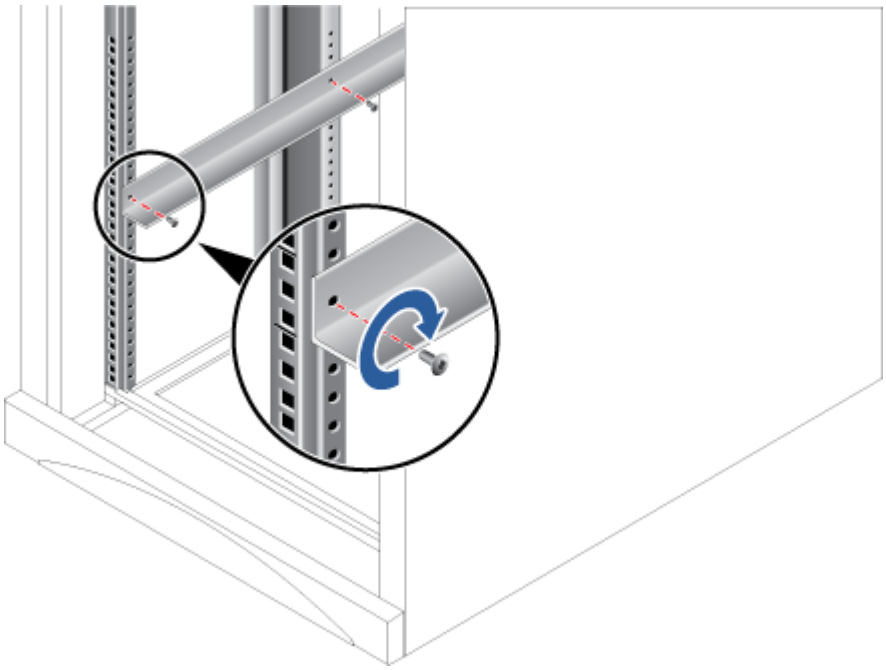
Figure 3-3 Installing a floating nut



Step 3 Install L-shaped guide rails.

1. Place a guide rail horizontally in the planned position and keep the guide rail in contact with the mounting bars in the cabinet.
2. Tighten the screws on the guide rail clockwise, as shown in **Figure 3-4**.
3. Install the other guide rail in the same way.

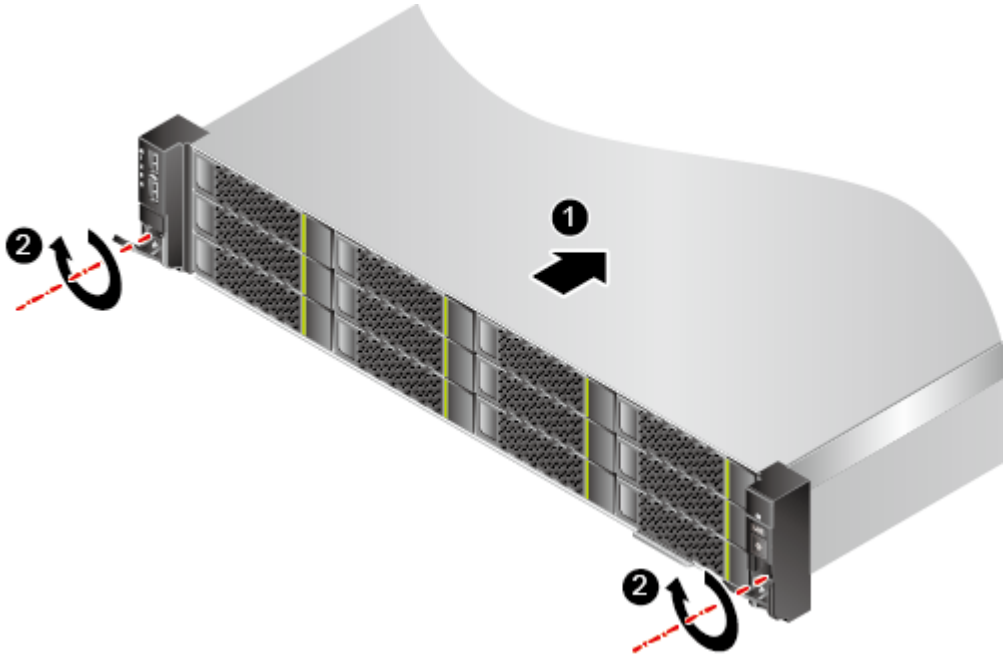
Figure 3-4 Installing an L-shaped guide rail



Step 4 Install the TaiShan 2280 server.

1. At least two persons are required to lift the TaiShan 2280 server.
2. Place the TaiShan 2280 server onto the guide rails and slide it into the cabinet, as shown in **Figure 3-5**.
3. When the two mounting ears of the TaiShan 2280 come into contact with the mounting bars on the cabinet, tighten the captive screws on the mounting ears clockwise to secure the TaiShan 2280 server.

Figure 3-5 Installing a TaiShan 2280



----End

Follow-up Procedure

Connect power cables to the TaiShan 2280 and power on the server. Connect network cables, VGA cables, and USB devices as required.

3.3.2 Installing the TaiShan 2280 on Adjustable Guide Rails

This section describes how to install the server on adjustable guide rails.

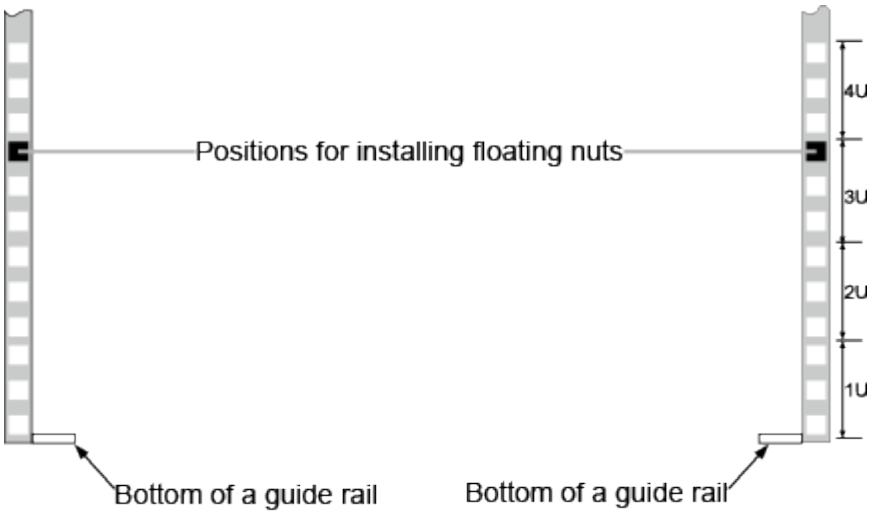
Context

Adjustable guide rails apply to a cabinet with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.

Procedure

Step 1 Determine the positions for installing floating nuts. See **Figure 3-6**.

Figure 3-6 Positions for installing floating nuts



Step 2 Install floating nuts.

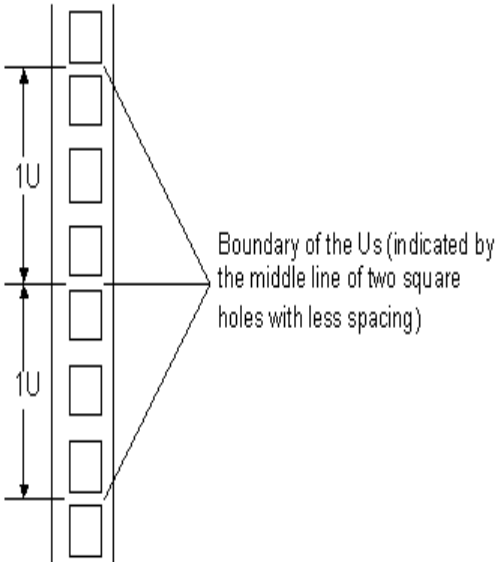
1. Determine the installation locations of the floating nuts according to the installation plan of devices in the cabinet.

   NOTE

   Floating nuts are used to secure screws.

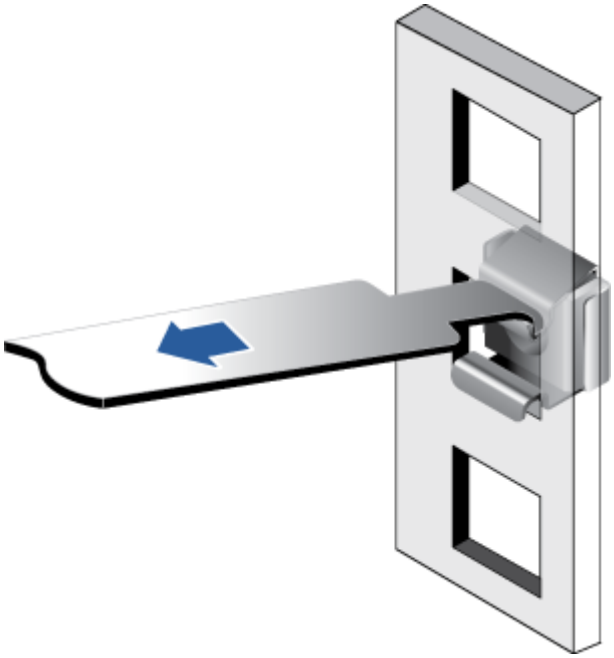
   The boundary of two Us is indicated by the smaller spacing between two adjacent square holes, as shown in **Figure 3-7**. The boundary between Us is used as the reference for calculating device installation space.

Figure 3-7 Boundary between Us



2. Fasten one end of a floating nut to the target square hole in a mounting bar at the front of the cabinet.
3. Use a floating nut hook to pull the upper end of the floating nut, and fasten it to the upper edge of the square hole, as shown in **Figure 3-8**.

Figure 3-8 Installing a floating nut



Step 3 Install guide rails.

1. Place a guide rail horizontally in the planned position and keep the guide rail in contact with the mounting bars in the cabinet. Hook the guide rail to the cabinet. See (1) in **Figure 3-9**.

   NOTE

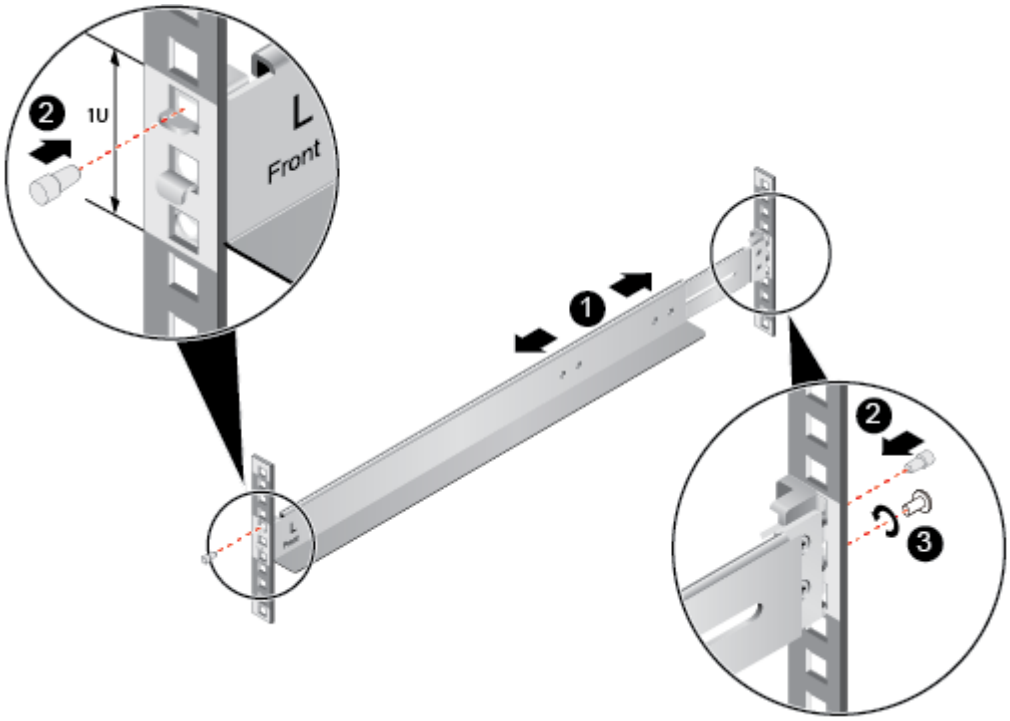
   The distance between the three holes in each mounting bar for the guide rail must be within 1U.

2. Insert the plugs delivered with the guide rail into the two square holes to secure the guide rail. See (2) in **Figure 3-9**.
   - Lowest square hole on the front side of the guide rail
   - Highest square hole on the rear side of the guide rail
3. (Optional) Install an M6 screw in the first square hole at the rear of the guide rail to secure it. See (3) in **Figure 3-9**.

   NOTE

   You can install the adjustable guide rails free from screws. M6 screws at the rear will make the server more shockproof and secure.
4. Install the other guide rail in the same way.

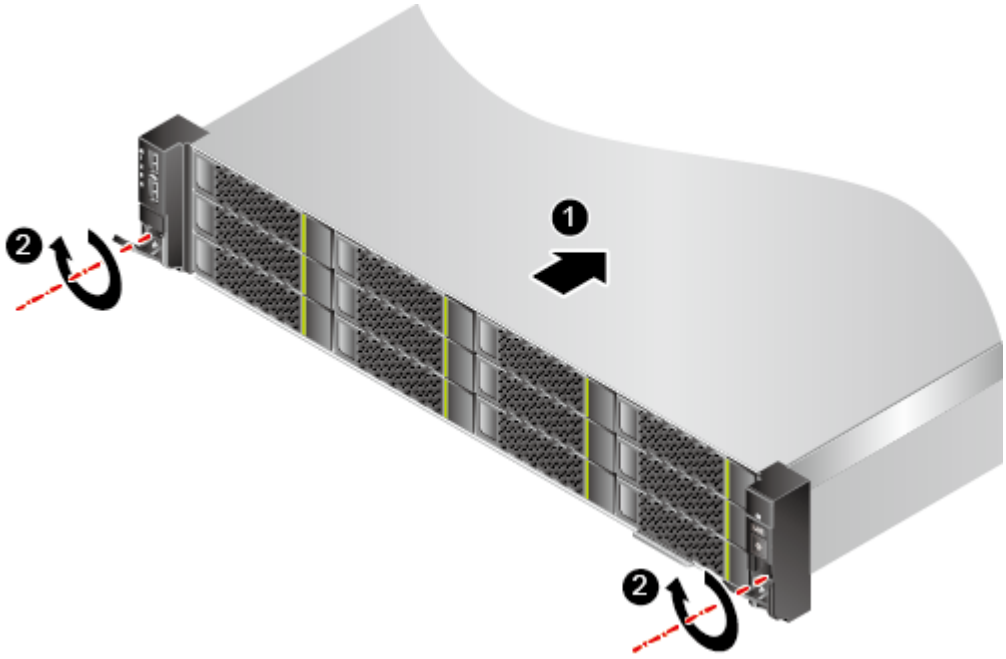
Figure 3-9 Installing an adjustable guide rail



Step 4 Install the TaiShan 2280 server.

1. At least two persons are required to lift the TaiShan 2280 server.
2. Place the TaiShan 2280 server onto the guide rails and slide it into the cabinet, as shown in **Figure 3-10**.
3. When the two mounting ears of the TaiShan 2280 come into contact with the mounting bars on the cabinet, tighten the captive screws on the mounting ears clockwise to secure the TaiShan 2280 server.

Figure 3-10 Installing a TaiShan 2280



----End

Follow-up Procedure

Connect power cables to the TaiShan 2280 and power on the server. Connect network cables, VGA cables, and USB devices as required.

3.3.3 Installing the Server on the Ball Bearing Rail Kit

Context

The ball bearing rail kit applies to cabinets with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.

Procedure

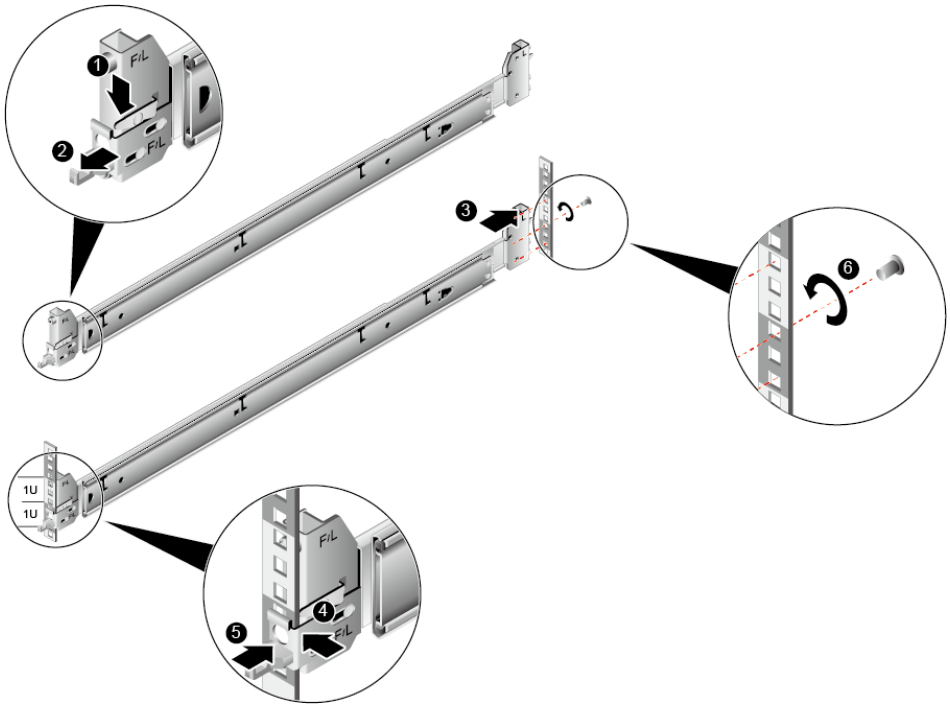
Step 1 Install a ball bearing rail kit.

Two types of ball bearing rail kits are available, and the installation procedure varies.

- To install the ball bearing rail kit (BOM code: 21241258), do as follows:
  a. Hold down the release latch on the front end of the guide rail and pull out the hook. See (1) and (2) in **Figure 3-11**.
  b. Insert the positioning pins at the rear of the guide rail into the square holes at the rear of the cabinet. See (3) in **Figure 3-11**.
  c. Align the front of the guide rail with the square hole, and push the guide rail forward until it snaps into place. See (4) in **Figure 3-11**.
  d. Push the hook backwards so that its metal sheet contacts the column. See (5) in **Figure 3-11**.

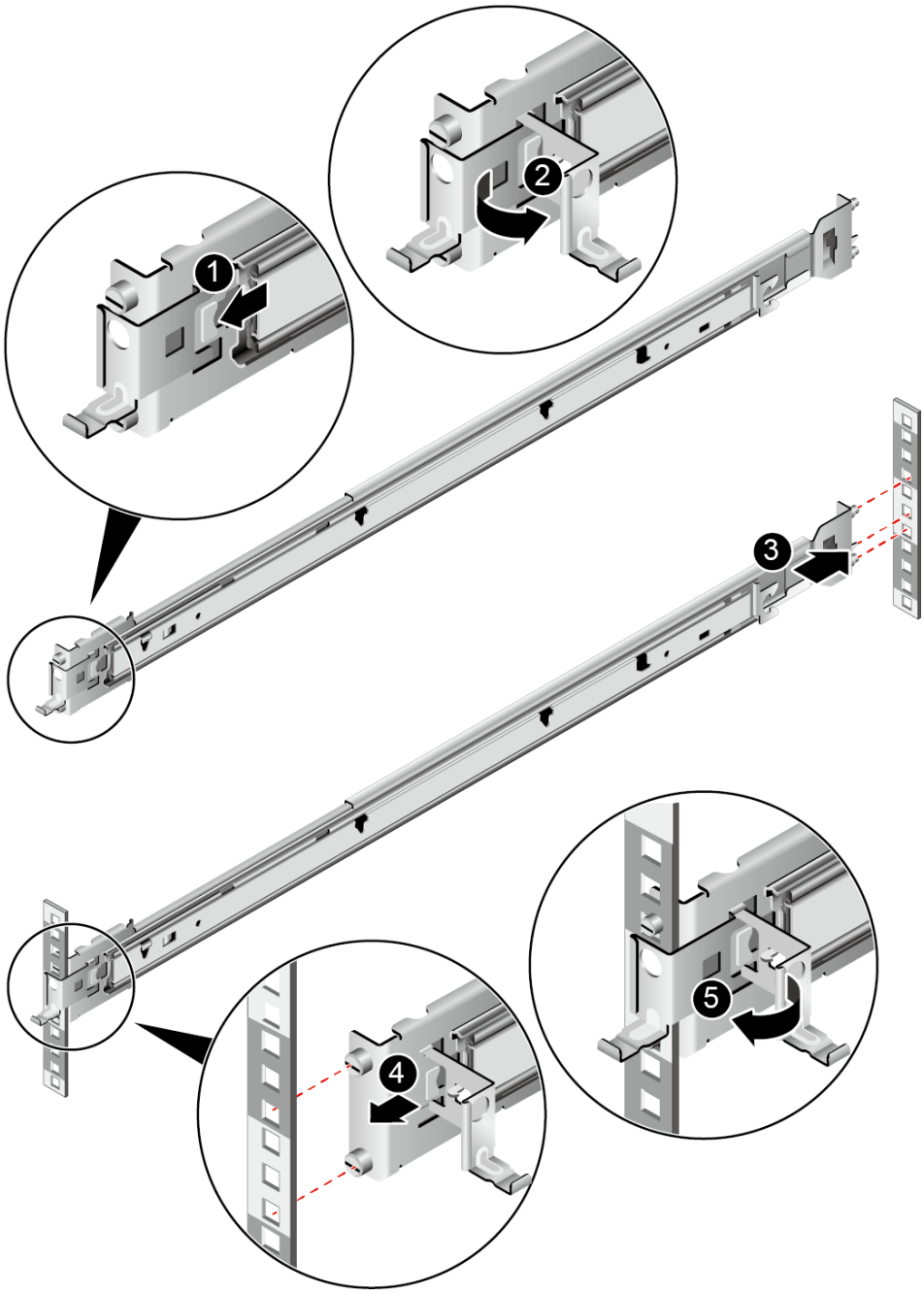
e. (Optional) Install an M6 screw in the third square hole at the rear of the guide rail to secure it. See (6) in **Figure 3-11**.

Figure 3-11 Installing the ball bearing rail kit (BOM code: 21241258)



- To install the ball bearing rail kit (BOM code: 21241258-002), do as follows:
  a. Push the release latch on the front end of the guide rail and pull out the hook. See (1) and (2) in **Figure 3-12**.
  b. Insert the positioning pin at the rear end of the rail kit into the hole on the rear post of the cabinet. See (3) in **Figure 3-12**.
  c. Keep the rail horizontal, and push the front end of the rail until it is inserted into the hole on the front post of the cabinet. See (4) in **Figure 3-12**.
  d. Hook the rail kit. See (5) in **Figure 3-12**.

Figure 3-12 Installing the ball bearing rail kit (BOM code: 21241258-002)



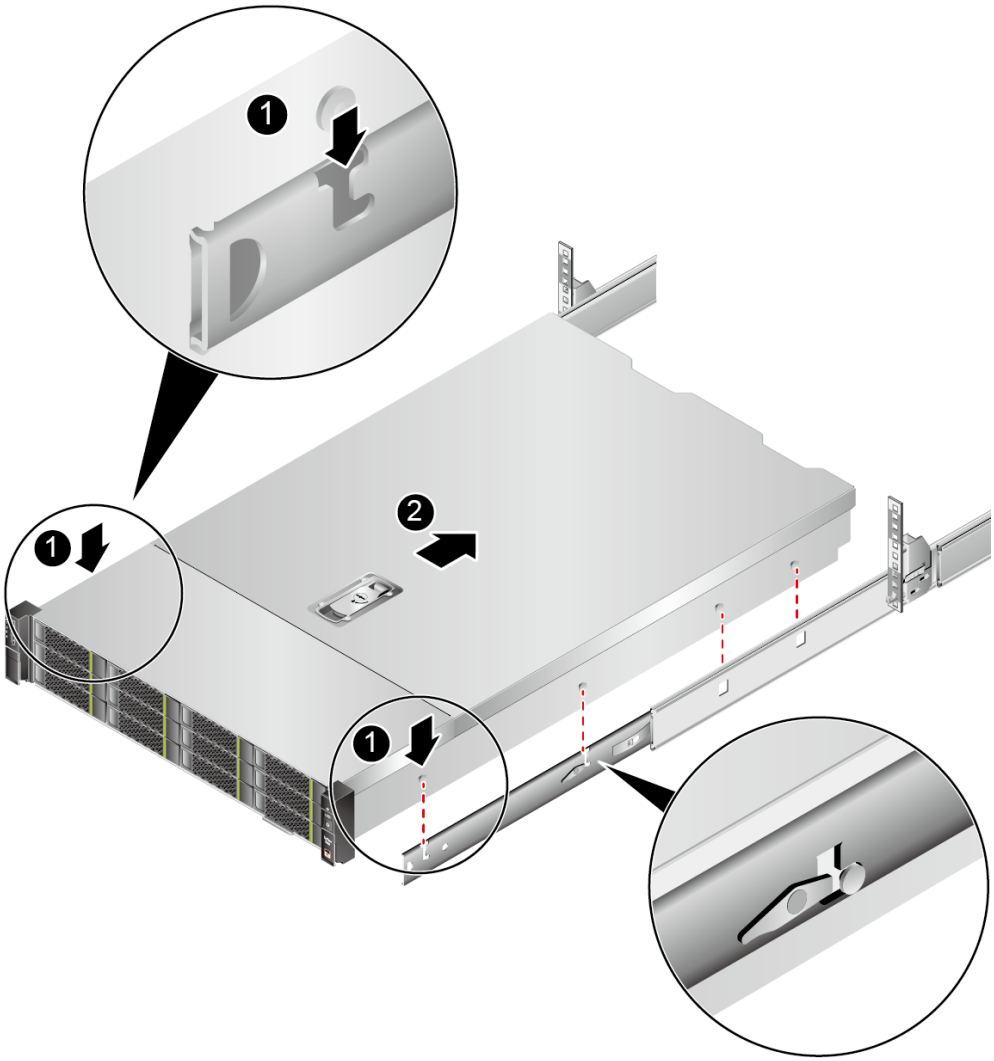
Step 2 Install the server.

1. Pull out the inner rail, as shown in **Figure 3-13**.

Figure 3-13 Pulling out an inner rail

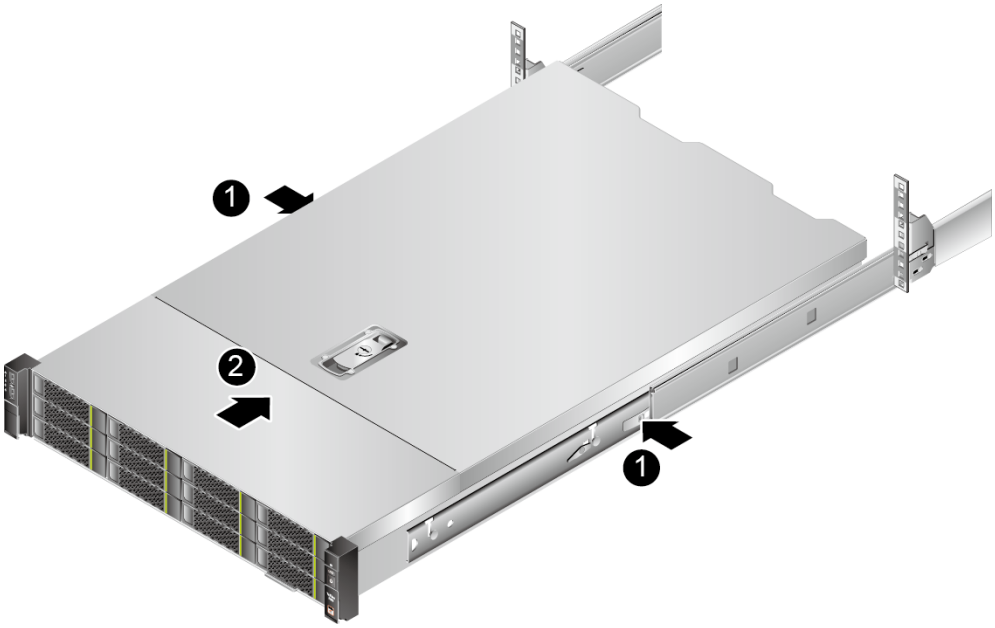
2. Align the securing holes in the inner rails with the positioning pins on the server, and secure the inner rails to the server, as shown in **Figure 3-14**.

Figure 3-14 Installing a server



3. Press the release buttons on both sides, and push the server into the cabinet until the server cannot move forward. See (1) and (2) in **Figure 3-15**.

Figure 3-15 Pushing the server into the cabinet along the guide rails

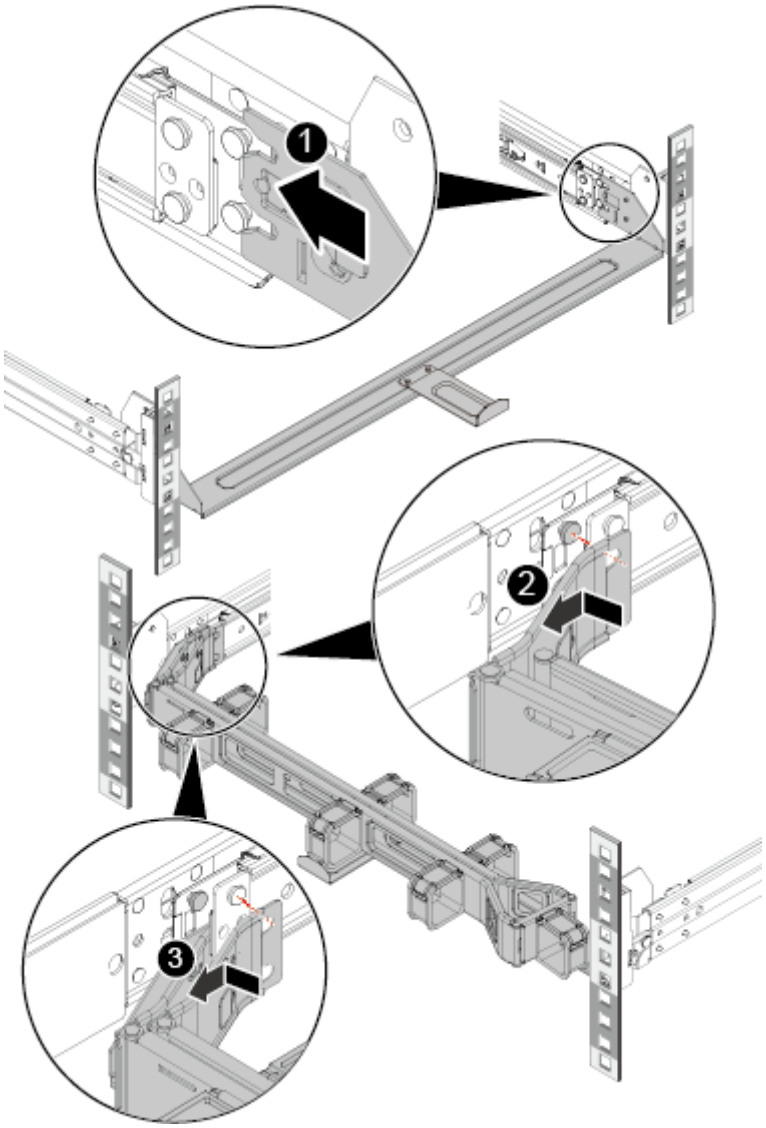


Step 3 Install a cable management arm (CMA).

Two types of CMAs are available and the installation procedure varies.

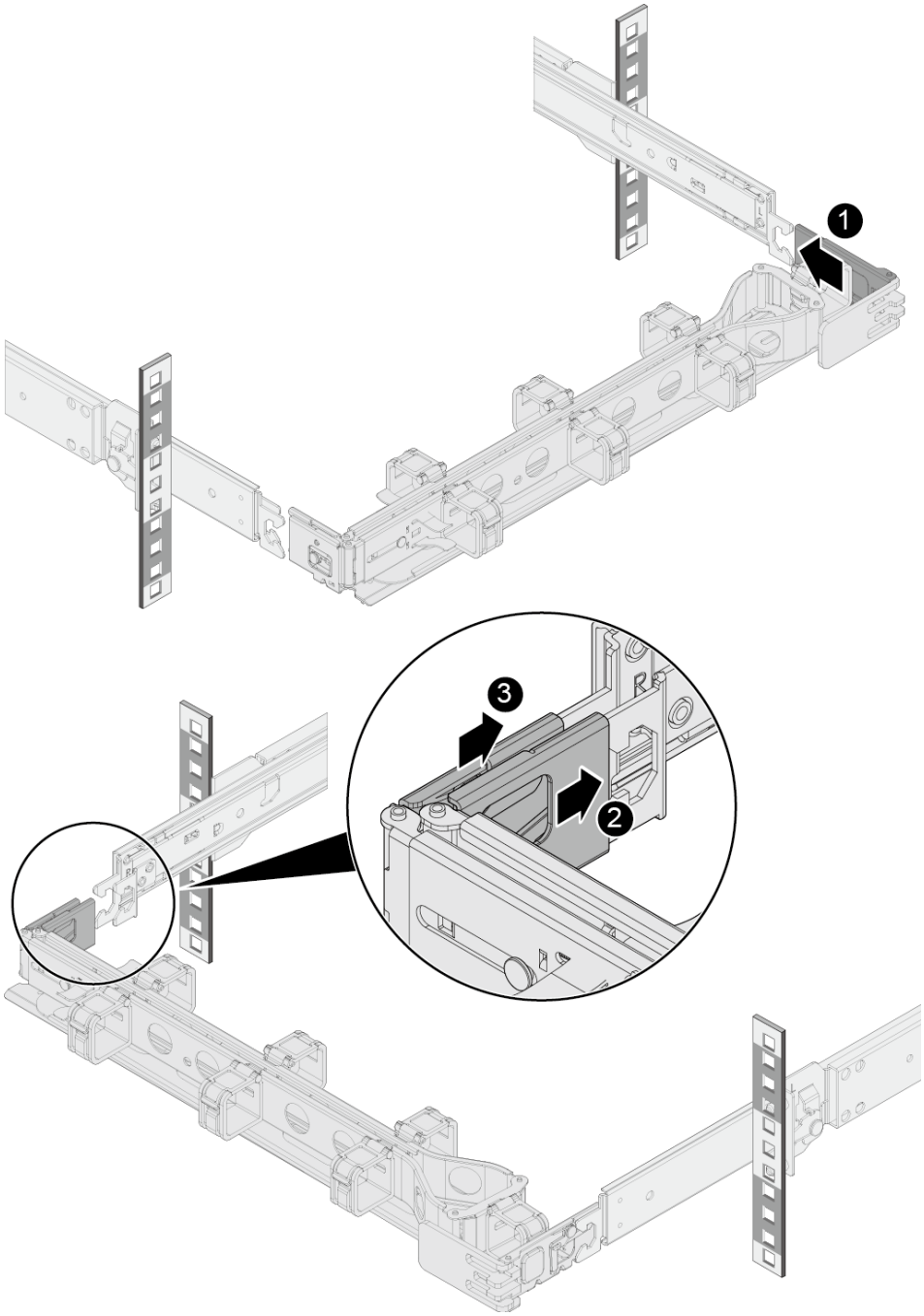
- To install the CMA (BOM code: 21241259) used with the rails (BOM code: 21241258), do as follows:
  a. Insert the support lever into both left and right outer rails. See (1) in **Figure 3-16**.
  b. Insert the nail heads on the outer left rail into the holes on the outer support lever of the cable organizer, and pull the cable organizer out to secure it. See (2) in **Figure 3-16**.
  c. Insert the nail heads on the inner left rail into the holes on the inner support lever of the cable organizer, and pull the cable organizer out to secure it. See (3) in **Figure 3-16**.

Figure 3-16 Installing a CMA (BOM code: 21241259)



- To install the CMA (BOM code: 21241259-001) used with the rails (BOM code: 21241258-002), do as follows:
  a. Insert the bracket on the right of the CMA into the right guide rail. See (1) in **Figure 3-17**.
  b. Insert the internal bracket on the left of the CMA into the left guide rail. See (2) in **Figure 3-17**.
  c. Insert the external bracket on the left of the CMA into the left guide rail. See (3) in **Figure 3-17**.

Figure 3-17 Installing a CMA (BOM code: 21241259-001)



----End

Follow-up Procedure

Connect power cables to the server and power on the server. Connect network cables, VGA cables, and USB devices as required.

3.4 Connecting External Cables

This topic describes how to connect cables to the server.

3.4.1 Connecting Cables to a Mouse, Keyboard, and VGA Port

This section describes how to connect cables to a mouse, keyboard, and VGA port.

Scenarios

After powering on the server, set the basic input/output system (BIOS) and RAID, and log in to the OS.

The rear panel of the server provides a DB15 VGA ports but no standard PS/2 ports for a keyboard or mouse.

You can connect a keyboard and mouse to the USB ports on the front and rear panels, using either of the following methods:

- Connect the keyboard and mouse to the USB ports.
- Connect the keyboard and mouse using a USB-to-PS/2 cable.

Conditions

Prerequisites

No special condition is required for this operation.

Data

No data preparation is required for this operation.

Procedure

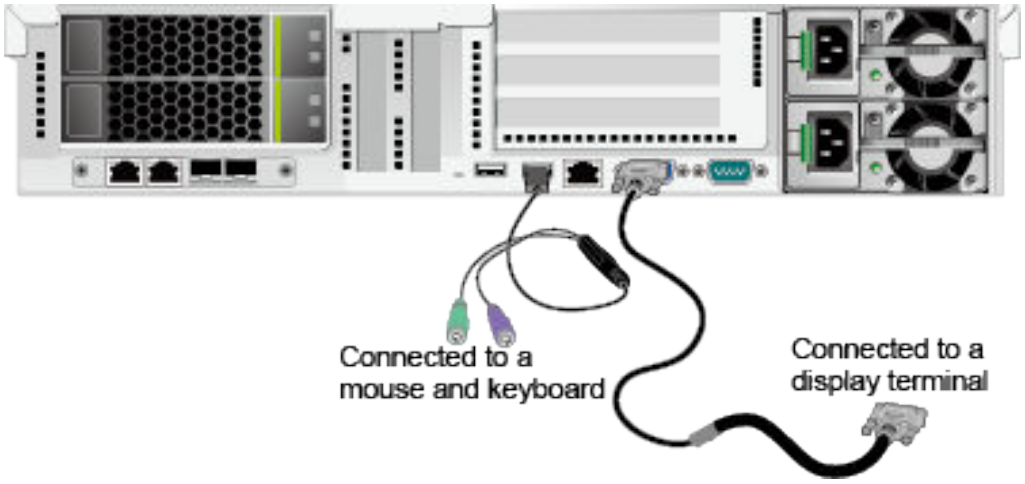
Step 1 Connect the USB connector on one end of the USB-to-PS/2 cable to a USB port on the front or rear panel of the server.

Step 2 Connect the connector on the other end to the keyboard and mouse.

Step 3 Connect the DB15 connector on the VGA cable to the VGA port on the front or rear panel of the server and tighten the two screws.

Step 4 Connect the other end of the VGA cable to the VGA port on the monitor and tighten the two screws.

Figure 3-18 Connecting USB-to-PS/2 and VGA cables



----End

3.4.2 Connecting a Network Cable

This section describes how to connect network cables.

Scenarios

Connect a network cable in the following scenarios:

- The network needs to be set up over GE.
- You want to log in to the iBMC of the server over the management network port for device management.
- One or more network cables do not work.
- A network cable needs to be replaced if the existing network cable does not meet length requirements after a device is replaced or moved.

Conditions

Prerequisites

- The network plan is complete.
- Spare network cables are available and placed near the device.
- Use a network cable tester to check whether the new network cable works properly.
- Check that the new network cable is of the same model as the old one or compatible with the old one. Determine whether they are straight-through or crossover cables.

Data

No data preparation is required for this operation.

Tools

- Phillips screwdriver: used to tighten screws

- ESD wrist strap or ESD gloves: used to prevent ESD damage
- Diagonal pliers: used to trim the cable ties after binding cables
- RJ45 crimping tool: used to make network cable connectors
- Network cable tester: used to test the cable connectivity
- Multimeter: used to test the resistance

Procedure

Step 1 Determine the model of the new network cable.

Step 2 Number the new network cable.

- The new network cable must have the same number as the existing one to be replaced.
- Use the same type of labels for network cables. Record the name and number of the local device to be connected on one side of the label, and those of the peer device on the other side. Attach the label 2 cm (0.79 in.) away from the end of the network cable.

Step 3 Route the new network cable.

Route the new network cable in the same way (underfloor or overhead) as the network cable to be replaced. Note the following:

- Underfloor cabling is recommended because it is tidy and easy to route. Route network cables in the cabinet based on the installation requirements. You are advised to arrange new cables in the same way as existing cables. Ensure that cables are routed neatly and undamaged.
- Separate network cables from power cables when routing.
- The minimum bend radius of a network cable is 4 cm. Ensure that the cable insulation layer is intact. Ensure that cables are routed for easy maintenance and capacity expansion.
- Bind cables with ties when routing. Ensure that network cables are bound closely, neatly, and straight, and cable ties are in even distance and fastened properly.

Step 4 Remove the network cable to be replaced.

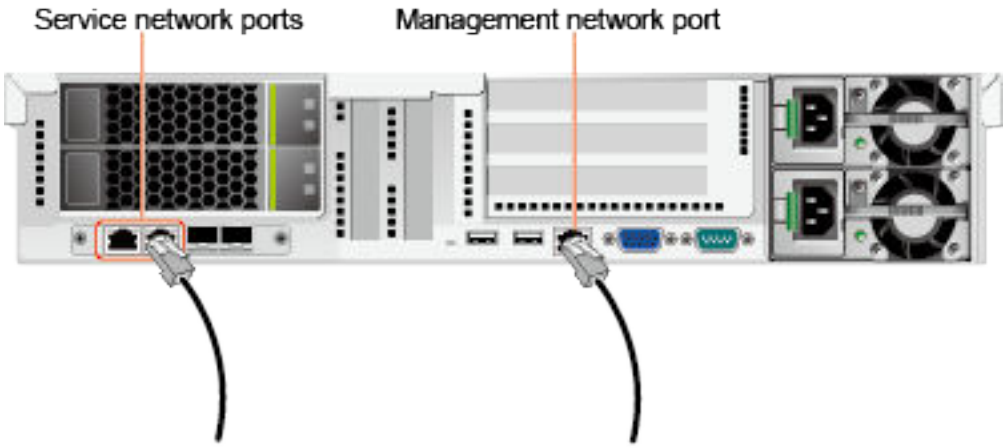
Remove the network cables from the NIC or board in the cabinet.

Step 5 Install the new network cable.

Note the following:

- Connect the new network cable to the same port as the removed one.
- Connect the network cable to the network port securely.

Figure 3-19 Connecting a network cable



Step 6 Connect the new network cable to the peer network port.

Connect the other end of the network cable to the peer device based on the network plan. Note the following:

- Connect the new network cable to the same port as the removed one.
- Connect the network cable to the network port securely.

Step 7 Check whether the new network cable is properly connected.

Power on the device, and ping the peer device connected by the new network cable. If the peer device cannot be pinged, check whether the network cable is intact or connectors are properly connected.

Step 8 Bind the new network cable with other cables.

Bind the new cable in the same way as the existing cables. You can also remove all existing cable ties and bind all network cables again if necessary.

----End

3.4.3 Connecting a Cable to a 10GE Port

This section describes how to connect a cable to a 10GE port.

Scenarios

Connect a cable to a 10GE port in the following scenarios:

- A 10GE network needs to be set up.
- One or more optical fibers or SFP+ cables are not properly connected.
- The existing optical fibers or SFP+ cables are not long enough after a network device is replaced or migrated.

Conditions

Prerequisites

- You can connect an optical fiber or SFP+ cable to a 10GE port. You need to determine the type of cable to be connected, depending on site requirements.

- The network plan is complete.
- A spare cable is ready and placed near the device.
- Use a network cable tester to check whether the new network cable works properly.
- Check that the new network cable is of the same model as the old one or compatible with the old one. Determine whether they are straight-through or crossover cables.

Data

No data preparation is required for this operation.

Tools

- Phillips screwdriver: used to tighten screws
- ESD wrist strap or ESD gloves: used to prevent ESD damage

Procedure

Step 1 Determine the model of the new cable.

Step 2 Number the new cable.

- The new cable must have the same number as the existing one to be replaced.
- Use the same type of labels for optical cables. On one side of an optical cable, record the name and number of the local device to be connected, and on the other side, record those of the peer device. Attach the label 2 cm (0.79 in.) away from the end of the optical cable.

Step 3 Route the new cable.

Route the new cable in the same way (underfloor or overhead) as the old one. Note the following:

- Route optical or SFP+ cables in the cabinet based on the installation requirements. You are advised to arrange new cables in the same way as existing cables. Ensure that cables are routed neatly and intact.
- Separate optical or SFP+ cables from power and signal cables when routing the cables.
- Bend an optical fiber or SFP+ cable with a bending radius of at least 4 cm (1.57 in.) to prevent damage to core wires. Ensure that the cable is intact. Ensure that optical or SFP+ cables are properly routed for easy maintenance and capacity expansion.
- Bind optical cables using cable ties. Ensure that optical cables are bound closely, neatly, and straight, and cable ties are in even distance and fastened properly.

Step 4 Connect a cable to a 10GE port.

When you use an optical cable:

1. Remove the optical cable to be replaced.

   Remove the existing optical cable from the server.

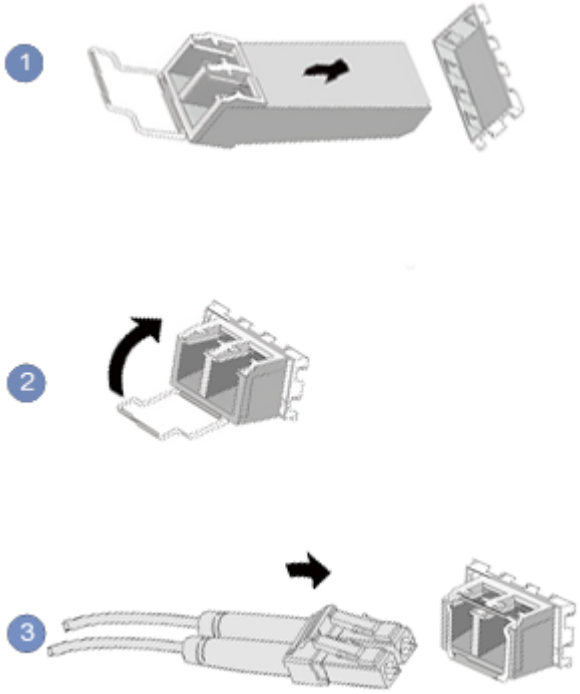
2. Connect the new optical cable.

NOTE

- Connect the new optical cable to the same port as the removed one.
- Connect the optical cable to the optical module securely.

1. Insert the optical module into the optical port. See (1) in **Figure 3-20**.
2. Close the latch on the optical module to secure it. See (2) in **Figure 3-20**.
3. Insert the optical cable into the optical module. See (3) in **Figure 3-20**.

Figure 3-20 Connecting an optical cable



When you use an SFP+ cable:

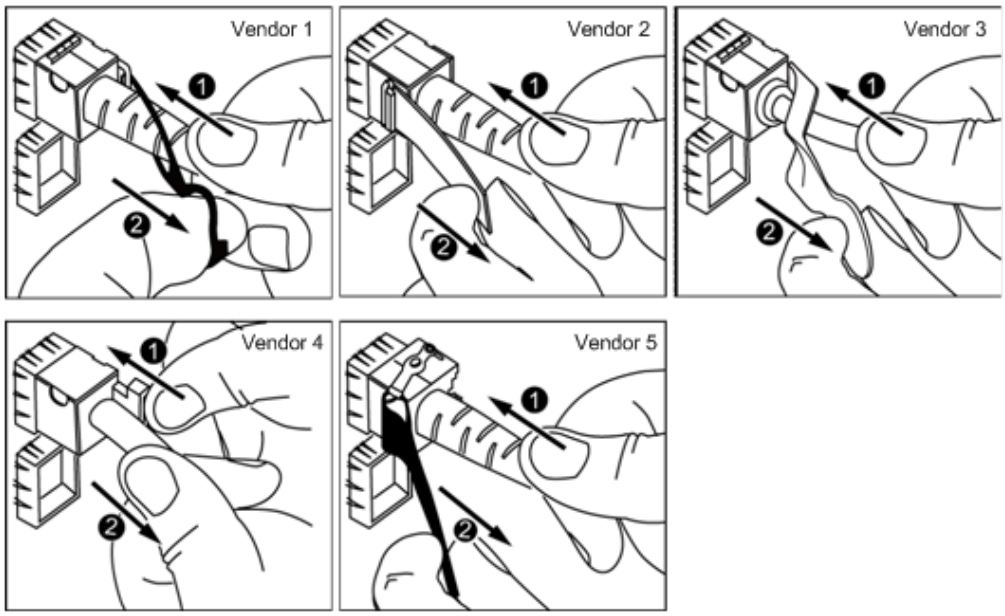
1. Remove the SFP+ cable to be replaced.

   Gently push the power connector inwards and pull the latch out to remove the SFP+ cable. See **Figure 3-21**.

NOTICE

Do not directly pull the latch out.

Figure 3-21 Removing an SFP+ cable



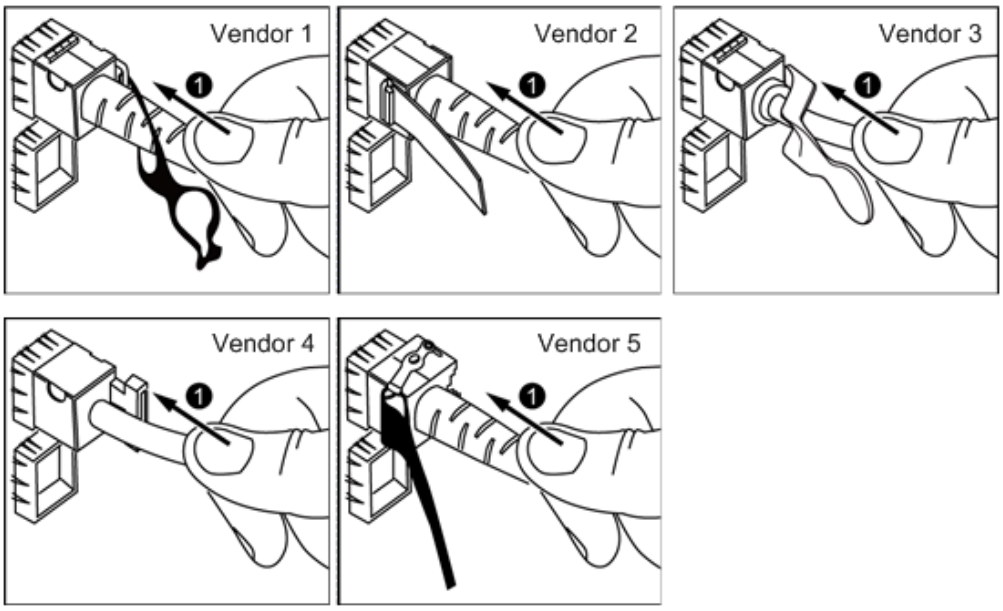
2. Connect the new SFP+ cable.

   Remove the dust-proof cap from the port, and insert the cable connector into the port. See **Figure 3-22**.

NOTE

When you hear a click and the cable cannot be pulled out, the connector is secured.

Figure 3-22 Connecting an SFP+ cable



Step 5 Check whether the new cable is properly connected.

Power on the device, and ping the peer device connected by the new network cable. If the peer device cannot be pinged, check whether the cable is intact or the connectors are securely connected.

Step 6 Bind the new optical cable.

Bind the new optical cable in the same way as the existing optical cables. You can also remove all cable ties and bind all optical cables again if necessary.

----End

3.4.4 Connecting a USB Device

This section describes how to connect a USB device.

Scenarios

Connect a USB device in the following scenarios:

- Use a USB keyboard and mouse to set parameters after logging in to the OS.
- Use a USB storage device, DVD-ROM drive, or floppy disk drive (FDD) to transmit data or install an OS.

Conditions

Prerequisites

- You have located the server in the cabinet to which the USB device is to be connected.
- A USB device is ready and placed near the device.
- The USB storage device to be connected operates properly.

Data

Required data has been copied to the USB storage device to be connected.

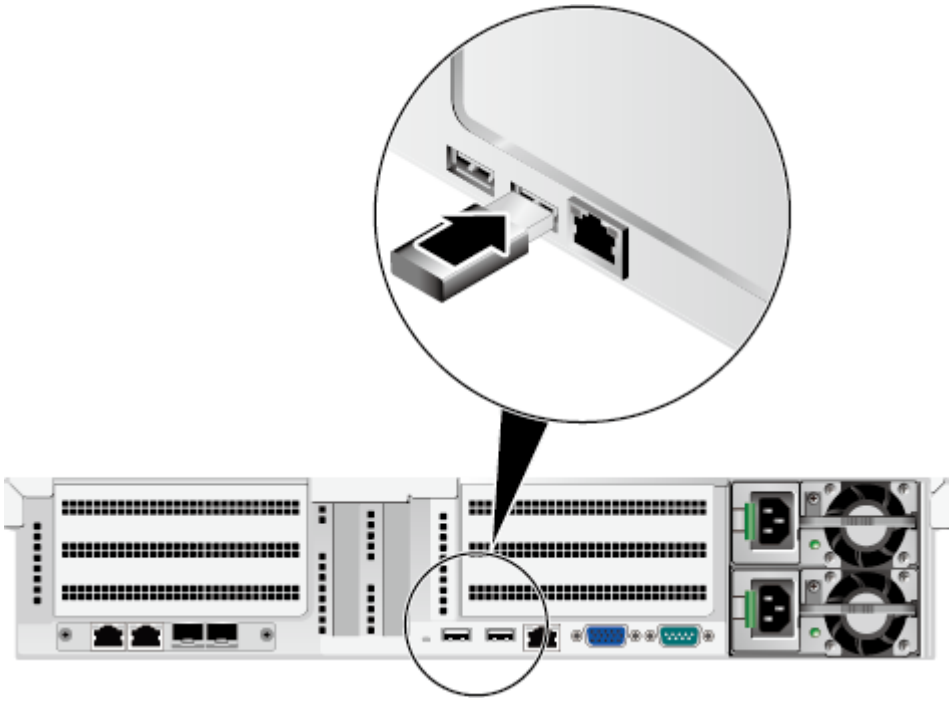
Tools

ESD wrist strap

Procedure

Step 1 Connect the USB storage device to the USB port on the server, as shown in **Figure 3-23**.

Figure 3-23 Connecting a USB device



----End

3.4.5 Connecting a Serial Cable

This section describes how to connect a serial cable.

Scenarios

The rear panel of the server provides a standard DB9 serial port, which works as the system serial port by default. You can set it as the iBMC serial port using the iBMC CLI.

The serial port can be used as:

- System serial port for monitoring the OS status
- iBMC serial port for debugging and fault locating

Conditions

Prerequisites

No special condition is required for this operation.

Data

You have determined the cabinet number and installation position for the server to be connected.

Tools

ESD wrist strap or ESD gloves: used to prevent ESD damage

Documents

For details about the command for setting the system serial port to the iBMC serial port, see **TaiShan Rack Server iBMC User Guide**.

Hardware

Serial cable with a DB9 connector

Procedure

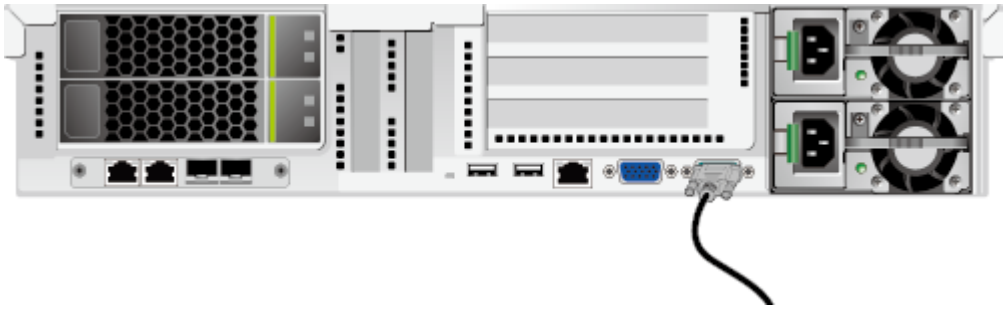
Step 1

NOTICE

Do not use excessive force; otherwise, the pins in the serial port may be damaged.

Align the connector on the serial cable with the serial port, and use even force to insert the connector completely into the serial port. See **Figure 3-24**.

Figure 3-24 Connecting a serial cable



Step 2 Tighten the screws on the connector clockwise to secure the serial cable.

----End

3.4.6 Connecting a Power Cable

This section describes how to connect a power cable.

Scenarios

Connect a power cable in any of the following scenarios:

- The device needs to be powered on after it is properly installed.
- A power supply unit (PSU) is replaced and the new PSU is to be powered on.
- A new PSU needs to be powered on after it is properly installed.

The following describes how to connect AC and DC power cables.

Conditions

Prerequisites

- The power cable must be securely connected.

- Use the recommended power cables at all times.
- Use power cables only for dedicated servers. Do not use them for other devices.

Data

No data preparation is required for this operation.

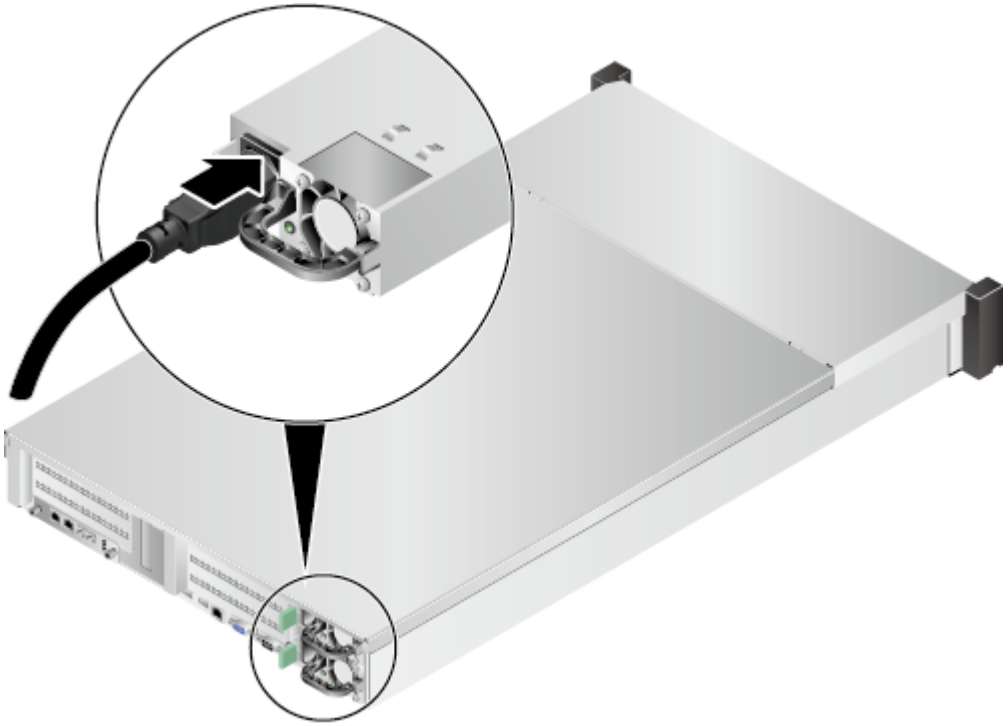
Tools

ESD wrist strap or ESD gloves: used to prevent ESD damage

Procedure

1. Connect one end of the AC power cable to the power port on the PSU of the server. See **Figure 3-25**.
2. Close the latch on the PSU.
3. Insert the other end of the power cable into the AC power socket on the cabinet. The AC power socket is located horizontally at the rear of the cabinet. Select a jack on the power socket for connection.
4. Bind the power cable to the CMA using cable ties.

Figure 3-25 Connecting an AC power cable



3.4.7 Cable Routing

This section describes the rules and common methods for cable routing.

Basic Rules

- Lay out and bind cables of different types (such as power and signal cables) separately. Cables of the same type must be in the same direction. Route

cables near each other in crossover mode. When cables are routed in parallel, the distance between power cables and signal cables must be longer than or equal to 30 mm (1.18 in.).

- If you cannot identify cables according to the existing labels, attach an engineering label on each cable.
- Protect cables from burrs, heat sinks, and active accessories, which may damage the insulation layers of cables.
- Bind cables with proper cable ties. Do not connect two or more cable ties into one to bind cables. After binding cables properly, trim off the excess lengths of the cable ties and ensure that the cuts are neat and smooth.
- Ensure that cables are properly routed, supported, or fixed within the cable troughs inside the cabinet to prevent loose connections and cable damage.
- Coil any surplus lengths of cables and bind them to proper positions inside the cabinet.
- Route cables straightly and bind them neatly. The bending radius of a cable varies depending on the position where the cable is bent.
  - If you need to bend a cable in its middle, the bending radius must be at least twice the diameter of the cable.
  - If you need to bend a cable at the output terminal of a connector, the bending radius must be at least five times the cable diameter, and the cable must be bound before bending.
  - Do not use cable ties at a place where the cables are bent. Otherwise, the cables may break.

Common Methods

Route cables inside a cabinet using one of the following methods:

- Determine overhead cabling and underfloor cabling for power cables based on specific conditions of the equipment room. Specifically, take into consideration the AC power distribution frame (PDF), surge protector, and terminal block.
- Determine overhead and underfloor cabling for service data cables based on specific conditions of the equipment room.
- Place the connectors of all service data cables at the bottom of the cabinet so that the connectors are difficult to reach.
- Do not cross multi-port cables so that ports can be easily identified and servers can be easily inserted or removed.

Cable Routing Rules

NOTICE

To ensure optimal heat dissipation, do not block the air exhaust vents of PSUs.

3.4.8 Verifying Cable Connections

This section describes how to verify cable connections.

CAUTION

Before verifying cable connections, ensure that the power is off. Any incorrect or loose connection may cause personal injury or equipment damage.

Check cable connections against **Table 3-3**.

Table 3-3 Cable connection checklist

Item	Description
Power cable	The power cable is connected correctly to the rear of the chassis.
Network cable	Network cables are connected correctly to the management or data ports on the rear panel of the chassis.
Ground cable	**NOTE** The TaiShan 2280 does not provide grounding ports. It is grounded through the cabinet. Ensure that the cabinet is properly grounded.

3.5 Removing the TaiShan 2280

This section describes how to remove the TaiShan 2280 server.

3.5.1 Removing the Server and L-Shaped Guide Rails

This section describes how to remove a server from L-shaped guide rails.

Context

L-shaped guide rails apply only to a Huawei cabinet.

Procedure

Step 1 Read **1 Safety Instructions**.

Step 2 Power off the server. For details, see **4 Power-On and Power-Off**.

Step 3 Disconnect all power cables and signal cables from the server.

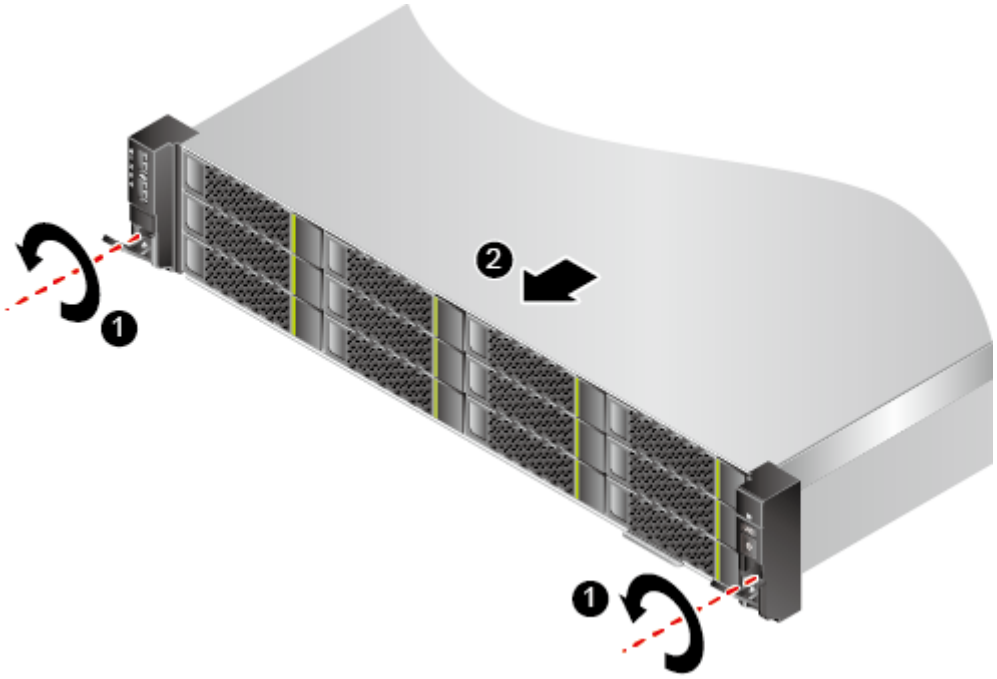
NOTE

Remove power cables first to prevent damage or injury caused by static electricity.

Step 4 Remove the server.

1. Loosen the captive screws on the TaiShan 2280 server panel using a screwdriver. See (1) in **Figure 3-26**.

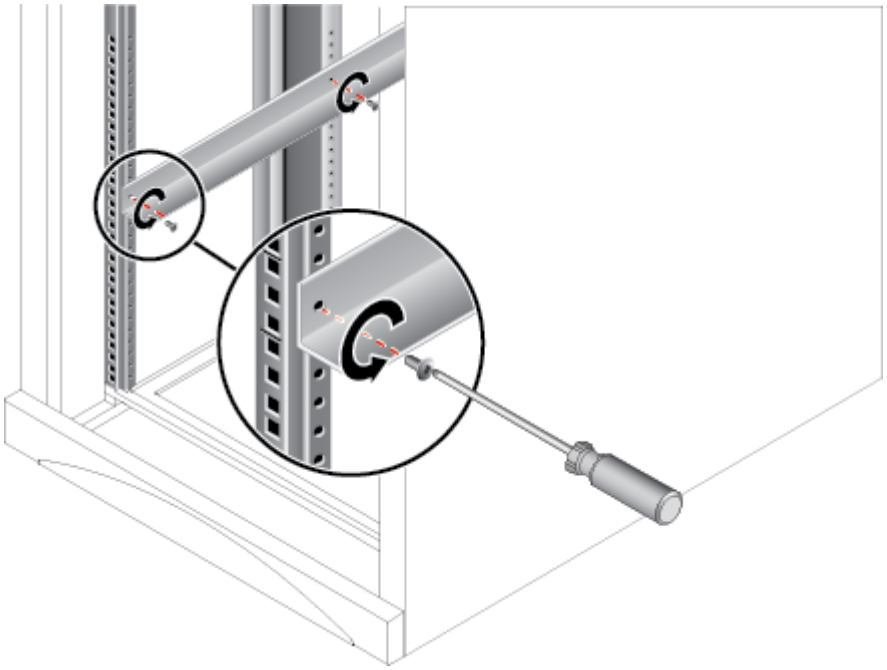
Figure 3-26 Removing a TaiShan 2280



2. Pull out the server along the guide rails away from the cabinet. See (2) in **Figure 3-26**.
3. Place the removed server on an ESD platform.

Step 5 Loosen the screws on the guide rail counterclockwise. See **Figure 3-27**.

Figure 3-27 Removing an L-shaped guide rail



Step 6 Remove the other guide rail in the same way.

----End

3.5.2 Removing the Server and Adjustable Guide Rails

This section describes how to remove a server from adjustable guide rails.

Context

Adjustable guide rails apply to a cabinet with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.

Procedure

Step 1 Read **1 Safety Instructions**.

Step 2 Power off the server. For details, see **4 Power-On and Power-Off**.

Step 3 Disconnect all power cables and signal cables from the server.

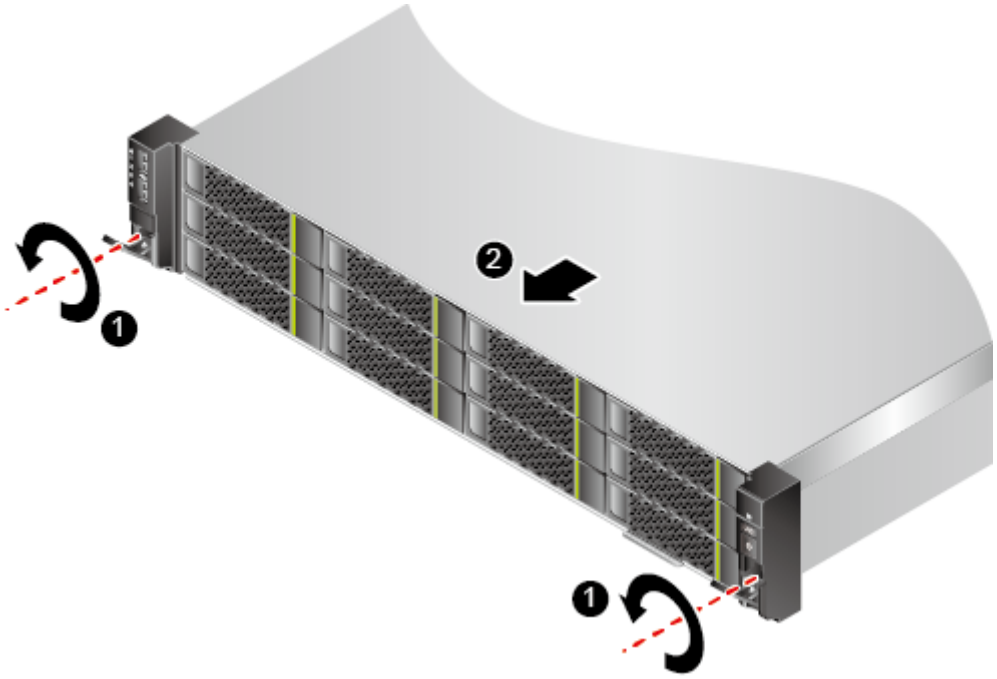
NOTE

Remove power cables first to prevent damage or injury caused by static electricity.

Step 4 Remove the server.

1. Loosen the captive screws on the TaiShan 2280 server panel using a screwdriver. See (1) in **Figure 3-28**.

Figure 3-28 Removing a TaiShan 2280



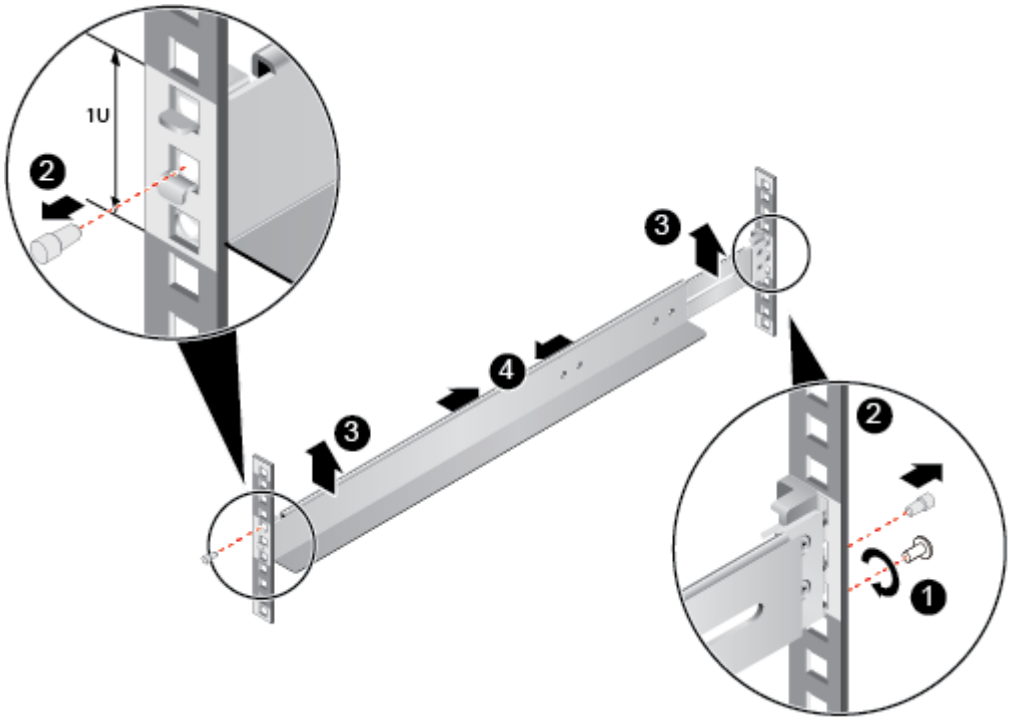
2. Pull out the server along the guide rails away from the cabinet. See (2) in **Figure 3-28**.
3. Place the removed server on an ESD platform.

Step 5 Loosen the M6 screw from the lowest square hole at the rear of a guide rail. See (1) in **Figure 3-29**.

Step 6 Remove the plugs from the two square holes. See (2) in **Figure 3-29**.

Step 7 Slightly lift the guide rail, retract it from the square holes, and take it out. See (3) and (4) in **Figure 3-29**.

Figure 3-29 Removing an adjustable guide rail



Step 8 Remove the other guide rail in the same way.

----End

3.5.3 Removing the Server and Ball Bearing Rail Kit

Context

The ball bearing rail kit applies to cabinets with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.

Procedure

Step 1 Read **1 Safety Instructions**.

Step 2 Power off the server. For details, see **4 Power-On and Power-Off**.

Step 3 Disconnect all power cables and signal cables from the server.

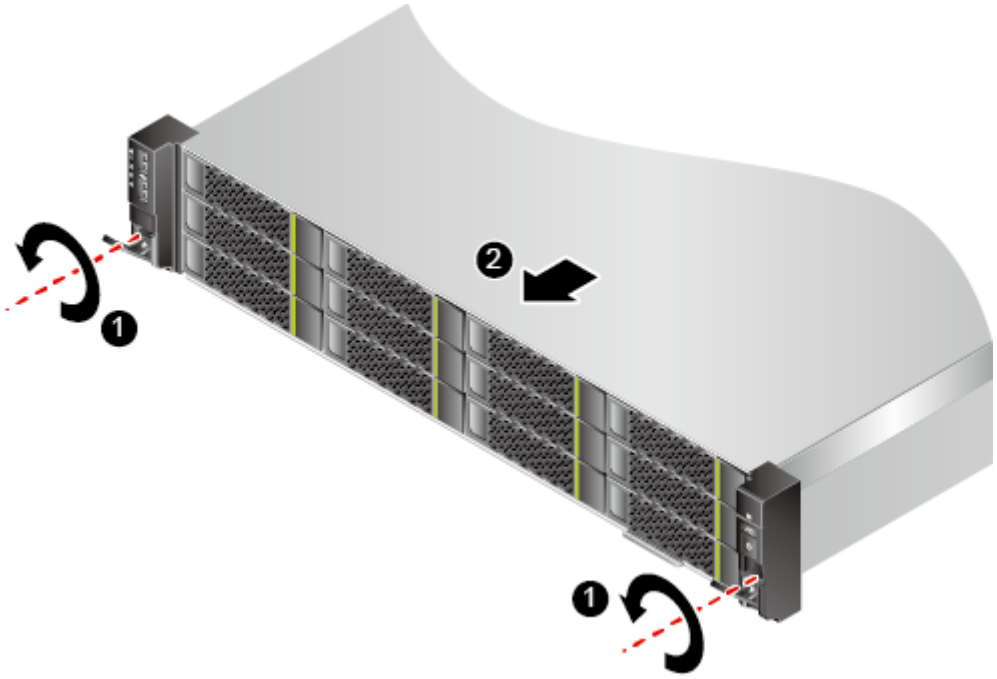
NOTE

Remove power cables first to prevent damage or injury caused by static electricity.

Step 4 Remove the server.

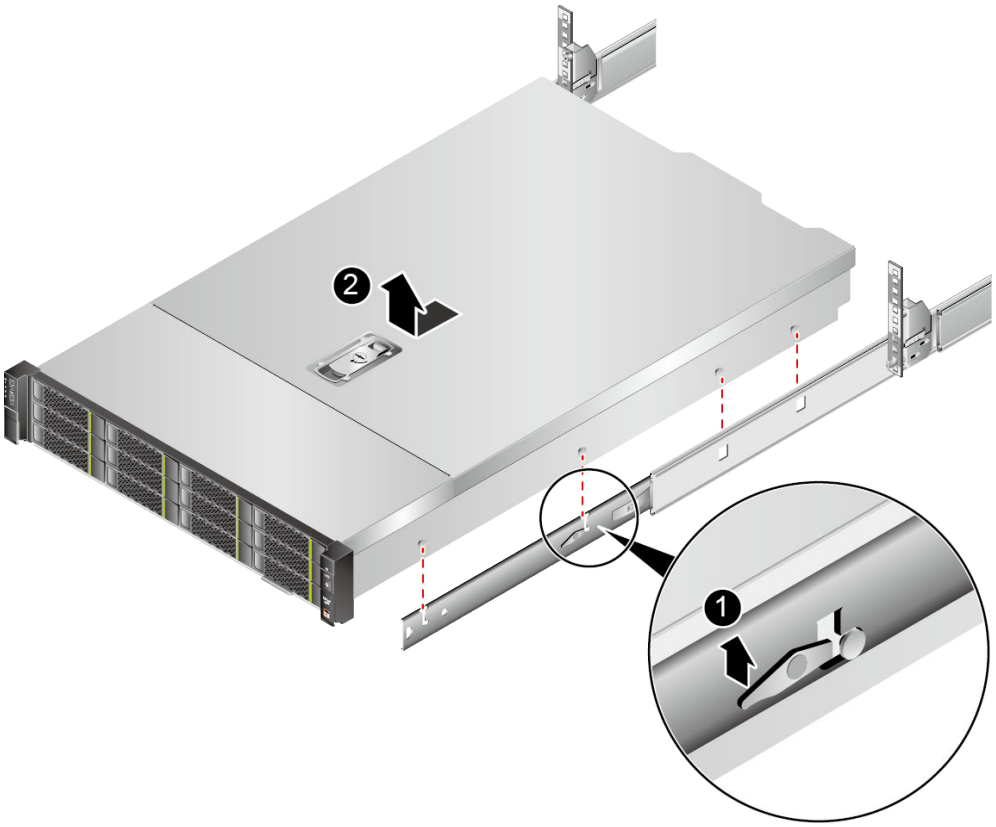
1. Loosen the captive screws on the server panel using a screwdriver. See (1) in **Figure 3-30**.

Figure 3-30 Pulling out the server



2. Pull out the server along the guide rails away from the cabinet as far as the server will go. See (2) in **Figure 3-30**.
3. Pull the release button upwards, and pull the server out. See (1) and (2) in **Figure 3-31**.

Figure 3-31 Removing a server from guide rails



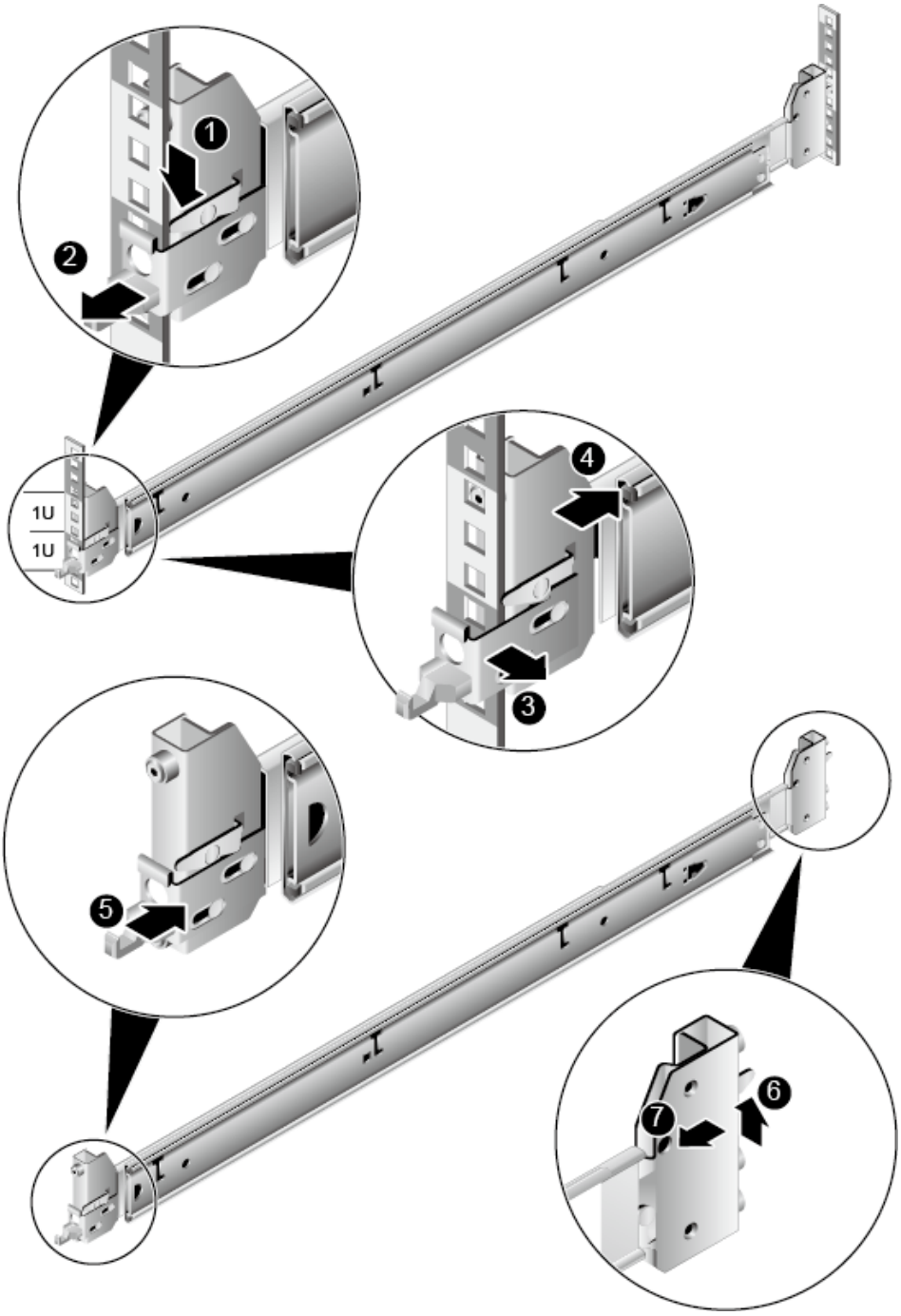
4. Place the removed server on an ESD platform.

Step 5 Remove the ball bearing rail kit.

Two types of ball bearing rail kits are available, and the removal procedure varies.

- To remove the ball bearing rail kit (BOM code: 21241258), do as follows:
  a. Hold down the release latch on the front end of the guide rail and pull out the hook. See (1) and (2) in **Figure 3-32**.

Figure 3-32 Removing the ball bearing rail kit (BOM code: 21241258)



b. Push the guide rail backwards away from the mounting bar. See (3) in **Figure 3-32**.

c. Remove the front end of the guide rail from the inner side of the mounting bar. See (4) in **Figure 3-32**.

d. Push back the retainer plate until it closes. See (5) in **Figure 3-32**.

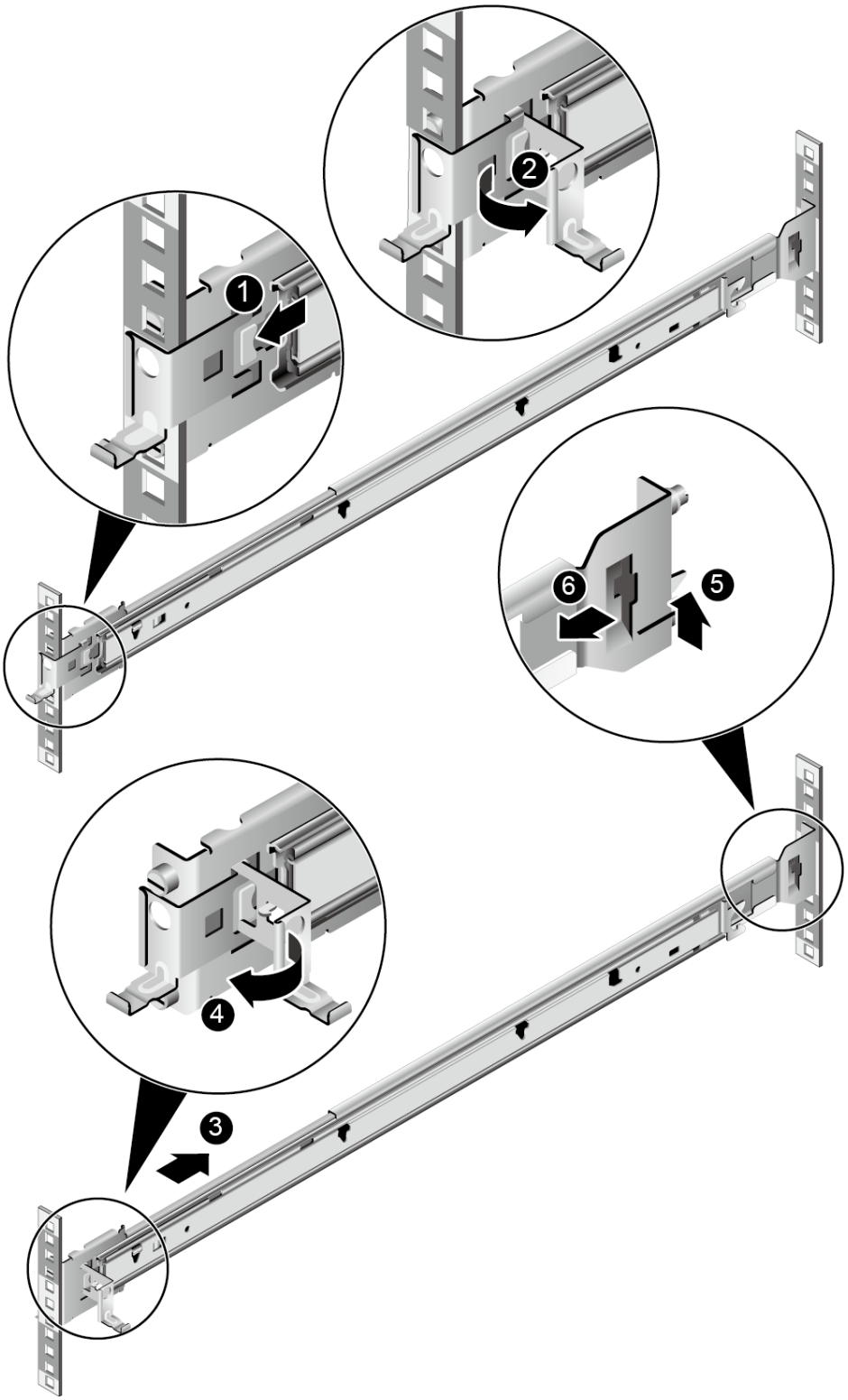
e. Remove the rear end of the guide rail.

Lift the positioning pin and pull the rear end of the guide rail until it is removed from the mounting bar. See (6) and (7) in **Figure 3-32**.

- To remove the ball bearing rail kit (BOM code: 21241258-002), do as follows:

a. Push the release latch on the front end of the guide rail and pull out the hook. See (1) and (2) in **Figure 3-33**.

Figure 3-33 Removing the guide rail (BOM code: 21241258-002)



b. Keep the rail horizontal, and push the front of the rail until it is completely out of the hole on the front column of the cabinet. See (3) in **Figure 3-33**.

c. Hook the rail kit. See (4) in **Figure 3-33**.

d. Lift the positioning pin at the rear of the rail, and pull the rear of the rail until it is completely out of the hole on the rear column of the cabinet. See (5) in **Figure 3-33**.

e. Push the front of the rail until the inner rail is completely inserted in the rail.

Step 6 Remove the other guide rail in the same way.

----End

4 Power-On and Power-Off

About This Chapter

This chapter describes the precautions and procedures for powering on and off the server.

4.1 Powering On the Server

This section describes how to power on the TaiShan 2280 server.

Scenario

Power on the server after it is properly installed.

Conditions

Prerequisites

The server and its internal components have been properly installed.

Data

- You have determined the cabinet number and position of the server to be powered on.
- You have obtained the IP address, user name, and password for the iBMC management network port.

Tools

ESD wrist strap or ESD gloves

Documents

For details about how to obtain the IP address of the iBMC management network port and how to perform operations on the iBMC, see **TaiShan Rack Server iBMC User Guide**.

Procedure

- If PSUs are properly installed and not powered on, power on the server as follows:

  Connect the external power supply to PSUs. Then the server will power on with PSUs.

  NOTE

  The default value of **System State Upon Power Supply** is **Power On**, which indicates that the server automatically powers on after power is supplied to PSUs. To change the value, log in to the iBMC WebUI and choose **Power** > **Power Control**.

- If PSUs are powered on and the server is in the standby state, power on the server as follows:

  NOTE

  When the power indicator is steady yellow, the server is in the standby state.

  - Press the power button on the front panel to power on the server. For the position of the power button, see **2.4 Indicators and Buttons**.
  - Power on the server using the iBMC WebUI.
    i. Log in to the iBMC WebUI. For details, see **9.2 Logging In to the iBMC WebUI**.
    ii. Choose **Power** > **Power Control**.
    The **Power Control** page is displayed.
    iii. Click **Power On**. In the displayed dialog box, click **Yes** to power on the server.
  - Power on the server using the remote virtual console.
    i. Log in to the remote virtual console. For details, see **9.4 Logging In to the Remote Virtual Console**.
    ii. On the **KVM** screen, click on the toolbar.
    iii. Select **Power On**.
    A dialog box is displayed.
    iv. Click **Yes**.
    The server is being powered on.
  - Power on the server using the iBMC CLI.
    i. Log in to the iBMC CLI. For details, see **9.3 Logging In to the iBMC CLI**.
    ii. In the CLI of the management software, run the **ipmcset -d powerstate -v 1** command to power on the server remotely.

Verification

Check the indicator status after the server is powered on.

4.2 Powering Off the Server

This section describes how to power off the TaiShan 2280 server.

Scenario

Power off the server to have it enter the standby state.

Impact on the System

Services and programs running on the server will be interrupted when it is powered off.

Conditions

Prerequisites

Services and programs running on the server will be interrupted when it is powered off. Before powering off the server, ensure that all services and programs have been stopped or switched to another server.

Data

- Ensure that all data has been saved before powering off the server.
- You have determined the cabinet number and position of the server to be powered off.
- You have obtained the IP address, user name, and password for the iBMC management network port.

Tools

ESD wrist strap or ESD gloves

Documents

For details about how to obtain the IP address of the iBMC management network port and how to perform operations on the iBMC, see **TaiShan Rack Server iBMC User Guide**.

Procedure

- Connect the server to a video display, keyboard, and mouse using cables, and shut down the operating system.
- Press and hold down the power button on the front panel until the server is powered off. For the position of the power button, see **2.4 Indicators and Buttons**.
- Power off the server using the iBMC WebUI.
  a. Log in to the iBMC WebUI. For details, see **9.2 Logging In to the iBMC WebUI**.
  b. Choose **Power** > **Power Control**.
     The **Power Control** page is displayed.
  c. Click **Power Off** or **Forced Power Off**. In the displayed dialog box, click **Yes** to power off the server.
- Power off the server using the remote virtual console.
  a. Log in to the remote virtual console. For details, see **9.4 Logging In to the Remote Virtual Console**.

b. On the **KVM** screen, click  on the toolbar.
c. Choose **Power Off** or **Forced Power Off**.
   A dialog box is displayed.
d. Click **Yes**.
   The server is being powered off.

- Power off the server using the iBMC CLI.
  a. Log in to the iBMC CLI. For details, see **9.3 Logging In to the iBMC CLI**.
  b. In the CLI of the management software, run the **ipmcset -d powerstate -v 0** command to power off the server remotely.

5 Configuring TaiShan 2280

5.1 Default Information

This topic describes the default information required for configuring the server.

Table 5-1 lists the default user name, password, and IP address required for configuring the server.

Table 5-1 Default information

Category	Resource	Default Value
iBMC management network port information	IP address and subnet mask	• IP address: 192.168.2.100 • Subnet mask: 255.255.255.0
iBMC login data	User name and password	• User name: **root** • Password: **Huawei12#$**
BIOS	Password	**Huawei12#$**

Category	Resource	Default Value
iBMC U-Boot information	Default password	**Huawei12#$**

5.2 Configuration Overview

This topic describes the initial configuration process of a server.

Figure 5-1 shows the initial configuration process of TaiShan 2280.

Figure 5-1 Initial configuration process

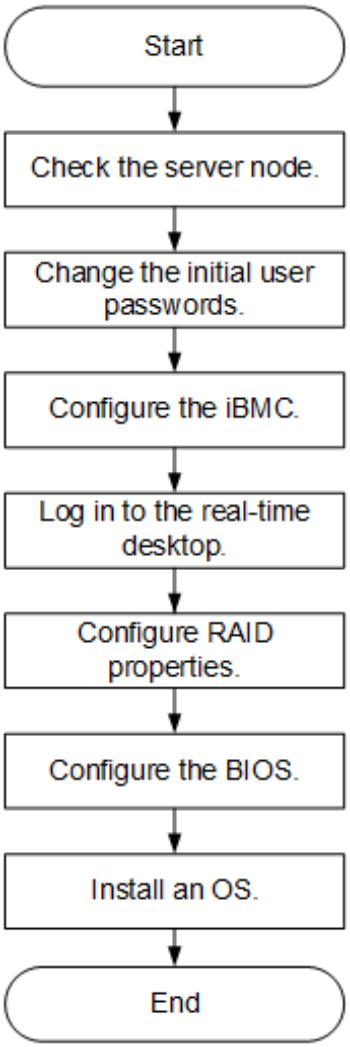


Table 5-2 describes the process in each phase.

Table 5-2 Procedure for configuring the server

Step	Action
Checking the server node	• Check that the server version information is correct. • Check that no alarm exists on the server.
Changing the initial password	Change the following initial passwords: • Password of an iBMC user • U-Boot password
Configuring the iBMC	Configure the iBMC IP address of the server.
Logging in to the real-time desktop	Log in to the iBMC WebUI, and then log in to the OS of the server node in remote mode.
Configuring RAID	The TaiShan 2280 server supports the SR130 (LSI SAS3008) and SR430C (LSI SAS3108) RAID controller cards. For details about how to configure RAID, see **Huawei Server RAID Controller Card User Guide (Arm)**.
Configuring the BIOS	Configure the server BIOS, including setting the boot option priority and BIOS password.
Installing an OS	Install an OS for the TaiShan 2280 server.

5.3 Checking TaiShan 2280

This topic describes how to check the initial status of the TaiShan 2280.

Scenario

Log in to the iBMC WebUI or CLI to check the health status of the TaiShan 2280. Ensure that its health status meets the environment requirements for software installation.

Conditions

Prerequisites

The TaiShan 2280 is powered on.

Data

- User name and password for logging in to the TaiShan 2280 iBMC WebUI and CLI.
- IP address of the TaiShan 2280 iBMC management network port.

Table 5-3 Default information

Item	Resource	Default Value
iBMC management network port information	IP address and subnet mask	• IP address: 192.168.2.100 • Subnet mask: 255.255.255.0
iBMC login data	User name and password	• User name: **root** • Password: **Huawei12#$**
BIOS	Password	**Huawei12#$**

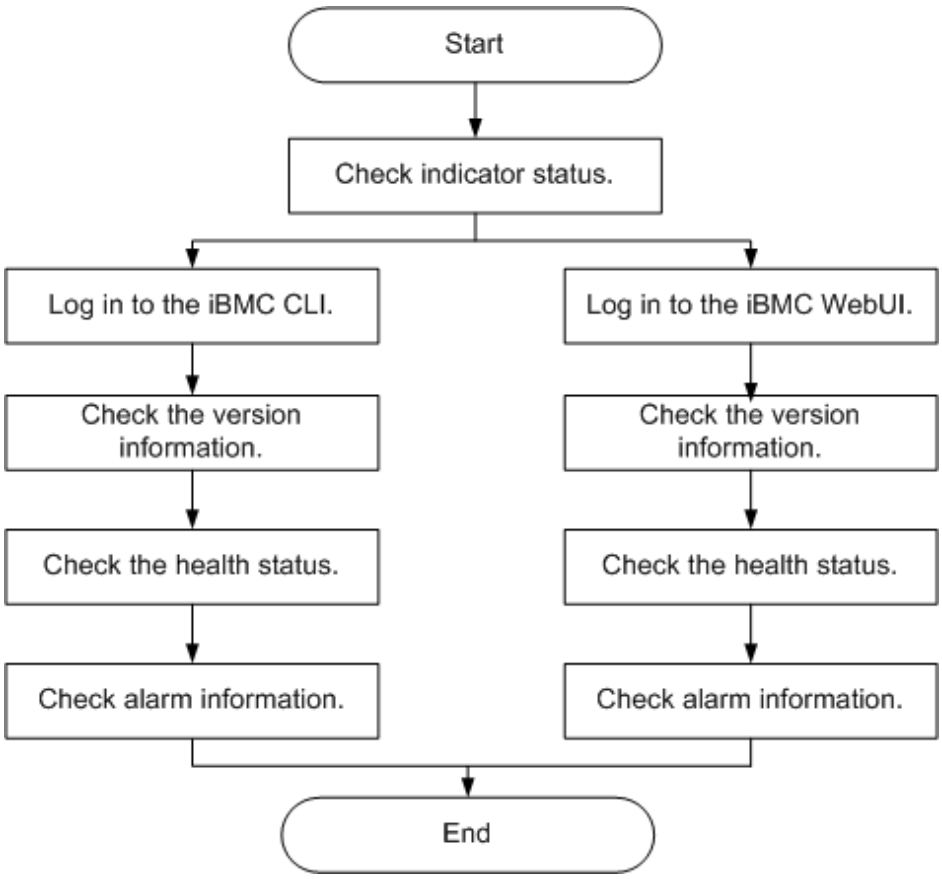
Documents

For details about the CLI, see the **TaiShan Rack Server iBMC User Guide**.

Workflow

Check the TaiShan 2280 in the sequence shown in **Figure 5-2**. Determine the check method based on the site requirements.

Figure 5-2 Checking process



Procedure

Step 1 Check the indicator status.

Observe the TaiShan 2280 server indicator status and ensure that the hardware status is normal. For details, see **2.4 Indicators and Buttons**.

Step 2 Check the TaiShan 2280.

- Check the TaiShan 2280 on the iBMC WebUI.
  a. Log in to the iBMC WebUI. For details, see **9.2 Logging In to the iBMC WebUI**.

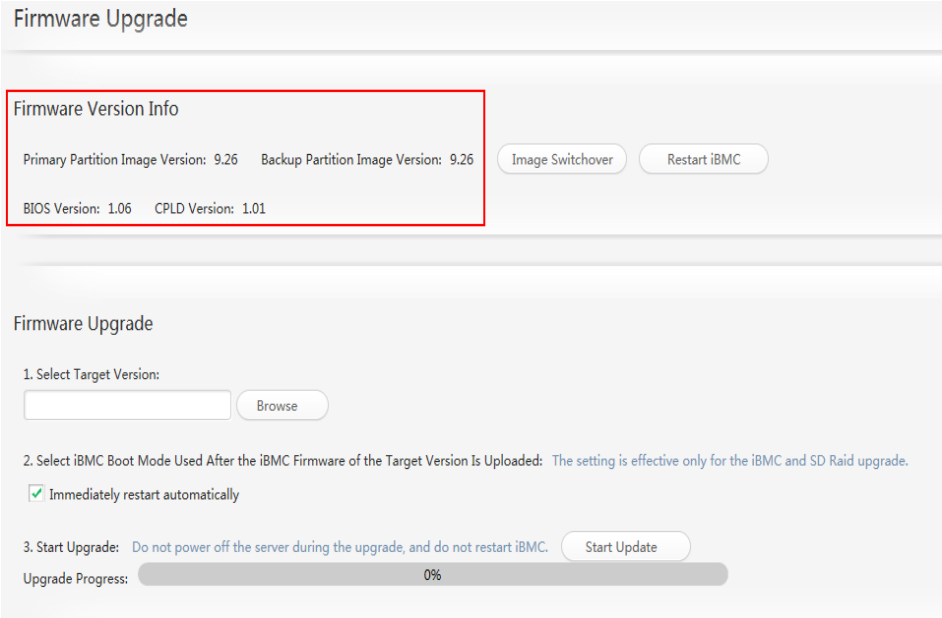
  NOTE

  You are advised to change the initial password when logging in to the iBMC for the first time. For details about how to change the password, see **5.4 Changing the Initial Passwords**.

  b. Choose **System** > **Firmware Upgrade**, and view TaiShan 2280 versions, as shown in **Figure 5-3**.

  Ensure that the TaiShan 2280 versions meet the site requirements.

  Figure 5-3 Querying version information

  c. Choose **Information** > **Information Summary**, and view server health status, as shown in **Figure 5-4**.

Figure 5-4 Querying the health status

d. If there are alarms, see the **TaiShan Rack Server iBMC Alarm Handling** to clear the alarms.

- Check the TaiShan 2280 server using the iBMC CLI.

  a. Set an IP address for the PC. This IP address must be on the same network segment as the iBMC management network port.

  b. Connect the PC to the iBMC management network port of the TaiShan 2280 server using a network cable.

  c. Run a command line management tool (such as SSH and PuTTY) tool on the PC, and enter the IP address of the iBMC management network port, user name, and password to log in.

  > **NOTE**
  >
  > By default, SSH is used to log in to the iBMC. If the SSH service is disabled, enable it by choosing **Config** > **Port Settings** on the iBMC WebUI.

  d. Query the TaiShan 2280 version information.

  Ensure that the TaiShan 2280 versions meet the site requirements. The following is an example:

```
iBMC ~ # ipmcget -d ver
------------------ iBMC INFO -------------------
IPMC              CPU:          Hi1710
IPMI           Version:         2.0
CPLD           Version:         (U1045)1.01
Active iBMC    Version:         (U19)9.26
Active iBMC    Build:           002
Active iBMC    Built:           14:44:03 Dec  1 2016
Backup iBMC    Version:         9.26
SDK            Version:         2.04
SDK            Built:           19:18:22 Jun 16 2016
Active Uboot   Version:         1.1.39 (Dec 09 2015 - 16:13:03)
Backup Uboot   Version:         1.1.39 (Dec 09 2015 - 16:13:03)
----------------- Product INFO -----------------
Product           ID:           0x0001
Product           Name:         TaiShan 2280
iME            Version:         6.01
BIOS           Version:         (U94)1.06
-------------- Mother Board INFO ---------------
Mainboard      BoardID:         0x0006
Mainboard      PCB:             .A
-------------- HDD Backplane INFO --------------
BC11THBF       BoardID:         0x0073
BC11THBF       PCB:             .B
BC11THBF  CPLD Version:         (U3)1.02
```

  - **CPLD Version**: CPLD version of the server

- **BIOS Version**: BIOS version of the server
- **Active iBMC Version**: active iBMC version of the server
- **Backup iBMC Version**: backup iBMC version of the server

e. Query the health status of the TaiShan 2280 server.

```
iBMC ~ # ipmcget -d health
System in health state
```

- If "System in health state" is displayed, no further action is required.
- If alarm information is displayed, go to the next step.

f. Query alarms for the TaiShan 2280 server.

```
iBMC ~ # ipmcget -d health
System in health state
```

g. Clear alarms. For details, see **TaiShan Rack Server iBMC Alarm Handling**.

----End

5.4 Changing the Initial Passwords

This topic describes how to change the initial user passwords of the iBMC.

Scenario

Change the initial user passwords of the iBMC to improve the security of system operation and maintenance (O&M).

Change the following initial user passwords:

- Initial password of the default iBMC user
- Initial password for the iBMC U-Boot

NOTE

- The default iBMC user is **root**.
- U-Boot is a kind of underlying software used to configure basic settings, for example, initialize hardware devices and set up memory space mapping, to prepare for commissioning the OS.
- To ensure system security, change the initial password upon the first login and change the password periodically.
- Simple passwords are easy to crack and make the system vulnerable. You are advised to use a password that meets complexity requirements or to enable the password complexity check function.
- The password complexity check function is enabled by default.

Conditions

Prerequisites

The servers have been powered on.

Data

Table 5-4 describes the default user names and passwords.

Table 5-4 Default user names and passwords

Type	Default Value
iBMC default user	**root**
iBMC default password	**Huawei12#$**
iBMC U-Boot default user	-
iBMC U-Boot default password	**Huawei12#$**

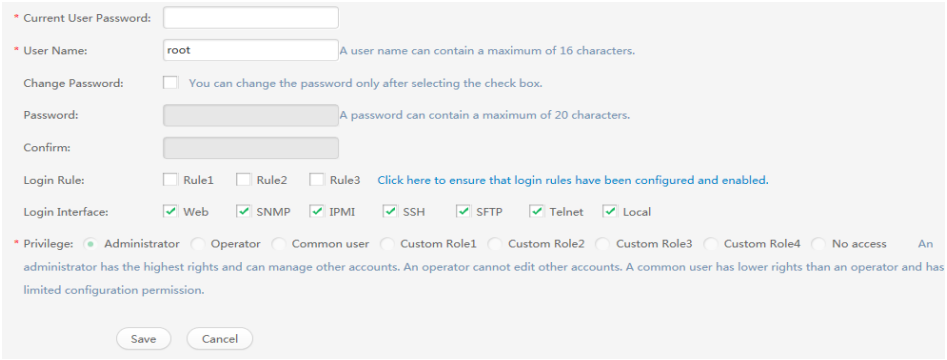
Documents

You can change an iBMC user password on the iBMC WebUI or CLI. The following describes how to change a user password on the iBMC WebUI. For details about operations on the iBMC CLI, see **TaiShan Rack Server iBMC User Guide**.

Procedure

- Changing the initial password of the default iBMC user
  a. On the iBMC WebUI, choose **Configuration** > **Local Users**.
     The **Local Users** page is displayed.
  b. Click  under the user whose password is to be changed, as shown in Figure 5-5.

     Figure 5-5 Local Users page

  c. Change the user password following on-screen instructions.
     A password must meet the following complexity requirements:
     i. Contains 8 to 20 characters.
     ii. Contains at least one space or one of the following special characters:
     `~!@#$%^&*()-_=+\|[{}];:'",<.>/?
     iii. Contains at least two types of the following characters:
     1) Lowercase letters a to z

2) Uppercase letters A to Z
3) Digits 0 to 9

iv. Cannot be the same as the user name or user name in reverse order.

- Changing the initial iBMC U-Boot password

a. Log in to the iBMC CLI over the serial port.
b. Run the following command to restart the iBMC:

iBMC ~ # ipmcset -d reset

The command output is as follows:

```
This operation will reboot IPMC system. Continue? [Y/N]:
```

c. Type **y** and press **Enter**.

The system restarts.

d. When the message "Hit 'ctrl + b' to stop autoboot: 1" is displayed, press **Ctrl+B**.
e. Enter the default password of the iBMC U-Boot.

The following command output indicates that you have logged in to the U-Boot.

```
u-boot>
```

f. Run the following command to change the U-Boot password:

u-boot> passwd

The following information is displayed:

```
Enter old password:
```

g. Enter the old password.

The following information is displayed:

```
Enter new password:
```

h. Enter a new password.

Information similar to the following is displayed:

```
Enter the new password again:
```

i. Enter the new password again.

If the command output is as follows, the password has been changed:

```
. done
Un-Protected 1 sectors
Erasing Flash...
. done
Erased 1 sectors
Writing to Flash... done
. done
Protected 1 sectors

password be changed successfully.
```

j. Run the following command to exit the U-Boot:

boot

5.5 Configuring a RAID

The TaiShan 2280 server supports the SR130 (LSI SAS 3008) and SR430C (LSI SAS 3108) RAID controller cards.

For details about how to configure RAID, see **Huawei Server RAID Controller Card User Guide (Arm)**.

5.6 Configuring the BIOS

Configure the BIOS of the TaiShan 2280 server, including setting the boot option priority and BIOS password.

Scenario

Configure the BIOS for the TaiShan 2280 in remote control mode.

The configuration items are as follows:

- Server boot mode
- BIOS password

NOTE

For details about how to configure the BIOS, see the **BIOS Parameter Reference (Kunpeng 916 Processor)**.

Conditions

Prerequisites

- The TaiShan 2280 is powered on.
- You have logged in to the WebUI of the management module. For details, see **9.2 Logging In to the iBMC WebUI**.

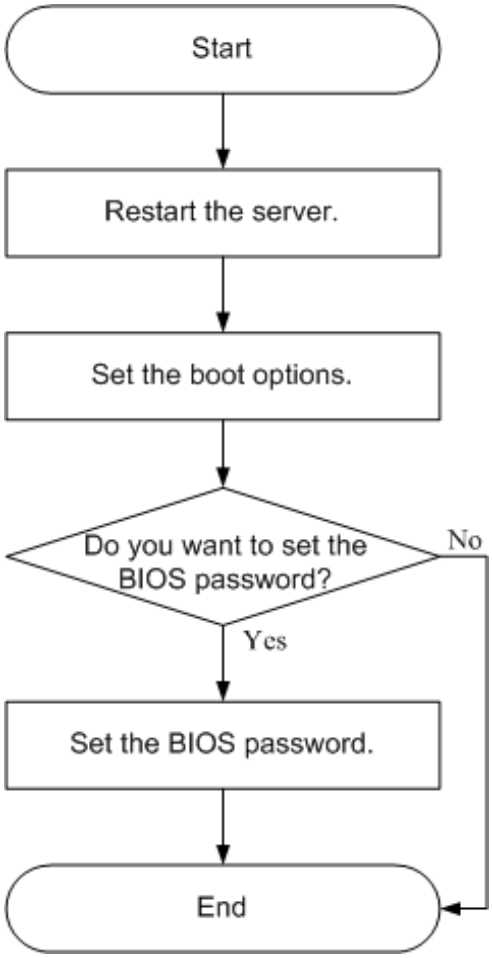
Data

None

Workflow

Figure 5-6 shows the process for configuring the BIOS.

Figure 5-6 Process for configuring the BIOS



Procedure

Step 1 Restart the server.

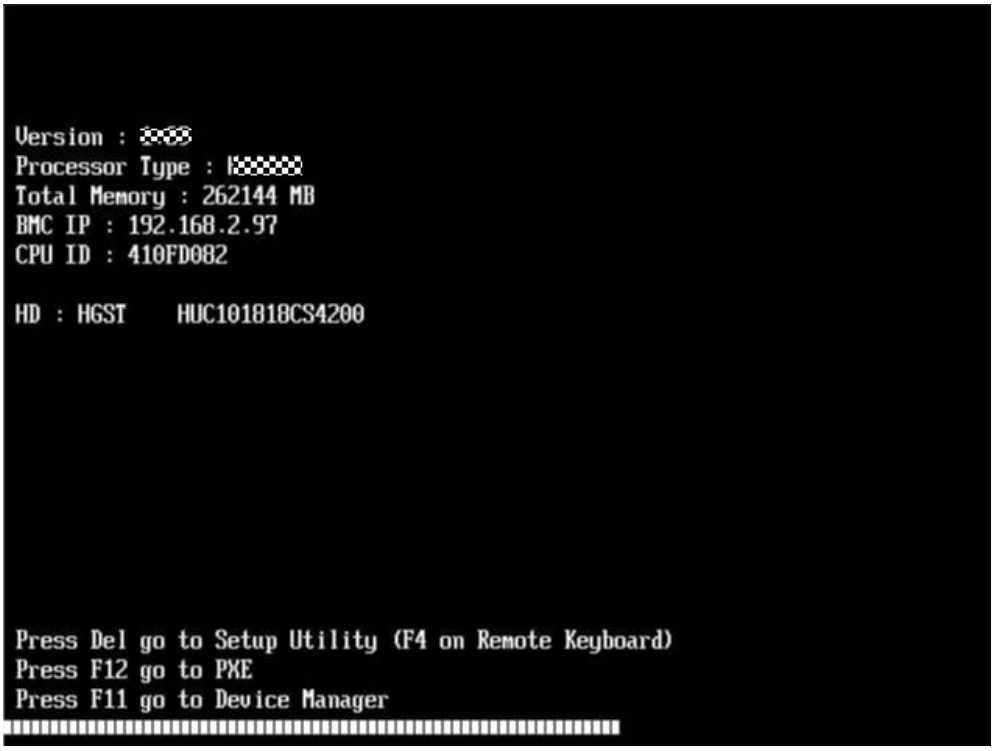
1. Click on the menu bar of the remote virtual console.

   For details about how to log in to the remote virtual console, see **9.4 Logging In to the Remote Virtual Console**.
2. Select **Reset**.

   The **Are you sure to perform this operation** dialog box is displayed.
3. Click **Yes**.

   The server restarts.
4. Press **Delete** repeatedly when the screen shown in the following figure is displayed during server startup.

Figure 5-7 BIOS boot screen



5. Enter the BIOS password as prompted. The screen for setting the BIOS is displayed.

   NOTE

   The default BIOS password is **Huawei12#$** for the French or American keyboard and is **Huawei12£$** for the English keyboard.

   To ensure system security, you are advised to change the default BIOS password upon the first login. For details, see **Step 3**.

Step 2 Set the server boot mode.

1. Press ← or → to select the **Boot** menu, as shown in **Figure 5-8**.

Figure 5-8 Boot

NOTE

The TaiShan server supports only the UEFI boot mode. If you run the IPMI command to switch to the Legacy mode, the command will be successfully executed, but the actual boot mode is still UEFI.

2. Select a boot option and press **+** or **-** to change the boot order.
   - Press **+** to move a boot option up.
   - Press **-** to move a boot option down.

   NOTE

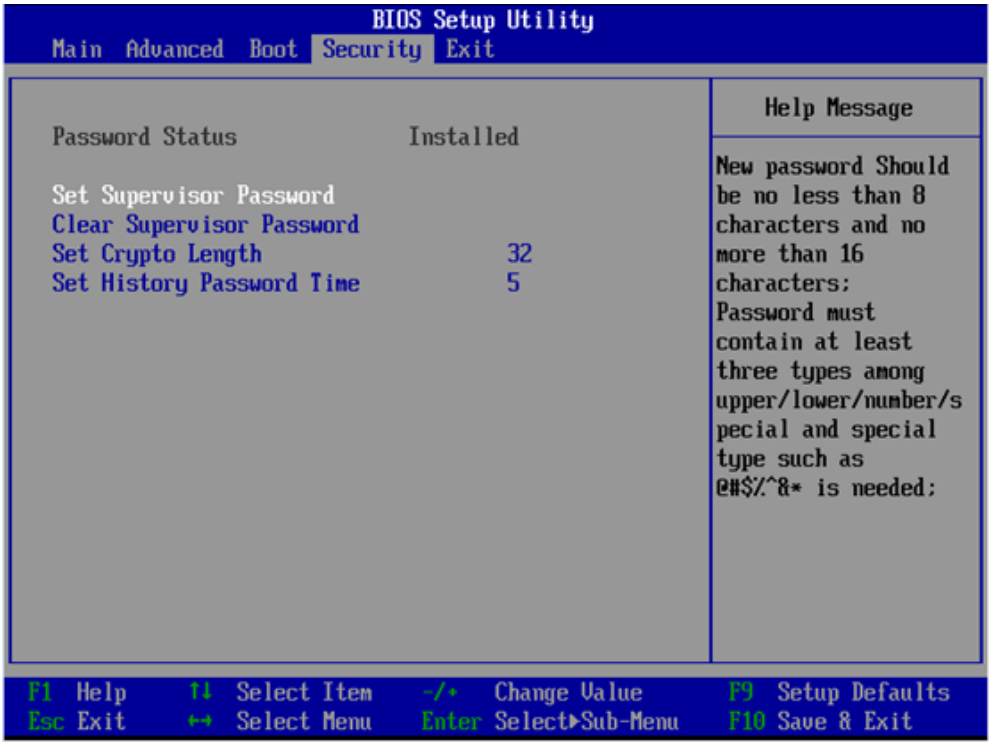
   The server will boot in the order displayed.
3. After the setting is complete, press **F10**.

   The **Save configuration and exit?** dialog box is displayed.
4. Select **Y** to save the settings.

Step 3 Set the BIOS password.

1. Select the **Security** tab.

Figure 5-9 Security page



2. Select **Set Supervisor Password** and press **Enter** to set the administrator password for logins. Enter the original password before setting a new one.

   NOTE

   - The administrator password must meet the following requirements: (1) contains 8 to 16 characters; (2) contains special characters (including spaces) and at least two types of the following characters: uppercase letters, lowercase letters, and digits.
   - The default password is **Huawei12#$**.

3. (Optional) After a password is set, select **Clear Supervisor Password** to delete the password.
4. After the setting is complete, press **F10**.

   The **Save configuration and exit?** dialog box is displayed.
5. Select **Y** to save the settings.

----End

5.7 Installing an OS

The server is compatible with different types of OSs. Use the **Computing Product Compatibility Checker** to check compatible OSs.

The installation method varies according to the OS type. For details, see the installation guide of the OS you use.

6 Replacing Parts

6.1 Replaceable Parts

This topic describes the replaceable parts of the TaiShan 2280 server.

The TaiShan 2280 is 2U high. It is easy to install and replace components. Replaceable parts:

- Drive
- PSU
- Fan module
- PCIe card on a riser card
- Riser card
- PCIe card on the mainboard
- System battery
- Screw-in RAID controller card
- Supercapacitor
- SATADOM
- Heat sink
- DIMM

- Mainboard
- Front drive backplane
- Rear drive backplane
- PSU backplane
- Left mounting ear
- Right mounting ear

NOTE

The preceding replaceable parts are for reference only. Actual replaceable parts may differ.

6.2 Removing a Drive

This section describes how to remove a drive.

Remove a drive before replacing it with a new one.

You do not need to power off the server when removing a drive. If services are running on the TaiShan 2280, back up data on the drive.

Determine the drive to be replaced before the operation. Removing a drive by mistake may cause a RAID array failure.

NOTE

If a drive is frequently removed and installed at an interval of shorter than 30 seconds, there are risks that the drive cannot be detected.

Table 6-1 shows the mapping between the silkscreens on the drive panel and the slot IDs in the System Event Log.

Table 6-1 Mapping

Drive Position	Panel Silkscreen	Physical Slot Number in SEL
Front drives	0 to 7 (8 x 2.5" drive configuration)	disk0 to disk7
	0 to 7 (8 x 3.5" drive configuration)	disk0 to disk7
	0 to 11	disk0 to disk11
	0 to 23	disk0 to disk23
	0 to 24	disk0 to disk24
Rear drives	HDD A0, HDD B0, HDD A1, HDD B1	diskA, diskB, diskC, diskD

NOTE

For details about the mapping between the silkscreens on the drive panel and the actual positions of the drives, see **2.2 Panels**.

NOTICE

Before removing a drive, you can use Smart Provisioning to delete data from the drive. For details, see "Erasing Hard Disks" in the **Smart Provisioning User Guide (AArch64)**.

Scenarios

Remove a drive in any of the following scenarios:

- A faulty drive needs to be replaced.
- A drive is to be replaced with a new model.
- A drive that has no free space needs to be replaced.

NOTE

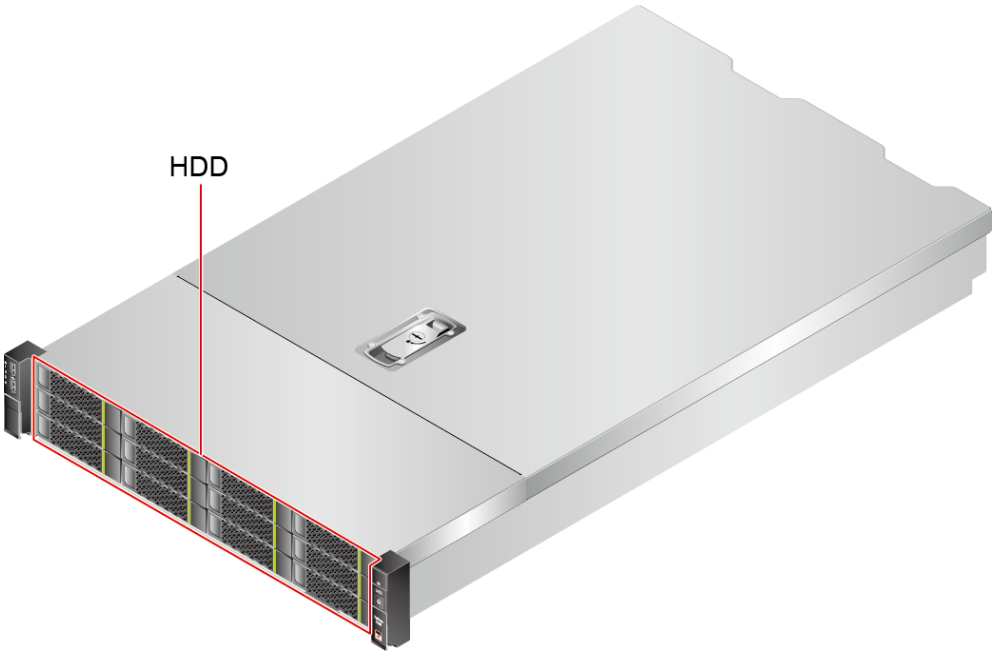
You do not need to power off the server when removing a drive.

Conditions

Prerequisites

- If services are running on the TaiShan 2280, ensure that you have backed up data on the drive.
- You have determined the position of the front drive in the TaiShan 2280. See **Figure 6-1**.

Figure 6-1 Drive location



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

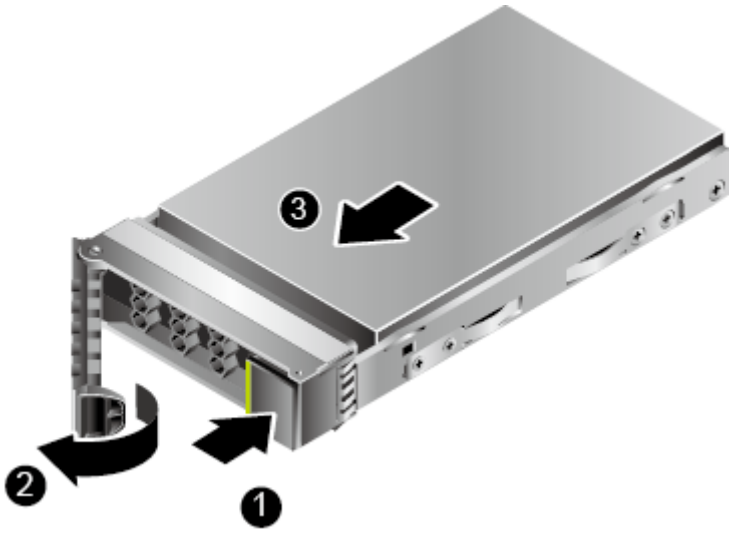
- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. For details, see **1 Safety Instructions**.
2. Push the ejector release button on the drive. See (1) in **Figure 6-2**.

   The ejector lever automatically ejects.

   Figure 6-2 Removing a drive



3. Holding onto the ejector lever, pull out the drive about 3 cm (1.18 in.). See (2) in **Figure 6-2**. Wait for at least 30 seconds until the drive stops working, and remove the drive from the TaiShan 2280. See (3) in **Figure 6-2**.
4. Place the removed drive into an ESD bag.
5. Install a filler module in the drive slot if you do not want to install a drive immediately.

6.3 Installing a Drive

This section describes how to install a drive.

Scenario

Install a drive in any of the following scenarios:

- A faulty drive needs to be replaced.
- A drive is to be replaced with a new model.

- A drive that has no free space needs to be replaced.
- A drive needs to be added.

NOTE

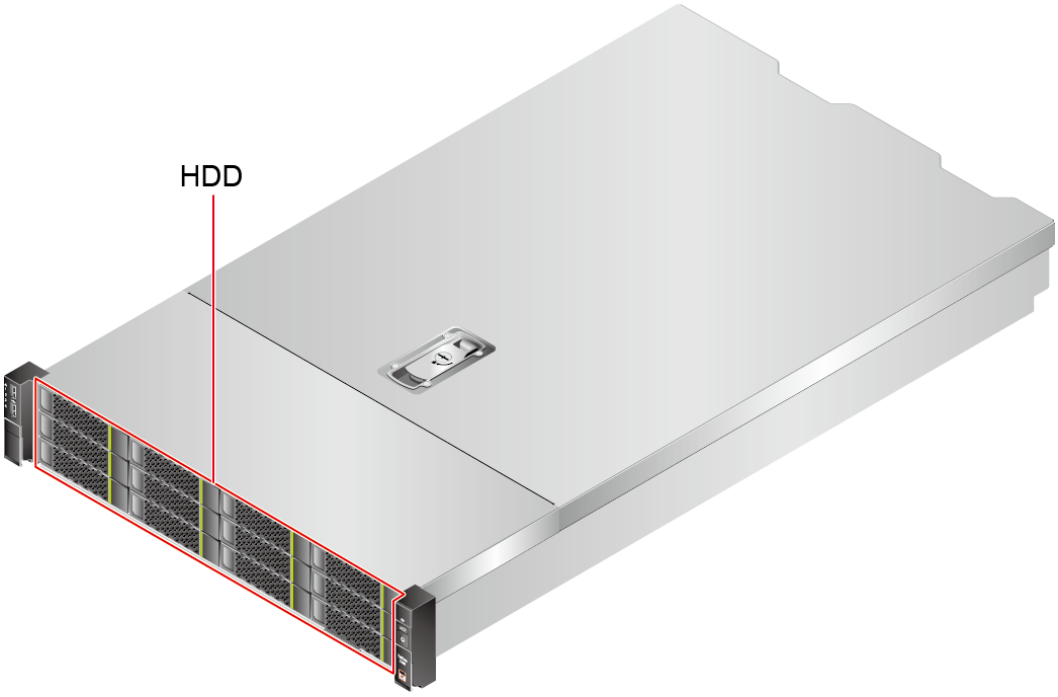
You do not need to power off the server when installing a drive.

Conditions

Prerequisites

Determine the position of the front drive in the TaiShan 2280. See **Figure 6-3**.

Figure 6-3 Drive location



Data

- You have determined the position of the drive to be installed in the TaiShan 2280.
- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Hardware

A spare drive

Procedure

1. Read **1 Safety Instructions**.
2. Take a spare drive out of its ESD bag.
3. Fully raise the ejector lever and push the drive into the chassis along the guide rails as far as it will go. See (1) in **Figure 6-4**.

   Figure 6-4 Installing a drive

4. Ensure that the ejector lever is fastened to the chassis beam, and lower the ejector lever to completely insert the drive into the slot, as shown in step (2) in **Figure 6-4**.

   Check the drive indicators to determine whether the drive status is normal. For details about the indicators, see **2.4 Indicators and Buttons**.

6.4 Removing an AC PSU

This section describes how to remove an AC PSU.

Scenarios

Remove an AC PSU in any of the following scenarios:

- An AC PSU has failed.
- An AC PSU is to be replaced with a new model.

Conditions

Prerequisites

When two PSUs are configured, you can remove one PSU without powering off the server if the other PSU is operating properly and its power rating is greater than or equal to the power rating of the TaiShan 2280 server. Observe the PSU indicators to check the PSU status. For details about the indicators, see **2.4 Indicators and Buttons**.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

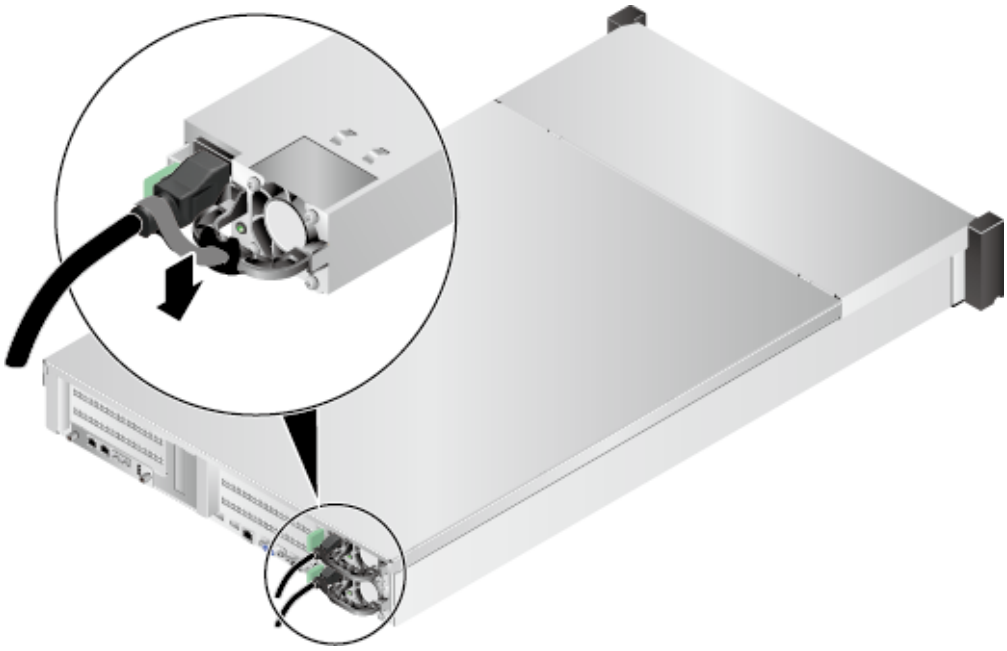
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

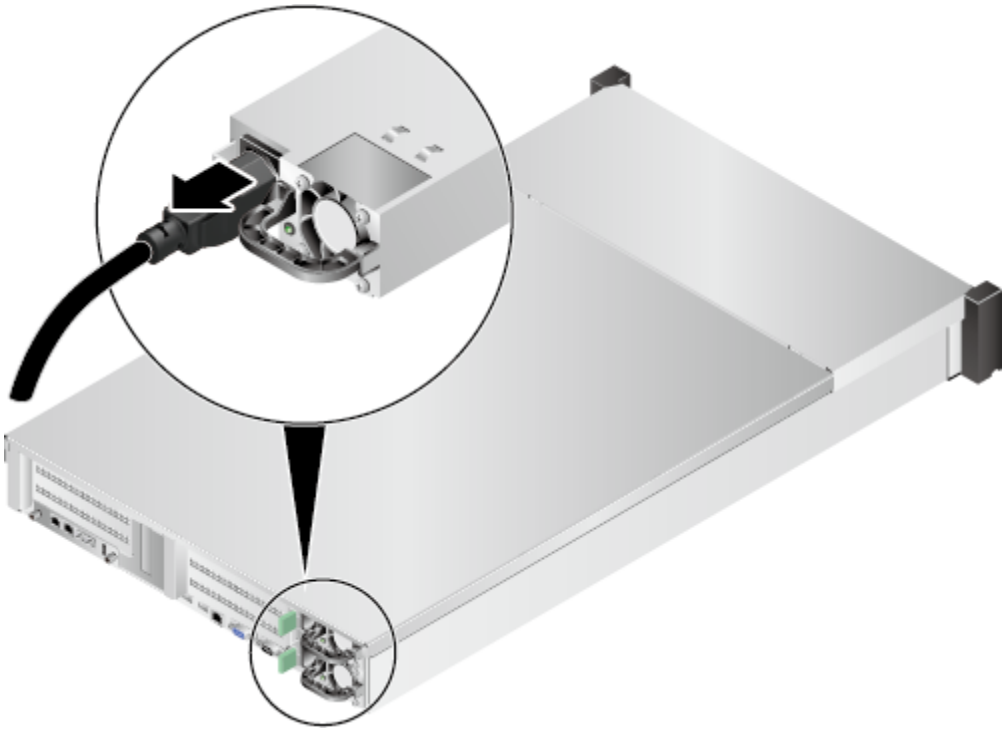
1. Read **1 Safety Instructions**.
2. (Optional) If only one PSU is configured, power off the TaiShan 2280. For details, see **4.2 Powering Off the Server**.
3. Undo the velcro strap that secures the power cable. See **Figure 6-5**.

   Figure 6-5 Undoing the velcro strap

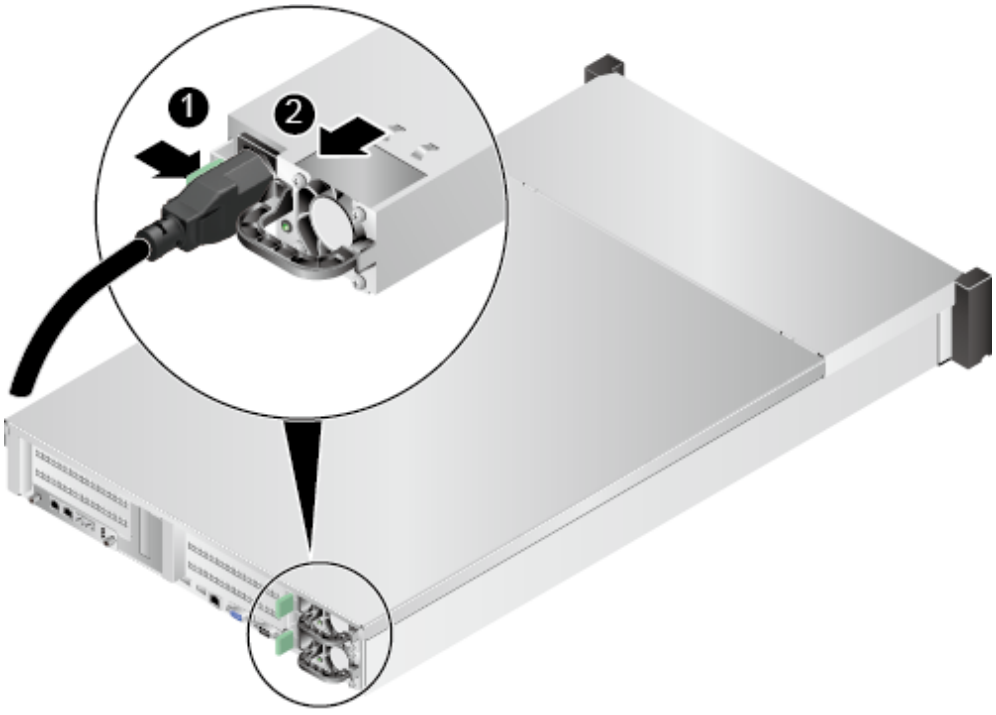
4. Remove the power cable from the PSU to be replaced. See **Figure 6-6**.

Figure 6-6 Removing the power cable



5. Press the latch on the PSU in the arrow direction, and pull the PSU out of the slot by holding the handle. See (1) and (2) in **Figure 6-7**.

Figure 6-7 Removing a PSU



6. Place the removed PSU in an ESD bag.

6.5 Installing an AC PSU

This section describes how to install an AC PSU.

Scenarios

Install an AC PSU in any of the following scenarios:

- An AC PSU has failed.
- An AC PSU is to be replaced with a new model.
- An AC PSU is to be added to improve reliability when only one AC PSU is configured for the TaiShan 2280 server.

Conditions

Prerequisites

None

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

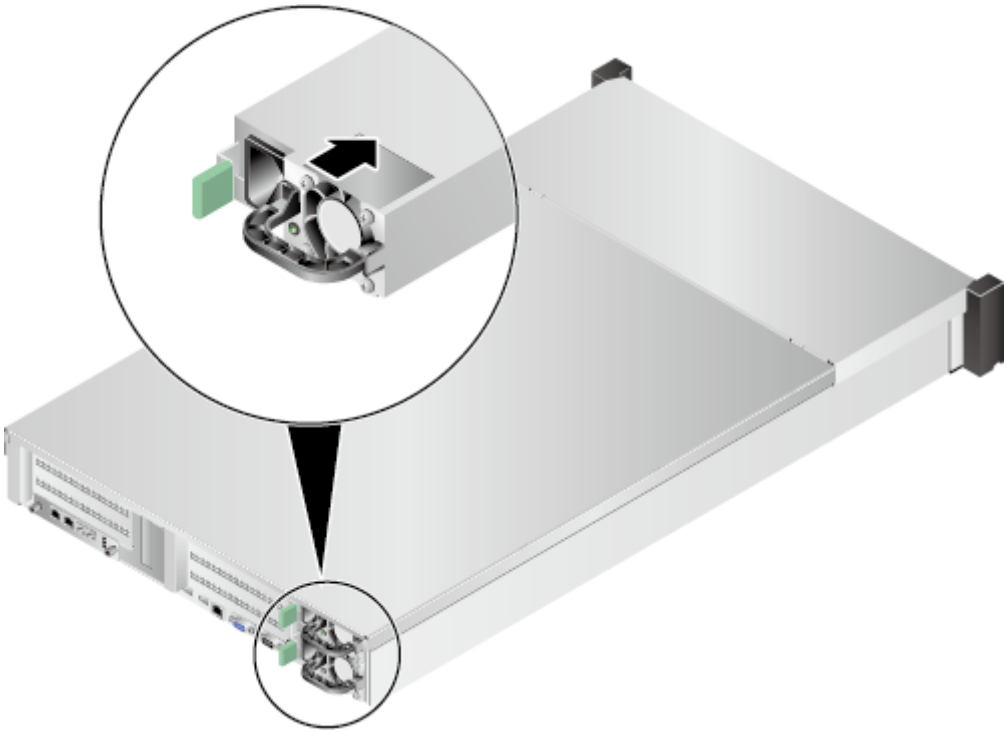
Hardware

A spare AC PSU

Procedure

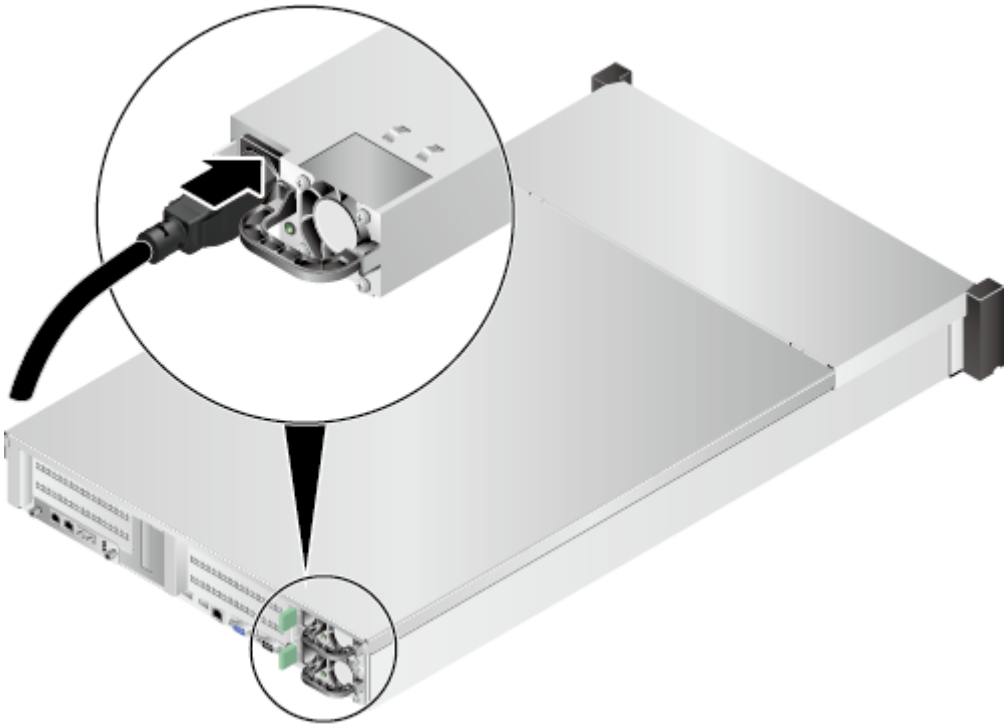
1. Read **1 Safety Instructions**.
2. Take a spare AC PSU out of its ESD bag.
3. Push the spare PSU along the guide rails into a slot until the PSU clicks into place. See **Figure 6-8**.

Figure 6-8 Installing an AC PSU



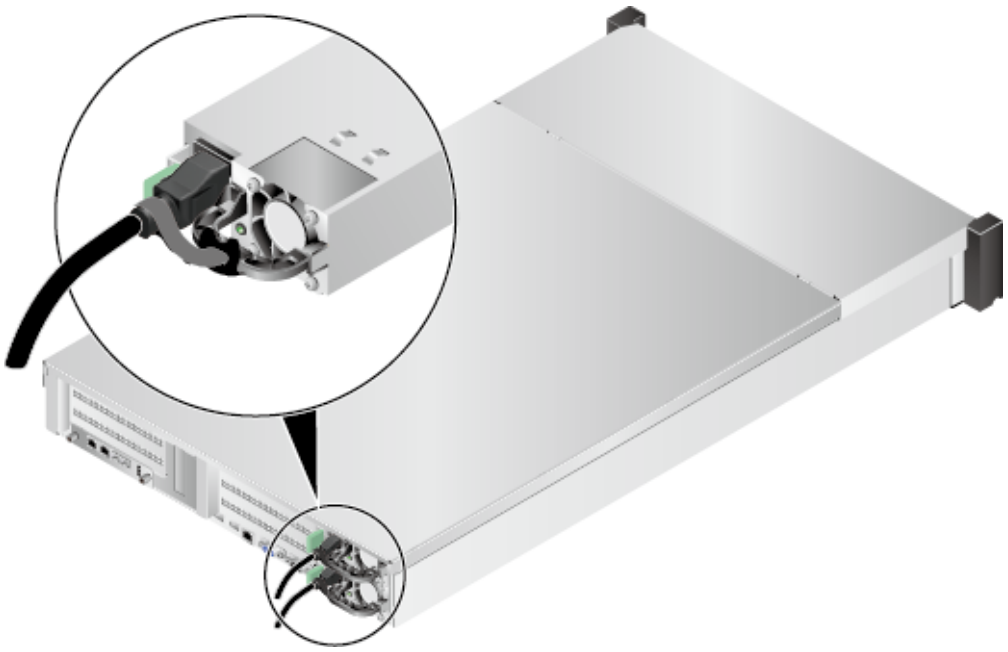
4. Connect the power cable, as shown in **Figure 6-9**.

Figure 6-9 Connecting a power cable



5. Secure the power cable using a velcro strap. See **Figure 6-10**.

Figure 6-10 Securing the cable



6.6 Removing the Chassis Cover

This section describes how to remove the chassis cover.

Scenario

Remove the chassis cover before replacing components in the TaiShan 2280 chassis.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

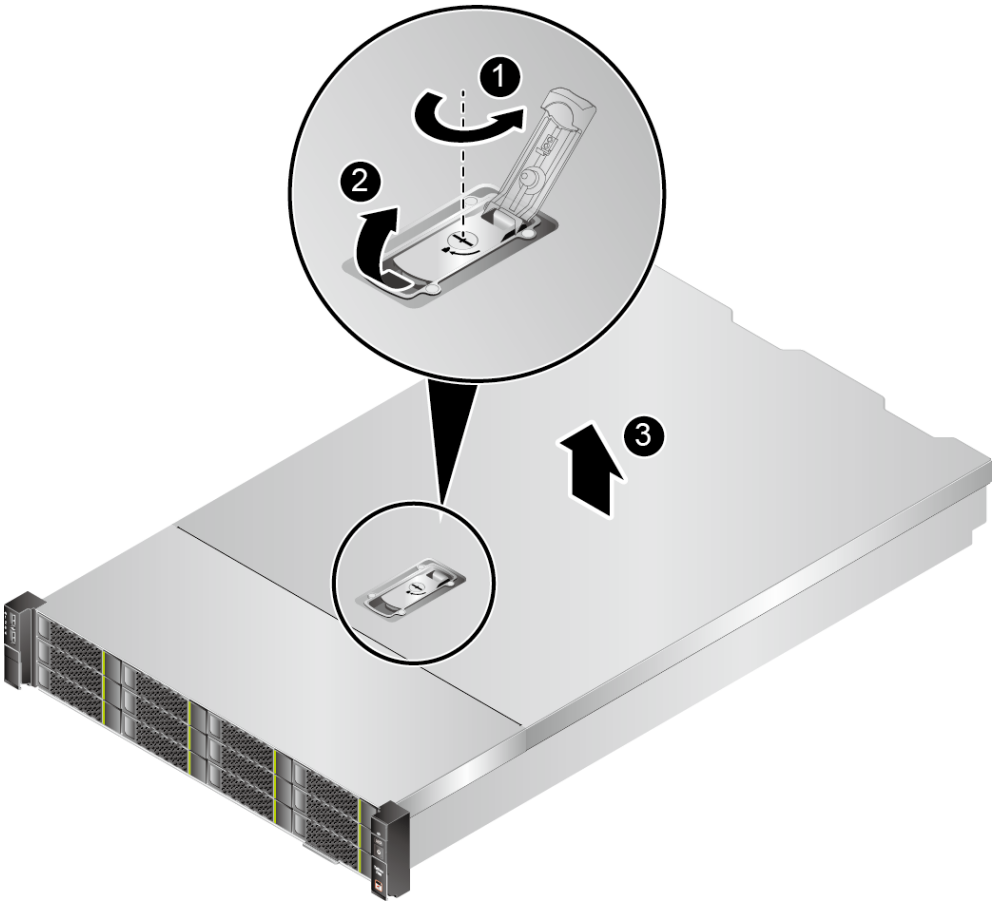
- ESD gloves or ESD wrist strap
- Flat-head screwdriver

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.

3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Use a flat-head screwdriver to loosen the latch that secures the ejector lever of the chassis cover. See step 1 in **Figure 6-11**.
5. Pull out the handle to push the chassis cover backwards. See (2) in **Figure 6-11**.

Figure 6-11 Removing a chassis cover



6. Lift the chassis cover. See (3) in **Figure 6-11**.

6.7 Installing a Chassis Cover

This section describes how to install a chassis cover.

Scenario

Install a chassis cover after replacing one or more internal components of the TaiShan 2280 server.

Conditions

Prerequisites

You have replaced the components in the chassis.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Flat-head screwdriver

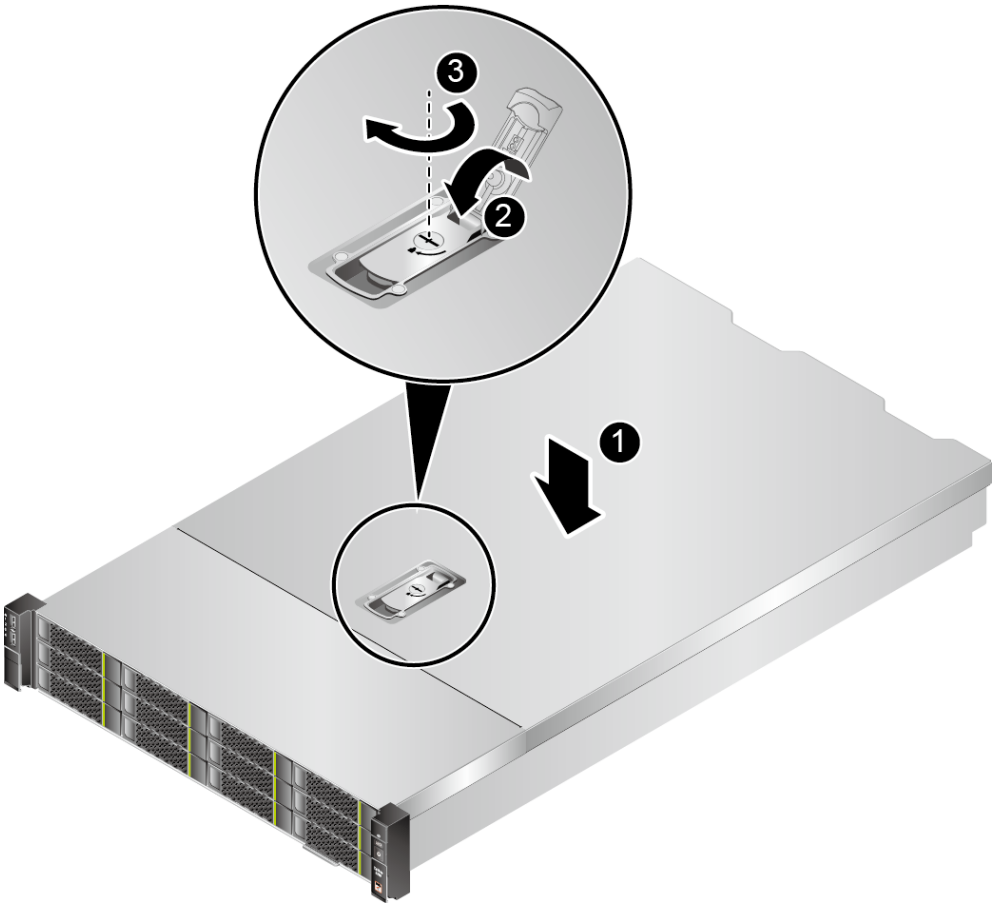
Hardware

A spare chassis cover

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Place the chassis cover horizontally, align it with the fixing slots on both side panels of the chassis, and close the ejector lever, as shown in steps (1) and (2) in **Figure 6-12**.
5. Tighten the latch using a flat-head screwdriver clockwise to secure the handle. See (3) in **Figure 6-12**.

Figure 6-12 Installing a chassis cover



6. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
7. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
8. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.8 Removing an Air Duct

This section describes how to remove an air duct.

Scenario

Remove an air duct in any of the following scenarios:

- An air duct has failed.
- A memory module or supercapacitor is to be replaced.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

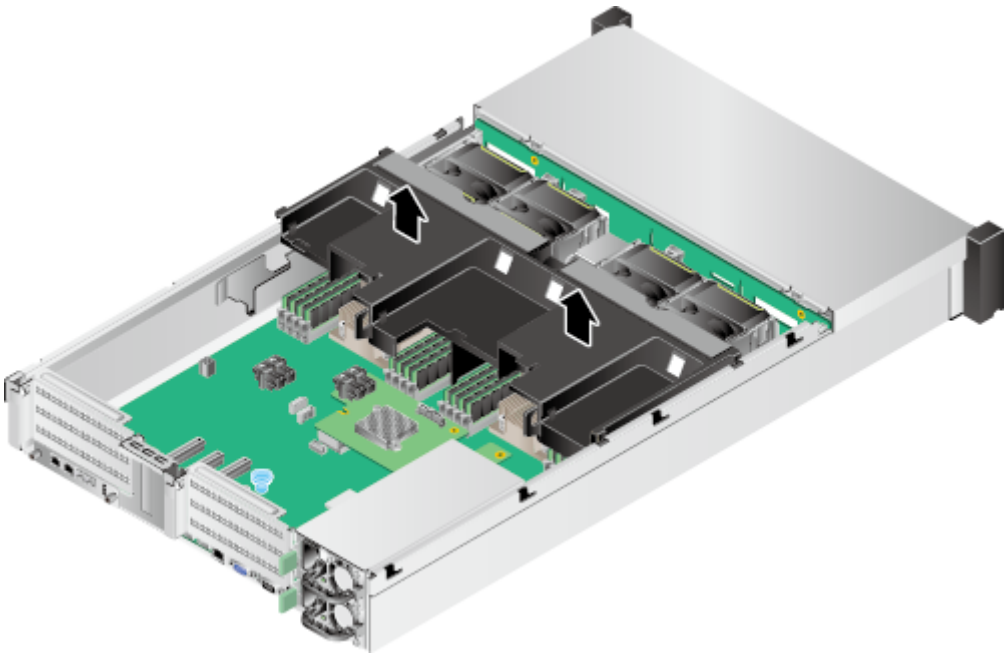
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Lift the air duct. See **Figure 6-13**.

Figure 6-13 Removing an air duct



7. Place the removed air duct in an ESD bag.

6.9 Installing an Air Duct

This section describes how to install an air duct.

Scenario

Install an air duct in any of the following scenarios:

- An air duct has failed.
- A memory module or supercapacitor is to be replaced.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

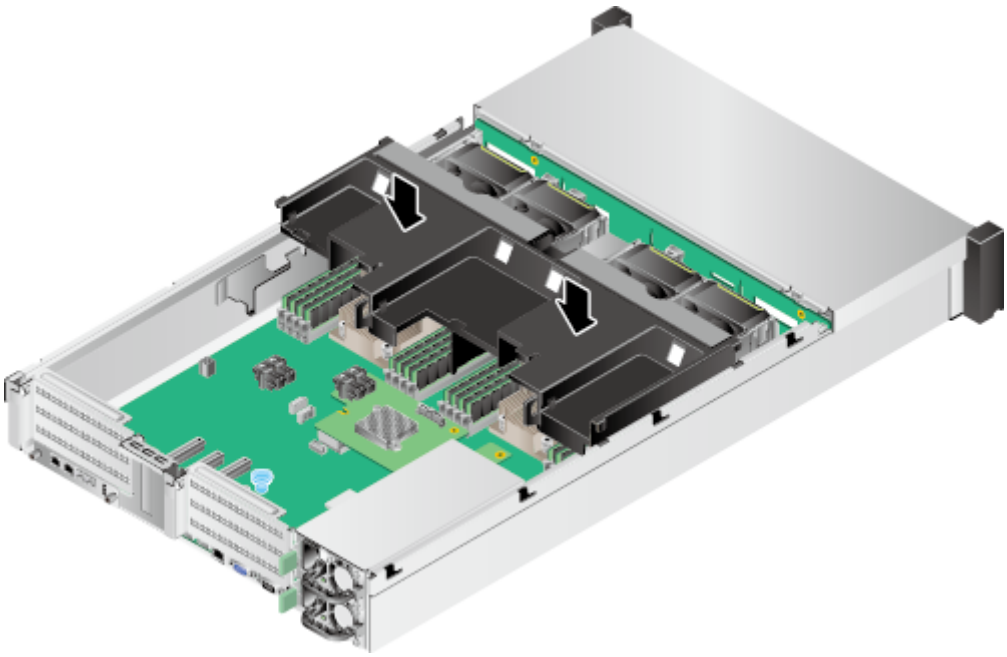
Hardware

A spare air duct

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the spare air duct out of the ESD bag.
7. Align the positioning pins on the air duct with the fixing holes on the mainboard by following the instructions on the chassis. Vertically place the air duct downwards. See **Figure 6-14**.

Figure 6-14 Installing an air duct



8. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
9. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
10. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
11. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.10 Removing a Fan Module

This section describes how to remove a fan module.

Scenario

Remove a fan module before replacing it with a new one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

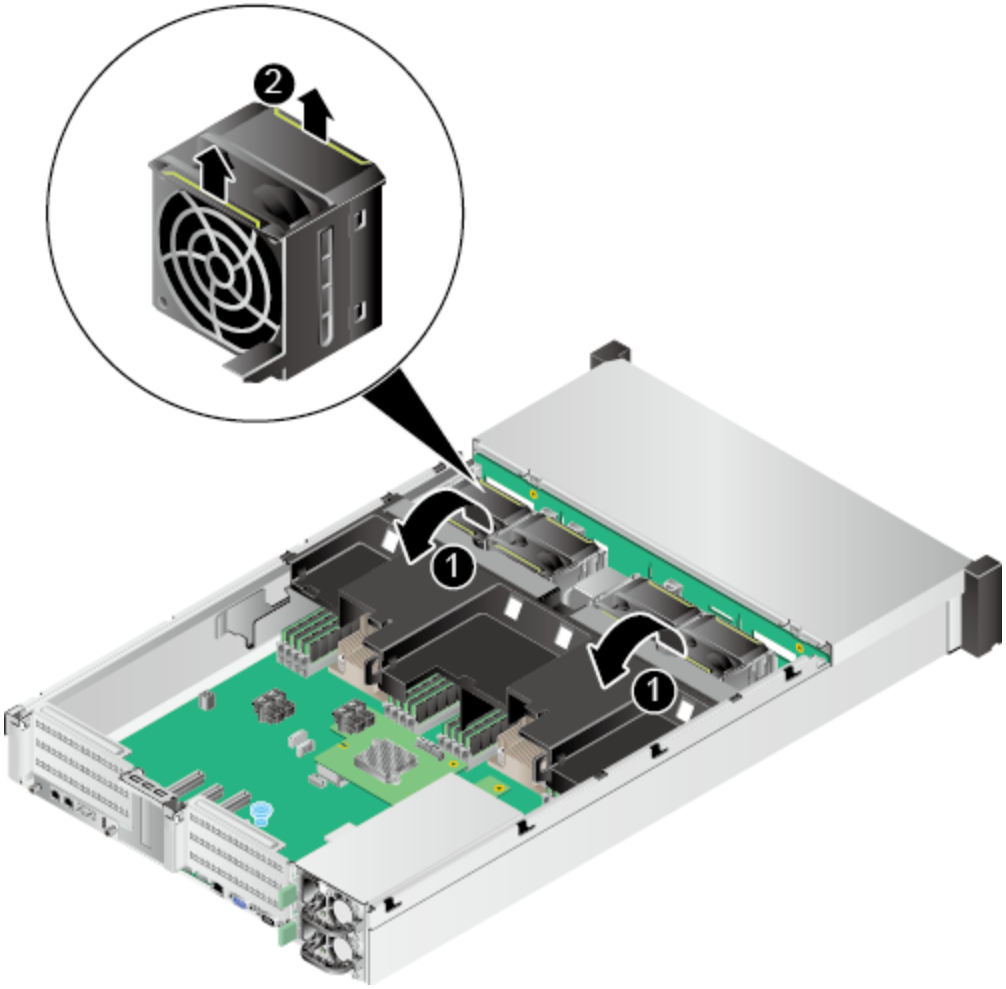
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Open the memory windows on the air duct. See (1) in **Figure 6-15**.
7. Lift the fan module slowly, as shown in step (2) in **Figure 6-15**.
8. Remove the loosened fan module from the slot.

Figure 6-15 Removing a fan module



9. Place the removed fan module into an ESD bag.

6.11 Installing a Fan Module

This section describes how to install a fan module.

Scenario

Install a fan module to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

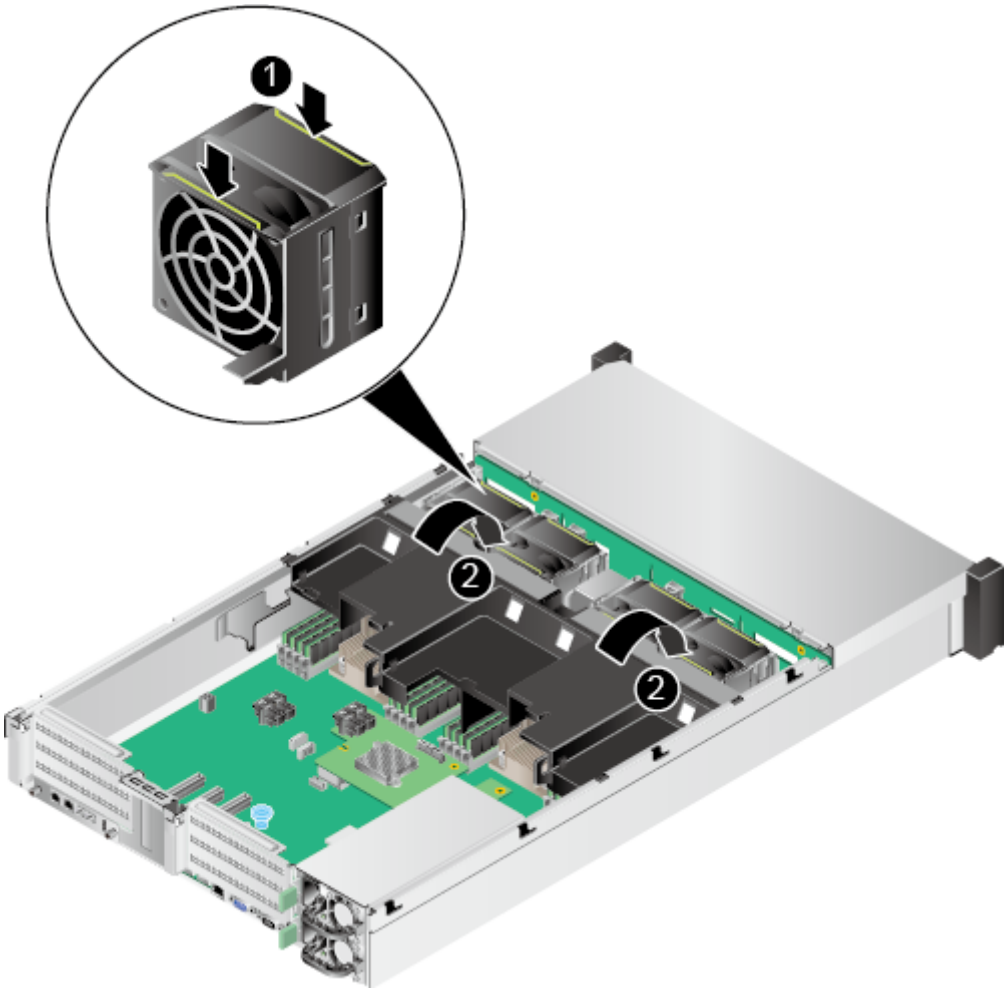
Hardware

A spare fan module

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the spare fan module out of its ESD bag.
7. Insert the fan module along the guide rails into the slot. Ensure that the fan cable connector is securely inserted into the mainboard connector. See (1) in **Figure 6-16**.

Figure 6-16 Installing a fan module



8. Close the memory windows on the air duct downwards. See (2) in **Figure 6-16**.
9. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
10. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
11. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
12. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.12 Removing a Riser Card

This section describes how to remove a riser card.

Scenario

Remove a riser card in any of the following scenarios:

- A riser card has failed.
- The mainboard is to be removed.
- The RAID controller card is to be removed.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

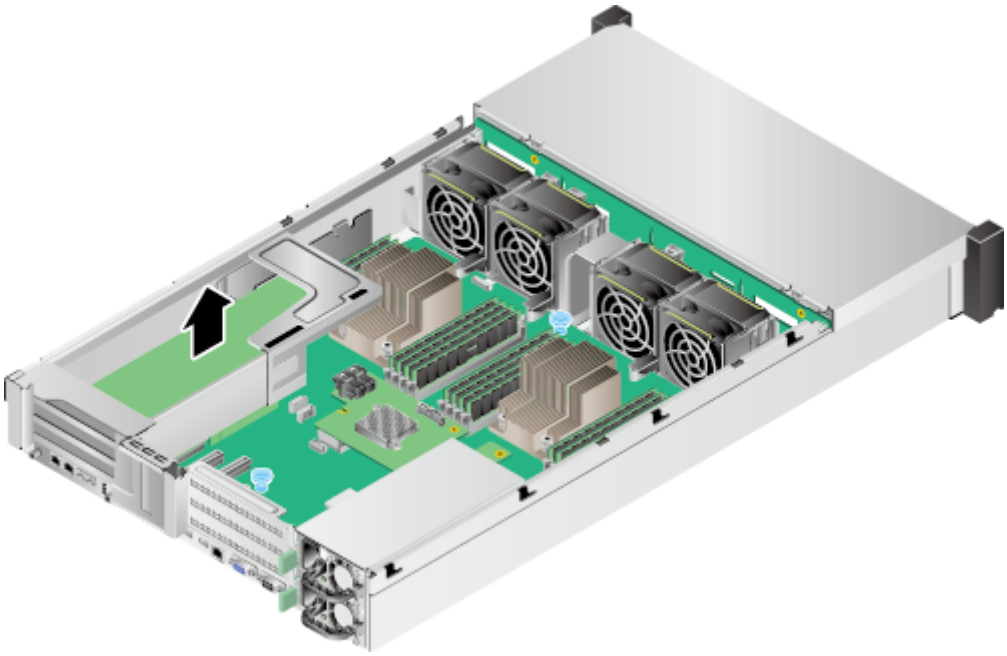
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

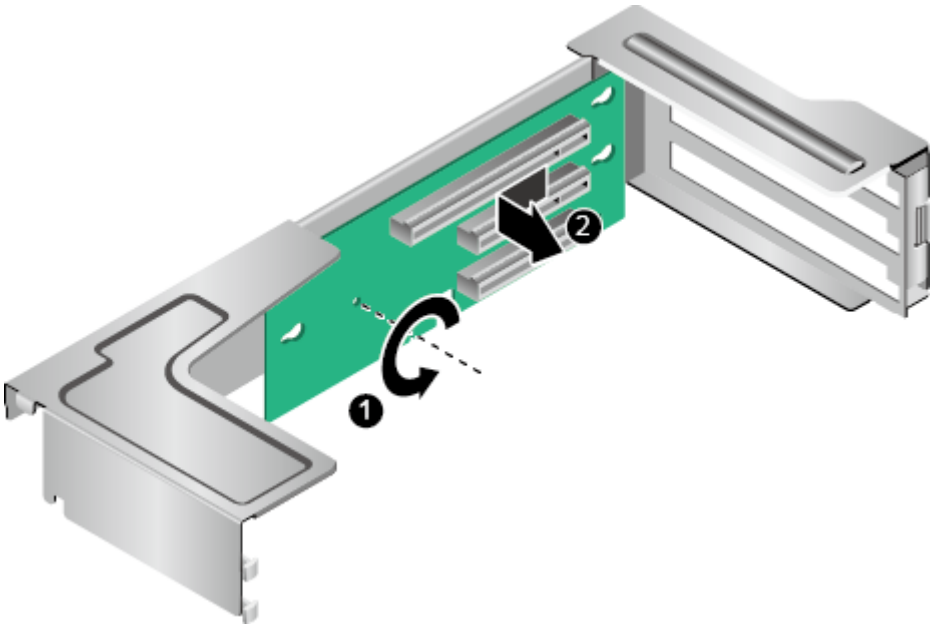
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Lift the riser card tray. See **Figure 6-17**.

Figure 6-17 Removing a riser card tray



7. Remove the PCIe card from the riser card tray. For details, see **6.14 Removing a PCIe Card from a Riser Card**.
8. Loosen the screws on the riser card. See (1) in **Figure 6-18**.
9. Pull the riser card in the arrow direction to remove it. See (2) in **Figure 6-18**.

Figure 6-18 Removing a riser card



10. Place the removed riser card in an ESD bag.

6.13 Installing a Riser Card

This section describes how to install a riser card.

Scenario

Install a riser card to replace the original one or to increase the number of PCIe cards.

NOTE

You can insert only a riser card into the riser card slot on the mainboard instead of inserting a PCIe card into the riser card slot directly.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

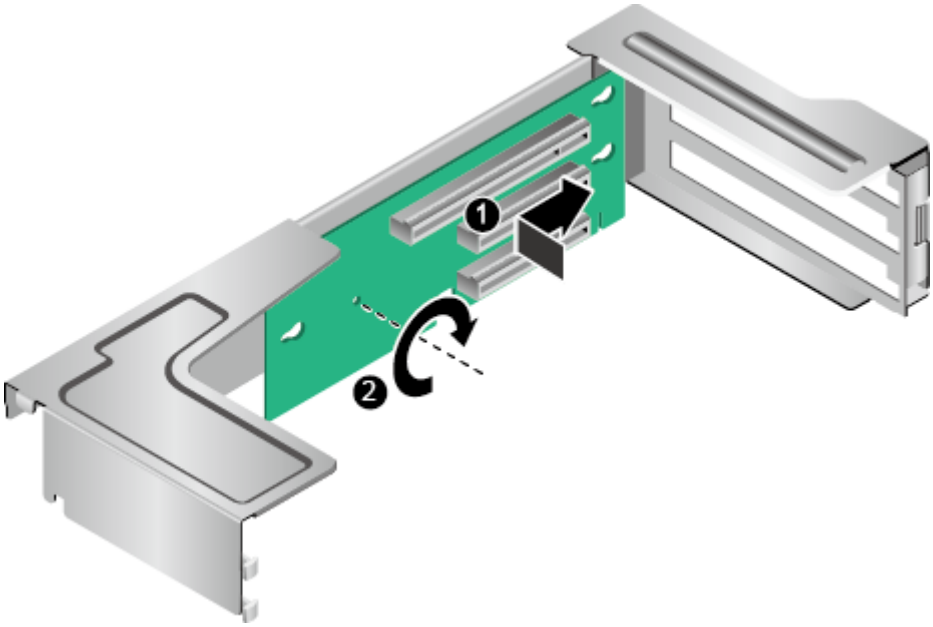
Hardware

A spare riser card and tray

Procedure

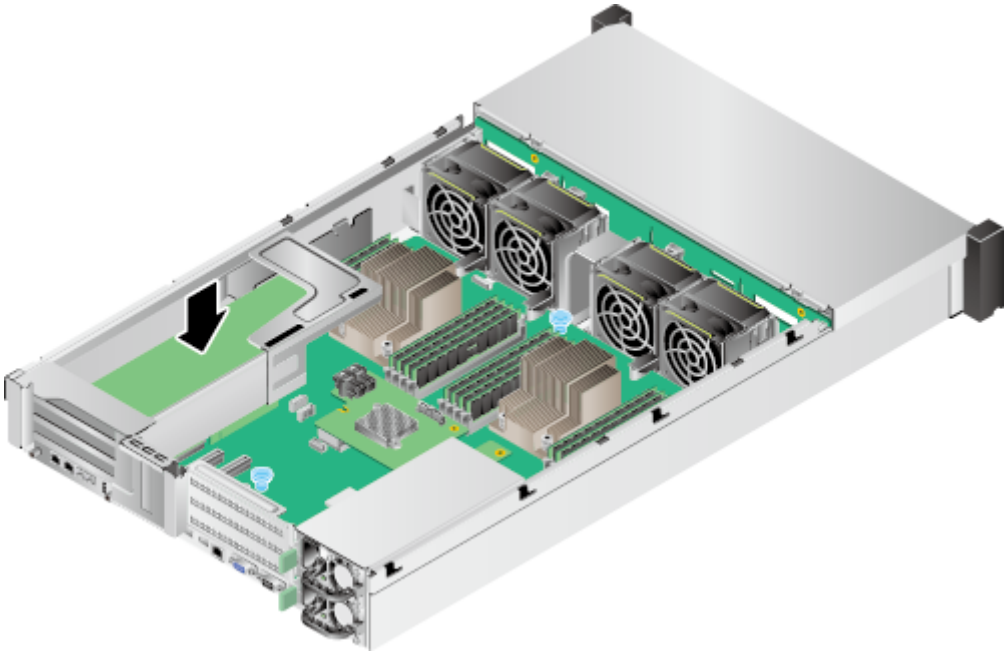
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the replacement riser card out of its ESD bag.
7. Place the riser card in the tray and push it in the arrow direction until it does not move. See (1) in **Figure 6-19**.
8. Tighten the screw on the riser card. See (2) in **Figure 6-19**.

Figure 6-19 Installing a riser card



9. Install the PCIe card on the riser card tray. For details, see **6.15 Installing a PCIe Card on a Riser Card**.
10. Install the riser card tray. See **Figure 6-20**.

Figure 6-20 Installing a riser card tray



11. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
12. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
13. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
14. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.14 Removing a PCIe Card from a Riser Card

This section describes how to remove a PCIe card from a riser card.

Scenarios

Remove a PCIe card in any of the following scenarios:

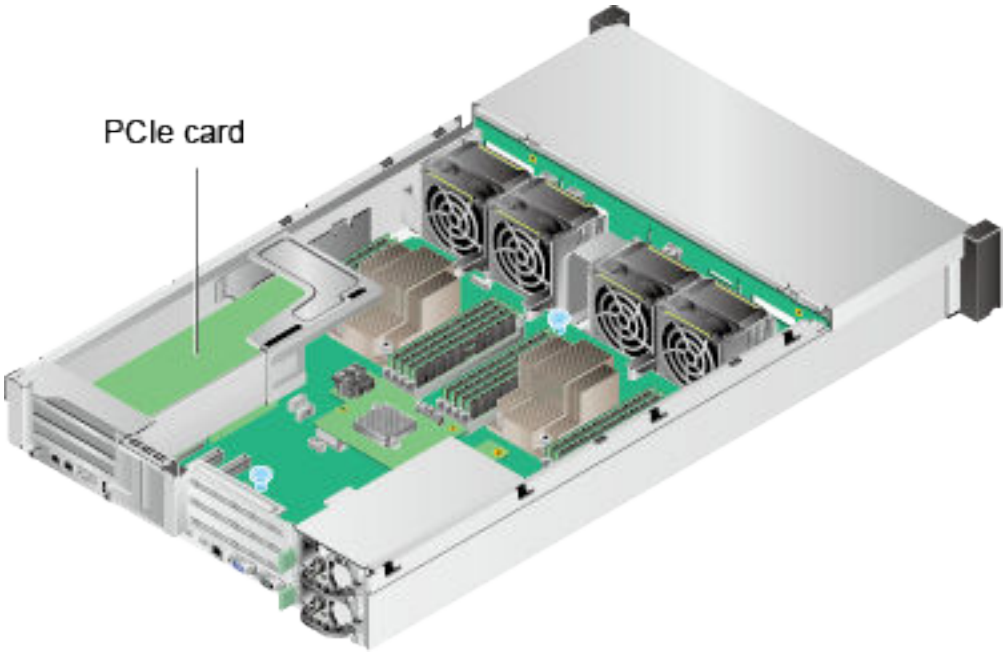
- A PCIe card has failed.
- The riser card connected to a PCIe card is to be removed.
- A PCIe card needs to be replaced with a new model.

Conditions

Prerequisites

You have determined the PCIe card location in the chassis. See the following figure.

Figure 6-21 PCIe card location on a riser card



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

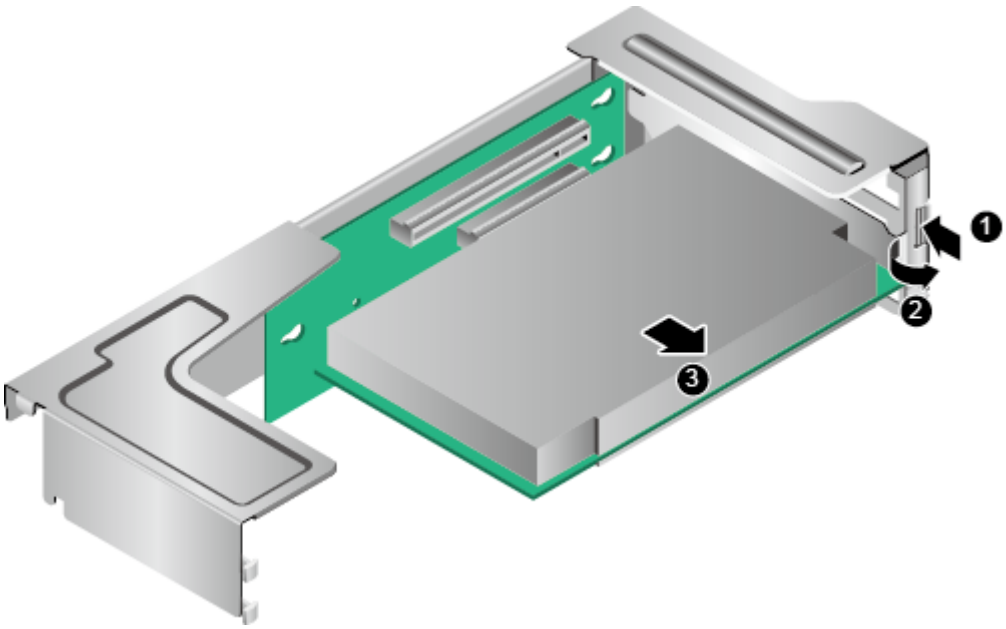
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Push the PCIe card latch outwards to release it. See (1) in **Figure 6-22**.
7. Rotate the PCIe card latch to open it, as shown in (2) in **Figure 6-22**.
8. Remove the PCIe card. See (3) in **Figure 6-22**.

Figure 6-22 Removing the PCIe card from a riser card



9. Place the removed PCIe card in an ESD bag.

6.15 Installing a PCIe Card on a Riser Card

This section describes how to install a PCIe card on a riser card.

Scenario

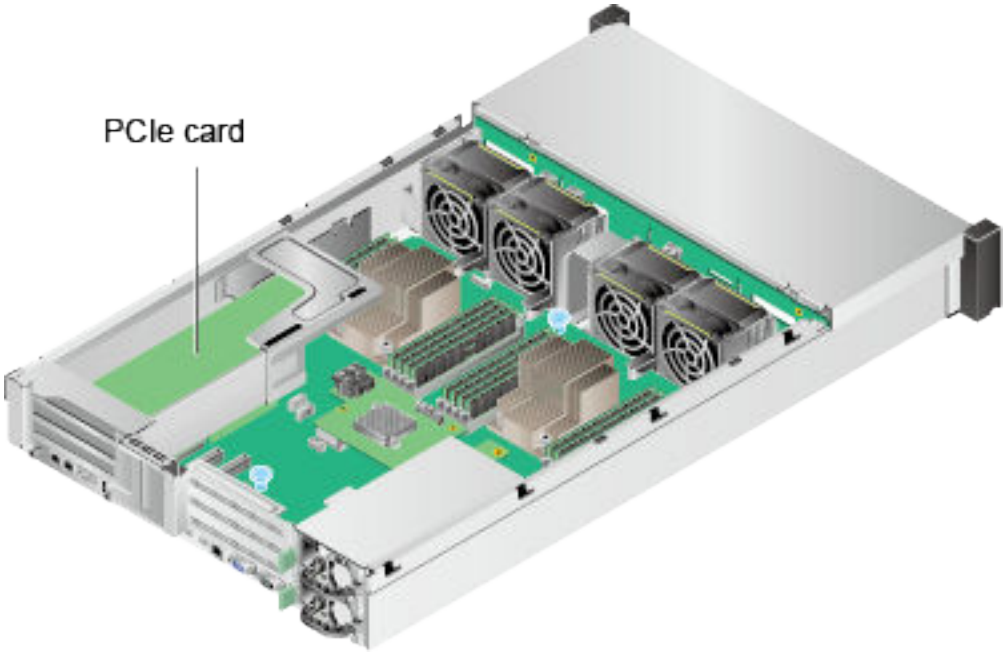
Install a PCIe card to replace the faulty one, add a PCIe card, or replace a PCIe card with a new model.

Conditions

Prerequisites

You have determined the PCIe card location in the chassis. See the following figure.

Figure 6-23 PCIe card location on a riser card



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

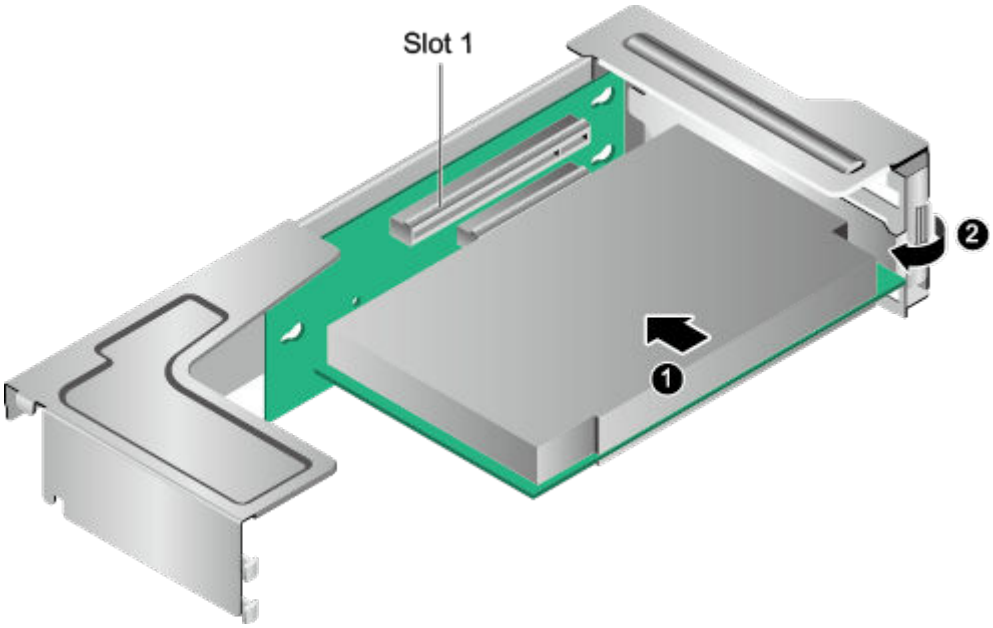
Hardware

A spare PCIe card

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the replacement PCIe card out of its ESD bag.
7. Insert the PCIe card into the PCIe slot. See step (1) in **Figure 6-24**.
8. Close the latch. See (2) in **Figure 6-24**.

Figure 6-24 Installing a PCIe card on a riser card



NOTE

A PCIe card can be installed only in slot 1 of a TaiShan 2280 server riser card. See **Figure 6-24**.

9. Install the riser card tray. For details, see **6.13 Installing a Riser Card**.
10. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
11. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
12. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
13. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.
14. For PCIe GPU cards, you need to install the corresponding GPU card driver after replacing the GPU card of a different model. For details about how to install the driver, see *NVIDIA GPU Card Driver Installation Guide*.

6.16 Removing a PCIe Card from the Mainboard

This section describes how to remove a PCIe card from the mainboard.

Scenario

Remove a PCIe card before replacing it with a new one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

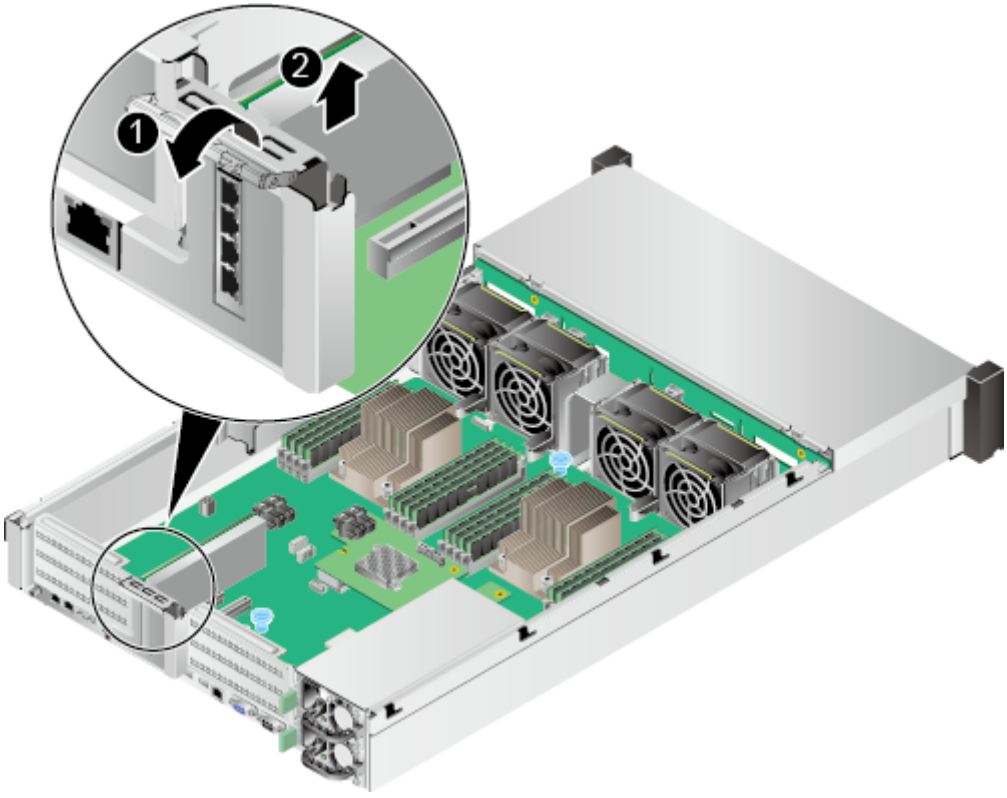
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Open the PCIe card latch. See (1) in **Figure 6-25**.
7. Lift the PCIe card slowly out of the slot. See (2) in **Figure 6-25**.

Figure 6-25 Removing a PCIe card from the mainboard



8. Place the removed PCIe card in an ESD bag.

6.17 Installing a PCIe Card on the Mainboard

This section describes how to install a PCIe card on the mainboard.

Scenario

Install a PCIe card to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

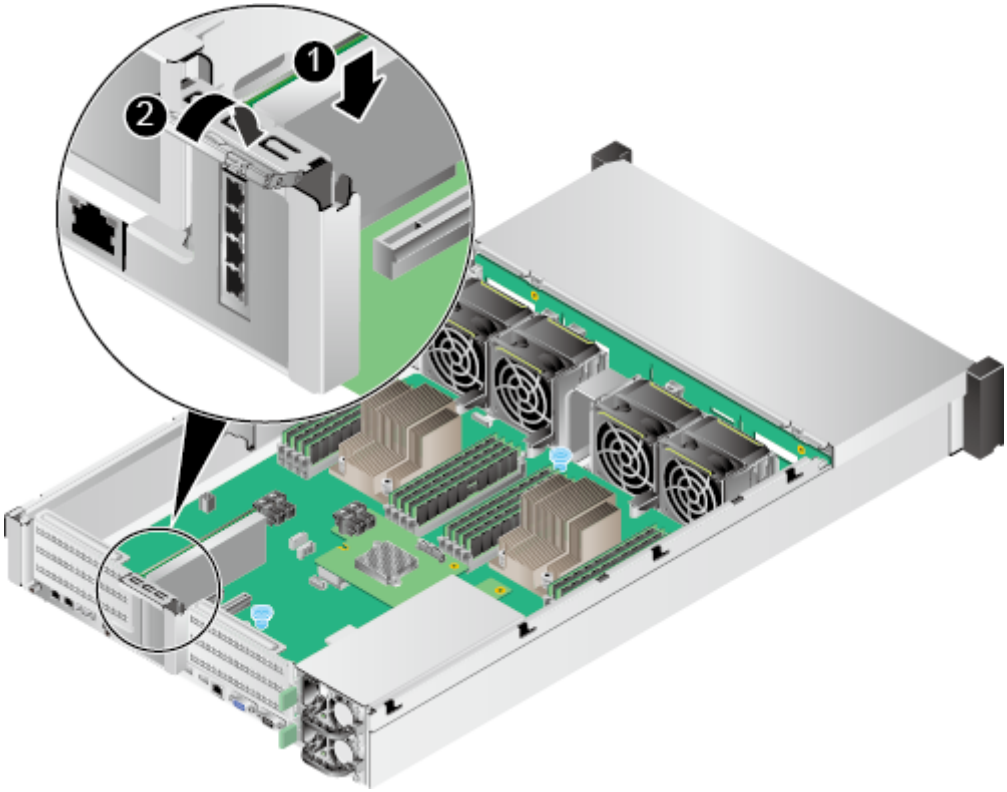
Hardware

A spare PCIe card

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the replacement PCIe card out of its ESD bag.
7. Insert the PCIe card into a PCIe slot with a mapping port model. See (1) in **Figure 6-26**.
8. Take the replacement PCIe card out of its ESD bag.
9. Close the latch. See (2) in **Figure 6-26**.

Figure 6-26 Installing a PCIe card on the mainboard



10. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
11. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
12. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
13. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.18 Removing a System Battery

This section describes how to remove a system battery.

Scenarios

Remove a system battery in any of the following scenarios:

- A system battery fails.
- A system battery is low.

Conditions

Prerequisites

None.

Data

- You have determined the position of the system battery to be removed in the TaiShan 2280 server.

- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

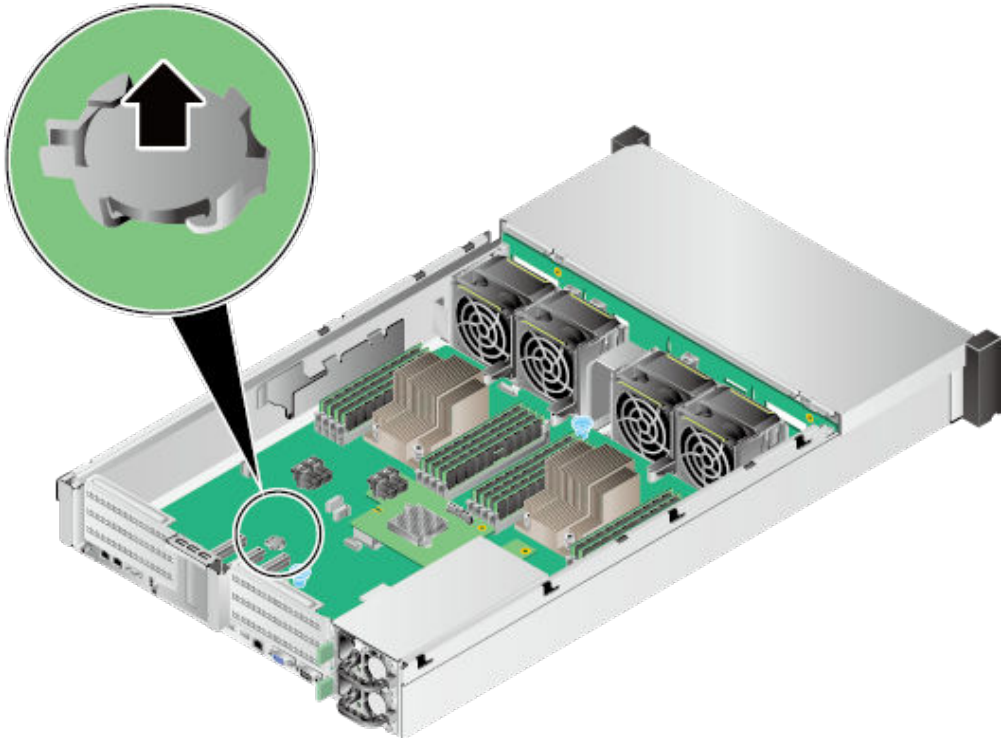
Tools

ESD wrist strap or ESD gloves

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Pull up the right end of the battery and remove it from the slot. See **Figure 6-27**.

Figure 6-27 Removing a system battery



7. Place the removed system battery in an ESD bag.

6.19 Installing a System Battery

This section describes how to install a system battery.

Scenarios

Install a system battery in any of the following scenarios:

- A system battery fails.
- A system battery is low.

Conditions

Prerequisites

None.

Data

- You have determined the position on the TaiShan 2280 server for installing a system battery.
- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD wrist strap or ESD gloves
- Packing materials, for example, ESD bags

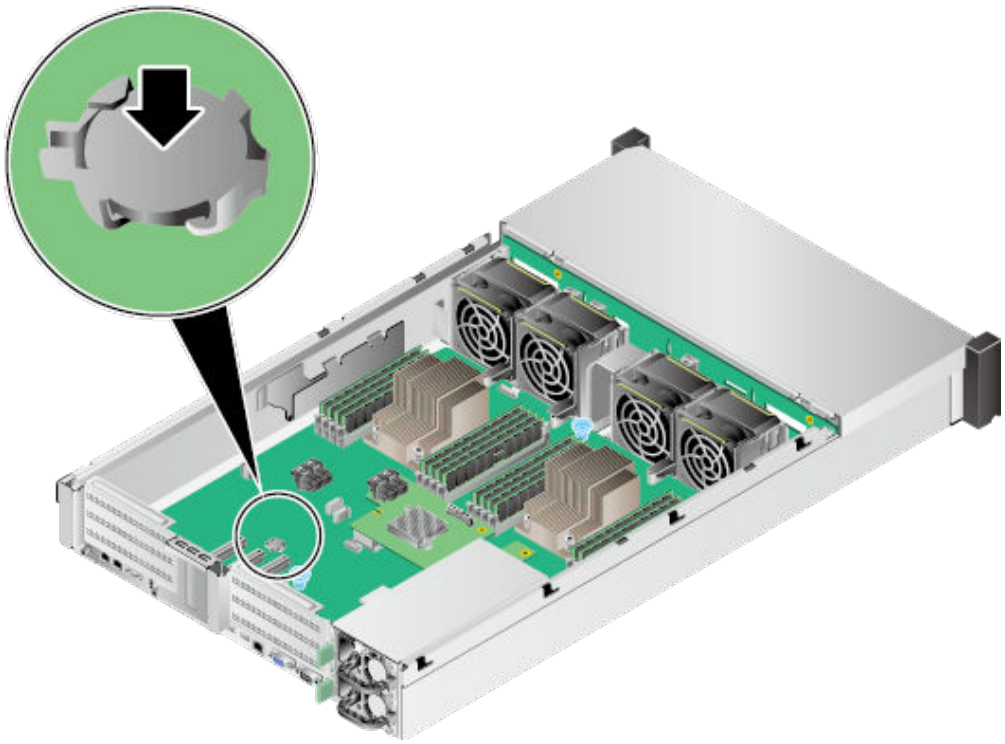
Hardware

A spare system battery

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the spare system battery out of the ESD bag.
7. Hold the battery with the side marked with text facing upwards, insert the left end of the battery into the slot, and gently press down the battery until it is properly installed in the slot. See **Figure 6-28**.

Figure 6-28 Installing a system battery



8. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
9. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
10. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
11. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.20 Removing a Screw-in RAID Controller Card

This section describes how to remove a screw-in RAID controller card.

Scenarios

Remove a screw-in RAID controller card in any of the following scenarios:

- A screw-in RAID controller card has failed.
- A screw-in RAID controller card needs to be replaced with a new model.

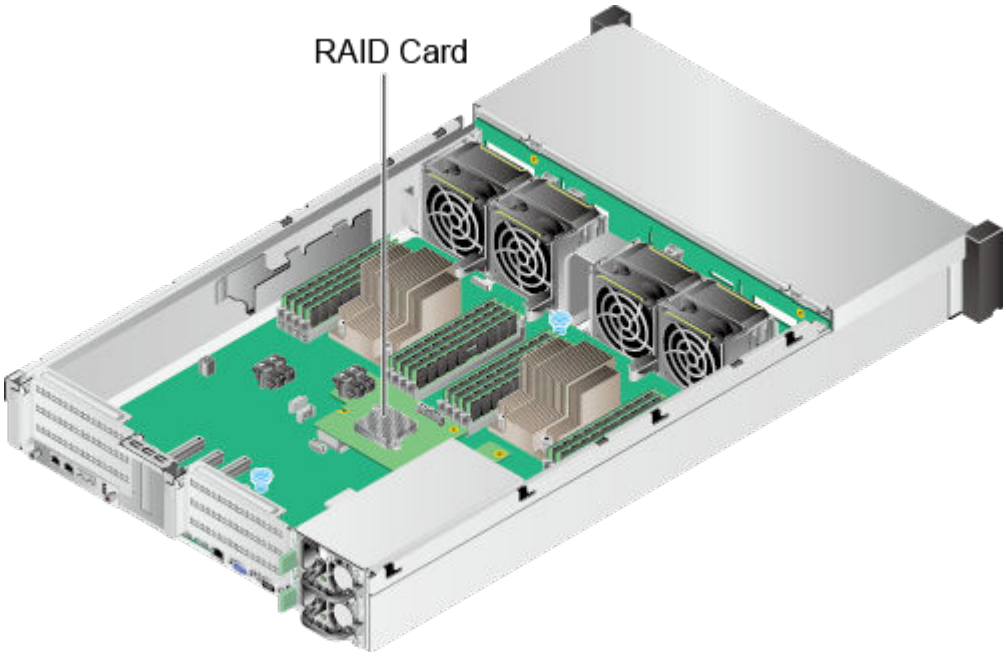
The appearance and position of a screw-in RAID controller card may vary according to models, but the removal method is the same.

Conditions

Prerequisites

You have determined the location of the screw-in RAID controller card on the TaiShan 2280 server. See **Figure 6-29**.

Figure 6-29 Location of the screw-in RAID controller card



Data

- You have determined the position of the screw-in RAID controller card to be removed in the TaiShan 2280 server.
- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

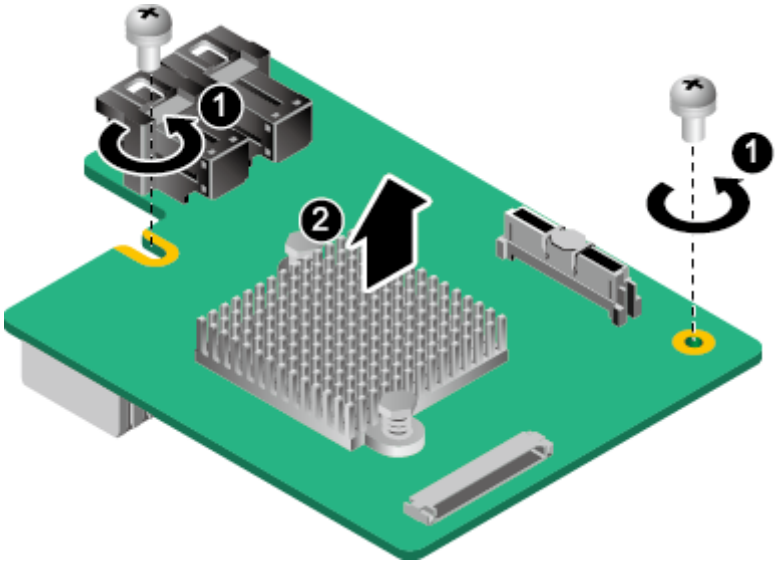
Tools

- ESD gloves or ESD wrist strap
- M3 Phillips screwdriver
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Press and hold down the latches on the screw-in RAID controller card cable connectors and remove the cables. See **2.8 Internal Cabling**.
7. Unscrew the RAID controller card. See step (1) in **Figure 6-30**.
8. Slowly lift the screw-in RAID controller card upwards away from the connector on the mainboard. See (2) in **Figure 6-30**.

Figure 6-30 Removing the screw-in RAID controller card



9. Place the removed RAID controller card in an ESD bag.

6.21 Installing a Screw-in RAID Controller Card

This section describes how to install a screw-in RAID controller card.

Scenarios

Install a screw-in RAID controller card in any of the following scenarios:

- A screw-in RAID controller card has failed.
- A screw-in RAID controller card needs to be replaced with a new model.

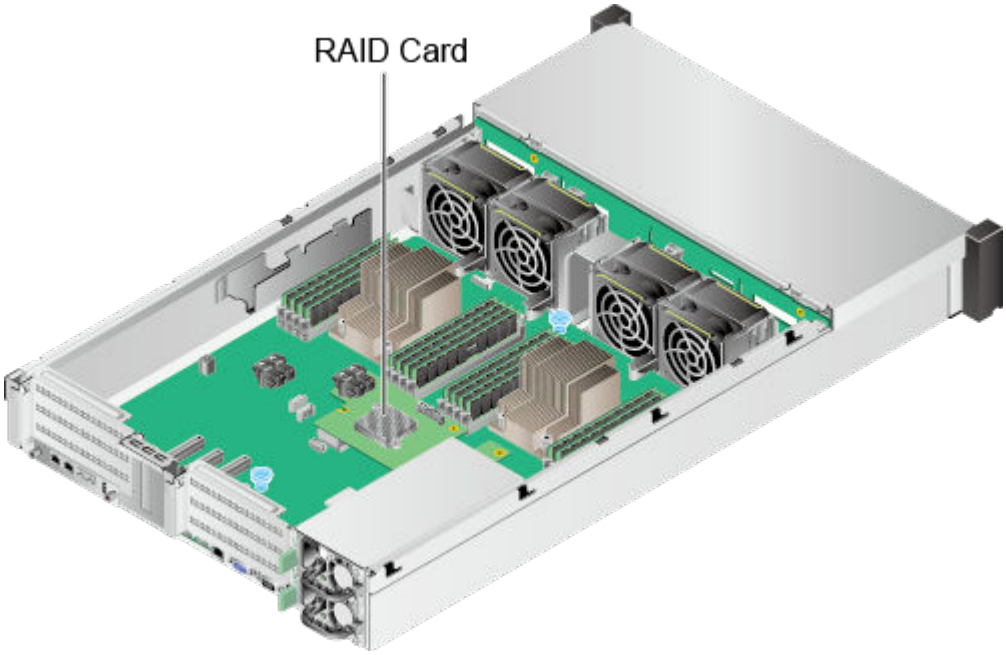
The appearance and position of a screw-in RAID controller card may vary according to models, but the installation method is the same.

Conditions

Prerequisites

You have determined the location of the screw-in RAID controller card on the TaiShan 2280 server. See **Figure 6-31**.

Figure 6-31 Location of the screw-in RAID controller card



Data

- You have determined the position of the screw-in RAID controller card to be installed in the TaiShan 2280 server.
- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- M3 Phillips screwdriver
- Packing materials, for example, ESD bags

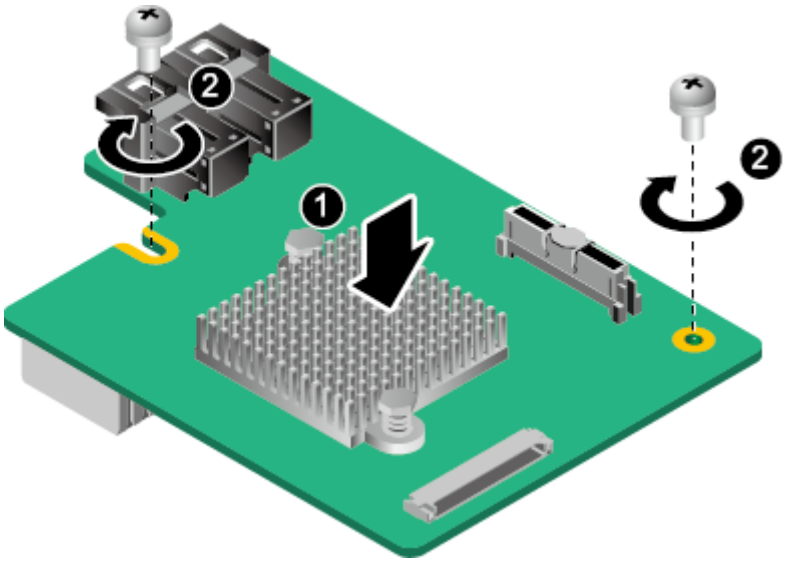
Hardware

A spare RAID controller card

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take the replacement RAID controller card out of its ESD bag.
7. Align the connector on the screw-in RAID controller card with the slot on the mainboard, and slowly insert the screw-in RAID controller card into the mainboard. See (1) in **Figure 6-32**.

Figure 6-32 Installing a screw-in RAID controller card



8. Tighten the screws to secure the RAID controller card. See step (2) in **Figure 6-32**.
9. Connect cables to the RAID controller card. For details, see **2.8 Internal Cabling**.
10. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
11. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
12. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
13. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.22 Removing a Supercapacitor

This topic describes how to remove a supercapacitor.

Scenarios

You can configure a supercapacitor to provide power-off protection for the LSI SAS3108 controller card. Remove a supercapacitor in any of the following scenarios:

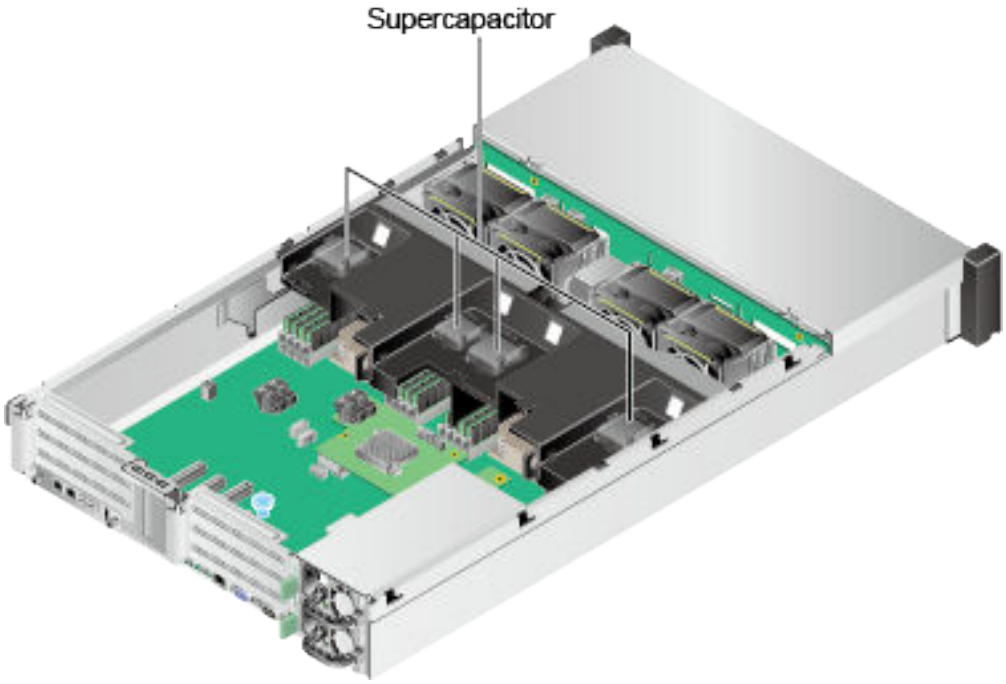
- A supercapacitor has failed.
- A supercapacitor is low.

Conditions

Prerequisites

You have determined the position of the supercapacitor in the TaiShan 2280. See **Figure 6-33**.

Figure 6-33 Position of the supercapacitor



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

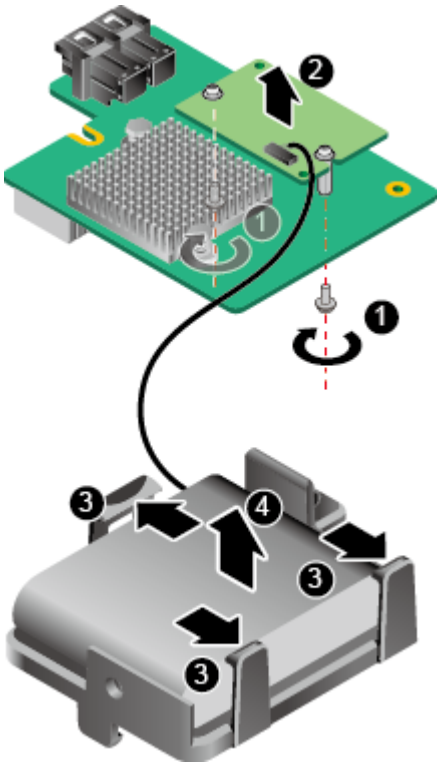
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the riser card tray above the screw-in RAID controller card. For details, see **6.12 Removing a Riser Card**.
7. Remove the screw-in RAID controller card. For details, see **6.20 Removing a Screw-in RAID Controller Card**.
8. Loosen the screws on the TFM. See (1) in **Figure 6-34**.

Figure 6-34 Removing a TFM



9. Lift the TFM out of the RAID controller card. See step (2) in **Figure 6-34**.
10. Horizontally open the plastic latches that secure the supercapacitor. See step (3) in **Figure 6-34**.
11. Exert even force to lift the supercapacitor out of the server. See step (4) in **Figure 6-34**.
12. Place the removed supercapacitor in an ESD bag.

6.23 Installing a Supercapacitor

This topic describes how to install a supercapacitor.

Scenarios

You can configure a supercapacitor to provide power-off protection for the LSI SAS3108 controller card. Install a supercapacitor in any of the following scenarios:

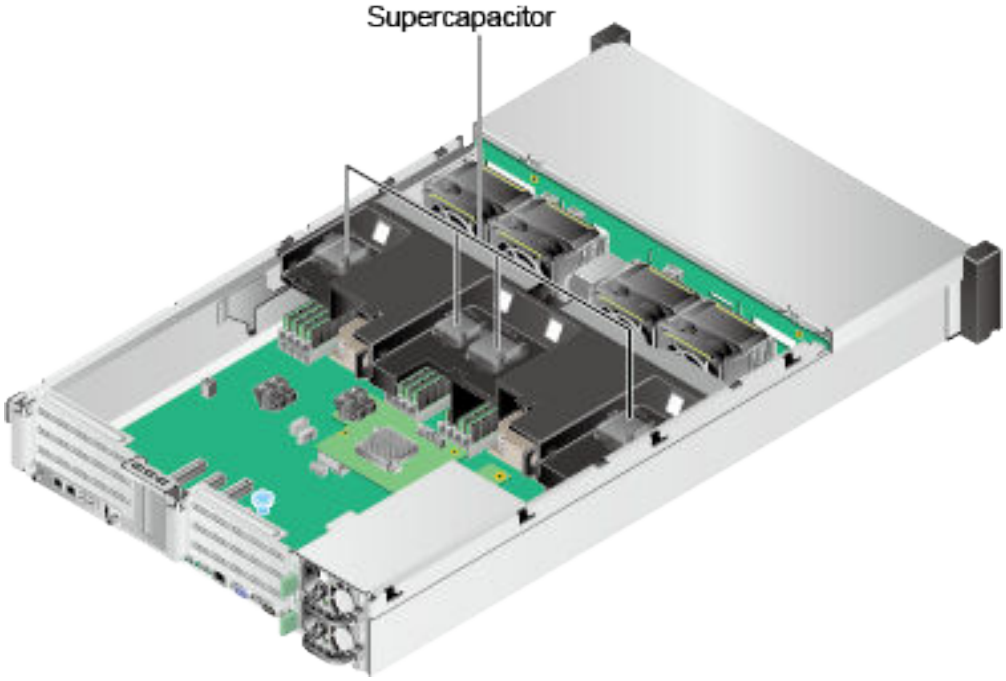
- A supercapacitor has failed.
- A supercapacitor is low.

Conditions

Prerequisites

You have determined the position of the supercapacitor in the TaiShan 2280. See **Figure 6-35**.

Figure 6-35 Position of the supercapacitor



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- M3 Phillips screwdriver
- Packing materials, for example, ESD bags

Hardware

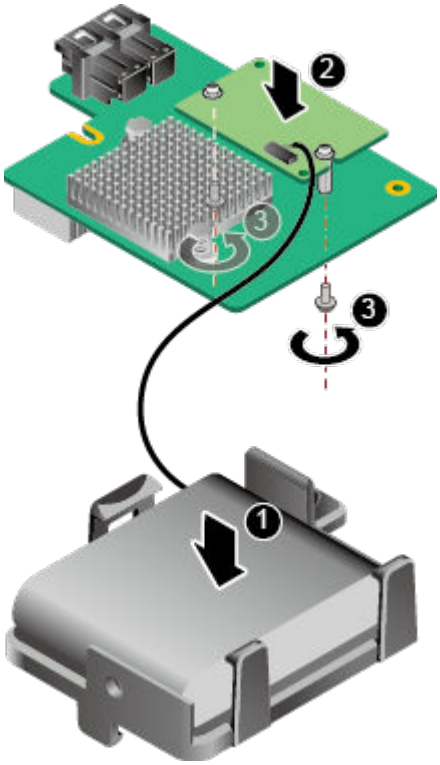
A spare supercapacitor

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the riser card tray above the screw-in RAID controller card. For details, see **6.12 Removing a Riser Card**.
7. Remove the screw-in RAID controller card. For details, see **6.20 Removing a Screw-in RAID Controller Card**.
8. Take the spare supercapacitor out of its ESD bag.

9. Place the supercapacitor vertically downward in the tray. Ensure that the supercapacitor is secured by the plastic latches. See step (1) in **Figure 6-36**.

Figure 6-36 Installing a supercapacitor



10. Insert the TFM vertically into the RAID controller card. See (2) in **Figure 6-36**.
11. Screw the TFM. See step (3) in **Figure 6-36**.
12. Install the screw-in RAID controller card. For details, see **6.21 Installing a Screw-in RAID Controller Card**.
13. Install the riser card tray above the RAID controller card. For details, see **6.13 Installing a Riser Card**.
14. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
15. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
16. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
17. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.24 Removing a SATA DOM

This topic describes how to remove a SATA DOM.

Scenario

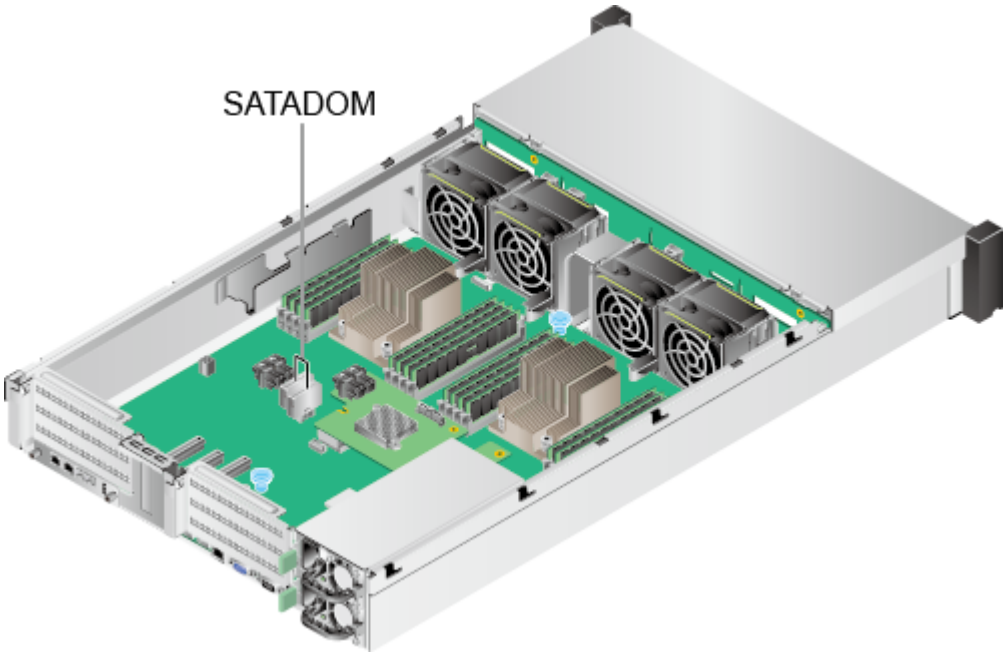
Remove a SATA DOM before replacing it with a new one.

Conditions

Prerequisites

You have determined the position of the SATA DOM in the TaiShan 2280. See **Figure 6-37**.

Figure 6-37 Position of the SATA DOM



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

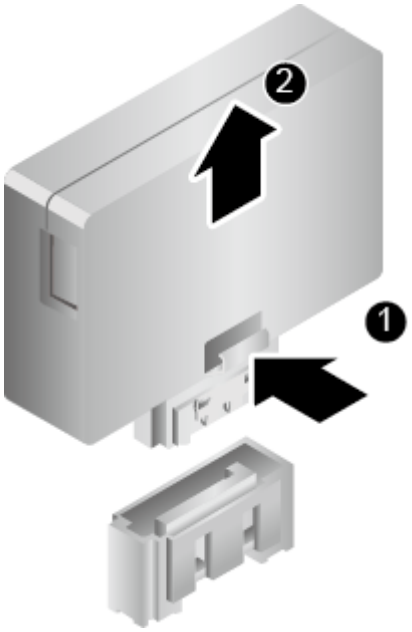
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Press the latch on the side of the SATA DOM. See **Figure 6-38**.

Figure 6-38 Removing a SATA DOM



7. Place the removed SATA DOM in an ESD bag.

6.25 Installing a SATA DOM

This topic describes how to install a SATA DOM.

Scenario

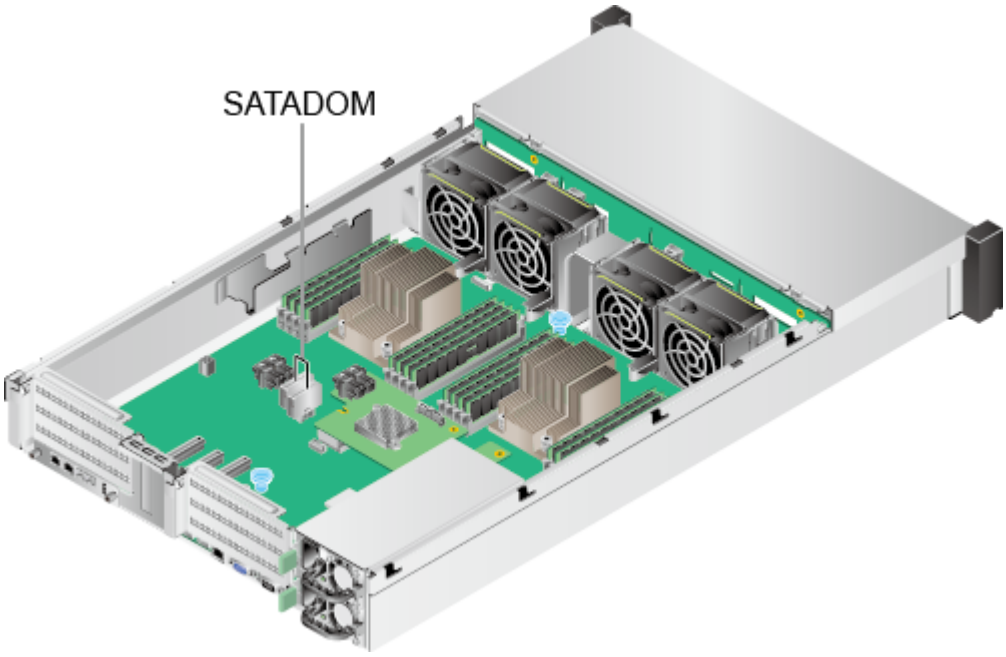
Install a SATA DOM to replace the faulty one.

Conditions

Prerequisites

You have determined the position of the SATA DOM in the TaiShan 2280. See **Figure 6-39**.

Figure 6-39 Position of the SATA DOM



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- M3 Phillips screwdriver
- Packing materials, for example, ESD bags

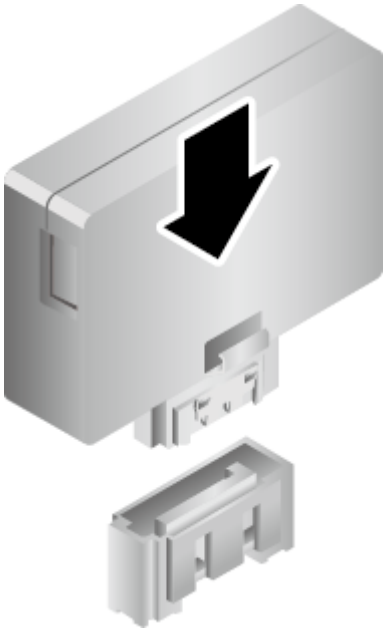
Hardware

A spare SATA DOM

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take a spare SATA DOM out of its ESD bag.
7. Insert the SATA DOM vertically downwards into the connector on the mainboard. See **Figure 6-40**.

Figure 6-40 Installing a SATA DOM



8. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
9. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
10. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
11. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.26 Removing a Heat Sink

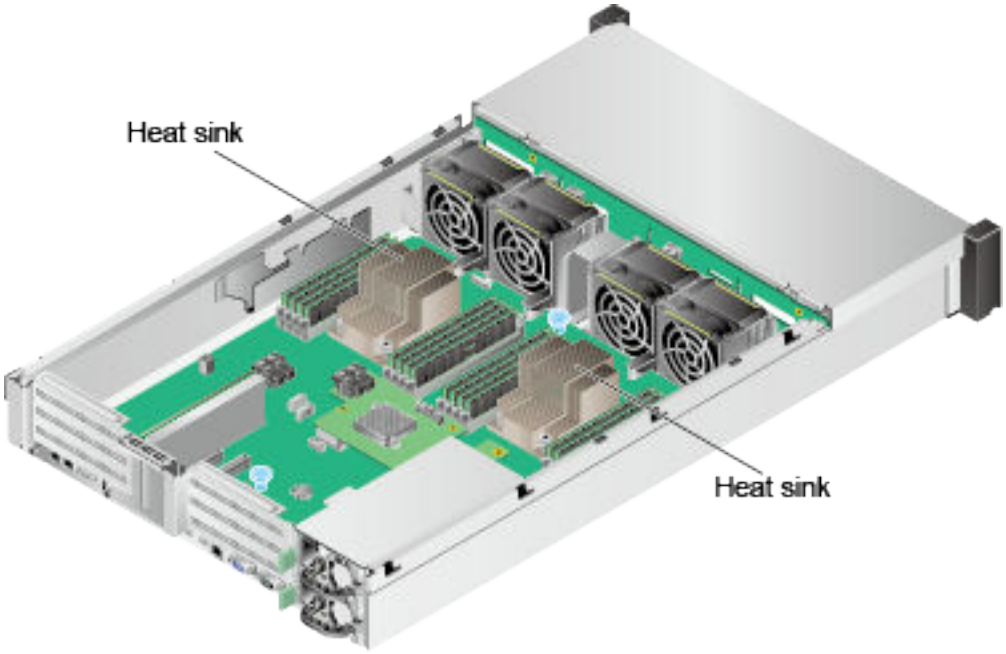
This section describes how to remove a heat sink.

Conditions

Prerequisites

You have determined the location of a heat sink on the TaiShan 2280 server. See **Figure 6-41**.

Figure 6-41 Heat sink position



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

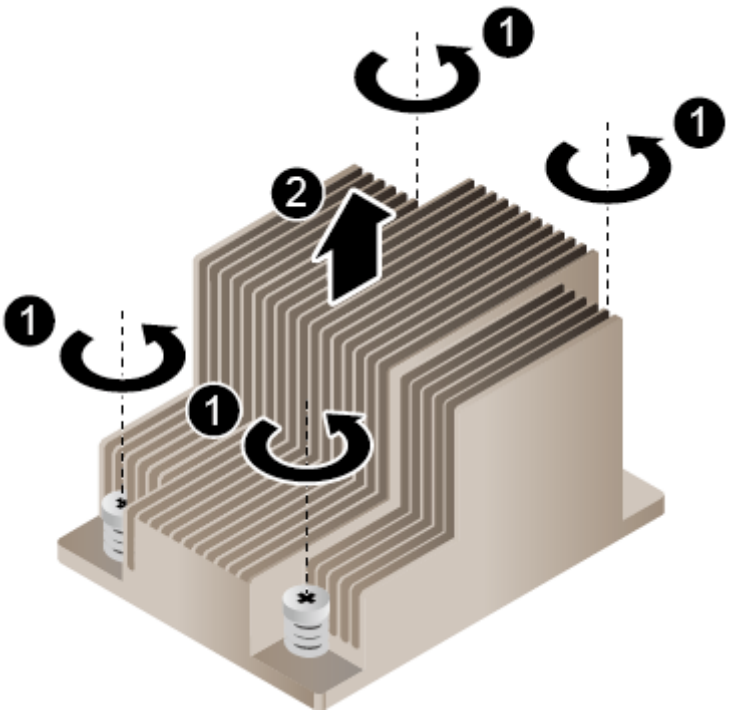
Tools

- ESD wrist strap
- M3 Phillips screwdriver
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Use a Phillips screwdriver to loosen one pair of diagonally opposite screws on the heat sink halfway and then loosen the other pair of screws. See (1) in **Figure 6-42**.

Figure 6-42 Removing a heat sink



8. Lift the heat sink. See (2) in **Figure 6-42**.
9. Place the removed heat sink in an ESD bag.

6.27 Installing a Heat Sink

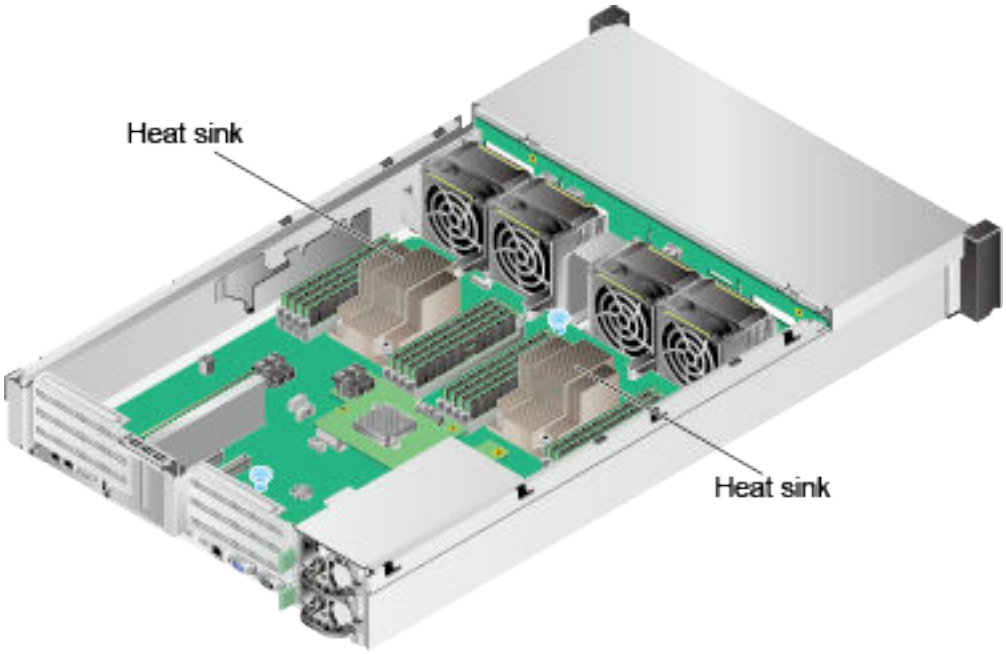
This section describes how to install a heat sink.

Conditions

Prerequisites

You have determined the location of a heat sink on the TaiShan 2280 server. See **Figure 6-43**.

Figure 6-43 Heat sink position



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD wrist strap
- M3 Phillips screwdriver

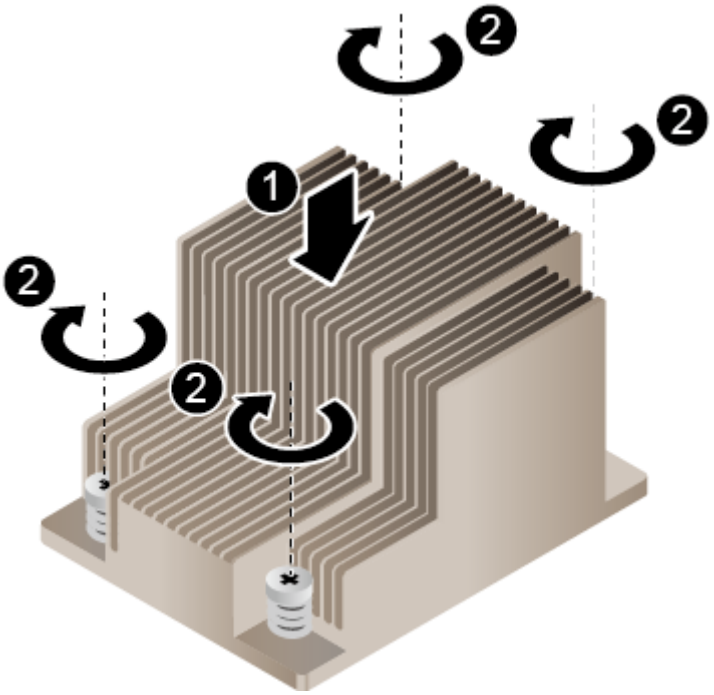
Hardware

A spare CPU

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Take the spare heat sink out of its ESD bag.
8. Align the heat sink with the fastening studs on the CPU socket, and place the heat sink on the CPU. See (1) in **Figure 6-44**.

Figure 6-44 Installing a heat sink



9. Use a Phillips screwdriver to tighten the four screws on the heat sink in a diagonal sequence. See (2) in **Figure 6-44**.
10. Install the air duct. For details, see **6.9 Installing an Air Duct**.
11. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
12. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
13. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
14. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.28 Removing a DIMM

This section describes how to remove a DIMM.

Scenarios

Remove a DIMM in any of the following scenarios:

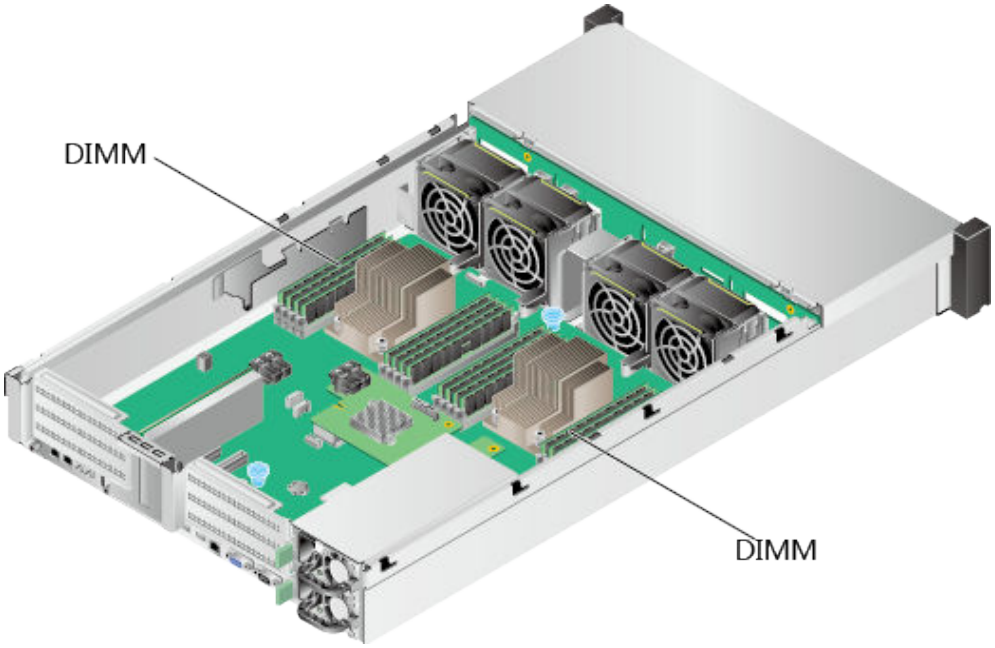
- A DIMM has failed.
- A DIMM needs to be replaced with a new model.

Conditions

Prerequisites

You have determined the location of the DIMM to be removed. See **Figure 6-45**.

Figure 6-45 DIMM location



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

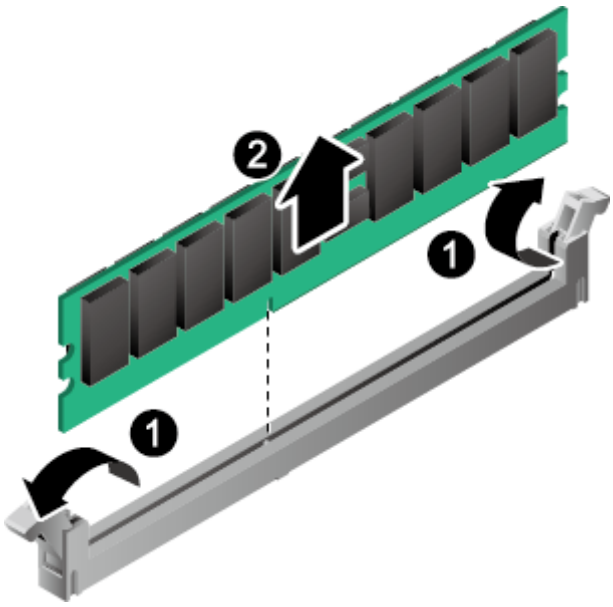
Tools

- ESD gloves or ESD wrist strap
- Packaging materials (such as a DIMM box)

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Open the two latches on the DIMM slot simultaneously. See (1) in **Figure 6-46**.

Figure 6-46 Removing a DIMM



8. Remove the DIMM from the slot, as shown in step 2 in **Figure 6-46**.
9. Place the removed DIMM in the DIMM box.

6.29 Installing a DIMM

This section describes how to install a DIMM.

Scenarios

Install a DIMM in any of the following scenarios:

- A DIMM has failed.
- A DIMM needs to be replaced with a new model.
- The memory capacity needs to be expanded.

The rules for installing a DIMM are as follows:

- The server provides 8 double data rate 4 (DDR4) DIMM slots. Each memory riser integrates two memory channels: 0 and 1. The position is shown in **Figure 6-47**.

Figure 6-47 DIMM slots

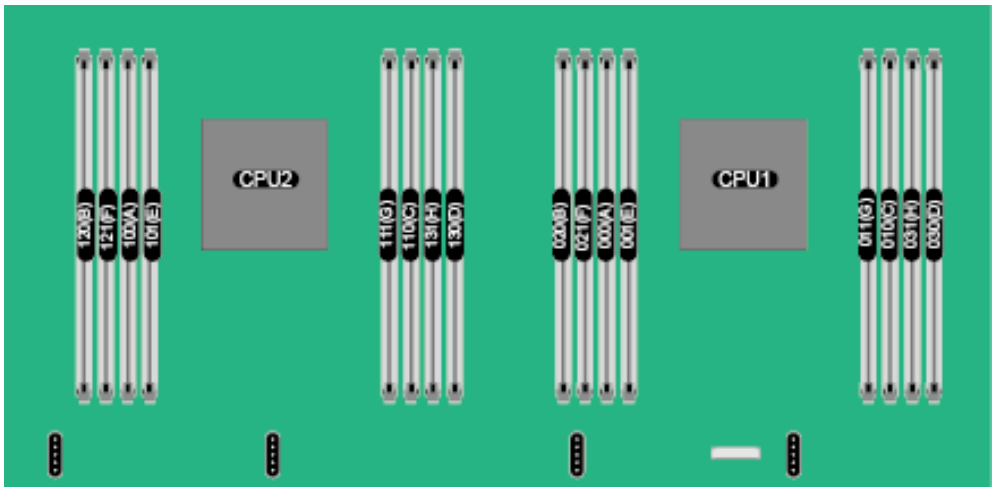


Table 6-2 Composition of channels

Channel	DIMM Slot
CPU 1	020(B), 021(F), 000(A), 001(E), 011(G), 010(C), 031(H), 030(D)
CPU 2	120(B), 121(F), 100(A), 101(E), 111(G), 110(C), 131(H), 130(D)

- You must comply with the memory configuration rules listed in **Figure 6-48**.

Figure 6-48 DIMM configuration rule

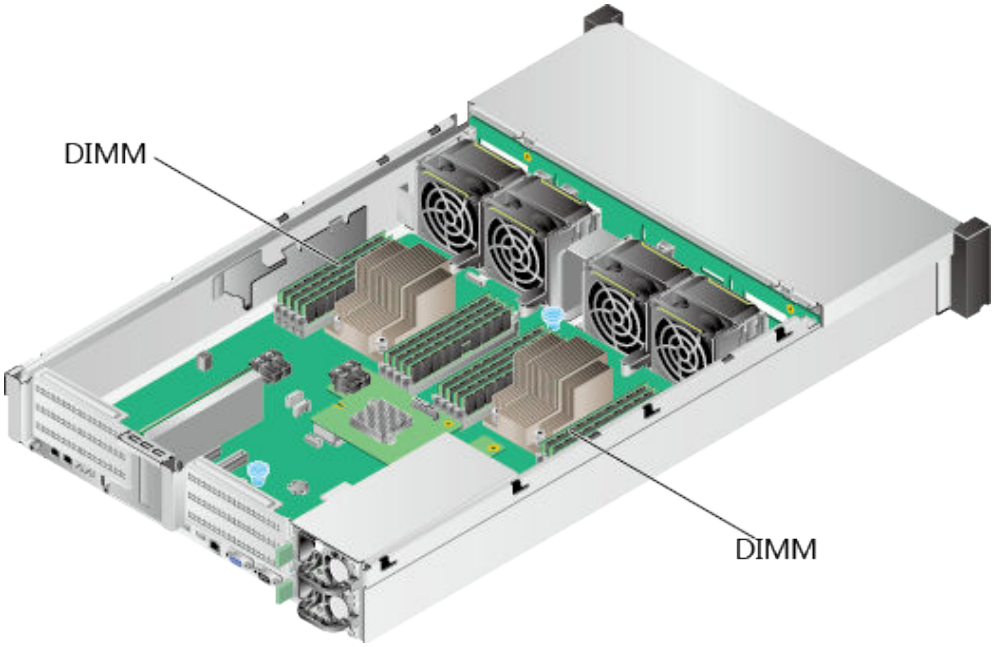
CPU	Channel	DIMM Location	DIMM Quantity √: Recommended O: Not recommended															
			O	O	O	√	O	O	O	√	O	O	O	O	O	O	O	√
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CPU 1	TB_A	DIMM000(A)	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	TB_A	DIMM001(E)									·	·	·	·	·	·	·	·
	TB_B	DIMM010(C)					·	·	·	·	·	·	·	·	·	·	·	·
	TB_B	DIMM011(G)													·	·	·	·
	TA_A	DIMM020(B)			·	·	·	·	·	·	·	·	·	·	·	·	·	·
	TA_A	DIMM021(F)											·	·	·	·	·	·
	TA_B	DIMM030(D)							·	·	·	·	·	·	·	·	·	·
	TA_B	DIMM031(H)															·	·
CPU 2	TB_A	DIMM100(A)		·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	TB_A	DIMM101(E)										·	·	·	·	·	·	·
	TB_B	DIMM110(C)						·	·	·	·	·	·	·	·	·	·	·
	TB_B	DIMM111(G)														·	·	·
	TA_A	DIMM120(B)				·	·	·	·	·	·	·	·	·	·	·	·	·
	TA_A	DIMM121(F)												·	·	·	·	·
	TA_B	DIMM130(D)								·	·	·	·	·	·	·	·	·
	TA_B	DIMM131(H)																·

Conditions

Prerequisites

You have determined the location of the DIMM to be removed. See **Figure 6-49**.

Figure 6-49 DIMM location



Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packaging materials (such as a DIMM box)

Hardware

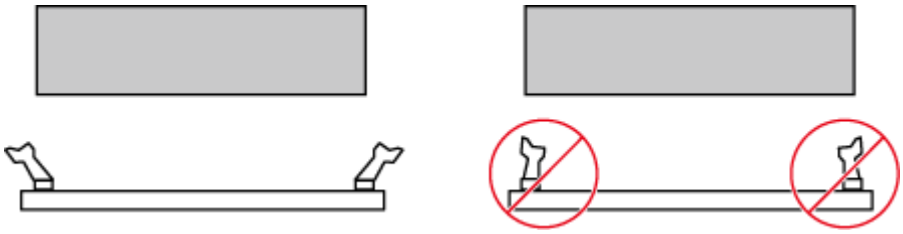
A spare DIMM

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Take a spare DIMM out of the DIMM box.

8. Ensure that the two latches on the DIMM slot are fully opened. See **Figure 6-50**.

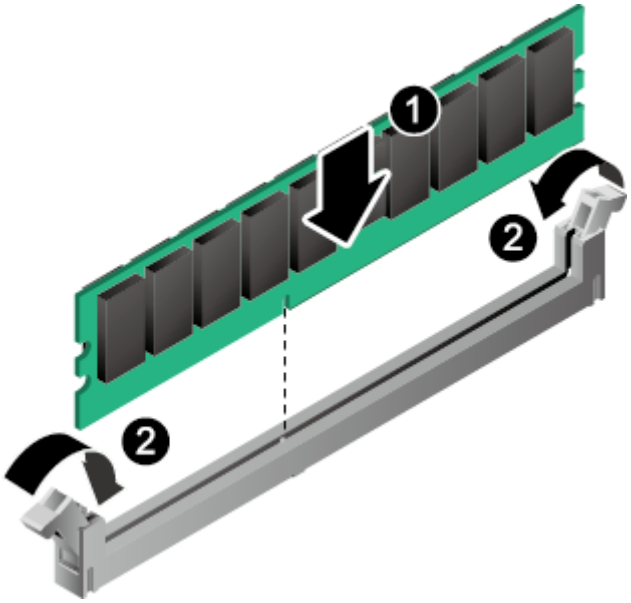
Figure 6-50 Opening fixing clips on a DIMM slot



9. Align the DIMM with the DIMM slot, and insert the DIMM into the slot. See **Figure 6-51**.

   The two fixing clips close automatically.

Figure 6-51 Installing a DIMM



10. Install the air duct. For details, see **6.9 Installing an Air Duct**.
11. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
12. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
13. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
14. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.30 Removing a Mainboard

This section describes how to remove a mainboard.

Scenario

Remove the mainboard before replacing it with a new one.

Conditions

Prerequisites

None.

Data

- You have determined the position of the mainboard to be removed in the TaiShan 2280.
- You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

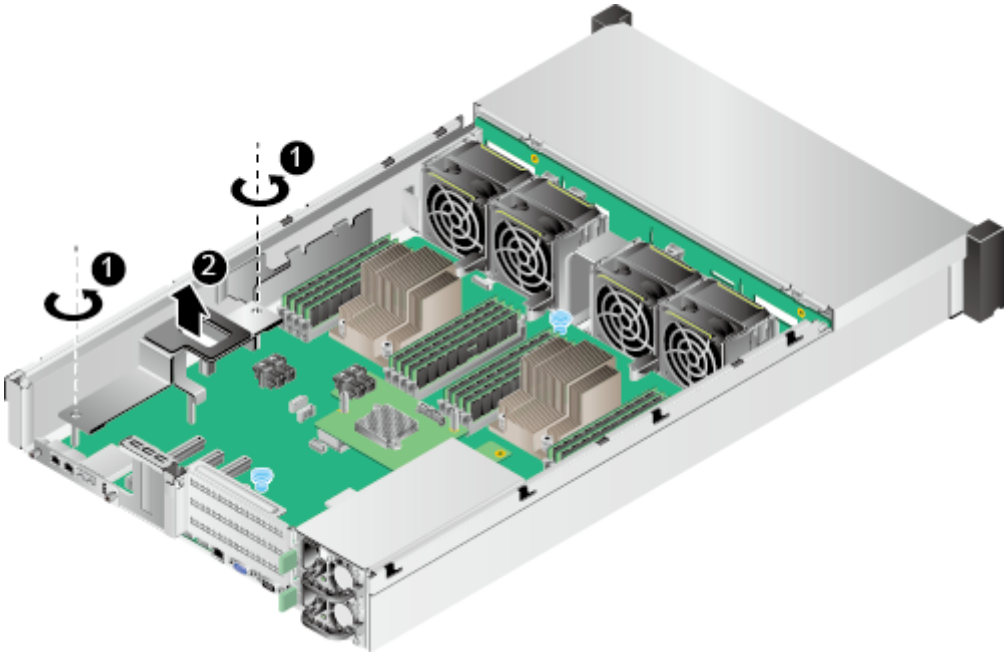
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

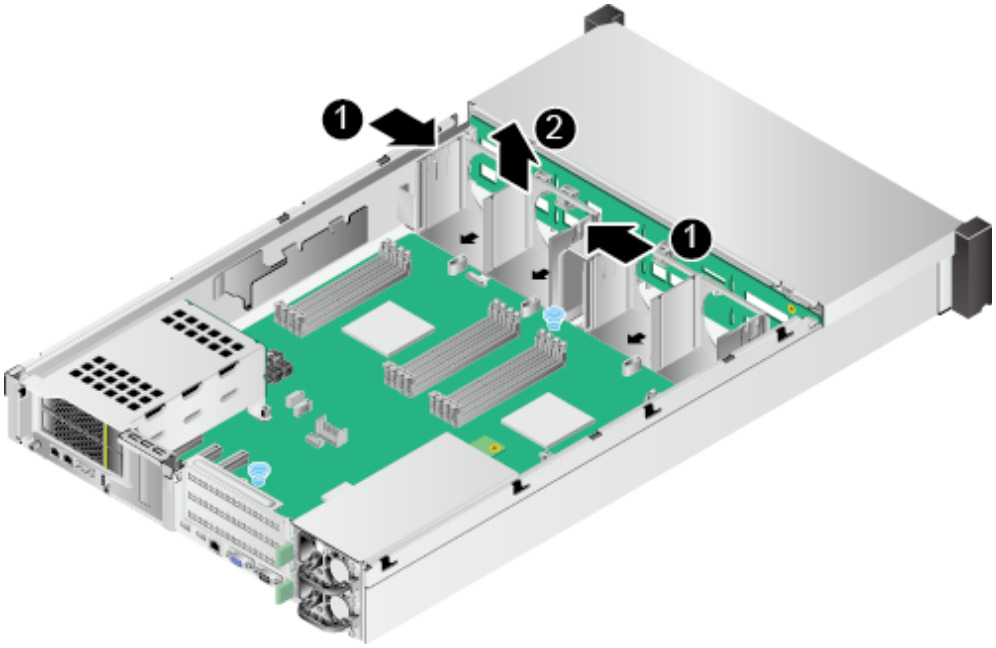
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Remove all fan modules. For details, see **6.10 Removing a Fan Module**.
8. Remove all cables from the mainboard. For details, see **2.8 Internal Cabling**.
9. Remove all DIMMs. For details, see **6.28 Removing a DIMM**.
10. Remove heat sinks. For details, see **6.26 Removing a Heat Sink**.
11. Remove the screw-in RAID controller card. For details, see **6.20 Removing a Screw-in RAID Controller Card**.
12. Remove PSUs. For details, see **6.4 Removing an AC PSU**.
13. Remove the PSU backplane. For details, see **6.36 Removing a PSU Backplane**.
14. Remove a riser card. For details, see **6.12 Removing a Riser Card**.
15. (Optional) If the server is configured with three WX 5100 GPUs, remove the GPU card tray. Loosen the two screws on the tray using a Phillips screwdriver, lift the tray, and loosen the three studs under the tray. See steps (1) and (2) in **Figure 6-52**. If you do not want to replace the GPU immediately, place the studs and tray in the same ESD bag.

Figure 6-52 Removing the WX 5100 GPU card tray



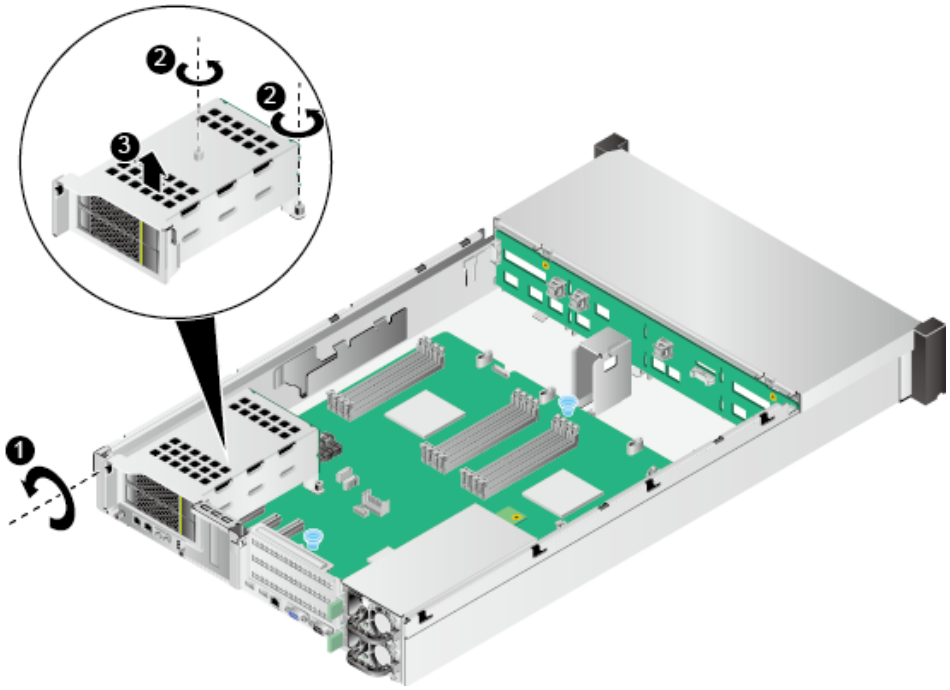
16. Press and hold down the latches on both sides of a fan module bracket, and lift the bracket. See (1) and (2) in **Figure 6-53**.

Figure 6-53 Removing a fan module bracket



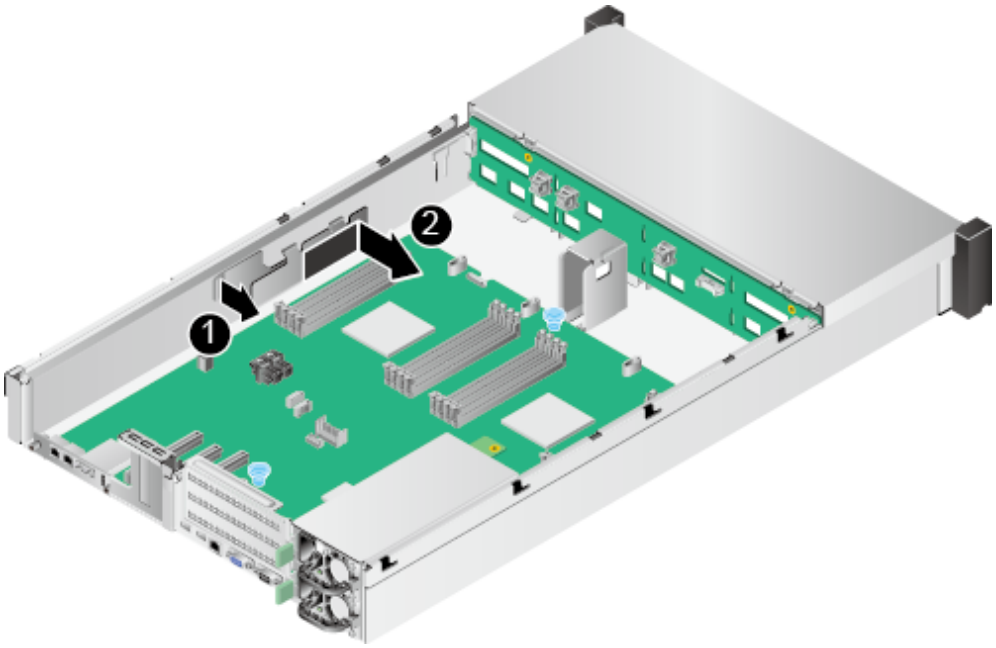
17. Loosen the screws that secure the rear drive module. See (1) and (2) in **Figure 6-54**.

Figure 6-54 Removing a rear drive module



18. Lift the rear drive module. See (3) in **Figure 6-54**.
19. Open the latch in arrow direction (1), and remove the cable organizer in arrow direction (2). See **Figure 6-55**.

Figure 6-55 Removing a cable organizer

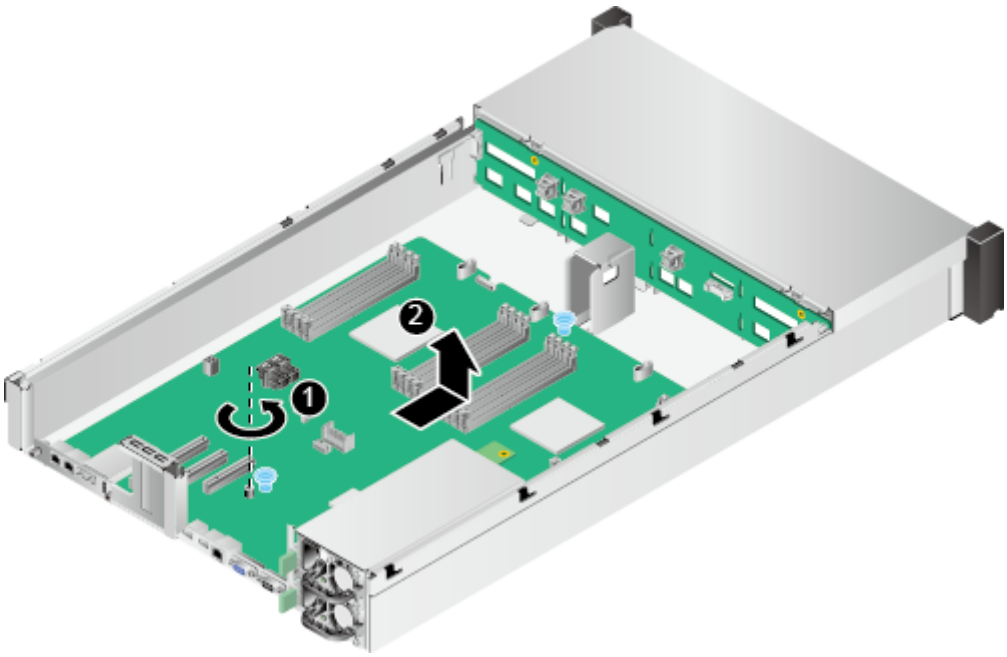


20. Loosen the screw that secures the mainboard using a Phillips screwdriver. See (1) in **Figure 6-56**.

NOTICE

You must remove all cables from the mainboard. The cables include those connected to the drive backplane and the left and right mounting ears.

Figure 6-56 Removing a mainboard



21. Push the mainboard in the arrow direction until it does not move, and lift the mainboard by holding the handle. See (2) in **Figure 6-56**.

NOTICE

Do not hold any other protruding part on the mainboard to lift it. Otherwise, the components on the mainboard may be damaged.

22. Place the removed mainboard in an ESD bag.

6.31 Installing a Mainboard

This section describes how to install a mainboard.

Scenario

Install a mainboard to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

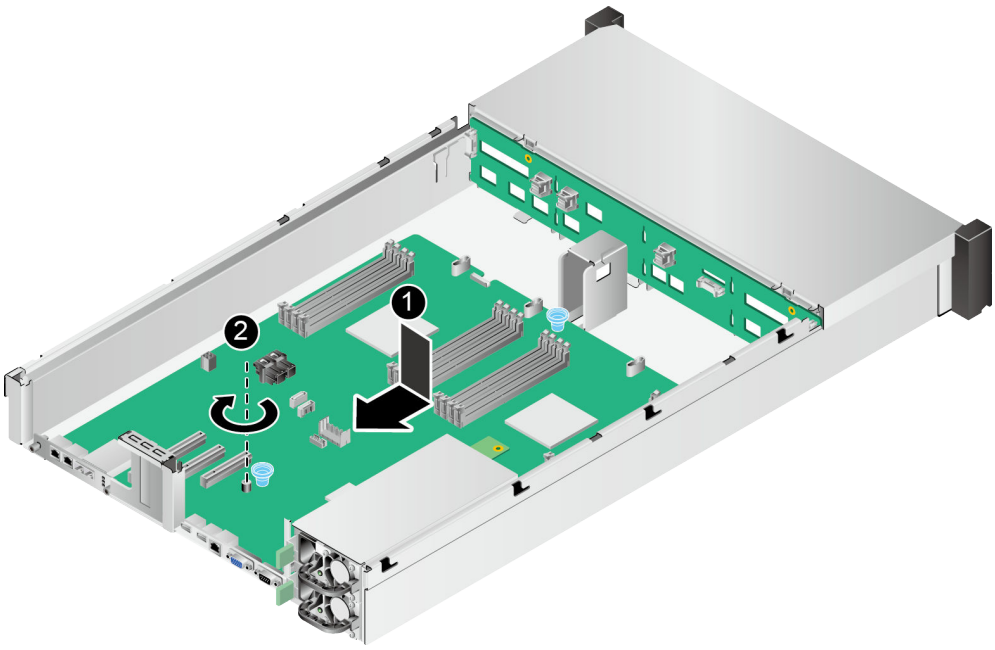
Hardware

A spare mainboard

Procedure

1. Read **1 Safety Instructions**.
2. Take the replacement mainboard out of its ESD bag.
3. Holding the handles on the mainboard, place the mainboard in the chassis and push the mainboard in the arrow direction as far as it will go. See (1) in **Figure 6-57**.
4. Tighten the screw that secures the mainboard using a Phillips screwdriver. See (2) in **Figure 6-57**.

Figure 6-57 Installing a mainboard

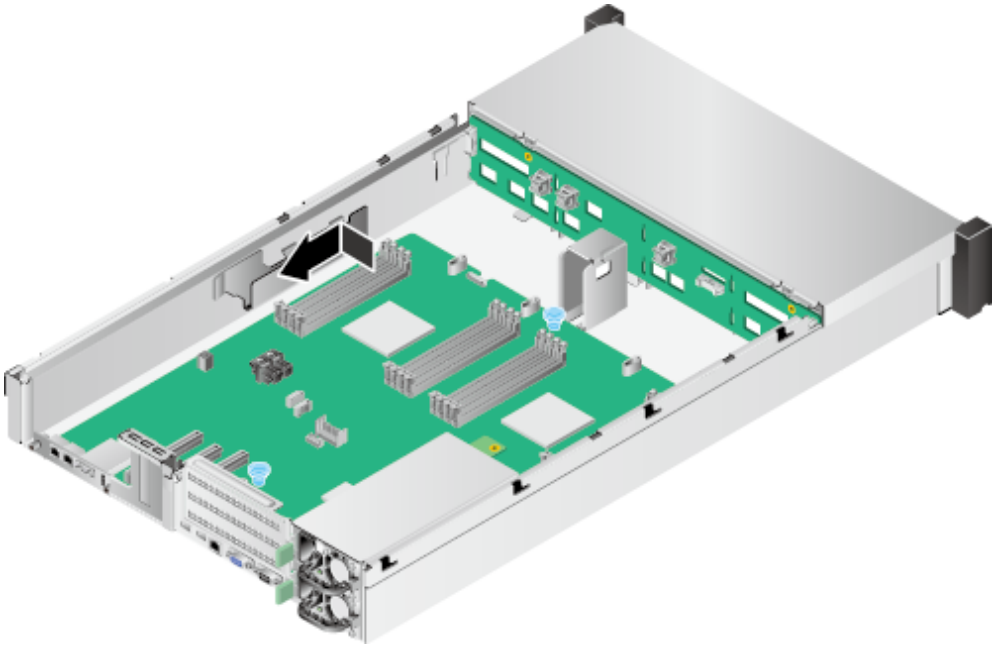


NOTE

To burn the original SN onto the new mainboard after replacement, contact Huawei engineers.

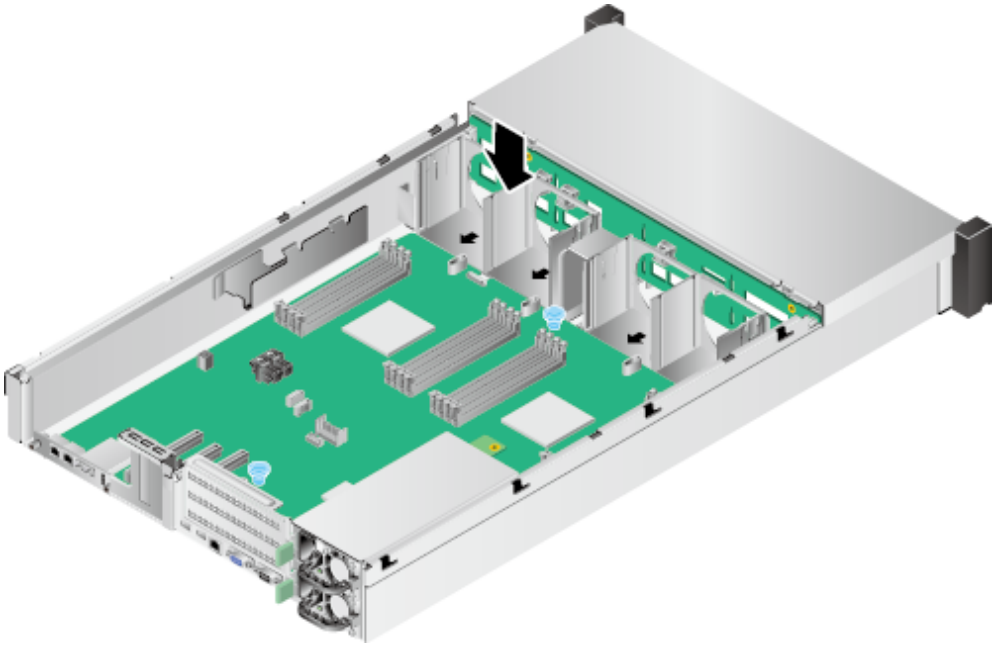
5. Place the cable organizer in the chassis, and push the cable organizer in the arrow direction as far as it will go. See **Figure 6-58**.

Figure 6-58 Installing a cable organizer



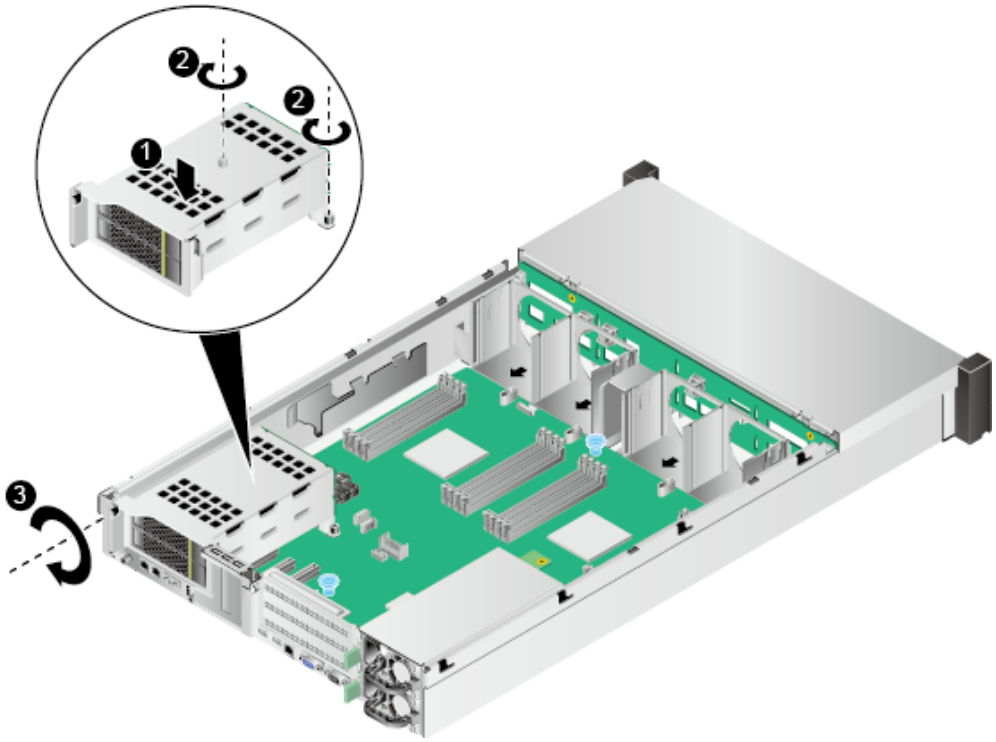
6. Install the fan module brackets in the chassis. See **Figure 6-59**.

Figure 6-59 Installing a fan module bracket



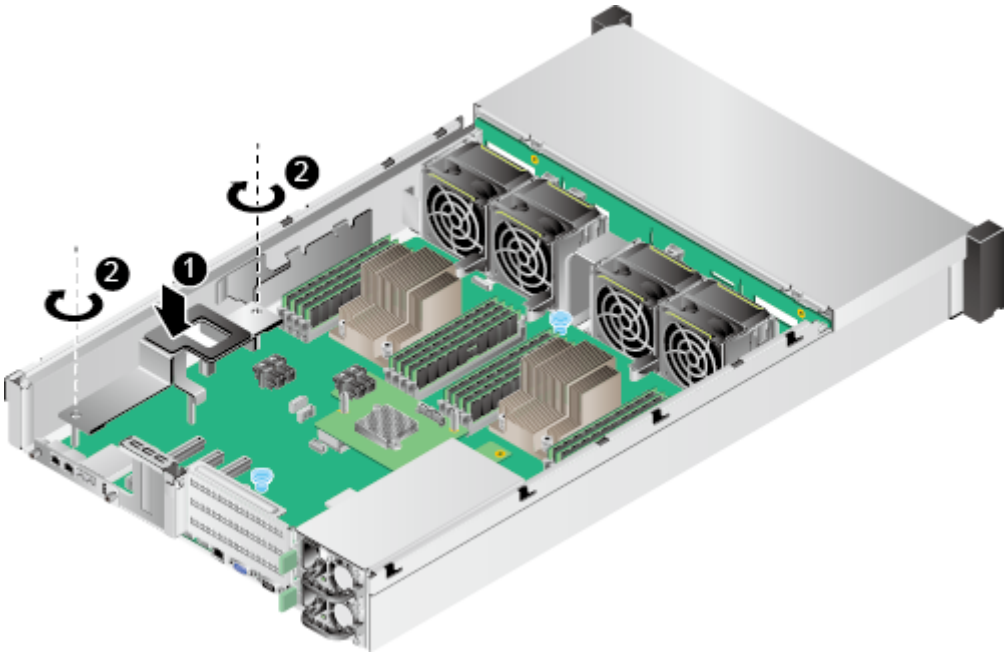
7. Place the rear drive module into the right location, and tighten the screws to secure the module. See (1), (2), and (3) in **Figure 6-60**.

Figure 6-60 Installing a rear drive module



8. Install the fan modules. For details, see **6.11 Installing a Fan Module**.
9. Install the heat sinks. For details, see **6.27 Installing a Heat Sink**.
10. Install the DIMMs. For details, see **6.29 Installing a DIMM**.
11. Install the RAID controller card. For details, see **6.21 Installing a Screw-in RAID Controller Card**.
12. Install the PSU backplane. For details, see **6.37 Installing a PSU Backplane**.
13. Install the PSUs. For details, see **6.5 Installing an AC PSU**.
14. (Optional) If the server is configured with three WX 5100 GPUs, configure a GPU card tray. Loosen the three screws on the new mainboard, and install the three studs removed from the original mainboard. Vertically install the GPU card tray on the studs, and tighten the two screws on the tray using a Phillips screwdriver. See steps (1) and (2) in **Figure 6-61**.

Figure 6-61 Installing the WX 5100 GPU card tray

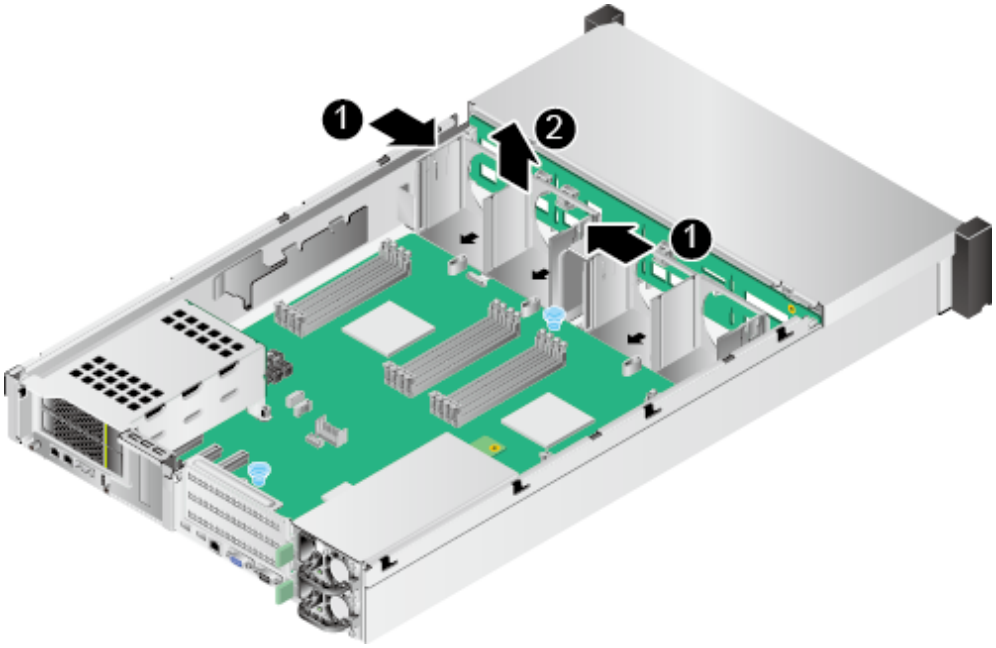


15. Install the riser card. For details, see **6.13 Installing a Riser Card**.
16. Connect the cables to the mainboard. For details, see **2.8 Internal Cabling**.
17. Install the air duct. For details, see **6.9 Installing an Air Duct**.
18. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
19. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
20. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
21. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.32 Removing a Front Drive Backplane

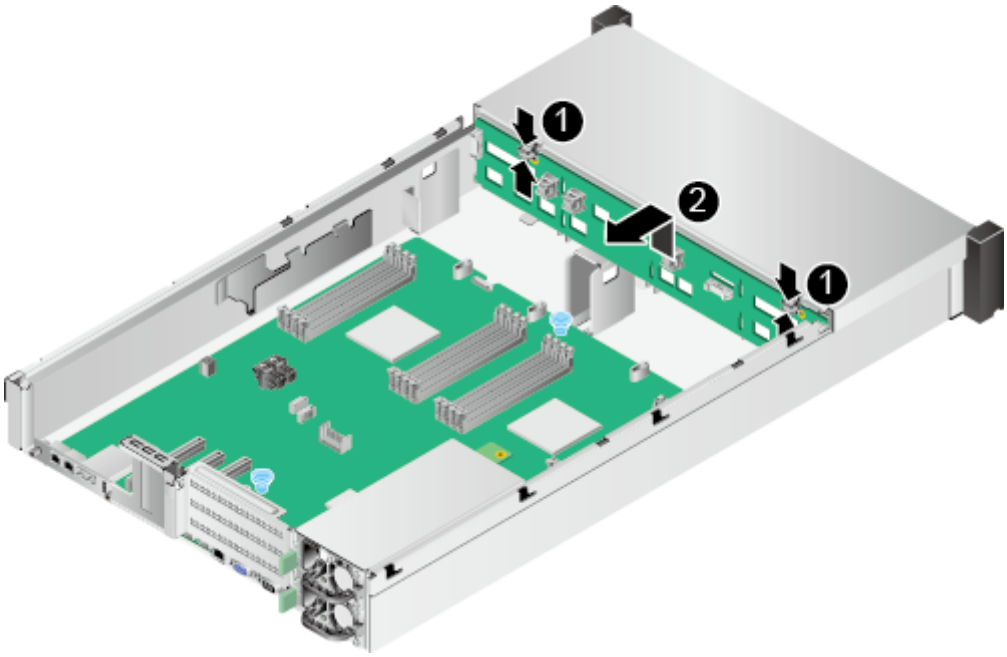
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove all drives. For details, see **6.2 Removing a Drive**.
7. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
8. Remove all fan modules. For details, see **6.10 Removing a Fan Module**.
9. Press and hold down the latches on both sides of a fan module bracket, and lift the bracket. See (1) and (2) in **Figure 6-62**.

Figure 6-62 Removing a fan module bracket



10. Remove all cables from the drive backplane. For details, see **2.8 Internal Cabling**.
11. Hold down and open the latches on the backplane, lift the backplane as far as it will go, and pull it out in the arrow direction. See **Figure 6-63**.

Figure 6-63 Removing a drive backplane

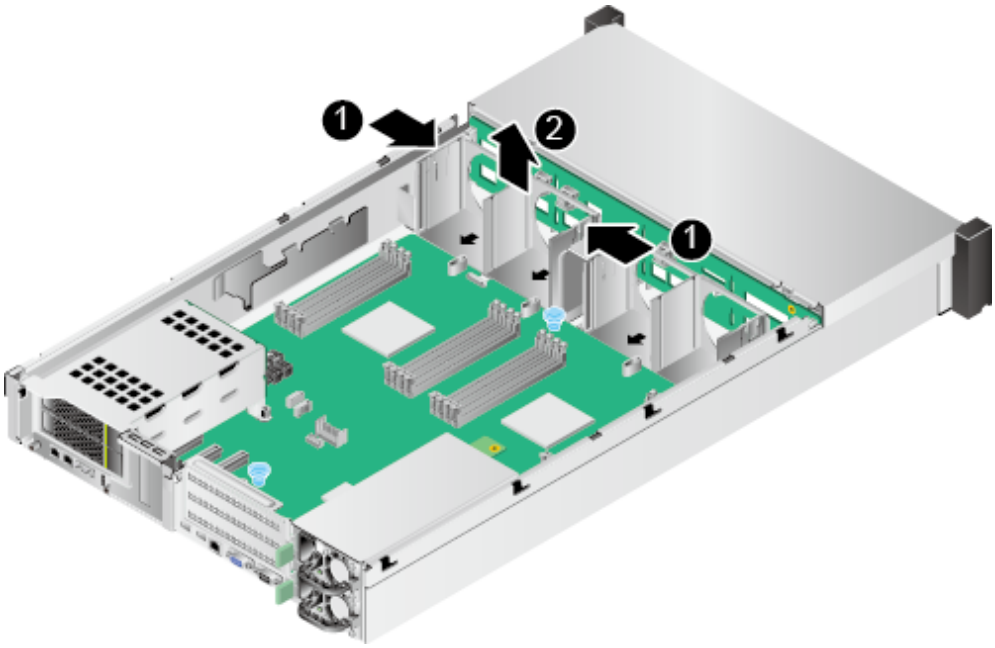


12. Place the removed drive backplane in an ESD bag.

6.33 Installing a Front Drive Backplane

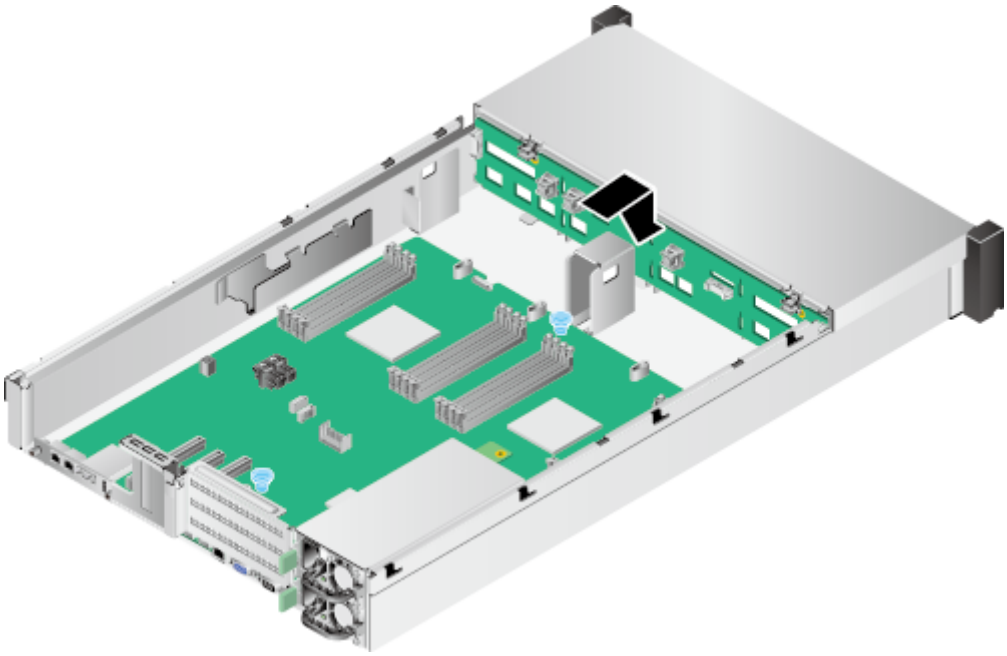
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove all drives. For details, see **6.2 Removing a Drive**.
7. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
8. Remove all fan modules. For details, see **6.10 Removing a Fan Module**.
9. Press and hold down the latches on both sides of a fan module bracket, and lift the bracket. See (1) and (2) in **Figure 6-64**.

   Figure 6-64 Removing a fan module bracket



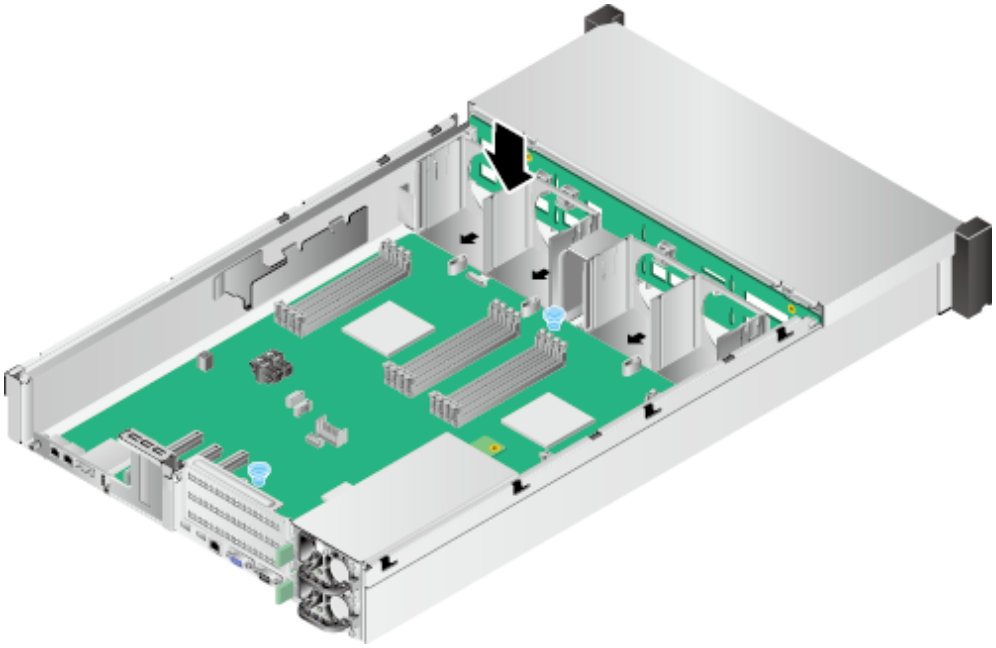
10. Remove all cables from the drive backplane. For details, see **2.8 Internal Cabling**.
11. Take a spare drive backplane out of its ESD bag.
12. Hook the drive backplane, and push it in the arrow direction until the latches are locked and it does not move. See **Figure 6-65**.

Figure 6-65 Installing a drive backplane



13. Connect the cables for the front backplane. For details, see **2.8 Internal Cabling**.
14. Install all drives. For details, see **6.3 Installing a Drive**.
15. Insert the fan module bracket into the chassis, as shown in **Figure 6-66**.

Figure 6-66 Installing a fan module bracket



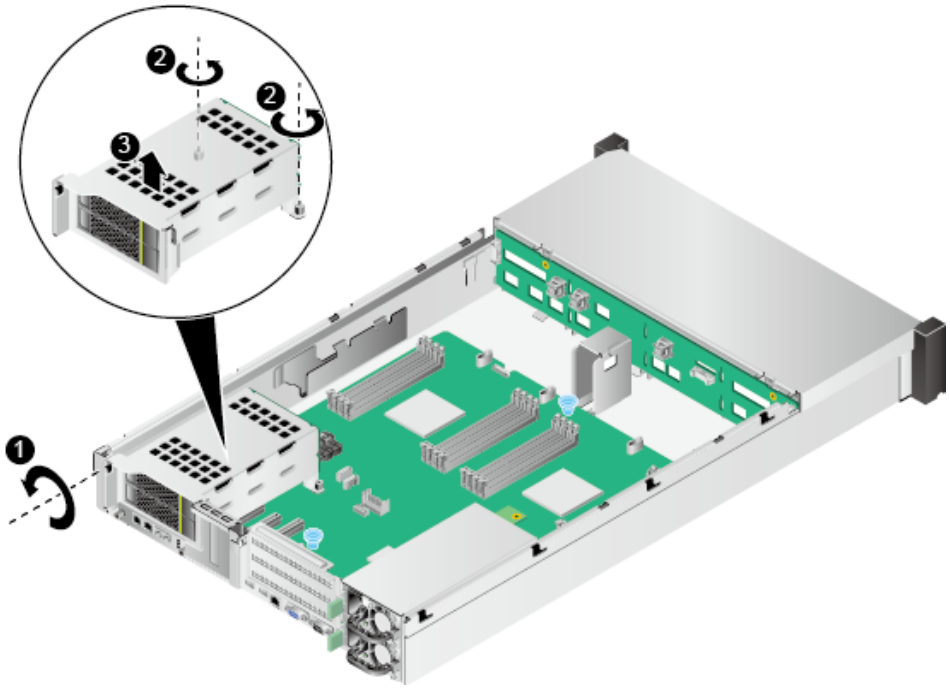
16. Install the fan modules. For details, see **6.11 Installing a Fan Module**.
17. Remove the cables between the drive backplane and the mainboard and between the drive backplane and the RAID controller card. For details, see **2.8 Internal Cabling**.

18. Install the air duct. For details, see **6.9 Installing an Air Duct**.
19. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
20. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
21. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
22. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.34 Removing a Rear Drive Backplane

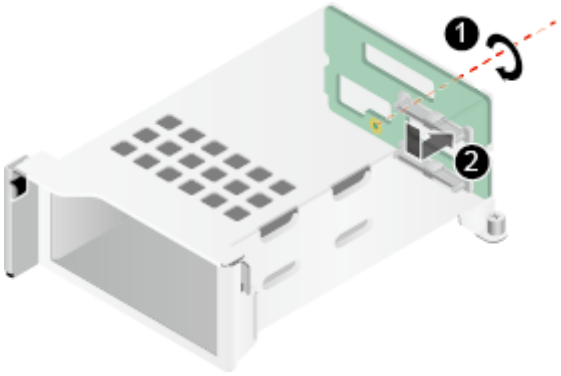
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove all cables from the rear drive module. For details, see **2.8 Internal Cabling**.
7. Loosen the screws that secure the rear drive module. See (1) and (2) in **Figure 6-67**.

Figure 6-67 Removing a rear drive module



8. Lift the rear drive module. See (3) in **Figure 6-54**.
9. Remove all drives from the drive module.
10. Unscrew the rear drive backplane and remove it in arrow direction. See **Figure 6-68**.

Figure 6-68 Removing the 2-bay rear drive backplane

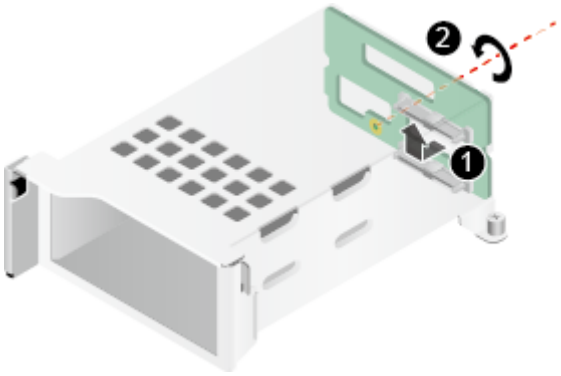


11. Place the removed drive backplane in an ESD bag.

6.35 Installing a Rear Drive Backplane

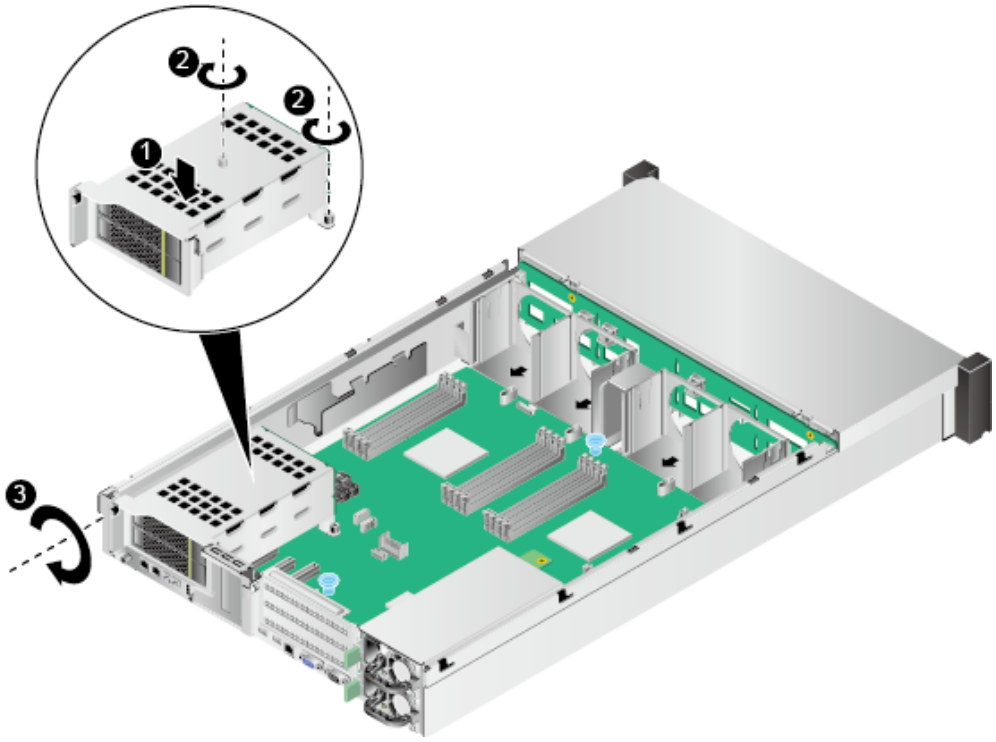
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Take a spare rear drive backplane out of its ESD bag.
7. Install the rear drive backplane in the rear drive module, and tighten the screw that secures the rear drive backplane. See (1) and (2) in **Figure 6-69**.

Figure 6-69 Installing a two-bay rear drive backplane



8. Install all drives in the rear drive backplane.
9. Place the rear drive module in the correct position, and tighten the screws on the rear drive module. See steps (1), (2), and (3) in **Figure 6-70**.

Figure 6-70 Installing a rear drive module



10. Connect cables to the rear drive backplane. For details, see **2.8 Internal Cabling**.
11. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
12. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
13. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
14. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.36 Removing a PSU Backplane

This section describes how to remove a PSU backplane.

Scenario

Remove the PSU backplane before replacing it with a new one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

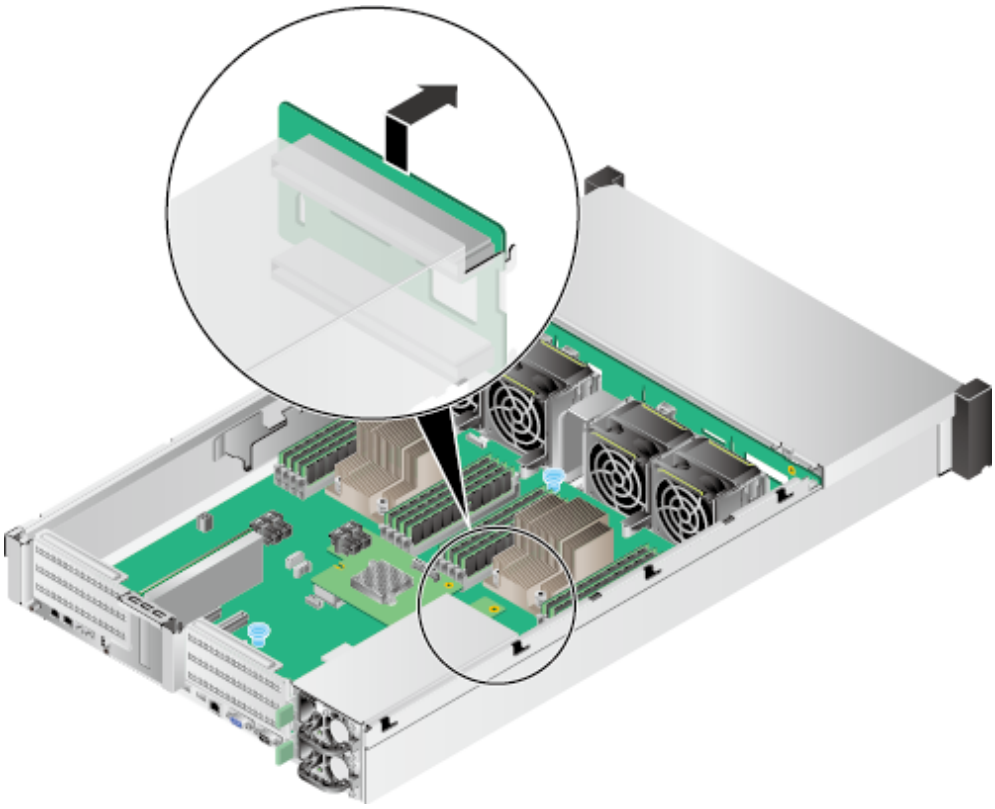
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Remove PSUs. For details, see **6.4 Removing an AC PSU**.
8. Remove all cables from the PSU backplane.
9. Lift the PSU backplane to remove it. See **Figure 6-71**.

Figure 6-71 Removing a PSU Backplane



10. Place the removed PSU backplane in an ESD bag.

6.37 Installing a PSU Backplane

This section describes how to install a PSU backplane.

Scenario

Install a PSU backplane to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags

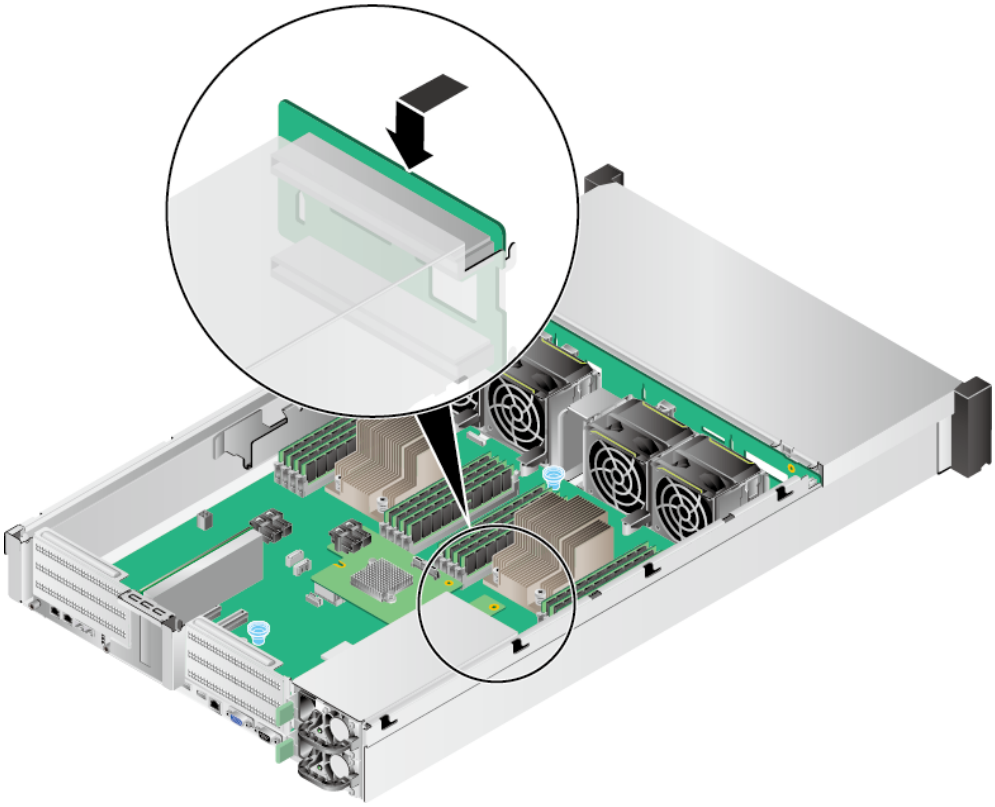
Hardware

A spare PSU backplane

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Remove PSUs. For details, see **6.4 Removing an AC PSU**.
8. Take the spare PSU backplane out of the ESD bag.
9. Place the PSU backplane in the planned position, and push it downward until it cannot move, as shown in **Figure 6-72**.

Figure 6-72 Installing a PSU backplane



10. Install the air duct. For details, see **6.9 Installing an Air Duct**.
11. Install the PSUs. For details, see **6.5 Installing an AC PSU**.
12. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
13. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
14. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
15. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.38 Removing a Left Mounting Ear

This section describes how to remove a left mounting ear.

Scenario

Remove a left mounting ear before replacing it with a new one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags
- Phillips screwdriver

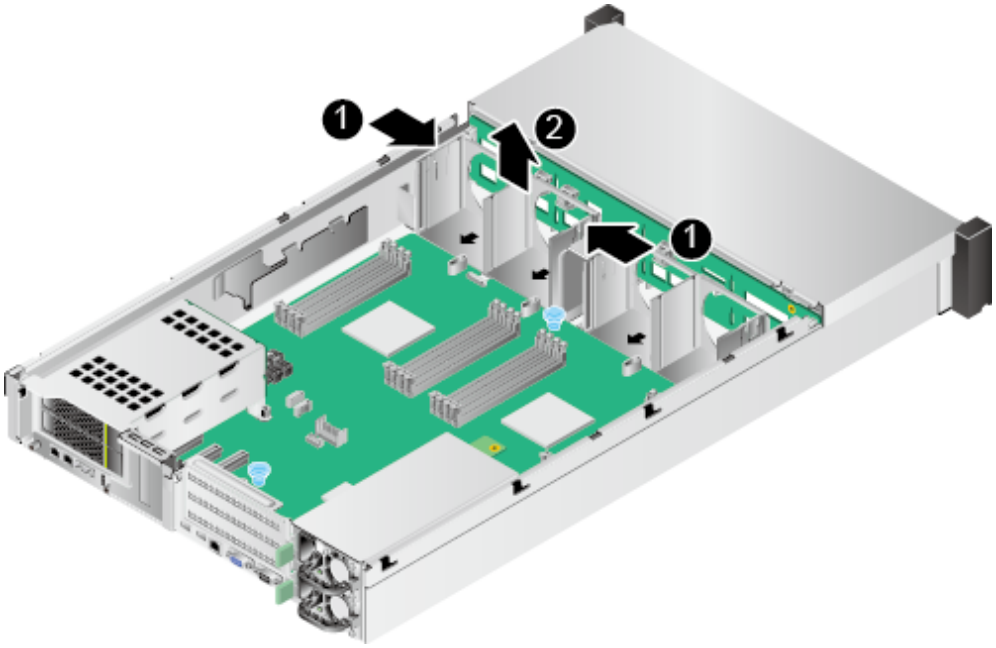
Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Determine the position of the left mounting ear on the TaiShan 2280 server. See **Figure 6-73**.

Figure 6-73 Position of the left mounting ear

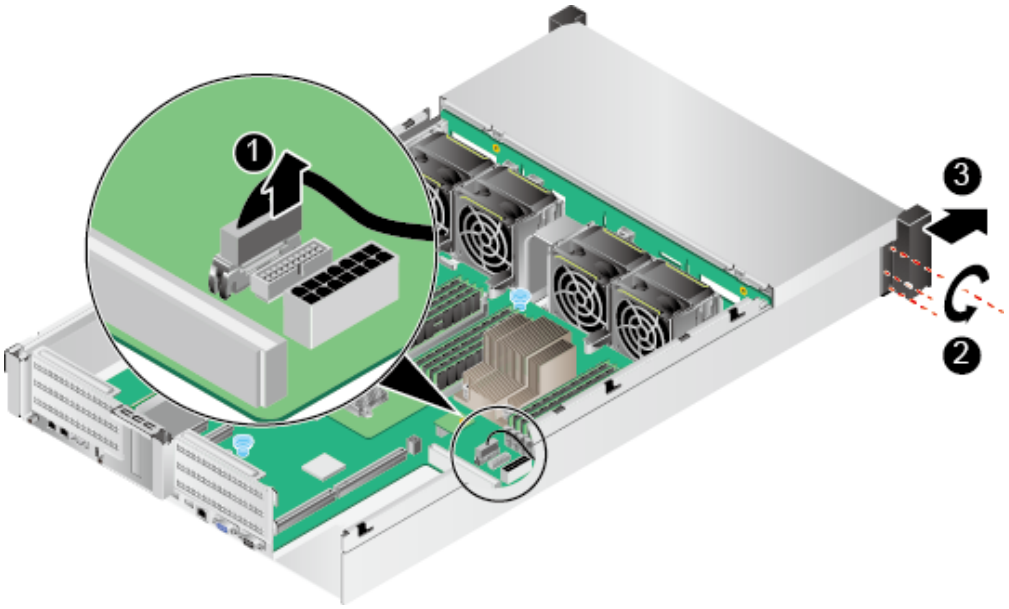
6. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
7. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
8. Remove all fan modules. For details, see **6.10 Removing a Fan Module**.
9. Press and hold down the latches on both sides of a fan module bracket, and lift the bracket. See (1) and (2) in **Figure 6-74**.

Figure 6-74 Removing a fan module bracket



10. Press and hold down the latch of the left mounting ear signal cable, and remove the cable in the arrow direction. See (1) in **Figure 6-75**.

Figure 6-75 Removing a left mounting ear



11. Loosen the screws. See (2) in **Figure 6-75**.
12. Remove the left mounting ear in the arrow direction and slowly pull the mounting ear signal cable out of the chassis along the chassis interior surface. See step (3) in **Figure 6-75**.
13. Place the removed left mounting ear in an ESD bag.

6.39 Installing a Left Mounting Ear

This section describes how to install a left mounting ear.

Scenario

Install a left mounting ear to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags
- Phillips screwdriver

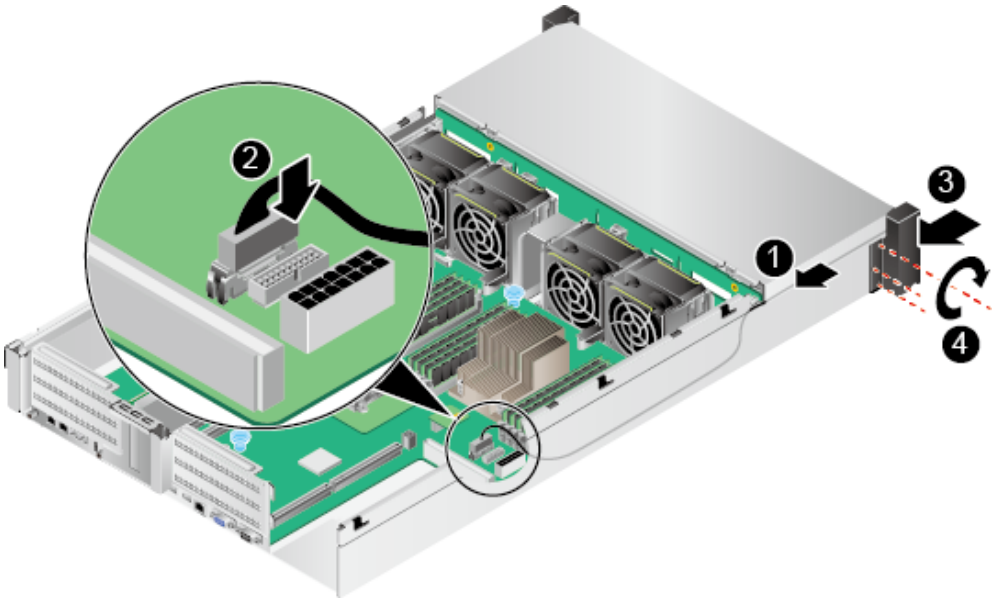
Hardware

A spare left mounting ear

Procedure

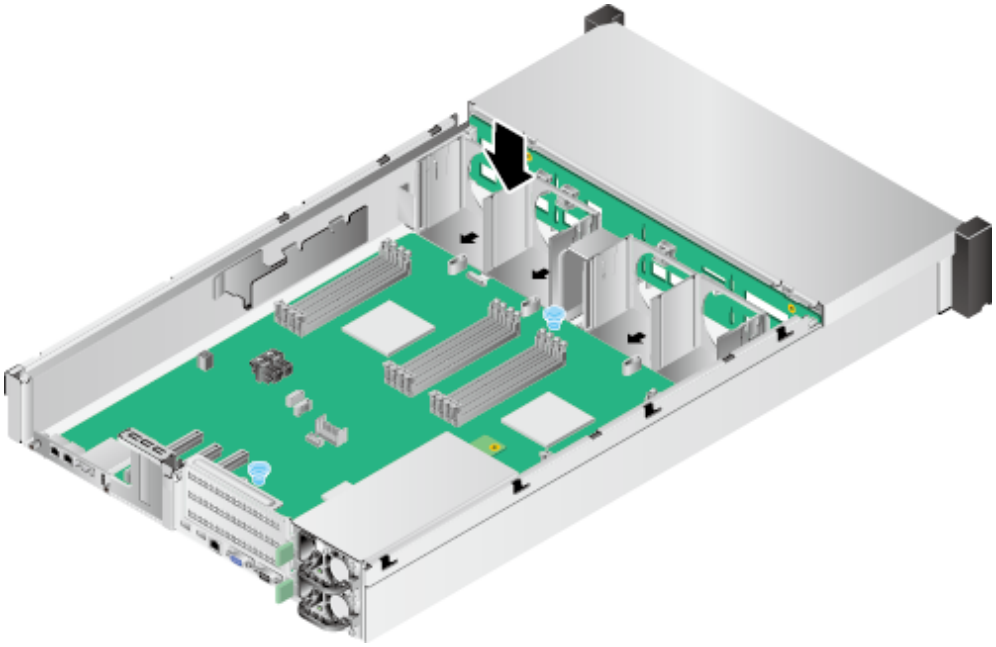
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the left mounting ear to be replaced. For details, see **6.38 Removing a Left Mounting Ear**.
4. Take the spare left mounting ear plate out of its ESD bag.
5. Route the left mounting ear signal cable through the chassis in the arrow direction. See (1) in **Figure 6-76**.

Figure 6-76 Installing a left mounting ear



6. Connect the mounting ear signal cable to the left mounting ear connector (J162) on the mainboard. See step (2) in **Figure 6-76**.
7. Install the mounting ear in the arrow direction, as shown in step (3) in **Figure 6-76**.
8. Tighten the screws. See (4) in **Figure 6-76**.
9. Insert the fan module bracket into the chassis, as shown in **Figure 6-77**.

Figure 6-77 Installing a fan module bracket



10. Install the fan modules. For details, see **6.11 Installing a Fan Module**.
11. Install the air duct. For details, see **6.9 Installing an Air Duct**.
12. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.

13. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
14. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
15. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

6.40 Removing a Right Mounting Ear

This section describes how to remove a right mounting ear.

Scenario

Remove the right mounting ear before replacing it with a new one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

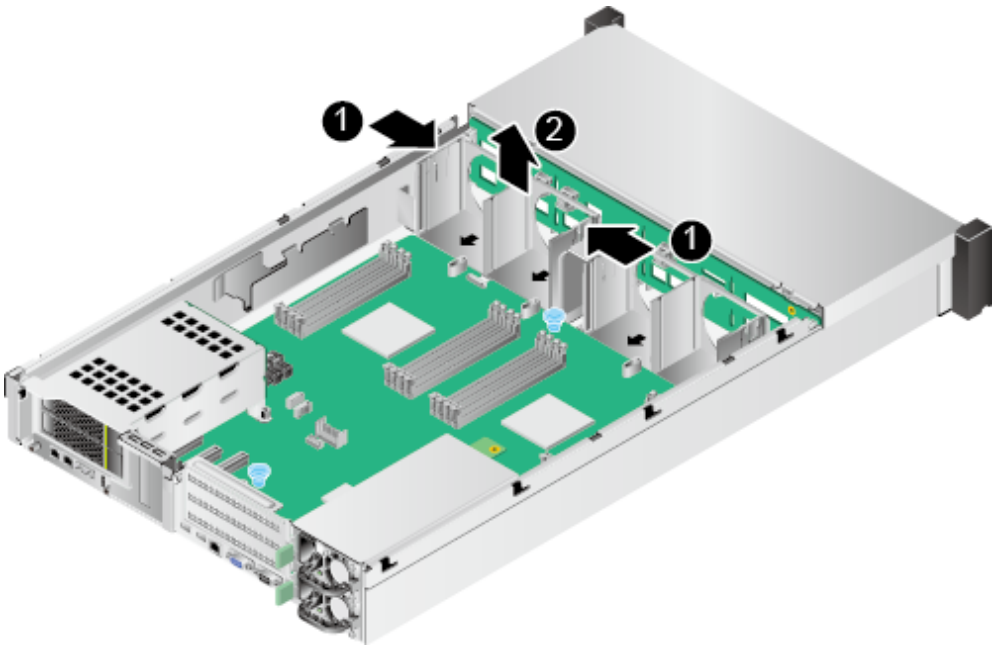
Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags
- Phillips screwdriver

Procedure

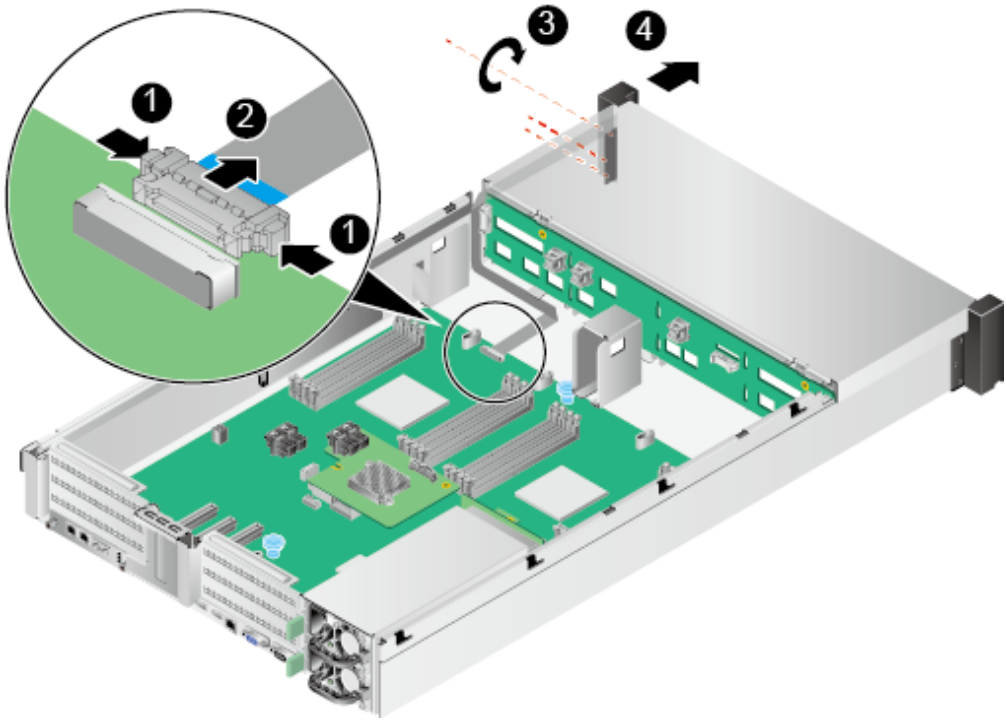
1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the power cables. For details, see **6.4 Removing an AC PSU**.
4. Remove the TaiShan 2280 server. For details, see **3.5 Removing the TaiShan 2280**. Place the TaiShan 2280 server on an ESD desktop.
5. Remove the chassis cover. For details, see **6.6 Removing the Chassis Cover**.
6. Remove the air duct. For details, see **6.8 Removing an Air Duct**.
7. Remove all fan modules. For details, see **6.10 Removing a Fan Module**.
8. Press and hold down the latches on both sides of a fan module bracket, and lift the bracket. See (1) and (2) in **Figure 6-78**.

Figure 6-78 Removing a fan module bracket



9. Press and hold down the latch of the right mounting ear signal cable, and remove the cable in the arrow direction. See (1) and (2) in **Figure 6-79**.

Figure 6-79 Removing the right mounting ear



10. Loosen the screws. See (3) in **Figure 6-79**.
11. Remove the right mounting ear in the arrow direction and slowly pull the mounting ear signal cable out of the chassis along the chassis interior surface. See step (4) in **Figure 6-79**.
12. Place the removed right mounting ear in an ESD bag.

6.41 Installing a Right Mounting Ear

This section describes how to install a right mounting ear.

Scenario

Install a right mounting ear to replace the faulty one.

Conditions

Prerequisites

None.

Data

You have determined the cabinet number and chassis number of the TaiShan 2280 and labeled its panel to prevent misoperations.

Tools

- ESD gloves or ESD wrist strap
- Packing materials, for example, ESD bags
- Phillips screwdriver

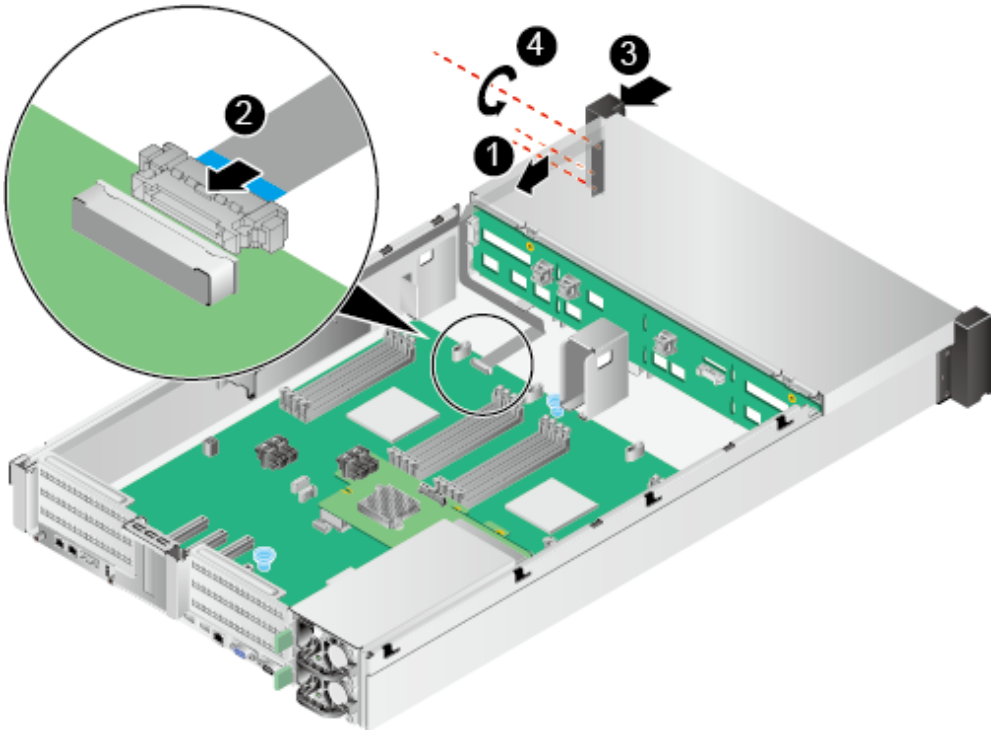
Hardware

A spare right mounting ear

Procedure

1. Read **1 Safety Instructions**.
2. Power off the TaiShan 2280 server. For details, see **4.2 Powering Off the Server**.
3. Remove the right mounting ear to be replaced. For details, see **6.40 Removing a Right Mounting Ear**.
4. Take a spare right mounting ear out of its ESD bag.
5. Route the right mounting ear signal cable through the chassis in the arrow direction. See (1) in **Figure 6-80**.

Figure 6-80 Installing a right mounting ear

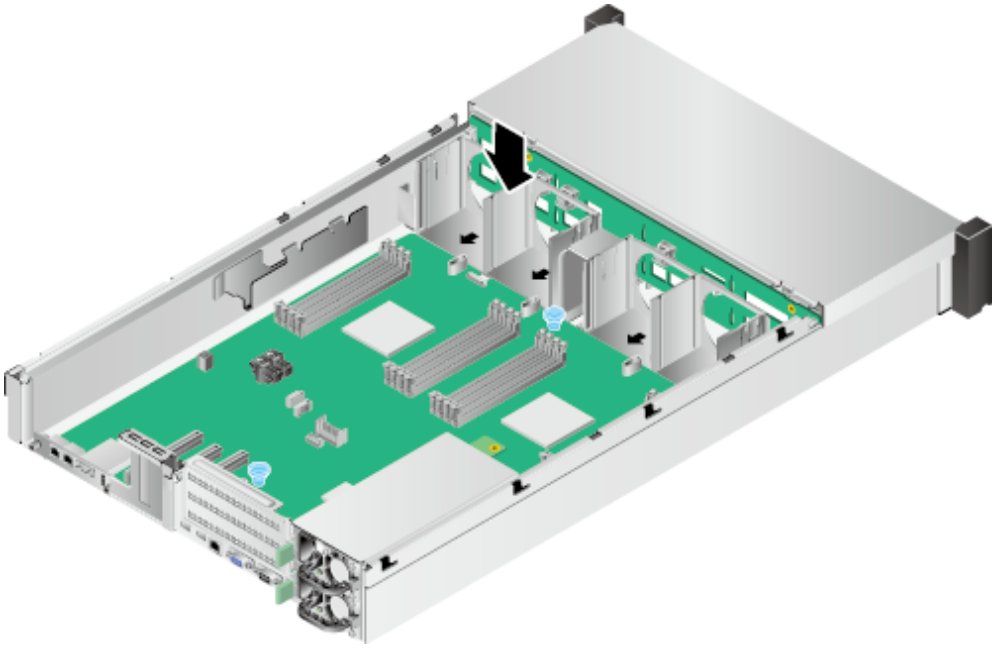


6. Remove the adhesive backing from the signal cable and route the signal cable along the mark on the chassis. Bend the signal cable only along its black lines. See **Figure 6-80**.
7. Connect the right mounting ear signal cable to the right mounting ear connector (J43) on the mainboard. See (2) in **Figure 6-80**.

   NOTE

   Ensure that the blue side of the signal cable faces upwards when connecting the cable. Do not use excessive force when connecting or removing the cable.
8. Install the right mounting ear in the arrow direction. See step (3) in **Figure 6-80**.
9. Tighten the screws. See (4) in **Figure 6-80**.
10. Insert the fan module bracket into the chassis, as shown in **Figure 6-81**.

Figure 6-81 Installing a fan module bracket



11. Install the fan modules. For details, see **6.11 Installing a Fan Module**.
12. Install the air duct. For details, see **6.9 Installing an Air Duct**.
13. Install the chassis cover. For details, see **6.7 Installing a Chassis Cover**.
14. Install the TaiShan 2280 server. For details, see **3.3 Installing the TaiShan 2280**.
15. Connect the power cables. For details, see **6.5 Installing an AC PSU**.
16. Power on the TaiShan 2280 server. For details, see **4.1 Powering On the Server**.

7 Troubleshooting

For details about troubleshooting, see **TaiShan Server Troubleshooting**, which covers:

- Troubleshooting process
- Fault information collection
- Fault diagnosis
- Software and firmware upgrade
- Preventive maintenance

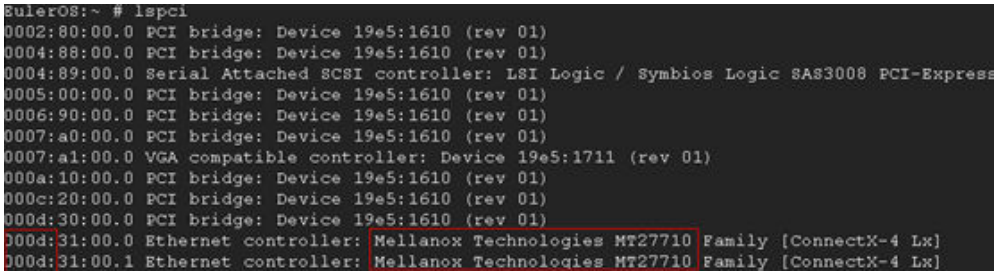
8 Cases

8.1 Optimizing Mellanox NIC Performance

Preparations

- Obtain the performance optimization script package from **http://www.mellanox.com/downloads/tools/mlnx_tuning_scripts.tar.gz**.
- Run the **lspci** command to query the **PCIe segment** domain value of the Mellanox NIC. As shown in **Figure 8-1**, the **PCIe segment** of the Mellanox NIC is **000d**, indicating that the NIC is connected to the secondary CPU.

Figure 8-1 Querying the PCIe segment of the Mellanox NIC



NOTE

- If the value of **PCIe segment** ranges from 0000 to 0007, the NIC connects to the primary CPU.
- If the value of **PCIe segment** ranges from 0008 to 000f, the NIC connects to the secondary CPU.

Optimizing MT27630 ConnectX®-4 10GE NIC Performance

The optimization procedure is as follows:

1. Decompress the Mellanox performance optimization script package **mlnx_tuning_scripts.tar.gz** to obtain the **set_irq_affinity_cpulist.sh** script.

   NOTICE

   If security hardening is configured on the OS (such as EulerOS), the irqbalance service cannot be stopped. You need to run the **systemctl start polkit** command to modify the configuration permission first.

   Run the **systemctl stop irqbalance.service** command to stop the irqbalance service.

2. Run the **set_irq_affinity.sh** script to configure NIC interrupt binding. Run the **./set_irq_affinity_cpulist.sh 32-35 eth0** command to bind the eth0 interrupt of the Mellanox NIC to cores 32 to 35 of the secondary CPU, as shown in **Figure 8-2**.

   NOTE

   It is recommended that **four CPU cores be bound to each NIC**. To connect the NIC to the primary CPU, set IRQ affinity with cores of the primary CPU; to connect the NIC to the secondary CPU, set IRQ affinity with cores of the secondary CPU.

   Figure 8-2 Setting NIC IRQ affinity

```
localhost:~/mlnx_tuning_scripts_package # ./set_irq_affinity_cpulist.sh 32-35 eth0
Discovered irqs for eth0: 1178 1179 1181 1182 1184 1185 1187 1188 1190 1191 1193 1194 1196
Assign irq 1178 core_id 32
Assign irq 1179 core_id 33
Assign irq 1181 core_id 34
Assign irq 1182 core_id 35
Assign irq 1184 core_id 32
Assign irq 1185 core_id 33
Assign irq 1187 core_id 34
Assign irq 1188 core_id 35
Assign irq 1190 core_id 32
Assign irq 1191 core_id 33
Assign irq 1193 core_id 34
Assign irq 1194 core_id 35
Assign irq 1196 core_id 32
Assign irq 1197 core_id 33
Assign irq 1199 core_id 34
Assign irq 1200 core_id 35
Assign irq 1202 core_id 32
Assign irq 1203 core_id 33
Assign irq 1205 core_id 34
Assign irq 1206 core_id 35
Assign irq 1208 core_id 32
Assign irq 1209 core_id 33
Assign irq 1211 core_id 34
Assign irq 1212 core_id 35
Assign irq 1214 core_id 32
Assign irq 1215 core_id 33
Assign irq 1217 core_id 34
Assign irq 1218 core_id 35
Assign irq 1220 core_id 32
Assign irq 1221 core_id 33
Assign irq 1223 core_id 34
Assign irq 1224 core_id 35

done.
```

3. Perform Mellanox NIC service tests.

Optimizing MT27630 ConnectX®-4 Single-Port 25GE NIC Performance

The optimization procedure is as follows:

1. Decompress the Mellanox performance optimization script package **mlnx_tuning_scripts.tar.gz** to obtain the **set_irq_affinity_cpulist.sh** script.

   NOTICE

   If security hardening is configured on the OS (such as EulerOS), the irqbalance service cannot be stopped. You need to run the **systemctl start polkit** command to modify the configuration permission first.

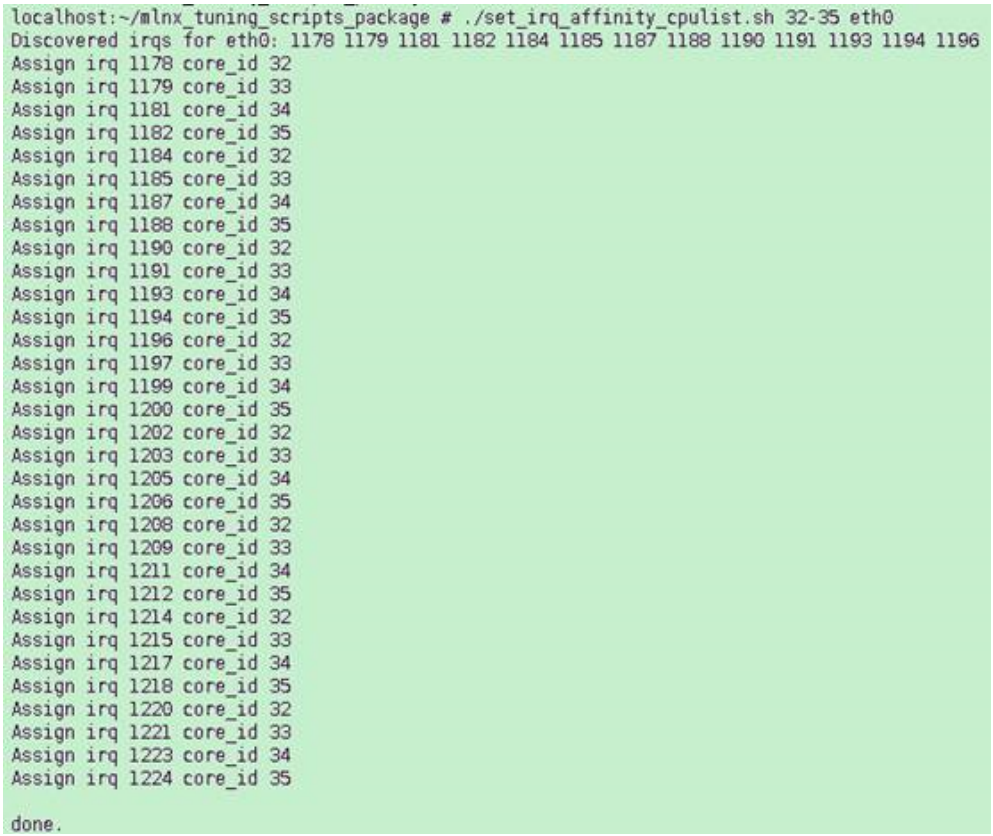
   Run the **systemctl stop irqbalance.service** command to stop the irqbalance service.

2. Run the **set_irq_affinity.sh** script to configure NIC interrupt binding. Run the **./set_irq_affinity_cpulist.sh 32-35 eth0** command to bind the eth0 interrupt of the Mellanox NIC to cores 32 to 35 of the secondary CPU, as shown in **Figure 8-3**.

   NOTE

   It is recommended that **four CPU cores be bound to each NIC**. To connect the NIC to the primary CPU, set IRQ affinity with cores (0 to 31) of the primary CPU; to connect the NIC to the secondary CPU, set IRQ affinity with cores (32 to 63) of the secondary CPU.

Figure 8-3 Setting NIC IRQ affinity



3. Perform Mellanox NIC service tests.

Optimizing MT27630 ConnectX®-4 Dual-Port 25GE NIC Performance

The optimization procedure is as follows:

1. Decompress the Mellanox performance optimization script package **mlnx_tuning_scripts.tar.gz** to obtain the **set_irq_affinity_cpulist.sh** script.

   NOTICE

   If security hardening is configured on the OS (such as EulerOS), the irqbalance service cannot be stopped. You need to run the **systemctl start polkit** command to modify the configuration permission first.

   Run the **systemctl stop irqbalance.service** command to stop the irqbalance service.

2. Run the **set_irq_affinity.sh** script to configure NIC interrupt binding. Run the **./set_irq_affinity_cpulist.sh 32-35 eth0** command to bind the eth0 interrupt of the Mellanox NIC to cores 32 to 35 of the secondary CPU, as shown in **Figure 8-4**.

   NOTE

   It is recommended that **four CPU cores be bound to each NIC**. To connect the NIC to the primary CPU, set IRQ affinity with cores (0 to 31) of the primary CPU; to connect the NIC to the secondary CPU, set IRQ affinity with cores (32 to 63) of the secondary CPU.

Figure 8-4 Setting NIC IRQ affinity

```
localhost:~/mlnx_tuning_scripts_package # ./set_irq_affinity_cpulist.sh 32-35 eth0
Discovered irqs for eth0: 1178 1179 1181 1182 1184 1185 1187 1188 1190 1191 1193 1194 1196
Assign irq 1178 core_id 32
Assign irq 1179 core_id 33
Assign irq 1181 core_id 34
Assign irq 1182 core_id 35
Assign irq 1184 core_id 32
Assign irq 1185 core_id 33
Assign irq 1187 core_id 34
Assign irq 1188 core_id 35
Assign irq 1190 core_id 32
Assign irq 1191 core_id 33
Assign irq 1193 core_id 34
Assign irq 1194 core_id 35
Assign irq 1196 core_id 32
Assign irq 1197 core_id 33
Assign irq 1199 core_id 34
Assign irq 1200 core_id 35
Assign irq 1202 core_id 32
Assign irq 1203 core_id 33
Assign irq 1205 core_id 34
Assign irq 1206 core_id 35
Assign irq 1208 core_id 32
Assign irq 1209 core_id 33
Assign irq 1211 core_id 34
Assign irq 1212 core_id 35
Assign irq 1214 core_id 32
Assign irq 1215 core_id 33
Assign irq 1217 core_id 34
Assign irq 1218 core_id 35
Assign irq 1220 core_id 32
Assign irq 1221 core_id 33
Assign irq 1223 core_id 34
Assign irq 1224 core_id 35

done.
```

3. Disable the network ports of the Mellanox NIC. For example, the network ports of the Mellanox NIC are eth0 and eth1. Run the **ifconfig eth0 down** and **ifconfig eth1 down** commands.

NOTICE

After a network port is disabled (for example, after the **ifconfig down** command is executed), you need to perform the following operation to bind the NIC descriptor to enable the network port. The operation is not required when the connected network port is disabled or the physical link is disconnected.

4. Bind the NIC descriptor to a single CPU.

NOTE

- To connect the NIC to the primary CPU, bind the NIC descriptor to the cores (0 to 31) of the primary CPU.
- To connect the NIC to the secondary CPU, bind the NIC descriptor to the cores (32 to 63) of the secondary CPU.

For example, the network ports of the Mellanox NIC are eth0 and eth1, and the corresponding IP addresses are 192.168.1.10 and 192.168.2.11. Run the **taskset -c 32-63 ifconfig eth0 192.168.1.10/24** and **taskset -c 32-63 ifconfig eth1 192.168.2.11/24** commands to bind the NIC descriptor to cores (32 to 63) of the secondary CPU.

NOTICE

If a Mellanox dual-port 25GE NIC is used, the increase of service threads may result in the decline in total bandwidth.

5. Bind service processes or test processes to a single CPU.

   NOTE

   - To connect the NIC to the primary CPU, bind the NIC descriptor to the cores (0 to 31) of the primary CPU.
   - To connect the NIC to the secondary CPU, bind the NIC descriptor to the cores (32 to 63) of the secondary CPU.

   If the test tool is iperf and the NIC connects to the secondary CPU, run the **taskset -c 32-63 iperf -c 192.168.22.22 -p 10000 -P 100 -t 1000 -i 1|grep SUM** command to bind the iperf client process to CPU cores 32 to 63.

8.2 Optimizing Onboard XGE NIC Performance

Principles

1. Interrupt-core binding optimization
   a. Default core binding

      During the initialization, the XGE NIC driver binds the interrupts in the RX and TX queues to different CPU cores. 16 groups of queues (16 RX queues +16 TX queues) that correspond to a network port are bound to CPU cores 0 to 31. This binding ensures that each port can effectively use the processing capabilities of CPU cores, preventing CPU processing capability bottlenecks. In addition, the NIC driver implements optimization based on the specific core binding relationship to achieve optimal XGE NIC performance.

   b. irqbalance effect

      Enabling the irqbalance service will damage the core binding relationship during driver initialization. A small number of CPUs are preferentially used in full load. In this case, the multi-core advantage and the optimization on fixed core binding relationship do not take effect. As a result, the optimal performance cannot be achieved.

   c. Optimization method

      You can disable the irqbalance service and restore the default core binding relationship to optimize the XGE performance.
2. Interrupt aggregation parameter auto-adaption
   a. Default interrupt aggregation parameter

      NOTICE

      After the parameter is enabled, there are more interrupts when the traffic is heavy. In this case, the CPU usage is high, affecting the maximum bandwidth. The 10-thread bidirectional bandwidth is 9.2 Gbit/s or higher, but cannot be stably higher than 9.3 Gbit/s.

By default, the interrupt aggregation parameter is a fixed smaller value, and the interrupt aggregation degree is not high. Therefore, a single packet can be processed promptly.

b. Interrupt aggregation parameter auto-adaption

NOTICE

After the function is enabled, the delay of processing a single packet becomes longer. It is recommended that this function be disabled in scenarios that have short delay requirements.

After interrupt aggregation parameter auto-adaption is configured, the driver dynamically adjusts the interrupt aggregation degree based on the current traffic. In the case of heavy traffic, high degree of interrupt aggregation is implemented to reduce the CPU usage and improve the XGE performance to the line rate (about 9.4 Gbit/s).

Optimizing XGE NIC Performance

The optimization procedure is as follows:

1. Interrupt-core binding optimization

NOTICE

Before interrupt-core binding, stop the irqbalance service.

You can optimize the performance by disabling the irqbalance service by default or dynamically binding cores when the irqbalance service is started.

a. If the irqbalance service is not started by default, no additional optimization is required.

b. If the irqbalance service is started, stop the irqbalance service and bind cores again for optimization.

NOTICE

The core binding takes effect after the OS is restarted.

– Method 1: Setting the irqbalance service to be disabled by default during OS startup

NOTE

If the irqbalance service is disabled by default during OS startup, optimal performance can be achieved without any other optimization action.

- Disabling **euleros-security** and **irqbalance** on EulerOS

  1) Run the **systemctl disable euleros-security** command to disable **euleros-security**.

2) Run the **systemctl disable irqbalance** command to disable the irqbalance service.

3) After OS restart, the irqbalance service does not start by default.

- Disabling **irqbalance** in **euleros-security** on EulerOS

1) Run the **vi /usr/lib/systemd/system/euleros-security.service** command to open the **euleros-security.service** file and delete the **irqbalance.service** field, as shown in **Figure 8-5**.

Figure 8-5 Disabling the irqbalance service

2) Run the **systemctl disable irqbalance** command to disable the irqbalance service.

3) After OS restart, the irqbalance service does not start by default.

- Disabling the irqbalance service on other OSs

1) Run the **systemctl disable irqbalance** command to disable the irqbalance service.

2) After OS restart, the irqbalance service does not start by default.

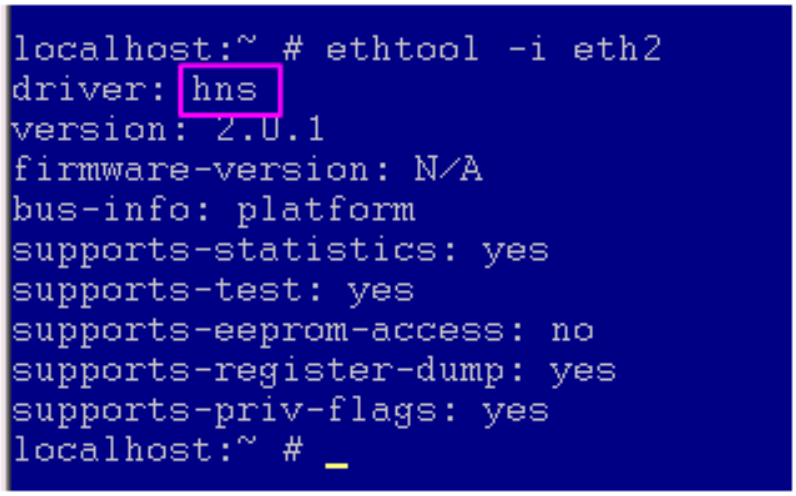
– Method 2: Stopping the irqbalance service after OS startup

NOTE

This method takes effect during OS running, but the core binding relationships are damaged after the irqbalance service is manually stopped. You need to perform core binding again for the interrupts in the queues.

i. Run the **ethtool -i eth2** command to query the NIC driver information and find the onboard XGE network port, as shown in **Figure 8-6**.

Figure 8-6 Querying NIC driver information



NOTE

The driver is **hns**, so **eth2** is an onboard network port.

ii. Run the **systemctl start polkit** command to modify the configuration permission.

iii. Run the **systemctl stop irqbalance.service** command to stop the irqbalance process.

NOTICE

Replace *eth2* with the actual XGE network port name.

Run **i=0; for irq_num_string in `cat /proc/interrupts | grep eth2-tx | awk {'print $1'}`; do irq_num=${irq_num_string/:/}; smp_v=$((1<<$i)); printf "%x" $smp_v >/proc/irq/$irq_num/smp_affinity; ((i=i+2)); done** to bind the 16 TX queues to the cores of even numbers in cores 0 to 31, as shown in **Figure 8-7**.

Figure 8-7 Binding TX queues to cores of even numbers

```
localhost:~ # i=0; for irq_num_string in `cat /proc/interrupts | grep eth2-tx |
awk {'print $1'}`; do irq_num=${irq_num_string/:/}; smp_v=$((1<<$i)); printf "%x
" $smp_v > /proc/irq/$irq_num/smp_affinity; ((i=i+2)); done
localhost:~ #
```

NOTICE

Replace *eth2* with the actual XGE network port name.

Run **i=1; for irq_num_string in `cat /proc/interrupts | grep eth2-rx | awk {'print $1'}`; do irq_num=${irq_num_string/:/}; smp_v=$((1<<$i)); printf "%x" $smp_v > /proc/irq/$irq_num/smp_affinity; ((i=i+2)); done** to bind the 16 RX queues to the cores of odd numbers in cores 0 to 31, as shown in **Figure 8-8**.

Figure 8-8 Binding RX queues to cores of odd numbers

```
localhost:~ # i=1; for irq_num_string in `cat /proc/interrupts | grep eth2-rx |
awk {'print $1'}`; do irq_num=${irq_num_string/:/}; smp_v=$((1<<$i)); printf "%x
" $smp_v > /proc/irq/$irq_num/smp_affinity; ((i=i+2)); done
localhost:~ #
```

2. (Optional) Interrupt aggregation parameter auto-adaption

   a. Query the current interrupt aggregation parameter. **Figure 8-9** uses eth2 as an example.

      Run the **ethtool -c eth2** command. The command output indicates that the current interrupt aggregation parameter is **rx-usecs 30 tx-usecs30 rx-frames 50 tx-frames 50**.

NOTICE

Record the command output. The values in the output are required in subsequent settings. The values vary according to OSs and thus are for reference only.

Figure 8-9 Querying the interrupt aggregation parameter

```
localhost:~ # ethtool -c eth2
Coalesce parameters for eth2:
Adaptive RX: on  TX: on
stats-block-usecs: 0
sample-interval: 0
pkt-rate-low: 0
pkt-rate-high: 0

rx-usecs: 30
rx-frames: 50
rx-usecs-irq: 0
rx-frames-irq: 0

tx-usecs: 30
tx-frames: 50
tx-usecs-irq: 0
tx-frames-irq: 0

rx-usecs-low: 1
rx-frame-low: 1
tx-usecs-low: 1
tx-frame-low: 1

rx-usecs-high: 1023
rx-frame-high: 1023
tx-usecs-high: 1023
tx-frame-high: 1023

localhost:~ # _
```

b. Modify the interrupt aggregation parameter. Using **eth2** as an example, run the **ethtool –C eth2 rx-usecs 1 rx-frames 1 tx-usecs 1 tx-frames 1** command, as shown in **Figure 8-10**.

Figure 8-10 Modifying the interrupt aggregation parameter

```
localhost:~ # ethtool -C eth2 rx-usecs 1 rx-frames 1 tx-usecs 1 tx-frames 1
localhost:~ #
```

NOTE

To restore the interrupt aggregation parameter to the default value (using the result queried in the previous step as an example), run the **ethtool –C eth2 rx-usecs 30 rx-frames 50 tx-usecs 30 tx-frames 50** command.

3. Start the performance test.

8.3 Installing the LOM Driver

Procedure

Step 1 (Optional) Run the **ethtool -i** *<NIC_name>* command to view the driver version.

If **2.0** is displayed, perform the following steps to upgrade the LOM driver. If **21.2.1** is displayed, the driver is of the latest version and does not need to be upgraded.

Step 2 Obtain the driver package.

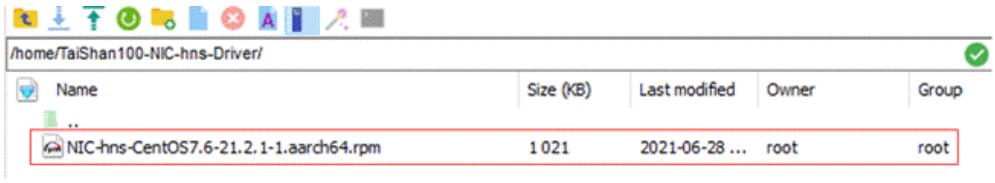
- For enterprise users: Visit **TaiShanServer iDriver 3.0.30.SPC100** to obtain the TaiShan 100 LOM driver package.
- For carriers: Contact the technical support personnel of your local Huawei office.

Step 3 Download the driver package.

For example, the compressed file for CentOS 7.6 is **TaiShanServer_iDriver_hns_21.2.1_CentOS7.6_aarch64.zip**. After downloading the file, decompress it to obtain **NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm**.

Step 4 In the home directory of the **root** user, run the **mkdir TaiShan100-NIC-hns-Driver** command to create a **TaiShan100-NIC-hns-Driver** directory.

Upload **NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm** to the **TaiShan100-NIC-hns-Driver** directory.



Step 5 Assign a permission on the **TaiShan100-NIC-hns-Driver** directory.

Run the **chmod -R 777 TaiShan100-NIC-hns-Driver** command.

```
[root@localhost home]# ls TaiShan100-NIC-hns-Driver/
NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm
[root@localhost home]# chmod -R 777 TaiShan100-NIC-hns-Driver/
[root@localhost home]# ls TaiShan100-NIC-hns-Driver/
NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm
[root@localhost home]#
```

Step 6 Install the driver.

Run the **rpm -ivh NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm** command.

NOTE

It is normal that the installation is suspended for a short period of time.

If the NIC driver has been installed and has not been uninstalled, a message is displayed indicating the existing driver. Uninstall it and retry the installation. For details, see **FAQ**.

```
[root@localhost home]# cd TaiShan100-NIC-hns-Driver/
[root@localhost TaiShan100-NIC-hns-Driver]# ls
NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm
[root@localhost TaiShan100-NIC-hns-Driver]# rpm -ivh NIC-hns-CentOS7.6-21.2.1-1.aarch64.rpm
准备中...                          ################################# [100%]
正在升级/安装...
   1:hns-21.2.1-1                  ################################# [100%]
Updating initramfs with dracut...
Successfully updated initramfs.
[root@localhost TaiShan100-NIC-hns-Driver]#
```

Step 7 After the installation is complete, run the **ethtool -i** *<NIC_name>* command again. If **21.2.1** is displayed, the upgrade is successful.

```
[root@localhost ~]# ethtool -i enahisic2i1
driver: hns
version: 21.2.1
firmware-version: N/A
expansion-rom-version:
bus-info: platform
supports-statistics: yes
supports-test: yes
supports-eeprom-access: no
supports-register-dump: yes
supports-priv-flags: no
[root@localhost ~]#
```

----End

FAQ

- How do I view system information?

  Run the **cat /etc/redhat-release** command.

  ```
  [root@localhost ~]# cat /etc/redhat-release
  CentOS Linux release 7.6.1810 (AltArch)
  [root@localhost ~]#
  ```

- How do I restart the network if the network connection fails?

  Run the **systemctl restart network.service** command.

- How do I uninstall the driver if the installation fails or is incomplete?

  Run the **rpm -qa | grep hns** command to view the driver information, and then run the **rpm -e** *<Queried_driver_information>* command to uninstall the driver.

  ```
  [root@localhost TaiShan100-NIC-hns-Driver]# rpm -qa |grep hns
  hns-21.2.1-1.aarch64
  [root@localhost TaiShan100-NIC-hns-Driver]# rpm -e hns-21.2.1-1.aarch64
  ```


9 Common Operations

9.1 Querying the IP Address of the Management Network Port

This section describes how to query the IP address of the iBMC management network port.

Methods

You can query the management network port IP address using any of the following methods:

- Default IP address
- BIOS
- iBMC CLI. Run the **ipmcget –d ipinfo** command to query the management network port IP address. For details, see **TaiShan Rack Server iBMC User Guide**.

Querying the Default IP Address

Table 9-1 lists the default IP address of the iBMC management network port.

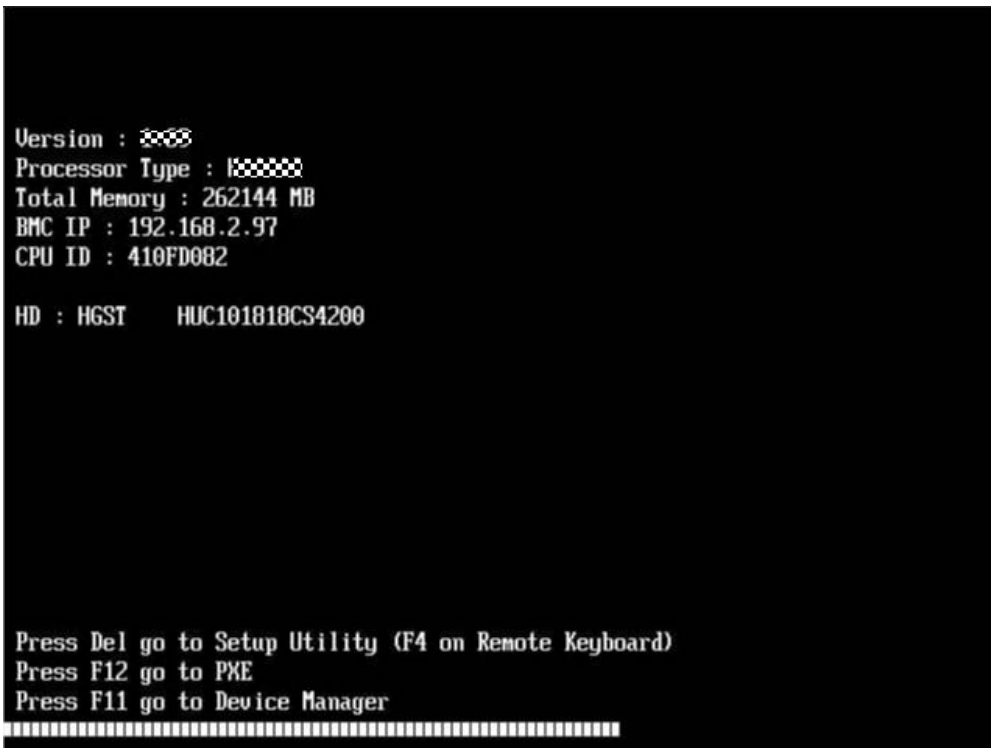
Table 9-1 Default IP address

Product	IP
TaiShan 2280	192.168.2.100

Querying the IP Address on the BIOS

1. Connect a mouse and a keyboard to the two USB ports on the server.
2. Use a VGA cable to connect a monitor to the VGA port on the server.
3. Restart the OS.
4. Press **Delete** repeatedly when the screen shown in the following figure is displayed during server startup.

Figure 9-1 BIOS boot screen



5. Enter the BIOS password as prompted. The screen for setting the BIOS is displayed.

NOTE

The default BIOS password is **Huawei12#$** for the French or American keyboard and is **Huawei12£$** for the English keyboard.

To ensure system security, you are advised to change the default BIOS password upon the first login. For details, see **5.6 Configuring the BIOS**.

9.2 Logging In to the iBMC WebUI

This section describes how to log in to the iBMC WebUI.

Scenarios

Log in to the iBMC WebUI by using a browser on the local PC. The following uses the PC running Windows 7 and Internet Explorer 8.0 as an example.

Impact on the System

This operation has no adverse impact on the system.

Conditions

Prerequisites

Ensure that the local PC meets the following networking conditions:

- The local PC is connected to the iBMC management network port on the server through a network cable.
- The IP addresses of the local PC and the iBMC management network port are on the same network segment.

Data

Table 9-2 lists the data required for the login.

Table 9-2 Data to be obtained

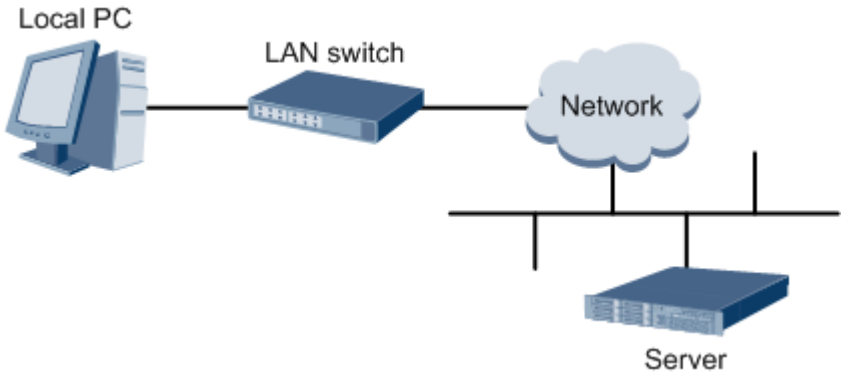
Category	Parameter	Description	Example
User login information	User name	User name for logging in to the iBMC WebUI	**root**
	Password	User password for logging in to the iBMC WebUI **NOTE** The default iBMC user name is **root**, which belongs to the administrator group. Its default password is **Huawei12#$**.	Huawei12#$
	IP address	IP address of the iBMC management network port on the server	192.168.2.100

Procedure

Step 1 Connect the local PC to the iBMC management network port on the server by using a crossover cable or twisted pair cable.

Figure 9-2 shows the networking diagram.

Figure 9-2 Networking diagram



Step 2 Open Internet Explorer on the local PC.

Step 3 In the address box, enter the iBMC address in the format of **https://***IP address of the iBMC management network port on the server* (for example, **https://*192.168.2.100***).

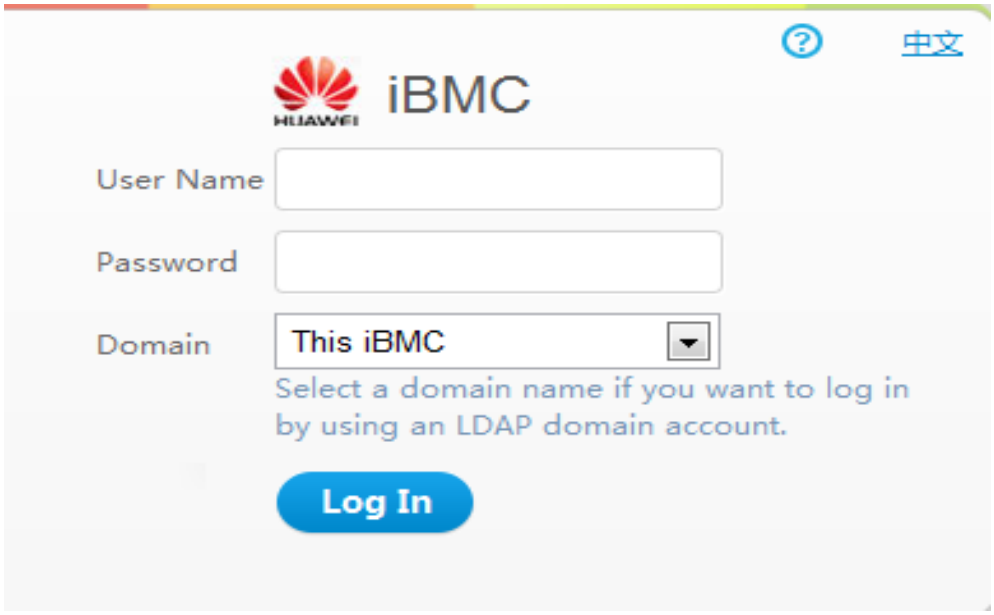
Step 4 Press **Enter**.

The iBMC login page is displayed, as shown in **Figure 9-3**.

NOTE

- If the message "There is a problem with this website's security certificate" is displayed, click **Continue to this website (not recommended)**.
- If the **Security Alert** dialog box is displayed indicating a certificate error, click **Yes**.

Figure 9-3 Logging in to the iBMC



Step 5 On the iBMC login page, enter the user name and password for logging in to the iBMC.

NOTE

The user account will be locked after five consecutive login failures with wrong passwords. If your user account is locked, log in again 5 minutes later.

Step 6 In the **Domain** drop-down list, select **This iBMC**.

Step 7 Click **Log In**.

The **Information Summary** page is displayed. The user name is displayed in the upper right corner of the page.

----End

9.3 Logging In to the iBMC CLI

This topic describes how to log in to the iBMC CLI.

Scenarios

You can log in to the iBMC CLI to manage and monitor the device.

There are different ways to access the CLI of the management software. Choose a way based on site requirements.

Prerequisites

Conditions

- The network port of the configuration terminal is properly connected to the management network port of the server using a network cable.
- The IP addresses of the two network ports are on the same network segment.

Data

- IP address of the iBMC management network port
- User name and password of the iBMC management network port

  The default iBMC user name is **root**, and the default password is **Huawei12#$**.

Procedure

Logging In over SSH

The SSH protocol is used to provide secure remote login and other network services on an insecure network.

NOTE

SSH is used by default to log in to the iBMC. If the SSH service is disabled, enable it by choosing **Config** > **Service Settings** on the iBMC web user interface (WebUI).

To log in to the CLI over SSH, perform the following operations:

- In Linux
  a. Connect the network port of the configuration terminal to the management network port of the server.
  b. Run the following command in the terminal tool to log in to the iBMC CLI:

     ssh *ipaddress*
- In Windows
  a. Download and install the client communications tool that supports SSH.
  b. Connect the network port of the configuration terminal to the management network port of the server.
  c. Enter the user name, password, and IP address of the management network port on the client communications tool to log in to the iBMC CLI.

Logging In over Telnet

Telnet is insecure and is disabled by default. To log in to iBMC over Telnet, enable the Telnet service by choosing **Config** > **Service Settings** on the iBMC WebUI.

To log in to the iBMC CLI over Telnet, perform the following operations:

- In Linux
  a. Connect the network port of the configuration terminal to the management network port of the server.
  b. Run the following command in the terminal tool to log in to the iBMC CLI:

     telnet *ipaddress*
- In Windows
  a. Connect the network port of the configuration terminal to the management network port of the server.
  b. Run the following command in the terminal tool to log in to the iBMC CLI:

     telnet *ipaddress*

9.4 Logging In to the Remote Virtual Console

This section describes how to log in to the server remote desktop over the iBMC WebUI.

Scenarios

Log in to the iBMC WebUI and open the Remote Virtual Console to monitor and operate the server.

Conditions

Prerequisites

The web browser and Java Runtime Environment (JRE) of the required versions have been installed on the local PC.

Ensure that the local PC meets the following networking conditions:

- The local PC is connected to the iBMC management network port on the server through a network cable.
- The IP addresses of the local PC and the iBMC management network port are on the same network segment.

Data

The following data must be available:

- IP address of the iBMC management network port
- iBMC user name and password

  By default, the user name is **root** and the password is **Huawei12#$**.

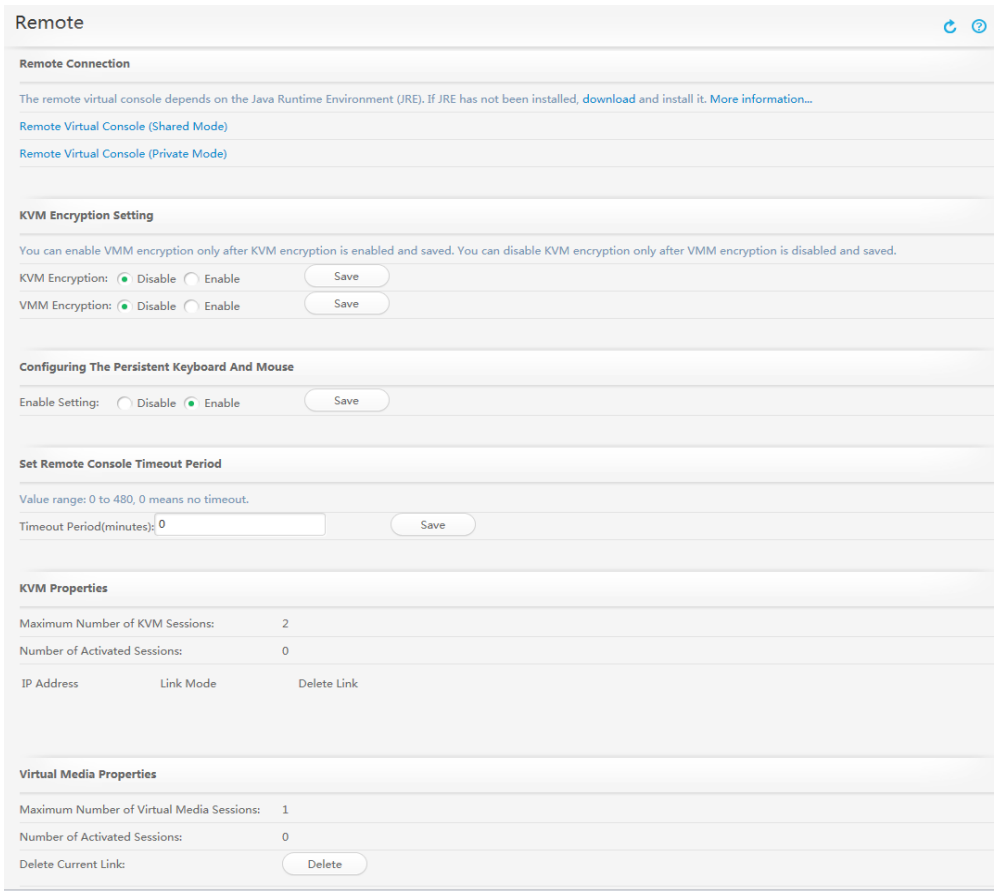
Procedure

Step 1 Log in to the iBMC WebUI.

For details, see **9.2 Logging In to the iBMC WebUI**.

Step 2 Choose **Remote**. The **Remote** page is displayed, as shown in **Figure 9-4**.

Figure 9-4 Remote page

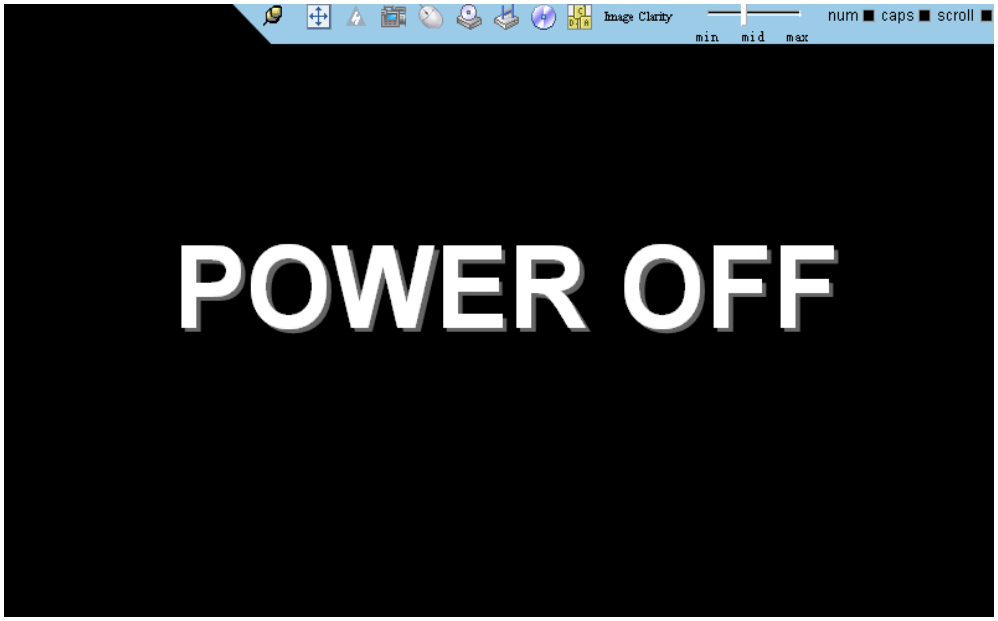


Step 3 Click **Remote Virtual Console**. The real-time operation console is displayed, as shown in **Figure 9-5**.

NOTE

- **Remote Virtual Console (Shared Mode)**: allows two users to access and manage the server at the same time. The two users can see the operations of each other.
- **Remote Virtual Console (Private Mode)**: allows only one user to access and manage the server at a time.

Figure 9-5 Real-time operation console



----End

10 More Information

10.1 Technical Support

Huawei provides timely and efficient technical support through:

- Local branch offices
- Secondary technical support system
- Telephone technical support
- Remote technical support
- Onsite technical support

Technical Support Website

Technical documents are available at:

- **Huawei Enterprise website**
- **Huawei Carrier website**

Self-Service Platform and Community

Learn more about servers and communicate with experts at:

- **Huawei Server Information Service Platform** for specific server product documentation.
- **Huawei Enterprise iKnow** for Q&A about products.
- **Huawei Enterprise Support Community (Servers)** for learning and discussion.

Bulletins

For notices about product life cycles, warnings, and rectifications, visit **Product Bulletins**.

Cases

To learn server applications, visit **Computing Product Case Library**.

Contact Huawei

Huawei provides comprehensive technical support and services. To obtain assistance, contact Huawei technical support as follows:

- Contact Huawei customer service center.

  Enterprise customers in China:

  – Call 400-822-9999

  – Send emails to **support_e@huawei.com**.

  Enterprise customers outside China: visit **Global Enterprise Service Hotline**.

  Telecom carriers in China:

  – Call 400-830-2118

  – Send emails to **support@huawei.com**.

  Telecom carriers outside China: visit **Global Carrier Service Hotline**.
- Contact the technical support of your local Huawei office.

10.2 Maintenance Tools

Table 10-1 Maintenance tools

Resource	Description	How to Obtain
FusionServer Tools SmartKit	SmartKit contains tools used for batch deployment, maintenance, and upgrade of servers. • Enterprise users: Refer to **SmartKit Computing User Guide**. • Carrier users: Refer to **SmartKit Computing User Guide**.	• Enterprise users: Download it from **FusionServer Tools**. • Carrier users: Contact the technical support of your local Huawei office.
FusionDirector	FusionDirector is the management software for intelligent O&M over the entire server lifecycle. It provides intelligent functions to manage deployment, assets, versions, faults, and energy efficiency. Enterprise users: Refer to **FusionDirector Specifications List**.	• Enterprise users: Download it from **FusionDirector**. • Carrier users: Contact the technical support of your local Huawei office.
Computing Product Compatibility Checker	A tool used to query the OSs, parts, and peripherals compatible with a server.	Click **Computing Product Compatibility Checker**.

Resource	Description	How to Obtain
Computing Product Power Calculator	A tool used to calculate server power consumption based on the server configuration.	Click **Intelligent Computing Product Power Calculator**.
Computing Product Memory Configuration Assistant	Shows the DIMM installation sequence in a graphical manner after the product name, CPU quantity, and DIMM quantity are specified.	Click **Computing Product Memory Configuration Assistant**.

A Appendixes

This chapter describes the terms, acronyms, and abbreviations involved in this document.

A.1 Glossary

This topic defines the terms mentioned in this document.

BMC	Baseboard management controller The BMC complies with the Intelligent Platform Management Interface (IPMI) standard, responsible for collecting, processing, and storing sensor signals, and monitoring the operating status of each component. The BMC provides the hardware status and alarm information about the managed objects for the management module, so that the management module can manage the objects.
ejector lever	An item or part on the panel, used to insert or remove a blade in or out of a slot.
Ethernet	A baseband local area network (LAN) architecture developed by Xerox Corporation in cooperation with DEC and Intel. Ethernet uses Carrier Sense Multiple Access/Collision Detection (CSMA/CD) and supports a data transfer rate of 10 Mbit/s on multiple cables. The Ethernet specification is the basis for the IEEE 802.3 standard.
hot swap	In a running system, insertion or removal of a blade or component does not affect normal running of the system.
KVM	Keyboard, video, and mouse A switch that provides a public video, keyboard and mouse for all server blades.
mezzanine module	A card connected to the mainboard through the connector, level to the mainboard. It is used on a device which has high requirement for space usage.
P	A unit of power. 1 P = 0.735 kW

panel	The front-most element of a server, perpendicular to the PCB, which serves to mount connectors, indicators, controls and mezzanines, and also seals the front of the subrack for airflow and electromagnetic compatibility (EMC).
PCIe	A high-speed serial computer expansion bus standard designed to replace the older PCI, PCI-X, and AGP bus standards. PCIe has numerous improvements over the aforementioned bus standards, including higher maximum system bus throughput, lower I/O pin count and smaller physical footprint, better performance-scaling for bus devices, a more detailed error detection and reporting mechanism (Advanced Error Reporting), and native hot-plug functionality. More recent revisions of the PCIe standard support hardware I/O virtualization.
RAID	Redundant array of independent disks A storage technology that combines multiple hard disks into a logical unit in several ways called "RAID levels", providing high storage and redundancy performance.
redundancy	The ability of a system to keep functioning normally in the event of a device failure by having a backup device automatically replace the faulty one.
SEL	System event log A non-volatile storage area and associated interfaces for storing system platform events for later retrieval.
server	A special computer that provides various services for clients over a network.
U	A unit defined in International Electrotechnical Commission (IEC) 60297-1 to measure the height of a cabinet, chassis, or subrack. 1 U = 44.45 mm = 1.75 in.

A.2 Acronyms and Abbreviations

This section describes the acronyms and abbreviations that may be involved in this document.

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

BIOS	basic input/output system
BMC	baseboard management controller
C	
CD	calendar day
CE	Conformite Europende
CIM	common information model
CLI	Command-Line Interface
D	
DC	direct current
DDR4	double data rate 4
DDDC	double device data correction
DEMT	dynamic energy management technology
DIMM	dual in-line memory module
DRAM	dynamic random-access memory
DVD	digital video disc
E	
ECC	error checking and correcting
ECMA	European Computer Manufacturer Association
EDB	execute disable bit
EN	European Efficiency
ERP	enterprise resource planning
ETS	European Telecommunication Standards
F	
FB-DIMM	fully buffered DIMM
FC	fibre channel
FCC	Federal Communications Commission
FCoE	Fibre Channel Over Ethernet
FTP	File Transfer Protocol
G	

GE	Gigabit Ethernet
GPIO	general purpose input/output
GPU	graphics processing unit
H	
HA	high availability
HDD	hard disk drive
HPC	high-performance computing
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
I	
IC	Industry Canada
ICMP	Internet Control Message Protocol
IDC	Internet data center
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Message Protocol
iBMC	integrated baseboard management controller
IOPS	input/output operations per second
IP	Internet Protocol
IPC	intelligent power capability
IPMB	intelligent platform management bus
IPMI	intelligent platform management interface
K	
KVM	keyboard, video, and mouse
L	
LC	Lucent connector
LDIMM	local dual in-line memory module
LED	light emitting diode
LOM	LAN on motherboard

M	
MAC	media access control
N	
NBD	next business day
NC-SI	network controller sideband interface
MMC	module management controller
P	
PCIe	Peripheral Component Interconnect Express
PDU	power distribution unit
PHY	physical layer
PMBUS	power management bus
POK	Power OK
PWM	pulse-width modulation
PXE	pre-boot execution environment
Q	
QPI	QuickPath interconnect
R	
RAID	redundant array of independent disks
RAS	reliability, availability, and serviceability
RDIMM	registered dual in-line memory module
REACH	Registration Evaluation and Authorization of Chemicals
RJ45	Registered Jack 45
RoHS	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
S	
SAS	Serial Attached Small Computer System Interface
SATA	serial advanced technology attachment
SCM	supply chain management
SDDC	single device data correction

SERDES	serializer/deserializer
SGMII	Serial Gigabit Media Independent Interface
SMI	Serial Management Interface
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SOL	Serial Over LAN
SONCAP	Standards Organization of Nigeria-Conformity Assessment Program
SSD	solid-state drive
SSE	streaming SIMD extension
T	
TACH	tachometer signal
TBT	Turbo Boost Technology
TCG	trusted computing group
TCO	total cost of ownership
TDP	thermal design power
TELNET	Telecommunication Network Protocol
TET	Trusted Execution Technology
TFTP	trivial file transfer protocol
TOE	TCP offload engine
U	
UDIMM	unbuffered dual in-line memory module
UEFI	Unified Extensible Firmware Interface
UID	unit identification light
UL	Underwriter Laboratories Inc.
USB	universal serial bus
V	
VCCI	Voluntary Control Council for Interference by Information Technology Equipment
VGA	video graphics array
VLAN	virtual local area network

VRD	voltage regulator-down
W	
WEEE	waste electrical and electronic equipment
WSMAN	web service management

